FT-113Fill

Filling and Packing Controller

User Manual

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1. SAFETY INSTRUCTIONS

CAUTION: READ this manual BEFORE operating or servicing this equipment. FOLLOW these instructions carefully. SAVE this manual for future reference. DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment. ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL Flintec for parts, information, and service.

WARNING: Only permit qualified personnel to service this equipment. Exercise care when making checks, tests and adjustments that must be made with power on. Failing to observe these precautions can result in bodily harm.

WARNING: For continued protection against shock hazard connect to properly grounded outlet only. Do not remove the ground prong.

WARNING: Disconnect all power to this unit before removing the fuse or servicing.

WARNING: Before connecting/disconnecting any internal electronic components or interconnecting wiring between electronic equipment always remove power and wait at least thirty (30) seconds before any connections or disconnections are made. Failure to observe these precautions could result in damage to or destruction of the equipment or bodily harm.

CAUTION: Observe precautions for handling electrostatic sensitive devices.

2. INTRODUCTION

2.1 Overview

FT-113Fill filling and packing controller is economic and smart instrument for automatic gravimetric filling machines like liquid filling, bagging machines etc. Its specific filling algorithm, custom / application specific Recipe build feature, 250 Recipe record size memory, smart filling functions and master – slave operation gives big advantage in use.

The filling and packing machines equipped with FT-113Fill controller can be used in all kinds of industrial areas up to wet and hygienic environments with its fast and efficient cleaning build to the international guidelines.

2.2 Variants

This panel type controller may have various variants regarding analogue or digital load cell connection, the location of digital I/O's and industrial interfacings. The basic instrument variants are regarding the load cell type, digital I/O terminals, and fieldbus options.

The variants of load cell type and digital I/O hardware

	Analogue load cell	Digital load cell	With internal digital I/O board	Without internal I/O board	Order includes RIO16 digital I/O unit
FT-113Fill A	Yes	-	Yes	-	-
FT-113Fill N	Yes	-	-	Yes	-
FT-113Fill R	Yes	-	-	Yes	Yes
FT-113(D)Fill A	-	Yes	Yes	-	-
FT-113(D)Fill N	-	Yes	-	Yes	-
FT-113(D)Fill R	-	Yes	-	Yes	Yes

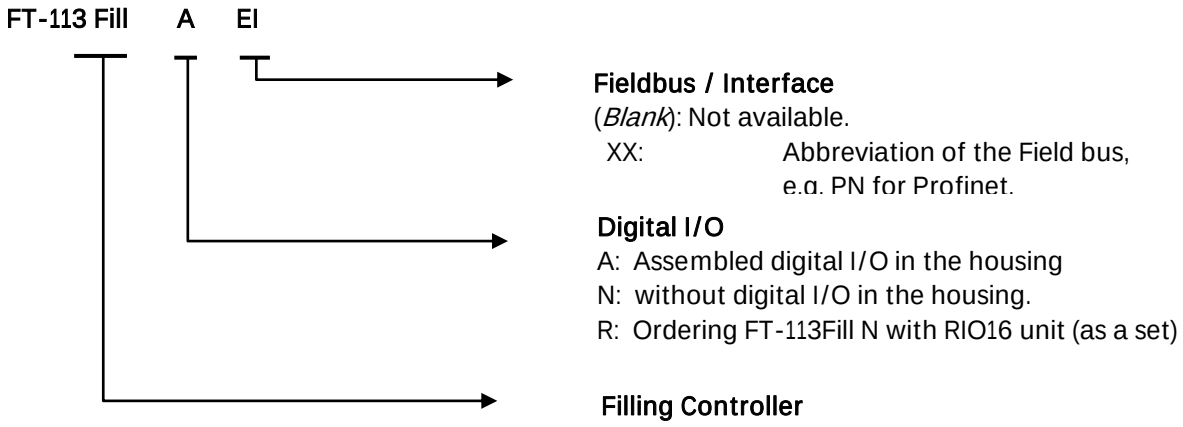
As you will find easily from variant coding, the "D" letter after FT-113 model name defines the digital load cell interfacing instead of analogue load cell. The letters at the end of the basic instrument name defines the digital I/O connection type:
"A" defines the digital I/O board is assembled in the housing,
"N" defines the instrument has neither digital I/O in the housing nor external digital I/O unit RIO16,
"R" defines ordering the FT-113Fill N instrument together with RIO16 digital I/O unit as a set.

Peripheral interfacings codes are located at the end of the instrument model name as shown below.

	FT-113(D)Fill A	FT-113(D)Fill A PB	FT-113(D)Fill A PN	FT-113(D)Fill A CO	FT-113(D)Fill A EI	FT-113(D)Fill A EC	FT-113(D)Fill A CC	FT-113(D)Fill A PL	FT-113(D)Fill A IE
Serial interface RS 232C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial interface RS 485	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial interface RS 422	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Profibus DPV1 interface	-	Yes	-	-	-	-	-	-	-
CANopen interface	-	-	-	Yes	-	-	-	-	-
CC-Link interface	-	-	-	-	-	-	Yes	-	-
Profinet interface	-	-	Yes	-	-	-	-	-	-
Ethernet interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EtherNet/IP interface	-	-	-	-	Yes	-	-	-	-
EtherCAT interface	-	-	-	-	-	Yes	-	-	-
Powerlink interface	-	-	-	-	-	-	-	Yes	-
CC-Link IE Field	-	-	-	-	-	-	-	-	Yes
Modbus RTU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Modbus TCP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

***Note:**. Only the industrial interfaces of FT-113Fill A are shown in the table. For ordering any other variant you may place N or R instead of A.*

The ordering code of the Filling controller defines all data on the instrument.



For example, the ordering code of FT-113Fill with analogue load cell input, with Profinet interface and together with the DIN rail mount digital I/O unit RIO16 is **FT-113Fill R PN**.

2.3 Specifications

Specifications	
Analogue Load cell	
A/D converter type	24-bit Delta-Sigma ratio metric with integral analog and digital filters
Conversion rate	Up to 1600 measurement values per second
Input sensitivity	0.4 µV/e approved; 0.05 µV/d non approved.
Analog input range	-5 mV to +19 mV approved (up to -125 mV to +125 mV automatic range, non-approved)
Internal resolution	up to 16 000 000
Excitation	5 VDC max. 150 mA
Number of load cells	Up to 8 load cells 350 Ω or 25 load cells 1100 Ω.
Connection	4- or 6-wire technique. Home run cable length: maximum 1000 m/mm² for 6-wire connection between FT-113Fill and junction box.
Scale	
Range	Single range, up to 3 x multi-intervals, up to 3 x multi ranges.
Display resolution	**FT-113Fill** Approved up to 10 000 division, according to EN45501 and OIML R76. Up to 300 000 division at industrial use.
Platform / Scale	**FT-113Fill** Platforms /scales constructed with analogue strain-gage based load cells.
Calibration and Functions	
Calibration	Calibration with test weights, eCal-electronic calibration without test weights, Temporary zero calibration, Zero adjustment, Gain adjustment, Coefficient entry.
Digital filter	7 steps programmable adaptive filter
Dynamic filter	Programmable dynamic filter
Weighing functions	Taring, zeroing, auto zero tracking, motion detection, auto zero at power up, increased resolution, automatic tare and clear, temporary gross indication, unit change.
Filling modes	OPEN : Open container filling. BUNG : Bung- type container filling. BOTT : Filling from bottom of the container with lance control. PACK : Packing machine. BAG : Bag filling. BIG : Big bag filling. VENT : Valve bag filling. 1BAG : Bagging machine with one weighing hopper. nBAG : Bagging machine with up to 16 weighing hoppers. nPAC : Packing machine with up to 16 weighing hoppers. TANK : Charging material to the tank and then filling container from tank. WOUT : Weigh in – Weigh out.

Memory		
Application memories		Each 250 records size two memories for Recipe and ID
Alibi memory (optional)		19 999 records
Communication		
Connectable with		PC, PLC, Printer, Remote display, EPL printer etc.
RS 232	Isolation	Galvanically isolated.
	Baud rate	1200 to 57600 programmable
	Data	Length 7 or 8 bits; parity even, odd or none
RS 485	Isolation	Galvanically isolated.
	Baud rate	1200 to 57600 programmable
	Data	Length 7 or 8 bits; parity even, odd or none
	Stations	Up to 31 stations
RS 422	Connection	Reserved to interface with external digital I/O unit, RIO16.
	Description	Up to 4 pcs RIO16 unit can be connected to FT-113 instruments, if the customized filling mode software supports Important note: Do not use this port if there is in-house digital I/O board.
Ethernet TCP/IP	Transmission rate	10 / 100 Mbit/s, Full duplex
	TCP/IP settings	Manual IP assign over EtherX PC Software or by keys in progr mode.
	Connection method	Server or Client
	Installation	Switched Ethernet transmission with shielded twisted pair cables and RJ-45.
	Isolation	Galvanically isolated bus electronics
	Response speed	Up to 4 ms response delay after read/write commands
USB	Connection	Standard USB Micro-B cable
	Response speed	Min. 4 ms response delay after read/write commands

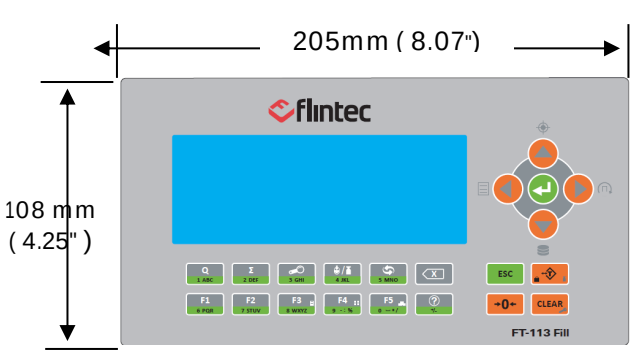
Digital Inputs and Outputs	
Digital Inputs	Opto-isolated 12 digital inputs, 12 to 28 VDC, 10mA. Selectable input(s) can be used as a Remote input of your PLC over BSI or Modbus.
Digital Outputs	Opto-isolated 14 transistor outputs, 12 to 28 VDC, 0.1A. Short circuit protected. Selectable output(s) can be used as a Remote output of your PLC over BSI or Modbus.
Analogue Output for feeding speed control (optional)	
Voltage output	0-10 V
Current output	0-20mA
Resolution	60 000 steps
Max. cable length	300 meters
Max. load resistance (Current output)	500 Ω
Minimum load resistance (Voltage output)	10 kΩ
Profibus DPV1 (optional)	
Data rate	Up to 12000 kbit/s with automatic baud rate detection
GSD file	Generic GSD-file provided
Topology	Depending on physical media RS-485: segmented line topology without stubs
Installations	Shielded twisted pair cable. Line length depending on physical media and transmission speed
Max. Stations	up to 126 stations per network
Isolation	Galvanically isolated bus electronics
Response speed	Min. 4 ms response delay after read/write commands
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.
Profinet (optional)	
Data rate	100 Mbit/s, full duplex
GSDML file	Generic GSDML-file provided
TCP/IP settings	DHCP or manual IP are assigned over EtherX PC Software or by keys in programming mode. Device identity customization
Topology	Line, Bus, Star or Tree topology depending on physical media
Installation	Switched Ethernet transmission with shielded twisted pair cables and RJ-45 connectors.
Web client	Available
Isolation	Galvanically isolated bus electronics
Response speed	Min. 4 ms response delay after read/write commands
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.

CANopen (optional)	
Data rate	10 kbit/s – 1 Mbit/s (selectable) kbit/s
EDS file	Generic EDS-file provided
Topology	Line with Trunkline, Dropline structure and Termination at both Ends Line length depending on baud rate 25 – 500 meters.
Installation	2 wire shielded twisted pair cable Alternatively, 4 wire with 24 Volt power over the bus
Max. Stations	Up to 127 stations per network
Isolation	Galvanically isolated bus electronics
Response speed	Min. 4 ms response delay after read/write commands
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.
EtherNet/IP (optional)	
Data rate	10 Mbit/s or 100 Mbit/s, full duplex
EDS file	Generic EDS-file provided
DLR (Device Level Ring)	Available
TCP/IP settings	DHCP or manual IP assign over EtherX PC Software or by keys in programming mode.Device identity customization
Topology	Line, Bus, Star or Tree topology depending on physical media
Installation	Switched Ethernet transmission with shielded twisted pair cables and RJ-45 connectors.
Web client	Available
Isolation	Galvanically isolated bus electronics
Response speed	Up to 4 ms. response delay after read/write commands.
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.
EtherCAT (optional)	
Data rate	100 Mbit/s, full duplex
ESI file	Generic ESI-file provided
Topology	Line, Tree, Star or Daisy-chain topology depending on physical media
Installation	Switched Ethernet transmission with shielded twisted pair cables and RJ-45 connectors.
Isolation	Galvanically isolated bus electronics
Response speed	Up to 4 ms. response delay after read/write commands.
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.

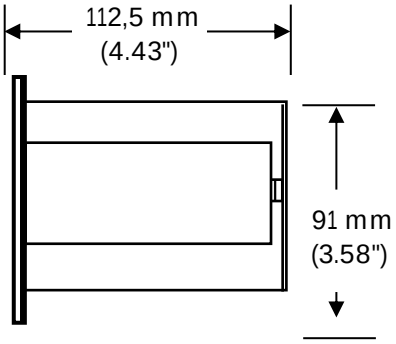
CC-Link (optional)	
Data rate	156 kbit/s – 10 Mbit/s (selectable)
Topology	Line with Trunkline, Branch structure and Termination at both Ends.
Installation	3 wires shielded twisted pair cable.
Max. Stations	Up to 64 stations per network
Isolation	Galvanically isolated bus electronics
Response speed	Up to 4 ms. response delay after read/write commands
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.
Powerlink (optional)	
Compatibility	Supports Ethernet POWERLINK V2.0 Communication Profile Specification version 1.2.0
Data rate	100 Mbit/s, half duplex
XDD file	XDD-file provided
Ring redundancy	Available
Topology	100% free choice of star, tree, ring or daisy chain
Installation	Switched Ethernet transmission with shielded twisted pair cables and RJ-45 connectors.
Isolation	Galvanically isolated bus electronics
Response speed	Min. 4 ms response delay after read/write commands
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.
CC-Link IE Field (optional)	
Data rate	1 Gbit/s Baud Rate
CSP+ file	Generic CSP+ file provided
Topology	Line, Star, Line/Star mixture or Ring topology depending on physical media
Installation	IEEE802.3 1000Base-T cable, ANSI/TIA/EIA-568-B (Category 5e) compliant 4-pair balanced-type shield cable, Double-shield type is recommended.
Max. number of networks	Up to 239
Number of connected nodes per network	Master station=1, Slave station= 120
Isolation	Galvanically isolated bus electronics
Response speed	Up to 4 ms. response delay after read/write commands.
Remote IO	Selectable digital inputs and outputs of the instrument can be programmed independently as a Remote IO's of PLC to control them over fieldbus.
Power Consumption	
	FT-113Fill 12 – 28 VDC; 250 mA + max. 500 mA for fieldbus interfacing

Environment and Enclosure:		
Operation temp. range	Approved scales -10 °C to +40 °C Industrial use -15 °C to +55 °C	
Humidity	80% RH max, non-condensing	
Enclosure	Stainless steel front panel and rear panel, aluminum body.	
Protection	Front panel IP67	
Panel cut size	186 x 92 mm	(7.32 x 3.62")
Sizes (W x H x D)	205 x 108 x 113 mm	(8.07 x 4.25 x 4.43")
Weight	1,4 kg	(3,07 lb)
Packing sizes (WxHxD)	273 x 190 x 153 mm	(10,75 x 7,48 x 6,02")
Weight Packed	2,5 kg	(5,51 lb)

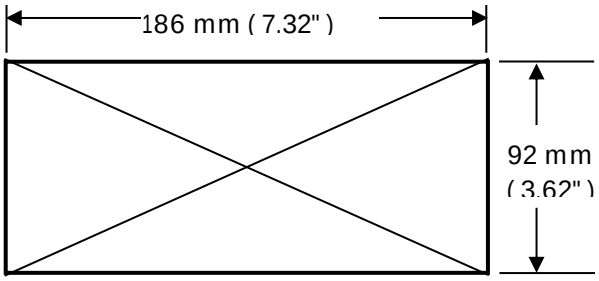
2.4 Housing



Front view

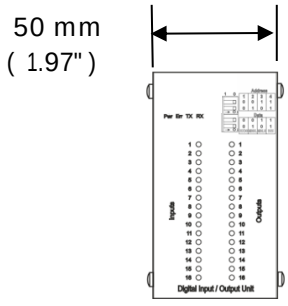


Side view

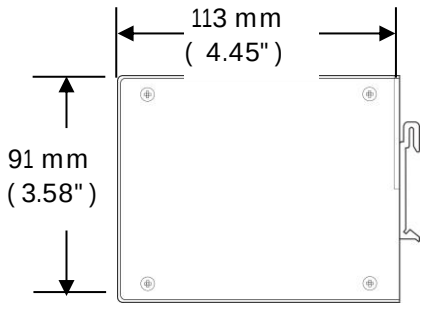


Panel cut sizes

RIO16



Front view



Side view

3. TERMINOLOGY

Recipe related terminology in this manual is described in this section for easy understanding.

Term	Definition
Recipe	The recipe is the group of filling specific values like target, feeding cutoff values etc. to fill the product fast and in high accuracy. Every recipe may have a name.
Recipe name	The name of the recipe which will be indicated on the display and on the printout, which can have max. 16 digits alpha numeric.
Recipe code	Recipe number which defines the location of the recipe in the recipe memory.
Recipe build	The basic elements of the recipe are target and feeding cut-off values. You may expand your recipe content for dissimilar products or containers, e.g., fine feed cut-off adjustment ratio. Setting the recipe content is called a Recipe build. Refer to **section 9.5**
Target	Target is the nominal material weight which is written on the package. Target is basic element of the recipe.
Overfill	Overfill is the weight of the additional material which will be filled into the pack against under filling or to shift statistical values - like mean value - to adhere to strict packing regulatory requirements. Default is 0. Overfill might be positive and negative to increase or decrease the target at filling. Refer to **parameter** 419.
Filling weight	Due to the market surveillance reasons, required overfilling entry is available without changing the target. The filling weight is the material weight which will be filled into the package. Filling Weight = Target ± Overfill Overfill value can be entered positive or negative.
Batch Quantity	The specified number of fillings is the batch quantity. The batch quantity is entered in the recipe or via programmed **F1** key. Refer to **parameter** 41A.
Batch Total	Batch total is a specified total material weight which will be filled. Batch total weight is entered in the recipe or via programmed **F2** key. Refer to **parameter** 41A.
Bulk weight	Bulk weight specifies total material weight which is transferred accurately via filling machine. The filled weights are totalized to transfer the bulk weight accurately. Refer to **parameter** 41A.

Tolerance	Tolerance checking is done against the Target weight or Filling weight. In tolerance checking with Target weight: Target – Tol < In tolerance filling < Target + Tol In tolerance checking with Filling weight: F.Weight – Tol < In tolerance filling < F.Weight + Tol Refer to **parameter 412**
Coarse	Coarse feed in value defines the coarse feeding cut-off which is basic element of the recipe. Coarse cut off = (Target ± Overfill) – Coarse Coarse cut off = Filling weight – Coarse Refer to **parameters 315, 371 and 406**.
Medium	Medium feed in value defines the medium feeding cut-off. Medium cut off = Filling weight - Medium Refer to **parameters 315, 371 and 407**.
Fine	Fine feed in value defines the fine feeding cut-off which is basic element of the recipe. Fine cut off = Filling weight - Fine Refer to **parameters 315, 371 and 408**.

4. THE FRONT VIEW AND KEY FUNCTIONS

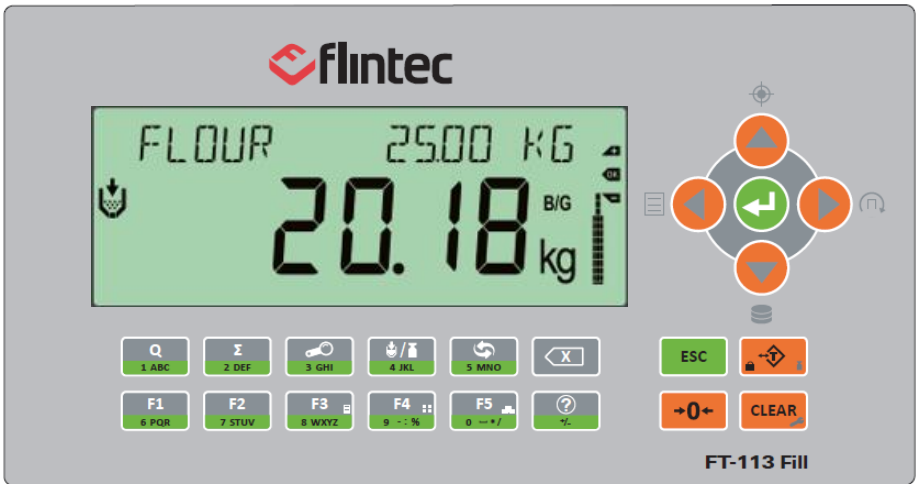
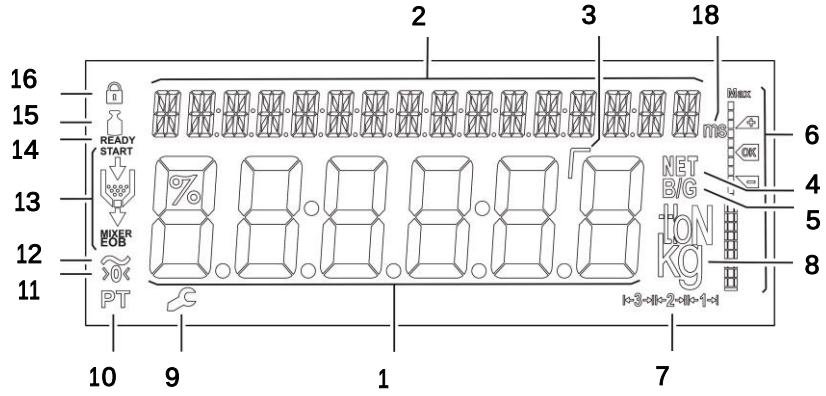


Figure 4.1 – Front view of FT-113Fill

4.1 Display

The colorful bright and wide-angle LCD display of the FT-113 is shown below.



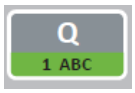
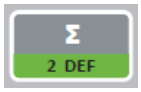
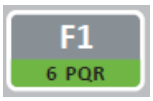
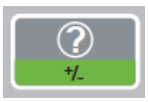
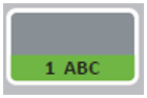
The meanings of the announcement symbols on the display are:

1	8	6-digit 22 mm height big weight display with sign
2		16-digit 8 mm height alphanumeric information display
3	⌜	High resolution digit separator.
4	NET	Announces the indicated value is the net weight.
5	B/G	Announces the indicated value is the gross weight.
6		Bar graph
7	⊢3⊣⊢2⊣⊢1⊣	Indicates the range of the scale at multi range and multi-interval operations.

8	kg	g, kg, t, lb or klb units are located on the right of the display.
9		Announces the instrument is at repair status or call service.
10	PT	Announces the scale is preset tarred by entering the specific value or calculated the average tare.
11		Announces the weight value is in the center of zero range.
12		Announces the weighing is not stabile. After stabilization of the weighing, this symbol disappears.
13		Announces the process steps feeding, full, discharge etc.
14	Ready	Announces the instrument is ready to start filling.
15		Announces the instrument is at basic weighing.
16		Announces the keys are locked.

4.2 Key Functions

	**Target.** Press this key to enter the target, overfill and tolerance values.	*Page 99, 100, 100*
	**Feeding Cutoff entries.** The cutoff values for coarse, medium and fine feedings are entered after pressing this key sequentially.	*Page 17, 100.*
	**Recipe.** This key is used to enter to all Recipe data.	*Page 16 99,101.*
	**Memory.** Press this key to record the Recipes and ID's into the memory or recall them for use.	*Page 102*
	**Navigation keys** These keys are used to navigate in the memories, entries, and programming. The meanings of the navigation keys are Previous parameter. Next digit or parameter. Increase or next block. Decrease or previous block. Enter the parameter to enter data. Save the data after entry. Go to the next parameter.	*Page 124*
	**Enter.** Save the data and go to the next step. **Print.** Press this key to transfer weight data to the printer or to PC (only at weighing mode).	*Page 121*

	**Escape** Press this key to exit from any entry or from any block at programming.	
	**Quantity.** This key is used to follow the erasable total quantity.	*Page 124, 152*
	**Total.** This key is used to follow the erasable total weight.	*Page 124, 152*
	**High resolution.** Press this key to indicate the load weight 10 times higher resolution (default). If you do not need to display the load in high resolution, you may set this key for another function (**parameter** 351).	*Page 148, 161*
	**Weighing mode.** This key is used to switch to use the instrument in basic weighing. Press second time for return to filling mode. The instrument should be in filling mode for automatic filling described in this manual.	*Page 34, 35*
	**Unit change.** This key is used to change the unit to display and for printout (default). If you do not need to switch between units, you may set this key for another function (**parameter** 352)	*Page 35, 148*
	**Programmable function keys.** These keys are used for various filling related functions like average filling, last filling, statistical results etc.	*Page 38, 150*
	**Help.** This key is used to indicate functions of F1, F2, F3, F4 and F5 keys and other programmable keys.	*Page 37*
	**Tare.** Press this key to tare the scale at basic weighing mode.	*Page 34, 36, 92, 151,*
	**Zeroing.** If the unloaded scale does not show zero at gross operation, press this key to compensate zero drift at basic weighing mode or at ready status.	*Page 34, 153,161,*
	**Clear.** Clears the tare and indication returns to the gross value.	*Page 34*
	**Alphanumeric keys.** Alphanumeric data entries are done with these keys.	
	**Delete.** Deletes last entered digit. Press more than 2 seconds to clear the data on the display at data entry.	

5. INSTALLATION

***PRECAUTION**: Read this section carefully before installation the instrument. Applying the recommendations in this section will increase your system reliability, accuracy, and its long-term performance.*

5.1 Recommendations

5.1.1 Environment

The filling controller should be placed in an area which is clean, not getting direct sun light if possible, having a temperature between -15 ºC and +55 ºC and humidity not exceeding 80% non-condensing. All external cables should be installed safely to avoid mechanical damages.

This instrument is very low-level signal measuring instrument. To avoid electrical noise, it should be separated from equipment that produces electrical noise. The instrument body must be connected to the good ground against the electromagnetic disturbances. Load cell cable must be separated from other cables especially from power cables if possible. If there are electrical noise-generating equipment such as heavy load switches, motor control equipment, inductive loads etc., please pay attention against the EMC interference and take all the prevention. Connect parallel reverse diodes to the DC inductive loads like relays, solenoids etc. to minimize voltage peaks on the DC power lines.

5.1.2 Mechanical Installation Recommendations

This panel type controller is designed to mount on to the panel of the control cabinet.

- Use the metal cabinet to attenuate electrical disturbances.
- Install control motors, relays which has high contact current, solenoids etc. in a separate section of the cabinet.
- Protect the cabinet from mechanical impacts and vibration.

Cut the space for the instrument.

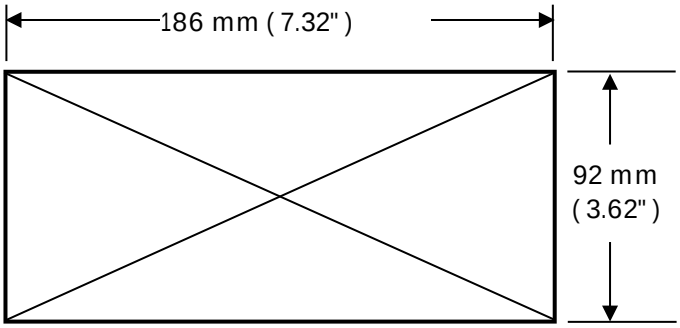


Figure 5.1- Panel cut sizes of FT-113

5.1.3 Cabling Recommendations

- All cables coming to the instrument shall be high quality and shielded.
- Distance from load cell cables, interface cables and DC power supply cables to power line cables shall be minimum 30 cm. The separate cable tray use for these low signal level cables is strongly recommended.
- Shields of all cables should be connected to the grounding screws under terminals as shown at the picture below.

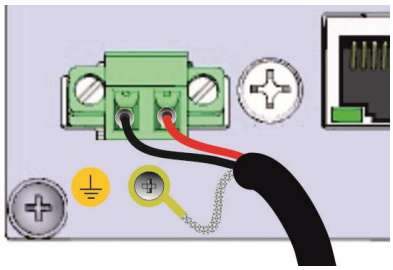


Figure 5.2– The shield connection to the protective earth.

5.1.4 Electrical Connection Recommendations

- Always remember that FT-113Filling controller is very low voltage measuring instrument in the industrial environment. Your proper installation increases the reliability and performance of the instrument.
- The trained person should interfere the instrument against malfunction at installation.
- If the energy condition of your plant is bad, prepare a special power line for DC power supply in the cabinet.
- The quality of your plant grounding will provide weighing accuracy and the safety of your controller. If grounding of your plant is bad, prepare a special grounding.
- Powered off the instrument before connecting or disconnecting any peripheral instrument.
- The shielded cable and ground connection of the shield will increase the immunity against electrical disturbances.
- Shields of all cables must connect to the ground screws rear the instrument as indicated in the Figure 5.3 (recommended).
- All required electrical connections should be done as described in the installation section.
- Reverse diodes should be connected to all inductive components in the cabinet to minimize electrical disturbances.
- If service of the controller is needed, turn the power off and wait at least 30 seconds before opening housing to interfere it.

Location of the Peripheral Connections

The electrical terminals are located on the rear of the instrument.

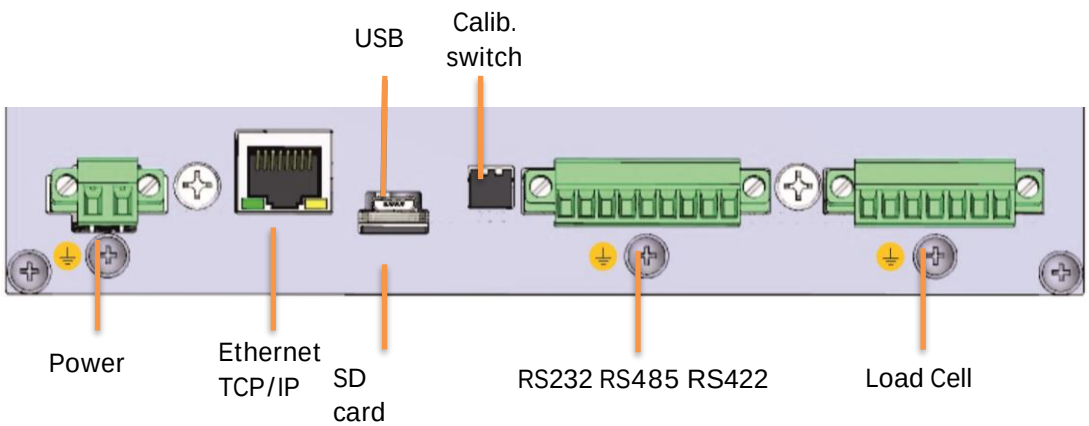


Figure 5.3 – The rear view of the instrument and terminal names.

5.2 Installation

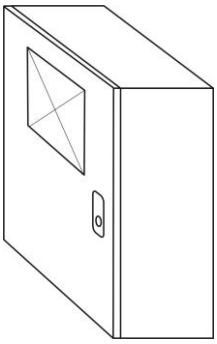
Follow the steps below carefully to install the instrument.

Step 1: Preliminary Preparations

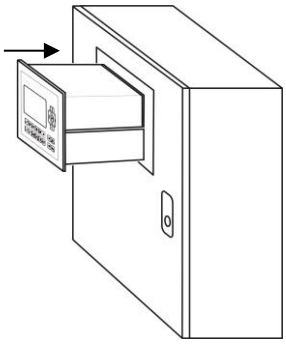
Before starting the installation,

1. Prepare the filling controller location on the cabinet front. Refer to recommendations in the previous section.
2. Prepare the Protective Earth (PE) cable to grounding the FT-113Fill housing and cabinet. The protective earth should be as good as possible for system reliability.
3. Use high quality and EMC certified DC power source in the cabinet.
4. Follow the requirements on cabling. Refer to page 21.

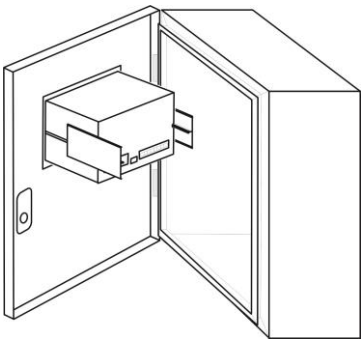
Step 2: Mechanical Installation



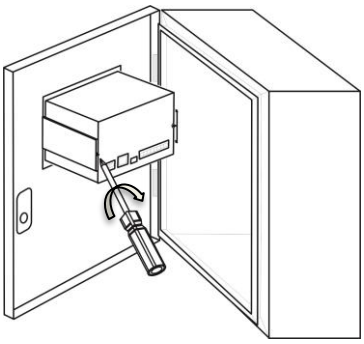
Cut a space to install the instrument. Refer to Figure 5.1 for panel cut sizes.



Insert the instrument into space after placing the waterproof sealing rubber behind the panel of FT-113 weighing instrument.



Place holder parts of the instrument to the both side of the instrument.

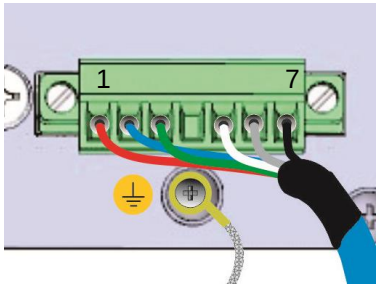


Use 2 pcs M4 screws to mount the instrument to the panel after alignment it.

Step 3: Analogue Load Cell Connection

To avoid damages, the load cell wiring should be made carefully before energizing the instrument. Load cell connection schematics are in Figure 6.4.

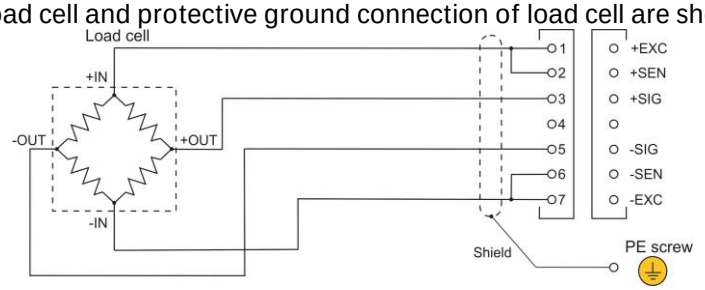
The same polarity sense and excitation pins of the load cell connector **should be short circuited** for 4-wire installation. If you have junction box in your system, use 6 wire cable between indicator and the junction box, and short circuit these pins in junction box for better performance as appears in the Figure 6.4



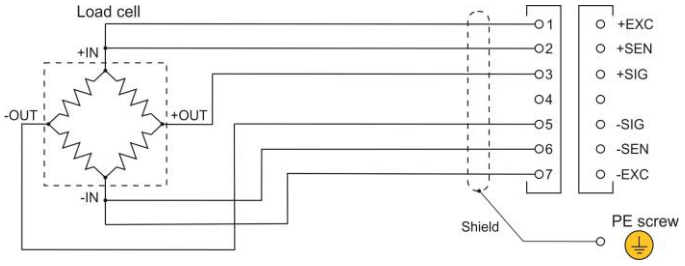
Pin number	Definition	Description
1	+Exc	+ Excitation
2	+Sen	+ Sense
3	+Sig	+ Signal
4	NC	Not connected
5	-Sig	- Signal
6	-Sen	- Sense
7	-Exc	- Excitation
⏚	Shield	Protective Earth

Table 5-1 – Pin configuration of the analogue load cell terminal.

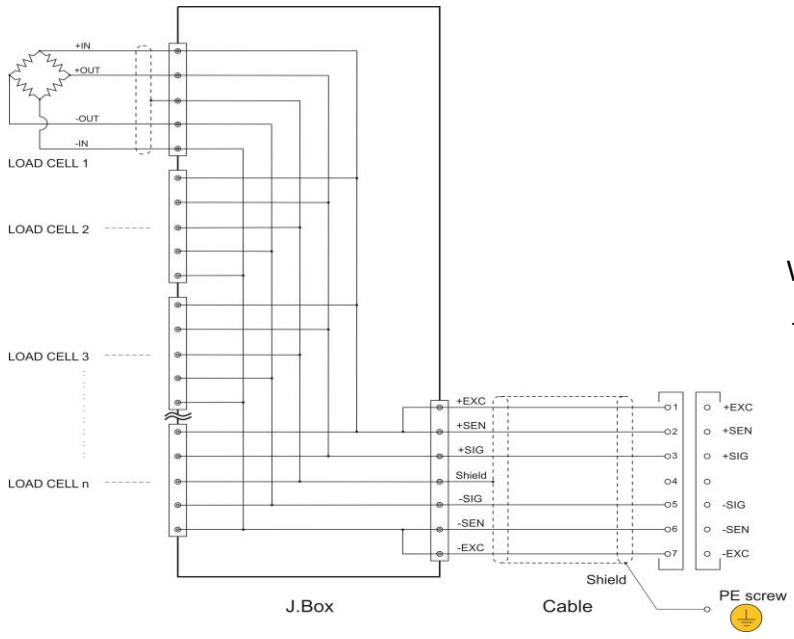
Load cell and protective ground connection of load cell are shown below.



4 wire load cell connection



6 wire load cell connection



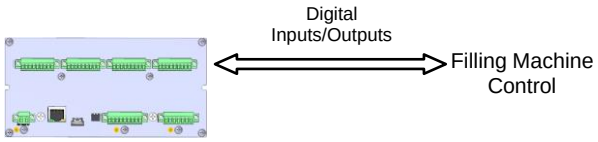
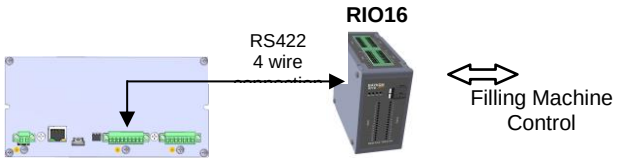
IMPORTANT NOTE:
Wiring between instrument and junction box should be 6 wires.

Figure 5.4 – The analogue load cell and junction box connection.

***Warning**: Always connect sense pins to Excitation pins for 4 wire connection. Non-connected sense pins may cause the wrong Excitation voltage measurement and create an accuracy and instability problems.*

Step 4: Digital Inputs and Outputs

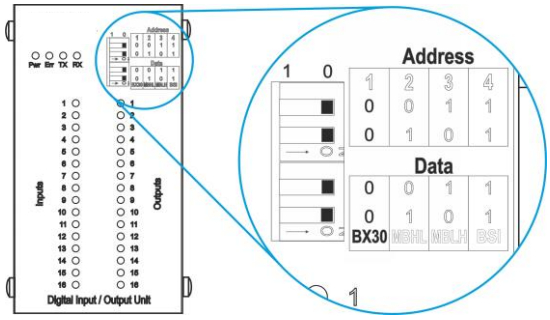
The FT-113Filling controller has two variants which have the internal digital I/O board and external DIN rail mount digital I/O unit connection to control the filling process.

Variant	Description	Digital I/O Connection
FT-113Fill **A**	FT-113Fill with internal digital I/O board; The 'FT-113Fill A' variant has the internal digital I/O board which has 12 digital inputs and 14 digital outputs. The digital I/O terminals are located on the top of the rear panel.	
FT-113Fill **N** FT-113Fill **R**	FT-113Fill with external digital I/O unit; The 'FT-113Fill N' variant hasn't the internal digital I/O board and is connected to the DIN rail mount RIO16 digital I/O unit via RS422 serial port to control filling machine.	

Input and output terminal configuration of these two variants is identical. The only difference between the two variants is the digital I/O cabling from the instrument of the unit on the DIN rail. The functions of digital inputs and outputs for different filling applications are described in section 7, page 41.

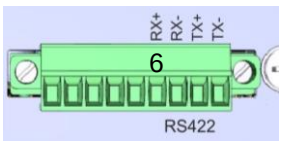
RIO16

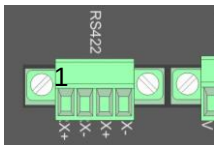
This DIN rail mount digital I/O unit enables easier cabling in the control cabinet. The FT-113Fill N (without digital I/O in the housing) instrument interfaces with this digital I/O unit over RS422 port. 120-ohm line termination resistors should be installed on both ends of the RS422 line.



All DIP switches position must be "0"

Figure 5.5 - The data format and address of the RIO16.





FT-113Fill		RIO16	
RS422 Pin number	**Definition**	**Definition**	**RS422 Pin number**
6	RX+	RX+	1
7	RX-	RX-	2
8	TX+	TX+	3
9	TX-	TX-	4
Under the terminal	⏚	⏚	PE

Table 5-2 – Pin configuration and connection of RS422 ports.

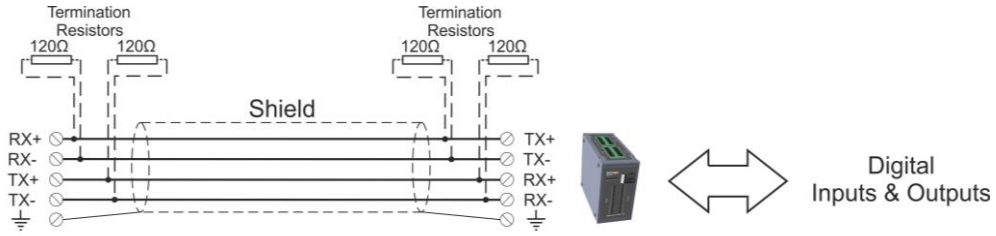


Figure 5.6 – RS422 cabling between FT-113Fill N and RIO16.

Check the data format and address of the RIO16 before start operation which are shown in the Figure 5.5.

Digital inputs

Galvanically isolated Input signals are actuated by applying voltage between input terminal and common terminal. The polarity of the input can be positive or negative. The input current is 10 mA at 24VDC input.

The equivalent circuit of inputs is drawn below. Buttons, switches, contacts, or PLC outputs can be connected to inputs as appears below.

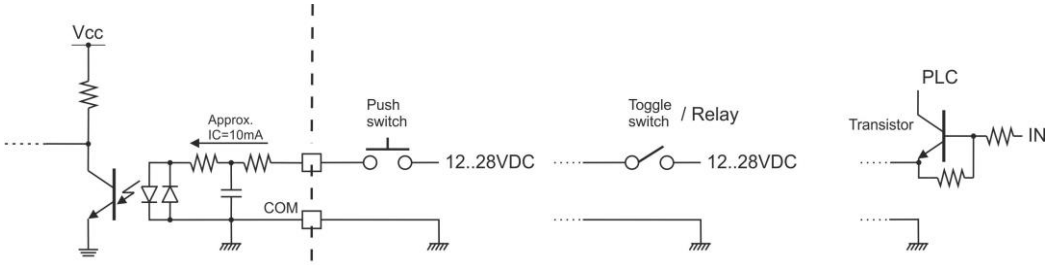


Figure 5.7 – Digital input connection diagram

Digital outputs

Galvanically isolated digital outputs are solid state relay output and protected against short circuit. The polarity of the output is positive and actuated high voltage. The max output current is 200 mA.

The equivalent circuit of digital outputs is drawn below. Relays, Inductors or PLC inputs can be connected to outputs as appears below. The reverse diodes shall be connected in parallel to connected inductive loads.

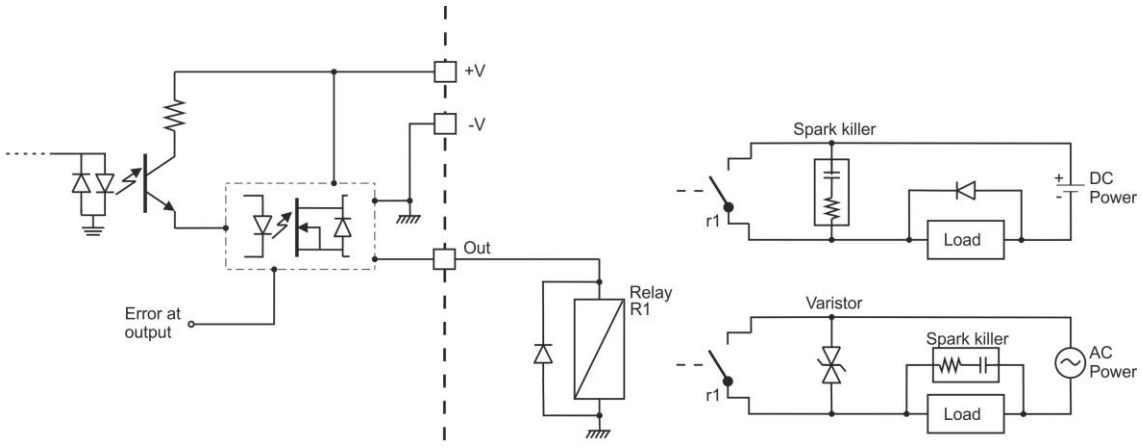


Figure 5.8 – Digital output connection diagram

Step 5: Feeding control with Analogue output.

FT-113Fill controller can be equipped with an analogue output to connect to the analogue input of the feeder controller. Order " Analog output and RS23C & RS485 serial interface board" to have this feature.
Refer to section 8.5 and parameter group **Fehler! Verweisquelle konnte nicht gefunden werden.** for details.

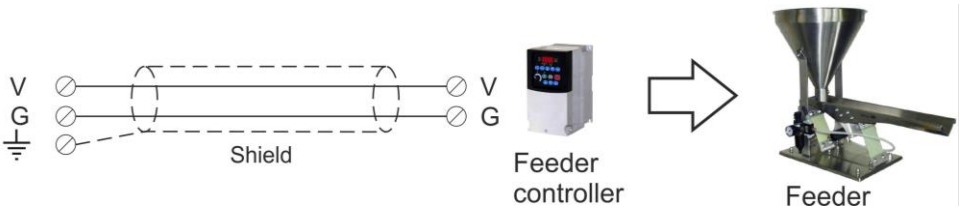


Figure 5.9 Voltage output connections

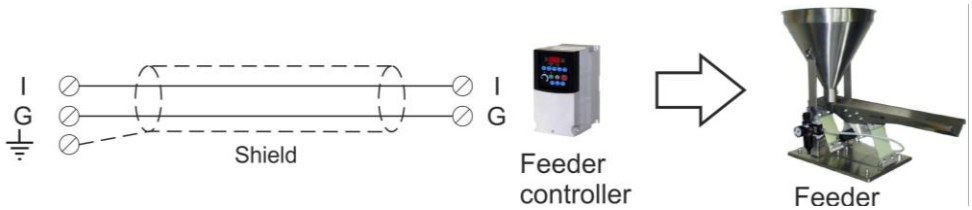


Figure 5.10 Current output connections

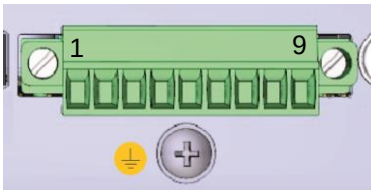
Figure 5.11 – Analogue output connections for speed control

Step 6: RS232C Serial Port

FT-113Filling controller has RS232C serial port which is galvanically isolated from main board circuitry to increase the EMC immunity. The use of this serial port and its specifications are described in the Table 5-3 and its pin configuration is shown in Table 5-4.

Use	Interfacing with printer, PC, PLC, remote display etc.
Data formats	Continuous, Fast Continuous, Printer, BSI Protocol or Modbus RTU
Baud rate	1200 / 2400 / 4800 / 9600 (Default) / 19200 / 38400 / 57600 bps
Length	7 or 8 (default) bits
Parity	Even, Odd or No (default)
Start / Stop bits	1 start bit and 1 stop bit

Table 5-3 – RS 232C Serial Interface Specifications



Definition	RS232C Pin number
TXD	1
RXD	2
GND	3
⏚	Screw under the terminal

Table 5-4 – Pin configuration of RS232C terminals

2-wire connection to peripherals: RS 232C serial connection is done with two wires as indicated below in Figure 5.12. if there is no data entry to the filling controller. Printer, remote display etc. connections can be done with 2 wire.

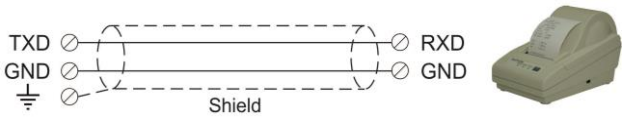


Figure 5.12 – 2 wire RS 232C connection with a printer or PC

3-wire connection to the peripherals: RS232C serial connection is done with three wires as indicated below in Figure 5.13 for bidirectional interfacing. Typical application is bidirectional BSI format interfacing with PC or PLC.

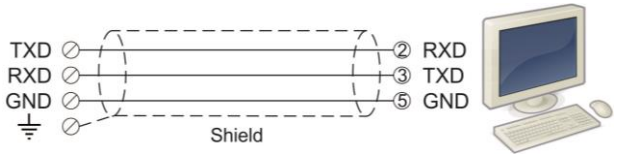


Figure 5.13 – 3 wire RS232C connection with a PC or PLC

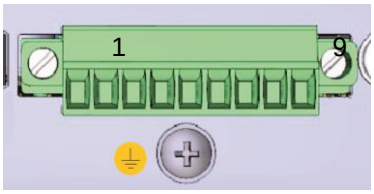
Step 7: RS485 Serial Port

The use of this galvanically isolated serial port and its specifications are described in the Table 5-5 and its pin configuration is shown in Table 5-6.
Refer to **page 133** to configure RS485 serial port and **page 120** for details on data formats.

120-ohm line termination resistors should be installed both ends of the RS485 line.

Use	Interfacing with Printer, PC, PLC, remote display etc.
Data formats	Continuous, Fast Continuous, Printer, BSI Protocol or Modbus RTU
Baud rate	1200 / 2400 / 4800 / 9600 (Default) / 19200 / 38400 / 57600 bps
Length	7 or 8 (default) bits
Parity	Even, Odd or No (default)
Start / Stop bits	1 start bit and 1 stop bit
Address	Programmable between 01 99
Max quantity	Maximum 31 instruments on the line.
Cable length	Maximum 1000m.

Table 5-5 – RS485 Serial Interface Specifications



Definition	RS485 Pin number
A+	4
B-	5
⏚	Under the terminal

Table 5-6 – Pin configuration of RS485 terminal

RS485 serial connection is done with two wires as indicated below in Figure 5.14.

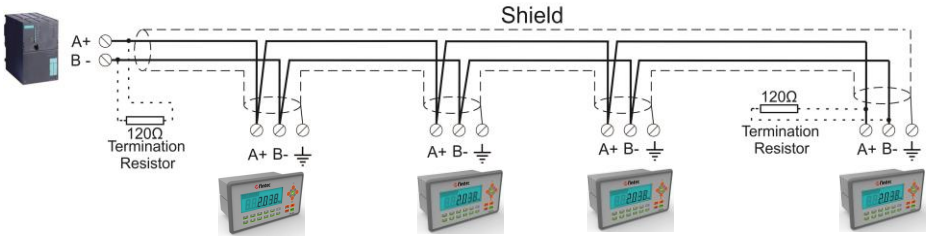


Figure 5.14 – Multi instrument connection with PLC

Step 8: Ethernet TCP/IP

The use of the Ethernet port on the main PCB and its data formats are shown in the Table 5-7 and its pin configuration is shown in Table 5-8. Refer to Section 17.4 of the manual to configure this interface. Use the RJ45 connecter with metal body and connect shield of the Ethernet cable to the metal body of the connector.

Use	Interfacing with Printer, PC, PLC, remote display etc.
Data formats	Continuous, Fast Continuous, Printer, BSI Protocol or Modbus TCP

Table 5-7 – Data formats of Ethernet port

Pin no	Signal	DIR	Description
1	TX+	Out	Differential Ethernet transmit data +
2	TX–	Out	Differential Ethernet transmit data –
3	RX+	In	Differential Ethernet receive data +
6	RX–	In	Differential Ethernet receive data –
4	Not used		Terminated
5	Not used		Terminated
7	Not used		Terminated
8	Not used		Terminated
Body	Shield		Metal body of the RJ45 connector.

Table 5-8 – Pin configuration of RJ45 Ethernet connector

The HUB connection cabling is a direct connection as shown below:

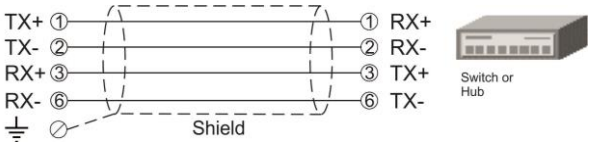


Figure 5.15 - HUB connection

The PC connection cabling is done via cross cable as shown below. IP address blocks and gateway address of FT-113Fill and PC should be the same in cross connection.

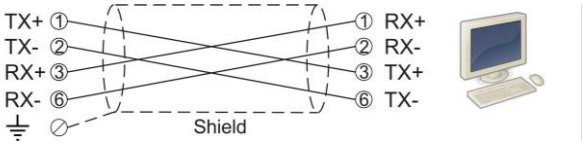


Figure 5.16 - PC connection with cross cable

***IMPORTANT NOTE**: Disconnect Flintec set up PC software before Ethernet interfacing.*

Step 9: USB Port

The micro USB connector is located on the rear of the instrument. The use of the USB 2.0 and its specifications are shown in the Table 5-9. Refer to page 134 for USB port configuration.

Use	Interfacing with PC via USB 2.0
Data formats	Continuous, Fast Continuous, BSI Protocol to PC near the instrument

Table 5-9 – Data formats of the USB port

Step 10: Power Source Connection and Grounding

Connect DC power supply of FT-113Fill to the noise proof power line due to the weighing instrument measures very low signal levels. The quality of the power line and DC power supply will determine the accuracy and the safety of your measuring system. The instrument should not share power lines with noise-generating parts such as heavy load switching relays, motor control equipment, inductive loads, etc. If the condition of the power supply in the plant is poor, prepare a special power line and grounding. Before connecting the power source check its voltage before connection.

Pin number	DC Power Supply
1	0
2	+24 VDC
PE Protective Earth (Grounding)	PE cable to the screw under the power supply terminal

Table 5-10 – Pin configuration of power supply connector.

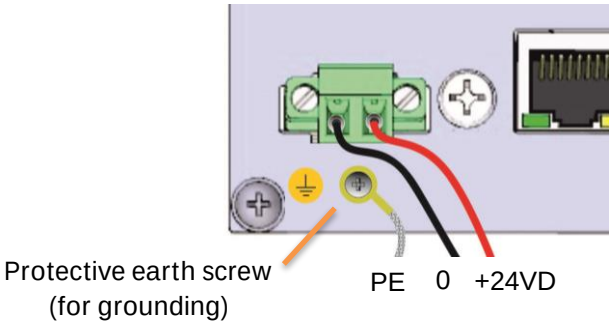


Figure 5.17 – Power source connection and grounding.

If the voltage is correct.

1. Connect the grounding screw under the power supply terminal to the good protective ground.
2. The 24 VDC supplied instruments are shipped with installed 2-meter power supply cable. Connect this cable to power supply as shown in Table 5-10.

If your power source is not proper, do not connect the scale to the power source and contact your authorized dealer.

Step 11: Set up the Scale and Calibration

The filling controller should be set up and calibrate according to your operation and application. Read this document carefully and select the parameter values which are convenient for your use before programming the instrument.

Follow the commissioning steps to adjust the instrument.

Warning: *You cannot change the legally related parameter values and calibration after sealing the instrument in legal use. Be sure you have done proper set up for your use before sealing the scale.*

5.3 Commissioning

***PRECAUTION**: Please read this manual carefully before energizing the instrument. Perform the commissioning operation according to the procedure given in this section. Only trained person is allowed for cleaning, commissioning, checking, and servicing of the instrument. The interference of untrained person may cause some unwanted damages or injuries.*

After finishing installations and connections of FT-113 as described before, follow the items below to start up the system.

1. Check all cabling and grounding of your system.
2. Energize the instrument.
3. Set calibration switch to ON position and enter the set-up. Refer to page 129.
4. Set parameter group [**2--**] for your use.
5. Adjust scale related parameters in the parameter group [**5--**].
6. Calibrate the scale in parameter group [**61-**].
7. Test the scale performance.
8. Set calibration switch to OFF position.
9. Enter the machine construction to the instrument via parameter groups [**31-**], [**32-**] and [**33**].
10. Set material and Recipe related parameters in the parameter group [**4--**].
11. Enter target and feed cut off values by pressing  and  keys.
12. Test the filling machine.
13. Set programmable select inputs and outputs in parameter groups [**33-**], [**35**] and [**36-**].
14. Improve your filling machine performance by adjusting the digital filters, parameters 235 and 236 and material related parameters in parameter group [**4--**].
15. Build Recipe content by adding [**4--**] parameters into the Recipe, if required. Refer to page 101.
16. Save Recipes into the Recipe memory, if need be.
17. Enter the Recipe or select the Recipe from Recipe memory. Check the Recipe data.
18. Test the filling of the machine. And improve its performance by adjusting parameters.
19. Connect serial interfaces after adjusting their parameters.
20. Connect Fieldbus after setting its parameters and test it.

You can find the meaning of the parameters on the filling cycle diagram appears below, on page 99.

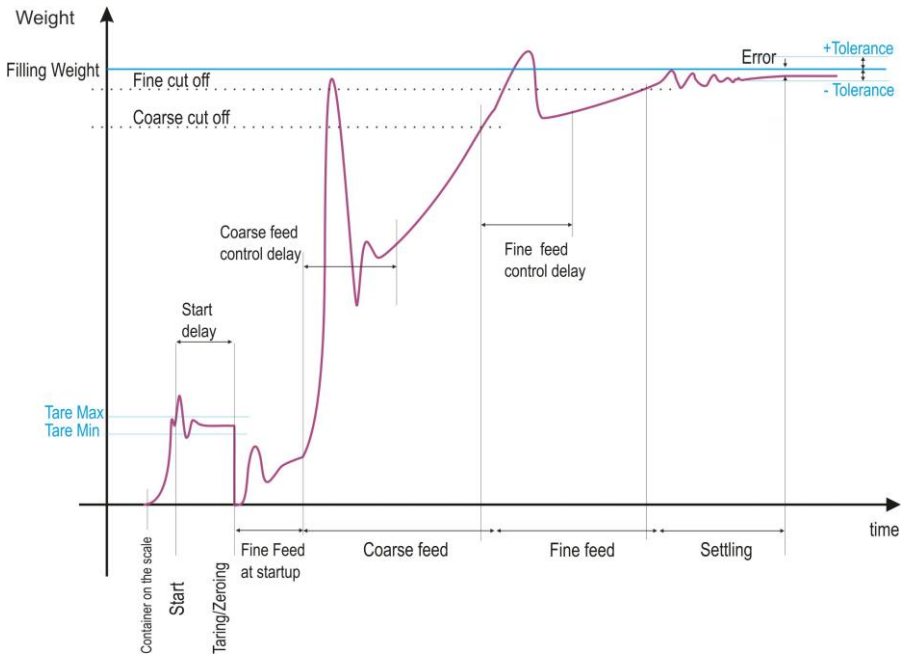


Figure 5.18 – Typical filling diagram (displayed weight vs. time)

5.4 Cleaning

Warning: *Disconnect the instrument from power source before start cleaning for your safety.*
FT-113Filling controller is designed for using in wet, hygienic and harsh environment. To maintain the instrument, never use harsh abrasive cleaners or solvents. Wipe the instrument with a soft cloth slightly dampened with warm soapy water or with mild detergent. You may wash the instrument with washing machine, max. 10 liter/min and 20 kPa.

5.5 Disposal

In conformance with the European Directive 2002/96 EC Waste Electrical and Electronic Equipment (WEEE), this device may not be disposed of with domestic waste. This rule also applies to the non-EU countries, according to their specific regulations. Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. For your questions, please contact the responsible local authority. Thank you for your attention to environmental protection.

6. FEATURES

6.1 Basic Weighing Functions

Basic weighing mode

FT-113 weighing controller can also be used for basic weighing additionally to its filling controller operation.

The instrument goes in the filling operation mode after turning on. Press key to switch to the basic weighing mode. To return to filling mode press the same switch again.

Zeroing

Zeroing corrects the drifts of the unloaded scale from the zero point.

1. Unload the scale.
2. Press →0← key.
3. Centre of zero appears ›0‹ symbol on the display.
4. Check the center of zero sign on the left of the display. If it is not appears, press the →0← key once more for correct zeroing.

Zeroing is available in the limited range by zeroing **parameter 514**, page 161.

Basic weighing

1. Press key for basic weighing operation.
2. Press →0← key, if [0.00 kg] is not displayed at unloaded scale.
3. Place weighing item on the scale.
4. Wait until the motion annunciator ~ disappears.
5. Read the weighing result.

Net weighing in the container at basic weighing

Taring is used to weight material in the container at basic weighing operation.

1. Place the empty container on to the scale and press key in the weighing mode.
2. The zero display and the **NET** symbol appear.
3. Check ›0‹ sign on the display. If it is not appearing, press the key once more for correct taring.
4. Add the material into the container and follow its weight in net.

Clearing the tare at basic weighing

Press CLEAR key at basic weighing mode. The **NET** symbol disappears, and **B/G** (Gross) symbol appears on the display together with the gross weight indication.

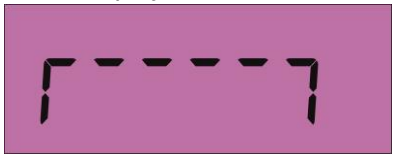
Printing

Printing is done automatically at operation as programmed or press key when the item is on the pan and weight is stable to print the label. The printout format can be selected from parameter 161. Flintec PC software is used to program EPL printout data and download into the instrument for free programming the data output or for label printing including barcode. Refer to page 136, and 121 for details.

Out of the weight indication range

If the loading is out of the indication range the prompts below are displayed.

Under of negative indication limit



Over than positive indication limit

6.2 Advanced Functions

Basic Weighing / Filling operation selection

The instrument goes in the filling mode after powering it on. Press  key to change the operation to basic weighing mode at ready status. To return to filling mode, press this key again.

High resolution

Press  key to display the weight value with10 times higher resolution. Press the same key again to reduce the resolution. High resolution is displayed temporarily for 5 seconds at approved scales. High resolution cannot be printed. Refer to **parameter 351**, page 148.

Unit change

Press  key to change the weight unit to the alternative unit. Press this key again to return to the first unit. The unit change is available between kg and lb. Refer to sub-block 352, page 148.

Dynamic weighing

APPLICATION: Filling of unstable loads. This feature cannot be used at fast speed filling systems.
RELATED PARAMETERS: Parameters 235 and 236.

The dynamic filter can be activated for filling under the unstable load or environmental conditions. This feature might be disabled at fast filling by the instrument. Adjust the adaptive filter and the dynamic filter together to find the optimum result.

IMPORTANT NOTES: *Testing different combinations of the digital filter and dynamic filter is recommended for accurate filling at higher speed. High filtering is not always the best!*

Date and Time

RELATED PARAMETERS: Parameters 241, 242 and 243.

Date format of the country

1. Enter the programming and go to **parameter 241**, page 142.
2. Press ▲ or ▼ keys to select date format: DMY (DD.MM.YYYY), MDY (MM.DD.YYYYY) or YMD (YYYY.MM.DD) and press ↵ key to confirm.
3. Press ESC key until [SAVE : YES] prompt appears.
4. Press ↵ key to save or press ▲ or ▼ keys to select "NO" to return operation without saving.

Date adjustment

1. Enter the programming and go to **parameter 242,** page 142.
2. Press numerical keys to enter the date and press ↵ key to confirm.
3. Press ESC key until [SAVE : YES] prompt appears.
4. Press ↵ key to save or press ▲ or ▼ keys to select "NO" to return operation without saving.

Time adjustment

1. Enter the programming and go to **parameter 243**, page 142.
2. Press numerical keys to enter the time and press ↵ key to confirm.
3. Press ESC key until [SAVE : YES] prompt appears.
4. Press ↵ key to save or press ▲ or ▼ keys to select "NO" to return operation without saving.

Tilt switch

Tilt switch is used to prevent wrong weighing in case of over tilting of the scale. Connect tilt switch to one of the selectable Inputs and enable tilt switch function by setting the **parameters 51A** and 33- block.

[TILTED] [------ kg] prompt is displayed in case of over tilting.

User Language

RELATED PARAMETERS: Parameter 237.

You can select the operation and printout language of the instrument. The available languages are English, German, French, Italian, Spanish and Turkish. The language of programming is English which has the parameter code in front of parameter name for easy use.

Language selection

1. Enter the programming and go to **parameter 237**, page 142.
2. Press ▲ or ▼ keys to select language and press ↵ key to confirm.
3. Press ESC key until [SAVE : YES] prompt appears.
4. Press ↵ key to save or press ▲ or ▼ keys to select "NO" to return operation without saving.

Bar graph at basic weighing

The Bar graph, which is located on the right side of the display, is used for the graphical visualization of the measured value. It changes according to the Gross weight even the scale is displaying in Net. The use of the scale capacity and the available range appears on the bar graph. In the example below 70% of the capacity is used and 30% is available.

Net sign correction

Some weighing of materials is done by unloading the material from the container. The net sign correction enables always positive net weighing at loading and at unloading the material from scale by switching gross and tare weights, if necessary. Refer to **parameter 162** to enable net sign correction.
Enabled net sign correction affects the display and printed data.

Displaying and printout	Net sign correction disabled	Net sign correction enabled
Tare	120.0 kg	30.0 kg
Gross	30.0 kg	120.0 kg
Net	- 90.0 kg	90.0 kg

Passwords

RELATED PARAMETERS: Sub-block 25- .

FT-113 has 4 different passwords, which are key lock, Recipe, supervisor and service passwords, and their authorization increase in sequence below.

Key lock password
This two-digit password is used to lock and unlock keys to prevent unwanted interfering to the instrument. The default password is '--' which means no password. You may enter new passport in set-up mode, **parameter 251**. For key locking or unlocking without password, do not enter new password in set-up mode.

Recipe password
This four-digit password is used to prevent unauthorized persons access to the Recipe related menus, target entry with  key, changing feeding speed cut offs with  key, Recipe menu and Recipe build menu. The default password is '----' which enables Recipe entry without password. You may enter new password in set-up mode, **parameter 252**. To cancel entry to the Recipe menu with password, do not enter new password in set-up mode.

Target related entries with navigation keys are authorized to the Recipe password. This authority can be given to key lock password by **parameter 255**.

Supervisor password
This supervisor password is used to enter user related parameters of the set-up menu additional to the authority of the Recipe password. The default **password is 1111**.

Service password
This highest-level password is used to interfere all related parameters and calibration parameters only by trained technical persons. The default **password is 1111**. Changing metrological parameters and performing calibration are additionally required to set the calibration switch to on position.

Key lock

FT-113 has capability to lock the keys to avoid unauthorized persons interfere to the instrument at ready status. Operation related keys are always locked automatically during operation. Refer to **parameter 251** to enable key lock feature of the instrument. The default password is '--' which means no password.

Lock the keys:

1. Press  key more than 2 seconds. [KLOCK PASSWORD:] prompt appears on the display.
2. Enter the key lock password. Refer to **parameter 251**.
3. Press  key.  symbol appears on the display.

Unlock the keys:

1. Press  key more than 2 seconds. [KLOCK PASSWORD:] prompt appears on the display.
2. Enter the key lock password.
3. Press  key. symbol disappears on the display.

Next verification date

The instrument warns the operator on the following verification or calibration date, if date is entered by **parameter 823**. The warning is disappeared after pressing  key until switch on the instrument again.

Help

The  key is used to follow functions of programmable keys and function keys by pressing  key consecutively. Press this key sequentially until going back operation. Pressing  key is ended the help menu.

6.3 Advanced Filling functions with Programmable keys

 ,  ,  ,  ,  ,  and  keys can be programmed for your needs at use of machine. These functions will give you advantage to control or to check or to follow the weighing results of your filling machine. Refer to sub-block **35** on page 148 for available functions of keys.

Start Filling

The start key starts the filling which can be done via digital input or any serial interface. The second function of this key is resuming the filling, which means the filling result is accepted and go on the operation. Alternatively, the filling may start automatically after loading the container on the scale, after discharging etc.

Start Discharge / Empty

This key starts the discharging/Emptying process of the packing cycle like start the discharge/empty process of the machine via digital input or via any serial interface. The second function of this key is resuming the discharge, which means the discharge result is accepted and go on the operation.

Empty the Scale

This feature opens the emptying gate manually to empty the residual material or to clean it for maintenance. Press the key to open the emptying gate or valve until pressing the key second time.

Bypass

This feature empties the material silo via filling machine. Pressing this key, it opens the emptying and feeding gates and energizes feeders to empty the material silo / tank. There is not any weighing process at bypass. Press second time the key to stop bypass.

Reset

Pressing this key, it resets the filling cycle and returns the instrument to the ready status immediately. If there is any material on the scale it should be removed before start following filling.

Interrupt

Pressing this emergency stop key, it interrupts the filling. All filling cycle related outputs are set to their ready status. For example, the feeding stops, and the valve goes to the up position at liquid filling modes. After releasing the interrupt input, the filling continues. Reset input returns the filling machine to ready status.

Hold

Pressing this key. it stops the feeding only. If pressing this key again, it ends the hold status and filling process continues. If reset or reject entries are received the filling machine returns to ready status.

Statistical Values

Average Filling, Standard Deviation, Over, Under and Okay values are calculated in the instruments and these values can be displayed by pressing the key sequentially.

Last Filling

Last filled weight is displayed after pressing the key sequentially. Pressing the key for the third time, it returns the display at operational data.

Batch Quantity

Press this key to enter the batch quantity at ready status, if it is enabled in the Recipe or in set up. Only  key can be set to this function.

1. Press  key at ready status.
2. Enter the batch quantity.
3. Press  key. The new batch quantity of the Recipe is saved.

Refer to **section 11.1** for details.

Batch Total

Press this key to enter the specific batch weight at ready status, if this function is enabled in the Recipe or in set up. Only  key can be set for batch total entry.

1. Press  key at ready status.
2. Enter the batch total.
3. Press  key. The new batch total of the Recipe is saved.

Pressing this key in operation it indicates the residual material weight of the batch which will be transferred. Refer to **section 11.2** and **11.3** for details.

Flow Rates

Coarse, Medium, and Fine feeding flow rates are displayed sequentially by pressing the key. They displayed temporarily for 20 seconds or until pressing the key second time.

Feeding Cutoffs

Coarse, Medium, and Fine feed in values are displayed sequentially by pressing the key. They displayed temporarily for 20 seconds or until pressing the key second time.

Check Stop

For testing the filling machine performance and accuracy, stopping filling process at specified point(s) is needed. Three different check stops can be defined to function keys at this filling controller.

Check Filling. Pressing the key, it stops the filling/packing process at the end of filling to follow the filling accuracy of the filling machine.

Check Discharge. Pressing the key, it holds the filling process at the end of discharge / emptying to follow the discharging / emptying accuracy or residual material on scale.

Check Step. Pressing the key, it holds the filling / packing process at the end of each cycle like filling, discharging, emptying, zeroing etc. to follow the process.

Pressing the key for the second time allows the process to continue.

6.4 Back up / Restore with SD card

RELATED PARAMETERS: Sub-blocks **96-***.*

IMPORTANT NOTE: SD card memory should be formatted to FAT32 and maximum 16 GB. For FAT32 formatting, click the "Restore device defaults" and uncheck the "Quick format" box on PC.

The Recipe data, set-up and calibration data of the instrument can be copied to SD card for having back up of the filling controller. After restoring, you may go on operation without reentering all these data.

All data are copied into the SD card. Restoring can be done separately or all data is restored. If the calibration data is restored, the previous calibration is lost.

This feature is used commonly for loading set-up, calibration, and Recipe data to the new filling machine. The scale can be recalibrated after restoring the data, if needed.

Back up:

- Insert SD card FAT32 formatted into the SD card slot rear of the instrument (Refer to section 21),
- Enter the parameter 961,
- Press  key.

Restore:

- Insert SD card (max. 16 GB) into the SD card slot rear of the instrument,
- Enter the parameter 962,
- Select "All" or set-up or calibration or Recipe,
- Press  key.

6.5 Copying the weighing-related data from SD card to a PC

FT-113 Fill has data logging feature that can record all weighing-related data to the SD card. This data can be transferred to a PC, as explained below

1. Prepare a PC with a terminal program such as the Hyper terminal®.
2. PC to FT-113 Fill connection can be done in two ways.
   a. Direct connection via RS232/485/Ethernet/USB
   b. Via local area network. If PC and FT-113 Fill are connected to the same local area this connection can be made. After Ethernet connection enter the IP address of FT-113 Fill to the terminal program.
3. Select the data format of the port connected to FT-113 Fill as BSI and make other necessary communication settings for the port accordingly (Refer to page **Fehler! Textmarke nicht definiert.**).
4. Send BSI command "L" via terminal program to transfer data from SD card to PC. (Refer to Section 22).
5. After sending "L" command, the data in the SD card is copied to the PC. Save data to PC when copying is finished.
6. After saving the data, send the "E" BSI command to delete the data in the SD card.

7. FILLING MODES

FT-113 has various filling modes for common filling & packing machines as indicated below. Select the mode which corresponds to your filling machine and read its descriptions in detail to design the control cabinet.

Mode	Description	Application
OPEN	Open container filling *Section 7.1, page 42*	Semiautomatic liquid filling into open container. Automatic linear open container filling machines. Automatic rotary open container filling machines.
BUNG	Bung-Type container filling *Section 7.2, page 46*	Semiautomatic liquid filling through bung hole. Automatic linear bung type container filling machines. Automatic rotary bung type container filling machines.
BOTT	Filling with lance control *Section 7.3, page 50*	Liquid filling with lance through bung hole. Automatic linear filling machines with lance control. Automatic rotary filling machines with lance control.
PACK	Packing *Section 7.4, page 55*	Automatic packing machines.
BAG	Bagging *Section 7.5, page 59*	Automatic bagging machines. Big bag filling from hopper scale.
BIG	Big bag filling *Section 7.6, page 63*	Big bag filling machines
VENT	Valve bag filling *Section 7.7, page 66*	Valve type bag filling machines.
1BAG	Bagging machine with one hopper scale *Section 7.8, page 69*	Controls the filling machine with one hopper scale including bag hold control.
nBAG	Bagging machine with up to 16 scale *Section 7.9, page 73*	Multi hopper scale bag filling machine. #1 scale is the master controller of the bagging machine which controls the bag holder.
nPAC	Packing machine with up to 16 scale *Section 7.10, page 79*	Controls the weighing section of the multi weighing hopper packing machine. #1 scale is the master controller of the weighing section of the machine.
TANK	Tank filling & filling from tank *Section 0, page 84*	Tank filling control and/or accurate container filling from tank.
WOUT	Weigh in / weigh out *Section 7.12, page 88*	Sticky/high viscosity material transfer from hopper or tank scale.

Operational details and meanings of digital Inputs and outputs are found in the section of each mode which is written in the description column.

7.1 [OPEN] Open Container Filling

This mode is used for filling the non-foamy products into an open type of container on the weighing platform. Valve always stays above the container, and it does not move at filling. If there is a lifter to load the container on to the scale at filling machine, the valve may come closer to the container.

Two typical uses of Open Container Filling mode are shown below.

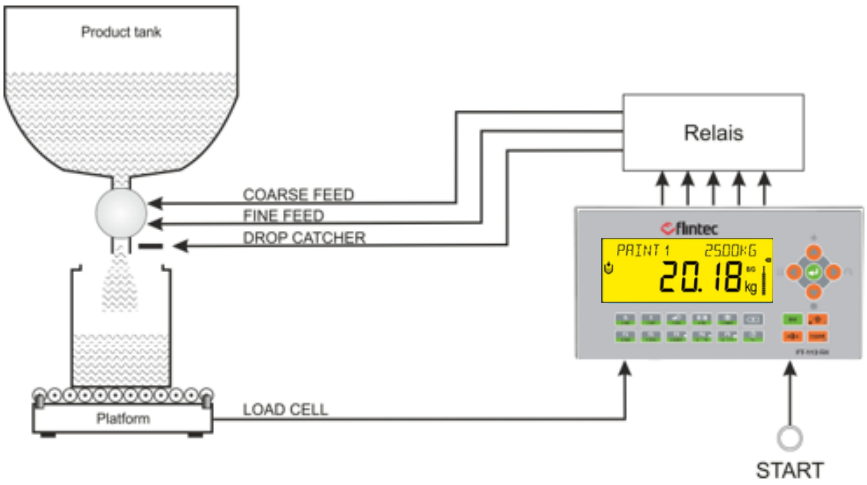


Figure 7.1 - Open container filling machine

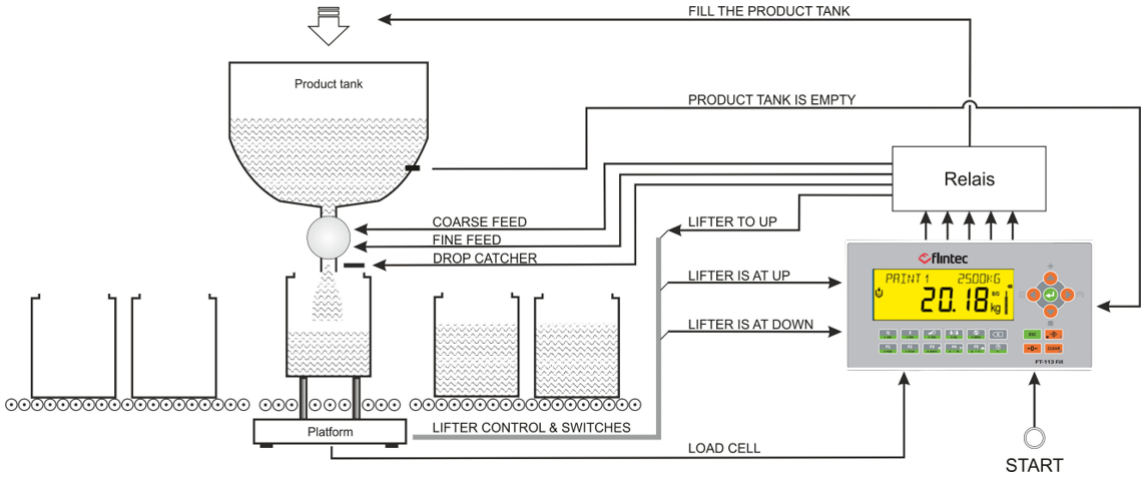


Figure 7.2 - Automatic open container filling machine with lifter

IMPORTANT NOTES:

1. *If filling machine has the container lift up mechanism, set the* ***parameter*** **325** *to LIFT.*
2. *2 sensors are recommended for checking the lifter position is up or down at automatic filling machines.*

Typical Applications

- Filling of liquids into the open container,
- Filling of solid materials into the box /container,
- Filling controller of the linear filling machine with or without lifter.
- Filling controller of the multi-head rotating filling machine with or without lifter.

Advantages and opportunities:

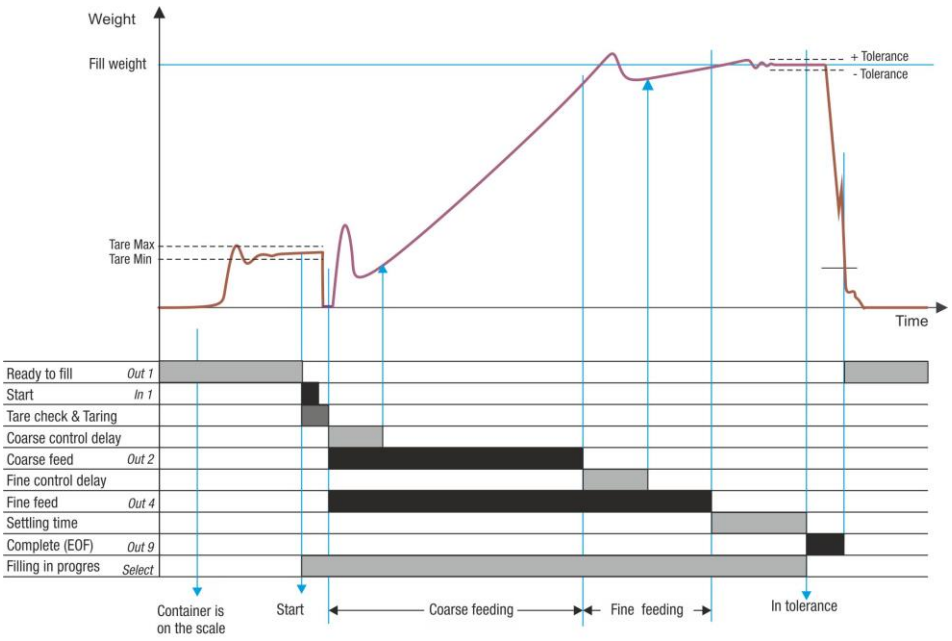
- You may build up your Recipe for each product filling and can save it in the controller.
- Filling may start with fine or medium feeding against splash the material from open container.
- Container lifting mechanism control at automatic filling machines.
- Feeding adjustments are done automatically to increase accuracy.
- Filling starts with start input or automatically after loading the platform.
- The start signal can be delayed for positioned the container and settling the scale before filling.
- The instrument may calculate the average tare weight to increase the machine productivity.
- Vibration output is available to remove air from product during filling.
- Programmable Select digital inputs and outputs can be used to control peripherals of the machine.
- Production does not stop in case of digital port malfunction! Use reserve inputs and outputs until changing the digital In/Out board or unit.
- Batch and bulk fillings are available.

The main operation steps.

- Place a container on to the scale and apply start input to start filling process.
- If there is a lift mechanism, the container moves to up position.
- The container weight is checked. It should be between maximum and minimum tare limits.
- The dead load on the scale tared automatically at net filling.
- Feeding is done in 1 or 2 or 3 speeds. Feeding may start with fine or medium feeding against splashing the material from container. Course / Medium and fine control delays inhibit feeding cut-off controls in their sequences. These entries should be big enough to eliminate impact effects of feedings.
- Tolerance control is done after feeding and settling the scale.
- The lifting mechanism moves down, if any.
- The End of Filling output is produced if filling is complete. If not, error signal is produced.
- Feeding adjustments are done automatically to increase accuracy and to optimize the filling time.
- Filling cycle ends after unloading the container from the platform.
- The filling controller goes to the ready status for the following filling.

Conditions to start a filling.

1. The tare should be in tolerances, Tare min < Tare < Tare max.
2. The scale should be stable for zeroing or taring.

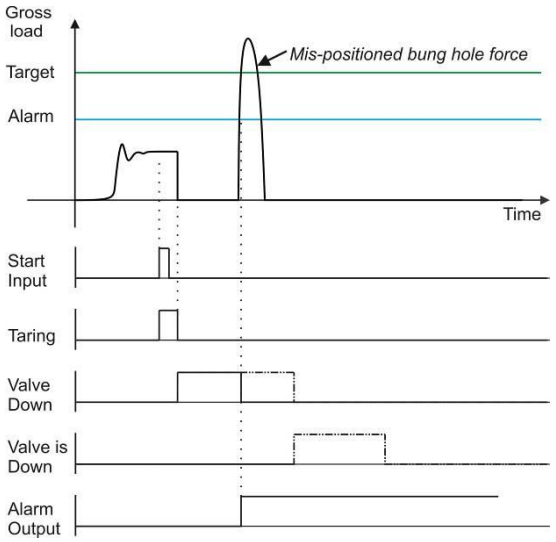


If the valve applies force to the container during lifting, the filling ends.

This protection is very important at liquid filling machines against destroying the container and to splash the material outside. Error message warns the operator in case of mis-positioned container at lifting.

If the weight is increased more than the maximum valve force, the filling process will end, and the lifter will go back to its DOWN position. Enter smaller value than destroying force of the container.

Entries: Valve force parameter 416.



Notes:

1) *There is a settling delay if the preact adjustment is done after the filling (refer to parameter).*
2) *The printout or data transfer after filling is required the settling the scale.*

Descriptions on the selectable functions:

1) The ***Run enable***, ***Filling inhibits,*** and ***Resume*** functions are activated when inputs are at high level, e.g. the start signal is executed if run enable input is at high level.
2) The ***Interrupt*** function is activated when input is at low level, i.e. the filling is interrupted if the interrupt input is at low level.
3) ***Filling***, ***Tolerance***, ***under filling errors*** can be used to warn the operator against various filling related errors.
4) ***Filling in process*** output can be used to block some filling machine functions during filling, like conveyors.
5) ***Alarm*** output can be used to warn the operator in case of over filling of the container.
6) ***Logical functions*** and ***timers*** can be used for material silo level and feeding control.
7) ***Timers*** can be used for producing various control outputs.

IMPORTANT NOTES: *In case of malfunction at any digi.input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* ***33-*** *and* **37-**.

7.1.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Lifter is at down position		3	2
Input 3	-		4	3
Input 4	-		5	4
Input 5	Lifter is at up position		6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready to Fill		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Lift to up		21	5
Output 6	-		22	6
Output 7	-		23	7
Output 8	Drop catcher		24	8
Output 9	Complete (End of filling)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled))*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the filling machine. Refer to section 12 on page 106 for details. The available functions:

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Drop catcher switch • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Remote output of fieldbus

7.2 [BUNG] Below Bung hole and Above Level Filling

This mode is used to fill non-foamy liquids below the bung hole of the container on the weighing platform. The valve moves down through the bung hole after taring for above level filling and moves up at the end of feeding the material. The container lifting mechanism can be used at this application instead of valve movement.

Two typical applications of this mode:

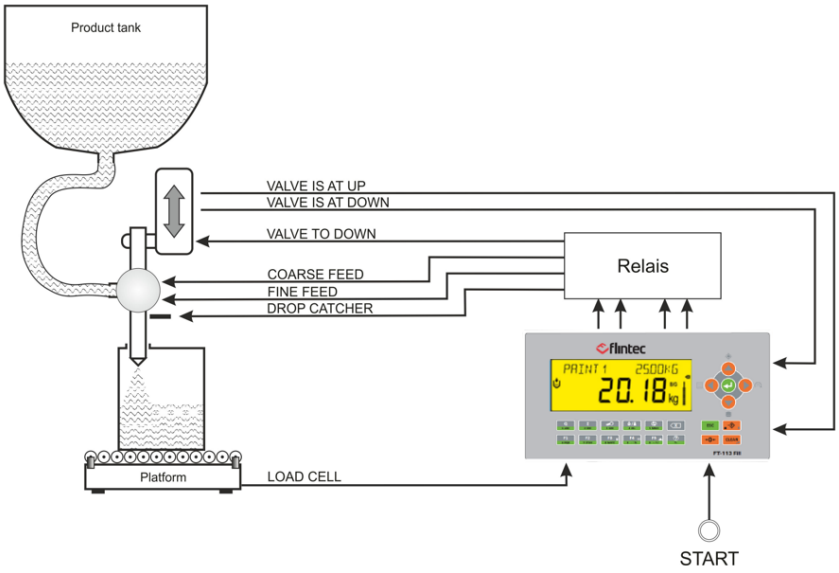


Figure 7.3 - Bung hole type container filling machine

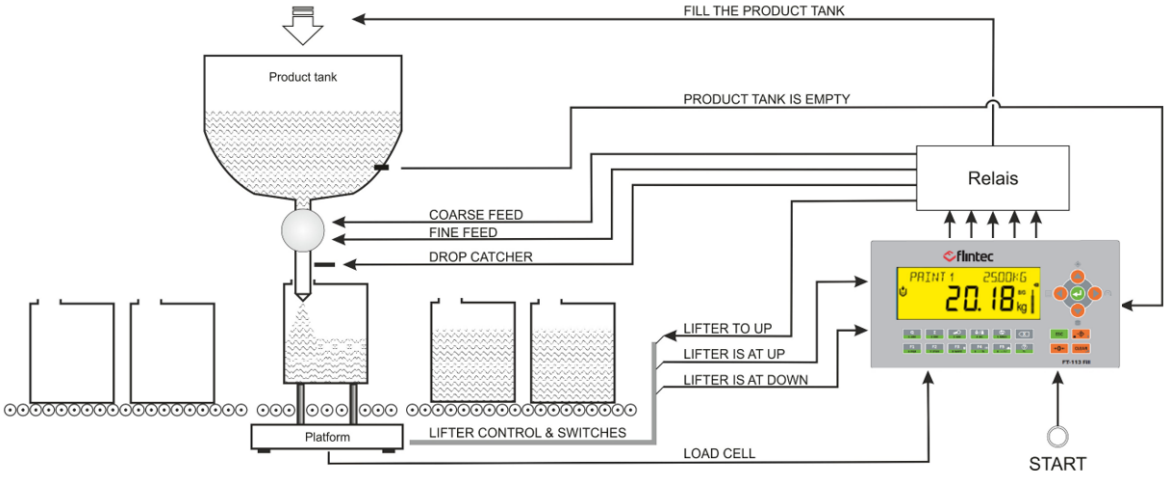


Figure 7.4 - Automatic bung hole container filling machine with container lifter

Typical Applications:

- Filling above level of bung type container by valve movement,
- Filling above level of bung type container by lifting mechanism,
- The linear filling machines.
- The rotating filling machines.

Advantages and opportunities

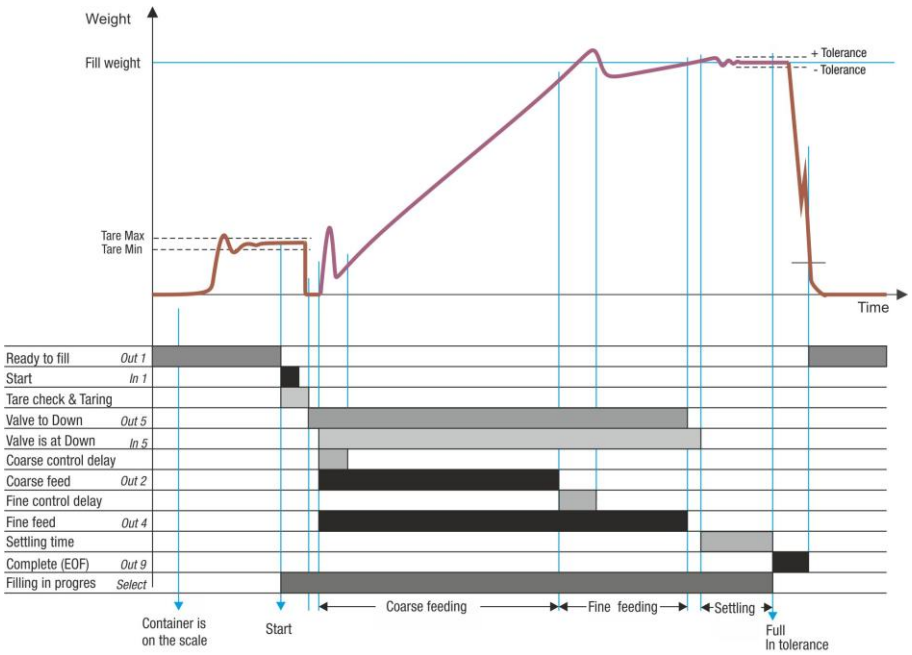
- You may build up your Recipe for each product filling and can save it in the controller.
- Feeding adjustments are done automatically to increase accuracy and to optimize the filling time.
- Valve movement or container lifting mechanism control for below bung hole feeding.
- Container weight is checked before feeding material.
- Filling may start with fine or medium feeding against splash the material from container.
- Filling starts with start input or automatically after loading the platform.
- The start signal can be delayed for positioned the container and settling the scale before filling.
- The instrument may calculate the average tare weight to increase the machine productivity.
- Vibration output is available to remove air from product during filling.
- Programmable Select digital inputs and outputs can be used to control peripherals of the machine.
- Production does not stop in case of digital port malfunction! Use reserve inputs and outputs until changing the digital In/Out board or unit.
- Batch and bulk fillings are available.
- Resets filling automatically if the valve applies the force to the container instead of going down through the hole.

The main operation steps for the machine with valve are

- Place the container on to the scale and apply start input to start filling process.
- If there is a lift mechanism, the container moves to up position.
- The container weight is checked. It should be between maximum and minimum tare limits.
- The dead load on the scale tared automatically at net filling.
- Valve moves down to go into the container through the bung hole.
- Feeding is done in 1 or 2 or 3 speeds. Feeding may start with fine or medium feeding against splashing the material from container. Course / Medium and fine control delays inhibit feeding cut-off controls in their sequences. These entries should be big enough to eliminate impact effects of feedings.
- Valve moves to up position at the end of feeding.
- Tolerance control is done after settling the scale.
- The lifter goes down if any.
- The feeding cut off adjustments are done automatically to increase filling accuracy of the following cycles.
- The End of Filling output is produced if filling is complete. If not, error signal is produced.
- Filling cycle ends after unloading the container from the platform.
- The filling controller goes to the ready status for the following filling.

Conditions to start the filling.

1. The tare should be in tolerances, Tare min < Tare < Tare max.
2. The scale should be stable for zeroing or taring.

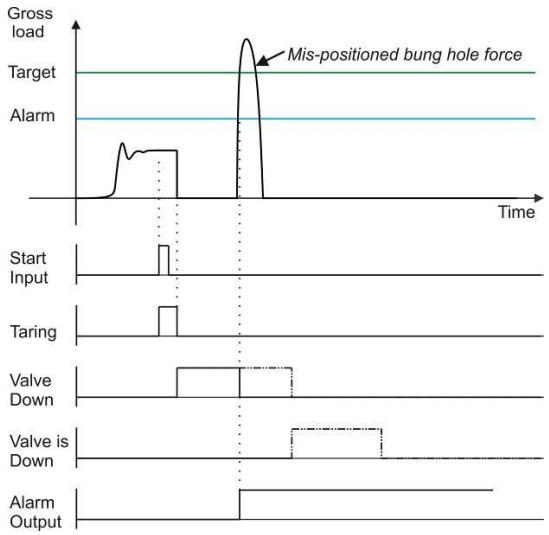


If the valve applies a force on the container during the movement entering the container

This protection is very important at liquid filling machines against destroying the container and to splash the material outside. Error message warns the operator in case of mis-positioned container at lifting.

If the weight increases more than the maximum valve force, the filling process will end, and the valve will go back to its UP position. Enter smaller value than destroying force of the container.

Entries: Valve force parameter 416.



Notes:

*1) There is a settling delay if the preact adjustment is done after the filling (refer to **parameter**).*

2) The printout or data transfer after filling is required the settling the scale.

Descriptions on the selectable functions:

1) The ***Run enable, Filling inhibits,*** and ***Resume*** functions are activated when inputs are at high level, e.g. the start signal is executed if run enable input is at high level.
2) The ***Interrupt*** functions is activated when input is at low level, i.e., the filling is interrupted if the interrupt input is at low level.
3) ***Filling***, ***Tolerance***, ***under filling errors*** can be used to warn the operator against various filling related errors.
4) ***Filling in process*** output can be used to block some filling machine functions during filling, like conveyors.
5) ***Alarm*** output can be used to warn the operator in case of over filling of the container.
6) ***Logical functions*** and ***timers*** can be used for material silo level and feeding control.
7) ***Timers*** can be used for producing various control outputs.

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to par. groups 33- and 37.*

7.2.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Valve is at up position / Lifter at down position		3	2
Input 3	-		4	3
Input 4	-		5	4
Input 5	Valve is at down position / Lifter at up position		6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready to Fill		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Valve to down / Lifter to up		21	5
Output 6	-		22	6
Output 7	-		23	7
Output 8	Drop catcher		24	8
Output 9	Complete (End of Filling)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2/ Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*		15
Output 16	Select 6	*(Default: Disabled)*		16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the filling machine. Refer to section 12 on page 106 for details. The available functions:

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Drop catcher switch • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Remote output of fieldbus

7.3 [BOTT] Container Filling from Bottom

This mode is used to fill the containers with lance position control from bottom to upward against foaming or oxidization of materials. The filling can be done below or above the material level in the container.

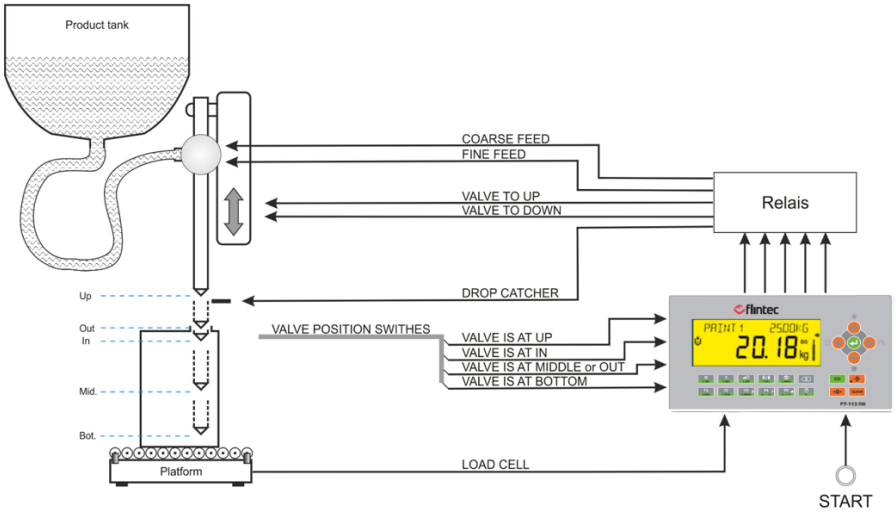


Figure 7.5 – Container filling machine with 4 position lance control

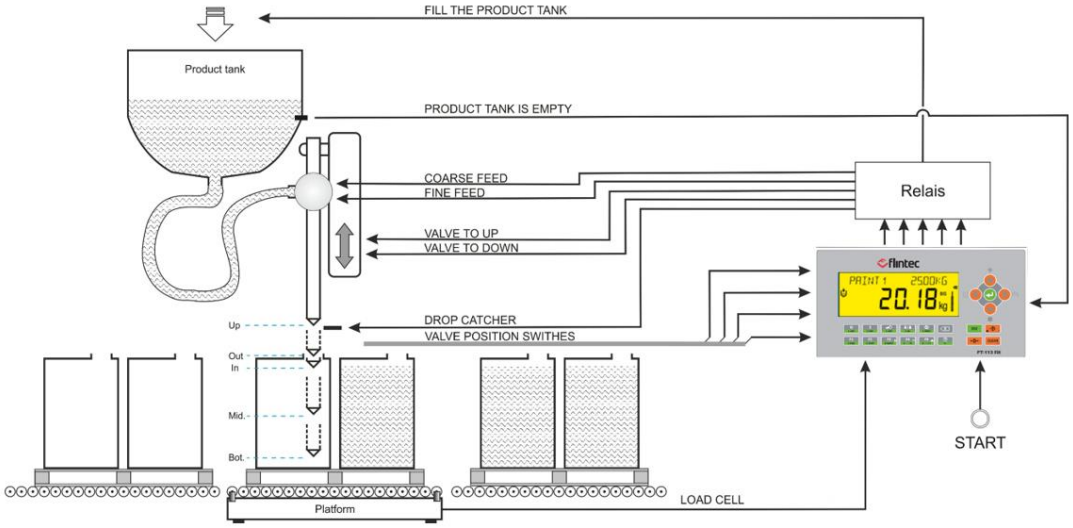


Figure 7.6 - Palette filling machine with lance control

Available switch positions

UP position of lance	The lance is at up position
OUT from bung hole	The lance may go out from bung hole during material feeding.
IN the bung hole	The lance is in the bung hole to finalize product feeding.
MIDDLE level of the container	The lance is at the middle of the container
BOTTOM of the container	The lance is at the bottom of the container

FT-113Fill offers for four different (**par. 417**) options to controls the lance movement.

1. 3-position control by placing lance control switches to the BOTTOM, IN and UP positions.
   a. The lance goes to BOTTOM position to start feeding the material.
   b. The lance moves to the IN position after weight is reached the LANCE BOTTOM weight (**par. 417**).
   c. The lance movement stops at the IN position to finalize feeding.
   d. The lance goes to the UP position at the end of feeding.

2. 4-position control by placing lance control switches to the BOTTOM, MIDDLE, IN and UP positions. Middle position control is strongly recommended at the filling of the foaming materials.
    a. The lance goes to BOTTOM position to start feeding the material.
    b. The lance moves to the MIDDLE position after weight is reached to the LANCE BOTTOM weight (**par. 417**).
    c. The lance waits at MIDDLE position until material weight is reached to the LANCE MIDDLE weight (**par. 418)** then goes to the IN position.
    d. The lance goes to the UP position at the end of feeding.

3. 4-position control by placing lance control switches to the BOTTOM, IN, OUT and UP positions. This and the following configurations are recommended against material splash due to lance drift risk.
    a. The lance goes to BOTTOM position to start feeding the material.
    b. The lance moves to the IN position when the material weight is reached to the LANCE BOTTOM weight (**par. 417**).
    c. The feeding is finished at the IN position.
    d. In case of the lance drift to upward during feeding, the OUT sensor detects its drift and the lance moved downward to the IN position against splash.
    e. The lance goes to the UP position at the end of feeding.

4. 4-position control by placing lance control switches to the BOTTOM, MIDDLE, IN and OUT positions.
    a. The lance goes to BOTTOM position to start feeding the material.
    b. The lance moves to the MIDDLE position when weight is reached to the LANCE BOTTOM weight (**par. 417**).
    c. The lance waits at MIDDLE position until material weight is reached to the LANCE MIDDLE weight (**par. 418**), then goes to the IN position.
    d. In case of the lance drift to upward during feeding, the OUT sensor detects its drift and the lance moved downward to the IN position against splash.
    e. The lance goes to the up position at the end of feeding.

Typical Applications

- Above level or under level filling of foaming or easy oxidation materials from bottom of the container with multipoint lance position control.
- Drum filling machines with antioxidant gas blowing into the container.
- Filling from below of the material at multi-head rotating machine, linear filling machine etc.
- Filling of drums on the palette is available.

Advantages and opportunities

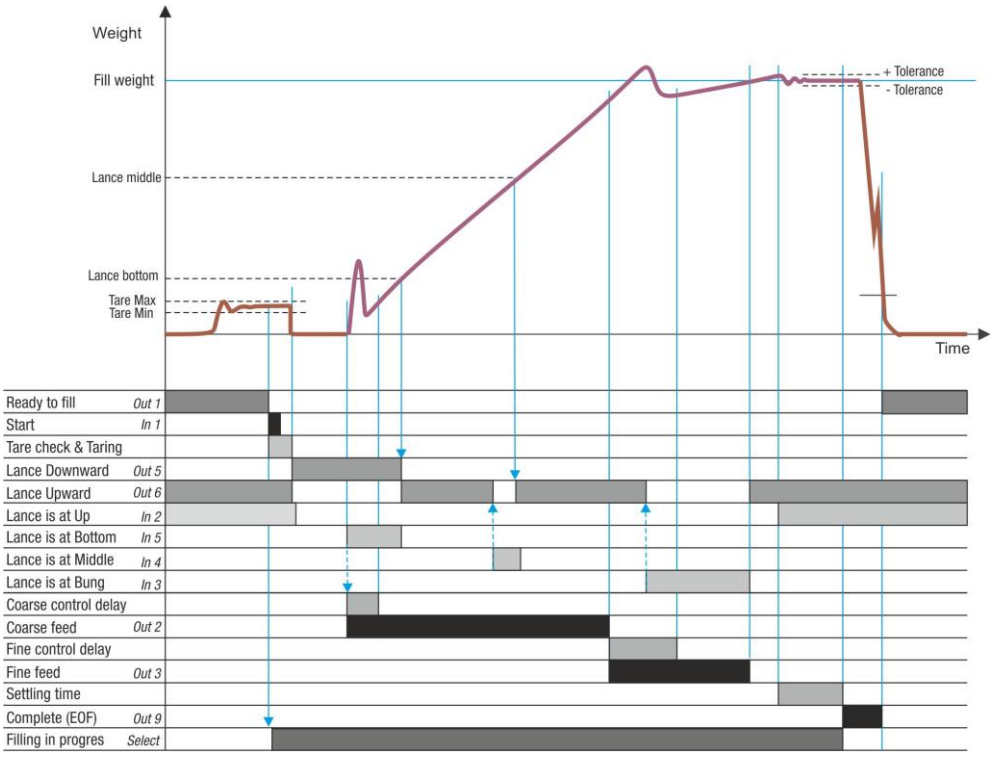
- You may build up your Recipe for each product filling and can save it in the controller.
- Valve drift or container lifting mechanism control against splash the material.
- Anti- oxidation gas blowing into the container is available.
- Container weight is checked before feeding material.
- Filling may start with fine or medium feeding against splash or foaming the material in the container.
- Feeding adjustments are done automatically to increase accuracy.
- Filling starts with start input or automatically after loading the platform.
- The start signal can be delayed for positioned the container and settling the scale before filling.
- The instrument may calculate the average tare weight to increase the machine productivity.
- Vibration output is available to remove air from product during filling.
- Programmable Select digital inputs and outputs can be used to control peripherals of the machine.
- Production does not stop in case of digital port malfunction! Use reserve inputs and outputs until changing the digital In/Out board or unit.
- Batch and bulk fillings are available.
- Resets filling automatically if the valve applies the force to the container instead of going down through the hole.

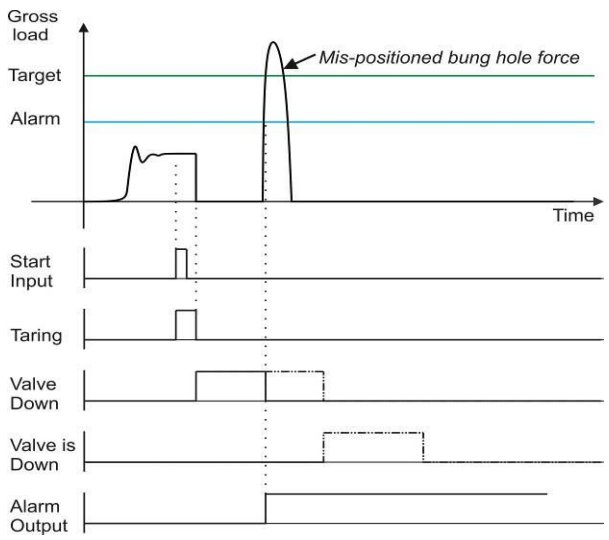
The main operation steps for the machine with position switches at bottom, middle, in and out positions:

- Place the container on to the scale and apply start input to start filling process.
- The dead load on the scale is tared automatically if container weight is in tare limits for net filling.
- Valve moves down to go into the container through the bung hole.
- After valve is gone to the down position, feeding is done in 2 or 3 speeds. Temporary fine feeding start is available against splashing the material from container.
- Lance moves from BOTTOM to MIDDLE point if the material is heavier than lance moving weight from bottom (**par 417**). After receiving the lance is at MIDDLE point input, the lance is stopped.
- Lance moves from MIDDLE point to the filling in the bung hole position, if the material is heavier than lance moving weight from middle position, **par. 418**. After receiving the lance is at bung hole filling position input, the lance is stopped until end of feeding.
- At the end of feeding, the valve goes out from the container to the up position.
- Tolerance control is done after settling the scale.
- The feeding cut off adjustments are done automatically to increase filling accuracy of the following cycles.
- The end of filling output is activated after filling is completed. If not, error signal is produced.
- Filling cycle ends after unloading the container from the platform.
- The filling controller goes to the ready status for the following filling.

Conditions to start the filling:

1. The tare should be in tolerances, Tare min < Tare < Tare max.
2. The scale should be stable for zeroing or taring.



If the valve applies force to the container during movement to go into the container *This protection is very important at liquid filling machines against to destroy the container and to splash the material outside. Error message warns the operator in case of mis-positioned container at lifting.* *If the weight increases more than the maximum valve force, the filling process will end, and the valve will go back to the to its UP position. Enter smaller value than destroying force of the container.* *Entries: Valve force parameter 416.*	

Notes

1) *There is a settling delay only if the preact adjustment is done after the filling (refer to **parameter 433**).*
2) *The printout or data transfer after filling is required the settling the scale.*
3) *The fine feed output is activated together with coarse feed output if **parameter 316** is FC as indicated in the drawing above. If this parameter is adjusted to C, the fine feed output is activated after coarse feeding.*

Descriptions on the selectable functions

1) The ***Run enable***, ***Filling inhibits,*** and ***Resume*** functions are activated when inputs are at high level, e.g. the start signal is executed if run enable input is at high level.
2) The ***Interrupt*** function is activated when input is at low level, e.g. the filling is interrupted if the interrupt input is at low level.
3) ***Filling***, ***Tolerance***, ***under filling errors*** can be used to warn the operator against various filling related errors.
4) ***Filling in process*** output can be used to block some filling machine functions during filling, like conveyors.
5) ***Alarm*** output can be used to warn the operator in case of over filling of the container.
6) ***Logical functions*** and ***timers*** can be used for material silo level and feeding control.
7) ***Timers*** can be used for producing various control outputs.

IMPORTANT NOTES: In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups **33** *and* **37-**.

7.3.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Valve is at UP position for BIU, BMIU and BIOU or Valve is at OUT position for BMIO		3	2
Input 3	Valve is at IN position		4	3
Input 4	Valve is at MID position for BMIU and BMIO or Valve is at OUT position for BIOU		5	4
Input 5	Valve is at bottom position		6	5
Input 6	Reset		7	6
Input 7	Select 1/ Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2/ Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*		14
Input 14	Select 8	*(Default: Disabled)*		15
Input 15	Select 9	*(Default: Disabled)*		16
Input 16	ACK / Resume	*(Default: Disabled)*		17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready to Fill		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Valve down		21	5
Output 6	Valve up		22	6
Output 7	-		23	7
Output 8	Drop catcher		24	8
Output 9	Complete (End of filling)		25	9
Output 10	Error		26	10
Output 11	Select 1/ Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2/ Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*		15
Output 16	Select 6	*(Default: Disabled)*		16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the filling machine. Refer to section 12 on page 106 for details. The available functions:

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Bypass	• Drop catcher switch • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error • Tare errors	• Alarm • In zero range • Remote output of fieldbus

7.4 [PACK] Packing Scale

This mode is used to control an accurate filling of the material at the weighing scale and emptying it to the packing section of the packing machine. After receiving start input or automatically after emptying, the accurate filling will be done. Filled material in the hopper is emptied after receiving empty input from packing machine controller. The cut-off adjustments are done automatically for accurate filling in a long time.

Multicycle filling is available to fill containers / bags which their nominal weights are more than the scale capacity.

Use of "packing machine with up to 16 weighing hoppers" mode is recommended to eliminate additional interface between FT-113Fill controllers and PLC for emptying scales in sequence.

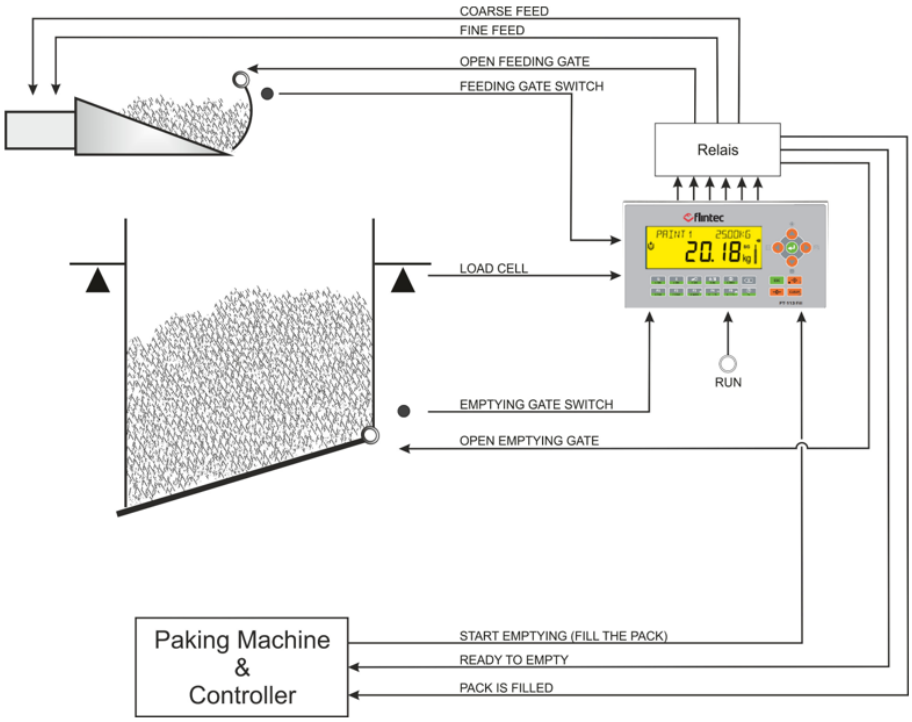


Figure 7.7 - Weighing scale control of the packing machine

Typical Applications

- Multi scale packing machines.
- Weighing of additives in tank or hopper.
- Batching with material scales.
- Adding critical materials to a batch.

Advantages and opportunities

- You may build up your Recipe content.
- Filling adjustment is done automatically to increase accuracy.
- Programmable zeroing period to increase the packing capacity.
- Automatic accuracy adjustment with programmable sampling quantity and frequency.
- Operation runs automatically or under PLC/HMI control.
- The operation may start from filling or from emptying.
- The filling start can be delayed for accurate zeroing the scale.
- Pre-feeding can be done into the feeding gate to increase the speed of the material transfer if the feeding gate is designed to collect some material in it.
- Vibration control for throwing gas from product at filling or at emptying.

- Free programmable digital inputs and outputs for your machine control.
- Production does not stop in case of port problem! Reserve inputs and outputs in case of malfunction at digital I/O board to use until receiving the new board.

Operation

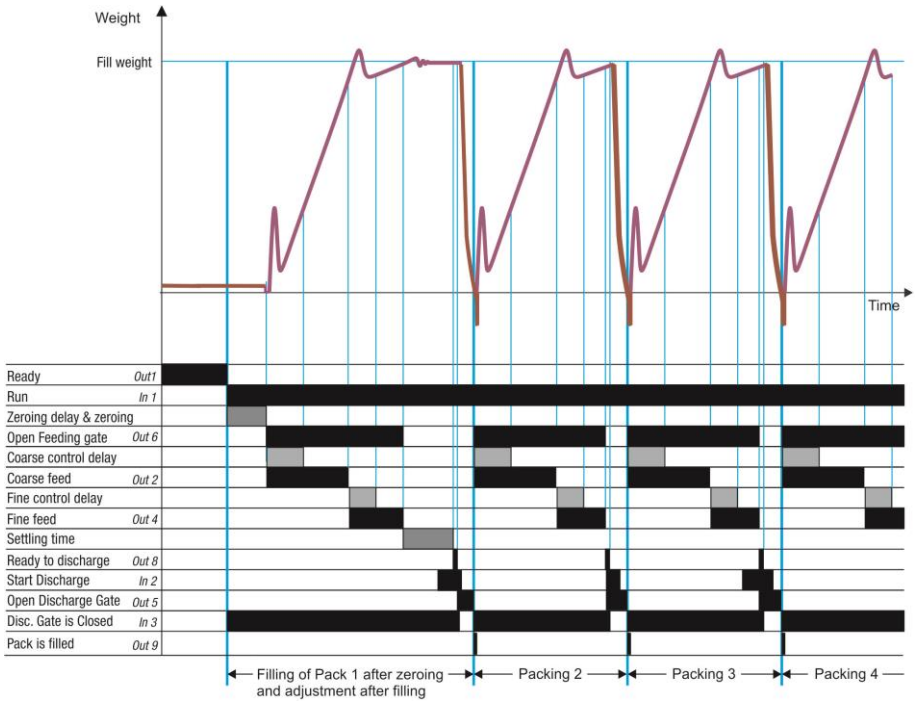
The filling and emptying are follows each other automatically or via digital fill start and empty inputs. The operation may set to start from filling or from emptying in automatic operation.

Filling the hopper

- Weighing of the material starts automatically after emptying or by start input. Use Run Enable input if start is automatic.
- The scale is zeroed for accurate filling.
- 2 or 3 speed filling start if the emptying gate is close.
- At the end of filling the tolerance control is done.
- End of filling output is produced if filling is in tolerances.
- The material is ready to empty the packing machine.

Emptying the hopper

- Apply discharge input if the filled material is ready to empty and pack is ready to fill.
- The emptying gate is opened.
- If the load is lighter than Empty weight, gate delay time runs.
- The emptying gate closes at the end of the delay time and Pack is filled output is produced for 200ms.
- The weighing scale is ready to fill.



Notes:

*1) There is a settling delay only if the preact adjustment is done after the filling (refer to **parameter 433**).*

*2) The fine feed output is activated together with coarse feed output if **parameter 316** is FC as indicated in the drawing above. If this parameter is adjusted to C, the fine feed output is activated after coarse feeding.*

Descriptions on the selectable functions:

1) The ***Run enable,*** Filling ***inhibits,*** and ***Resume*** functions are activated when inputs are at high level, e.g. the start signal is executed if run enable input is at high level.
2) The ***Interrupt*** function is activated when input is at low level, e.g. the filling is interrupted if the interrupt input is at low level.
3) ***Filling***, ***Tolerance***, ***Under filling errors*** can be used to warn the operator against various filling related errors.
4) ***Filling in process*** output can be used to block some filling machine functions during filling, like conveyors.
5) ***Scale is empty*** output can be used to transfer the empty container automatically to the filling station.
6) ***Alarm*** output can be used to warn the operator in case of over filling of the container.
7) ***Logical functions*** and ***timers*** can be used for material silo level and feeding control.
8) ***Timers*** can be used for producing various control outputs.

IMPORTANT NOTES: In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups **33** *and* **37-**

7.4.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling / RUN		2	1
Input 2	Start discharge (from packing machine)		3	2
Input 3	Discharge gate is closed		4	3
Input 4	Feeding gate is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready to Run		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Open discharge gate		21	5
Output 6	Open feeding gate		22	6
Output 7			23	7
Output 8	Ready to discharge (to packing machine)		24	8
Output 9	Pack is filled (to the packing machine)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the packing machine. Refer to section 12 on page 106 for details. The available functions

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Remote output of fieldbus

7.5 [BAG] Bagging Scale

This mode is used to control an accurate filling and emptying the weighing hopper to fill a bag. After receiving start input or automatically after emptying, the accurate filling will be done. The filled material in the hopper is emptied after receiving empty input. The cut-off adjustments are done automatically for accurate filling in a long time.
"Bagging machine with single weighing hopper" or "bagging machine with up to 16 weighing hoppers" modes are recommended to eliminate additional controllers or PLC in these bagging machines. Multicycle filling is available to fill containers / bags which their nominal weights are more than the scale capacity (Refer to page 98 for details).

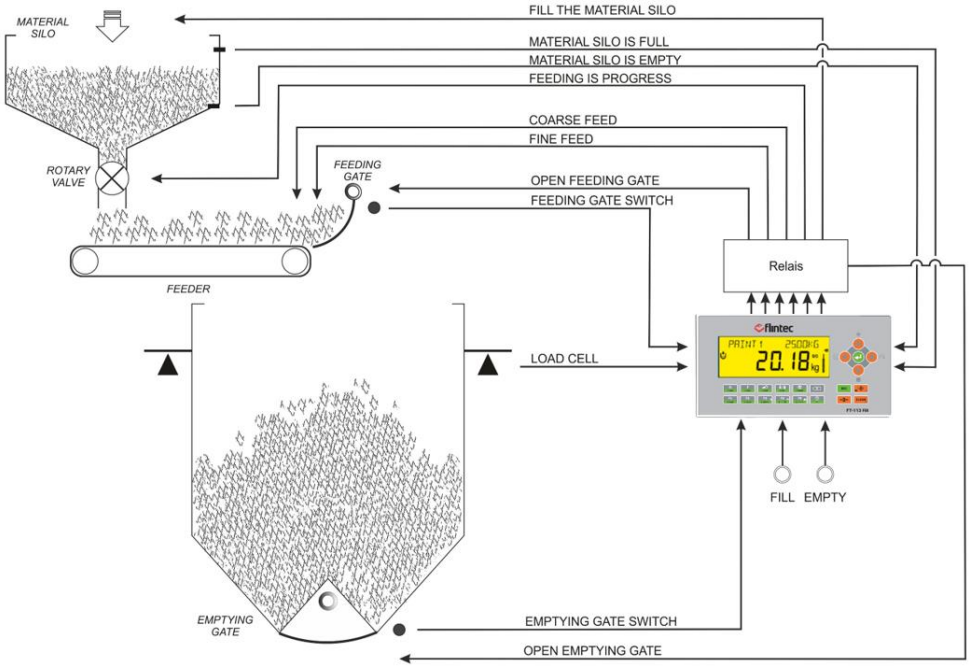


Figure 7.8 - Weighing hopper control of the Bagging machine

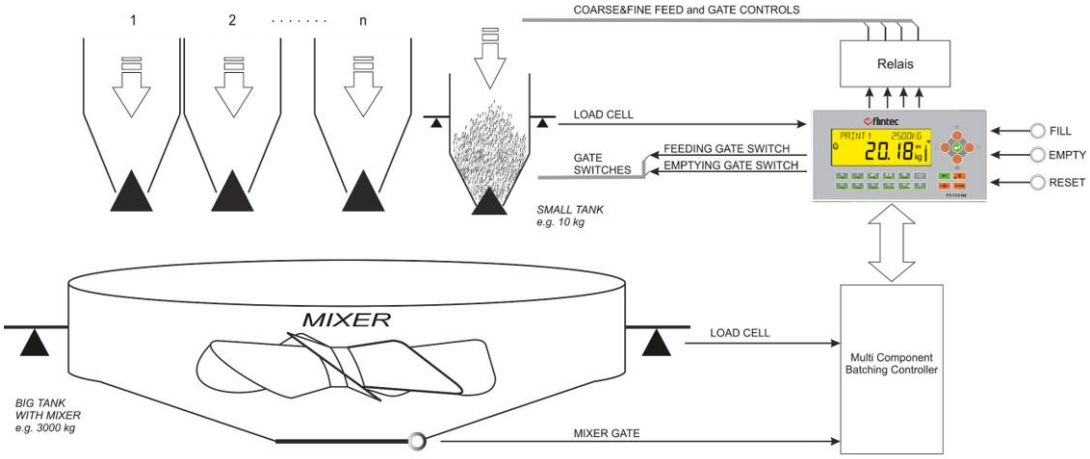


Figure 7.9 - Single material weighing at batching system

Typical Applications

- Bag and big bag filling machines.
- Weighing of additives in tank or hopper.
- Batching with separate material weighing hoppers.
- Adding critical materials to a batch.

Advantages and opportunities

- You can decide your recipe content depend on the use.
- Filling adjustment is done automatically to increase accuracy.
- Programmable zeroing period to increase the filling speed.
- Automatic accuracy adjustment with programmable sampling quantity and frequency.
- Operation runs automatically or under PLC/HMI control.
- The operation may start from filling or from emptying.
- The filling start can be delayed for zeroing the scale safely.
- Pre-feeding can be done into the feeding gate to increase the speed of the material transfer, if the feeding gate is designed to collect some material in it.
- Vibration control for throwing gas from product at filling or at emptying.
- Programmable digital inputs and outputs for your machine.
- Production does not stop in case of port problem! Reserve inputs and outputs in case of malfunction at digital I/O board to use until receiving the new board.
- Batch and bulk fillings are available.

Operation:

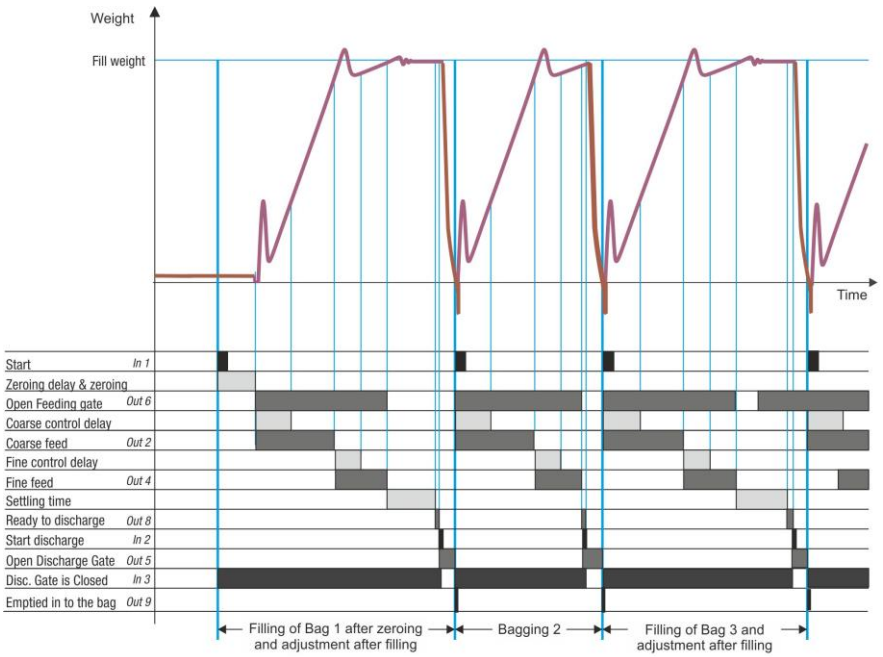
The filling and emptying follow each other automatically or via digital fill start and empty inputs. The operation may set to start from filling or from emptying in automatic operation.

Filling the hopper:

- The filling starts automatically after emptying or by start filling input. Select Start Filling signal as level and apply Start Filling Input during bagging, which means RUN, if filling will start automatically.
- The hopper weight is zeroed if zeroing period is over.
- 2 or 3-speed filling starts if the emptying gate is closed.
- The tolerance control is done at the end of feeding.
- End of filling output is produced if filling is in tolerances.

Emptying the hopper:

- Empty input is applied to FT-113Fill if the bag is ready to fill.
- The emptying gate is opened.
- If the load is lighter than Empty weight, gate delay time runs.
- The emptying gate closes at the end of the delay time to minimize the residual material.
- The complete output is produced after complete delay time to the following process.



Notes:

1) *There is a settling delay only if the preact adjustment is done after the filling (refer to* ***parameter 433****).*
2) *The fine feed output is activated together with coarse feed output if* ***parameter 316*** *is FC as indicated in the drawing above. If this parameter is adjusted to C, the fine feed output is activated after coarse feeding.*

Descriptions on the selectable functions

1) The ***Run enable, Filling inhibits,*** and ***Resume*** functions are activated when inputs are at high level, e.g. the start signal is executed if run enable input is at high level.
2) The ***Interrupt*** function is activated when input is at low level, e.g. the filling is interrupted if the interrupt input is at low level.
3) ***Filling***, ***Tolerance***, ***under filling errors*** can be used to warn the operator against various filling related errors.
4) ***Filling in process*** output can be used to block some filling machine functions during filling, like conveyors.
5) ***Scale is empty*** output can be used to transfer the empty container automatically to the filling station.
6) ***Alarm*** output can be used to warn the operator in case of over filling of the container.
7) ***Logical functions*** and ***timers*** can be used for material silo level and feeding control.
8) ***Timers*** can be used for producing various control outputs.

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-***.*

7.5.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling / Run		2	1
Input 2	Start discharge		3	2
Input 3	Discharge gate is closed		4	3
Input 4	Feeding gate is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready to fill		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Open discharge gate (to fill the bag)		21	5
Output 6	Open feeding gate		22	6
Output 7			23	7
Output 8	Ready to discharge		24	8
Output 9	Emptied into the bag (200ms)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program the selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions are

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Remote output of fieldbus

7.6 [BIG] Big Bag filling machine

The most common four kinds of the big bag filling machine type can be controlled by FT-113Fill. Additional functions requirements can be supplied by setting the selectable I/O's.

Set the **parameter 326** for the operation type of the big bag filling machine.

1. **Filling on the scale with lifter control:** The bag, loop holders, the bag clamp mechanism etc. are located on the weighing system. The big bag is placed on the holders. Catch the bag signal is applied to the FT-113Fill controller to hold the bag. After closing the clamp, the material feeding starts during lifting the big bag or after lifting it. The vibration can be applied to the big bag, or the holders are moved down and up to settle the material in the big bag during filling. After end of filling the lifter goes down and catch clamp released to end filling.
2. **Filling on the scale without lifter control:** The bag, loop holders, the bag clamp mechanism etc. are located on the weighing system. The big bag is placed on the holders and position of loop holders are controlled by operator. After placing the bag valve to the material outlet, catch the bag signal is applied to the FT-113Filling controller. After closing the clamp, the feeding starts. During feeding the vibration can be applied to the big bag to settle the material in the bag. The catch clamp is released, and Filling is ended output is produced after filling.
3. **Filling from the weighing hopper:** Refer to Bag filling machine related modes on pages 59, 63.
4. **Open big bag filling:** You may fill open big bags by canceling valve catching operation.

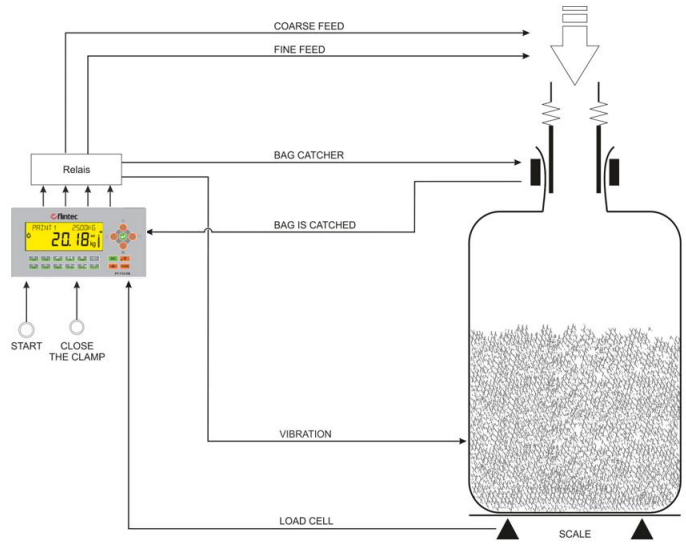


Figure 7.10 - Bag filling on the platform

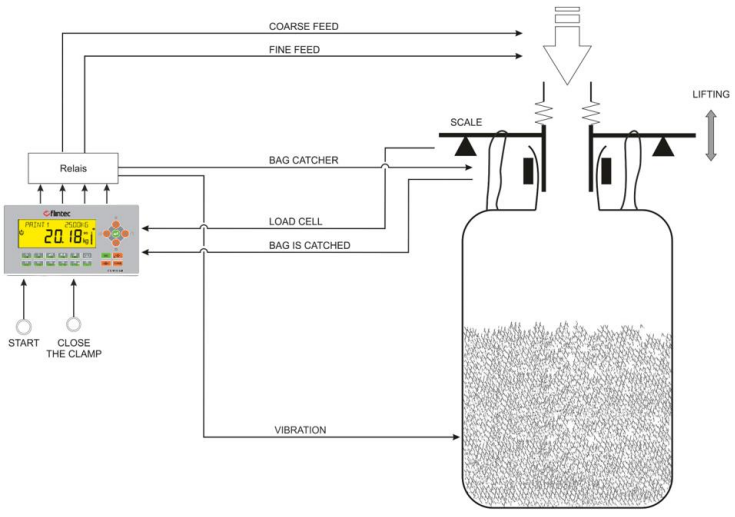


Figure 7.11 - Bag filling by hanging the bag

Typical Applications:

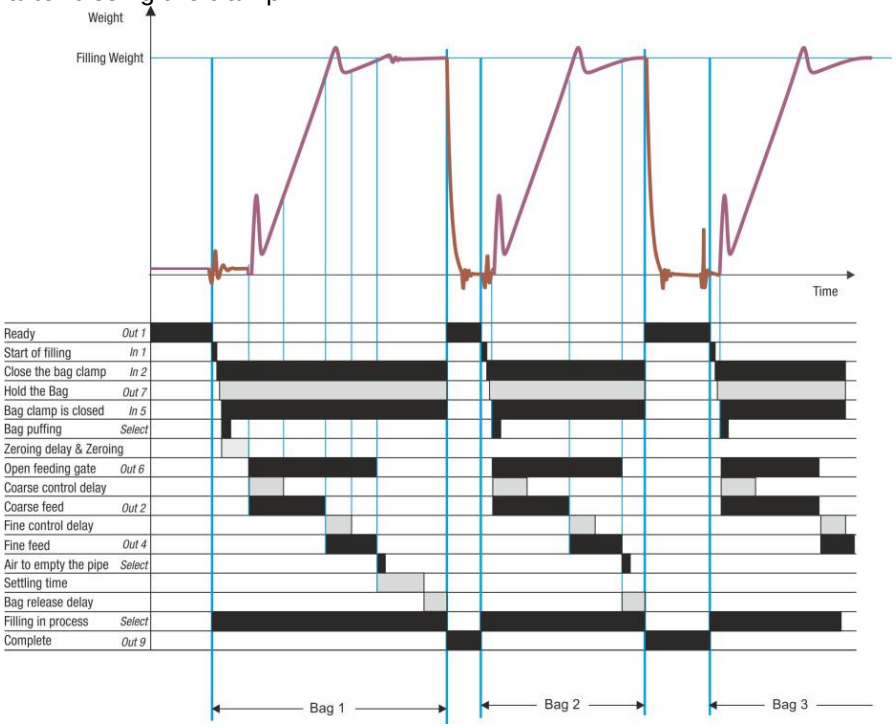
- Big bag filling on the platform.
- Big bag filling by hanging scale.
- Open big bag filling

Advantages and opportunities:

- Eliminates additional PLC in the cabinet to control complete machine.
- Increases the system reliability, speed, and efficiency due to only one electronic instrument for controlling whole machine.
- Vibration control for throwing gas from product at filling.
- Filling adjustment is done automatically to increase accuracy.
- The operation may start with bag valve clapping or with lifting the big bag.
- Programmable digital inputs and outputs for peripheral control needs, e.g. signal to bag transfer conveyor after releasing the bag, hanger movement for settling the material during filling etc.
- Material feeding control to the material bin on the bagging machine is available.
- Air blower control on the material feeding line is available.
- Production does not stop in case of dig. Port malfunction! Use reserve inputs and outputs until changing the digital In/Out board or unit.
- Batch and bulk fillings are available

Operation :

The diagram shown below indicates the operation of the filling machine with lifting control. Here material feeding is started after closing the clamp.



Notes :

1) *Bag puffing output can be produced from catch the bag output or "bag i**clamp is closed**" input or feeding gate output or feeding is progress output (selectable) by timer function of any select output, if any.*
2) *The air output to empty the feeding pipe can be produced from the fine feed output and timers 3 output of any select output.*
3) *The bag transfer system can be informed that the bag is dropped by using the complete output.*

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-**.

7.6.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Catch the big bag		3	2
Input 3	Lifter is at up position		4	3
Input 4	Feeding gate is open		5	4
Input 5	Bag clamp is closed		6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Lifter to up		21	5
Output 6	Open feeding gate		22	6
Output 7	Clamp (Hold the bag)		23	7
Output 8	Full (EOF, 200ms)		24	8
Output 9	Complete (Filled / Bag is released for 200ms)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable I/Os for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Feeding is progress	• Vibration • Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Logic output • Remote output of fieldbus

7.7 [VENT] Valve Mount Type Bag filling machine

This mode is used to control the valve type bag filling machines. The machine weights the bag during filling and drops it on to the transport system after filling.

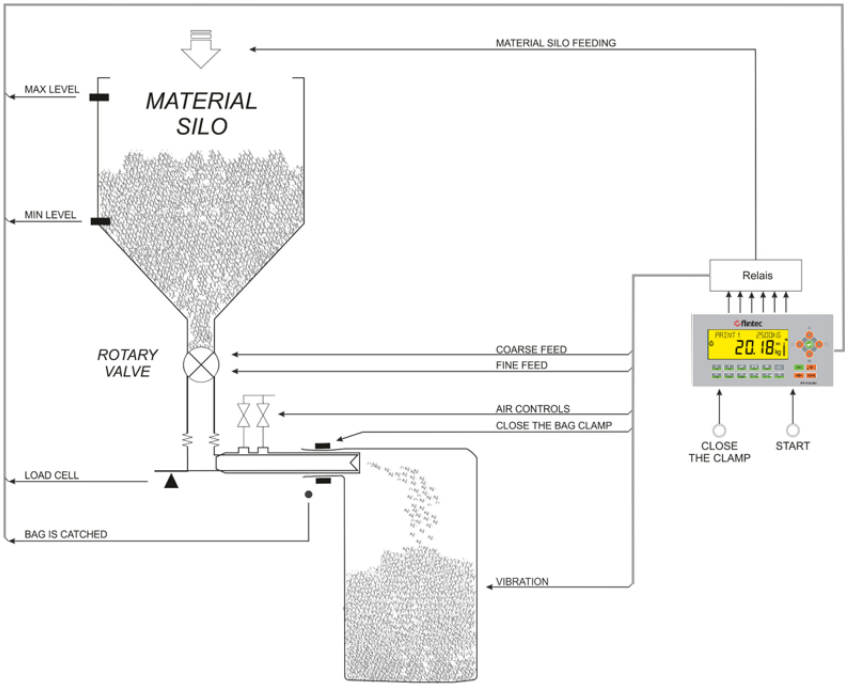


Figure 7.12 – Valve mount type bag filling machine

Typical Applications:

- Valve mount type bag filling machine

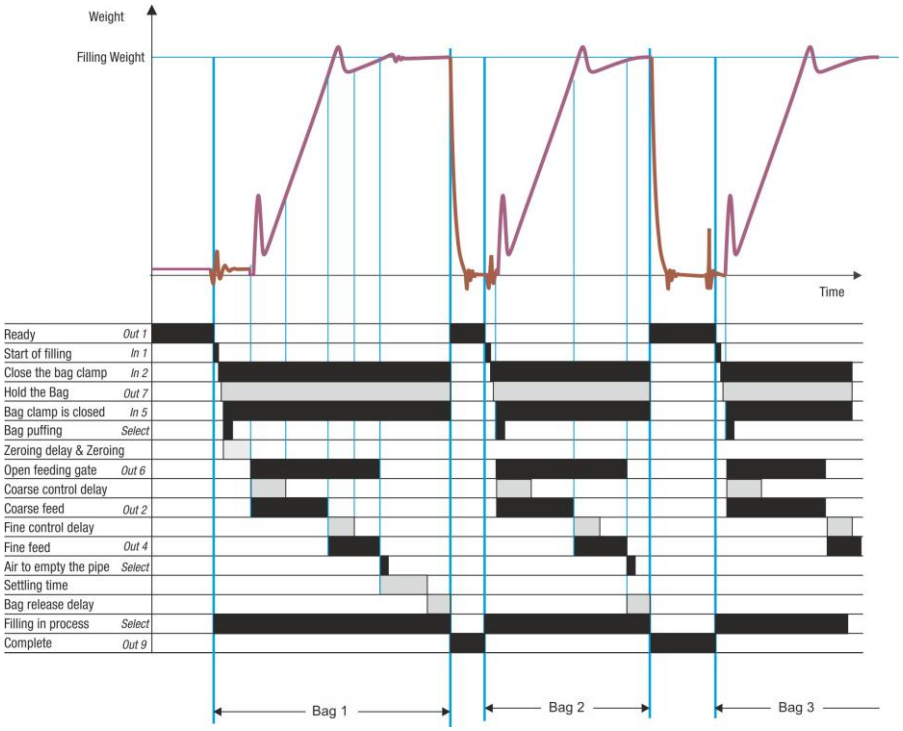
Advantages and opportunities:

- Eliminates additional PLC in the cabinet to control complete bagging machine.
- Increases the system reliability, speed and efficiency due to only one electronic instrument for controlling whole machine.
- Vibration control for throwing gas from product at filling.
- Bag puffing control before start feeding and air exhaust control during filling and until dropping the bag.
- Filling adjustment is done automatically to increase accuracy.
- The operation may start with filling or with emptying.
- Programmable digital inputs and outputs for peripheral control needs, e.g. signal to bag transfer conveyor after releasing the bag.
- Material feeding control to the material bin on the bagging machine is available.
- Air blower control on the material feeding line is available.
- Production does not stop in case of any port problem! Reserve inputs or outputs can be set to the malfunctioned ports until receiving the new digital input / output board.
- Batch and bulk fillings are available.

Operation:

The bagging starts by holding the bag and then the feeding starts to fill the bag after blowing it. At the end of filling the bag clamp is released to drop the bag.

- The "Close the bag clamp" input is applied to the controller after placing the bag.
- The bag clamp is closed, and bag is puffed by pressured air.
- 2 or 3 speed filling start after opening the feeding gate. Air in the bag is exhausted during feeding the material.
- Vibration is applied to the bag for throwing gas from material.
- At the end of filling the tolerance control is done.
- The bag clamp is dropped after bag clamp release delay.



Notes :

1) *Bag puffing output can be produced from catch the bag output or "bag clamp is closed" input or feeding gate output or feeding is progress output (selectable) by timer function of any select output, if any.*
2) *The air output to empty the feeding pipe can be produced from the fine feed output and timers 3 output of any select output.*
3) *The bag transfer system can be informed that the bag is dropped by using the complete output.*

IMPORTANT NOTES**: In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-.*

7.7.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Close the bag clamp		3	2
Input 3			4	3
Input 4	Feeding gate is open		5	4
Input 5	Bag clamp is closed		6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5			21	5
Output 6	Open feeding gate		22	6
Output 7	Clamp (Hold the bag)		23	7
Output 8	Full (EOF, 200ms)		24	8
Output 9	Bag is released (complete, 200ms)		25	9
Output 10	Error		26	10
Output 11	Select 1	*(Default: Disabled)*	27	11
Output 12	Select 2	*(Default: Disabled)*	28	12
Output 13	Select 3 / Reserve 1	*(Default: Disabled)*	29	13
Output 14	Select 4 / Reserve 2	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions are

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Feeding is progress	• Vibration • Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Logic output • Remote output of fieldbus

7.8 [1BAG] Bagging machine with single weighing hopper

This mode is used to control the bagging machine which has a single weighing hopper without any PLC requirement. The FT-113Fill controls the bag clamp system, feeding rotary valve, pump, material silo empty control etc. besides controlling of the accurate filling and emptying of the weighing hopper. The operation can be started by emptying or by filling after power on and ends after releasing the last filled bag.

Multicycle filling is available to fill containers / bags which their nominal weights are more than the scale capacity. Selectable digital inputs and outputs of both instruments can be used to control other peripherals on the filling machine.

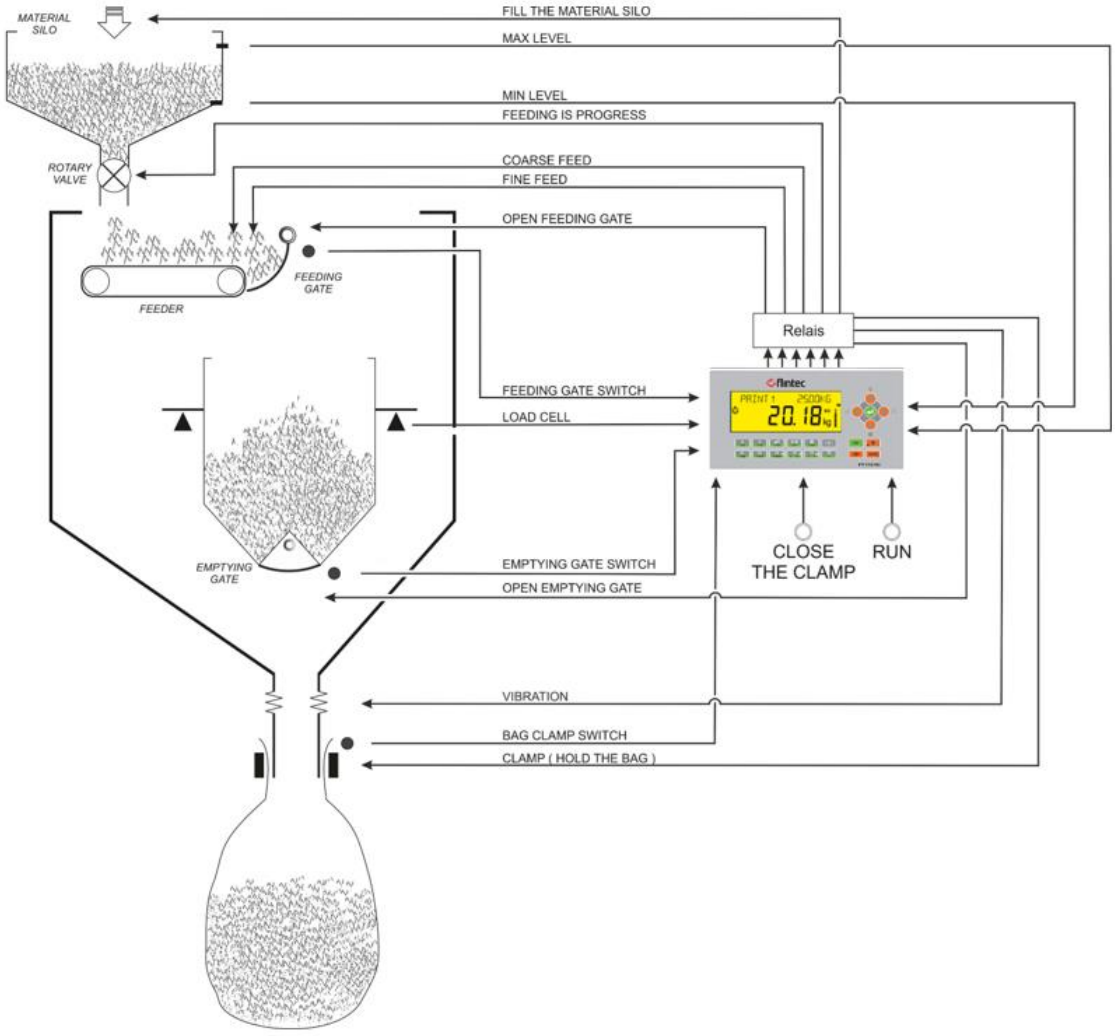


Figure 7.13 - Bagging machine with a single weighing scale

Typical Applications

- Filling machines with one scale for liquid or solid materials.
- Big bag filling machines with weighing hopper.

Advantages and opportunities

- Eliminates additional PLC in the cabinet to control complete bagging machine.
- Increases the system reliability, speed, and efficiency due to only one electronic instrument for controlling the whole machine.
- Filling adjustment is done automatically to increase accuracy.
- The operation may start with filling or with emptying.
- Pre-feeding can be done into the feeding gate to increase the speed of the material transfer, if the feeding gate is designed to collect some material in it.
- Vibration control for throwing gas from product at filling or at emptying.
- Free programmable digital inputs and outputs for peripheral control needs, e.g. signal to bag transfer conveyor after releasing the bag.
- Material feeding control to the material bin on the bagging machine is available.
- Production does not stop in case of any port problem at digital inputs or outputs! Reserve inputs or outputs can be set to the malfunctioned ports until receiving the new digital input / output board.
- Batch and bulk fillings are available.

Operation

The machine runs during the start input is active and ends after emptying the last filled bag. Use the Run Enable input or level start input to stop the operation after emptying the last filled material into the bag.

Bag clamp control

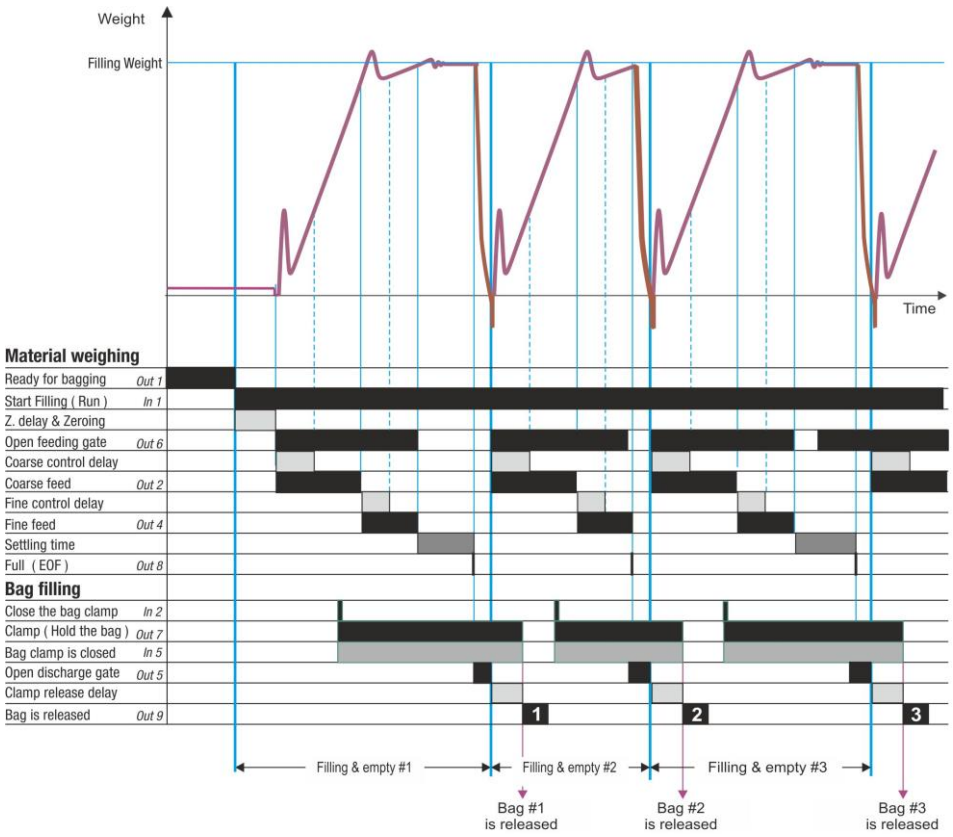
- Insert the bag to its place and hold it while applying Close the bag clamp input to the controller. Both close the bag clamp input should be applied together, if the second close the bag clamp input "S2" is selected from parameter 33.
- The bag clamp is closed to catch the bag.
- After emptying the weighted material from hopper, the bag clamp delay starts and then the bag clamp releases the bag.
- The operator places the empty bag to the machine to go on bagging.

Filling the hopper

- The filling starts automatically after closing the emptying gate if Run Enable input is active.
- The hopper weight is zeroed after zeroing delay.
- 2 or 3 speed material feeding starts. The filling stops if the emptying gate is opened during filling.
- At the end of filling the tolerance control is done.
- End of filling output is produced if filling is in tolerances.
- The material is ready to empty to the empty bag
- The feeding cut off values are adjusted automatically for following filling.

Emptying the hopper

- If the filled material is ready to empty from weighing hopper, and empty bag is catched after releasing the previous filled bag.
- The emptying gate is opened.
- The material weight is controlled to down to the empty range and then emptying delay runs.
- The gate is closed at the end of the emptying delay and bag clamp delay starts to release the bag.



Notes:

1) *There is a settling delay only if the preact adjustment is done after the filling (refer to* ***parameter*** *433).*
2) *The fine feed output is activated together with coarse feed output if* ***parameter 316*** *is FC as indicated in the drawing above. If this parameter is adjusted to C, the fine feed output is activated after coarse feeding.*

Descriptions on the selectable functions

1) The ***Run enable, Filling inhibits,*** and ***Resume*** functions are activated when inputs are at high level, e.g. the start signal is executed if run enable input is at high level.
2) The ***Interrupt*** function is activated when input is at low level, e.g. the filling is interrupted if the interrupt input is at low level.
3) ***Filling***, ***Tolerance***, ***under filling errors*** can be used to warn the operator against various filling related errors.
4) ***Filling in process*** output can be used to block some filling machine functions during filling, like conveyors.
5) ***Scale is empty*** output can be used to transfer the empty container automatically to the filling station.
6) ***Alarm*** output can be used to warn the operator in case of over filling of the container.
7) ***Logical functions*** and ***timers*** can be used for material silo level and feeding control.
8) ***Timers*** can be used for producing various control outputs.

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-***.*

7.8.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling / Run		2	1
Input 2	Close the bag clamp		3	2
Input 3	Discharge gate is closed		4	3
Input 4	Feeding gate is open		5	4
Input 5	Bag clamp is closed		6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready for bagging		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Open discharge gate		21	5
Output 6	Open feeding gate		22	6
Output 7	Clamp (Hold the bag)		23	7
Output 8	Ready to discharge		24	8
Output 9	Bag is full (EOF, 200ms)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable I/Os for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • S2 (hold back with both hands)	• Bypass • Release the bag • Logic inputs • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error • Alarm	• In zero range • Logic output • Remote output of fieldbus

7.9 [nBAG] Bagging machine with 2 weighing hoppers

This mode is mostly used to controls the whole bagging machine which has double or four weighing hoppers without using a PLC or HMI. FT-113Fill weighing controllers control the bag clamp system, feeding rotary valves, pump, material silo empty control, emptying sequence etc. additional to fill and discharge the material.

The master controller transfers the recipe data to slave controllers before start filling. The master unit controls emptying sequence, bag clamp control etc. additional to its filling process. Slave instruments control the weighing and emptying cycles of their hoppers. Selectable digital inputs and outputs of both instruments can be used to control other peripherals on the filling machine.

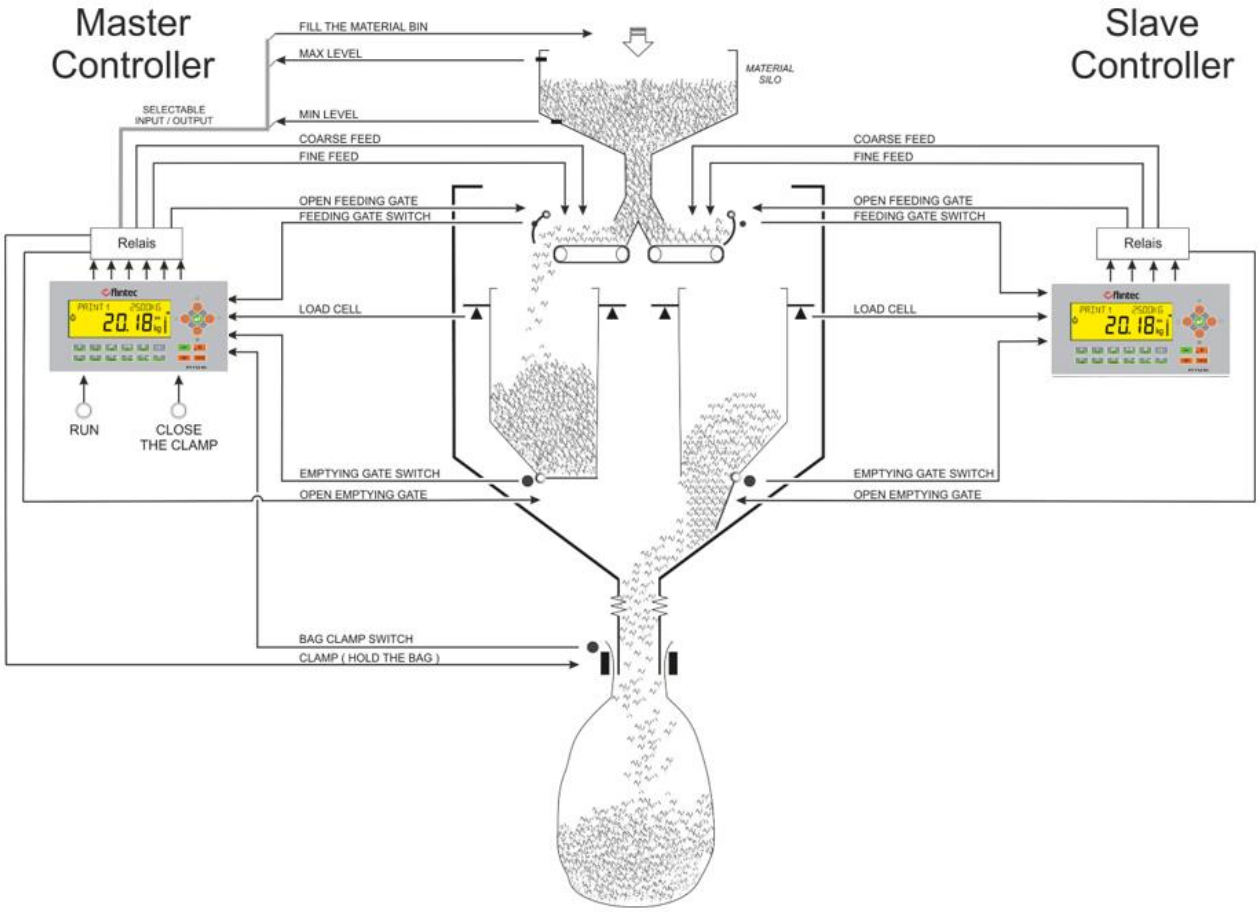


Figure 7.14 - Bagging machine with double weighing scale

Typical Applications:

- Bagging machines with 2 or more weighing hoppers.
- Select inputs and outputs can be used to level control of the material bin, feeding gate control, rotary valve control etc.
- Vibration control for sticky materials or throw out the gas from bag.
- The feeder can be used as buffer to cumulate the material to increase the bagging capacity after closing feeding gate.

Advantages and opportunities:

- Eliminates additional PLC in the cabinet to control complete bagging machine.
- Emptying the scales are done in sequence.
- Increases the system reliability, speed, and efficiency due to only one electronic instrument for controlling whole machine and filling.
- Filling adjustment is done automatically to increase the accuracy.

- Pre-feeding can be done into the feeding gate to increase the speed of the material transfer, if the feeding gate is designed to collect some material in it.
- Vibration control for throwing gas from product at weighing or at emptying of the material.
- Free programmable digital inputs and outputs for peripheral control needs, e.g. signal to bag transfer conveyor after releasing the bag.
- Production does not stop in case of any port problem! Reserve inputs or outputs can be set to the malfunctioned ports until receiving the new digital input / output board.
- Batch and bulk fillings are available.
- In case of malfunction at one of the controllers, the other operates the machine with one scale.

Interconnection between two FT-113Fill and commissioning

Two filling controllers can be connected to each other via RS232C, RS485 or Ethernet TCP/IP serial ports for master slave operation. The RS232C port can be used only at double FT-113Fill connection. The serial port of master controller must be addressed to "01" (scale 1) and the slave controller to "02" (scale 2) and more in sequence. All parameters, Recipe build, Recipe entries and memory entries must be done in the master controller and transferred to the slave controllers automatically.

1. Enter interconnection port of master unit and set it to MASTER and address 01.
2. Enter the set-up mode of the slave controllers. Enter the parameter of the interconnection ports. Select master slave operation MAST and set their address 02, 03, 04 etc. in sequence.
3. Connect instruments via serial port which will be used for interconnection after installing controllers to the cabinet and cabling as described in this section.
4. Enter set – up parameters of master controller and set all parameter values including calibration related parameters, capacity, division etc.
5. All parameter values are transferred automatically to the slave controllers at the exit from programming. The zero and gain calibration coefficients are not transferred.
6. Perform calibration to each scale and test their weighing performance.
7. Build recipe and save the data into memories at master controller.
8. Select the recipe at master controller and apply run input to start packing with four scales.
9. The operation will start after transferring the recipe data to slave instruments.

Operation

The filling and emptying are follows each other automatically after applying RUN input. The operation can start from filling or emptying. The master scale controls the bag clamp additional to its filling and discharging control. De-activate the run input to end the filling. The machine stops the filling after emptying all hoppers.

Bag clamp control by master controller

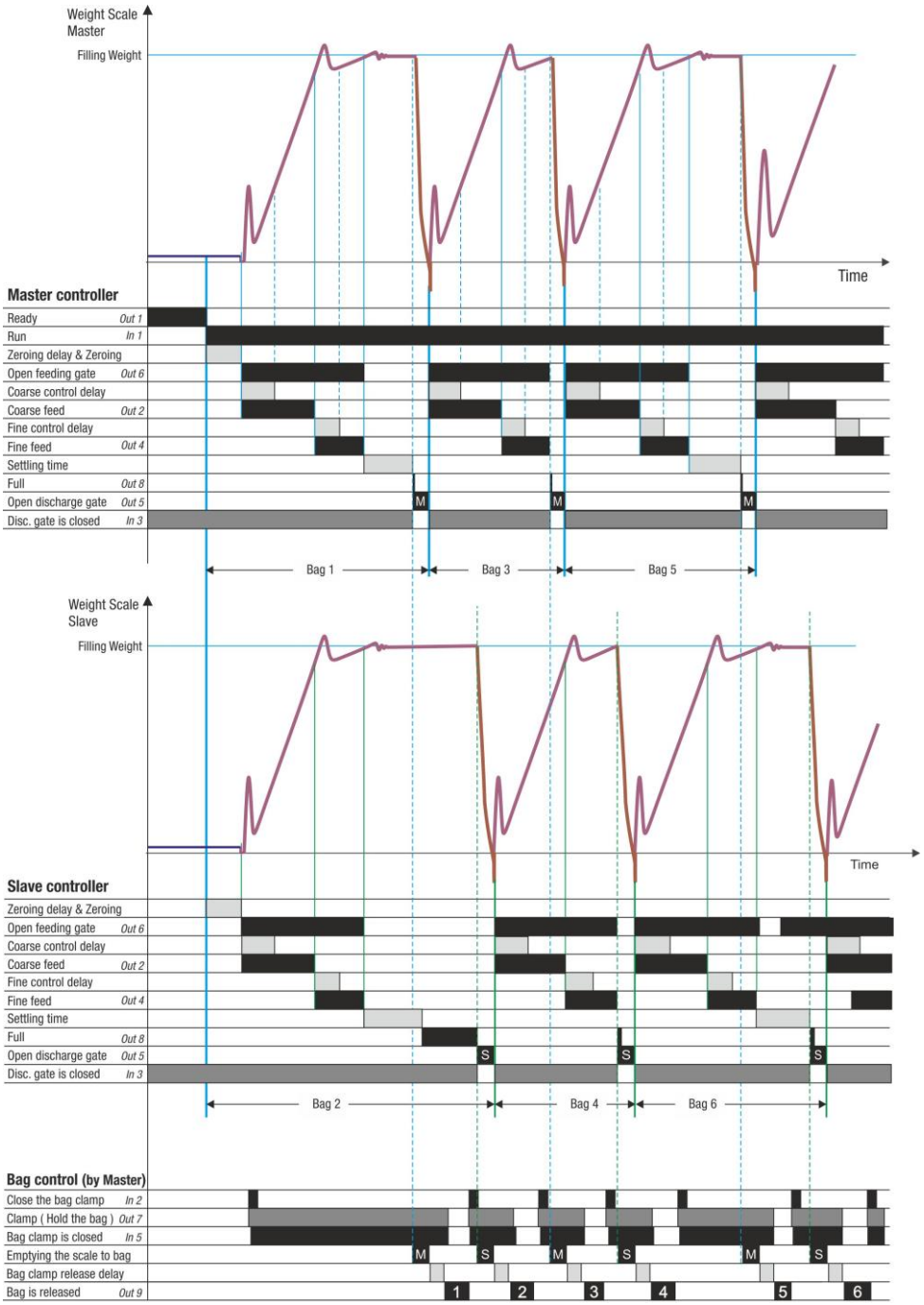
- The bag is brought to its filling place and the "hold the bag" input is applied to the master controller.
- The bag clamp is closed to hold the bag for filling.
- After emptying the weighing hopper, the bag clamp delay starts and then the bag clamp releases.
- The operator places the empty bag to the machine to discharge the second scale.

Filling each hopper

- The filling of the hopper starts if Run Enable input is active after discharge.
- The hopper weight is zeroed.
- Filling starts if the emptying gate is close.
- At the end of filling the tolerance control is done.
- End of filling output is produced if filling is in tolerances.

Emptying the hopper

- Master scale transmits discharge command to the scale which will be discharged via serial interface if the bag is ready to fill.
- The emptying gate of the scale opened.
- The scale load is controlled to down to the empty range and then gate delay runs.
- The gate closes at the end of the delay and end of discharge output is produced.



Notes:

1) Zeroing is done in frequency entered to the zeroing frequency.
*2) There is a settling delay only if the preact adjustment is done after the filling (refer to **par.** 433).*
*3) The fine feed output is activated together with coarse feed output if **parameter 316** is FC as indicated in the drawing above. If this parameter is adjusted to C, the fine feed output is activated after coarse feeding.*
4) The material in the material tank / silo can be controlled via select inputs and outputs.
5) Tolerance controls only can be done during preact adjustment.
6) Statistical calculations are done during preact adjustment as a sampling for statistical quality control.

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-**

7.9.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Run		2	1
Input 2	Close the bag clamp		3	2
Input 3	Discharge gate-1 is closed		4	3
Input 4	Feeding gate-1 is open		5	4
Input 5	Bag clamp is closed		6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready		17	1
Output 2	Coarse feed-1		18	2
Output 3	Medium feed-1		19	3
Output 4	Fine feed-1		20	4
Output 5	Open discharge gate-1		21	5
Output 6	Open feeding gate-1		22	6
Output 7	Clamp (Hold the bag)		23	7
Output 8	Full (EOF)		24	8
Output 9	Bag is released (complete, 200ms)		25	9
Output 10	Error		26	10
Output 11	Select 1	*(Default: Disabled)*	27	11
Output 12	Select 2	*(Default: Disabled)*	28	12
Output 13	Select 3 / Reserve 1	*(Default: Disabled)*	29	13
Output 14	Select 4 / Reserve 2	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Digital Inputs and Outputs of Slave Controller (Scales 2 / 3 / 4 ... / 16).

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1			2	1
Input 2			3	2
Input 3	Discharge gate-2 is closed		4	3
Input 4	Feeding gate-2 is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*Default: Disabled)*	-	14
Input 14	Select 8	*Default: Disabled)*	-	15
Input 15	Select 9	*Default: Disabled)*	-	16
Input 16	ACK / Resume	*Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1			17	1
Output 2	Coarse feed-2		18	2
Output 3	Medium feed -2		19	3
Output 4	Fine feed-2		20	4
Output 5	Open discharge gate-2		21	5
Output 6	Open feeding gate-2		22	6
Output 7			23	7
Output 8	Full (EOF)		24	8
Output 9			25	9
Output 10			26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*		
Output 16	Select 6	*(Default: Disabled)*		
+V	12 to 30 VDC power supply		16	17
-V	Ground		15	18

Free programmable Input / Outputs

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions

Selectable Input functions	Master	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • S2 (Hold bag with both hands)	• Bypass • Logic inputs • Release the bag • Remote input of fieldbus
	Slave	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus	
Selectable output functions	Master	• Filling in progress • Feeding is progress • Scale is empty • End of batch	• Vibration • Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Logic output • Remote output of fieldbus
	Slave	• Feeding is progress • Scale is empty • Vibration • Filling errors	• Tolerance error • Under filling error • Alarm • In zero range	• Logic output • Remote output of fieldbus

7.10 [nPAC] Packing machine with up to 16 weighing hoppers

This mode is used to control the whole weighing section of the packing machine. The master FT-113Fill controller directs operation of all weighing scales and manages synchronization between weighing and packing sections of the machine. FT-113Fill controllers may be control the level of the material silo. In this application, the scale which its addressed as 01 will be master and the address of slave shall be addressed as 02, 03 and 04 sequentially. Refer to parameter 111 and 119.

The master controller transfers the Recipe data to slave controllers and controls emptying sequence at the weighing hoppers besides the filling and discharging of its scale. Select inputs or outputs of instruments can be used to control other peripherals of the filling machine like material silo level control. Using of slave controllers, slave inputs and outputs as select ports are suggested due to sharing the real time controls between instruments.

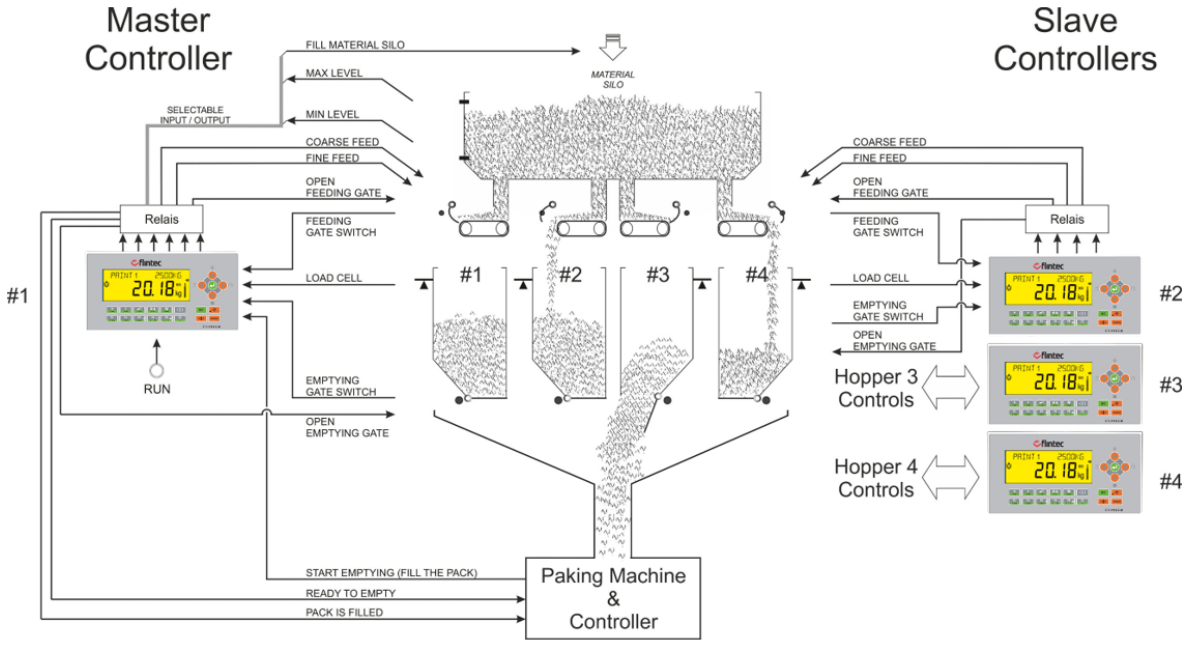


Figure 7.15 - Packing machine with four weighing scale

Typical Applications:

- Packing machine with 4 weighing scale.
- Multi scale packing machine.

Advantages and opportunities:

- Eliminates additional PLC in the cabinet to control complete weighing section of the packing machine.
- Signalization between weighing section and packing section of the packing machine.
- Emptying scales are done in sequence. Every filled scale is emptied in sequence against subsidence of the material.
- Increases the system reliability, speed, and efficiency due to eliminated PLC.
- Filling adjustment is done automatically to increase the accuracy.
- The operation may start with filling or with emptying.
- Pre-feeding can be done into the feeding gate to increase the speed of the material transfer, if the feeding gate is designed to collect some material in it.
- Vibration control for throwing gas from product at weighing or at emptying of the material.
- Free programmable digital inputs and outputs for peripheral control needs, e.g. signal to pack

transfer conveyor or material silo level control.

- The feeder can cumulate the material after closing feeding gate to increase the packing capacity.
- Production does not stop in case of any port problem! Reserve inputs or outputs can be set to the malfunctioned ports until receiving the new digital input / output board.
- In case of malfunction at one of the controllers, the second can be attended as master to go on packing with 3 scales.

Interconnection between four FT-113Fill and commissioning

Filling controllers can be connected to each other via RS485 or Ethernet TCP/IP serial ports for master slave operation. The serial port of master controller is addressed to "01" (scale #1) and the slave controllers are addressed to "02" (scale #2), "03" (scale #3) and "04" (scale #4). All parameters, recipe build, recipe entries and memory entries must be done in the master controller and will be transferred to the slave controllers automatically.

1. Enter the set-up mode of the controllers. Enter parameter of the interconnection port. Select master slave operation MAST and set master address 01 and slave addresses 02, 03 and 04 sequentially.
2. Connect instruments via serial port which will be used for interconnection after installing controllers to the cabinet and cabling as described in this section.
3. Enter set – up parameters of master controller and set all parameter values including calibration related parameters, capacity, division etc.
4. All parameter values are transferred automatically to the slave controllers at the exit from programming.
5. Perform calibration of scales.
6. Build recipe and save the data into memories at master controller.
7. Select the recipe at master controller and apply run input to start packing with four scales.
8. The operation will start after transferring the recipe data to slave instruments.

Operation:

The filling and emptying are follows each other automatically after applying RUN input. The operation may set to start from filling or from emptying in automatic operation. The master scale controls the bag clamp additional to its filling and discharging control.

Filling the hopper

- The material weighing starts if Run input is active after discharging.
- The hopper weight is zeroed.
- Filling starts if the emptying gate is close.
- At the end of filling the tolerance control is done.
- End of filling data is transferred to the master.
- Master activated Complete output which informs one of the scales is ready to empty.

Emptying the hopper

- Packing section of the machine sends start empty command to master unit.
- Master scale transmits discharge command to the scale which will be discharged.
- The emptying gate of the scale opened.
- The gate closes at the end of the emptying. The filling starts automatically.
- Master activated Complete (close the pack) output to the packing section after complete delay. Complete delay should be adjusted to fall the whole material in to the pack before closing it.

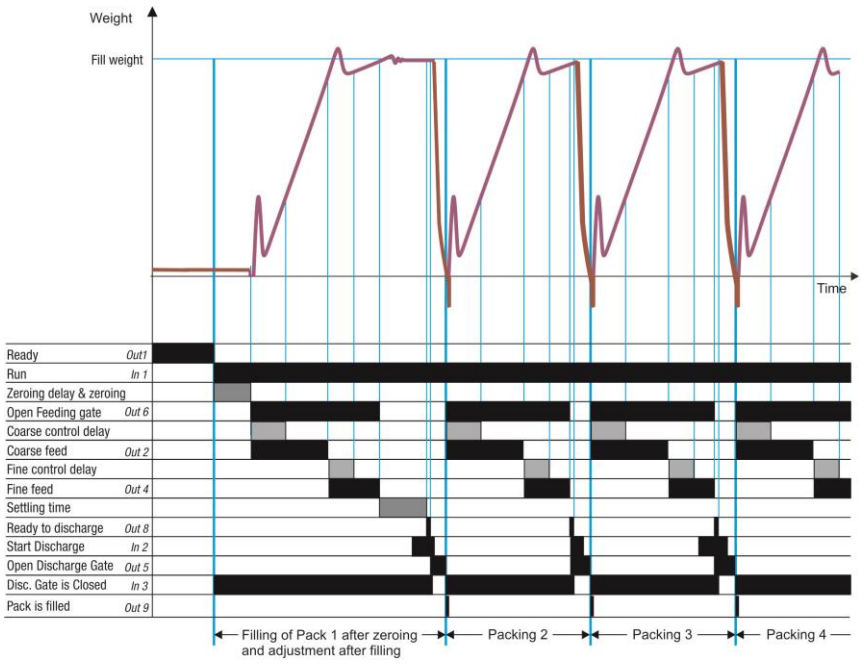


Figure 7.16 – Filling cycle for scale-1

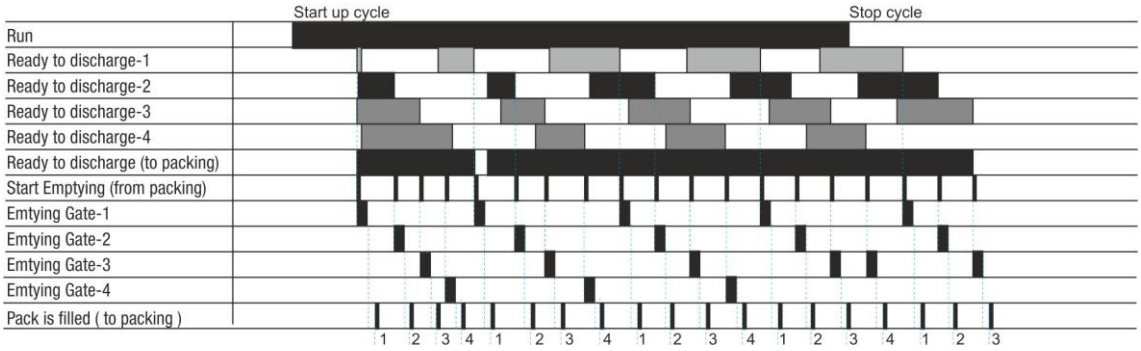


Figure 7.17 – Signalization between the weighing and packing sections of the machine.

Notes:

1) *Zeroing is done in frequency entered to the zeroing frequency.*
2) *There is a settling delay only if the preact adjustment is done after the filling (refer to* ***parameter*** 433 ***433).***
3) *The fine feed output is activated together with coarse feed output if* ***parameter 316*** *is FC as indicated in the drawing above. If this parameter is adjusted to C, the fine feed output is activated after coarse feeding.*
4) *The material in the material tank / silo can be controlled via select inputs and outputs.*
5) *Tolerance controls only can be done during preact adjustment.*
6) *Statistical calculations are done during preact adjustment as a sampling for statistical quality control.*

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-***.*

7.10.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Run		2	1
Input 2	Start discharge (from packing machine)		3	2
Input 3	Discharge gate-1 is closed		4	3
Input 4	Feeding gate-1 is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready		17	1
Output 2	Coarse feed-1		18	2
Output 3	Medium feed-1		19	3
Output 4	Fine feed-1		20	4
Output 5	Open discharge gate-1		21	5
Output 6	Open feeding gate-1		22	6
Output 7			23	7
Output 8	Ready to Discharge (to packing machine)		24	8
Output 9	Pack is filled (to the packing machine, 200ms)		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Digital Inputs and Outputs of Slave Controllers (Scales 2 / 3 / 4 … / 16).

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1			2	1
Input 2			3	2
Input 3	Discharge gate-2 / 3 / 4…/ 16 is closed		4	3
Input 4	Feeding gate-2 / 3 / 4…/ 16 is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7

Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1			17	1
Output 2	Coarse feed-2 / 3 / 4.../ 16		18	2
Output 3	Medium feed -2 / 3 / 4.../ 16		19	3
Output 4	Fine feed-2 / 3 / 4.../ 16		20	4
Output 5	Open discharge gate-2 / 3 / 4.../ 16		21	5
Output 6	Open feeding gate-2 / 3 / 4.../ 16		22	6
Output 7			23	7
Output 8			24	8
Output 9			25	9
Output 10			26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*		15
Output 16	Select 6	*(Default: Disabled)*		16
+V	12 to 30 VDC power supply		16	17
-V	Ground		15	18

Free programmable Input / Outputs

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions are

Selectable Input functions	Master	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus
	Slave	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus	
Selectable output functions	Master	• Filling in progress • Feeding is progress • Scale is empty • End of batch	• Vibration • Filling errors • Tolerance error • Under filling error	• Alarm • In zero range • Logic output • Remote output of fieldbus
	Slave	• Feeding is progress • Scale is empty • Vibration • Filling errors	• Tolerance error • Under filling error • Alarm • In zero range	• Logic output • Remote output of fieldbus

7.11 [TANK] Fill the Container from Tank Scale

This mode is used to fill the weighing tank with material(s) and discharging it to fill containers. Filling and discharging can be done very accurately by saving proper recipes into the recipe memory. You may use some part of recipe memory for filling and some part of Recipe memory for discharging. This mode can be used at various batching and filling systems.

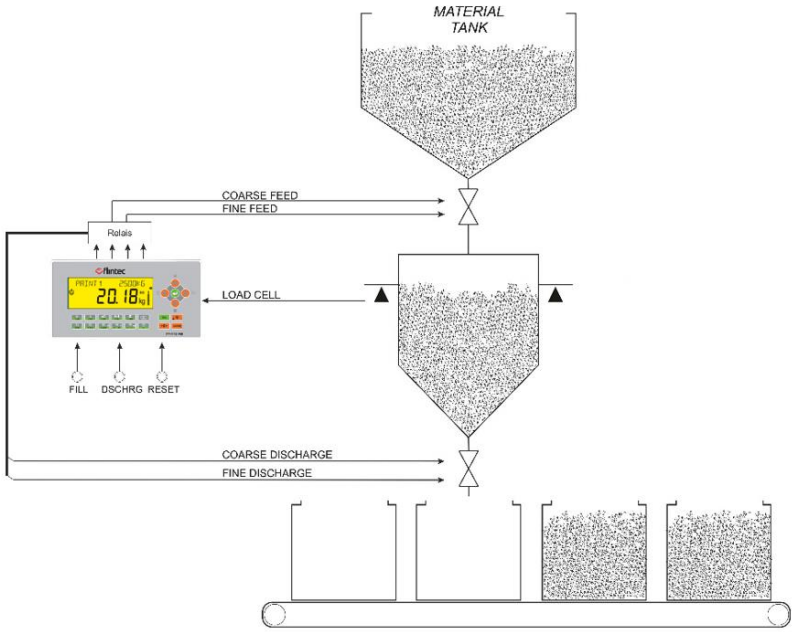


Figure 7.18 - Filling by weighing the tank or silo

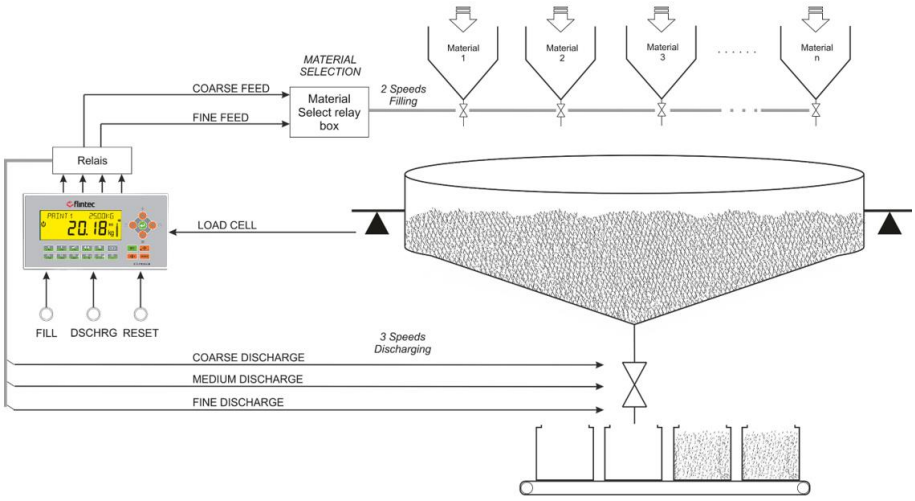


Figure 7.19 - Filling from batching scale by using very simple PLC.

Typical Applications:

- Filling the material tank with material and then filling containers from tank.
- Batching and filling at the same tank scale.
- Basic multicomponent batching.
- Discharging the ingredient to the tank / mixer at constant amounts.
- Filling the mixer and discharging it at specified amounts.

Advantages and opportunities:

- You may build up your recipe content.
- Some recipes in the memory can be used for filling and some of them can be used for discharging.
- Materials of the batch can be saved into the recipe memory and each material can be filled after selecting the material feeding system and its recipe from memory.
- Weighing controller controls accurate weighing of all materials.
- The start and discharge operations can be delayed.
- Vibration output can be used for settling the material in the tank, for mixing, for heating etc.
- Select In / Out can be used for controlling peripherals.
- Production does not stop in case of port problem! Use reserve inputs and outputs in case of malfunction until receiving the new board.

Operation:

The filling and discharging can be done independently as described below.

Filling or discharging weight = Target + Overfill

The target and overfill values should be entered before start filling or discharging due to their common use at filling and discharging. Using separate Recipes for filling and discharging is recommended.

Filling

- Enter target and feed-in values to the weighing controller or select the – filling - recipe from memory.
- Select the material from cabinet in case of multi feeding tank.
- Apply filling start input to start filling of material into the tank.
- If the discharge gate is closed, the feeding starts to fill the weighing tank after zeroing or taring.
- Tolerance control is done after settling time.
- At the end of filling the feeding gate is closed and Full (EOF prompt displayed.
- This means the material is ready in the tank.
- You may fill the following material or discharge the tank into containers or empty the tank.

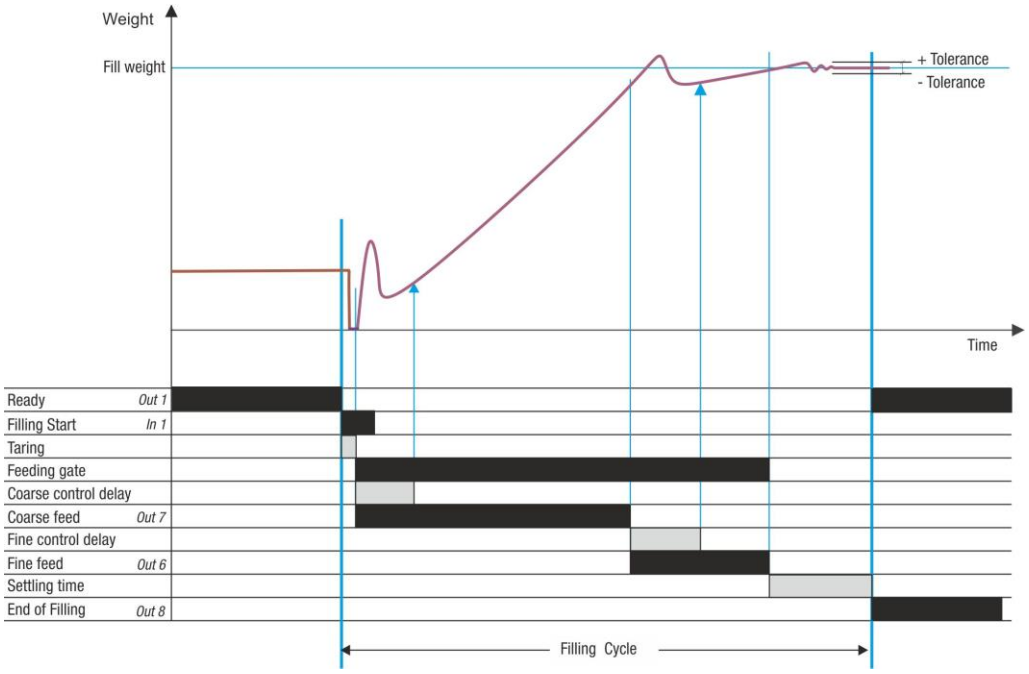


Figure 7.20 – Filling cycle

Discharging

- Enter target and feed-in values to the weighing controller or select the – discharge – recipe from memory.
- After receiving the discharge start input the scale tares automatically and discharging starts.
- Discharging is done accurately in multi speeds under feeding gate control. The feeding stops and error signal produced if feeding gate opens during discharging.
- Tolerance control is done after settling time.
- The EOD output produced at the end of discharging.

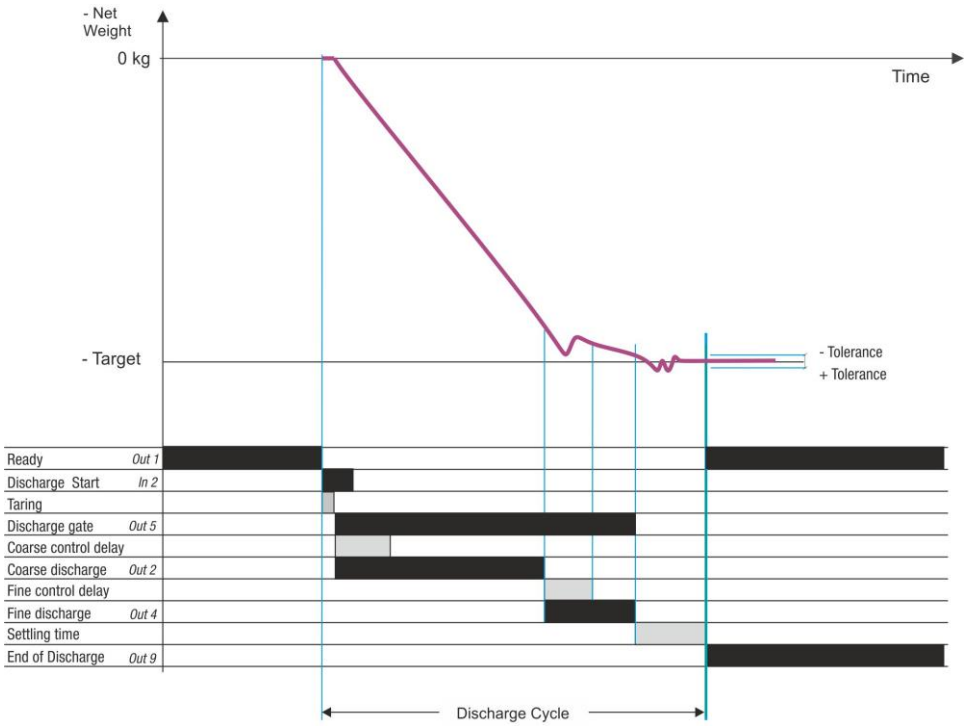


Figure 7.21 – Discharge cycle

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-**.

7.11.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Start discharge		3	2
Input 3	Discharge gate is closed		4	3
Input 4	Feeding gate is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready		17	1
Output 2	Coarse discharge		18	2
Output 3	Medium discharge		19	3
Output 4	Fine discharge		20	4
Output 5	Open discharge gate		21	5
Output 6	Fine feed		22	6
Output 7	Coarse feed		23	7
Output 8	End of filling		24	8
Output 9	End of discharge		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to section 12 on page 106 for details. The available functions

Selectable Input functions	• Run enable • Filling inhibits • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error • Alarm	• In zero range • Logic output • Remote output of fieldbus

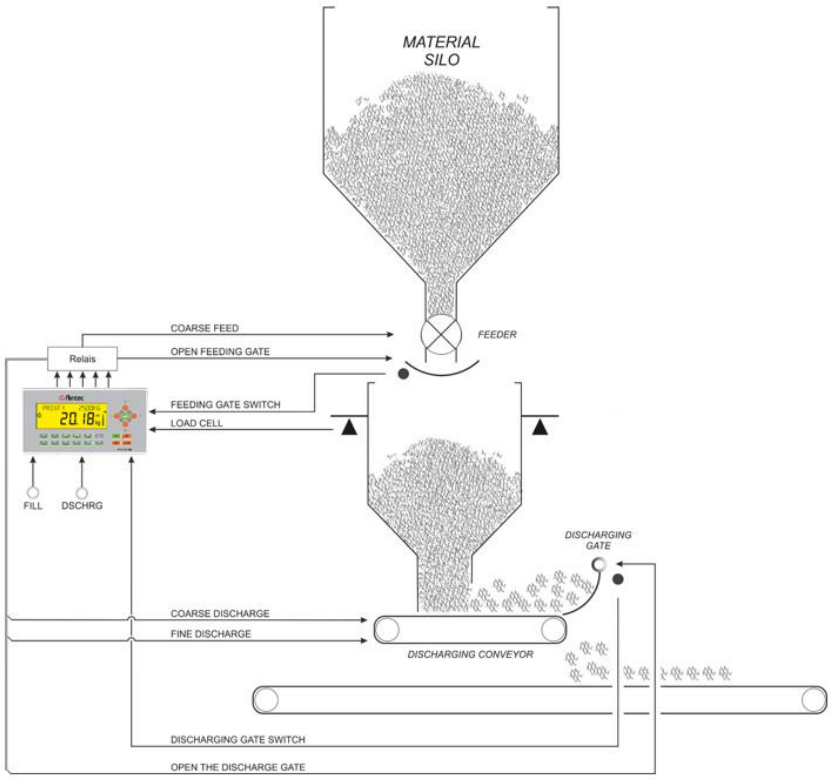
7.12 [WOUT) Weight-in / Weight-out

This mode is used to fill the material which has high viscosity and is not easy to empty the material from the weighing hopper, or for weighing critical ingredients of batching systems. The accurate material weighing is done during discharging at Weigh-in / Weigh-out mode. Filling and discharging are done in sequence for having better accuracy due to remaining material which its weight affects the accuracy of weighing for risky materials. The system accuracy increases for dust materials if the filling is done just before discharging.

In this operation:

Filling weight = Target + Overfill + Empty weight (Remaining material)
Discharge weight = Target + Overfill.

Filling is done one speed and discharging can be done up to 3 speeds. The recommended remaining material weight is more than 5% of the Target for accurate discharging which depends on the material fluidity.



Typical Applications

- High accurate weighing in multi-scale batching systems by weighing ingredients at discharge to increase the batching accuracy of the formula.
- Filling or transfer materials which has high viscosity.
- Ingredient / additive weighing of the batch in high accuracy.
- Adding critical materials into the batch.
- Weighing of sticky materials to add into the batch at mixer.
- To place the raw materials on the transfer conveyor as a sandwich by adjusting discharge timings of hoppers.

Advantages and opportunities

- You may build up your Recipe and program your operation for best.
- The instrument follows the material behavior at filling and discharging separately to increase the system accuracy.
- Adjustments are done automatically to minimize deviations from targets at filling and discharging.
- Weighing controller checks the flow rates at weighing cycle to increase the accuracy.
- Vibration control is available for regular discharging.
- Programmable digital inputs and outputs for your machine requirements.
- Production does not stop in case of port problem! Reserve inputs and outputs in case of malfunction at digital I/O board to use until receiving the new board.
- Batch or bulk discharging are available.

Operation

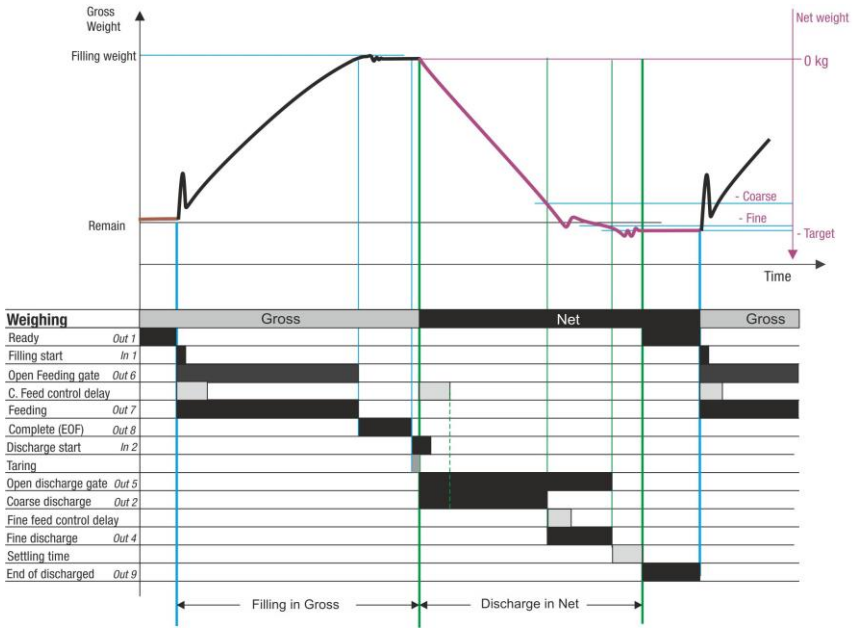
The operations should start with filling and discharging and is finished at a full hopper. If the material weight in the hopper is heavier than 98% of filling weight the EOF (Full output) is activated at power on.

Filling

- Apply filling start input to start filling.
- If the discharge gate is closed, the feeding starts to fill the weighing hopper to filling weight [Target + Overfill + Empty weight].
- At the end of filling the feeding gate is closed and Full (EOF) prompt displayed.
- The material is ready to transfer in the weighing hopper / tank.

Discharging

- After receiving the discharge start input, discharging starts if the discharged weight is at least 98% of the material weight in the hopper.
- The scale tares automatically and starts discharging.
- Discharging is done in multi speeds.
- Tolerance control is done after settling time.
- The Complete output produced at the end of discharging.



Notes :

*1) There is a settling delay only if the preact adjustment is done after the filling (refer to **par.** 433).*

*2) The fine feed output is activated together with coarse feed output if **par. 316** is FC as indicated in the drawing above. If this par. is adjusted to C, the fine feed output is activated after coarse feeding.*

IMPORTANT NOTES: *In case of malfunction at any digital input or output port, you can use reserve ports to go on filling until receiving the new digital input / output board or unit. Refer to parameter groups* **33** *and* **37-**.

7.12.1 Digital Inputs and Outputs

RELATED PAGES: Refer to pages 25, 147, 146, 172.

I / O	Description		FT-113Fill A	RIO16 Unit
Input 1	Start filling		2	1
Input 2	Start discharge		3	2
Input 3	Discharge gate is closed		4	3
Input 4	Feeding gate is open		5	4
Input 5			6	5
Input 6	Reset		7	6
Input 7	Select 1 / Reserve 1	*(Default: Disabled)*	9	7
Input 8	Select 2 / Reserve 2	*(Default: Disabled)*	10	8
Input 9	Select 3	*(Default: Disabled)*	11	10
Input 10	Select 4	*(Default: Disabled)*	12	11
Input 11	Select 5	*(Default: Disabled)*	13	12
Input 12	Select 6	*(Default: Disabled)*	14	13
Input 13	Select 7	*(Default: Disabled)*	-	14
Input 14	Select 8	*(Default: Disabled)*	-	15
Input 15	Select 9	*(Default: Disabled)*	-	16
Input 16	ACK / Resume	*(Default: Disabled)*	-	17
Com	Common for inputs		1, 8	9, 18
Output 1	Ready		17	1
Output 2	Coarse feed		18	2
Output 3	Medium feed		19	3
Output 4	Fine feed		20	4
Output 5	Open discharge gate		21	5
Output 6	Open feeding gate		22	6
Output 7	Feeding		23	7
Output 8	End of filling		24	8
Output 9	End of discharge		25	9
Output 10	Error		26	10
Output 11	Select 1 / Reserve 1	*(Default: Disabled)*	27	11
Output 12	Select 2 / Reserve 2	*(Default: Disabled)*	28	12
Output 13	Select 3	*(Default: Disabled)*	29	13
Output 14	Select 4	*(Default: Disabled)*	30	14
Output 15	Select 5	*(Default: Disabled)*	-	15
Output 16	Select 6	*(Default: Disabled)*	-	16
+V	+12 to 28 VDC		16	17
-V	0 VDC		15	18

Selectable Input / Outputs Functions

If you program selectable inputs and outputs for your use, you will have additional digital interfaces to control peripherals of the bagging machine. Refer to sec. 12 on page 106 for details. The available functions

Selectable Input functions	• Run enable • Filling inhibit • Interrupt • Resume	• Reject • Hold status • Empty scale • Bypass	• Logic inputs • Remote input of fieldbus
Selectable output functions	• Filling in progress • Scale is empty • End of batch • Vibration	• Filling errors • Tolerance error • Under filling error • Alarm	• In zero range • Logic output • Remote output of fieldbus

8. OPERATION METHODS

Operation process can be described to the machine by defining filling method, tare type, machine type and related functions additional to scale related features. In this section, the filling methods taring types and adjustment technics are described.

8.1 Filling Methods

RELATED PARAMETERS: Parameters 312, 344 and 41A

FT-113Filling controller can control filling processes in 5 ways.

Method	Operation
Continuous filling with pulse start input	The filling machine starts filling cycle after receiving start input of the automatic filling machine or semiautomatic filling machine. The following filling starts after receiving start input when the instrument is at ready status.
Continuous filling with level start input	The start input should be a level input and is used as a run signal. The filling machine operates continuously as an auto-start filling machine. Automatic filling ends after removing the "Start" input.
Batch quantity filling	Batch filling is used to fill the product at specified quantity. The batch counter start from the batch quantity and decreases to zero to follow the remaining quantity of the batch. The filling stops at the end of batch filling. The new batch starts after entering the new batch quantity.
Batch total filling	Batch total weighing is used to fill the product to the specified total weight. The target weight is added in to the total after each filling. The filling of the batch starts after entering the batch total and ends at the end of the batch weighing.
Bulk filling	Bulk total weighing is used to transfer the material accurately at the specified total weight to the customer. The last pack can be less than target to transfer the accumulated bulk weight accurately. Filling of the bulk starts after entering the total weight of the bulk and ends after transferring the material accurately.

8.2 Taring Types

RELATED PARAMETERS: Parameters 413, 414 and 415.

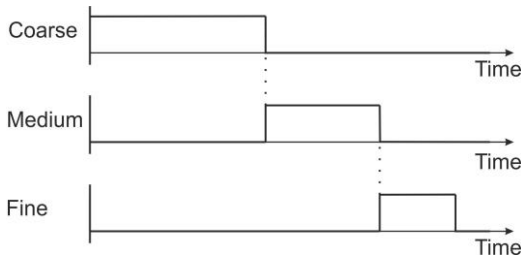
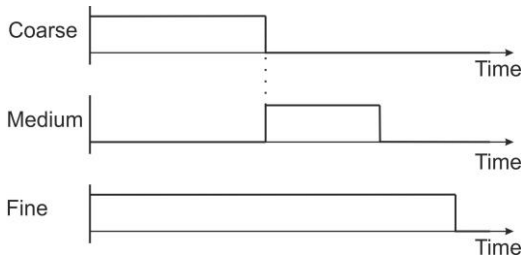
FT-113Filling Controller tares the container weight in 3 ways in net filling.

Type	Description
Automatic tare	The weight of the container is zeroed automatically after receiving start input in net filling. The gross weight should be positive, and scale should be stable for taring. If the gross weight is negative, zeroing can be done automatically instead of taring at some filling modes. Tare is cleared at the end of net filling.
Average tare	The filling machine tares the scale to the average weights of containers to increase the filling machine speed. The average weight is calculated periodical as 5 samples of 25 filling, 10 samples of 100 filling, Or 10 sampling only at the start of batch/ bulk or at the start of the new Recipe.
Specific tare	The specific container weight PT can be entered into the Recipe for specific taring.

8.3 Feeding Types

RELATED PARAMETERS: Parameters 315 and 316.

Function of feeding outputs can be programmed as below.

Sequential output	Par. item	Timing diagram
Only related output	C	
Fine output is activated at coarse and medium feedings.	FC	
Coarse&Medium&Fine, Medium&Fine and Fine feedings are enabled sequentially.	FMC	

8.4 Adjustment technics of feeding cut-offs

*RELATED PARAMETERS: Parameters **431** and **432** and **43D**. .*

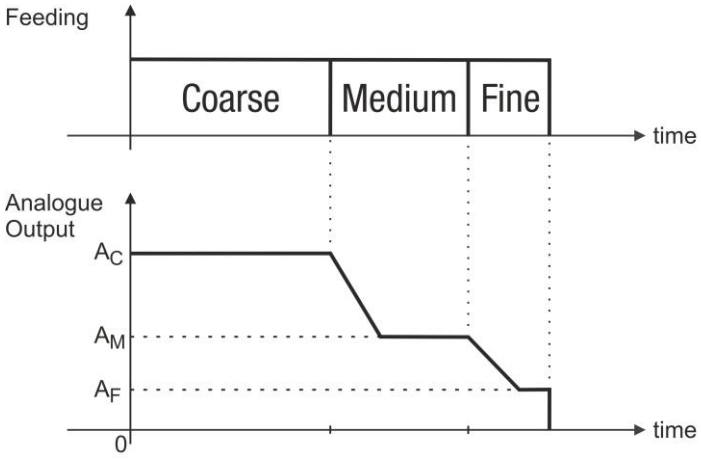
FT-113Filling Controller adjusts cut-off values automatically if enabled as

Adjustment	Description
None	The feeding cut-off values are entered manually and not changed.
Automatic	The fine feed cut-off weight value is adjusted automatically to minimize filling error according entered to sampling quantity, adjustment frequency and correction ratio. Coarse cut off is not adjusted automatically.
Fine feed time	This feature enables the fastest filling speed at specified fine feed time. The coarse feeding cut-off weight value is adjusted automatically to provide fine feed time. Fine feed adjustment frequency, sampling quantity, and correction ratio are parameters for fine cut- off adjustment. Increase the fine feeding time if there is high instability at coarse feeding flow rate.
Smart	At this adjustment method, entries are target and fine feeding time. Coarse and fine feeding cut-off weights are calculated by the instrument at start up by setting cut-off values automatically. The smart operation is suggested if the coarse feeding is more than 2 seconds at filling. The smart operation is suggested if the coarse feeding is more than 2 seconds at filling. Fine feed time can be changed by pressing  key and then by pressing  or  keys or enter numerically at ready status.

8.5 Analogue output for material feeding control

RELATED PARAMETERS: Sub-block [45-]

FT-113Fill controls the analogue output according to the figure below. It can control feeding speeds via electrical motor or valve if FT-113Fill is equipped with analogue output. The analogue output type, and the output values for coarse, medium, and fine feedings should be entered to activate this feature in parameter group 45-. Parameters of feeding speed values should be selected for Recipe in Recipe build block to enter different feeding values for different materials easily.



8.6 Preact Adjustment

*RELATED PARAMETERS: Parameters **433**, **434** and **435**.*

FT-113Filling Controller has 3 parameters to adjust cut-off values automatically which are

Parameter	Description
Preact adjustment frequency	The preact adjustment is done in the preact adjustment frequency. E.g. If parameter 433 is 10, the preact adjustment is done automatically after each 10 fillings. In case of tolerance control at filling, preact adjustment frequency is equal to the sampling quantity at operation.
Sampling quantity	The preact adjustment is done according to the mean error of the fillings in sampling quantity. E.g. if the sampling quantity is 3, the calculated filling error is the mean error of these following three fillings.
Correction ratio	The filling error changes the feed-in value after multiplying with correction ratio. If the correction ratio is 50 per cent, the feed-in value will change by adding half of the filling error.

The fine feed cut-off weight value is adjusted automatically to minimize filling error according to entered to sampling quantity, adjustment frequency and correction ratio.

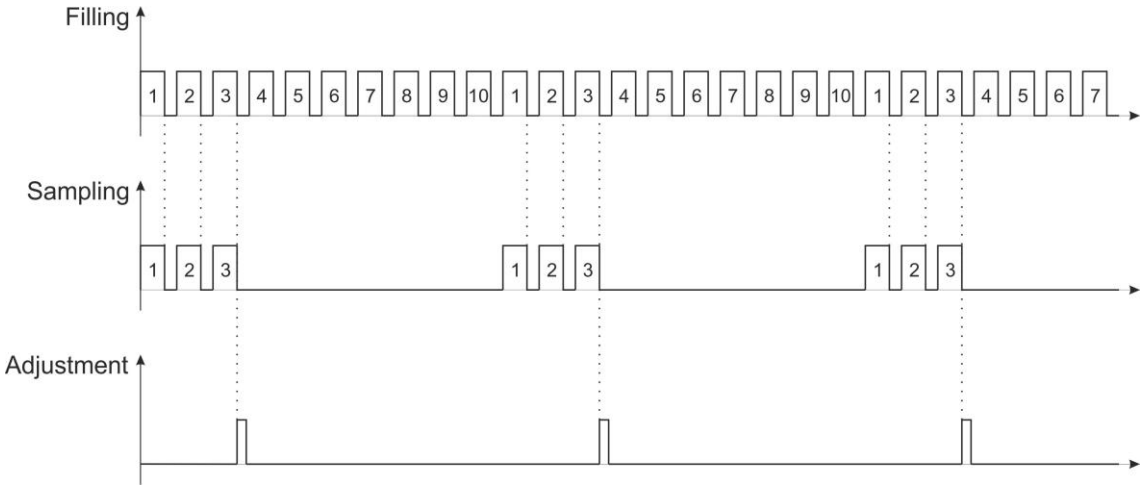


Figure 8.1 - Preact adjustment with sampling

The new Fine feed in value calculation is done as

Fine feed in correction = Correction factor x (Fill error1 + Fill error2 + ... + Fill errorN) / N

Example: If sampling quantity is 3, correction ratio is 50 percent and filling errors of following three samples are 1 g, 3 g and 0 g, the new feed in is corrected 0.5 x (1 + 3 + 0) / 3 = 0.7 g.
If fine feed-in was 2.5 g, the new feed-in will be 3.2 g for the following 10 filling to reduce the material.

8.7 Master Slave Operation at Multi head Filling

APPLICATION : Linear and rotative liquid filling machines, cement bagging machines etc.

RELATED PARAMETERS: Parameters 111, 119, 121, 129, 151, 153 and 319*.*

The multi head filling machines fills the same product at the same time, e.g. rotating liquid filling machine. The set-up of the filling controllers on these machines are the same even they are running independently. FT-113Filling controller gives the opportunity to transfer set-up data and Recipe from master instrument to other instruments at multi head filling machines.

The master controller transfers the set-up and Recipe data to up to 30 slave controllers at ready status, if the filling mode is any standalone filling mode, e.g. any liquid filling mode.

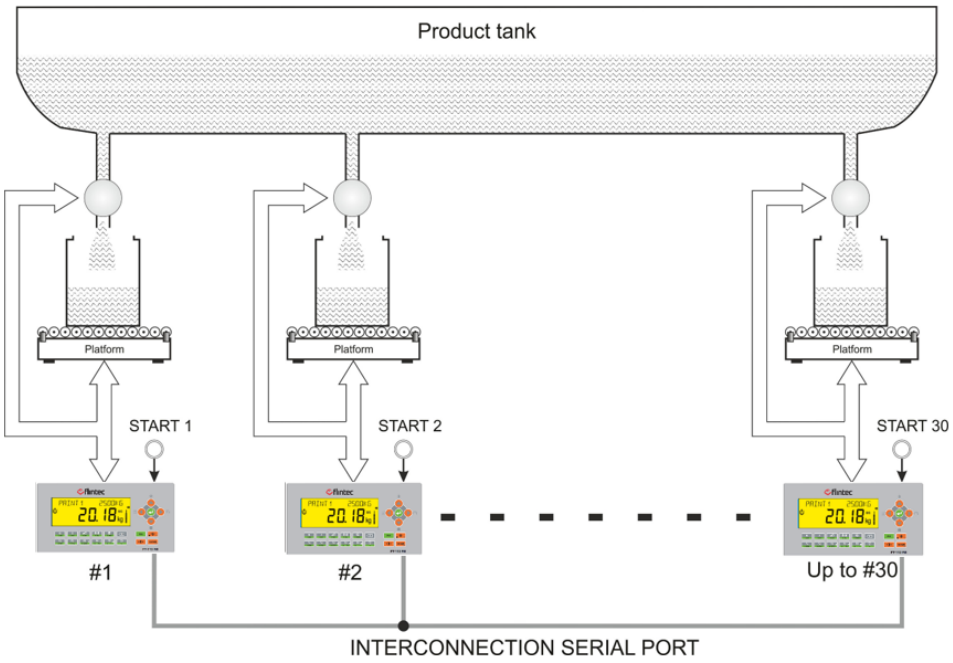


Figure 8.2 – Master slave operation at rotating filling machine

Typical Applications:

- Multi head rotating or linear liquid filling machines,
- Multi head bagging machines,

Interconnection between up to thirty FT-113Fill and commissioning

Filling controllers can be connected to each other via RS485 or Ethernet TCP/IP serial ports for master slave interfacing. The serial port of master controller is addressed to "01" (scale #1) and the slave controllers are addressed to "02" (scale #2), "03"(scale #3) and up to "30" (scale #30). All parameters, Recipe build, Recipe entries and memory entries are setup in the master controller and the required data is transferred to the slave controllers automatically.

1. Connect instruments via serial port which will be used for interconnection after installing controllers to the cabinet and cabling as described in this section.
2. Enter the set-up parameters of the slave controllers. Enter parameter of the interconnection port. Select master slave operation MAST and set its address from 02 up to 30 sequentially.
3. Enter set-up parameters of master controller and set all parameter values including calibration related parameters, capacity, division etc. Remember interconnection port of master unit will be set to MAST and address 01.
4. All parameter values are transferred automatically to the slave controllers at the exit from programming.

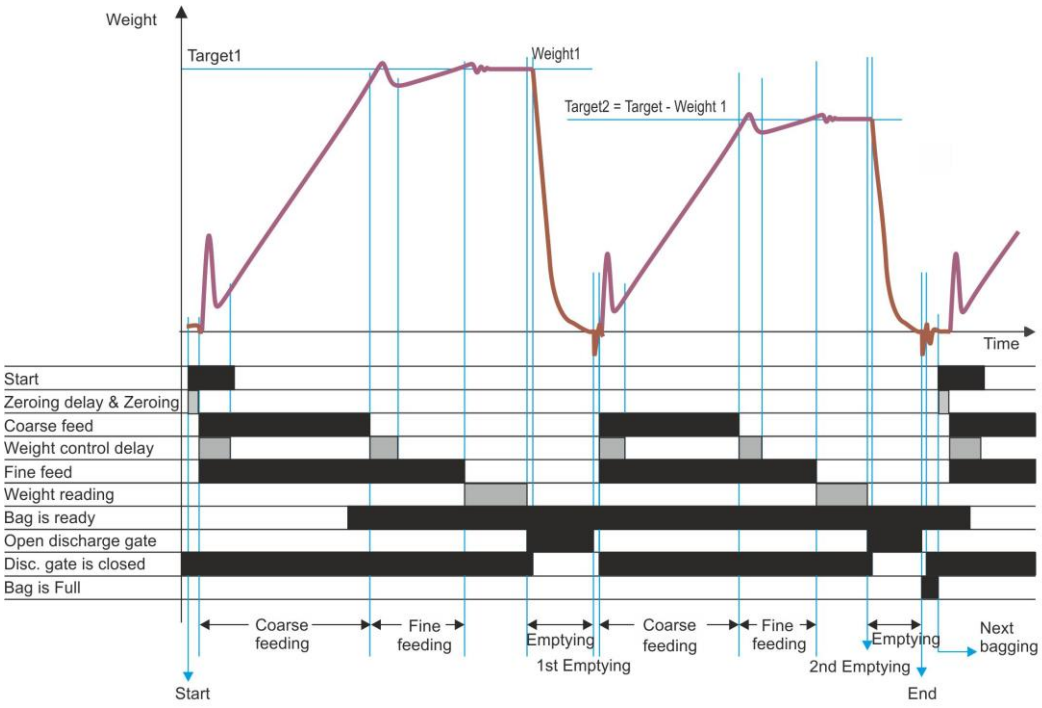
5. Perform calibration to scales.
6. Build Recipe and enter Recipe values at master controller.
7. Select the Recipe at master controller.
8. Run the filling machine.

8.8 Multicycle Packing or Bagging

Multicycle filling can be done at Packing and Bagging filling modes to fill the packages/bags heavier than Maximum filling capacity of the filling machine which has the weighing hoppers.

IMPORTANT NOTES: *Enable this feature if you will fill big packages/bags which is heavier than the Maxfill (**par. 317**) of filling machine by selecting **parameter 411** as MULT (Multicycle filling). If you will not fill your container more than one cycle, never set **parameter 411** as MULT.*

The target weight of each weighing cycle is calculated automatically to minimize the bag filling error. The machine compensates the filling error of the filled part at the following filling to minimize filling errors. Due to the accurate filling, the weighing controller reads the material in the hopper each cycle before emptying it even there is not any adjustment or tolerance control. Preact adjustment frequency **parameter** 433 should be adjusted to 1 in this mode. The typical filling cycle is shown at drawing below for filling in 2 cycles.



For multicycle filling

1. Set **parameter 411** as MULT to enable multicycle filling which means the filling is done more than one time in to the container if filling weight is bigger than Maxfill.
2. Select preact correction frequency and its sample quantity as 1.
3. Enter the target and overfill for multicycle filling.
4. If the filing weight which is total of target and overfill is bigger than Maxfill of the machine, FT-113Fill instrument warns the operator for multicycle operation on the information display.
   with [MULTICYCLE FILL?]. Press ↵ key to confirm multicycle operation or press ESC key to return.

Multicycle operation

1. Start input is applied to start filling.
2. The weighing hopper is filled to the calculated optimum weight for the first weighing.
3. The filling error is calculated after the first weighing.
4. The target of the second filling is corrected to compensate the filling error of the first cycle.
5. The second filling is done with this new calculated Target2 weight.
6. The following cycles are done as described at item 3 and item4.
7. The EOF output is produced at the end of the filling of the container.

***Warning**: The target and overfill values should be entered carefully against over filling of containers if **parameter 411** is programmed to MULT.*

8.9 Pre-feeding at Packing or Bagging

APPLICATION: Packing and bagging machines etc.

RELATED PARAMETERS: Parameter 4B1.

The feeding gate is designed to collect some material in it after filling the weighing hopper. The feeding gate closed at the end of the fine feeding operation and feeding goes on for a while to collects some material in the feeding gate.
The collected material is emptied into the weighing hopper when the feeding gate is opened for the following weighing. Set the pre-feeding time carefully to fill in the feeding gate without any leakage to the weighing hopper, **parameter 4B5**.

9. RECIPE

The operation specific parameters are located in the recipe for accurate and high-speed filling of various materials or various filling application like batch filling. Elements of the basic recipe are target and feed cutoff values as a default. The recipe content of the instrument can be expanded by adding material related parameters to the recipe to adjust them for every recipe.

9.1 Weight Value Entry Types

APPLICATION: The entry types of feeding cutoff values, tolerances etc. are defined as value or deviation.

*RELATED PARAMETERS: **Parameters 315 and 341**.*

Weight Cut-off value

Target and overfill values should be entered as a weight value. Feeding cutoff points can be programmed to enter as weight as shown in the example below. This type is not available at feeding entries.

Example: If the target is 20.0 kg, and coarse and fine cut off points are18.0 kg and 19.8 kg, enter weight values as;

Target	= 20.0
Coarse	= 18.0
Fine	= 19.8

This type of entry can be used if only the machine fills only one type of material and only one target. Otherwise changing target value requires to change cutoff values too.

Deviation

This is the most common entry type at filling applications. Feeding cutoff points and tolerances can be entered as deviations in weight from the target weight.

Example: If the target weight is 20.0 kg, tolerances are ±0.2 kg, and coarse and fine cut off points are 18.0 kg and 19.8 kg the enter the values as;

Target	= 20.0 kg
Coarse	= Target – Coarse cutoff = 20.0 – 18.0 = 2.0 kg
Fine	= Target – Fine cutoff = 20.0 – 19.8 = 0.2 kg
Tolerance	= 0.2 kg

Changing target weight or overfill weight do not required coarse and fine values.

9.2 Editing the Actual Recipe

You may access to the target weight value, tolerance(s) and others by pressing shortcut key to edit values.

1. Press key and Press key after recipe password entry.
2. [401 R. NAME: RECE] prompt appears on the display. Enter the recipe name up to 16 characters. Press key.
3. [402 TARGET: 000.0] prompt appears on the display. Enter the target weight of filling and press key.
4. [403 TOL +] prompt appears on the display, if tolerance is located in the recipe . Enter the tolerance value of filling and press key.
5. [406 COARSE : 000.0] prompt appears on the display. Enter the coarse value and press key.
6. [408 FINE : 000.0] prompt appears on the display. Enter the fine value and press key.
7. The parameters located in the recipe appear on the display sequentially by pressing key to edit their values.
8. After editing to the last parameter, the first line of recipe item 2 appears by pressing key. Checking your recipe is suggested.
9. Press ESC key to return operation.

IMPORTANT NOTE: *If the actual recipe which is selected from the memory is edited as described above, this edit is saved into the recipe memory.*

9.3 Filling Weight Entry Shortcut

You may access to the target weight value, tolerance(s) and overfill by pressing shortcut key to enter new values.

1. Press key to display target weight value of the actual recipe.
2. Press numerical keys to enter new target weight value.
3. Press key to go to the Tolerances or press ESC key to return operation after saving.
4. Press numerical keys to enter new tolerance.
5. Press key to go to the following entries or press ESC key to return operation after saving.
6. The instrument goes back to the operation after last entry.

Warning: Entering any value is automatically saved into the actual Recipe

9.4 Feeding cut-off Entry Shortcut

You may access to the cut-off values of feedings by press key to display or edit them.

1. Press key to display Coarse value of the actual Recipe.
2. Press numerical keys to enter new value.
3. Press key to go to Medium or press ESC key to return operation after saving.
4. Press numerical keys to enter new Medium.
5. Press key to go to Fine or press ESC key to return operation after saving.
6. Enter new value by pressing numerical keys.
7. Press key or ESC key to return operation.

Warning: Entering any value is automatically saved in the actual Recipe.

9.5 Recipe Build

APPLICATION: You may build up your recipe from basic to more complex how much you need by adding recipe related parameters to the recipe. This feature gives you advantage to enter different values to the parameters which are added to the recipe.

Elements of the basic recipe are target and feed cutoff values as a default. These data in the recipe are sufficient for most of applications which is used only one type of material filling. Values of recipe parameters [4--] are used at all recipes.

At dissimilar material filling at the machine, it may be required to change values of some recipe parameters at main block [4--] for accurate filling which is not practical. In this case, you may add required recipe parameters to your recipe by using the r**ecipe build** feature of FT-113Fill.

Added parameter appears in the recipe and in the recipe memory to enter specific values, and disappeared from recipe parameters, main-block [4--].

To build your recipe content

1) Press  Key for more than 3 seconds.
2) Enter the supervisor password and press  key to enter the Recipe build block.
3) The first parameter of sub-group appears on the display [411 G/N/MULT : PAR]. Press  or  keys to change it as RCPT to add this parameter to the recipe.
4) Press  key to enter the following parameter [412 TOL CONT : PAR]. Press  or  keys to change it as RCPT to add this parameter to the recipe. Or select PAR to remove the parameter from recipe.
5) Press  key to enter the next parameter. Select RCPT to parameters which will be added to the recipe as described in item 4.
6) After selecting the last parameter press  key to return operation.

Example: If tolerance, overfill, preact correction frequency and its sampling quantity are located in the Recipe together with target and feeding cutoff values, their parameters [412] , [419] [431], [433] and [434] should be set as RCPT in Recipe build menu. These parameters are in the Recipe and disappeared from set up, ea. from parameter group [4--].

***Warning**: It is recommended to build a recipe before loading recipe(s) into the recipe memory.*

***Attention**: Parameters which are in the recipe will disappear from the main-group 4-- and appears in the recipe.*

Very important note on recipe memory

1) *Recipe content should be built before entering recipes into the memory. If you add any parameter in to the recipe, its' value is transferred to all recipes. Adjust them for every recipe.*
2) *The last used value is loaded in the parameter after removing any parameter from recipe.*
3) *After reselecting any parameter into recipe, its value at the unused Recipe is the same as before removing it.*
4) *Select or reselect any parameter into the recipe may be required to check or reenter all recipes in the memory for safety.*

10. RECIPE MEMORY

FT-113Filling controller has recipe memory capacity for 250 items. The items in the memory have a recipe number and a recipe name. The recipe memory transactions are done as described below

10.1 Recipe Edit in the Recipe Memory

Recipes are saved in the memory by its number and name. The recipe content should be defined before starting the recipe entry. Refer to recipe build on page 101.

1. Press  key for more than 3 seconds and press  keys in sequence and then enter recipe password.
2. [REC: 009] appears on the information display. The data on the display is the recipe number and the Recipe name.
3. Press  or  keys to change the Recipe or enter the recipe number by pressing numerical keys.
4. Press  key to start edit. [401 R. NAME: RECE] prompt appears on the display. Enter the recipe name up to 16 characters. Press  key.
5. [402 TARGET: 000.0] prompt appears on the display. Enter the target weight of filling and press  key.
6. [403 TOL +] prompt appears on the display, if tolerance is located in the recipe . Enter the tolerance value of filling and press  key.
7. [405 OVERFILL] prompt appears on the display, if overfill is located in the Recipe. Enter the overfill value and press  key. Negative value entry is available.
8. [406 COARSE : 000.0] prompt appears on the display. Enter the coarse value and press  key.
9. [407 MEDIUM : 000.0] prompt appears on the display. Enter the medium value and press  key.
10. [408 FINE : 000.0] prompt appears on the display. Enter the fine value and press  key.
11. Press  key sequentially and enter their values to edit all parameters in the recipe.
12. After entry to the last parameter, the target weight appears on the display. You may check the Recipe by pressing the enter key sequentially.
13. Press  key to the return the operation.

10.2 Recipe Select

Recipes are saved in the memory by its number and name. Steps below are done to select recipe 123 for filling.

1. Press  key for more than 3 seconds and press  key's in sequence and then enter Recipe password.
2. [REC: 001] appears on the information display.
3. Press  or  keys to change the Recipe or enter the Recipe number by pressing numerical keys.
4. [REC: 123] appears on the information display. Press  key to select the Recipe.
5. [USE RECIPE 123] appears on the Recipe.
6. Press  key to select the Recipe 123 or
7. Press  key to return without select the Recipe.

10.3 Recipe Copy

Copying a recipe and changing some parameter values is recommended to edit a new recipe easily.

1. Press  key for more than 3 seconds and press  keys in sequence and then enter recipe password.
2. The actual recipe [REC: 009] appears on the information display. Enter the recipe number which will be copied, e.g. [REC: 123].
3. Press  key to copy [REC: 123].
4. [COPY TO 123] appears on the display. Enter the destination recipe number by keys [COPY TO 222] and press  key.
5. [COPIED] prompt appears on the display for a while and the new recipe number appears on the display [REC: 222].
6. Edit new recipe after copying for specified filling.
7. Press  key sequentially to return operation.

10.4 Delete Recipe

Any recipe or all recipes can be deleted from the memory.

Delete one recipe

1. Press  key for more than 3 seconds and press  key's in sequence and then enter recipe password.
2. [REC: 009] appears on the information display.
3. Press  or  keys to change the recipe or enter its number by pressing numerical keys.
4. Press  key to delete the recipe.
5. [DELETE : 123] prompt appears and press  key to delete the recipe.
6. [ARE YOU SURE ?] prompt appears and press  key to confirm it.
7. Or press  key to return to the operation without delete the recipe.

***Note**: If you delete any recipe, you should delete the same code(s) of ID memory, if ID and Recipe memories are linked.*

Delete all Recipes

1. Go to parameter 996 [DEL RECIPES] in set-up. Refer to Section 17.
2. Press  key to delete all recipe memory.
3. [ARE YOU SURE ?] prompt appears and press  key to confirm it.
4. [INITIALIZING] prompt appears on the display for a while and 996 parameter appears on the display.
5. Or press  key to return operation without delete Recipes when [ARE YOU SURE ?] prompt on the display.

11. BATCH FILLING

APPLICATION : The filling machine packs the material to a specific quantity or total.
PARAMETERS: 41A.

FT-113Filling controller can be used to fill a batch in quantity or in total weight or for filling the bulk to transfer specified material to the customer. Recipes for batch quantity filling, batch total filling and bulk total filling should be different. If any batch filling is set in the **parameter 41A,** other operations are disabled, and the system runs as select in this parameter. If the filling controller will fill the material in various ways, select the **parameter 41A** to the Recipe. Refer to Recipe build, page 101.

11.1 Batch Quantity Filling

RELATED PARAMETERS: Select batch quantity weighing in the Recipe, par. 41A *and*  *key should be selected for batch quantity entry, Par.* 353*.*

The batch quantity filling is used to pack the specified quantity at the filling machine. The programmed  key as BQTY is used to enter the specified quantity.

The filling machine operates continuous until entering the specific filling quantity in the Recipe and stops at the end of batch filling.

1. Select the Recipe which has batch quantity entry.
2. Press  key at ready status to change the quantity of the batch in the Recipe.
3. Activate Run input to start batch filling.
4. After starting the batch filling, pressing  key indicates the remain quantity of the batch.
5. At the end of the batch, the instrument stops the filling and produces End output.
6. De-activate the run input.

After batch quantity filling.

- Set passive and then activate Run input to start the following batch to the quantity written to the Recipe.
- Enter new batch quantity for the following batch via  key and then activate the run input.

11.2 Batch Total Filling

RELATED PARAMETERS: Select batch total weighing in the Recipe, par. 41A *and*  *key should be selected for batch total entry, Par.* 354*.*

The batch total filling is used to pack the specified total load at the filling machine according to the nominal weight of the pack. The programmed  key as BWGT is used to enter the specified total weight to be filled at ready status.

The filling controller calculates the batch quantity.

Q = Round up (Total / Target weight)

For example: If the Target is 3 kg and the Batch total is 1000 kg

Q = round up (1000 / 3) = Round up (333.33) = 334 packs.

Pack no	Fill weight	Fillled weight	Accumulation
1	3.000 kg	3.000 kg	3.000 kg
2	3.000 kg	3.001 kg	6.001 kg
...	.....	.....	.....
333	3.000 kg	2.999 kg	999.004 kg
334	3.000 kg	3.000 kg	1002.004 kg

End of Batch

The filling machine operates continuously until entering the specific filling quantity from the Recipe and stops at the end of batch filling. Refer to **parameter 41A** to enable this feature.

1. Press F2 key and enter the total weight of the batch at ready status.
2. Activate Run input during batch filling.
3. Follow the filling start process according to your set-up.
4. After starting the batch filling, press F1 key (if programmed as BQTY) to indicate the remaining quantity of the batch and press F2 key to announce the remaining batch weight.
5. At the end of the batch, the instrument stops the filling and produces End output.

After batch quantity filling

- Set passive and then activate Run input to start the following batch to the weight written in the Recipe.
- Enter new batch total for the following batch via F2 key and then activate the run input.

11.3 Bulk Total Filling

Important note: This method is only used to transfer a bulk material to the customer accurately; not for distributing containers or bags to the end-user.

The bulk total filling is used to transfer the material to the customer accurately without caring the last pack weight. The actual filled material weights are accumulated at bulk total filling. The material in the last pack might be less than the Filling weight to transfer the material to the customer accurately. Refer to **parameter 41A** to enable this feature.

The filling controller does not calculate the estimated bulk quantity and accumulates the filled material weights after each filling.

For example: If the Target is 3 kg, there is not any overfill, and the Bulk total is 1000 kg.

Pack no	Fill weight	Fillled weight	Accumulation	To be filled
1	3.000 kg	3.000 kg	3.000 kg	997.000 kg
2	3.000 kg	3.001 kg	6.001 kg	993.999 kg
...	.....	.....	.....	.....
333	3.000 kg	2.999 kg	999.004 kg	0.996 kg
334	0.996 kg	0.996 kg	1000.000 kg	0.000 kg

End of Bulk

1. Press F2 key and enter the total weight of the bulk at ready status if you will not use the weight from the Recipe.
2. Activate Run input during bulk filling.
3. Follow the filling start process according to your set-up.
4. After starting the bulk filling, press F1 key (if programmed as BQTY) to indicate the remaining quantity of the bulk and press F2 key to announce the remaining bulk weight.
5. At the end of the bulk, the instrument stops the filling and produces End output.

After bulk quantity filling

- Set passive and then activate Run input to start the next bulk to the weight written to the Recipe.
- Enter new bulk total for the following batch via F2 key and then activate the run input.

12. SELECTABLE INPUTS / OUTPUTS

APPLICATION: You may use selectable inputs and outputs additional to control your filling machine more efficient by designating them some functions.

RELATED PARAMETERS: Sub-blocks 33- and 37-.

There might be a lot of type machine and filling operation which requires different digital input and output functions. Even this filling controller has a lot of inputs and outputs, these ports might not be enough for all requirements of the machine designer or control of peripheral equipment like additional feeder controls, transport system synchronization, material silo level control, air blowing into the material during filling, collecting some material on the feeder for the following packing etc. This feature eliminates additional PLC, timer or I/O in the cabinet and reduces your cost.

12.1 Selectable Inputs

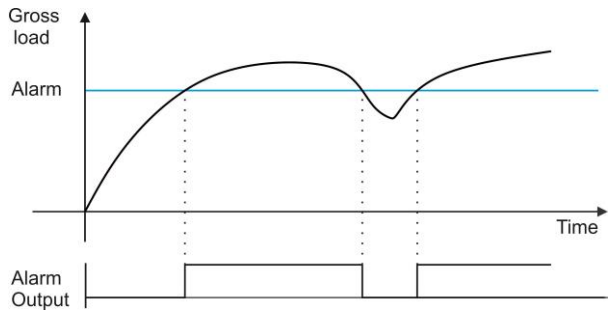
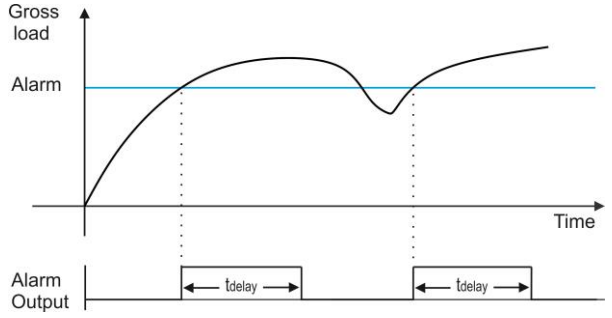
Run enable	Enables filling if this input is at high level. The filling ends and the following start input will not be executed. The start inputs will be executed during RUN input is at high level if RUN function is selected as an input.
Fill inhibit	This input is used to inhibit filling due to any reason on production line. Start inputs are not executed while Fill inhibit is at high level.
Resume / Error acknowledgement	This resume input is applied to the instrument after any error to continue the operation. If tolerance control is done after filling, this input should be selected to resume the filling error via input or one of the keys. The filling result is accepted and recorded after applying this input.
Reject	This input is applied to cancel the filling in case of error at filling. The filling result is not saved to the records and instrument returns to the ready status after receiving this input.
Interrupt	Interrupt input is used to inform instrument the filling is interrupted in case of any problem by operator or by host. Feeding is stopped during interrupt input and goes on filling after removing interrupt input. The instrument goes to the ready status if the reject or reset input is applied during interrupt. The start input is not executed during interrupt.
Hold	The filling stopped and other outputs hold their status during this input. After removing the hold input the filling goes on.
Empty the scale	The emptying gate / valve is opened during this input to empty the weighing tank, hopper etc. The instrument should be at ready status to empty the scale.
Bypass	The filling and emptying gates are opened, and the coarse feeding is started to empty the material tank / silo over the scale. The instrument should be at ready status to empty the scale.
S2	This feature is used the bag holding applications with double button. Only when input-2 (Close the bag clamp) and S2 inputs are applied simultaneously, the bag holder is activated.
Fieldbus Remote input	The digital input data is transferred to the PLC via fieldbus like Profinet, Modbus, CC-link etc. as a remote input of the PLC.

TILT	Tilt switch is used to prevent wrong weighing in case of over tilting of the scale. Refer to page **Fehler! Textmarke nicht definiert.**, 162.
STBY	In master-slave operation, if one or more of the instruments are damaged for any reason such as maintenance or malfunction, it is used to leave these devices inactive.
RCP1, RCP2	It allows the practical selection of the first and second recipe from memory via selectable digital inputs.
DINT	Discharge Interrupt input is used to inform instrument the discharging is interrupted in case of any problem by operator or by host. Feeding is stopped during this input and goes on discharging after removing the input. The instrument goes to the ready status if the reject or reset input is applied during interrupt. The start and discharge inputs are not executed during interrupt.
RLB1, RLB2	The release the bag feature, it is possible to release the bag clamp for any reason in bagging applications. It can be used in two different ways, RLB1 active high and RLB2 active low.

12.2 Selectable Outputs

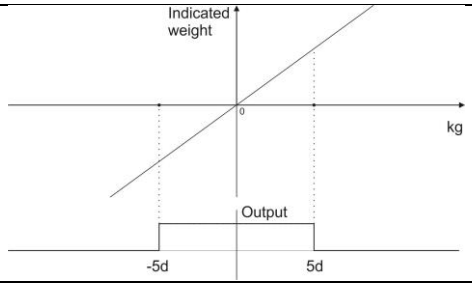
Alarm

USE: Activate an alarm signal in case of overloading if the gross loading is heavier than the alarm value at weighing and filling modes or reset the filling if the valve cannot go through the bung hole of the container and touch the top of it in modes BUNG (Below Bung Hole Filling) and BOTT (Container Filling from Bottom). This function is automatically activated at Selectable output 1 at filling machines filling the bung-hole containers.
*VARIABLES: Alarm set point (parameter 36) and alarm time (**parameter** 472)*
*OUTPUT : Set one of the select output as alarm (**parameter block** 33).*

Overload Alarm, continuous The alarm appears comparing the alarm set point and gross weight as shown on the right. Entries: Setpoint is entered and alarm time is zero.	
Overload Alarm, with timer The alarm appears for an adjusted time by comparing the alarm set point and gross weight as shown on the right. Entries: Setpoint is entered and alarm delay is not zero.	

ZR I Zero range of the indicated weight

USE: Announces the loading is in the zeroing range of the indicated weight which means the indicated weight can be accepted zero.
*VARIABLES: Zero range of indicated weight (**parameter** 477).*
*OUTPUT : Set one of the select output as ZR I (**parameter block** 33).*

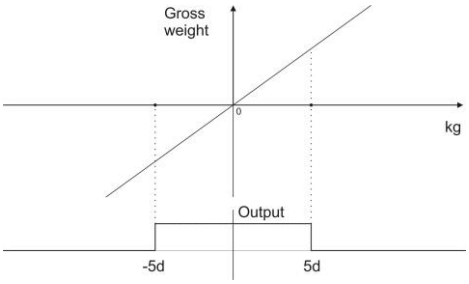
In Zero range at Indicated weight The digital output is activated if the indicated weight is in the zero range. Refer to **parameter** 477 to enter zero range value.	

ZR G Zero range of the gross weight

USE: Announces the loading is in the zeroing range of the gross weight which means the gross weight can be accepted zero.

*VARIABLES: Zero range of gross weight (**parameter** 477).*

*OUTPUT : Set one of the select output as ZR G (**parameter block** 33).*

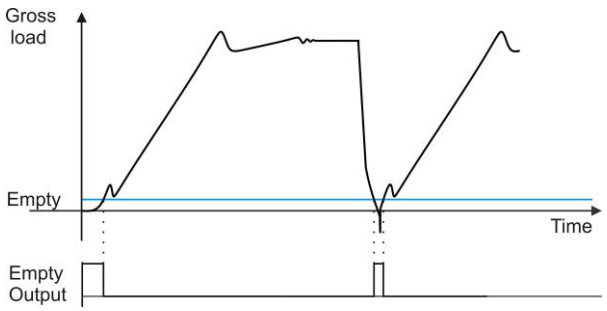
In Zero range at Gross The digital output is activated if the gross weight is in the zero range. Refer to **477** to enter zero range value.	

Empty

USE: Announces the gross loading is below the empty value which means the scale can be accepted empty, close to zero range, at emptying or to disable discharge.

*VARIABLES: Empty setpoint (**parameter** 41E).*

*OUTPUT : Set one of the select output as EMPT (**parameter block** 33).*

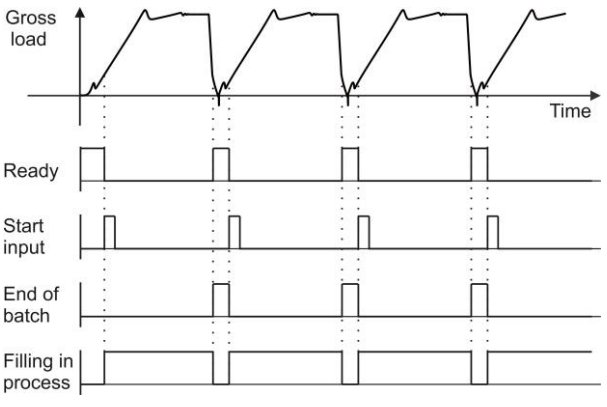
Empty The digital output is activated if the gross weight is smaller than the Empty value, **parameter 41E**.	

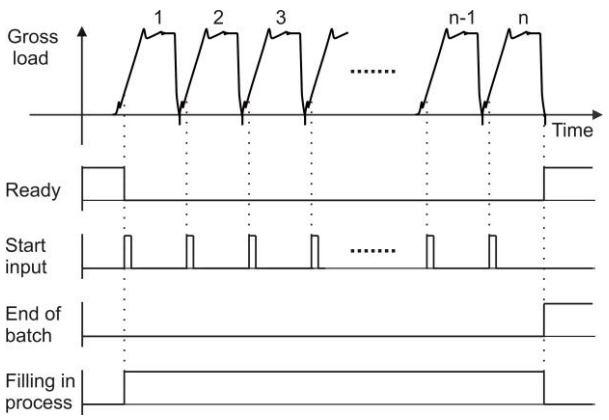
Filling / Batching in progress (Running)

USE: The digital output is at high level during the filling cycle or the filling of the batch.

VARIABLES: Qn (quantity of batch) and Σn (Bulk weight) values specifies the use is continuous or batch.
***Parameters* 41A.**

*OUTPUT: Set one of the select output as PROG (**parameter block** 33).*

At continuous filling This output is at high level during the filling cycle at continuous operation, if one of the select input is selected as " RUN ".	

At batch and Bulk filling. This output is high level until end of the batch filling from applying "Run" input, if one of the select input is selected as " RUN ".	

Feeding is progress

USE: To activate /dis-activate any operation while feeding is progress.
VARIABLES: -
*OUTPUT : Set one of the select output as FEED (**parameter block** 33).*

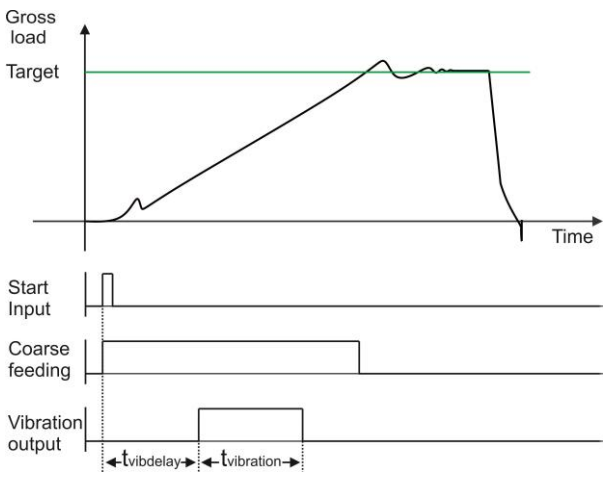
Feeding Gate 2nd position

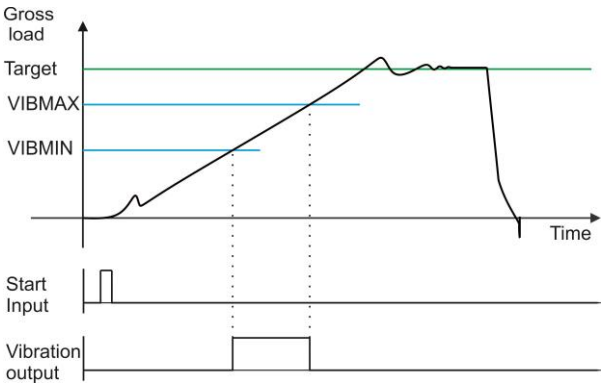
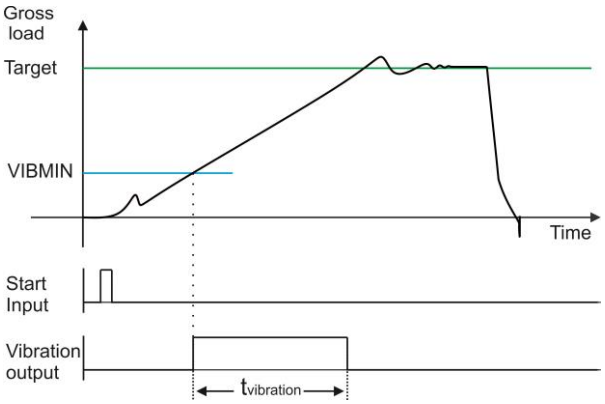
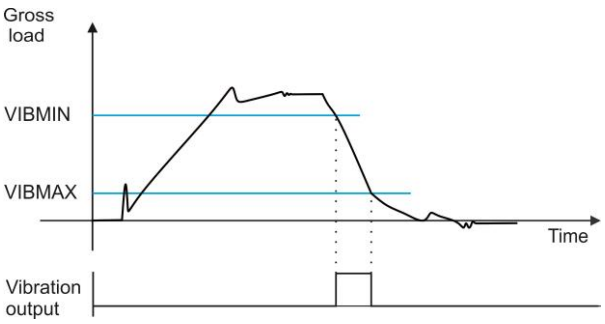
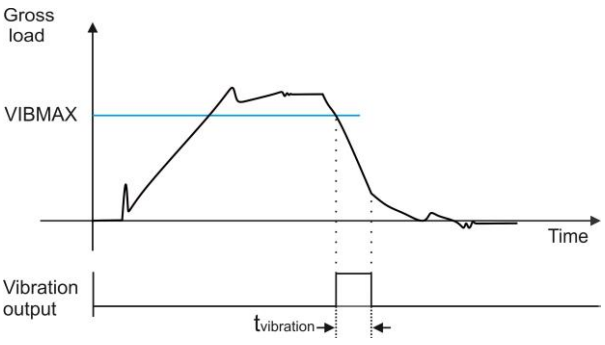
USE: To open the feeding gate totally during coarse and medium feedings.
PARAMETERS: 321.
*OUTPUT : Set one of the select output as FGAT (**parameter block** 33).*

Vibration

VARIABLES: VIB MIN, VIB MAX setpoints and VIB DEL, VIB TIME timers (parameters 473, ***474***, ***475***, ***476***).
*OUTPUT : Set one of the select output as VIBR (**parameter block** 33).*

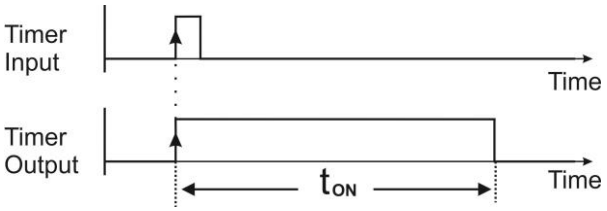
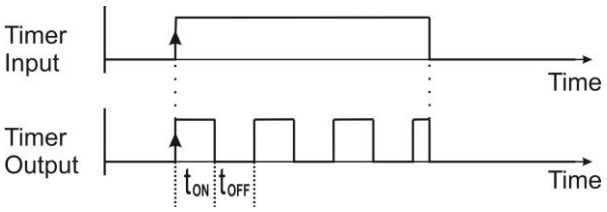
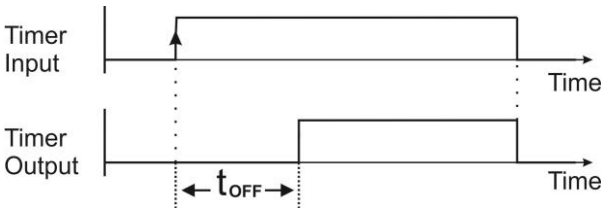
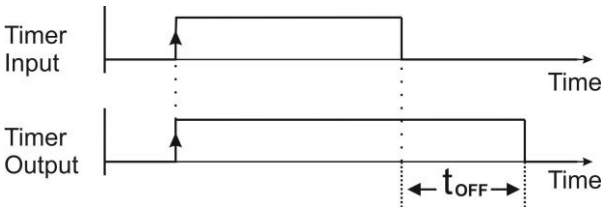
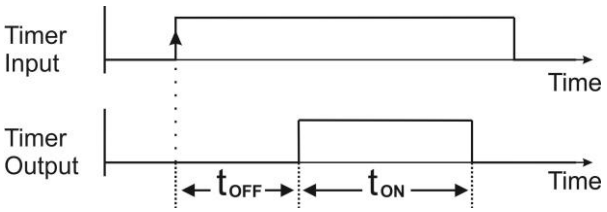
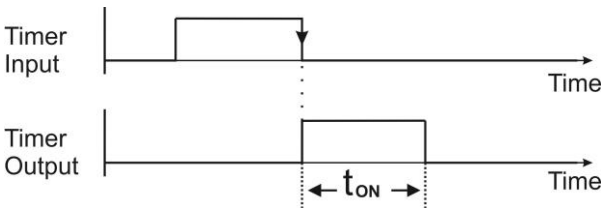
The vibration output is used to settle the material in the container / bag or to empty the weighing hopper. The vibration can be done at various conditions. If there is no vibration in your system, you may use this feature for different requirement due to its functions of two cutoff and timer.

Vibration at coarse filling with time The vibration output is done while coarse feed of filling. Conditions: $t_{vibdelay} \geq 0$, $t_{vibration} > 0$ and VIBMIN = VIBMAX = 0	

Vibration between 2 weights at filling The output signal is produced between 2 set points during filling or loading. Conditions: VIBMIN < VIBMAX	
Vibration at filling with timer The timer is started if the weight is bigger than the VIBMIN at filling or loading, and vibration output is produced during a vibration time. Conditions: VIBMAX = 0 and $t_{vibration} > 0$	
Vibration at discharging / emptying The output is produced if the load is between VIBMIN and VIBMAX at discharging or emptying. Conditions: VIBMIN > VIBMAX	
Vibration at discharging / emptying with timer The timer is started if the weight is smaller than the setpoint 2 at discharging or emptying, and vibration output is produced during a vibration time. Conditions: VIBMIN = 0 and $t_{vibration} > 0$.	

Timers

The FT-113Filling controller has 3 free programmable timers. To use any timer, one set of select input and select output should be programmed for this timer and its use type should be selected, refer to parameter sub-blocks **33** and **48-**. Timers can be used in the filling operation to control machine or independently like filling of material silo with timer. Typical uses of timers are material silo feeding, to activate some systems during filling, to transmit some signals as a pulse to host, to delay the control of any point of the filling machine, going to the fine feeding for a while after closing the feeding gate, fine feeding with jogging etc.

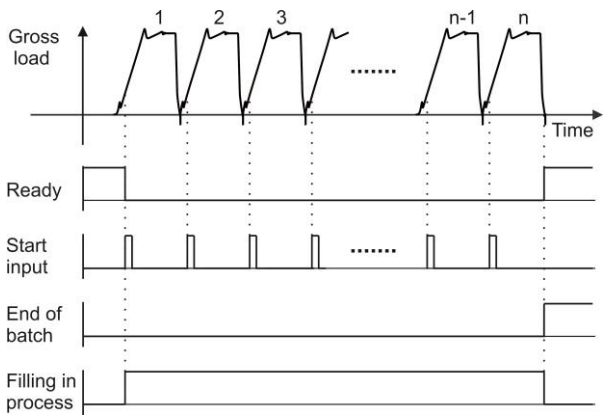
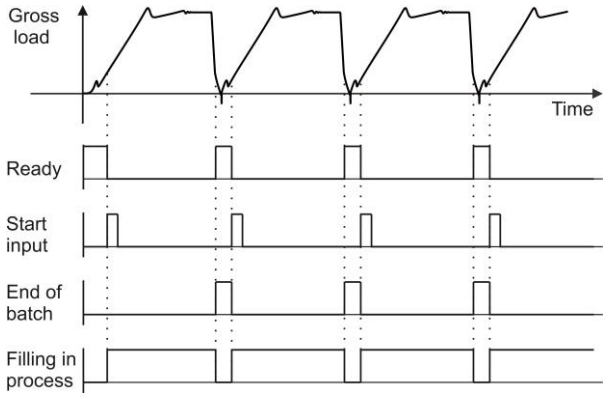
Type A: Output for a specific time Timer triggered by the increasing edge of the input signal.	
Type B: Flash/ repeated output Output flashes during input signal.	
Type C: Delay the signal Timer delayed the input signal.	
Type D: Delay the signal-low Timer delayed the switch off the input signal.	
Type E: Delayed output for specified time The input signal is delayed and then the output is produced by a timer.	
Type F: Timer output at signal low The timer output is produced by removing input signal.	

End

USE: The digital output is at high level at the end of batch / bulk filling to warn the operator, host etc. This output is the same with "Complete" output at continuous operation.

VARIABLES: -

*OUTPUT : Set one of the select output as END (**parameter block** 33).*

End of batch / Bulk The end output is active at the end of the batch / bulk.	
End at continuous operation The end output is active at the end of the filling cycle which is the identical to the complete output.	

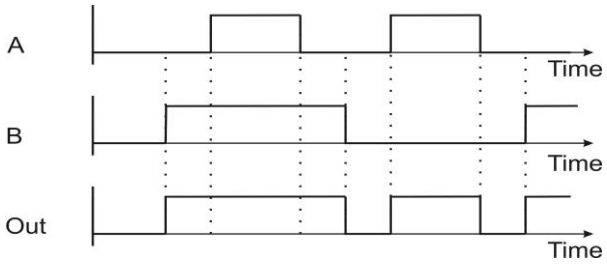
Logical functions

VARIABLES: Logical function define (parameter block **4A-**

*OUTPUT : Set one of the select output as LOGI (**parameter block** 33).*

*INPUT : Set one of the select input as IN-A and another one as IN-B (**parameter block** 33).*

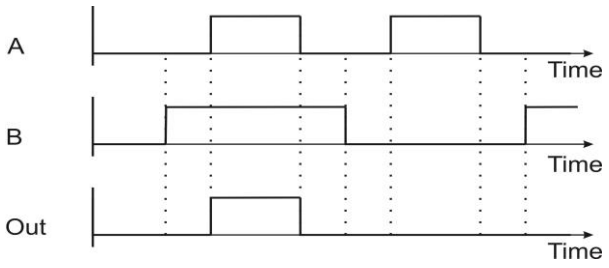
The FT-113Filling controller has logical functions as shown below if select inputs and outputs are programmed. This feature eliminates PLC requirement only for basic logical I/O control. Logical outputs can be used to adapt filling related output to the filling machine or independently.

A + B This summing logical output is high if at least one input is high. Other saying the output is at low level if two inputs are low level. Use: instead of parallel connection of 2 relay contact.	

A . B

The multiplying output is high if both inputs are high. Other saying the output is low if even only one input is low.

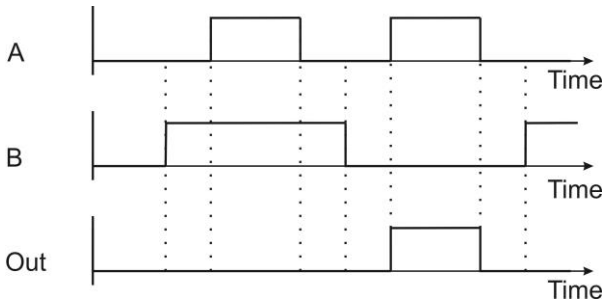
Use: Instead of serial connection of 2 relay contact.



A . B'

This function is multiplying A with the inverse of B. The output is high if the A is high and B is low.

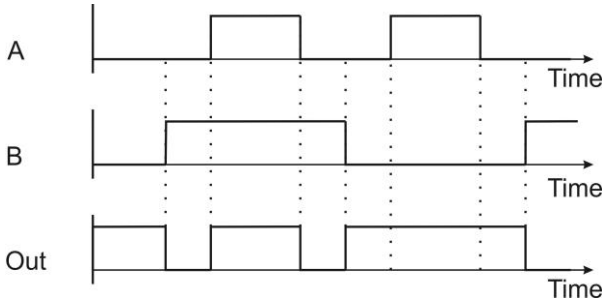
Use: Instead of serial connection of A (NO) and B (NC) contacts.



A + B'

The output is high if A is high or B is low. Other saying the output is low if A is low and B is high.

Use: Instead of parallel connection of A (NO) and B (NC) contacts.



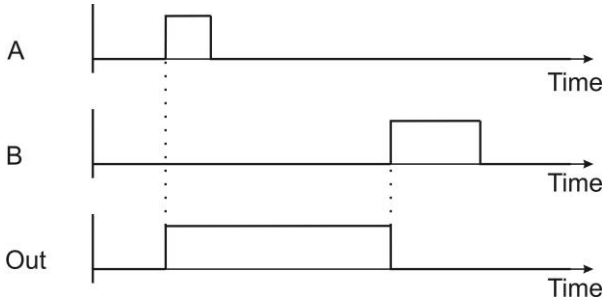
Set (A) – Reset (B)

The output increases to high if A is high and decreases to low if B is high.

A	B	Out
1	0	1
0	1	0
1	1	0
0	0	Out (no change)

Typical use: This function can be used to fill the material bin with 2 sensors, high level NO, low level NC).

***Note**: If A is connected to high, output is reversed the input signal B.*



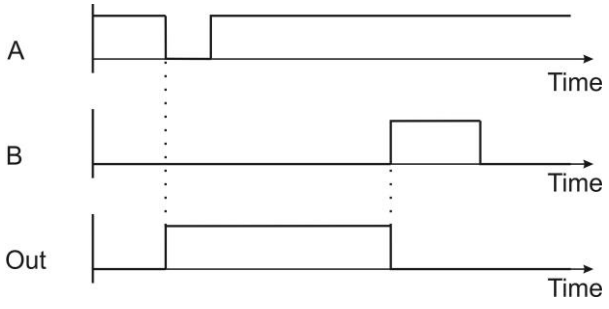
Set (A') – **Reset (B)**

The output is high if A is low and the output is low if B is high.

A	B	Out
1	0	Out (no change)
0	1	0
1	1	0
0	0	1

Typical use: This function can be used to fill the material bin with 2 sensors, both NO.

***Note**: If both, input connected to one signal, output is reversed the input signal.*



Error Fill
The digital output is activated when any filling related error (including tolerance error) is announced on the display.

Error Tolerance
The digital output is activated if the filled material is out of tolerances. This output can be released by error acknowledgement entry or by removing the load from the scale.

Error Underfilling
The digital output is activated if the filled material is lighter than the given under tolerance to warn the operator at missed fillings. This output can be released by error acknowledgement entry or by removing the load from the scale.

Error Tare
The digital output is activated if the instrument is not executed tare operation to warn the operator. This output can be released by error acknowledgement, by reset inputs or by removing the load from the scale for automatic liquid filling application.

FBUS Fieldbus controlled output
The digital output can be controlled from PLC if the instrument is equipped with any fieldbus option. Refer to related fieldbus command table to activate or deactivate the output.

13. IDENTIFICATION

APPLICATION: To enter identification data to the instrument to printout or to transfer together with weighing result.

RELATED PARAMETERS: Sub-block 36- .

One of the function keys can be programmed as identification key for storing identification data ID which has an alphanumeric identification header and data.

The identification data can be entered via keys or via serial interface; and selected from ID memory to transfer together with the weight value. The length of identification header and data can be maximum 16 characters. ID header is entered in the programming mode.

The identification data ID can be saved into the ID memory which has 250 items, each has 16 characters identification data record size.

ID data in the memory can be linked to the Recipe memory. This feature gives advantage to select the ID automatically by selecting Recipe from memory. i.e. if ID memory is linked to Recipe memory, the 123th record in the ID memory is loaded automatically after saving 123th Recipe from Recipe memory.
Related **parameter is 363**.

Identification data entering via alphanumeric keys

1. Press the function key which is set to ID.
2. Enter the identification data up to 16 digits via alphanumeric keys.
3. Confirm with key.

Identification data record into the ID memory

1. Press key for more than 2 sec in ready status. The [MEMORY] prompt will appear.
2. Press ID key to enter ID memory. The last used memory code appears as [ID : 123].
3. Enter the memory code numerically and press key.
4. The ID code and identification data in the memory appears on the display. Press key.
5. Enter the new alphanumeric ID data up to 16 digits and press key.
6. The next memory code appears on the display to enter the ID data. Press key to enter ID data from the following memory or repeat from item 3 to enter the new memory record number.
7. To return the operation press ESC key.

Identification data selection from ID memory

1. Press the identification key. The ID data appears.
2. Press key to enter the memory.
3. After the last used code appears [ID1 :123], enter the ID memory code of the item.
4. Press key to select the identification data which is displayed for a short while. The instrument returns to the operation mode after loading the identification data. If there is any linked memory to the ID memory, the linked memories are selected automatically.
5. Or press ESC key to return without any select.

Data Entry to the linked ID memory

In case of linked memories, Recipe and ID memories are linked to each other by coupling the same code of memories.

After selection of any code from Recipe memory, the linked memory record at ID memory will be saved automatically.

For example, saving the Recipe code 123 from memory for filling it saves automatically the ID code 123 from ID memory.

14. SMARTAPP

APPLICATION: Smart operation together with visual information and acoustic warning.

RELATED PARAMETERS: Sub-blocks 31- and 32-. Parameters 213 or 214.

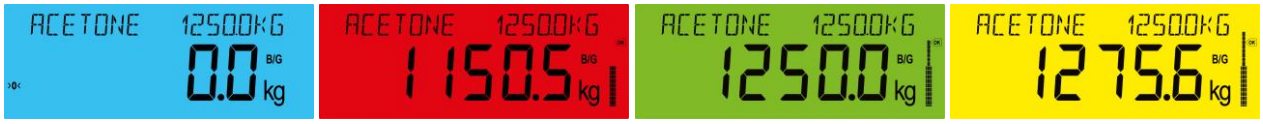
SmartAPP is a special function to help the operator to follow the weighing results on the analog bar and by changing the display color on filling cycle.

At SmartAPP operation

1. The display background color changes to facilitate the use. For example, the background color changes automatically as red, green, or yellow to indicate under tolerance, in tolerance or over tolerance after filling.
2. The operator may follow the filling on the bar graph.
3. The digital inputs and outputs set to the filling machine type automatically.
4. You can control the level of the material silo, and you may configure various timer functions, logical functions to control flaps or valves or to produce alarm / empty lambs. Refer to section 12, page 106.
5. The instrument adjusts itself automatically for higher accuracy and for more productivity.

Operation with display colour

The filling controller informs the operator about the filling results by changing the display colors at the end of the filling. The advantage of this feature is no additional lamp signals are needed.



Operation | Under tolerance | Okay | Over tolerance

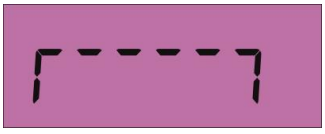
Figure 14.1 - Weight display and toolbar at filling.

If there is no tolerance control at filling machine the display colours will be;

Operation | Filled

Figure 14.2 - Weight display and toolbar at filling.

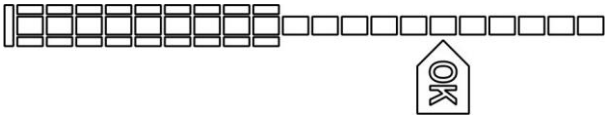
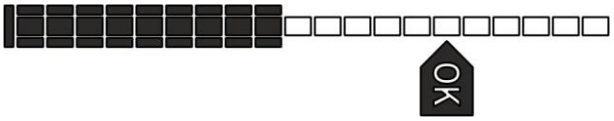
The purple colour informs the operator about a weighing error, or malfunction on any digital outputs of the digital 12 In / 14 Out board or unit.



Over loading of the scale

Bar graph

The bar graph on the right of the display is used to follow the filling on the bar as appears below.

Basic weighing mode	-	
Filling mode	Ready	
	Coarse & Medium feeding	
	Fine feeding	
	End of filling and result	

Acoustic warning

The filling controller produces key sounds if pressing a key. Additionally, the acoustic alarm is active in case of hardware, scale and weighing related errors.

15. SERIAL DATA OUTPUTS

RELATED PARAMETERS: Parameters 111, 121, 141, 151 and 161.

FT-113Filling controller has standard RS232, RS485, USB and Ethernet interfaces. In this section, you will find the data structure of different type of the data outputs via these serial ports. If, you transmit ASCII codes of **P(print), Z(zero), T(tare) or C(clear)** letters to the serial port of FT-113; it will act like the related key is pressed.

15.1 Continuous Data Output

Continuous data output of the instrument is transmitted in the following data structure. The serial ports of FT-113 are suitable for bi-directional communication.

CR (Carriage return) and LF (Line feed) codes can be enabled or disabled from response.
CHK (Checksum) can be enabled or disabled from both command and response and only continuous data output can be programmed for more than one interface.

The data format of continuous data output is;

	Status			Indicated						Tare								
STX	STA	STB	STC	D5	D4	D3	D2	D1	D0	D5	D4	D3	D2	D1	D0	CR	LF	CHK

The including of the status bytes STA, STB and STC

Definition Table for Status A (STA)									
Bits 0, 1 and 2				**Bits 3 and 4**			**Bit 5**	**Bit 6**	**Bit 7**
0	1	2	Decimal point	3	4	Increment size	Always 1	Always 1	X
0	0	0	XXXXOO	1	0	X 1			
1	0	0	XXXXXO	0	1	X 2			
0	1	0	XXXXXX	1	1	X 5			
1	1	0	XXXXX.X						
0	0	1	XXXX.XX						
1	0	1	XXX.XXX						
0	1	1	XX.XXXX						
1	1	1	X.XXXXX						

Definition Table for Status B (STB)		
Bit 0	0 = Gross	1 = Net
Bit 1	0 = Weight positive	1 = Weight negative
Bit 2	0 = No Error	1 = Error
Bit 3	0 = Stable	1 = Unstable
Bit 4	Always = 1	
Bit 5	Always = 1	
Bit 6	0 = Not power on zeroed	1 = Zeroed with power on zero
Bit 7	X	

Definition Table for Status C (STC)		
Bit 0	Always 0	
Bit 1	Always 0	
Bit 2	Always 0	
Bit 3	Always 0	
Bit 4	Always 1	
Bit 5	Always 1	
Bit 6	Always 0	
Bit 7	X	

CHK (Checksum) = 0 – (STX + STATUS A + ... + LF)

Error Messages: UNDER, OVER, A.OUT, L-VOLT and TILT are represented in Indicated data fields.
Note: *The weight data is represented with right aligned and the error messages are represented with left aligned.*

15.2 Fast continuous data output

Fast continuous "indicated weight" data output can be used only for the instruments which can communicate fast. The output rate is related with the baud rate. Use higher baud rate for faster data rate. CR and LF can be enabled. You may reduce the data transfer speed by increasing the delay between data output packages.

The data format of the fast-continuous data output is;
[STX][STATUS][SIGN][WEIGHT VALUE][CR][LF]

Examples:

S+000123.4	(weight is stable and 123.4)
D+000123.4	(weight is unstable and 123.4)
M+000123.4	(Dynamic weighing result is 123.4)
----------	(Dynamic weighing in calculating)
+	(Over load)
-	(Under load)
O	(ADC out error)

15.3 Print Mode

15.3.1 Data transfer after filling

The data transfer is done automatically after filling if the printout related parameters are set single line, multi-line or EPL format. Refer to details in Section 15.3 on page 121. Single line data format is recommended to transfer filling result to PC or PLC. Refer to section 15.5 for details on data output for service. Only one serial port can be programmed to the print format.

SINGLE LINE

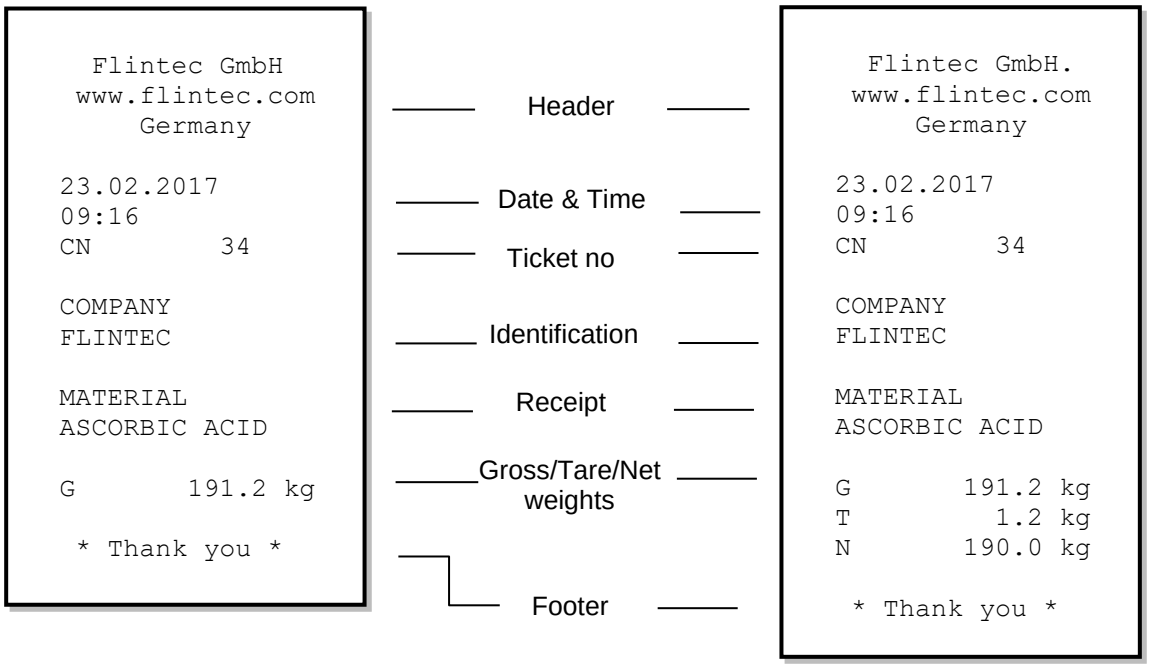
You can transmit the printout data in single line format by pressing key. This format is recommended to send the print data to PC or to any host. The data output structure is;

12.02.2016 14:47 CN: 71 G: 3.007kg T: 1.001kg N: 2.006kg *ALB: 5*

DATE		TIME		Recipe Header		Recipe Name		ID Header		ID Data		CN		GROSS		PT or TARE		NET		ALB	CR	LF
10	3	5	3	16	3	16	3	16	3	16	3	9	3	13	3	13	3	13	4	12	1	1

MULTI LINE

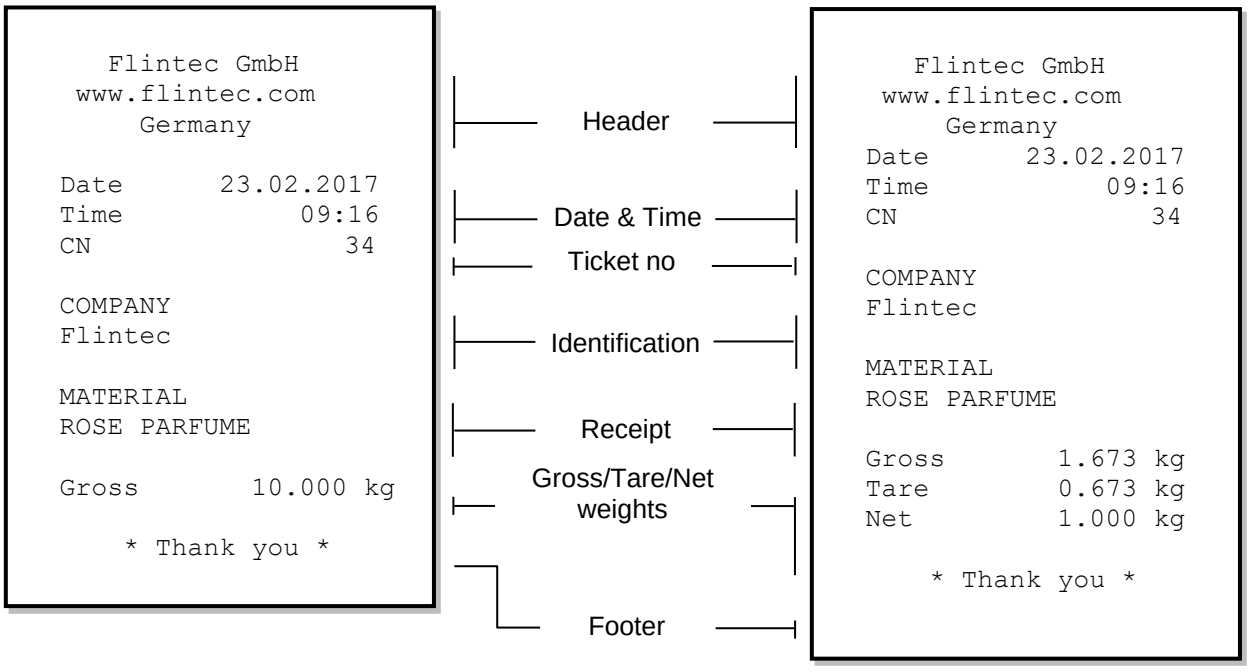
You can send the data in multiple line formats as appears in the label given below by pressing key. The data output including can be programmed with printer parameters. The multiline data output can be programmed for 16-byte narrow printers and for others.
Format for 16-character printer:



16F1 – Includes only Gross or Net weight value

16F2 – Includes Gross or Gross\ Tare\Net weight values

Format for minimum 26 or more character printer



26F1 – Includes only Gross or Net weight value

26F2 – Includes Gross or Gross\ Tare\Net weight values

15.3.2 EPL format

The EPL format of the data output in Print mode is selected to print the label data in graphical format EPL after filling. This feature eliminates to add PC or similar instrument in your filling system for labelling the package.

You can design your label in EPL format by using the printer label design software and Flintec software as describe below.

1. Connect FT-113Filling controller to Flintec Indface2x software.
2. Enter EPL print format window. You will find the command table which includes commands to get data from weighing in the label design.
3. Open label design software of the printer. Design your label by using the commands in item 2.
4. Save/Compile/ Convert your design to EPL format in Label design software.
5. Import the EPL file to Indface2x software.
6. Load this file into filling controller.

Figure 15.1- Sample of the label printout of FT-113 which is designed in EPL format.

15.3.3 Test Mode

***Important note**: This format waits for the stability after each filling. Disable this mode after adjusting your machine.*

RELATED PARAMETERS: Parameters 91B.

The test mode format is used to follow the filling process against changing important parameters. The data below is transferred automatically at testing mode which are time, Filling weight, Coarse, fine, Preact adjustment frequency and its sampling, adjustment ratio, Coarse and fine control delays, fine feeding time, high resolution Filled weight, high resolution Filing error and filling time in sequence.

TIME	Target	Coarse	Fine	Fr	Smp	%	Cdel	Fdel	FineT	Filled	Error	FILLT
15:55	10.00	3.00	1.00	4	2	50	0.7	0.7	3.0	11.761	1.761	3.0
15:56	10.00	3.00	0.80	4	2	50	0.7	0.7	2.9	10.050	0.050	3.7
15:56	10.00	3.00	0.80	4	2	50	0.7	0.7	2.9	------	------	3.2
15:56	10.00	3.00	0.80	4	2	50	0.7	0.7	2.9	------	------	3.2
15:56	10.00	2.50	0.50	4	2	50	0.7	0.7	1.5	9.955	-0.045	3.2
15:56	10.00	3.00	0.50	4	2	50	0.7	0.7	1.0	10.000	0.000	2.9
15:56	10.00	3.00	0.50	4	2	50	0.7	0.7	1.0	------	------	2.4
15:56	10.00	3.00	0.50	4	2	50	0.7	0.7	1.0	10.000	0.000	2.9

15.3.4 BSI Data Structure for dialog with PC

Flintec instruments are capable for integration in a computer system, data acquisition system, data logging system etc. Flintec filling controller launched on the market supports the standardized command set BSI data form, depending on the functionality of the instrument. This easy data format gives the reliable and speedy interface advantages in communication with PLC or PC for process control, or transactional applications. BSI is divided into 3 levels;

BSI-BASE	Command sets of basic weighing instruments, e.g., taring, zeroing, setpoint loading etc.
BSI-PRO	Extension of the command set for professional weighing indicators, e.g., commands related with identification data application related commands etc.
BSI-DIALOG	Extension of the command set for transactional applications.

If you will integrate FT-113 into your computer or if you will interface FT-113 with your PLC which do not have any fieldbus interface, using BSI commands will help you to expand your system with additional FLINTEC scale without having to change your application programs.
Refer to Appendix 5 for details, page 178.

16. FILLING REPORTS

Filling results, various accumulations and statistical reports can be transferred to printer or PC as described below. Refer to Fieldbus sections in Appendixes for details on transferring data to PLC.

16.1 Accumulations

This instrument has various accumulations printouts which are erasable totalization, batch accumulation report, current day's totalization, yesterday's totalization, grand totalization.

The [OVER] appears on the display if any value is too high for displaying.

To display or to transfer accumulation data, one of the programmable **F keys** should be programmed to accumulation.

1. Press the F key which is set to Accumulation.
2. The batch total appears on the display as [B :1234 123456789].
3. Erasable total appears [1234 123456789] after pressing F key.
4. Current day report appears [C :1234 123456789] after pressing F key.
5. Yesterday report appears [Y :1234 123456789] after pressing F key.
6. Grand total [GT: 123456789012] is displayed after pressing F key.
7. Press F key to exit from accumulations.

Press 

key to exit from accumulations at any step above.

16.1.1 Erasable Accumulation

The erasable quantity and total are displayed as [Σ 1234 123456789] on the information display.

Quantity. The displayed quantity on the left side of the display is the quantity of the filled material(s) in a specific time.

Total. The displayed total on the right size of the display is quantity of the filled material(s) in a specific time.

Press  key to transfer this accumulation to printer, PC or PLC when quantity or total are on the display.

To erase the quantity and total together, press  key during Quantity or total on the display and confirm by pressing the  key.

Q and Σ keys are also can be used to display erasable quantity and total. The erasable accumulated report can be also printed after pressing Q and Σ key at ready status.

Press  key to transfer this accumulation to printer, PC or PLC when quantity or total are on the display. The report is printed as shown below

Single line
Accumulation Report 21.12.2018 12:30 Qty: 71 pcs Total: 10345.5 kg

Accumulation Report		DATE		TIME		Qty	Qty value		pcs		Total:	Total weight		Unit	CR	LF
21	1	10	1	5	2	4	4	1	3	2	6	14	1	3	1	1

Multiple line

```
**************************
Accumulation Report
21.12.2018  12:30

Qtity :      71 pcs
TOTAL :   10345.5 kg
**************************
```

16.1.2 Accumulation of material at batch / bulk fillings

You may choose the batch / bulk total by pressing  key programmed as BWGT at the end of their fillings and before starting next filling.

This data appears on the display as [B :1234 123456789] after pressing the  key.

Press  key to transfer this accumulation to printer, PC or PLC when quantity or total are on the display.

Single line
Batch Report 21.12.2016 12:31 Qty: 28 pcs Total: 200.0 kg

Batch Report		DATE		TIME		Qty	Qty value		pcs		Total	Total weight		Unit	CR	LF
21	1	10	1	5	2	4	4	1	3	2	6	14	1	3	1	1

Multiple line

```
**************************
Batch Report
21.12.2018  12:31

Qtity :      28 pcs
TOTAL :    200.0 kg
**************************
```

16.1.3 Current day's Accumulation

Current day totalization is the quantity and total weight of the filled materials in the day. This totalization starts at 00:00:00 and ends at 23:59:59 of the actual day. The accumulation is erased at the end of the day after saving it to the Yesterday Accumulation memory automatically.

This data appears on the display as [C :1234 123456789]. Here the first is quantity and the second is the total of today until now.

Press  key to transfer this accumulation to printer, PC or PLC when quantity or total are on the display.

Single line

Report of Current day 21.12.2018 12:32 Qty: 99 pcs Total: 10545.5 kg

Report of Current day		DATE		TIME		Qty	Qty value		pcs		Total	Total weight		Unit	CR	LF
21	1	10	1	5	2	4	4	1	3	2	6	14	1	3	1	1

Multiple line

****

Report of Current day
21.12.2018 12:32

Qtity : 99 pcs
TOTAL : 10545.5 kg

****

16.1.4 Yesterday's Accumulation

You may follow the filled quantity and filled material weight a day ago with this accumulation. This accumulation is updated every day at 24:00.
This data appears on the display as [Y :1234 123456789]. Here the first is quantity and the second is the total of the yesterday.

Press  key to transfer this accumulation to printer, PC or PLC when quantity or total are on the display.

Single line

Report of Yesterday 21.12.2018 12:33 Qty:5248 pcs Total: 548340.5 kg

Report of Yesterday		DATE		TIME		Qty:	Qty value		pcs		Total:	Total weight		Unit	CR	LF
21	1	10	1	5	2	4	4	1	3	2	6	14	1	3	1	1

Multiple line

****

Report of Yesterday
21.12.2018 12:33

Qtity : 5248 pcs
TOTAL : 54340.5 kg

****

16.1.5 Grand Total

You may follow the total of filled material weight in long term by using this function. The grand total can be used as monthly or annual total.
This data appears on the display as [GT: 1234567890123] after pressing the Accumulations key sequentially.

Press  key to transfer this accumulation to printer, PC or PLC when quantity or total are on the display.

Press  key to erase the grand total while it is on the display and confirm by pressing the  key.

Single line
Grand Total Report 21.12.2018 12:34 Qty:5347 pcs Total: 558886.0 kg

Grand Total Report		DATE		TIME		Qty:	Qty value		pcs		Total:	Total weight		Unit	CR	LF
21	1	10	1	5	2	4	4	1	3	2	6	14	1	3	1	1

Multiple line

****
Grand Total Report
21.12.2018 12:34

Qtity : 5347 pcs
TOTAL : 558886.0 kg
****

16.2 Statistical Report

This instrument calculates statistical values average filling weight, standard deviation, Max, Min and Range of batch and bulk fillings for online inspection of the filling machine. One of the programmable F keys should be selected to statistical to display or to print statistical results.

Statistical calculations are done for each 50 fillings which has the settling time in cycle for tolerance control or preact adjustment at continuous operation. Sampling quantity and sampling frequency of statistical report are defined by the sampling size and frequency of the preact adjustment, refer to **parameters** 434 **and** 433. If preact adjustment frequency is entered 1, the statistical results will be result of 100 % inspection, otherwise sampling ration of operation will be

Sampled quantity = 50 x [Sampling size]
Sampling period = 50 x [Preact adjustment Quantity]
Sampling ratio% = 100 x [Sampling size of preact adjustment, **in par** 434] / [Preact adjustment frequency, **in par** 433]
Sampling size: Sampling size of the preact adjustment, **parameter** 434.
Preact adjustment frequency: The cycle of preact adjustment, **parameter** 433.

Statistical reports are updated at the end of the following cycle. The statistical report is produced at the end of the batch filling which should be transferred until end the following batch.

Press selected F key which is programmed to indicate statistical values and then Press  key to transfer the statistical data to PC or printer.

Press 

key to erase the statistical data while it is on the display and confirm with  key.

****
Statistical Report
21.12. 2018 15:00

Machine Bagging #3
Recipe XXXXXXXXXXXXXXX

Batch Qty : 125 pcs
Batch wgt : 2500 kg

Target wgt : 20.00 kg
Overfill : 0.03 kg
Filling wgt: 20.03 kg
+Tolerance : 0.20 kg
-Tolerance : 0.10 kg
Samp. Qty : 3 pcs
Samp. freq : 10
Sampled Qty: 39 pcs
Samp. ratio: 31 %

Avg. fill : 20.00 kg
Avg. tare : 0.76 kg
S.Deviation: 0.05 kg
Max : 20.01 kg
Min : 19.99 kg
R : 0.02 kg
Okay : 125 pcs
Under : 0 pcs
Over : 0 pcs

Samp Tot: 780.1 kg
TOTAL : 2500.1 kg C
****

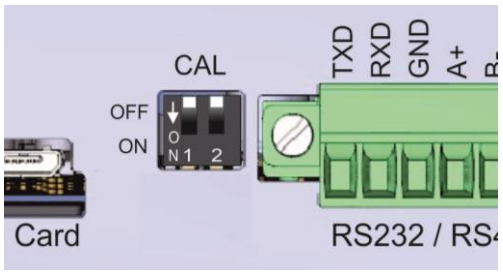
The statistical report should be transferred before starting the new batch or until end of the following sampling period at continuous operation.

17. PROGRAMMING AND CALIBRATION

You will find the programming and calibration procedure of FT-113Fill in this section. The arrow on navigation keys indicates the function of the keys in programming menu. The basic meanings of these keys are

						
Navigation between parameters	Exit from any entry or block or from programming.	Go to previous block or parameter.	Next block.	Previous block.	Go to next block or parameter.	Enter the parameter to edit it.
Parameters' value	Exit with previous value	Move to the left digit.	Next option	Before option	Move to the right digit.	Confirm and go to the next parameter.

A set-up DIP switch is located near the load cell connector at the FT-113's rear side as shown in the figure below and its position should be "ON" (downward) to change the metrological related parameters including calibration.



DIP Switch	Description
1	Calibration SW OFF: Locked ON: Set- up
2	Reserve

Figure 17.1- The location of calibration DIP switch.

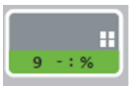
17.1 Entering to the Programming and Calibration

Enter the programming menu as described below. Legally related parameters can be changed if the calibration dip switch is at ON position. These parameters are marked with **M** symbol in the parameter table in this section. If you will change any legally relate parameter or will perform calibration, set the calibration switch to the ON position before entering to the programming.

Display	**Operation**
[123.456 kg]	Press  key until [**PASSWORD :**] prompts appears.
[PASSWORD]	Enter your 4 digit passport. (Default is 1111)
[****]	Press  key.
[1—INTERFACE]	You entered to the programming main menu and the first main block [1—INTERFACE] prompt appears.

17.2 Quick Access Parameter Blocks used Frequently

The instrument has fast access feature to the frequently adjusted parameters for easy use or service. As described in the previous section, if you press the keys below for more than 2 seconds at main block **[1—INTERFACE]** , you will access to the parameter blocks fast.

Fast access key	Function
	Press this key to access the fieldbus parameters, Sub-block [19-].
	Press this key to access filling parameters, Sub-block [31-].
	Press this key to access the Recipe parameters, Sub-block [41-].
	Press this key to access the calibration, Sub-block [621].
	Press this key to access the diagnostic parameters, Main-block [9--].

17.3 Exit from Programming

Exit from programming after adjusting parameters and calibration as described in section 17.4. You may save your adjustment for the use or until power off the instrument for service. The original set-up and calibration are used after power off the instrument once.

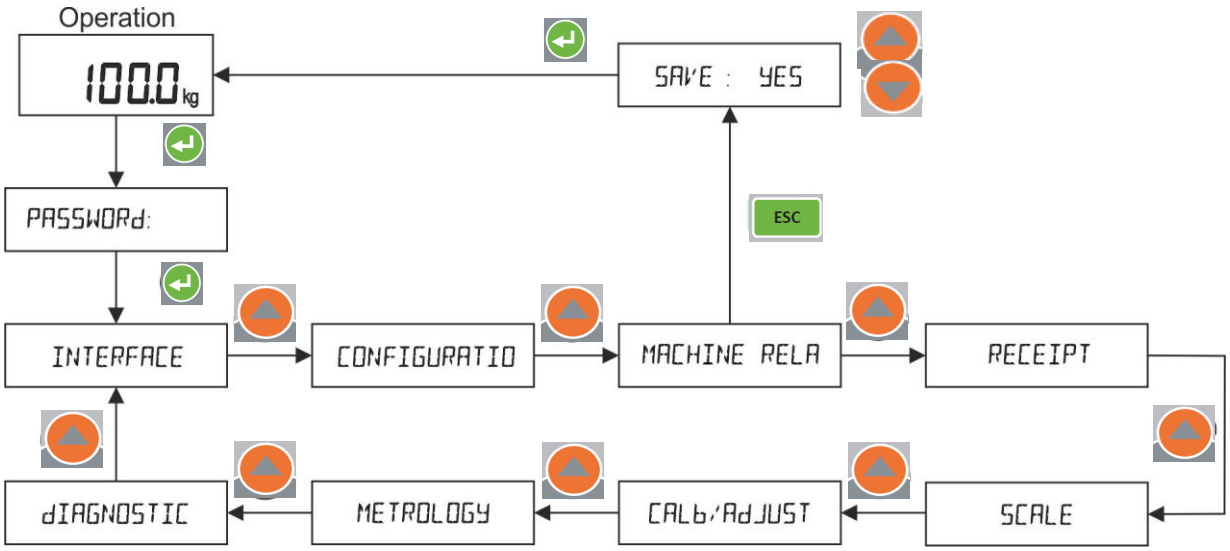
1. Press  key until [SAVE : YES] prompt appears on the display.
2. Press  key to save the changes into the memory or
3. Press  key to change item to [SAVE : NO] prompt appears, press  key to leave from programming without saving the changes or
4. Press  key to change item to [SAVE : BACK] prompt appears, press  key to return to menu or
5. Press  key to change item [SAVE : TEMP] prompt appears, press  key to store the changes until the power off the instrument.

[WAIT] message will appear on the display for a short while, and the filling controller returns to the weighing mode.

WARNING: *Do not forget to switch off the instrument and bring the calibration DIP switch position to the "OFF" before using your scale in trade.*

17.4 Programming and Parameters

FT-113Filling controller is programmed under the seven main blocks in the programming menu which are serial interface, configuration, machine related, Recipe, scale, calibration, metrology, and diagnostic.



Main blocks in the programming menu are displayed like [1-- INTERFACE] and sub-blocks are displayed like [11- RS232C]. Parameters are located in the sub-blocks like [111 FORMAT: CONT].

You can move in the blocks by pressing ▲ or ▼ keys. After reaching the desired block, press ↵ key or ▶ key to enter it. After reaching the parameter to change, you may change its function by pressing ▲ or ▼ keys. If the value will be entered to the parameter press numerical keys, then press ↵, press ▶ key to go to the next parameter.

For example, to change the Baud rate of RS485 serial interface to 57600;

1. After entering the programming, the [1-- INTERFACE] sub-block prompt appears. Press ▶ key.
2. [11- RS232C] prompt appears. Press ▲ key until appearing [12- RS485].
3. Press ▶ key until appearing [122 BAUD: 9600] prompt.
4. Press ▲ key until [122 BAUD: 57K6] prompt appears.
5. Press ▶ key to go to the next parameter.

Legally related parameters can be changed if the calibration dip switch is at ON position. The values of these parameters limited according to the OIML against wrong set up. Legally related parameters are marked with M symbol in the table below.

[1-- INTERFACE]	**INTERFACE MAIN BLOCK** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to go to the next block, or press ESC key to exit from programming.
[11- RS232C]	**RS 232C SERIAL PORT** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[111 FORMAT : NO]	Data format of the serial port *Page 96, 120, 188, 185,* NO : Port is disabled CONT : Continuous data output FAST : High speed continuous data output PRNT : Printout BSI : BSI format for PC, PLC interface MBHL : Modbus RTU High-Low format MBLH : Modbus RTU Low-High format MAST : Master unit - Slave unit interface
[*FLINTEC*]	Press →0← key to select output format different than Flintec continuous data format while the selection is CONT in the information display. Available functions appear on the weight display after pressing →0← key sequentially. Press ↵ key after selecting the data format. Refer to Appendix 6 for details data structure. FLINTEC : Flintec continuous format. HBM : Commonly used by HBM, GSE, PT, Systec, TOLEDO : Rinstrum. SYSTEC : Commonly used by Toledo, Mettler Toledo. SMA : Commonly used by Systec. Commonly used by USA producers, Cardinal, Rice SARTOR : Lake etc. RINSTR : Commonly used by Sartorious. AVERY : Commonly used by PT, Rinstrum, HBM, GSE. BASTER : Commonly used by Avery E1205. LM2 Commonly used by Baster. Flintec LM2 (par.000=6)
[112 BAUD : 9600]	Baud rate 1200 : 1200 19K2 : 19200 2400 : 2400 38K4 : 38400 4800 : 4800 57K6 : 57600 9600 : 9600
[113 LENGTH : 8]	Data Length 7 : 7 bits 8 : 8 bits
[114 PARITY : NO]	Parity NO : No parity ODD : Odd parity EVEN : Even parity

[115 CSUM : NO]	Checksum at continuous and BSI formats. NO : Checksum disable YES : Checksum enable
[116 CR : YES]	Carriage return at continuous formats. NO : Carriage return disable YES : Carriage return enable
[117 LFEED : YES]	Line feed at continuous formats. NO : Line feed disable YES : Line feed enable
[118 DELAY : 50]	Data output delay at Modbus and BSI formats; delay between continuous format data. 000 .... 999 milliseconds.
[119 ADDRESS : 00]	Address of the port 00 .... 99. 00 means data format without address. (at Master / Slave operation, address 01 is master. Slaves will be addressed as Address. 02, 03, 04, 05 ....)
[12- RS485]	**RS 485 SERIAL PORT** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[121 FORMAT : NO]	Data format of the serial port *Page 96, 120, 188, 185,* NO : Port is disabled CONT : Continuous data output FAST : High speed continuous data output PRNT : Printout BSI : BSI format for PC, PLC interface MBHL : Modbus RTU High-Low format MBLH : Modbus RTU Low-High format MAST : Master unit - Slave unit interface
[*FLINTEC*]	Press →0← key to select output format different than Flintec continuous data format while the selection is CONT in the information display. Available functions are appears on the weight display after pressing →0← key sequentially. Press ↵ key after selecting the data format. Refer to Appendix 6 for details data structure. FLINTEC : Flintec continuous format. HBM : Commonly used by HBM, GSE, PT, Systec, TOLEDO : Rinstrum. SYSTEC : Commonly used by Toledo, Mettler Toledo. SMA : Commonly used by Systec. Commonly used by USA producers, Cardinal, Rice SARTOR : Lake etc. RINSTR : Commonly used by Sartorious. AVERY : Commonly used by PT, Rinstrum, HBM, GSE. BASTER : Commonly used by Avery E1205. LM2 : Commonly used by Baster. Flintec LM2 (par.000=6)
[122 BAUD : 9600]	Baud rate

	1200 : 1200 19K2 : 19200 2400 : 2400 38K4 : 38400 4800 : 4800 57K6 : 57600 9600 : 9600
[123 LENGTH : 8]	Data Length 7 : 7 bits 8 : 8 bits
[124 PARITY : NO]	Parity NO : No parity ODD : Odd parity EVEN : Even parity
[125 CSUM : NO]	Checksum at continuous and BSI formats. NO : Checksum disable YES : Checksum enable
[126 CR : YES]	Carriage return at continuous formats. NO : Carriage return disable YES : Carriage return enable
[127 LFEED : YES]	Line feed at continuous formats. NO : Line feed disable YES : Line feed enable
[128 DELAY : 50]	Data output delay at Modbus and BSI formats; delay between continuous format data. 000 .... 999 milliseconds.
[129 ADDRESS : 01]	Address of the port 00 .... 99. 00 means data format without address. (at Master / Slave operation, address 01 is master. Slaves will be addressed as Address. 02, 03, 04, 05 ....)
[14- USB]	**USB** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[141 FORMAT : NO]	Data format of the serial port. *Page 120, 185,* NO : Port is disabled CONT : Continuous data output FAST : High speed continuous data output BSI : BSI format for PC, PLC interface
	Press →0← key to select output format different than Flintec continuous data format while the selection is CONT in the information display. Available functions are appears on the weight display after pressing →0← key sequentially. Press ↵ key after selecting the data format. Refer to Appendix 6 for details data structure.

[*FLINTEC*]	FLINTEC : Flintec continuous format. HBM : Commonly used by HBM, GSE, PT, Systec, TOLEDO : Rinstrum. SYSTEC : Commonly used by Toledo, Mettler Toledo. SMA : Commonly used by Systec. Commonly used by USA producers, Cardinal, Rice SARTOR : Lake etc. RINSTR : Commonly used by Sartorious. AVERY : Commonly used by PT, Rinstrum, HBM, GSE. BASTER : Commonly used by Avery E1205. LM2 : Commonly used by Baster. Flintec LM2 (par.000=6)
[142 CSUM : NO]	Checksum at continuous and BSI formats. NO : Checksum disable YES : Checksum enable
[143 CR : YES]	Carriage return at continuous formats. NO : Carriage return disable YES : Carriage return enable
[144 LFEED : YES]	Line feed at continuous formats. NO : Line feed disable YES : Line feed enable
[145 DELAY : 50]	Data output delay at BSI formats; delay between continuous format data. 000 .... 999 milliseconds.
[15- ETHERNET]	**ETHERNET TCP/IP** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[151 FORMAT : NO]	Data format of the Ethernet port *Page 96, 120, 185, 209,* NO : Port is disabled CONT : Continuous data output FAST : High speed continuous data output PRNT : Printout BSI : BSI format for PC, PLC interface MBHL : Modbus TCP High-Low format MBLH : Modbus TCP Low-High format MAST : Master unit - Slave unit interface
[*FLINTEC*]	Press →0← key to select output format different than Flintec continuous data format while the selection is CONT in the information display. Available functions are appears on the weight display after pressing →0← key sequentially. Press ↵ key after selecting the data format. Refer to Appendix 6 for details data structure. FLINTEC : Flintec continuous format. HBM : Commonly used by HBM, GSE, PT, Systec, TOLEDO : Rinstrum. SYSTEC : Commonly used by Toledo, Mettler Toledo. SMA : Commonly used by Systec. Commonly used by USA producers, Cardinal, Rice SARTOR : Lake etc. RINSTR : Commonly used by Sartorious. AVERY : Commonly used by PT, Rinstrum, HBM, GSE. BASTER : Commonly used by Avery E1205. LM2 : Commonly used by Baster. Flintec LM2 (par.000=6)

[152 IP : 250]	IP address. Default is 192.168.016.250
[153 ADDRESS : 01]	Address of the port 00 .... 255. 00 means data format without address. (at Master / Slave operation, address 01 is master. Slaves will be addressed as Address. 02, 03, 04, 05 ....)
[154 SUB MASK : 000]	Subnet mask address. Default is 255.255.255.000
[155 GATEWAY : 253]	Gateway address. Default is 192.168.016.253
[156 LOCAL P1 : 502]	Local port 1. 000 65535
[157 LOCAL P2 : 503]	Local port 2. 000 65535
[158 LOCAL P3 : 504]	Local port 3. 000 65535
[159 DNS : 222]	DNS address. Default is 208.067.222.222
[15A MAC ADR :]	MAC address. AA:BB:CC:DD:EE:FF
[15B TIMEOUT : 5]	Inactivity time out. 00 means disable. 01.... 60 sec.
[15C CR-LF : YES]	Carriage return and Line feed at continuous formats. NO : Disable YES : Enable
[15D DELAY : 50]	Data output delay at demand formats; delay between continuous format data. 000 .... 999 milliseconds.
[15E REMOTEIP : 000]	Remote IP address. Default is 0.0.0.0
[15F REMOTEPO : 0]	Remote port. 0 65535
[16- PRINTER]	**PRINTER** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to enter the next sub-block.
[161 FORMAT : SING]	Data format of the printout *Page 121* SING : Single line 16F1 : Multiline Format 1 for 16 Character printer 16F2 : Multiline Format 2 for 16 Character printer 26F1 : Multiline Format 1 for 26 Character printer 26F2 Multiline Format 2 for 26 Character printer EPL EPL Format

[162 NETSIGN : NO]	Net sign correction *Page 36* NO : Disable YES : Enable
[163 METHOD : AUTO]	Printing method K AU : Printing with key and auto print after end of filling. AUTO : Auto print after filling end of filling. REPO : Only reports are printed with key.
[164 PRT MSG : NO]	Display " PRINTING " message at printout NO : Disable YES : Enable
[165 CN : YES]	Ticket number on printout. *Page 121, 142* NO : Disable YES : Enable
[166 DATE : NO]	Date printing on printout. *Page 121, 142* NO : Disable YES : Enable
[167 TIME : NO]	Time printing on printout. *Page 121, 142* NO : Disable YES : Enable
[168 RECIPE : NO]	Recipe name on printout. *Page 121, 99,102, 149* NO : Disable NAME : Print Recipe name H+N : Print Recipe header and name
[169 ID : NO]	ID printing on printout. *Page 121 116, 146* NO : Disable DATA : Print ID data H+D : Print ID header and data
[17- LABEL SETUP]	**LABEL SETUP** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to enter the next sub-block.
[171 HEADER 1 :]	Header of printout, the first line. *Page 121* Maximum 20 characters.
[172 HEADER 2 :]	Header of printout, the second line. *Page 121* Maximum 20 characters.
[173 HEADER 3 :]	Header of printout, the third line. *Page 121* Maximum 20 characters.
[174 FOOTER 1 :]	Footer of printout, the first line. *Page 121* Maximum 20 characters.
[175 FOOTER 2 :]	Footer of printout, the second line. *Page 121* Maximum 20 characters.
[176 LF BEFO : +2]	Line feed before printout. : + = Forward , - = Backward : NO,1,2....9 : Line feed quantity before data. Example: +2 means 2-line feed forward.
[177 LF AFTE : +4]	Line feed after printout.

	: + = Forward , - = Backward : NO,1,2....9 : Line feed quantity after data. Example: -2 means 2-line feed backward.
[178 FORM FE : NO]	Form feed. NO : Disable YES : Enable
[179 LEFT SP : 0]	Space from left of the label. 0...9
[17A COPY : 1]	Copy quantity. 1...9
[19- PROFIBUS]	**PROFIBUS CONFIGURATION** (Only FT-113Fill PB) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the Profibus *Page 210* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 ADDRESS : 001]	Node address 001...125
[19- PROFINET]	**PROFINET CONFIGURATION** (Only FT-113Fill PN) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the Profinet *Page 213* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 IP : 250]	IP address of Ethernet port. Default is 192.168.16.250
[194 SUB MASK : 000]	Subnet mask address of Ethernet port. Default is 255.255.255.000
[195 GATEWAY : 253]	Gateway address. Default is 192.168.16.253
[196 S. NAME : FILL]	Station (device) name. Default is FILLING-1
[19A MAC ADR :]	MAC address AA:BB:CC:DD:EE:FF
[19- CANOPEN]	**CANOPEN CONFIGURATION** (Only FT-113Fill CO) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the CANopen *Page 217* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 ADDRESS : 001]	Node address 001...127

[19- ETHERNET IP]	**ETHERNET/IP CONFIGURATION** (Only FT-113Fill EI) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the EtherNet/IP *Page 241* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 IP : 250]	IP address of Ethernet port. Default is 192.168.16.250
[194 SUB MASK : 000]	Subnet mask address of Ethernet port. Default is 255.255.255.000
[195 GATEWAY : 253]	Gateway address. Default is 192.168.16.253
[19A MAC ADR :]	MAC address AA:BB:CC:DD:EE:FF
[19- ETHERCAT]	**ETHERCAT CONFIGURATION** (Only FT-113Fill EC) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the EtherCAT *Page 245* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[19- CC-LINK]	**CC-LINK CONFIGURATION** (Only FT-113Fill CC) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the CC-Link *Page 248* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 ADDRESS : 001]	Node address 001...64
[193 BAUD : 156K]	Baud rate 156K : 156 kbps 625K : 625 kbps 2.5M : 2.5 Mbps 5M : 5 Mbps 10M : 10 Mbps
[19- POWERLINK]	**POWERLINK CONFIGURATION** (Only FT-113Fill PL) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the Powerlink *Page 251*

	INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 ADDRESS : 001]	Node address 001...239
[19- CC-LINK IE]	**CC-LINK IE CONFIGURATION** (Only FT-113Fill IE) Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press Esc key to enter the next main-block.
[191 FORMAT : INTG]	Data format of the CC-Link IE Field. *Page 254* INTG : Signed 32-bit integer, no decimal point implied. FLOA : 32 bit float, decimal point implied.
[192 STATION : 001]	Station number. 001...120
[193 NETWORK : 001]	Network number. 001...239

[2-- CONFIGURATIO]	**CONFIGURATION MAIN BLOCK** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to enter the next block, or press ESC key to exit from programming.
[21- DSPLY ACUSTI]	**DISPLAY AND ACOUSTIC** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to enter the next sub-block.
[211 LIGHT : ON]	Backlight OFF : Backlight disabled. ON : Always bright. AUTO : Automatic backlight to increase the battery life.
[212 COLOR : TURQ]	Backlight color at basic weighing WHIT : White LGRE : Light Green GREE : Green TURQ : Turquoise BLUE : Blue YELL : Yellow AMBE : Amber
[213 SMART : BAR]	Warning the operator on filling result with the backlight colour. *Page 118* NO : Disabled BAR : Bargraph COLO : Colour change C+B : Bargraph and colour change
[214 CHANGE : YGR]	Display colour changes for announcing under, okay or over after filling. *Page 118* RGY : Red, Green, Yellow YGR : Yellow, Green, Red RGR : Red, Green, Red.
[215 KEYSOUN : YES]	Key sound NO : Disable YES : Enable
[216 REFRESH : 9]	Display refresh rate X : 1...9 times/sec.
[23- START UP]	**START UP** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to enter the next sub-block.
[231 TARING : YES]	Taring at basic weighing. *Page 34* NO : Disabled. YES : Tare with key, via serial interface or via digital input. Multitare. ***Note :*** *Preset taring is available only at automatic operation.* *Refer to parameters 311, 411.*

[235 FILTER : MEDI]	Adaptive digital filter. NO : Disable. Fastest weighing; but the most sensitive to environmental vibrations. XLOW : Extra low VLOW : Very low filtering LOW : Low filter MEDI : Medium filter HIGH : High filter VHIG : Very high filter. Slowest and the most stable weighing. XHIG : Extra high.
[236 DYNAMIC : NO]	*Page 35* Dynamic digital filter. Increase this filter level step by step, if there is a vibration on the filling scale which cannot be eliminated with adaptive filter. NO : Disable. LOW : Low filter MEDI : Medium filter HIGH : High filter
[237 LANGUAGE : ENG]	*Page 36* User language. ENG : English DEU : Deutsch FRA : Français ITA : İtaliano ESP : Espagnol TUR : Türkçe
[24- ENTRIES]	**ENTRIES** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[241 DATE : DMY]	*Page 35* Date format DMY : DD.MM.YYYY MDY : MM.DD.YYYY YMD : YYYY.MM.DD
[242 DATE SET :]	*Page 35* Date setting XX.XX.XX
[243 TIME SET :]	*Page 35* Time adjustment HH:MM
[244 CN :]	*Page 121* Consecutive number 1...100000
[245 S. NAME : FILL]	Scale name. Maximum 16 characters. Default is “FILLING1”
[25- PASSWORDS]	**PASSWORD ENTRIES** Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press Esc key to enter the next main-block.
[251 KEY LOCK :]	*Page 37* Key lock password. NEW - CONFIRM

	To disable password: Do not enter any password as new and confirm it.
[252 RECIPE :]	Recipe and Recipe memory password. *Page 37* NEW - CONFIRM To disable password: Do not enter any password as new and confirm it.
[253 SUPERVIS : 1111]	Supervisor password to enter user related parameters of Recipe build, set-up and programming. This password has rights of the previous password. *Page 37* NEW - CONFIRM To disable password: Do not enter any password as new and confirm it.
[254 SERVICE : 1111]	Service password which has the highest authority to interfere the instrument. *Page 37* NEW - CONFIRM
[255 TARG KEY : FREE]	Target and feed cut-off keys' authorization. *Page 37* FREE : Target entry is not required any password. KEY : Target entry is available with the key lock password. RECE : Target entry is required the Recipe password.

[3-- MACHINE RELA] Machine Related Block

[3-- MACHINE RELA]	**MACHINE RELATED PARAMETERS MAIN BLOCK** Define your filling machine to the FT-113Fill filling controller carefully in this main block. Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to go to the next block, or press Esc key to exit from programming.
[31- MACHINE TYPE]	**MACHINE TYPE** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[311 FILLMOD : OPEN]	Filling mode. *Page 40* Select the filling mode which matches your filling machine. OPEN : Open container filling. Page 42 BUNG : Bung- type container filling. Page 46 BOTT : Filling from bottom of the container with lance control. Page 50 PACK : Packing machine. Page 55 BAG : Bag filling. Page 59 BIG : Big bag filling. Page 63 VENT : Valve type bag filling. Page 66 1BAG : Bagging machine with one weighing hopper. Page 63

	nBAG : Packing / Bagging machine with up to 16 weighing hoppers. (Enter the quantity at par 319) Page 73 nPAC : Packing / Bagging machine with up to 16 weighing hoppers (Enter the quantity at par 319) Page 79 TANK : Charging material to the tank and then filling container from tank. Page 84 WOUT : Weighin - Weighout Page 84
[312 F.START : LEVE]	Start input signal type *Page 38, 91* PULS : Pulse (button) LEVE : Level (switch) AUTO : After loading the container (liquid filling modes, if the load is heavier than TAREMIN) or automatic start filling after discharging. (BAG filling mode).
[313 D.START : LEVE]	Discharge input signal type *Page 38* PULS : Pulse (button) LEVE : Level (switch)
[314 STRT BY : FILL]	Start filling or emptying/discharging at power on. *Page 118* (Only at automatic operation of bunker weighing.) FILL : Start operation with filling the hopper. DISC : Start operation with emptying the hopper.
[315 FEED SPD : 2]	Feeding speed quantity. Enter the feeding speed quantity of the machine. 1 : 1 speed filling (fine) 2 : 2 speed filling (coarse and fine) 3 : 3 speed filling (coarse, medium, and fine)
[316 FEEDOUTS : FC]	Feeding outputs can be programmed to your feeding system design which are: C : Only related output is active, e.g. only coarse output is activated at coarse feeding. FC : Fine output is activated at coarse and medium FMC : feedings. Fine and medium outputs are activated at coarse feeding, and fine output is active at medium feeding.
[317 MAXFILL : 0]	Maximum target of filling / packing machine. This entry limits the maximum filling weight of the machine. (0 means maximum target of filling checking is disable)
[318 MINFILL : 0.20]	Minimum target of filling / packing machine. This entry limits the minimum filling weight of the machine.
[319 SCL QTY : 2]	Scale quantity at master slave operation. *Page 96*

	Enter the weighing hopper quantity at nBAG and nPAC machines. The master controls the bag holder and emptying sequence of scales. Or enter the quantity of the filling machines which Recipe will be transferred at multi head filling machines. Only Recipe data and set-up are transferred to slave controllers at linear or rotating filling machines. Maximum scale quantity at master slave operation is 30. Therefore, it can be entered a value up to 30.
[32- SIGNALIZATION]	**SIGNALIZATION IN THE MACHINE** This group defines switches and switch related operation of the filling machine. Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to enter the next sub-block.
[321 F GATE : NO]	Feeding gate position control type. *Page 33A* Select the control type of the feeding gate. NO : No any control 1 POS : Feeding gate which has one position. 2 POS : 2 positioned feeding gate, [coarse / med] and fine. ***IMPORTANT NOTE**: One of the select outputs should be set to feeding gate (FGATE) for 2 position control.*
[322 FGATE SW : NOPE]	Feeding gate switch type. Select the switch type on the feeding gate placed at the closed position. NO : There is not switch on the feeding gate. NCLO : There is a normally closed switch on the gate. NOPE : There is a normally open switch on the gate.
[323 DGATE SW : NOPE]	Switch type at the closed position of the discharge gate. Select the switch type on the discharge gate placed at the closed position. NO : There is not position sensor on the discharge gate. NCLO : There is a normally closed position sensor on the gate. NOPE : There is a normally open position sensor on the gate.
[324 LANCEPOS : BIU]	Lance position control type. *Page 50* Defines locations of switches on the lance which are BIU : Switches at BOTTOM, IN and UP positions of lance. BMIU : Switches are at BOTTOM, MIDDLE level, IN and UP positions. BIOU : Switches at BOTTOM, IN, OUT and UP positions. BMIO : Switches are at BOTTOM, MIDDLE level, IN and OUT positions.
[325 MOVEMENT : NO]	Movement of valve or lifter before start feeding the material at liquid filling modes. NO : No VALV : Move the valve down before start feeding (only at bung hole container filling). LIFT : Move the lifter up before start feeding. (at open or bung hole containers filling).
[326 SEQUNCE : NO]	Movement of valve or lifter before start feeding the material at big bag filling mode.

	NO : No bag clamp and lifter control before filling. CLAM : Close bag clamp then start filling. UP-A : Lift the big bag after closing the bag clamp then start filling. UP-B : Close the bag clamp, start feeding and lift the big bag during filling (Refer to **parameter 417**).

[33- SELECT IN / OUT]	SELECTABLE INPUTS / OUTPUTS You may define selectable inputs and output functions for your use. Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[331 SEL IN 1 : NO]	The function of Select input 1 *Page106* NO ::: Disable. RUN ::: Run enable. INHI ::: Filling inhibit. ACK : Error acknowledgment / Resume. REJE : Reject / Do not record. INTE : Interrupt. HOLD : Stop feeding the material and holds status. DROP : Drop catcher position sensor. EMPT : Empty / Discharge the scale. BYPA : Bypass. TMR1 : Start Timer 1. TMR2 : Start Timer 2. TMR3 Start Timer 3. IN-A Input A. IN-B Input B. FBU1 Remote Input of the PLC via Fieldbus or BSI. FBU2 Remote Input of the PLC via Fieldbus or BSI. TILT Tilting. RSRV Reserve input 1
[332 SEL IN 2 : NO]	The function of Select input 2. Refer to Select Input 1 for available functions.
[333 SEL IN 3 : NO]	The function of Select input 3. Refer to Select Input 1 for available functions.
[334 SEL IN 4 : NO]	The function of Select input 4 Refer to Select Input 1 for available functions.
[335 SEL IN 5 : NO]	The function of Select input 5 Refer to Select Input 1 for available functions.
[336 SEL IN 6 : NO]	The function of Select input 6 Refer to Select Input 1 for available functions.
[337 SEL IN 7 : NO]	The function of Select input 7 Refer to Select Input 1 for available functions.
[338 SEL IN 8 : NO]	The function of Select input 8 Refer to Select Input 1 for available functions.
[339 SEL IN 9 : NO]	The function of Select input 9 Refer to Select Input 1 for available functions.

[33A SEL OUT 1 : NO]	The function of Select Output 1. *Page 108*

	NO : Disable. PROG : Filling / Batching is progress. EMPT : The scale is empty. END : End of lot/batch. FEED : Feeding is progress (for pump, rotary valve etc.). FGAT : Open feed gate full at 2 position control of the feed gate. VIBR : Vibration. ALAR : Alarm. ZR I : Zero range of indicated weight. ZR G Zero range of gross weight. EFIL : Filling related errors. ETOL : Tolerance error. UNDE : Under filling (W< T-Tol) error. TMR1 : Timer 1 output. TMR2 : Timer 2 output. TMR3 : Timer 3 output. LOGI : Logical output of A and B inputs. FBU1 : Remote Output of the PLC controlled by Fieldbus or BSI. FBU2 Remote Output of the PLC controlled by Fieldbus or BSI. OVER Over filling (W> T+Tol) error ETAR Taring error RSVR Reserve output 1
[33B SEL OUT 2 : NO]	The function of Select Output 2. Refer to Select Output 1 for available functions.
[33C SEL OUT 3 : NO]	The function of Select Output 3. Refer to Select Output 1 for available functions.
[33D SEL OUT 4 : NO]	The function of Select Output 4. Refer to Select Output 1 for available functions
[33E SEL OUT 5 : NO]	The function of Select output 5. *(Appears if RIO16 is installed)* Refer to Select Output 1 for available functions.
[33F SEL OUT 6 : NO]	The function of Select output 5. *(Appears if RIO16 is installed)* Refer to Select Output 1 for available functions
[34- HUMAN / MACHIN]	**HUMAN MACHINE INTERFACE** Set the HMI related parameters in this group. Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[341 FEEDENTR : DEV]	Preact, Medium and Fine feeding entries. *Page 99* VAL : The weight value entry DEV : Deviation from Target
[342 IND TYPE : INCR]	Weight displaying at Filling. INCR : Weight indication increases at filling. DECR : Weight indication decreases from target at filling.
[343 FULLDISP : FILL]	M Displaying after filling.

	ACTU : Display actual weight FILL : Display filled weight for 1 second. TARG : Display target weight
[344 INFO DIS : R+T]	*Page 91* Information data on the left of the alphanumeric display. NO : No data TARE : Tare weight is displayed. GROS : Gross weight is displayed RCPT : Recipe name R + T : Recipe name and target R + Q : Recipe name and quantity (if Qn in usage, indicates Qn) Q+Σ : Quantity and total (if Qn or Σn in use, indicates the batch) TOTA : Total PHAS : Phase of the filling.
[35- KEY FUNCTION]	**PROGRAMMING OF KEY FUNCTIONS** Define functions of programmable keys in this group. Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[351 MAGNIFY : HR]	*Page 38* The function of magnify key (for 10 seconds temporary displaying). NO : Disable HR : High resolution LAST : Last filling CMF : Coarse, medium, and Fine feed in values G-N : Temporary gross weight indication PHAS : Phase of the filling.
[352 CHANGE : PHAS]	The function of unit - change key NO : Disable UNIT : Unit Change ID : Identification data R + T : Recipe name and target LAST : Last filled PHAS : Phase of the filling. STBY : Standby mode enable/disable.

[353 F1 KEY : STRF]	The function of F1 key. NO : Disable STRF : Start Filling / Resume STRD : Start discharge/ Resume EMPT : Empty / Discharge the scale. BYPA : Bypass (Empty the material silo / tank) RST : Reset INTE : Interrupt HOLD : Stop feeding, hold status CHKF : Check stop at the end of filling CHKD : Check stop at the end of discharge / emptying CHKS : Check stop at the end of filling and discharging / emptying. BQTY : Batch Quantity entry. CMF : Coarse, medium and Fine feed in values LAST : Last filling. AV FT : Average filling and average tare. SDEV : Standard deviation. MMR : Statistical values Max, Min and Range. STAT : Statistical report. FLOW : Coarse, Mid and Fine flow rates ACCU : Accumulations. ID : Identification data. ACK Error acknowledgment / Resume REJE Reject / Do not record RCP1 Select the 1st Recipe from memory. RCP2 Select the 2nd Recipe from memory. RCP3 Select the 3rd Recipe from memory. RCP4 Select the 4th Recipe from memory. RCP5 Select the 5th Recipe from memory.
[354 F2 KEY : LAST]	The function of F2 key. Refer to function of F1 key for available functions.
[355 F3 KEY : CMF]	The function of F3 key. Refer to function of F1 key for available functions
[356 F4 KEY : ACCU]	The function of F4 key. Refer to function of F1 key for available functions.
[357 F5 KEY : RST]	The function of F5 key. Refer to function of F1 key for available functions.
[36- IDENTIFICATI]	**IDENTIFICATION DATA** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[361 RCP HEAD : RECE]	Identification name of recipe. *Page 99* Enter header of the recipes on printout, e.g. Product. Maximum 16 characters. Default is RECIPE.
[362 RCP LINK : NO]	Linked memory to the Recipe memory. *Page 117* NO : Disabled. ID : ID memory. ***Note:*** *This parameter is shown as 40C in recipe menu.*

[363 ID HEAD : ID]	Identification name of ID. *Page 116* Enter header of the ID on printout, e.g., Customer. Maximum 16 characters. Default is ID.
[37- RSRV IN/OUT]	**RESERVE IN / OUT FUNCTIONS** These ports are used as a reserve ports in case of any malfunction at any input or output. This sub-group is activated if any Select port is programmed as reserve. Refer to sub-group 33-. Press ▶ key or ↵ key again to enter this menu. Press ▲ key to return to beginning of the sub-block or press ESC key to enter the next main-block.
[371 RSRV IN1 : 00]	*Page 172* Reserve Input 1. Enter input number of the input to assign to the reserve input 1. Default 00 (no assignment).
[372 RSRV IN2 : 00]	*Page 172* Reserve Input 2. Enter input number of the input to assign to the reserve input 2. Default 00 (no assignment).
[373 RSV OUT1 : 00]	*Page 172* Reserve Output 1. Enter output number of the output to assign to the reserve output 1. Default 00 no assignment).
[374 RSV OUT2 : 00]	*Page 172* Reserve Output 2. Enter output number of the output to assign to the reserve output 2. Default 00 (no assignment).

[4-- RECIPE] Recipe Block

The recipe related parameters are located in this main block. Necessary parameters can be transferred to the Recipe from this block. Refer to Recipe Build section, page 101.

[4-- RECIPE]	**RECIPE RELATED PARAMETERS MAIN GROUP** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key enter the next block, or press ESC key to exit from programming.
[41- FILLING]	**FILLING PROCESS RELATED PARAMETERS** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key enter to the next sub-block.
[411 G/N/MULT : GROS]	*Page 98* Gross, net, or multicycle filling. Defines the weighing during filling. Multicycle filling is available only at PACK and BAG modes. NET : Net filling into the container. GROS : Gross filling into the container MULT : Multicycle gross filling. (only PACK and BAG modes)
[412 TOL CONT : NO]	*Page 17* Tolerance control. Defines the tolerance control method as; NO : Disable +/-T : One value entry for both sides of target weight. +T -T : Positive and negative tolerances are entered separately for target. +/-F : One value entry for both sides of filling weight. +F -F : Positive and negative tolerances are entered separately for filling weight.
[413 TARING : AUTO]	*Page 92* Taring at filling. Select the taring method at filling. AUTO : Automatic taring. AV 5 : Average tare 5 /25. AV10 : Average tare 10 /100. ACON : Average tare 10 /∞ (10 sampling only after select the Recipe or after power on) SPEC : Specific tare PT.
[414 TARE MIN : 999.99]	Minimum tare value. The material feeding does not start if the container is lighter than the minimum tare weight value. (0 means minimum tare checking is disable)
[415 TARE MAX : 9999.99]	Maximum tare value. The material feeding does not start if the container is heavier than the maximum tare weight value. (0 means maximum tare checking is disable)
[416 V FORCE : 1.00]	Valve force.

		It means the valve could not go into the container and applied force to it. If this force is bigger than the entered value, the movement is cancelled, and error signal is produced.
[417 LANCE B LIFT W : 2.00]		The load which starts movement of the lance from BOTTOM to upward. Lance moves upward from BOTTOM if the load is heavier than this value. This value starts lifting system of big bag machine if parameter 326 is set to UP-B.
[418 LANCE M : 5.00]		The load which starts movement of the lance from middle waiting point at middle waiting control types BMIU and BMIO. Lance moves upward from middle waiting point if the load is heavier than this value.
[419 OVERFILL : 0.00]		*Page 16* Overfill weight. Enter the over fill quantity which may be required by law. ± XXXXXX kg ***Note:*** *This parameter is shown as 40A and 40B in Recipe menu.*
[41A BATCH : NO]	M	*Page 91 109* Batch filling availability of the recipe to transfer product in batch or bulk. Only selected operation is permitted, others are restricted at recipe. NO : Disabled. QTY : Only Batch filling in quantity. 🖷T : Only Batch filling in total. Q+🖷T : Batch quantity filling and batch total are available. BULK : Bulk filling which transfers the total accurately.
[41B SOFTSTRT : NO]		Start filling with fine or medium feeding. Select if there is any splash risk at the start of the filling. NO : Disabled. FINE : Start with fine feeding. MED : Start with medium feeding.
[41C SOFT T : 3.0]		Soft start time. Soft start feeding is done during this time, then coarse feeding starts. XX.X seconds.
[41D EMPTYPE : TIME]		The emptying / discharge type.
		TIME : Opening time of the discharge gate is controlled by empting timer. There is not the weight checking at emptying. LOAD : Discharge time is started after lowering the material weight below Empty / Discharge weight.
[41E EMPTY W REMAIN : 1.00]		Empty/Discharge weight / Remaining weight. The weight which the scale accepted unloaded at container fillings and at fillings by weighing hopper / silo. Remaining material weight after discharge is entered here at Weigh in - Weigh out mode.
[41F EMPTY T : 1.0]		Emptying / discharge time.

	Enter the time to minimize the residual material after emptying. The emptying / discharge gate opens during this time at filling machines with weighing hopper. This delay starts after reducing weight to the Empty / discharge weight (Par. 41E) value, if there is weight control at emptying / discharge. XX.X seconds.
[43- ADJUSTMENT]	**AUTOMATIC ADJUSTMENTS** This block defines the adjustment technic of the instrument to minimized filling errors. Press ▶ key or ↵ key again to enter this menu. Or press ▲ key enter to the next sub-block.
[431 ADJ TECH : AUTO]	*Page 93* Correction technic at Feeding / Discharging. NO : Disabled. AUTO : Automatic correction. TIME : Fine feeding time optimization SMRT : Smart start up and correction
[432 FINE TIM : 2.0]	*Page 94* Fine feeding time. The coarse feeding cut off is adjusted automatically to ensure the fine feeding time. XX.X seconds
[433 PRE FREQ : 15]	*Page 94* Preact adjustment frequency. Defines the quantity of filling to readjust the fine feed cutoff. I.e. the preact adjustment is done after each 15 filling if the parameter is set to 15.
[434 SAMPLING : 3]	*Page 94* Sampling quantity. Defines the sampling quantity to adjust the fine feed cutoff. I.e. The error calculation is done after reading 3 filling results, if sampling rate is 3.
[435 RATIO : 50]	*Page 94* Preact correction ratio in percent. The adjustment is done at percent of the calculated filling error. XX %
[436 Z FREQ : 50]	Zeroing frequency. Defines the frequency of zeroing of the weighing hoppers. Default is zeroing at each 50 filling. ***Note**: If zeroing is done automatically in every 60 minutes, if the time is longer than 60 minutes between two zeroing.*
[437 JOGGING : NO]	Jogging. Feeding some material into the container in case of less material filling to get into tolerances. NO : Disable TIME : Jogging is done only one time for jogging on time. AUTO : Automatic jogging for 3 times. If tolerance is not reached , error signalized.

[438 JOG ON : 0.5]	Jogging on time. Defines the feeding time of jogging process in case of underfilling. XX.X seconds.
[439 JOG OFF : 1.0]	Jogging off time before start tolerance checking. XX.X seconds.
[43A MIN ERR : 0.02]	Minimum filling error limit to make preact adjustment. The fine adjustment is not done if the filling error is smaller than minimum error. XXXXXX kg
[43B MAX ERR : 1.00]	Maximum error limit to make preact adjustment. The fine adjustment is not done if the filling error is bigger than maximum error. XXXXXX kg
[43C M WINDOW : 1.0]	Motion window at filling process. This parameter defines the motion window during filling process to increase the filling speed. This motion window is used specially to minimize the feeding adjustment times. ± XX.X d (divisions)
[43D C RATIO : 25]	Preact correction ratio in percent for coarse feeding cut-off. *Page 94* The coarse feeding cut-off is adjusted upon the correction ratio in percent for the minimum fine time limit and smart adjustment methods. XX %
[44- TIMERS]	**TIMERS OF FILLING** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[441 Z DELAY : 2.5]	Zeroing delay. Zeroing is delayed to settle the scale after closing the emptying / discharge gate. XX.X seconds.
[442 T DELAY : 2.0]	Taring delay. Taring is delayed to settle the scale after loading the container on to the scale. XX.X seconds.
[443 STB CHK : 0.7]	Stability check delay. Stability checking after filling delayed to settle the product in the container after feeding. XX.X seconds.
[444 STB MAX : 5.0]	Maximum stability time. Defines the maximum limit of the settling time of the scale after filling. XX.X seconds.
[445 STRT DEL : 0.0]	Start delay.

	Delays the start of filling / closing the clamp to catch the bag. XX.X seconds.
[446 EOB DEL : 0.0]	End of batch output delay. Enter the delay time to produce delayed trigger signal to any mechanism at the end of batch, if need be. EOB or EOF output is delayed to indicate the filling result a while before producing the EOB output. XX.X seconds.
[447 COARSE D : 0.7]	Coarse and medium feed control delay. The weight is not controlled at the beginning of feedings for a while to eliminate the shock effects of feeding initiations. The weight control starts after ending this time at feedings. ***Caution:*** *Longer time may obstacle the feeding control.* XX.X seconds.
[448 FINE DEL : 0.7]	Fine feed control delay. The weight is not controlled at the beginning of fine feeding for a while to eliminate the effects of feeding at initiation. The weight control starts after ending this time at fine feeding. ***Caution:*** *Longer time may obstacle the feeding control.* XX.X seconds.
[449 FG DEL : 3.0] VALV DEL LIFT DEL	FG DEL : Maximum delay time of the switch signal on the feeding gate and discharge gate at bagging, packing etc. VALVDEL : Maximum delay time between the valve output and its switch signal at liquid fillings. LIFTDEL : Maximum delay time between the lifter output and its switch signal at liquid fillings. If the switch signal is not received in this time - which means the required action is not done-, error prompt is produced. XX.X seconds.
[44A CMPL DEL : 0.0]	Complete delay. The complete output is delayed transferring the product or container to the following step and the following step started with complete output. The next filling does not wait for the complete output, i.e. filling starts after closing the emptying / discharge gate at packing machine. XX.X seconds
[44B CATC DEL : 0.0]	Catch delay. Closing the clamp to catch the bag. XX.X seconds.
[44C CLAMPDEL : 2.0]	The clamp release delay.

	The clamp releases the bag after this delay after filling it. This parameter is used to settle the material in the pack after filling. XX.X seconds.
[44D MAXFILLT : 999]	Maximum filling time. The filling process is ended and error message is displayed, if the filling is not finished in this time. XXX seconds.
[45- ANALOG OUT]	**ANALOGUE OUTPUT** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[451 TYPE : NO]	Analogue output type. NO : Disabled. 0-20 : 0 mA - 20 mA 0-10 : 0 VDC - 10 VDC
[452 COARSE : 00.00]	Analogue output value for Coarse feed.
[453 MEDIUM : 00.00]	Analogue output value for Medium feed.
[454 FINE : 00.00]	Analogue output value for Fine feed.
[46- PALETTE]	**FILLING ON THE PALETTE** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[461 OPERATIO : NO]	Weighing operation type of the machine. The subtractive or additive taring can be used for taring at palette filling. NO : Disabled. ADDI : Taring does not reduce the weighing range. SUBT : The taring reduces the net weighing range.
[462 QUANTITY : 4]	Container quantity on the palette.
[463 BATCH : FILL]	Operation at Batch filling. This parameter defines the filling method of the last palette of the batch. STOP : Apply the Batch quantity / batch weight absolutely. and stop filling even palette is not fulfilled. FILL : Fill all containers on the last palette at batch filling.

[47- SELECT USAGE]	**USAGE of SELECTABLE FUNCTIONS** Adjust your selectable functions like alarm, vibration etc in this group. Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[471 ALARM SP :]	Alarm Setpoint. *Page 108* The instrument produces the alarm output if the gross load is heavier than this value and if alarm feature is selected in sub-block 33-. Default is 9999.99
[472 ALARM T : 5.0]	Alarm time. *Page*

	108 Alarm output is active during alarm time, if programmed. 00 means timer is disabled. XX.X seconds.
[473 VIB MIN : 0.00]	The weight to activate vibration output. *Page 110* Default is 0.
[474 VIB MAX : 0.00]	The weight to release the vibration output. *Page 110* Default is 0.
[475 VIB DEL : 0.0]	Vibration delay. *Page 110* Vibration output is delayed after start feeding. XX.X seconds.
[476 VIB TIME : 0.0]	Vibration time. *Page 110* The value of this parameter defines Vibration time. XX.X seconds.
[477 ZR [d] : 1.0]	Zero range in XX.X division. *Page 108* The output is active if the indication is lower than zero range. For example: if the scale division is 0.5 kg and you want zero range output if the load is heavier than 1.2 kg , enter 1.2 / 0.5 = 2.4 division.

[48- SELECT TIMERS]	TIMERS of SELECTABLE FUNCTIONS Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[481 TIMER 1 : SELE]	Timer 1 Trigger. Defines trigger of Timer 1. SELE : Selectable input which is selected as TMR1. Refer to sub-block 33. IN : Enter the number of the digital input to trigger Timer 1. OUT : Enter the number of the digital output to trigger Timer 1.
[482 NUMBER : 1]	Number of digital input or output to trigger Timer 1. XX
[483 TMR1 TYP : A]	*Page 112* Timer 1 Type. Defines the usage of Timer 1. A : Type A B : Type B C : Type C D : Type D E : Type E F : Type F
[484 TMR1 ON : 0.0]	Timer 1 On time. XX.X seconds.
[485 TMR1 OFF : 0.0]	Timer 1 Off time. XX.X seconds.
[486 TIMER 2 : SELE]	Timer 2 Trigger. Defines trigger of Timer 2. SELE : Selectable input which is selected as TMR2. Refer to sub-block 33. IN : Enter the number of the digital input to trigger Timer 2. OUT : Enter the number of the digital input to trigger Timer 2.
[487 NUMBER : 1]	Number of digital input or output to trigger Timer 2. XX
[488 TMR2 TYP : A]	*Page 112* Timer 2 Type. Defines the usage of Timer 2. A : Type A B : Type B C : Type C D : Type D E : Type E F : Type F
[489 TMR2 ON : 0.0]	Timer 2 On time. XX.X seconds.
[48A TMR2 OFF : 0.0]	Timer 2 Off time.

	XX.X seconds.
[48B TIMER 3 : SELE]	Timer 3 Trigger. Defines trigger of Timer 3. SELE : Selectable input which is selected as TMR3. Refer to sub-block 33. IN : Enter the number of the digital input to trigger Timer OUT : 3. Enter the number of the digital input to trigger Timer 3.
[48C NUMBER : 1]	Number of digital input or output to trigger Timer 3. XX
[48D TMR3 TYP : A]	Timer 3 Type. *Page 112* Defines the usage of Timer 3. A : Type A B : Type B C : Type C D : Type D E : Type E F : Type F
[48E TMR3 ON : 0.0]	Timer 3 On time. XX.X seconds.
[48F TMR3 OFF : 0.0]	Timer 3 Off time. XX.X seconds.
[4A- SELECT LOGIC]	**LOGICAL of SELECTABLE FUNCTIONS** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to beginning of the sub-block or press Esc key to go to the next main-block.
[4A1 LOGIC - AB : A+B]	Logical Function of (A, B). *Page 113* One of the select output should be selected as logic output. The function of the logic output can be defined as; A+B : Sum A and B AxB : Multiply A and B A+NB : Sum A and inverse of B AxNB : Multiply A and inverse of B S – R : Start (A) – Reset (B) NS-R : Inverse of set (A) – Reset (B) N : Inverse of sum A and B NAB : Inverse of multiply A and B
[4A2 A TRIGG : SELE]	Defines the trigger of the logic A. SELE : Selectable input which is selected as IN-A. Refer to sub-block 33. IN : Enter the number of the digital input to trigger logic A. OUT : Enter the number of the digital input to trigger logic A.
[4A3 NUMBER : 1]	Number of digital input or output to trigger logic A. XX
[4A4 B TRIGG : SELE]	Defines the trigger of the logic B.

	SELE : Selectable input which is selected as IN-B. Refer to sub-block 33. IN : Enter the number of the digital input to trigger logic B. OUT : Enter the number of the digital input to trigger logic B.
[4A5 NUMBER : 1]	Number of digital input or output to trigger logic B. XX
[4B- PRE-FEEDING]	**PRE-FEEDING OF MATERIAL** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to beginning of the sub-block or press Esc key to go to the next main-block.
[4B1 PREFEED : NO]	Pre-feeding operation. *Page 99* The feeding gate closed at the end of the fine feeding and feeding goes on for a while to collects some material in the feeding gate. NO : Disabled. YES : Enable pre-feeding to the feeding gate.
[4B4 SPEED : FINE]	Feeding speed at pre-feeding. FINE : Fine feeding COAR : Coarse feeding MEDI : Medium feeding
[4B5 PREFD T : 0.0]	Pre-feeding timer. Pre-feeding is done during this time. XX.X seconds.

[5-- SCALE] Scale Block

These blocks are related with the measurement related parameters which are described the use of the scale. The most important parameter is 511 which limit the use of the parameters in main blocks 5, 6 and 8.

IND	Industrial weighing	Selections of parameters at set up and calibration are free for industrial use of the instrument.
INDG	Industrial weighing only gross	Autozeroing, taring and power on zero are disabled. (Recommended for tank /silo weighing in gross.)
INDN	Industrial weighing net (taring can be enabled)	Autozeroing and power on zero are disabled. (Recommended for tank /silo weighing in gross.
OIML	Approved scale according to OIML	Metrology related parameters are restricted to limits of OIML R76 and EU type approval of the instrument.

After setting parameter 511, even you set any parameter out of the accepted range of selection of par 511, it is saved in the acceptable limit. For example, if taring is activated at INDG selection, it will be disabled while exiting from set up. For approved scales, set the parameters in main blocks 5, 6 and 8 perform calibration carefully due to sealing of the scale in legal use.

[5-- SCALE]		**SCALE RELATED PARAMETERS MAIN BLOCK** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to go to the next block, or press ESC key to exit from programming.
[51- SET UP]		**SCALE SET UP** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[511 APROVAL : IND]	M	Approval IND : Industrial. All parameters can be freely selected. INDG : Industrial weighing of tank, hopper, or silo in gross. (Taring, AZTrack and Power on Zero are disabled) INDN : Industrial weighing in Net of tank, hopper or silo. (Disabled AZT and Power on Zero, enabled Tare) OIML : OIML approved scale.
[512 HIGHRES : TOGG]	M	High resolution *Page 38* TEMP : Temporary indication with key. TOGG : Toggle. Start and end high resolution by pressing key in sequence. ALWA : Always high resolution.
[513 PWR ZERO : NO]	M	Power on zero. NO : Disable. 2% : ± 2% 2%LK : ± 2%, [POWER ON ZERO ERR] prompt cannot be erased. Call service. 10% : ± %10 15-5 : + %15, - %5 20% : ± %20
[514 ZEROING : 50%]	M	Zeroing range. *Page 34*

		NO : Disable. 2% : ± 2% 3% : ± 3% 20% : ± 20% 50% : ± 50%
[515 AZTRACK : NO]	M	Automatic zero tracking. Be careful to activate automatic zero tracking function against wrong zeroings at the beginning of feedings. NO : Disable. 0.3d : ± 0,3d 0.5d : ± 0,5d 1d : ± 1d 2d : ± 2d 3d : ± 3d
[516 STABLE : 0.5d]	M	Stability detection range at static weighing and for printout. NO : Disable. 0.3d : ± 0,3d 0.5d : ± 0,5d 1d : ± 1d 2d : ± 2d 3d : ± 3d 4d : ± 4d 5d : ± 5d 9d : ± 9d
[517 STBTIME : 0.7]		Stability time. The scale is accepted as a stable to process if the scale is stable during this time. 0.1.... 9.9 seconds.
[51A TILT : NO]	M	Tilt switch to prevent wrong weighing results in mobile scales. Set any select input as TILT. NO : Not used. OPEN : Normally open contact. CLOS : Normally closed contact.
52- BUILD]		**SCALE BUILD** Press ▶ key or ↵ key again to enter this menu. Press ▲ key to enter the next sub-block or press ESC key to enter the next main-block.
[521 UNIT : KG]	M	*Page 35* The scale unit. (Primary unit which calibration is done.) Select NO, g, kg, t, lb or klb.
[522 RANGE : SING]	M	Scale range. SING : Single Range 2MR : 2 x Multi Range 3MR : 3 x Multi Range 2MI : 2 x Multi Interval 3MI : 3 x Multi Interval
[523 MAX :] MAX1/d1 MAX2/d2 MAX3/d3	M	Scale capacity Max and division (d). Enter scale capacity and division after press ↵ key. Capacities and divisions of MR and MI scales are entered as Max1, d1, Max2, d2, Max3, d3.

[524 OVER : 9d]	M	Limit of Indication. NO : Over indication after Max 1d : 1 division more than Max 5d : 5 division more than Max 9d : 9 divisions more than Max 2% : 2% more than Max 5% : 5% more than Max
[525 LC mV/V : 2.00]	M	Load cell sensitivity. Enter load cell sensitivity of the load cell from catalogue as X.XX up to 9.99mV/V. Enter 9.99 if the load cell sensitivity is between 9.90mV/V to 15mV/V.
[526 TARETYPE : SUB]	M	Tare type. SUB : Subtractive tare. Taring reduces the maximum net. ADD : Additive tare. Taring is limited to MaxTare and Net weighing is done up to Max due to weighing range is not reduced after taring. BOTH : Subtractive and additive taring are available and can be selected in the Recipe.
[527 MAXTARE : 0.00]	M	Maximum tare at additive tare. Enter the maximum tare of the scale which is written on the marking label as; T= + XXXX.X at additive tare Default is 0.0 which means no limit.

[6-- CALB / ADJUST] Calibration and Adjustment Block

[6-- CALIB / ADJUST]				**SCALE ZERO AND SPAN SETTING MAIN BLOCK** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to go to the next block, or press ESC key to exit from programming.
[61- CALIBRATION]				**CALIBRATION** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[611	TEST WEIGHT	]	M	Scale calibration with test weight
[612	LINEARIZATIO	]	M	Multipoint scale calibration to increase linearization
[613	ELECTRONIC	]	M	eCal electronic calibration without test weight
[62- ADJUSTMENT]				**ADJUSTMENTS** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[621	ZERO ADJUSTM	]	M	Zero adjustment
[622	SPAN ADJUSTM	]	M	Span adjustment
[623	S UNDER LOAD	]	M	Span adjustment of loaded scale Span adjustment under load Span adjustment with temporary zeroing
[624	GRAVITY CAL	]	M	Gravity acceleration of the place of the calibration.
[625	GRAVITY USAG	]	M	Gravity acceleration of the place of the use.
[63- COEFFICIENTS]				**CALIBRATION COEFICIENTS** Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to go to the next main-block.
[631	LOAD COEFFIC	]	M	The load weight used at the calibration is indicated here.
[632	ZERO COEFFIC	]	M	This coefficient is determined the zero point of the scale.
[633	GAIN COEFFIC	]	M	This coefficient is related with the gain factor of the scale.

Calibration

Calibration involves emptying the scale then placing a known test weight on an empty platform and allowing FT-113 to capture values for zero and span. Calibration is performed as;

1. Press key at the [611 TEST WEIGHT] prompt to start the calibration.
2. At the [UNLOAD THE SCALE] prompt, remove any weight on the platform, then press key.
3. The filling controller automatically starts to capture zero and the [WAIT] message appears during zero adjustment.
4. The test weight value will be used for the calibration and appears on the display as [LOAD THE SCALE] [XXXXXX] after zero adjustment. Enter the test weight value via numerical keys. A minimum test load requirement is 20% of scale capacity for accurate calibration. FLINTEC recommends test load between 50% to 75% of the capacity.
5. Place the test weight on the scale.
6. Press key to start span calibration. [WAIT] message will appear on the display for 10 seconds while span calibration is being performed.

Linearity Correction

Because of the load cell non-linearity or mechanical scale hardware, you may see nonlinearity on the scale performance. Multipoint calibration in this parameter improves the scale performance.

1. Press key at the [612 LINEARIZATIO] prompt to start the calibration.
2. At the [UNLOAD THE SCALE] prompt, remove any weight on the platform, then press key.
3. The filling controller automatically starts to capture zero and the [WAIT] message appears during zero adjustment.
4. At the [LOAD 1] [XXXXXX] prompt, the test weight value will be used for the first step calibration and appears on the display. A test load requirement is between 35% to 60% of capacity. Load the scale and enter the test weight value via numerical keys.
5. Place the test weights or another practical weight on the scale.
6. Press key to start span calibration. [WAIT] message will appear on the display for10 seconds while the first span calibration is being performed.
7. At the [LOAD 2] [XXXXXX] prompt, the test weight value will be used for the second step calibration and appears on the display. Place test weight on the platform at least 90% of scale capacity, preferable at scale capacity. Enter the weight value by numerical keys.
8. Press to start second step span calibration. [WAIT] message will appear on the display for 10 seconds while the span calibration is being performed.

Zero and Span Adjustments

In this sub-block you can only perform zero adjustment or span adjustment automatically without performing full calibration. Do not perform span calibration if eCal electronic calibration.

Automatic Zero Adjustment

1. Press key at the [621 ZERO ADJUSTM] prompt to start the zero adjustment.
2. At the [UNLOAD THE SCALE] prompt, remove any weight from the platform, then press key.
3. The filling controller automatically starts to capture zero and the [WAIT] message appears during zero adjustment.

Automatic Span Adjustment

1. Press key at the [622 SPAN ADJUSTM] prompt to start the span adjustment.
2. At the [LOAD THE SCALE] [XXXXXX] prompt, the test weight value will be used for the calibration and appears on the display. Enter the test weight value via numerical keys. A minimum test load requirement is 20% of scale capacity for accurate calibration. FLINTEC recommends test load between 50% to 75% of the capacity.
3. Place the test weights on the scale.

4. Press  to start span calibration. [WAIT] message will appear on the display for 10 seconds during span calibration.

Automatic Span Adjustment Under Load

This parameter is being used to perform span adjustment of a scale without lifting the load on it. This operation is especially used for span adjustment tank / silo which have some material in it. You can make span adjustment without emptying the tank.

1. Press  key at the [623 S UNDER LOAD] prompt to start the span adjustment under load.
2. [P.ZERO] prompt appears on the display to indicate the scale load will be determined as temporary zero.
3. Press  key and the display will show [WAIT] message during temporary zero adjustment.
4. At the [LOAD THE SCALE] [XXXXXX] prompt, the test weight value will be used for the calibration and appears on the display. Enter the test weight value via numerical keys. A minimum test load requirement is 20% of scale capacity for accurate calibration. FLINTEC recommends test load between 50% to 75% of the capacity. Sum of the preload of the scale and test weight must be less than capacity.
5. Place the test weights on the scale.
6. Press  to start span calibration. [WAIT] message will appear on the display for 10 seconds during span calibration.
7. Zero adjustment is recommended after emptying the scale.

eCal Electronic Calibration

***IMPORTANT NOTE**: The eCal electronic calibration is based on the zero adjustment by entering the dead load value or automatic zero adjustment and span adjustment by entering the load cell data.*

***WARNING** : If the primary unit is different than kg, the selected unit should be saved by exit from set-up and then perform eCal.*

1. Full calibration cancels the eCal performed before.
2. Span adjustment is cancels the eCal performed before.
3. Gravity adjustment cannot be done after eCal.
4. "Span adjustment under load " cannot be done after eCal.
5. Shift adjustment cancelled the eCal performed before.

This parameter lets you to perform calibration without using any test weights. A/D coefficients of the filling controller are adjusted in production for increasing eCal accuracy. The calibration coefficients are calculated by scale capacity, total load cell capacity, load cell full scale output and estimated dead load. If the conditions are convenient for zero calibration, you may perform automatic zero adjustment instead of entering estimated preload.

[TOTAL LC CAPACIT]
[XXXXXX]
Enter total load cell capacity via numerical keys and press  key to go to the next step.

Example : If the weighing system has 4 pcs 1000 kg load cell, enter 4000.

[AVARAGE LC OUT]
[XXXXXX]
Enter load cell output in mV/V via numerical keys. If the weighing system has more than one load cell, calculate the mean value of load cells outputs mV/V indicated on the certificates of the load cells. Press  key to go to the next step.

Example: If load cell outputs are LC1: 2.0010, LC2: 1.9998, LC3:1.9986 and LC4:2.0002, the averaged value will be;

Average of LC outputs = (2.0010 + 1.9998 + 1.9986 + 2.0002) ÷ 4 = 1.9999 mV/V.
[ZERO ADJUST]
If the scale is empty and you want to make automatic zero adjustment instead of entering estimated dead load (see next step), press key, it appears [UNLOAD THE SCALE] and press key to start zero calibration after unloading the scale. The display will show [WAIT] message during zero adjustment. In this while the scale must be unloaded and stable. Approximately 10 seconds later electronic calibration is performed.

If the scale is not empty or you prefer to enter estimated preload value, press the key before pressing the key.

[ESTIM DEAD LOAD]
[XXXXXX]
Enter the dead load value of the weighing system in current unit by using numerical keys. Press the key to go to the next step.

Notes:
Dead load correction: You may change the dead load value after testing the scale and adding the displayed gross weight value of unloaded scale to the dead load value. Do not press →0← key after switch on the instrument after calibration, and the power on zero and automatic zero tracking should be disabled to determine the dead load error.
Dead load value is cancelled after automatic zero adjustment.

Gravity adjustment

***WARNING**: This parameter should ONLY be used at the scale that will be initially verified in two stages by gravity adjustment in legal metrology applications.*

The gravity acceleration values of the place of the calibration and of the place of the use are entered in this parameter.

1. Press key to access this parameter.
2. [624 GRAVITY CAL : 9.80255] prompt appears. Enter the gravity acceleration value of the calibration place. Confirm with key.
3. [625 GRAVITY USAG : 9.80255] prompt appears after pressing key. Enter the gravity acceleration value of the place of the use.
4. Confirm with key.

Calibration coefficients

Calibration coefficients are calculated after calibration and saved to the memory for use until next calibration. Note these coefficients to use them in case of calibration lost. Changing them slightly improves the scale accuracy without recalibration. Entering these values to another the indicator may cause slightly reducing the weighing accuracy due to offset differences between two analogue digital circuits.

[8-- METROLOGY] Metrology Block

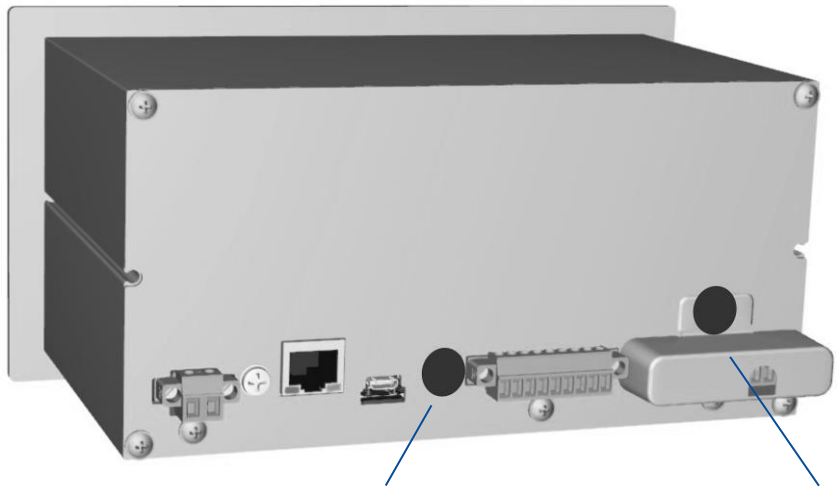
[8-- METROLOGY]			**METROLOGY MAIN BLOCK** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to go to the next block, or press ESC key to exit from programming.
[81- ALIBI MEMORY]			**ALIBI MEMORY** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[811 ALIBI	: NO	]	M Alibi memory NO : Disable YES Enable *Page 175*
[812 PORT	: PRNT	]	Select the Alibi data transfer port. PRNT : to the printer port. R232 : to the RS232C. USB : to the USB ETH : to the Ethernet TCP/IP.
[813 ACCESS	: NUM	]	Access to the Alibi memory record NUM : Search by Alibi number DATE : Search by date CN : Search by Consecutive value *Page 175*
[814 TRANSFER	: NO	]	Transfer Alibi memory records NO : No ALL : Transfer alibi memory record to the printer port *Page 176*
[815 ALIBI ABOUT		]	Transfer alibi memory information. *Page 176*
[816 FORMAT	: NO	]	M Format alibi memory SD card. NO : No YES : Start formatting alibi SD card. *Attention : Only authorized person !!!* *Page 176*
[82- INFORMATION]			**METROLOGIC INFORMATION** Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press ESC key to enter the next main-block.
[821 CAL COUNTER		]	This counter announces interfering quantity to the instrument with service password when calibration switch enabled. Count number increases at exit from set-up mode if service password is used and calibration is enabled to enter set-up mode.
[822 CONFIG COUNT		]	This non-resettable and protected counter announces interfering quantity to the instrument. Count number increases at every exit from set-up mode.
[823 NEXT VERIFIC		]	Date of the next verification *Page 37*

[9-- DIAGNOSTIC] Diagnostic Block

[9-- DIAGNOSTIC]		**DIAGNOSTIC MAIN BLOCK** Press ▲ key sequentially to access this main block, or press ▶ key or ↵ key to enter configuration parameters, or press ▲ key to go to the next block, or press ESC key to exit from programming.
[91- HARDWARETEST]		**HARDWARE TESTING** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[911 KEY TEST]		Key testing
[912 RS232]		RS232C serial port testing
[913 RS485]		RS485 serial port testing
[914 RS422]		RS422 serial port testing
[915 USB]		USB port testing
[916 INPUTS]		Digital Input testing
[917 OUTPUTS]		Digital Output testing
[918 DISPLAY]		Display testing
[919 LC SIGNAL mV]		Load cell signal measuring in millivolt (only FT-113Fill)
[91A PRINTER]		Printer testing
[91B TESTPRNT : NO]	M	Data output format for easy adjustment the machine at service. NO : No YES : Data transfer to follow the machine performance at service. *WARNING: Disable this parameter after service.*
[92- HISTORY]		**HISTORY** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[921 PEAK LOAD]		The last 20 peak loads listed in this parameter.
[922 UNDER LOGS]		The last 20 under errors listed in this parameter.
[923 ERROR LOGS]		The last 20 errors listed in this parameter.
[924 ENTRY LOGS]		The last 20 Service/User entry listed in this parameter.
[925 FILL ERRO]		The last 20 Filling errors are listed in this parameter.
[93- DIG OUT CHEC]		**DIGITAL OUTPUTS CHECKING** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[931 FEEDOUTS : NO]		Instrument can test the feeding outputs for any malfunctioning at every start-up. NO : Disable YES : Coarse, Medium and Fine outputs check against malfunctioning or no connect to any load.
[932 IO POWER : NO]		Instrument can test the power supply of IO board or RIO16 unit at every start-up.

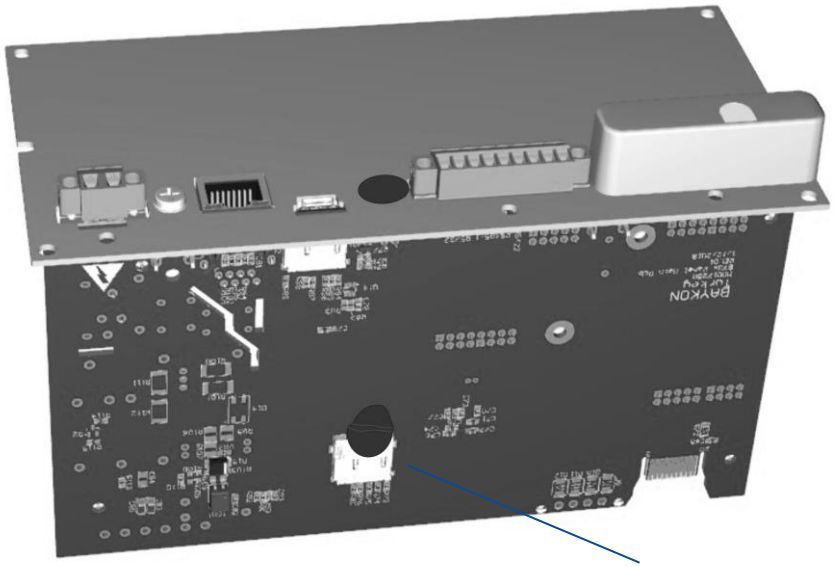
		NO : Disabled. YES : Enabled.
[96- BACKUP/RESTO]		**BACKUP / RESTORE** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[961 BACKUP : ALL]		Backup to SD card. *Page 177* ALL : Backup the instrument's all parameter to SD card.
[962 RESTORE : RCPT]	M	Restore the instrument from SD card. *Page 177* RCPT : Recipe build configuration and Recipe in the use (4-- parameter group). SETP : Parameters of 1-- , 2-- and 3-- parameter groups. CAL : Parameter group 5-- and calibration coefficients. ALL : All parameters and calibration. *WARNING: CAL and ALL items can be loaded if the calibration switch is at ON position.*
[965 M.BACK UP : RECP]		Backup memories to SD card. *Page, 177, 40* RECP : Recipe memory. ID : ID memory. ALL : All Memories.
[966 M.RESTORE : RECP]		Restore memories from SD card. *Page 177, 40* RECP : Recipe memory. ID : ID memory. ALL : All Memories.
[97- FIRMWARE]		**FIRMWARE INFORMATION** Press ▶ key or ↵ key again to enter this menu. Or press ▲ key to go to the next sub-block.
[971 INSTRUMENT]		XX.XX
[972 OPTION]		XX.XX
[973 UPGRADE]	M	Firmware upgrade Call Flintec service or dealer to upgrade.
[975 I/O BOARD]		XX.XX
[976 AN BOARD]		XX.XX
[977 DISPLAY BOAR]		XX.XX
[99- DEFAULT]		**DEFAULTS LOADING** Press ▶ key or ↵ key again to enter this menu. Press ▲ key to go to beginning of the sub-block or press Esc key to enter the next main-block.
[993 PARAMET DEF]	M	Load parameters default (Calibration do not change)
[994 FACTORY DEF]	M	Load factory defaults
[996 DEL RECIPES]		Delete all Recipes.

18. SEALING OF APPROVED SCALE



Sealing of Calibration switch

Sealing of Load cell connector

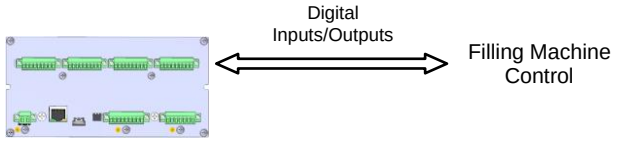
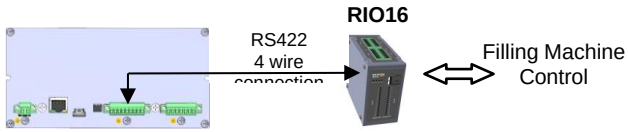


Alibi SD card sealing

19. APPENDIX 1. DIGITAL INPUTS AND OUTPUTS

APPLICATION: Digital inputs are used to control the filling machine and the digital outputs are used to control gates, valves, feeders etc. or to produce alarm. Refer to section 12 for details. The reserve inputs and outputs can be attended instead of malfunctioned inputs or outputs until receiving the new PCB or unit.

FT-113Fill filling controller has two variants. The first variant is equipped with internal 12 digital inputs and 14 digital outputs and the second variant is connected to the DIN rail mount type Remote Input Output Unit RIO16 -which has 16 inputs and 16 outputs- via RS422 serial interface. The configuration of these inputs and outputs are the same and defined after selecting the filling machine type.

Variant	Description	Digital I/O Connection
FT-113Fill A	FT-113Fill with internal digital I/O board. The 'FT-113Fill A' variant has an internal digital I/O board which has 12 digital inputs and 14 digital outputs. The digital I/O terminals are located on the top of the rear panel.	
FT-113Fill R	FT-113Fill with external digital I/O unit. The 'FT-113Fill R' variant has not the internal digital I/O board and connected to the DIN rail mount RIO16 unit via RS422 serial port to control filling machine.	

Input and output terminal configuration of these two variants is identical. The only difference between the two variants is the digital I/O cabling from the instrument of from the unit on the DIN rail. The functions of digital inputs and outputs for different filling applications are described in section 7, page 40.

Selectable inputs / outputs

The selectable input and output feature of the instrument eliminates the PLC requirement in the cabinet for frequently used functions at filling machines like level control of the material bin on the filling machine. These inputs can be used to interrupt the filling, for error acknowledgement, to control or inhibit filling operation, to set or reset some function etc. Refer to section 12 for details of available digital input and output functions for your use.

Reserve inputs / outputs

If any input or output of the instrument has any malfunction due to any external reason, you may use reserve port until receiving the new PCB or unit without stopping your filling machine. This feature gives you opportunity to go on production until repairing the instrument. Refer to sub-block **37-** to set-up.

19.1 Hardware and connection of the digital inputs and outputs

Digital inputs

Galvanically isolated Input signals are actuated by applying voltage between input terminal and common terminal. The polarity of the input can be positive or negative. The equivalent circuit of inputs are drawn below. Buttons, switches, contacts or PLC outputs can be connected to inputs as appears below. The input current is 10 mA at 24VDC input.

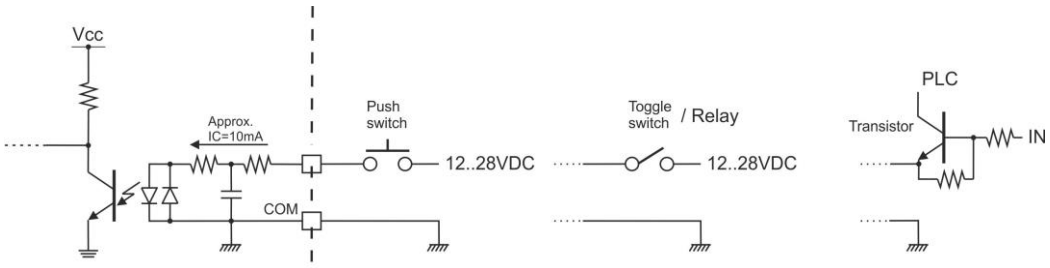


Figure 19.1 – Digital input connection diagram.

Digital outputs

Galvanically isolated Digital outputs are solid state relay output which are protected against short circuit. The polarity of the output is positive and actuated high voltage. The equivalent circuit of outputs are drawn below. Relays, Inductors or PLC inputs can be connected to outputs as appears below. The reverse diodes shall be connected in parallel to connected loads. The maximum output current is 200 mA.

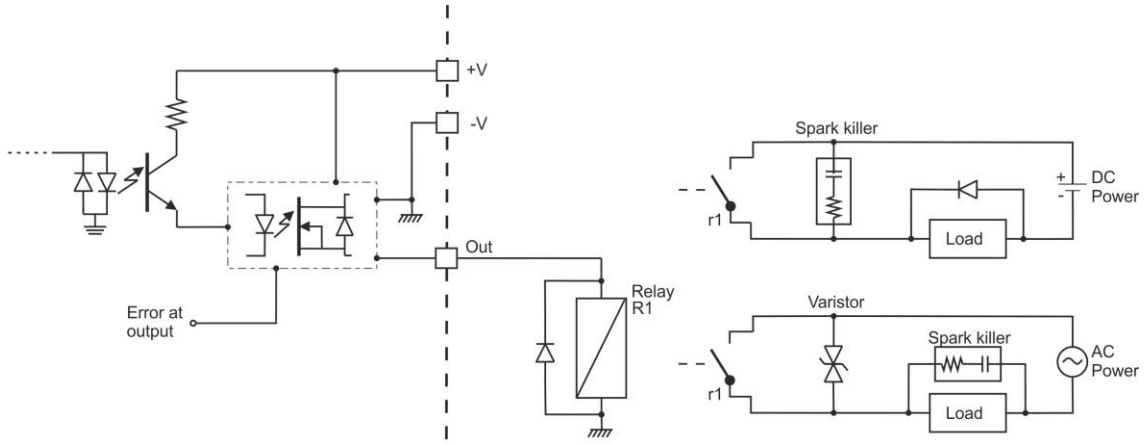


Figure 19.2 – Digital output connection diagram.

Note: The pin assignment of the digital Inputs / Outputs is individually specified for every mode in section 8.

20. APPENDIX 3. ALIBI MEMORY

RELATED PARAMETERS: Main block 8--

You can fulfill your weight data recording obligations with the alibi memory in certified operation without having paper archive. The weight data is saved into the alibi memory after every weighing operation together with date and time. The alibi record number may also be found on the printout data.
The alibi memory recording principle is a loop memory which deletes the oldest record after the capacity limit 19 999 reached to overwrite the latest weighing. You can quickly access to the record of specific weighing by entering the suitable search criteria.

20.1 Installation of Alibi SD card

Alibi memory requires the Flintec-Alibi SD card at the SD1 card slot on the bottom of the main board as shown in the pictures below. Order Alibi SD pack from Flintec or dealer.

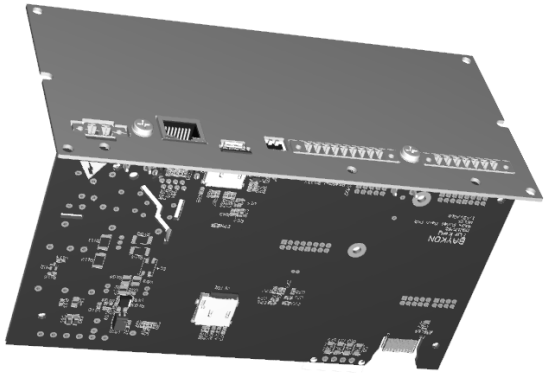
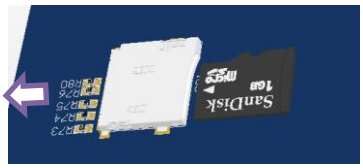


Figure 20 1- Location of Alibi SD card slot

Inserting or removing the Alibi SD card

1. Deenergize the instrument and wait 30 seconds before interfering the instrument.
2. Remove 6 pcs M4 screws of the backplane.
3. Draw out the back plane and mainboard from the body of the enclosure. The location of the alibi card is on the rear side of the main board which is named as SD2.
4. Insert the Alibi SD card into the slot until it locks into place. Or remove the SD card by pressing it gently. Do not use a screwdriver to install or remove SD card.



5. Place the sealing sticker as indicated at the sealing section.
6. Place the main card into the instrument and mount the backplane to the body.
7. Energize the instrument.

20.2 Activating Alibi Memory

1. Go to the parameter [8-- METROLOGY] main block in set up.
2. Press ▶ key 2 times to access parameter 811.
3. Press ↵ key after selecting YES in the parameter.
4. Press ESC key until [SAVE : YES] prompt appears on the display and press ↵ key to save the changes into the memory. [E42 NEW ALIBI] message appears.
5. Reenter the set-up and format the SD memory card in parameter 816.
6. Press ↵ key until [SAVE : YES] message appears on the display and press ↵ key to exit the set up.

20.3 How to Record the Data into the Alibi Memory?

After the following actions, the transferred data is recorded into the alibi memory:

1. Press ↵ key to print the label,
2. Automatic printing (automatic print data transferring),
3. Interface command ASCII < P >,
4. BSI commands which request the stable weight,
5. Print commands of fieldbus interfaces,

20.4 Recall Data from Alibi Memory

RELATED PARAMETERS: Parameter 813.

You may display the alibi record by selecting the criteria which are alibi number, date, net weight, gross weight, or tare weight. You also may transfer alibi memory records to your PC.

Access to Alibi records

1. Go to the parameter [8-- METROLOGY] main block in set up.
2. Press ▶ key 4 times to access parameter 813.
3. Select the suitable criteria by pressing ▲ or ▼ keys which are NUM (Alibi number), DATE (weighing date), NET (net weight), GROS (gross weight), TARE (tare weight) or CN (consecutive number).

Alibi records display sequentially on the display:
The alibi record of the selected weighing is displayed in the sequence below.

1. Alibi record number
2. Date
3. Time
4. Consecutive number

Search with Alibi record number:

1. Press ↵ key after selecting NUM in parameter 813.
2. Press numerical keys to enter alibi number in the printout data and press ↵ key. You may navigate in the alibi memory with ▲ or ▼ keys after entering alibi number.
3. The weighing data in the alibi memory is indicated on the display.
4. Press ↵ key to print this record and the previous nine weighing.
5. Press ESC key 4 times to return operation.

Search with date:

1. Press key after selecting DATE in parameter 813.
2. Press numerical keys to enter date in the printout data and press key. The date format entry should be as in the operation. e.g. date entry should be DDMMYY if **parameter 241** is set to DMY. You may navigate in the alibi memory with or keys after entering the date.
3. The weighing data in the alibi memory is indicated on the display.
4. Press key to print this record and the previous nine weighing.
5. Press ESC key 4 times to return to the operation.

Transfer all Alibi records

1. Go to the parameter [8-- METROLOGY] main block in set up.
2. Press key 5 times to access **parameter 814**.
3. Press or keys to select PRNT and press key to start transferring.
4. Or you may stop transferring by pressing ESC key.

About Alibi Memory

1. Go to the parameter [8-- METROLOGY] main block in set up.
2. Press key 6 times to access **parameter** 815.
3. Press key to print alibi information.

Format Alibi Memory

Warning : *Alibi memory formatting should be done by authorized person. Otherwise erasing alibi memory may bring you undesired legal responsibility.*

You may need to format alibi memory after installing the used SD card, to erase previous records before starting use in legal or to erase alibi memory if you don't need previous records legally. This process runs if the calibration switch is at programming position.

1. Go to the parameter [8-- METROLOGY] main block in set up.
2. Press key 6 times to access **parameter** 816.
3. Select YES and press key.
4. The warning prompt [ARE YOU SURE?] appears on the display.
5. Press key to start formatting or Press ESC key to escape.
6. Press ESC key 3 times to return operation.

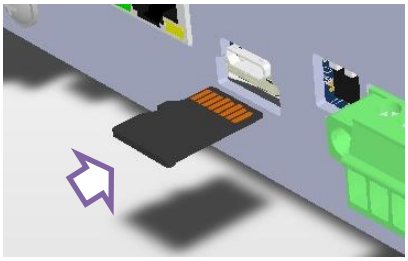
The empty fields are indicated as [-------] and transferred as [NO RECORD]; and the corrupted records are indicated as [Error] and transferred as [CORRUPTED].

21. APPENDIX 4. INSTALLATION OF SD CARD

Some features of the FT-113Fill require SD card. Its slot is located on the rear of the instrument. Some options might be activated by SD pack which should be supplied from Flintec. Standard SD cards can be used for data logging.

Inserting the SD card

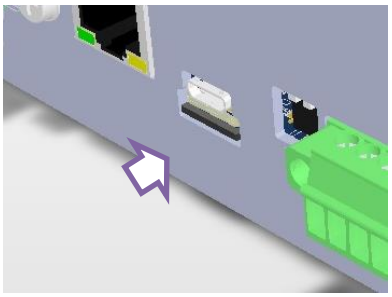
1. Deenergize the instrument and wait 30 seconds.
2. Insert the SD card into the slot until it locks into place.



3. Energize the instrument. FT-113 read the SD card at power on to initiate its function.

Removing the SD card

1. Deenergize the instrument.
2. Gently press on the SD card to release the lock, then carefully pull the card out.



3. Insert the new SD card as described above, if required.
4. Energize the instrument 30 seconds later power off.

22. APPENDIX 5. BSI PROTOCOL TO INTERFACE WITH PC AND PLC

New generation of FLINTEC´s weighing indicators launched on the market support the standardized command set BSI (Flintec Serial Interface) data form, depending on the functionality of the instrument. This easy data format gives the reliable and speedy interface advantages with communicating PLC or PC for process control or transactional applications.

BSI is divided into 2 levels

BSI-BASE	Command sets of basic weighing instruments, e.g. taring, zeroing, setpoint loading.
BSI-PRO	Extension of the command set for professional weighing indicators, e.g. commands related with identification data application related commands.

General Rules:

1.	Commands are only in CAPITAL.
2.	CHK (2 ASCII char) can be enabled or disabled from both command and response.
3.	Weight data and limit values are 8-byte with dot and non-significant zeros on the left.
4.	Headers are 16-byte length.
5.	ID identification data are 16-byte length.
6.	APW at piece weighing are 12-byte length.
7.	Address (2 ASCII char) will be located in the structure, if not 00.

Command format:
A general description of the command is as follows:
[ADR][COMMAND][CHK][CR][LF]

Response format with weight:
A general description of the response is as follows
[ADR][COMMAND][STATUS][SIGN][WEIGHT][CHK][CR][LF]

Response format without weight:
[ADR][COMMAND][STATUS][CHK][CR][LF]

***Note**: CHK, CR and LF will not be shown in below data format descriptions in this section.*

Status Table
The status data in the interfacing are listed below

A	Ack, the command is operated successfully
D	Dynamic, unstable weight
E	Errors except of H, L, O, +, –.
H	High voltage detected
I	The weight is in range
L	Low voltage detected
M	Mean (Average)
N	Nack, the command couldn't be operated
O	ADC out
S	Stable weight
X	Syntax error (not recognized the received command)
+	Overload
–	Underload

Checksum Calculation:
CHK is transmitted as two ASCII characters calculated with the Checksum formulation.
Checksum = 0 – (SUM of all response data before CHK)

***Example**: Read stable current weight data.*

BSI Examples: (CHK is enabled and instrument address is 01)

Command: 01P[CHK][CR][LF]
Checksum = 0 – (0x30 + 0x31 + 0x50)
= 0 – 0XB1
= 0x4F
= Char '4' and 'F'

Response: 01PS+000123.4[CHK][CR][LF]

Checksum = 0 – (0x30 + 0x31 + 0x50 + 0x53 + 0x2B + 0x30 + 0x30 + 0x30 + 0x31+ 0x32 + 0x33 + 0x2E + 0x34)
= 0 – 0x02B7
= 0x49
= Char '4' and Char '9'

22.1 BSI-Base Commands

BSI-BASE Command Table:

Description	Command	Response
Read all weight data immediately	[ADR][A]	[ADR][A][STATUS][SIGN][NET W] [SIGN][TARE W] [SIGN] [GROSS W]
Read Gross weight value immediately	[ADR][B]	[ADR][B][STATUS][SIGN][WEIGHT VALUE]
Clear the tare memory	[ADR][C]	[ADR][C][A]
Read voltage value of DC power supply	[ADR][G]	[ADR][G][STATUS][VOLTAGE VALUE]
Read current weight (indicated) value immediately	[ADR][I]	[ADR][I][STATUS][SIGN][WEIGHT VALUE]
Print: Read the stable weight	[ADR][P]	[ADR][P][STATUS][SIGN][WEIGHT VALUE]
Read Status	[ADR][S]	[ADR][S][STATUS-1][STATUS-2] [STATUS-3]
Tare	[ADR][T]	[ADR][T][STATUS]
Read digital inputs	[ADR][U]	[ADR][U][STATUS][Inputs]
Read digital outputs	[ADR][V]	[ADR][V][STATUS][Outputs]
Set/Reset digital outputs	[ADR][W][Outputs]	[ADR][W][STATUS]
Read weight value in increased resolution	[ADR][X]	[ADR][X][STATUS][SIGN][WEIGHT VALUE]
Zero	[ADR][Z]	[ADR][Z][STATUS]

BSI-Base Commands and Responses

A	Read all weight data immediately
B	Read Gross weight value immediately
C	Clear the tare
DJ	Print the label
DO	Read the last printed data
G	Read voltage value of DC power supply
I	Read current weight (indicated) value immediately
P	Read the current stable weight value
S	Read Status
T	Tare
U	Read digital inputs
V	Read digital outputs
W	Set/Reset digital outputs
X	Read current weight value in increased resolution immediately
Z	Zero

A	Read all weight data

Command : [ADR][A]
Response : [ADR][A][STATUS][SIGN][NET W][SIGN][TARE W][SIGN][GROSS W]
Example :
Command : 01A
Response : 01AS+000123.4+000111.1+000234.5
01AD+000123.4+000111.1+000234.5
01AO (ADC out error)
Comments :
The response is net, tare and gross weight values or error status.
All weight data is transmitted immediately after receiving the command.

B	Read Gross weight

Command : [ADR][B]
Response : [ADR][B][STATUS][SIGN][WEIGHT VALUE]
Example :
Command : 01B
Response : 01BS+000123.4 (gross weight is stable and 123.4)
01BD+000123.4 (gross weight is dynamic and 123.4)
01B– (under load)
Comments :
The response is the gross weight value (stable or dynamic) or error status.
Gross weight data is transmitted immediately after receiving command.

C	Clear the tare memory

Command : [ADR][C]
Response : [ADR][C][A] (Cleared and the scale is in gross mode)
Comments :
The response status is always Ack in weighing or force mode.

DJ	Print the label

Command : [ADR][DJ]
Response : [ADR][DJ][STATUS]
Example :
Command : 01DJ
Response : 01DJA (Printing is done successfully)
01DJN (Could not print)

Comments: Checks status and it must be stable. Else Nack status is send.

DO	Read the last print data

Command : [ADR][DO]
Response : [ADR][DO][single line data format]
Example :
Command : 01DO
Response : 01DOA[single line data format] (Printing is done successfully)

Comments: Refer to section **Fehler! Verweisquelle konnte nicht gefunden werden.** for single line data format details.

G	Read voltage value of DC power supply

Command : [ADR][G]
Response : [ADR][G][STATUS][VOLTAGE VALUE]
Example :
Command : 01G
Response : 01GA234 (Power supply is 23.4 VDC)
01GA150 (Power supply is 15.0 VDC)
Comments :
Voltage value is 3 byte and sends with 0.1 V increment.

I	Read indicated weight

Command : [ADR][I]
Response : [ADR][I][STATUS][SIGN][WEIGHT VALUE]
Example :
Command : 01I
Response : 01IS+000123.4 (Weight is stable and 123.4)
01ID+000123.4 (Weight is dynamic and 123.4)
01I+ (Overload)
Comments: Indicated weight value (stable or dynamic) is transmitted immediately.
The weight value may be in gross or net.

P	Print :Read the stable weight

Command : [ADR][P]
Response : [ADR][P][STATUS][SIGN][WEIGHT VALUE]
Example :
Command : 01P
Response : 01PS+000123.4 (Weight is stable and 123.4) or
01PN (Could not print)
Comments: Checks status and it must be stable. Else Nack status is send.
Status can be Stable or Nack.

S	Read Status

Command : [ADR][S]
Response : [ADR][S][STATUS-1][STATUS-2][STATUS-3]
Example :
Command : 01S
Response : 01SSGI (Stable, Gross, In Range)
01SDGL (Dynamic, Gross, Low voltage error)
Comments: The response includes 3 status information.
STATUS-1 can be Stable or Dynamic.
STATUS-2 can be Gross or Net.
STATUS-3 can be 'In range', 'Out of range', '+ Over', '- Under', 'Low voltage', 'High voltage' or 'Errors'.

T	Tare

Command : [ADR][T]
Response : [ADR][T][A] (Taring is done successfully and scale is in net)
[ADR][T][N] (Taring could not executed)
[ADR][T][X] (Taring is disabled)
Comment: The tare value is overwritten by the new tare weight value.
Status must be stable in 2 seconds time out delay. If so, Ack is send.
If it cannot be stable in time out delay, Nack is send.

U	Read digital inputs

Command : [ADR][U]
Response : [ADR][U][STATUS][Inputs]
Example :
Command : 01U
Response : 01UA00000003 (Input 2 and Input 1 are active)
01UA00004296 (Bypass, Reject, Inhibit, Input 5,3 and 2 are active)
01UA000000FF (All 8 inputs are active)
01UN (Could not read inputs)
Comments :
Data length change according to number of digital inputs.
Inputs are implemented to ASCII char of 4-bit. '1111' inputs are implemented to char 'F'.

INPUTS	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	TILT	FBUS-2	FBUS-1	IN-B	IN-A	TIMER-3	TIMER-2	TIMER-1	BYPASS	EMPTY	DROP	HOLD	INTERRUPT	REJECT	ACK	INHIBIT	RUN	IN-6	IN-5	IN-4	IN-3	IN-2	IN-1
Bit wise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	1	1	0
ASCII	0				0				0				0				4				2				9				6			

V	Read digital outputs

Command : [ADR][V]
Response : [ADR][V][STATUS][Outputs]
Example :
Command : 01V
Response : 01VA00000003 (Output 2 and Output 1 are active)
01VA00004296 (FGATE, Output 10,8,5,3 and 2 are active)
01VA000000FF (All 8 outputs are active)
01VN (Could not read outputs)
Comments :
Data length change according to number of digital outputs.
Outputs are implemented to ASCII char of 4-bit. '1111' is implemented to char 'F'.

OUTPUTS	Not used	Not used	Not used	Not used	FBUS-2	FBUS-1	LOGI	TIMER-3	TIMER-2	TIMER-1	UNDE	ETOL	FEILL	ZR-G	ZR-I	ALARM	VIBRATION	FGATE	FEED	END	EMPTY	PROG	OUT-10	OUT-9	OUT-8	OUT-7	OUT-6	OUT-5	OUT-4	OUT-3	OUT-2	OUT-1
Bit wise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	1	1	0
ASCII	0				0				0				0				4				2				9				6			

W	Write (Set/Reset) digital outputs

Command : [ADR][W][Outputs]
Response : [ADR][W][STATUS]
Example :
Command : 01W0C000000

Response : 01WA (FBU1 and FBU2 are activated)
01WN (Outputs could not be activated)

Comments :

Data length change according to number of digital outputs.

Outputs are implemented to ASCII char of 4-bit. '1111' outputs are implemented to char F'.

The parameter of output(s) must be programmed as 'FBU1 or FBU2' for this feature in process *(Page 146)*.

OUTPUTS	Not used	Not used	Not used	Not used	EBUS-2	EBUS-1	LOGI	TIMER-3	TIMER-2	TIMER-1	UNDE	ETOL	EEIL	ZR-G	ZR-I	ALARM	VIBRATION	EGATE	FEED	END	EMPTY	PROG	OUT-10	OUT-9	OUT-8	OUT-7	OUT-6	OUT-5	OUT-4	OUT-3	OUT-2	OUT-1
Bit wise	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASCII	0				C				0				0				0				0				0				0			

X	Read weight value in increased resolution

Command : [ADR][X]

Response : [ADR][X][STATUS][SIGN][WEIGHT VALUE]

Example :

Command : 01X

Response : 01XS+00123.41 (weight is stable and 123.41) or
01XD+00123.41 (weight is dynamic and 123.41) or
01XE (Error)

Comments: The response includes weight data with divided the increment to 10.

Z	Zero

Command : [ADR][Z]

Response : [ADR][Z][A] (Zeroed)
[ADR][Z][N] (Zeroing could not be operated)
[ADR][Z][X] (Zeroing is disabled)

Comments :

Zero command cannot work in net weighing.

Weight must be in zeroing range for all operating modes.

Status must be stable in 2 seconds time out delay. If so, Ack is send.

If it cannot be stable in time out delay, Nack is send.

22.2 BSI-PRO Commands

BSI-PRO Commands and Responses:

Description	Command	Response
ID name and data write	DA 1 [16d name] [16 digit data]	DAA
Recipe name and data write	DA 2 [16d name] [16 digit data]	DAA
ID name write	DH 1 [16 digits name]	DHA
ID data write	DI 1 [16 digits data]	DIA
Recipe name write	DH 2 [16 digits name]	DHA
Recipe data write	DI 2 [16 digits data]	DIA
ID name and data read	DK 1	DKA [16d name] [16 digits data]
Recipe name and data read	DK 2	DKA [16d name] [16 digits data]
Key lock / unlock	DL 1(0)	DLA

23. APPENDIX 6. CONTINUOUS DATA FORMATS

RELATED PARAMETERS: Parameters 111, 121, 141 and 151.

Continuous data output can be programmed to some common formats besides Flintec continuous formats. To select one of the described formats below press the →0← key sequentially. Press ↵ key to go to the next parameter.

Flintec®

Character number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Description		STX	STA	STB	STC	Indicated weight						Tare weight						CR	LF	CHK
Example-1	ASCII	☻	}	1	0			0	7	5	0				2	5	0			♠
	Hex	02	7D	31	30	20	20	30	37	35	30	20	20	20	32	35	30	0D	0A	06

Function	Description
STX	Start of transmission character.

STA (STATUS A)

Bit 7	Bit 6	Bit 5	Bits 4 and 3			Bits 2,1 and 0			
			4	3	Increment	2	1	0	Decimal point
Always 0	Always 1	Always 1	0	1	x 1	0	0	0	XXXX00
			1	0	x 2	0	0	1	XXXXX0
			1	1	x 5	0	1	0	XXXXXX
						0	1	1	XXXXX.X
						1	0	0	XXXX.XX
						1	0	1	XXX.XXX
						1	1	0	XX.XXXX
						1	1	1	X.XXXXX

STB (STATUS B)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Always 0	1 = Zeroed with power on zerp	Always 1	Always 1	1 = Unstable	1 = Error (1)	0 = Weight negative	1= Net
	0 = Not power on zeroed			0 = Stable	0 = No Error	0 = Weight positive	0 = Gross

STC (STATUS C)	Always 0 as ASCII (30 hex).
Indicated Weight	These seven characters are a string containing the current weight not including the decimal point.
Tare Weight	These seven characters are a string containing the tare weight not including the decimal point.
CR	Carrige Return.
LF	Line Feed.
CHK	Checksum byte. Checksum calculation is; CHK (Checksum) = 0 – (STX + STATUS A + ... + LF)

(1) Error Messages: UNDER, OVER, A.OUT, L-VOLT and TILT are represented in Indicated data fields as left aligned.

HBM®

Description	STX	Sign	Indicated weight							S1	S2	S3	S4	Unit			ETX
Example	☻				0	.	7	5	0	N			1	k	g		♥

Toledo®

Description	STX	A	B	C	Indicated weight						Tare weight						CR	LF	CHK
Example	☻	}	1	0			0	7	5	0				2	5	0			♠

SysTec®

Description	Status		Indicated weight										SP	Unit		CR	LF
Example	S							0	.	7	5	0		k	g		

SMA

Description	LF	S	R	N	M	F	Indicated weight									Unit			CR
Example			1	N								0	.	7	5	0	k	g	

Function	Description
LF	Line Feed (0A hex)
S	Z = Centre of zero, O = Over cap, U = Under cap, E = Weight not currently being displayed. " "*(space)* = None of the above conditions.
R	Range. 1 = First range, 2 = Second range, 3 = Third range.
N	Mode. G = Gross weight, T = Tare weight, N = Net weight, g = Gross weight in increased resolution. n = Net weight in increased resolution.
M	Motion. M = Motion, " "*(space)* = No motion.
F	Always a space as ASCII (20 hex).
Indicated Weight	These ten characters are a string containing the current weight including the decimal point.
Unit	Unit of weight value are kg, g, lb, klb, N or kN as left aligned.
CR	Carrige Return (0D hex)

Sartorious®

Description	Ignore						Sign	SP	Indicated weight							SP	Unit			CR	LF
Example							+					0	.	7	5	0		k	g			

Rinstrum®

Description	STX	Sign	Indicated weight							ST	ETX
Example	☻				0	.	7	5	0	N	♥

Avery® E1205

Description	STX	Indicated weight							SP	Unit		SP	ST	CR	LF	ETX
Example	☻			0	.	7	5	0		k	g		N			♥

Baster®

Description	Indicated Weight							LF
Example			0	.	7	5	0	

LM2

Character number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	Indicated Weight								Unit		SP	NET			LF	CR
Example-1				0	.	7	5	0	K	g		N	E	T	LF	CR
Example-2				1	.	0	0	0	K	g	LF	CR				

Function	Description
Indicated Weight	These eight characters are a string containing the current weight not including the decimal point.
Unit	Unit of weight value are Kg, G, Lb, N or KN as left aligned.
SP	Only sent a space character in Net operation. Otherwise there is no any character.
NET	These three characters are only sent in Net operation. Otherwise there is no any character.
LF	Line Feed (0A hex)
CR	Carrige Return (0D hex)

Tunaylar® Load Line-2

Description	STX	A	B	C	SP	Indicated Weight						SP	Tare Weight						ETX	CHK	CR
Example	☻	!	1	0		0	0	2	4	6	0		0	0	0	0	0	0	♥		

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24. APPENDIX 7. MODBUS RTU

FT-113 controller offers a Modbus RTU interface over RS485 or RS232C serial port. This interface can be programmable to High-Low or Low-High for different type of PLC's. You can find below the difference of these data formats and some companies using these formats. Two types are available

24.1 Modbus RTU Data Structure

IMPORTANT NOTE: *Scale configuration, calibration, and Recipe parameters (address 40127 and above) must be loaded at Ready status.*

After programming RS485 or RS232C serial port for Modbus RTU, it can be used as a Modbus RTU slave on Modbus RTU network. The Modbus slave address is defined in the RS-485 address (Page 133). Functions code '0x03' (Read Holding Registers), '0x06' (Single Write Register), '0x17' (Read/Write Multiple Registers) and '0x10' (Preset Multiple Registers) are supported.

Modbus RTU High-Low: In two-word registers, the data is stored to the registers in big-endian format. Least significant word is stored to the highest register address; and most significant word is stored to the lowest register address.

Modbus RTU Low-High: In two-word registers, the data is stored to the registers in little-endian format. Least significant word is stored to the lowest register address; and most significant word is stored to the highest register address.

Parameters set-up:
Set the RS 485 / RS 232C Data Format : Modbus RTU High-Low or Modbus RTU Low-High
RS-485 Data Length & Parity: 8 none 1, 8 odd 1 or 8 even 1
RS-485 Address: 01 to 31
Make the RS485 / RS232C parameter settings as defined on Page 133,132.

Please find Modbus information in the web site of http://www.modbus.org

24.2 Modbus RTU/TCP Command Table

Address	R/W	Word	Command	Definition	
40001	R	2	Actual weight (Net if the indication is in Net)		
40003	R/W	2	Tare weight		
40005	R	2	Gross weight		
40007	R	2	Status	**Bit**	**Definition**
				B0	Not used
				B1	Not used
				B2	0 – Weight is Stable / 1 – Weight is unstable
				B3	0 – Gross mode / 1 – Net mode
				B4	0 – Preset tare is passive / 1 – Preset tare is active
				B5	0 – Not power on zeroed / 1 – Zeroed with pwr on zero
				B6	0 – First Unit (power on) / 1 – Second Unit
				B7-B10	Not used
				B11	0 – Key lock is passive / 1 – Key lock is active
				B12	0 – Out of center of zero / 1 – Weight is in center of zero
				B13	0 – High res. is passive / 1 – High res. is active
				B14-15	Not used

				B16	0 – Fill mode	1 – Basic weighing mode
				B17	0 – No filling error	1 – Process error. Refer to 40045 for details.
				B18	0 – Interrupt is passive	1 – Interrupt is active
				B19	0 – Inhibit is passive	1 – Inhibit is active
				B20	0 – By-Pass is passive	1 – By-Pass is active
				B21	0 – Hold is passive	1 – Hold is active
				B22-26	Not used	
				B27	0 – None	1 – Decimal point is X.XXXX
				B28	0 – None	1 – Decimal point is X.XXX
				B29	0 – None	1 – Decimal point is X.XX
				B30	0 – None	1 – Decimal point is X.X
				B31	0 – None	1 – No decimal point
40009	R	2	Error Status	**Bit**	**Definition**	
				B0	0 – No Error	1 – Low voltage det.
				B1	0 – No Error	1 – In programming mode
				B2	0 – No Error	1 – System error
				B3	0 – No Error	1 – ADC under range
				B4	0 – No Error	1 – ADC over range
				B5	0 – No Error	1 – ADC out of range
				B6	0 – No Error	1 – Tilt Switch is active
				B7	0 – No Error	1 – Master/Slave comm. error
				B8-B31	Not used	
40011	R	2	Heartbeat		Heartbeat for connection checking, this value is increased every 100 milliseconds.	
40013	R	2	Last filled weight			
40015	R/W	2	CN (Label number)		This value is increased automatically after filling, if the preact adjustment is done.	
40017	R	2	Quantity of Batch/Bulk		Refer to section 11 and par. 41A to enable this feature. Refer to 40537 and 40539 to enter Batch/Bulk Quantity and total weight.	
40019	R	2	Total of Batch/Bulk			
40021	R/W	4	Not used			
40025	R/W	2	Commands ([1])	**Dec**	**Definition**	
				0	None	
				1	Zero at basic weighing mode	*Page 34*
				2	Tare at basic weighing mode	*Page 34*
				3	Clear at basic weighing mode	*Page 34*
				4	Print at basic weighing mode	*Page 34*
				5	Reprint the last label	*Page 121*
				6	High resolution enable	*Page 38*
				7	High resolution disable	
				8	Unit change (from first to second unit)	*Page 35*
				9	Unit change (from second to first unit)	
				10	Keylock enable	*Page 37*
				11	Keylock disable	
				12	Switch to Filling mode	*Page 35*
				13	Switch to Basic weighing mode	
				14	Start of filling	*Page 38*

				15	Start of emptying / discharge	*Page 38*
				16	Reset	*Page 38*
				17	RUN enable	*Page 106*
				18	RUN disable	
				19	By-Pass enable	*Page 106*
				20	By-Pass disable	
				21	Hold enable	*Page 106*
				22	Hold disable	
				23	Interrupt enable	*Page 106*
				24	Interrupt disable	
				25	Filling inhibit enable	*Page 106*
				26	Filling inhibit disable	
				27	Error acknowledgment / Resume	*Page 106*
				28	Reject / Do not record	*Page 106*
				29	Empty / Discharge the scale	*Page 106*
				30	Standby enable/disable	
				31-39	Not used	
				40	Save Recipe parameters to controller. (first, Load Recipe parameters between 40521 to 40827)	
				41	Write to the recipe memory (First, load memory number to 40029 and then write recipe parameters between 40521 to 40827)	
				42	Call and use from the recipe memory (First, load memory number to 40029)	
40027	R	2	Commands status	0	None	
				1	Command is processing...	
				2	Command is successfully.	
				3	Command failed.	
40029	R/W	2	Recipe memory number	Enter a number to call from recipe memory or to write into recipe memory.		
40031	R/W	7	Reserve			
40038	R/W	1	Year as BCD format		Date and time setting. Refer to sub-block **24-**.	
40039	R/W	1	Month & day as BCD format			
40040	R/W	1	Hour & minute as BCD format			
40041	R	2	Status of Inputs	**Bit**	**Definition**	
				B0	Input-1	0 – Passive 1 – Active Refer to related filling mode and select inputs for details. Page 41 and 146.
				B1	Input-2	
				B2	Input-3	
				B3	Input-4	
				B4	Input-5	
				B5	Input-6	
				B6	Not used	
				B7	RUN	

				B8	INHI	
				B9	ACK	
				B10	REJE	
				B11	INTE	
				B12	HOLD	
				B13	DROP	
				B14	EMPT	
				B15	BYPA	
				B16	S2	
				B17	TMR1	
				B18	TMR2	
				B19	TMR3	
				B20	IN-A	
				B21	IN-B	
				B22	FBU1	
				B23	FBU2	
				B24	TILT	
				B25	STBY	
				B26	RCP1	
40043	R/ W	2	Status of Outputs	B0	Output-1	0 – Passive 1 – Active Refer to related filling mode and select outputs for details. Page 41.
				B1	Output-2	
				B2	Output-3	
				B3	Output-4	
				B4	Output-5	
				B5	Output-6	
				B6	Output-7	
				B7	Output-8	
				B8	Output-9	
				B9	Output-10	
				B10	Not used	
				B11	PROG	
				B12	EMPT	
				B13	END	
				B14	FEED	
				B15	FGAT	
				B16	VIBR	
				B17	ALAR	
				B18	ZR I	
				B19	ZR G	
				B20	EFIL	
				B21	ETOL	
				B22	UNDE	
				B23	TMR1	
				B24	TMR2	
				B25	TMR3	
				B26	LOGI	
				B27	FBU1	
				B28	FBU2	
				B29	OVER	
				B30	ETAR	
40045	R	2	Process Warning Messages *Refer to section 35.1*	**Dec**	**Description**	
				0	No process error	
				1	Batch Finished	
				2	By-Pass	
				3	Not used	

				4	Reset
				5	Interrupted
				6	Hold Status
				7	Check Fill Stop
				8	Check Discharge Stop
				9	Alarm
				10	Inhibited
				11	Discharge interrupted
			Process Error Messages Process Error Messages *Refer to section 0*	128	Feeding Gate position error.
				129	Tare Range Error
				130	Taring could not execute.
				131	Zeroing Fail
				132	Zeroing Range
				133	Filling Time
				134	Valve Position
				135	Wrong Position
				136	Not used
				137	Maxfill Limit
				138	+Tolerance Error
				139	Stable Error
				140	Clmp Is Open
				141	Loadcell Error
				142	-Tolerance Error
				143	Discharge Gate
				144	Tilted
				145	Not used
				146	Multicycle filling?
40047	R	2	Process states Messages Refer to section 35.1	**Dec**	**Description**
				0	No process (Adc out, Over, Under etc.)
				1	Weight Mode
				2	Ready
				3	Taring
				4	Zeroing
				5	Coarse Feed
				6	Middle Feed
				7	Fine Feeding
				8	Valve to Down
				9	Valve to Up
				10	Settling
				11	Filling
				12	End of Fill
				13	Discharging
				14	Discharging Delay
				15-19	Not used
				20	Run Inactive
				21	Inhibited
				22	Lance Position
				23	In Standby mode
				24	Release the bag input is active
				25	Waiting for a bag
				26	Lifter to Up
				27	Lifter to Down
40049	R/ W	2	Quantity of Erasable Accumulation		Refer to section 16.1.1
40051	R/ W	2	Total of Erasable Accumulation		

40053	R	2	Quantity of the Current day's Accu.	Refer to section 16.1.3
40055	R	2	Total of the Current day's Accu.	
40057	R	2	Quantity of Yesterday's Accu.	Refer to section 16.1.4
40059	R	2	Total of Yesterday's Accu.	
40061	R/W	2	Quantity of Grand Total	Refer to section 16.1.5
40063	R/W	4	Grand Total	

Scale Configuration and Calibration Parameters					
40127	R/W	2	Dynamic filter	**Dec**	**Description**
				0	No
				1	Low
				2	Medium
				3	High
40129	R/W	2	Digital filter	0	No
				1	Extra Low
				2	Very Low
				3	Low
				4	Medium
				5	High
				6	Very High
				7	Extra High
40131	R/W	2	Power on zero	0	Disable
				1	± 2%
				2	± 2%LK
				3	± 10%
				4	+ 15%, - 5%
				5	± 20%
40133	R/W	2	Zeroing Range	0	Disable
				1	± 2%
				2	± 3%
				3	± 20%
				4	± 50%
40135	R/W	2	Auto Zero Tracking	0	Disable
				1	± 0,3d
				2	± 0,5d
				3	± 1d
				4	± 2d
				5	± 3d
40137	R/W	2	Tare	0	No
				1	Yes
40139	R/W	2	Stability Detection Range	0	± 0,3d
				1	± 0,5d
				2	± 1d
				3	± 2d
				4	± 3d
				5	± 4d
				6	± 5d
				7	± 9d

40141	R/W	2	Stability Time	Refer to parameter [518] on page 162	
40143	R/W	10	Reserve		
40153	R/W	2	Unit	**Dec**	**Description**
				0	g (Gram)
				1	kg (Kilogram)
				2	t (Ton)
				3	lb (Libre)
				4	No unit (without unit)
				5	kLb (Kilolibre)
40155	R/W	2	Range	**Dec**	**Description**
				0	Single range
				1	2 x MR
				2	3 x MR
				3	2 x MI
				4	3 x MI
40157	R/W	2	MAX-1	Refer to parameter [523] on page 162	
40159	R/W	2	Decimal point-1	**Dec**	**Description**
				0	XXXXOO
				1	XXXXXO
				2	XXXXXX
				3	XXXXX.X
				4	XXXX.XX
				5	XXX.XXX
40161	R/W	2	Increment-1	**Dec**	**Description**
				0	X 1
				1	X 2
				2	X 5
40163	R/W	2	MAX-2		
40165	R/W	2	Decimal point-2		
40167	R/W	2	Increment-2		
40169	R/W	2	MAX-3		
40171	R/W	2	Decimal point-3		
40173	R/W	2	Increment-3		
40175	R/W	2	Limit of Indication	**Dec**	**Description**
				0	Over indication after Max.
				1	1 division more than Max.
				2	5 division more than Max.
				3	9 division more than Max.
				4	2% more than Max.
				5	5% more than Max.
40177	R/W	2	Tare type	0	Subtractive tare
				1	Additive tare
				2	Both

40179	R/W	2	Maximum tare	Refer to par. [527] page 163	
40181	R/W	4	Reserve		
40185	R/W	2	Calibration Commands (1) (continuation of previous page)	**Decimal**	**Definition**
				0	None
				188	Adjust Zero Calibration command
				220	Adjust Span Calibration command (first, load test weight value to 40187)
				23205	Apply the coefficients of eCal (first, load 40189, 40191 and 40193)
40187	R/W	2	Span Calibration Value		
40189	R/W	2	Total Load Cell capacity for eCal		eCal Coefficients
40191	R/W	2	Average mV/V value for eCal		
40193	R/W	2	Dead load value for eCal		
40195	R	2	Calibration Process Status & Errors	**Bit**	**Definition**
				B0	Ready for calibration
				B1	Zero calibration in process ...
				B2	Span calibration in process ...
				B3	Calibration Timeout - Restart calibration
				B4	ADC Error - Re-energize the instrument - If seen again, change the board.
				B5	Instrument cannot be calibrating - Check load cell cable - Re-energize the instrument
				B6	Instrument cannot be calibrating - Load cell signal is very low or too high
				B7	Calibration Error - Calibration loading is not enough - Check test weight loading - Check load cell connections
				B8	Calibration load value entry Error - Test weight is too small. Increase the weight
				B9	Scale unstable - Wait until scale become stable - Check grounding wiring
				B10	The Calibration switch is not 'On' position. - Check the calibration DIP switch.

40197	R/W	10	Reserve	
40207	R	2	Voltage of power supply	The value is indicated with 0.1 VDC increment for DC variant.
40209	R	2	Load cell millivolt value	Millivolt value of active scale is indicated with 0.01 mV increment. For example: 2.34 mV is indicated as integer 234 value.
40211	R/W	2	Load parameter's defaults	Write 0x6BB6 value to load parameter's defaults.
40213	R/W	2	Load factory defaults	Write 0x7CC7 value to load factory defaults.
Machine Related Parameters Main Group				
40255	R/W	2	Filling modes	Refer to parameter [311] on page 143
				0 OPEN
				1 BUNG
				2 BOTT
				3 PACK
				4 BAG
				5 BIG
				6 VENT
				7 1BAG
				8 nBAG
				9 nPAC
				10 TANK
				11 WOUT
40257	R/W	2	Start input signal type	Refer to parameter [312] on page 144
				0 PULS
				1 LEVE
				2 AUTO
40259	R/W	2	Discharge input signal type	Refer to parameter [313] on page 144
				0 PULS
				1 LEVE
40261	R/W	2	Start filling or emptying/discharging at power on	Refer to parameter [314] on page 144
				0 FILL
				1 DISC
40263	R/W	2	Feeding speed quantity	Refer to parameter [315] on page 144
				0 1
				1 2
				2 3
40265	R/W	2	Feeding outputs	Refer to parameter [316] on page 144
				0 C
				1 FC
				2 FMC
40267	R/W	2	Maximum target of filling	Refer to parameter [317] on page 144
40269	R/W	2	Minimum target of filling	Refer to parameter [318] on page 144
40271	R/W	2	Scale quantity at master slave operation	Refer to parameter [319] on page 144

40273	R/W	12	Not used		
40285	R/W	2	Feeding gate position control type	Refer to parameter [321] on page 145	
				0	NO
				1	1 POS
				2	2 POS
40287	R/W	2	Switch type on the feeding gate for checking its position.	Refer to parameter [322] on page 145	
				0	NO
				1	NCLO
				2	NOPE
40289	R/W	2	Switch on the discharge gate	Refer to parameter [323] on page 145	
				0	NO
				1	NCLO
				2	NOPE
40291	R/W	2	Lance position control type	Refer to parameter [324] on page 145	
				0	BIU
				1	BMIU
				2	BIOU
				3	BMIO
40293	R/W	2	Movement of valve or lifter at liquid filling modes	Refer to parameter [325] on page 145	
				0	NO
				1	VALV
				2	LIFT
40295	R/W	2	Movement of valve or lifter at liquid big bag mode	Refer to parameter [326] on page 145	
				0	NO
				1	CLAM
				2	UP-A
				3	UP-B
40297	R/W	18	Not used		
40315	R/W	2	Select input 1	Refer to parameter [331] on page 146	
				0	NO
				1	RUN
				2	INHI
				3	ACK
				4	REJE
				5	INTE
				6	HOLD
				7	DROP
				8	EMPT
				9	BYPA
				10	S2
				11	TMR1
				12	TMR2
				13	TMR3
				14	IN-A
				15	IN-B
				16	FBU1
				17	FBU2
				18	TILT
				19	STYB
				20	RCP1
				21	RCP2
				22	DINT

				23	RLB1
				24	RLB2
				25	RSRV (only for Select input 1 &2)
40317	R/W	2	Select input 2	Refer to parameter [332] on page 146	
40319	R/W	2	Select input 3	Refer to parameter [333] on page 146	
40321	R/W	2	Select input 4	Refer to parameter [334] on page 146	
40323	R/W	2	Select input 5	Refer to parameter [335] on page 146	
40325	R/W	2	Select input 6	Refer to parameter [336] on page 146	
40327	R/W	2	Select input 7	Refer to parameter [337] on page 146	
40329	R/W	2	Select input 8	Refer to parameter [338] on page 146	
40331	R/W	2	Select input 9	Refer to parameter [339] on page 146	
40333	R/W	2	Select output 1	Refer to parameter [33A] on page 146	
				0	NO
				1	PROG
				2	EMPT
				3	END
				4	FEED
				5	FGAT
				6	VIBR
				7	ALAR
				8	ZR I
				9	ZR G
				10	EFIL
				11	ETOL
				12	UNDE
				13	TMR1
				14	TMR2
				15	TMR3
				16	LOGI
				17	FBU1
				18	FBU2
				19	OVER
				20	ETAR
				21	RSVR (only for Select output 1 &2)
40335	R/W	2	Select output 2	Refer to parameter [33B] on page 147	
40337	R/W	2	Select output 3	Refer to parameter [33C] on page 147	
40339	R/W	2	Select output 4	Refer to parameter [33D] on page 147	
40341	R/W	2	Select output 5	Refer to parameter [33E] on page 147	
40343	R/W	2	Select output 6	Refer to parameter [33F] on page 147	
40345	R/W	2	Preact, Medium and Fine feeding entries	Refer to parameter [341] on page 147	
				0	VAL
				1	DEV
40347	R/	2	Weight displaying at Filling	Refer to parameter [342] on page 147	

	W			0	INCR
				1	DECR
40349	R/W	2	Display after filling	Refer to parameter [343] on page 147	
				0	ACTU
				1	FILL
				2	TARG
40351	R/W	2	Information display	Refer to parameter [344] on page 148	
				0	NO
				1	TARE
				2	GROS
				3	RCPT
				4	R+T
				5	R+Q
				6	Q+🖷
				7	TOTA
				8	PHAS
				9	NAME
40353	R/W	22	Not used		
40375	R/W	2	The function of magnify key	Refer to parameter [351] on page 148	
40377	R/W	2	The function of change key	Refer to parameter [352] on page 148	
40379	R/W	2	The function of F1 key	Refer to parameter [353] on page 149	
40381	R/W	2	The function of F2 key	Refer to parameter [354] on page 149	
40383	R/W	2	The function of F3 key	Refer to parameter [355] on page 149	
40385	R/W	2	The function of F4 key	Refer to parameter [356] on page 149	
40387	R/W	2	The function of F5 key	Refer to parameter [357] on page 149	
40389	R/W	16	Not used		
40405	R/W	2	Reserve Input 1	Refer to parameter [371] on page 150	
40407	R/W	2	Reserve Input 2	Refer to parameter [372] on page 149	
40409	R/W	2	Reserve output 1	Refer to parameter [373] on page 150	
40411	R/W	2	Reserve output 2	Refer to parameter [374] on page 149	
Recipe Related Parameters Main Group					
40521	R/W	2	Target (2)	Refer to section 3 for meaning of parameters.	
40523	R/W	2	+ Tolerance		
40525	R/W	2	- Tolerance		
40527	R/W	2	Overfill weight. (2) (The same as 40565)		
40529	R/W	2	Coarse (2)		

40531	R/W	2	Medium (2)		
40533	R/W	2	Fine (2)		
40535	R/W	2	PT (Specific Tare)		
40537	R/W	2	Quantity of Batch/Bulk		
40539	R/W	2	Total of Batch/Bulk		
40541	R/W	8	Not used		
40549	R/W	2	Gross, net or multicycle filling	Refer to parameter [411] on page 151	
				0	NET
				1	GROSS
				2	MULT
40551	R/W	2	Tolerance control	Refer to parameter [412] on page 151	
				0	No
				1	+/-T
				2	+T -T
				3	+/-F
				4	+F -F
40553	R/W	2	Taring at filling.	Refer to parameter [413] on page 151	
				0	AUTO
				1	AV 5
				2	AV10
				3	ACON
				4	SPEC
40555	R/W	2	Minimum tare value.	Refer to parameter [414] on page 151	
40557	R/W	2	Maximum tare value.	Refer to parameter [415] on page 151	
40559	R/W	2	Valve force	Refer to parameter [416] on page 151	
40561	R/W	2	Lance Bottom / Lift Weight	Refer to parameter [417] on page 152	
40563	R/W	2	Lance Middle	Refer to parameter [418] on page 152	
40565	R/W	2	Overfill weight.	Refer to parameter [419] on page 152	
40567	R/W	2	Batch filling.	Refer to parameter [41A] on page 152	
				0	NO
				1	QTY
				2	Σ T
				3	Q+ΣT
				4	BULK
40569	R/W	2	Soft start method	Refer to parameter [41B] on page 152	
				0	NO
				1	FINE
				2	MED
40571	R/W	2	Soft start time	Refer to parameter [41C] on page 152	
40573	R/W	2	The emptying / discharge type	Refer to parameter [41D] on page 152	
40575	R/W	2	Empty/Discharge weight / Remaining weight	Refer to parameter [41E] on page 152	

40577	R/W	2	Emptying / discharge time	Refer to parameter [41F] on page 152	
40579	R/W	30	Not used		
40609	R/W	2	Correction technic at Feeding / Discharging.	Refer to parameter [431] on page 153	
				0	NO
				1	AUTO
				2	TIME
				3	SMRT
40611	R/W	2	Fine feeding time	Refer to parameter [432] on page 153	
40613	R/W	2	Preact adj. frequency.	Refer to parameter [433] on page 153	
40615	R/W	2	Sampling size.	Refer to parameter [434] on page 153	
40617	R/W	2	Preact correction ratio in percent for fine feeding cut-off.	Refer to parameter [435] on page 153	
40619	R/W	2	Zeroing frequency.	Refer to parameter [436] on page 153	
40621	R/W	2	Jogging	Refer to parameter [437] on page 153	
				0	NO
				1	TIME
				2	AUTO
40623	R/W	2	Jogging on time	Refer to parameter [438] on page 154	
40625	R/W	2	Jogging off time	Refer to parameter [439] on page 154	
40627	R/W	2	Minimum filling error	Refer to parameter [43A] on page 154	
40629	R/W	2	Maximum error limit	Refer to parameter [43B] on page 154	
40631	R/W	2	Motion window at filling process	Refer to parameter [43C] on page 154	
40633	R/W	2	Preact correction ratio in percent for coarse feeding cut-off	Refer to parameter [43D] on page 154	
40635	R/W	6	Not used		
40639	R/W	2	Zeroing delay.	Refer to parameter [441] on page 154	
40641	R/W	2	Taring delay.	Refer to parameter [442] on page 154	
40643	R/W	2	Stability check delay.	Refer to parameter [443] on page 154	
40645	R/W	2	Maximum stability time.	Refer to parameter [444] on page 154	
40647	R/W	2	Start delay	Refer to parameter [445] on page 154	
40649	R/W	2	End of batch output delay	Refer to parameter [446] on page 155	
40651	R/W	2	Coarse and medium feed control delay	Refer to parameter [447] on page 155	
40653	R/W	2	Fine feed control delay	Refer to parameter [448] on page 155	

40655	R/W	2	FG DEL, VALV DEL or LIFT DEL	Refer to parameter [449] on page 155	
40657	R/W	2	Complete delay	Refer to parameter [44A] on page 155	
40659	R/W	2	Catch delay	Refer to parameter [44B] on page 155	
40661	R/W	2	The clamp release delay	Refer to parameter [44C] on page 155	
40663	R/W	2	Maximum filling time	Refer to parameter [44D] on page 156	
40665	R/W	4	Not used		
40669	R/W	2	Analogue output type	Refer to parameter [451] on page 156	
				0	NO
				1	0-20
				2	0-10
40671	R/W	2	Analogue output value for Coarse feed	Refer to parameter [452] on page 156	
40673	R/W	2	Analogue output value for Medium feed	Refer to parameter [453] on page 156	
40675	R/W	2	Analogue output value for Fine feed	Refer to parameter [454] on page 156	
40677	R/W	22	Not used		
40699	R/W	2	Weighing operation type of the machine.	Refer to parameter [461] on page 156	
				0	SUBT
				1	NO
				2	ADDI
40701	R/W	2	Container quantity on the palette.	Refer to parameter [462] on page 156	
40703	R/W	2	Operation at Batch filling.	Refer to parameter [463] on page 156	
				0	STOP
				1	FILL
40705	R/W	24	Not used		
40729	R/W	2	Alarm Setpoint	Refer to parameter [471] on page 156	
40731	R/W	2	Alarm time	Refer to parameter [472] on page 156	
40733	R/W	2	Minimum Vibration weight	Refer to parameter [473] on page 157	
40735	R/W	2	Maximum Vibration weight	Refer to parameter [474] on page 157	
40737	R/W	2	Vibration delay	Refer to parameter [475] on page 157	
40739	R/W	2	Vibration time	Refer to parameter [476] on page 157	
40741	R/W	2	Zero range	Refer to parameter [477] on page 157	
40743	R/W	16	Not used		
40759	R/W	2	Timer 1 Trigger	Refer to parameter [481] on page 158	
				0	SELE
				1	IN
				2	OUT

40761	R/W	2	Number	Refer to parameter [482] on page 158	
40763	R/W	2	Timer 1 Type	Refer to parameter [483] on page 158	
				0	Type A
				1	Type B
				2	Type C
				3	Type D
				4	Type E
				5	Type F
40765	R/W	2	Timer 1 On time	Refer to parameter [484] on page 158	
40767	R/W	2	Timer 1 Off time	Refer to parameter [485] on page 158	
40769	R/W	2	Timer 2 Trigger	Refer to parameter [486] on page 158	
				0	SELE
				1	IN
				2	OUT
40771	R/W	2	Number	Refer to parameter [487] on page 158	
40773	R/W	2	Timer 2 Type	Refer to parameter [488] on page 158	
				0	Type A
				1	Type B
				2	Type C
				3	Type D
				4	Type E
				5	Type F
40775	R/W	2	Timer 2 On time	Refer to parameter [489] on page 158	
40777	R/W	2	Timer 2 Off time	Refer to parameter [48A] on page 158	
40779	R/W	2	Timer 3 Trigger	Refer to parameter [48B] on page 159	
				0	SELE
				1	IN
				2	OUT
40781	R/W	2	Number	Refer to parameter [48C] on page 159	
40783	R/W	2	Timer 3 Type	Refer to parameter [48D] on page 159	
				0	Type A
				1	Type B
				2	Type C
				3	Type D
				4	Type E
				5	Type F
40785	R/W	2	Timer 3 On time	Refer to parameter [48E] on page 159	
40787	R/W	2	Timer 3 Off time	Refer to parameter [48F] on page 159	
40789	R/W	30	Not used		
40819	R/W	2	Logical functions	Refer to parameter [4A1] on page 159	
				0	A+B
				1	AxB
				2	A+NB
				3	AxNB
				4	S-R

				5	NS-R
				6	N■
				7	NAB
40821	R/W	2	A Trigger	Refer to parameter [4A2] on page 159	
				0	SELE
				1	IN
				2	OUT
40823	R/W	2	Number	Refer to parameter [4A3] on page 159	
40825	R/W	2	B Trigger	Refer to parameter [4A4] on page 159	
				0	SELE
				1	IN
				2	OUT
40827	R/W	2	Number	Refer to parameter [4A5] on page 160	
40829	R/W	20	Not used		
40849	R/W	2	Pre-feeding type	Refer to parameter [4B1] on page 160	
				0	NO
				1	YES
40851	R/W	4	Not used		
40855	R/W	2	Speed	Refer to parameter [4B4] on page 160	
				0	FINE
				1	COARSE
				2	MEDIUM
40857	R/W	2	Pre-feeding timer	Refer to parameter [4B5] on page 160	

(1) Add 100 to command value for NOE interfacing. For example: Send 101 from NOE to FT-113Fill instead of 1 for Zeroing.

(2) In Master-Slave operation, in the master device, these fields can also be changed during the process. But the master device cannot update the slave devices during the process, so these fields must be updated for each slave device separately in Master-Slave operation.

Programming steps of frequent used commands:

Reading a weight value:

1. Read 40009 and 40010.
2. Check error status,
3. If there isn't any error, read the weight value (gross, net or tare),
4. If there is an error, check the error code.

Zero Calibration procedure:

1. Check the bit B0 of 40195 which should be '1' to start adjustment.
2. Load the decimal '188' to 40185 to start Zero calibration.
3. Check the bit B1 of 40195 which is '1' during zero calibration process.
4. The bit B0 of 40195 changes to '1' at the end of the Zero calibration.
5. If one of error bits (B3 ~ B10) of 40195 is '1', check error code to understand the calibration error.

Span Calibration procedure:

1. Check the bit B0 of 40195. it should be '1' to start adjustment.
2. First load the span value to 40187-188 and then load the decimal '220' to 40185 to start Span calibration.
3. Check the bit B2 of 40195 which is '1' during span calibration process.
4. The bit B0 of 40195 changes to '1' at the end of the Span calibration.
5. If one of error bits (B3 ~ B10) of 40195 is '1', check error code to understand the calibration error.

EXPLANATION:

***Attention**: For hardware connection details, please refer to the related hardware descriptions in this manual.*

Exception codes:

1: Function code is not supported.

2: Out of beginning and ending address range.

3: Invalid value entrance or wrong byte number.

4: Operation error.

Modbus RTU Command Examples:

Performing Read and Write operations according (Modbus RTU High-Low) to hex system with the instrument set to address "0x01".

Below you will find some command samples.

Description	Hex
Request weight data	01,03,00,00,00,02,C4,0B
Answer of request weight (weight value is 100000)	01,03,04,00,01,86,A0,38,4A
Request status data	01,03,00,07,00,02,75,CA
Taring	01,10,00,18,00,02,04,00,00,00,02,72,C4
Request tare data	01,03,00,02,00,02,65,CB
Answer of request tare (tare value is 10000)	01,03,04,00,00,27,10,E0,0F
Zero Command	01,10,00,18,00,02,04,00,00,00,01,32,C5
Request Calibration Status	01,03,00,C2,00,02,65,F7
Answer of request Calibration Status (Instrument is ready for calibration)	01,03,04,00,00,00,01,3B,F3
Zero Calibration	01,10,00,B8,00,02,04,00,00,00,BC,F8,CC
Span Calibration Command with Span value 50000	01,10,00,B8,00,04,08,00,00,00,DC,00,00,C3,50,94,84
Total LC capacity Command with Total LC capacity value 100000	01,10,00,B8,00,06,0C,00,00,00,EC,00,00,00,00,00,01,86,A0,D7,B9
Average mV/V Command with Average mV/V value 1.9999	01,10,00,B8,00,08,10,00,00,00,FA,00,00,00,00,00,00,00,00,00,00,4E,1F,8E,3D
Dead load Command with Dead load value 12345	01,10,00,B8,00,0A,14,00,00,00,AB,00,00,00,00,00,00,00,00,00,00,00,00,00,30,39,7F,06
Save the coefficients of eCal Command	01,10,00,B8,00,02,04,00,00,5A,A5,03,A6
Read digital inputs	01,03,00,28,00,02,44,03
Answer of digital inputs (Input-2 is active)	01,03,04,00,00,00,02,7B,F2
Read digital outputs	01,03,00,2A,00,02,E5,C3
Answer of digital outputs (Output-3 is Active)	01,03,04,00,00,00,04,FB,F0

Modbus TCP/IP Command Examples:

Performing Read and Write operations according (Modbus TCP/IP High-Low) to hex system with the instrument set to address "0x01". MBAP (Modbus Application Protocol) Header is not included to the below Modbus TCP/IP application data units.

Below you will find some command samples;

Description	Hex
Request weight data	01,03,00,00,00,02
Answer of request weight (weight value is 100000)	01,03,04,00,01,86,A0
Request status data	01,03,00,07,00,02
Taring	01,10,00,18,00,02,04,00,00,00,02
Request tare data	01,03,00,02,00,02
Answer of request tare (tare value is 10000)	01,03,04,00,00,27,10
Zero Command	01,10,00,18,00,02,04,00,00,00,01
Request Calibration Status	01,03,00,C2,00,02
Answer of request Calibration Status (Instrument is ready for calibration)	01,03,04,00,00,00,01
Zero Calibration	01,10,00,B8,00,02,04,00,00,00,BC
Span Calibration Command with Span value 50000	01,10,00,B8,00,04,08,00,00,00,DC,00,00,C3,50
Total LC capacity Command with Total LC capacity value 100000	01,10,00,B8,00,06,0C,00,00,00,EC,00,00,00,00,00,01,86,A0
Average mV/V Command with Average mV/V value 1.9999	01,10,00,B8,00,08,10,00,00,00,FA,00,00,00,00,00,00,00,00,00,00,4E,1F
Dead load Command with Dead load value 12345	01,10,00,B8,00,0A,14,00,00,00,AB,00,00,00,00,00,00,00,00,00,00,00,00,00,00,30,39
Save the coefficients of eCal Command	01,10,00,B8,00,02,04,00,00,5A,A5
Read digital inputs	01,03,00,28,00,02
Answer of digital inputs (Input-2 is active)	01,03,04,00,00,00,02
Read digital outputs	01,03,00,2A,00,02
Answer of digital outputs (Output-3 is Active)	01,03,04,00,00,00,04

25. APPENDIX 8. ETHERNET TCP/IP

Ethernet output of FT-113Fill is programmable to BSI command set, Continuous data output, Fast continuous data output, Modbus TCP/IP High-Low, Modbus TCP/IP Low-High. The first three data structures are in the related sections indicated in the table below.

Data Format	Description
BSI Command set	Refer to *Page 174.*
Continuous	Refer to *Page 120, 185.*
Fast Continuous	Refer to *Page 121.*
Modbus TCP High-Low	Modbus TCP interfacing. Refer to *Page 209*.
Modbus TCP Low-High	Modbus TCP interfacing. Refer to *Page 209*.

Table 25-1 – Ethernet output interfacing

You can communicate with FT-113Fill after programming Ethernet TCP/IP and Modbus TCP related parameters [15-].

25.1 Ethernet Parameters

Ethernet parameters can be adjusted by keys in programming mode. Refer to parameter block [15-].

Parameters	Descriptions
Host Name	Device name of the instrument. Refer to parameter 245.
IP Address	Obtain IP address manually. Refer to parameter 152.
Local Port	Ethernet connection port of the instrument. Refer to parameter 156.
Gateway	Network point that acts as an entrance to another network. Refer to parameter 155.
Subnet Mask	Describes IP address can be used in network. Refer to parameter 154.
Primary DNS	Obtain primary DNS manually. Refer to parameter 159.
Secondary DNS	Obtain secondary DNS manually.
Remote Connection Check Box	Automatic connection to any device on the network. Refer to parameter 15E and 15F. Default is 'Disabled'.
Remote IP Address	IP address of the PC, Printer or Device to be connected automatically. Enter IP address of the remote device.
Remote Port	Ethernet connection point of PC, Printer or Device to be connected automatically. Enter port number of the remote device.
Password	**Default password is 123456**.
Set Defaults	Sets factory defaults.

25.2 Modbus TCP Data Structure

IMPORTANT NOTE: *Scale configuration, calibration and Recipe parameters (address 40127 and above) must be loaded at Ready status.*

If the instrument is programmed for Modbus TCP/IP, it can be used as a Modbus TCP/IP slave on Ethernet communication network. Functions code '0x03' (Read Holding Registers), '0x06' (Single Write Register), '0x17' (Read/Write Multiple Registers) and '0x10' (Preset Multiple Registers) are supported.

Modbus TCP/IP High-Low: In two-word registers, the data is stored to the registers in big-endian format. Least significant word is stored to the highest register address; and most significant word is stored to the lowest register address.

Modbus TCP/IP Low-High: In two-word registers, the data is stored to the registers in little-endian format. Least significant word is stored to the lowest register address; and most significant word is stored to the highest register address.

Parameter's set-up:
Set Ethernet Data Format : Modbus TCP/IP High-Low or Modbus TCP/IP Low-High
Ethernet Address : 01 to 255
Make the Ethernet parameter settings as defined on sub-block *15-*.

Please find Modbus information in the web site of http://www.modbus.org

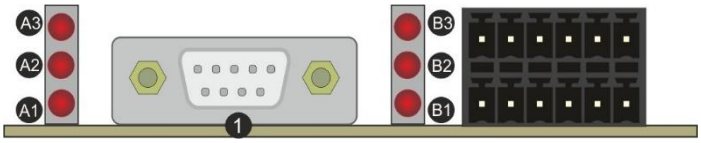
Modbus TCP/IP Command Table see Appendix 25.2 , on page 188

26. APPENDIX 9. PROFIBUS DP (ONLY FT-113FILL PB)

In Profibus DPV1 interface, baud rate is detected automatically. Supported baud rates are 9.6 kbps, 19.2 kbps, 45.45 kbps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps, 3 Mbps, 6 Mbps and 12 Mbps. No 'baud rate' instance exists. Refer to Profibus parameters, sub-block 19-,

Profibus GSD file is available on internet www.flintec.com .

There are LEDs near the Profibus connector



Ref.	Definition	Ref.	Definition	Ref.	Definition
A3	Operation Error LED	B3	Module Error LED		
A2	Not used	B2	Not used		
A1	Operation mode LED	B1	Module Status LED	1	Profibus port

A1 Operation mode LED

State	Indication	Comment
Off	Not online /No power	Check power and cable
On	On-line, data exchange	-
Flashing	On-line, clear	-

A3 Operation Error LED

State	Indication	Comment
Off	No error	
Flashing (2 flash)	PROFIBUS configuration error	Check GSD file configuration.

B1 Module Status LED

State	Indication	Comment
Off	Not power or not initialized	No power or Profibus module is in initialization state
On	Initialized	
Flashing	Initialized, diagnostic event(s) present	Diagnostic is active

B3 Module Error LED

State	Indication	Comment
Off	No error	
On	Exception error	There is an exception error

26.1 Electrical Connection

Figure 26.1 - PLC Connection

PROFIBUS Connector pin configuration (DB9F)

Pin	Signal	Description
1	-	-
2	-	-
3	B Line	Positive RxD / TxD, RS-485 level
4	RTS	Request to send
5	GND Bus	Ground (isolated)
6	+5V Bus Output	+5V termination power (isolated)
7	-	-
8	A Line	Negative RxD / TxD, RS-485 level
9	-	-
Housing	Cable Shield	Ground

Pin configuration of digital input and output connector is described in Appendix 1.

26.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter 191.

26.3 GSD Configuration

Profibus data consist of 2 pcs Input-2 words and 2 x Output-2 words.
GSD configuration for PLC programmers is shown in Figure 26.2.

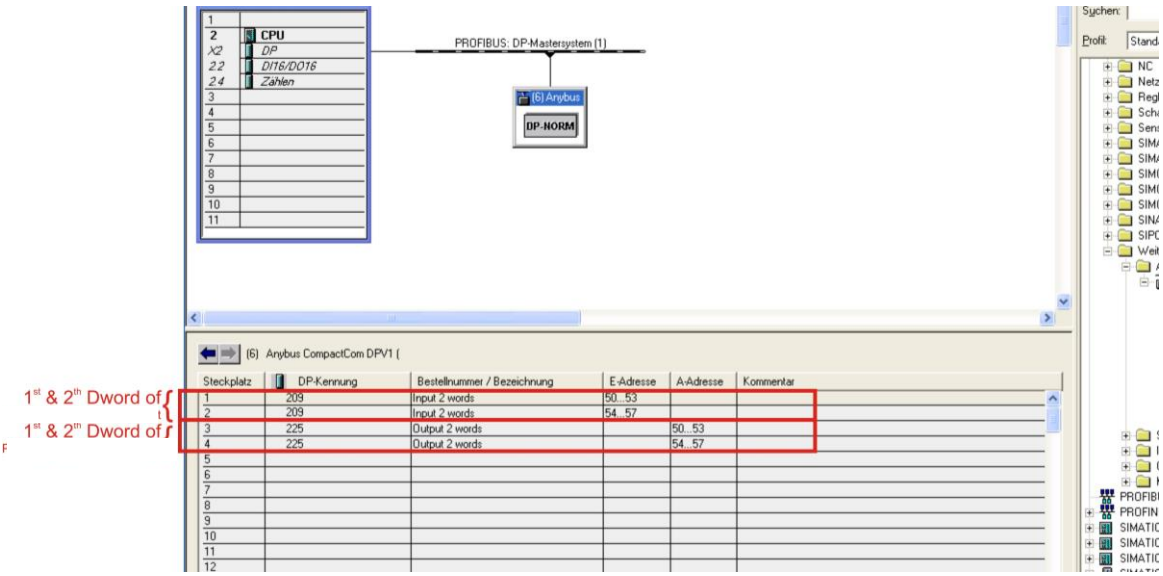


Figure 26.2 - GSD Configuration

GSD Configuration	Description
Input 2 words	1st Dword (FT-113Fill Output to PLC Input)
Input 2 words	2nd Dword (FT-113Fill Output to PLC Input)
Output 2 words	1st Dword (PLC Output to FT-113Fill Input)
Output 2 words	2nd Dword (PLC Output to FT-113Fill Input)

26.4 Profibus DP Data Structure

For the Data Structure see Appendix -Data Structure, **page 256**

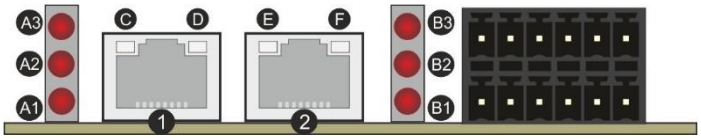
27. APPENDIX 10. PROFINET (ONLY FT-113FILL PN)

Profinet interface of the weighing instrument can be done via hub switch or serial bus over two Profinet port.

1. Serial bus connection of instruments. You may connect instruments serial to your Profinet bus via two ports.
2. Star connection. If you connect the instrument to your PLC via hub switch, you can use P1 or P2 port on the instrument. You may change the port, if there is any malfunction on port in use.

The Profinet interface is 100Mbit and full duplex.
GSDML file for two port Profinet is available on www.flintec.com

There are announcement LEDs on the instrument to indicate the interface status as appears below.



Ref.	Definition	Ref.	Definition	Ref.	Definition
A3	Not used	B3	Module Error LED	1,2	Interface ports (P1,P2)
A2	Not used	B2	Not used	D,F	Not used
A1	Network Status LED	B1	Module Status LED	C,E	Link/Activity LEDs

A1 Network Status LED

LED State	Description	Comment
Off	Not online /No power	Check power and cable
On	On-line RUN	-
Flashing	On-line STOP	-

B1 Module Status LED

LED State	Description	Comment
Off	Not power or not initialized	No power or Profinet module is in initialization state
On	Normal operation	
1 flash	Initialized, diagnostic event(s) present	Diagnostic is active

B3 Module Error LED

LED State	Description	Comment
Off	No Error	
On	Exception error	There is an exception error
1 flash	Configuration Error	Check GSDML configuration
2 flashes	IP Address Error	IP address not set
3 flashes	Device Name Error	Device name not set
4 flashes	Internal Module Error	Re-energize the instrument. If seen again, change the board.

In the case of LED warning, check cabling, configuration, IP address and device name. Power off the instrument and reenergize the instrument 30 seconds later.

C,E LINK/Activity LED

LED State	Description	Comment
Off	No Link	No link, no communication present
On	Link	Ethernet link established, no communication present
Flickering	Activity	Ethernet link established, communication present

27.1 Electrical Connection

Figure 27.1 - PLC Connection

PROFINET Connector pin configuration (RJ45)

Pin	Signal	DIR	Description
1	TX+	Out	Differential Ethernet transmit data +
2	TX–	Out	Differential Ethernet transmit data –
3	RX+	In	Differential Ethernet receive data +
6	RX–	In	Differential Ethernet receive data –
4	Not used		Terminated
5	Not used		Terminated
7	Not used		Terminated
8	Not used		Terminated
	Shield		Chassis ground

The HUB connection cabling will be a direct connection as shown below:

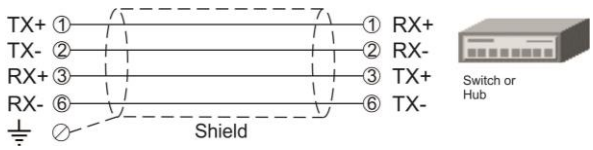


Figure 27.2 - HUB connection

The PC connection cabling will be done via cross cable as shown below. IP address blocks and gateway address of filling controller and PC should be the same in cross connection.

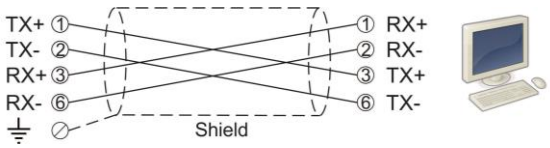


Figure 27.3 - Cross PC connection

Pin configuration of digital input and output connector is described in Appendix 1.

27.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

27.3 Profinet Parameters

Profinet parameters can be adjusted by keys in programming mode. Refer to parameter block [19-].

Note: *Station name is 'filling1' as a default.*

Parameters	Descriptions
DHCP	Dynamic Host Configuration Protocol automates network parameters if it is enabled.
Host Name	Device name of the instrument. Refer to parameter 196.
IP Address	If DHCP is disabled, obtain IP address manually. Refer to parameter 192.
Gateway	If DHCP is disabled, obtain default gateway manually. Refer to parameter 195.
Subnet Mask	If DHCP is disabled, obtain subnet mask manually. Refer to parameter 194.
Primary DNS	If DHCP is disabled, obtain primary DNS manually. Refer to parameter 199.
Secondary DNS	If DHCP is disabled, obtain secondary DNS manually.
Password	**Default password is 123456**.

27.4 GSDML Configuration

Profinet data consist of 2 x Input-2 words and 2 x Output-2 words.
GSDML configuration for PLC programmers is shown in Figure 27.5.

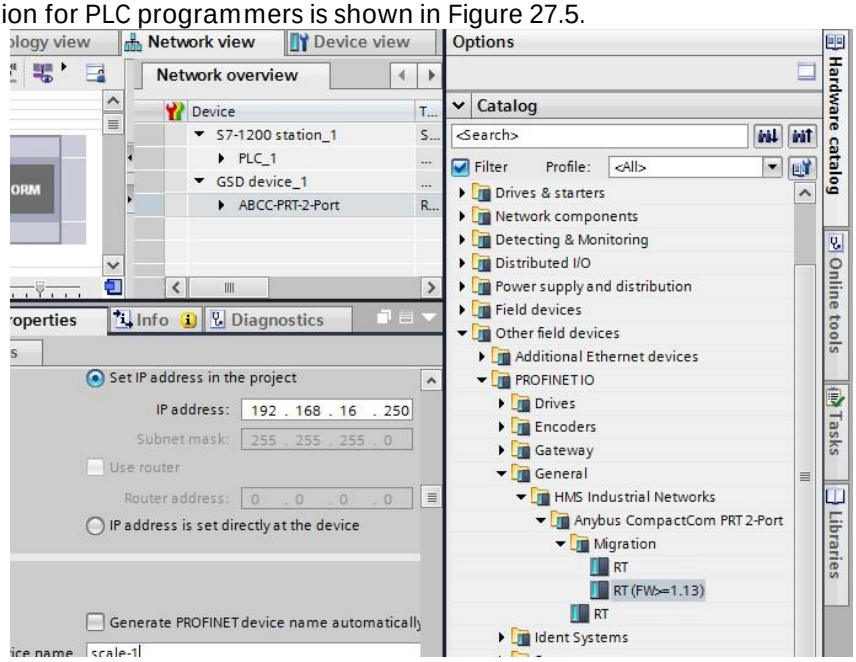


Figure 27.4 – Location of Hardware catalog

RT Use with newer PLC hardware such as S7-1200 and S7-1500.
RT Migration Use with older PLC hardware such as S7-300.

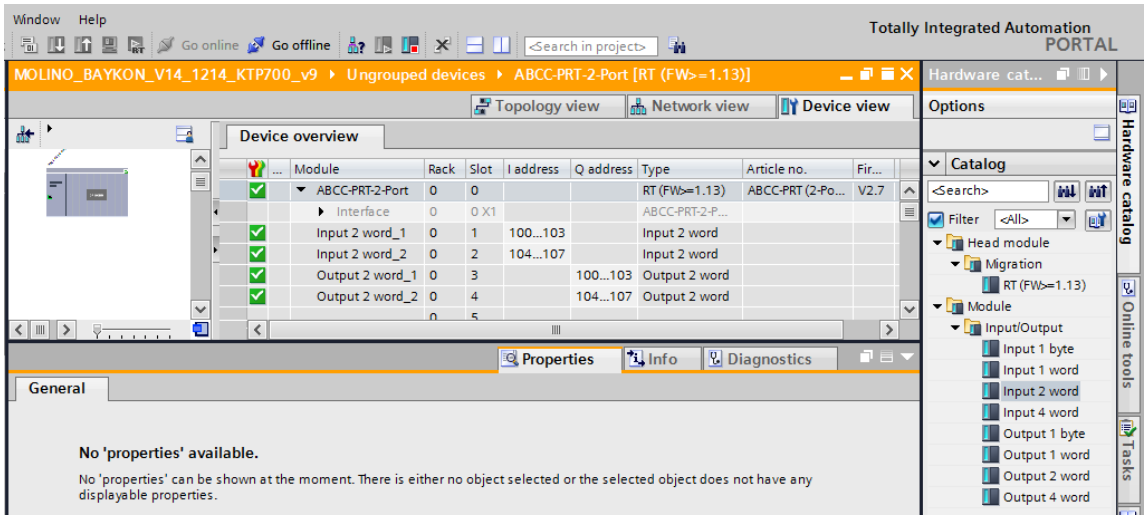


Figure 27.5 - GSDML Configuration

GSDML Configuration	Description
Input 2 word_1	1st Dword (FT-113Fill Output to PLC Input)
Input 2 word_2	2nd Dword (FT-113Fill Output to PLC Input)
Output 2 word_1	1st Dword (PLC Output to FT-113Fill Input)
Output 2 word_2	2nd Dword (PLC Output to FT-113Fill Input)

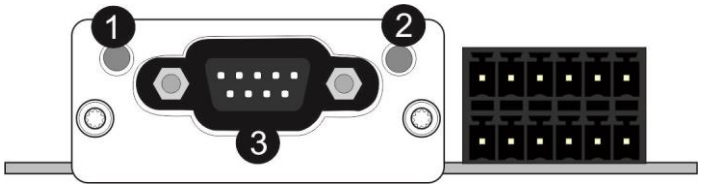
27.5 Profinet Data Structure

For the Data Structure see Appendix - Data Structure, **page 256**

28. APPENDIX 11. CANOPEN (ONLY FT-113FILL CO)

After setting related parameters you can communicate with FT-113Fill via CANopen network.
EDS file is available on www.flintec.com
Automatically detected and supported baud rates are 10 kbps, 50 kbps, 100 kbps, 125 kbps, 250 kbps, 500 kbps, 800 kbps, 1 Mbps, Autobaud (default).

There are 2 LEDs near the CANopen connector which are



1	(A) RUN LED
2	(B) ERROR LED
3	CANopen interface

(A) Run LED

State	Indication	Comment
Off	Not online / No power	Check power and cable
Green	On-line, data exchange	-
Green, blinking	On-line, initializing	-
Green, single flash	Stopped	Check hardware damages
Green, flickering	Auto baudrate detection in progress	-
Red	CANopen configuration error	Check EDS file

(B) Error LED

State	Indication	Comment
Off	-	No power or CANopen module is in initialization state
Red, single flash	Warning limit reached	A bus error counter reached or exceeded its warning level
Red, flickering	LSS	LSS services in progress
Red, double flash	Error count event	A guard- (NMT-Slave or NMT-master) or heartbeat event (Heartbeat consumer) has occurred.
Red	Bus off (Fatal Event)	Bus off.

28.1 Electrical Connection

CANopen connection is done with four wire as indicated below in Figure 28.1. The data line ends must be terminated with 120-ohm resistors.

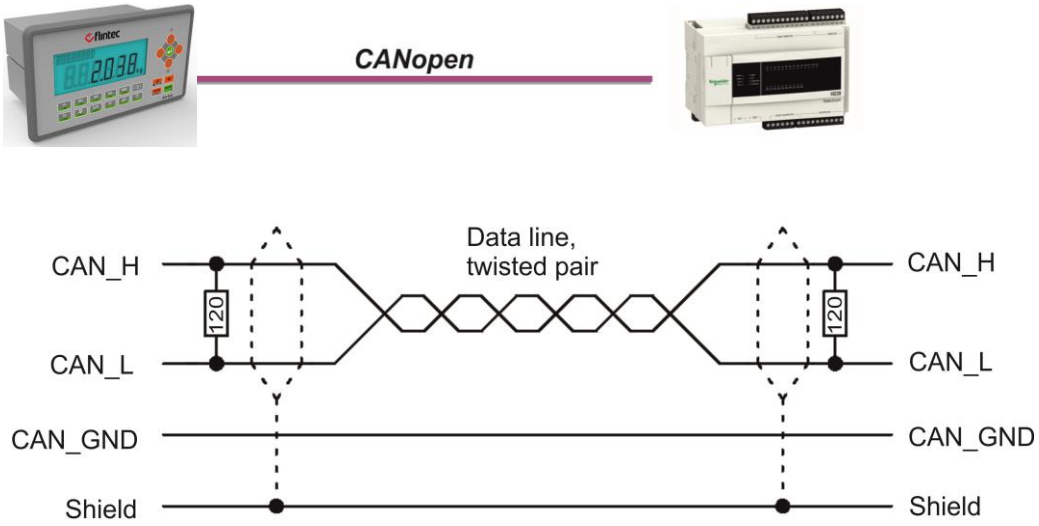


Figure 28.1 - PLC Connection

CANopen Connector pin configuration (DB9M)

Pin	Signal	Description
1	-	-
2	CAN_L	-
3	CAN_GND	-
4	-	-
5	CAN_SHIELD	-
6	-	-
7	CAN_H	-
8	-	-
9	-	-
Housing	Cable Shield	-

Pin configuration of digital input and output connector is described in Appendix 1.

28.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

28.3 EDS Configuration

CANopen data structures consist of TxPDO (64 bit) and RxPDO (64 bit). EDS configuration for PLC programmers is shown in Figure 28.2.

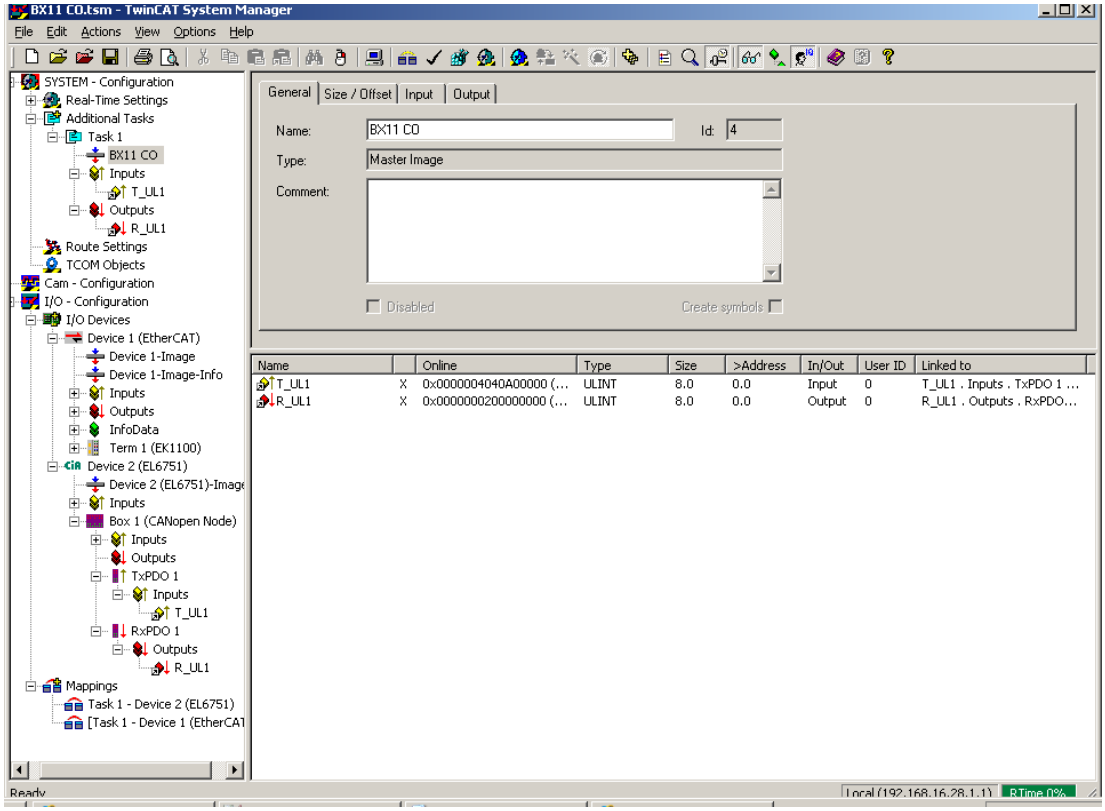


Figure 28.2 - EDS Configuration

EDS Configuration	Description
TxPDO 1 (4 words)	Unsigned Long (FT-113Fill Output to PLC Input)
RxPDO 1 (4 words)	Unsigned Long (PLC Output to FT-113Fill Input)

28.4 CANopen Data Structure

FT-113Fill Output to PLC Input

Bitwise of a Dword:

Unsigned Long (Only read)	High Dword	B63	B62	B61	B60	B59	B58	B57	B56	B55	B54	B53	B52	B51	B50	B49	B48
		B47	B46	B45	B44	B43	B42	B41	B40	B39	B38	B37	B36	B35	B34	B33	B32
	Low Dword	B31	B30	B29	B28	B27	B26	B25	B24	B23	B22	B21	B20	B19	B18	B17	B16
		B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0

TxPDO 1 (T_UL1)	High Dword	Out 10	Out 9	Out 8	Out 7	Out 6	Out 5	Out 4	Out 3	Out 2	Out 1	In 6	In 5	In 4	In 3	In 2	In 1
		Error codes of FT-113Fill				Unit	Process Error	P.Tare	Centre of zero	Gross Net	SD	Read command response					Cmd Flg
	Low Dword	By default, Actual weight value is represented. To represent other weight or calibration status, refer to B37...B33.															

Description of High Dword of TxPDO 1 (T_UL1)

Bit Number	Description			
B63 ... B54	Digital Outputs	Output bit status (Active = 1)		
B53 ... B48	Digital Inputs	Input bit status (Active = 1)		
B47 ... B44	Error Codes	**Bin**	**Dec**	**Descriptions**
		0000	0	No error found
		0001	1	ADC out
		0010	2	ADC over
		0011	3	ADC under
		0100	4	System Error
		0101	5	In programming mode
		0110	6	Low/High Voltage Error
		0111	7	Tilt Switch is active
		1000	8	Master/Slave Communication error
B43	Unit	0		First unit
		1		Second unit
B42	Process Error	0		No error
		1		Check "Process error messages" in the read command
B41	Preset Tare	0		Preset tare is passive
		1		Preset tare is active
B40	Centre of zero	0		Weight is out of zero range
		1		Weight is in zero range
B39	Indication	0		Gross
		1		Net
B38	Stability Detection	0		Stable
		1		Unstable
	Read	**Bin**	**Dec**	**Descriptions**

B37 … B33	Command Response	00000	0	Actual weight (Net if the indication is in Net)
		00001	1	Gross weight
		00010	2	Tare weight
		00011	3	ALL Status *(Refer to* 28-2*)*
		00100	4	Calibration Status *(Refer to* 28-3*)*
		00101 01100	5 12	Not used
		01101	13	Digital Inputs status *(Refer to Table 28-4)*
		01110	14	Digital Outputs status *(Refer to* 28-5*)*
		011111 0000	15 16	Not used
		10001	17	Target value
		10010	18	+ Tolerance
		10011	19	Coarse feed value
		10100	20	Medium feed value
		10101	21	Fine feed value
		10110	22	Label number (CN)
		10111	23	Last filled value
		11000	24	Quantity of Erasable Accumulation
		11001	25	Total of Erasable Accumulation
		11010	26	The current day's Accumulation
		11011	27	Yesterday's Accumulation
		11100 11101	28 29	Not used
		11110	30	Process error messages *(Refer to* 28-1*)*
		11111	31	Expanded Commands List *(Refer to Table 28-6)*
B32	CMD Flag	Toggles		The command is applied successfully
B31…B0	By default, Actual weight value is represented. To represent other weight or calibration status, refer to B37…B33.			

Process error messages (always 32 bit integer)

Low Dword of TXPDO 1(T_UL1) indicated in the table below when read command selected as 'Process error messages'. *Refer to RxPDO 1(R_ UL1) to select this command.*

Bit Number	Low Dword of TxPDO 1(T_UL1) Description			
B31 … B16	Not in use			
B15 … B8	Process State Refer to section 35.1	**Bin**	**Dec**	**Process state**
		00000000	0	No process (Adc out, Over, Under etc.)
		00000001	1	Weight Mode
		00000010	2	Ready
		00000011	3	Taring
		00000100	4	Zeroing
		00000101	5	Coarse Feed
		00000110	6	Middle Feed
		00000111	7	Fine Feeding
		00001000	8	Valve to Down
		00001001	9	Valve to Up
		00001010	10	Settling
		00001011	11	Filling
		00001100	12	End of Fill
		00001101	13	Discharging
		00001110	14	Discharging Delay
		00001111	15-19	Not used

		00010011		
		00010100	20	Run Inactive
		00010101	21	Inhibited
		00010110	22	Lance Position
		00010111	23	In Standby mode
		00011000	24	Release the bag input is active
		00011001	25	Waiting for a bag
		00011010	26	Lifter to Up
		00011011	27	Lifter to Down
B7 ... B0	Process Warning Messages Refer to section 35.1	**Bin**	**Dec**	**Messages**
		00000000	0	No process error
		00000001	1	Batch Finished
		00000010	2	By-Pass
		00000011	3	Not used
		00000100	4	Reset
		00000101	5	Interrupted
		00000110	6	Hold Status
		00000111	7	Check Fill Stop
		00001000	8	Check Discharge Stop
		00001001	9	Alarm
		00001010	10	Inhibited
		00001011	11	Discharge interrupted
	Process error Messages *Refer to section 0*	10000000	128	Feeding Gate is not Opening or Closing
		10000001	129	Tare Range Error
		10000010	130	Taring could not execute.
		10000011	131	Zeroing Fail
		10000100	132	Zeroing Range
		10000101	133	Filling Time
		10000110	134	Valve Position
		10000111	135	Wrong Position
		10001000	136	Not used
		10001001	137	Maxfill Limit
		10001010	138	+Tolerance Error
		10001011	139	Stable Error
		10001100	140	Clmp Is Open
		10001101	141	Loadcell Error
		10001110	142	-Tolerance Error
		10001111	143	Discharge Gate
		10010000	144	Tilted
		10010001	145	Not used
		10010010	146	Multicycle filling?

Table 28-1 – Process error messages

ALL Status (always 32 bit integer)

Low Dword of TXPDO 1(T_UL1) indicated in the table below when read command selected as 'ALL Status' Process error messages'. *Refer to RxPDO 1(R_ UL1) to select this command.*

Bit Number	Low Dword of TxPDO 1(T_UL1) Description		
B31	Place of decimal point	0	None
		1	No decimal point
B30		0	None
		1	Decimal point is X.X
B29		0	None
		1	Decimal point is X.XX
B28		0	None
		1	Decimal point is X.XXX
B27		0	None
		1	Decimal point is X.XXXX
B22 ... B26	Not in use		
B21	Hold	0	Hold is passive
		1	Hold is active
B20	By-Pass	0	By-Pass is passive
		1	By-Pass is active
B19	Inhibit	0	Inhibit is passive
		1	Inhibit is active
B18	Interrupt	0	Interrupt is passive
		1	Interrupt is active
B17	Process Error	0	No filling error
		1	Process error. (Check the 'Process error messages')
B16	Operation mode	0	Filling mode
		1	Basic weighing mode
B14 ... B15	Not in use		
B13	High resolution status	0	Passive
		1	Active
B12	Centre of zero	0	Weight is out of zero range
		1	Weight is in zero range
B11	Key lock status	0	Passive
		1	Active
B7-B10	Not used		
B6	Unit indication	0	First Unit (power on unit)
		1	Second Unit
B5	Power On Zero	0	Not power on zeroed
		1	Zeroed with power on zero
B4	Preset Tare	0	Preset tare is passive
		1	Preset tare is active
B3	Indication	0	Gross mode
		1	Net mode
B2	Motion Detection	0	Stable
		1	Unstable
B1	Not used		
B0	Not used		

Table 28-2– ALL Status table

Calibration Status (always 32 bit integer)

Low Dword of TXPDO 1(T_UL1) indicated in the table below when read command selected as 'calibration status'. *Refer to RxPDO 1(R_ UL1) to select this command.*

Bit Number	Low Dword of TxPDO 1(T_UL1) Description	
B31 ... B11	Not in use	
B10	0	No Error
	1	The Calibration DIP switch is not 'On' position. - Check the calibration DIP switch.
B9	0	No Error
	1	Scale unstable - Wait until scale become stable - Check grounding wiring
B8	0	No Error
	1	Calibration load value entry Error - Test weight is too small. Increase the weight
B7	0	No Error
	1	Calibration Error - Calibration loading is not enough - Check test weight loading - Check load cell connections
B6	0	No Error
	1	Instrument cannot be calibrated. - Load cell signal is very low or too high
B5	0	No Error
	1	Instrument cannot be calibrated. - Check load cell cable - Re-energize the instrument
B4	0	No Error
	1	ADC Error - Re-energize the instrument - If seen again, change the board.
B3	0	No Error
	1	Calibration Timeout - Restart calibration
B2	0	None
	1	Span calibration in process ...
B1	0	None
	1	Zero calibration in process ...
B0	0	Not ready for calibration
	1	Ready for calibration

Table 28-3 – Calibration status

Digital Inputs Status (always 32 bit integer)

Low Dword of TXPDO 1(T_UL1) indicated in the table below when read command selected as 'Digital input status'. *Refer to RxPDO 1(R_ UL1) to select this command.*

Bit Number	Low Dword of TxPDO 1(T_UL1) Description	
B31 ... B25	Not in use	0 – Passive 1 – Active Refer to related filling mode and select inputs for details. Page 41 and 146
B24	TILT	
B23	FBU2	
B22	FBU1	
B21	IN-B	
B20	IN-A	
B19	TMR3	
B18	TMR2	
B17	TMR1	
B16	S2	
B15	BYPA	
B14	EMPT	
B13	DROP	
B12	HOLD	
B11	INTE	
B10	REJE	
B9	ACK	
B8	INHI	
B7	RUN	
B6	Not used	
B5	Input-6	
B4	Input-5	
B3	Input-4	
B2	Input-3	
B1	Input-2	
B0	Input-1	

Table 28-4 – Digital inputs status

Digital Outputs Status (always 32 bit integer)

Low Dword of TXPDO 1(T_UL1) indicated in the table below when read command selected as 'Digital output status'. *Refer to RxPDO 1(R_ UL1) to select this command.*

Bit Number	Low Dword of TxPDO 1(T_UL1) Description	
B31	Not in use	0 – Passive 1 – Active Refer to related filling mode and select inputs for details. Page 41 and 147
B30	ETAR	
B29	OVER	
B28	FBU2	
B27	FBU1	
B26	LOGI	
B25	TMR3	
B24	TMR2	
B23	TMR1	
B22	UNDE	
B21	ETOL	
B20	EFIL	
B19	ZR G	
B18	ZR I	
B17	ALAR	
B16	VIBR	
B15	FGAT	
B14	FEED	
B13	END	
B12	EMPT	
B11	PROG	
B10	Not used	
B9	Output-10	
B8	Output-9	
B7	Output-8	
B6	Output-7	
B5	Output-6	
B4	Output-5	
B3	Output-4	
B2	Output-3	
B1	Output-2	
B0	Output-1	

Table 28-5 – Digital outputs status

PLC Output to FT-113Fill Input

RxPDO 1 (R_UL1)	High Dword	Int.		SFE	Reset	Filling start	By-Pass		Expanded Commands List	
		Not in use					Command List		Read Data Selection	New CMD
	Low Dword	B37-B33 bits defines the usage of this Dword.								

Description of High Dword of RxPDO 1 (R_UL1)

Bit Number	Descriptions				
B63	Interrupt	A transition from 0 to1 activates the interrupt function and transition from 1 to 0 deactivates the interrupt function.			
B62	Not used				
B61	Start for emptying (SFE)	A transition form 0 to1 activates the "Start for emptying" command.			
B60	Reset	A transition form 0 to1 activates the "Reset" command.			
B59	Start for filling	A transition form 0 to1 activates the "Start for filling" command.			
B58	By-Pass	A transition from 0 to1 activates the by-pass function and transition from 1 to 0 deactivates the by-pass function.			
B57	Not used				
B56 ... B48	Select an item in the Expanded Commands List *(Refer to Table 28-6)*				
B47 ... B43	Not in use				
B42 ... B38	Command List	**Bin**	**Dec**	**Commands**	
		00000	0	No command is activated	
		00001	1	Zero	
		00010	2	Tare	
		00011	3	Clear	
		00100	4	Print	
		00101	5	Adjust zero calibration	Calibration
		00110	6	Adjust span calibration (1)	
		00111	7	Total Load Cell Capacity (1)	eCal Coefficients Refer to par. [613]
		01000	8	Average mV/V value (1)	
		01001	9	Dead Load value (1)	
		01010	10	Save the coefficients of eCal	
		01011 01101	11 13	Not used	
		01110	14	Control the digital outputs manually [1] *(Refer to* 28-5 *for meanings of bits)*	
		011111 0000	15 16	Not used	
		10001	17	Target value [1]	

		10010	18	+ Tolerance
		10011	19	Coarse value [1]
		10100	20	Medium value
		10101	21	Fine value [1]
		10110	22	Label number (CN)
		10111	23	Not used
		11000	24	Quantity of Erasable Accumulation
		11001	25	Total of Erasable Accumulation
		11010 11110	26 30	Not used
		11111	31	Use the Expanded Command list (*Refer to Table 28-6)*
B37 … B33	Read Data Selection	00000	0	Actual weight (Net if the indication is in Net)
		00001	1	Gross weight
		00010	2	Tare weight
		00011	3	ALL Status (Refer to 28-2)
		00100	4	Calibration Status (Refer to 28-3)
		00101 01100	5 12	Not used
		01101	13	Digital Inputs status *(Refer to Table 28-4)*
		01110	14	Digital Outputs status *(Refer to* 28-5 *)*
		011110000	15 16	Not used
		10001	17	Target value
		10010	18	+ Tolerance
		10011	19	Coarse feed value
		10100	20	Medium feed value
		10101	21	Fine feed value
		10110	22	Label number (CN)
		10111	23	Last filled value
		11000	24	Quantity of Erasable Accumulation
		11001	25	Total of Erasable Accumulation
		11010	26	The current day's Accumulation
		11011	27	Yesterday's Accumulation
		11100 11101	28 29	Not used
		11110	30	Process error messages *(Refer to* 28-1 *)*
		11111	31	Use the Expanded Command list *(Refer to Table 28-6)*
B32	New CMD	Toggle		Apply commands which are listed in this table.
B31-B0	B37-B33 bits defines the usage of this Dword.			

(1) Write this command after writing values to Low Dword of RxPDO then apply this command with New CMD.

Expanded Command List

IMPORTANT NOTE:

a) Scale configuration and Recipe parameters (address 63 and above) in the Expanded command list must be loaded at Ready status.

b) To save the Recipe parameters into controller first, load Recipe parameters between address 252 to 405 and then apply the command 'Save Recipe parameters' (address 20).

c) The expanded command list below is valid for instrument software version 01.05 or higher. For software version 01.04 or lower refer to manual revision 1.1.0 for command list of instrument

Here 1st Dword (Input) is the data receiving from PLC and the "B24 ... B16" bits describe below.

Here 1st Dword (Input) is the data receiving from PLC and the "B48 ... B56" bits describe below.

Bit No	Description						
B56 ... B48	Expand. Cmds List	Binary	Dec	Commands			
		00000000	0	R	Voltage of power supply(2) The value is indicated with 0.1 VDC increment.		
		00000001	1	R	Load cell millivolt value(2) Millivolt of active scale is indicated with 0.01 mV increment.		
		00000010	2	R	Command status (2)	Dec	Descr. of 1st Dword
						0	None
						1	Cmd. is processing
						2	Command is done
						3	Command failed
		00000011	3	R/W	Reprint the last label (1) (2)	0	None
						1	Reprint the last label
		00000100	4	R/W	High resolution (1) (2)	0	Enable
						1	Disable
		00000101	5	W	Unit change (1)	0	From first to second
						1	From second to first
		00000110	6	R/W	Key lock (1) (2)	0	Enable
						1	Disable
		000000111	7	R/W	Mode (1) (2)	0	Filling mode
						1	Basic w. mode
		00001000	8	W	Start of filling (1)	0	None
						1	Start of filling
		00001001	9	W	Start of Emptying / Discharge (1)	0	None
						1	Start of Discharge
		00001010	10	W	Reset (1)	0	None
						1	Reset
		000001011	11	R/W	Run (1) (2)	0	Enable
						1	Disable
		00001100	12	R/W	By-Pass (1) (2)	0	Enable
						1	Disable
		000001101	13	R/W	Hold (1) (2)	0	Enable
						1	Disable
		000001110	14	R/W	Interrupt (1) (2)	0	Enable
						1	Disable
		000001111	15	R/W	Inhibit (1) (2)	0	Enable
						1	Disable
		00001000	16	W	Error ACK /Resume (1)	0	None

		0				1	Error Ack / Resume
		000010001	17	R/W	Reject /Do not record (1) (2)	0	None
						1	Reject/Do not record
		000010010	18	R/W	Empty / Discharge the scale (1) (2)	0	Enable
						1	Disable
		000010011	19	R/W	Standby (1) (2)	0	Enable
						1	Disable
		000010100	20	W	Save receipt parameters (1)	0	None
						1	Save
		000010101	21	W	Write to the recipe memory (1)	0	None
						X	X=Recipe memory number
		000010110	22	W	Call and use from the recipe memory (1)	0	None
						X	X=Recipe memory number
		000010111 000011001	23 25	Not used			
		000011010	26	R	Quantity of Batch/Bulk (2)		
		000011011	27	R	Total of Batch/Bulk (2)		
		000011100	28	R/W	Quantity of Erasable Accumulation (1) (2)		
		000011101	29	R/W	Total of Erasable Accu. (1) (2)		
		000011110	30	R	Quantity of the Current day's Accu. (2)		
		000011111	31	R	Total of the Current day's Accu. (2)		
		000100000	32	R	Quantity of Yesterday's Accu. (2)		
		000100001	33	R	Total of Yesterday's Accu. (2)		
		000100010	34	R/W	Quantity of Grand Total (1) (2)		
		000100011	35	R/W	Grand Total (1) (2) (Low Dword)		
		000100100	36	R/W	Grand Total (1) (2) (High Dword)		
		000100101	37	R/W	Year, Month, day (1) (2) (YYYYMMDD)		Date and time settings. Refer to par. 24-. (always BCD format)
		000100110	38	R/W	Hour & minute (1) (2) (0000HHMM)		
		000100010000111110	39 62	Not used			
		000111111	63	R/W	Dynamic filter (1) (2)	**Dec**	**Descr. of 1st Dword**
						0	No
						1	Low
						2	Medium
						3	High
		001000000	64	R/W	Filter (1) (2)	0	No
						1	Extra Low
						2	Very Low
						3	Low
						4	Medium

						5	High
						6	Very High
						7	Extra High
		00100000 1	65	R/W	Power on zero (1) (2)	0	Disable
						1	± 2%
						2	± 2%LK
						3	± 10%
						4	+ 15%, - 5%
						5	± 20%
		00100001 0	66	R/W	Zeroing Range (1) (2)	0	Disable
						1	± 2%
						2	± 3%
						3	± 20%
						4	± 50%
		001000011	67	R/W	Auto Zero Tracking (1) (2)	0	Disable
						1	± 0,3d
						2	± 0,5d
						3	± 1d
						4	± 2d
						5	± 3d
		00100010 0	68	R/W	Tare (1) (2)	0	No
						1	Yes
		001000101	69	R/W	Stability Detection Range (1) (2)	0	± 0,3d
						1	± 0,5d
						2	± 1d
						3	± 2d
						4	± 3d
						5	± 4d
						6	± 5d
						7	± 9d
						8	Disable
		001000110	70	R/W	Stability Time (1) (2)	Refer to par. [517] on page 162	
		001000111	71	R/W	Unit (1) (2)	0	g
						1	kg
						2	t
						3	lb
						4	No unit
						5	kLb
		00100100 0	72	R/W	Range (1) (2)	0	Single range
						1	2 x Multi Range
						2	3 x Multi Range
						3	2 x Multi Interval
						4	3 x Multi Interval
		001001001	73	R/W	Capacity-1 (1) (2)	Refer to par. 523 on page 162	
		001001010	74	R/W	Decimal point-1 (1) (2)	0	XXXXOO
						1	XXXXXO
						2	XXXXXX
						3	XXXXX.X
						4	XXXX.XX
						5	XXX.XXX
		001001011	75	R/W	Increment-1 (1) (2)	0	X1
						1	X2
						2	X5

		001001100	76	R/W	Capacity-2 (1) (2)		
		001001101	77	R/W	Decimalpoint-2(1) (2)		
		001001110	78	R/W	Increment-2 (1) (2)		
		001001111	79	R/W	Capacity-3 (1) (2)		
		00101000 0	80	R/W	Decimalpoint-3(1) (2)		
		001010001	81	R/W	Increment-3 (1) (2)		
		001010010	82	R/W	Limit of Indication (1) (2)	0	Over ind. after Max
						1	1 d more than Max
						2	5 d more than Max
						3	9 d more than Max
						4	2% more than Max
						5	5% more than Max
		001010011	83	R/W	Tare type (1) (2)	0	Subtractive tare
						1	Additive tare
						2	Both
		001010100	84	R/W	Maximum tare (1) (2)	Refer to par. [527] on page 163	
		001010101 01000000 0	85 128	Not Used			
		01000000 1	129	R/W	Filling modes (1) (2)	Refer to par. [311] on page 143	
						0	OPEN
						1	BUNG
						2	BOTT
						3	PACK
						4	BAG
						5	BIG
						6	VENT
						7	1BAG
						8	nBAG
						9	nPAC
						10	TANK
						11	WOUT
		01000001 0	130	R/W	Start input signal type (1) (2)	Refer to par. [312] on page 144	
						0	PULS
						1	LEVE
						2	AUTO
		010000011	131	R/W	Discharge input signal type (1) (2)	Refer to par. [313] on page 144	
						0	PULS
						1	LEVE
		01000010 0	132	R/W	Start filling or emptying/discharging at power on (1) (2)	Refer to par. [314] on page 144	
						0	FILL
						1	DISC
		010000101	133	R/W	Feeding speed Quantity (1) (2)	Refer to par. [315] on page 144	
						0	1

						1	2	
						2	3	
		010000110	134	R/W	Feeding outputs (1) (2)	Refer to par. [316] on page 144		
						0	C	
						1	FC	
						2	FMC	
		010000111	135	R/W	Max. target of filling (1) (2)	Refer to par. [317] on page 144		
		010001000	136	R/W	Min. target of filling (1) (2)	Refer to par. [318] on page 144		
		010001001	137	R/W	Scale quantity at master slave operation (1) (2)	Refer to par. [319] on page 144		
		010001010 010001111	138 143	R/W	Not used			
		010010000	144	R/W	Feeding gate position control type (1) (2)	Refer to par. [321] on page 145		
						0	NO	
						1	1 POS	
						2	2 POS	
		010010001	145	R/W	Switch type on the feeding gate for checking its position (1) (2)	Refer to par. [322] on page 145		
						0	NO	
						1	NCLO	
						2	NOPE	
		010010010	146	R/W	Switch on the discharge gate (1) (2)	Refer to par. [323] on page 145		
						0	NO	
						1	NCLO	
						2	NOPE	
		010010011	147	R/W	Lance position control type (1) (2)	Refer to par. [324] on page 145		
						0	BIU	
						1	BMIU	
						2	BIOU	
						3	BMIO	
		010010100	148	R/W	Movement of valve or lifter at liquid filling modes (1) (2)	Refer to par. [325] on page 145		
							For Open mode	For Bung mode
						0	NO	VALV
						1	LIFT	NO
						2	VALV	LIFT
		010010101	149	R/W	Movement of valve or lifter at liquid big bag mode	Refer to par. [326] on page 145		
						0	NO	
						1	CLAM	
						2	UP-A	
						3	UP-B	
		010010110 010011110	150 158	R/W	Not used			
		010011111	159	R/W	Select input 1 (1) (2)	Refer to par. [331] on page		

						146	
		01010000 0	160	R/W	Select input 2 (1) (2)	Refer to par. [332] on page 146	
		010100001	161	R/W	Select input 3 (1) (2)	Refer to par. [333] on page 146	
		010100010	162	R/W	Select input 4 (1) (2)	Refer to par. [334] on page 146	
		010100011	163	R/W	Select input 5 (1) (2)	Refer to par. [335] on page 146	
		010100100	164	R/W	Select input 6 (1) (2)	Refer to par. [336] on page 146	
		010100101	165	R/W	Select input 7 (1) (2)	Refer to par. [337] on page 146	
		010100110	166	R/W	Select input 8 (1) (2)	Refer to par. [338] on page 146	
		010100111	167	R/W	Select input 9 (1) (2)	Refer to par. [339] on page 146	
		010101000	168	R/W	Select output 1 (1) (2)	Refer to par. [33A] on page 146	
		010101001	169	R/W	Select output 2 (1) (2)	Refer to par. [33B] on page 147	
		010101010	170	R/W	Select output 3 (1) (2)	Refer to par. [33C] on page 147	
		010101011	171	R/W	Select output 4 (1) (2)	Refer to par. [33D] on page 147	
		010101100	172	R/W	Select output 5 (1) (2)	Refer to par. [33E] on page 147	
		010101101	173	R/W	Select output 6 (1) (2)	Refer to par. [33F] on page 147	
		010101110	174	R/W	Preact, Medium and Fine feeding entries (1) (2)	Refer to par. [341] on page 147	
						0	VAL
						1	DEV
		010101111	175	R/W	Weight displaying at Filling (1) (2)	Refer to par. [342] on page 147	
						0	INCR
						1	DECR
		010110000	176	R/W	Display after filling (1) (2)	Refer to par. [343] on page 147	
						0	ACTU
						1	FILL
						2	TARG
		010110001	177	R/W	Information display (1) (2)	Refer to par. [344] on page 148	
						0	NO
						1	TARE
						2	GROS
						3	RCPT
						4	R+T
						5	R+Q
						6	Q+🖷
						7	TOTA
						8	PHAS
		010110010 010111100	178 188	R/W	Not used		

		010111101	189	R/W	The function of magnify key (1) (2)	Refer to par. [351] on page 148	
		010111110	190	R/W	The function of change key (1) (2)	Refer to par. [352] on page 148	
		010111111	191	R/W	The func. of F1 key (1) (2)	Refer to par. [353] on page 149	
		011000000	192	R/W	The func. of F2 key (1) (2)	Refer to par. [354] on page 149	
		011000001	193	R/W	The func. of F3 key (1) (2)	Refer to par. [355] on page 149	
		011000010	194	R/W	The func. of F4 key (1) (2)	Refer to par. [356] on page 149	
		011000011	195	R/W	The func. of F5 key (1) (2)	Refer to par. [357] on page 149	
		011000100 011001001	196 201	R/W	Not used		
		011001010	202	R/W	Reserve Input 1 (1) (2)	Refer to par. [371] on page 150	
		011001011	203	R/W	Reserve Input 2 (1) (2)	Refer to par. [372] on page 150	
		011001100	204	R/W	Reserve output 1 (1) (2)	Refer to par. [373] on page 150	
		011001101	205	R/W	Reserve output 2 (1) (2)	Refer to par. [374] on page 150	
		011001110 011111011	206 251	R/W	Not used		
		011111100	252	R/W	Target (1) (2) (3)	Refer to section 3	
		011111101	253	R/W	+ Tolerance (1) (2)		
		011111110	254	R/W	- Tolerance (1) (2)		
		011111111	255	R/W	Not used		
		100000000	256	R/W	Coarse (1) (2) (3)		
		100000001	257	R/W	Medium (1) (2) (3)		
		100000010	258	R/W	Fine (1) (2) (3)		
		100000011	259	R/W	PT (Specific Tare) (1) (2)		
		100000100	260	R/W	Qty of Batch/Bulk (1) (2)		
		100000101	261	R/W	Total of Batch/Bulk (1) (2)		
		100000110 100001001	262 265	R/W	Not used		
		100001010	266	R/W	Gross, net or multicycle filling (1) (2)	**Dec**	**Descr. of 1st Dword**
						Refer to par. [411] on page 151	
						0	NET
						1	GROSS
						2	MULT
		100001011	267	R/W	Tolerance control (1) (2)	Refer to par. [412] on page 151	
						0	No
						1	+/-T

						2	+T -T
						3	+/-F
						4	+F -F
		100001100	268	R/W	Taring at filling (1) (2)	Refer to par. [413], page 151	
						0	AUTO
						1	AV 5
						2	AV10
						3	ACON
						4	SPEC
		100001101	269	R/W	Min. tare value (1) (2)	Refer to par. [414] page 151	
		100001110	270	R/W	Max. tare value (1) (2)	Refer to par. [415] page 151	
		100001111	271	R/W	Valve force (1) (2)	Refer to par. [416] page 151	
		100010000	272	R/W	Lance B. / Lift W. (1) (2)	Refer to par. [417] page 152	
		100010001	273	R/W	Lance Middle (1) (2)	Refer to par. [418] page 152	
		100010010	274	R/W	Overfill weight (1) (2) (3)	Refer to par. [419] page 152	
		100010011	275	R/W	Batch filling (1) (2)	Refer to par. [41A] page 152	
						0	NO
						1	QTY
						2	⊞T
						3	Q+⊞T
						4	BULK
		100010100	276	R/W	Soft start method (1) (2)	Refer to par. [41B] page 152	
						0	NO
						1	FINE
						2	MED
		100010101	277	R/W	Soft start time (1) (2)	Refer to par. [41C] page 152	
		100010110	278	R/W	The emptying / discharge type (1) (2)	Refer to par. [41D] page 152	
		100010111	279	R/W	Empty/Discharge weight / Remaining weight (1) (2)	Refer to par. [41E] page 152	
		100011000	280	R/W	Emptying / discharge time (1) (2)	Refer to par. [41F] page 152	
		100011001 100100111	281 295	R/W	Not used		
		100101000	296	R/W	Correction technic at Feeding / Discharging (1) (2)	Refer to par. [431] page 153	
						0	NO
						1	AUTO
						2	TIME
						3	SMRT
		100101001	297	R/W	Fine feeding time (1) (2)	Refer to par. [432] page 153	
		100101010	298	R/W	Preact adj. frequency (1) (2)	Refer to par. [433] page 153	
		100101011	299	R/W	Sampling size (1) (2)	Refer to par. [434] page 153	

		100101100	300	R/W	Preact correction ratio in percent (1) (2)	Refer to par. [435] on page 153	
		100101101	301	R/W	Zeroing freq. (1) (2)	Refer to par. [436] on page 153	
		100101110	302	R/W	Jogging (1) (2)	Refer to par. [437] on page 153	
						0	NO
						1	TIME
						2	AUTO
		100101111	303	R/W	Jogging on time (1) (2)	Refer to par. [438] on page 154	
		100110000	304	R/W	Jogging off time (1) (2)	Refer to par. [439] on page 154	
		100110001	305	R/W	Min. filling error (1) (2)	Refer to par. [43A] on page 154	
		100110010	306	R/W	Max. error limit (1) (2)	Refer to par. [43B] on page 154	
		100110011	307	R/W	Motion window at filling process (1) (2)	Refer to par. [43C] on page 154	
		100110100	308	R/W	Preact correction ratio for coarse feeding cut-off (1) (2)	Refer to par. [43D] on page 154	
		100110100 100110110	308 310	R/W	Not used		
		100110111	311	R/W	Zeroing delay (1) (2)	Refer to par. [441] on page 154	
		100111000	312	R/W	Taring delay (1) (2)	Refer to par. [442] on page 154	
		100111001	313	R/W	Stbl. check delay (1) (2)	Refer to par. [443] on page 154	
		100111010	314	R/W	Max. stbl. time (1) (2)	Refer to par. [444] on page 154	
		100111011	315	R/W	Start delay (1) (2)	Refer to par. [445] on page 154	
		100111100	316	R/W	End of batch output delay (1) (2)	Refer to par. [446] on page 155	
		100111101	317	R/W	Coarse and medium feed control delay (1) (2)	Refer to par. [447] on page 155	
		100111110	318	R/W	Fine feed ctrl delay (1) (2)	Refer to par. [448] on page 155	
		100111111	319	R/W	FG DEL, VALV DEL or LIFT DEL (1) (2)	Refer to par. [449] on page 155	
		101000000	320	R/W	Complete delay (1) (2)	Refer to par. [44A] on page 155	
		101000001	321	R/W	Catch delay (1) (2)	Refer to par. [44B] on page 155	
		101000010	322	R/W	Clamp release delay (1) (2)	Refer to par. [44C] on page 155	
		101000011	323	R/W	Maximum filling time (1) (2)	Refer to par. [44D] on page 156	
		101000100 101000101	324 325	R/W	Not used		
		101000110	326	R/W	Analogue output Type (1) (2)	Refer to par. [451] on page 156	
						0	NO
						1	0-20

						2	0-10
		101000111	327	R/W	For Coarse feed (1) (2)	Refer to par. [452] on page 156	
		101001000	328	R/W	For Medium feed (1) (2)	Refer to par. [453] on page 156	
		101001001	329	R/W	For Fine feed (1) (2)	Refer to par. [454] on page 156	
		1010010101 01010100	330 340	R/W	Not used		
		101010101	341	R/W	Weighing operation type of the machine (1) (2)	Refer to par. [461] on page 156	
						0	SUBT
						1	NO
						2	ADDI
		101010110	342	R/W	Container quantity on the palette (1) (2)	Refer to par. [462] on page 156	
		101010111	343	R/W	Operation at Batch filling (1) (2)	Refer to par. [463] on page 156	
						0	STOP
						1	FILL
		101011000 101100011	344 355	R/W	Not used		
		101100100	356	R/W	Alarm Setpoint (1) (2)	Refer to par. [471] on page 156	
		101100101	357	R/W	Alarm time (1) (2)	Refer to par. [472] on page 156	
		101100110	358	R/W	Min. Vibration weight (1) (2)	Refer to par. [473] on page 157	
		101100111	359	R/W	Max. Vibration weight (1) (2)	Refer to par. [474] on page 157	
		101101000	360	R/W	Vibration delay (1) (2)	Refer to par. [475] on page 157	
		101101001	361	R/W	Vibration time (1) (2)	Refer to par. [476] on page 157	
		101101010	362	R/W	Zero range (1) (2)	Refer to par. [477] on page 157	
		101101011 101110010	363 370	R/W	Not used		
		101110011	371	R/W	Timer 1 Trigger (1) (2)	Refer to par. [481] on page 158	
						0	SELE
						1	IN
						2	OUT
		101110100	372	R/W	Number (1) (2)	Refer to par. [482] on page 158	
		101110101	373	R/W	Timer 1 Type (1) (2)	Refer to par. [483] on page 158	
						0	Type A
						1	Type B
						2	Type C
						3	Type D
						4	Type E
						5	Type F
		101110110	374	R/W	Timer 1 On time (1) (2)	Refer to par. [484] on page 158	
		101110111	375	R/W	Timer 1 Off time (1) (2)	Refer to par. [485] on	

						page 158	
		101111000	376	R/W	Timer 2 Trigger (1) (2)	Refer to par. [486] on page 158	
						0	SELE
						1	IN
						2	OUT
		101111001	377	R/W	Number (1) (2)	Refer to par. [487] on page 158	
		101111010	378	R/W	Timer 2 Type (1) (2)	Refer to par. [488] on page 158	
		101111011	379	R/W	Timer 2 On time (1) (2)	Refer to par. [489] on page 158	
		101111100	380	R/W	Timer 2 Off time (1) (2)	Refer to par. [48A] on page 158	
		101111101	381	R/W	Timer 3 Trigger (1) (2)	Refer to par. [48B] on page 159	
						0	SELE
						1	IN
						2	OUT
		101111110	382	R/W	Number (1) (2)	Refer to par. [48C] on page 159	
		101111111	383	R/W	Timer 3 Type (1) (2)	Refer to par. [48D] on page 159	
		110000000	384	R/W	Timer 3 On time (1) (2)	Refer to par. [48E] on page 159	
		110000001	385	R/W	Timer 3 Off time (1) (2)	Refer to par. [48F] on page 159	
		110000010 110010000	386 400	R/W	Not used		
		110010001	401	R/W	Logical functions (1) (2)	Refer to par. [4A1] on page159	
						0	A+B
						1	AxB
						2	A+NB
						3	AxNB
						4	S-R
						5	NS-R
						6	N
						7	NAB
		110010010	402	R/W	A Trigger (1) (2)	Refer to par. [4A2] on page 159	
						0	SELE
						1	IN
						2	OUT
		110010011	403	R/W	Number (1) (2)	Refer to par. [4A3] on page 159	
		110010100	404	R/W	B Trigger (1) (2)	Refer to par. [4A4] on page 159	
						0	SELE
						1	IN
						2	OUT
		110010101	405	R/W	Number (1) (2)	Refer to par. [4A5] on page 160	
		110010110 110011111	406 415	R/W	Not used		
		110100000	416	R/W	Pre-feeding type	Refer to par. [4B1] on	

						page 160	
		110100001 110100010	417 418	R/W	Not used		
		110100011	419	R/W	Speed	Refer to par. [4B4] on page 160	
						0	FINE
						1	COARSE
						2	MEDIUM
		110100100	420	R/W	Pre-feeding timer	Refer to par. [4B5] on page 160	

Table 28-6 – Expanded Command List

(1) Write this command after writing values to Low Dword of RxPDO then apply this command with New CMD.
(2) To access the related value, read Low Dword of TxPDO.
(3) In Master-Slave operation, in the master device, these fields can also be changed during the process. But the master device cannot update the slave devices during the process, so these fields must be updated for each slave device separately in Master-Slave operation.

Programming steps of frequent used commands:

Reading a weight value:

1. Check the B47...B44 bits of TxPDO 1 (T_UL1).
2. If there is not any error, read the weight value (gross, net or tare).

Zero Calibration procedure:

1. Check the Bit-0 of Calibration Status. it should be '1'(set) to start adjustment.
2. Write 'Adjust Zero Calibration' command and apply New CMD to start Zero calibration.
3. Check the Bit-1 of Calibration Status. it is '1'(set) during zero calibration process.
4. The Bit-0 of Calibration Status changes to '1'(set) at the end of the Zero calibration.
5. If the Bit-3~Bit-10 of Calibration Status is '1'(set), check the description to understand the calibration error.

Span Calibration procedure:

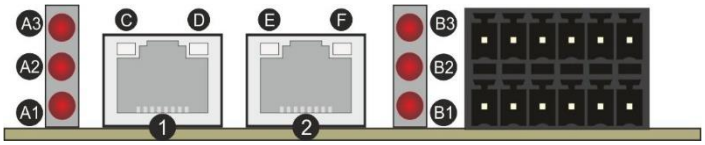
1. Check the Bit-0 of Calibration Status. it should be '1'(set) to start adjustment.
2. Write 'Adjust Span Calibration' command after writing test weight values to Low Dword of RxPDO 1 (R_UL1), then apply this command with New CMD to start Span calibration.
3. Check the Bit-1 of Calibration Status. it is '1'(set) during span calibration process.
4. The Bit-0 of Calibration Status changes to '1'(set) at the end of the Span calibration.
5. If the Bit-3~Bit-10 of Calibration Status is '1'(set), check the description to understand the calibration error.

29. APPENDIX 12. ETHERNET/IP (ONLY FT-113FILL EI)

EtherNet/IP interface of the weighing instrument can be done via hub switch or serial bus over two EtherNet/IP port.

1. Serial bus connection of instruments. You may connect instruments serial to your EtherNet/IP bus via two ports.
2. Star connection. If you connect the instrument to your PLC via hub switch, you can use P1 or P2 port on the instrument. You may change the port, if there is any malfunction on port in use.

The EtherNet/IP interface supports 10/100Mbit, full or half duplex operation.
EDS file for two port EtherNet/IP is available on www.flintec.com
There are announcement LEDs on the instrument to indicate the interface status as appears below.



Ref.	Definition	Ref.	Definition	Ref.	Definition
A3	Network Error LED	B3	Module Error LED	1,2	Interface ports (P1,P2)
A2	Not used	B2	Not used	E,F	Link/Activity LEDs for P2
A1	Network Status LED	B1	Module Status LED	C,D	Link/Activity LEDs for P1

A1 Network Status LED

LED State	Description
Off	No IP address
On	Online, one or more connections established (CIP Class 1 or 3)
Flashing	Online, no connections established

A3 Network Error LED

LED State	Description
Off	No error
On	Duplicate IP address, FATAL error
Flashing	One or more connections timed out (CIP Class 1 or 3)

B1 Module Status LED

LED State	Description
Off	No power
On	Controlled by a scanner in run state
Flashing	Not configured, or scanner in idle state

B3 Module Error LED

LED State	Description
Off	No Error
On	Major fault (EXCEPTION state, FATAL error etc.)
Flashing	Recoverable fault(s)

In the case of LED warning, check cabling, configuration, IP address and device name. Power off the instrument and reenergize the instrument 30 seconds later.

C,D,E,F LINK/Activity LED

LED State	Description
Off	No link, no activity
Green	Link (100 Mbit/s) established
Green, flickering	Activity (100 Mbit/s)
Yellow	Link (10 Mbit/s) established
Yellow, flickering	Activity (10 Mbit/s)

29.1 Electrical Connection

Figure 29.1 – PLC Connection

EtherNet/IP Connector pin configuration (RJ45)

Pin	Signal	DIR	Description
1	TX+	Out	Differential Ethernet transmit data +
2	TX–	Out	Differential Ethernet transmit data –
3	RX+	In	Differential Ethernet receive data +
6	RX–	In	Differential Ethernet receive data –
4	Not used		Terminated
5	Not used		Terminated
7	Not used		Terminated
8	Not used		Terminated
	Shield		Chassis ground

The HUB connection cabling will be a direct connection as shown below:

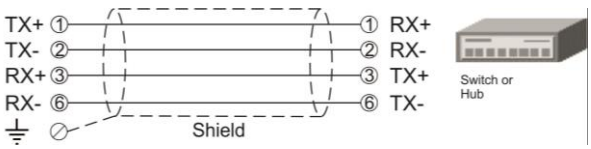


Figure 29.2 - HUB connection

The PC connection cabling will be done via cross cable as shown below. IP address blocks and gateway address of filling controller and PC should be the same in cross connection.

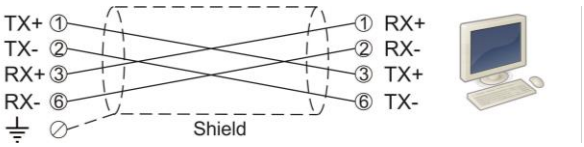


Figure 29.3 - Cross PC connection

Pin configuration of digital input and output connector is described in Appendix 1.

29.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

29.3 EtherNet/IP Parameters

EtherNet/IP parameters can be adjusted by keys in programming mode.
Refer to parameter block [19-].

Parameters	Descriptions
Host Name	Device name of the instrument.
DHCP	Dynamic Host Configuration Protocol automates network parameters if it is enabled.
IP Address	If DHCP is disabled, obtain IP address manually. Refer to parameter 192.
Gateway	If DHCP is disabled, obtain default gateway manually. Refer to parameter 195.
Subnet Mask	If DHCP is disabled, obtain subnet mask manually. Refer to parameter 194.
Primary DNS	If DHCP is disabled, obtain primary DNS manually.
Secondary DNS	If DHCP is disabled, obtain secondary DNS manually.
Password	Default password is 123456.

29.4 EDS Configuration

EtherNet/IP data structures consist of **2 x Input-2 words and 2 x Output-2 words**.
EDS configuration for PLC programmers is shown in Figure 29.4 and Figure 29.5.

Data Length	Description
Input 2 words	1st Dword (FT-113Fill Output to PLC Input)
Input 2 words	2nd Dword (FT-113Fill Output to PLC Input)
Output 2 words	1st Dword (PLC Output to FT-113Fill Input)
Output 2 words	2nd Dword (PLC Output to FT-113Fill Input)

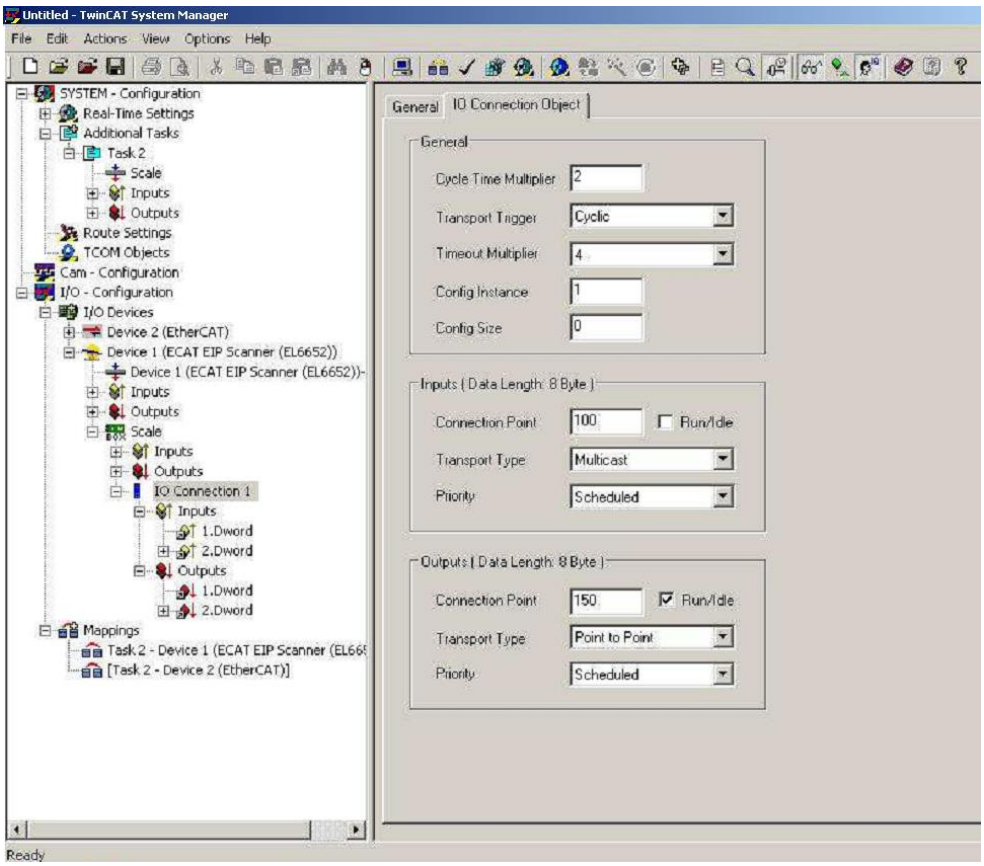


Figure 29.4 – Configuration of module properties without EDS file

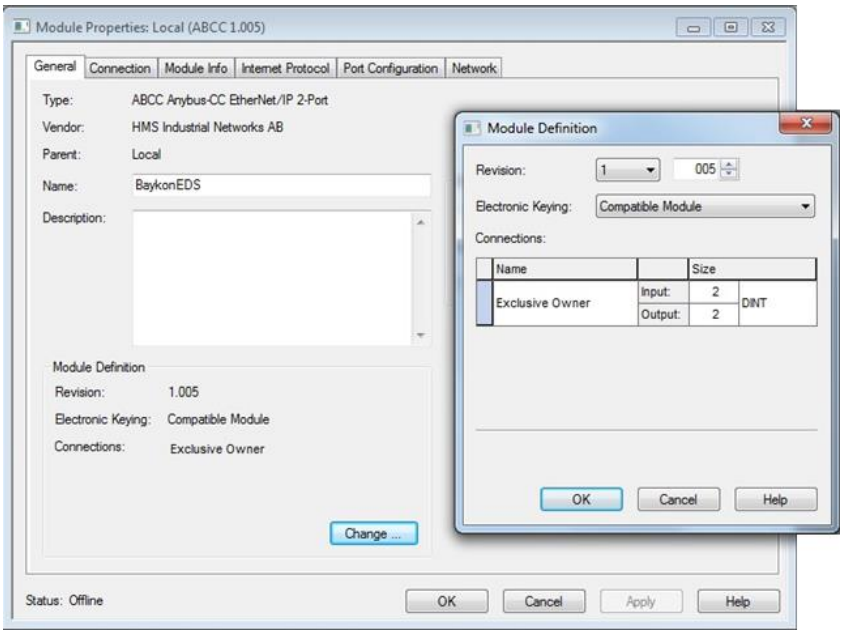


Figure 29.5 – Configuration of module properties with EDS file

29.5 EtherNet/IP Data Structure

For the Data Structure see Appendix Data Structure, page 256

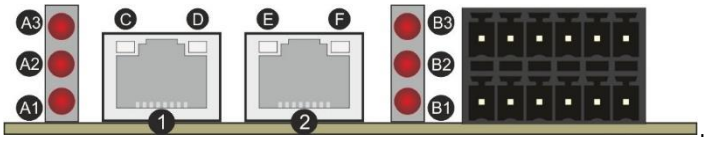
30. APPENDIX 13. ETHERCAT (ONLY FT-113FILL EC)

EtherCAT interface of the weighing instrument can be done via hub switch or serial bus over two EtherCAT port.

1. Serial bus connection of instruments. You may connect instruments serial to your EtherCAT bus via two ports.
2. Star connection. If you connect the instrument to your PLC via hub switch, you can use P1 port on the instrument.

The EtherCAT interface supports 100Mbit, full duplex operation.
ESI file for two port EtherCAT is available on www.flintec.com .

There are announcement LEDs on the instrument to indicate the interface status



Ref.	Definition	Ref.	Definition	Ref.	Definition
A3	Network Error LED	B3	Not used	1,2	Interface ports (IN, OUT)
A2	Not used	B2	Not used	D,F	Not used
A1	Network Status LED	B1	Module Status LED	C,E	Link/Activity LEDs

A1 Network Status LED

LED State	Description
Off	INIT
On	OPERATIONAL
Blinking	PRE-OPERATIONAL
Single flash	SAFE-OPERATIONAL

A3 Network Error LED

LED State	Description
Off	No error
On	(Fatal Event)

B1 Module Status LED

LED State	Description
Off	No any error (or no power)
Blinking	Invalid configuration; State change received from master is not possible due to invalid register or object settings.
Single flash	Unsolicited state change; Slave device application has changed the EtherCAT state autonomously.
Double flash	Application watchdog timeout
On	Application controller failure

In the case of LED warning, check cabling, configuration, IP address and device name. Power off the instrument and reenergize the instrument 30 seconds later.

C,E LINK/Activity LED

LED State	Description
Off	No link, no activity.
Green	Link sensed, no activity.
Green, flickering	Link sensed, activity exist.

30.1 Electrical Connection

Figure 30.1 – PLC Connection

EtherCAT Connector pin configuration (RJ45)

Pin	Signal	DIR	Description
1	TX+	Out	Differential Ethernet transmit data +
2	TX–	Out	Differential Ethernet transmit data –
3	RX+	In	Differential Ethernet receive data +
6	RX–	In	Differential Ethernet receive data –
4	Not used		Terminated
5	Not used		Terminated
7	Not used		Terminated
8	Not used		Terminated
	Shield		Chassis ground

The HUB connection cabling will be a direct connection as shown:

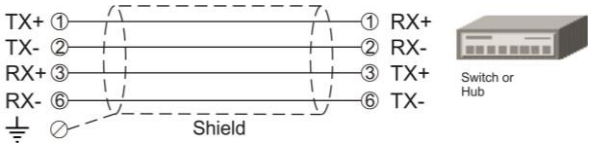


Figure 30.2 - HUB connection

Pin configuration of digital input and output connector is described in Appendix 1.

30.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

30.3 ESI Configuration

EtherCAT data structures consist of 2 x Input-2 words and 2 x Output-2 words.

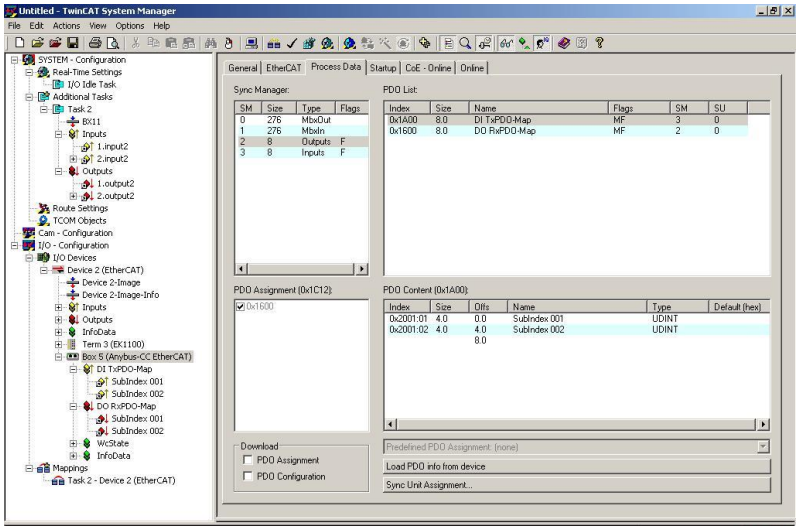


Figure 30.3 – Configuration of module properties for Beckhoff

Input/Output	Definition	Description
DI TxPDO-Map	SubIndex 001	1st Dword (*FT-113Fill Output to PLC Input*)
	SubIndex 002	2nd Dword (*FT-113Fill Output to PLC Input*)
DO RxPDO-Map	SubIndex 001	1st Dword (*PLC Output to FT-113Fill Input*)
	SubIndex 002	2nd Dword (*PLC Output to FT-113Fill Input*)

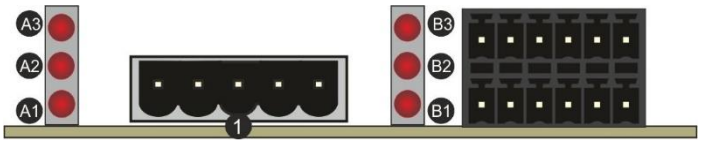
30.4 EtherCAT Data Structure

For the Data Structure see Appendix Data Structure, **page 256**

31. APPENDIX 14. CC-LINK (ONLY FT-113FILL CC)

After setting related parameters you can communicate with FT-113Fill via CC-Link network. Supported CC-Link version is v1.10 and baud rates are 156 kbps (default), 625 kbps, 2,5 Mbps, 5 Mbps and 10 Mbps.

There are LEDs near the CC-Link connector which are;



Ref.	Definition	Ref.	Definition	Ref.	Definition
A3	Operation Error LED	B3	Not used		
A2	Not used	B2	Not used		
A1	Operation mode LED	B1	Module Error LED	1	CC-Link port

A1 Operation mode LED

LED State	Description
Off	No network participation, timeout status (no power)
On	Participating, normal operation

A3 Operation Error LED

LED State	Description
Off	No error
On	Major fault (FATAL error)

B1 Module Error LED

LED State	Description
Off	No error detected (no power)
On	Major fault (Exception or FATAL event)
Flickering	CRC error (temporary flickering)
Flashing	Station Number or Baud rate has changed since startup (flashing)

In the case of red LED warning, check cabling, configuration and station number. Power off the instrument and reenergize the instrument 30 seconds later.

31.1 Electrical Connection

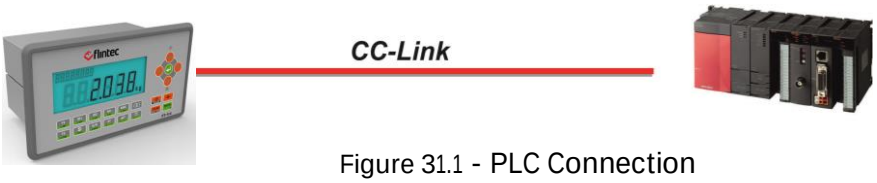
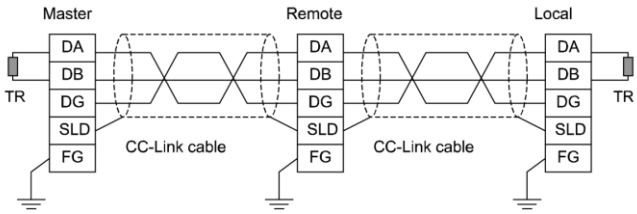


Figure 31.1 - PLC Connection

CC-Link Connector pin configuration

Pin	Signal	Description
1	DA	PositiveRS485 Rxd/TxD
2	DB	NegativeRS485 Rxd/TxD
3	DG	Signal ground
4	SLD	Cable Shield
5	FG	Protective Earth



Pin configuration of digital input and output connector is described in Appendix 1.

31.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

31.3 CC-Link Configuration

The filling controller has occupied one station area on CC-Link network and station type of filling controller must be programmed as 'Remote device station' in the PLC software.

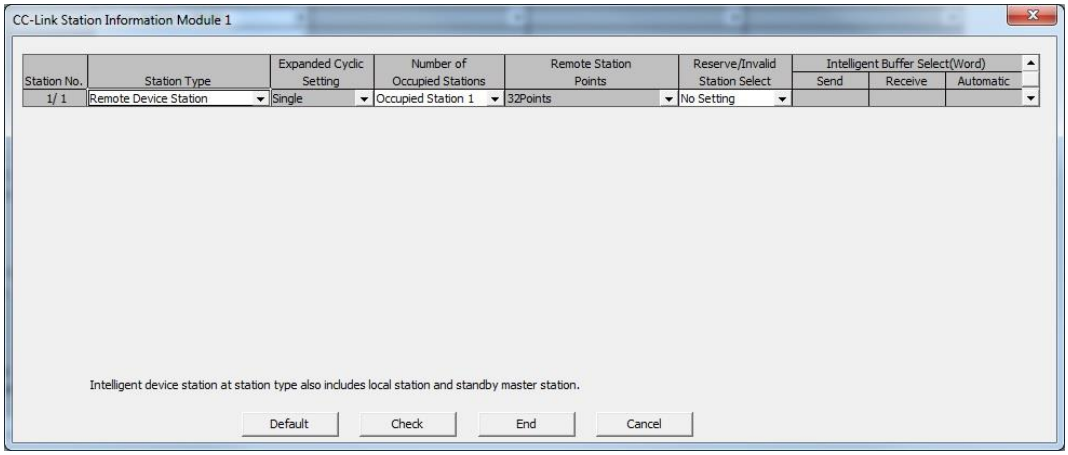


Figure 31.2 – Station information

Input/Output	Definition	Description
Remote Register (RWr)	RWr0, RWr1	1st Dword Input (*FT-113Fill Output to PLC Input*)
	RWr2, RWr3	2nd Dword Input (*FT-113Fill Output to PLC Input*)
Remote Input (RX)	RX0 ~ RX31	Not used
Remote Register (RWw)	RWw0, RWw1	1st Dword Output (*PLC Output to FT-113Fill Input*)
	RWw2, RWw3	2nd Dword Output (*PLC Output to FT-113Fill Input*)
Remote Output (RY)	RY0 ~ RY31	Not used

31.4 CC-Link Data Structure

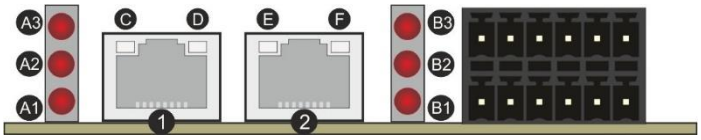
For the Data Structure see Appendix Data Structure, **page 256**

32. APPENDIX 15. POWERLINK (ONLY FT-113FILL PL)

Powerlink interface of the weighing instrument can be done via hub switch or serial bus over two Powerlink port.

1. Serial bus connection of instruments. You may connect instruments serial to your Powerlink bus via two ports.
2. Star connection. If you connect the instrument to your PLC via hub switch, you can use P1 or P2 port on the instrument. You may change the port if there is any malfunction on port in use.

The Powerlink interface is 100Mbit and half duplex.
XDD file for two port Powerlink is available on www.flintec.com
There are announcement LEDs on the instrument to indicate the interface status as appears below.



Ref.	Definition	Ref.	Definition	Ref.	Definition
A3	Network Error LED	B3	Not used	1,2	Interface ports (IN, OUT)
A2	Not used	B2	Not used	D,F	Not used
A1	Network Status LED	B1	Module Error LED	C,E	Link/Activity LEDs

A1 Network Status LED

LED State	Description
Off	Module is off, initializing, or not active.
Fast flashinga	NMT_CS_BASIC_ETHERNET Basic Ethernet state: no POWERLINK traffic has been detected.
Single flash	NMT_CS_PRE_OPERATIONAL_1. Only asynchronous data.
Double flash	NMT_CS_PRE_OPERATIONAL_2. Asynchronous and synchronous data. No PDO data.[b]
Triple flash	NMT_CS_READY_TO_OPERATE. Ready to operate. Asynchronous and synchronous data. No PDO data.[b]
On	NMT_CS_OPERATIONAL. Fully operational. Asynchronous and synchronous data. PDO data is sent and received.
Slow flashingc	NMT_CS_STOPPED Module stopped (for controlled shutdown, for example). Asynchronous and synchronous data. No PDO data.[b]

a. On 50 ms, off 50 ms.
b. Any process data sent is declared not valid and received process data must be ignored in this state.
c. On 200 ms, off 200 ms.

A3 Network Error LED

LED State	Description
Off	No error
On	If the MODULE ERROR LED also is On, a fatal event was encountered.

B1 Module Error LED

LED State	Description
Off	No error
On	If the NETWORK ERROR LED is Off, a non-fatal error has been detected. If the NETWORK ERROR LED is On, a fatal event was encountered.

In the case of LED warning, check cabling, configuration, IP address and device name. Power off the instrument and reenergize the instrument 30 seconds later.

C,E LINK/Activity LED

LED State	Description
Off	No link.
Green	Link, no traffic.
Green, flashing	Link and traffic.

32.1 Electrical Connection

Figure 32.1 - PLC Connection

Powerlink Connector pin configuration (RJ45)

Pin	Signal	DIR	Description
1	TX+	Out	Differential Ethernet transmit data +
2	TX–	Out	Differential Ethernet transmit data –
3	RX+	In	Differential Ethernet receive data +
6	RX–	In	Differential Ethernet receive data –
4	Not used		Terminated
5	Not used		Terminated
7	Not used		Terminated
8	Not used		Terminated
	Shield		Chassis ground

The HUB connection cabling will be a direct connection as shown below:

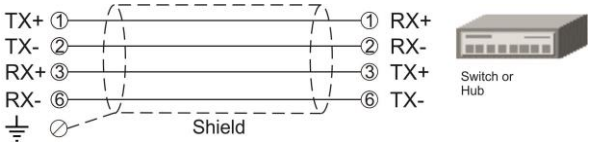


Figure 32.2 - HUB connection

Pin configuration of digital input and output connector is described in Appendix 1.

32.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

32.3 XDD Configuration

Powerlink data structures consist of 2 x Input-2 words and 2 x Output-2 words. XDD configuration for PLC programmers is shown in Figure 32.3.

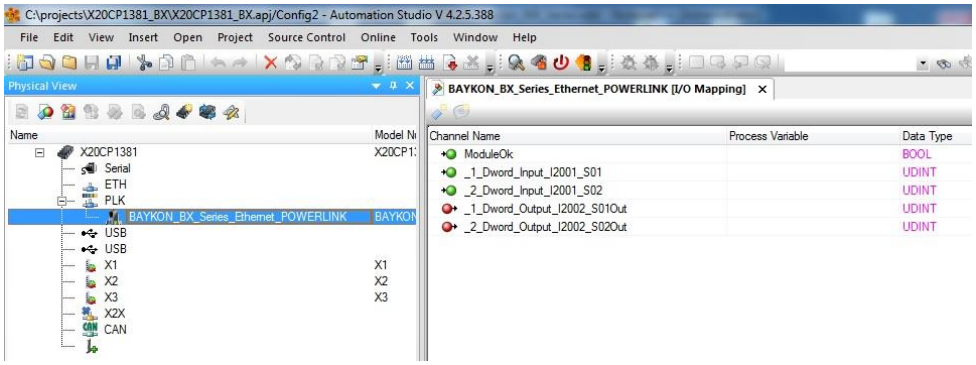


Figure 32.3 – Configuration of module properties with XDD file

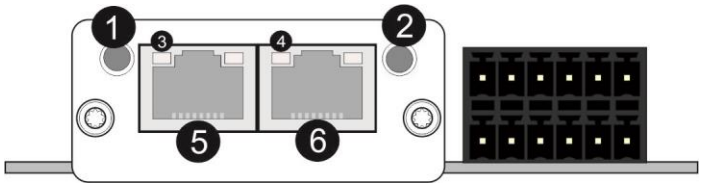
Data Length	Description
1_Dword_Input_I2001_S01	1st Dword (FT-113Fill Output to PLC Input)
2_Dword_Input_I2001_S02	2nd Dword (FT-113Fill Output to PLC Input)
1_Dword_Output_I2002_S01Out	1st Dword (PLC Output to FT-113Fill Input)
2_Dword_Output_I2002_S02Out	2nd Dword (PLC Output to FT-113Fill Input)

32.4 Powerlink Data Structure

For the Data Structure see Appendix Data Structure, **page 256**

33. APPENDIX 16. CC-LINK IE FIELD (ONLY FT-113FILL IE)

After setting related parameters you can communicate with FT-113Fill via CC-Link network.



1	(A) NS/RUN LED
2	(B) AS/ERROR LED
3	Link/Activity LED (port 1)
4	Link/Activity LED (port 2)
5	P1 interface (port 1)
6	P2 interface (port 2)

(A) NS/RUN LED

State	Indication
Off	No power Operation abnormal
Green	Operation normal
Red	Fatal Event *If NS/RUN and AS/ERR turn red, this indicates a fatal event.*

(B) AS/ERROR LED

State	Indication
Off	No error detected (or no power)
Red	Error *An error occurred in the device. If NS/RUN is off, the device enters state EXCEPTION. If NS/RUN and AS/ERR turn red, this indicates a fatal event.*

In the case of red LED warning, check cabling, configuration and station number. Power off the instrument and reenergize the instrument 30 seconds later.

33.1 Electrical Connection

Figure 33.1 - PLC Connection

CC-Link IE Field Connector pin configuration

Pin	Signal	Description
1	TP1+	Transmit/Receive 1 positive
2	TP1-	Transmit/Receive 1 negative
3	TP2+	Transmit/Receive 2 positive
6	TP3+	Transmit/Receive 3 positive
4	TP3-	Transmit/Receive 3 negative
5	TP2-	Transmit/Receive 2 negative
7	TP4+	Transmit/Receive 4 positive
8	TP4-	Transmit/Receive 4 negative
Housing	Shield	Connected to FE through a 1nF capacitor and a 1 Mohm resistor. Note that the connector shields are separated to prevent ground currents.

Pin configuration of digital input and output connector is described in Appendix 1.

33.2 Data Format

Data format of weight value can be programmable for Floating point (IEEE 754) or Integer.
Refer to parameter [191].

33.3 CC-Link IE Configuration

The filling controller has occupied one station area on CC-Link network and station type of filling controller must be programmed as 'Remote device station' in the PLC software. CC-Link configuration for PLC programmers is shown in Figure 31.2.

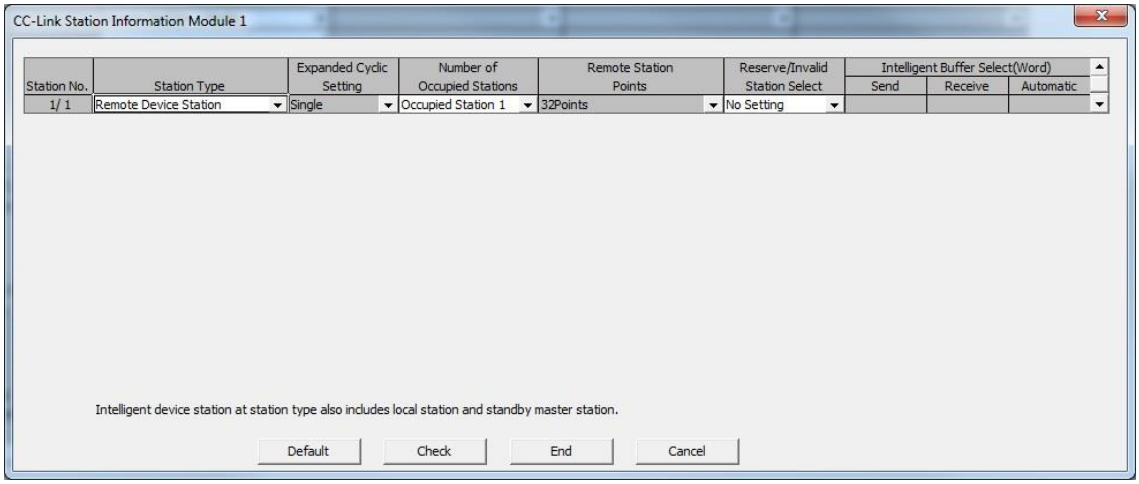


Figure 33.2 – Station information

Input/Output	Definition	Description
Remote Register (RWr)	RWr0, RWr1	1st Dword Input (*FT-113Fill Output to PLC Input*)
	RWr2, RWr3	2nd Dword Input (*FT-113Fill Output to PLC Input*)
Remote Input (RX)	RX0 ~ RX31	Not used
Remote Register (RWw)	RWw0, RWw1	1st Dword Output (*PLC Output to FT-113Fill Input*)
	RWw2, RWw3	2nd Dword Output (*PLC Output to FT-113Fill Input*)
Remote Output (RY)	RY0 ~ RY31	Not used

33.4 CC-Link IE Data Structure

For the Data Structure see Appendix Data Structure, **page 256**

34. DATA STRUCTURE - PROFIBUS, PROFINET, ETHETNET/IP, ETHERCAT, CC-LINK, POWERLINK, CC-LINK IE

FT-113Fill Output to PLC Input

Bitwise of a Dword:

Dword (Only read)	B31	B30	B29	B28	B27	B26	B25	B24	B23	B22	B21	B20	B19	B18	B17	B16
	B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0

1st Dword Input (RWr0, RWr1)	By default, Actual weight value is represented. To represent other weight or calibration status, refer to next Dword.															
2nd Dword Input (RWr2, RWr3)	Out10	Out9	Out8	Out7	Out6	Out5	Out4	Out3	Out2	Out1	In 6	In 5	In 4	In 3	In 2	In 1
	Error codes of FT-113Fill				Unit	Process Error	P.Tare	Centre of zero	Gross Net	SD	Read command response					Cmd Flg

Description of Input 2nd Dword (INPUT)

Bit Number	Description			
B31... B22	Digital Outputs	Output bit status (Active = 1)		
B21... B16	Digital Inputs	Input bit status (Active = 1)		
B15... B12	Error Codes of FT-113Fill	**Bin**	**Dec**	**Descriptions**
		0000	0	No error found
		0001	1	ADC out
		0010	2	ADC over
		0011	3	ADC under
		0100	4	System Error
		0101	5	In programming mode
		0110	6	Low/High Voltage Error
		0111	7	Tilt Switch is active
		1000	8	Master/Slave Communication error
B11	Unit	0		First unit
		1		Second unit
B10	Process Error	0		No error
		1		Check "Process error messages" in the read command
B9	Preset Tare	0		Preset tare is passive
		1		Preset tare is active
B8	Centre of zero	0		Weight is out of zero range
		1		Weight is in zero range
B7	Indication	0		Gross
		1		Net
B6	Stability Detection	0		Stable
		1		Unstable

		Bin	Dec	Descriptions
B5 … B1	Read Command Response	0000 0	0	Actual weight (Net if the indication is in Net)
		00001	1	Gross weight
		00010	2	Tare weight
		00011	3	ALL Status (Refer to Table 34-2)
		00100	4	Calibration Status (Refer to *Table 34-3*)
		00101 01100	5 12	Not used
		01101	13	Digital Inputs status *(Refer to Table 34-4)*
		01110	14	Digital Outputs status *(Refer to Table 34-5)*
		011111 0000	15 16	Not used
		10001	17	Target value
		10010	18	+ Tolerance
		10011	19	Coarse feed value
		10100	20	Medium feed value
		10101	21	Fine feed value
		10110	22	Label number (CN)
		10111	23	Last filled value
		11000	24	Quantity of Erasable Accumulation
		11001	25	Total of Erasable Accumulation
		11010	26	The current day's Accumulation
		11011	27	Yesterday's Accumulation
		11100 11101	28 29	Not used
		11110	30	Process error messages *(Refer to Table 34-1)*
		11111	31	Expanded Commands List *(Refer to Table 34-6)*
B0	CMD Flag	Toggles		The command is applied successfully

Process error messages (always 32 bit integer)

1st Dword (INPUT) indicated in the table below when read command selected as 'Process error messages'.
Refer to 2nd Dword (OUTPUT) to select this command.

Bit Number	1st Dword Description			
B31 … B16	Not in use			
B15 … B8	Process State Refer to section 35.1	Bin	Dec	Process state
		00000000	0	No process (Adc out, Over, Under etc.)
		00000001	1	Weight Mode
		00000010	2	Ready
		00000011	3	Taring
		00000100	4	Zeroing
		00000101	5	Coarse Feed
		00000110	6	Middle Feed
		00000111	7	Fine Feeding
		00001000	8	Valve to Down
		00001001	9	Valve to Up
		00001010	10	Settling
		00001011	11	Filling
		00001100	12	End of Fill
		00001101	13	Discharging
		00001110	14	Discharging Delay
		00001111 00010011	15-19	Not used
		00010100	20	Run Inactive

		00010101	21	Inhibited
		00010110	22	Lance Position
		00010111	23	In Standby mode
		00011000	24	Release the bag input is active
		00011001	25	Waiting for a bag
		00011010	26	Lifter to Up
		00011011	27	Lifter to Down
B7 … B0	Process Warning Messages Refer to section 35.1	**Bin**	**Dec**	**Messages**
		00000000	0	No process error
		00000001	1	Batch Finished
		00000010	2	By-Pass
		00000011	3	Not used
		00000100	4	Reset
		00000101	5	Interrupted
		00000110	6	Hold Status
		00000111	7	Check Fill Stop
		00001000	8	Check Discharge Stop
		00001001	9	Alarm
		00001010	10	Inhibited
		00001011	11	Discharge interrupted
	Process error Messages *Refer to section 0*	10000000	128	Feeding Gate is not Opening or Closing
		10000001	129	Tare Range Error
		10000010	130	Taring could not execute.
		10000011	131	Zeroing Fail
		10000100	132	Zeroing Range
		10000101	133	Filling Time
		10000110	134	Valve Position
		10000111	135	Wrong Position
		10001000	136	Not used
		10001001	137	Maxfill Limit
		10001010	138	+Tolerance Error
		10001011	139	Stable Error
		10001100	140	Clmp Is Open
		10001101	141	Loadcell Error
		10001110	142	-Tolerance Error
		10001111	143	Discharge Gate
		10010000	144	Tilted
		10010001	145	Not used
		10010010	146	Multicycle filling?

Table 34-1 – Process error messages

ALL Status (always 32 bit integer)

1st Dword (INPUT) indicated in the table below when read command selected as 'ALL Status'. *Refer to 2nd Dword (OUTPUT) to select this command.*

Bit Number	1st Dword (input) Description		
B31	Place of decimal point	0	None
		1	No decimal point
B30		0	None
		1	Decimal point is X.X
B29		0	None
		1	Decimal point is X.XX
B28		0	None
		1	Decimal point is X.XXX
B27		0	None
		1	Decimal point is X.XXXX
B22 ... B26	Not in use		
B21	Hold	0	Hold is passive
		1	Hold is active
B20	By-Pass	0	By-Pass is passive
		1	By-Pass is active
B19	Inhibit	0	Inhibit is passive
		1	Inhibit is active
B18	Interrupt	0	Interrupt is passive
		1	Interrupt is active
B17	Process Error	0	No filling error
		1	Process error. (Check the 'Process error messages')
B16	Operation mode	0	Filling mode
		1	Basic weighing mode
B14 ... B15	Not in use		
B13	High resolution status	0	Passive
		1	Active
B12	Centre of zero	0	Weight is out of zero range
		1	Weight is in zero range
B11	Key lock status	0	Passive
		1	Active
B7-B10	Not used		
B6	Unit indication	0	First Unit (power on unit)
		1	Second Unit
B5	Power On Zero	0	Not power on zeroed
		1	Zeroed with power on zero
B4	Preset Tare	0	Preset tare is passive
		1	Preset tare is active
B3	Indication	0	Gross mode
		1	Net mode
B2	Motion Detection	0	Stable
		1	Unstable
B1	Not used		
B0	Not used		

Table 34-2 – ALL Status table

Calibration Status (always 32 bit integer)

1st Dword (INPUT) indicated in the table below when read command selected as 'Calibration Status'. *Refer to 2nd Dword (OUTPUT) to select this command.*

Bit Number	1st Dword (input) Description	
B31 ... B11	Not in use	
B10	0	No Error
	1	The Calibration DIP switch is not 'On' position. - Check the calibration DIP switch.
B9	0	No Error
	1	Scale unstable - Wait until scale become stable - Check grounding wiring
B8	0	No Error
	1	Calibration load value entry Error - Test weight is too small. Increase the weight
B7	0	No Error
	1	Calibration Error - Calibration loading is not enough - Check test weight loading - Check load cell connections
B6	0	No Error
	1	Instrument cannot be calibrated. - Load cell signal is very low or too high
B5	0	No Error
	1	Instrument cannot be calibrated - Check load cell cable - Re-energize the instrument
B4	0	No Error
	1	ADC Error - Re-energize the instrument - If seen again, change the board.
B3	0	No Error
	1	Calibration Timeout - Restart calibration
B2	0	None
	1	Span calibration in process ...
B1	0	None
	1	Zero calibration in process ...
B0	0	Not ready for calibration
	1	Ready for calibration

Table 34-3 – Calibration status

Digital Inputs Status (always 32 bit integer)

1st Dword (INPUT) indicated in the table below when read command selected as 'Digital Inputs Status'. *Refer to 2nd Dword (OUTPUT) to select this command.*

Bit Number	1st Dword (input) Description	
B31	Not in use	0 – Passive 1 – Active Refer to related filling mode and select inputs for details. Page 41 and 146
B30	RLB2	
B29	RLB1	
B28	DINT	
B27	RCP2	
B26	RCP1	
B25	STBY	
B24	TILT	
B23	FBU2	
B22	FBU1	
B21	IN-B	
B20	IN-A	
B19	TMR3	
B18	TMR2	
B17	TMR1	
B16	S2	
B15	BYPA	
B14	EMPT	
B13	DROP	
B12	HOLD	
B11	INTE	
B10	REJE	
B9	ACK	
B8	INHI	
B7	RUN	
B6	Not used	
B5	Input-6	
B4	Input-5	
B3	Input-4	
B2	Input-3	
B1	Input-2	
B0	Input-1	

Table 34-4 – Digital inputs status

Digital Outputs Status (always 32 bit integer)

1st Dword (INPUT) indicated in the table below when read command selected as 'Digital Outputs Status'. *Refer to 2nd Dword (OUTPUT) to select this command.*

Bit Number	1st Dword (input) Description	
B31 ... B29	Not in use	0 – Passive 1 – Active Refer to related filling mode and select inputs for details. Page 41 and 147
B30	ETAR	
B29	OVER	
B28	FBU2	
B27	FBU1	
B26	LOGI	
B25	TMR3	
B24	TMR2	
B23	TMR1	
B22	UNDE	
B21	ETOL	
B20	EFIL	
B19	ZR G	
B18	ZR I	
B17	ALAR	
B16	VIBR	
B15	FGAT	
B14	FEED	
B13	END	
B12	EMPT	
B11	PROG	
B10	Not used	
B9	Output-10	
B8	Output-9	
B7	Output-8	
B6	Output-7	
B5	Output-6	
B4	Output-5	
B3	Output-4	
B2	Output-3	
B1	Output-2	
B0	Output-1	

Table 34-5 – Digital outputs status

PLC Output to FT-113Fill Input

1st Dword Input (RWr0, RWr1)	Next Dword defines the usage of this Dword.								
2nd Dword Input (RWr2, RWr3)	Int.		SFE	Reset	Filling start	By-Pass		Expanded Commands List	
	Not used					Command List		Read Data Selection	New CMD

Description of Input 2nd Dword (OUTPUT)

Bit Number	Descriptions				
B31	Interrupt	A transition from 0 to1 activates the interrupt function and transition from 1 to 0 deactivates the interrupt function.			
B30	Not used				
B29	Start for emptying (SFE)	A transition form 0 to1 activates the "Start for emptying" command.			
B28	Reset	A transition form 0 to1 activates the "Reset" command.			
B27	Start for filling	A transition form 0 to1 activates the "Start for filling" command.			
B26	By-Pass	A transition from 0 to1 activates the by-pass function and transition from 1 to 0 deactivates the by-pass function.			
B25	Not used				
B24... B16	Select an item in the Expanded Commands List (Refer to Table 34-6)				
B15... B11	Not used				
B10 ... B6	Command List	**Bin**	**Dec**	**Descriptions**	
		00000	0	None command is activated	
		00001	1	Zero	
		00010	2	Tare	
		00011	3	Clear	
		00100	4	Print	
		00101	5	Adjust zero calibration	Calibration
		00110	6	Adjust span calibration (1)	
		00111	7	Total Load Cell Capacity (1)	eCal Coefficients
		01000	8	Average mV/V value (1)	
		01001	9	Dead Load value (1)	
		01010	10	Save the coefficients of eCal	*Refer to par. [613]*
		01011011101	11 13	Not used	
		01110	14	Control the digital outputs manually [1] *(Refer to Table 34-5 for meanings of bits)*	
		01111100000	15 16	Not used	
		10001	17	Target value [1]	
		10010	18	+ Tolerance	

		10011	19	Coarse feed value [1]
		10100	20	Medium feed value [1]
		10101	21	Fine feed value [1]
		10110	22	Label number (CN)
		10111	23	Not used
		11000	24	Quantity of Erasable Accumulation
		11001	25	Total of Erasable Accumulation
		11010 11110	26 30	Not used
		11111	31	Use the Expanded Command list *(Refer to Table 34-6)*
B5 ... B1	Read Data Selection	00000	0	Actual weight (Net if the indication is in Net)
		00001	1	Gross weight
		00010	2	Tare weight
		00011	3	ALL Status (Refer to Table 34-2)
		00100	4	Calibration Status (Refer to *Table 34-3*)
		00101 01100	5 12	Not used
		01101	13	Digital Inputs status *(Refer to Table 34-4)*
		01110	14	Digital Outputs status *(Refer to Table 34-5)*
		011111 0000	15 16	Not used
		10001	17	Target value
		10010	18	+ Tolerance
		10011	19	Coarse feed value
		10100	20	Medium feed value
		10101	21	Fine feed value
		10110	22	Label number (CN)
		10111	23	Last filled value
		11000	24	Quantity of Erasable Accumulation
		11001	25	Total of Erasable Accumulation
		11010	26	The current day's Accumulation
		11011	27	Yesterday's Accumulation
		11100 11101	28 29	Not used
		11110	30	Process error messages *(Refer to Table 34-1)*
		11111	31	Use the Expanded Command list *(Refer to Table 34-6)*
B0	New CMD	Toggle		Apply commands which are listed in this table.

(1) Write this command after writing values to 1st Dword, then apply this command with New CMD

Expanded Command List

IMPORTANT NOTE:

a) Scale configuration and Recipe parameters (address 63 and above) in the Expanded command list must be loaded at Ready status.

b) To save the Recipe parameters into controller; first, load Recipe parameters between address 252 to 405 and then apply the command 'Save Recipe parameters' (address 20).

c) The expanded command list below is valid for instrument software version 01.05 or higher. For software version 01.04 or lower refer to Manual version 1.1.0 for command list of the instrument.

Here 1st Dword (Input) is the data receiving from PLC and the "B24 ... B16" bits describe below.

Bit No	Description						
B24 ... B16	Expand. Cmds List	**Bin**	**Dec**	**Commands**			
		000000000	0	R	Voltage of power supply(2) The value is indicated with 0.1 VDC increment.		
		000000001	1	R	Load cell millivolt value(2) (Only FT-113Fill) Millivolt of active scale is indicated with 0.01 mV increment.		
		000000010	2	R	Command status (2)	**Dec**	**Descr. of 1st Dword**
						0	None
						1	Cmd. is processing
						2	Command is done
						3	Command failed
		000000011	3	R/W	Reprint the last label (1) (2)	0	None
						1	Reprint the last label
		000000100	4	R/W	High resolution (1) (2)	0	Enable
						1	Disable
		000000101	5	W	Unit change (1)	0	From first to second
						1	From second to first
		000000110	6	R/W	Key lock (1) (2)	0	Enable
						1	Disable
		000000111	7	R/W	Mode (1) (2)	0	Filling mode
						1	Basic w. mode
		000001000	8	W	Start of filling (1)	0	None
						1	Start of filling
		000001001	9	W	Start of Emptying / Discharge (1)	0	None
						1	Start of Discharge
		000001010	10	W	Reset (1)	0	None
						1	Reset
		000001011	11	R/W	Run (1) (2)	0	Enable
						1	Disable
		000001100	12	R/W	By-Pass (1) (2)	0	Enable
						1	Disable
		000001101	13	R/W	Hold (1) (2)	0	Enable
						1	Disable
		000001110	14	R/W	Interrupt (1) (2)	0	Enable
						1	Disable
		000001111	15	R/W	Inhibit (1) (2)	0	Enable
						1	Disable
		000010000	16	W	Error ACK /Resume (1)	0	None
						1	Error Ack / Resume

		000010001	17	R/W	Reject /Do not record [1] [2]	0	None
						1	Reject/Do not record
		000010010	18	R/W	Empty / Discharge the scale [1] [2]	0	Enable
						1	Disable
		000010011	19	R/W	Standby [1] [2]	0	Enable
						1	Disable
		000010100	20	W	Save Recipe parameters [1]	0	None
						1	Save
		000010101	21	W	Write to the recipe memory [1]	0	None
						X	X=Recipe memory number
		000010110	22	W	Call and use from the recipe memory [1]	0	None
						X	X=Recipe memory number
		000010101 000011001	21 25	Not used			
		000011010	26	R	Quantity of Batch/Bulk [2]		
		000011011	27	R	Total of Batch/Bulk [2]		
		000011100	28	R/W	Quantity of Erasable Accumulation [1] [2]		
		000011101	29	R/W	Total of Erasable Accu. [1] [2]		
		000011110	30	R	Quantity of the Current day's Accu. [2]		
		000011111	31	R	Total of the Current day's Accu. [2]		
		000100000	32	R	Quantity of Yesterday's Accu. [2]		
		000100001	33	R	Total of Yesterday's Accu. [2]		
		000100010	34	R/W	Quantity of Grand Total [1] [2]		
		000100011	35	R/W	Grand Total [1] [2] (Low Dword)		
		000100100	36	R/W	Grand Total [1] [2] (High Dword)		
		000100101	37	R/W	Year, Month, day [1] [2] (YYYYMMDD)		Date and time settings. Refer to par. 24-. (always BCD format)
		000100110	38	R/W	Hour & minute [1] [2] (0000HHMM)		
		000100010 000111110	39 62	Not used			
		000111111	63	R/W	Dynamic filter [1] [2]	**Dec**	**Descr. of 1st Dword**
						0	No
						1	Low
						2	Medium
						3	High
		001000000	64	R/W	Filter [1] [2]	0	No
						1	Extra Low
						2	Very Low
						3	Low
						4	Medium
						5	High
						6	Very High
						7	Extra High

		001000001	65	R/W	Power on zero (1) (2)	0	Disable
						1	± 2%
						2	± 2%LK
						3	± 10%
						4	+ 15%, - 5%
						5	± 20%
		001000010	66	R/W	Zeroing Range (1) (2)	0	Disable
						1	± 2%
						2	± 3%
						3	± 20%
						4	± 50%
		001000011	67	R/W	Auto Zero Tracking (1) (2)	0	Disable
						1	± 0,3d
						2	± 0,5d
						3	± 1d
						4	± 2d
						5	± 3d
		001000100	68	R/W	Tare (1) (2)	0	No
						1	Yes
		001000101	69	R/W	Stability Detection Range (1) (2)	0	± 0,3d
						1	± 0,5d
						2	± 1d
						3	± 2d
						4	± 3d
						5	± 4d
						6	± 5d
						7	± 9d
						8	Disable
		001000110	70	R/W	Stability Time (1) (2)	Refer to par. [517] on page 162	
		001000111	71	R/W	Unit (1) (2)	0	g
						1	kg
						2	t
						3	lb
						4	No unit
						5	kLb
		001001000	72	R/W	Range (1) (2)	0	Single range
						1	2 x Multi Range
						2	3 x Multi Range
						3	2 x Multi Interval
						4	3 x Multi Interval
		001001001	73	R/W	Capacity-1 (1) (2)	Refer to par. 523 on page 162	
		001001010	74	R/W	Decimal point-1 (1) (2)	0	XXXXOO
						1	XXXXXO
						2	XXXXXX
						3	XXXXX.X
						4	XXXX.XX
						5	XXX.XXX
		001001011	75	R/W	Increment-1 (1) (2)	0	X1
						1	X2
						2	X5
		001001100	76	R/W	Capacity-2 (1) (2)		
		001001101	77	R/W	Decimalpoint-2 (1) (2)		

		001001110	78	R/W	Increment-2 (1) (2)		
		001001111	79	R/W	Capacity-3 (1) (2)		
		001010000	80	R/W	Decimalpoint-3(1) (2)		
		001010001	81	R/W	Increment-3 (1) (2)		
		001010010	82	R/W	Limit of Indication (1) (2)	0	Over ind. after Max
						1	1 d more than Max
						2	5 d more than Max
						3	9 d more than Max
						4	2% more than Max
						5	5% more than Max
		001010011	83	R/W	Tare type (1) (2)	0	Subtractive tare
						1	Additive tare
						2	Both
		001010100	84	R/W	Maximum tare (1) (2)	Refer to par. [527] on page 163	
		001010101 010000000	85 128	Not Used			
		010000001	129	R/W	Filling modes (1) (2)	Refer to par. [311] on page 143	
						0	OPEN
						1	BUNG
						2	BOTT
						3	PACK
						4	BAG
						5	BIG
						6	VENT
						7	1BAG
						8	nBAG
						9	nPAC
						10	TANK
						11	WOUT
		010000010	130	R/W	Start input signal type (1) (2)	Refer to par. [312] on page 144	
						0	PULS
						1	LEVE
						2	AUTO
		010000011	131	R/W	Discharge input signal type (1) (2)	Refer to par. [313] on page 144	
						0	PULS
						1	LEVE
		010000100	132	R/W	Start filling or emptying/discharging at power on (1) (2)	Refer to par. [314] on page 144	
						0	FILL
						1	DISC
		010000101	133	R/W	Feeding speed Quantity (1) (2)	Refer to par. [315] on page 144	
						0	1
						1	2
						2	3
		010000110	134	R/W	Feeding outputs (1) (2)	Refer to par. [316] on page 144	
						0	C
						1	FC

						2	FMC
		010000111	135	R/W	Max. target of filling (1) (2)	Refer to par. [317] on page 144	
		010001000	136	R/W	Min. target of filling (1) (2)	Refer to par. [318] on page 144	
		010001001	137	R/W	Scale quantity at master slave operation (1) (2)	Refer to par. [319] on page 144	
		010001010 010001111	138 143	R/W	Not used		
		010010000	144	R/W	Feeding gate position control type (1) (2)	Refer to par. [321] on page 145	
						0	NO
						1	1 POS
						2	2 POS
		010010001	145	R/W	Switch type on the feeding gate for checking its position (1) (2)	Refer to par. [322] on page 145	
						0	NO
						1	NCLO
						2	NOPE
		010010010	146	R/W	Switch on the discharge gate (1) (2)	Refer to par. [323] on page 145	
						0	NO
						1	NCLO
						2	NOPE
		010010011	147	R/W	Lance position control type (1) (2)	Refer to par. [324] on page 145	
						0	BIU
						1	BMIU
						2	BIOU
						3	BMIO
		010010100	148	R/W	Movement of valve or lifter at liquid filling modes (1) (2)	Refer to par. [325] on page 145		
							For Open mode	For Bung mode
						0	NO	VALV
						1	LIFT	NO
						2	VALV	LIFT
		010010101	149	R/W	Movement of valve or lifter at liquid big bag mode	Refer to par. [326] on page 145	
						0	NO
						1	CLAM
						2	UP-A
						3	UP-B
		010010110 010011110	150 158	R/W	Not used		
		010011111	159	R/W	Select input 1 (1) (2)	Refer to par. [331] on page 146	
		010100000	160	R/W	Select input 2 (1) (2)	Refer to par. [332] on page 146	
		010100001	161	R/W	Select input 3 (1) (2)	Refer to par. [333] on page 146	
		010100010	162	R/W	Select input 4 (1) (2)	Refer to par. [334] on	

						page	
		010100011	163	R/W	Select input 5 (1) (2)	Refer to par. [335] on page 146	
		010100100	164	R/W	Select input 6 (1) (2)	Refer to par. [336] on page 146	
		010100101	165	R/W	Select input 7 (1) (2)	Refer to par. [337] on page 146	
		010100110	166	R/W	Select input 8 (1) (2)	Refer to par. [338] on page 146	
		010100111	167	R/W	Select input 9 (1) (2)	Refer to par. [339] on page 146	
		010101000	168	R/W	Select output 1 (1) (2)	Refer to par. [33A] on page 146	
		010101001	169	R/W	Select output 2 (1) (2)	Refer to par. [33B] on page 147	
		010101010	170	R/W	Select output 3 (1) (2)	Refer to par. [33C] on page 147	
		010101011	171	R/W	Select output 4 (1) (2)	Refer to par. [33D] on page 147	
		010101100	172	R/W	Select output 5 (1) (2)	Refer to par. [33E] on page 147	
		010101101	173	R/W	Select output 6 (1) (2)	Refer to par. [33F] on page 147	
		010101110	174	R/W	Preact, Medium and Fine feeding entries (1) (2)	Refer to par. [341] on page 147	
						0	VAL
						1	DEV
		010101111	175	R/W	Weight displaying at Filling (1) (2)	Refer to par. [342] on page 147	
						0	INCR
						1	DECR
		010110000	176	R/W	Display after filling (1) (2)	Refer to par. [343] on page 147	
						0	ACTU
						1	FILL
						2	TARG
		010110001	177	R/W	Information display (1) (2)	Refer to par. [344] on page 148	
						0	NO
						1	TARE
						2	GROS
						3	RCPT
						4	R+T
						5	R+Q
						6	Q+🖶
						7	TOTA
						8	PHAS
		010110010 010111100	178 188	R/W	Not used		
		010111101	189	R/W	The function of magnify key (1) (2)	Refer to par. [351] on page 148	
		010111110	190	R/W	The function of change key (1) (2)	Refer to par. [352] on page 148	
		010111111	191	R/W	The func. of F1 key (1) (2)	Refer to par. [353] on page 149	
		011000000	192	R/W	The func. of F2 key (1) (2)	Refer to par. [354] on	

						page 149	
		011000001	193	R/W	The func. of F3 key (1) (2)	Refer to par. [355] on page 149	
		011000010	194	R/W	The func. of F4 key (1) (2)	Refer to par. [356] on page 149	
		011000011	195	R/W	The func. of F5 key (1) (2)	Refer to par. [357] on page 149	
		011000100 011001001	196 201	R/W	Not used		
		011001010	202	R/W	Reserve Input 1 (1) (2)	Refer to par. [371] on page 150	
		011001011	203	R/W	Reserve Input 2 (1) (2)	Refer to par. [372] on page 150	
		011001100	204	R/W	Reserve output 1 (1) (2)	Refer to par. [373] on page 150	
		011001101	205	R/W	Reserve output 2 (1) (2)	Refer to par. [374] on page 150	
		011001110 011111011	206 251	R/W	Not used		
		011111100	252	R/W	Target (1) (2)	Refer to section 3	
		011111101	253	R/W	+ Tolerance (1) (2)		
		011111110	254	R/W	- Tolerance (1) (2)		
		011111111	255	R/W	Not used		
		100000000	256	R/W	Coarse (1) (2)		
		100000001	257	R/W	Medium (1) (2)		
		100000010	258	R/W	Fine (1) (2)		
		100000011	259	R/W	PT (Specific Tare) (1) (2)		
		100000100	260	R/W	Qty of Batch/Bulk (1) (2)		
		100000101	261	R/W	Total of Batch/Bulk (1) (2)		
		100000110 100001001	262 265	R/W	Not used		
		100001010	266	R/W	Gross, net or multicycle filling (1) (2)	**Dec**	**Descr. of 1st Dword**
						Refer to par. [411] on page 151	
						0	NET
						1	GROSS
						2	MULT
		100001011	267	R/W	Tolerance control (1) (2)	Refer to par. [412] on page 151	
						0	No
						1	+/-T
						2	+T -T
						3	+/-F
						4	+F -F
		100001100	268	R/W	Taring at filling (1) (2)	Refer to par. [413] on page 151	
						0	AUTO
						1	AV 5

						2	AV10
						3	ACON
						4	SPEC
		100001101	269	R/W	Min. tare value (1) (2)	Refer to par. [414] on page 151	
		100001110	270	R/W	Max. tare value (1) (2)	Refer to par. [415] on page 151	
		100001111	271	R/W	Valve force (1) (2)	Refer to par. [416] on page 151	
		100010000	272	R/W	Lance B. / Lift W. (1) (2)	Refer to par. [417] on page 152	
		100010001	273	R/W	Lance Middle (1) (2)	Refer to par. [418] on page 152	
		100010010	274	R/W	Overfill weight (1) (2)	Refer to par. [419] on page 152	
		100010011	275	R/W	Batch filling (1) (2)	Refer to par. [41A] on page 152	
						0	NO
						1	QTY
						2	T
						3	Q+T
						4	BULK
		100010100	276	R/W	Soft start method (1) (2)	Refer to par. [41B] on page 152	
						0	NO
						1	FINE
						2	MED
		100010101	277	R/W	Soft start time (1) (2)	Refer to par. [41C] on page 152	
		100010110	278	R/W	The emptying / discharge type (1) (2)	Refer to par. [41D] on page 152	
		100010111	279	R/W	Empty/Discharge weight / Remaining weight (1) (2)	Refer to par. [41E] on page 152	
		100011000	280	R/W	Emptying / discharge time (1) (2)	Refer to par. [41F] on page 152	
		100011001 100100111	281 295	R/W	Not used		
		100101000	296	R/W	Correction technic at Feeding / Discharging (1) (2)	Refer to par. [431] on page 153	
						0	NO
						1	AUTO
						2	TIME
						3	SMRT
		100101001	297	R/W	Fine feeding time (1) (2)	Refer to par. [432] on page 153	
		100101010	298	R/W	Preact adj. frequency (1) (2)	Refer to par. [433] on page 153	
		100101011	299	R/W	Sampling size (1) (2)	Refer to par. [434] on page 153	
		100101100	300	R/W	Preact correction ratio in percent (1) (2)	Refer to par. [435] on page 153	
		100101101	301	R/W	Zeroing freq. (1) (2)	Refer to par. [436] on page 153	
		100101110	302	R/W	Jogging (1) (2)	Refer to par. [437] on page 153	
						0	NO

						1	TIME
						2	AUTO
		100101111	303	R/W	Jogging on time (1) (2)	Refer to par. [438] on page 154	
		100110000	304	R/W	Jogging off time (1) (2)	Refer to par. [439] on page 154	
		100110001	305	R/W	Min. filling error (1) (2)	Refer to par. [43A] on page 154	
		100110010	306	R/W	Max. error limit (1) (2)	Refer to par. [43B] on page 154	
		100110011	307	R/W	Motion window at filling process (1) (2)	Refer to par. [43C] on page 154	
		100110100 100110110	308 310	R/W	Not used		
		100110111	311	R/W	Zeroing delay (1) (2)	Refer to par. [441] on page 154	
		100111000	312	R/W	Taring delay (1) (2)	Refer to par. [442] on page 154	
		100111001	313	R/W	Stbl. check delay (1) (2)	Refer to par. [443] on page 154	
		100111010	314	R/W	Max. stbl. time (1) (2)	Refer to par. [444] on page 154	
		100111011	315	R/W	Start delay (1) (2)	Refer to par. [445] on page 154	
		100111100	316	R/W	End of batch output delay (1) (2)	Refer to par. [446] on page 155	
		100111101	317	R/W	Coarse and medium feed control delay (1) (2)	Refer to par. [447] on page 155	
		100111110	318	R/W	Fine feed ctrl delay (1) (2)	Refer to par. [448] on page 155	
		100111111	319	R/W	FG DEL, VALV DEL or LIFT DEL (1) (2)	Refer to par. [449] on page 155	
		101000000	320	R/W	Complete delay (1) (2)	Refer to par. [44A] on page 155	
		101000001	321	R/W	Catch delay (1) (2)	Refer to par. [44B] on page 155	
		101000010	322	R/W	Clamp release delay (1) (2)	Refer to par. [44C] on page 155	
		101000011	323	R/W	Maximum filling time (1) (2)	Refer to par. [44D] on page 156	
		101000100 101000101	324 325	R/W	Not used		
		101000110	326	R/W	Analogue output Type (1) (2)	Refer to par. [451] on page 156	
						0	NO
						1	0-20
						2	0-10
		101000111	327	R/W	For Coarse feed (1) (2)	Refer to par. [452] on page 156	
		101001000	328	R/W	For Medium feed (1) (2)	Refer to par. [453] on page 156	
		101001001	329	R/W	For Fine feed (1) (2)	Refer to par. [454] on page 156	
		1010010101 01010100	330 340	R/W	Not used		

		101010101	341	R/W	Weighing operation type of the machine (1) (2)	Refer to par. [461] on page 156	
						0	SUBT
						1	NO
						2	ADDI
		101010110	342	R/W	Container quantity on the palette (1) (2)	Refer to par. [462] on page 156	
		101010111	343	R/W	Operation at Batch filling (1) (2)	Refer to par. [463] on page 156	
						0	STOP
						1	FILL
		101011000 101100011	344 355	R/W	Not used		
		101100100	356	R/W	Alarm Setpoint (1) (2)	Refer to par. [471] on page 156	
		101100101	357	R/W	Alarm time (1) (2)	Refer to par. [472] on page 156	
		101100110	358	R/W	Min. Vibration weight (1) (2)	Refer to par. [473] on page 157	
		101100111	359	R/W	Max. Vibration weight(1) (2)	Refer to par. [474] on page 157	
		101101000	360	R/W	Vibration delay (1) (2)	Refer to par. [475] on page 157	
		101101001	361	R/W	Vibration time (1) (2)	Refer to par. [476] on page 157	
		101101010	362	R/W	Zero range (1) (2)	Refer to par. [477] on page 157	
		101101011 101110010	363 370	R/W	Not used		
		101110011	371	R/W	Timer 1 Trigger (1) (2)	Refer to par. [481] on page 158	
						0	SELE
						1	IN
						2	OUT
		101110100	372	R/W	Number (1) (2)	Refer to par. [482] on page 158	
		101110101	373	R/W	Timer 1 Type (1) (2)	Refer to par. [483] on page 158	
						0	Type A
						1	Type B
						2	Type C
						3	Type D
						4	Type E
						5	Type F
		101110110	374	R/W	Timer 1 On time (1) (2)	Refer to par. [484] on page 158	
		101110111	375	R/W	Timer 1 Off time (1) (2)	Refer to par. [485] on page 158	
		101111000	376	R/W	Timer 2 Trigger (1) (2)	Refer to par. [486] on page 158	
						0	SELE
						1	IN
						2	OUT
		101111001	377	R/W	Number (1) (2)	Refer to par. [487] on page 158	
		101111010	378	R/W	Timer 2 Type (1) (2)	Refer to par. [488] on	

						page 158	
		101111011	379	R/W	Timer 2 On time (1) (2)	Refer to par. [489] on page 158	
		101111100	380	R/W	Timer 2 Off time (1) (2)	Refer to par. [48A] on page 158	
		101111101	381	R/W	Timer 3 Trigger (1) (2)	Refer to par. [48B] on page 159	
						0	SELE
						1	IN
						2	OUT
		101111110	382	R/W	Number (1) (2)	Refer to par. [48C] on page 159	
		101111111	383	R/W	Timer 3 Type (1) (2)	Refer to par. [48D] on page 159	
		110000000	384	R/W	Timer 3 On time (1) (2)	Refer to par. [48E] on page 159	
		110000001	385	R/W	Timer 3 Off time (1) (2)	Refer to par. [48F] on page 159	
		110000010 110010000	386 400	R/W	Not used		
		110010001	401	R/W	Logical functions (1) (2)	Refer to par. [4A1] on page159	
						0	A+B
						1	AxB
						2	A+NB
						3	AxNB
						4	S-R
						5	NS-R
						6	N∑
						7	NAB
		110010010	402	R/W	A Trigger (1) (2)	Refer to par. [4A2] on page 159	
						0	SELE
						1	IN
						2	OUT
		110010011	403	R/W	Number (1) (2)	Refer to par. [4A3] on page 159	
		110010100	404	R/W	B Trigger (1) (2)	Refer to par. [4A4] on page 159	
						0	SELE
						1	IN
						2	OUT
		110010101	405	R/W	Number (1) (2)	Refer to par. [4A5] on page 160	
		110010110 110011111	406 415	R/W	Not used		
		110100000	416	R/W	Pre-feeding type	Refer to par. [4B1] on page 160	
		110100001 110100010	417 418	R/W	Not used		
		110100011	419	R/W	Speed	Refer to par. [4B4] on page 160	
						0	FINE
						1	COARSE
						2	MEDIUM

		110100100	420	R/W	Pre-feeding timer	Refer to par. [4B5] on page 160

Table 34-6 – Expanded command list

(1) Write this command after writing values to 1st Dword (Output) then apply this command with New CMD.
(2) To access the related value, read 1st Dword (Input).
(3) In Master-Slave operation, in the master device, these fields can also be changed during the process. But the master device cannot update the slave devices during the process, so these fields must be updated for each slave device separately in Master-Slave operation.

Programming steps of frequent used commands:

Reading a weight value:

1. Check the B12...B15 bits of 'FT-113Fill Output to PLC Input 2nd Dword'.
2. If there is not any error, read the weight value (gross, net or tare).

Zero Calibration procedure:

1. Check the Bit-0 of Calibration Status. it should be '1'(set) to start adjustment.
2. Write 'Adjust Zero Calibration' command and apply New CMD to start Zero calibration.
3. Check the Bit-1 of Calibration Status. it is '1'(set) during zero calibration process.
4. The Bit-0 of Calibration Status changes to '1'(set) at the end of the Zero calibration.
5. If the Bit-3~Bit-10 of Calibration Status is '1'(set), check the description to understand the calibration error.

Span Calibration procedure:

1. Check the Bit-0 of Calibration Status. it should be '1'(set) to start adjustment.
2. Write 'Adjust Span Calibration' command after writing test weight values to 1st Dword, then apply this command with New CMD to start Span calibration.
3. Check the Bit-1 of Calibration Status. it is '1'(set) during span calibration process.
4. The Bit-0 of Calibration Status changes to '1'(set) at the end of the Span calibration.
5. If the Bit-3~Bit-10 of Calibration Status is '1'(set), check the description to understand the calibration error.

35. TROUBLE SHOOTING

FT-113Filling control had been designed as a very reliable and virtually error free instrument. However, if there is an error occurs, do not attempt to repair the equipment before understanding what caused the error. Note the problems you have with your instrument and the error messages shown on the display. Then try to solve the problem according to the error table given below.

35.1 Display Messages at Filling Process

The messages below are shown on the display in the filling cycle or if there is any error in the filling.

DISPLAY MESSAGE	DESCRIPTION
READY	The controller is ready to start filling or discharging.
WAIT FOR BAG	The controller is ready to hold a bag.
TARING	Announces taring before feeding.
ZEROING	Announces automatic zeroing before start feeding.
FILLING	Announces the filling process at TANK and WOUT modes.
VALVE TO DWN	Announces the filling valve is going down.
VALVE TO UP	Announces the filling valve is going up.
LIFTER DOWN	Announces the filling lifter is going down.
LIFTER UP	Announces the filling lifter is going up.
COARSE FEED	Announces the coarse feeding is progress.
MIDDLE FEED	Announces the middle feeding is progress.
FINE FEEDING	Announces the fine feeding is progress.
SETTLING	Announces the stable checking for preact adjustment or sampling.
END OF FILL	This message is shown at the end of filling. The message is shown until the container is removed from the platform in OPEN, BUNG and BOTT modes.
DISCHARGING	Announces the discharging process at bagging and packing modes.
DSCHRG DELAY	Emptying/ Discharge delay time in function.
RUN INACTIVE	Start input is not executed due to run input is not active.
INHIBITED	Announces the inhibit input is active and the filling is inhibited.
LANCE POSITI	Announces the lance position is not at start-up position.
STAND BY	Announces the standby function is active.
BATCH END	Bulk/Batch process is ended.
BYPASS	Announces the By-Pass input is active and bypass is started.
RESET	Announces the process is reset.
INTERRUPTED	Announces the interrupt input is active and filling is interrupted.
HOLD	Announces the hold input is active and filling is held.

CHK FILL STP	Announces that stopped the filling/packing process at the end of filling.
CHK DISC STP	Announces that hold the filling process at the end of discharge / emptying to follow the discharging / emptying.
ALARM	Announces the alarm output is active.
MULTICYCLE?	Announces start filling process as multi cycle method.
SETUP LOADING	Announces related parameters are sending to slave instrument(s).
M/S COMM ERR	Announces the slave instrument is not communicate with the master instrument.
REL CLAM ACT	Announces the release the bag clamp input is active.
WGHT MODE	Announces the controller is at basic weighing.

35.2 Filling Process Related Errors

ERROR MESSAGE	DESCRIPTION
P01 FEEDING GATE	Feeding Gate position error.
P02 TARE RANGE	This message appears if tare of the container is not between minimum tare and maximum tare values entered in Recipe **parameters 413 and 414**. This error is acknowledged by Start or ACK Inputs, if the tare goes to the range.
P03 TARING FAIL	This message appears if Taring could not be executed. For example, if the weight is negative or scale is not stable. When the conditions become normal, error is acknowledged by Start or ACK Inputs.
P04 ZEROING FAIL	This message appears if zeroing cannot be done at the beginning of filling because of the zeroing range (**par. 514**) or unstable load. Applying start or ACK inputs restarts the filling cycle.
P05 ZEROING RANG	This error means the weight is out of Empty weight (**par. 41E**) at the beginning of Filling cycle. Can be acknowledged by Start or ACK inputs.
P06 FILLING TIME	This prompt announces that the filling is not finished in the filling time and is ended. Error is cancelled by Reset input. Refer to **parameter** 44D.
P07 VALVE POSITI	This prompt is displayed and feeding stops, if "Valve is at down position" input becomes passive during feeding. Feeding starts again after "Valve is at down position" input becomes "active".
P08 WRONG POSITI	While the filling valve is going down, if the weight is bigger than Valve Force weight (**par. 416**) this message appears. Error is cancelled by Reset input.
P10 MAXFILL LIMI	The weight is less than discharging target. Error is cancelled by Reset input.
P11 OVER TOLERAN	This message appears if there is over tolerance. Error is acknowledged by the ACK or Start input. Reset or reject inputs cancels the filling.
P12 STABLE ERROR	This message appears if the weight is not stable for 5 times consecutively at the end of filling.
P13 CLMP IS OPEN	Bag holder error. Appears if the bag holder is not closed in Catch delay time (**par. 331**).
P14 OUT OF RANGE	Load exceeds the operation range.

P15 UNDER TOLERA	This message appears in case of under tolerance. Error is acknowledged by the ACK or Start input. Reset and reject inputs cancels the filling.
P16 DSCHRG GATE	Discharge Gate position error.
P17 TILTED	Announces the tilt position error.
P18 SMRT STRT ER	Announces the smart start up feature is not executed. Check the fine time value and material feeder speeds.
P19 CHECK MAXFIL	Announces the multicycle filling feature is not executed. Check the maximum filing limit (**par. 317**).

35.3 General Error Codes

ERROR CODE	DESCRIPTION	THINGS TO DO
	Weight is too low	- Check the load - Load cell or instrument could be broken.
	Over Load	
LC Err	Load exceeds the operation range	- Check the load - Check the calibration - Load cell or instrument could be broken.
+POWERONZEROERR	Weight is out of power on zero range.	- Press ESC key to start indication Without zeroing and call service.
-POWERONZEROERR		
LOW VOLT PWR OFF	Power source voltage is less than 9 VDC.	- Check the power supply voltage.
HIGH VOLT PWROFF	Voltage is more than 30 VDC.	
TILTED	The tilt position error.	- Too much tilting for operation. - Check the tilt equipment. - Change the tilt input.
E01 ADC ERROR	ADC initialization error. ADC could not initialize at power on. ADC or its interface circuitry has a malfunction.	- Power off the instrument reenergizes it after 30 seconds. - Check external load cell connection. - Check load cell connector in the instrument. - Change main board or second scale board.
E02 ADC ERROR	ADC conversion error. ADC could not convert the load cell signal. ADC or its load cell connection circuitry may have a malfunction.	
E03 ADC ERROR	ADC data is out of the range. ADC could not convert the load cell signal in range. ADC or its load cell connection circuitry may have a malfunction or load cell excitation voltage is too low.	
E7 IO POWER ERR	No power for digital I/O board.	- Check the digital I/O board power.

E8 DIG OUT ERR	-There is a failure in the device (relay, valve, etc.) connected to the digital output, - or nothing connected to the digital output, - or the load impedance is too high.	- Check if there is a failure in the device connected to the digital output. - Check if there is a device connected to digital output. - Connect the 100K resistance parallel to the load if the load impedance is too high.
E09 DISPLAY COMM	Communication error between display board and main board.	- Power off the instrument reenergizes it after 30 seconds. - If not, change main board.
E10 NVM VERSION	NVM version error. Factory default will be loaded.	- If you changed the E^2ROM (U12 and U13) press Enter key. The factory defaults will be loaded. - If not, change main board.
E20 CALIBRATION	Checksum error of calibration coefficients.	- Check the scale performance. - Recalibrate the scale. - Change mainboard.
E21 SETUP ERROR	Check sum error of parameters.	- Check the scale performance. - Recalibrate the scale. - Change mainboard.
E22 CHECKSUM ERR	Checksum error of the data.	- Change E^2ROM (U12).
E23 HEADER FOOTE	Header checksum error.	- Press enter key and re-enter the headers. - Change E^2ROM (U13).
E24 HEADER FOOTE	Footnote checksum error.	- Press enter key and re-enter the footers. - Change E^2ROM (U13).
E25 FBUS SETUP E	Fieldbus set up error.	- Press enter key and re-enter the fieldbus setup. - Change E^2ROM (U13).
E28 CLOCK ERROR	Clock error.	- Change CR2032 battery. - Change the main board.
E29 HEADER FOOTE	ID header checksum error.	- Change main board. - Change E^2ROM (U13).
E32 LABEL ERROR	Checksum error of EPL printout format.	- Press enter key and re-load the EPL code. - Change E^2ROM (13).
E34 NOT LOADED	ADC output is not changed enough to make span calibration.	- Recalibrate the scale. - Change mainboard.
E35 LC CONNECTIO	The load cell output is decreased after loading.	- Check load cell connections. - Check test weight loading. - Recalibrate the scale. - Change mainboard.
E36 ADD LOAD	The load is not enough for span calibration.	
E37 UNSTABLE	The load is not stable at calibration.	- Wait until scale become stable. - Check grounding wiring. - Recalibrate the scale. - Change mainboard.
E40 NO ALIBI SD	Alibi memory SD card is not installed.	- Disable Alibi memory if not required. - Check Alibi SD card. - Change mainboard.
E41 ALIBI ERROR	Alibi SD card is not supplied from FLINTEC.	- Install Flintec Alibi SD card.
E42 NEW ALIBI	Alibi memory serial number error. The new alibi SD card is installed.	- Format the alibi memory SD card. Refer to parameter 816.

E43 ALIBI ERROR	Alibi memory could not be initialized.	- Check alibi memory SD card - Change main board.
E44 ALIBI ERROR	Alibi CSUM error.	- Check alibi memory records. - Change Alibi memory SD card. - Change main board.
E47 ALIBI ERROR	Alibi information CSUM error.	
E48 ALIBI ERROR	Wrong SD card at alibi memory.	- Order Alibi SD card.
E60 DIG I/O COM	The I/O Board or RIO16 is broken or not installed.	- Re-energize controller and RIO16. - Change the I/O Board / RIO16.
E61 FLASH ERROR	E^2PROM Error (U13).	- Change E^2ROM (U13). - Change main board.
E62 FLASH ERROR	E^2PROM Error (U12).	- Change E^2ROM (U12). - Change main board.
E69 MODULE FAULT	Fieldbus module is not initialized	- Re-energize controller. - Change the fieldbus module. - Change the fieldbus board.
E70 MB SELECT ER	Modbus selection error	- Check data format of other interfaces. - Other interfaces should not be Modbus.
E78 NO PT RECORD	Preset tare memory error.	- PT is not entered or PT checksum error. - Enter PT. - Call service
E80 VERIFY SCALE	Reverify the scale.	- Reverify the scale after checking the scale hardware, load cells, performance etc. -Press enter key to on filling.
HF: xx (1)	Hardware error or undefined error	- Take a note the message and call Flintec service or dealer. - Re-energize the instrument.
HWERR xx (1)	Hardware error	- Re-energize the instrument. - Change the fiedbus board. - Change the main board. - Call your service or dealer.

1) xx = Error code.

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