# FAA-27

**Analogue Amplifier**

## *Technichal Manual*


www.flintec.com

# Table of Contents

## RIGHTS AND LIABILITIES



# 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 ENGINEERING 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.

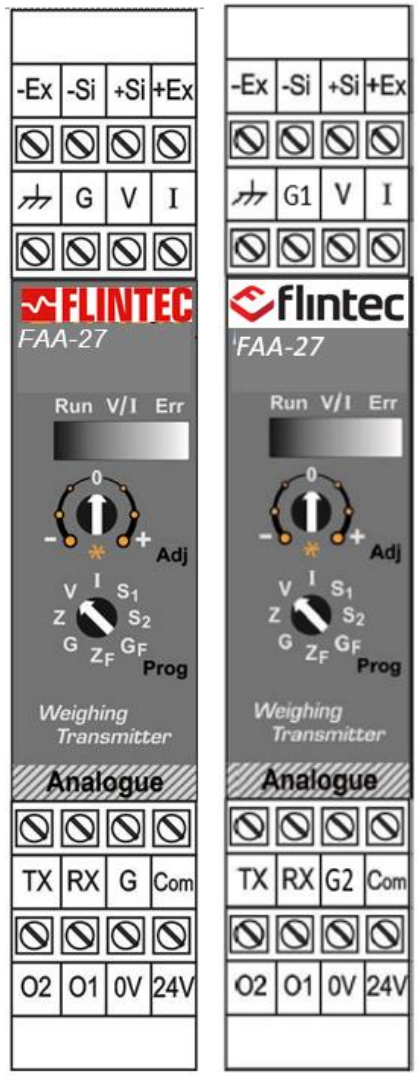
**CAUTION** OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

# 2. Front View, Features and Specifications

Microcontroller based analog load cell transmitter FT-27 has a very high accuracy and long term stability with its high tech design. Its high-performance electronic calibration via RS232C serial port without any test weight and fast calibration without measuring output signal give big advantage to the users for calibration scales.

This high-tech instrument gives the system designers a lot of advantages to increase the system reliability and to reduce the installation and service times. Besides the traditional analog output adjustment with any test weight, the electronic calibration eCal and fast calibration with 20% max. test load reduces the calibration time.
All analog outputs of instruments are matched in the production to perform calibration at PLC and for changing the instrument without recalibration in service.

There are 8 positioned rotary switches and annunciator LEDs in front of the instrument. The front view and pin descriptions of FT-27 is shown below.




till April 2021 from Mai 2021

| Pin Name | Definition |
|---|---|
| **LOAD CELL CONNECTION** | |
| - Ex | - Excitation |
| + Ex | + Excitation |
| - Si | - Signal |
| + Si | + Signal |
| **ANALOGUE OUTPUT** | |
| I | Current output |
| V | Voltage output |
| G / G1 | GND (G1 from Mai 2021) |
| ⏚ | Shield and Protective ground |
| **SERIAL CONNECTION** | |
| TX | TxD (RS232C) |
| RX | RxD (RS232C) |
| G / G2 | Ground (RS232C) (G2 from Mai 2021) |
| **SETPOINT CONNECTION** | |
| O1 | Digital Output 1 |
| O2 | Digital Output 2 |
| Com | Digital Outputs Common |
| **POWER SUPPLY** | |
| 24V | +24VDC |
| 0V | 0VDC |

## Meanings of the positions of rotary switches;

| | | | |
|---|---|---|---|
| Programming (Prog) switch | V | Voltage output type run | (refer to page 9) |
| | I | Current output type run | (refer to page 9) |
| | S1 | Setpoint 1 adjustment | (refer to page 17) |
| | S2 | Setpoint 2 adjustment | (refer to page 17) |
| | Z | Zero adjustment | (refer to page 11) |
| | G | Gain adjustment with test weight | (refer to page 11) |
| | ZF | Fast zero adjustment | (refer to page 13) |
| | GF | Fast gain adjustment with 20% test weight of Maximum scale capacity | (refer to page 13) |
| Adjustment (Adj) switch | 0 | Operation mode (Run) | |
| | * | Special Functions in “Fast Adjustment, “Setpoint Adjustment” | |
| LEDs | | Annunciator LEDs ( Run, Output type, Error ). Refer to chapter 9 | |

# Features

- Minimized zero and span drifts due to its microcontroller technology and high accuracy, very low temperature drift, 24 bits ADC and 16 bits DAC converters.
- Long time stability and low temperature drifts eliminate the frequent readjustment period.
- Very easy and user-friendly digital adjustment via rotary switches located on the front of the instrument.
- Programmable digital adaptive anti-vibration filters to minimize environmental vibrations.
- eCal- electronic calibration without weights and digital filter adjustment via RS232C port and xFace PC software.
- Fast calibration feature to reduce the adjustment time and to minimize adjustment error.
- Calibration at PLC does not require readjustment after changing instrument because of matching in the production.
- 2 pcs free relay contact output for alarm or controlling valves, gate etc.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Analogue input range | 0 mV to 20 mV |
| Min. input range | < 1 mV |
| Linearity | < % 0.01 |
| Temperature drift | < 0.007 % FSR / ºC |
| Converters | 24-bit Delta-Sigma ratiometric ADC with integral analog and digital filters<br>16-bit very low drift DAC |
| Internal resolutions | 16 000 000 counts ADC |
| External resolution | Analogue output changes up to 65000 steps |
| Calibration | With rotary switches in the front with any test load.<br>Fast calibration with 20% max.<br>Electronic calibration via PC.<br>Preadjusted instrument for calibration at PLC |
| Digital Filter | Programmable 3 step adjustable digital adaptive filter. |
| Analogue outputs | Current output for 0-20 mA and 4-20 mA or<br>voltage output for 0 – 5 V and 0-10 V. |
| Max. cable length | 300 meters |
| Max. load resistance (current output) | 500 Ω |
| Set point | 2 pcs free programmable setpoints. |
| Digital Output | 2 relay contacts for setpoints, 230 VAC or 30 VDC, 1 A. |
| Load cell excitation | 5 VDC |
| Number of Load Cells | Up to 4 units of 350 Ω or 12 units of 1100 Ω (min. 85 Ω) |
| Power supply | 12 to 28 VDC 0.2 A |
| Operation Temperature | Between -10°C and +45°C at 85% RH max, non-condensing |
| EMC Immunity | Class E2 |
| Enclosure | Polyamide, for DIN-rail mount, IP20 |
| Dimensions | Front Width:22,5 mm, Front Length: 99 mm , Height:114,5mm |

# 3. Installation and Commissioning

## Recommendations

***Warning*: Please care the following warnings for designing the control cabinet which will increase your system reliability.**

The control cabinet should be designed so that instrument can operate safely.

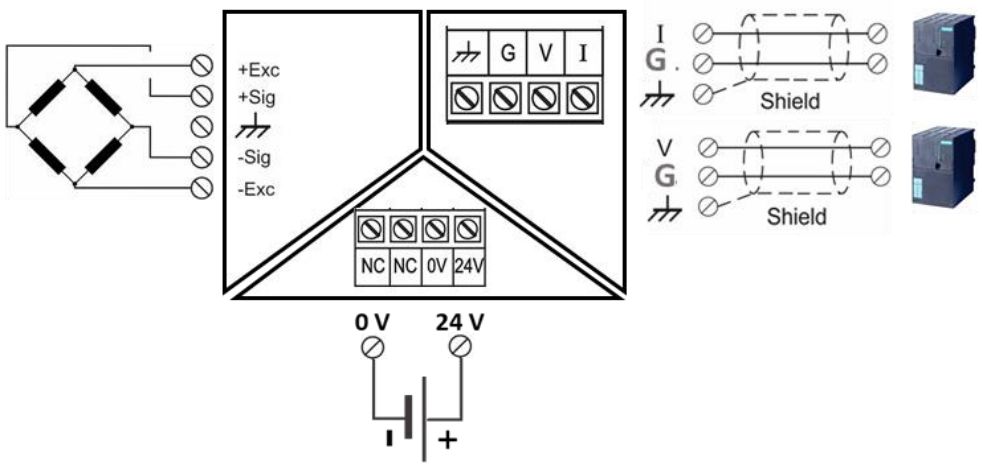
The panel should be placed in clean area, if possible, not getting direct sun light, with a temperature between -10 ºC and +40 ºC, humidity not exceeding 85% non-condensing. All external cables should be installed safely to avoid mechanical damages.

FAA-27 instruments are very low-level signal measuring instruments. To avoid electrical noise, FAA-27 should be separated from the equipments that produce electrical noise. Preferable use metal cabinet against radio frequency interference and the cabinet shall be connected to ground against the electromagnetic disturbances. Load cell cable and analog output cable trays must be separated from others, if possible. If there are noise-generating equipments such as heavy load switches, motor control equipments, inductive loads etc., please be careful against the EMC interference in the cabinet. Connect parallel reverse diodes to the DC inductive loads like relays, solenoids etc. to minimize voltage peaks on the DC power lines.

All load cell and analogue output cables coming to the control cabinet shall be shielded.

Units produced from Mai 2021 were revised and the load cell input, analogue output, and power supply were electrically isolated from each other. This isolation method eliminates ground loop errors, reduce noise, and block high voltage transient surges.

To provide the signal isolation make the FAA-26 weight transmitter wiring as shown in the picture below.



***Warning*: *Control cabinet design and proper installation increase reliability and performance of the instrument. Please do not forget that the instrument must be powered off before inserting or removing any peripheral connector.***

Follow the installation and commissioning described below carefully to prevent unwanted results after installation.

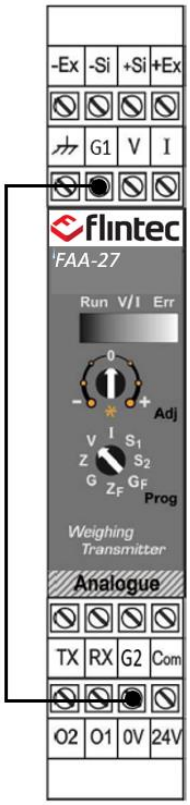
### Note

In the control cabinet, if the same ground connection is used for the analog output and power supply short circuit the following terminals as shown in the figure below.

***Connect G1 to 0V***

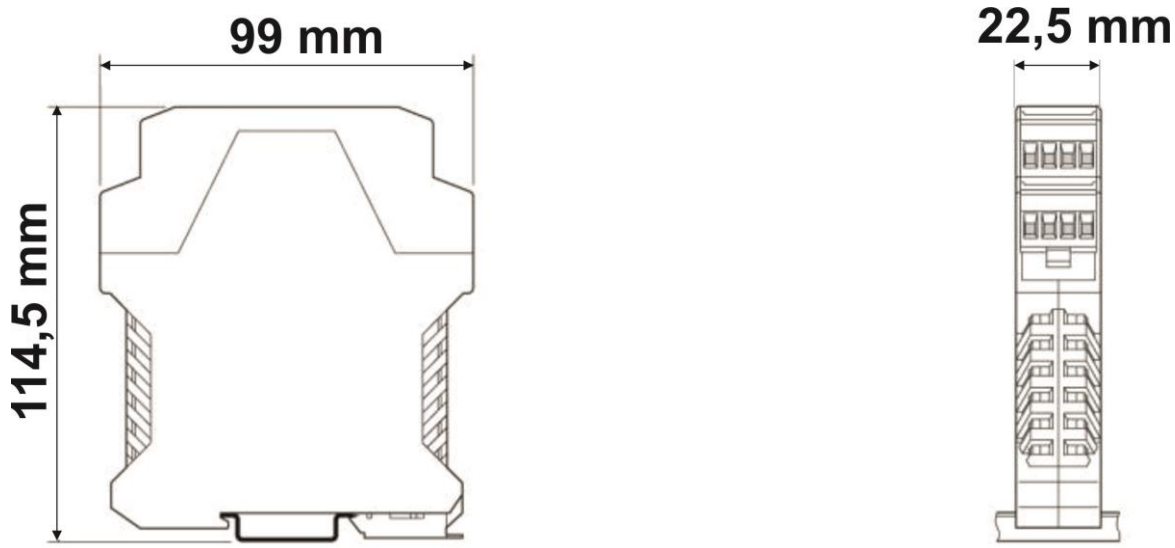
Since this connection eliminates signal isolation, it should be considered that the signal immunity against electrical noise and electromagnetic disturbances will decrease.

The same connection between terminals should be done in case of changing an older instrument with a new one.



## 3.1 Mechanical Installation

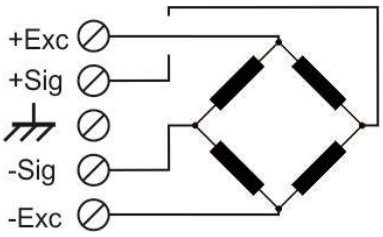
The place where you will use/install your instrument should be clean, not getting direct sun light, if possible, with a temperature between -10ºC and +40ºC, 85% maximum relative humidity non-condensing. Install the instrument on the DIN rail in the cabinet.
The instrument mechanical drawing




## 3.2 Load Cell Connection

The load cell wiring should be made carefully before energizing to avoid damages of the instrument and load cells. The input resistance of the load cells that you want to connect should be more than 85 Ω.

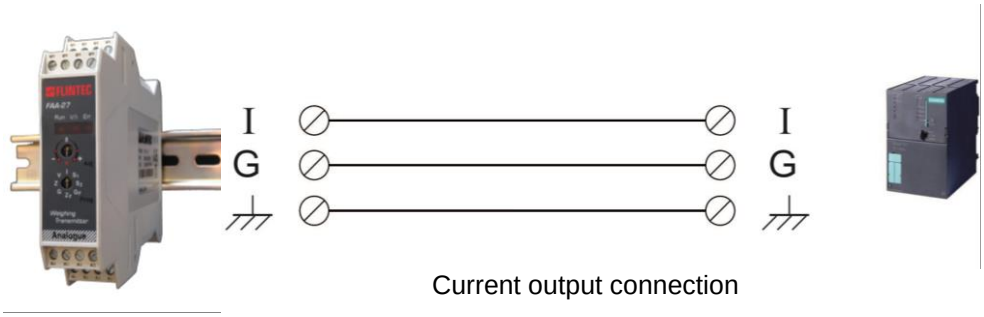
| Pin Name | Load Cell Cable |
|---|---|
| +Ex | + Excitation |
| -Ex | - Excitation |
| +Si | + Signal |
| -Si | - Signal |
| ⏚ | Shield |



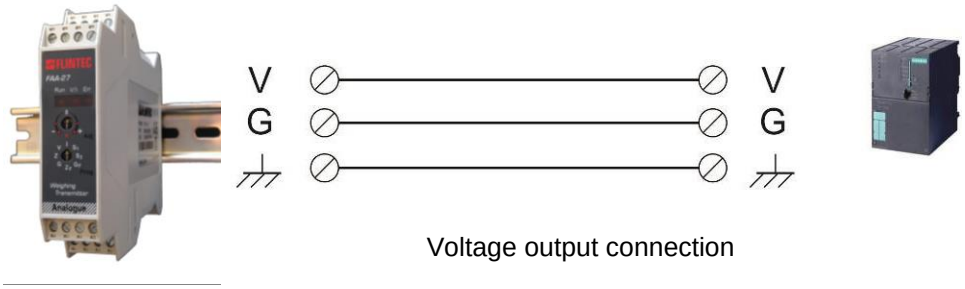
## 3.3 Analogue Output Connection

Only one of the analog output types can be used at the same time and must be selected in the setup type. Install the analog output measuring instrument for adjustment, if needed.

| Pin Name | Definition |
|---|---|
| I | Current Output |
| V | Voltage Output |
| G / G1 | GND |
| ⏚ | Shield |



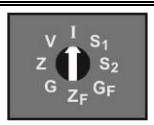
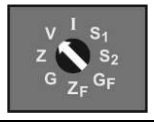

Current output connection




Voltage output connection

## 3.4 Changing the Analogue Output

FAA-27 sets its analog output according to the table below at power on. Turn the programming switch and connect TxD and RxD pins as indicated in the table below before power on the instrument to set analog output type and its signal level.

| Analogue Output Range | Prog. Switch Position | TxD & RxD pins | V / I LED |
|---|---|---|---|
| 4 - 20 mA |  | Open circuited | On |
| 0 - 20 mA | | Short circuited | Off |
| 0 - 10 VDC |  | Open circuited | Flash |
| 0 - 5 VDC | | Short circuited | Blinking |

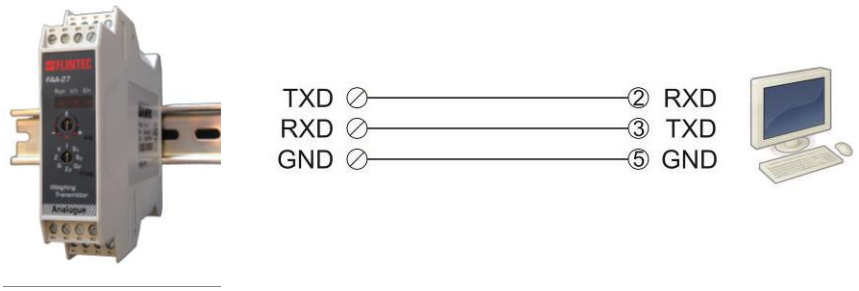
You can also set the analog output type after energizing.

- Turn the programming switch to the analog output type (to V or I position)
- Connect or disconnect TxD and RxD pins according to the table above to set the output range.
- Turn the adjustment switch to the ✳ position. After 2 seconds turn in back to the "**0**" - position (if the instrument is powered on before).

The analogue output type can be followed by the V / I LED on front of the instrument after running it (refer to table above).

After setting up the analog output of the instrument according to the table above go to the next step.

## 3.5 Serial Port Connection




## 3.6 Commissioning

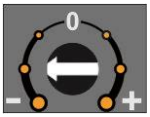
Double check the following topics before energizing the instrument.

- Check Mechanical installation, grounding, load cell connection and power supply connection.
- Check the analogue output set up described in chapter 4.4.
- The analogue output cabling should be done for the same analogue output type.
- The adjustment (Adj) rotary switch shall be at "**0**" - position.

# 4. Adjustments

## 4.1 Adjustment with Rotary Switches

To start the adjustment the programming switch should be at analog output type position, **V** or **I**.
**Z** and **G** positions of the programming switch are used for performing zero and gain adjustments in sequence. Analog output is changed by turning the adjustment switch as described in the table below.

| Adjustment rotary switch position | Rotary switch description | Run LED |
|---|---|---|
|  | Do not change, operation | On |
|   | Decrease ( - ) / Increase ( + ) in slow steps | Flash |
|   | Decrease ( - ) / Increase ( + ) in medium steps | Flash |
|   | Decrease ( - ) / Increase ( + ) in big steps | Flash |

RUN LED flashes to indicate the instrument is not in operation.

### Zero Adjustment

- Connect the measurement instrument to the analog output.
- Unload the scale.
- Turn the programming switch to the **Z** position from the analog output type position.
- Increase or decrease the analog output by adjustment rotary switch.
  Never bring the adjustment switch position to ✱ position in this adjustment.
  The adjustment switch must be at **0** - position at the end of the adjustment.
- Turn the programming switch to analog output type position (**V** or **I**) to start the operation or to the **G** position to start gain adjustment.

### Gain Adjustment

- Connect the measurement instrument to the analog output.
- Load the scale.
- The analog output value should be calculated for the applied load.

Use the formula for calculating the analog output value.

$$\text{Analog Output} = \text{Minimum output} + \frac{\text{Maximum output} - \text{Minimum output}}{\text{Scale capacity}} * \text{Load}$$

**Example:**

| | |
|---|---|
| Scale capacity | 100kg |
| Output range | 4 – 20 mA |
| Load | 25kg |

The 4-20mA analog output current will be at 25kg ;

$I_{out}$ = 4mA + (( 20mA – 4mA ) / 100kg ) * 25kg = 4 + 0.16 * 25 =
$I_{out}$ = 8mA

The 0 – 10VDC analog output voltage will be at 25kg:

$V_{out}$ = 0 + (10V / 100kg ) * 25kg = 0,1 * 25 =
$V_{out}$ = 2.5VDC

- Turn the adjustment switch to the **G** position from the analog output type position you set before.
- Increase or decrease the analog output by adjustment rotary switch to the calculated output value.
  Never bring the adjustment switch position to ✳ position in this adjustment. The adjustment switch must be at **0** - position at the end of the adjustment.
- Turn the programming switch to analog output type position for operation. (to **V** or **I**).

***Important note:*** *The instrument saves 4 different adjustments in its memory for the voltage and current outputs and their ranges. Changing the analog output type, it automatically set the adjustment to the output range used before.*

## 4.2 Fast Adjustment to Nominal Output Range

You may perform fast adjustment method if you will set zero and gain to analog output nominal values. This feature gives advantage to the instrument for small and medium capacity weighing systems' fast and easy adjustment.

### Fast Zero Adjustment:

- Unload the scale.
- Turn the programming switch to **ZF** position.
- Turn the Adj. switch to ✱ position and turn it back to **0** - position 2 seconds later.
- Turn the programming switch to analog output type position to start operation or to **GF** position for gain adjustment.

For example, for 4 – 20mA range and for 100kg capacity scale, unload the scale and perform fast adjustment to set the output to 4mA.

### Fast Gain Adjustment:

- Load the scale to the 20% of the maximum capacity (if scale capacity is 100kg, load 20 kg).
- Turn the programming switch to **GF** position.
- Turn the Adj. switch to ✱ position and turn it back to "**0**" - position 2 seconds later.
- Turn the programming switch to analog output type position for operation.

For example, for 4 – 20mA range and for 100kg capacity scale, load the scale 20kg test weight and perform fast gain adjustment to set the output to 7,2mA at this load. The output will be 20mA at 100kg loading.

## 4.3 eCal Electronic Adjustment via xFace Software

The adjustment of high-capacity tanks and silos are very difficult in practice and takes very long time. You may save a lot of time by eCal adjustment by entering theoretical scale and load cell values to the instrument instead of loading the scale. Due to the production process of FAA-27, eCal accuracy is very high. Adjustment with eCal is performed via RS232 port of the instrument and can be comfortable executed with xFace software. Refer to chapter 8 for installation and using the software.

For increasing the eCal accuracy you must enter the specific load cell rated output, which is printed on "Final Data Summary" attached to every load cell. Using more than one load cell an arithmetic average of all load cells must be calculated.

## 4.4 Adjustment (eCal) with PLC

All instruments are adjusted in the production to operate in its analog output range between 0mV and 10mV load cell signal as default. For example, if the instrument is at factory default values and programmed to operate 4 – 20mA output range, the output will be 4mA at 0mV load cell signal and will be 20mA at 10mV load cell signal (only for 2mV/V load cells).

Changing the FAA-27 instrument a recalibration is not required due to matching instruments in production by Flintec.

***Warning:*** *If the instrument is adjusted before and its factory defaults are changed, you should load factory defaults with xFace.*

### FAA-27 Programming via RS232C

FAA-27 can be electronically calibrated via RS232C serial interface by commands or by xFace software. If you want to use your own software to calibrate the FAA-27 from your PLC or PC, you may use the commands below. The yellow colored bytes are the data in the command and blue colored bytes are check sum in this document.

Output type setting and eCal electronic calibration should be done in sequence.

**RS232C PORT SETTING :**
Adjust your PC or PLC serial port as 9600, 8 None 1.

**DATA STRUCTURE :**
ASCII, HEX DATA and CR (Carriage Return) at the end of the command.

| **COMMANDS:** | | **Descriptions** |
|---|---|---|
| **1. Analog output type setting:** | | |
| **a) 4 - 20mA setting:** | | |
| Command: | @01100000000102000BE1 | Set to 4-20 mA range |
| Response: | @011000000001EE | ACK |
| **b) 0 - 20mA setting:** | | |
| Command: | @01100000000102001 4D8 | Set to 0-20 mA range |
| Response : | @011000000001EE | ACK |
| **c) 0 - 10VDC setting :** | | |
| Command: | @01100000000102000AE2 | Set to 0-10 VDC range |
| Response : | @011000000001EE | ACK |
| **d) 0 - 5VDC setting :** | | |
| Command: | @01100000000102001 3D9 | Set to 0-5 VDC range |
| Response : | @011000000001EE | ACK |

## 2. eCal procedure steps:

**Descriptions**

Step 1 START eCal

| | | |
|---|---|---|
| Command: | @0110000000001020001EB | Start the eCal process. |
| Response: | @011000000001EE | ACK |

Step 2. Total Load cell Emax entry

| | | |
|---|---|---|
| Command: | @0110000300020400000 1F4F1 | Total LC is 500kg. |
| Response: | @011000030002EA | ACK |

Step 3. Average Load cell mV/V entry

| | | |
|---|---|---|
| Command: | @0110000500020400004E2F67 | LC sensitivity: 2.0015mV/V. |
| Response: | @011000050002E8 | ACK |

Step 4. Estimated Dead load entry

| | | |
|---|---|---|
| Command: | @0110000700020400000000E2 | Dead load is 0kg. |
| Response: | @011000070002E6 | ACK |

Step 5. Scale Capacity entry

| | | |
|---|---|---|
| Command: | @0110000900020400000FAE6 | Scale capacity is 250kg. |
| Response: | @011000090002E4 | ACK |

Step 6. SAVE with estimated dead load value

| | | |
|---|---|---|
| Command: | @0110000000001020007E5 | Save the eCal values. |
| Response: | @011000000001EE | ACK |

Or SAVE with automatic zero adjustment.
Unload the scale and send the command below to start the zero adjustment.

| | | |
|---|---|---|
| Command: | @0110000000001020015D7 | Save eCal with Zero Adj |
| Response: | @011000000001EE | ACK |

Step 7. APPLY

| | | |
|---|---|---|
| Command: | @0110000000001020009E3 | Apply the calibration. |
| Response: | @011000000001EE | ACK |

Step 8. STOP eCal

| | | |
|---|---|---|
| Command: | @0110000000001020002EA | Stop the eCal process |
| Response: | @011000000001EE | ACK |

## 3. Digital Filter Setting:

| | | |
|---|---|---|
| Command: | @0110002200010200000CA | Set the Fast filter |
| Command: | @0110002200010200001C9 | Set to Medium filter |
| Command: | @0110002200010200002C8 | Set to Slow filter |
| Response: | @011000220001CC | ACK |

**4. Load Factory Defaults:** **Descriptions**

| | | |
|---|---|---|
| Command: | @011000240001025AA5C9 | Set to factory default. |
| Response: | @011000240001CA | ACK |

**CHECKSUM CALCULATION :**

CSUM = 0 – (Slave_Add + Function + … + Last_data)
(STX and CSUM are neglected while calculating CSUM)

**Example**

For Medium (1) filter: @01100022000102 0001XX

CSUM = 0 – ( 01+10+00+22+00+01+02+00+01)
= 0 – 37
= C9

Command is @01100022000102 0001C9 < Carriage Return >

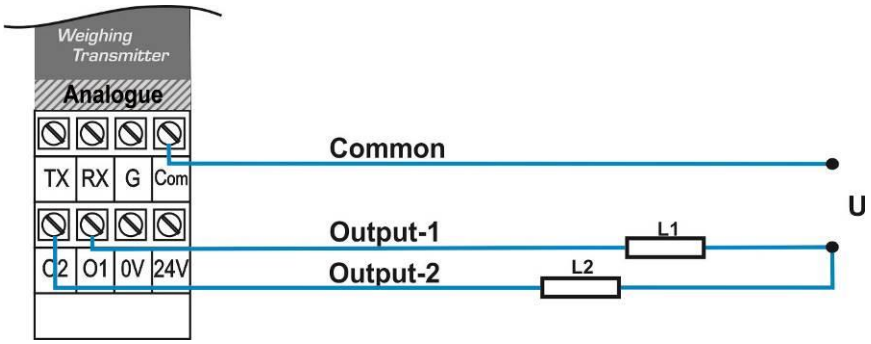
## 4.5 Testing the Scale Performance

You must check the scale performance by testing the scale eccentricity, scale linearity at loading up to maximum loading value, repeatability etc. before using it.

# 5. Setpoints

## 5.1 Setpoint Connection

FAA-27 has 2 free relay contact output. These outputs can be connected to maximum 230VAC or maximum 30VDC, maximum 1A loads. Reverse diode connection to the DC loads is recommended to increase the relay contact life and to reduce the disturbances. Output connection is;




## 5.2 Setpoint Adjustment

The instrument closes the relay contacts if the weight value is higher than the adjusted setpoint. These contact signals can be used to stop charging or discharging or produce alarm signal. You can apply two methods to adjust setpoints.

## 5.3 Adjustment to the Load on the Scale

Setpoint can be adjusted to the load value on the scale:

- Load the scale to the value you want to produce setpoint signal.
- Turn the programming switch to **S1** (or **S2**) position from operation position (from **V** or **I** position).
- Turn the Adj. switch to positions ✱ position and turn it back to **0** - position 2 seconds later.
- Turn the programming switch to analog output type position for operation (**V** or **I** position) or to other setpoint position to adjust it.

## 5.4 Adjustment by Measuring the Analog Output

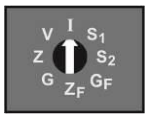
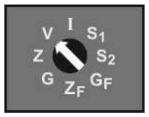
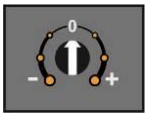
You can adjust the setpoint by measuring the analogue output value without loading the scale:

- Connect the measuring instrument to the analog output.
- Turn the programming switch to **S1** (or **S2**) position from operation position (from **V** or **I** position).
- Increase or decrease the analog output by adjustment rotary switch (refer to table in chapter 5.1 ).

  Do not bring the adjustment switch position to ✱ position in this adjustment. The adjustment switch must be at **0** - position at the end of the adjustment.
- Turn the programming switch to analog output type position to start operation (**V** or **I** position) or to other setpoint position to adjust it.

# 6. Operation

There are 3 LEDs and 2 rotary switches on the front panel of FAA-27. The rotary switches are being used for adjustment as described in chapter 4.4 and the LEDs have different meanings in operation and setup type as indicated below.

| Analogue Output Range | Prog. Switch position | Adj. Switch position | TxD & RxD pins | V / I LED (after power on) |
|---|---|---|---|---|
| 4 - 20mA |  |  | Open circuited | On |
| 0 - 20mA | | | Short circuited | Off |
| 0 - 10VDC |  |  | Open circuited | Flash |
| 0 - 5VDC | | | Short circuited | Blinking |

The status of the LEDs in the operation type is given in the table below. Refer to chapter 9 in case of the Err LED turns on.

The analogue output signal also gives information about the status of the system and the weighing process to inform PLC as:

| Condition | 4-20mA output | 0-20mA output | 0 – 10V output | 0 – 5V output |
|---|---|---|---|---|
| Operation | X | X | X | X |
| Programming | X | X | X | X |
| The weight is over the range (Over signal to PLC) | 24mA | 24mA | 11V | 5,5V |
| The weight is under the range (Under signal to PLC) | 0mA | 0mA | -4.0V | -4.0V |
| “Error” signal to PLC | 0mA | 0mA | 0V | 0V |
| “ADC is out of operating range” error to PLC | 24mA | 24mA | 11V | 5,5V |

# 7. Programming with xFace Software over RS232

FAA-27 has RS232C serial interface to perform eCal electronic calibration and to adjust filter, setpoint values and to follow status by using **xFace** software installed on a PC.
For installing the xFace software download it from www.flintec.com, follow the steps described below.

## 7.1 Installation of xFace Software

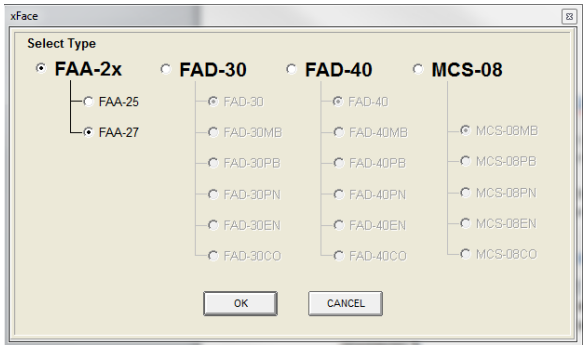
- Close all applications on your PC
- Enter the file xFace software v2.03 or higher
- Double click “Setup.exe” to start the installation. The setup Wizard will be displayed.
- Follow the menus in the setup wizard step by step.
- After finishing the installation, the Setup Wizard will inform you about the success of the software installation. Click the OK button.
- After closing the Setup Wizard you can start to use the xFace software.

## 7.2 Connection to the xFace Software

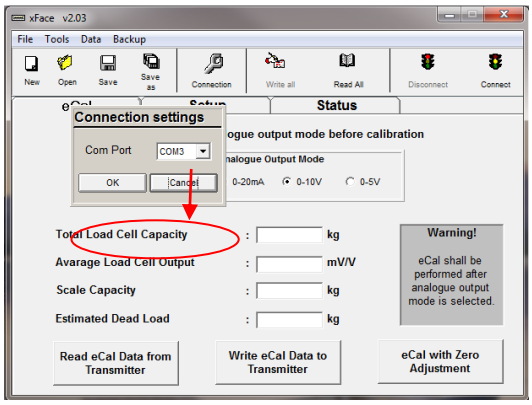
For programming instrument via xFace follow the instructions below;

1. Power off the instrument.

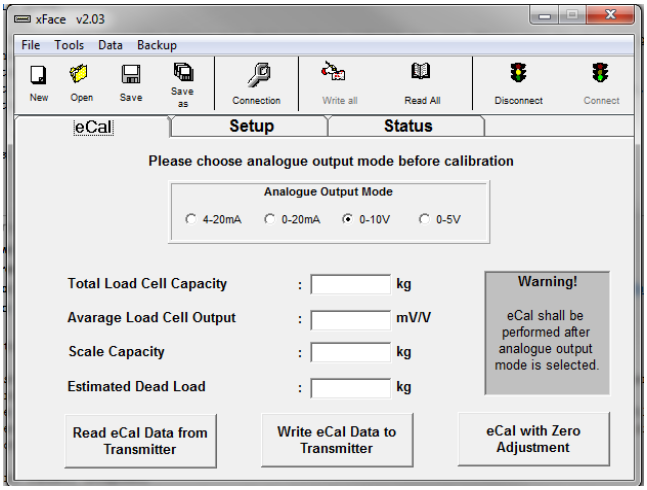
2. Connect the instrument to PC as shown in chapter 4.5 to use xFace software and run the software. Select FAA-27 and press “OK” button.




3. Select the Com-port and press on “Connect” to connect to the instrument.



4. Select the analog output type.
5. Enter Total Load Cell capacity, Average Load Cell Output, Scale Capacity and Estimated Dead Load.
6. Press “Write eCal Data to Transmitter” button on the monitor to perform eCal.
7. Unload the scale and Press “eCal with Zero Adjustment“ button on the monitor.




8. Adjust filter value and setpoints in section “Setup”.
9. In section “Status” instrument information are available.
10. Power off the instrument before disconnecting from PC. Bring the programming switch to the analog output type position and apply the connection between TxD and RxD pins which is described in chapter 7 to set the analog output type.
11. Turn the adjustment switch position to “**0**“ - position.
12. Power on the instrument for operation.

After performing eCal as described in the software, check the performance of your system.

You may adjust to instrument to factory default by xFace, if it is changed before.

# 8. Trouble Shooting

The type FAA-27 amplifier is designed as a very reliable and virtually error free instrument. However, if an error occurs, do not attempt to repair the equipment before you understand what caused the error. Note the status of the front panel LEDs, and try to find the problem with the help of the table given below. Do not let unauthorized people interfere with the instrument.

| FRONT PANEL LEDS | | | DEFINITION |
|---|---|---|---|
| **Run** | **V/I** | **Err** | |
| Off | Off | Off | - No power<br>- Board failure |
| On | On | Off | - Operation in 4 – 20mA output type. |
| On | Off | Off | - Operation in 0 – 20mA output type. |
| On | Flash | Off | - Operation in 0 – 10VDC output type. |
| On | Blinking | Off | - Operation in 0 – 5VDC output type. |
| On | X | On | - Input signal is out of range<br>- Calibration needed.<br>- Check output circuit and cabling.<br>- Board failure |
| Flash | On | On | - Calibration mode<br>- Setting mode |

The analogue output also give additional information about the weighing system as described in chapter 7.

www.flintec.com