
*User
Manual*

CC1W-30/50klb



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1. Product Description

The CC1W is a wireless version of our CC1 pump off control load cell. The CC1W utilizes the same proven design attributes as the CC1. This includes a stainless steel body, hermetic sealing, with fatigue rating. The CC1W transmits polished rod load wirelessly, which solves the industry wide problem of cable failures. After months of development in the field, working hand in hand with end users, our design addresses the most demanding concerns raised.

The CC1W technology sets our product apart from other wireless products currently available in the market. The primary advantage we bring is extremely low power consumption. Despite the low power consumption, the product can deliver a continuous flow of data, high signal strength and long battery life. We also offer position sensing capability which is synchronized with the load measurement. This eliminates the need for hall effect sensors or inclinometers and the costly maintenance associated with each. The wireless enclosure also incorporates an independent compartment for both the wireless technology and the battery. This allows for easy, single handed access to the battery for replacement in the field. We specified a pre-wired "D cell" battery that is inexpensive and commercially available worldwide.

- Continuous flow of data: 100 readings per second
- Low power consumption: 12-18 month battery life
- High signal strength: $\geq +12\text{dBm}$, 30-300 meter transmission
- HazLoc approved: UL rated for Class 1, Division 1 environments (see label for full approval)
- On-board position: $\pm 2\%$ accuracy
- Security: Proprietary wireless transmission protocol
- Ease of use: independent battery access, commercially available battery
- Weatherproof: IP67 rating, rated for use in -70°F to 175°F (-55°C to 80°C)

Parts in the box:

- Base unit (receiver)
- Base antenna & 12ft extension cable
- Magnetic cable clamps (4pcs) for extension cable
- Loadcell with transmitter (CC1W)
- Lithium battery (Included)
- U-bolt assembly for mounting the base unit/receiver to a pole
- User manual

Accessories (Sold separately):

- P/N 53-003004 - OD-73mm [2-7/8"], ID-39.7mm [1-9/16"], H-14mm [0.56"] Stainless Steel Spherical Washers
- P/N 53-003301 - OD-73mm [2-7/8"], ID-39.7mm [1-9/16"], H-14mm [0.56"] Black oxide Spherical Washers
- P/N 52-0091955 - OD-88.6mm [3.49"] and ID-42.4mm [1.67"], H-19mm [3/4"] Nickel Plated Load Spacer
- P/N 52-0089758 - DIN Rail Assembly for mounting the Base

2. Mounting Instructions

IMPORTANT

The employees responsible for the equipment installation and verification must take into consideration all the actions concerning this subject specified in IEC 60079-14:2013 ed. 5.0 (electrical installations design, selection and erection) standard. In addition to general specifications associated with any system installed in hazardous locations, special attention should be paid for specific requirements regarding essential safety.

2.1 Base Unit

The base unit comes with a magnet to the rear for easy mounting to a metal surface, inside or outside the pump controller cabinet. Base mounts outside the hazardous area is not intended to meet the hazardous location safety standards.



Base Unit

Where there is no metallic surface to make use of the base units magnet, brackets, plates or other types of support can be used to suitably fasten the base to any structure.



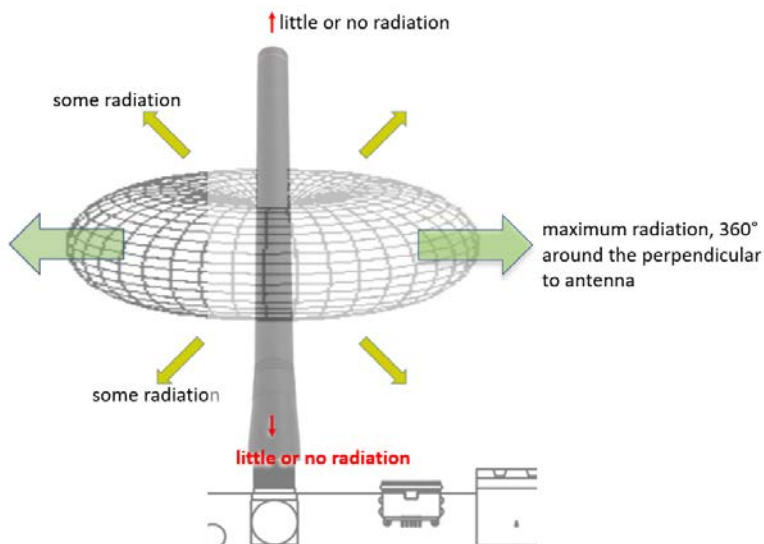
DIN rail mount



Pole mount with u-bolt assembly

IMPORTANT In order to achieve the best performance the antenna attached to the top right corner of the base unit must be perpendicular/horizontal to the polished rod, as shown in the above images.

You may optionally use an extension cable to mount the antenna. Make sure RF filter connected directly to the base unit.



2.2 Antenna Recommendations

▪ Omni Directional Antenna

CC1W base unit is equipped with an Omni-directional antenna in order to provide the widest possible signal coverage.

▪ RP-SMA Connector (female)

The antenna is provided with a threaded, weatherproof, RP-SMA female connector. This connector must be properly tightened to the male connector on the enclosure.

▪ Vertical Alignment

Perpendicular/horizontal alignment of the antenna, relative to the polished rod, is essential.

▪ Line-of-sight

Is important to ensure line of sight to the load cell is not compromised by obstacles. The base unit should be mounted in such a way as to minimize obstacle interference.

Note: Fresnel Zone (the area around the visual line-of-sight that radio waves spread out into after they leave the antenna) must be as clear as possible. Obstacles may weaken signal strength.

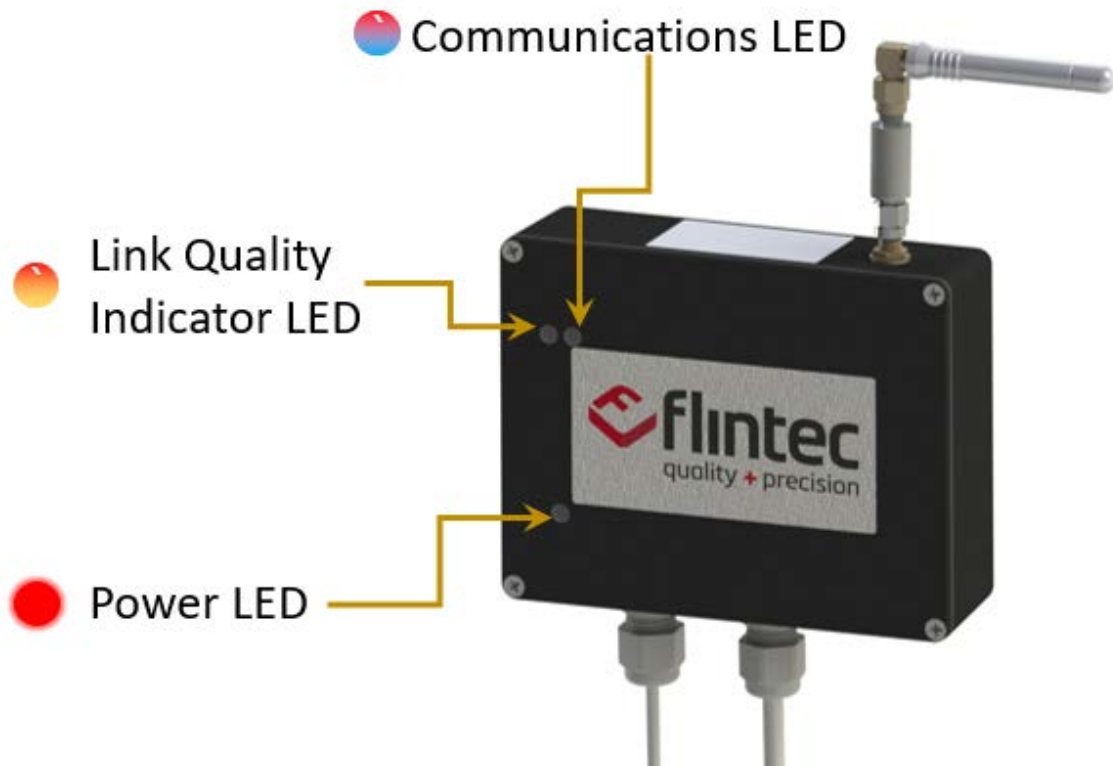
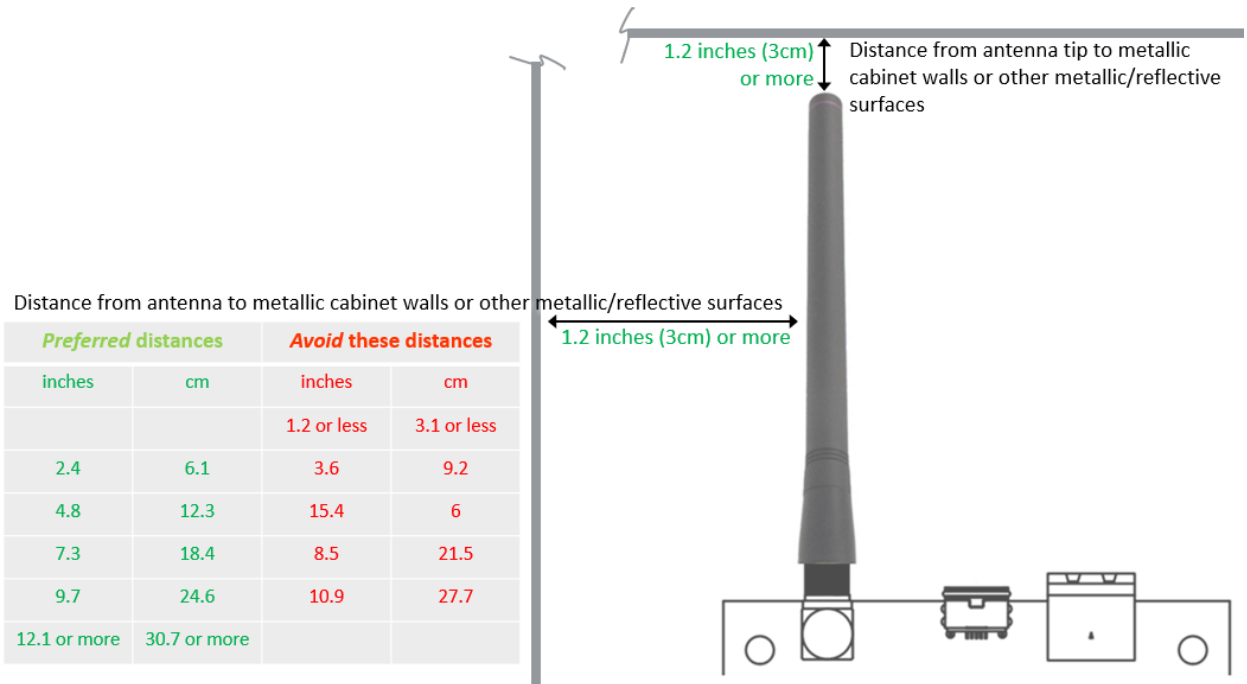
▪ Antenna Height

The base unit antenna can be positioned flexibly using the antenna extension cable. Mounting the antenna at a higher position to the base unit may help to achieve a cleaner line of sight.

Note: The use of the antenna extension cable should not result in the line of sight being compromised. The antenna should only be extended higher than the base unit, it should not be positioned close to the ground.

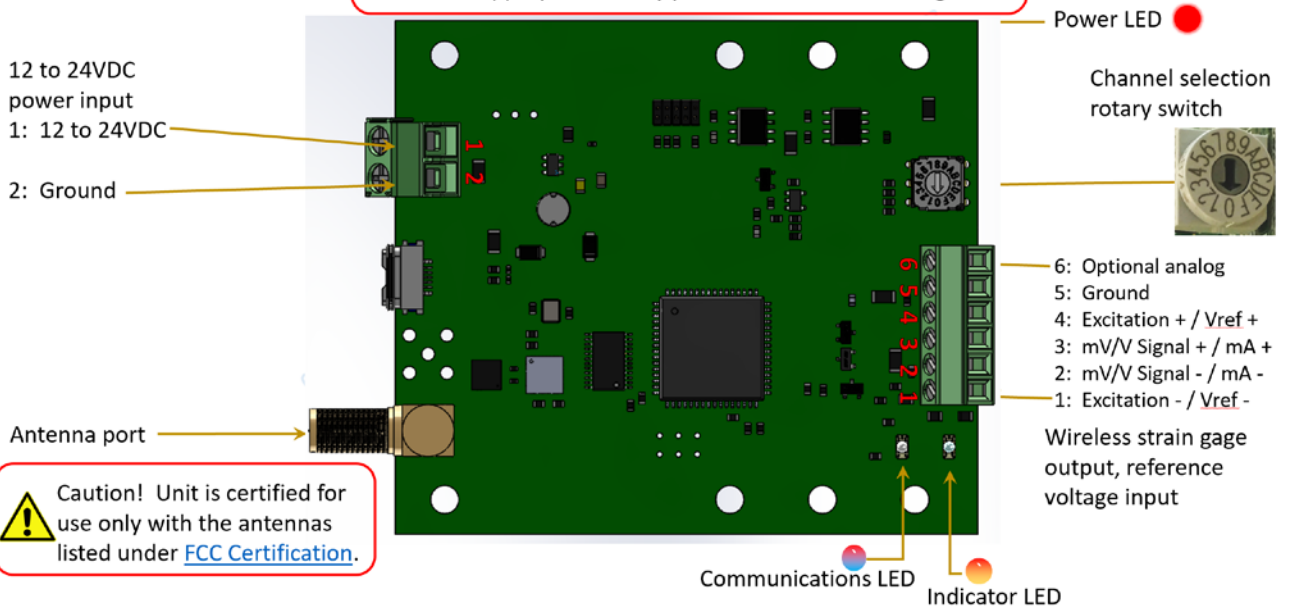


Enclosure Mounting



Base Unit Connections

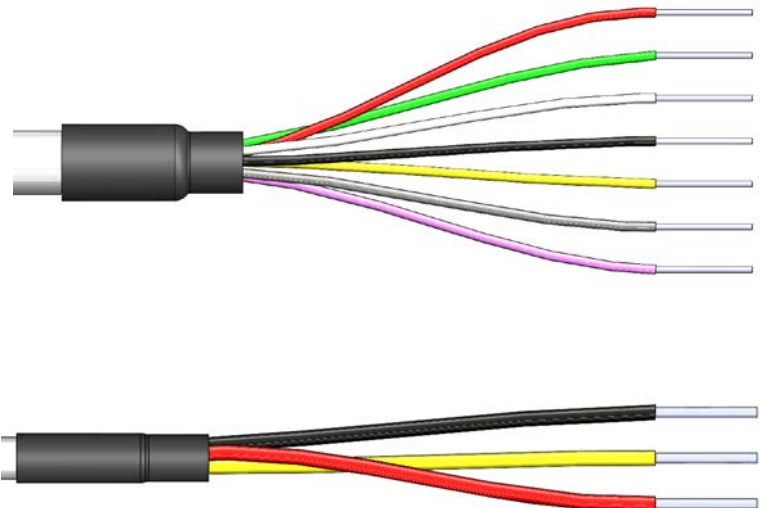
Caution! The Base Unit is not intended to meet safety certifications. Use appropriate safety procedures when installing.



Caution! Unit is certified for use only with the antennas listed under [FCC Certification](#).

SIGNAL CABLE COLOR CODE	
RED	Excitation + / Vref +
GREEN	mV/V Signal + / mA +
WHITE	mV/V Signal - / mA -
BLACK	Excitation - / Vref -
YELLOW	Shield (NC)
GRAY	Optional analog
VIOLET	Ground

POWER CABLE COLOR CODE	
BLACK	Ground
YELLOW	Shield
RED	12 to 24VDC



WARNING: Insulate unused leads to prevent shorting.
Advertisement: Isolez les fils inutilisés pour éviter les courts-circuits.

2.3 Remote Unit (Wireless Loadcell)



CC1W is mounted in the same way as other polished rod load cells. No special mounting procedure is required.

IMPORTANT

Position the remote unit (plastic enclosure at front of load cell) so that the best possible line of sight is achieved.

2.4 Battery Installation

The CC1W is powered by a battery, positioned within the battery enclosure. Damaged or wet batteries MUST NOT be fitted. Damaged or wet batteries must be discarded and replaced.



WARNING: The CC1W is certified for use with TADIRAN TL-5930/F. Make sure the battery cable tucks cleanly inside the compartment to prevent damage when the battery enclosure door is closed.

Advertisement: Le CC1W est certifié pour une utilisation avec le TADIRAN TL-5930/F. Assurez-vous que le câble de la batterie rentre proprement à l'intérieur du compartiment pour éviter tout dommage lorsque la porte du boîtier de la batterie est fermée.

1. Unscrew the door knob
2. Push out the door knob
3. Open the door to install the battery and plug the connector as shown below
4. Close the door and hand tighten the door knob until it stops (engage two flat door stoppers)



3. Equipment Maintenance

The only live maintenance permitted for this product is replacement of the battery pack which must be done in non-hazardous areas.

Repair is not permitted / la réparation n'est pas autorisée

Health and safety standards in the workplace must be strictly observed for all personnel conducting maintenance tasks.

This manual must be read and carefully kept. The manual should be referenced before conducting any fitment or maintenance task.

3.1 Battery Replacement

The CC1W is powered by a **TADIRAN – TL-5930/F** D cell battery.

To replace:

1. Open up the battery compartment loosening the battery door knob (see section 2.4).
2. Unplug the battery connector from housing.
3. Take the battery out.
4. Replace the battery with the new one (ensuring the new battery is not wet or damaged)
5. Close the door and lock with the door knob (see section 2.4 on this manual)



WARNING: Do not replace battery when an explosive atmosphere is present.

Avertissement : Ne remplacez pas la batterie en présence d'une atmosphère explosive

IMPORTANT

Please refer to battery manufacturer, TADIRAN's guidelines (LTN0111), for disposal of Lithium batteries.

4. Operation

1. Disconnect or turn off power to the base unit.
2. Ensure the base antenna connected with RF filter. RF filter always mounted on the base as shown on pictures.
The remote's antenna is installed by the manufacturer; to preserve safety certifications, it is not intended to be removed.
3. Ensure the manufacturer-supplied battery is connected to the remote unit.
4. The remote unit's indicator LED, if viewable, will flash about twice per second.



Caution! To preserve safety certifications, do not attempt to remove the remote from its housing in order to view the LED.

5. Connect or turn on power to the base unit.
6. The base and remote will connect on the last-used radio channel in about a second.
7. If the base unit is set to use an alternate channel, it will switch the load cell to that channel. This only takes a few seconds.
8. Normal operation begins.
A reconstructed version of the mV/V nominal load cell output will appear at the base output (for mA variant this is a 4-20mA current loop).
9. As shown on section 4.1 on this manual, if radio interference occurs, an alternate channel may be selected.

Base Unit LEDs

- Power LED (red)
'ON' continuously when nominal 12 to 24VDC power is applied
- Link Quality Indicator LED (red/yellow)
Yellow: low radio signal strength
Red: very low radio signal strength
- Communications LED (blue/red):

Flashing Pattern	State
~25Hz blue	Normal operation
Red flash, once	Communications error
1 – 4 blue flashes, then same number of 1 – 4 blue flashes	Switching to selected channel, then completed
1 – 4 blue flashes, then 10 quick blue flashes	Switching to selected channel, then failed
3 quick blue flashes	Communications loss; reverting to default channel
20 quick blue flashes	Communications loss on default channel

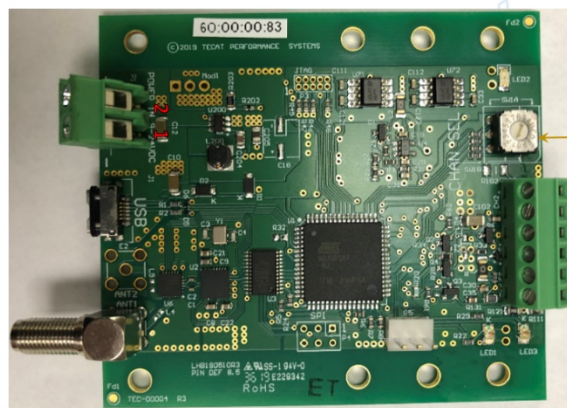
4.1 Base Unit Wireless Channel Selection (if needed)

Remove the base top cover. Unscrew the 4 Phillips head screws attached to the flat base cover with the proper tool (manual Phillips screwdriver).



WARNING: Gently lift the cover to prevent damage to the 3 LED light tubes attached to the cover.

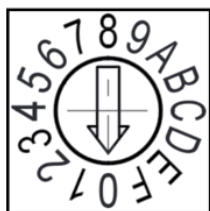
Advertisement: soulevez doucement le couvercle pour éviter d'endommager les 3 tubes lumineux à LED attachés au couvercle



Channel selection rotary switch



16-channel selector rotary switch



Switch Position	Channel #	Switch Position	Channel #
0	11*	8	19
1	12	9	20
2	13	A	21
3	14	B	22
4	15	C	23
5	16	D	24
6	17	E	24**
7	18	F	24**

Use a small, flat-blade screwdriver to rotate the switch to the desired channel.

The communication LED (Blue) will flash 1 – 4 times to indicate a new channel is selected, then flash the same number of times when channel change is completed.

*Default channel. At power-on, the remote unit will revert to the default channel. The base will power-up on the last-used channel. If there is no communications after 8 seconds, the base will revert to the default channel. Once communications are re-established, they will switch to the selected channel.

**Channels 25 and 26 are unused; channel 24 is used instead.

5. Technical Specification

Standard Specifications	lbf	30k, 50k
Rated Output	mV/V	2.00 ± 0.5%
	mA (alternative model)	4-20
Rated Position Output	% FS (Stroke)	± 2
Nonlinearity	% FS	± 0.25
Hysteresis	% FS	± 0.25
Non-Repeatability	% RO	± 0.1
Static Error Band	% FS Max	± 0.5
Temperature		
Compensated Temperature Range	°F (°C)	-14 to 150 (-25 to 65)
Safe Operating Temperature Range	°F (°C)	-70 to 175 (-55 to 80)
Temperature Effect on Zero	% RO/°F Max	± 0.0075
Temperature Effect on Output	%RO/°F Max	± 0.005
Zero Balance	% RO Max	± 1
Safe, Axial Load	% Capacity Max	200
Deflection at Capacity	inch Nom	0.005
Weight, Remote Unit	lb. nom	4.2
Fatigue Rating (Compression)	Min Cycles @Capacity	50,000,000
Shock Rating	g	Up to 500
Vibration Rating	MIL-STD-810G	514.6; 516.6
Sensor Element		17-4 PH Stainless Steel
Protection according EN60529		IP67 or higher
Electronics		
Remote and Base Transceiver Units Matched	Mac ID	(32bit) Specific; no external connection - Paired unit
Data Rate	Readings/Sec	100
Radio Frequency	GHz	2.405 to 2.470
Radio Channels	Selectable (*)	14
Telemetry Range	Feet (Meters) (*)	100 - 1000 (30-300)
RF Power Output - Remote Unit	dBm (*)	Min = 13.0dBm, Max = 15.5dBm
RF Power Output - Base Unit	dBm (*)	Min = 16.0dBm, Max = 17dBm
Battery Life	Min @ 100 rps (**)	12 - 18 months
Battery Type	Remote Battery	(TL-5930/F) Lithium D Cell, 3.6VDC, 19Ah
Housing Material		Grivory GV-5H (Glass reinforced plastic)
Base Unit		
Power Supply	VDC, mA	12 - 24; Min. 250mA
Virtual Excitation (External Ref)	VDC	4.8-10.1 (Ref 5 ± 0.05)
Virtual Bridge Resistance	Ω	700
Housing Material		Die-cast Aluminium

(*) 2-3dBm; Telemetry range will change according to site RF Channel Settings

(**) Battery Life changes as per RF output; latency; Temp; antenna distances etc. Refer to Manufacturer for details.

6. Markings

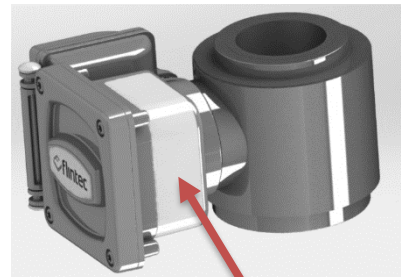
Remote unit (transmitter)

FUNTEC PO Box 24, Spur Rd 2, Phase 1, KEPZ, Katunayake, Sri Lanka.	MODEL	: CC1W-xxklb	IECEx UL 20.0073X	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation WARNING: DO NOT REPLACE BATTERY WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT. POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS Avertissement : Ne remplacez pas la batterie en présence d'une atmosphère explosive. Risque potentiel de charge électrostatique - voir les instructions Intrinsically Safe and sécurité intrinsèque and Exia
	PMN/HVIN	: CC1WRR	DEMKO 20 ATEX 2322X	
	S/N	: xxxxxxxx	II 1 G Ex ia IIC T4 Ga	
	FCC ID	: 2AUSA-CC1WRR	-55° ≤ Ta ≤ +80°C	
	IC	: 25535-CC1WRR	CLASS I, ZONE 0, AEx ia IIC T4 Ga	
	MAC #	: xx.xx.xx.xx	CLASS I, DIV 1, GROUPS A,B,C,D; T4	
	FIRMWARE #	: xxxxx	DOM: YYYY-MM	
FVIN	: xxxxx			



Typical ATEX & IECEx Marking										
CE	0359	Ex	II	2	G	Ex	db	IIC	T4	Gb
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Complies with European Directive*	Notified Body Number*	Specific Marking for Explosion Protection*	Equipment Group*	Equipment Category*	Environment*	Explosion Protection	Protection Type	Atmosphere Group	Temperature Class	Equipment Protection Level (EPL)

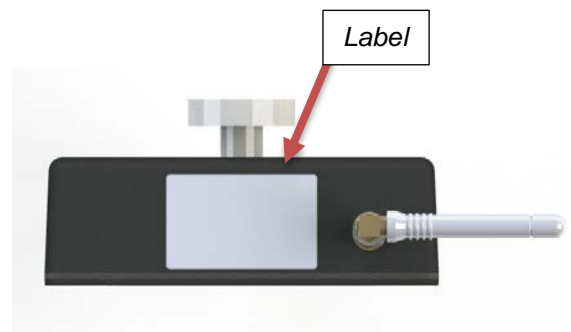
*ATEX only (ATEX 2014/34/EU)



- | | | | |
|---|------------|--|--------------|
| Equipment Group | II | - All areas except mines | Label |
| Equipment category and environment | 1 G | - Gas, vapor, mist | |
| Explosion protection | Ex | - Conformity with some of the IECs protection modes | |
| Protection type | ia | - Intrinsic security "ia" protection mode than mines. Gases groups | |
| Temperature class | T4 | - Max surface temp 135°C (275°F) | |
| Equipment Protection Level (EPL) | Ga | - Gas atmospheres. Very high level of protection | |

Base Unit (receiver)

		PO Box 24, Spur Rd 2, Phase 1, KEPZ, Katunayake, Sri Lanka.
MODEL	: xxxxxxxx	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation Made in Sri Lanka
PMN/HVIN	: CC1WRB	
S/N	: xxxxxxxx	
FCC ID	: 2AUSA-CC1WRB	
IC	: 25535- CC1WRB	
MAC #	: xx.xx.xx.xx	
FIRMWARE #	: xxxxx	
FVIN	: xxxxx	

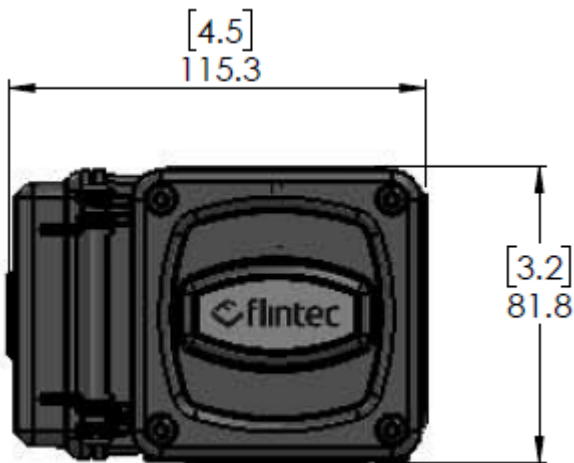
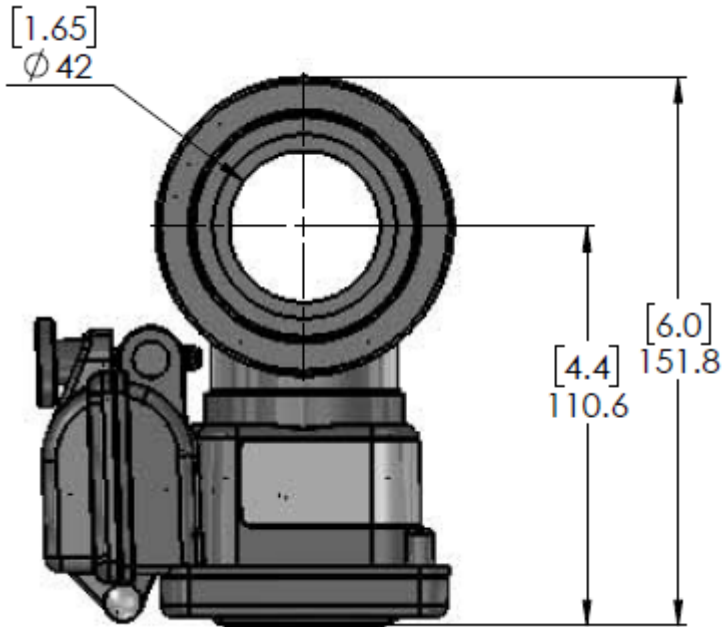


Ordinary Location Markings

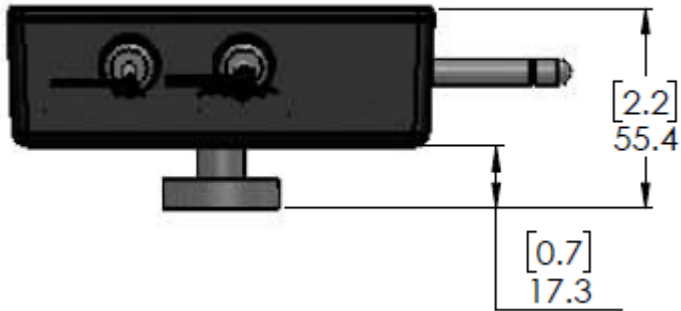
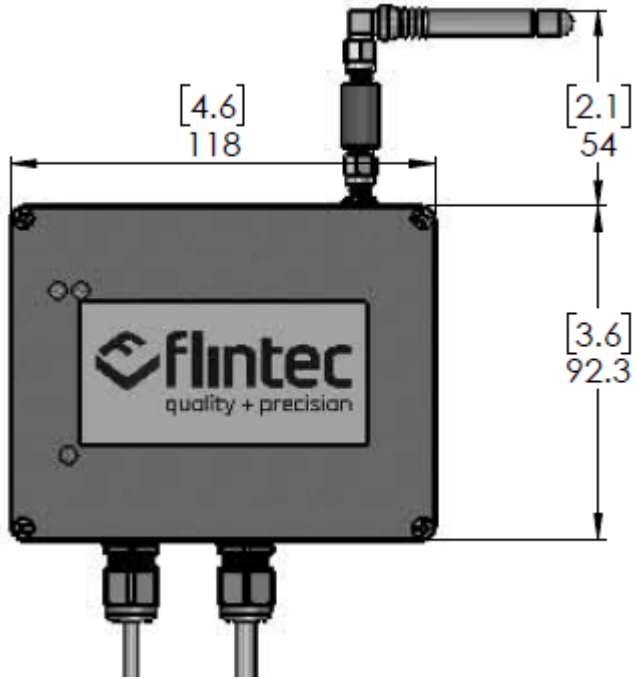
- Maximum Operating Temperature: 80°C accordingly.
- Maximum Humidity: 95 % without moisture condensation.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Maximum Altitude: 2000 Meters

7. Product Dimensions

Remote unit (dimensions in ^[inches]
mm)



Base unit (receiver)



8. Safety Information



Intended Usage

Operating temperatures cannot exceed 80°C or -55°C. Operation of the CC1W outside of the defined temperatures will result in none compliance of awarded safety certification. Avoid placement of the CCW1 radio device in areas of heating or cooling sources.

The CC1W system works as a wireless network. Component positioning is essential to ensuring correct operation. The load cell and base unit should be positioned as closely together as possible. The line of sight should be free of obstacles and positioned away from electrical noise sources to limit interference.



Lithium Batteries

The CC1W is powered by a Lithium battery (single). Special care must be taken in order to prevent damage to the battery. The battery is composed of a single Lithium-Thionyl Chloride (Li-SOCl₂) cell connected with an extension cable.

- Do not apply pressure that may deform the battery.
- Do not use the battery if there are signs of swelling. Remove immediately.
- Do not direct heat to the battery or solder.
- Work areas should be free of sharp objects that could damage the insulating material.
- Use only TADIRAN TL-5930/F Batteries



WARNING: Do not replace battery when an explosive atmosphere is present
Advertisement: Ne remplacez pas la batterie en présence d'une atmosphère explosive



Maintenance Safety

Product maintenance must be performed by a suitably trained, competent, person. Standard safety protocols must be adhered to when working with the CC1W system.



X Mark Conditions

The capacitance of exposed isolated metal parts was found to be 53.9 pF.

Static discharge - It is recommended that fitment and maintenance be carried out in electrostatic clothing, whilst wearing gloves and using insulating objects/tools.

Cleaning should be carried out with a damp cloth. Contamination on non-metallic parts can cause electrostatic charges, especially at low humidity or dry conditions. Special care must be taken to avoid places or areas where airflows occur.



FCC Certification Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device has been designed to operate with the antenna(s) listed below, having a maximum gain of +3.2dBi. Antennas not included in this list or having a gain greater than +3.2dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Base Unit: FCC ID: 2AUSA-CC1WRB

Permitted Antennas

- Linx ANT-2.4-CW-HW, maximum gain of +3.2dBi
- Linx ANT-2.4-CW-HW-T, maximum gain of +3.2dBi
- Linx ANT-2.4-CW-HWR-RPS, maximum gain of +3.2dBi
- *Linx ANT-2.4-CW-RCS, maximum gain of -0.2dBi*

Remote Unit: FCC ID: 2AUSA-CC1WRR

Permitted Antennas

- Yageo ANTX150P112B24553, maximum gain of +2.2dBi
- *Molex 1461870150, maximum gain of +3.0dBi*



ISED RSS-Gen Notice

“This device complies with Industry Canada’s license-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.”

“Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes :

- 1) l’appareil ne doit pas produire de brouillage;
- 2) l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.”



ISED RSS-Gen Notice

“CAN ICES-3/NMB-1”



IC Certification Statement

This radio transmitter (identify the device by certification number, or model number if (Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes : (1) l’appareil ne doit pas produire de brouillage, et (2) l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

Base Unit: IC: 25535-CC1WRB

Permitted Antennas

- *Linx ANT-2.4-CW-RCS, maximum gain of -0.2dBi*
- *Linx ANT-2.4-CW-HW, maximum gain of +3.2dBi*
- *Linx ANT-2.4-CW-HW-T, maximum gain of +3.2dBi*
- *Linx ANT-2.4-CW-HWR-RPS, maximum gain of +3.2dBi*

Remote Unit: IC: 25535-CC1BRR

Permitted Antennas

- Yageo ANTX150P112B24553, maximum gain of +2.2dBi
- Molex 1461870150, maximum gain of +3.0dBi



FCC & ISED Canada RF Exposure Notice

This device is intended to be mounted at a fixed location.
This device is not intended to be operational while carried on a person.

When used in an outdoor location:

To comply with FCC/IC RF exposure limits for general population/uncontrolled exposure, the antenna(s) used for this transmitter must be installed on outdoor permanent structures to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

When used in an indoor location:

To comply with FCC/IC RF exposure limits for general population/uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.



Avis d'exposition FCC et ISDE Canada RF

Cet appareil est destiné à être monté à un emplacement fixe.
Cet appareil n'est pas destiné à être opérationnel lorsqu'il est transporté par une personne.

Lorsqu'il est utilisé à l'extérieur:

Pour se conformer aux limites d'exposition RF FCC / IC pour la population générale / exposition non contrôlée, les antennes utilisées pour cet émetteur doivent être installées sur des structures permanentes extérieures pour fournir une distance de séparation d'au moins 20 cm de toutes les personnes et ne doivent pas être co -situé ou fonctionnant en conjonction avec toute autre antenne ou émetteur.

Lorsqu'il est utilisé à l'intérieur:

Pour se conformer aux limites d'exposition RF FCC / IC pour la population générale / exposition non contrôlée, les antennes utilisées pour cet émetteur doivent être installées pour fournir une distance de séparation d'au moins 20 cm de toutes les personnes et ne doivent pas être colocalisées ni fonctionner en conjonction avec toute autre antenne ou émetteur.