
*User's
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 - stainless steel, hermetic seal, fatigue rating and intrinsically safe operation. 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 all 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 carefully 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: +13dBm to +17dBm, 30-300 meter transmission
- HazLoc approved: UL rated for Class 1, Division 1 environments (see label for full approval)
- On-board position: +/-0.5% 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)

Accessories:

Base/Receiver (included)

Antenna & Connection Cables (included)

Lithium Battery (Included)

Magnetic Mount or Post Mount for Base (user specified)

Load Spacer/Plate

Spherical Washer Set

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 intrinsic safety (section 12).

2.1 Base Unit

The “Base” (receiver) of the device comes with a magnet base for easy mounting on a metal surface inside or outside of the pump controller cabinet. Base is mounting outside the hazardous area and not intended to meet hazardous location safety standards.

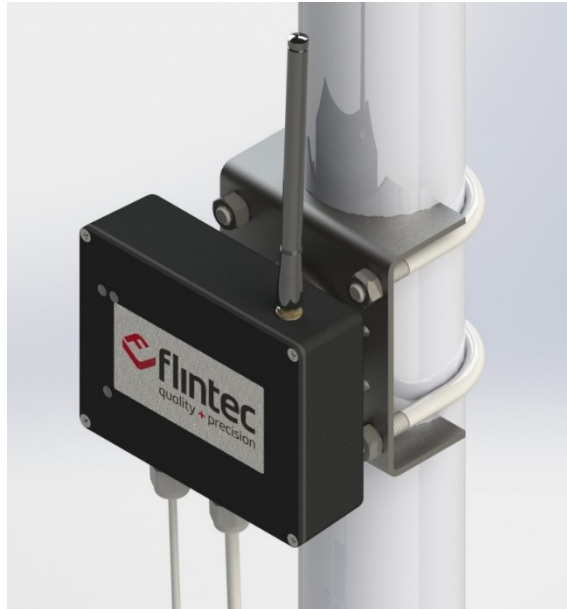


Base Unit

When the magnet base is not directly attached due to non-metallic surface or space constraint, the base can be suitably fastened to any structure using brackets, plates or other type of support.



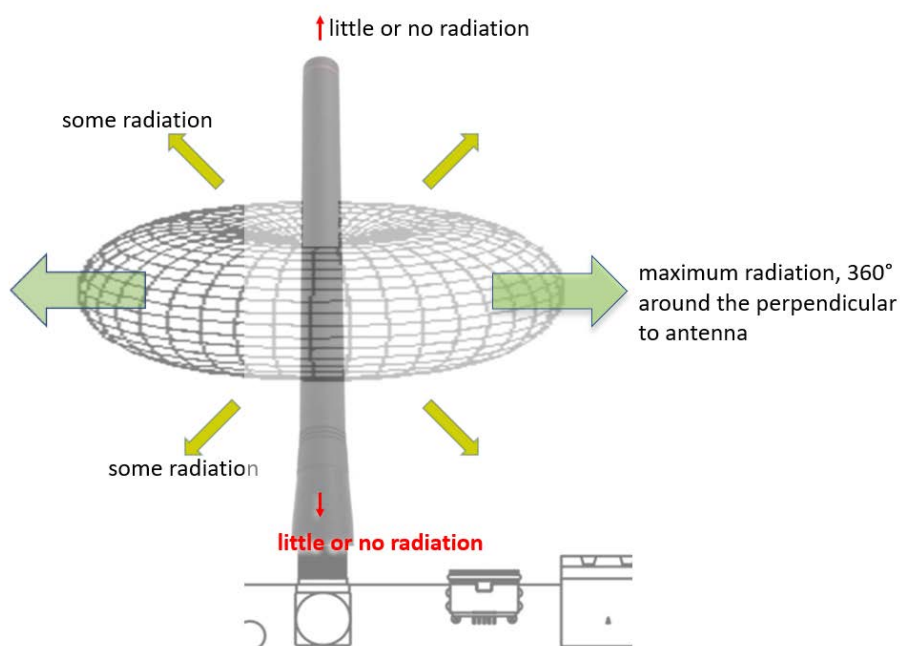
DIN rail mount



Pole mount with U-

IMPORTANT In order to achieve the best performance a vertical alignment of the antenna must be ensured.

You may optionally use an extension cable to mount the antenna.





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**

In order to achieve the best performance a vertical alignment of the antenna must be ensured.

- **Line-of-sight**

Is important to find, whenever possible, a spot full line of sight with the receptor where no obstacles reside between the path.

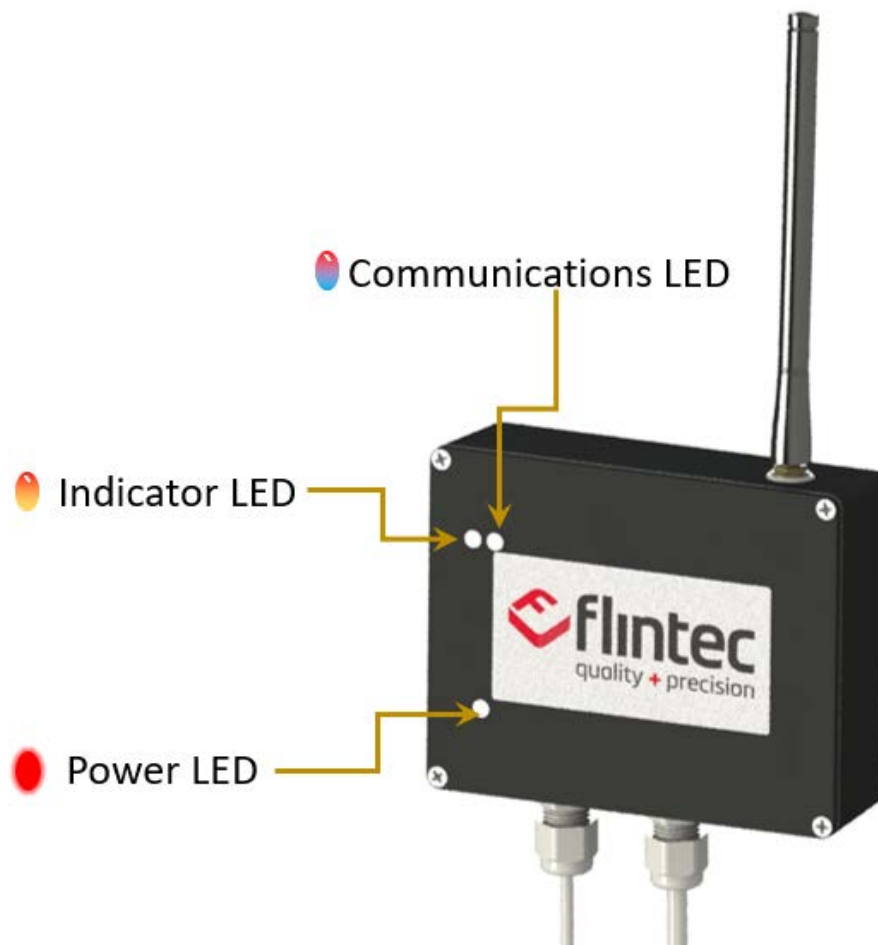
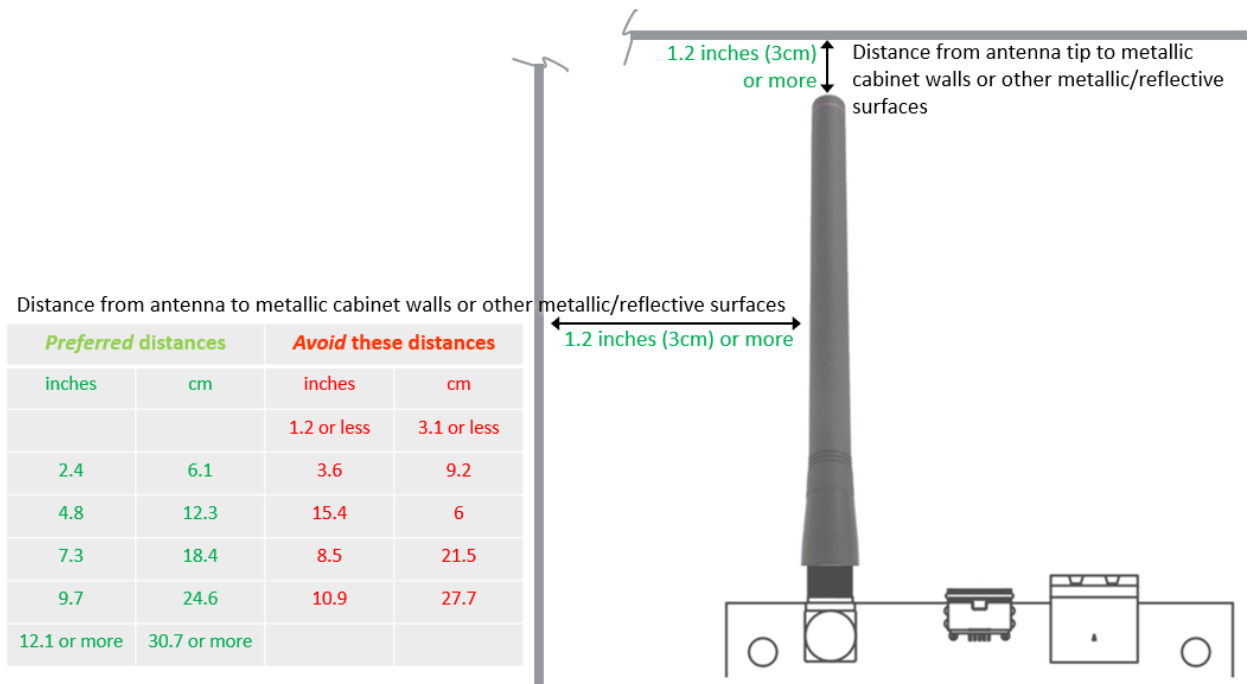
Note: Fresnel Zone, the area around the visual line-of-sight that radio waves spread out into after they leave the antenna must be clear or the signal strength will be weakened due to reflections.

- **Antenna Height**

Taking advantage of the free positioning of the base antenna, a convenient place in height with good clearance and away from ground must be considered.

Note: The use of extension cables that always represent attenuation and signal strength losses should be avoided if possible

When mounting inside an enclosure



Base Unit Connections



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

12 to 24VDC
power input (see
also next pages)

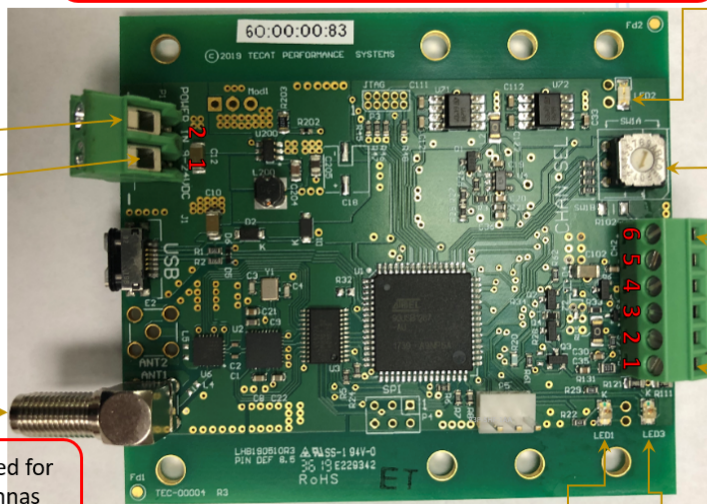
1: 12 to 24VDC

2: Ground

Antenna port



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



Power LED

Channel selection
rotary switch



6: Optional analog

5: Ground

4: 5 or 10 VDC excitation

3: 0-10mV high

2: 0-10mV low

1: Ground

Wireless strain gage
output, reference
voltage input
(see also next pages)

Communications LED

Indicator LED

SIGNAL CABLE COLOR CODE
RED
GREEN
WHITE
BLACK
YELLOW
GRAY
VIOLET

Vref +

Sig +

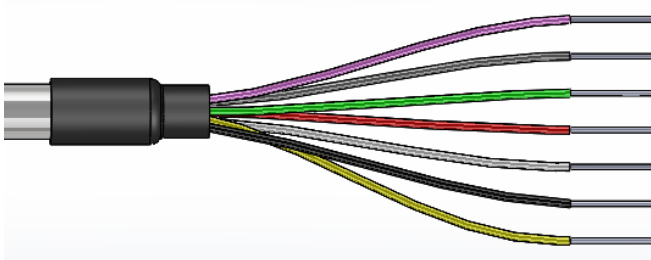
Sig -

Vref -

Shield

Sig 2 +

Sig 2 -



POWER CABLE COLOR CODE
BLACK
YELLOW
RED

Ground

Shield

12 to 24VDC



WARNING: Insulate unused leads to prevent shorting.

2.3 Remote Unit (Wireless Loadcell)



CC1W must be mounted as same as any other regular loadcell on the polished rod.

IMPORTANT

Position the remote unit (Plastic enclosure with Flintec Logo) direct to the base unit for better performance

2.4 Battery Installation

CC1W remote unit powered by a primary battery and must be fitted suitably in the battery compartment. The person in charge of the installation must verify that the battery not damaged or soaked.

WARNING: This product is certified for use with TADIRAN TL-5930/F. Make sure the battery cable tuck inside the compartment to prevent squeeze in between the edges when closing the door



3. Equipment Maintenance

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

This manual must be read and kept carefully, in order to be always at the operator's disposal in case of need.

3.1 Battery Replacement

CC1W remote unit (transmitter) is powered from a specific battery

- TADIRAN – TL-5930/F

The battery must be replaced in non-hazardous areas where no any potential of explosion atmospheres.

1. Open up the battery compartment loosening the battery door knob (see section 2.4 on this manual).
2. Unplug the battery connector from housing.
3. Take the battery off.
4. Replace the battery for a new one.
5. Close the door and lock with the door knob (see section 3.3 on this manual)

4. Operation

1. Disconnect or turn off power to the base unit.
2. Ensure the base antenna is connected.
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 is set to use an alternate channel, it will switch the remote to that channel.
This only takes a few seconds.
8. Normal operation begins.
A reconstructed version of the 0-10mV or 0-20mV nominal load cell output will appear at the base output.
9. As shown on section 4.1 on this manual, if radio interference occurs, an alternate channel may be selected.

Base Unit LEDs

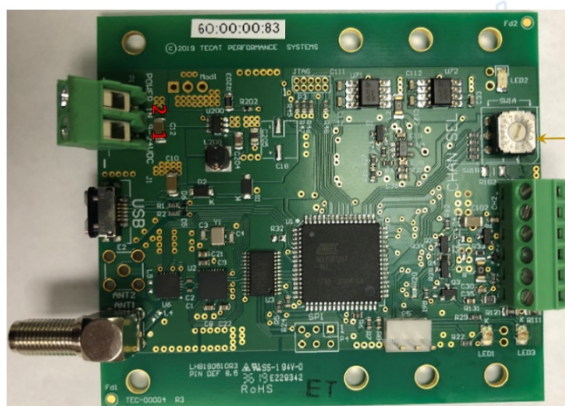
-  Power LED (red)
'ON' continuously when nominal 12 to 24VDC power is applied
-  Indicator LED (red/yellow)
Yellow: low radio signal strength
Red: very low radio signal strength
-  Communications LED (blue/red):

Flashing Pattern	State
~25Hz blue	Normal operation
Red flash, once	Retransmission
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)

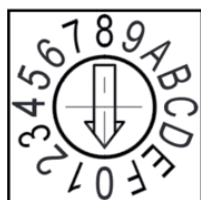
Remove up the base top cover. The 4 Philips head screws attached to the flat base cover loosened with the proper tool (manual Philips screwdriver).

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



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 blue LED 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

<u>Standard Specifications</u>	<i>lbf</i>	<i>30k, 50k</i>
<i>Rated Output</i>	<i>mV/V</i>	<i>2.00 ± 0.5%</i>
	<i>mA (Optional)</i>	<i>4-20</i>
<i>Rated Position Output</i>	<i>% FS (Stroke)</i>	<i>± 0.5</i>
<i>Nonlinearity</i>	<i>% FS</i>	<i>± 0.25</i>
<i>Hysteresis</i>	<i>% FS</i>	<i>± 0.25</i>
<i>Non-Repeatability</i>	<i>% RO</i>	<i>± 0.1</i>
<i>Static Error Band</i>	<i>% FS Max</i>	<i>± 0.50</i>
<u>Temperature</u>		
<i>Compensated Temperature Range</i>	<i>°F (°C)</i>	<i>-14 to 150 (-25 to 65)</i>
<i>Safe Operating Temperature Range</i>	<i>°F (°C)</i>	<i>-70 to 175 (-55 to 80)</i>
<i>Temperature Effect on Zero</i>	<i>% RO/°F Max</i>	<i>± 0.005</i>
<i>Temperature Effect on Output</i>	<i>%RO/°F Max</i>	<i>± 0.002</i>
<i>Zero Balance</i>	<i>% RO Max</i>	<i>± 1</i>
<i>Safe, Axial Load</i>	<i>% Capacity Max</i>	<i>200</i>
<i>Deflection at Capacity</i>	<i>inch Nom</i>	<i>0.005</i>
<i>Weight, Remote Unit</i>	<i>lb. nom</i>	<i>4.2</i>
<i>Fatigue Rating (Compression)</i>	<i>Min Cycles @Capacity</i>	<i>50,000,000</i>
<i>Shock Rating</i>	<i>g</i>	<i>Up to 500</i>
<i>Vibration Rating</i>	<i>MIL-STD-810G</i>	<i>514.6; 516.6</i>
<i>Sensor Element</i>		<i>17-4 PH Stainless Steel</i>
<i>Protection according EN60529</i>		<i>IP67 or higher</i>
<u>Electronics</u>		
<i>Remote and Base Transceiver Units Matched</i>	<i>Mac ID</i>	<i>(32bit) Specific; no external connection - Paired unit</i>
<i>Data Rate</i>	<i>Readings/Sec</i>	<i>100</i>
<i>Radio Frequency</i>	<i>GHz</i>	<i>2.405 to 2.470</i>
<i>Radio Channels</i>	<i>Selectable (*)</i>	<i>14</i>
<i>Telemetry Range</i>	<i>Feet (Meters) (*)</i>	<i>100 - 1000 (30-300)</i>
<i>RF Power Output - Remote Unit</i>	<i>dBm (*)</i>	<i>Min = 13.0dBm, Max = 15.5dBm</i>
<i>RF Power Output - Base Unit</i>	<i>dBm (*)</i>	<i>Min = 16.0dBm, Max = 17dBm</i>
<i>Battery Life</i>	<i>Min @ 100 rps (**)</i>	<i>12 - 18 months</i>
<i>Battery Type</i>	<i>Remote Battery</i>	<i>(TL-5930/F) Lithium D Cell, 3.6VDC, 19Ah</i>
<u>Base Unit</u>		
<i>Power Supply</i>	<i>VDC, mA</i>	<i>12 - 24; Min. 250mA</i>
<i>External Ref. (Virtual Excitation)</i>	<i>VDC</i>	<i>4.8-10.1</i>
<i>Virtual Bridge Resistance</i>	<i>Ω</i>	<i>700</i>

(*) 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.

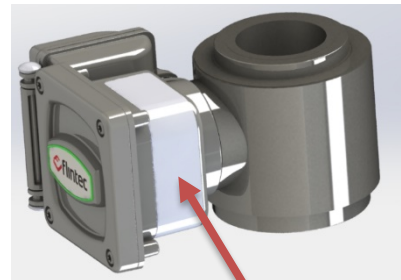
6. Product Label

Remote Unit (Transmitter)

Flintec 18 Kane Industrial Drive, Hudson MA 01749, USA Made in Sri Lanka	MODEL	: CC1W-xxdb	IECEX UL 19.0124 Issue 0	 0539    LISTED UL File E-471172	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: Substitution of components may impair intrinsic safety. AVERTISSEMENT: La substitution de composants peut compromettre la sécurité intrinsèque.
	PMN/HVIN	: CC1WRR	DEMKO 19 ATEX 2322 Rev. 0		
	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	CLASS II, DIV 1, GROUPS E,F,G		
	FVIN	: xxxxx	CLASS III		

Typical ATEX & IECEX Marking										
		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)



Label

Equipment Group	II	- All areas except Mines
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)

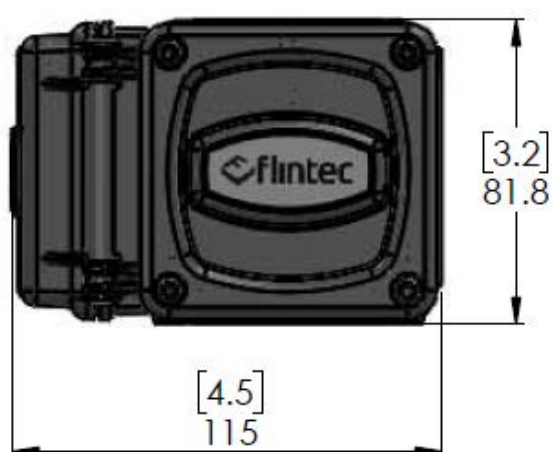
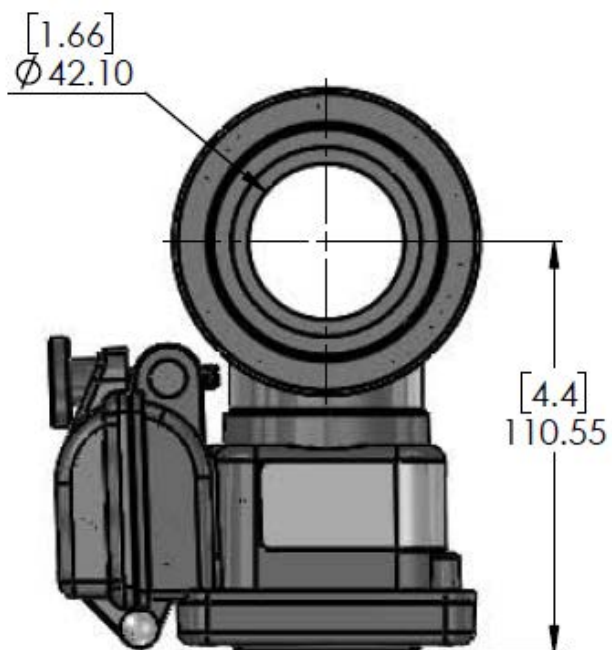
		18 Kane Industrial Dr, Hudson MA 01749, USA	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation 	Made in Sri Lanka
MODEL	: xxxxxxxx			
PMN/HVIN	: CC1WRB			
S/N	: xxxxxxxx			
FCC ID	: 2AUSA-CC1WRB			
IC	: 25535-CC1WRB			
MAC #	: xx.xx.xx.xx			
FIRMWARE #	: xxxxx			
FVIN	: xxxxx			



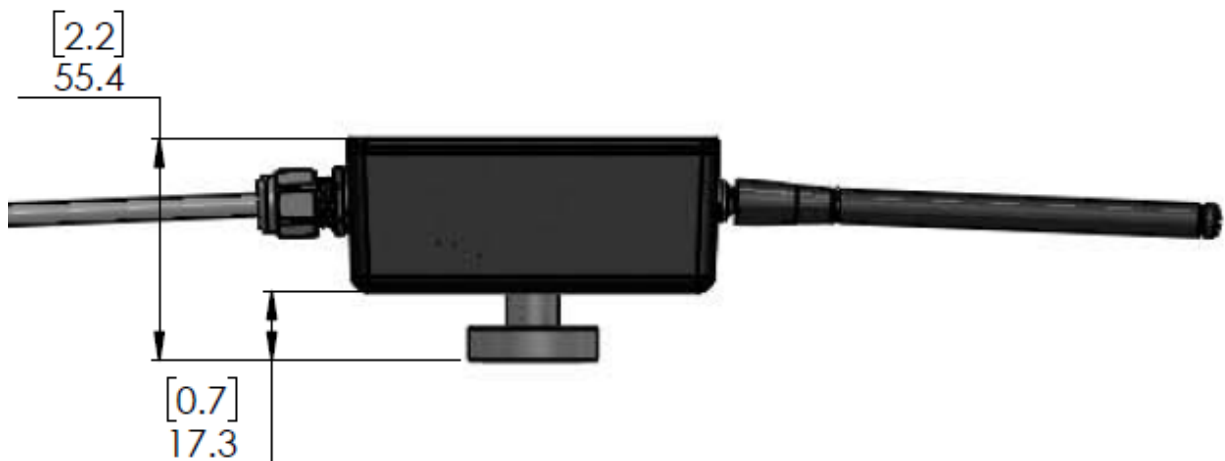
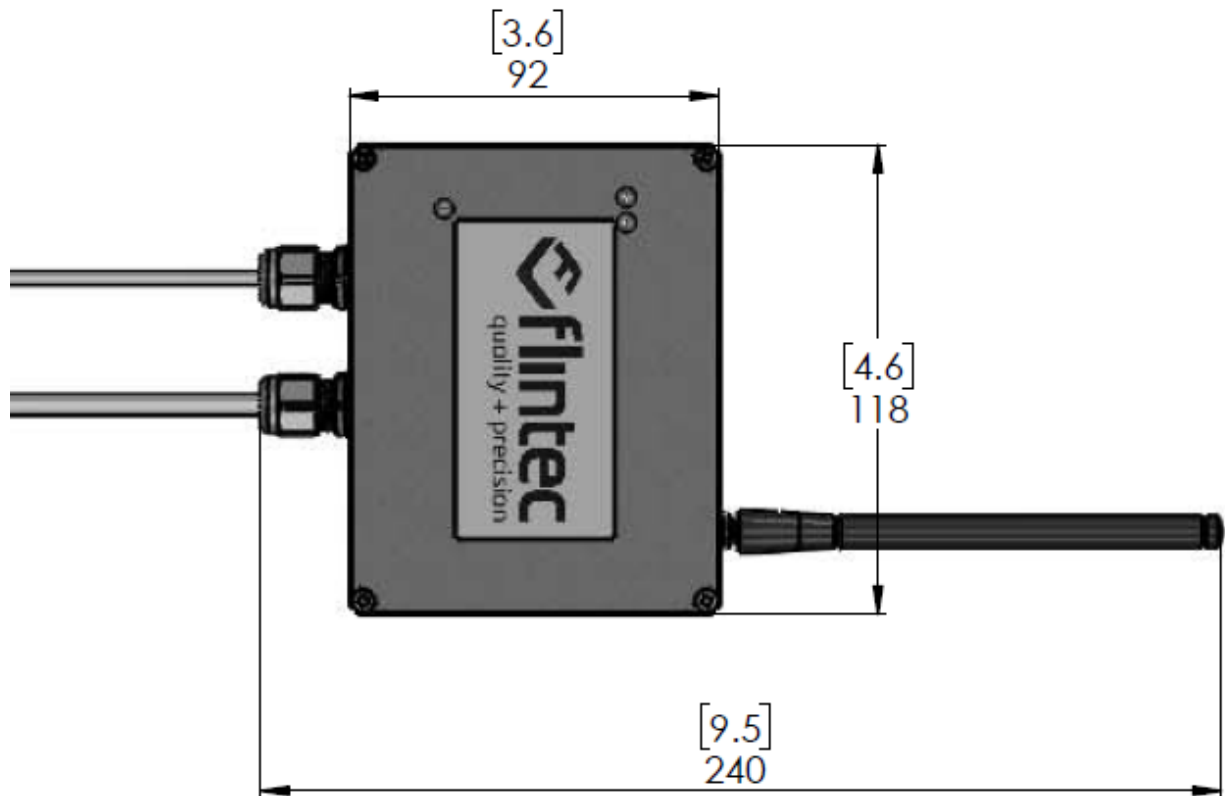
Label

7. Product Dimensions

Remote Unit



Base Unit (Receiver)



8. Safety information



Intended Usage

A maximum temperature on the device enclosure must not reach temperatures higher than 80°C or lower than -55°C. This condition must be guaranteed permanently in order to be compliant with the intrinsic safety certification. The CC1W radio device must not be placed near heating or cooling sources that can put at risk.

As a radio node forming part of a wireless network its positioning can greatly affect its coverage area and the strength of its signal. It is always recommend to position the transceiver set free of obstructions and with good line-of-sight to the rest of the network and whenever possible away of electrical noise sources that can cause interferences.



Lithium Batteries

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

- ☒ Do not apply pressure that may deform the battery
- ☒ Do not use the battery if there are signs of swelling – remove immediately
- ☒ Do not directly heat or solder
- ☒ Work areas should be free of sharp objects that could puncture the insulating material

IMPORTANT: The battery must be replaced in non-hazardous areas.



Maintenance Safety

There must be a competent person with enough skills and knowledge supervising all works performed. Experienced and trained personnel must follow the industrial standard safety protocol when authorized maintenance activities are carried out on the equipment.

**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 ANT-X100P112B24553, maximum gain of +2.2dBi
Molex 1461870150, maximum gain of +3.0dBi



ISED RSS-Gen Notice

“This device complies with Industry Canada’s licence-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-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

IC: 25535-CC1BRR

Permitted Antennas

- Yageo ANT-X100P112B24553, 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.