



TRAX

**Intelligent Pipeline
Technology**

EMTx20 Operating Manual

Electromagnetic Transmitter



CONFIGURATION INFORMATION	
SERIAL NUMBER :	
PRODUCT CODE :	
FREQUENCY :	
RATE 1 PULSE LENGTH :	
RATE 1 REPETITION RATE :	
RATE 1 BATTERY LIFE AT +5°C :	
*RATE 2 PULSE LENGTH :	
*RATE 2 REPETITION RATE :	
*RATE 2 BATTERY LIFE AT +5°C :	
SPECIFIED ON PRESSURE :	
**SPECIFIED OFF PRESSURE :	

*Rate 2 only applicable when a Dual Rate Endcap is fitted.

**Off pressure only applicable when a non-latching Pressure Switch Endcap is fitted.

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Revision	Updated By	Description of Update	Update Date
C	BG	CR-24-01-04-01: Content now applicable to all transmitter variants.	11/03/24

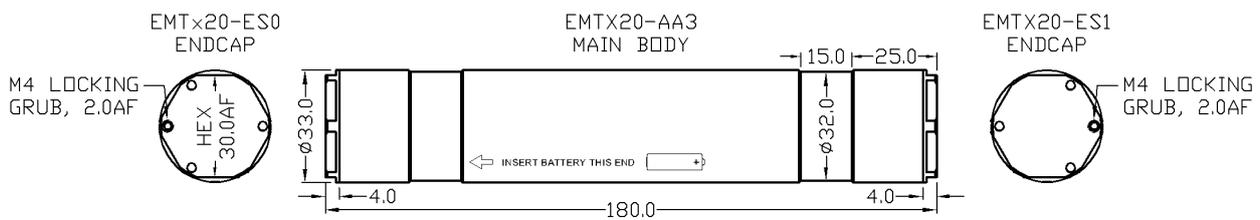
1. GENERAL DESCRIPTION

The EMTx20 EM Transmitter series are ATEX/IECEX CERTIFIED electromagnetic transmitters which can be used for pig tracking and locating functions. The transmitters operate effectively in buried pipelines, pipelines carrying gas or liquid and in pipeline bundles where acoustic transmitters are either less effective or ineffective.

The standard transmission frequency is 22.0Hz, however the frequency is factory and user programmable over the frequency range of 15Hz to 38Hz. An inherent EM null spot is detectable when an EM receiver antenna is at 90 degrees to and pointing towards the centre of the transmitter, allowing for centimetre accurate locating of the pig.

The EMTx20 transmitter signal can be detected through pipeline walls. Signal strength is dependent on several factors including transmitter type, pipeline diameter, pipeline material, pig design, pig speed and background EM noise levels. The transmitter power level can be adjusted to achieve the optimum balance between signal strength and battery life. Pulsed signalling can also be utilised to extend battery life. Please contact IK Trax to discuss the most effective configuration.

Pigging discs can be fitted directly to the transmitter, meaning the transmitter becomes the pig body. This dramatically increases the received EM signal as it no longer needs to propagate through the pig body in addition to the pipeline.



1.1. ENDCAP OPTIONS

All EMTx20 transmitters come fitted with ATEX/IECEX certified Battery and PCB Endcaps as standard. There are several different endcaps options available which add additional functionality to the unit. The EMTx20 incorporates an endcap detection circuit that allows it to determine the type of endcap that has been fitted and behave accordingly. As a result, any endcap can be fitted to any EMTx20 housing. Refer to Section 7 ENDCAP OPTIONS of this manual for further information.

2. SPECIFICATIONS:

NOTE THAT THE SPECIFICATIONS BELOW ARE VALID FOR THE STANDARD CONFIGURATION ONLY. REFER TO PAGE 1 OF THIS MANUAL FOR THE CONFIGURATION INFORMATION SPECIFIC TO THE TRANSMITTER BEING USED.

MODELS:

EMTx20 AA1 (1 cell)⁽¹⁾..... Non certified.
EMTx20 AA2 (2 cell) ATEX/IECEX certified.
EMTx20 AA3 (3 cell) ATEX/IECEX certified.

BATTERY LIFETIMES:

Battery lifetime at +5°C ⁽³⁾ in air Up to 68 days. ⁽¹⁾

GENERAL:

Battery Type (1AA)..... Lithium Thionyl Chloride AA cell.
Battery Type (2AA & 3AA) Alkaline AA DURACELL ID1500 cells.
Standard signal at 1m +20°C in air ⁽³⁾..... 1 cell (12mVpp), 2 cell (35mVpp), 3 cell (80mVpp)
Standard frequency ⁽³⁾ 22Hz
Temperature range See section 10 CERTIFICATION APPENDIX
Bump rating..... 20G
Housing material 316L Stainless Steel or Grade 5 Titanium
Endcap material 2205 Duplex Stainless Steel
O-ring material NBR70
Weight in SS 316L (including batteries)..... 1 cell (0.35kg), 2 cell (0.6kg), 3 cell (0.9kg)
Weight in Grade 5 Titanium (including batteries) 1 cell (0.4kg), 2 cell (0.4kg), 3 cell (0.7kg)
External pressure rating in 316L Stainless Steel 300bar/4,531 Psi
External pressure rating in Grade 5 Titanium 500bar/7,252 Psi
ATEX/IECEX code II 2 G Ex db IIC Gb T6 Tamb -20°C to 51°C
EU Type Examination Certificate Number.....EMT 16 ATEX 0011X
IECEX Certificate NumberIECEX EMT 16.0009X

(1) EMTx20 AA1 is available as a Lithium battery powered unit only and is not ATEX/IECEX certified.

(2) Dependent on Model and configuration. Contact IK Trax to discuss individual requirements.

(3) Parameters such as Power, Lifetime, Frequency, ON time and OFF time can be customised, please contact IK Trax to discuss your project requirements.

3. RULES FOR SAFE OPERATION

⚠ WARNING: The Special Conditions for Safe Use as detailed in Section 10 CERTIFICATION APPENDIX must be followed at all times.

⚠ WARNING: Any operation involving pressure is potentially hazardous. No person should use this equipment unless fully aware of the potential hazards of working with pressurised vessels. The purchaser of this equipment is responsible for the training and competence of operators and the manner in which it is used. This manual should be read through and understood before installation and commissioning so that the operator is familiar with the equipment. Contact Online Electronics Ltd immediately should any difficulty arise in the use of this equipment.

⚠ WARNING: DO NOT open when an explosive atmosphere may be present. Always use caution when opening equipment which has been in a pressurised environment. It is possible for pressure to leak into the equipment and remain there even after external pressure has been removed. ALWAYS point the end to be opened towards a safe area and away from yourself or others. Contact Online Electronics immediately if there is a suspicion that the equipment has become pressurised.

⚠ WARNING: Replace all batteries at the same time. NEVER install used batteries. NEVER install a mix of new and used batteries. USE ONLY new batteries from the same package or manufacturing batch. DO NOT mix different brands or types of batteries. ALWAYS observe correct battery polarity. New batteries should be installed before each deployment.

⚠ WARNING: Do not expose to aggressive solvents or chemicals which could be harmful to the HOUSING, O-RINGS, CONNECTORS or any other parts of the equipment.

⚠ CAUTION: Opening of the equipment should take place in a clean laboratory environment.

⚠ CAUTION: To prevent the formation of condensation within the transmitter, allow the transmitter temperature to stabilise within the laboratory environment for a minimum of 6 hours prior to opening.

⚠ CAUTION: It is possible for liquids to become trapped in threads and/or gaps around openings. ALWAYS point the end to be opened downwards to allow any trapped liquid to drain out of and not into the equipment.

4. OPERATION

The following instructions are for a unit fitted with the standard Battery Endcap and PCB Endcap For operation instructions relating to a unit fitted with any of the alternative endcaps, please refer to Section 7 ENDCAP OPTIONS of this manual.

1. Familiarise yourself with all the rules for the safe operation of this equipment as described in Section 3 RULES FOR SAFE OPERATION.

4.1. TURNING ON

1. To turn the transmitter on, use the supplied ENDCAP REMOVAL TOOL to remove the BATTERY ENDCAP, then remove the battery isolator. Using the supplied ENDCAP REMOVAL TOOL, re-fit the BATTERY ENDCAP, do not use excessive torque. The transmitter takes approximately 5 seconds to turn on.

4.2. FUNCTION TEST

An EM receiver, such as an IT Trax EMRxE Receiver is required to receive the signal from the transmitter. Refer to the relevant EM receiver manual for instruction on setup and operation of the EM receiver.

1. Place the EM receiver approximately 4m away and parallel to the transmitter.
2. Activate the transmitter as detailed in Section 4.1 TURNING ON.
3. Confirm that a clear signal is received, and the pulse rate is as expected.
4. Switch the transmitter between OFF and ON a few times to ensure that the signal received reacts as expected.
5. An inherent null spot is detectable when the antenna is at 90 degrees to and pointing at the centre of the transmitter allowing accurate positioning of a pig. Refer to the relevant EM receiver manual for further information.
6. Turn OFF the transmitter as detailed in Section 4.5 TURNING OFF.
7. If all results were as expected, then the system is functional.

4.3. INSTALLATION

⚠ WARNING: The Special Conditions for Safe Use as detailed in Section 10 CERTIFICATION APPENDIX must be followed at all times.

⚠ WARNING: The transmitter must be mounted in such a way that no movement or vibration is possible whatsoever (e.g. clamped). If the transmitter is allowed to rattle and/or vibrate within the pig then the resultant hammering effect can exceed the bump rating of the transmitter leading to damage and/or failure. This is particularly important in gas pipelines.

⚠ WARNING: Transmitters with the main body manufactured from Titanium MUST be installed in such a way that ignition sources due to impact and friction sparks are excluded. Refer to the main body markings for the material type supplied.

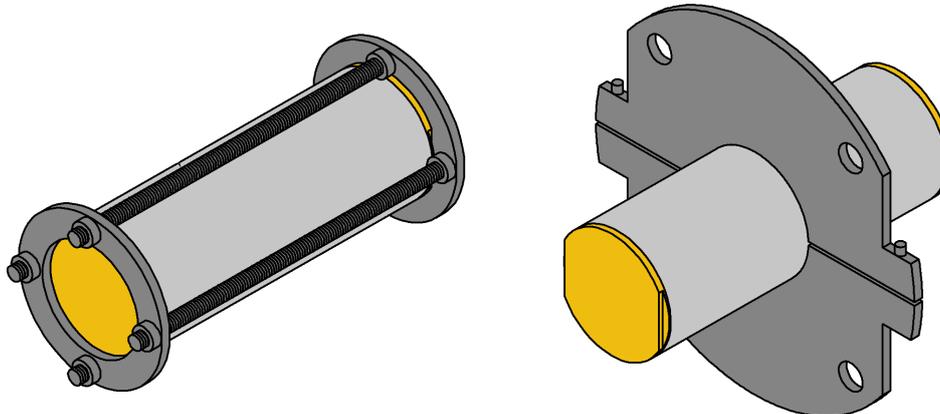
⚠ CAUTION: All EM transmitters will induce electrical currents in any conductive materials closely surrounding them which can result in a severe reduction in signal strength and/or battery lifetime. This effect can be minimised by reducing the amount of conducting material

surrounding the transmitter and leaving as much of the transmitter exposed as possible. Any slits or apertures which can be made in the surrounding material will help. Use materials with as high resistance as possible. Non-conducting materials such as plastics will not suffer from this effect. EM transmitters must not be surrounded by low resistance metals such as aluminium (including tubes or mounting clamps) under any circumstances.

⚠ CAUTION: Any magnetic material surrounding the transmitter will tend to block the EM signal from the transmitter and reduce the received signal strength outside the pipeline. This effect can be minimised by reducing the amount of magnetic material surrounding the transmitter and leaving as much of the transmitter exposed as possible. Any slits or apertures which can be made in the surrounding material will help. Use materials with as low magnetic permeability as possible. Non-magnetic materials such as plastics will not suffer from this effect. The table below shows the typical characteristics of several potential pig and mounting materials with the best choice at the top, and the worst choice at the bottom. 316 stainless steel provides a good balance of properties and cost. An aluminium alloy would be a very poor choice because of the very low resistivity and should not be used under any circumstances.

MATERIAL	RESISTIVITY ($\mu\Omega.m$)	MAGNETIC PERMEABILITY
PLASTIC	∞	1.000
316 STAINLESS STEEL	0.75	1.008
2205 DUPLEX SS	0.80	>25.0
1005 STEEL	0.20	>100
ALUMINIUM ALLOYS	0.04	1.000

For optimum performance the transmitter should be clamped inside a plastic pig body or plastic guide discs should be clamped around the transmitter to form a pig. The advantage of these methods is the fact that there is no metal around the transmitter apart from the pipeline itself. Two alternative mounting arrangements are shown below. The first uses several lengths of threaded studding to clamp the transmitter between two plates. The second uses a clamping disc. The advantage of these arrangements is that they have limited amounts of metal around the transmitter and will therefore have limited effect on the transmitter performance. Please contact IK Trax for further information and guidelines regarding EM transmitter mounting and installation.



4.4. DEPLOYMENT

Before each deployment ensure that the following checks have been completed.

1. Ensure that the transmitter has been installed as detailed in Section 4.3 INSTALLATION.
2. Visually inspect all system components to ensure that they are secure and undamaged.
3. Refer to Page 1 of this manual for the expected battery lifetime and ensure that it is adequate for the planned operations.
4. Activate the transmitter as detailed in Section 4.1 TURNING ON.
5. Complete a Section 4.2 FUNCTION TEST.

4.5. TURNING OFF

1. To turn the transmitter off, loosen the BATTERY ENDCAP 5 full turns using the supplied ENDCAP REMOVAL TOOL.
2. Use an EM receiver such as the IK Trax EMRxEx to confirm that the transmitter has turned off.

5. MAINTENANCE

Familiarise yourself with all of the rules for the safe operation of this equipment as described in Section 3 RULES FOR SAFE OPERATION.

The EMTx20 EM transmitters are designed to require minimum maintenance. The transmitter should be cleaned using fresh water and cleaning agents as necessary (e.g. WD40). Do not use chemicals which could be damaging to the housing or O-rings.

Check flame paths / threads on the housing body and endcaps for signs of corrosion or damage. If badly pitted or damaged, consult IK Trax for advice on replacing the relevant part.

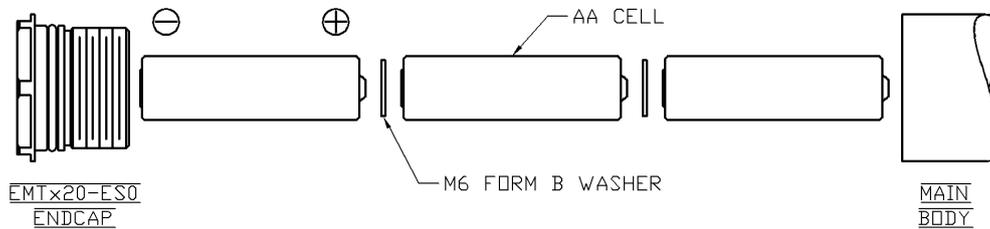
All parts which are replaced must be in accordance with the manufacturers' specifications. Failure to use such components may invalidate the certification/approval and may make the equipment dangerous.

IK Trax can supply redress kits containing a complete set of replacement batteries, washers, O-rings, O-ring grease, thread lubricant and endcap locking screws, contact IK Trax for more information.

5.1. BATTERY REPLACEMENT

1. Familiarise yourself with all warnings given at the start of Section 3 RULES FOR SAFE OPERATION.
2. Loosen the M4 locking grub screw on the BATTERY ENDCAP by 3 turns, using a 2.0mm AF Allen key.
3. Loosen the BATTERY ENDCAP 5 full turns using the supplied ENDCAP REMOVAL TOOL to release any internal pressure and to turn the transmitter off.
4. Fully remove the BATTERY ENDCAP using the supplied ENDCAP REMOVAL TOOL.

- Remove all DURACELL INDUSTRIAL ID1500 cells and M6 Form B Washers. Visually inspect the cells, contact Online Electronics Ltd immediately if there are any signs of damage or electrolyte leakage. Dispose of them in a responsible way.
- Observing correct battery orientation as shown below, insert new DURACELL INDUSTRIAL ID1500 AA Alkaline cells into the battery compartment POSITIVE END first with Stainless Steel M6 Form B Washers between the cells (note that the washer will self-locate once inside the unit).



- Once all cells are installed ensure that it is the FLAT, NEGATIVE END of the cells which you see when looking into the open end of the transmitter.
- Examine the O-ring seals for any signs of contamination or damage, replace and/or re-grease if necessary. Refer to Section 5.2 O-RING REPLACEMENT for guidance.
- Replace the BATTERY ENDCAP using the supplied ENDCAP REMOVAL TOOL. Do not use a vice or spanner, it only needs to be hand tight. Damage may occur if over tightened.
- Tighten the M4 grub screw (until the grub screw engages with the housing to lock the ENDCAP). Note that very little torque is required. Damage may occur if over tightened.
- Fully tighten the BATTERY ENDCAP to turn on the transmitter. Using an EM receiver, confirm transmitter function and correct transmission rate.
- If the transmitter is not to be used immediately after battery replacement, loosen the BATTERY ENDCAP 5 full turns to switch the transmitter off.

5.1.1. BATTERY LIFETIME

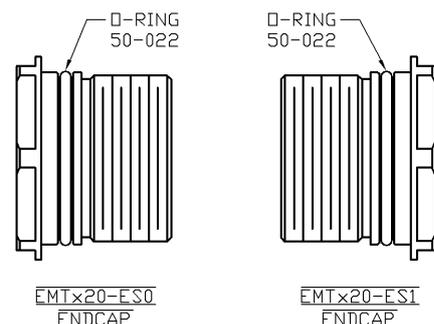
The operating temperature which the transmitter is used at alters the operating lifetime, typically, colder temperatures will shorten the stated lifetime.

Note that upon customer request, the transmitters can be adjusted at IK Trax to provide a stronger signal at the expense of lifetime or extended lifetime at the expense of signal, contact IK Trax for more details and to discuss your requirements.

In extreme circumstances the transmitter operating lifetime may be reduced by how the transmitter is installed on a pig. Refer to section 4.3 INSTALLATION within this manual for tips on how to achieve optimum performance from the transmitter with regards to the mounting arrangement.

5.2. O-RING REPLACEMENT

- Using a 2.0mm AF Allen key fully unscrew the M4 locking grub screw on both ENDCAPS by 3 turns.
- Loosen the BATTERY ENDCAP by 5 full turns using the supplied ENDCAP REMOVAL TOOL to release any internal pressure and to turn the transmitter off.
- Using the supplied ENDCAP REMOVAL TOOL, fully remove the BATTERY ENDCAP, any batteries and then the PCB ENDCAP.



5. Referring to the figure below, remove all O-rings and clean all sealing surfaces on all parts.
6. Examine all surfaces, including threads for signs of corrosion, scoring, and other damage. If there is excessive damage the mechanical parts may need to be replaced.
7. Lightly grease all sealing surfaces using a suitable grease (e.g. DOW CORNING MOLYKOTE 111 COMPOUND).
8. Lightly grease each O-ring with a suitable grease (e.g. DOW CORNING MOLYKOTE 111 COMPOUND) before fitting.
9. Apply a small amount of an oil-based thread lubricant such as "Blue Goop" to the endcap threads.
10. Referring to Section 5.1 BATTERY REPLACEMENT re-insert the batteries, then refit the BATTERY ENDCAP to the BATTERY end of the housing and the PCB ENDCAP to the PCB end of the housing using the ENDCAP REMOVAL TOOL. Do not use a vice or spanner, the endcaps only need to be hand tight.
11. Tighten the M4 grub screw on each ENDCAP (until the grub screw engages with the housing to lock each endcap in place). Note that very little torque is required. Damage may occur if over tightened.

6. STORAGE

Familiarise yourself with all of the rules for the safe operation of this equipment as described in Section 3 RULES FOR SAFE OPERATION.

If the transmitter is to be placed in storage for a long period of time remove the batteries from the transmitter and store separately.

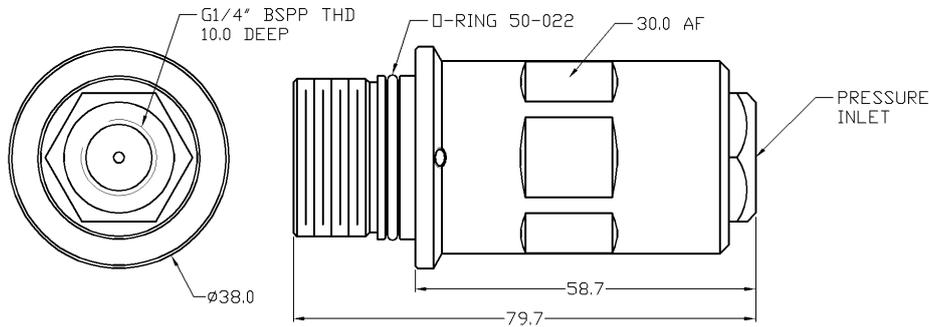
As a minimum the BATTERY ENDCAP must be loosened 5 full turns to switch the transmitter off.

7. ENDCAP OPTIONS

7.1. PRESSURE SWITCH ENDCAP

The EMTx20 PRESSURE SWITCH ENDCAP is an ATEX/IECEX certified endcap that can be fitted in place of the standard PCB ENDCAP to allow the unit to be activated once the external pressure exceeds a pre-configured ON PRESSURE.

There are six different pressure switch endcaps available that cover both latching and non-latching versions and three different pressure bands: 1-4 bar, 3-10 bar, and 6-18 bar. Transmitters configured with non-latching pressure switches will stop transmitting when the external pressure drops below the ON PRESSURE minus the DEAD BAND, whereas transmitters configured with latching pressure switches will continue transmitting until the batteries are depleted or one of the endcaps is removed.



7.1.1. SPECIFICATIONS

ENDCAP TYPE	LATCHING	PRESSURE RANGE (bar)	ON PRESSURE REPEATABILITY (bar)	AVERAGE DEAD BAND
EP0	NO	1-4	±0.1 + 3% of setting	12% of setting
EP1	NO	3-10	±0.17 + 3% of setting	13% of setting
EP2	NO	6-18	±0.26 + 3% of setting	13% of setting
EP3	YES	1-4	±0.1 + 3% of setting	12% of setting
EP4	YES	3-10	±0.17 + 3% of setting	13% of setting
EP5	YES	6-18	±0.26 + 3% of setting	13% of setting

Note that the values above are given for +20°C. The ON PRESSURE and DEAD BAND tolerances will typically be greater at lower temperatures.

7.1.2. OPERATION

Familiarise yourself with all the rules for the safe operation of this equipment as described in Section 3 RULES FOR SAFE OPERATION.

7.1.3. TURNING ON

1. To turn the transmitter on, remove the BATTERY ENDCAP then remove the battery isolator. Use the supplied ENDCAP REMOVAL TOOL to fully tighten the BATTERY ENDCAP. Do not use excessive torque.
2. Note that the unit will start to consume battery power at <50uA once both endcaps are tightened but will not transmit until the pressure level at the endcap inlet exceeds the specified ON pressure.

3. Connect an external pressure source to the pressure inlet on the end of the PRESSURE SWITCH ENDCAP (G1/4" BSPP THD), then apply pressure above the ON PRESSURE and use an EM receiver system to confirm that the transmitter is functioning properly at the expected pulse rate, the transmitter takes approximately 5 seconds to turn on.

7.1.4. TURNING OFF

1. To turn the transmitter completely OFF, loosen the BATTERY ENDCAP at the battery end of the unit by 5 full turns using the supplied ENDCAP REMOVAL TOOL.

7.1.5. FUNCTION TEST

1. Refer to Section 4.2 FUNCTION TEST of this user manual.

7.1.6. FUNCTION TEST

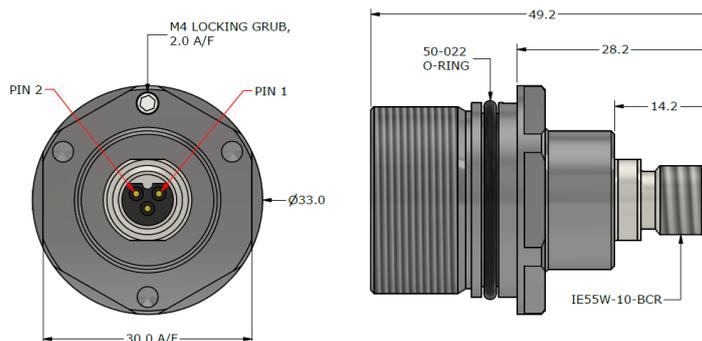
1. Refer to Section 4.2 FUNCTION TEST of this user manual.

7.2. DUAL RATE ENDCAP (NON-CERTIFIED)

⚠ WARNING: This endcap is NON-ATEX/IECEX certified. If this endcap is fitted to an ATEX/IECEX certified transmitter body, then the transmitter must NOT be used in an ATEX/IECEX only environment.

DUAL RATE ENDCAP - Can be fitted to an EMTx20 transmitter in place of the PCB ENDCAP to allow an external piece of equipment (e.g. an IK Trax 7000 ARGF) to switch between two pre-configured pulse rates. With a DUAL RATE ENDCAP fitted, the unit will transmit at pulse rate 1 when pins 1 and 2 on the IE55 Connector are open (resistance > 3k), and at pulse rate 2 when pins 1 and 2 are shorted together (resistance < 3k). This allows the pulse rate of the EMTx20 transmitter to be controlled by an external piece of equipment, e.g. a BWGP (Break Wire Gauge Plate).

LATCHING DUAL RATE ENDCAP - Works in the same way as the DUAL RATE ENDCAP except that the unit will permanently switch from pulse rate 2 to pulse rate 1 when the unit detects an open circuit between pins 1 and 2 on the IE55 connector.



7.2.1. OPERATION

Familiarise yourself with all of the rules for the safe operation of this equipment as described in Section 3 RULES FOR SAFE OPERATION.

7.2.2. TURNING ON

1. To turn the transmitter on, remove the BATTERY ENDCAP then remove the battery isolator. Use the supplied ENDCAP REMOVAL TOOL to fully tighten the BATTERY ENDCAP. Do not use excessive torque.

2. Short pins 1 & 2 of the IE55 connector together.
3. Use an EM receiver such as IK Trax EMRx Topside to confirm that the transmitter is functioning properly at the expected pulse rate.

7.2.3. TURNING OFF

1. Remove the short from Pins 1 & 2, then loosen the BATTERY ENDCAP by 5 full turns using the supplied ENDCAP REMOVAL TOOL.
2. Use an EM receiver such as IK Trax EMRx Topside to confirm that the transmitter has turned off.

7.2.4. FUNCTION TEST

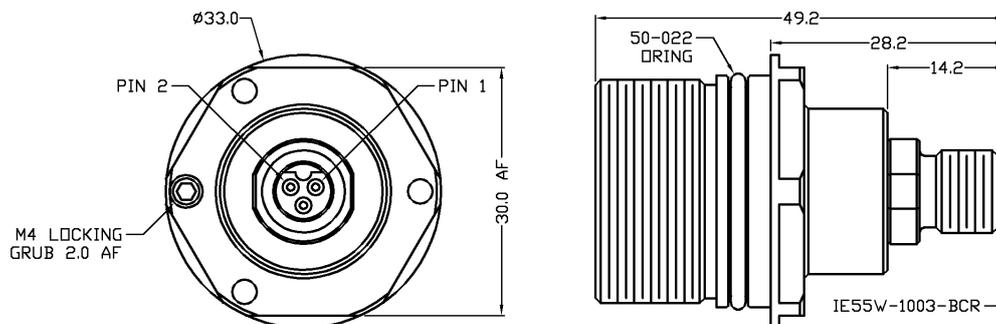
1. Refer to Section 4.2 FUNCTION TEST of this user manual.

7.3. WATER ACTIVATED ENDCAP (NON-CERTIFIED)

⚠ WARNING: This endcap is NON-ATEX/IECEX certified. If this endcap is fitted to an ATEX/IECEX certified transmitter body, then the transmitter must NOT be used in an ATEX/IECEX only environment.

WATER ACTIVATED NON-LATCHING ENDCAP - Can be fitted in place of the standard PCB ENDCAP to allow the unit to be activated only in the presence of conductive fluid such as water. The presence of a suitable fluid between pin 1 and pin 2 of the IE55W connector fitted to the endcap will activate the transmitter and will deactivate the transmitter when dry.

WATER ACTIVATED LATCHING ENDCAP - Can be fitted in place of the standard PCB ENDCAP to allow the unit to be activated only in the presence of conductive fluid such as water. The presence of a suitable fluid between pin 1 and pin 2 of the IE55W connector fitted to the endcap will activate the transmitter and will not deactivate the transmitter when dry.



7.3.1. OPERATION

Familiarise yourself with all of the rules for the safe operation of this equipment as described in Section 3 RULES FOR SAFE OPERATION.

7.3.2. TURNING ON

1. To turn the transmitter on, remove the BATTERY ENDCAP then remove the battery isolator. Use the supplied ENDCAP REMOVAL TOOL to fully tighten the BATTERY ENDCAP. Do not use excessive torque.
2. Short pins 1 & 2 of the IE55 connector together.

3. Use an EM receiver such as IK Trax EMRx Topside to confirm that the transmitter is functioning properly at the expected pulse rate.

7.3.3. TURNING OFF

1. Remove the short from Pins 1 & 2, then loosen the BATTERY ENDCAP by 5 full turns using the supplied ENDCAP REMOVAL TOOL.
2. Use an EM receiver such as IK Trax EMRx Topside to confirm that the transmitter has turned off.

7.3.4. FUNCTION TEST

1. Refer to Section 4.2 FUNCTION TEST of this user manual.

8. DISPOSAL OF UNIT

IK Trax takes its responsibilities under the WEEE Regulations extremely seriously and has taken steps to be compliant in line with our corporate and social responsibilities. In the UK, IK Trax has joined a registered compliance scheme WeeeCare (registration number **WEE/MP3538PZ/SCH**).

Electrical and electronic equipment should never be disposed of with general waste but must be separately collected for the proper treatment and recovery.

The crossed-out bin symbol, placed on the product, reminds you of the need to dispose of it correctly at the end of its life.

When buying a new product, you will have the possibility to return, free of charge, another end-of-life product of equivalent type that has fulfilled the same functions as the supplied equipment. These items may be deposited at:

Online Electronics Ltd
Doing business as IK Trax
Blackburn Business Park
Woodburn Road
Blackburn
Aberdeen
AB21 0PS
UK

Alternatively, to arrange a collection of any waste electrical equipment, obligated to IK Trax please telephone WeeeCare on **0844 800 2004**.

9. WARRANTY

Online products are guaranteed for one year from the date of purchase. Goods should be returned transportation prepaid to IK Trax.

There is no charge for parts or labour should any product require repair due to a manufacturing deficiency during the guarantee period.

In the event of a manufacturing deficiency the inward transportation costs will be repaid to the client.

10. CERTIFICATION APPENDIX

EQUIPMENT: EMTx20X 1V5 range of electromagnetic transmitters

MANUFACTURER: **Online Electronics Ltd**
 Online House
 Blackburn Business Park
 Woodburn Road
 Blackburn
 Aberdeen
 AB21 0PS
 UK
 Tel: +44 (0) 1224 714 714
 Web: www.online-electronics.com

NOTIFIED BODY NUMBER: 2812

ATEX CERTIFICATE: EMT16ATEX0011X

IECEX CERTIFICATE: IECEX EMT 16.0009X

MARKINGS:  II 2 G Ex db IIC Gb T6

APPLICABLE STANDARDS: EN 60079-0:2012/A11:2013
 EN 60079-1:2014
 IEC 60079-0:2011
 IEC 60079-1:2014

SPECIAL CONDITIONS FOR SAFE USE:

1. Only use one complete set of new and identical cells.
2. Only the following permitted batteries shall be used with the corresponding ambient temperature and temperature class.

CELL MANUFACTURER & PART NUMBER	CELL TYPE	CELL VOLTAGE	OPERATING AMBIENT TEMPERATURE	TEMPERATURE CLASS
DURACELL ID1500	Alkaline	1.5V	-20°C to +50°C	T6
DURACELL MN1500	Alkaline	1.5V	-20°C to +50°C	T6
DURACELL MX1500	Alkaline	1.5V	-20°C to +50°C	T6
ENERGIZER EN91	Alkaline	1.5V	-18°C to +51°C	T6

3. Batteries must be installed into the enclosure in accordance with the orientation detailed on the markings.
4. Repair of flamepaths is not permitted by the end user.
5. Do not open when an explosive atmosphere may be present.
6. Enclosures manufactured from titanium must be installed such that ignition sources due to impact and friction sparks are excluded.
7. Where used, the bleed screw must be tightened to a torque between 4 Nm and 8 Nm. Do not exceed 8 Nm.