

Rhein Tech Laboratories, Inc.  
360 Herndon Parkway  
Suite 1400  
Herndon, VA 20170  
<http://www.rheintech.com>

Client: L3 Communications  
Model #: FAP5010-001  
Standards: FCC 15.247  
FCC ID: XG8-TB100001  
Report #: 2009239

## **Appendix H: Manual**

Please refer to the following pages.

# INSTALLATION AND USER'S GUIDE

## FOR

### FIXED TRACKING BEACON

### FAP5010-001



Innovative Wireless Technologies, Inc.  
1047 Vista Park Drive, Suite A  
Forest, VA 24551

Phone: (434)316-5230

Fax: (434)316-5232

[www.iwtwireless.com](http://www.iwtwireless.com)

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# 1. PRODUCT OVERVIEW

Innovative Wireless Technologies' Fixed Tracking Beacon is a transmitter intended primarily for use in industrial mining applications. The **FAP5010-001 Fixed Tracking Beacon** design provides enhanced tracking for miners and equipment in high-traffic areas of a coal mine.

The Fixed Tracking Beacon is one component of a communication and tracking system that includes the Innovative Wireless Technologies' FAP4210-001 Fixed Mesh Node and FAP2210-001 Gateway Node.

# 2. SAFETY INFORMATION

**IMPORTANT INFORMATION ON SAFE OPERATION. READ THIS INFORMATION BEFORE INSTALLING AND OPERATING THE FIXED TRACKING BEACON.**

**Changes or modifications to this unit not expressly approved by L-3 Communications Global Security & Engineering Solutions may void the user's authority to operate this equipment.**

**FCC ID: XG8-TB100001**

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

When operated above ground, the Fixed Tracking Beacon must be installed with the following antenna connected to the 900 MHz RF output (ANTENNA PORT 1):

Modified Pulse MSU900FME 900MHz Antenna Assembly

Modifications to the MSU900FME antenna must be per IWT instruction (IWT document no: ASY-FAA9100-010, Rev. R2A). Modifications include replacing the OTS coaxial cable and FME connector with a MSHA approved flame resistant RG-58A/U cable with RP-TNC connector.

**IMPORTANT NOTE:** To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The Fixed Tracking Beacon must be installed 20 cm or more from any personnel in order to comply with FCC exposure requirements.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These designed limits provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### 3. SPECIFICATIONS FOR FAP5010-001

<b>ENVIRONMENTAL</b>	
Operating Temperature	-30C to +60C ambient <sup>1</sup>
Storage Temperature	-20C to +35C ambient
Dimensions	4" x 3" x 1.6"
Weight	1 lb
Enclosure	IP65
<b>POWER</b>	
<b>Battery</b>	
Type	Alkaline C cells (x2)
<b>ELECTRICAL</b>	
Frequency Range	902 – 928 MHz
RF Transmit Power – below ground	+10 dBm
RF Transmit Power – above ground	+10 dBm
RF output	50 ohms nominal (RP-TNC connector)

Note 1: Operating at extreme temperatures may influence the battery life of the Fixed Tracking Beacon. To maximize battery life, maintain operating temperatures in the range +15C to +35C.

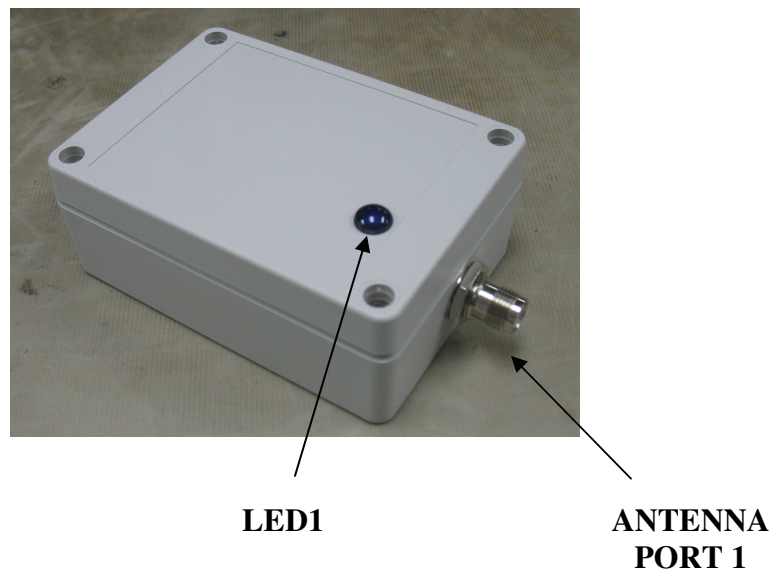
## 4. DESCRIPTION

### 4.1 Outputs

The following is an explanation of the Fixed Tracking Beacon outputs shown in Figure 1:

**LED1:** The blue power LED indicates the status of the Fixed Tracking Beacon (see section 7.0)

**ANTENNA PORT 1:** 900 MHz antenna port. Connector type is RP-TNC.



**FIGURE 1: FIXED TRACKING BEACON CONNECTIONS**

### 4.2 Components Necessary for Installation

The Fixed Tracking Beacon installation uses the following components and accessories (see sections 5.0 and 6.0 for installation instructions):

**Antenna (900 MHz):**

The Fixed Tracking Beacon can only use the following antenna model in applications that must meet FCC requirements:

## Modified Pulse MSU900FME 900MHz Antenna Assembly

Modifications to the MSU900FME antenna must be per IWT instruction (IWT document no: ASY-FAA9100-010, Rev. R2A). Modifications include replacing the OTS coaxial cable and FME connector with a MSHA approved flame resistant RG-58A/U cable with RP-TNC connector.

The antenna base includes a magnetic mount for quick installation.

### **C Cell Alkaline Batteries:**

Two C cell alkaline primary batteries power the Fixed Tracking Beacon. The batteries are located in the battery holder inside the enclosure. Battery maintenance and replacement details are in section 7.

### **Magnetic Mounting Feet:**

The Fixed Tracking Beacon includes three magnetic mounting feet for quick installation. The mounting feet screw into the base of the enclosure.

## **5. PRIOR TO INSTALLATION**

### **5.1 Site Survey**

Conduct a survey to determine the appropriate sites to install the Fixed Tracking Beacon from an RF perspective.

### **5.2 Visually inspect each Fixed Tracking Beacon to ensure that:**

- The enclosure is free from damage or defects.
- Four screws properly secure the enclosure lid.



## 6. INSTALLATION INSTRUCTIONS

### 6.1 Installations Below Ground

#### **IMPORTANT NOTE:**

**TRAINED PERSONNEL MUST PROFESSIONALLY INSTALL THE FIXED TRACKING BEACON.**

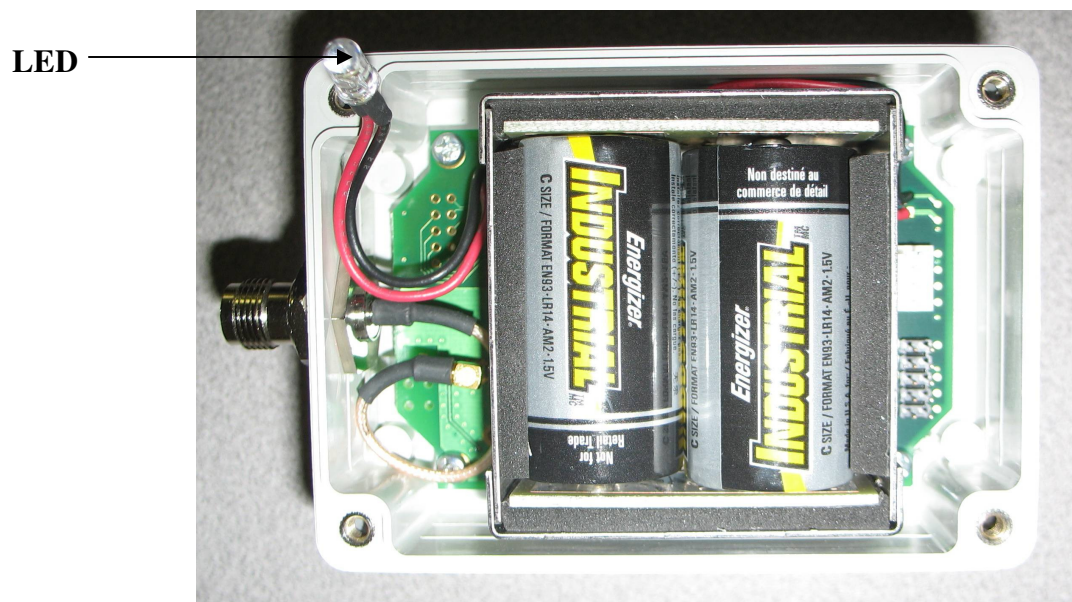
At each of the sites determined by the survey described in 5.1:

#### 6.1.1 Antenna Placement

Determine the placement for the 900 MHz antenna to ensure proper RF propagation. For units installed in coal mines below ground, mount the antennas to roof bolts using the magnetic antenna mount. Select locations that ensure proper RF communication. Antenna location should not present a safety hazard or opportunity for damaged to occur.

#### 6.1.2 Applying Power to the Fixed Tracking Beacon

Remove the enclosure lid of the Fixed Tracking Beacon. Insert two C cell batteries into the battery holder. The LED should begin to blink, indicating that the Fixed Tracking Beacon is transmitting. Replace the enclosure lid ensuring that the LED lines up with the LED lens located on the lid. Secure the lid with all four screws.



## **FIGURE 2: POWERING THE FIXED TRACKING BEACON (SHOWN WITHOUT BATTERIES)**

### **6.1.3 Fixed Tracking Beacon Enclosure Placement**

Locate a place to mount the Fixed Tracking Beacon enclosure. Use the enclosure's magnetic mounting feet to mount the Beacon to a roof bolt (or other acceptable location).

### **6.1.4 Fixed Tracking Beacon Antenna Connection**

Connect the antenna cable to ANTENNA PORT 1 of the Fixed Tracking Beacon.

## **6.2 Installations Above Ground**

At each of the sites determined by the survey described in 5.1:

### **6.2.1 Fixed Tracking Beacon Installation Instructions**

Follow installation instructions of 6.1. Equipment above ground should be located so as not to present a safety hazard or cause damage. Secure all equipment using the proper hardware.

### **6.2.2 Follow all FCC guidelines listed in Section 2.0.**

# **7. OPERATING AND MAINTENANCE INSTRUCTIONS**

The Fixed Tracking Beacon does not have any direct user interface.

Monitor the status of the Fixed Tracking Beacon by observing the LED mounted on the outside of the enclosure (LED1):

**BLINK** (ON—1 ms, OFF—500 ms):            Power ON / Device transmitting

**OFF:**    Power OFF / Device not transmitting

The Fixed Tracking Beacon requires little routine maintenance. Inspect each box periodically every 3-6 months to ensure that the box remains free of defects. It is important that the box remains dust tight. Replace defective boxes immediately. Do not continue to use any boxes that may have had their dust seal compromised.

Replace the C cell batteries inside the Fixed Tracking Beacon enclosure once each year. To replace the batteries:

1. Remove enclosure lid by unscrewing the four lid screws.
2. Remove the two C cell batteries from the battery holder.
3. Insert two fresh C cell batteries into the battery holder noting proper polarity.
4. Ensure that LED is blinking after replacing batteries.
5. Line up the LED with the LED lens located in the lid of the enclosure.
6. Replace enclosure lid and secure all four lid screws.

To prevent dust and moisture from entering the Fixed Tracking Beacon enclosure during battery replacement, replace the batteries in a location above ground and free from excessive moisture and coal dust.