

# INSTRUCTION MANUAL

(UMTX-3-1)

## Everyday Wireless Model TX-3 UHF FM Data Transceiver



**EVERYDAY WIRELESS LLC**

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**Thank you for purchasing the Everyday Wireless Model TX-3 UHF FM Data Transceiver.** Before proceeding with the equipment installation, it is imperative that you read the following pages of notices and precautions. In order to ensure your equipment installation complies with FCC specifications and fulfills all warranty-related obligations, read comprehensively the **IMPORTANT USER NOTICES** and **PRECAUTIONS** sections below.

## **IMPORTANT USER NOTICES**

- **FCC WARNING:** This equipment generates or uses radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.
- **FCC RF Exposure Requirements:** The antenna included with the Model TX-3 Transceiver must be installed to provide a separation distance of *at least 20 centimeters* from all persons, must not be co-located or operating in conjunction with any other antenna or transmitter, and must not exceed the antenna gain specified in the Antenna Use description below. Failure to observe these restrictions will result in exceeding the FCC RF exposure limits.
- **Antenna Use:** The AU2-UHF antenna is included with the shipment of each Model TX-3 Transceiver. **DO NOT** use any other antenna with the Model TX-3 Transceiver or modify the antenna / coaxial cabling without first consulting with Everyday Wireless or an Everyday Wireless qualified service organization. The included AU2-UHF antenna is a quarter-wave, omni directional antenna with 3 dBi of gain, and integral GPS antenna. The RG-58 UHF coaxial cable line has a minimum loss of 1.0 dB.
- **Accessories:** The accessories supplied with the Model TX-3 GPS transceiver are specifically designed for the Model TX-3. Use of other accessories may severely degrade performance or even damage the transceiver, and will void the warranty.
- **Component Access:** There are no service accessory parts inside the transceiver. Do not try to open the transceiver without prior approval from Everyday Wireless. Opening the transceiver will void the warranty.
- **Service:** Only qualified service personnel must install or repair equipment.

## **PRECAUTIONS**

- Do not modify the transceiver for any reason.
- Do not expose the transceiver to long periods of direct sunlight, nor place it near heating appliances.
- The Model TX-3 UHF FM Transceiver transmits data in the 450-470 MHz frequency band, which is regulated in the United States by the FCC. Because the FCC grants access to specific frequencies, and can grant access by multiple users to the same frequency, system performance may be affected by the presence of other nearby users of the frequency used by the owner of this transceiver.
- The United States Government is responsible for the operation, accuracy, and continued operation of the Global Positioning System (GPS). Accuracy and position fixes (latitude, longitude and altitude) can be affected by alterations made to the GPS satellites by the U. S. Government. Accuracy is subject to

change in accordance with the U. S. Department of Defense civil GPS user policy and Federal Radio-navigation Plan. Positional accuracy and time to fix time can also be affected by poor view caused by obstructions such as tall buildings, heavy foliage, and large cliffs or other obstructions where GPS satellite signals are blocked and poor satellite geometry conditions result.

## **DISCLAIMER AND LIMITATION OF LIABILITY**

- Under no circumstances shall Everyday Wireless be responsible for any loss of data or any special, incidental, consequential, or indirect damages howsoever caused. Everyday Wireless assumes no responsibility for any damage or loss caused by deletion of data as a result of user error, malfunction, or repairs.
- Everyday Wireless LLC assumes no responsibility for any damages or loss resulting from the use of this product and user guide. Everyday Wireless LLC assumes no responsibility for any loss or claims by third parties that may arise through the use of this system.
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## Section 1 – Introduction

**Note:** Make sure you have read the IMPORTANT USER NOTICES and PRECAUTIONS sections before proceeding with the installation instructions.

### 1.1) Product Description and Basic Operation

The Everyday Wireless Model TX-3 is a synthesized UHF FM data transceiver designed to operate in the frequency range of 450 to 470 MHz. There are no user controls or adjustments.

The Everyday Wireless Model TX-3 is a half-duplex data communications device providing radio frequency (RF) data transmit and receive functions. The Model TX-3 transceiver is an all-inclusive unit containing a synthesized UHF data radio, GPS receiver, and supporting processing overhead to gather, compute, and transmit vehicle information in real-time. The Model TX-3 design is intended to be used for 12.5 kHz channel data telemetry applications.

Each Model TX-3 comes pre-programmed to a specific frequency licensed to each user. Reprogramming the unit to a different frequency can only be accomplished by the manufacturer.

The Model TX-3 processes GPS information and the status of multiple vehicle inputs. Each Model TX-3 transceiver is configured to transmit data packets containing position, vehicle, and trip information at a predetermined interval (typically every 10 seconds).

The Model TX-3 unit also comes pre-programmed with a vehicle transceiver identification number that dictates its transmission time slot. When the time slot corresponding with the pre-programmed vehicle number is approaching, the Model TX-3 prepares its encrypted data packet, checks to make sure the channel is clear, and then bursts the data at its precise time slot time interval. Because data packets from the Model TX-3 burst (typically 25 msec.) in a proprietary time slot protocol, message collisions are avoided and higher throughputs are achieved.

The Model TX-3 has no user adjustments. Maximum output power is pre-set to 45 watts. The Model TX-3 Transceiver unit should only be opened by the manufacturer.

## 1.2) Technical Specifications

General	
Frequency Range	450 - 470 MHz (banded)
Channel Spacing	12.5 kHz
Frequency Stability	$\pm$ 2.5 ppm
Supply Voltage	13.6 V DC $\pm$ 15%
Supply Current	
Transmit	< 7.5 A @ 13.6 VDC
Receive	< 100 mA @ 13.6 VDC
Size	5" wide X 3.25" deep X 1.75" high
Weight	approx. 1.5 pounds
Connectors:	
Power	2 position power connector
RF	SMA jack
GPS	MCX jack
Temperature (operating)	-25 deg. C + 55 deg. C
Temperature (storage)	-30 deg. C + 80 deg. C
Duty Cycle	Transmit: <1.0%
Antenna Impedance	50 ohms
Data Rate	Up to 9,600 bps
Transmitter	
RF Power Output	45 watts max.
Modulation / Emission Designator	11K3F1D
Rx to Tx Switching Time	<25 msec
Spurious and Harmonic Output	> 70 dBc
Receiver	
Sensitivity (12 dB SINAD)	< -113 dBm
Image Rejection	> 60 dB
Intermodulation Rejection	> 60 dB
Blocking	> 75 dB
Adjacent Channel	> 60 dB
Intermediate Frequencies	45 MHz and 455 kHz

## Section 2 – Receiving, Inspection, and Installation

**Note:** Make sure you have read the IMPORTANT USER NOTICES and PRECAUTIONS sections before proceeding with the installation instructions.

### 2.1) Packing Contents and Inspection

Carefully unpack the transceiver and other installation items. Identify all of the items listed in the following table before discarding the packing material. If any items have been damaged during shipment, file a claim with the carrier immediately.

#### Supplied Accessories

Item #	Item	Part Number	Quantity
1	UHF Data Transceiver	Model TX-3	1
2	Power cable assembly	PCTX-3-2	1
4	Fuse assembly (7.5 amp fuse)	FATX-3-1	1
5	Combi-whip antenna (UHF / GPS)	AU2-UHF	1
6	Mounting strap and screws	MSTX-3-3	2
7	User manual	UMTX-3-1	1

### 2.2) Installation

**WARNING!** VARIOUS ELECTRONIC EQUIPMENT IN YOUR VEHICLE MAY MALFUNCTION IF THEY ARE NOT PROPERLY PROTECTED FROM THE RADIO FREQUENCY ENERGY WHICH IS PRESENT WHILE TRANSMITTING. ELECTRONIC FUEL INJECTION, ANTI-SKID BRAKING, AND CRUISE CONTROL SYSTEMS ARE TYPICAL EXAMPLES OF EQUIPMENT THAT MAY MALFUNCTION. IF YOUR VEHICLE CONTAINS SUCH EQUIPMENT, CONSULT EVERYDAY WIRELESS OR AN EVERYDAY WIRELESS AUTHORIZED REPRESENTATIVES TO DETERMINE IF THEY WILL PERFORM NORMALLY WHILE TRANSMITTING.

**Note:** The following preparation instructions are for use by your EVERYDAY WIRELESS dealer, an authorized EVERYDAY WIRELESS service facility, or the factory.

**Note:** The antenna and transceiver require certain mounting surfaces and environments as described below. If no suitable mounting surface is available, please contact EVERYDAY WIRELESS for alternative hardware and mounting solutions.

#### Tools Required

**Note:** Before installing the transceiver antenna, always check to see how far the antenna base will extend below the mounting surface. When drilling the mounting hole, be careful not to damage vehicle wiring or parts.

The following tools are required for installing the transceiver:

- 6mm (1/4 inch) or larger electric drill

- Step drill bit capable of drilling a 3/4 inch hole
- 1/8 to 1/4 inch drill bit
- Test light and voltmeter

## **Antenna and Transceiver Location**

Identify a location on the vehicle roof where the antenna will be installed. The antenna should be located on a flat metallic surface at a minimum of 6 inches from all roof edges. Prior to installing the antenna, identify the location where the transceiver will be installed.

The transceiver installation location should be in an enclosed area of the vehicle where the power cables and antenna cables can be easily accessed without potential for damaging the cables. The transceiver location should also provide protection for the transceiver from moisture and excessive heat.

Once the locations of the antenna and transceiver have been identified, ensure that the antenna cables are sufficiently long to reach from one location to the other location.

## **Antenna Installation (AU2-UHF)**

1. Drill a starter hole using a 1/8 to 1/4 inch drill bit at the chosen location of the antenna.
2. Use the step drill to drill a 7/8 inch hole to accommodate the antenna.
3. Slide the rubber gasket onto the metal base of the antenna and feed the antenna leads into the vehicle.
4. Once the antenna leads are inside the vehicle, pass the leads through the plastic wheel nut and the metal locking nut.
5. Bring the plastic wheel nut and metal locking nut up to the inside of the mounting surface.
6. Secure the antenna in place by tightening the plastic wheel nut and metal locking nut.
7. Feed the antenna leads to the location where the transceiver is located.

***Caution:*** Care should be taken to ensure that there are no kinks in the antenna leads and that the antenna leads will not be damaged when replacing panels or other interior components that may have been removed during installation or that may subsequently be removed during vehicle maintenance. Significant signal strength loss can occur if the antenna leads are subjected to sharp corners and care should be taken to avoid such circumstances.

## **Power Cable Installation (PCTX-3-2)**

***Caution:*** The Transceiver operates in 12 V negative ground systems only. Check the battery polarity and voltage of the vehicle before installing the transceiver. Use a test light or voltmeter to ensure that the transceiver will be powered only when the vehicle key is in the accessory or ignition position.

1. Check to see that there is access from the power source to the transceiver location.
  - a. If access does not exist, holes should be drilled in a manner that no damage to the vehicle or its parts will occur.
2. Run the power cable leads from the transceiver to the power source. Keep the plug end of the cable at the transceiver.

3. Attach the provided fuse assembly (FATX-3-1) to the black lead of the power cable. Locate the fuse as close to the power source as possible.
4. Connect the free end of the fuse assembly lead to the positive (+) power source of the accessory or ignition power source.
5. Connect the white lead of the power cable to a suitable vehicle ground connection.
6. Recoil and secure the surplus cable with a suitable cable tie.
  - a. Be sure to leave enough slack in the cables so that the transceiver can be removed for servicing while keeping the power applied.

### **Installing the Model TX-3 Transceiver**

***Note: Since there are no user adjustments necessary to operate the transceiver, mount the transceiver in a convenient, yet enclosed and secured location.***

1. Find a relatively flat, steel surface on which to mount the transceiver that is within reach of the antenna cables and power cords.
2. Place the magnet side of the transceiver against the flat surface until a solid mount is made. If a flat area is not available, contact Everyday Wireless for a mounting bracket.
3. Screw in one of the mounting strap (MSTX-3-3) ends above the top edge of the transceiver (at the horizontal center of the transceiver). Pull the mounting strap down and over the center of the transceiver and screw in the other end of the strap below the bottom edge of the transceiver. The strap should fit tightly over the transceiver.
4. Repeat step 3 with the second mounting strap (MSTX-3-3), but run this mounting strap horizontal, securing the screws at the left and right edges of the box (at the vertical center of the transceiver). The strap should fit tightly over the transceiver. The mounting straps should cross in the middle of the top plate of the transceiver.
5. Connect the antenna leads and the supplied power cable to the transceiver.

### **Installing Optional Accessories for the Model TX-3 Transceiver**

***Note: Accessories are supplied with user manuals and installation instructions specific to each accessory. Please consult Everyday Wireless for a list of accessories and for user manuals and installation instructions.***

1. Each Model TX-3 has a DB25 connection on the transceiver, which is used to connect the TX-3 transceiver to Everyday Wireless vehicle sensor modules. Please consult the user manual of your specific sensor module for installation instructions.
2. Under no circumstances should any other device or cable be connected to the Model TX-3 except those supplied or approved by Everyday Wireless.

## Section 3 – Maintenance

*In order to ensure that the Model TX-3 is always ready for operation, it should be checked periodically so that potential defects may be discovered and corrected before they develop into any serious damage. A minimal preventive maintenance program will significantly increase the transceiver's lifespan.*

This section describes the necessary preventive maintenance checks and tests the user can perform to easily identify most defects and problems. Any other defects or problems discovered during the normal operation of the system should be noted for future corrective measures.

### **CAUTION:**

Stop the operation of the transceiver immediately if a problem is noted during normal operation that can otherwise damage the system.

This section also describes the corrective maintenance checks that can be performed on the transceiver.

#### **3.1) Maintenance Concept**

The maintenance concept for the transceiver is limited to the removal and replacement of the entire unit.

#### **3.2) Preventive Maintenance Requirements**

The following is a recommended timetable for performing preventive maintenance checks on the transceiver.

### **CAUTION:**

Primary power to the transceiver must be turned OFF when performing preventive maintenance on the equipment.

#### **Inspection**

The transceiver should be inspected at least every three (3) months for defects or physical damage developed during operation. Inspect all the interface cables to and from the system for cracks, breaks, and proper seating with their mating connectors on the faceplate. Inspect all cables for frayed, broken, or damaged wires. In addition, inspect all transceiver connections for accumulation of dirt, grease, or any foreign material that can cause a non-connection. If a cable is found damaged or non-repairable, it should be replaced before operating the system again.

1. Confirm that the power cord plug is firmly locked into place at the transceiver unit.
2. Verify that the GPS MCX connector is securely in place. Push to confirm that the MCX jack has remained securely locked into its connector.
3. Verify that the UHF SMA connector is securely fastened.
  - a. Rotate the SMA connector clockwise to ensure the connection is tight.
4. If applicable, verify that the Everyday Wireless vehicle sensor module connection is firmly connected to the Model TX-3 transceiver's DB25 port.

The frequency of inspection should be increased for units exposed to dusty or heavy particulate environments.

## **Cleaning**

Clean the outside surfaces and areas around the connectors once a year. Clean the surfaces with a clean, soft, lint-free cloth. Clean the areas around the connectors with a soft bristle brush. To remove grease, fungus, or corrosion, use a cloth dampened with an appropriate electronics cleaning fluid. The frequency of cleaning should be increased for units exposed to dusty or heavy particulate environments.