Miltel Transmitter

Wireless Transmitter

for Data Collection

FCC ID: **MLLCPTX450A**

User Manual

Miltel Communications Ltd. *January 2004*

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Chapter 1

Introduction

1.1 Purpose and Use

The ***Miltel Transmitter*** (FCC ID: MLLCPTX450A) is a data link transmitter that is used for data acquisition in Miltel's telemetric data collection system. This device is installed on-site by a professional field technician, thus it includes technical terms. The equipment is not to be installed by a non-professional individual that has not been trained and authorized.

1.2 System General Description

The Miltel data collection system is a computerized fully system incorporating one-way transmitters that automatically collect data from utility meters and/or other sensors. The system requires no human intervention after initial installation. The system enables remote, continuous and accurate reading of water or gas consumption. The ***Miltel CPTx*** transmits the data acquired from various sensors such as water meters, electric meters, temperature or moisture sensors or any other analog or digital sensor to a receiver connected to a regional data concentrator. The concentrator transfers the data to the central computer for data collection and for further analysis and reporting.

Chapter 2

Theory of Operation

2.1 General Description

The ***Miltel CPTx*** is the first link in the data collection system. It is an independent unit that does not require an external power source, wiring, or the preparation of any special infrastructure. The unit is installed in proximity to the physical sensor and can be connected to several different sensors in parallel (for example four water meters of adjacent apartment, three ground moisture sensors at different depths, etc).

Pictures 2-1 through 2-3 (see next page) show typical installations of a ***Miltel CPTx*** unit, connected various sensors. The unit can be connected to any type of sensor which has a digital output, analog output, dry contact pulsed output (a passive magnetic open/short reed relay), or any active pulse or encoded output.

The ***Miltel Transmitter*** acquires the data from the sensor and stores this data in its internal memory. The unit includes a miniature RF transmitter which transmits the data on a periodic basis to a regional concentrator.

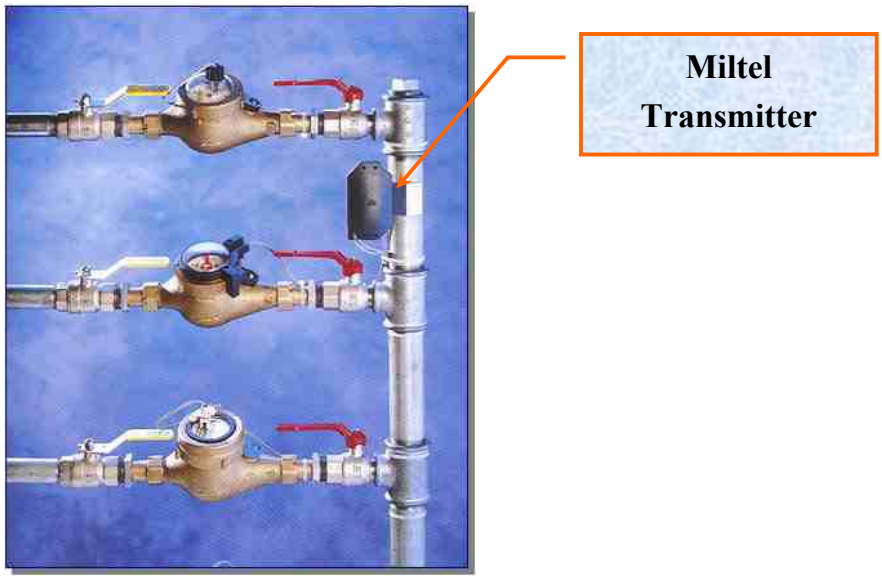


Figure 2-1: Miltel Transmitter Typical Multi Meter Installation

(S Type Enclosure)

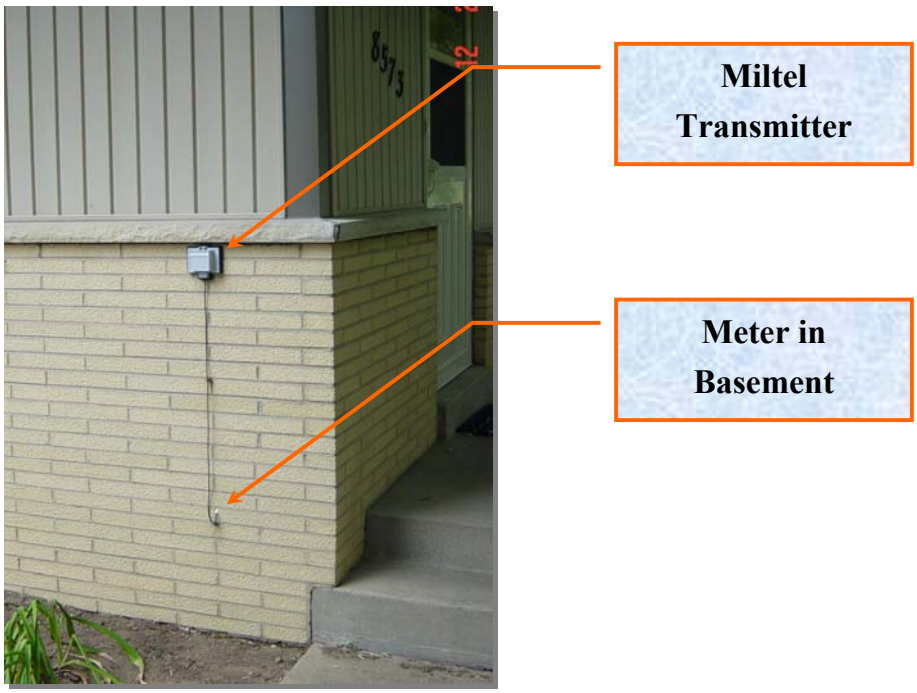


Figure 2-2: Miltel Transmitter Typical Remote Installation

(B Type Enclosure)

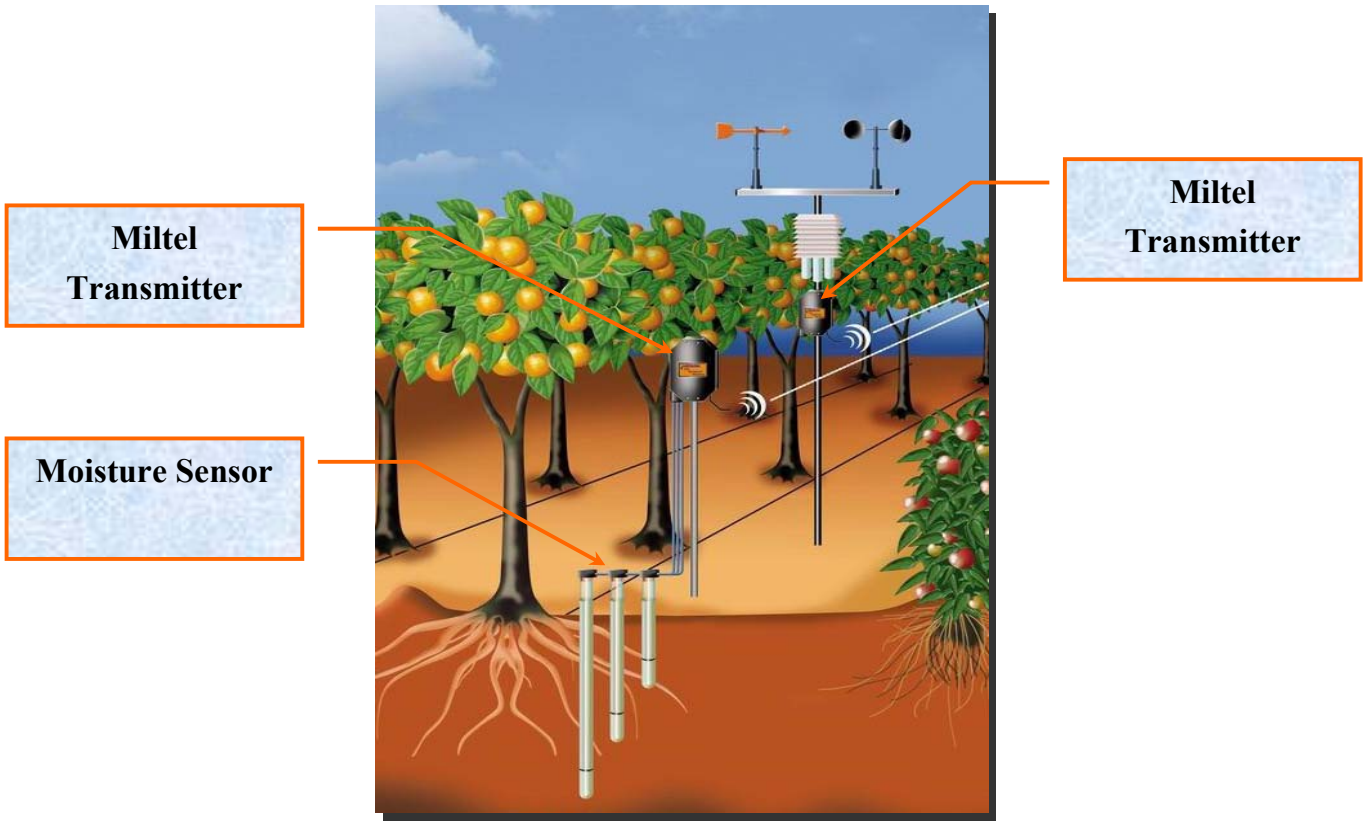


Figure 2-3: Miltel Transmitter Typical Agricultural Sensor Installation (N Type Enclosure)

2.2 Block Diagram Description

2.2.1 General

Figure 2-2 describes the block diagram of the ***Miltel Transmitter unit***. This device consists of two major sections, all using a common power source:

- Digital section (Micro Controller)
- RF section

A 3.6 volts Lithium battery provides power to all parts of the device. The power supply for the RF section is controlled via the Tx switch (not shown), thus cutting of

power to the transmitter unless necessary for actual data transmission (standby mode).

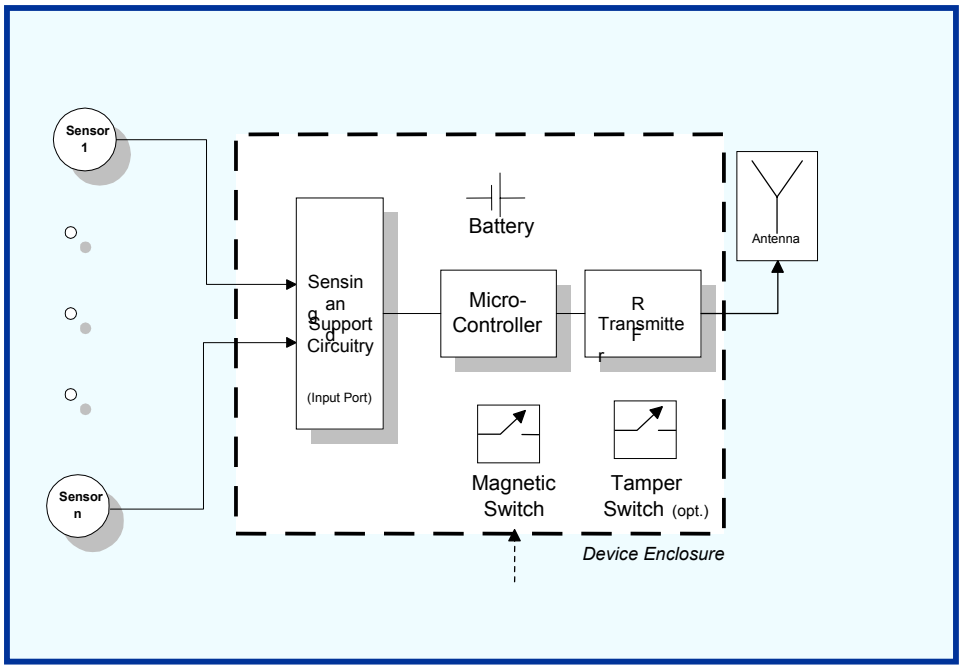


Figure 2-4: ***Miltel Transmitter Block Diagram***

2.2.2 Description of Operation

The digital section of the ***Miltel Transmitter*** performs the following functions:

- Samples analog sensors OR communicates with digital sensors
- Accumulates data for each sensor separately
- Stores data (including alarms) in internal memory
- Interfaces the data to the RF section

The controller gathers the data for 10-240 minutes before initiating a transmission. If any of the counters/sensors has exceeded a preset value, or any alarm (such as tamper) has been received, the controller generates a single message immediately. Any further message will include alarm information along with counter data, if alarm condition still exists. Note: The duration interval between two transmissions is always greater than 30 minutes.

The messages generated by the controller are 16-48 bytes each (depending on the number and type of sensors connected). The messages are exported from the digital section to the RF section as serial data (RS-232 standard protocol) via the DATA OUT output of the controller.

The Tx control output of the controller is used for activating the TX switch for the duration of the message, to enable power supply to the RF section thus enabling the transmission of the message (transmit mode).

The RF section takes the message and transmits it through the RD circuitry.

Chapter 3

Technical Characteristics

3.1 Technical Specification

3.1.1 Electrical

Max Effective Radiated Power (ERP)	29.5 mW
Output frequency	450-470 MHz
Carrier wave modulation	2 Level FSK
Power supply	Lithium battery, 3.6 Volt
Input Channels	Pulse / Analog / Digital
Duration between automatic transmissions	At least 10 Min.

3.1.2 Physical

Operating temperature	-30°C ÷+50°C
Water Resistance	IP64 / IP68 (optimal)

Dimensions	**Enclosure Type B**	**Enclosure Type N**	**Enclosure Type S**
Length	11 cm.	11 cm.	11 cm.
Width	8 cm.	8 cm.	8 cm.
Depth	3 cm.	3 cm.	3 cm.

Chapter 4

Installation Instructions

4.1 General

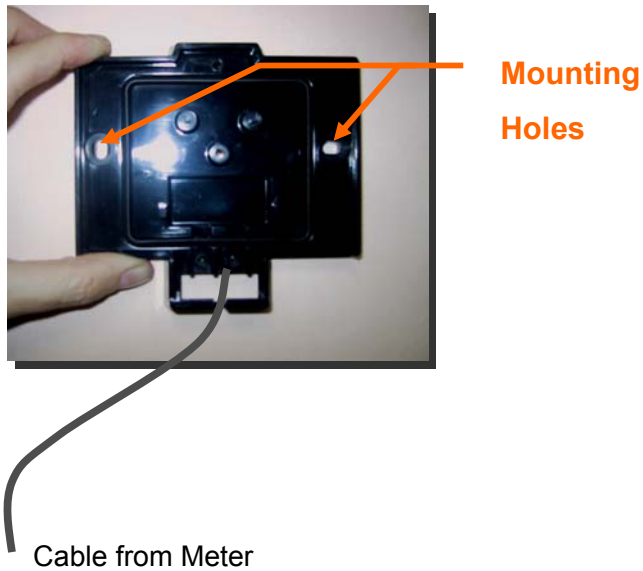
The ***Miltel Transmitter*** is installed by a professional technician. Several possibilities for installation have been programmed into the system in order to provide solutions for installation of various types of sensors including water, gas or electric meters.

4.2 Installation

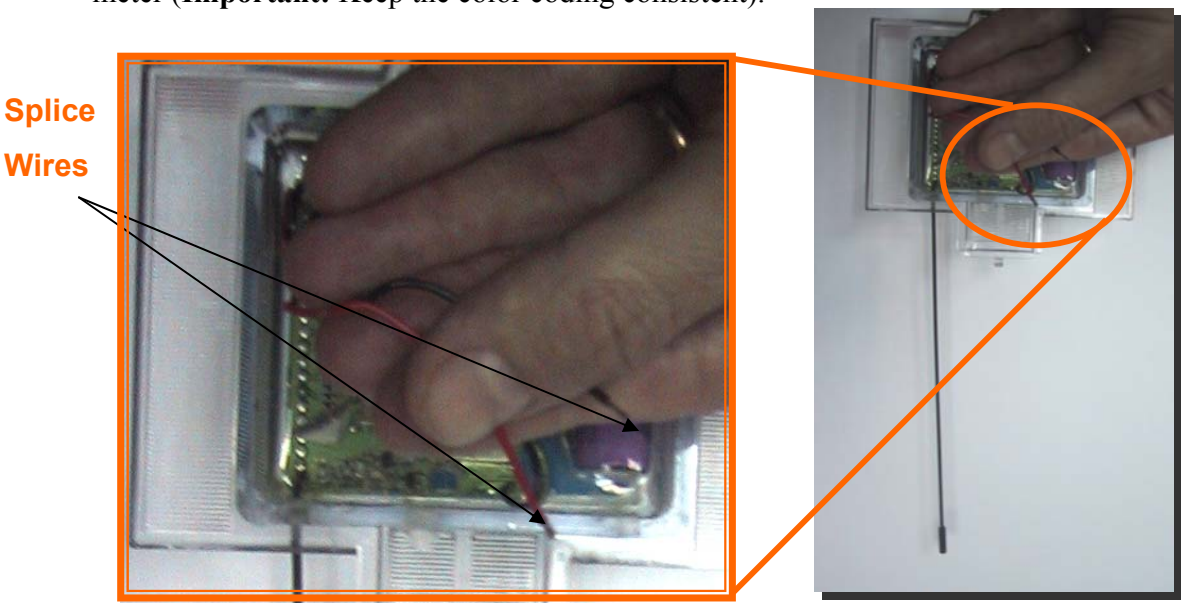
4.2.1 Enclosure Type B

For on-site installation of the ***Miltel Transmitter Type B*** device, proceed as follows:

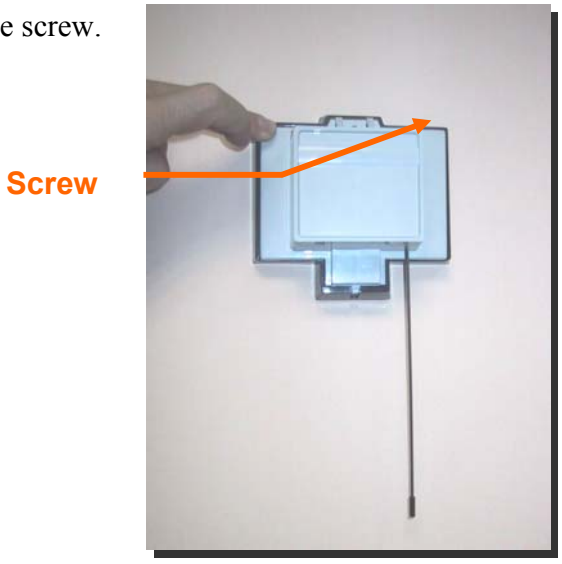
1) Mount the back plate to the wall using two mounting screws.



2) Splice the wires coming from the transmitter with the wires coming from the meter (**Important:** Keep the color coding consistent).



3) Close the enclosure by placing the transmitter box (grey) over the base plate (black) and fasten with one screw.

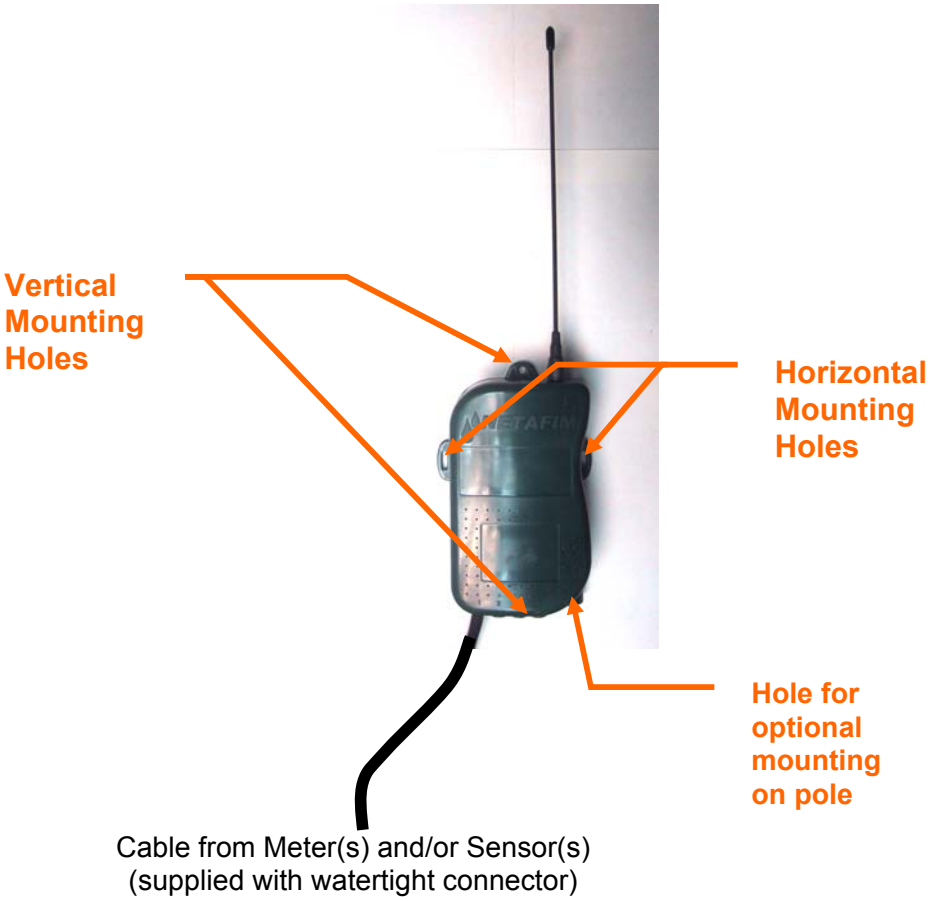


4) Perform a functional radio transmission test by touching the side of the transmitter enclosure with a strong magnet (trigger transmission). Verify correct reception of data at the base station (concentrator).

4.2.2 Enclosure Type N

For on-site installation of the ***Miltel Transmitter Type N*** device, proceed as follows:

1) Mount the transmitter enclosure to the wall using at least two of the four mounting screws or Mount the transmitter on ground mounting pole.



2) Connect the connector(s) to the meter and/or sensor.

NOTICE

This equipment must be installed only by a professional and certified installer that was trained in the proper installation of this device. The intended use is only for the specific application the device was designed for. It is forbidden to use this device with any antenna other than the original antenna supplied by the original equipment manufacturer.

4.2.3 Enclosure Type S

For on-site installation of the ***Miltel Transmitter Type S*** device, proceed as follows:

1) Loosen the four screws fastening the unit's box and open the box cover.

2) Install the unit's box base as required:

3) For pipeline installations (as in Figure 2-1), first attach the stainless steel clamp (see Figure 4-1) to the pipeline, close it around the pipeline and fasten the screw in the middle of the device. Place the unit's box base on top of the screw and install it using two steel screws.

4) For wall mounting of the unit, install the base directly onto the wall or surface using the two steel screws.

5) Connect the wire pairs from the water meters to the terminal blocks on the PCB. Up to four such pairs can be connected, with unused connections left open (i.e., no termination is required).

Note

Connect each pair of wires to the respective terminals; note the connections for future reference.

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6) Close the unit's box cover.

7) Perform a functional radio transmission test by touching the side of the transmitter enclosure with a strong magnet (trigger transmission). Verify the correct reception of the data at the base station (concentrator). Update water actual readings for the respective meter.

8) Close the four screws fastening the cover.

9) Insert plastic protection plugs.

Figure 4-1: Miltel Transmitter - Pipeline Installation