

*Metering
For
Tomorrow
... Today*



Technologies To Be, Incorporated

*RC 2500
Field Installation
Guide*

METERING FOR TOMORROWTODAY

RC 2500 Field Installation Guide

Document RC 2500-002 7/05

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Important Information

Compliance Statement

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 limits are designed to provide a 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 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 or TV technician for help.

This device complies with Subpart C of Part 15 of FCC Rules. Operation of this device is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference that may cause undesirable operation

This device complies with Part 15.247 of the FCC rules governing spread spectrum devices. The device operates in the 900 MHz unlicensed band at a maximum peak power level of 1 watt with a transmission duration that will not exceed 400 milliseconds.

This device must be permanently mounted such that it retains a distance of 20 centimeters (7.9 inches) from all persons in order to comply with FCC RF exposure levels

Modifications and Repairs

To ensure FCC compliance and system performance, this device shall not be changed or modified without the express approval of Technologies To Be, Incorporated. Any modification may void the user's authority to use the equipment.

Warning! This device contains no user serviceable parts. Attempts to repair this device by unauthorized personnel may subject the person to shock hazard if removal of protective covers is attempted. Unauthorized repair may void the warranty and/or maintenance contract with your company.

Meter Installation/Removal

In the event of malfunction, all repairs should be performed by Technologies To Be, Incorporated. It is the responsibility of users requiring service to report the need for service to Technologies To Be, Incorporated.

Warning! The installation of this device may subject the installer to hazardous conditions, including the possibility of electrical shock. Trained professionals should install this device. This instruction manual should be considered supplemental and used in addition to and in accordance with your company's meter installation and removal procedures and all related safety regulations.

Customer Service

If you have questions, comments or suggestions contact Technologies To Be, Incorporated as follows:

E-mail: AMR@ttbi.com

Introduction

Purpose Of The Document

This document describes the installation and configuration of the RC 2500 remote collector unit.

Audience

This document is intended for utility field personnel and others associated with the installation and maintenance of the radio based communications and control system. Installers should have had previous training and experience in the following:

Installation and maintenance of utility meters of the type being monitored by the ARC system

Electrical wiring and related skills

All utility-specific OSHA regulations and procedures

Getting Started

Getting To Know Your Collector Unit

The Technologies To Be, Incorporated Automatic Reading and Control (ARC) system is a radio based meter reading and control system that transmits utility meter readings through a radio based communications network to a collector unit, and allows utility personnel to enter commands at the central station to control meter-side equipment. Examples of equipment that can be controlled are electrically activated water valves and electrical relays.

Each Meter Side Unit (MSU) is given a unique identification. The unique ID is electronically stamped into the memory of the MSU, and is transmitted with each meter reading. The reading also contains the meter ID of the meter read, the current meter reading, and any data flags provided by the meter. Examples of these data flags are tamper indicators and back-flow indicators.

Collector units are configured to read and record the transmissions of the MSUs assigned to the collector unit. The preamble of each transmission of a MSU includes the MSU ID. Each collector, upon receiving the transmission of a MSU, checks to see if the transmitting MSU is included in the list of MSUs being serviced by the collector. If the MSU is not in the list, the collector unit ignores the MSU transmission. If the MSU is in the list, the collector decodes the MSU and records the data contained in its transmission. In addition, the collector checks to see if there are any commands waiting to be passed to the MSU. If there are, the collector unit will pass those commands back to the MSU in response to the MSU checking in.

RC 2500 Specifications

Power Source	120 VAC 50-60 Hz
Operating Temperature	-40°F to 140°F
Storage Temperature	-40°F to 140°F
Operating Humidity:	Up to 100% Humidity, non-condensing
Receive and Transmit Frequency Range:	902 to 928 MHz
Communications Mechanism:	Frequency Hopping Spread Spectrum

Input and Output

Each collector unit comes with an omnidirectional antenna of 3 dB gain. This antenna has been specially selected to meet regulatory requirements and insure the proper performance of the device. **Users should not attempt to operate the collector unit without the antenna attached. Users should not replace the antenna or alter the antenna in any way. Doing so will void the warranty on the collector unit, and may cause the unit to operate in a manner harmful to nearby personnel, and/or operate in a manner in violation of the relevant laws and regulations.**

Each collector unit also includes a power supply lead and serial port. These leads should be connected to their perspective connection devices.

RC 2500 Installation

Installation Preparation

Each collection unit should be positioned in a manner that provides the greatest line-of-site to the meter side units, which transmit to the collector. It might be appropriate to perform a collector placement study to insure there exists no shadows or under-serviced meter side units prior to installing the collector unit system. Use the following rules of thumb when placing the collector in the optimum location:

- Install the collector antenna as high as practical.
- Be aware that tall buildings or geographical features between collectors and meter side units can reduce the received MSU transmission signal strength. Try to install the collector unit above the elevation of these potential terrain features
- Beware of trees, branches or other moving objects that could strike the collector and cause damage to the unit or its antenna.

- Try not to install the collector unit below the elevation of bridges, overpasses, tunnels or similar structures in the area.
- Be aware that secondary harmonics from RF transmitters can interfere with the communications of the collector unit. Be aware of high power transmitters near the collector unit. Do not install the collector unit within 400 feet of a high-power transmitter, or in the immediate vicinity of other transmitters that operate in the ISM band (902-928 MHz).
- Try to install the antenna away from other devices, particularly metallic devices, near the collector unit.
- Be aware that some devices transmit RF interference as a result of their daily operation. Examples of these devices are fluorescent lights, Neon lights, and power transformers. Try to install the antenna away from these sources of broadband RF interference.

Installation of RC 2500

Each RC 2500 will be installed either inside a structure, or outside in a weatherproof enclosure. Follow the installation directions for the particular installation enclosure selected.

Collector Unit to Central Collector Communication

Each collector unit communicates with the central collector using either dial-up modems, a LAN, WAN or Internet connection, or a digital cellular modem. Follow the networking instructions for the selected communications protocol to establish the collector unit to central collector communications.

Configuring the Collector Unit

Each collector unit is connected to a PC, which communicates to the collector via a serial port. Basic configuration of the collector (which MSUs the collector will respond to) occurs by entering data into the PC side collector software. Once a collector knows to respond to an MSU, the collector will automatically establish communications with the MSU, and automatically begin collecting data from the MSU.