

**RCR™**

**ETI REMOTE COMMUNICATION RECEIVER**  
**SPECIFICATION**

ELECTRONIC TECHNOLOGY INCORPORATED  
511 LYONS AVENUE  
IRVINGTON, NEW JERSEY 07111

August 20, 2005

TABLE OF CONTENTS

<u>PARAGRAPH</u>	<u>DESCRIPTION</u>
1.0	<u>SCOPE</u>
2.0	<u>GENERAL</u>
3.0	<u>BASIC FEATURES</u>
4.0	<u>ADDITIONAL FEATURES</u>
5.0	<u>TECHNICAL SPECIFICATIONS</u>
6.0	<u>PRODUCTION TEST &amp; CERTIFICATION</u>

## 1.0 SCOPE

1.1 This document will serve as the specification for the ETI Remote Communication Receiver.

## 2.0 GENERAL

2.1 The ETI Remote Communication Receiver is fully compatible with existing RMS systems. All existing transmitters and Pick-Up Coils are compatible with the ETI RCR™. The Receiver is housed in a wall mountable, 19 inch rack enclosure. Racks can be configured for 8 to 120 Pick-Up Coils. Redundant, hot swappable power supplies provide all system power. A VMICPCI processor board provides system control. This main processor board also provides one (1) Fast Ethernet Interface, one (1) USB port and two (2) high performance serial ports. The Ethernet port supports Lanworks Technologies, Inc.'s BootWare BIOS to allow for remote booting and diagnostics. Also provided onboard is a real time clock and system watchdog. Two PMC expansion slots are provided. Available memory will support data logging for up to 48 hours if communications is lost. A DSP based Discriminator Board operating in real time provides detection of data from the pick up coil. The reception algorithm does not require phasing information from the substation and provides incoming signal strength. Future changes in the RMS powerline protocol can be programmed into the DSP front end without hardware changes. A built in test function is provided for checking pick-up coil operation. Each Discriminator Board handles multiple Pick-Up Coils. The DSP Discriminator Boards are connected via the highspeed backplane to the main processor board. Customer connections are provided by interface boards that plug into the rear of the rack system. A Fault Tolerant Modem is provided for communication over existing telephone data lines. Communications support of DNP3.0 via 10/100BaseT or Fiber is also offered.

## 3.0 BASIC FEATURES

3.1 The Receiver shall process and decode reports from all generations of transmitters.

- 3.1.1 Identify each received report and validate before placing it in memory.
- 3.1.2 Check received reports for errors and reject or indicate an error in the output.
- 3.1.3 Add the following static data to each transmitter report in memory.
  - 3.1.3.1 Feeder Number (5 digit alpha numeric), (aannnn).
  - 3.1.3.2 Vault Number (9 digit alpha numeric), (aaannnnnn).
  - 3.1.3.3 Area (2 digit alpha numeric), (aa).
- 3.1.4 Multiply the load currents by a predetermined correction factor for each location.
- 3.1.5 Monitor and display the age of each report in memory when an output is generated.
- 3.1.6 Maintain a history file, which will indicate the occurrence of an event for each digital input to the transmitters.
- 3.1.7 Maintain a retrievable record of "non-reporting" transmitters.
- 3.1.8 Maintain a retrievable file of all static data, which will be used to alter each report.

3.2 The operation of the receiver shall be fully automatic except for outputs. All outputs shall be obtained on demand either remotely or a direct connected local terminal/printer.

- 3.3 Outputs obtained via telephone shall be achieved through a "smart modem" which will transmit and receive (Full Duplex) at 9600 BAUD over a standard data line.
- 3.4 The following required output formats are provided:
  - 3.4.1 Print All Data - print a serial list of all reports by "Area", including all identifications, dynamic data (corrected), static data, and history.
  - 3.4.2 Print data for units with a Specific Feeder Number - print ID number, Vault number, Feeder Number, Area, Load Data, Status History, and Age for all units with the specified Feeder Number. Print all non-reporting units after the reporting units.
  - 3.4.3 Print data for units with a specified Status Condition - (any one of 5) - print ID Number, Vault Number, Feeder Number, Area, Load Data, Status, History, and Age by Area.
  - 3.4.4 Print data for all units meeting a Specified Load Criteria (either greater than or less than a Specified value). - Print ID Number, Vault Number, Feeder Number, Area, Load Data, Status History, and Age by Area.
  - 3.4.5 Print data for all units with a Specified Area - print ID Number, Vault Number, Area, Load Data, Status, History and Age.
  - 3.4.6 Print data for a Specified Vault or ID Number - print all data.
  - 3.4.7 Delete data for a Specified Vault or ID Number - delete all dynamic data as specified for a given entry.
  - 3.4.8 Delete History - delete all history data for all entries.
  - 3.4.9 Suspend Output - suspend receiver output during any output functions.
  - 3.4.10 Resume Output - resume receiver output after a "Suspension" only.
  - 3.4.11 Memory Test - print out results of memory self test.
  - 3.4.12 Clock - reset calendar and 24 hour clock.
  - 3.4.13 Print data for non-reporting units - print Vault Number, ID number, Feeder, and Area for all units not reporting or "timed out" (age greater than 120 minutes).
  - 3.4.14 Print Program - print all static data (ID Number, Area, Correction Factor) which is assigned or processed for each entry.
- 3.5 Except for printouts of data for one specific vault or ID number, all outputs are to be prefaced with a heading which includes the following:
  - 3.5.1 Name of network.
  - 3.5.2 Current date (month, day, year), (mm/dd/yy).
  - 3.5.3 Current time (hours, minutes), (24 hour format), (hh:mm).
  - 3.5.4 Titles for each column of data Printed.
- 3.6 The receiver supports the following nominal carrier frequencies.
  - 3.6.1 45 KHz
  - 3.6.2 50 KHz
  - 3.6.3 55 KHz
  - 3.6.4 62.5 KHz

### 3.7 Local Indicators

- 3.7.1 Power On LED
- 3.7.2 System Operation Normal LED
- 3.7.3 Pick-Up Coil Fault LED

### 3.8 Configuration Software

- 3.8.1 Windows XP based configuration software is provided for the Receiver.

## 4.0 ADDITIONAL FEATURES

### 4.1 Expanded Command List

- 4.1.1 Alarm Mode [Status, Off, On]
- 4.1.2 Clear Data
- 4.1.3 Data
- 4.1.4 Data New
- 4.1.5 Delete History
- 4.1.6 Delete ID [nnnn]
- 4.1.7 Delete Vault [aaannnnn]
- 4.1.8 List ID [All, Used, Unused]
- 4.1.9 Print All
- 4.1.10 Print All Age [>nnn, <nnn]
- 4.1.11 Print All Area [aa]
- 4.1.12 Print All Configuration [n]
- 4.1.13 Print All Feeder [aaaaa]
- 4.1.14 Print All Flag [a, b, c, d, e, f, g, h] [Off, On]
- 4.1.15 Print All Load [>nnn, <nnn]
- 4.1.16 Print All New
- 4.1.17 Print All Status [A, P, T, W, E]
- 4.1.18 Print All [High, Low] Voltage [>nnn, <nnn]
- 4.1.19 Print Command List
- 4.1.20 Print ID [nnnn]
- 4.1.21 Print Index
- 4.1.22 Print Non-Reporting
- 4.1.23 Print Static Data
- 4.1.24 Print Vault [aaannnnn]
- 4.1.25 Resume
- 4.1.26 Suspend
- 4.1.27 Test Alarm [On, Off]
- 4.1.28 Test Memory
- 4.1.29 Time

### 4.2 Transmitter Signal Strength Diagnostics

- 4.2.1 Print Weak Signal
- 4.2.2 Print Signal Strength ID [nnnn]
- 4.2.3 Print Signal Strength Vault [aaannnnn]

#### 4.3 Power Loss Alarm

4.3.1 The Receiver will send unsolicited alarm message upon power failure

#### 4.4 Power Direction Diagnostics

4.4.1 Print All Reverse Power

#### 4.5 Pick-Up Coil Diagnostics

4.5.1 Print Pick-Up Status

#### 4.6 Data Log

4.6.1 Print Data Log

### 5.0 TECHNICAL SPECIFICATIONS

#### 5.1 Dimensions

5.1.1 The receiver is housed in a wall mountable, slope topped rack enclosure. The overall size shall not exceed 48"H X 30"W X 22"D.

#### 5.2 Power

5.2.1 The receiver is powered from redundant, hot swappable, rack mounted power supplies. Input power requirements are 90-264 VAC, 1 phase, 47-63 Hz at 7 amps maximum. Receivers can also be supplied with alternate power inputs of 48 VDC.

5.2.2 The receiver power is not phase sensitive and may be powered from any phase.

#### 5.3 Pick-Up Head Channels

5.3.1 Receivers can be configured from 8 to 120 Pick-Up Heads

#### 5.4 Communications

##### 5.4.1 Main Processor

5.4.1.1 One Fast Ethernet Interface

5.4.1.2 One USB Port

5.4.1.3 Two high performance Serial Ports

5.4.1.4 One Super VGA Interface

5.4.1.5 One PS/2 Keyboard and Mouse Port

##### 5.4.2 PMC Expansion Slot 1

5.4.2.1 Eight Intelligent Serial Ports

##### 5.4.3 PMC Expansion Slot 2

5.4.3.1 Reserved for High Speed Fiber

##### 5.4.4 Modems

5.4.4.1 One General DataComm Compatible

### 5.3 Temperature

5.3.1 The receiver has a continuous operating temperature range of 0°C to 50°C.

5.3.2 The receiver has a storage temperature range of -40°C through +85°C.

### 5.4 Humidity

5.4.1 The receiver is rated to operate in up to 95% non-condensing.

## 6.0 TESTING AND CERTIFICATION

6.1 Each receiver is tested and calibrated prior to shipment in accordance with the design parameters and tolerances listed in the previous sections herein.

6.1.1 Operating Voltage Range.

6.1.2 All modes of operation as defined in Section 4.0.

6.1.3 96 hour burn in period for completely assembled units to preclude early failures and stability or drift problems. The ambient is maintained at 50°C.

6.2 The results of the testing for each receiver is available on request.