



Remote Logger Unit User Manual

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Remote Logger Unit

The Remote Logger Unit (RLU) is a compact device used to monitor multiple power meters and multifunctional probe inputs.

The unit has both local and GPRS interfaces for monitoring and configuration.

The main features of the RLU include:

- Monitoring of up to eight power meters (UTL PDUs and ND Modbus) via four ports
- Monitoring of up to six multifunctional environment channels
- Configuration and monitoring via local and network (GPRS) interfaces
- RS232 and USB interfaces for local access
- Networked logging of monitor data

Environment Monitoring

The Remote Logger Unit has the capability to monitor temperature, humidity, air pressure and speed, luminous intensity, contact state, and pulse count, and to raise alarms if a user-configured threshold is crossed.

PDU Monitoring

The Remote Logger Unit via intelligent PDUs and ND Modbus meters allows around-the-clock monitoring of the electrical power environment including the raising of alarms if a user-configured threshold is crossed.

Contacting Panduit

For Technical Support on PIM Software, please contact Panduit Technical Support using one of the following methods:

- Toll-Free: 1-866-721-5302, Monday-Friday, 24 hours/day
- 24/7 phone support - Response typically within the hour on weekends
- Email: systemsupport@panduit.com

Document Overview

This manual uses the following typographic conventions:

{somevalue}	Italics surrounded by curly braces indicate a user supplied entry that must be input. E.g.: {drive}: setup
<ctrl+alt+delete>	Text surrounded by angled brackets indicate specific keys to be pressed. Use of the + sign in combination indicate that keys should be pressed together.

Information of note may be presented like this.

Warning: These messages alert you to specific procedures or practices; serious consequences, including injury, may result if you disregard them.

Document History

This manual is intended to document the Remote Logger Unit product. Throughout this document it is assumed that the user has a basic to intermediate knowledge of IT and Networking concepts. Further information regarding IT and Networking fundamentals may be found in the appendices of this document.

This is version 1.0 of this document.

Remote Logger Unit Package

The standard RLU package contains a Remote Logger Unit and a Localized Mains Lead.

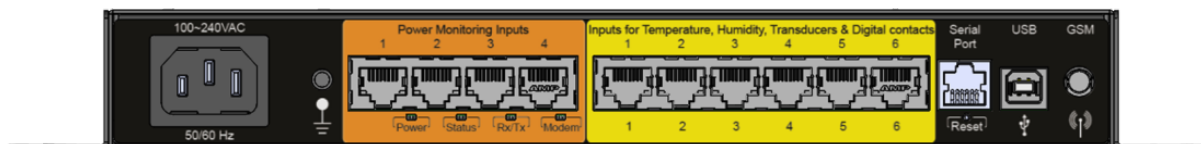
Front of RLU

The following image shows the front panel of the Remote Logger Unit:



Rear of RLU

The following image shows the rear panel of the Remote Logger Unit:



LEDs

LEDs can be found on the rear of the RLU. Their purpose is described below.

- **Power:** Illuminates when the unit is powered [Green LED]
- **Status:** Indicates system activity [Yellow LED]
- **Rx/Tx:** Indicates the network connection state [Yellow LED]
- **Modem:** Indicates modem activity [Yellow LED]

Reset Button

The back of the RLU includes a **Reset** button, which allows the user to reboot the unit.

Connections

On the rear of the RLU are several connectors:

- **Power Monitoring:** PDUs connect here
- **Inputs:** Probes are connected here
- **Serial Port:** For connection of a smart meter or serial terminal
- **USB:** For connection of a USB device such as a serial terminal
- **GSM:** For connection of a GSM aerial

Rack Mounting

This section covers the basic bracket mounting of the RLU.

Equipment Required

You need to supply a minimum of two 5mm x 15mm pan head or hexagonal head bolts, two 5mm washers and nuts, and the appropriate tools.

Before You Begin

When determining where to install the RLU, please verify that these guidelines are met:

- Airflow around the RLU is unrestricted.
- Clearance to the front and rear panels meet these conditions:
 - Rear-panel LEDs can be easily read.
 - Access to ports is sufficient for unrestricted cabling.
 - AC power cord from the power supply can reach the AC power outlet and the RLU.
 - The aerial can be placed such that it has sufficient signal to make a connection. Temperature around the RLU does not exceed 40° C.
 - Humidity around the RLU does not exceed 90% Relative Humidity.

Installation Warning Statements

This section includes the basic warning statements.

- Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
- To prevent the RLU from overheating, do not operate in an area that exceeds the maximum recommended ambient temperature of 40° C.
- Installation of the RLU must comply with local and national electrical codes.
- The rack or cabinet or fixing surface should be adequately secured to prevent it from becoming unstable and/or falling over.
- To prevent personal injury when mounting or servicing the RLU, you must take care to ensure the system remains stable.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (use of a power strip etc).

Rack-Mount the RLU

Hold the RLU and attach the bracket to the rack using two 12-24 screws.



Initial Setup

Installation Requirements

- Remote Logger Unit.
- IEC mains lead (supplied localized).
- Computer system with serial terminal emulator program to set up the RLU.
- Serial lead (see below).

Connection to Configuration Interface

The Remote Logger Unit can be configured entirely using the command line interface accessible via the RS232 and USB ports.

For the RS232 connection a lead will be needed as follows.

Function	RLU	Dir	PC
RTS	6-way RJ45	1 →	8
Rx		2 ←	3
Gnd		3 ↔	5
CTS		4 ←	7
Tx		5 →	2
3.3V		6 →	-
			9-way D female

For the USB connection a standard USB lead will be needed. The serial port terminal should be configured as follows:

- 115,200 bits/s
- 8 bit
- No parity
- No flow control

When the USB connects a PC to an RLU for the first time, the drive will be installed. No further setup is needed and the commands will work exactly as for the serial interface.

Default Network Settings

To determine the default network settings enter the following at the CLI:

```
type autoapn
```

This will list the file containing all available network configurations. To determine whether or not your network is configured you need to determine its IMSI and check whether the first digits of this code appear as any of the network IDs (first field in each data line) of the data returned.

Initial Network Setup

To discover the current configuration, enter:

```
CONFIG <filter>
```

where the filter is the first letters of a set of commands. CONFIG has two aliases: ? and CFG.

If the ID of the required network isn't present, the configuration can be entered manually using the following commands:

```
GPRS_APN <apn_name>
```

```
GPRS_USERNAME <gprs_username>
```

```
GPRS_PASSWORD <gprs_password>
```

```
SAVE
```

To check these values enter:

```
CONFIG GPRS
```

Network Server Setup

To communicate with the network server for RLU configuration, data uploads, and firmware updates, the server must be configured as follows:

```
SERVER_NAME 1 <server_1_name>|<server_1_ipaddr>
```

```
SERVER_PORT 1 <server_1_port>
```

```
SERVER_PASS 1 <server_1_password>
```

```
SAVE
```

To check these values enter:

CONFIG SERVER

The server updates are configured as follows:

- `UI <interval>` sets the interval (in seconds) between successive server update operations.
- `UI_SYNC <time>` sets a server update synchronization point (format: HHSS) in the current 24-hour period.
- `FW_NAME <fname>` sets the name of a file (format: f or f_*) on the server in which an application update image will be stored. This image will be downloaded and installed if it differs from the currently installed image.
- `SAVE` saves the configuration.

Logging Setup

Prior to uploading to the power meter and probe monitoring information is periodically stored on the RLU. The logging times are configured as follows:

- `LI <interval>` sets the interval (in seconds) between successive logging operations.
- `LI_SYNC <time>` sets a logging synchronization point (format: HHSS) in the current 24-hour period.
- `SAVE` saves the configuration.

Power Meters

The power meter configuration is determined by a configuration record identified by the ID number.

Configuration Records

The format of a configuration record is as follows:

```
<cfgrcd> = id>,<type>,<name>,<port>,<addr>,<baud>,<numslvs>
```

where

- `<id>` is an arbitrarily assigned unique number (1 through 8).
- `<type>` indicates the meter type ID as in table below.
- `<name>` is an arbitrarily assigned string of up to 31 characters.

- `<Port>` is the physical port to which the meter is connected (1 through 4).
- `<addr>` is the base address of the meter if it is a Modbus device; otherwise the value is set to 0.
- `<baud>` is the baud rate of the meter port.
- `<numslvs>` represents the number of slave units if relevant; otherwise this value is set to 0.

ID	Power Meter Type
0	None
1	UTL PDU Single-Phase
2	UTL PDU 48V DC
3	UTL PDU Three-Phase
4	ND Multi-Cube
5	ND 350

To read back a configuration record:

```
pwr cfg <id>
```

To install a new configuration record use:

```
pwr cfg <cfgrcd>
```

To delete a configuration record use:

```
pwr cfg <id+128>
```

To read back all configuration records use:

```
pwr cfg all
```

UTL PDUs

The types of PDU are:

- Single-phase
- 48V DC
- Three-phase

For these, `<addr>` and `<numslvs>` should both be 0.

Modbus Devices

The types of digital sensors are:

- ND MultiCube
- ND 350

For ND 350 <numslvs> should be 0.

Limits

The thresholds that can be set are:

- kWh Upper Threshold
- kWh Lower Threshold

Limits may be configured as follows:

```
PWR ALARMSET <id>,<sllt>,<slht>[;<snlt>,<pnht>]...
```

Values apply to all meter types. Slave channels must appear in address order.

Alarms are enabled by default when configured, but their enable status may be controlled as follows:

```
PWR ALARMEN <id>,<sllt>,<slht>[;<snlt>,<pnht>]...
```

Alarm levels and the enable state for a particular meter can be read back as follows:

```
ENV ALARM <id>
```

Format for each row as follows:

```
Low: <threshold>(<en_state>) High: <threshold>(<en_state>)
```

Note: There are no lower limits for total energy as energy consumption can only go up not down.

Input Sensors

The Input Sensor values are all determined by a template for its particular probe type. Default templates are supplied for some probe types.

Probe Templates

The format of a template is as follows:

```
<template> = <id>, <name>, <p0>, <p1>, ..., <pn>
```

To read back the template for a particular probe id use:

```
env template <id>
```

To install a new template for a particular probe id use:

```
env template <template>
```

To uninstall a template and return to the default use:

```
env template <id>, 0
```

To read back the names of all active templates use:

```
env template
```

Analog Probes

The types of analog sensors are:

- Temperature
- Humidity
- Luminous Intensity
- Air Pressure
- Air Velocity

For analog sensors, the template supplies a set of exactly 41 floating-point values (the mapping), which define the output value over the full range of the sensor input, which may be 0-5V or 0-10V, depending on probe type.

Digital Probes

The types of digital sensors are:

- Open/Close Contacts
- Pulse Count

For digital sensors the template supplies a set of integer values defining open circuit state and de-bounce counts (high and low) for each port. This set of values has the following format:

```
<o1>, <o2>, <o3>, <o4>, <o5>, <o6>, <h1>, <h2>, <h3>, <h4>, <h5>, <h6>, <l1-1>, <l2>, <l3>, <l4>, <l5>, <l6>
```

If an incomplete set of values is supplied, missing (trailing) values will be set to 0.

Limits

The thresholds that can be set are as follows:

- Upper Threshold
- Lower Threshold

Limits may be configured as follows:

```
ENV ALARMSET <plid>, <pllt>, <plht> [ ; <pnid>, <pnlt>, <pnht> ] ...
```

Values apply to all probe types – including digital – regardless of measurement units. Port configurations do not have to be in any particular order.

Alarms are enabled by default when configured, but their enable status may be controlled as follows:

```
ENV ALARMEN <plid>, <plle>, <plhe> [ ; <pnid>, <pnle>, <pnhe> ] ...
```

Alarm levels and enable states can be read back as follows:

```
ENV ALARM
```

Format for each row:

```
Low: <threshold>(<en_state>) High: <threshold>(<en_state>)
```

Networked Configuration

All of the configuration commands described in this document may also be executed from a server configuration file.

Firmware Update

There are two main ways of updating the application firmware: locally via a serial port and remotely from the network server.

Serial Port

To update firmware via the serial port, enter the following command at the terminal:

```
ymodem fw
```

Then use the **Y Modem** facility to send the application firmware update to the RLU. On completion, restart the RLU by pressing **Reset**, and the new firmware version will install and start to execute.

Networked

To update firmware via the network:

1. Rename the application firmware update file to be the same as for the FW_NAME in the configuration parameters.
2. Copy the file to the server download/ directory. On the next server synchronization the file will be downloaded and installed and the system restarted.

Note : The system will always attempt to update the firmware if it finds a valid update file on the server that is different from the one currently being executed.

Bootloader

If the firmware cannot be updated via the application, then an update can be performed by the bootloader.

1. Connect the PC to the RLU via the serial port and a terminal emulator program.
2. At the terminal emulator program, hold down the space bar and power the RLU. The bootloader menu displays.
3. At the terminal, select option **f**, and then send the application image.
4. On completion of the download, select option **t** to install the update and start the RLU (--- means deleting, +++ means programming).
5. On completion of firmware installation, select option **j** to start the RLU application.

Troubleshooting

Resetting the RLU to Factory Default Settings

To reset the Remote Logger Unit to the factory default, perform the following steps:

Note: This process is best accomplished from the back side of unit (the side with the connectors).

1. Press and release the **Reset** button. This starts the reboot process.
2. The green Status light will illuminate and then extinguish, and the red Alarm light will illuminate. Press and hold the **MODE** button for around 10 seconds until the Alarm light extinguishes.
3. Wait 30 seconds.
4. Press and release the **Reset** button to complete the process.

The factory default settings will be restored.

Appendix A: Technical Details

Factory Default Settings

SmartZone EPA126 Gateway Defaults

IP Address	192.168.0.253
Subnet Mask	255.255.255.0 (/24)
Default Gateway	192.168.0.1
Web Management Address	http://192.168.0.253/
Default Username	admin
Default Password	admin

Operating Information

Input Power	100-240 VAC (45W) 50-60 Hz
Operating Temperature	0°C to 40 °C
Storage Temperature	-10 °C to 70 °C
Operating Humidity	5% to 90% RH
Storage Humidity	5% to 100% RH

Caution: There is a risk of explosion if the battery is replaced with an incorrect type. Dispose of used batteries according to the instructions.