

3-PHASE DIN RAIL ENERGY METER 1/5A (MID CERTIFIED) **NMID30-1**



USER'S MANUAL



**1 Introduction**

This document provides operating, maintenance and installation instructions. This unit measures and displays the characteristics of Single Phase Two Wire (1P2W), Three Phase Three Wire (3P3W) and Three Phase Four Wire (3P4W) networks. The measuring parameters include Voltage (V), Current (A), Frequency (Hz), Power (kW/KVA/KVAh), Power Factor (PF), Imported, Exported and Total Energy (kWh/kVAh). The unit also measures Maximum Demand Current and Power, this is measured over preset periods of up to 60 minutes.

This particular model accommodates 1A or 5A Current Transformers and can be configured to work with a wide range of CTs. It also comes with a complete comms capability with built in Pulse and RS485 Modbus RTU outputs, configuration is password protected.

This unit can be powered from a separate auxiliary supply (AC or DC). Alternatively, it can be powered from the monitored supply by linking the voltage reference and neutral reference in to terminals 5 & 6 (Please refer to wiring diagram).

**1.1 Unit Characteristics**

The NMID30-1 can measure and display:

- Phase to Neutral Voltage and THD% (Total Harmonic Distortion) of all Phases
- Line Frequency
- Current, Maximum Demand Current and Current THD% of all Phases
- Power, Maximum Power Demand and Power Factor
- Imported, Exported & Total Active Energy
- Imported, Exported & Total Reactive Energy

The unit has a Password-Protected set up menu for:

- Changing the Password
- System Configuration - 1P2W, 3P3W, 3P4W.
- Demand Interval Time
- Reset for Demand Measurements
- Pulsed Output Duration

**1.2 Current Transformer Primary Current**

This unit requires configuring to operate with the appropriate current transformer(s), the optional secondary currents are 1A or 5A. It is programmed by inputting the ratio (CT Primary divided by the CT Secondary). It can be used on primary currents up to 6000A.

**On the MID Version, you can only program the CT Rate ONCE.**

**1.3 RS485 Serial – Modbus RTU**

This unit is compatible with remote monitoring through RS485 Modbus RTU. Set-up screens are provided for configuring the RS485 port. Refers to section 4.2. **The list of registers and description of the Modbus protocol can be found in a separate manual available at [www.lumel.com.pl](http://www.lumel.com.pl)**

**1.4 Pulsed Outputs**

The NMID30-1 has Two Pulsed Outputs that can be set for active (kWh) or reactive (kVAh) energy. Terminals 11 & 12 have a fixed output of 3200imp/kWh. Terminals 9 & 10 are configurable within the setup menu.

**2 Start Up Screens**

	The first screen lights up all display segments and can be used as a display check.
	The second screen indicates the firmware installed in the unit and its build number.
	The interface performs a self-test and indicates the result if the test passes.

\*After a short delay, the screen will display active energy measurements.

**3 Measurements**

The buttons operate as follows:

	Selects the Voltage and Current display screens. In Set-up Mode, this is the "Left" (press) or "Escape" (hold 3sec) button.
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	Select the Frequency and Power factor display screens. In Set-up Mode, this is the "Up" (press) button.
	Select the Power display screens. In Set-up Mode, this is the "Down" (press) button.
	Select the Energy display screens. In Set-up mode, this is the "Right" (press) or "Enter" (hold 3sec) button.

**3.1 Voltage and Current**

Each successive press of the button selects a new parameter:

	Phase to neutral voltages.
	Current on each phase.
	Neutral Current
	Phase to neutral voltage THD%.
	Current THD% for each phase.

**3.2 Frequency and Power Factor and Demand**

Each successive press of the button selects a new range:

	Frequency and Power Factor (total).
	Power Factor of each phase.
	Maximum Current Demand.
	Maximum Power Demand.

**3.3 Power**

Each successive press of the button select a new range:

	Instantaneous Active Power in kW.
	Instantaneous Reactive Power in kVAh.
	Instantaneous Volt-Amps in KVA.
	Total kW, kVAh, kVA.

**3.4 Energy Measurements**

Each successive press of the button selects a new range:

	Total active energy in kWh.
	Total reactive energy in kVAh.
	Imported active energy in kWh.

	Exported active energy in kWh.
	Imported reactive energy in kVAh.
	Exported reactive energy in kVAh.

Please note the register is 9999999.9 display over two lines.

**4 Set Up**

To enter set up mode, hold the button for 3 seconds, until the password screen appears.

	The set up is password-protected so you must enter the correct password (default '1000') before processing.
	If an incorrect password is entered, the display will show: <b>PASS Err (Error)</b>

To exit the set up menu, hold the for 3 seconds, the measurement screen will display.

**4.1 Set up Entry Methods**

Some menu items, such as Password and CT, require a four-digit number entry while others, such as supply system, require selection from a number of menu options.

**4.1.1 Menu Option Selection**

1. Use the and buttons to scroll through the different options of the set up menu.
2. Hold the button for 3 seconds to confirm your selection.
3. If an item flashes, then it can be adjusted by the and buttons.
4. Having selected an option from the current layer, hold the button for 3 seconds to confirm your selection.
5. Having completed a parameter setting, hold the button for 3 seconds to return to a higher menu level.
6. On completion of all setting-up, hold the button for 3 seconds, the measurement screen will then be restored.

**4.1.2 Number Entry Procedure**

When setting up the unit, some screens require the entering of a number. In particular, on entry to the setting up section, a password must be entered. Digits are set individually, from left to right. The procedure is as follows:

1. The current digit to be set flashes and then can be adjusted using the and buttons.
2. Press the button to move right to the next digit.
3. After setting the last digit, hold the button for 3 seconds to save your selection.

**4.2 Communication**

The RS485 port can be used for communication using Modbus RTU Protocol. To configure the Modbus settings, such as Address and Baud Rate, this is also done within the Password-protected set up menu.

**4.2.1 RS485 Address**

	Use the  and  buttons to select the menu option. The screen will show the current setting.
	Hold the  button to set the meter Address. Range: 001(default) to 247.
	Hold the  button to confirm the selection.

Use the and buttons to choose the necessary number, then press the button to move along to the next number. To save the new setting, hold the button for 3 seconds until the selection stops flashing.

**4.2.2 Baud Rate**

	Use the  and  buttons to select the menu option. The screen will show the current setting.
	Hold the  button to enter the menu option, the current selection will flash.

	Use the  and  buttons to select the required option.
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On completion of the entry procedure, hold the button to confirm the setting.

**4.2.3 Parity**

	Use the  and  buttons to select the menu option. The screen will show the current setting.
	Hold the  button to enter the menu option, the current selection will flash.
	Use the  and  buttons to select the required option. Range: None (default), Odd or Even.

On completion of the entry procedure, hold the button for 3 seconds until the selection stops flashing.

**4.2.4 Stop bits**

	Use the  and  buttons to select the menu option. The screen will show the current setting.
	Hold the  button to enter the menu option, the current selection will flash.
	Use the  and  buttons to select the required option. Range: 1 (default) or 2.

On completion of the entry procedure, hold the button for 3 seconds until the selection stops flashing.

**4.3 CT Configuration**

The CT options set the Secondary Current (CT2 5A or 1A) of the Current Transformer (CT) that are used with the meter.

	Use the  and  buttons to select the menu option. The screen will show the current setting.
	<b>Secondary CT Setting:</b> Hold the  button to set the CT secondary option: 5A (default) or 1A.
	<b>Set the CT Ratio Value:</b> Hold the  button to enter the CT Ratio setting screen. The range is from 0001 to 2000.

The CT Rate is the CT Primary divided by the CT Secondary. For Example: 200/5A Current Transformers - 200÷5=40, so the CT Rate would be 0040 and the CT2 would be 5.

**On the MID Version, you can only program the CT Rate ONCE.**

**4.4 PT**

The PT option sets the Secondary Voltage (PT2 100-500V) of the Voltage Transformer (PT) that may be connected to the meter.

	Use the  and  buttons to select the menu option. The screen will show the current setting. The default value is 400V.
	<b>Secondary PT Setting:</b> Hold the  button to set the PT secondary option: 100-500V.
	<b>Set the PT Ratio Value:</b> Hold the  button to enter the PT Ratio setting screen. The range is from 0001 to 2000.

The PT Rate is the PT Primary divided by the PT Secondary. For Example: Voltage Transformer - 11000÷110=100, so the PT Rate would be 0100 and the PT2 would be 110.

**4.5 Pulse Output**

Use this section to configure the Pulsed Output Type. Units: kVAh (default); kWh.

	Use the  and  buttons to select the menu option. The screen will show the current setting.
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