



SERIES 7000 V3

POWER QUALITY AND ENERGY ANALYZER INSTALLATION AND OPERATION MANUAL



INSTALLATION AND OPERATION MANUAL



GREEN RENEWABLE ENERGY METERING



====SHORT CUT==== FOR **RESETING THE DEMAND**

NOTE: This meter has been factory programmed for Voltage Readings Phase to Neutral, a 15 min. KW Demand Interval, 1 KHh Pulse on No. 1 Relay and Primary Ampere Rating. (See pg. 10-13 for field programming changes)

10 Start.			
1.Insert "Key" turn clockwise Push the "Max" Button Turn the "Key" off	P-n		Volt Screen
	PA 00		
2. Push the "Display" Button			Primary Amp Screen
	000		
	CodE	KW	
3. Push the "Display" Button			Code Screen
for	16		Demand choice
	PEr	KW	
4.Push the "Display" Button	15		Demand Time Period Screen (15) min.
	CLr	KW	
5. Push the "Display" Button	no		Clear the Demand Reading "No"
	CLr	KW	C C
6. Push the "MAX" Button	YES		Clear the Demand Reading YES
	dEF	KWh	
7. Push the "Display" Button	PAGE		Default Screen Selection

8. Push the "Reset" Button to enter the change and return to the Default Screen, which is factory set to kWh.





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INTRODUCTION TO THE SERIES 7V3

You now have in your possession one of the most reliable and highly accurate meters ever manufactured. You can obtain valuable information about the electrical supply by knowing how to operate this meter. Please take the time to read and understand this manual, or put it into the hands of who is in charge.

The installing information within this manual is to be used as a guide and any and all applicable electrical codes must take precedence.

WARNING

We recommend that all electrical circuits, that you are working on, be DE-ENERGIZED prior to installation of this meter or current transformers. If this is not possible than any and all applicable OSHA Safety Rules, Union Safety Rules or any other applicable safety rules when working with energized circuits must be adhered to. A licensed electrician must perform this installation for all applicable warrantees to be in effect.

The Series 7V3 Power Analyzer has 4 components, (The Meter and Three CTs). The CTs can be either solid core or split core. The line wires feeding this meter shall be protected with in-line 5 amp fuses or a three pole 15-Amp circuit breaker with a locking handle. All current transformers have 5-amp secondary output. <u>Never leave the black and white wires from a CT opened when the meter is not connected</u>. There is appreciable voltage across them depending on the CT Ratio and the Primary load going through the CT.

EXCEPTION:

The Model NMI-1250 split core current transformer has a 110mv output at full load. The black and white wires are to be capped individually when the meter is disconnected.

CHECK FOR SHIPPING DAMAGE and SHORTAGES

The Watt Watcher Meters are shipped in a protective box with the solid core CTs up to 400 Amps. Split Core CTs is in another box, depending on their size. After unpacking your meter please check for obvious damage or if any components are missing. In either case promptly notify the Distributor where it was purchased. NMI is not liable for any omissions or errors contained in this manual.

NOTE TO THE INSTALLER:

PLEASE LEAVE THIS MANUAL WITH THE METER AFTER THE INSTALLATION.

THANK YOU!





MAIN FEATURES

The Series 7000V3 Energy Analyzer is field programmable offering one model for both 3 and 4 wire circuits. The factory has programmed the meter for Voltage, Amperage and a 15min. KW Demand period, unless the Distributors' P.O. indicates other. If at any time you wish to change these settings or would like to view the program, see pages 10-11 "Set-Up Procedure." There is a back lit screen that will light when any button is pushed and stays on for 30 seconds. This "On" time is field programmable under the "T dis" screen in the Set-Up Procedure. (See page 11).

You will notice that there are 3 buttons, RESET, DISPLAY, and MAX on the right hand side of the screen that are used to change the display and program the meter. A key switch is used to reset the maximum demand as well as program the meter. You don't have to be worried about losing any energy readings by pushing the Display or Max buttons. You will lose the instantaneous maximum power readings for V, A, KW, PF, and THD when you push the Reset Button. There are 3 Red LEDs on the left side of the display indicating Line 1, Line 2 and Line 3 which will light when the display screen scrolls through each phase.

The kilowatt-hours appear in the first screen, which is the default screen. This screen has 7-KWh digits, the last one being 1 watt hr. There are no multipliers necessary to read the energy used. To reset the maximum demand simply follow "RESETTING THE DEMAND" instructions located behind the front cover. There are many power and energy readings, all of them are listed on Page 3. You will notice that the power readings i.e., V,A,PF,KW, Hz and THD scroll through L1, L2, L3., while the total readings (indicated by symbol III) will stay locked on until you push the Display button. Pushing the Display button allows you to scroll from one screen to another.

There are two relays located in the meter. The terminals are next to the CT terminals and are indicated by Relay-1 & Relay-2. These relays can be used for energy pulses, assigned to KWh or Hi, Lo, Alarm Contacts for any selected power parameter i.e., V, A, PF, KW, THD, or KVA. One relay can be an energy pulse while the other can be an alarm contact. These relays are field programmable (see page 12). The factory sets Relay-1 to 1 kWh per pulse as a standard unless instructed otherwise.

There is a RS485 ModBus Terminal block above the relays. This port works with our Intelligent Converter that plugs into the RS232 Com Port in your computer. NMI offers several software programs. Call the factory for more information.

The voltage and the current terminals are removable. If a field calibration check is necessary the terminals simply unplug and a portable meter tester can plug into them. These terminals are a standard feature on all of our meters. The CTs have two extra terminals for each CT that is used when paralleling two sets of CTs. Remember current sensors with voltage outputs cannot be paralleled. Voltage <u>is not additive in parallel</u>, where <u>current is</u>.

There are four holes, one located in each corner, for mounting the meter against a plywood board, sheet rock or switch boards. We don't recommend that the meter be mounted against a concrete wall. If there are any technical questions beyond what this manual covers please call our technical desk (603) 669.5790.

NOTE: The factory programs the meter for the rated ampacity, 15 min. demand, THD readings for V. & A. and the No. 1 relay for 1-KWh pulse. These are field programmable so any changes can be made.



PARAMETERS MEASURED SIMULTANEOUSLY BY METER

Parameter	Symbol	L1	L2	L3	Average	Notes
Voltage (phase to neutral)	V	Х	X	Х		Program Choice:
Voltage (phase to phase)	V	X	X	Х		P - P or
Current	А	X	X	X		P - N*
Active power	KW	X	X	X	X	
Power factor	PF	X	X	Х	X	
Apparent power L- & C+	Kva	X	X	X	X	
Voltage THD or D	har-V	Х	X	Х		Program Choice:
Current THD or D	har-A	X	X	X		THD /D
Frequency	Hz	X				
Power demand KW	Md				X	Interval
KWh	KWh				X	Choice: 1 – 60 Mins

* The meter will calculate a phase to neutral reading even without a neutral connected.

The Series 7V3 provides readouts of the above listed parameters by means of a LCD display in two rows that simultaneously shows both parameters in each screen, except for the kWh screen.

OTHER FEATURES

- True R.M.S. measurements
- Instantaneous, maximum and minimum values of each power parameter by pushing the Max button or turning the Key. The Reset button will erase these power readings and reboots the meter. It will not erase the energy readings.
- Harmonic distortion measures the percentage % of Distortion (D) or Total Harmonic Distortion (THD) of the Voltage and Current. Above 5% in voltage is on the high side and should be considered and the current can be 40-50%.





7V3 CONNECTION TERMINALS

Terminal No.	Designation	Description
L1 – L2	Power Supply	Power Supply at 230 or 480 VAC depending upon the model of the meter. Power supply is common with the measuring voltage. Separation is an optional feature.
Relay-1	Pulse or Alarm	Relay No. 1 Form 'A' contact.
Relay-2	Pulse or Alarm	Relay No. 2 Form "A" contact.
Com 1. RS485	+ GRN -	RS85 Links to PC (ModBus Protocol)
Ν	Ν	Neutral
L1	Measuring Voltage	Voltage signal from Phase A. L1
L2	Measuring Voltage	Voltage signal from Phase B. L2
L3	Measuring Voltage	Voltage signal from Phase C.L3
CT1 B&W	Current Transformer	Current or mill-volt-signal from CT on L1
CT2 B&W	Current Transformer	Current or mill-volt signal from CT on L2
CT3 B&W	Current Transformer	Current or mill-volt signal from CT on L3

Note:

Color code and size all wires according to National Electric Code. Current Transformer and Current Sensor wires shall be twisted to cancel noise. Current Transformers and Voltage shall be phase related i.e. L1 and CT1 are on the same phase, the same with L2. and L3.





CONNECTION DIAGRAMS:

Three Phase 4 wire Service, which also covers a High-leg Service. (High Leg L2.)



- 1. Use either 5 amp in-line fuses or a 3 pole 15 amp CB with locks
- 2. RS 485 Terminals (+ GRN -)
- 3. Relay-1 and Relay-2 alarm or pulse relays

Three Phase 3 wire: (Either a Delta Service or 3 wires off a 4 wire Wye Service.)



- **1**. Use either 5 Amp in-line fuses or a 3 pole 15 Amp CB with lock
- 2. RS 485 Terminals (+ GRN)
- **3**. Relay-1 and Relay-2 alarm or pulse relay

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WIRING INSTRUCTIONS

- 1. All wiring to this meter must comply with the National Electric Code or any local codes that are applicable. A grounding conductor must be installed and connected to the ground lug located under the terminal cover of the meter.
- 2. The voltage wires connected to the line terminals in the meter can be No.14 gauge. The load for the meter is a .07 amp. Either 5 Amp in-line fuses or a 3 pole 15 Amp CB with lock should protect the voltage leads.
- 3. The extended wires from the meter to the current transformers can be #16 gauge stranded wire up to 100' and 14 to 200' distance. The voltage and the current wires can be in the same conduit, you must twist the current wires independently. The CT leads must be shunted if the CT is to be installed before the meter, or if the meter is taken out of service. Never leave the CT leads open on an energized circuit drawing current. The CT will hum and vibrate and it will become magnetic distorting the accuracy. Exception is the NMI-1250 split core current sensors. The secondary output of this split core is 110 mV, not current. In this case the black and white wires are capped separately. The distance is up to 2000' with No. 16 gage wire.
- 4. Form all wires neatly within the field termination area provided. An extra row of CT terminals is provided, if paralleling current CTs. Both the voltage and the current terminals are removable for ease of wiring or if field-testing is required in the future.
- 5. <u>Please carefully check all connections before energizing meter.</u>

SOLID CORE CURRENT TRANSFORMERS

1. Solid Core 400amp CTs .are supplied with this meter, unless ordered by the Distributor. The LX 400 Amp CT works in a range of 4 to 400 Amps. The solid core CTs are more accurate than the split cores and are much smaller. Split Cores are available if the power cannot be turned off. The (H1) mark or white dot, depending on the manufacturer, faces the line side of the service.



Note: Shunt the black and white wires if the CT if installed and the meter has not been connected. 6.



SPLIT CORE MODEL "TP" CURRENT TRANSFORMERS



Please refer to the drawing above:

- 1. Remove and dispose of the packaging materials
- 2. To remove the end piece, unscrew the assembly nuts, push in on the end piece to relieve the pressure on the bolts. Pull the bolts out and pull the end from the main **U** shaped housing.
- 3. Position the "P1" side of the CT towards the line side of the service. Install the CT over the wire(s) and re-assemble the CT.
- 4. There are 2 pressure screw terminals labeled "S1" and "S2". Connect the white secondary 5 Amp wire to the "S2" terminal and the black wire to "S1" terminal.
- 6. The other two brass screws on top can be used for shunting out the CT with the use of a jumper, if needed. Remember to remove the jumper after connecting the CT to the meter. Do not put the CT around an energized conductor unless the CT is shunted or connected to the meter. An open CT will vibrate, hum and could magnetize the core.

CAUTION: NMI RECOMMENDS THAT YOU TURN OFF ALL POWER BEFORE INSTALLING CTS.





SPLIT CORE MODEL "1250" CURRENT SENSOR



The secondary side of these split core sensors is 110 milli-volts at 400 Amps. There is no dangerous voltage from the secondary side with the leads open, unlike a current transformer. You need to cap the black and white wires separately if the meter is not installed at the time the current transformer is in place.

Pull hard on the bottom section to open the yoke of the sensor. Install around conductor(s) and snap it back together. Twist the black and white wires independently from each sensor. The transformer wires and the voltage wires can be installed in the same conduit. You can run up to 2000' using #16 gage wire.



OPERATION MODE

- 1. The display screens have 4 digits per line, 2 readings are available on each screen, except for the KWh display, which has 7 digits ending with watt hrs. on bottom right.
- 2. The 3 LEDs to the left are Line 1, Line 2, and Line 3 indicators. The display screen information references the line that is lit at that time. The phase LEDs will light when the meter is scrolling power readings- V, A, KW, PF, Hz, KVA, THD-V. & A. These 8 parameters are displayed in 4 screens, scrolling 12 times (See page 9).
- 3. The 3 buttons RESET, DISPLAY, MAX and the KEY are used for meter functions.
- 4. The Comm LED will blink when the meter is talking with the PC. The bottom CPU LED will blink when the meter's logic is activated.

8.





SCREEN DISPLAYS

The KVA displayed on the screen is followed by (L) for inductive (neg. –) readings and (C) for capacitance (pos.+) readings.

The symbol (III) indicates total load for all readings except, P.F. and Harmonics readings, which is the average of all three phases.

The first screen is kWh and is also the default screen. D. is the display button located to the right of the display.







PROGRAMMING SET-UP PROCEDURES

Start at the KWh Display Screen-

123 KWh 466.0

Button Symbols and Instructions:

Turn KEY (②)to right– Turn Key (①) off– Push Reset (③) Button - Push Display (①) Button - Push MAX(④) Button

To enter Set-Up Program turn (\emptyset) to right, push (**M**) button, turn key (**O**) off. You have appox 30 sec. at each screen before it defaults back to the KWh screen. If you did not finish your programming and the meter went back to the default screen, start the Set-Up Program over again.

BUTTON FUNTIONS:

RESET BUTTON (R)

The RESET Button is used to reboot the meter and to get you back to the default screen. It is also used to take you from programming set-up back to the display screens. The RESET Button will not change the kWh readings. It is also used when programming the communication functions, as a means of turning on and off the meter.

CAUTION: You will loose the maximum and minimum readings for your power reading i.e.V, A, KW, PF, THD, and KVAL when pushing the RESET Button.

DISPLAY BUTTON (is used to change screens. It has no other function and <u>will not</u> effect any readings.

MAX BUTTON (M)

The MAX Button is used in the programming mode alone with the KEY. It is also used to find out what the maximum readings are in the power readings when the meter is in the display mode. Push the MAX Button and you will see the reading change to a max. read.

KEY 🌐

The key is located in the lower right hand corner. To enter the program turn the key to the right, push the MAX Button and turn the KEY off, you're in! (page 11.). The KEY is also used to get the minimum power readings when you're in the display mode. Turn the key when your in a powers screen and you will see the "Min" symbol appear with minimum readings since the meter was turned on or last reset.





Programming Display Screens:

NMI programs the meters parameters according to the Electrical Distributors' purchase order. The KWhr usage is the "Default Screen", which is the first screen which appears after the meter is energized. You may scroll through to view all eight set-up screens without changing any of the values by simply pressing the "Display" **D** button. If you want to change any one or all programmed parameters please follow the **dotted matrix** below. Symbols:

(Turn key clockwise \bigcirc , Turn key back to center position \bigoplus , Push "Reset" button \mathbb{R} , Push "Display" button \bigoplus , Push "Max" button \bigoplus .)







Programming Relays:

NMI programs Relay No. 1 for an energy pulse (KWhr). One pulse (closure) equals one KWhr. Relay No. 2 is not programmed. See the programming matrix below:



After pressing "Display" "OUT 2" appears. Program "OUT 2" using the same method used to program "OUT 1". Keep pressing "Display" **(D)**, in order to get to the "Default" screen, if no changes are to be made.

Example: Relay No. 2 is programmed for a KW Demand alarm set to close at 600 KW and open at 500 KW. The (d Sec) is the time delay, in seconds, of contact opening or closing from event initiation. This time delay is used as a buffer.



Parameter Readings and Examples:

Parameter	Format	Examples
Voltage Current Power Energy Power Factor Frequency	V C KW KWh +/- x.xx xx.x	220.5 = 220.5 ∨ 0150 = 150 A 0.540 = 540 W 0.500 = 500 Whr +/- 0.95 PF 60.0 Hz





The Code Tables are shown in two categories. The first category is **"Power Events**" used for alarm relay. The second category is **"Energy Events"** used for programming the relay to pulse, i e, "kWh Pulse Output".

Parameter	Symbol	Code	Symbol	Code	Symbol	Code
	Phase 1	L1	Phase	L2	Phase	3
Single Voltage	V-L1	01	V-L2	06	V-L3	11
Current	A-L1	02	A-L2	07	A-L3	12
Active Power	KW-L1	03	KW-L2	08	KW-L3	13
Power Factor	PF-L1	05	PF-L2	10	PF-L3	15
% THD V	THD-L1	25	THD-L2	26	THD-L3	27
% THD A	THD-L1	28	THD-L2	29	THD-L3	30

POWER EVENTS:

ENERGY EVENTS:

SYMBOL CODE PARAMETER PARAMETER SYMBOL CODE 3 Phase Active Power KW 111 16 Hz 21 Frequency 3 Phase Power Factor PF 111 20 Ph to Ph Voltage 22 V12 3 Phase Apparent Power KVA 111 34 Ph to Ph Voltage V23 23 31 V 31 Active Energy kWh. Ph to Ph Voltage 24





COMMON TERMS USED WITH THE SERIES 7V3 READINGS

VOLTAGE: The potential between phase and neutral or phase to phase. This can be 120 to 480 Volts depending upon the model selected.

AMPERE: A unit of electrical current, which will flow through a resistance of 1 Ohm by 1 Volt.

WATTS: A unit of active power, which is defined as the rate at which energy is delivered to a circuit. This is the power expanded when a current of one ampere flows through a resistance of one Ohm.

kW: A common abbreviation for 1000 watts.

kW DEMAND: A measurement of energy (kW) or (kVA) over a choice of a time interval in 15 or 30 minutes, which is most common. A thumb rule method is to count kWhs in 15 minutes and multiply by four. Multiply by two if the demand interval is 30 minutes.

ROLLING OR SLIDING WINDOW: A demand interval that moves in time through a sub-interval. One example would be a 15-minute demand interval could comprise of 15 one-minute sub-intervals. The first 1-minute sub-interval will slide into the next measuring period, dropping the last sub-interval. This is the method used in this meter, and by a good many utility companies.

WATT-HOUR: A unit of electric energy that measures one watt in one hour. There are one thousand-watt hours in one-kilowatt hour.

HERTZ: A practical unit measuring the number of positive and negative values occurring in one second. Sixty Hz is typical in the US and fifty Hz is used in Europe.

VOLT-AMPERE: A unit of volts and current that flows because of the voltage. Volt Ampere and kilowatts are the same at unity power factor. In an AC circuit with power factor other than unity the VA equals the square root of watts squared plus reactive volt-amperes squared. The greater the VA over KW is reflected by poor power factor.

KVA: A common abbreviation for 1000-Volt Amperes.

POWER FACTOR: The ratio of active power (kW) to apparent power (kVA). Capacitors or synchronous motors can correct power Factor (PF).

THD and D (TOTAL HARMONIC DISTORTION and DISTORTION):

Let's define linear and non-liner loads. From a simple and practical point of view, a linear load is that when supplied by a sinusoidal voltage, absorbs also a sinusoidal current. On the contrary, a non-linear load will absorb a non-sinusoidal current for the same supply voltage, although such current is habitually of periodical type. Representative examples are Static power converters, AC to DC power supplies, Discharge lamp lighting, Arc furnaces, Electric welding machines, Transformers, Iron core reactors, etc. The Distortion can be measured in two different ways, giving parameters known as "D" and "THD". THD rate is referred to the total R.M.S. value where as "D" is obtained by multiplying a fundamental voltage by a series of currents with frequencies multiple of the fundamental frequency.

Expected distortion rates commonly found in power systems are 5% and below in voltage and 30% and lower in current. Higher readings do not necessarily mean a faulty facility but should be looked at for a potential problem.

PULSE OUTPUTS: Each pulse represents a predetermined increment of power or other quantity. Relay 1 in this meter is factory programmed for 1 pulse equals 1 kWh.

ALARM RELAY: Relay 2 may be field programmed to indicate high levels of energy or powers. The relay can operate in conjunction with local field installed indicators - horn or light.

14.





SPECIFICATIONS:

Power Supply: Single Phase 230, 480 Vac in applicable models Voltage Tolerance –20% +20% Frequency 50 to 60 Hz. Burden .07A Operating Temperature -10 to 50 degrees C

Measuring Circuits: Rated Voltage - 300 V phase to neutral and 520 V phase to phase Rated Current - 5 amp in, and (110 mv.) specials Permanent Overload 1.25 % Current Input Burden 0.75 VA

Accuracy: Voltage .05% Current .05% Energy .05% Power Factor 0.5 to Unity 1% Measured Values between 5% and 100% of rated loads ANSI C-12.16 compliant

Mechanical Characteristics: Enclosure NEMA 1 ABS plastic Flame Rating UL 94 VO Metal Back Plate 1.2mm Metal Terminal Cover Removable Voltage and Current Terminals

Relays: Maximum Voltage 240 Vac Maximum switching load 3A Maximum Voltage 200Vdc Maximum switching load 400Ma Maximum Operations Cadence 3600 per hr.

Standards: ANSI C12.16 FCC Class A Part 15, New York City Board of Fire Underwriters Michigan Compliant

15.





COMMUNICATION NETWORK



One or more meters can be connected to a PC so you can read all the parameters at one central location. There is a terminal block marked RS485 (+ GR -) which is the connections for the 3 wire #16 shielded cable. You can connect more than one meter to a circuit but you must assign a different identification number to each meter (from 1-255).







MODBUS PROTOCOL

The Series 7000 Power Analyzer can communicate by means of the RS485 RTU ModBus protocol as described below:

When the meter communicates with Modbus, it uses the RTU mode (Remote Terminal Unit). Each 8-bit byte in a message contains two 4-bits hexadecimal characters.

Modbus RTU Protocol Default Configuration: 001 / 9600 / 8 bits / N / 1 bit

The format for each byte in RTU mode is:

Code	8-bits binary, hexadecimal 0-9, A-F Two hexadecimal characters contained in each 8-bit field of the message.
Bits per Byte	8 data bits
Error Check Field	Cyclical Redundancy Check (CRC)
Modbus Functions:	
Function 01	Reading of the Relay State
Function 03 or 04	Reading of n words (16 bits-2 bytes) This function permits to read all the electrical parameters. Each parameters is 32-bits long, hence two words are required to inquiry for a parameter. (4 bytes-xx xx xx xx).





EXAMPLE

Inquiry

OA		Meter peripherals number, 10 in decimal
04		Reading function
00 00		Initial address (first register)
00 0A		Number of registers to be read
7176		CRC character
Answer		0A 04 14 00 00 08 4D 00 00 23 28 00 00 0F A0 00 00 00
		90 00 00 00 60 2E
0A		Meter number, 10 in decimal
04		Reading function-the one used for the inquiry
14		Bytes received (20)
00 00	08 4D	V X 10 (register 00 Hex), in decimal 212.5 V
00 00	23 28	mA, in decimal 9000 mA
00 00	0F A0	W, in decimal 4000 W
00 00	00 60	PF X 100, in decimal 96 PF
CB 2E	2	CRC character

Reading digital outputs (relays)-Function 01:

Inquiry	PP010000008CRC	(PP = Peripheral No.)
Answer	PP0101XXCRC	

Where XX (hexadecimal byte) \rightarrow translated to binary $\|b7\|b6\|b5\|b4\|b3\|b2\|b1\|b0\|$

bit b0 = relay 1. (1 = ON; 0 = OFF)bit b1.= relay 2. (1 = ON; 0 = OFF)

METER PROGRAMMING FOR COMMUNICATION:

This set-up menu is accessible in order to perform the configuration of the meter with other features different from factory-supplied ones.

To access this menu proceed as follows:

Begin by turning the "Key" to the right. Push the "Reset" button then immediately press the "Display" and "MAX" buttons simultaneously. Once you see the "Setup 2" screen release the buttons and turn the key back to the center position.

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The following messages will be displayed on the screen

A. Communication protocol: **PROT BUS** = MODBUS

Press the "Display" Button

B. Setting the Communication Parameters

Cdef
NO = Default configuration (Only change after Factory approval)
Push "MAX" Button to switch from NO to YES

If YES is chosen, the configuration is; 001 / 9600 / 8 bits / N / 1 bit

If NO is chosen, press "DISPLAY" Button and the following options will appear.

•	n PER	Peripheral No. 001 to 255
•	Baud 1	Baud rate 1200-2400-4800-9600-19200
•	Parity	No, even, 0dd
•	LEN	(length) 8 bits
•	Stop bits	1 or 2

C. Locking or Unlocking the Set-up

Set Unlo = Loc (lock Set-up) or Unloc (unlock Set-up) Use the "MAX" Button to modify choice.

The parameters can be displayed but not changed when LOC is set.

To modify the previously set option, a 4-figure password is required to be entered, (in case that this password is not correct, this screen blinks and the previous menu is accessed again)

DEFAULT SETUP PASSWORD IS: 1234

Press the "RESET" Button to exit this set-up program at any time. If modifications were made and not saved, than go back to beginning and scroll through the program to the end.

Thank you for your time. If there are any questions contact NMI's Technical Department at (603) 669.5790.





IN CASE OF DIFFICULTY

First check the meter model number shown on label for the line voltage to assess that the correct meter is installed on the appropriate service.

Check the applicable wiring diagram to see that <u>ALL</u> wires are connected properly to the meter.

If more help is needed please refer to the following information.

Problem; The meter's LCD screen blinks with one or all of the red line LEDs.

Solution: This is a positive indication that the voltage is out of phase with the CTs or the CTs are installed backwards.

Check for proper phasing, at the meter, between voltage and the current. Make sure that the phase feeding L1. Terminal is the same phase that the CT is around and connected to CT1. In most cases the black wire from the CT connects to CT1B and the white wire from the CT connects to CT1W. Check L2 - CT2 and L3 - CT3 as well.

If the CTs are backwards and you can't fiscally change them you can swap the black and white wire on the meter terminals.

Push the RESET button to return back to the KWhr screen to see if it still flashes.

If the KWhr screen does not flash and there are no LEDs flashing push the yellow "Display" button to view each phase's Power Factor. If they are in the nominal range (.65 to Unity) the meter is running properly. If the Power Factor readings are questionable or if the KWhr screen is still flashing call Technical Assistance. Please have the meter's serial number and the current transformers' model number with you when you call.

THANK YOU!





NATIONAL METER INDUSTRIES INC. FIVE YEAR LIMITED WARRANTY

SUBJECT TO THE EXCLUSIONS LISTED BELOW NATIONAL METER INDUSTRIES INC. (NMII) WILL EITHER REPAIR OR REPLACE ITS PRODUCT WHICH CONTAINS A DEFECT IN MATERIAL OR WORKMANSHIP. THE FOLLOWING EXCLUSIONS APPLY:

1. Every precaution has been taken in the preparation of our installation manuals. NMII takes no responsibility for errors or omissions in the installation manuals. NMII is not responsible for any damage or monetary losses, whether direct, indirect, incidental or consequential. All installations shall be made by qualified electricians and all local and national electrical codes shall take precedence.

2. NMII warrants its meters to be free of any and all defects in material and workmanship and will give satisfactory service for a period of five years from the date of purchase. If the meter should malfunction, a call must be made to our customer service department, 1-800-325-6674, within 10 days after the defect becomes apparent, for verification. After verifying a meter malfunction an Authorized Return Number (ARN) will be issued for the return of the defective meter. Sent along with the meter shall be a contact name/phone number and a UPS returnable address. Freight is to be prepaid with the return number written on the packing slip. At no time will a replacement meter be sent out before the receipt of the defective meter.

3. After examination of the returned meter by NMII technicians proves the meter to be a warranted failure, the meter will be repaired or replaced without charge.

4. This limited warranty does not cover the labor costs for removal or reinstallation of the meter by the electrical contractor.

5. This warranty is null and void if the meter shows evidence of having been tampered with, abused, connected to the wrong voltage or if our specifications were exceeded.

6. This warranty does not cover any other product connected to the meter.

7. There are no other warranties, expressed or implied, as to the quality of the product or fitness for a particular application.