



Power Line Communications Metering Systems

RSM-5c

RSM-5

Installation Manual



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Thank you for purchasing a power meter manufactured by Quadlogic Controls Corporation. Quadlogic has been designing, manufacturing, and selling digital electric metering systems for over 25 years. We appreciate your business.

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Warning

This manual is for persons who have received training and are qualified to work with electricity and electrical metering equipment. All applicable national and local electrical codes and standards must be followed. Failure to follow proper procedures may result in damage to the equipment and/or serious bodily harm including death.

Disclaimer

Quadlogic Controls Corporation makes no warranty as to the accuracy or completeness of this material. Furthermore, the product(s) described herein may be changed or enhanced from time to time. This information does not constitute a commitment or representation by Quadlogic Controls Corporation, and is subject to change without notice.

Symbols

	WARNING
	NOTE
	CAUTION

The RSM-5c and RSM-5

The RSM-5c and RSM-5 products are single-tenant digital electric meters used for commercial, residential or industrial applications. The meters log data in intervals from 5 minutes to 60 minutes, which enables load profiling and custom Time-of-Use (TOU) billing options. They also measure four-quadrant energy, power-down events, frequency, etc. enabling the user to analyze power quality.

Quadlogic meters offer an optional Pulse Data Logger feature. This feature enables logging dry contact pulses from other devices such as gas, water, btu, steam meters, and utility service demarcation boxes. Each meter can log pulses from up to four discrete devices, even during power loss events.

Power Line Communications (PLC)

Power Line Communications, or PLC, is a method of transferring meter data via the existing electric power wires that serve each tenant in a building. Quadlogic employs a patented method of PLC to move large amounts of metered data for residential and commercial and industrial (C&I) customers to a central collection point. All Quadlogic meters can communicate over power lines. For more information about Quadlogic's PLC please visit our website at www.quadlogic.com.

Installation Cautions and Warnings

- Do not install if the device is damaged. Inspect the meter box for obvious defects such as dents or cracks in the housing.
- If the device is installed or used in a manner not specified by the accompanying documents, the safety of the device may be impaired.
- If the device functions abnormally, proceed with caution. The safety of the device may be impaired.
- Do not install the meter in the presence of explosive or combustible gas or gas vapor.
- Do not install the meter on an electrical service with current or voltage outside of the specified limits of the device.
- Do not operate the meter with the cover removed.
- To avoid electric shock, disconnect mains before replacing fuses.
- Beware of working around the meter when the voltage is live. There is a risk of electric shock.
- For protection against fire, replace only with fuses of the specified voltage and current rating.
- Installation should be done by persons who have received training and are qualified to work with electricity and electrical metering equipment. All applicable national and local electrical codes and standards must be followed. Failure to follow proper procedures may result in damage to the equipment and/or serious bodily harm including death.
- See instructions for connection diagrams.



Protective Conductor Terminal

Securely fasten one end of the grounding wire (#12 AWG recommended) so that the grounding screw cuts the paint on the back box. Securely fasten other end of the wire to true ground connection. When grounding to the electrical conduit, use continuous metallic pipes, bending when necessary instead of using couplers.

Step 1: Mount the box

The RSM-5c or RSM-5 back box is the enclosure for the meter head. The back box is supplied with the RSM-5c or RSM-5 fuse block installed in the box.

1. Choose a section of wall to mount the meter. This should be as close as possible to the distribution panel (preferably within 24"). The RSM-5c and RSM-5 meters mount in a single metal box that must be attached to the wall and connected by conduit.



It is recommended that the RSM-5c and RSM-5 meters be mounted on a concrete wall with the appropriate screws long enough to hold the box in place. If the only choice is to mount the meter on a drywall or plaster wall, make sure that the boxes are properly screwed on the studs of the wall.

2. Mount the RSM-5c or RSM-5 back box to the wall, with mounting screws. Connect the distribution panel box to the RSM-5c or RSM-5 back box with a metal conduit. This conduit will be used for the voltage taps and current transformer (CT) secondary wiring. There will be between 2 and 4 #12AWG wires in this conduit, connected to the hot line(s) and neutral (if present). There will also be between 2 and 6 #16 AWG stranded wires connected to the CT secondary wiring. The conduit should be sized to accommodate this.
3. The RSM-5c or RSM-5 metal boxes must be grounded. Either a ground wire may be run and attached to one of the box mounting screws, or the boxes may be grounded by the conduit.
4. Securely fasten one end of the grounding wire so that the screw cuts the paint on the back box. Securely fasten the other end of the wire to true earth ground connection. When grounding to the electrical conduit, use continuous pipes, bending when necessary instead of using couplers.

Step 2: Connect voltage taps



Power must be off when connecting these wires!

1. Locate the incoming feeder phase (hot) wires in the distribution panel. Tape the incoming feeder wires with colored electrical tape according to phase, for identification purposes.
2. Tap the feeder wires with #12 AWG stranded wires. The color of the insulation on these wires must match the color of the tape on the feeder wire to which they are connected. If neutral is required, tap the neutral connection with a #12 AWG stranded wire with white insulation. These voltage connections can be made in any way that meets local codes and requirements.



A service disconnect switch for the hot wires is required. It is

recommended that the disconnect switch should be placed as near as possible to the meter. If fused, no less than a 15-A fast-acting fuse must be used.

3. Run the #12 AWG feeder phase tap wires through the conduit to the back box.

Step 3: Install and connect Current Transformers (CTs)



Power must be off when connecting these wires!



Un-terminated CT secondary wires will produce hazardous electrical potentials if any current is flowing through the CT. While connecting the CTs, POWER MUST BE OFF until the CTs have all been connected to the fuse block.

1. Each CT is supplied with two secondary wires. One wire is colored black, red, or blue, and the other wire is white. Connect these 2 wires to the screw terminals on the fuse block.
2. If the wires that are supplied with the CTs are too short to reach the fuse block screw terminals, they must be extended. Extend the CT wires with #16 AWG stranded wire. This should be black, red, or blue wire to match the existing CT wire. Extend the white wire of each CT with a white wire. It is very important to maintain the association of a particular CT's secondary wires. One must keep track of which white wire goes with each individual colored wire. It may be helpful to tape them together before pulling them through the conduit.



Wire color coding may vary depending on local codes and regulatory standards within certain jurisdictions.

3. Locate the branch circuit that supplies current from the distribution panel to the metered load. Disconnect these wires one (or two) at a time and properly run each wire (or pair of wires) through a CT as shown in Figure 2-1. The colors of the CT leads must correspond to the color of the tape on the phase feeder wires that supply this load.

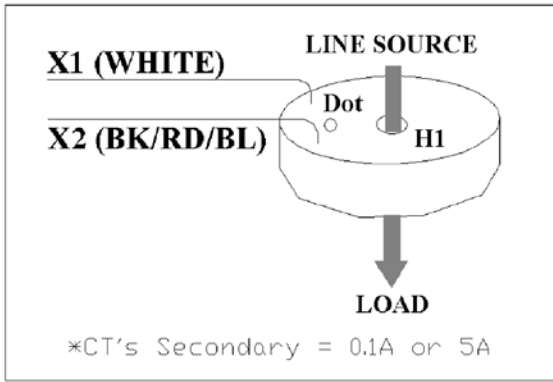


Figure 2-1. Correct CT orientation: H1, dot, or white side facing the line source.

4. Run the CT secondary wires through the conduit to the fuse block. The secondary wires of the CT may be extended to different lengths depending upon the gauge of the wire as shown in Table 2-1. For wire runs over 50' use a shielded, twisted pair. Connect each CT to its proper pair of screw terminals: X1->I and X2->N.



It is very important that the 2 wires from a particular CT go to the corresponding pair of screw terminals on the fuse block. For example, if the black wire (X2) from a CT goes to terminal "NA", then the white wire (X1) from that same CT must go to terminal "IA". The actual arrangement of the CT connections depends on the installation configuration. Diagrams of specific installations are located on the following pages.

Wire Size (AWG)	Length (feet)	
	0.1A CT	5A CT
#24	35	3
#22	55	5
#20	88	8
#18	140	13
#16	223	21
#14	355	34
#12	562	53
#10	893	85


Table 2-1: CT wire extension lengths

5. Repeat items 3 and 4 (above) for each CT until all CTs have been installed and connected to the MCI screw terminals.

Chapter 3 Fuse Block Connections

The following diagrams show the necessary fuse block connections for RSM-5 and RSM-5c meters. Figures 3-1, 3-2, and 3-3 show RSM-5c 3-phase 4-wire wye, 3-phase 3-wire delta, and 1-phase 3-wire (120/208V, 120/240V, or 277/480V network configuration) respectively.

Figures 3-4 and 3-5 show RSM-5 CL10 3-phase 4-wire wye and 3-phase 3-wire delta both with High Current Adapters (HCA). Figure 3-6 shows the RSM-5 CL10 3-Phase 4-wire wye configuration when using six current transformers. This allows you to measure two separate electric loads, providing one set of meter readings. Current transformers must be placed around the metered wires according to the instructions above to produce accurate readings.

 For specific product offerings please refer to Chapter 9: Ordering Information.

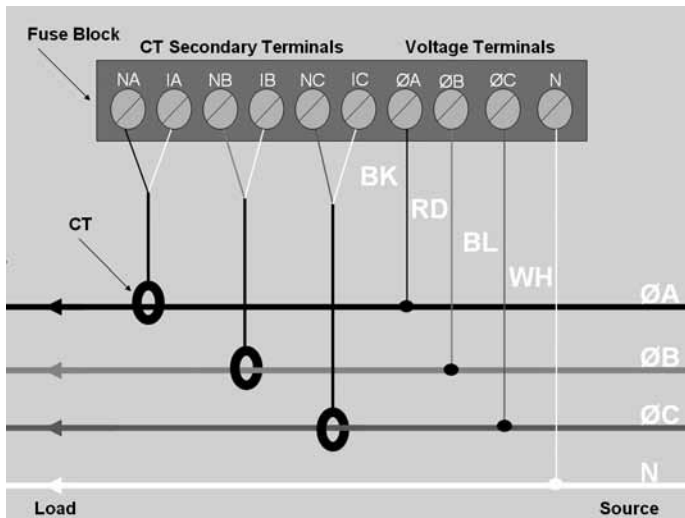


Figure 3-1. 3-Phase 4-Wire Wye Fuse Block Connections.

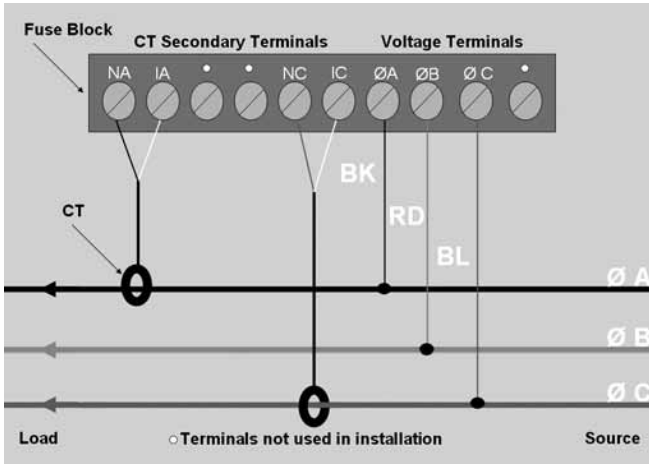


Figure 3-2. 3-Phase 3-Wire Delta Fuse Block Connections.

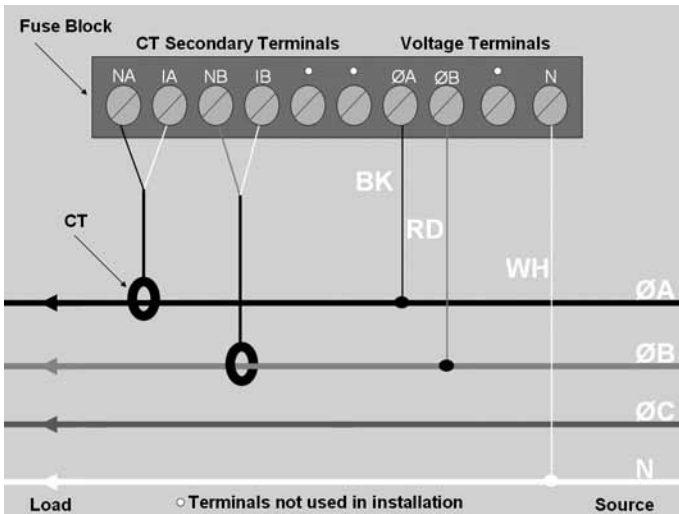


Figure 3-3. 1-Phase 3-Wire 120/240V, 120/208V, or 277/480V Network Fuse Block Connections.

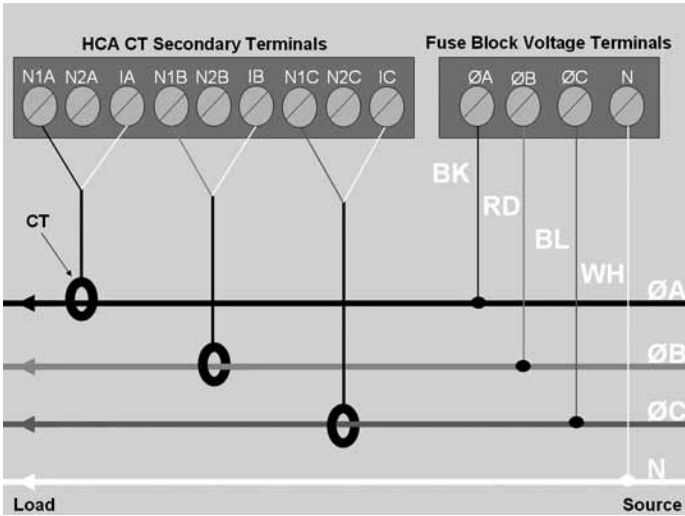


Figure 3-4. RSM-5 3-Phase 4-Wire Wye with High Current Adapter (HCA) (1600-3200 Amps). For use with 5 Amp secondary CTs.

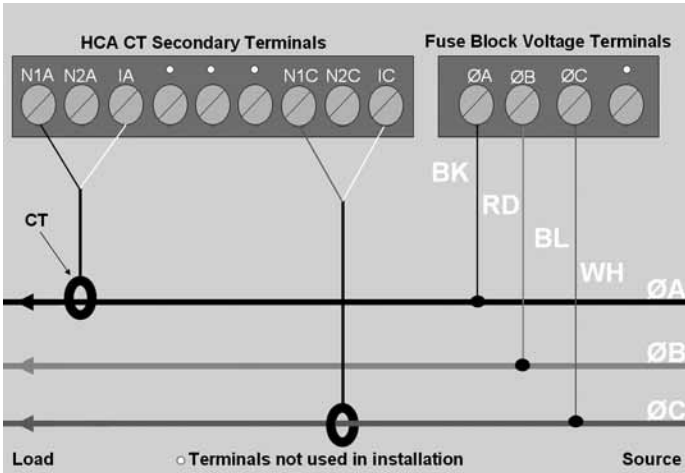


Figure 3-5. RSM-5 3-Phase 3-Wire Delta with High Current Adapter (HCA). For use with 5 Amp secondary CTs.

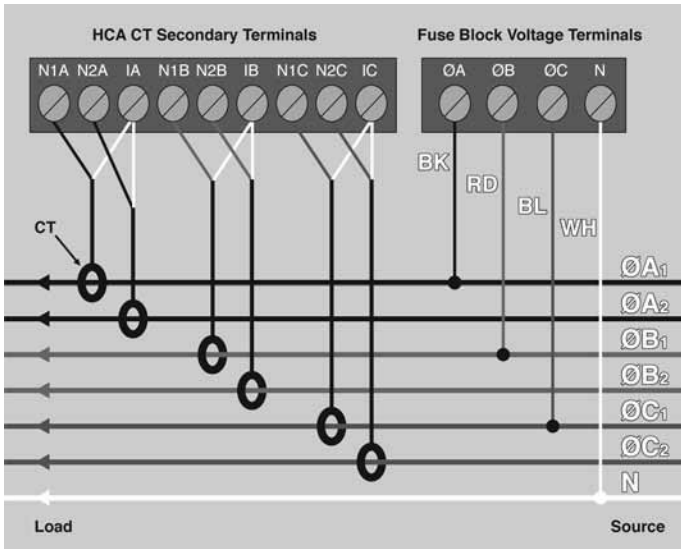


Figure 3-6. RSM-5 3-Phase 4-Wire Wye with High Current Adapter (HCA).
 All CTs must be the same primary amperage and secondary amperage must be 5 Amp.

The RSM-5c and RSM-5 user interface (LCD window) is located on the front panel of the meter. It is easy to navigate the various sub-menus to read metering data, reset values and view configuration data. See Figure 4-1.

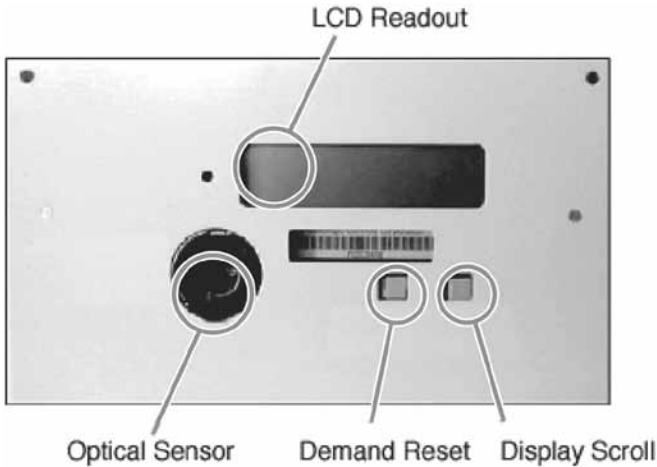


Figure 4-1. RSM-5c and RSM-5 Front Panel Display.

! *When reading the meter display, all consumption and demand values must be multiplied by the correct multiplier to calculate actual value. Please refer to the **Reading the Display** section for more details.*

Press and hold the "Display Scroll" button, which is the small square button on the right side when one is facing the meter. After two seconds, the LCD will display, REVERSE. If the user continues to hold down the Display Scroll button, after another two seconds the LCD will display FORWARD. These are simply directional indicators that one can use to navigate through the different sub-menu registers as shown in figure 4-3. Each main menu heading will be displayed in two-second intervals. Note that the RSM-5c and RSM-5 default to the kWh register.

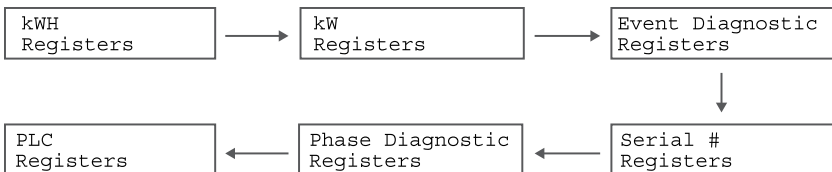


Figure 4-2. Meter LCD Main Menu headings.

Releasing the display scroll button at a given menu heading will allow the user to cycle through the registers listed under the selected menu heading as shown in Figure 4-4. For example, if the meter is in FORWARD mode and the Display Scroll button is released when the LCD reads "Serial # Registers", each subsequent depression of the Display Scroll button will show the following, in the order it appears below:

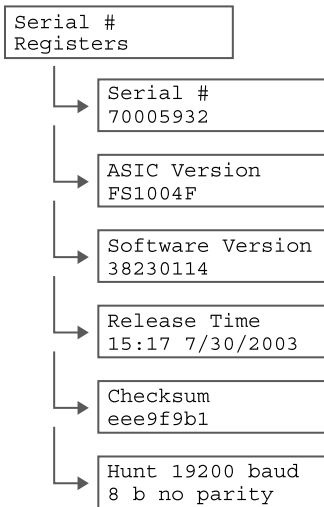


Figure 4-3. Serial Registers sub-menu.

To reverse scrolling direction at either the heading level or within a submenu, press and hold the display scroll button. When REVERSE is displayed after two seconds, release the display scroll button. The user can now go backwards through the menu selections by pressing and releasing the display scroll button. To go back to the forward scrolling option, follow the same procedure, except release the display scroll button when FORWARD is displayed.

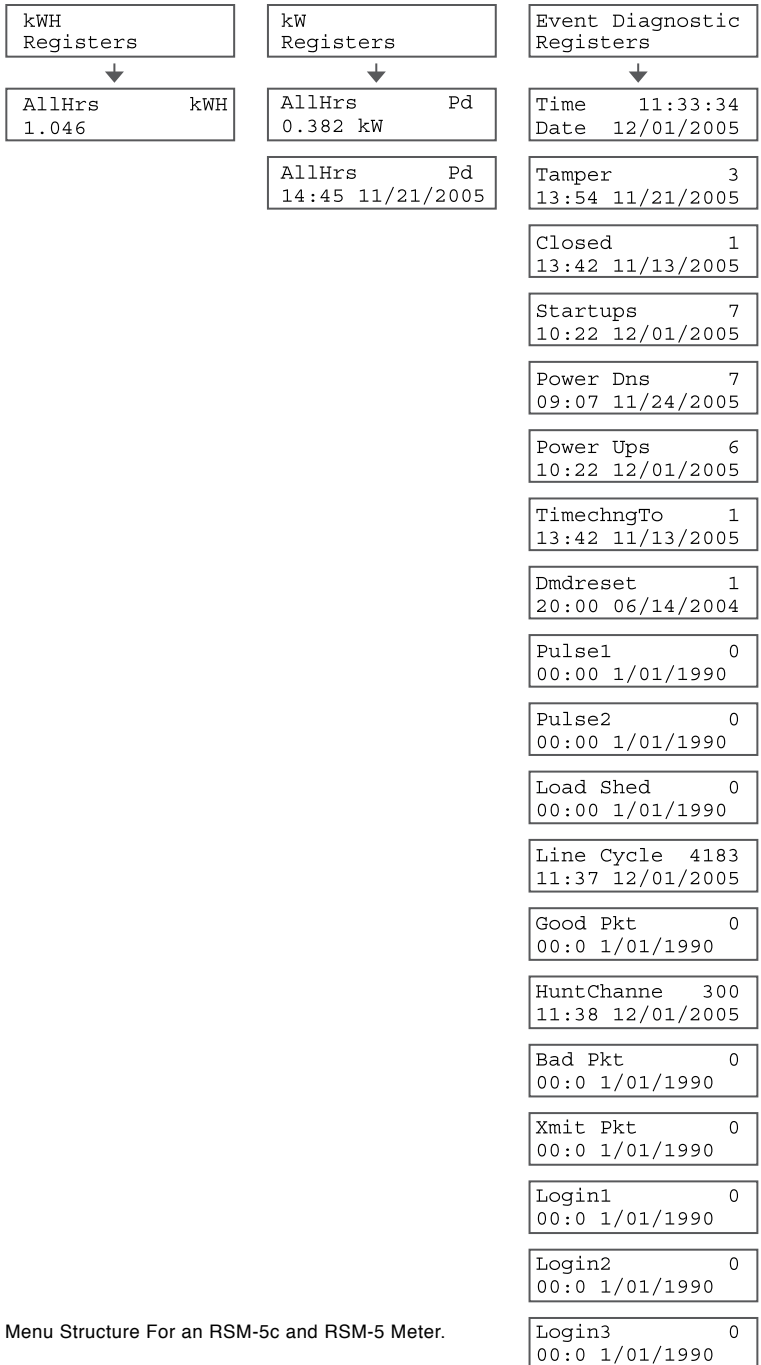


Figure 4-4. Display Menu Structure For an RSM-5c and RSM-5 Meter.

Serial #
Registers



Serial #
70005932

ASIC Version
FS1004F

Software Version
38230114

Release Time
15:17 7/30/2003

Checksum
eee9f9b1

Hunt 19200 baud
8 b no parity

Phase Diagnostic
Registers



Volts 125.3 A
124.0 B 124.7 C

Delta 114.7AB
114.7BC 114.7CA

VAR Phase 89.2
91.2 90.6

Line Frequency
60.092Hz

Multi 1.00W
1.00V 1.00A

Plus U 12.631V
Vbatt 2.967V

kWH 1 922.248

Phase 1 7.468 A
878.6 W 99.2 R

Ph 1 935.4 VA
9.1° .811 PF

Ph 1 0.000VAf
100.0% 9.37VA

kWH 2 922.248

Phase 2 7.573 A
818.7 W 101.2 R

Ph 2 811.3 VA
6.8° .875 PF

Ph 2 0.000VAf
100.0% 10.44VA

kWH 3 944.218

Phase 3 9.855 A
901.7 W 110.9 R

Ph 3 948.7 VA
7.2° .971 PF

Ph 3 0.000VAf
100.0% 10.37VA

PLC
Registers



Signal -64.4dBV
Noise -55.4dBV

XmitOn 0.0V+U
XmitOff 12.6V+U

GoodPkt 0
00:00 1/01/1990

Xmit Pkt 0
00:00 1/01/1990

Bad Pkt 0
00:00 1/01/1990

n1 CG 0 T 1 IO
Poll 0 Slave

PLCmode 20000081
CIP Timer 0

Vdiode 0.5228V
Temp 26.5C

It is very important to verify that the CTs of the RSM-5c and RSM-5 are properly installed. Follow the steps below to verify the voltage, kWh reading, current, and power.

I. Verifying Voltage

- 1) Press and hold the Display Scroll button until the following menu heading is displayed:

Phase Diagnostic Registers

- 2) Release the Display Scroll button. Scroll down by pressing and releasing the Display Scroll button until the "Volts" screen is displayed (examples shown for 120V, 277V, and 347V):

Volts	125.3 A
124.0 B	124.7 C

Volts	276.3 A
277.0 B	277.7 C

Volts	348.5 A
347.1 B	347.7 C

- 3) Verify that phases A, B, and C are displaying voltages within normal range, which is -10% to +10% of the rated voltage.

II. Verifying kWh Reading

1. Press and hold the Display Scroll button until the following menu is displayed:

kWh Registers

2. Release the Display Scroll button. Scroll down by pressing and releasing the Display Scroll button until the following screen is displayed, indicating the All Hours kWh reading for the meter:

AllHrs	kWh
1.046	

3. Verify that the kWh value increases on the LCD (assumes active load).

III. Verifying Current and Power

1. Press and hold the Display Scroll button. Scroll down by pressing and releasing the Display Scroll button until the following menu heading is displayed:

Phase Diagnostic Registers

2. Release the Display Scroll button. Scroll down by pressing and releasing the Display Scroll button until the following screen is displayed:

Phase 1	7.468 A
878.6 W	99.2 R

The A(mperage) reading is the indication of current. The A(mperage) reading in the display above will always be a positive number, even if the CT was incorrectly installed. Check the reading, and using the correct multiplier, see if it indicates the approximate expected current. Remember that this applies to Phase 1 only. If all the numbers on the multiplier screen (under the Phase Diagnostics menu in the Display Menu Structure) were 1.00 and the current transformers are 100:0.1, the correct multiplier is 1 and the readings are the actual values seen on the LCD. If the CT's are 200:0.1, multiply the LCD reading by 2.

The W(att) reading is the indication of power. The W(att) reading counts forward when viewed on the LCD. A negative power reading is indicative of an incorrectly installed CT, or one that is cross-phased with the wrong voltage (phase) leg. The R(eactive) reading can be negative, depending on the nature of the load. Negative values indicate a capacitive load while positive values indicate an inductive load.

3. Scroll down by pressing and releasing the Display Scroll button until the following screen is displayed:

Ph 1	935.4 VA
9.1°	.811 PF

Under normal conditions the phase angle ($x.x^\circ$) should be between -30° and $+30^\circ$ (refer to Figure 5-1) and the power factor should be a number between 0.80 and 1.0.

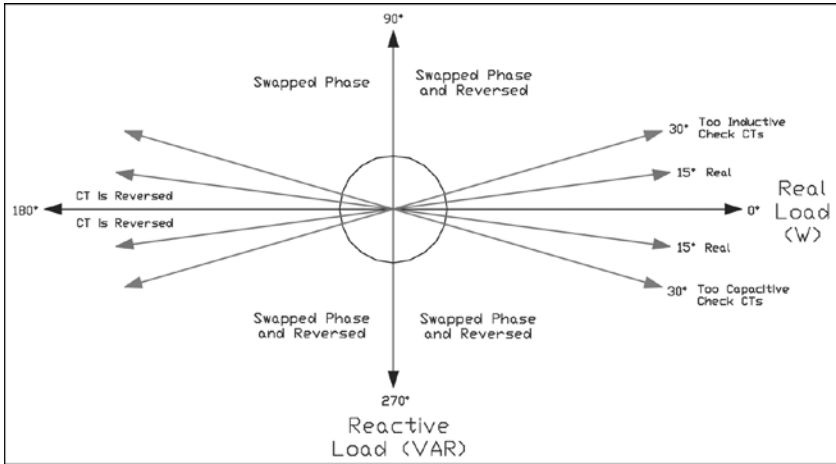


Figure 5-1. Four-Quadrant Energy Vector Diagram. For use in diagnosing meter installation. Note that highly reactive loads will cause greater phase angle deviations.

NOTE *Power factor for inductive loads will typically be lower than that of resistive loads, typically between 0.60 and 0.80.*

If the phase angle on the lower left is a number close to 180° it indicates the CT was installed backwards, or is 180° out-of-phase. If the angle is close to 120°, at least two CTs have been cross-phased, and a similar number will appear in the phase angle data in Phase 2.

4. To view screens for Phase 2 and 3, repeat steps 1 to 3 as above.



BE CERTAIN TO RECORD THE CURRENT PEAK DEMAND (WITH THE TIME AND DATE), BEFORE RESETTING THE DEMAND. Once the user resets the demand according to the instructions below, he/she cannot retrieve any prior demands locally. If one is unsure of using the above instructions, scroll through to the demand (kW) and record the demand value (kW).

Use the following procedure to reset the Demand registers to zero:

1. Press and hold the Demand Reset button shown in Figure 4-1.
2. The LCD will initially display the Quadlogic Copyright message.
3. The LCD will then display the Dmdreset event screen:

Dmdreset	1
20:00	06/14/2004

4. Keep the Demand Reset button depressed until the screen updates and displays the current date and time. This signifies that the demand has been reset.



When reading the meter display, all consumption and demand values must be multiplied by the correct multiplier to calculate actual value. This includes all register values (kWh, kW, kVARHLg, kVARHLd, etc.) and phase diagnostic values (real time Amps, Watts, etc.).

Volts, phase angle, frequency and power factor are displayed on the LCD as actual values and should not be multiplied.

The multiplier value is dependent upon the ratio of the external Current Transformers (CTs) and can be different for different meter points. Table 7-1 (using 0.1 AMP CTs) and Table 7-2 (using 5.0 AMP CTs) MUST be used to obtain actual consumption and demand readings.

Meter Catalog Numbers	CT Rating	Multiplier for 0.1A CT
RSM-5c RSM5c XXX RSM5c XXX D RSM5c XXX PD RSM5c 480DTA RSM5c 480DTA D RSM5c 480DTA PD RSM5c XXX 2PH All RSM5c Kits	50A	x0.5
	100A	x1.0
	200A	x2.0
	400A	x4.0
	600A	x6.0
	800A	x8.0
	1200A	x12.0
	RSM-5 RSM5 XXX 01A RSM5 XXX 01A D RSM5 XXX 01A M D RSM5 XXX 01A RS D RSM5 XXX 01A PD RSM5 480DTA01A D RSM5 480DTA01AMD RSM5 480DTA01ARSD RSM5 480DTA01A PD	1500A
1600A		x16.0
2000A		x20.0
3000A		x30.0
3200A		x32.0
4000A		x40.0

Table 7-1. Multiplier table for RSM-5c and RSM-5 meter with 0.1 AMP CTs. "XXX" represents voltage.

Meter Catalog Numbers	CT Rating	Multiplier for 5.0A CT
RSM5 XXX CL10	50A	x10.0
	100A	x20.0
RSM5 XXX CL10 D	200A	x40.0
	400A	x80.0
RSM5 XXX CL10 M D	600A	x120.0
	800A	x160.0
RSM5 XXX CL10 RS D	1200A	x240.0
	1500A	x300.0
RSM5 480DTACL10 D	1600A	x320.0
	2000A	x400.0
RSM5 480DTACL10MD	3000A	x600.0
	3200A	x640.0
RSM5 480DTACL10RSD	4000A	x800.0

Table 7-2. Multiplier table for RSM-5 meter with 5.0 AMP CTs. "XXX" represents voltage.

How CT multipliers are calculated

0.1 Amp CTs

The multiplier values for CTs with 0.1A secondary ratings are derived by dividing the primary side rating by 100. For example, a 50:0.1A-rated CT will have a multiplier of $50 \div 100$, which is 0.50. A 100:0.1A rated CT will have a multiplier of $100 \div 100$ which is 1.

5.0 Amp CTs

For CTs with 5.0A secondary ratings, the multipliers are derived by dividing the primary side rating by 5. For example, a 200:5.0A-rated CT will have a multiplier of $200 \div 5$, which is 40.

Example:

Meter point with 400:0.1A CT

LCD reading for meter is 3422.119kWh

The correct cumulative consumption (kWh) for this meter is **13688.476** kWh.

($400 \div 100 = 4$. Multiply face value, for consumption and demand values by 4.
 $3422.119 \times 4 = 13688.476$)

The multiplier must be applied when calculating both kW and kWh readings on every screen displayed on the LCD.



Failure to use the appropriate multiplier will result in an incorrect diagnosis of the meter's functionality and incorrect revenue billing.

Some features vary by model. Contact manufacturer for details.

Metered Voltage:

- 120, 208, 220, 230, 240, 277, 347, 380, 400, 480, 600 VAC Delta or Wye 50/60 Hz

Fusing:

- (1) 1/4-A 250V (T) and (3) 4-A 250V (F)
- (1) 1/8-A 600V (T) and (3) 4-A 600V (F)

Secondary Current Input:

- 0.1 Amp or 5 Amp CT inputs available

Four Quadrant Consumption & Demand:

- Delivered and received: kW, kVARLeading, kVARLagging, kVA, Volts-squared hours, and amp-squared hours

Programmable Interval Data & Peak Demand:

- 15 minutes to hourly time window
- Meter total and/or by phase
- Programmable to user-determined specific time blocks or rolling time block demand

Demand Reset:

- Allows local reset of peak demand (kW) register ("D" models only)

Real-time data per Phase:

- Voltage, current, phase angle, power factor, THD, watts, VARs, VA, and frequency

Time-of-Use (TOU):

- Up to 16 blocks per day available for all metering parameters (Exception: Pulse input data received by the RSM-5c and RSM-5 are not available in time-of-use blocks.)

Pulse Datalogger:

- Collects data from up to 4 water, gas, or BTU meters
 - Max. Distance: 300 feet from external pulse meter to RSM-5(18 gauge min.)
 - Min. Pulse Width: Power on-50msec
Power off-500msec
 - Max. Pulse Rate: Power on-10pulses/sec max.
Power off-1 pulse/sec max.

- When RSM-5 loses power, the pulse accumulator still has the capability to record pulses but the sample rate is reduced
 - Peak voltage: 5.5V
 - Peak current: not applicable
 - Isolation: 2.5kV isolation between pulse output and AC line
 - Max. signal debounce tolerance: 20msec

Data Collection Options:

- IQ Software
- MV-90 TIM Module
- ASCII-based, open-data protocol
- Open-source data conversion program

Accuracy:

- $\pm 0.5\%$ at unity power factor at any measured load between 1% and 100% of full-scale (excluding external CT error)
- $\pm 0.75\%$ at at 0.5 power factor (lead or lag)

Liquid Crystal Display:

- Push button scroll
- 32-digit liquid crystal display (16 digits x 2 rows)
- 6 whole digit consumption register
- Data digit height: 0.31"
- Programmable display scroll & decimal place display

Operating Range:

- Rated Voltage: 90% to 110%
- Temperature: -20°C to $+60^{\circ}\text{C}$

Memory:

- 512 kilobyte non-volatile flash memory retains daily and interval data
- During power outage:
 - Flash memory retains daily and interval data
 - Long-life lithium battery maintains time, logs incoming pulses and retains data acquired within the incompleted interval at the time of the outage

Shipping Weight and Dimensions:

- RSM-5 Enclosure: 13.5"H x 8.5"W x 4.5"D
Shipping weight: 1 meter assembly: 29.1-31.3 lbs
- RSM-5c Enclosure: 6.9"H x 9.8"W x 4.9"D
Shipping weight: 1 meter assembly: 8.4-13.8 lbs

Environment:

- Enclosure: NEMA 1 rated for indoor use only. (Outdoor NEMA 4X optional.)
- Temperature: -20°C to +60°C
- Humidity: 0-95% relative humidity (non-condensing)
- Pollution Degree: 2
- Maximum Altitude: 2000 meters

Type Tests:

- Transient/surge suppression: ANSI C37.90.1-1989
- Installation Category: III. This product falls under Installation Category III because of its distribution level, fixed installation, and has smaller transient over-voltage rating than an Installation Category IV.

Metering Industry Standards:

Meets ANSI: C12.1 for accuracy
UL and CUL: Listed under E204142

Meter Kits (CTs included).....pages 25-28

Meter Kits are available for the RSM-5c and RSM-5 products and include the complete meter assembly (meterhead, fuse block and back box) as well as the required current transformers (CTs) for operation.

Meters (CTs not included).....pages 29-34

Stand-alone meters include the complete meter assembly (meterhead, fuse block and back box). Current Transformers (CT) are not included.

Options:**Communication (for RSM-5 models only)**

"M D" Models: Stand-alone meter models ending in "M D" include modem, RS-485 and RS-232 connection for communications. These models are also demand meters.

"RS D" Models: Stand-alone meter models ending in "RS D" include a RS-485 connection for communication. These models are also demand meters.

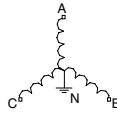
**Gas, Water, BTU Pulse Data Collection
(for RSM-5 and RSM-5c models)**

"PD" Models: Stand-alone meter models ending in "PD" or "P D" include 4 pulse inputs for gas, water, BTU or other dry contact pulses. These models are also demand meters.

RSM-5c Meter Kits: kWh Meters

Kits include meterhead, fuse block, back box and required current transformers.
Enclosure: 6.9”H X 9.8”W X 4.9”D

Three-Phase kWh Meter - Wye



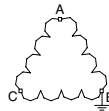
Catalog #	Volts	Amps	kWh Only	CTs included	Diagram
RSM5c 120100-3	120/208V	100	√	3 SPLIT CORE*	Figure 3-1
RSM5c 120200-3		200	√		
RSM5c 120400-3		400	√	3 SPLIT CORE	
RSM5c 120800-3		800	√		
RSM5c 277100-3	277/480V	100	√	3 SPLIT CORE*	
RSM5c 277200-3		200	√		
RSM5c 277400-3		400	√	3 SPLIT CORE	
RSM5c 277800-3		800	√		

For 1600 AMP or 3200 AMP, see page 24.

***Kits with solid core current transformers are also available:**

- RSM5c 120100-3SL (includes 3 **SOLID** CORE CTs)
- RSM5c 120200-3SL (includes 3 **SOLID** CORE CTs)
- RSM5c 277100-3SL (includes 3 **SOLID** CORE CTs)
- RSM5c 277200-3SL (includes 3 **SOLID** CORE CTs)

Three-Phase kWh Meter – DELTA (“DTA”)



Catalog #	Volts	Amps	kWh Only	CTs included	Diagram
RSM5c 480DTA100-2	480V	100	√	2 SPLIT CORE	Figure 3-2
RSM5c 480DTA200-2		200	√		
RSM5c 480DTA400-2		400	√		
RSM5c 480DTA800-2		800	√		

All meters have built-in Power Line Communications capability.

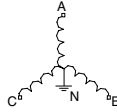
All meters have built-in Power Line Communications capability.

RSM-5 Meter Kits: kWh for Large Service Meters

For 1600Amp & 3200Amp Only

Kits include meterhead, fuse block, back box and required current transformers.

Enclosure: 13.5"H X 8.5"W X 4.5W



Three-Phase kWh Meter - Wye

Catalog #	Volts	Amps	kWh Only	CTs included	Diagram
RSM5 1201600-3	120/208V	1600	√	3 SPLIT CORE	Figure 3-4
RSM5 1203200-3		3200	√		
RSM5 2771600-3	277/480V	1600	√		
RSM5 2773200-3		3200	√		

All meters have built-in Power Line Communications capability.

RSM-5c Meter Kits: kWh Meters

Kits include meterhead, fuse block, back box and required current transformers.

Enclosure: 6.9"H X 9.8"W X 4.9"D

Single-Phase kWh Meter – Wye

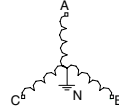
Catalog #	Volts	Amps	kWh Only	CTs included	Diagram
RSM5c 120100-2SL	120V/208V or 120/240V	100	√	2 SOLID CORE	Figure 3-3
RSM5c 120200-2SL		200	√		
RSM5c 277100-2SL	277/480V	400	√		
RSM5c 277200-2SL		800	√		

All meters have built-in Power Line Communications capability.

All meters have built-in Power Line Communications capability.

RSM-5c Meter Kits: Demand Meters

Kits include meterhead, fuse block, back box and required current transformers.
Enclosure: 6.9”H X 9.8”W X 4.9”D



Three-Phase Demand Meter - Wye

Catalog #	Volts	Amps	kWh and Demand	CTs included	Diagram		
RSM5c 120100-3D	120/208V	100	√√	3 SPLIT CORE	Figure 3-1		
RSM5c 120200-3D		200	√√				
RSM5c 120400-3D		400	√√				
RSM5c 120800-3D		800	√√				
RSM5c 277100-3D	277/480V	100	√√			3 SPLIT CORE	Figure 3-1
RSM5c 277200-3D		200	√√				
RSM5c 277400-3D		400	√√				
RSM5c 277800-3D		800	√√				

For 1600 AMP or 3200 AMP, see page 28.

Catalog #	Volts	Amps	kWh and Demand	CTs included	Diagram
RSM5c 480DTA100-2D	480V	100	√√	2 SPLIT CORE	Figure 3-2
RSM5c 480DTA200-2D		200	√√		
RSM5c 480DTA400-2D		400	√√		
RSM5c 480DTA800-2D		800	√√		

For 1600 AMP or 3200 AMP, see page 28.

All meters have built-in Power Line Communications capability.

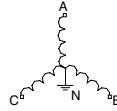
RSM-5 Meter Kits: kWh & Demand Meters for Large Service

For 1600Amp & 3200Amp Only

Kits include meterhead, fuse block, back box and required current transformers.

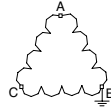
Enclosure: 13.5"H X 8.5"W X 4.5W

Three-Phase Demand Meter - Wye



Catalog #	Volts	Amps	kWh Only	CTs included	Diagram
RSM5 1201600-3D	120/208V	1600	√	3 SPLIT CORE	Figure 3-4
RSM5 1203200-3D		3200	√		
RSM5 2771600-3D	277/480V	1600	√		
RSM5 2773200-3D		3200	√		

Three-Phase Demand Meter - Delta ("DTA")



Catalog #	Volts	Amps	kWh Only	CTs included	Diagram
RSM5 480DTA1600-2D	480V	1600	√	2 SPLIT CORE	Figure 3-5
RSM5 480DTA3200-2D		3200	√		

All meters have built-in Power Line Communications capability.

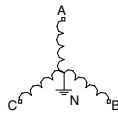
All meters have built-in Power Line Communications capability.

RSM-5c: Three-Phase and Single-Phase Meters

External CTs sold separately.

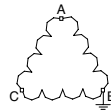


Dimension:
6.9"H x 9.8"W x 4.9"D



Three-Phase Meter - Wye

Catalog #	Volts	Amps	kWh Only	kWh & Demand**	kWh, Demand & 4 Pulse Inputs**	Diagram	
RSM5c 120	120/208V	0.1A	✓			Figure 3-1	
RSM5c 277	277/480V		✓				
RSM5c 120 D	120/208V				✓		
RSM5c 277 D	277/480V				✓		
RSM5c 120 P D	120/208V						✓
RSM5c 277 P D	277/480V						✓



Three-Phase Meter – DELTA (“DTA”)

Catalog #	Volts	Amps	kWh Only	kWh & Demand**	kWh, Demand & 4 Pulse Inputs**	Diagram
RSM5c 480DTA	0.1A	480V	✓			Figure 3-2
RSM5c 480DTA D					✓	
RSM5c 480DTA P D						

Single-Phase kWh Meter - Wye

Catalog #	Volts	Amps	kWh Only	Diagram
RSM5c 120 2PH	120/208V	0.1A	√	Figure 3-3
RSM5c 277 2PH	277/480V		√	

*Standard Configuration for kWh only models: kWh register and 1-hour data logging (intervals).

Customized programming not available for kWh models.

**Standard Configuration for Demand models ("D"): kWh register, peak demand (kW) register with date and time stamp and 15-minute data logging (intervals). Customized programming available for demand models only. Contact Manufacturer for details.

RSM-5: Three-Phase Meters

External CTs sold separately.



Dimension:
13.5" X 8.5" X 4.5"

Three-Phase Meter - Wye - 0.1Amp



Catalog #	Volts	Amps	kWh Only	kWh & Demand**	kWh, Demand & Modem**
RSM5 120 01A	120/208V	0.1A	√		
RSM5 277 01A	277/480V		√		
RSM5 120 01A D	120/208V			√	
RSM5 277 01A D	277/480V			√	
RSM5 120 01A M D	120/208V				√
RSM5 277 01A M D	277/480V				√
RSM5 120 01A RS D	120/208V				
RSM5 277 01A RS D	277/480V				
RSM5 120 01A PD	120/208V				
RSM5 277 01A PD	277/480V				

Three-Phase Meter - DELTA ("DTA") - 0.1Amp



Catalog #	Volts	Amps	kWh & Demand**	kWh, Demand & Modem**
RSM5 480DTA01A D	480V	0.1A	√	
RSM5 480DTA01AMD				√
RSM5 480DTA01ARSD				
RSM5 480DTA01A PD				

*Standard Configuration for kWh only models: kWh register and 1-hour data logging (intervals).

Customized programming not available for kWh models.

**Standard Configuration for Demand models ("D"): kWh register, peak demand (kW) register with date and time stamp and 15-minute data logging (intervals). Customized programming available for demand models only. Contact Manufacturer for details.

kWh, Demand & RS - 485**	kWh, Demand & 4 Pulse Inputs**	Diagram
		Figure 3-1
√		
√		
	√	
	√	

kWh, Demand & RS - 485**	kWh, Demand & 4 Pulse Inputs**	Diagram
		Figure 3-2
√		
	√	

RSM-5: Three-Phase Meters

External CTs sold separately.

Three-Phase Meter - Wye - CL10 (accepts one or two sets of 5Amp CTs)



Catalog #	Volts	Amps	kWh Only	kWh & Demand**	kWh, Demand & Modem**	
RSM5 120 CL10	120/208V	10A	√			
RSM5 277 CL10	277/480V		√			
RSM5 120 CL10 D	120/208V				√	
RSM5 277 CL10 D	277/480V				√	
RSM5 120 CL10 M D	120/208V					√
RSM5 277 CL10 M D	277/480V					√
RSM5 120 CL10 RS D	120/208V					
RSM5 277 CL10 RS D	277/480V					
RSM5 120 CL10 PD	120/208V					
RSM5 277 CL10 PD	277/480V					

Three-Phase Meter - DELTA ("DTA") – CL10 (accepts one or two sets of 5Amp CTs)



Catalog #	Volts	Amps	kWh & Demand**	kWh, Demand & Modem**
RSM5 480DTACL10 D	480V	10A	√	
RSM5 480DTACL10MD				√
RSM5 480DTACL10RSD				
RSM5 480DTACL10 PD				

*Standard Configuration for kWh only models: kWh register and 1-hour data logging (intervals).

Customized programming not available for kWh models.

**Standard Configuration for Demand models ("D"): kWh register, peak demand (kW) register with date and time stamp and 15-minute data logging (intervals). Customized programming available for demand models only. Contact Manufacturer for details.

kWh, Demand & RS - 485**	kWh, Demand & 4 Pulse Inputs**	Diagram
		Figure 3-4
√		
√		
	√	
	√	

kWh, Demand & RS - 485**	kWh, Demand & 4 Pulse Inputs**	Diagram
		Figure 3-5
√		
	√	

Release Dates

	MANUAL	QLC PART NO.	REVISION NO.	RELEASE DATE
(1)	RSM-5c kit and RSM-5 kit Installation Manual	RSM5/5c MANR1.0.R	1.0.R	11.17.06
(2)	RSM-5c and RSM-5 Installation Manual	RSM5/5c MANR1.1.R	1.1.R	1.2.07
(3)	RSM-5c and RSM-5 Installation Manual	RSM5/5c MANR1.2.R	1.2.R	6.19.07
(4)	RSM-5c and RSM-5 Installation Manual	RSM5/5c MANR2.0.R	2.0.R	10.27.08
(5)	RSM-5c and RSM-5 Installation Manual	RSM5/5c MANR2.1.R	2.1.R	1.1.11

Notable Revision History

DATE	PAGE	DESCRIPTION
1/2/7	1	• Pulse Datalogger functions during power loss events
	3	• Requirements for conduit size
	9	• Main menu navigates forward only
	17	• Separated table 7-1 into two tables for 0.1 AMP multipliers and 5 AMP multipliers
	29	• Included catalog numbers for reference
6/18/07	(preface page)	Updated: Quadlogic new address/copyright 2007
	5	Inserted table of maximum lead length
	8	Added clarifying note
	20	Correction of memory size to 512 kilobyte
	21	Meets ANSI C12.1
	26	Correction of voltage to 480V (Delta)

Preventive Maintenance

Preventative maintenance is not required.

Use a soft dry cloth to clean the meter.

A Toshiba CR2032 coin battery is used in each device ONLY for the clock when power is lost, and is intended to be good for decades before replacement. The meter does not rely on the battery, and the meter data is stored in non-volatile FLASH memory.

Product Limited Warranty

Quadlogic Controls Corporation warrants its equipment for 3 years from the ship date against defects in material or workmanship when installed in accordance with manufacturer's instructions by qualified personnel.

This warranty does not cover installation, removal, reinstallation or labor costs and excludes normal wear and tear. The warranty does not cover product which has been altered from its original manufactured condition due to faulty installation, tampering, accident, neglect, abuse, force majeure or abnormal conditions of operation.

Obligation under this warranty is limited to repair and/or replacement, at Quadlogic's option, of the manufactured product and in no event shall Quadlogic be liable for consequential or incidental damages.

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