



## PQM Firmware Revision History

FIRMWARE REVISION	BRIEF DESCRIPTION OF CHANGES	STARTING SERIAL#	RELEASE DATE
<b>3.62</b> <b>CURRENTLY IN PRODUCTION</b>	<ul style="list-style-type: none"><li>Support for mod 521 added</li></ul>	C6523399	August 20, 2002
<b>3.61</b>	<ul style="list-style-type: none"><li>Metered values stabilized for the case when all of the following conditions exist simultaneously: an input is maintained at its trace memory pickup threshold, trace memory is set to retrigger, and event recorder is enabled.</li><li>Corrected up/down arrow characters for LCD display.</li></ul>	C6522772	July 10, 2002
<b>3.60</b>	<ul style="list-style-type: none"><li>The PQM now Supports both VFD and LCD displays. The boot code was also changed to version 2.00 to support the new LCD during FW uploading.</li></ul>	C6521073	March 20, 2002
<b>3.51</b>	<ul style="list-style-type: none"><li>Power calculations for 3 WIRE DELTA 2VTs corrected to accommodate unbalanced phase currents above and below 20% load.</li><li>Corrected reactive power delay setpoint error.</li></ul>	C6514972	December 10, 2001
<b>3.50</b>	<ul style="list-style-type: none"><li>TRACE MEMORY algorithm changed to increase resolution, minimize nuisance triggers, and calculate the <i>RMS level on a PER CYCLE basis</i>. Anyone using the trace memory feature is recommended to upgrade.</li><li>Corrected, Clearing values through the Keypad, introduced in Version 3.41</li><li>Added a time/date stamp for last reset, Modbus memory map address 0462 - 0465</li></ul>	N/A	September 19, 2001
<b>3.41</b>	<ul style="list-style-type: none"><li>Sporadic occurrences of "NO EVENT" events have been corrected.</li><li>In firmware revision 3.40 the EVENT RECORDER data can become corrupted under certain combinations of clearing data, and cycling power.</li></ul>	C6506251	January 16, 2001
<b>3.40</b>	<ul style="list-style-type: none"><li>CALCULATED NEUTRAL CURRENT algorithm changed to accommodate for a loss of phase condition.</li><li>Updated UNDER/OVER VOLTAGE alarms when the VT wiring is set to SINGLE PHASE DIRECT.</li><li>Corrected the alarm levels for current and voltage alarms when DETECT USING PERCENTAGES is selected.</li><li>Added Tariff structure for energy cost.</li><li>Corrected the pickup/dropout angle for the VOLTAGE PHASE REVERSAL alarm.</li></ul>	C6505493	December 7, 2000
<b>3.30</b>	<ul style="list-style-type: none"><li>Analog out hardware changed, firmware update to accommodate</li></ul>	C6503167	July 6, 2000
<b>3.21</b>	<ul style="list-style-type: none"><li>Version 3.20 had an inconsistency regarding the setpoints data structure that was discovered shortly after its release, version 3.21 corrects this problem. Functionality of the PQM remains OK, but certain relay assignments may not be able to be stored via serial communications, but only via keypad entry.</li></ul>	C6590600	February 24, 1999



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3.20	<ul style="list-style-type: none"><li>Displacement Power calculations added using "EXTRACT FUNDAMENTAL" setpoint. When enabled, the PQM will calculate all metering quantities based upon the fundamental values of the inputs being sampled.</li><li>Added Clear min/max frequency Setpoint</li><li>Added "PHASE OVERCURRENT ACTIVATION" setpoint to the memory map at 0x1126.</li><li>Added ability to update options/MODs via passcode.</li><li>Added Trace Memory Trigger notification functionality to the output relays.</li><li>Added Internal Fault ID and Cause of Last Trace Trigger to the Event Recorder.</li><li>Added Analog Output Serial Control.</li><li>Added %CT/%VT selection to all current and voltage alarms.</li><li>Expanded Overfrequency Range to 125Hz.</li><li>Added kW/kVAR or MW/MVA base units selection to all power alarms.</li><li>Added MW/MVAR/MVA Actual Values display lines for 3 phase power.</li><li>Added Total Trace Triggers counter to memory map at 0x0B83.</li></ul>	C6590524	February 17, 1999
3.13	<ul style="list-style-type: none"><li>The kWhr accumulation registers have been modified to not saturate at high levels. They will now remain within stated accuracy through to <math>2^{32}</math>, at which point they will roll over to 0.</li><li>The DNP Port Assignments have been re-aligned</li></ul>	C6583396	Sept 1/98
3.10	<ul style="list-style-type: none"><li>Phasor angles for Voltage and Current have been added for use as a debugging tool in the field.</li><li>Two Switch input functions have been added, Clear Energy &amp; Clear Demand.</li><li>Clear All Demand Data has been added as a Broadcast Command.</li></ul>	C6572640	Oct 24/97
3.01	<ul style="list-style-type: none"><li>The Self Test alarm has been enhanced to remain latched until the reset key is pressed. The message has also been changed to indicate what type of internal failure has occurred.</li></ul>	C6571314	June 16/97



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3.00	<p>DNP 3.0 protocol has been implemented. For details on implementation of the DNP 3.0 protocol, refer to the PQM Instruction Manual (rev. CA or higher)</p> <p><b>NOTE: THE DNP 3.0 PROTOCOL IS ONLY AVAILABLE IF THE TWO CONDITIONS LISTED BELOW ARE MET:</b></p> <ol style="list-style-type: none"><li><b>SERIAL NUMBER IS EQUAL TO OR GREATER THAN C6570929.</b></li><li><b>THE BOOT PROGRAM VERSION SHOWN IN ACTUAL VALUES PAGE A4 UNDER SOFTWARE VERSIONS IS GREATER THAN OR EQUAL TO 1.10.</b></li></ol> <ul style="list-style-type: none"><li>The range for the Trace Memory Current Trigger setpoints has been increased to 1-150% CT and Voltage Trigger setpoints range has been increased to 20-150% NOMINAL. These setpoints are located in setpoints page S1 under TRACE MEMORY.</li><li>The range for the PULSE INPUT ADDITION setpoint has been increased to include 1+2+4 selection. This setpoint is located in setpoints page S1 under PULSE INPUT.</li></ul>	C6570929	May 05/97
2.02	<ul style="list-style-type: none"><li>The AVERAGE CURRENT and AVERAGE VOLTAGE messages have been combined into one message. This line is not visible if the VT WIRING setpoint is set to SINGLE PHASE DIRECT. L-N is displayed when the VT WIRING is set to 4 WIRE WYE (3 VTs), 4 WIRE WYE DIRECT, 4 WIRE WYE (2 VTs) or 3 WIRE DIRECT and L-L is displayed when VT WIRING is set to 3 WIRE DELTA (2 VTs).</li><li>When the VT WIRING is set to SINGLE PHASE DIRECT, the captured waveform samples for phase b and c current and voltage inputs are forced to 0.</li></ul>	C6570390	Feb. 27, 1997
2.01	<ul style="list-style-type: none"><li>Broadcast command has been added to the memory map to allow user to synchronize the date and time of the PQM with rest of the devices on-line.</li></ul>	C6570125	Jan. 15, 1997
2.00	<ul style="list-style-type: none"><li>Phase CT primary range changed from 5-6000 to 5-12000.</li><li>Pulse output width made variable from 100-2000ms.</li><li>Three more pulse inputs added for a total of four. The pulse inputs are user definable and can be totalized.</li><li>Time alarm feature added to pickup and dropout at specified times of the day.</li><li>The capability to stop the data logs from the PQM keypad added. Previously this was only possible using PQMPC.</li><li>Display Filter Constant added to average the display readings.</li><li>Trace Memory feature added to record waveforms based on set trigger points.</li></ul>	C6561033	Nov. 06, 1996



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1.22	<ul style="list-style-type: none"><li>Product firmware enhanced for efficiency in calculation and functionality.</li></ul>	C6560715	Aug. 16, 1996
1.21	<ul style="list-style-type: none"><li>The Analog Output accuracy specification was changed to +/- 2% from +/- 1%.</li><li>The functionality of the Real Power Demand Alarm and Reactive Power Demand Alarm was changed. Previously these two alarms activated on the absolute value of the corresponding demand quantity. Now there are four alarms: Positive Real Power Demand Alarm, Negative Real Power Demand Alarm, Positive Reactive Power Demand Alarm, and Negative Reactive Power Demand Alarm. The "positive" alarms activate for positive real and reactive power demand values only; the "negative" alarms activate for negative real and reactive power demand values only.</li></ul>	C6560581	Jul. 02, 1996
1.20	<ul style="list-style-type: none"><li>The ANALOG OUTPUT RANGE setpoint was added. This is visible only when the T20 option is installed. Range = 0-20 mA or 4-20 mA. This determines the analog output scaling.</li><li>The CT WIRING setpoint was added. This allows for the connection to only two current inputs on the PQM. When selected for two CT operation, the third current value is calculated from the other two. Range = A, B, AND C; A AND B; A AND C. Note that when a two CT connection is selected the neutral current must be measured using a separate CT.</li><li>The PHASE OVERCURRENT ACTIVATION setpoint was added. Range: AVERAGE, MAXIMUM. This allows the Overcurrent function to operate from the average phase current or the maximum of the three phase currents.</li><li>The VT Ratio maximum value was changed from 800.0 to 3500.0.</li><li>The Event Recorder now records events when Alarm/Control functions drop out.</li><li>The Voltage cut off default setpoint was changed from 50 to 125. The voltage and current cut off maximum values were changed from 100 to 300.</li><li>The average current and voltage THD values were added to the memory map.</li><li>If an attempt is made, via the keypad, to clear the Event Record, with the Event Recorder disabled, the message EVENT RECORDER DISABLED IS DISPLAYED.</li></ul>	C6560246	Apr. 16, 1996



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1.10	<ul style="list-style-type: none"><li>• Data Logger feature added</li><li>• Event Recorder feature added.</li><li>• The capability to assign Pulse Output feature to be Alarm relay added.</li><li>• The Phase CT Primary and Neutral CT Primary maximum values were changed from 5000 A to 6000 A.</li></ul>		Apr. 02, 1996
1.00	<ul style="list-style-type: none"><li>• First PQM release to production.</li></ul>		Jan. 01, 1996