



# PQM Power Quality Meter

## Revision 3.66 release notes

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## Overview

### Summary

- Affected products: PQM Power Quality Meter
- Date of release: September 29, 2006
- Firmware revision: 3.66
- Hardware revision: C, D
- Manual revision: GEK-106296D

### Release Summary

This release note covers the 3.66 revision of the PQM Power Quality Meter. This release includes modifications to values provided via DNP communications as well as enhancements to ensure proper setpoint configuration when loading a setting file. Changes were also made to increase accuracy of event recorder values.

It is recommended that the following users switch to firmware version 3.66:

- those communicating via DNP protocol
- those using the event recorder actual values for analysis purposes
- those wiring the meter as a 2VT Delta connection
- those injecting the meter with 3-phase power greater than 5,000,000 KW.

## Release Details

### New Features

#### Communications

- **RS232 Communication No Longer Requires Modbus Slave Address**  
The front RS232 port will now communicate with a Modbus master regardless of whether the "Modbus Communication Address" setpoint under Com1 is programmed.

### Modified Features

#### Communications

- **DNP Communications: Programmed DNP Communications port reliability improvement**  
The reliability of the DNP port has been improved by ensuring continuous communications when simultaneous communication is occurring via Modbus and DNP on the RS232, Com 2, and DNP ports.
- **DNP Communications: Improved DNP communication on COM1**  
The communications over the DNP protocols via the COM 1 port have been improved to prevent intermittent communication errors.
- **DNP Communications: Improvements to calculated values in Analog Input/Output change points list**  
The PQM 3.66 release improves the following analog input/output change points:
  - Point 6 (Nominal Single-Phase VA). The value read at this point will now be correct in all instances. The previous release would give a value of zero if the Voltage setpoints were changed.
  - Point 12 (neutral current). The value read at this point will now be correct in all instances. The previous release required PHASE CT PRIMARY and NEUTRAL CT PRIMARY setpoints to be equal.
  - Points 8 (phase A current), 9 (phase B current), 10 (phase C current), 11 (average current), 39 (phase A current demand), 40 (phase B current demand), 41 (phase C current demand). These setting values now read properly when the value for PHASE CT PRIMARY is larger than 495 A.
  - Points 14 (Van voltage), 15 (Vbn voltage), and 16 (Vcn voltage). The setting values will now read properly when the value for VT NOMINAL SECONDARY is larger than 495 V.
  - Points 18 (Vab voltage) and 19 (Vbc voltage). These values will now change according to the VT WIRING TYPE setting. In earlier revisions, these values were calculated as if the VT WIRING TYPE setting was set to "4 WireWye", regardless of the actual setting.
- **DNP Communications: Default variation for binary counters (object 20) changed from 6 (16-bit) to 5 (32-bit)**  
The default variation for binary counters was changed to 5 (32-bit) so that DNP masters with only generic-type interrogation capabilities are able to read the full counter value.

Object	Description	Default Variation
20	32-bit binary counter without flag	5

- **DNP Communications: Modifications to Analog Input/Output change points list (table 7-9 in manual)**  
The following points have been changed to "Reserved":

Point	Modbus Register	Description	Unit/Value	Deadband	Format	Event Class Assigned to
63	0X0481	voltage Vca THD	0.1 x %	5%	F1	3
140	0X048B	voltage Vca THD - maximum	0.1 x %	1 unit	F1	3

- **DNP Communications: Modifications to Binary Input change points list (table 7-7 in manual)**  
The following points have been changed to “Reserved” for the 3.66 release, as they had no functionality present:

Index	Description	Event Class Assigned to
27	Auxiliary 1 relay LED solid (not flashing)	Class 1
28	Auxiliary 2 relay LED solid (not flashing)	Class 1
29	Auxiliary 3 relay LED solid (not flashing)	Class 1
30	Alarm LED solid (not flashing)	Class 1
31	Program LED solid (not flashing)	Class 1
32	Simulation LED solid (not flashing)	Class 1
33	Alarm relay LED solid (not flashing)	Class 1
34	Self-test LED solid (not flashing)	Class 1

- **DNP Communications: Unsupported DNP objects removed from manual**  
The frozen counters (object 21), counter change events (object 22), and frozen counter events (object 23) are not supported by the PQM and have been removed from the manual.

### Monitoring

- **Voltage Metering: Voltage Angle display modified for “2 VT Delta” VT wiring type**  
A modification was made to display the actual value for voltage angle on Vb for all wiring settings, including 2 VT Delta.
- **3 Phase Real Power rolls over**  
The maximum 3 phase power that can be injected into the meter has been increase from 5,354,150 KW to 10,000,000 KW. Injected values larger than 10,000,000 KW will remain fixed at this maximum value.
- **Improvements to values recorded in event recorder**  
The accuracy of logged event recorder values has been improved by insuring that the that data items logged in the event recorder are from the most recently sampled event.
- **Improved phase angle reading for single phase connection**  
A PQM that is wired and configured as a single phase connection, now has the ability to display a measured value of the phase angle between the voltage and current.
- **Undercurrent and Undervoltage accuracy improvements when pickup set to % of CT/VT**  
The accuracy of Undercurrent and Undervoltage has been improved by setting the pickup as a set level of CT/VT, instead of as a % of CT/VT. Configuration of this level setting is done via the DETECT I/V ALARMS USING PERCENTAGE setting.
- **3- WIRE DELTA (2 VTs) improvements to displayed phase angles**  
When the VT Wiring setting is set to 3 WIRE DELTA (2 VTs), the phase angles for all three voltage paramenters are now displayed (Vab, Vbc, and Vca) instead of only Vab and Vcb.
- **Improved speed and accuracy on Phase Reversal function**  
To improve the accuracy and speed fo the the Phase Reversal, modifications were made to use less filtering in determining the value used for the trip criteria.
- **Improved Phasor reference readings**  
The phasor reference was improved in the following way:
  - Van is used as the reference angle. Vab will only be used as the reference for Delta connections.
  - When the voltage reference angle is not available, phase A current will be used as the reference.
  - If any voltage or current measured value is zero, its corresponding phase angle will also be zero.
- **Improvements to Positive Real Energy and Negative Real Energy when range is greater than 2500 kWh**  
Enhancements were made to increase the accuracy of Positive Real Energy and Negative Real Energy reading for energy reading above 2500kWh.

- **Overfrequency dropout hysteresis added**  
A hysteresis of 0.03 Hz has been added to the overfrequency dropout. This will prevent nuisance pickup and dropout when levels approach within 0.02 Hz of the pickup level.
- **Pulse Input 2 accumulation feature improved**  
When assigned to Switch Input D, the accumulation of Pulse Input 2 is now independent of the programmed value for the feature.

### Setup & Configuration

- **Setpoints Page roll-over in Mod 506**  
On units with Mod 506 (4-step capacitor bank switching) installed, S4 - Miscellaneous Page - would scroll into the S5 Settings at the end of the S4 menu. Now the S4 menu has menu roll-over disabled, creating a more clearly defined menu.
- **Switch Input option now hidden when 'C' option is not present**  
The Switch Input options are no longer shown if you have the 'A' option, but not the 'C' option. Both must be present for the functionality to be present.
- **THD Analog Output option now hidden when 'A' option is not present**  
With the T20 or T1 option, analog outputs are enabled. But if the 'A' option is not installed, it is unnecessary to have all the THD selections as analog output parameters (total of 11). THD is enabled only if the 'A' option is installed.
- **Analog Output functions for Switch Input now hidden when 'T' option is not present**  
With the 'C' option, but not the 'T' option present in the PQM, it is unnecessary to show switch input functions 'Select Analog Out' and 'Select Analog In'.
- **Time Alarm now recognizes midnight and noon**  
The Time Alarm feature has been modified to distinctly identify the stored time values for midnight (as zero) and noon (as 12).
- **Leap Year Date Storage**  
A modification was made to increase accuracy of stored data via Modbus. Users are now prevented from incorrectly storing the date of February 29th in non-leap years.
- **Analog Output Simulation settings retained for greater convenience**  
User-defined simulation setting values are stored and unchanged, regardless of the state of the Simulation Enable setting. As well, the physical Analog output will only change if the simulation is enabled.
- **Factory Default setpoints loaded after storing settings file**  
The 3.66 release has been modified to prevent the automatic download of default setpoints when zero values are written to a Modbus register belonging to a feature not installed in the PQM.

### Display

- **Notification message added when entering incorrect setpoint access code**  
The message "INCORRECT CODE" will now be shown after three consecutive unsuccessful attempts at entering the Setpoint Access code.
- **Cosmetic improvement to displayed phasor values**  
Spacing was added between 'KVat' to display "KV at". For example, "Va Phasor = 241.KVat 0 degree lag" changed to "Va Phasor = 241.KV at 0 degree lag".
- **Added "Main Compile Time" display under A4 PRODUCT INFO**  
An additional display was added to indicate the time of day that the firmware was compiled.

## Software updates

No updates to the EnerVista PQM Setup software version 3.61 were required for this release.

## Software and firmware update information

### Filenames and locations

- Firmware file location: <http://www.GEmultilin.com>
- Firmware filename: 65D366C4.000

### PC software upgrade procedure

Download and install the latest EnerVista PQM Setup software installation file from <http://www.GEmultilin.com>.

## GE Multilin technical support

GE Multilin contact information and call center for product support is shown below:

GE Multilin  
215 Anderson Avenue  
Markham, Ontario  
Canada L6E 1B3

**Telephone:** 905-294-6222 or 1-800-547-8629 (North America), +34 94 485 88 00 (Europe)

**Fax:** 905-201-2098 (North America), +34 94 485 88 45 (Europe)

**E-mail:** [multilin.tech@ge.com](mailto:multilin.tech@ge.com)

**Home Page:** <http://www.GEmultilin.com>