New features in PQ-Box 100/150/200 Software "WinPQ mobil" V3.1.5

26/1/2017 V2

This document details the main changes made in WinPQ mobil release V3.1.5 compared to V3.0.0.

Software V3.1.5 should be used with PQ-Box firmware:

File	PQ-Box 100	PQ-Box 150	PQ-Box 200
Boot	1.202	0.197	0.197
DSP	1.400	4.012	4.012
MCU	2.015	3.006	3.006
FPGA	N/A	N/A	0.012

To access some new features, the firmware in the PQ-Box must also be updated. Refer to the latest User Manual for instructions on how to update firmware.

Caution – Save/back-up setting and data files on your PQ-Box before updating MCU firmware. Updating the MCU deletes all measurement files.

As a precaution, please back-up user recording & data files on your PC before updating WinPQ mobil software.

Compatibility:
- This latest version of software is able to open data files downloaded with earlier versions.
- After updating the firmware of the PQ-Box to above, you should only use WinPQ mobil V3.1.5 (or later) to download data from the PQ-Box. While earlier version of WinPQ mobil may appear to permit downloading of data and uploading of new settings, the **use of earlier versions of WinPQ mobil will not be supported** as these do not use/set the full parameters of the latest PQ-Box firmware.

New Features:

1) New RMS Recorder Trigger – Under/Over Frequency and rate-of-change
The RMS Recorder can be tiggered by an under/over frequency event, and/or if the absolute frequency change during a 1 second measurement period is greater than the setting value.
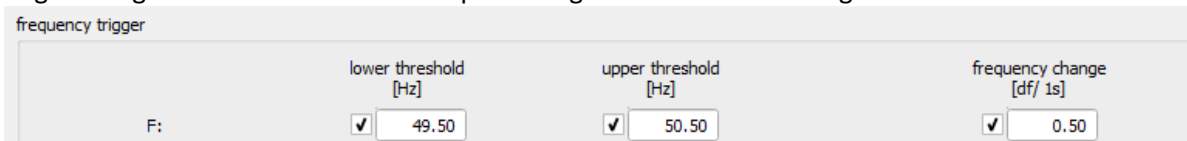
Figure 1. New RMS recorder triggers.

2) New frequency data has been added to the permanent recordings.

10 s, 3 s and 200 ms frequency measurements have been added. Frequency measurements now possible include:

Measurement	Enabled on PQ-Box	Description
F (10s)	100/150/200	A 10 second frequency measurement is recorded each 10 seconds. This is a set 10 second measurement period, independent of the set measuring interval
Mean / F	100/150/200	The average of all the frequency measurements during the interval [1]
Max / F max (10s)	100/150/200	The maximum 10 second reading during the measuring interval is recorded [1]
Min / F min (10s)	100/150/200	The minimum 10 second reading during the measuring interval is recorded [1]
F (3s)	100	3 second fequency measurement
	/150/200	3 second fequency is only enabled when other '3 second recording's are enabled
F (200ms)	/150/200	With 200 ms recording enabled, 200 ms frequency measurements are available
10ms	100/150/200	10ms frequency and 10ms df/dt data points are included in triggered '10 ms RMS' records
[1] Normally a 10 second measurement window is used, but if the measuring interval is less than 10 seconds then this is reduced.		

3) New groupings to the Permanent Data selections

With different time period data classes being added (see item 7) to the Permanent Recording, the "tree" display has changed slightly. Values have been re-grouped into new data classes.
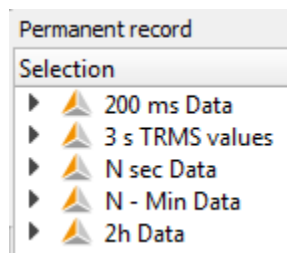

**Figure 2. New grouping of data classes.**

200 ms Data	Only available for PQ-Box 150 and PQ-Box 200 when "200ms recording" had been enabled
3 s TRMS values	3 second ripple control signal voltages (for PQ-Box 100, 150 & 200) For PQ-Box 150 and PQ-Box 200 when '3 s recording" is enabled many further 3 s values are added (see later)
N sec Data	This is the original data class set by the selected measuring interval (1 s to 30 mins)
N – Min Data	This is the original data class "Power (15 min)" and "Energy (15 min)" where the actual period (10/15/30 minutes) is set by the "Power Interval" setting
2h Data	This is the long time flicker value that was listed in the original main data class

4) Ripple Control changes:

The Ripple Control setup section now contains a 'Limit [%UN]' setting (default value = 9 %). A three second data class measurement for Ripple Control Voltage has been added. The EN Reporting Graph now includes an EN-50160 compliance (100 % and 99 % values) display of the 3 second values versus the limits.

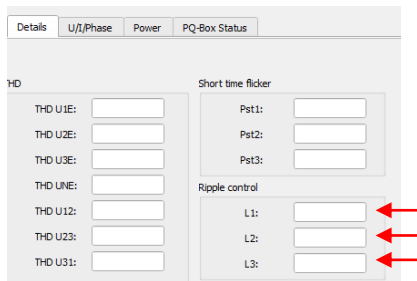**Figure 3. New field for entering Ripple Control EN-50160 compliance limits.**
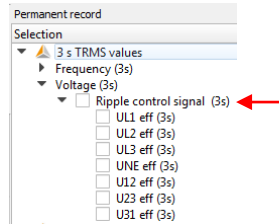
Figure 4. New 3 second data of Ripple Control voltage.

**Figure 5. EN 50160 display of Ripple Control voltage vs limits.**

In addition the ONLINE measurements have been updated to include the instantaneous values of Ripple Control Signal values (voltage).

Figure 6. Instantaneous values of Ripple Control voltage.

NOTE:

In the N sec Data, a "Ripple control signal" value is added. This is of use when users are using shorted than the recommended 10 minute measurement interval – given that the ripple signal duration is normally of a shorter duration.
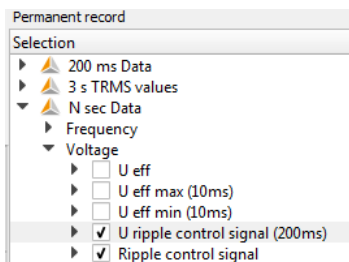
U ripple control signal (200ms) [UL x R]	Reports the maximum 200 ms values during the measuring interval [i.e. Peak]
Ripple control signal [UL x eff]	Reports the average ripple control signal from the entire measuring interval [i.e. Average]l

Figure 7. New Ripple control signal value added.

- This new measurement is available to all PQ-Box 100, 150 and 200 users and does not require the added "Ripple Control" licence.
- For users of PQ-Boxes with Ripple Control Signal enabled, the high speed Ripple Control signal measurement remains the same.
- Refer to PQ-Box 100 Hints and Tips #4 for further explanation on the Ripple Control measurements.

5) New "Interface Lock" for PQ-Box 150 and 200

In addition to the front button lock, it is now possible to lock the PQ-Box 150 and 200 using a 4 digit PIN. If the PIN function is enabled it automatically locks the device 1 minute after starting a measurement (it can also be done 'on demand' via the 'normal' keypad lock routine).

Note:
- The new lock function not only locks the display, but also deactivates the USB and Ethernet interface.
- 11 incorrect entries in a row will lock the device, requiring it to be sent back to the factory to be reset.

6) Harmonic Power

Harmonic Real Power, Harmonic Apparent Power, Harmonic Reactive Power and the Cosinus Phi Harmonic have been added to the long term ('permanent') measurement data

These are 'N sec Data values' (ie that set by the Measuring Interval). There is no energy, nor N-minute (10/15/30 minute Power Interval) equivelents of these values.
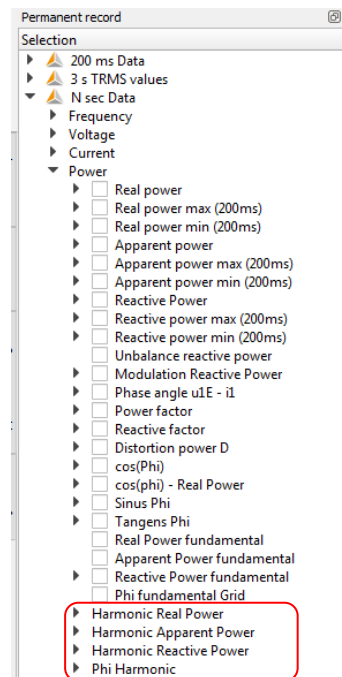

Figure 8. New harmonic values.

7) New 200 ms and 3 second measurements (PQ-Box 150 and PQ-Box 200 only)

In addition to the normal "Measuring Interval" (1 second to 30 minutes) and the selectable 10/15/30 minute Power Interval, PQ-Box 150 and 200 users can select to also record 200 ms and 3 s data. *(This selection must be made using WinPQ software – it is not available via front panel keys).*
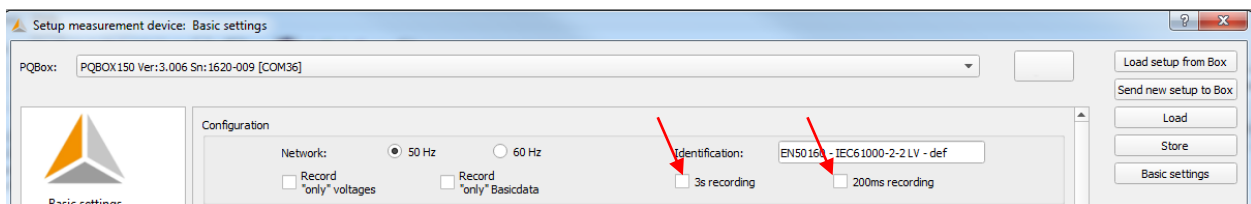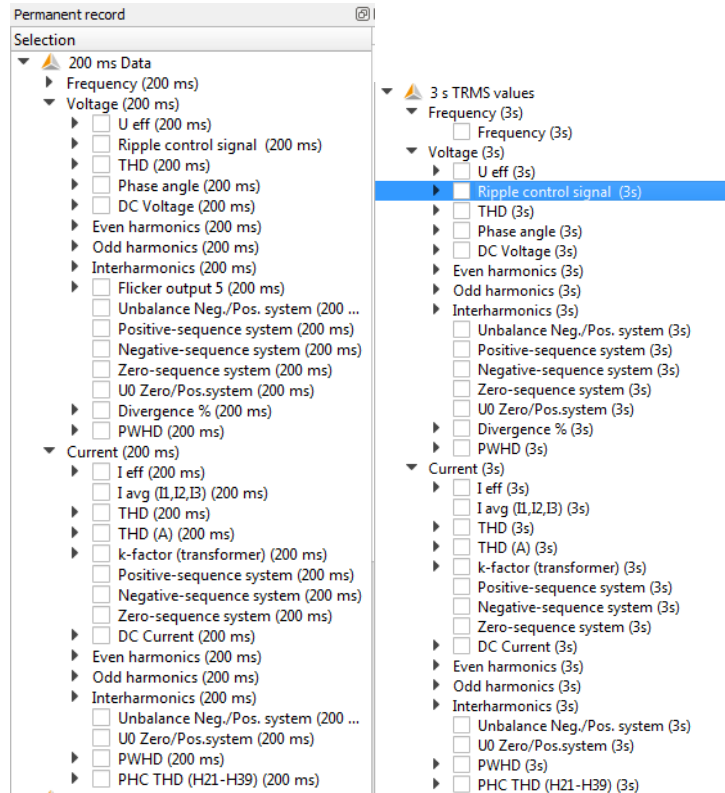

Figure 9. New 200 ms and 3 s data classes.

These new data classes are only intended for measurements of short durations as they produce a very large amount of data:

- The 200 ms data class produces approximately 80 MB per hour
- The 3 s data class produces approximately 5 MB per hour
- *This compares to the standard 10 minute data class producing about 15 MB per week*

Figure 10. Measurements provided in 200 ms and 3 s data classes for PQ-Box 150 & 200.

HV Powers Excel sheet "PQ-Box 100 -150 – 200 Measurements Details (V3.1.5)", provides a detailed list of the measurement values per data class. Please request a copy, or download via our website Technical Library, from the Power Quality section.

Figure 11. Example of voltage trace with 200 ms, 3 s and 10 minute data class.

8)   Other changes:

Poly phase events are applicable to 3 wire measurements

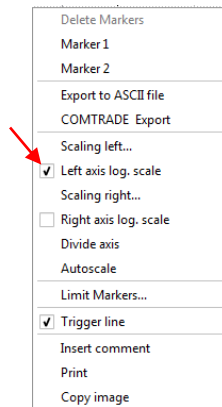**Figure 12. New PQ events classification 'single' and 'poly' for swell, dip and interruptions**

Figure 13. Right hand click menus on graphs – tick boxes added