

Release Notes NORMA PA FW V1.5

Improvement and extension of the harmonic measurement (new mode compliant to Standard IEC/EN61000-4-7):

1. Mode FFT: as before (sampling with fixed frequency and Hanning window, selectable frequency range by filter stages);
Improved calculation accuracy at low signal amplitudes
2. Mode DFT: as before (calculation of the integer harmonics by interpolation of the FFT results - see 1. above);
3. Mode STD: new; compliant to Standard IEC/EN61000-4-7 by using firmware synchronization / decimation technique and rectangular window
(valid for interval lengths of 10 (50Hz) and 12 (60Hz) = 200ms at nominal frequency)

Settings (user-selectable):

- a) Number of fundamental cycles in the interval (2048 decimated samples):
4 – 6 – 8 – 10(50Hz) – 12(60Hz)
- b) Grouping mode in accordance to standard IEC/EN61000-4-7:
 - none: Spectral Components (601 bins of the basic FFT);
width = 1/interval length = 5Hz nominal for 10(50Hz) and 12(60Hz) resp.;
no THD calculation
 - harm: Harmonic Components (integer multiples of the fundamental);
THD according to standard (U and I only)
 - hgrp: Harmonic Groups;
THDG according to standard (U and I only)
 - hsgrp: Harmonic Subgroups;
THDS according to standard (U and I only)
 - isgrp: Inter-harmonic Subgroups;
TIDS (U and I only; not defined in the standard)
 - sgrp: both Harmonic + Inter-harmonic Subgroups in one graph/table;
THDT (U and I only; not defined in the standard) = THDS + TIDS

In the grouping modes the harmonics are calculated up to order 50 (inter-harmonics up to order 49).

The THD values are calculated from the fixed harmonic range 2nd...40th. The THD is only shown in harmonics table view.

Note: all relative values in [%] representation are always related to the fundamental (H01). If the fundamental is less than 5% of the nominal range, the relative value gets undefined and shows "--.--".

A valid synchronization is needed throughout the interval (same source as used for averaging); in the absence of synchronization an empty graph or table is displayed. All channels / values are synchronized to a common frequency.

In contrast to the averaging, the sync range for harmonics STD mode is reduced:

341kHz sample rate:

Fundamental Cycles Setting	Lower Limit	Upper Limit
4	< 1,25 Hz	> 200 Hz
6	< 1,6 Hz	> 300 Hz
8	< 2,5 Hz	> 400 Hz
10(50Hz)	< 3 Hz	> 500 Hz
12(60Hz)	< 3,5 Hz	> 600 Hz

1MHz sample rate:

Fundamental Cycles Setting	Lower Limit	Upper Limit
4	< 1 Hz	> 650 Hz
6	< 1,5 Hz	> 1000 Hz
8	< 1,8 Hz	> 1300 Hz
10(50Hz)	< 2 Hz	> 1600 Hz
12(60Hz)	< 2,5 Hz	> 2000 Hz

100kHz sample rate:

Fundamental Cycles Setting	Lower Limit	Upper Limit
4	< 0,7 Hz	> 65 Hz
6	< 1 Hz	> 100 Hz
8	< 1,4 Hz	> 130 Hz
10(50Hz)	< 1,7 Hz	> 160 Hz
12(60Hz)	< 2 Hz	> 200 Hz

*For further details see updated **Operators Manual**.*

Remote Control Commands (new parameters / commands in **bold**):

CALCulate:TRANSform:FREQuency:MODE FFT | DFT | **STD**
 CALCulate:TRANSform:FREQuency:**CYCLes** 4 | 6 | 8 | 10 | 12
 CALCulate:TRANSform:FREQuency:**GROuping**
 COMPonent | **HARMonic** | **HGRoup** | **HSGRoup** | **ISGRoup** | **SGRoup**

Each harmonic measurement, which is to be read out via interface, needs to be triggered explicitly (as before):

CALCulate:TRANSform:FREQuency ONCE

The format for data readout by the commands

CALCulate:DATA:PREamble? and
 CALCulate:DATA?

is unchanged; in mode STD the header returns the (same) synchronization frequency for all variables.

Command for readout of THDs from harmonics calculation:

CALCulate:DATA:**THD?** => returns a list of THD values for every function

*For further details see updated **Remote Control Users Guide**.*

New VNC® Support (remote front-panel operation by PC mouse/keyboard – Virtual Network Computing)

Support for an additional protocol over Ethernet interface has been added:

The device can be configured to run a VNC server by selecting this protocol type for the Ethernet interface on the main setup screen. A VNC client program running on a PC or other computer can connect to the device and get front-panel control by mouse and keyboard action while being presented with a continuously updated device screen.

The high priority tasks (calculation of gapless measurement data, local screen refresh) allow only for a thin implementation of the VNC server in the device (limited protocol options and speed). Only a single connection is allowed, no support for SCPI remote control commands while in VNC mode.

VNC is a registered trademark of *RealVNC Ltd.*

*For further details see updated **Operators Manual.***