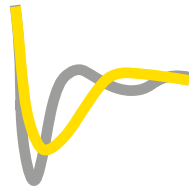


# PQA 8000



### Power Quality

Harmonics, THD  
Supraharmonics 500kHz  
Unbalance etc.



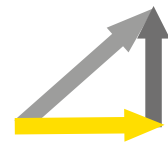
### System Dynamics

Phasor Measure Unit (PMU), Rate of Change of Frequency (RoCoF), WAMS, etc.



### Transients

1/2 period values,  
Phase Angle jumps,  
Resonances,  
Switching etc.



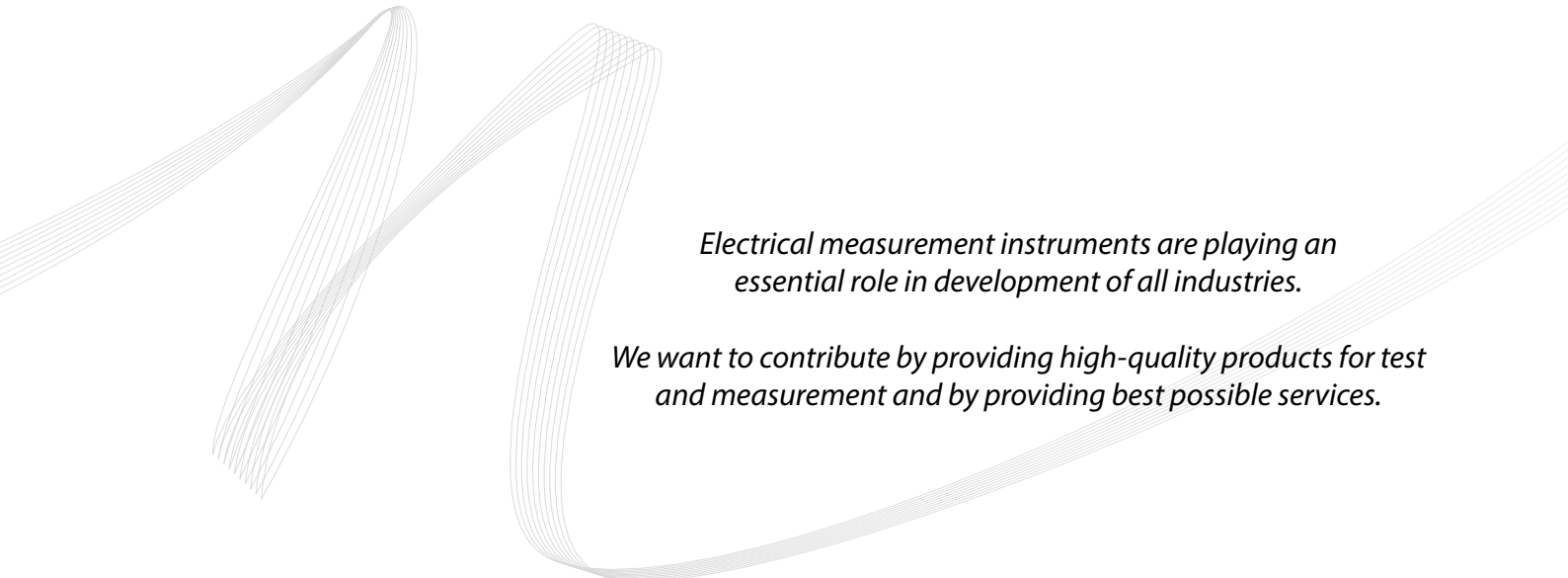
### Power

Active, reactive,  
apparent power,  
PF, harmonic power,  
energy, etc.

**HIGH ACCURACY**  
**HIGH SAMPLING RATE**  
**HIGH RESOLUTION**  
**HIGH DYNAMIC RANGE**  
**HIGH SAFETY CATEGORY**  
**DATA STORAGE**

0.05%  
124kS/s or 1MS/s  
18bit  
0.5mA to 150kA  
CAT IV 600V  
up to 1TB SSD

<b>Batterie</b>	<b>Display</b>
<b>4h</b> 90 Wh	<b>10.1 inch</b> Multi-Touch
<b>Isolation</b>	<b>Standards</b>
<b>6kV</b>	<b>IEC61000-4-30</b> <b>Class A</b>



*Electrical measurement instruments are playing an essential role in development of all industries.*

*We want to contribute by providing high-quality products for test and measurement and by providing best possible services.*

# HIGHLIGHTS



## SMART TOUCH

The large 10.1 inch full-HD Smart Touch display responds immediately without any delay with intuitive operation like on a mobile phone.

## MOBILE OPERATION

The integrated battery pack allows an operating time of up to 4 hours of operation. 5 LEDs indicate the remaining battery capacity. There is no need for an external power supply or special connectors... plug and play.

## GPS

Integrated GPS enables high-precision time measurements & synchronization, which is ideal for PMU applications.



## LARGE SSD

The instrument is equipped with two SSD disks. One is dedicated for the OS and application software, and the other one is equipped for data storage (up to 1 TB).

## INTERFACES

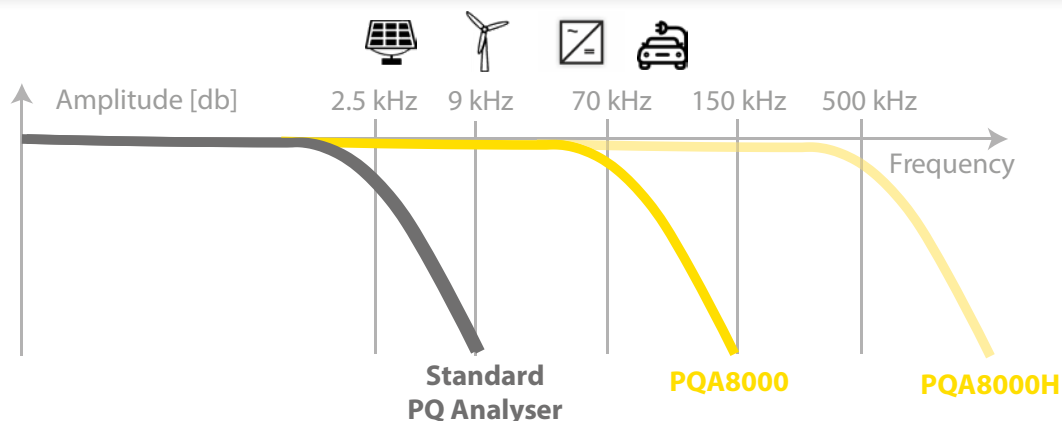
The instrument provides an easy integration with other analog and digital signals such as temperature. The interfaces include USB 3.0, TCP/IP, LAN, Wifi, Bluetooth, RS232, Modbus, 104, DIO, and CAN.

## SENSOR SUPPLY

The instrument can provide excitation for your current sensors, and there is no need for batteries or external power supplies.

## SUPRAHARMONICS UP TO 500 kHz FOR VOLTAGE AND CURRENT

Conventional PQ Analyzers, even if they are Class A certified, are not sufficient for modern measurement applications. We use the best available components to ensure the highest safety category and also the highest accuracy. NEO instruments offer high bandwidth (up to 1 MHz) and correct the frequency dependent behavior of current & voltage sensors as well as integrated electronics to achieve the best possible measurement results.  
*THE REFERENCE INSTRUMENT*



INTRODUCTION

MOBILE POWER QUALITY

POWER QUALITY MONITORS

PQ SYSTEM SOFTWARE

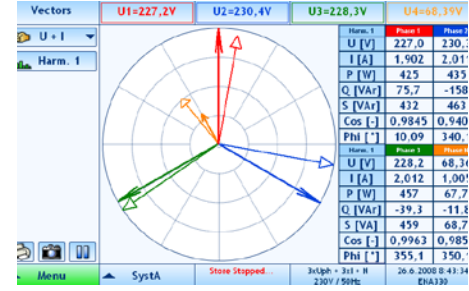
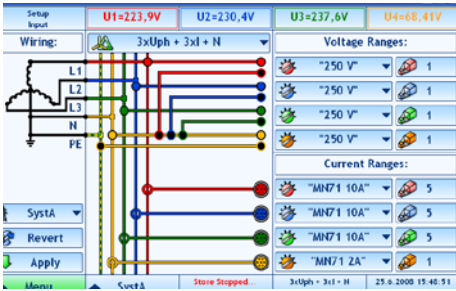
PHOTOVOLTAIIC TESTING

ACCESSORIES

SERVICES & ABOUT NEO

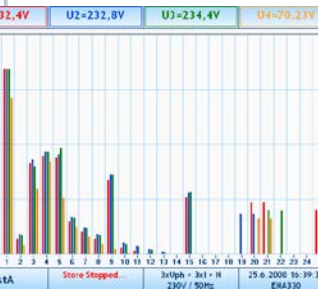
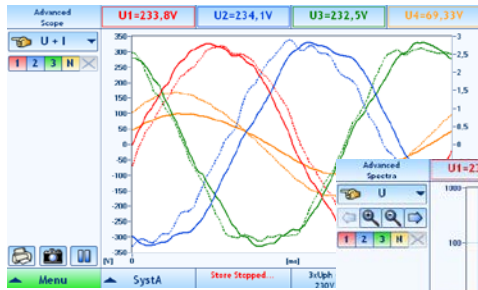
## 1 SETUP

The instrument has a clear structure that shows schematics with explanations.



## 2 MEASURE

During measurements the user can define widgets such as Scopes, Vector Scopes, Harmonic FFTs, Tables, and Recorders.



EasyTable U1=229,6V U2=236,5V U3=2

	Phase 1	Phase 2	Phase
U RMS [V]	229,6	239,8	232,1
I RMS [A]	1,889	2,059	2,011
P [W]	426,5	463,4	465,3
Q [VA]	79,17	-170,1	-59,58
S [VA]	433,8	493,6	465,1
Cos [-]	0,9845	0,9402	0,9963
f [Hz]			49,99



# TRULY INTUITIVE

Intuitive Measurement menus: Clearly structured and explicit menus

# HIGHLIGHTS



**3 ANALYZE**  
Sophisticated functions include PQ Data, Transients, Disturbances, and Alarms.



**4 REPORT**  
The instrument can automatically generate reports and professional documentation. The user can create reports that include all relevant information (location, comments, company logo, etc) directly on-site or during post processing. PDF reports that are saved on the instrument are always available and can be shared directly via email.

**Report  
EN50160**



**Database  
SCADA**



**Remote  
Connection**



**5 EXPORT**  
Data can be exported into CSV, XLS, PDF, Comtrade, and PQDiff.

**6 OTHER PROGRAMS**  
The instrument uses Microsoft Windows® as the operating system. Programs such as Microsoft Excel, Word or Matlab can be added as well as Email messaging services.

INTRODUCTION

MOBILE POWER  
QUALITY

POWER QUALITY  
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ABOUT NEO

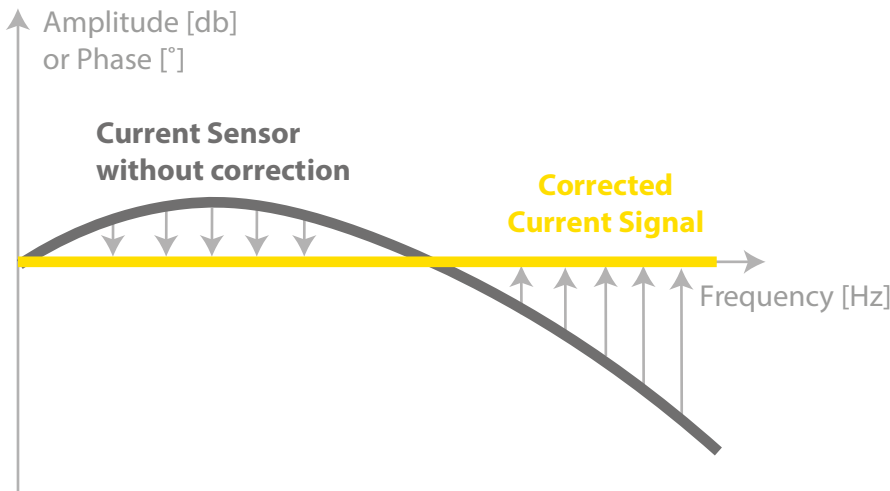
## HIGHEST PRECISION

### The NEO way of Sensor Integration

All current sensors offered by NEO Messtechnik are industry proven for different applications. We use and improve on the best available sensors in the market.

#### 1) FREQUENCY DEPENDENT CALIBRATION

The NEO sensor integration calibrates each sensor over a wide frequency bandwidth and corrects frequency dependent phase shift and amplitude damping. This enables high precision from DC to high-frequency measurements.



#### 2) MEASUREMENT RANGE DEPENDENT CALIBRATION

In addition, the sensors will be calibrated for each measurement range using multiple points. The calibration will typically cover points from 1% to 100% of the nominal measurement range. This will improve the accuracy and precision, especially at low current (e.g., 1% of nominal measurement range).

All sensors will be delivered with a standard calibration, which improves the accuracy compared to nominal specifications, whereas the NEO calibration will be performed on each individual sensor and needs to be ordered separately.



# INSTRUMENT OPTIONS

## PQA8000

4x Voltage Input 1600V DC  
4x Current Input (Rogowski, Clamp)  
CAN / RS485



## PQA8000-P

4x Voltage Input 1600V DC  
6x Current Input (Rogowski, Clamp)  
2x Analog Input ( $\pm 10V$ )  
CAN / RS485 / DIO



## PQA8000-M

4x Voltage Input 1600V DC  
8x Current Input (Rogowski, Clamp)  
CAN / RS485 / DIO



## CUSTOMIZE DESIGN

### Instrument Colour



Customize the color of the rubber perimeter

### Connector Color

-select the color of the connectors to match cabling or standards



In addition, the transport bag of the PQA8000 device can be embroidered with company logos.

# SPECIFICATIONS & ACCESSORIES

INTRODUCTION

MOBILE POWER QUALITY

POWER QUALITY MONITORS

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PHOTOVOLTAIC TESTING

ACCESSORIES

SERVICES & ABOUT NEO

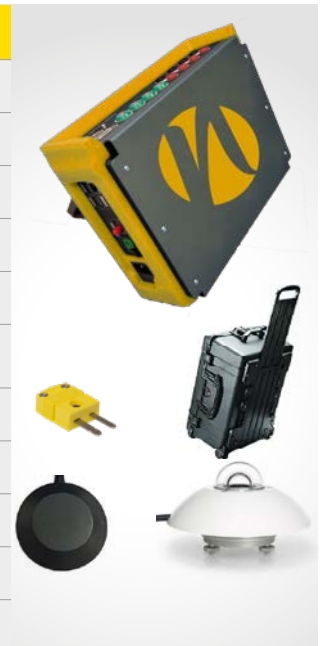


## GENERAL SPECIFICATIONS

<b>PC</b>	Microsoft® Windows 10 IOT(64 bit) Intel® Quad Core Processor and 8GB RAM Locked OS for reliable operation Multilanguage Support
<b>Storage</b>	256GB SSD for OS and application software 256GB SSD dedicated for Data storage
<b>Display</b>	10.1 inch Capacitive Multi-Touch TFT LCD Sunlight Readable / 800cd
<b>Battery</b>	Li-Ion Battery 90Wh up to 4h operation
<b>Power Supply</b>	115V / 230V AC
<b>Interfaces</b>	3x USB, 1x Ethernet, WiFi, 1x HDMI
<b>Dimensions</b>	298 x 225 x 95 mm 11.8 x 8.8 x 3.7 inch
<b>Weight</b>	4kg / 8.8pound
<b>Temperature Range</b>	Operating: 0 to 60°C (32°F to 140°F) Storage: -20 to 80°C (-4°F to 176°F)
<b>IP Class</b>	IP2X
<b>Accessories</b>	Transport Bag and Keyboard included
<b>Standards &amp; Certification</b>	IEC61010-1 (2011) / IEC61010-2-030 / IEC 61000-4-3 / IEC 61000-4-4 / LVD Directive 2014 / EMC Directive 2014/ Rohs Directive 2015/ EN 61000-3-2 / EN 61000-3-3 / EN 61326-1 / EN 55011 +A1, Class A

## OPTIONS AND ACCESSORIES

<b>SSD Upgrade</b>	Upgrade to 512GB or 1TB data storage
<b>GPS</b>	Integrated GPS receiver and GPS mouse
<b>GSM</b>	Integrated Modem for telecommunication
<b>DC Power</b>	DC Power supply input +9V .... +36V DC
<b>Dust Cover</b>	Protect PQA8000 instrument in tough environments
<b>Transport Case</b>	Ruggedized Pelican-Case (IP67), with foamed insert adapted for the measurement instrument and pullout handle
<b>color Code</b>	Color code for all voltage and current inputs
<b>Temperature Sensor</b>	Thermocouple Type K temperature sensor on DSUB15 input
<b>Radiation Sensor</b>	Pyranometer Sensor on DSUB15 input
<b>Current Sensor</b>	See Chapter Accessories
<b>Test Leads</b>	See Chapter Accessories





# SPECIFICATIONS

VOLTAGE INPUTS	
Inputs	4x
Range	Standard: 1600V/ 800V MV-Version: 600V / 20V
Accuracy	0.05% f.s.
Isolation	6kV isolation
Safety	CAT III 1000V CAT IV 600V
Impedance	10 MΩ

CURRENT INPUTS	
Inputs	PQA8000: 4x PQA8000-P: 6x PQA8000-M: 8x
Accuracy	0.05% f.s.
Type	Clamp or Rogowski
Instrument Ranges Clamp	2mV to 10V (15x Ranges)
Integrator Rogowski Range	1A to 300kA
Additional Analog Inputs (AIN)	1V, 2V, 5V, 10 V
Sensor Supply	±15V / 9V
TEDS	Automatic Sensor Detection*
Impedance	10 MΩ



ANALOG DIGITAL CONVERSION (A/D)	
Sampling Rate / Resolution	PQA8000: 124 kS/s / 24bit PQA8000H: 1 MS/s / 18bit
Filters	Analogue and Digital Automatic Anti-Aliasing Filter

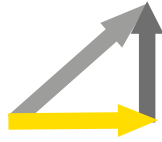
DIGITAL I/O & INTERFACES	
Digital In/Out	Adjustable Trigger max. 350V
CAN, RS485	Selectable Termination

## POWER

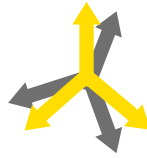
**Voltage  
Current**



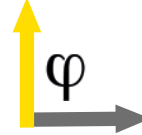
**Power**



**Vector**



**Reactive  
Power**



**Energy**

**kWh**

**Digital  
Signalling**



<b>Power Calculation</b>	P, Q, S, PF, cos phi, D, DH, QH
<b>Frequency</b>	10 sec, AVE, MIN, MAX
<b>Voltage, Current</b>	RMS, AVE, MIN, MAX, 1/2 Period-values, 200ms, 10s, 10min
<b>Energy</b>	Total, positive, negative (P, Q, P+, P-, Q+, Q-)
<b>Efficiency</b>	DC / AC, U-I Curve for PV
<b>Wiring</b>	DC, 1-Phase, 2-Phase, 3-Phase Star and Delta

## WAVEFORM & TRANSIENTS

**Transients**



**Resonances  
Oscillations**



**Switching**



**DC Offset**



**Oversvoltage**



**Undervoltage**



<b>MIN, MAX, RMS, AVE</b>	U, I, P, Q, S, f, PF, phi, THD, Harmonics, Interharm., Unbalance, etc.
<b>ENVELOPE / WINDOW</b>	U, I
<b>DELTA</b>	dU, dI, df, dP, etc.
<b>DERIVATE (RATE OF CHANGE)</b>	dU/dt, df/dt etc. ... per ms, number of periods or half-period
<b>COMBI-TRIGGER</b>	Combination of triggering including multiple conditions
<b>VOLTAGE SIGNALLING</b>	Threshold
<b>RAPID VOLTAGE CHANGES (RVC's)</b>	dU, dc, dt
<b>EN50160</b>	Trigger on any EN50160 parameter (Max, Quantil)

## COMPLYING STANDARDS

### POWER QUALITY, HARMONICS, FLICKER:

IEC61000-4-30 Ed. 3 Class A / IEC61000-4-7 / IEC61000-4-15 / IEC62586-2 Ed. 2 / IEC62586-1

### PUBLIC GRID, RAILWAY AND INDUSTRY

EN50160 / EN50163 / IEC61000-2-2 / IEC61000-2-4 (Class 1; 2; 3) / IEEE519 / IEEE 1159 / IEC61000-2-12 / NRS048

### WIND POWER, RENEWABLES AND GRID CODES

IEC61400-21 / IEC61400-12 / FGW-TR3 / VDE N-4105 / VDE N-4100 / VDE N-4110 / D-A-CH-CZ / BDEW / ROCOF / IEEE C37.118-2005 (PMU)

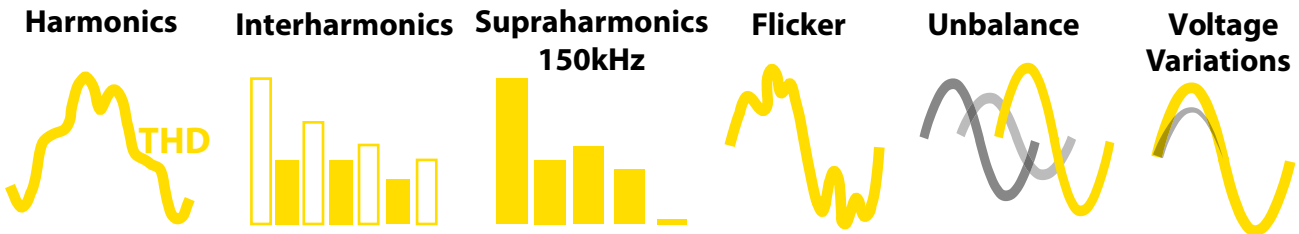
### MOTORS, TRANSFORMERS AND ELECTRICAL EQUIPMENT

IEC60034 / IEC 60076-1 / IEC61000-3-2 / IEC61000-3-3 / IEC61000-3-11 / IEC61000-3-12



# CLASS A++

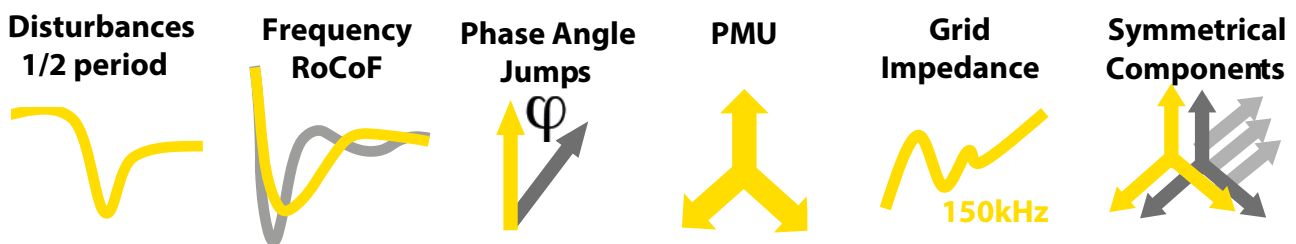
## POWER QUALITY



according to IEC 61000-4-30 Ed.3 and IEC 62586

<b>Harmonics</b> (Voltage, Current, Phi, Power)	Class A
<b>Interharmonics</b>	Class A
<b>THD U, THD I</b>	Class A
<b>Higher Frequencies</b> (200Hz band)	2 - 9 kHz (can be calculated from 0 to definable upper limit)
<b>Higher Frequencies</b> (2000Hz band)	8 - 150 kHz / 500 kHz for voltage and current (PQA 8000H)
<b>Symmetrical Components &amp; Unbalance</b> (Pos-, Neg- and Zero Sequence)	Class A
<b>Rapid Voltage Changes</b>	Class A
<b>Flicker</b> (PST, PLT, Pinst)	Class A
<b>Voltage Events</b> (dip, swell, interruption – time, extrema, length)	Class A
<b>Frequency</b>	10 sec, AVE, MIN, MAX
<b>Voltage, Current</b>	RMS, AVE, MIN, MAX, ½ Period-values, 200ms, 10s, 10min
<b>Time Synchronisation</b>	Class A

## DISTURBANCES AND SYSTEM DYNAMICS



<b>1/2 PERIOD TRIGGER</b>	U, I, P, Q, S, f, PF, phi, THD, Harmonics, Interharm., Unbalance, etc.	
<b>PHASE ANGLE TRIGGER</b>	phi	
<b>SYMMETRICAL COMPONENTS</b>	Pos., Neg., Zero sequence	
<b>RATE OF CHANGE FREQUENCY (ROCOF)</b>	df/dt	
<b>Phasor Measure Unit (PMU)</b> according to IEEE C37.118	Total Vector Error	0.01% (typ.)
	Angle Error	0.003°(typ)
	Timestamp Accuracy	0.1 µs
	up to 50 fps / via TCP / open PDC format / Offline storage possible	

### ADDITIONAL FEATURES INCLUDE

- ✓ compounded trigger settings
- ✓ definable pre-triggers and post-time extensions

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