

# INFORMA PMD-A



Performance measuring and monitoring device

## Providing all the answers needed, not just data, at the click of a button

- Power quality monitoring - IEC 61000-4-30 Class A (Edition 2.0)
- Digital fault recording
- Single screen power system overview
- Device and communication health check

### Product Summary

**Description** Single performance measuring and monitoring device with multi-functional capabilities including Class A power quality and fault recording. 9 (optional: 18/27/36) analog channels available as AC or DC. Eliminates 90% analytical time, very easy to use. Flexible, scalable architecture enables users to acquire only one function at a time adding other functions later

**Application** Distribution substation monitoring



# QUALITROL®

Defining Reliability

# INFORMA PMD-A Performance measuring and monitoring device

## Providing all the answers needed, not just data, at the click of a button

- First monitor that combines (in one device) IEC 61000-4-30 Class A power quality, digital fault recording and energy metering (to double check billing meter)
- Scalable system to meet basic and demanding monitoring requirements
- INFORMATION - NOT DATA: due to the sophisticated software capabilities, the required information is available when needed, where needed and in the desired format
- One click data analysis available via customized shortcuts for preferred analysis style / parameter / device group (a favorite analysis style can be saved for quick, future reference)

## Power quality monitoring IEC 61000-4-30 Class A (Edition 2.0, 2008-10) 3rd party approved

- Power quality measurement in accordance with IEC 61000-4-30 Class A for all parameters
- Continuous recording of up to 1014 parameters (min, max, avg) for 10 minute intervals (frequency in 10 seconds, Plt 2 hours, harmonic reports in 3 second intervals)
- Continuous recording of up to 256 parameters (min, max, avg) for customized time interval (1 min - 24 hours)
- Triggered recordings for sags / dips, swells, interruptions, rapid voltage changes and triggers on other power quality parameters that exceeded predefined thresholds

## Full function digital fault recording

- Fault records (512 samples per cycle) combine analog and digital events in one screen for fault analysis
- Many power quality monitoring devices are only designed to connect to the metering CT. The INFORMA PMD-A can also be connected to the protection CT
- Option available to connect to **both** (protection **and** metering) CTs → applies where accurate normal load current (for power and energy calculation) **and** accurate fault current are required
- Unlike typical power quality monitors, the INFORMA PMD-A has extensive trigger options in addition to the normal sags / dips, swells and interruptions. There are level and rate of change triggers on all calculated parameters including frequency. There is also a power swing trigger based on low frequency oscillations plus triggering from all digital inputs. Records can be initiated by Boolean combinations of individual triggers. It is also possible for multiple devices in a substation to cross trigger each other
- Variable record length up to 30 seconds (shorter when disturbance is shorter)
- Records from different devices can be merged and analyzed as a single DFR composite waveform

## Single screen power system overview

- This patent pending power system overview provides tailored information of your whole system in one single screen
- Supports big monitoring systems with up to 1000 devices
- Enables engineers to get a very quick status of all important PQ parameters

## Device and communication health check

- This single screen of system and device health provides information about device communication, time synchronization, UPS status, power supply failure and critical memory status
- Enables engineers to fix communication infrastructure problems before device data is lost

## High immunity

- The INFORMA PMD-A is designed to comply with Transmission EMC requirements

## Embedded EN 50160 report

- Complete compliance reports automatically computed every week. Can be stored in the device for one year
- Provides rapid overview of the supply quality
- Can be summarized and printed with a single mouse click



### Embedded user defined report

- Standard or user-defined thresholds can be set, e.g, dips defined at -10 % in EN 50160 can be changed to user thresholds of -15 %
- Cumulative probability (CP) of 95% as defined in EN 50160 can also be changed (e.g. 99%)

### Customized reporting

- Meeting utilities specific report requirements. Qualitrol's report writer enables customized reports, the saving of report templates, the creation of automatic reports and notification when critical events happen (via e-mail, text message or mobile phone)
- No need to create regulatory or company internal reports manually

### Plug and play data backup on-site

### USB port for data upload to memory stick

- Plug and play USB port enabling the simple upload of device data onto a USB memory stick when on-site
- Easy data upload in the event that communication infrastructure is out of order
- Copy / synchronize the data into the main database
- Reduce risk of data loss when communication infrastructure breaks down

### IEC 61000-3-6 and 61000-3-7 reports (Edition 2.0, 2008-02)

- Automatic compliance reports in accordance with IEC 61000-3-6 (Assessment of emission limits for distorting loads in MV and HV power systems)
- Automatic compliance reports in accordance with IEC 61000-3-7 (Assessment of emission limits for fluctuating loads in MV and HV power systems)

### Easy commissioning and configuration

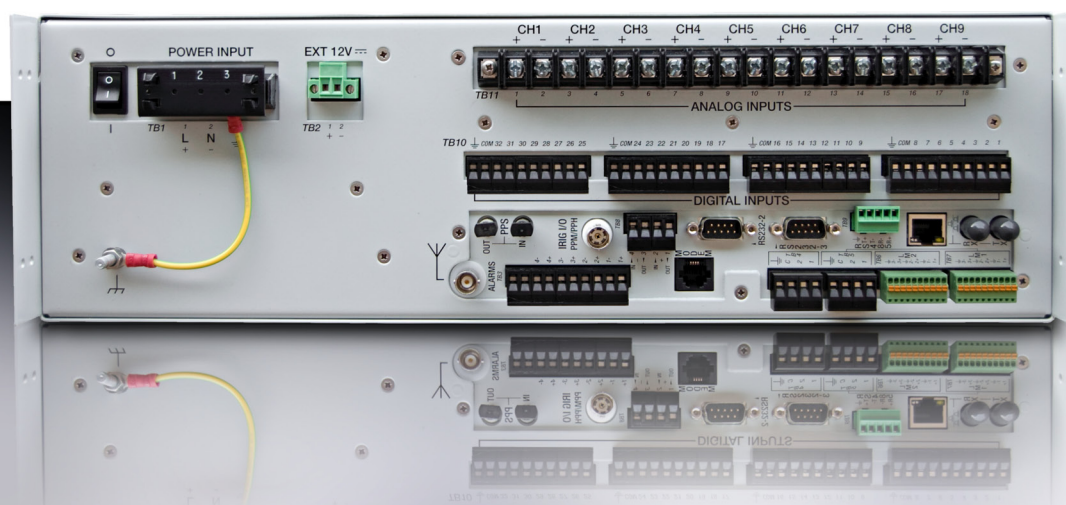
- Device configuration can be copied from one device to another
- The device commissioning tool is designed to avoid that important parameters are not set
- Configuration and commissioning software does not require an installation on a PC, therefore no installation or license is required for the PCs of commissioning personnel
- Instruction for commissioning personnel can be done in a few minutes

### Data available where and how you need it

- The default included database is the Microsoft SQL 2005 Express (4 GB)
- For larger systems the fully licensed Microsoft SQL is used
- The system is designed to work with up to 1000 devices

### Transient Recording

- Capture impulsive transients (mainly caused by lightning) and oscillatory transients (mainly caused by capacitor bank switching) with very high resolution of 20 MHz sampling rate to get additional information to your normal fault record



# INFORMA PMD-A Performance measuring and monitoring device

## INFORMA PMD-A - product description

### IEC 61000-4-30 Class A Power Quality

- Power quality measurement is still a developing market. Basic variables (e.g. RMS values of voltage and current) are well defined but the calculation methods of the PQ quantities were not. With so many different manufacturers and devices available, it is likely to obtain varying results depending on the brand of instrument used. To obtain reliable, repeatable and comparable results, the International Electrotechnical Commission standard, IEC 61000-4-30 has defined standard measurement methods for each type of parameter.

### Focus on user friendliness

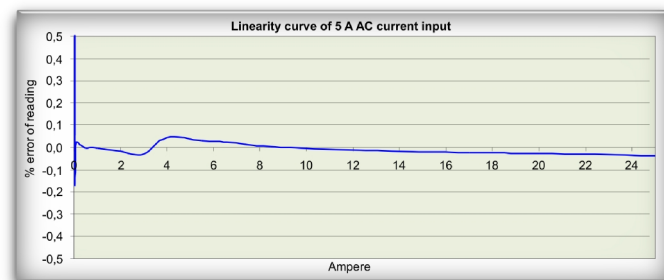
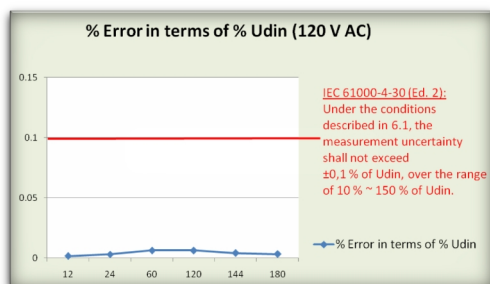
- Delivering ease of use has been the main objective in the development process. Customer requirements collected over the past 20 years influenced the specification. Fast client-less information access (PQ reports), favourite parameters, overview screens, automated analysis, quick configuration copy from one device to another, easy device commissioning (wizard style) and system health checks are just some of the features built in. The end result is a comprehensive package that provides critical analysis at the click of a single button.

### Future proof scalability

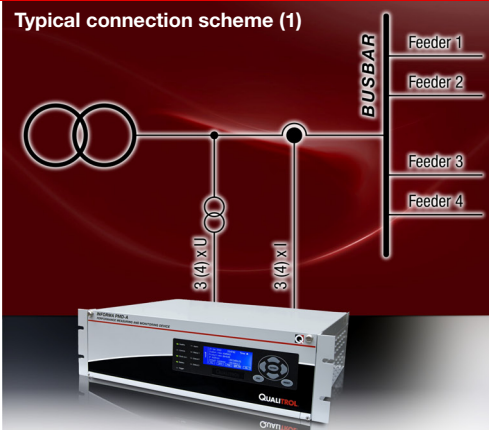
- The INFORMA PMD-A can be expanded in functionality as needs change. It can be configured as a power quality monitor, a simplified digital fault recorder or a fully integrated, full function power quality / digital fault recording device. Adding functionality in the future can be easily and inexpensively accomplished, without the need for an additional, separate device or software.

### Input accuracy

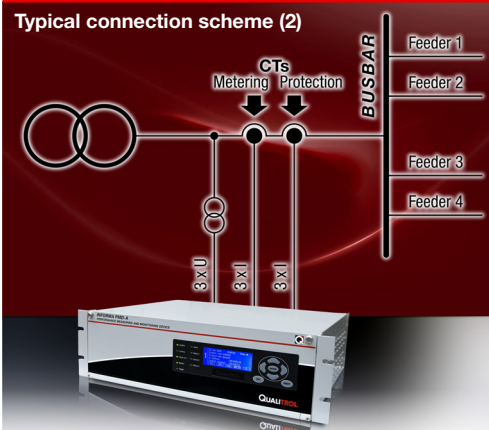
- In accordance with IEC 61000-4-30 Class A.



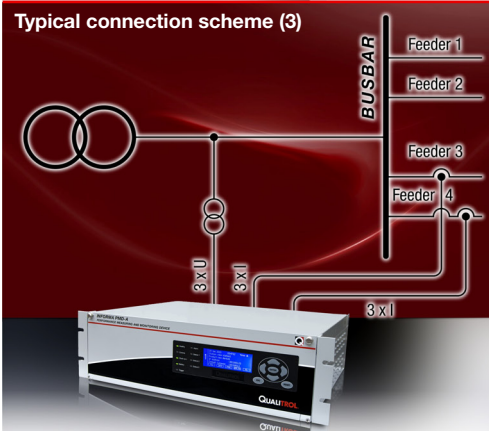
Typical connection scheme (1)



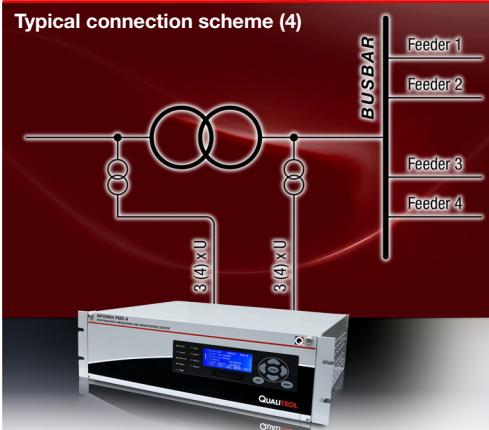
Typical connection scheme (2)



Typical connection scheme (3)



Typical connection scheme (4)





## TECHNICAL SPECIFICATIONS

<b>Overview</b>	Processor	32 bit, 400 MHz processor 9 configurable analog channels for INFORMA PMD-A 3U device 9/18/27/36 configurable analog channels for INFORMA PMD-A 6U device Sampling rate 25.6 kHz at 50 Hz, 30.72 kHz at 60 Hz Bandwidth 25 to 4600 Hz $\pm$ 0.5 dB
	Operating system	MontaVista Linux with real time extensions
	Status indicators	9 LEDs - healthy, communication, clock sync, battery, trigger, alarm and sensors (status)
	Quality system	Developed, designed, and manufactured according to DN ISO 9001:2000
	Calibration	Solid state design, no user adjustments Calibration check to be performed once in 5 years
	Data storage	Compact Flash for record storage 4 GB standard (8 GB/16 GB optional) On-board Flash for firmware - 64 MB A RAM based temporary file system is used to avoid excessive Flash use avoiding Flash wear. The INFORMA firmware is designed to optimize the write operations for every memory block.
	<b>Power supply</b>	Input range
Maximum load		40 VA for 3U INFORMA PMD-A device and 80 VA for 6U INFORMA PMD-A device
Typical load		25 VA for 3U INFORMA PMD-A device and 50 VA for 6U INFORMA PMD-A device
Auxiliary output		DC output 12 VDC at 750 mA
<b>Analog inputs - voltage AC</b>	Input range	Nominal ( <i>full scale</i> ) in VAC: 63.5 (140), 120 (270), 240 (480), 440 (800)
	Safety rating	300 V CAT III, 150 V CAT IV
	Maximum overload	1000 VAC continuous
	Input option 1: TX_AFE	Impedance: > 2.5 M $\Omega$ (at 63.5 V), > 2 M $\Omega$ (at 120 V), > 1 M $\Omega$ (at 240 V), > 0.1 M $\Omega$ (at 440 V) 16-bit resolution for voltage.
	Input option 2: HIA_AFE	Impedance: > 4M $\Omega$ 24-bit resolution for voltage/current channels. Error $\leq$ 0.1 $^\circ$
	Optional for HIA-AFE: Fast Transient Recording	The transient voltage (up to 6 kV) is detected by the TR module with a bandwidth of 2.5 kHz to 5 MHz. Sampling rates (user configurable): 20 MHz, 10 MHz, 5 MHz, 2.5 MHz, 1.25 MHz 12-bit resolution
<b>Analog Inputs - Voltage DC (optional - instead of AC)</b>	Input range	Full scale in VDC: 12, 120, 240, 480
	Safety rating	300 V CAT III, 150 V CAT IV
	Maximum overload	500 VDC continuous
	Input impedance	$\geq$ 420 K $\Omega$ (TX-AFE and HIA-AFE)

# INFORMA PMD-A Performance measuring and monitoring device

## TECHNICAL SPECIFICATIONS

<b>Analog inputs - current</b>	Input range	Nominal ( <i>full scale</i> ) in AAC: 1 (10), 2 (20), 5 (50), 10 (100)
	Maximum overload	200 A for 1 second, 40 A continuous
	Input impedance	< 0.02Ω. 20-bit resolution for current (To achieve a 20-bit resolution on a current channel two 16-bit A/D converters are used with different gain factors to provide an effective 20-bit resolution.)
	Digital inputs	32 (isolated into groups of 8) Voltage range independent from 24/48 to 250 VDC
	Alarm notification	4 form A/B relay outputs (configurable - normally closed or normally open at factory) Relay 1 indicates system healthy Relays 2 and 3 are user configurable for PQ parameters Relay 4 is user configurable for either temperature under/over temperature threshold Resistive load: 250 VAC 5 A, 110 VDC 0.5 A, 48 VDC 1.0 A
<b>Options</b>	Time synchronization	GPS (accuracy ± 300 ns between time masters) IRIG-B modulated and level shift (accuracy ± 2 ms between time masters) Time slave (synchronized through 1 PPS)
<b>Mechanical</b>	Dimensions - 3U device	H x W x D: 132.5 mm [5.2'] x 487 mm [19.2'] x 362.2 mm [14.3']
	Dimensions - 6U device	H x W x D: 265.8 mm [10.5'] x 487 mm [19.2'] x 362.2 mm [14.3']
	Weight - 3U device	15 kg [33.1 lbs] without battery and 15.5 kg [34.2 lbs] with battery
	Weight - 6U device	23 kg [50.1 lbs] without any external battery and 24 kg [52.9 lbs] with two external batteries
	Housing/mounting	Metal 19" rack mountable enclosure
<b>Communication</b>	Ports	Four serial ports (of these, three are RS232 ports with male DB-9 connectors, and one is RS485 with 1*5 pin connector) Internal PSTN (V.90) modem (optional on RS232-2) Two 100 Mb Ethernet ports with RJ45 connectors Optional fiber optic Ethernet (on rear port) Differential (RS485 levels) for 1 PPS for time synchronization Fiber optic 1 PPS output (master) / input (slave)
	Protocols	TCP/IP, Modbus, IEC 60870-5, IEC 61850, GSM, GPRS
<b>Standard compliance</b>		IEC 61000-4-30 Class A IEC 61000-4-7 harmonics and inter-harmonics IEC 61000-4-15 flicker CBEMA, ITIC IEEE 1159, IEEE 519
<b>Environmental</b>	Temperature	Operating: -5°C to 50°C (23°F to 122°F) Cold start is not possible below 0°C (32°F) Storage: -30°C to +70°C (-22°F to +158°F)
	Humidity	0 to 95% non-condensing
	Enclosure	IP 41 according to IEC 60529
	Others	RoHS compliant



## EMC STANDARDS

IEC 60255-22-6 / IEC 61000-4-6 Conducted Susceptibility (CS)	Tested to IEC 61000-4-6. Tested for 10 V, 150 kHz - 80 MHz Tested on power line, RS232 -1, Ethernet port 1, analog inputs (V and I), digital inputs and relay outputs. <i>Passed with Criteria A</i>
IEC 60255-22-4 / IEC 61000-4-4 and ANSI C37.90.1.2002 Electrical fast transient burst test	Tested to IEC 61000-4-4. Tested for 4 kV, 5 kHz / 100 kHz / 2.5 kHz Tested on power line, RS232-1, Ethernet port 1, analog inputs (V and I), digital inputs and relay outputs <i>Passed with Criteria A</i>
IEC 60255-22-3 / IEC 61000-4-3 Radiated Susceptibility (RS)	Tested to IEC 61000-4-3. Tested for 10 V/m, 80 MHz - 1000 MHz Tested on complete device <i>Passed with Criteria A</i>
EN 55011 Conducted Emission (CE)	Tested to CISPR-11. Tested for 79 dB (µV) quasi-peak and 66 dB (µV) average at 0.15 MHz to 0.5 MHz Tested for 73 dB (µV) quasi-peak and 60 dB (µV) average at 0.50 MHz to 5 MHz Tested for 73 dB (µV) quasi-peak and 60 dB (µV) average at 0.50 MHz to 5 MHz Tested on complete device <i>Passed and the emission levels are within the specified limits of CISPR 11</i>
EN 55011 Radiated Emission (CE)	Tested to CISPR-11. Tested for 40 dB (µV/m) quasi-peak from 30 MHz to 230 MHz at 10 m (32.8 ft) Tested for 47 dB (µV/m) quasi-peak from 230 MHz to 1000 MHz at 10 m (32.8 ft) Tested on complete device <i>Passed and the emission levels are within the specified limits of CISPR 11</i>
IEC 61000-4-8 Power frequency magnetic field test	Tested to IEC 61000-4-8. Tested for 30 A/m, x, y, z axis. Tested on complete device <i>Passed with Criteria A</i>
IEC 60255-22-1 / IEC 61000-4-12 and ANSI C37.90.1.2002 Damped oscillatory wave disturbance tests	Tested to IEC 61000-4-12. Tested for 2.5 kV common mode, 1 kV differential mode, 1 MHz Tested on power-line, digital, analog inputs (V), relay <i>Passed with Criteria A</i>
IEC 61000-4-12 Ring wave test	Tested to IEC 61000-4-12. Tested for level 3, ±2 kV common mode, 1 kV differential mode, 100KHz Tested on power-line, digital, analog inputs (V), relay <i>Passed with Criteria A</i>
IEC 61000-4-5 Surge test	Tested to IEC 61000-4-5. Tested for class 4, I/O 4 kV common mode, 2 kV differential mode Tested on power-line, digital, analog inputs (V), relay <i>Passed with Criteria A</i>
ENV 50204 Immunity to EMI from digital radio telephones	Tested to ENV 50204. Tested for level 3, 10 V/m, at 900 MHz ± 5 MHz, at 1890 MHz ± 10 MHz keyed at frequency 200 Hz ± 1%, 50% duty cycle (2.5 ms ON 2.5 ms OFF). Tested on complete device <i>Passed with Criteria A</i>
IEC 60255-5 Clause 6 Dielectric test ANSI IEEE C37.90 - 1989 SWC dielectric tests	Tested to 2.5kV for 1 minute. Tested for 2 kV for power port, analog inputs (V and I), digital inputs, relay and 1 kV for isolated communication ports (RS232 and RS485) <i>No flashover or breakdown occurred</i>
IEC 60255-5 Clause 7 Insulation test	Tested to applied 500 VDC with respect to earth. Tested on power port, analog inputs (V and I), digital inputs and relay. The impedance was greater than 100 MΩ
IEC 60255-5 Clause 8 Impulse voltage test	Tested to ±5 kV, 0.5 J. Tested on power-line, digital, analog inputs (V and I) and relay <i>No flashover or breakdown occurred</i>
IEC 61000-4-11 Supply voltage dips and interruptions	Tested to dips - Class-3, interruptions - Class-3. Tested on Power-port. <i>Passed with dips - Criteria A, interruptions - Criteria B</i>
IEC 60255-22-2 / IEC 61000-4-2 Electro static discharge tests	Tested to IEC 61000-4-2. Tested for 8 kV contact, 15 kV air Tested on enclosure, all accessible I/O lines and ports <i>Passed with Criteria A</i>
IEC 60255-6 / EN60255-6 Supply voltage limit test	Tested for PSU Tested for DC range 80 VDC to 132 VDC
IEC 60068-2-1 / EN60068-2-1 Cold tests	Tested for cold storage -45°C (49°F) for 96 hours. Cold operating -5°C (23°F) for 16 hours Tested on complete device
IEC 60068-2-6 Vibration tests	Tested for 2g acceleration, frequency is 10 - 150 HZ, 20 sweep cycles in each of three mutually perpendicular planes (x, y, and z). Tested on complete device
IEC 60068-2 Cyclic temperature test	Tested for cyclic temperature test for 5 cycles Each cycle has 3 hours for 70 degrees and 3 hours for -5 degree in power off condition Tested on complete device
BS EN 62262:2002 Spring hammer test	Mechanical shocks of 0.5 J
BS EN 60068-2-29 Bump test	Peak acceleration value: 10 ms - 2. Duration of the pulse: 16 ms Number of jolts: 1000 ± 10. Rate: 3 jolts per second
IEC 61000-4-13 Testing and measurement techniques	Harmonics and inter harmonics



## INFORMA PMD-A Performance measuring and monitoring device

Spannungsqualität      Digitaler Störschreiber  
 Qualità dell'Energia Elettrica      Oscilloperturbografo  
 Qualité de la tension      Oscilloperturbographe numérique  
 Calidad de energía      Registrador de fallas digital  
 Qualidade de Energia      Registador digital de defeitos  
 Spanningskwaliteit      Digitale Storingsschrijver  
 Kvalita výkonu      Digitální zapisovač poruch  
 Kvalita elektrické energie      Digitálny zapisovač porúch  
 jakość energii      cyfrowa rejestracja zakłóceń  
 Качество электроэнергии      Цифровой регистратор аварийных событий  
 电能质量管理      故障录波  
 Calitatea Energiei      Inregistrare digitala defect  
 Enerģijas kvalitāte      Digitālais bojājumu reģistrētājs  
 võimsuskvaliteet      digitaalne salvestus

*Power Quality*      *Digital Fault Recorder*

# INFORMA PMD-A

energijos kokybė      skaitmeninis gedimų rašiklis  
 Kakovost električne energije      okvare  
 Kvalitet električne energije      kvara  
 Villamos energia minő      rőrő  
 КАЧЕСТВО НА ЕНЕРГИЯ      ТА  
 Kvaliteta električne en      tra  
 คุณภาพไฟฟ้า      1  
 Chất lượng điện      cđ  
 전력 품질      계  
 Power Quality      n



Power Standards Lab  
**PSL CLASS A**  
 230V 50/60Hz

### QUALITROL® Field Services

QUALITROL® provides on-site commissioning/start-up and comprehensive maintenance contracts to all customers worldwide. To further improve reliability, an extended warranty is available on selected products commissioned by QUALITROL®.

### QUALITROL® Educational Services

QUALITROL® professional training (designed to achieve hands-on performance based objectives) prepares operations, maintenance, and engineering personnel to install, test, configure, operate and maintain QUALITROL® products.

### QUALITROL® Accelerated Delivery

QUALITROL® provides accelerated delivery on many products and services including replacements, spare parts and repairs.

### About QUALITROL®

QUALITROL® manufactures substation and transformer monitoring and protection devices used by electric utilities and manufacturing companies. It is the global leader in sales and installations of transformer asset protection equipment, fault recorders and fault locators. Established in 1945, QUALITROL® produces thousands of different types of products on demand, each customized to customers' unique requirements.

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