

## FAULT RECORDERS



# DR-300 Multi-Function Recorder

## For Distribution Power System Monitoring

The DR-300 is designed for the Distributed Generation Renewables market with Class A PQ and traditional DFR capabilities to capture and diagnose power system anomalies in today's inverter-based applications. With multiple recording modes and continuous transient oscillography, you will never miss an event. The DR-300 captures high speed transients and long-term system disturbances with enough memory to give you a complete view of the system disturbance.

### Multi-Function Capability

The DR-300 is packaged in a compact 3U X 19" rack mount chassis taking the place of several devices, by providing fault and disturbance recording, continuous logging, power quality monitoring and sequence of events recording. All recording modes operate simultaneously and independently to provide a complete picture of system events.

### Ease of Use

The DR-300 is easy to configure, install and operate using the same field proven display station software used in AMETEK Fault Recorders. The compact modular architecture is suited for all applications by adding up to four input modules to the chassis to fit your needs.

### High Reliability

The DR-300 is highly reliable, incorporating a low-power fan-less operation with no moving parts and a 64 GB solid-state drive for long-term storage. Each chassis can be equipped with up to four input modules, configured with six analog and 12 digital inputs, for a maximum 24 analog and 48 digital inputs, multiple time sync options, three programmable contact outputs and optional battery backup. Input modules each have their own dedicated processor for independent monitoring.

Multiple independent ethernet ports support simultaneous connections for reliable network communications and secure data transfers.

## FEATURES AND BENEFITS

- Multiple recording modes - capture high speed transient faults and long-term disturbances
- Never miss an event - flexible triggering, continuous transient oscillography and longer recording times
- Ease of use - 100% software configurable, no jumpers or switches
- High reliability - 64 GB solid-state memory, no moving parts
- Field proven display station software - single software platform for all products
- Synchrophasor (PMU) C37.118.1a-2014<sup>1</sup>
- IEC 61850 (edition 2) MMS & GOOSE<sup>1</sup>
- DNP 3.0<sup>1</sup>
- PQ standards (IEC 61000-4-30 Class A)<sup>1</sup>

### Field Proven Technology - Never Miss An Event

The core strength of AMETEK Recorders is the extensive triggering and recording capabilities to ensure you never miss an event. Flexible triggering options make it easy to capture a simple fault or uncover a complex system anomaly. Independent of any triggers, the transient oscillography feature provides continuous waveform recording for four<sup>1</sup> days to capture events that are too sensitive for your triggers or to extend pre-and post-fault data recorded.

# SPECIFICATIONS

## INPUTS

### Analog Inputs

- Built in DSP for computations
- 16 bits, 32,768 levels (15 plus signs)
- Fixed 256 samples/cycle (26 kHz/31 kHz)
- Accuracy better than 0.1% of reading down to 3% of full scale voltage input ranges
- 1.414, 10, 150, 300 V RMS full-scale or custom range (AC or DC compatible)

### Current Input Ranges

- 1 A or 5 A RMS nominal (thru current shunts/ CICT's)

### Frequency Response

- DC-1/2 sampling rate

### Digital Inputs

- 24 to 250 VDC normally open or closed wetted contact

### Input Modules - up to 4 IMs

- Fixed 6 analog (current or voltage)
- Fixed 12 digital

### System Capacity

- 6, 12, 18 or 24 analog (current or voltage)
- 12, 24, 36 or 48 digital
- Multiple units tied together for larger systems

## TRIGGERING (TRANSIENT/DISTURBANCE)

### Analog Channels

- Voltage/current: over/under, rate of change (ROC)
- Harmonics: THD and individual harmonics (2 per channel)

### Phase Group Sequence Triggers

- Over zero, over negative, over/under and ROC positive sequence

### Frequency

- Frequency channels 1 & 2, frequency differential, over/under, ROC

### Digital Channels

- Normal to alarm state and return to normal state. Edge or level sensitive.

## TRIGGERING (DISTURBANCE)

### Analog Channels

- Over/under level of fundamental and ROC, frequency and ROCOF

### Line Group Triggers

- Over/under, ROC
- Impedance, power factor, power factor displacement, power oscillation, power (watts, VARs, VA)

## RECORDING (TRANSIENT)

### Recording Rate

- 32, 64, 128 & 256 SPC (samples/cycle)
- 1.6, 3.2, 6.4, 12.8 & 25.6 kHz (50 Hz)
- 1.9, 3.8, 7.7, 15.6 & 30.7 kHz (60 Hz)

### Pre-fault time

- 2 to 300 cycles

### Post-fault time

- 8 to 50 cycles. Fault length extends while trigger condition exists.

### Safety Window

- 0 to 8 cycles recording time after active trigger

### Recording Duration

- 0 to 30 sec. (prevents memory filling with a continuous trigger)

## RECORDING (DISTURBANCE)

### Recording Rate

- 0.5, 1.0 & 2.0 SPC
- ½, 1 or 2 X supply frequency (25/50/100 Hz or 30/60/120 Hz) pre-fault
- 10 sec. to 5 min

### Post-fault Time

- 30 sec. to 2 min.
- Fault length extends while trigger point condition exists.

### Safety Window

- 30 sec. to 1 min., recording time after active trigger

### Recording Duration

- 60 sec. to 20 min.

### Recorded Values

- Voltage and current phasor and RMS values and frequency (x2)

## CONTINUOUS RECORDING (LOGGING)

### Recording Rate

- 1 min.

### Recording Time

- 52 weeks

### Stored Parameters

- Voltage and current per channel, watts (per circuit)
- Frequency (2 channels)

## CONTINUOUS RECORDING (POWER QUALITY)

### Recording Rate

- 10 min.

### Recording Time

- 52 weeks

### Stored Parameters

- Voltage imbalance, flicker, individual harmonics to 128th

## SER RECORDING

- 1 msec. recording of all digital inputs

## CONTINUOUS RECORDING (TRANSIENT OSCILLOGRAPHY)

### Recording Interval

- 8, 16, 32 samples/cycle
- 400, 800, 1,600 Hz (50 Hz)
- 480, 960, 1,440 Hz (60 Hz)
- Recording duration
- 1 to 4<sup>1</sup> days (depending on sample rate)

## CONTINUOUS RECORDING (DISTURBANCE LOGGER)

### Recording Rate

- ½ or 1 x supply frequency (25/50 Hz or 30/60 Hz)

\*additional licensing required

### Recording Time

- 14 to 28 days (based on recording rate) stored parameters
- Voltage and current phasors RMS values and frequency +(x2)

## SYSTEM TIMING

### Time Synchronization Accuracy

- Internal GPS receiver
- IRIG-B (Mod & TTL)
- NTP

## COMMUNICATIONS

### Network Protocol: TCP/IP

- 10/100 Base-TX, (1 Front, 2 Rear)
- 3 X RJ/45 type (1 Front, 2 Rear)

### USB Serial Ports

- 3 x USB -2 (1 Front, 2 Rear)

## DATA STORAGE

### Solid-State Storage

- 64 GB internal solid-state memory

## POWER SUPPLY

### Input Voltage Options

- 88 to 373 VDC, 85 to 264 VAC

### Power Requirement

- 65 W

### Battery Backup Optional

- 20 min. duration

## ENCLOSURE

### Chassis

- Cabinet mount (11.75 in x 16.0 in x 8.25 in) (300 mm x 400 mm x 210 mm)
- 3U (7") 19" chassis mount

## ENVIRONMENT

### Operating Temperature

- 14°F to 131°F (-10°C to 55°C)

### Relative Humidity

- 0 to 97% non-condensing

## CERTIFICATIONS & STANDARDS

### CE

### Complies with Power Industry Substation Standards Including: vibration tests for relays and protection equipment

- IEC 60255-21-(1, 2, 3)
- Measuring relays and protection equipment, electromechanical compatibility - for Class B Installation.
- IEC 60255-26-(IEC 61000-4-(2-12), 16-18) CISPR11, 22
- IEC 60255-27

### Electrical Equipment for Measurement, Control & Laboratory Use - EMC

- EC 61326-1 (IEC 61000-4-(2-6, 8-12, 16-18, 29)
- Environmental testing

### WORLD HEADQUARTERS

255 North Union Street  
Rochester, NY 14605  
Toll Free: +1.800.950.6686  
Tel: +585.263.7700  
Fax: +585.454.7805

### EUROPEAN HEADQUARTERS

UK  
+44.770.280.9377  
power.sales@ametek.com

### ASIA PACIFIC HEADQUARTERS

Singapore  
+65.6484.2388  
sales@ametekasia.com

### AMETEK INSTRUMENTS INDIA PVT. LTD.

Bengaluru  
+91.80.6782.3252  
power.sales@ametek.com

### WEBSITE

www.ametekpower.com

### EMAIL

power.sales@ametek.com



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