DigiAMR

HIGHEST ACCURACY & LOWEST COST

Digital Circuit Breaker Analyzer

DigiAMR

Open, Close, Open-Close, Close-Open and Open-Close-Close.

Timing a breaker's contact and relays ($V_{trigger}$: 30-300V).

LCD screen, "QWERTY" keypad, printer and USB Interface.

Store up to 200 test records & 100 circuit breaker test plans.

"On-line" Timing Mode.

amperis

www.amperis.com

The Amperis DigiAMR is an inexpensive, easy to use digital circuit breaker analyzer. The DigiAMR can be operated stand-alone or can be computer controlled. It can fully analyze a circuit-breaker's performance by testing the contact time, stroke, velocity, over-travel, and contact wipe. Contact and motion analysis can be performed for all breaker contact operations (Open, Close, Open – Close, Close – Open, and Open – Close – Open). Timing results are recorded and displayed on the 256 x 128 pixels back-lit LCD screen and can also be printed on the built-in 4.5" wide thermal printer.

"On-line" Timing Mode

In addition to the conventional off-line timing mode, the DigiAMR also offers an optional "on-line" timing mode. In this mode, the DigiAMR captures the breaker's trip or close time, the trip/close coil current "fingerprint," and the battery supply voltage while the breaker is still in service. The trip/close time is derived from the time of trip, or close coil initiation, to the breaker's bushing current breaker-make as detected by an AC clamp-on current sensing probe.

The "on-line" timing mode can detect a breaker's operating conditions with little or no down time. In this mode, the first trip operation time of the breaker is captured. If a breaker has been in service for a long period of time and sitting in close position, the first trip time of the breaker may be slow possibly due to a sticky mechanism. The "on-line" mode is very useful in such cases because traditional breaker timing may not detect this condition since several operations may have occurred before the first timing test is conducted.

Diagnostic Capabilities

The DigiAMR can perform diagnostics on its internal electronics. Diagnostics can be performed to verify contact cable connections and to test the travel transducer's electronics.

Internal Test Record and Test Plan Storage

The DigiAMR can store up to 200 test records and 100 circuit breaker test plans in Flash EEPROM. A test plan comprises of all circuit breaker performance specifications (Stroke, Velocity, and Contact Time). When a test plan is used, the DigiAMR compares the test results for the circuit breaker against its performance to generate a "Pass/Fail" report.

Test plans are generated using the included Windows®-based Circuit Breaker Analysis application. Test plans can be transferred to the DigiAMR via the USB or optional Bluetooth interface, or by using an external USB Flash drive. Up to 999 test records and 999 test plans can be stored on an external USB Flash drive.

Open/Close Coil Current Monitoring

A built-in Hall-Effect current sensor records the circuit breaker's operating coil current amplitude and duration. The circuit breakers' operating-coil waveforms (effectively, a performance "fingerprint" or "current profile") can be used as a diagnostic tool for analyzing a circuit breaker's performance.

DigiAMR's Connections

DigiAMR's Controls

Ext. Trigger Input Connector

Voltage Input Channels

Contact Timing Channels

USB Flash Drive Interface

Back-lit LCD Screen (240 x 128 pixels)

Rugged "QWERTY"-style membrane keypad

AC Clamp-on Current Probe

Bluetooth Status Indicator

Digital Transducer Connectors

Breaker Initiate Output

USB PC Interface

Breaker Initiate Arm Switch

4.5" Wide Thermal Printer

Contact Timing Inputs
Dry-contact input channels are used for timing circuit-breaker contacts. Each contact input channel can detect main contact and insertion resistor contact times in milli-seconds and cycles. Three contact timing channels are available on the DigiAMR.

Breaker Stroke and Velocity
One digital transducer input channel is available to measure circuit breaker contact stroke, velocity, over-travel, and bounce-back. With the use of a Vanguard digital travel transducer, no set-up calibration is required before testing. A special feature is also available to "Slow-Close" test a circuit breaker and obtains test results. An optional Resistor Transducer Adapter Device can be used to interface with any resistor transducer.

CT Input
One non-contact AC current sensor is used to monitor circuit breaker on-line current for the "on-line" timing mode.

Voltage Monitoring Input
One analog input channel, designated as (V1), is dedicated to monitoring the substation DC supply or coil voltage (0-255 Volts, DC or peak AC). A second voltage input channel, designated as V2, is dedicated to detecting voltage On/Off status (presence or absence). This input can be used to monitor the status of an A/B switch.

Circuit Breaker Initiate Feature
A built-in solid-state initiate device is used to operate the circuit breaker from the DigiAMR. Operational modes include Open, Close, Open-Close, Close-Open, and Open-Close-Open. Multiple operations such as Open-Close, Close-Open, and Open-Close-Open can be initiated using a programmable delay or by sensing the circuit breaker's contact condition. The circuit breaker coil current amplitudes and waveforms are recorded and can be printed on the thermal printer.

Computer Interface
One USB interface port and one optional Bluetooth interface is available for computer-control. Amperis' Windows®- based Circuit Breaker Analyzer application is included with each DigiAMR. The software can be used to control the unit, review test records, and create circuit breaker test plans. Test records can be exported to PDF, Excel, and XML format. All future software updates can be downloaded from the Vanguard web site at no additional charge.

User Interface
The DigiAMR features a back-lit (256 x 128 pixels) graphic LCD screen to display menus and test results. A convenient, rugged, 44-key QWERTY-style keypad is used to control the unit and enter data.
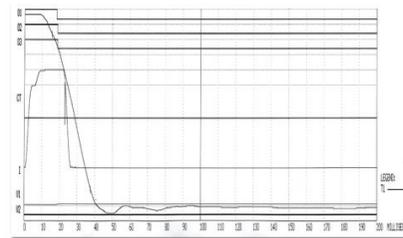
Built-in Thermal Printer
The DigiAMR features a built-in 4.5" wide thermal printer that can print test results in both tabulated and graphic format.

DigiAMR's Specifications

Type	Portable Digital Circuit Breaker Analyzer
Physical specifications	18K"W x 14"H x 7"D (47.0 cm x 35.7cm x 17.6 cm). 20 lbs (9.1 kg)
Input power	100-240Vac, 3A, 50/60Hz
Dry-contact inputs	3 dry-contact channels; each channel detects main contact and insertion resistor contact
Timing windows	1 second, 10 seconds, or 20 seconds
Timing resolutions	±50 micro-seconds @ 1 sec. duration, ±500 micro-seconds @ 10 sec. duration, ±1.0 milli-seconds @ 20 sec. duration
Timing accuracy	0.05% of reading ±0.1 milli-seconds @ 1 second duration
Dry-contact detection range	Closed: Less than 20 Ohm. Opened: greater than 5000 ohm
Resistor detection range	50 - 5,000 ohms
Trigger input voltage	Open/close: 30 - 300 V, DC or peak AC
Voltage sensing input range	V1: analog input; 0 - 255 V DC or peak AC; sensitivity ±1 V
	V2: voltage presence/absence detector input; 30 - 300 V DC or peak AC
Breaker operations	Initiate Open, Close, Open-Close, Close-Open, Open-Close-Open
Breaker initiate capacity	30A, 250 Vac/dc max
Initiate current reading range	One, non-contact, Hall-effect sensor, 0 - 20 amp range, dc to 5 Khz AC
Digital travel transducer inputs	1 digital travel transducer channel; linear range: 0.0 - 60.0 in (±0.005 in). Rotary range: 0 - 360 degrees (±0.006 degrees)
Contact travel point difference	Measures "slow-close" contact-point distances; results can be printed
CT current sensor	One, non-contact, 0-100A
Display	Back-lit LCD screen (128 x 240 pixels); viewable in bright sunlight and low light
Printer	Built-in 4½" wide thermal printer that can print both graphic contact travel waveforms and tabulated test results
Internal test record storage	Store up to 200 test records and 100 test plans
Computer interfaces	One USB port, optional Bluetooth wireless interface
Pc software	Windows® based Breaker Analysis software included with purchase price
Cables	Furnished with full set of test leads (including 20-foot contact leads and 30-foot contact lead extensions)
Options	Transportation case (available for the DigiAMR and travel transducers)
Safety	Designed to meet UL/IEC 61010 and CAN/CSA C22.2 No. 1010.1-92 standards
Environment	Operating: -10°C to +50°C (+15°F to +122°F); Storage: -30°C to +70°C (-22°F to +158°F)
Humidity	90% RH @ 40°C (104°F) non-condensing
Altitude	2,000 m (6,562 ft) to full safety specifications
Warranty	One year on parts and labor

Thermal printout of tabulated test results

Thermal printout of graphic test results

NOTE: the above specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F). Specifications are subject to change without notice