



DOBLE PROTECTION TESTING

DRTS 34L

DIGITAL RELAY TEST SYSTEM



AUTOMATED THREE-CURRENT, FOUR-VOLTAGE SECONDARY DEVICE TEST AND MEASUREMENT INSTRUMENT

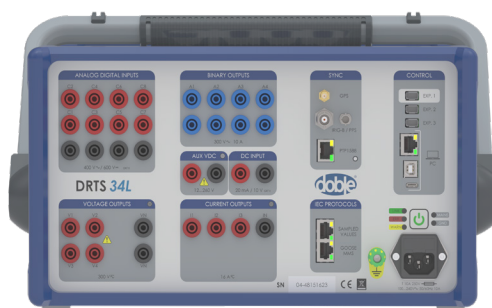
DRTS L-SERIES TEST SETS

Precision meets purpose in the DRTS L-Series from Doble. Designed specifically for modern relays with 1 A (ampere) CT inputs, any of the four variants offers robust analog and digital functionality for single and three-phase testing across relays, IEDs, energy meters, power quality meters, and transducers. Choose the model with the current and voltage configuration you require and have high accuracy across 0.16 A, 1.6 A, and 16 A ranges plus multiple integrated test and measurement tools in a right-sized instrument built for precision—not excess.



DRTS 33L:

3 x 16 A, 3 x 300 V
13.4 kg (29.5 lbs).



DRTS 34L:

3 x 16 A, 4 x 300 V
13.6 kg (30.0 lbs)



DRTS 64L:

6 x 16 A, 4 x 300 V
15.8 kg (34.8 lbs)

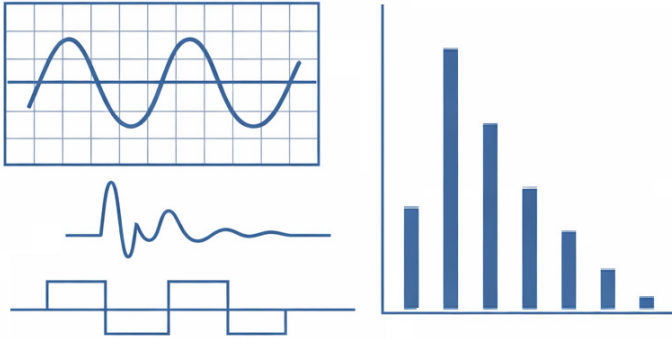


DRTS 66L:

6 x 16 A, 6 x 300 V
16.0 kg (35.3 lbs)

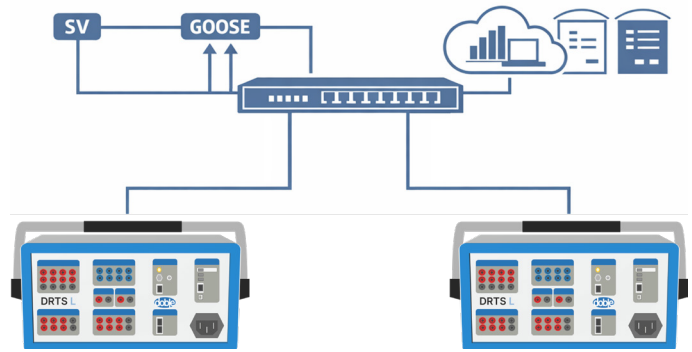
IEC 61850 Compatible

Dedicated CPUs, one for publishing sampled values (optional) and one for publishing and subscribing to GOOSE mean uncompromising performance when testing IEDs in digital protection and control schemes.



Efficient and Practical

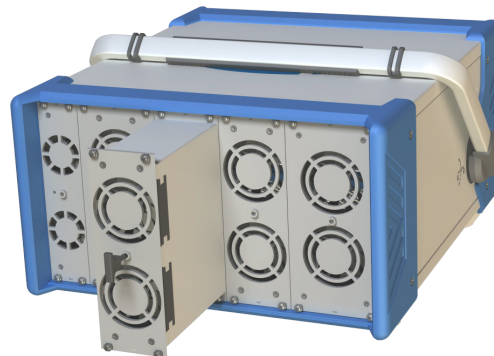
Instrument layout and Class D amplifiers contribute excellent heat dissipation. Easily removable current and voltage modules simplify instrument maintenance.



Supports Advanced Diagnostics

The Transcope™ module in TDMS Pro software converts analog trip inputs into several network analysis tools:

- Multimeter
- Oscilloscope
- Data logger
- Waveform recorder



Ergonomic

Compact dimensions (35 W x 18 H x 35 D cm), limited weight, multi-position locking handle, retractable tilt feet that elevate the front panel during horizontal use, and two bumpers that provide protection from impacts and allow secure upright operation.



DRTS 34L

Three 16 A Current Sources / Four 300 V Voltage Sources



Configurations

DRTS L-Series test sets are offered in three levels - Core, Expanded, and Full - allowing you to choose configurations that best suit for your testing requirements and operational environment.

	CORE	EXPANDED	FULL
Part Number	43700	47700	29700
Standard Features 8 x Multifunction Inputs 4 x Binary Outputs 1 x DC Voltage Output 1 x DC Voltage / DC Current Measurement Input	•	•	•
GOOSE Publishing and Subscribing IEC 61850-8 Edition 2.0	•	•	•
Energy Meter and Transducer Testing	•	•	•
Power Quality and Network Analysis	•	•	•
Time Synchronization GPS IRIG-B (fiber and copper) Pulse Per Second Precision Time Protocol		•	•
Sampled Values Publishing IEC 61850-9-LE and IEC 61869-9			•



TDMS Pro

Automated Test and Data Management Software



TDMS Pro is the integrated software platform of DRTS L-Series instruments. The modern interface provides all the tools needed for driving powerful test and measurement procedures as well as efficient data management, analysis, and reporting. TDMS Pro seamlessly incorporates testing with IEC 61850 protocols for a consistent user experience between digital and conventional test cases.



DRTS 34L Technical Information

Current Outputs	Number of Channels	3
	Max Current per Channel	16 A
	Max Power per Current Channel	3 X 100 VA @ 8 A to 16 A
	Current Generator Bandwidth	0 Hz to 2 kHz (sinewave) 0 Hz to 5 kHz (transient)
	Max Amplitude Derating per Channel	16 A @ 0 Hz to 1 kHz 8 A @ 2 kHz
	Programmable Rate of Change	Min $\pm 0,001$ A/s Max ± 999 A/s
	Max 1-phase Current (all generators connected in parallel)	1 X 48 A
	Max 1-phase Power (all generators connected in parallel)	1 X 300 VA @ 48 A
	Max 1-phase Power (generators in series)	1 X 200 VA @ 16 A
	Max DC Current	48 A
	Accuracy	Range 1: 0 to 16 A I < 50 % of the range: < 0,02 % reading + 0,005 % range (typical) < 0,04 % reading + 0,007 % range (guaranteed) I $\geq$ 50 % of the range: < 0,04 % reading + 0,005 % range (typical) < 0,08 % reading + 0,007 % range (guaranteed) Range 2: 0 to 1,6 A < 0,04 % reading + 0,007 % range (guaranteed) Range 3: 0 to 0,16 A < 0,05 % reading + 0,02 % range (guaranteed)
	Resolution	0,25 mA (range 16 A) 0,1 mA (range 1,6 A) 0,05 mA (range 0,16 A)
	Distortion (TDH+N) @ 50/60 Hz	< 0,1 %
	Signaling of Overload Conditions (open circuit)	Generation is stopped automatically, alerting the operator with an alarm signal

Voltage Outputs	Number of Channels	4
	Max Voltage per Channel	300 V
	Max Power per Voltage Channel	4 x 50 VA @ 125 V to 300 V
	Max 3-phase Power	3 x 50 VA @ 125 V to 300 V
	Voltage Generator Bandwidth	0 Hz to 2 kHz (sinusoidal) 0 Hz to 5 kHz (transient)
	Max Amplitude Derating	300 V @ 0 Hz to 700 Hz 100 V @ 0 Hz to 2 kHz
	Programmable Rate of Change	Min $\pm 0,001$ V/s Max ± 999 V/s
	Max 1-phase Voltage (2 voltage generators in series)	600 V
	Max 1-phase Power (2 voltage generators in series)	100 VA @ 0 V to 600 V
	Max DC Power	270 W @ 300 V
	Accuracy	Range 1: 0 to 300 V < 0,05 % reading + 0,01 % range (typical) < 0,1 % reading + 0,02 % range (guaranteed) Range 2: 0 to 12,5 V < 0,05 % reading + 0,01 % range (typical) < 0,1 % reading + 0,02 % range (guaranteed) Range 3: 0 to 125 V < 0,02 % reading + 0,005 % range (typical) < 0,04 % reading + 0,01 % range (guaranteed)
	Resolution	0,3 mV (range 300 V) 0,1 mV (range 125 V) 0,2 mV (range 12,5 V)
	Distortion (TDH+N) @ 50/60 Hz	< 0,1 %
Output Frequency and Angle	Signaling of Overload Conditions (short circuit)	Generation is stopped automatically, alerting the operator with an alarm signal
	Frequency Accuracy	0,5 ppm (25 μ Hz @ 50 Hz)
	Frequency Resolution	0,1 mHz
	Programmable Rate of Change (frequency)	Min $\pm 0,001$ Hz/s Max $\pm 999,999$ Hz/s
	Frequency Thermal Drift	< 0,1 ppm/°C @ 45 to 65 Hz
	Angle Accuracy @ 50/60 Hz	Typical $\pm 0,02^\circ$ Guaranteed $\pm 0,05^\circ$
	Angle Resolution	0,001°
	Programmable Rate of Change (angle)	Min $\pm 0,1$ °/s Max ± 999 °/s

Digital Inputs	Number of Inputs	8
	Galvanic Insulation	By groups of 2
	Insulation Voltage	1 kV
	Input Impedance	1 MΩ
	Max Input Voltage	600 VDC
	Adjustable Thresholds	* Potential free * User defined: - range 2 ÷ 400 V DC - resolution 1 V
	Sampling Frequency	10 kHz (for time measurement) 100 kHz (for pulse counting)
	Time Measurement Accuracy	< 0,025 % reading ± 0,1 ms
AC/DC Analog Inputs	Number of Measurement Inputs	8
	Ranges of Measurement	0,1 V / 1 V / 10 V / 100 V / 425 V (RMS)
	Accuracy	< 0,06 % range (typical) < 0,15 % range (guaranteed) For the 0,1 V range only: < 0,15 % range (typical) < 0,3 % range (guaranteed)
	Input Impedance	500 kΩ / 50 pF
	Sampling Frequency	500 Hz / 1 kHz / 2 kHz / 5 kHz / 10 kHz / 20 kHz / 50 kHz
	Recording Duration	8 channels simultaneously: 100 s @ 5 kHz sampling 3 channels simultaneously: 120 s @ 10 kHz sampling 1 channel: 80 s @ 50 kHz sampling
Binary Outputs	Number of Outputs	4 relays
	Relay Characteristics	V max: 300 Vac / 300 Vdc I max: 10 Aac / 10 Adc P max: 2400 VA / 250 W
	Switching Time	< 5 ms
Auxilliary DC Voltage Output	Output Voltage	12 to 260 V DC
	Output Power	50 W
	Accuracy	< 1% reading + 0,1 % range
DC Voltage Measurement Input	Range	10 V DC
	Accuracy	0,02 % reading ± 0,01 % range
	Resolution	10 μV
	Impedance	400 kΩ
DC Current Measurement Input	Range	5 mA / 20 mA
	Accuracy	< 0,05 % reading ± 0,02 % range (up to 5 mA) < 0,02 % reading ± 0,01 % range (up to 20 mA)
	Resolution	10 nA
	Impedance	120 Ω



IEC 61850-8 Edition 2.0	Max Number of GOOSE Published	128
	Max Number of Virtual Outputs	360
	Max Number of GOOSE Subscribed	128
	Max Number of Virtual Inputs	360
	Connector Type	RJ45
	Time Synchronization	SNTP Server
	Performance	Type 1A; Class P2 (IEC 61850-5) Processing time < 1 ms
	Certifications 	IEC 61850 Ed.2.0, UCAIUG Conformance Test Procedures for Server Devices with IEC 61850-8-1 Ed.2 interface – Rev.2.0.6
Power Over Ethernet	Standard	IEEE 802.3af - Type 1
	Port Capability	Class 3 (12.95 W)
Miscellaneous	PC Communication	1 x Type B USB port 1 x Type C USB port 1 x Ethernet port
	Supply Voltage	95 to 255 VAC, single phase sinusoidal
	Supply Frequency	47 to 63 Hz
	Max Power Consumption	1200 W
	Weight	13.6 kg (30.0 lbs)
	Dimensions	350 (W) X 180 (H) X 350 (D) mm

Network Time Synchronization

Time Synchronization	GPS Time Accuracy	1 μ s
	GPS Input Type	SMA connector for external antenna
	IRIG-B Time Accuracy	10 μ s
	IRIG-B Input Type	Optical fiber (ST type) and BNC
	IRIG-B Standards	IRIG-B00x, IRIG-B12x AM 1 kHz
	PPS Time Accuracy	1 μ s
	PPS Input Type	Optical fiber (ST type) and BNC
	SNTP Time Accuracy	1 ms
	SNTP Input Type	RJ45
	PTP Time Accuracy	100 ns
	PTP Input Type	RJ45
	PTP Standards	IEEE 1588-2008 (Power Profile) IEC 61850-9-3 (Utility Profile)

Sampled Values Publishing

IEC 61850-9-2LE	Max Number of Sampled Values Streams	3 streams up to 4 voltages + 4 currents each
	Sampled Values Publishing	* Sampled Values only * Sampled Values and Conventional Sources
	Connector Type	RJ45
	Time Synchronization	PPS analog PPS fiber
	Certification	 UCAIUG 9-2LE, UCAIUG Test Procedures for Sampled Values Publishers according to IEC 61850-9-2 (9-2LE) Rev.1.1 and TPCL v.1.1
IEC 61869-9	Max Number of Sampled Values Streams	3 streams up to 4 voltages + 4 currents each 1 stream up to 12 voltages + 12 currents
	Sampled Values Publishing	* Sampled Values only * Sampled Values and Conventional Sources
	Connector Type	RJ 45
	Time Synchronization	PPS fiber Precision Time Protocol
	Certification	 IEC 61850 Ed.2.1, UCAIUG Conformance Test Procedures for Server Devices with IEC 61850-8-1 Edition 2 Amd.1 interface Revision Rev1.2

Optional Hardware and Accessories

PTP Grandmaster Antenna (part number 98462)	Supported Protocol	IEEE 1588-2008; IEEE C37.238-2011 or 2017 Power Profile
	Time Accuracy	< 100 ns under clear sky
	Output Synchronization Rate	128 packets per second
	Power Consumption	< 12 W
	Power Supply	Power Over Ethernet IEEE 802.3af - Type 1 Power Range 44 - 56 VDC
	Weight	300 g (0.66 lbs)
	Degree of Protection	IP65
	Accessories Included	Ethernet cable (20 meters) Tripod for the antenna Rigid transport case
Industrial Media Converter (part number 21700)	Industrial Protocol	IEEE 1588 v.2 PTP (Precision Time Protocol) transparent clock mode
	Physical Ports	2 x 10/100/1000 BASE-T Gigabit Ethernet RJ45 ports 2 x 100/1000/2500 BASE-X SFP ports for SFP type auto detection
	SFP LC Connector	2 connectors included
Transport Case (part number 16700)	Features	Molded case construction Top and side handles Wheels
	Dimensions	604 (W) x 473 (D) x 283 (H) mm
	Weight	9.0 kg (19.8 lbs)
Cable Set	Cables	1 x Ethernet (2 meters) 1 x Ethernet (5 meters) 1 x USB-B to USB-A (2 meters) 1 x USB-C to USB-C (2 meters) 1 x for expansion port (1 meter) 1 x for mains power
	Test Leads	9 x red (2 meters) 4 x yellow (2 meters) 4 x blue (2 meters) 7 x black (2 meters) 1 x ground lead with clamp (6 meters)
	Jumpers	4 x red
	Crocodile Clips	4 x red 4 x black
	Adapters	10 x for screw-type terminals (red) 10 x for screw-type terminals (black) 20 x for cable lugs
	Carry Bag	Soft construction Tear opening Shoulder strap



DRTS 34L

DIGITAL RELAY TEST SYSTEM

- 3 x 16 A / 4 x 300 V sources
- Class 0.2S meter accuracy
- Dedicated SV and GOOSE CPUs
- Right-sized, multifunctional, and reliable in extreme conditions



To request a demo, speak with your Doble representative.



Doble Engineering
Worldwide Headquarters
123 Felton Street, Marlborough, MA 01752
USA tel +1 617 926 4900 | fax +1 617 926 0528
www.doble.com