

TDMS

- protective relays
- energy meters
- transducers
- power quality
- CT-VT-PT
- transformers
- ground grid
- circuit breakers
- batteries
- surge arresters

Protective Relays have a very important role to play in the prevention of damage to equipment like generators, transformers, busbars, feeders and transmission lines.

Reliability and consequently the maintenance; mis-operation and consequently the failure to operate, finally the relaying scheme can be verified and checked with the help of test sets.

ISA has a complete and wide range of automatic test sets that can fulfil all the basic and advanced testing requirements to assure the correct behaviour of relays installed in networks. Furthermore thanks to the leading edge technology of its test sets, ISA can also provide advanced automatic testing for transducers, energy meter and power quality meters.

TDMS Test & Data Management Software is the Integrated testing solution to perform any substation apparatus commissioning and maintenance

- Multi-tasking test set designed for testing protection relays, energy meters, transducers.
- Powerful and lightweight.
- High accuracy: better than 0.1% (standard); HP model better than 0,05%.
- IEC61850 Protocol interface.
- Up to 9 current and 6 voltage outputs plus auxiliary D.C. supply.
- USB and RS232 port.
- Laptop PC or PDA control.

DRTS 6 has been designed to test:

- All Protection Relays
- Watt-hour meters
- Transducers
- Meters

A P P L I C A T I O N

DRTS 6 can test all the following relays

RELAY TYPE	IEEE NO
Distance relay	21
Synchronizing device	25
Under/over-voltage relay	27/59
Directional Power relay	32
Field relay	40
Reverse phase current relay	46
Phase sequence voltage relay	47
Incomplete sequence relay	48
Instantaneous over-current relay	50
Inverse time over-current relay	51
Power factor relay	55
Voltage balance relay	60
Ground detector relay	64
Directional over-current relay	67
Phase angle out of step relay	78
Automatic reclosing relay	79
Frequency relay	81
Pilot wire receiver relay	85
Lockout relay	86
Differential protection relay	87
Voltage directional relay	91
Power directional relay	92
Tripping relay	94



DRTS 6 SPECIFICATIONS

Six phase AC/DC current outputs

AC/DC current outputs

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
6 X	0...15	80	0.35	230 μ A
6 X	0...1.5		0.35	23 μ A
6 X	0...0.15		0.35	2 μ A
3 X	0...15	100	0.44	230 μ A
3 X	0...1.5		0.44	23 μ A
3 X	0...0.15		0.44	2 μ A
3 X	0...30	160	0.18	460 μ A
3 X	0...3		0.18	46 μ A
3 X	0...0.3		0.18	5 μ A
3 X	0...15	160	0.71	230 μ A
2 X	0...45	240	0.12	690 μ A
1 X	0...90	480	0.06	1.38 mA
1 X	0...30	320	0.35	460 μ A

- Six independent current sources with a common neutral.
- Independent adjustment of current outputs.
- Duty cycle: continuous.
- Waveform resolution: 28 bit.
- Capable of stepping or ramping the current.
- Rate of change programmable between ± 0.001 A/s and ± 999 A/s.
- Output accuracy: $\pm 0.025\%$ typical, $\pm 0.1\%$ guaranteed.
- Distortion: 0.03% total maximum.
- Automatic protection for overloads and open circuit.

Four phase AC/DC voltage outputs

AC/DC voltage outputs

	VOLTAGE V	POWER VA	ZMAX Ohm	RESOLUTION
4 X	0...125	85	195	1.9 mV
3 X	0...12.5		195	190 μ V
3 X	0...1		195	19 μ V
1 X	0...250	160	390	3.8 mV
1 X	0...125	160	97	1.9 mV
OPTIONAL 300 V OUTPUT				
4 X	0...300	85	1125	4.6 mV
3 X	0...125	85	195	1.9 mV
3 X	0...12.5		195	190 μ V
1 X	0...600	160	390	9.2 mV
1 X	0...300	160	97	4.6 mV

- Four independent voltage sources, with a common neutral.
- Independent adjustment of voltage outputs.
- Duty cycle: continuous.
- Waveform resolution: 28 bit.
- Capable of stepping or ramping the voltage.
- Rate of change programmable between ± 0.001 V/s and ± 999 V/s.
- Voltage accuracy: $\pm 0.1\%$ of the value, $\pm 0.02\%$ of the range.
- Distortion: 0.1% total maximum.
- Automatic protection for overloads, counter-feed and short circuit.
- The fourth voltage output can be selected to act as:
 - . Fourth voltage output V4 (AC/DC);
 - . Zero-sequence component
$$V_0 = (V_1+V_2+V_3)/3$$
 or
$$V_0 = (V_1+V_2 +V_3/1.73).$$

Battery simulator

Output voltage: 0...260 V DC, program controlled.
 Power: 100 W or 2 A on all range; continuous duty.
 Accuracy: $\pm 1\%$.
 Automatic protection for overloads.
 Step or ramp control.

Angles

Phase angle range: $0^\circ - 360^\circ$.
 Angle resolution: 0.01° .
 Angle accuracy: $\pm 0.1^\circ$.
 Step or ramp control with a rate of change between $\pm 0.1^\circ/s$ and $999^\circ/s$.

Output frequency

Frequency range: from DC (0 Hz) to 2000 Hz. Transient 5 kHz.
 Capable of generating different frequencies on any output.
 Maximum frequency error: 25 μ Hz (0.5 ppm).
 Resolution: 0.1 mHz.
 Programmable df/dt between ± 0.01 Hz/s and 999 Hz/s for easy testing of load shedding relays.
 Capable of generating waveform with superimposed harmonic distortion.

Low Level Signal Outputs

The purpose of these low voltage outputs is to test protection relays that use transducers such as Rogowsky coils and voltage dividers; for this simulation low voltage inputs are necessary.

Number of outputs: 6.

Full range V & I output: 0... 7.26 V rms.

Frequency: DC to 20 kHz.

Output current: 5 mA max.

Resolution: 0.43 mV or 0.043 mV.

Accuracy: 0.02% typical, 0.1% guaranteed.

Distortion: 0.01% typical.

Binary inputs

10 binary inputs clean or with voltage from 24 to 250 V AC and 4 to 300 V DC, separated in two groups of 5, with two common points isolated at 1 kV AC.

Selection of the type of input: Voltage clean;

5 - 24 - 48 - 110 V; software controlled.

Selection of input debounce:

from 0 to 2,000 μ s; software controlled.

Timer range: 0 - 999,999.9999 s (277 hours) or, in cycles:

0 - 50,000,000 cycles (50 Hz);

0 - 60,000,000 cycles (60 Hz).

Resolution: 0.1 ms, 0.005 cycles.

Timer accuracy: 0.01% of reading \pm 0.1 ms.

Event recording resolution: 1 ms.

Counter inputs

These inputs allow testing energy meters, including high frequency outputs.

Number of inputs: 2; with no common zero point.

Frequency range: 0 to 50 kHz.

Auxiliary outputs

Four timed relay contacts; both normal open and normal closed provided.

Characteristics of contacts with a resistive load:

. Maximum voltage: 300 V AC/DC;

. Maximum current: 8 A.

Range of programmable delay: from 0 to 999.99 s.

Analog Measurements (optional):

DC Current measuring Input, Low

Measuring range: \pm 20 mA.

Accuracy: 0.02%.

DC Voltage measuring Input, Low

Measuring range \pm 10 V.

Accuracy: 0.02%.

AC/DC Current measuring Input, High

Measuring range: \pm 20 A.

Accuracy: 0.2% DC; 0.3% AC.

AC/DC Voltage measuring Input, High

Measuring range \pm 250 V.

Accuracy: 0.1% DC; 0.2% AC.

Interface connection

Type of interface: USB and RS232 at 57.6 kbaud.

Power supply

Mains power supply: 90 to 264 V AC single phase.

Frequency: 47 to 63 Hz.

Power consumption:

. at rest: less than 150 W;

. maximum load: 1600 W.

Case

Aluminum, with carrying handle.

Weight and dimensions

Weight: 18 kg.

Dimensions: 170 (h) x 470 (w) x 430 (d) mm.

Accessories supplied with the unit

Protective carrying bag.

Set of test leads.

Power supply cable.

Serial interface cable and USB cable.

Instruction and maintenance manuals.

DRTS 6 HP

High Precision option

This option has enhanced characteristics with respect to the standard model. This model is conceived for the test of class 0.2 energy meters.

The following table summarizes the performances of the DRTS 6 HP (High Precision) version with respect to the standard one.

STANDARD DRTS 6 ACCURACY	
OUTPUT CURRENT	Typical: $\pm 0.05\% \pm 0.01\%$ of range Maximum: $\pm 0.1\% \pm 0.02\%$ of range
OUTPUT VOLTAGE	Typical: $\pm 0.05\% \pm 0.01\%$ of range Maximum: $\pm 0.1\% \pm 0.02\%$ of range
PHASE ANGLE	Typical: $\pm 0.02^\circ$ Maximum: $\pm 0.05^\circ$
POWER	Typical: $\pm 0.05\%$ Maximum: $\pm 0.2\%$

DRTS 6 HP ACCURACY	
OUTPUT CURRENT	Typical: $\pm 0.02\%$ from 0.1 to 15 A Maximum: $\pm 0.05\%$ from 0.1 to 15 A
OUTPUT VOLTAGE	Typical: $\pm 0.02\%$ from 50 to 300 V Maximum: $\pm 0.05\%$ from 50 to 300 V
PHASE ANGLE	Typical: $\pm 0.01^\circ$ Maximum: $\pm 0.02^\circ$
POWER	Typical: $\pm 0.05\%$ Maximum: $\pm 0.1\%$

ADDITIONAL EXTERNAL AMPLIFIERS FOR DRTS 6

AMI 99 Three phase current amplifier



The three phase current amplifier AMI 99 is an additional device to the DRTS 6. DRTS 6 in connection with AMI 99 allows to have 9 currents or 6 currents at 30 A per phase or three currents at 60 A per phase.

AMI 99 with DRTS 6

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
9 X	6 x 0...15	80	0.35	230 μ A
	3 x 0...30	160	0.18	460 μ A
9 X	6 x 0...1.5			23 μ
	3 x 0...3			46 μ A
9 X	6 x 0...0.15			2.3 μ A
	3 x 0...0.3			4.6 μ A
6 X	0...30	160	0.18	460 μ A
6 X	0...3		0.18	46 μ A
6 X	0...0.3		0.18	4.6 μ A
3 X	0...60	320	0.09	920 μ A
3 X	0...6		0.09	92 μ A
3 X	0...0.6		0.09	9.2 μ A
1 X	0...180	760	0.023	2.8 mA

AMI 99 stand alone

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
3 X	0...30	160	0.18	460 μ A
3 X	0...3		0.18	46 μ A
3 X	0...0.3		0.18	4.6 μ A
3 X	0...30	320	0.35	460 μ A
1 X	0...90	480	0.06	1.38 mA

AMI 99 stand alone

- Three independent current sources, with a common neutral.
- Automatic range switch and independent range selection.
- Waveform resolution: 28 bit.
- Output accuracy: $\pm 0.1\%$ of the value, $\pm 0.02\%$ of the range.
- Distortion: 0.1% total maximum, with any load.
- Automatic protection for overloads.
- Angle accuracy: $\pm 0.1^\circ$.

Power supply

Mains power supply: 90 to 264 V AC, single phase.

Frequency: 47 to 63 Hz.

Power consumption:

- at rest: less than 100 W;
- maximum load: 1000 W.

Weight and dimensions

Weight: 16 kg.

Dimensions without the handle:

170 (h) x 470 (w) x 430 (d) mm.

Case

Case: aluminium, with carrying handle.

Accessories supplied with the unit

Protective plastic bag. Mains supply cable to DRTS 6.

Interconnecting cable to DRTS 6.

AMI 66

Three phase current amplifier



The three phase current amplifier AMI 66 is an accessory for DRTS 6 for tests that require nine independent currents at the same time (two secondary differential transformers). The three current outputs of AMI 66 can be generated together with DRTS 6: this also allows paralleling current outputs thus increasing output current and power.

AMI 66 with DRTS 6

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
9 X	0...15	80	0.35	230 μ A
9 X	0...1.5		0.35	23 μ A
9 X	0...0.15		0.35	2.3 μ A
3 X	0...45	240	0.12	690 μ A
3 X	0...4.5		0.12	69 μ A
3 X	0...0.45		0.12	7 μ A
1 X	0...120	640	0.04	2 Ma

AMI 66 stand alone

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
3 X	0...15	80	0.35	230 μ A
3 X	0...1.5		0.35	23 μ A
3 X	0...0.15		0.35	2.3 μ A
1 X	0...15	160	0.71	230 μ A
1 X	0...30	160	0.18	460 μ A

- Three independent current sources, without a common neutral.
- Accuracy: 0.1% of the value, \pm 0.02% of the range.
- Automatic protection for overloads.
- Waveform resolution: 24 bit.
- Frequency range: from 0 Hz to 2 kHz; transient 5 kHz.

Power supply

- Mains power supply: 110 or 230 V AC, single phase; to be specified at order.
- Frequency: 47 to 63 Hz.
- Power consumption, maximum load: 800 W.

Weight and dimensions

Weight: 7 kg.

Dimensions: 200 (h) x 470 (w) x 360 (d) mm.

Case

Aluminium, with handle.

Accessories supplied with the unit

Power supply cable.

Connection cable to DRTS 6.

AMIV 66

Three phase current and two phase voltage amplifier



The three phase current and two phase voltage amplifier AMIV 66 is an accessory for the DRTS 6 for tests that require nine independent currents at the same time (two secondary differential transformers), or six voltages at the same time (synchronising devices), or six currents and six voltages. The three current outputs of AMIV 66 can be generated together with DRTS 6: this also allows paralleling current outputs, thus increasing output current and power.

Three phase current generator

AMIV 66 with DRTS 6

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
9 X	0...15	80	0.35	230 μ A
9 X	0...1.5		0.35	23 μ A
9 X	0...0.15		0.35	2.3 μ A
3 X	0...45	240	0.12	690 μ A
3 X	0...4.5		0.12	69 μ A
3 X	0...0.45		0.12	7 μ A
1 X	0...120	640	0.04	2 Ma

AMIV 66 stand alone

	CURRENT A	POWER VA	ZMAX Ohm	RESOLUTION
3 X	0...15	80	0.35	230 μ A
3 X	0...1.5		0.35	23 μ A
3 X	0...0.15		0.35	2.3 μ A
1 X	0...15	160	0.71	230 μ A
1 X	0...30	160	0.18	460 μ A

- Three independent current sources, with a common neutral.
- Output frequency: from 0 Hz to 2000 Hz; transient 5 kHz.
- Waveform resolution: 28 bit.
- Output accuracy: $\pm 0.1\%$ of the value, $\pm 0.02\%$ of the range.
- Distortion: 0.1% total maximum, with any load.
- Automatic protection for overloads.
- Angle accuracy: $\pm 0.1^\circ$.

Two phase voltage generator

AMIV 66 with DRTS 6

	VOLTAGE V	POWER VA	ZMAX Ohm	RESOLUTION
6 X	0...125	80	195	1.9 mV
6 X	0...12.5		195	190 μ V
6 X	0...1		195	19 μ V
1 X	0...250	320	195	3.8 mV
1 X	0...125	320	50	1.9 mV
OPTIONAL 300 V OUTPUT				
6 X	0...300	80	1125	4.6 mV
6 X	0...125	80	195	1.9 mV
6 X	0...12.5		195	190 μ V
1 X	0...600	320	1125	9.2 mV
1 X	0...300	320	280	4.6 Mv

AMIV 66 stand alone

	VOLTAGE V	POWER VA	ZMAX Ohm	RESOLUTION
2 X	0...125	80	195	1.9 mV
2 X	0...12.5		195	190 μ V
2 X	0...1		195	19 μ V
1 X	0...250	160	390	3.8 mV
1 X	0...125	160	97	1.9 mV
OPTIONAL 300 V OUTPUT				
2 X	0...300	80	1125	4.6 mV
2 X	0...125	80	195	1.9 mV
2 X	0...12.5		195	190 μ V
1 X	0...600	160	2250	9.2 mV
1 X	0...300	160	560	4.6 Mv

- Three independent voltage sources, with a common neutral.
- Output frequency: from 0 Hz to 2000 Hz; transient 5 kHz.
- Waveform resolution: 28 bit.
- Output accuracy: $\pm 0.1\%$ of the value, $\pm 0.02\%$ of the range.
- Distortion: 0.1% total maximum, with any load.
- Automatic protection for overloads.
- Angle accuracy: $\pm 0.1^\circ$.

Power supply

Power supply voltage: 90 to 264 V AC single phase.
 Frequency: 47 to 63 Hz.
 Power consumption, maximum load: 1000 W.

Case

Aluminium, with carrying handle.
 Accessories supplied with the unit
 Power supply cable. Interconnecting cable to DRTS 6.
 Plastic carrying bags.

Weight and dimensions

Weight: 13 kg.
 Dimensions: 170 (h) x 470 (w) x 360 (d) mm.

AMV 66

Two phase voltage amplifier



The two phase voltage amplifier AMV 66 is an accessory for the DRTS 6, for tests that require six voltages at the same time (synchronising devices).

Two phase voltage generator

AMV 66 with DRTS 6

	VOLTAGE V	POWER VA	ZMAX Ohm	RESOLUTION
6 X	0...125	80	195	1.9 mV
6 X	0...12.5		195	190 μ V
6 X	0...1		195	19 μ V
1 X	0...250	320	195	3.8 mV
1 X	0...125	320	50	1.9 mV
OPTIONAL 300 V OUTPUT				
6 X	0...300	80	1125	4.6 mV
6 X	0...125	80	195	1.9 mV
6 X	0...12.5		195	190 μ V
1 X	0...600	320	1125	9.2 mV
1 X	0...300	320	280	4.6 mV

AMV 66 stand alone

	VOLTAGE V	POWER VA	ZMAX Ohm	RESOLUTION
2 X	0...125	80	195	1.9 mV
2 X	0...12.5		195	190 μ V
2 X	0...1		195	19 μ V
1 X	0...250	160	390	3.8 mV
1 X	0...125	160	97	1.9 mV
OPTIONAL 300 V OUTPUT				
2 X	0...300	80	1125	4.6 mV
2 X	0...125	80	195	1.9 mV
2 X	0...12.5		195	190 μ V
1 X	0...600	160	2250	9.2 mV
1 X	0...300	160	560	4.6 mV

- Three independent voltage sources, with a common neutral.
- Output frequency: from 0 Hz to 2000 Hz; transient 5 kHz.
- Waveform resolution: 28 bit.
- Output accuracy: $\pm 0.1\%$ of the value, $\pm 0.02\%$ of the range.
- Distortion: 0.1% total maximum, with any load.
- Automatic protection for overloads.
- Angle accuracy: $\pm 0.1^\circ$.

Power supply

Power supply voltage: 90 to 264 V AC single phase.
 Frequency: 47 to 63 Hz.
 Power consumption, maximum load: 500 W.

Case

Aluminium, with carrying handle.

Accessories supplied with the unit

Power supply cable.
Interconnecting cable to DRTS 6.

Weight and dimensions

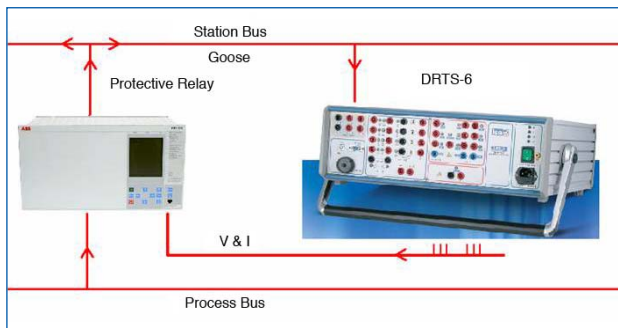
Weight: 7 kg.
Dimensions: 170 (h) x 230 (w) x 360 (d) mm.

OPTIONAL ACCESSORIES

IEC 61850 interface

The standard IEC 61850 describes the communication of devices in substations. IEC61850 messages coming from the devices connected to the substation network (such as a relay) are also called GOOSE. GOOSE messages describe binary status signals over the substation network and are also used for relays tripping. For relay testing applications within IEC 61850 substations it is necessary to access to these data. This new feature is performed by ISA Automatic Relay Test Set DRTS 6 and with the new software TDMS rev. 5.01. By means of a dedicated hardware and the TDMS software, ISA DRTS 6 can expand his testing capabilities by handling those IEC61850 messages.

The IEC61850 Interface option for DRTS 6 is required for relay testing with Ethernet-based substation communication protocol. The IEC61850 Interface is mounted directly on the front panel of the DRTS 6.



IN2-CDG current booster for 1 A rated high burden relays

With DRTS 6 the full power of 100 VA is available only at the current of 15 A.

The option IN2-CDG by means of a set of three current transformers, with the following characteristics:

- Primaries: 12.5 A and 15 A;
- Secondaries: 0.5 A; 1 A; 2.5 A; 5 A;
- Nominal power: 100 VA;
- Current ratio error: 0.2.

Case: plastic.

For the single phase test of the CDG relay it is possible to have three times the above power, connecting current outputs in series.

I100A current booster

The option I100A is set of six current transformers, that allows to perform the following tests:

- With DRTS 6, 3x50 A;
- With DRTS 6 and AMI 99, 6X50 A (differential relays) or 3x100 A (over-current relays).

Characteristics:

- Primary: 3x(2x15) +3x30 A;
- Secondary: 6x50 A, that can be put in parallel, to form 3x100 A;
- Nominal power: 6x120 VA @ 50 A, or 3x240 VA, steady;
- Current ratio error: 0.5%;
- Frequency range: 40 Hz to 2 kHz.

Case: plastic.

Dimensions: 400 x 300 x 175 mm.

Weight: 14 kg.

Inputs from DRTS 6 are put in parallel inside the option: all transformers have 30 A on the primary and 50 A on the secondary.

The option includes twelve connecting cables to DRTS 6 and AMI 99 current outputs, 1 m long, 6 sq. mm cross section.

With this options, it is possible to perform the following tests:

- . With DRTS 6 only, 3x50 A;
- . With AMI 99, 6X50 A (differential relays) or 3x100 A (over-current relays).

Goose List					
Order Goose List by <input type="text" value="Goose ID"/>					
#	Src Mac Address	Dest Mac Address	Goose ID	Data set Reference	Event Timestamp
1	00:80:82:59:1C:34	01:0C:CD:01:00:02	ABB_REL670LD0/LLN0\$GO\$G_ZM1_TRIPS	ABB_REL670LD0/LLN0\$ZM1_TRIPS	2007-10-02 15.58.27,938
2	00:80:82:59:1C:34	01:0C:CD:01:00:03	ABB_REL670LD0/LLN0\$GO\$G_ZM2_STARTS	ABB_REL670LD0/LLN0\$ZM2_STARTS	2007-10-02 16.00.35,954
3	00:80:82:59:1C:34	01:0C:CD:01:00:03	ABB_REL670LD0/LLN0\$GO\$G_ZM2_STARTS	ABB_REL670LD0/LLN0\$ZM2_STARTS	2007-10-02 16.00.35,954
4	00:80:82:59:1C:34	01:0C:CD:01:00:03	ABB_REL670LD0/LLN0\$GO\$G_ZM2_STARTS	ABB_REL670LD0/LLN0\$ZM2_STARTS	2007-10-02 16.00.35,954
5	00:80:82:59:1C:34	01:0C:CD:01:00:03	ABB_REL670LD0/LLN0\$GO\$G_ZM2_STARTS	ABB_REL670LD0/LLN0\$ZM2_STARTS	2007-10-02 16.00.36,977
6	00:80:82:59:1C:34	01:0C:CD:01:00:04	ABB_REL670LD0/LLN0\$GO\$G_ZM2_TRIP	ABB_REL670LD0/LLN0\$ZM2_TRIP	2007-10-02 16.00.36,977
7	00:80:82:59:1C:34	01:0C:CD:01:00:01	ABB_REL670LD0/LLN0\$GO\$G_TRIP	ABB_REL670LD0/LLN0\$TRIPS	2007-10-02 16.01.47,938

Optional GPS synchronizer



External module for synchronization of two DRTS 6 sets via GPS system, for end to end test of differential relays.

1 digital output 0-24 V DC, for synchronisation.

1 selector to program the following pulse intervals:

5 s; 10 s; 20 s; 30 s; 40 s; 60 s.

Maximum timing error with respect to nominal: 2 μ s.

Two test sets synchronized with GPS produce the maximum error of 50 μ s.

Power supply: 110/220 V AC.

The option includes the antenna and connection cables.

Weight: 1.7 kg.

Dimensions: 150 x 100 x 240 mm.

Case: plastic case.

IO-6432 Digital input and output expansion

The option IO-6432 increases the number of logic inputs and outputs that can be monitored by the DRTS 6. The option adds to inputs and outputs that are located in the DRTS 6.

The IO-6432 is fitted internally in the DRTS 6 unit.

IO-6432 Specification

Inputs

Number of inputs: 64, by 4 groups of 16.

Inputs: logic, voltage from 5 to 130 V DC; maximum load current 3 mA.

Input and output groups are isolated from each other; they are also isolated from the rest of the instrument, from the mains supply and from the ground.

It is possible to separately program each input as Normally Open or Normally Closed or Disabled.

It is possible to separately program the timer stop of each programmed input as Trip or Reset.

Logic input time measurement resolution: 1 ms.

Logic input time measurement accuracy: 2 ms.

Outputs

Number of outputs: 32, in 4 groups of 8.

Type of outputs: open collector; maximum voltage 130 V; minimum current capability 15 mA.

It is possible to separately program each logic output as Normally Open or Normally Closed.

It is possible to separately delay each logic output with respect to currents and voltages.

Logic output time accuracy: 1 ms.

OUT32 for the IO-6432 option

IO-6432 outputs drive the load to zero. If the output must be driven with the voltage, or if the current is not sufficient, it is available the module OUT32, that has the following characteristics:

Inputs: 32, from IO-6432 of DRTS.

Outputs: 32 relay contacts (both ends), with the following characteristics.

- . Vmax: 250 V;
- . Imax: 0.5 A;
- . Outputs protected against over-voltage;
- . Time delay: less than 10 ms.

Connection to DRTS: with a cable 1 m long, provided.

Lights that turn on when the relay is closed.

Output connection: by two 50-way connectors.

Power supply: from the mains; 220 V 50 Hz.

Weight: 3 kg.

Dimensions: 25 x 19 x 11 cm.

Case: plastic, with graved front face.

SHA-1 energy meters universal scanning head



SHA-1 is a scanning head that eases the test of energy meters. It is an universal scanning head because it can be used both with LED impulse electronic meters and Ferraris rotating disk meters. With rotating disk the sensor uses a green light beam that optimizes the recognition of any type of mark.

With LED recognition the following specification applies:

- . Impulse duration: more than 60 us;
- . Impulse frequency: less than 500 Hz;
- . Duty cycle: 50%;
- . Light wavelength: 500 to 960 nm (red).

The option includes:

- . A support to keep the scanning head in front of the energy meter;
- . The cable, 2 m long, from the scanning head to the DRTS 6;
- . The power supply transformer, for the power of 220 V AC, to supply the scanning head.

Palm control



The Palm Control is an innovative control of the DRTS 6 and for DRTS and DRTS 3 too, which uses a PDA (Personal Digital Assistant) or Pocket PC that runs under the Windows Mobile operating system. We have developed a simple graphical interface that allows the users to have a low cost interface, extremely compact for simple and fast testing operations. The Palm Control has a colour touch screen that allows a simple graphical control of the DRTS's outputs. The Palm Control is made by a PDA and the Mobile XPRO software module.

APPLICABLE STANDARDS

Electromagnetic compatibility

Directive no. 89/336/CEE dated May 3, 1989, modified by the directive 92/31/CEE dated May 5, 1992.

Applicable Standards: EN 50081-2; EN 50082-2; EN 55011; EN 61000-3-3; EN 50082-2; ENV 50140; ENV 50141; ENV 50204; IEC 1000-4-2; IEC 1000-4-4; IEC 1000-4-6; IEC 1000-4-8.

Low voltage directive

Directive n. 73/23/CEE, modified by the directive 93/68/CEE.

Applicable standards, for a class I instrument, pollution degree 2, Installation category II: CEI EN 61010-1.

In particular:

Operating temperature: 0 - 50°C; storage: - 25°C to 70°C.

Relative humidity: 5 - 95% without condensing.

Ordering information:

CODE	MODULE
10156	DRTS 6 6 x I 0...15 A 4 x V 0...125 V 1 x V DC output 0...260 V at 50 W
10015	TDMS - Test & Data Management Software

Options for External Amplifiers:

CODE	MODULE
23156	Voltage outputs 0...300 V for AMIV 66
73156	Voltage outputs 0...300 V for AMV 66
18156	Protector AirTransport Case
15156	Set of Test cables

Option for DRTS 6

CODE	MODULE
81156	IEC 61850 Interface, hardware and software
23156	High precision (HP) outputs; 0,05% accuracy outputs with SIT laboratory certificate (EU accredited)
33156	Voltage outputs 0 - 300 V for DRTS 6
14150	Input/Output Expansion Module IO6432
18156	Protector Air Transport Case
15156	Set of Test cables
10161	GPS Synchronizer
20162	Universal scanning head for testing watt-hour meters SHA-6
19153	Analog AC/DC Measurement Module
47156	I100 A high current booster
36156	PA-I Option to put in parallel the current output (3 x 30A)
35150	SEI Option to put in serie the current output
98156	IN 2 CDG - Option for 2A High burden relays
ZSW30086	X.Pro Mobile (software) and PDA package Ipaq HX 2400 PDA with RS232 card
26156	USB port upgrade
24156	Power Line Synchronizer

External Amplifiers for DRTS 6:

CODE	MODULE
17156	AMI 66 (3 x I - 0...15 A at 80 VA)
27156	AMI 99 (3 x I - 0...30 A at 160 VA)
63156	AMV 66 (2 x V - 0...125 A at 80 VA)
13156	AMIV 66 (3 x I - 0...15 A at 80 VA) (2 x V - 0...125 V at 80 VA)