

DIGITAL MEASURE TRANSMITTERS

Single or 3-phase balanced/unbalanced networks
3, 4 wire

Series TRM-TAI

♦ This range is declined into 8 input versions which can be combined with output options according to your requirements.

TAI 40 Measuring of U, I, F

Single ph. network,
3-phase balanced
12 parameters

TRM1

TRM1 TA

TRM1 (400Hz)

Single phase network,
3-phase balanced / unbalanced
All parameters

TRM3

TRM3 TA

TRM3 PBUS

TRM3 (400Hz)

Sinusoidal signals

Wave train and phase angle

Digital data link RS485 Profibus DP

Network at 400 Hz



Programming by
µConsole or by
the PC software
SuperVision.



♦ Output options according to versions

A, 2A, 4A Analog outputs : 1, 2 or 4 current outputs
uni and bidirectional (voltage on request)

R / 2R / 4R Relay outputs : 1, 2 or 4 relays
(mode setpoint / window or energy pulse)

N Insulated digital output : RS485 and RS422
(Modbus-Jbus or Profibus DP)

H Harmonics analysis

Introduction

Measurement, control and display of all the parameters of AC electrical networks, for DIN rail mounting.

A range of programmable converters which can be adapted closely to your applications.

They can be equipped with a µConsole (TAI - series TRM1) with 4 green digits alphanumeric display, allowing direct access to the programming.

♦ Programming by PC : Software Supervision

Software for programming and analysis (Windows environment); Allows :

Storage of configurations as files which can be consulted, modified, duplicated or loaded into the converters. Edition and printing of files with or without having a converter connected.

♦ Programming by µConsole

(not available on the series TRM3)

This miniaturised µConsole can be clipped on the front face of the instruments to allow :

Visualisation of the measure

Visualisation and modification of the programming.

Teleloading of a programming file for duplication to other converters.



Functions

♦ Self-diagnosis :

The instrument permanently watches some of its parameters. If an error is detected, it can be reported on the relays and on the analog output.

♦ Input scale overstepping :

The meter will indicate a caliber overstepping by an alarm message.

♦ Filtering of the measure :

Programmable integration indice, allows display stabilising in case of unsteady input.

♦ Phase ranks test :

Version TRM3 only.

Environment

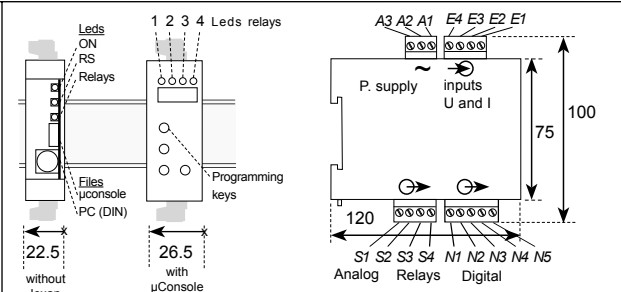
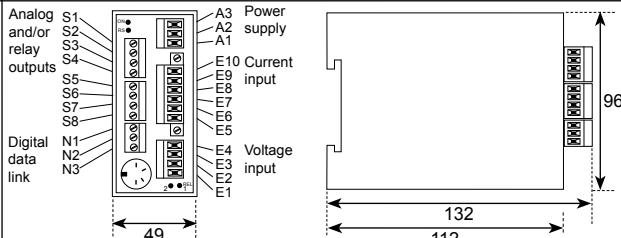
	TAI / Series TRM1	Series TRM3
Standards	CE marking (89/336 rev.92/31). Complies with standards IEC 61000-6-2 on immunity, IEC 61000-6-4 on emissions. Test standards EN55011 cl. A	
Relat. dampness	80 % annual average	
Operating T°	-10°C to +55°C	
Storage T°	-25°C to +70°C	
Power draw	5VA	

Input features

Names of the transmitters	Parameters	Input features	Accuracy rating (at +25°C)
Meas. of U, I, F TAI 40 	3 measurable parameters : 2 voltages, current, frequency	2 programmable current or voltage calibers (1) Frequency : 45...50...65Hz Measure cycle : 55ms <i>Single phase, 3/4 wire balanced networks</i>	U, I : 0.2
<i>Single or 3-phase balanced network with or without neutral</i>			
Sinusoidal signals TRM1 	14 measurable parameters : 2 voltages, current, 5 powers (P,Q,S), frequency, cosine, 4 energies	2 programmable current or voltage calibers (1) Frequency : 45...50...65Hz Measure cycle : 55ms <i>Single phase, 3/4 wire balanced networks</i>	U, I : 0.2 P : 0.5 E act. : 1
Wave train and phase angle TRM1 TA 	11 measurable parameters : 2 voltages, current, 5 powers (P,S), cosine, 2 energies (active), current and voltage MAX	2 programmable current or voltage calibers (1) Frequency : 50 Hz (60 Hz by programming) Measure cycle programmable from 20ms to 250s, or automatic - <i>Single phase, 3, 4 wire balanc. networks</i> <i>Captions (details) : AP:phase angle TA:wave train</i>	AP : U, I:0.5 P:1 E: 2(5A) 3(1A) TA : U, I:0.2 P:0.5 E : 1(5A) 2(1A)
Network at 400 Hz TRM1 (400Hz) 	12 measurable parameters : 2 voltages, current, 5 powers, frequency, cosine, 4 energies	2 programmable current or voltage calibers (1) Frequency : 300...400...800Hz Measure cycle : 55ms <i>Single phase, 3/4 wire balanced networks</i>	U, I : 0.2 P : 0.5 E act. : 1
<i>All network types, balanced or not</i>			
Sinusoidal signals TRM3 	34 measurable parameters : 6 voltages, 3 currents, distortion rate, 2 harmonics, 9 powers, frequency, 4 cosines, leak current, 7 energies	2 programmable current or voltage calibers (1) Frequency : 45...50...65Hz Measure cycle : 55ms <i>3 or 4 wire networks</i>	U, I : 0.2 P : 0.5 E act. : 1
Wave train and phase angle TRM3 TA 	22 measurable parameters : 6 voltages, 3 currents, 5 powers (P,S), 4 cosines, 2 energies (active), current and voltage MAX	2 programmable current or voltage calibers (1) Frequency : 50 Hz (60 Hz by programming) Measure cycle programmable from 20ms to 250s, or automatic - <i>3, 4 wire networks</i> <i>Captions (details) : AP:phase angle TA: wave train</i>	AP : U, I:0.5 P:1 E: 2(5A) 3(1A) TA : U, I:0.2 P:0.5 E : 1(5A) 2(1A)
Profibus DP network TRM3 PBUS 	31 measurable parameters : 6 voltages, 3 currents, 9 powers, frequency, 4 cosines, leak current, 7 energies	2 programmable current or voltage calibers (1) Frequency : 45...50...65Hz Measure cycle : 55ms <i>3 or 4 wire networks</i>	U, I : 0.2 P, Q, S : 0.5 E act. : 1 E reac. : 2
Network at 400 Hz TRM3 (400Hz) 	31 measurable paremeters : 6 voltages, 3 currents, 9 powers, frequency, 4 cosines, leak current, 7 energies	2 programmable current or voltage calibers (1) Frequency : 300...400...800Hz Measure cycle : 55ms <i>3 or 4 wire networks</i>	U, I : 0.2 P : 0.5 E act. : 1
Programmable current or voltage calibers : (1) U : 150Vac and 500Vac - Un : 150Vac and 500Vac I : 1Aac and 5Aac - In : 1.2Aac and 6Aac Overstepping 1.2Un - 1.2 In Permanent overload : U=750V and I=10A Overload during 10s : U=1000V and I=50A Impedance : Voltage : resistors ≥1MΩ - Current : <0.2VA		Thermic drift : <200ppm /°C Test voltage : 2kV/50Hz/1min. Energies saved every 5 minutes Measuring method : Real time simultaneous sampling of the voltages and the currents. Digital calculation on 32 bits. Measuring of deformed signals.	

Description

	TAI / Series TRM1	Series TRM3
Housing	Self-extinguishing black UL94VO ABS	
Latching	Case for latching on symmetrical DIN rail (TAI/TRM1 : mount the cases vertically and provide a 2 mm space between each)	
Con-nectors	Plug-off connector for screwed connections (2.5mm ² , flexible or rigid)	
Protection	Case/terminals : IP 30	Case/terminals : IP 20
Display μConsole	4 digit green alpha-numerical display	-
Weight	230 g	from 200g to 400g

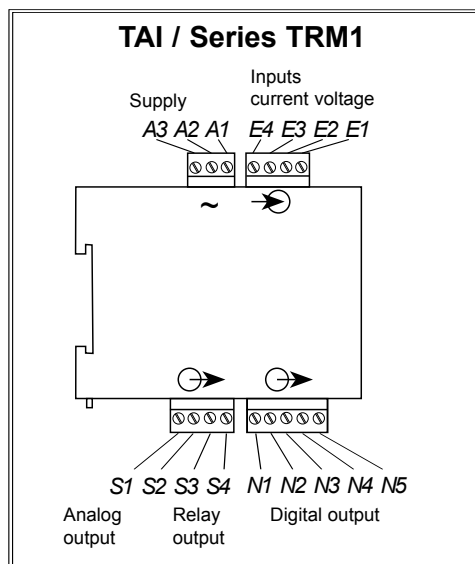
TAI / Series TRM1 Dimensions : 75x22.5x120 mm With μConsole : 80x26.5x130 mm	
Series TRM3 Dimensions : 96x49x112 mm	

Options

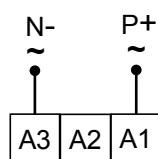
Name	Type	Features
Analog output A, 2A or 4A 	<u>3 types of outputs avail. according to versions :</u> A : 1 analog output (TAI and TRM1) 2A : 2 analog outputs (TRM3) 4A : 4 analog outputs (TRM3) <u>Programmable current output (mA)</u> -20/20 -10/10 -5/5 0/5 0/10 0/20 4/20 mA (for option 4A, 2 of the outputs are uni-directionnal) Galvanic partition : 2kV eff.50Hz-1min. (option 4kV : available on versions TRM3)	Scale setting : 0 to 100% of the measure range by programming Admissible load : $0\Omega < L_r < 600\Omega$ (20 mA) (700 Ω PBUS versions) Resolution of the board : 24000 points. Accuracy of the board : <0.1% of the full scale on -20/20mA (in relation to the display) . <0.2% on -5/5 mA. Residual ripple : $\pm 2.5\text{mV}$ (peak to peak) on 50 Ω load. Response time : version TA : <120ms for Umax. and Imax., 2x (measure cycle) for the other values. Response time : other versions : from 50ms (<120ms input $\rightarrow$ output). Thermic drifts : < 100ppm ($\pm 20\text{mA}$) <200ppm (0/20mA)
Relay outputs R, 2R or 4R 	<u>3 types of outputs are avail. according to versions :</u> R : 1 programmable setpoint relay (TAI : setp.) 2R : 2 independently programmable relays 4R : 4 independently programmable relays Combinable relays : Setpoints or/and pulses Type of contact : potential free. Galvanic partition : 2.5kV eff.50Hz-1min. (option 4kV : available on versions TRM3) Rated load : 5A - 250Vac Response time : versions TA: 100ms for Umax. and Imax., 2x (measure cycle) for the other values. 100ms for the other TRM.	<u>Energy pulse output</u> Count rate : 1 to 4 pulses per second max. Width of the pulses : 100 to 400ms (programmable) Weight of the pulses : programmable <u>Setpoint relay</u> Setting of the setpoints : 0 to 100% of the measure range by programming Switching hysteresis : 0 to 15% of the setpoint by programming Time delay : 0 to 15s. by programming, in 1s. increments
Digital output N 	<u>Versions PBUS</u> : RS485 Insulated (2kV) PROFIBUS DP. Transmission speed from 9600 bds to 12 Mbauds. Format of the data : integer 16 bits. Sub-D9 point female connecting. <u>Other versions</u> : RS 485 or 422 insulated (2kV) (2 or 4 wire) Modbus Jbus RTU 8 bits : Programmable parity. 1 or 2 stop bits. Format of the data : integer 16 bits. Slave number programmable from 1 to 250 with a transmission speed of 4800 / 9600 / 19200 bauds. (option 4kV : available on versions TRM3)	
Harmonics analysis H	<u>Versions PBUS</u> : PROFIBUS DP retransm. of the odd harmonics and the THD of the 3 voltages and the 3 currents from rank 3 to 29. <u>Other versions</u> : Display of the harmonics and the THD (harmonics distortion rate) of the 3 voltages and the 3 currents from rank 2 to rank 50 (odd and even). Retransmission possible in Modbus.	
Power supply 2 or 3	High voltage (2) : 90 to 270Vac and 88 to 350Vdc or Low voltage (3) : 20 to 40Vac and 20 to 60Vdc (40/60/400Hz)	

Coding

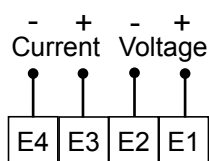
Measuring of U, I, F	TAI 40	A	R			R : Setpoint relay output only
Single or 3-phase balanced / unbalanced networks with or without neutral						
Sinusoidal signals	TRM1	A	R	N	H	R : Setpoint relay or pulse output N : Digital data link RS485/422 Modbus
Wave train and phase angle	TRM1 TA	A	R	N		
Network at 400 Hz	TRM1 (400Hz)	A	R	N		
All network types						
Sinusoidal signals	TRM3	2A or 4A	2R or 4R	N	H	1 to 4 combinable analog and/or relay outputs N : Digital data link RS485/422 Modbus <u>Options :</u> Voltage outputs 0-10V (specify) Insulation at 4kV (specify)
Wave train and phase angle	TRM3 TA	2A or 4A	2R or 4R	N		
Network at 400 Hz	TRM 3 (400Hz)	2A or 4A	2R or 4R	N		
Digital output RS485 Profibus	TRM3 PBUS	2A or 4A	2R or 4R		H	1 to 4 combinable analog and/or relay outputs Digital data link RS485 Profibus DP <u>Options :</u> Voltage output 0-10V (specify) Insulation at 4kV (specify)
<u>Example</u> : For a TRM1 with an analog output and 1 relay, supplied in 230 Vac, request reference : TRM1 AR 2			<u>Example</u> : For a TRM3 TA with 2 analog outputs plus 2 relays and digital output, supplied in 230 Vac, request reference : TRM3 TA 2A2RN 2			



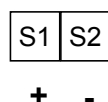
Power supply



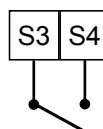
Inputs



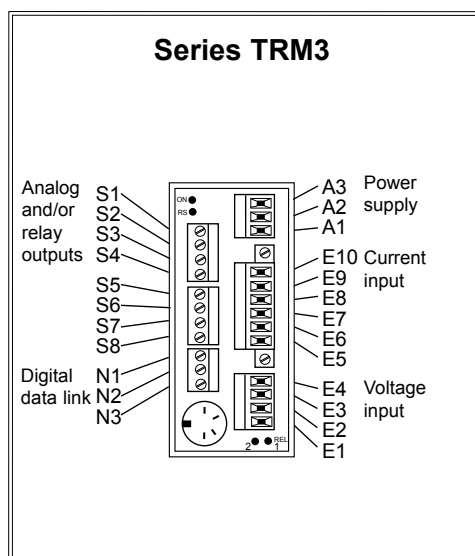
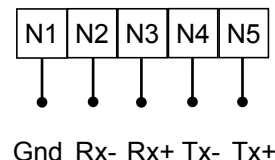
Analog output



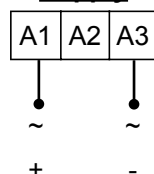
Relay output



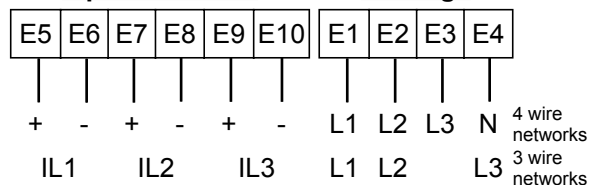
Digital output



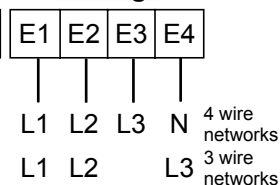
Supply



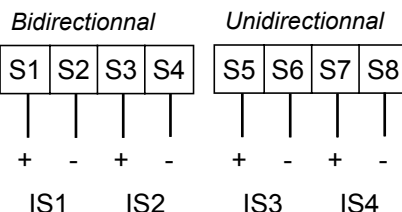
Inputs : current



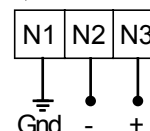
: voltage



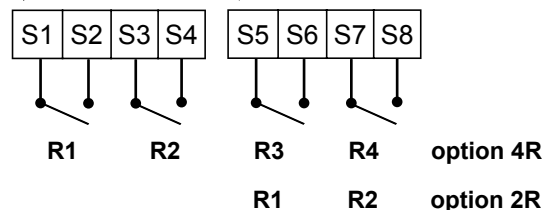
Analog outputs



Digital data link RS485



Relay outputs



(for the details of the wiring see the manual delivered with the instrument)

These instruments are dedicated to industrial applications. They have to be installed in an electrical switchbox, or equivalent.



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