TECOMAT TC700 – Analog modules

Type	IT-7601	IT-7602	IT-7604	IT-7606	OT-7652
Analog inputs/outputs	8 AI	16 AI	8 AI	32 AI	8 AO
Input/output range	Standard U, I	Standard U, I	Standard U, I, RTD, thermocouples	Standard U, I, RTD	Standard U, I
Connecting	2× 20pin Screwless connector	2× 20pin Screwless connector	2× 20pin Screwless connector	2× 20pin Screwless connector	20pin Screw type connector Screwless conector

Basic features

- Expansion modules with 8, 16 or 32 analog inputs or 8 analog outputs for enlarging number of I/O of the TC700 configuration.
- Inputs are differential (IT-7601, IT-7602 and IT-7604) or organized in one group with common minus pole (IT-7606).
- Outputs are organized in one group with common minus pole (OT-7652)
- Galvanic isolation of inputs/outputs from internal circuits of the controller is provided.
- Each analog channel can be configured individually in the Mosaic development environment.
- Status of the module and of each input/output is indicated by LED on the front panel.
- Sensor defect signalization.
- Module IT-7604 ensures linearisation and conversion according to the type of sensor like Celsius centigrades for thermocouples and resistance sensors.
- Module provides the cold junction compensation for thermocouples.
- Modules can be placed in any position of the rack.
- Modules support a hot-swap. This feature is programmable and must be enabled by the programmer.
- Other details are given in the tables below.

Connecting

- Front end connectors are ordered separately since user can choose the screw/screwless one.
- The analog input /output modules can be connected through the cable to external input/output modules with protection elements.
- Modules are to be fixed in the rack by one screw at the top of the module.
- Modules are addressed by their position in the rack.
- Modules are power supplied from the rack. The loads must be supplied by external power supply.

Use

- IT-7601 is the module designed for common measurement of voltage or current signals.
- IT-7602 is the high-speed module for the connection of quickly changing voltage or current signals.
- IT-7604 is the universal module that serves not only for connecting voltage or current analog signals but mainly for direct connection of signals from thermocouples and resistance sensors.
- IT-7606 is the module with high density of inputs designed for the connection of high amount of slowly changed analog signals, mainly from RTD.
- OT-7652 is the output module used for the operation of continuously controlled devices or instruments.

IT-7601

IT-7602

IT-7604

IT-7606

Analog inputs	IT-7601	IT-7602	IT-7604	IT-7606
No. of inputs/ groups	8/ 1	16/ 2	8/ 1	32/ 1
Type of input	differential	differential	differential	with common pole
Input configuration	SW configuration independent for each channel	SW configuration independent for each channel	SW configuration independent for each channel	SW configuration independent for each channel
Input voltage range/ resolution for 1 bit	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV ± 1 V/ 32 µV ± 0.5V/ 16 µV ± 0.2V/ 6.4 µV ± 0.1V/ 3.2 µV	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV ± 1 V/ 32 µV ± 0.5 V/ 16 µV ± 0.2 V/ 6.4 µV ± 0.1 V/ 3.2 µV	± 10 V/ 320 µV ± 5 V/ 160 µV ± 2 V/ 64 µV ± 1 V/ 32 µV ± 0.5 V/ 16 µV
Input current ranges /resolution for 1 bit	0 ÷ 20 mA/ 0.32 µA +4 ÷ 20 mA/ 0.32 µA ± 20 mA/ 0.64 µA 0 ÷ 5 mA/ 80 nA ± 5 mA/ 160 nA	0 ÷ 5 mA ±5 mA 0 ÷ 20 mA 4 ÷ 20 mA ± 20 mA	0 ÷ 20 mA/ 0.32 µA +4 ÷ 20 mA/ 0.32 µA ± 20 mA/ 0.64 µA 0 ÷ 5 mA/ 80 nA ± 5 mA/ 160 nA	0 ÷ 20 mA/ 0.32 µA +4 ÷ 20 mA/ 0.32 µA ± 20 mA/ 0.64 µA 0 ÷ 5 mA/ 80 nA ± 5 mA/ 160 nA
RTD / resolution for 1 bit			Pt100 (W_{100}=1.385; 1.391) /0.1°C Pt1000 (W_{100}=1.385; 1.391) /0.1°C Ni1000 (W_{100}=1.617; 1.500) /0.1 °C OV100/ 0.002 Ω OV1000/ 0.02 Ω	Pt1000 (W_{100}=1.385; 1.391) /0.1°C Ni1000 (W_{100}=1.617; 1.500) /0.1 °C OV1000/ 0.02 Ω
Thermocouples / resolution for 1 bit	–	–	J, K, R, S, T, B, N types/ 0.1 °C	-
A/D converter resolution	16 bit	16 bit	16 bit	16 bit
Conversion method	Multiplexed sigma-delta modulation	Multiplexed sigma-delta modulation	Multiplexed sigma-delta modulation	Multiplexed sigma-delta modulation
Conversion time of 1 channel	typ. 65 ms	typ. 1.5 ms	typ. 65 ms	typ. 65 ms
Sample repeating period	typ. 520 ms	typ. 12 ms	typ. 520 ms	typ. 2.08 s
Galvanic isolation	Yes	Yes	Yes	Yes
Insulation voltage among inputs and internal circuits	500 V DC	500 V DC	500 V DC	500 V DC
Type of protection	yes, integrated overvoltage protection	yes, integrated overvoltage protection yes	yes, integrated overvoltage protection yes	external diodes
Detection of open input (current loop)	yes, for 4 ÷ 20 mA only	yes, for 4 ÷ 20 mA only	yes, for 4 ÷ 20 mA only	yes, for 4 ÷ 20 mA only

Power supply	IT-7601	IT-7602	IT-7604	IT-7606	OT-7652
Power supply voltage (SELV)	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack	Internal 24 V from the rack
Power input	3 W	4.5 W	3 W	3 W	4.2 W

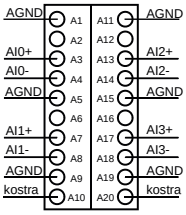
Dimensions and Weight	IT-7601	IT-7602	IT-7604	IT-7606	OT-7652
Dimensions	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm	137 × 30 × 198 mm
Weight	300 g	300 g	300 g	300 g	300 g

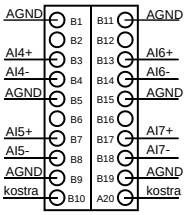
Analog outputs

	OT-7652
No. of outputs/ groups	8/ 1
Type of output	Active voltage output/ passive current output
Output voltage range/ resolution for 1 bit	0 ÷ +10.0 V/ 0.16 mV –5.0 ÷ +5.0 V/ 0.16 mV –10.0 ÷ +10.0 V/ 0.32 mV
Output current ranges/ resolution for 1 bit	0 ÷ +20.0 mA/ 0.32 µA 4 ÷ +20.0 mA/ 0.32 µA
D/ A converter resolution	16 bit
Conversion method	Multiplexed D/A converter
Conversion time of 1 channel	20 ms
Sample repeating period	160 ms
Galvanic isolation	Yes
Insulation voltage among outputs and internal circuits	500 V DC
Type of protection	Integrated overvoltage protection
Detection of open output (current loop)	No
External power supply for output circuits	for current loop, max. 32 V DC

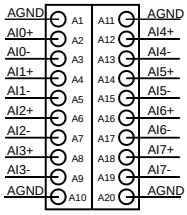
Connection

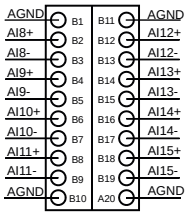
IT-7601



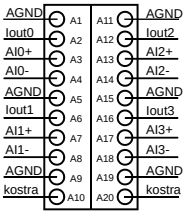


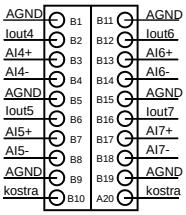
IT-7602





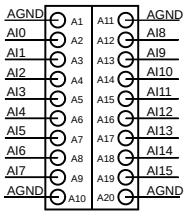
IT-7604

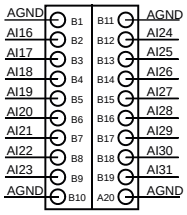




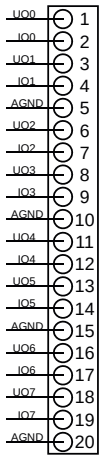
Connector	2× 20pin Screwless connector TXN 102 40	2× 20pin Screwless connector TXN 102 40	2× 20pin Screwless connector TXN 102 40
Conductors cross-section	max. 1 mm^2	max. 1 mm^2	max. 1 mm^2

IT-7606





OT-7652



Connector	2× 20pin Screwless connector TXN 102 40	20pin Screw type connector/ Screwless connector TXN 102 3×
Conductors cross-section	max. 1 mm^2	max. 2.5 mm^2

Order number

TXN 176 01	IT-7601 8 analog differential inputs, galvanic isolation, for voltage or current measure
TXN 176 02	IT-7602 16 analog differential inputs, galvanic isolation, for voltage or current measure, 1.5 ms
TXN 176 04	IT-7604 8 analog differential inputs, voltage, current, RTD, thermocouples, galvanically isolated
TXN 176 06	IT-7606 32 analog inputs, voltage, current, Ni1000, Pt1000, galvanically isolated
TXN 176 52	OT-7652 8 analog outputs 0-10 V or 0-20 mA
TXN 102 30	Connector, screwless type, 20 pins, pitch 5.08 mm
TXN 102 31	Connector, screw type, parallel,20 pins, pitch 5.08 mm
TXN 102 32	Connector, screw type, right angle, 20 pins, pitch 5.08 mm
TXN 102 40	2 connectors, screwless type, 20 pins, pitch 3.5 mm

OT-7652

Example of external input module for analog signals

TXN 102 40

TXN 102 30

TXN 102 32