

Analogue interfaces and modules

TSX AST/ASR analogue output interfaces and modules

General, operation, description

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General

The analogue output interfaces and modules are used to control continuous signal actuators such as variable speed drives, proportional control valves etc.
They can be used in open loop control or continuous process control applications.

6 types of module are available :

- **TSX AST 200 interface** : 2 channels, unipolar voltage or current output, isolated from the PLC bus, with 8-bit resolution, this interface can be installed in any PLC in the range.
- **TSX ASR 200 module** : 2 channels, bipolar voltage or current output, isolated from the bus and from each other, with 12-bit resolution.
- **TSX ASR 401 module** : 4 channels, ± 10 V voltage output, isolated from the bus and from each other, with 11-bit + sign resolution.
- **TSX ASR 402 module** : 4 channels, 4-20mA current output, isolated from the bus and from each other, with 12-bit resolution.
- **TSX ASR 403 module** : 4 channels, 4-20mA current output, isolated from the bus and from each other, with 12-bit resolution. Power to the outputs must be supplied externally.
- **TSX ASR 800 module** : 8 channels, bipolar voltage or current output, isolated from the PLC bus, with 12-bit resolution.

Operation

These modules perform digital/analogue conversion. The current or the voltage is proportional to the digital value defined by the user program :

- For the TSX AST 200 module, this value varies from 0 to 255 in an 8-bit string.
- For the TSX AST 4●● module, this value varies from 0 to 4096 or - 2048 to 2047 in the register words.
- For the TSX AST 800 module, this value depends on the range chosen :
 - At ± 10 V, it varies from - 4000 to + 4000 or - 10 000 to + 10 000.
 - At 0 - 20 mA, it varies from 0 to + 4000 or 0 to + 10 000.
 - At 4 - 20 mA, it varies from 800 to + 4000 or 0 to + 10 000.

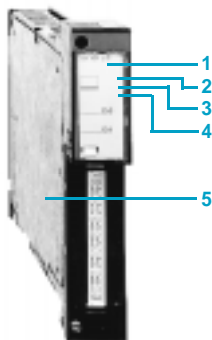
A control word is associated with each TSX ASR 4●●/800 which allows the user to select the format of the digital value as a number of converter points or as a scale percentage.

If the CPU stops, these modules either force the outputs to zero on the selected range or maintain the last value received. This type of operation avoids surges on the actuators when debugging the user program.

Software installation

Software installation on TSX ASR (1) modules is achieved using PL7-REG or PL7-PMS2 process control software (using the ANOUT function block). SYSDIAG is required for module diagnostics.

Description



TSX AST/ASR analogue output interfaces and modules comprise :

- 1 A front panel with a transparent label holder and an identification label
- 2 A red LED indicating a module fault (2)
- 3 A green LED indicating module powered up and operating (2)
- 4 A red LED indicating channel fault (2)
- 5 A hinged side panel for accessing the configuration jumpers for selecting input ranges on the TSX AST 200 or TSX ASR 200

Connector to be ordered separately : TSX BLK 4 removable terminal block

(1) For the TSX ASR 800, the minimum version of SYSDIAG is V5.4 and that of the ANOUT block is V6.2 (available in DIAG PACK V6 and the TXT L PL7 REG/PMS2 respectively, see page 46200/3)
(2) On the TSX ASR 4●● and TSX ASR 800 only

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Characteristics, references

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Characteristics

Types of interface and module			TSX AST 200	TSX ASR 200	TSX ASR 401	TSX ASR 402	TSX ASR 403	TSX ASR 800	
Output ranges	Number of channels Ranges	V	2	2	4	4	4	8	
		V	–	± 10	± 10	–	–	± 10	
		V	–	± 5	–	–	–	–	
		V	0/10	0/10	–	–	–	–	
		V	–	0/5	–	–	–	–	
		mA	0/20	0/20	–	–	–	0/20	
Load	Voltage Current	mA	4/20	4/20	–	4/20	4/20	4/20	
		Voltage	500 minimum	500 minimum	1000 minimum	–	–	1000 minimum	
		Current	650 maximum	650 maximum	–	300 maximum	300 maximum	600 maximum	
Static characteristics FS : full scale	Resolution	points	256	4096	4096	4096	4096	3200/4000 (0/20,4/20 mA) 8000 (± 10 V)	
		LSB value	40 mV (0/10 V)	2.5 mV (0/10 V)	5 mV	4 µA	4 µA	2.5 mV or 5 µA	
		Error ± 10 V	–	± 0.1 %FS	± 0.3 %FS	–	–	± 0.2 %FS	
		at 25 °C	0/10 V	± 0.2 %FS	± 0.1 %FS (1)	–	–	–	
			4/20 mA	± 0.2 %FS	± 0.1 %FS (1)	–	± 0.3 %FS	± 0.3 %FS	
								± 0.3 %FS (4/20 and 0/20 mA)	
Error 0-60 °C	± 10 V	–	± 0.3 %FS	± 0.5 %FS	–	–	± 0.4 %FS		
		0/10 V	± 0.45 %FS	± 0.3 %FS (1)	–	–	–		
		4/20 mA	± 0.45 %FS	± 0.3 %FS (1)	–	± 0.5 %FS	± 0.5 %FS		
							± 0.5 %FS (4/20 and 0/20 mA)		
Dynamic characteristics	Conversion time	ms	< 15	< 10	< 20	< 20	< 20 External 24 V	< 10	
General characteristics	Output power supply Protection		By PLC	By PLC	By PLC	By PLC	–	By PLC	
			Short-circuit	Short-circuit	Short-circuit	Wire break detection	Wire break detection	Short-circuit open circuit	
	Iso. between channels Chann./bus	V rms	No	1500	500	500	500	500	Common point
		Hz	–	50/60	50/60	50/60	50/60	50/60	–
	V rms	1500	750	750	750	750	750	1000	
	Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	

References



TSX ASR 00E

Type	Number of channels	Type	Output signal ranges	Reference (2)	Weight kg
High level 8 bits	2 channels	Voltage Current	0/10 V 0/20 mA, 4/20 mA	TSX AST 200E	1.250
High level 12 bits	2 channels	Voltage Current	0/10 V, 0/5 V, ± 5 V, ± 10 V 0/20 mA, 4/20 mA	TSX ASR 200E	1.250
High level 11 bits + sign	4 channels	Voltage	± 10 V	TSX ASR 401E	1.200
High level 12 bits	4 channels	Current	4/20 mA	TSX ASR 402E	1.200
		Current (Ext. supply)	4/20 mA	TSX ASR 403E	1.200
	8 channels	Voltage Current	± 10 V 0/20 mA, 4/20 mA	TSX ASR 800E	1.110

Separate parts

Type	Use	Reference	Weight kg
Universal terminal block Safety voltage < 48 V	Connected to TSX AST/ASR module Requires TSX RAC20 earthing strip	TSX BLK 4	0.150

Documentation (in English)

Description	Included with product	Reference	Weight kg
Installation manuals	TSX AST 200E/ASR200E/ASR400E	TSX D23 007E	0.250
	TSX ASR 800E	TSX DM ASR 800E	0.150

(1) Module recalibrated in its range of operation.

(2) The letter **E** at the end of a reference indicates that the product includes documentation in English.