

# TSX 47-10/20/25 sequential PLCs

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## Description

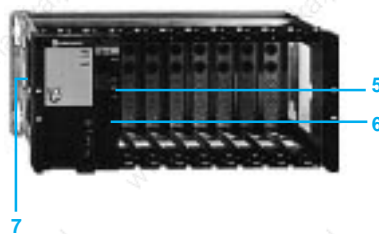
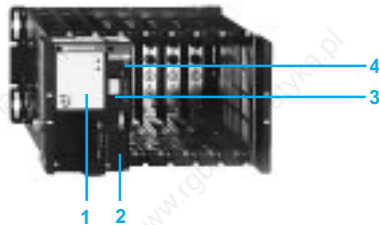
The TSX 47-10/47-20/47-25 base configurations are modular sequential PLCs which can accept all discrete I/O interfaces. They are available in two formats :

- Short rack, with 5 slots available for TSX 47-J/ and TSX 47-20J.
- Standard rack, with 8 slots available for TSX 47-10 and TSX 47-20/47-25.

Each TSX 47-10/47-20/47-25 base configuration can be extended by a direct I/O extension rack which increases the maximum number of slots to 16.

Sequential PLCs can also accept counting and analogue interfaces as well as the TELWAY network module. The TSX 47-20J and TSX 47-20/47-25 PLCs also support two intelligent modules.

## Description of the base configuration



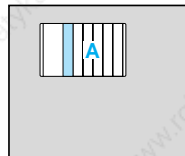
The base configuration comprises a short or standard rear mounted rack incorporating :

- 1 Power supply  $\sim$  110/240 V, 50/60 Hz, TSX SUP 40 (or TSX SUP 702 with TSX 47-25 PLC ) or  $\equiv$  24/48 V, TSX SUP 41/42 (see page 42202/3)
- 2 A processor with a 2 K byte protected internal RAM data memory. It comprises :
- 3 A slot for a user memory cartridge (32 K byte cartridge supplied with TSX 47-25 PLC)
- 4 Green RUN lamp (program running)
- 5 Three red lamps :
  - CPU processor fault
  - MEM memory cartridge fault
  - I/O fault
- 6 A 9-way SUB-D type connector for terminal connection (20 mA current loop)
- 7 A direct extension connector for the TSX 47-10 and TSX 47-20 configurations (see page 42307/3)

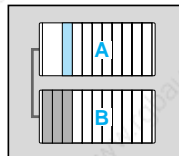
**Note :** The TSX SCM 2116 UNI-TELWAY module is supplied with the TSX 47-25.

## Maximum configurations

TSX 47-J/47-20J



TSX 47-10/47-20/47-25



- TSX 47-J and TSX 47-20J PLCs :  
The maximum configuration is limited to the PLC base rack.
- TSX 47-10 and TSX 47-20/47-25 PLCs :  
The maximum configuration is limited to the PLC base rack with the addition of a direct I/O extension.

A PLC base.

B TSX RKE 7/8 direct I/O extension.

The 24 and 32 point modules can only be used in the base rack. When used in this way, the corresponding direct extension rack slot must be left empty.

# TSX 47-10/20/25 sequential PLCs

## Functions

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## Memory structure

### Internal RAM memory

The internal RAM memory of the PLC processor supports the application data handled by the PLC. This memory is battery-backed for 5 weeks and is divided into 2 zones.

- **Bit memory**

This memory contains the image of all the bit objects.

System bits	24	Function block output bits	128
Discrete I/O	(1)	Internal bits	256
Grafcet steps	96	Fault bits	1 per I/O module

- **Word memory (16 bits)**

This memory is intended to hold all PL7-2 application word objects.

Internal words (2)	1024	Grafcet step activity times	96
Intelligent module words (TSX 47-20J/20)	2 x 16	System words	4
TELWAY network common words	16 x 4	-	-

### User memory cartridge

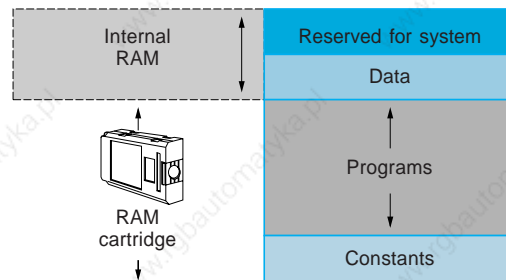
This memory supports the program and the constants relating to the PL7-2 application. The size of the memory allocated to the constants is fixed at 2 K bytes.

With a capacity of 8 to 32 K bytes (8 bits), this removable memory is mounted on the PLC processor. Two types of cartridge are available :

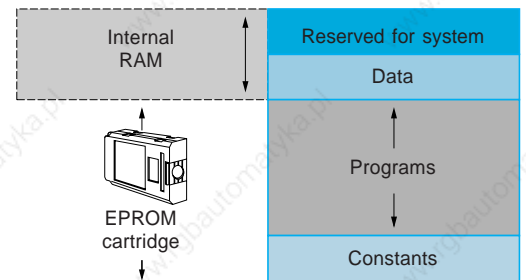
- Battery-backed RAM memory cartridge (5 weeks) in modules of : 8, 16, 32 K bytes.
- EPROM memory cartridge in modules of : 8, 16, 32 K bytes.

The designer can, according to his needs, select one of two possible solutions.

#### Solution 1

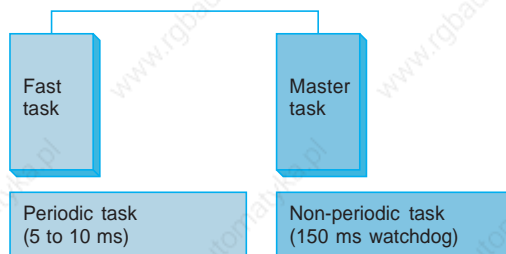


#### Solution 2



## Software structure

The TSX 47 sequential PLCs are programmed in PL7-2 graphic languages : Ladder and Grafcet.



#### Dual-task structure :

- A master task. This non-periodic task is monitored by a 150 ms watchdog. It can be programmed in Ladder and/or in Grafcet.
- A fast task. This optional task allows short duration data to be processed at a higher execution rate. It can only be programmed in Ladder language.

PL7-2 software is available on a cartridge for the TSX T407 terminal or on PC compatible diskettes (under PL7-DOS user interface, under MINI X-TEL or X-TEL software workshop).

(1) 256 for TSX 47-10/20, 160 for TSX 47-J/20J.

(2) Direct access to the first 128 words, by table transfer for the remaining words.

# TSX 47-10/20/25 sequential PLCs

## Characteristics, dimensions

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### Environment

<b>Temperature</b>	Operation + 5...+ 55 °C, storage -25...+ 70 °C
<b>Altitude</b>	0...2000 m
<b>Degree of protection</b>	IP 20 conforming to IEC 664 and NF C 20040

### Characteristics

Type of PLC	TSX 47-J	TSX 47-10	TSX 47-20J	TSX 47-20	TSX 47-25
<b>Functions</b>					
Max no. of discrete I/O	160	256	160	256	
No. of intelligent modules	0	0	2 (in base rack)		4
Max no. of slots	5	16	5	16	
No. of direct extensions	0	1	0	1	
<b>Discrete I/O interfaces</b>					
4/8 or 16 points	Yes	Yes	Yes	Yes	
24 or 32 points	Yes	Yes (1)	Yes	Yes (1)	
<b>Analogue interfaces</b>	TSX ADT 20 ●, TSX AST 200,				
<b>Counting interface</b>	TSX AXT 200				
<b>Intelligent modules</b>	No	No	Yes (mounted in the first 4 slots)		
Analogue measurement system	-	-	TSX AEM 41●, TSX AEM 811/821		
Analogue outputs	-	-	TSX ASR 40●		
Counting, positioning	-	-	TSX CCM 100, TSX DTM 100, TSX DMR 1652		
Axis control	-	-	No	No	
Asynchronous link	-	-	TSX SCM 20●●, TSX SCM 22●● (except TSX SCM●●13)		
<b>Communication modules</b>					
UNI-TELWAY bus	No	No	TSX SCM 21●6		TSX SCM 2116 integral
TELWAY network	TSX MPT 104 (only one module can be mounted on any one slot of the base rack)				

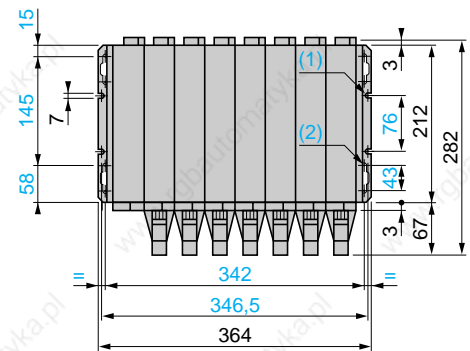
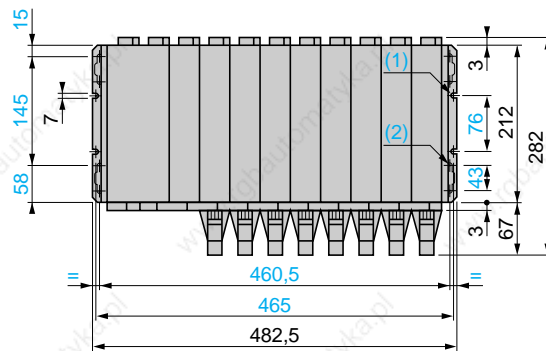
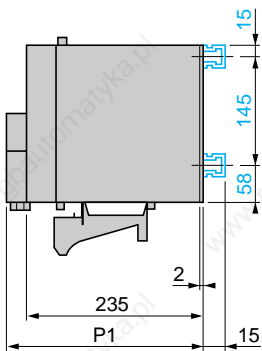
### Dimensions

Rear mounting racks (mounted on 35 mm wide rails)

View of common rail

TSX 47 10●1/47 20●0/RKE 8

TSX 471101/47 2100/RKE 7



(1) 4 x Ø 7 mm  
(2) 8 x Ø 7 mm

Type of module	P
Discrete I/O (with BLK terminal block)	235
Modules with TSX BLK 4 terminal block	267
TSX MPT 1074 module	262
TSX AXT/DTM 100 modules	275
TSX SCM modules	310

P1 = overall depth including connection

**Note** : when the racks are mounted in a cabinet or enclosure :

- the minimum distance between racks must be 150 mm
- the maximum distance between a rack and its extension is 800 mm

(1) 24 or 32 point modules only in the base rack. When a 24 or 32 point module occupies a slot at position n in the base rack, the slot in the same position n in the direct extension rack must be left empty.

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## References

### Base configurations (1)

These base configurations comprise :

- A rack with 5 or 8 available slots
- A power supply
- A processor without user memory cartridge
- An installation manual

The TSX 47-25 configuration also includes a RAM user memory cartridge, TSX RAM 32 8 and a TSX SCM 2116 UNI-TELWAY module.

All slots have locating devices and backplane connector covers.



TSX 47 ●10●

Power supply	PLC	Rack format	No. of available slots	Reference	Weight kg
~ 110/220 V	TSX 47-J	Short	5	<b>TSX 47 1101</b>	7.100
	TSX 47-20J	Short	5	<b>TSX 47 2100</b>	7.100
	TSX 47-10	Standard	8	<b>TSX 47 1001</b>	7.400
	TSX 47-20	Standard	8	<b>TSX 47 2000</b>	7.400
	TSX 47-25	Standard	8	<b>TSX 47 2500</b>	8.450
= 24 V	TSX 47-10	Standard	8	<b>TSX 47 1011</b>	7.200
	TSX 47-20	Standard	8	<b>TSX 47 2010</b>	7.200
= 48 V	TSX 47-10	Standard	8	<b>TSX 47 1021</b>	7.200
	TSX 47-20	Standard	8	<b>TSX 47 2020</b>	7.200



TSX 47 ●0●●

### User memory cartridge

Type	Capacity	Reference	Weight kg
<b>Battery-backed RAM</b> (5 weeks protection)	16 K bytes	<b>TSX RAM 16 8</b>	0.075
	32 K bytes	<b>TSX RAM 32 8</b>	0.085
<b>EPROM</b>	16 K bytes	<b>TSX RPM 16 8</b>	0.065
	32 K bytes	<b>TSX RPM 32 8</b>	0.075

### Direct extension assemblies

The direct extension assembly comprises an empty rack (unused slots fitted with covers) and 1.20 m long extension cable.

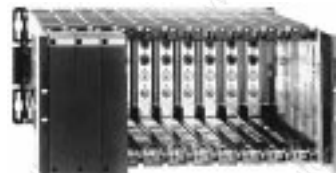


TSX RAM ●● 8

TSX RPM ●● 8

Rack format	Type of bus	No. of available slots	Reference	Weight kg
<b>Short</b>	Simplified	7	<b>TSX RKE 7</b>	2.100
<b>Standard</b>	Simplified	8	<b>TSX RKE 8</b>	3.300

### Accessories and separate parts



TSX RKE 8

Description	Sold in multiples of	Unit reference	Weight kg
<b>Wire guide</b>	10	<b>TSX RAC 10</b>	0.220
<b>Backplane locating device</b>	10	<b>TSX RAC 40</b>	0.025
<b>Cover for empty slot</b> (1 per slot)	10	<b>TSX RAC 50</b>	0.600
<b>Earthing strip</b> (essential for TSX BLK 4 terminal block)	1	Standard rack <b>TSX RAC 20</b>	0.260
	1	Short rack <b>TSX RAC 25</b>	0.240
<b>Extraction tool</b> for TSX 7 modules	1	<b>TSX MNC 30</b>	0.210

### Documentation (in English)



TSX CD D MTE 01E

Description	Manual format	Included with product	Reference	Weight kg
<b>Installation manual</b> TSX 47-10/47-20/47-25	A4 bound	TSX 47 ●●●●	<b>TSX D41 732</b>	0.440
<b>TSX technical documentation</b>	CD-ROM	To be ordered separately	<b>TSX CD D MTE 01E</b>	0.120

(1) PL7-2 application development and diagnostics software. See pages 46503/5 and 46200/2.