

# TSX 47-10/20/25 sequential PLCs

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## Description

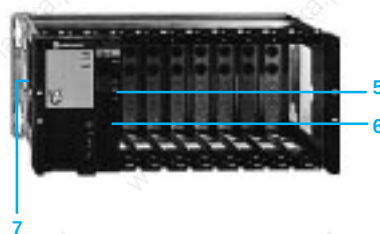
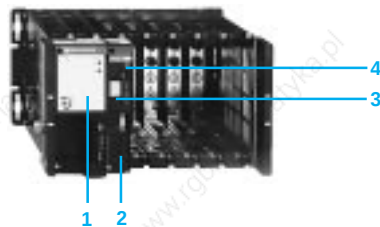
The TSX 47-10/47-20/47-25 base configurations are modular sequential PLCs which can accept all discrete I/O interfaces. They are available in two formats :

- 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



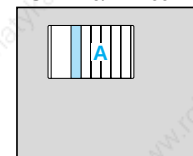
The base configuration comprises a short or standard rear mounted rack incorporating :

- 1 Power supply  $\sim 110/240$  V, 50/60 Hz, TSX SUP 40 (or TSX SUP 702 with TSX 47-25 PLC ) or  $\sim 24/48$  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)

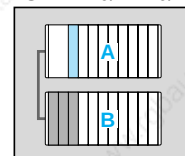
**Note :** The TSX SCM 2116 UNI-TELWAY module is supplied with the TSX 47-25.

## 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.

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## Functions

## 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

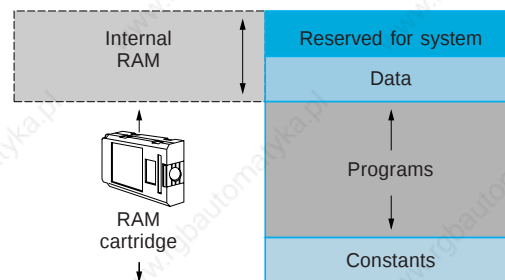
This memory supports the program and the constants relating to the PL7-2 application. The size of the memory allocated to the constants is fixed at 2 K bytes.

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 :

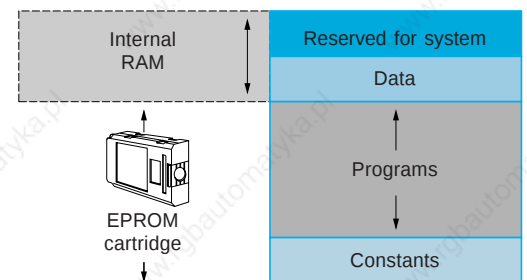
- Battery-backed RAM memory cartridge (5 weeks) in modules of : 8, 16, 32 K bytes.
- EPROM memory cartridge in modules of : 8, 16, 32 K bytes.

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

#### Solution 1

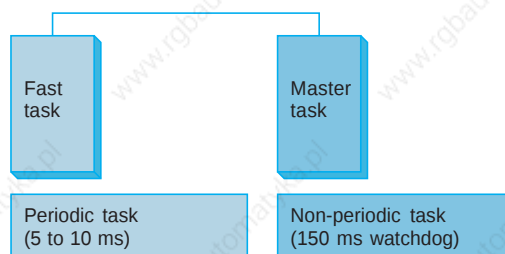


#### Solution 2



## 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.

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## Characteristics, dimensions

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### Environment

|                      |                                                |
|----------------------|------------------------------------------------|
| Temperature          | Operation + 5...+ 55 °C, storage -25...+ 70 °C |
| Altitude             | 0...2000 m                                     |
| Degree of protection | 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             |
|-----------------------------|-------------------------------------------------------------------------------|-----------|-------------------------------------------------|-----------|-----------------------|
| Functions                   |                                                                               |           |                                                 |           |                       |
| 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         |                       |
| Discrete I/O interfaces     |                                                                               |           |                                                 |           |                       |
| 4/8 or 16 points            | Yes                                                                           | Yes       | Yes                                             | Yes       |                       |
| 24 or 32 points             | Yes                                                                           | Yes (1)   | Yes                                             | Yes (1)   |                       |
| Analogue interfaces         | TSX ADT 20 ●, TSX AST 200,                                                    |           |                                                 |           |                       |
| Counting interface          | TSX AXT 200                                                                   |           |                                                 |           |                       |
| Intelligent modules         | 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) |           |                       |
| Communication modules       |                                                                               |           |                                                 |           |                       |
| 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) |           |                                                 |           |                       |

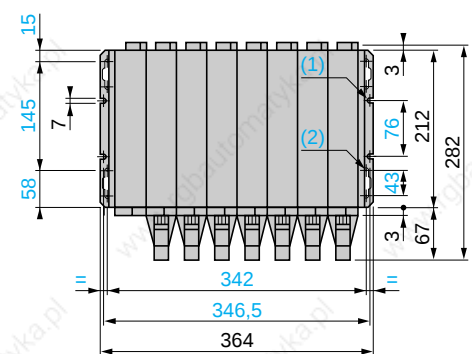
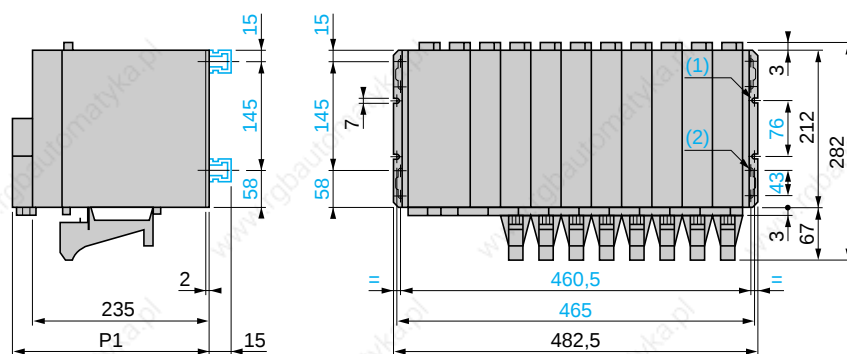
### Dimensions

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 10

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



TSX 47 20 20

### User memory cartridge

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

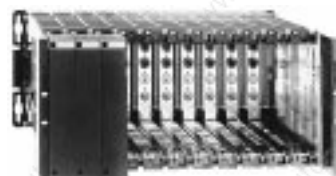


TSX RPM 16 8

| Rack format | Type of bus | No. of available slots | Reference | Weight kg |
|-------------|-------------|------------------------|-----------|-----------|
| Short       | Simplified  | 7                      | TSX RKE 7 | 2.100     |
| Standard    | Simplified  | 8                      | TSX RKE 8 | 3.300     |

### Accessories and separate parts

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



TSX RKE 8

### Documentation (in English)

| Description                                  | Manual format | Included with product    | Reference        | Weight kg |
|----------------------------------------------|---------------|--------------------------|------------------|-----------|
| Installation manual<br>TSX 47-10/47-20/47-25 | A4 bound      | TSX 47 1000              | TSX D41 732      | 0.440     |
| TSX technical documentation                  | CD-ROM        | To be ordered separately | TSX CD D MTE 01E | 0.120     |



TSX CD D MTE 01E

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