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## 1 - Premium automation platform

*Selection guide: Processors and coprocessors* ..... page 1/2

- Racks and fan modules ..... page 1/4
- Bus X remote rackmaster module ..... page 1/8
- Power supply modules ..... page 1/10
- Processors ..... page 1/14
- Atrium coprocessors ..... page 1/20
- PCMCIA memory extension cards ..... page 1/24



**Applications** Single network modular PLCs with PL7 Junior/Pro development software



<b>Number of racks</b>	4/6/8 solts	4	16
	12 solts	2	8

<b>Discrete I/O</b>	In-rack	512 (1), remote Bus X	1024 (1), remote Bus X
	V2 AS-i bus (2)	838 max.	1736 max.
	Fieldbus (3)	2048 max. 4032 max.	6080/8672 max. (4)

**Preventa modules** Emergency stop monitoring and limit switches

<b>Analogue I/O</b>	Max. no. of channels	24 in-rack (1)	24 in-rack (1) 640 on Fipio	80 in-rack (1) 640 on Fipio	80 in-rack (1) 640 on Fipio
	In-rack type	Inputs: high level 1 (with common point or isolated), 12...16 bits; inputs: isolated, 16 bits; inputs:			

<b>App-spec. channels</b>	Maximum no.	8 (1)	24 (1)
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<b>Type</b>	Counter	40 kHz, 500 kHz and 1 MHz counter (with SSI absolute encoder)	
	Motion	Motion control for servomotors (500 kHz with incremental encoder, 200 kHz with SSI absolute encoder),	
	Weighing	Module with measurement input for 8 sensors maximum, 2 discrete outputs and 1 RS 485 output for	
	Communication	Communication module, 2 channels with 1 isolated RS 485 integrated channel (with Uni-Telway,	

<b>Network connections</b>	Maximum no.	1	
	With integrated Ethernet	-	yes
	Type	Fipway, Modbus Plus, Ethernet TCP/IP, Ethernet TCP/IP with or without integrated Web server	

<b>Bus connections</b>	Uni-Telway	Integrated	Integrated
	AS-i	2 max.	4 max.
	Fipio manager	- yes	depending on model yes
	Fipio Agent	1	1
	Third-party : CANopen, InterBus-S, Profibus-DP	-	1

<b>Process control</b>	Number of channels	10
	Loop profile	Per channel : 3 single, process, cascade, secondary,

<b>Memory capacity</b>	Integrated RAM	32 Kwords	48 Kwords 64 Kwords (model with Fipio integrated link)
	Extension	64 Kwords	160 Kwords
	Data storage	128 Kwords	128...2688 Kwords with memory extension
	Symbol storage	-	128 Kwords with memory extension

**Power supply** Modules ~ 100...240 V (26/50/85 W), --- 24 V non isolated (30/50 W), --- 24...48 V isolated (50 W).

<b>Type of processors</b>	TSX P57 103M	TSX P57 153M	TSX P57 2●3M (5)	TSX P57 2●23M (6)
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**Pages** 1/19

(1) Cumulative maximum values. (2) Sensor/actuator bus. (3) Fipio/Modbus Plus/InterBus-S/Profibus DP fieldbus.  
 (4) The first value corresponds to processor without Fipio integrated link, the second value with processeur Fipio integrated link.  
 (5) To replace ● by 0: model without Fipio integrated, 5: model with Fipio integrated.

Multinetwork modular PLCs with PL7 Junior/Pro development software

PLC coprocessors to be integrated in PC compatible



1024 (1), remote Bus X  
3472 max.  
10 112/12 704 max. (4) 10 112 max.

2048 (1), remote Bus X  
3472 max.  
14 114 max.

16  
8  
1024 (1), remote Bus X  
1736 max. 3472 max.  
6080 max. 12 704 max.

128 in-rack (1)  
640 on Fipio

128 in-rack (1)

256 in-rack (1)  
1472 on Fipio

80 in-rack (1)  
640 on Fipio

128 in-rack (1)  
640 on Fipio

thermocouple, 16 bits; outputs: isolated, 11 bits + sign; outputs: with common point, 13 bits + sign

32 (1)

64 (1)

24 (1)

32 (1)

motion control for stepper motor

display (one module is counted as 2 application-specific channels)

Modbus/Jbus or character mode protocol) and 1 PCMCIA card slot (multiprotocol serial link, Jnet network)

3  
- yes

4  
- yes

1 3  
-

Fipway, Modbus Plus, Ethernet TCP/IP with or without embedded Web server

Integrated  
8 max.max.

Depending on model -

1

2 (with only 1 CANopen)

Integrated  
8 max.

1

1

2 (with only 1 CANopen)

Integrated  
4 max.

- 8 max.

1

1 2 (with only 1 CANopen)

15

20

10

15

setpoint programmer

64/80 Kwords (7)  
80/96 Kwords (7)  
(model with Fipio integrated)

384 Kwords

128...2688 Kwords with memory extension

128 Kwords with memory extension

64/80 Kwords (7)

96/176 Kwords (7)

512 Kwords

128 ou 256 Kwords with memory extension

48 Kwords

160 Kwords

128 ou 640 Kwords with memory extension

128 Kwords with memory extension

80/96 Kwords (7)

384 Kwords

Each rack requires a power supply

TSX P57 303M (5)

TSX P57 3623M

TSX P57 453M

TSX P57 4823M

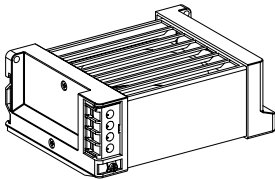
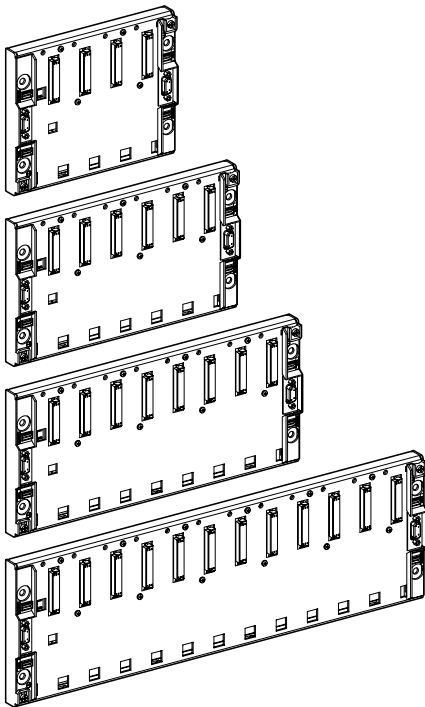
T PCX 57 203M

T PCX 57 353M

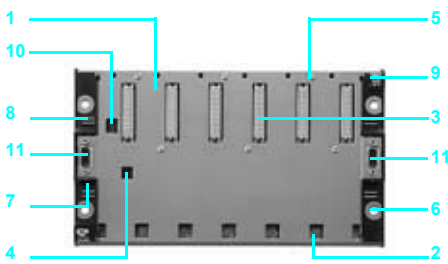
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(6) To replace ● by 6: model without Fipio integrated, 8: model with Fipio integrated..

(7) The second value corresponds to the capacity of the integrated when the application program is supported by the extension memory.



TSX FAN ●●P



### Presentation

TSX RKY ●●● racks form the basic elements of the Premium control system platform.

These racks provide the following functions:

- Mechanical function: they enable all the modules of a PLC station (power supply, processor, discrete I/O, analogue I/O, application-specific modules) to be fitted.
- Electrical function: they enable connection to the bus (Bus X) and provide distribution of:
  - power supplies required for each module in the same rack,
  - data and service signals for the entire PLC station where this has several racks.

To meet user requirements, several types of rack are available in order to make up PLC stations comprising 1 to 16 racks maximum distributed over Bus X with a maximum cumulative length of 100 meters.

TSX FAN ●●P fan modules installed above the racks of Premium PLCs provide forced air convection, in order to maintain an even ambient temperature inside the enclosure and to eliminate the various hot spots that may exist.

Fan modules are required whenever the ambient temperature is between 60 °C and 70 °C (forced ventilation enables the ambient temperature in the enclosure to be lowered by 10 °C) (1).

Three types of fan module are available: --- 24 V, ~ 110 V and ~ 220 V. According to the modularity of the racks used, one fan module is required for a 4 or 6 position rack, two fan modules for an 8-position rack and three fan modules for a 12 position rack.

(1) For an ambient temperature between 25 °C and 60 °C, the use of fan modules increases the MTBF.

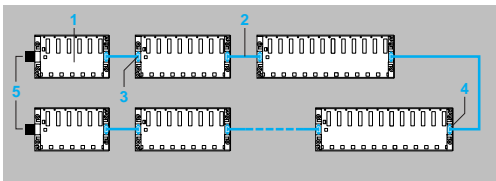
### Description

TSX RKY ●●● racks comprise:

- 1 Metal frame.
- 2 Slots for anchoring the module pins.
- 3 48-way female 1/2 DIN connectors for module-rack connections (the first connector is reserved for the power supply module).
- 4 Locating slot for the power supply module.
- 5 Tapped holes for fixing the module.
- 6 Four holes for fixing the rack.
- 7 Position for rack address label.
- 8 Position for station network address label.
- 9 Two earth terminals for earthing the rack.
- 10 Microswitches for coding the rack address (on extendable racks).
- 11 Two 9-way female SUB-D connectors for the remote connection of bus X to another rack (on extendable racks).

TSX FAN ●●P fan modules comprise:

- 1 Connection terminal for the fan module power supply, the internal temperature probe and the associated LED or preactuator.
- 2 Earth terminal.
- 3 Two fixing holes for the fan module.
- 4 Shuttered air outlets.



### Composition of a PLC station

Using TSX RKY 6/8/12 standard racks, it is possible to constitute a PLC station with Premium processors, with just a single rack.  
 Using 1 TSK RKY 4EX/6EX/8EX/12EX (1) extendable racks, a PLC station can be constituted which comprises up to:

- 4 racks for a station with TSX 57-10 processor,
- 16 racks for a station with TSX 57-20, 57-30, 57-40 or PCX 57-20/30 processor.

The racks are connected to each other by Bus X extension cables 2.

### Bus X

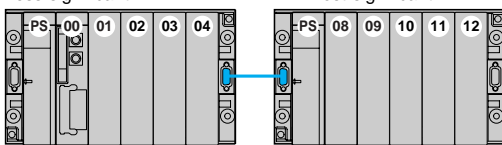
The racks distributed on Bus X are connected to each other via Bus X extension cables whose total length is 100 m maximum. Using TSX REY 200 Bus X remote modules enables the length of Bus X to be increased to a maximum of 2 x 350 m (see page 1/8).

The racks are connected to each other using TSX CBY ●●0K Bus X extension cables which are connected to one of the two 9-way SUB-D connectors on each extendable rack. The incoming cable from another rack can be connected to either the right 4 or left-hand 3 connector.

### Line terminations

The two extendable racks located at the ends of the line must have a TSX TLY EX line terminator 5 fitted on the unused 9-way SUB-D type connector, except when using PCX 57 coprocessors where the line terminator is supplied with the coprocessor module.

Address rack n (with power supply standard format)  
 "less-significant" "most-significant"



### Addressing the racks

**Address 0:** this address is always assigned to the rack which holds the processor. This rack can be located in any position on the line.  
**Addresses 1 to 7:** these can be assigned in any order to all the other extendable racks of the station.  
 As the two racks with 4, 6, or 8 slots which make up each pair can have the same address on the bus X, position numbers are defined as follows:  
 Rack n "less-significant": position 00 to xx (02, 04 or 06); rack n "most-significant": position 08 to yy (10, 12 or 14).  
 ■ Each rack with 12 slots holds an address (with position 00 to 10).

### Installing the various modules on the standard or extendable rack with address 0

The rack with address 0 must contain a power supply module and the processor module. For Premium PLCs which have two types of power supply (standard or double format), the position of the processor (standard or double format) will depend on the type of power supply used.

Using a standard format power supply module:

- The power supply module systematically occupies position PS.
- The processor module must be installed in position 00/01 (00 with TSX P57 1●3M processor).
- The other modules are installed from position 02 (01 with TSX P57 1●3M processor).

Using a double format power supply module:

- The power supply module systematically occupies positions PS and 00.
- The processor module must be installed in position 01/02 (01 with TSX P57 1●3M processor).
- The other modules are installed from position 03 (02 with TSX P57 1●3M processor).

### Installing the various modules on extendable racks with addresses 1 to 7

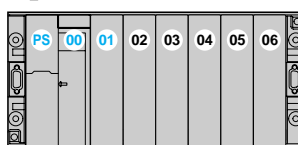
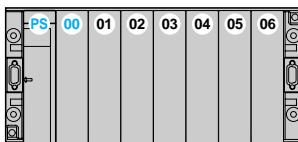
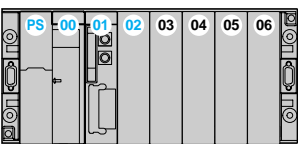
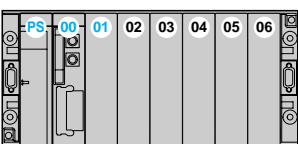
Each rack must have either a standard format or double format power supply module.

Using a standard format power supply module:

- The power supply module systematically occupies position PS.
- The other modules are installed from position 00 onwards.

Using a double format power supply module:

- The power supply module systematically occupies positions PS and 00.
- The other modules are installed from position 01 onwards.



1



TSX RKY 6



TSX RKY 6EX



TSX FAN 6P



TSX TLY EX

### Non-extendable racks

Description	Type of modules to be installed	Capacity	Reference	Weight kg
Non-extendable racks, for single rack configuration	TSX PSY power supply, TSX P57 processor, I/O modules, application-specific modules	6 positions	<b>TSX RKY 6</b>	1.470
		8 positions	<b>TSX RKY 8</b>	1.750
		12 positions	<b>TSX RKY 12</b>	2.310

### Extendable racks

Description	Type of modules to be installed	Capacity	Reference	Weight kg
Extendable racks for multi-racks configuration (maximum 16 racks) (1)	TSX PSY power supply, TSX P57 processor (main rack), I/O modules, application-specific modules	4 positions	<b>TSX RKY 4EX</b>	1.160
		6 positions	<b>TSX RKY 6EX</b>	1.500
		8 positions	<b>TSX RKY 8EX</b>	1.780
		12 positions	<b>TSX RKY 12EX</b>	2.340

### Fan modules

Description	Use	Power supply	Reference	Weight kg
Fan modules (2)	For TSX RKY ● or TSX RKY ●EX racks	~ 24 V	<b>TSX FAN D2P</b>	0.500
		~ 100...120 V	<b>TSX FAN A4P</b>	0.500
		~ 200...240 V	<b>TSX FAN A5P</b>	0.500

### Connection accessories

Description	Use	Comprising	Length	Unit reference	Weight kg
Daisy chaining cables Bus X (total length 100 m maximum) (3)	Between TSX RKY ●EX racks	2 x 9-way SUB-D connectors	1 m	<b>TSX CBY 010K</b>	0.160
			3 m	<b>TSX CBY 030K</b>	0.260
			5 m	<b>TSX CBY 050K</b>	0.360
			12 m	<b>TSX CBY 120K</b>	1.260
			18 m	<b>TSX CBY 180K</b>	1.860
			28 m	<b>TSX CBY 280K</b>	2.860
			38 m	<b>TSX CBY 380K</b>	3.860
			50 m	<b>TSX CBY 500K</b>	5.060
72 m	<b>TSX CBY 720K</b>	7.260			
100 m	<b>TSX CBY 1000K</b>	10.060			
Cable on reel	Length to be fitted with TSX CBY K9 connectors	Cable with free ends, 2 line testers	100 m	<b>TSX CBY 1000</b>	12.320
Line terminators (sold in lots of 2)	Compulsory on the 2 TSX RKY ●EX end racks	2 x 9-way SUB-D connectors labelled A and B		<b>TSX TLY EX</b>	0.050
Protective covers (Sold in lots of 5)	Unoccupied position on TSX RKY ● or TSX RKY ●EX racks	5 screw-on covers		<b>TSX RKA 02</b>	0.050
Bus X connectors (Sold in lots of 2)	For TSX CBY 1000 cable ends	2 x 9-way SUB-D connectors		<b>TSX CBY K9</b>	0.080
Installation of connectors	Mounting of TSX CBY K9 connectors	2 crimping pliers- 1 pen (4)		<b>TSX CBY ACC 10</b>	-
Fixing screws M6 x 25 (Order in multiple of 100)	Fixing for TSX RKY ● or TSX RKY ●EX racks	Captive screw and washer with hexagonal slotted head		<b>AF1-VA625</b>	0.007

(1) 16 racks TSX RKY 4EX/6EX/8EX maximum (4, 6 or 8 slots). Using the TSX RKY 12EX (12 slots) is the same as occupying 2 racks with 4, 6 or 8 slots.

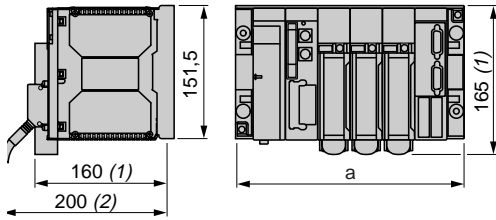
(2) One fan module for rack with 4 or 6 positions, two fan modules for rack with 8 positions and three fan modules for rack with 12 positions. Product supplied with bilingual Quick Reference Guide: English and French.

(3) 2 x 350 m maximum when using the TSX REY 200 Bus X remote module (see page 1/8).

(4) Installation of connectors on the cable also requires a wire stripper, a pair of scissors and a digital ohmmeter.

### TSX RKY

Common side view      Front view: TSX RKY 6/6EX example



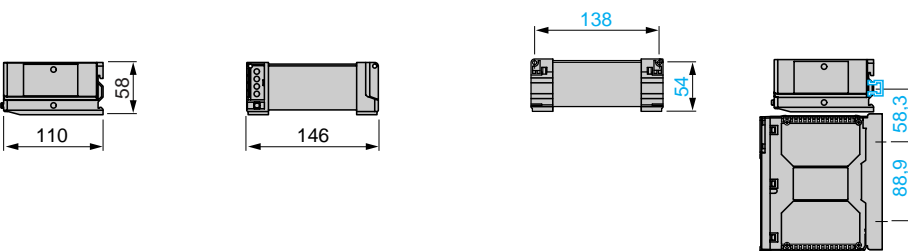
TSX RKY	a
4EX	187.9
6/6EX	261.6
8/8EX	335.3
12/12EX	482.6

(1) With screw terminal bloc

(2) With HE 10 or SUB-D type connectors

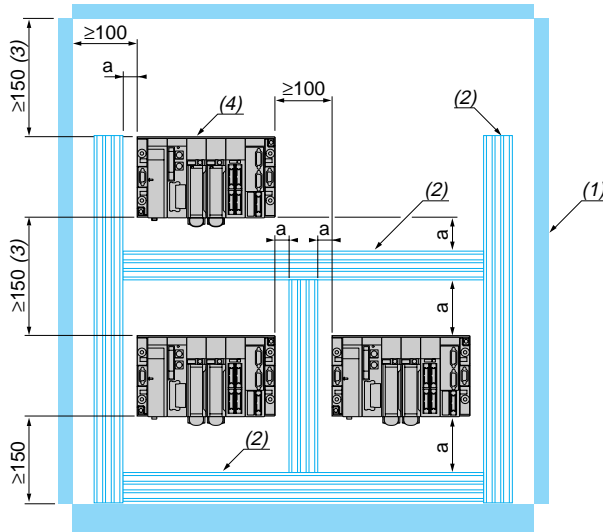
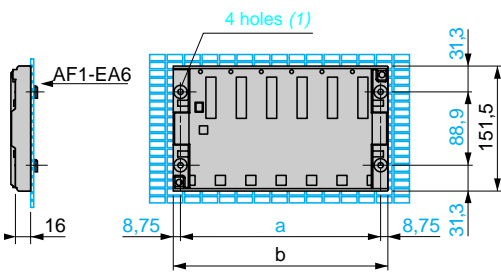
### TSX FAN ●●P

### Fan module mounting

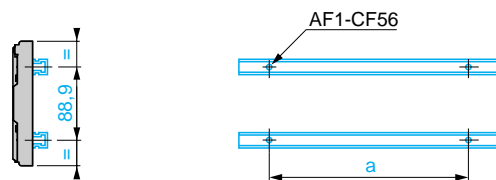


### Mounting of racks on AM1-PA perforated plate

### Installation rules



### Mounting of racks on AM1-ED profiles



TSX RKY	a	b
4EX	170.4	187.9
6/6EX	244.1	261.6
8/8EX	317.8	335.3
12/12EX	465.1	482.6

(1) For mounting on panel: the diameter of the fixing holes must be sufficient for an M6 screw

$a \geq 50$ mm	
(1) Equipment or enclosure	
(2) Cable ducting or clip	
(3) $\geq 130$ mm with TSX FAN ●●P fan module	
(4) TSX RKY 4EX/6/6EX	1 fan module per rack
TSX RKY 8/8EX	2 fan module per rack
TSX RKY 12/12EX	3 fan module per rack

### Presentation

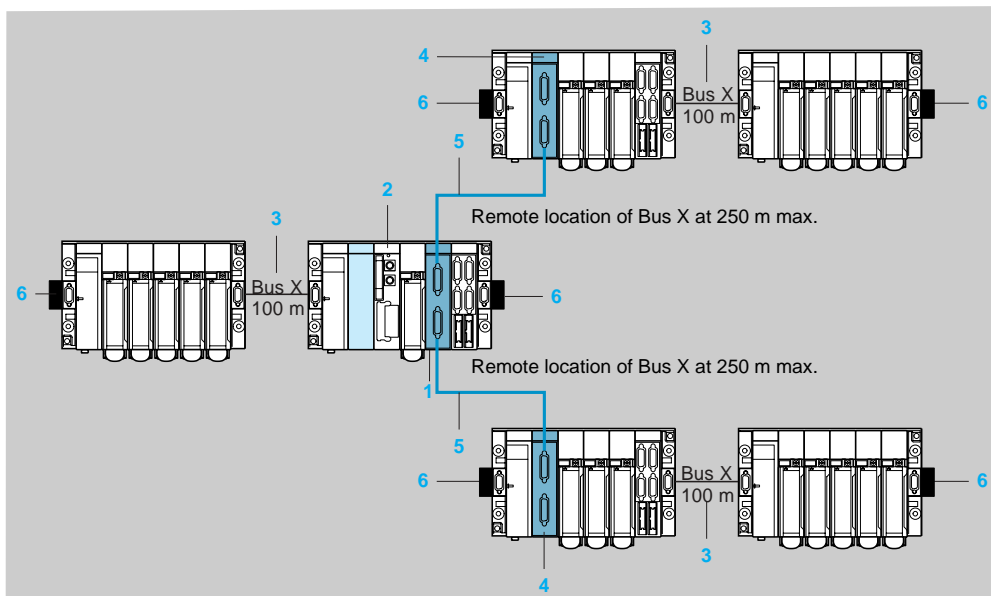
Bus X for Premium PLCs can be used to connect eight 12 position racks or sixteen 4, 6 or 8 position racks, distributed over a maximum length of 100 metres (see page 1/5).

For applications requiring longer distances between racks, the Bus X remote rackmaster module : TSX REY 200 can be used to increase this distance up to a maximum of 350 metres without reducing performance.

The Bus X remote system is electrical. Using the Bus X remote rackmaster module will not result in any loss of performance in reading or controlling I/O.

The Bus X remote system comprises :

- One TSX REY 200 module called the "Master" **1** located on the rack at address 0 (rack supporting the processor **2** and the main Bus X **3**). This module has 2 channels used to locate 2 Bus X segments **5** remotely at a maximum distance of 250 metres.
  - One or two TSX REY 200 modules **4** called "Slaves" located on each extendable rack.
  - Each Slave module is connected to the Master module by a TSX CBRV 2500 cable **5**, which the user should cut and fit with TSX CBRV K5 connectors as required (cabling does not require any special equipment).
- Each end of the Bus should be fitted with a TSX TLY EX line terminator **6**



### Maximum distances for remote location

From one remote system, the maximum permitted distances from the processor are shown in the table below :

Types of modules	References	Bus X remote system <b>5</b>
Discrete inputs(1)	TSX DEY ●●●	250 m
Discrete outputs	TSX DSY ●●●	
Preventa safety module	TSX PAY ●●●	
Discrete I/O (2)	TSX DMY	175 m less then the length of Bus X
Analogue I/O (3)	TSX AEY ●●●/ASY ●●●	
Counting/motion modules(4)	TSX CTY ●A/CTY 2C/CAY 21/CAY41/CFY ●1	
Weighing module	TSX ISP Y101/Y111	
AS-i Bus module	TSX SAY 100/1000	Remote location of Bus X not permitted
SERCOS motion module	TSX CSY84	
Communication module	TSX SCY 21601/11601	
Ethernet modules	TSX ETY ●●●●	
Third-party Bus modules	TSX IBY 100/PBY100	225 m less then the length of Bus X
(1)	TSX DEY 16FK (version ≥ 06)	
(2)	TSX DMY 28FK/28RFK	
(3)	TSX AEY 810/1614 TSX ASY 410 (version ≥ 11)	
(4)	TSX CTY 2C/CCY 1128 TSX CAY 22/42/33	



### Implantations

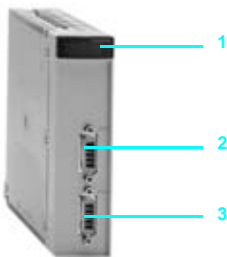
The rules for installing the Bus X remote rackmaster module, TSX REY 200, are as follows :

- Bus X remote rackmaster module acting as a Master. It is installed on the rack at address 0 supporting the processor with :
  - The power supply module systematically occupying position(s) PS (and 00). The processor module must be installed in position 01 (and 02 if it is a double format processor).
  - The Bus X remote rackmaster module, TSX REY 200, can be installed in any position after 02 (or 03 if it is a double format processor).
- Bus X remote rackmaster module acting as a Slave. It is installed in an extendable rack (located on an extendable Bus X segment) in any position apart from the positions dedicated to the power supply module.

### Description

The front panel of the Bus X remote rackmaster module TSX REY 200 comprises :

- 1 A display block with 6 indicator lamps :
  - RUN indicator : module running
  - ERR indicator : module has internal fault
  - I/O indicator : module has external fault
  - MST indicator : module acting as Master or Slave
  - CH0 indicator : channel 0 operating
  - CH1 indicator : channel 1 operating
- 2 9 to 5-way SUB-D 9 connector for the connection of channel 0.
- 3 9 to 5-way SUB-D 9 connector for the connection of channel 1.



TSX REY 200

### References

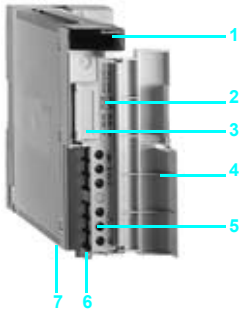
Description	Operation	Number of channels	Reference	Weight
Bus X remote rackmaster module	Master/slave	2	TSX REY 200	kg

### Connection cables and accessories

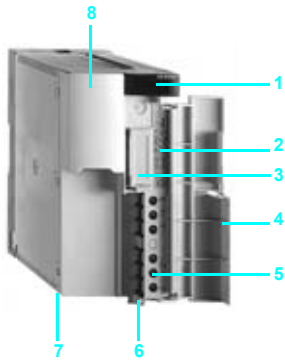
Description	Use	Length	Reference	Weight
Bus X cables supplied on a drum	Connection of two TSX REY 200 modules Class C1 flame resistance	250 m	TSX CBRY 2500	kg
	Cable for daisy chain mounting (2)	250 m	TSX CBRY 2500F	kg
5-ways SUB-D 9 connectors (sold in lots of 5)	Connections for bus X cable	-	TSX CBRY K5	kg

Description	Use	Composition	Reference	Weight
Line terminators (sold in lots of 2)	Must be fitted on each TSX RKY ●EX end rack	2 x 9-way SUB-D connectors	TSX TLY EX	0.050 kg

(1) Product supplied with multilingual Quick Reference Guide.  
 (2) Mobile installations: cables as per VDE 472, part 603/H:  
 - for use on cable drag chain with minimum bend radius of 75 mm,  
 - for use on gantry crane (strikethrough: portal support), subject to compliance with conditions for use such as acceleration, speed, length etc: contact our regional branch office for further information.  
 - not authorized for use on robots, or multi-axis applications.



TSX PSY 2600M



TSX PSY 5500M

### Description

TSX PSY●●●0M power supply modules provide the power supply for each rack and the modules installed on it.

The power supply module is selected according to:

- The mains electrical supply:  $\text{---} 24 \text{ V}$ ,  $\text{---} 24\text{...}48 \text{ V}$ ,  $\sim 100\text{...}120$ ,  $\sim 200\text{...}240 \text{ V}$
- The required power: standard format or double format model, see power consumption table on page 9/4.

TSX PSY●●●0M power supply modules comprise:

- 1 Display block comprising:
  - OK lamp (green), on if voltages are present and correct.
  - BAT lamp (red), on if the battery is faulty or missing.
  - 24 V lamp (green), on when the sensor voltage is present (according to model).
- 2 RESET pencil-point pushbutton causing a warm restart of the application.
- 3 Slot for a battery which protects the internal RAM memory of the processor.
- 4 Cover to protect the front panel of the module.
- 5 Screw terminal for connecting:
  - To mains supply.
  - The alarm relay contact.
  - The sensor power supply for a.c. supplies (according to model).
- 6 Opening for cable clamp.
- 7 Fuse located beneath the module and protecting:
  - 24 VR voltage on the non-isolated d.c. supply with TSX PSY 3610.
  - Primary voltage on the other power supplies.
- 8 110/220 voltage selector (according to model).

### Characteristics

Type of power supply module				TSX PSY 1610M	TSX PSY 3610M	TSX PSY 5520M	
Primary	Voltage	Nominal	V	~ 24	~ 24	~ 24...48	
		Limit (ripple included)	V	~ 19.2...30 (1) (possible up to 34 V for 1 h in every 24 h)		~ 19.2...60	
	Frequency	Nominal/limit	Hz	–	–	–	
	Currency	Nominal input 1 rms		A	≤ 1.5 at ~ 24 V	≤ 2.7 at ~ 24 V	≤ 3 at ~ 24 V ≤ 1.5 at ~ 48 V
			Initial start up at 25 °C (2)	1 inrush	A	100 at ~ 24 V	150 at ~ 24 V
		I <sup>2</sup> t on activation		A <sup>2</sup> s	12.5	20	50 at ~ 24 V 55 at ~ 48 V
			It on activation	As	0.2	0.5	7 at ~ 24 V 6 at ~ 48 V
	Duration of micro breaks	Main supply (accepted)	ms	≤ 1	≤ 1	≤ 1	
	Integrated protection				By fuse 5 x 20, time-delayed 3.5 A	No	By fuse 5 x 20, time-delayed 5 A
	Secondary	Power	Total useful (typical)	W	30	50	50
Output ~ 5 V		Nominal voltage	V	5	5	5	
		Nominal current	A	3	7	7	
		Power (typical)	W	15	35	35	
Output ~ 24 VR (3)		Nominal voltage	V	U mains - 0.6	U mains - 0.6	24	
		Nominal current	A	0.6	0.6	0.8	
		Power (typical)	W	15	19	19	
Output ~ 24 V sensors				–	–	–	
Integrated protection on outputs (4)				Yes, against overloads, short-circuits and overvoltages			
Conformity to standards				IEC 1131-2			
Isolation	Dielectric withstand	Primary/secondary and primary/earth	V eff	Non isolated, internal 0 V connected to PLC earth		2000 - 50/60 Hz - 1 min	
	Insulation resistance	Primary/secondary and primary/earth	MΩ	–		≥ 10	
Type of power supply module				TSX PSY 2600M	TSX PSY 5500M	TSX PSY 8500M	
Primary	Voltage	Nominal	V	~ 100...240	~ 100...120/200...240		
		Limit (ripple included)	V	~ 85...264	~ 85...140/190...264	~ 85...140/170...264	
	Frequency	Nominal/limit	Hz	50-60/47-63			
	Current	Nominal input 1 rms		A	0.5 at ~ 100 V 0.3 at ~ 240 V	1.7 at ~ 100 V 0.5 at ~ 240 V	1.7 at ~ 100 V 0.5 at ~ 240 V
			Initial start up at 25 °C (2)	I inrush current	A	37 at ~ 100 V 75 at ~ 240 V	38 at ~ 100 V 38 at ~ 240 V
		I <sup>2</sup> t on activation		A <sup>2</sup> s	0.63 at ~ 100 V 2.6 at ~ 240 V	4 at ~ 100 V 2 at ~ 240 V	15 at ~ 100 V 8 at ~ 240 V
			It on activation	As	0.034 at ~ 100 V 0.067 at ~ 240 V	0.11 at ~ 100 V 0.11 at ~ 240 V	0.15 at ~ 100 V 0.15 at ~ 240 V
	Duration of micro breaks	Mains supply (accepted)	ms	≤ 10	≤ 10	≤ 10	
	Integrated protection				By fuse 5 x 20, time-delayed, 4 A		
	Secondary	Power	Total useful (typical)	W	26	50	77 (5)
Output ~ 5 V		Nominal voltage	V	5	5	5	
		Nominal current	A	5	7	15	
		Power (typical)	W	25	35	75	
Output ~ 24 VR (3)		Nominal voltage	V	24	24	–	
		Nominal current	A	0.6	0.8	–	
		Power (typical)	W	15	19	–	
Output ~ 24 VC		Sensors	A	0.5	0.8	1.6 (TBTS)	
Integrated protection on outputs (4)				Yes, against overloads, short-circuits and overvoltages			
Conformity to standards				IEC 1131-2			
Isolation	Dielectric withstand	Primary/secondary and primary/earth	V eff	2000 - 50/60 Hz - 1 min		3000 - 50/60 Hz - 1 min	
	Insulation resistance	Primary/secondary and primary/earth	MΩ	≥ 100			

(1) When supplying modules with relay outputs, the range is reduced to 21.6...26.4 V.

(2) These values should be taken into account when starting several devices simultaneously and for sizing protection devices.

(3) Output ~ 24 V for supplying relays of modules with relay outputs.

(4) Output ~ 24 VR, cannot be accessed by the user and is protected by a fuse located beneath the module (5 x 20, 4 A, type Medium)

(5) 77 W at 60 °C, 85 W at 55 °C, or 100 W at 55 °C using TSX FAN fan modules.

### Functions

#### Alarm relay

The alarm relay located in each power supply module has a volt-free contact which can be accessed on the connection screw terminal of the module.

The operating principle is as follows:

- Module alarm relay located on the processor rack (rack 0): in normal operation, PLC in RUN, the alarm relay is activated and its contact is closed (state 1). Whenever the application stops, even partially, occurrence of a blocking fault, incorrect output voltages or loss of mains power, the relay de-energizes and the associated contact opens (state 0).
- Alarm relay of power supply modules located on other racks (racks 1 to 7): when the module is powered up and if the output voltages are correct, the relay is activated and its contact is closed (state 1). When the mains power is lost or if the output voltages are incorrect, the relay de-energizes (state 0).

#### Back-up battery

Each power supply module has a slot reserved for a battery which provides the power supply to the internal RAM memory located in the processors, in order to ensure that data is saved when the PLC is switched off. The duration of data back-up is one year. The battery must be changed as soon as the BAT lamp (red) on the front panel lights up.

#### RESET pushbutton

Pressing this pushbutton, which is located on the front panel of the power supply module, triggers a sequence of service signals which is the same as that for:

- A power break when the pushbutton is pressed
- A power up when the pushbutton is released

These operations are expressed by the application as a warm restart.

#### Sensor power supply

The TSX PSY 2600M/5500M/8500M a.c. power supply modules have an integrated power supply which provides a voltage of  $\approx 24$  V to supply the input sensors. Connection to this sensor power supply can be accessed via the module screw terminal. The available power on  $\approx 24$  V depends on model (0,5/0,8/1,6 A), see characteristics page 1/11.

## References

Each TSX RKY ●/●EX rack must be equipped with a single or double format power supply module (slot marked PS).

The power required to supply each TSX RKY rack depends on the type and number of modules installed in the rack. It is therefore necessary to establish a power consumption table rack by rack in order to determine the TSX PSY power supply module most suitable for each rack (see pages 9/4 and 9/5).

## Power supply module

Power supply	Available power (1)				Format	Reference (2)	Weight kg
	$\text{---} 5 \text{ V}$	$\text{---} 24 \text{ VR}$	$\text{---} 24 \text{ VC}$	Total			
$\text{---} 24 \text{ V non isolated}$ (3)	15 W	15 W	–	30 W	Standard	<b>TSX PSY 1610M</b>	0.540
	35 W	19 W	–	50 W	Double	<b>TSX PSY 3610M</b>	0.780
$\text{---} 24\text{...}48 \text{ V isolated}$	35 W	19 W	–	50 W	Double	<b>TSX PSY 5520M</b>	0.890
$\sim 100\text{...}240 \text{ V}$	25 W	15 W	12 W	26 W	Standard	<b>TSX PSY 2600M</b>	0.510
$\sim 100\text{...}120 \text{ V}$ $\sim 200\text{...}240 \text{ V}$	35 W	19 W	19 W	50 W	Double	<b>TSX PSY 5500M</b>	0.620
	75 W	–	38 W (TBTS)	77 W	Double	<b>TSX PSY 8500M</b>	0.740



TSX PSY 2600M



TSX PSY 5500M

## Accessories

Description	Use	Quantity	Reference	Weight kg
Battery	Internal RAM memory backup (position in power supply modules)	1 battery	<b>TSX PLP 01</b>	0.010
		10 batteries	<b>TSX PLP 101</b>	0.100

(1) Voltages  $\text{---} 5 \text{ V}$  and  $\text{---} 24 \text{ VR}$  for power supply to Premium modules, voltage  $\text{---} 24 \text{ VC}$  for supplying power to input sensors. The sum of absorbed power on each voltage ( $\text{---} 5 \text{ V}$ ,  $\text{---} 24 \text{ VR}$  and  $\text{---} 24 \text{ VC}$ ) should not exceed the total power of the module. See power consumption table on page 9/4.

(2) Product supplied with a RAM memory backup battery and multilingual installation guide (racks and power supplies) English, French, German, Spanish and Italian.

(3) The internal 0 V of the module is connected to the PLC earth.



TSX P57 2623/3623M



TSX P57 2823/4823M

### New developments

The Premium processor offer, until now made up of 7 models, has been joined by 4 new models featuring a TCP/IP 1 double format Ethernet port:

- TSX P57 2623M, with 1024 Discrete I/Os, 80 analog I/Os and 24 application-specific channels.
- TSX P57 2823M, offering the same characteristics as the TSX P57 2623M processor with an additional integrated Fipio link (bus manager).
- TSX P57 3623M with 1024 Discrete I/Os, 128 analog I/Os and 32 application-specific channels.
- TSX P57 4823M, with 2048 Discrete I/Os, 256 analog I/Os, 64 application-specific channels and an integrated Fipio link (bus manager).

This new processor offer is joined by a new SRAM memory extension card, reference TSX MRP DS 2048P. This type III PCMCIA card offers a 2 Mword data storage capacity. It is inserted in the lower processor slot and can be used in conjunction with application memory extension cards (type I in the upper slot).

To install the software of the new processors, you must use version  $\geq 4.3$  of the PL7 Junior/Pro design and setup software. The use of the SRAM cartridge requires version  $\geq 4.2$ .

### Presentation

Premium TSX P57 ●●3M control system platform processors manage the entire PLC station comprising discrete I/O modules, Preventa safety modules, analog I/O modules and application-specific modules which can be distributed over one or more racks connected on Bus X or on a fieldbus.

### 11 types of TSX P57 processor

The types of processor available are divided into various capacities according to memory, in-rack I/O, communication and processing speed. According to the model:

- 4 to 16 extendable racks (TSX RKY ●●EX).
- 512 to 2048 discrete I/Os.
- 24 to 256 analog I/O.
- 8 to 64 application-specific channels. Each application-specific module (counter, motion control, communication or weighing) comprises n application-specific channels.
- 1 to 4 networks (Ethernet TCP/IP, Fipway, Modbus Plus), 2 to 8 AS-i buses and 0 to 2 third-party buses (CANopen, INTERBUS, Profibus).
- 10 to 20 regulation channels.

### Integrated communication

According to the model, Premium processors include:

- A TCP/IP Ethernet port (RJ 45 connection).
  - A Fipio bus link (bus manager).
  - Communication via 2 terminal ports (TER and AUX) using Uni-Telway or character mode protocol (typically a programming terminal and operator dialog terminal).
- Each processor has a slot for a type III PCMCIA card pour for accepting a network card (Fipway, Modbus Plus) or bus (Modbus, Fipio Agent, Uni-Telway, CANopen and serial links).

### Application design and installation

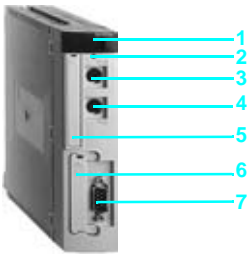
The new version V4.3 of the PL7 Junior and PL7 Pro software can be used to set up the 4 new processors with TCP/IP Ethernet ports. To find out about the other developments in version V4.3, see page 6/4.

PL7 Junior/Pro software licenses, including a one year subscription, are offered according to requirements, in different versions:

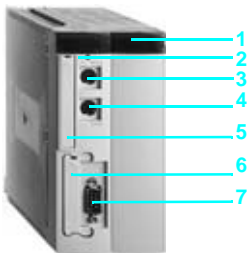
- Single station,
- Multi station in the form of independent local stations (Junior/Pro), remote stations connected to a server via a network (Pro OpenTeam for 3 to 10 stations or Pro OpenSite for  $\geq$  to 10 stations), or as a Client/Server architecture via Thin Client PC terminals (Pro Servi).

These licenses are compatible with PC terminals running Windows 98, Windows NT4, Windows Millenium, Windows 2000 or Windows XP operating systems.

For further details, see page 6/19.



TSX P57 1●3M



TSX P57 2●3/3●3/453M

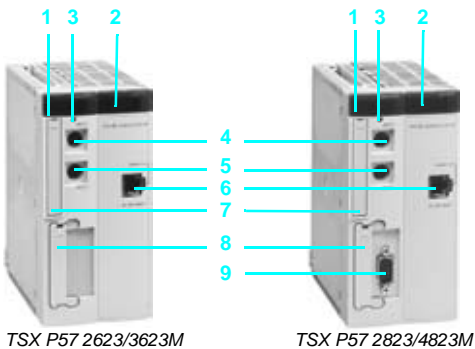
### Description of TSX P57●●3M processors without integrated Ethernet ports

Standard format TSX P57 1●3M processors and TSX P57 2●3/3●3/453M double format processors feature, on the front panel:

- 1 A display block with 5 indicator lamps:
  - RUN lamp (green): processor in operation (program execution).
  - ERR lamp (red): fault in the processor or its on-board devices (PCMCIA memory card and PCMCIA communication card).
  - I/O lamp (red): fault from another module of the station or configuration fault.
  - TER lamp (yellow): activity on the terminal port.
  - FIP lamp (red): activity on the integrated Fipio bus.
- 2 RESET button causing a cold restart of the PLC when it is activated.
- 3 A female 8-way mini-DIN connector marked TER for connecting a programming or adjustment terminal.
- 4 A female 8-way mini-DIN connector marked AUX for connecting a peripheral device.
- 5 Slot for a type I PCMCIA format memory extension card.
- 6 Slot for a type III PCMCIA format communication card. Can receive the 2 Mb SRAM memory extension data storage card (TSX MRP DS 2048P).
- 7 A 9-way SUB-D connector (on TSX P57 P57 153/253/353/453M) for Fipio bus manager communication.

### Description of TSX P57●●23M processors with integrated Ethernet ports

Double format TSX P57 2623/2823M and TSX P57 3623/4823M processors with integrated Ethernet ports feature, on the front panel:



TSX P57 2623/3623M

TSX P57 2823/4823M

- 1 A display block with 5 indicator lamps:
  - RUN lamp (green): processor in operation (program execution).
  - ERR lamp (red): fault in the processor or its on-board devices (PCMCIA memory card and PCMCIA communication card).
  - I/O lamp (red): fault from another module of the station or configuration fault.
  - TER lamp (yellow): activity on the terminal port.
  - FIP lamp (red): activity on the integrated Fipio bus.
- 2 A display block relating to the integrated Ethernet port featuring 5 lamps:
  - RUN lamp (green): Ethernet port ready.
  - ERR lamp (red): fault in Ethernet port.
  - COL lamp (red): collision detection.
  - STS lamp (yellow): Ethernet link diagnostics.
  - Two TX and RX lamps (yellow): transmission/reception activity.
- 3 RESET button causing a cold restart of the PLC when it is activated.
- 4 A female 8-way mini-DIN connector marked TER for connecting a programming or adjustment terminal.
- 5 A female 8-way mini-DIN connector marked AUX for connecting a peripheral device.
- 6 An RJ 45 type connector for connecting to the Ethernet network.
- 7 Slot for a type I PCMCIA format memory extension card.
- 8 Slot for a type III PCMCIA format communication card. Can receive the 2 Mb SRAM memory extension data storage card (TSX MRP DS 2048P).
- 9 A 9-way SUB-D connector (on TSX P57 2823/4823/M models) for Fipio bus manager communication.

Premium PLCs have been developed to comply with the main national and international standards on electronic industrial automation equipment, see pages 9/6 to 9/9 "Standards, certifications and environment conditions".

**Environment (characteristics common to all Premium components)**

Type of processor		TSX P57 103M	TSX P57 153M	TSX P57 203M	TSX P57 253M
Temperature	Operation	° C 0...+ 60 (+ 5...+ 55 according to IEC 1131-2), 0...+ 70 with TSX FAN fan modules			
	Storage	° C - 25...+ 70 (according to IEC 1131-2)			
Relative humidity	Operation	30 %...95 % without condensation			
	Storage	5 %...95 % according to IEC 1131-2 without condensation			
Altitude		m 0...2000			
Mechanical withstand	To vibrations	Complies with standard IEC 68-2-6, Fc test			
	To shocks	Complies with standard IEC 68-2-27, FA test			
Electrostatic discharge resistance		Complies with standard IEC 1000-4-2, level 3 (1)			
Resistance to HF interference	Immunity To radiated electromagnetic fields	Complies with standard IEC 1000-4-3, level 3 (1)			
	To fast transient bursts	Complies with standard IEC 1000-4-4, level 3 (1)			
	To shock waves	Complies with standard IEC 1000-4-5, level 3 (1)			
	To damped oscillatory waves	Complies with standard IEC 1000-4-12, level 3 (1)			
Resistance to LF interference		Conforms to the specifications of standard IEC 1131-2			

**Characteristics**

Type of processor		TSX P57 103M	TSX P57 153M	TSX P57 203M	TSX P57 2623M	TSX P57 253M	TSX P57 2823M
Maximum configuration	No. of racks	4 (2)		16 (2)			
	Maximum number of slots for modules	32		128			
Functions	Maximum number in rack	Of discrete I/O channels (3)	512		1024		
		Of analog I/O channels (3)	24		80		
		Of application-specific channels (3)	8		24		
	Maximum number of connections	Integrated Uni-Telway (terminal port)	1		1		
		Network (Ethernet TCP/IP, Fipway, Modbus Plus)	1		1		
		Fipio bus manager (integrated)	-		1		1
		Third-party fieldbus	-		1		
		AS-i sensor/actuator bus	2		4		
	Control channels	-		10			
	Real-time clock	Yes					
Memories (4)	Maximum capacity	Protected internal RAM	Kwords 32		48		64
		PCMCIA card capacity	Kwords 64		160		
	Maximum size of object zones (6)	Internal words (MWi/MDi/MFi)	Kwords 30.5		30.5		
		Constant words (MWi/MDi/MFi)	Kwords 32		32		
	Internal bits (% Mi)	Bits 4096		8132			
Application structure	Master task	1		1			
	Fast task	1		1			
	Event processing	32 (of which 1 has priority)		64 (of which 1 has priority)			
Execution time	One standard Boolean Instruction	µs 0.50/0.60 (7)		0.19/0.21 (7)			
	One standard numerical Instruction	µs 0.62/0.87 (7)		0.25/0.42 (7)			
	One instruction on floating points	µs 44		2.6			
<b>Typical program code execution time for 1 K instructions</b>							
System overhead	Internal RAM	100 % Boolean	ms 0.66		0.21		
		65 % Boolean and 35 % numerical	ms 0.95		0.28		
	PCMCIA memory card	100 % Boolean	ms 0.85		0.27		
		65 % Boolean and 35 % simple num.	ms 1.18		0.40		
MAST task		ms 1.5		3.1 (8)		1	1.2 (8)
	FAST task	ms 0.80		0.35			

(1) Minimum level in test conditions defined by the standards.  
 (2) Maximum number of TSX RKY racks. Using the TSX RKY 12EX rack (12 slots) is the same as using 2 racks with 4, 6 or 8 slots.  
 (3) The maximum numbers of discrete I/O, analog I/O and application-specific channels are cumulative. The remote I/O on a bus or network (AS-i/Uni-Telway/Fipio/Modbus Plus, etc.) or third-party bus (CANopen, InterBus or Profibus DP) are not taken into account in this maximum number.  
 (4) Memory capacity for symbol and data storage on PCMCIA cards, see page 1/25.



**Environment** (characteristics common to all Premium components)

Type of processor		TSX P57 303M	TSX P57 353M	TSX P57 453M
<b>Temperature</b>	Operation	° C 0...+ 60 (+ 5...+ 55 according to IEC 1131-2), 0...+ 70 with TSX FAN fan modules		
	Storage	° C - 25...+ 70 (according to IEC 1131-2)		
<b>Relative humidity</b>	Operation	30 %...95 % without condensation		
	Storage	5 %...95 % according to IEC 1131-2 without condensation		
<b>Altitude</b>		m 0...2000		
<b>Mechanical withstand</b>	To vibrations	Complies with standard IEC 68-2-6, Fc test		
	To shocks	Complies with standard IEC 68-2-27, FA test		
<b>Electrostatic discharge resistance</b>				
Immunity	To electrostatic charges	Complies with standard IEC 1000-4-2, level 3 (1)		
<b>Resistance to HF interference</b>				
Immunity	To radiated electromagnetic fields	Complies with standard IEC 1000-4-3, level 3 (1)		
	To fast transient bursts	Complies with standard IEC 1000-4-4, level 3 (1)		
	To shock waves	Complies with standard IEC 1000-4-5, level 3 (1)		
	To damped oscillatory waves	Complies with standard IEC 1000-4-12, level 3 (1)		
<b>Resistance to LF interference</b>		Conforms to the specifications of standard IEC 1131-2		

**Characteristics** (continued)

Type of processor		TSX P57 303M	TSX P57 3623M	TSX P57 353M	TSX P57 453M	TSX P57 4823M
<b>Maximum configuration</b>						
	No. of racks	16 (2)		16 (2)		
	Maximum number of slots for modules	128		128		
<b>Functions</b>						
Maximum number in rack	Of discrete I/O channels (3)	1024		2048		
	Of analog I/O channels (3)	128		256		
	Of application-specific channels (3)	32		64		
Maximum number of connections	Integrated Uni-Telway (terminal port)	1		1		
	Network (Ethernet TCP/IP, Fipway, Modbus Plus)	3		4		
	Fipio bus manager (integrated)	-		1		
	Third-party fieldbus	2		2		
	AS-i sensor/actuator bus	8		8		
Control channels		15		20		
Real-time clock		Yes		Yes		
<b>Memories (4)</b>						
Maximum capacity	Protected internal RAM	Kwords 64/80 (5)		80/96 (5)		
	PCMCIA card capacity	Kwords 384		512		
Maximum size of object zones (6)	Internal words (MWi/MDi/MFi)	Kwords 30.5		30.5		
	Constant words (MWi/MDi/MFi)	Kwords 32		32		
	Internal bits (% Mi)	Bits 16 384		32 768		
<b>Application structure</b>						
	Master task	1		1		
	Fast task	1		1		
	Event processing	64 (of which 1 has priority)		64 (of which 1 has priority)		
<b>Execution time</b>						
	One standard Boolean Instruction	µs	0.12/0.17 (7)		0.06	
	One standard numerical Instruction	µs	0.17/0.33 (7)		0.08	
	One instruction on floating points	µs	2.2/2.3 (7)		1.5	
<b>Typical program code execution time for 1 K instructions</b>						
Internal RAM	100 % Boolean	ms	0.15		0.07	
	65 % Boolean and 35 % numerical	ms	0.21		0.11	
PCMCIA memory card	100 % Boolean	ms	0.22		0.07	
	65 % Boolean and 35 % simple num.	ms	0.32		0.11	
<b>System overhead</b>						
	MAST task	ms	1		1	
	FAST task	ms	0.25		0.19	

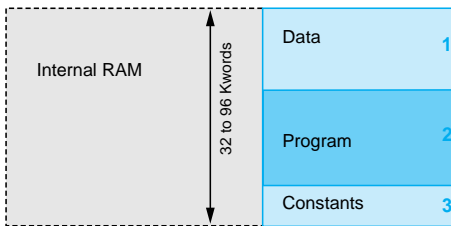
(5) The second value corresponds to the capacity of the integrated memory when the processor is fitted with a PCMCIA memory card.

(6) The sum of the program memory, data and constants zones is limited by the total memory capacity.

(7) The second value corresponds to the execution time when the processor is fitted with a PCMCIA memory card.

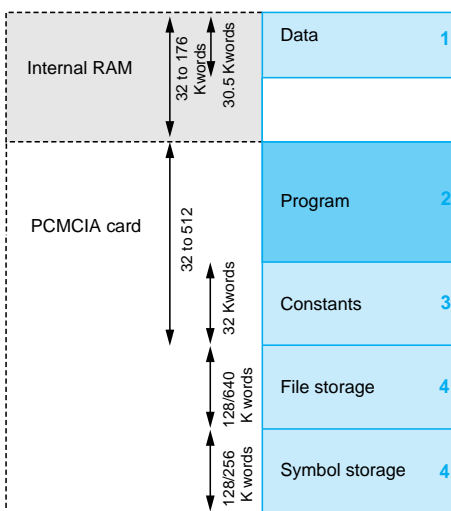
(8) If the Fipio integrated link is used. If not, the value will be the same as for the model without Fipio integrated link.

Processor without PCMCIA card



- 1 Application data (30.5 Kwords max.).
- 2 Task descriptor and executable code.
- 3 Constant words, initial values and configuration.

Processor with PCMCIA card



- 1 Application data (30.5 Kwords max.).
- 2 Task descriptor and executable code.
- 3 Constant words, initial values and configuration.
- 4 Depending on the model of PCMCIA card.

### Memory structure

The application memory is divided into memory zones, shared physically between the internal RAM memory and the PCMCIA memory extension card(s):

- Application data zone always in the internal RAM.
- Application program zone in the internal RAM or in the PCMCIA memory card.
- Constants zone in the internal RAM or in the PCMCIA memory card.

There are two ways of organizing the application memory for TSX P57 1●3/2●3/2●23/3●3/3623/453/4823 processors with or without a memory extension fitted in the form of a PCMCIA format card:

#### Application in internal RAM

The application is entirely loaded in the protected internal RAM (1) of the processor, whose capacity depends on the processor model (32 to 96 K words).

For example, the TSX P57 1●3 processor has 7.5 Kwords of application data and 24.5 K words of program, constants and system data (2).

This memory space (32 Kwords) is shared between the application data, the program, the constants and the system data (2).

#### Application in the PCMCIA card

The internal RAM is reserved for the application data.

The PCMCIA memory card contains the program and constants (32 to 512 K words). The file storage zone of 0, 128 K or 640 Kwords (depending on the model of PCMCIA card) can be used in remote applications, for storing production data information, production recipes, etc.

The symbol storage zone of 0, 128 K or 256 Kwords (depending on the model of PCMCIA card) enables the application symbol database to be held on the PLC.

#### File storage zone extension

This zone, containing between 0, 128 or 640 K words, can be extended to up to 2048 K words by using a SRAM TSX MRP DS 2048P PCMCIA memory card. This type III card is placed in the lower slot of the TSX P57 2●3/2●23/303/3623/453/4823 processors, and can be used in conjunction with memory extension cards (type I in the upper slot).

#### Data in internal RAM

The data zone can be extended to 30.5 K words. It is only supported by the PLC's internal RAM memory.

PL7 Micro/Junior/Pro software assists the application designer with the management of structure and the occupation of memory space for the Premium PLC.

### Protecting the application

Whatever the PLC memory structure: application located in internal RAM or in the PCMCIA card, it is possible to protect this in order to prohibit its access (read or modify program) in online mode under PL7 Junior/Pro.

A memory protection bit, set in configuration mode, is also available in order to lock any program modifications (via the programming terminal or download).

### Premium processor references

TSX P57 ●03/●53/●623/●823M processors are equipped with:

- A slot for memory extension (type I PCMCIA card).
- A slot for communication card (type III PCMCIA card).
- Two terminal ports (8-way female mini-DIN connector) Uni-Telway or character mode.

TSX P57 processors are double format modules (except TSX P57 1●3 processors which are single format).

TSX P57 3●3/3623/453/4823M processors enable program loading, via the terminal port, at a maximum speed of 115 K bps (limited to 19.2 K bps for TSX P57 1●3/2●3/2●23M processors).

The Fipio integrated link (bus manager) on TSX P57 253/2823/353/453/4823M processors enables a maximum of 127 connection points. The link on the TSX P57 153 processor is limited to 63 connection points.

(1) The internal RAM is protected by an optional battery, with 3 years battery life, located in the power supply module.

(2) The system reserves a minimum RAM memory zone in the order of 5 Kwords. Please refer to the PL7 Micro/Junior/Pro TLX DOC PL7 43M reference manual.



TSX P57 103M



TSX P57 153M



TSX P57 203/303M



TSX P57 253/353/453M



TSX P57 2623/3623M



TSX P57 2823/4823M

### TSX 57 processors

#### TSX 57-10 4 racks (2)

I/O capacity (3)	Capacity		Maximum number of bus/network modules	Ethernet TCP/IP	Reference (1)	Weight kg
	Integrated	Control channels				
512 discrete I/O 24 analog I/O 8 application-specific channels	32 integrated Kwords Max. 64 K words on PCMCIA	0	1 network 2 AS-i buses	–	<b>TSX P57 103M</b>	0.380
			1 integrated Fipio 1 network 2 AS-i buses	–	<b>TSX P57 153M</b>	0.420

#### TSX 57-20 16 racks (2)

1024 discrete I/O 80 analog I/O 24 application-specific channels	48 integrated Kwords Max. 160 K words on PCMCIA	10	1 network 4 AS-i buses 1 third-party bus	–	<b>TSX P57 203M</b>	0.520
				1 integrated Ethernet port	<b>TSX P57 2623M</b>	–
	64 integrated Kwords Max. 160 K words on PCMCIA	10	1 integrated Fipio 1 network 4 AS-i buses 1 third-party bus	–	<b>TSX P57 253M</b>	0.560
				1 integrated Ethernet port	<b>TSX P57 2823M</b>	–

#### TSX 57-30 16 racks (2)

1024 discrete I/O 128 analog I/O 32 application-specific channels	64/80 integrated K words (4) Max. 384 K words on PCMCIA	15	3 networks 8 AS-i buses 2 third-party buses	–	<b>TSX P57 303M</b>	0.520
		15	3 networks 8 AS-i buses 2 third-party buses	1 integrated Ethernet port	<b>TSX P57 3623M</b>	–
	80/96 integrated K words (4) Max. 384 K words on PCMCIA	15	1 integrated Fipio 3 networks 8 AS-i buses 2 third-party buses	–	<b>TSX P57 353M</b>	0.560

#### TSX 57-40 16 racks (2)

512 discrete I/O 24 analog I/O 8 application-specific channels	96/176 integrated K words (4) Max. 512 K words on PCMCIA	20	1 integrated Fipio 4 networks 8 AS-i buses 2 third-party buses	–	<b>TSX P57 453M</b>	0.560
				1 integrated Ethernet port	<b>TSX P57 4823M</b>	–

### Memory extension cards (PCMCIA type I and type III)

Premium modules can receive up to 2 memory extension cards, one type I and one type III. However, useful memory capacity is limited to the maximum size defined for the processor model. See pages 1/24 and 1/25.

- (1) Product supplied with multilingual installation guide (processors and discrete I/O): English, French, German, Spanish and Italian.  
 (2) Maximum number of TSX RKY 4EX/6EX/8EX racks (4, 6 or 8 slots). Using the TSX RKY 12 EX rack (12 slots) is the same as using 2 racks with 4, 6 or 8 slots.  
 (3) Cumulative maximum values. The number of remote I/Os on the bus is not counted.  
 (4) The second value corresponds to the capacity of the integrated memory when the processor is fitted with a type I PCMCIA memory card.

### Presentation

T PCX 57 ●●3M Atrium coprocessors are PC format cards (16-bit ISA bus) to be integrated in a PC running under Windows 95/98, Windows 2000 or Windows NT. This PLC/PC association optimizes performance in applications requiring, for example, a higher level of communication, control or supervision functions. The coprocessors manage the entire PLC station which comprises the same I/O modules as Premium processors (discrete, analog, application-specific and communication), and these modules can be distributed in one or more racks connected on the bus X.

Two types of Atrium coprocessor are available to meet various user requirements:

- 16 TSX RKY ●●EX extendable racks maximum.
- 1024 discrete I/O maximum.
- 80 or 128 analogue I/O.
- 24 or 32 application-specific channels. Each application-specific module (counter, motion control, communication or weighing) comprises n application-specific channels.
- 1 or 3 networks (Ethernet TCP/IP, Fipway, Modbus Plus), 4 or 8 AS-i buses and 1 or 2 third party buses (CANopen, InterBus-S, Profibus-DP).
- 10 or 15 regulation channels.

### Integrated communication

Depending on the model, the Atrium coprocessors include:

- A Fipio link (bus manager) for model T PCX 57 353M.
- Communication via a terminal port (TER) using Uni-Telway or character mode protocol (typically a programming terminal or operator dialog terminal).

Each processor has a slot for a type III PCMCIA card for accepting a network card (Fipway, Modbus Plus) or bus (Modbus, Fipio Agent, Uni-Telway, CANopen and serial links). This slot can also receive a 2 M word SRAM memory card TSX MRP DS 2048P, used for storing data (see page 1/24).

### Application design and installation

The application is designed using PL7 Junior/Pro software. The new version of these, version V4.3, is compatible with PC stations running Windows 98, Windows NT4, Windows Millenium, Windows 2000 or Windows XP operating systems.

For further details, see pages 6/4 and 6/19.

### Configuration

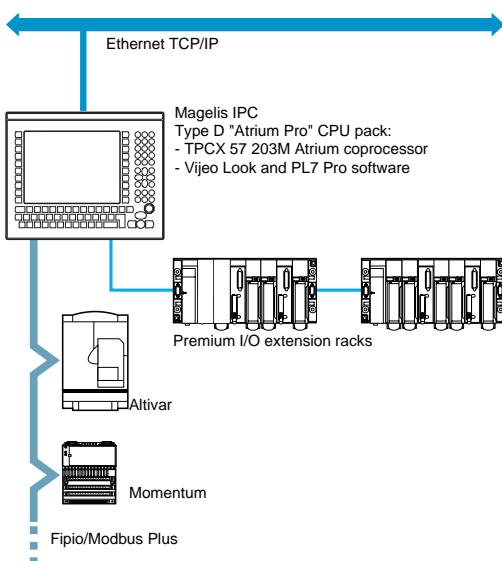
By integrating a T PCX 57 ●●3M (1) coprocessor card, the following architecture can be created using any compatible PC (equipped with 16-bit ISA bus slots), T XBT-F graphic stations and Magelis IPC industrial PC stations.

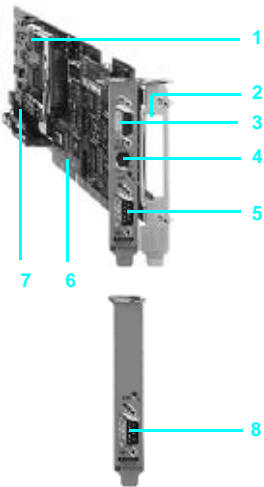
This solution can provide a PLC solution in which I/Os are:

- Remotely located close to the machine or process via the Fipio fieldbus or Modbus Plus (Momentum or TBX I/O).
- And/or centralized in the extendable racks.

TSX RKY ●●EX extendable racks connected on the bus X allow the use of application-specific modules and the installation of AS-i bus segments (see page 1/8).

(1) Certain T XBT-F or Magelis IPC industrial PC models include an Atrium coprocessor as standard, see pages 7/31 and 8/10.





### Description

T PCX 57 ●●3M coprocessors mechanically occupy two consecutive slots (standard pitch of 20.32 mm) on the ISA bus but only use one electrically.

- 1 A slot for a type I PCMCIA format memory extension card.
- 2 A slot for a type III PCMCIA format communication card.
- 3 A 9-way female SUB-D connector enables the X bus to be connected to an extendable rack.
- 4 A TER terminal port for the connection of a programming terminal or adjustment of a peripheral device.
- 5 A 9-way male SUB-D connector for connection to the Fipio bus (with T PCX 57 353M).
- 6 An ISA bus connector for connection to the host PC.
- 7 A slot for the coprocessor's internal RAM memory backup battery.
- 8 An additional plate (supplied as standard) fitted with a 9-way female SUB-D connector enables a second remote bus X to be connected.

### Setup

#### Integration in the host PC

To receive a T PCX 57 ●●3M coprocessor, the host PC must:

- Operate under Windows 95/98, Windows 2000 or Windows NT.
- Have a 16-bit ISA bus, 8 MHz.
- Have two consecutive slots (standard pitch of 20.32 mm) available on the ISA bus.

One PC can take a maximum of 2 T PCX coprocessors.

The coprocessor is completely independent of the application executed on the PC, in particular:

- The standard PC command "CTRL + ALT + DEL" has no effect on the coprocessor operating modes.
- Switching the PC off and then on again, causes a warm restart of the application being managed by the coprocessor.

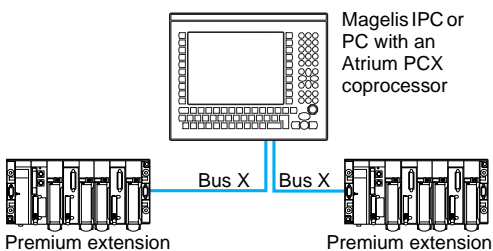
The installation of a communication driver (ISAWay 95/NT) supplied with the coprocessor enables transparent communication between the host PC and the coprocessor. The host PC, equipped with PL7 Junior/Pro software, can be used as a programming terminal for the T PCX 57 Atrium coprocessor.

#### Logical location on the bus X

The T PCX 57 Atrium coprocessor logically occupies the same 2 slots as a TSX P57 Premium processor of the same type (rack with address 0). The two slots in the TSX RKY rack with address 0 following the TSX PSY power supply module must therefore remain unoccupied (see page 1/5).

A bus X line terminator is integrated in the PCX coprocessor.

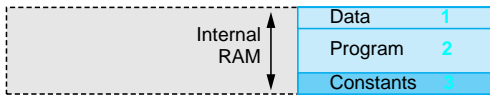
The additional plate 8 enables two X buses to be connected, providing a Y structure.



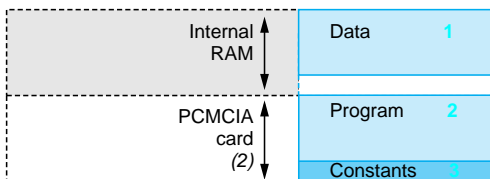
Memory structure

1

Coprocessor without PCMCIA card



Coprocessor with PCMCIA card



- 1 Application data (including internal words, system words, function blocks, DFB blocks, etc.).
- 2 Task descriptor and executable code.
- 3 Constant words, initial values and configuration.

There are two ways of organizing the application memory for T PCX 57 203M/353M coprocessors with or without a memory extension fitted in the form of a type 1 PCMCIA format card:

**Application in internal RAM**

The application is loaded entirely within the internal RAM of the coprocessor, battery protected (3 years battery life). For the maximum capacity of the internal RAM memory, see characteristics below.

**Application in the PCMCIA card**

The internal RAM is thus reserved for application data and system data (1). The PCMCIA memory card contains the program and constants.

The PL7 Junior/Pro software assists the application designer with the management of structure and the occupation of memory space for the Atrium coprocessor.

(1) The system reserves a minimum RAM memory zone of the order of 5 Kwords. Please refer to the PL7 Micro/Junior/Pro TLX DOC PL7 43M reference manual.

(2) In addition, there are certain models of PCMCIA card available which provide memory zones for storing files and symbols (see page 1/25).

Characteristics

Type of coprocessor		T PCX 57 203M	T PCX 57 353M
<b>Maximum configuration</b>	No. of racks	16 (1)	
	Maximum number of slots per module	128	
<b>Functions</b>			
Maximum number of channels	Discrete I/Os	1024 (2)	
	Analog I/Os application specific	80 (2)	128 (2)
Maximum number of connections	Integrated Uni-Telway (terminal port)	24 (2)	32 (2)
	Network (Ethway, Fipway, Modbus Plus)	1	
	Fipio bus manager (integrated)	1	3
	Third-party fieldbus	–	1
	AS-i fieldbus	1	2
Control channels	4	8	
Real-time clock	10	15	
<b>Memory (3)</b>	Protected internal RAM	Yes	
	Maximum capacity		
	PCMCIA memory card	<b>K words</b> 48	80/96 (4)
	Maximum size of zones (5)	<b>K words</b> 160	384
	Internal words (% MWi/MDi/MFi)	<b>K words</b> 30,5	
	Constants (% KWj/KDi/KFj)	<b>K words</b> 32	
<b>Application structure</b>	Internal bits (%Mi)	<b>Bits</b> 8192	16 384
	Master task	1	
	Fast task	1	
<b>Execution time</b>	Event processing	64 (of which 1 has priority)	
	A basic Boolean instruction	$\mu$ s 0.19/0.21 (6)	0.12/0.17 (6)
	A basic digital instruction	$\mu$ s 0.25/0.42 (6)	0.17/0.33 (6)
	An instruction using floating points	$\mu$ s 2.6	2.2/2.3
<b>Typical execution time of the program code for 1 K instructions</b>			
Internal RAM	100 % Boolean	ms 0.21	0.15
	65 % Boolean and 35 % numerical	ms 0.28	0.21
PCMCIA memory card	100 % Boolean	ms 0.27	0.22
	65 % Boolean and 35 % numerical	ms 0.40	0.32
<b>System overhead</b>	MAST task	ms 1	
	FAST task	ms 0.35	0.25

(1) Maximum number of TSX RKY racks. Using the TSX RKY 12EX rack (12 slots) is the same as using 2 racks with 4, 6 or 8 slots.

(2) The maximum number of discrete I/Os, analog I/Os and application-specific channels are cumulative. The remote I/Os on bus or network (AS-i/Uni-Telway/Fipio/Modbus Plus, etc.) or third-party bus (CANopen, InterBus-S or Profibus DP) are not taken into account in this maximum number.

(3) Memory capacity for storing data or symbols on a PCMCIA card, see page 1/24.

(4) The second value corresponds to the memory capacity when the processor is fitted with an integrated memory card.

(5) The sum of the program memory, data and constants zones is limited by the total memory capacity.

(6) The second value corresponds to the execution time when the coprocessor is fitted with a PCMCIA memory card.

### References

#### PCX 57 coprocessors

T PCX 57 ●●3M coprocessors, which are compatible with the PC ISA bus, have:

- A type I PCMCIA card slot for memory extension.
- A type III PCMCIA card slot for communication card.
- A terminal port (8-way female mini-DIN) Uni-Telway mode or character mode.
- A bus X remote system for extendable racks.
- A male connector (9-way SUB-D) for Fipio bus link (bus manager) (for model T PCX 57 353M).
- A bus X end of line terminator.
- OFS data server software (see page 8/15).
- ISAWay 95/NT communication driver software, (see page 5/65: all X-Way drivers TSX CD DRV 12M).

The coprocessor mechanically occupies 2 consecutive slots but only uses one slot electrically on the ISA bus (long slot).

#### 16-rack PCX 57-20 (1)

I/O capacity (2)	Capacities Memory	Control channels	Maximum number of bus/network modules	Reference (3)	Weight kg
1024 discrete I/Os 80 analogue I/Os 24 application- specific channels	48 integrated Kwords Maximum 160 Kwords using PCMCIA	10	1 network 4 AS-i buses 1 third-party bus	<b>T PCX 57 203M</b>	0.310



T PCX 57 203M

#### 16-rack PCX 57-30 (1)

I/O capacity (2)	Capacities Memory	Control channels	Maximum number of bus/network modules	Reference (3)	Weight kg
1024 discrete I/Os 128 analogue I/Os 32 application- specific channels	80/96 K integrated work (4) Maximum 384 Kwords using PCMCIA	15	1 integrated Fipio 3 networks 8 ASi buses 2 third-party buses	<b>T PCX 57 353M</b>	0.340



T PCX 57 353M

#### Memory extension cards (Type I PCMCIA)

The T PCX 57 ●●3 coprocessors can receive 1 type I memory extension card. However, useful memory capacity is limited to the maximum size defined for the processor model. See pages 1/24 and 1/25.

(1) Maximum number of TSX RKY 4EX/6EX/8EX racks (4, 6 or 8 slots). Using the TSX RKY 12EX rack (12 slots) is the same as using 2 racks with 4, 6 or 8 slots.

(2) Cumulative maximum values. The number of remote I/Os on the bus is not counted.

(3) Product supplied with multilingual Quick Reference Guide (processors and discrete I/Os): English, French, German, Spanish and Italian.

(4) The second value corresponds to the memory capacity when the processor is fitted with an integrated PCMCIA memory card (type I).

### Presentation

1

Type I and III PCMCIA cards are used to extend the internal RAM capacity for Premium processors and Atrium coprocessors (1). Depending on the model, these memory extension cards are designed to receive the program and constants, and to back up data files and various application object symbols.

**Memory capacity (in K words) without PCMCIA memory extension card** (data, program and constants in internal RAM memory):

Processors/coprocessors	TSX P57 103M	TSX P57 153M	TSX 57 203/2623M	T PCX 57 203M	TSX P57 253/2823M	TSX P57 303/3623M	TSX P57 353M	T PCX 57 353M	TSX P57 453/4823M
Internal RAM	32	32	48	48	64	64	80	80	96

**Memory capacities (in K words) with PCMCIA extension card(s)** (data in internal RAM memory, program, constants, data and symbol storage on PCMCIA card)

Processors/coprocessors	TSX P57 103M	TSX P57 153M	TSX P57 203/2623M	T PCX 57 203M	TSX P57 253/2823M	TSX P57 303/3623M	TSX P57 353M	T PCX 57 353M	TSX P57 453/4823M	
Internal RAM memory (2)	32	32	48	48	64	80	96	96	176	
PCMCIA extension	64	64	160	160	160	384	384	384	512	
Data storage (3)	128 Kwords		128, 640, 2048, 2176 or 2688 K mots	128 or 640 Kwords	128, 640, 2048, 2176 or 2688 K mots			128 or 640 Kwords	128, 640, 2048, 2176 or 2688 K mots	
Data storage (4)	-		128 Kwords						128 or 256 Kwords	

(1) Atrium coprocessors cannot take type III memory extension cards.

(2) For the same type of processor, internal RAM size is bigger in models with an integrated Fipio bus link in order to handle greater configuration needs.

(3) Intended for the storage of production recipes and data. Capacity depending upon PCMCIA card model (type I and/or type III).

(4) On the PLC, provides access to the symbols database connected to the application objects. Capacity depends on the PCMCIA card model.

#### Type I PCMCIA memory extension cards

These removable cards, located in the upper slot of the processors, store the application program and constants as well as, depending on the model, files and the application symbol database.

Two types of memory card are available:

##### ■ Protected RAM card

Used particularly in the application program design and debug phases, it allows all the services for application transfer and modification in online mode. The memory is protected by a removable battery integrated in the memory card.

##### ■ Flash EPROM memory card

Used when debugging of the application program is complete, it only allows one global transfer of the application and overcomes problems of battery protection.

Two other types of card enable the following to be stored in addition to the application program and constants:

##### ■ Data

This card is used to store data in protected RAM (copies of the data to provide production and production recipe traceability, etc.).

##### ■ Symbols

In addition, this type of card has an area for saving the symbols of various application objects. In this way, when the user connects to a programming terminal (for debugging or modifying an application) he does not have to download the relevant symbol file to his terminal before working on the application.

One final type of PCMCIA memory card is available:

##### ■ Backup memory card

Previously loaded with the application program, it reloads the program in the internal RAM memory and internal Flash EPROM memory of the processor without requiring the use of a programming terminal.

This function is restricted to applications whose program does not exceed 32 K words when completely loaded in the internal RAM of the processor.



### Presentation (continued)

#### Type III PCMCIA memory extension cards

This TSX MRP DS 2048P SRAM card enables the file storage areas to be increased by 2048 K mots (currently limited to 640 K words with TSX MRP 3256P/3384P type 1 PCMCIA cards. The maximum total storage area is thus 2688 words, accessible in initialization/write/read mode using PL7 instructions (requires a version of PL7 Junior/Pro software  $\geq$  4.2.)

The TSX MRP DS 2048P card is mounted in the lower slot of the processors TSX P57 2●3/2●23/3●3/3623/453/4823M (not authorized with Atrium coprocessors).

### Reference numbers

Premium TSX P57-20/30/40 processors and Atrium coprocessors can take the following extension cards. However, the useful memory capacity is limited to the maximum size specified for the processor model (see maximum memory capacity, extension on PCMCIA, page 1/24).

TSX P57-10 processors can take only 32/64 K words application extension cards.

#### PCMCIA type I (1) RAM memory extension

Use on processor	Memory size			Reference	Weight kg
	Application	Data storage	Symbol storage		
All Premium and Atrium types	32 K words	–	–	<b>TSX MRP 032P</b>	0.060
		128 K words	–	<b>TSX MRP 232P</b>	0.060
	64 K words	–	–	<b>TSX MRP 064P</b>	0.060
TSX P57 2●3/2●23M, 303/3623M, 453/4823M	128 K words	–	–	<b>TSX MRP 0128P</b>	0.060
		128 K words	128 K words	<b>TSX MRP 2128P</b>	0.060
	256 K words	–	–	<b>TSX MRP 0256P</b>	0.060
T PCX 57 203/363M	640 K words	128 K words	–	<b>TSX MRP 3256P</b>	0.060
	384 K words	640 K words	–	<b>TSX MRP 3384P</b>	0.060
TSX P57 453/4823M	512 K words	–	256 K words	<b>TSX MRP 0512P</b>	0.060



TSX MRP 032P

#### Flash EPROM PCMCIA type I memory extensions(2)

All Premium and Atrium types	32 K words	–	–	<b>TSX MFP 032P</b>	0.060
		128 K words	–	<b>TSX MFP 232P</b>	0.060
	64 K words	–	–	<b>TSX MFP 064P</b>	0.060
TSX P57 2●3/2●23M, 303/3623M, 453/4823M	128 K words	–	–	<b>TSX MFP 0128P</b>	0.060
		128 K words	–	–	<b>TSX MFP 0128P</b>
	T PCX 57 203/363M	–	–	–	–

#### PCMCIA type III SRAM memory extension (3)

TSX P57 2●3/2●23M, 303/3623M, 453/4823M	–	2048 K words	–	<b>TSX MRP DS 2048P</b>	0.090
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TSX MRP DS 2048P

### Replacement parts

Description	Use	Reference	Weight kg
<b>Backup battery</b>	Type I RAM PCMCIA memory card	<b>TSX BAT M01</b>	0.010
<b>Handle</b>	Type I PCMCIA memory card	<b>TSX P CAP</b>	0.030

(1) For the upper slot on TSX P57 processors or slot on the T PCX 57 coprocessor card.

(2) File storage zone in protected RAM memory.

(3) For lower slot on TSX P57 processors.