Modicon Premium automation platform

Premium processors

PL7

Premium platforms for PL7 software offer		TSX 57 1● processors		TSX 57 2● processors	
				 ★	 ★★
Number of racks (according to rack type)		4 with 4, 6, 8 slots or 2 with 12 slots		16 with 4, 6, 8 slots or 8 with 12 slots	
In-rack I/O *(1)*	Discrete I/O	512 channels (8-, 16-, 32- or 64-channel module)		1024 channels (8-, 16-, 32- or 64-channel module)	
	Analog I/O	24 channels (4-, 8- or 16-channel module)		80 channels (4-, 8- or 16-channel module)	
	Integrated process control	–		Configurable loops (10 channels with 3 loops max.)	
In-rack application-specific channels	Max. no. of channels	8		24	
	Counter	Modules with 2/4 counter channels 1 MHz max., single-channel electronic cam module			
	Motion *(2)*	Modules with 1/2 axes for stepper motors, 2/3/4 axes for analog control servo motors, 8/16 axes with SERCOS digital link			
	Weighing	Module for 8 load cells (2 application-specific channels)			
	Serial links	In-rack communication modules (1 application-specific channel)			
Serial link connections	Modbus	RS 232, RS 485 or current loop *(3) (4)* master/slave PCMCIA modules and RS 485 master/ slave in-rack communication modules			
	Uni-Telway	1 integrated RS 485 master/slave channel *(5)*, RS 232, RS 485 or current loop *(3) (4)* master/slave PCMCIA modules and RS 485 master/slave in-rack communication modules			
	Character mode	1 integrated RS 485 channel *(5)*, RS 232, RS 485 or current loop *(3) (4)* PCMCIA modules and RS 485 in-rack communication modules			
Bus connections	Actuator/sensor bus AS-Interface master V2	2 in rack modules		4 in rack modules	
	CANopen machine bus master V4.02 *(6)*	1 PCMCIA module *(3)*			
	INTERBUS field bus master V2 *(6)* or Profibus DP master V0 Class 1 and 2 *(6)*	–		1 in-rack module	
Network connections	Max. no. of networks	1		1	
	Ethernet Modbus/TCP	Multiprotocol in-rack modules (Modbus, Uni-TE, Global Data, I/O Scanning, TCP Open), Web server, FactoryCast service and Factory Cast HMI services			
	Communication modules	Fipway *(3) (4)* and Modbus Plus *(3)* PCMCIA modules, in-rack Ethway modules			
Memory capacity	Without PCMCIA extension	32 Kwords program and data		48/64 Kwords program and data *(7)*	
	With PCMCIA extension	32 Kwords data 64 Kwords program		48/64 Kwords data *(7)* 160 Kwords program	
	Data storage	128 Kwords		640 K words + 2048 K words	
	Symbol storage	–		128 Kwords	
Power supply		100…240 V ∿, 24 V ⎓ non-isolated and 24…48 V ⎓ isolated power supply modules. A power supply is required for each rack.			
Consumption		See page 9/6			
Standards and certifications		See pages 9/8 and 9/18			
Premium processor type *(8)*	Standard	**TSX P57 103M**		**TSX P57 203M** ➚ ★	
	Integrated Ethernet			**TSX P57 2623M** ➚ *(10)* ★★	
	Integrated Fipio		**TSX P57 153M** *(9)*	**TSX P57 253M** ➚	
	Integrated Ethernet and Fipio			**TSX P57 2823M** *(10)*	
Pages		1/19			

(1) The maximum values for the number of discrete I/O, analog I/O and process control channels are cumulative.
(2) 1 axis = 1 application-specific channel, except for SERCOS modules where, depending on the configuration, the module = 2…32 channels.
(3) Module to be inserted into the lower PCMCIA slot (no. 1) on the Premium processor.
(4) Module to be inserted into the PCMCIA slot on the **TSX SCY 21 601** *in-rack communication module.*
(5) Non-isolated serial link. For distances > 10 m, use connection accessory **TSX P ACC 01**, *see pages 5/131 and 5/133.*
(6) Reduce the number of modules permitted (INTERBUS or Profibus DP) by 1 when CANopen is used.
(7) The second value corresponds to the processor with integrated Fipio bus manager link.

TSX 57 3● processors			TSX 57 4● processors	
	 ★★	 ★★★		
16 with 4, 6, 8 slots or 8 with 12 slots				
1024 channels (8-, 16-, 32- or 64-channel module)				
128 channels (4-, 8- or 16-channel module)				
Configurable loops (15 channels with 3 loops max.)				
32			64	
Modules with 2/4 counter channels 1 MHz max., single-channel electronic cam module				
Modules with 1/2 axes for stepper motors, 2/3/4 axes for analog control servo motors, 8/16 axes with SERCOS digital link				
Module for 8 load cells (2 application-specific channels)				
In-rack communication modules (1 application-specific channel)				
RS 232, RS 485 or current loop *(3) (4)* master/slave PCMCIA modules and RS 485 master/ slave in-rack communication modules				
1 integrated RS 485 master/slave channel *(5)*, RS 232, RS 485 or current loop *(3) (4)* master/slave PCMCIA modules and RS 485 master/slave in-rack communication modules				
1 integrated RS 485 channel *(5)*, RS 232, RS 485 or current loop *(3)(4)* PCMCIA modules and RS 485 in-rack communication modules				
8 in rack modules				
1 PCMCIA module *(3)*				
2 in rack modules				
3			4	
Multiprotocol in-rack modules (Modbus, Uni-TE, Global Data, I/O Scanning, TCP Open), Web server, FactoryCast service and Factory Cast HMI services				
Fipway *(3) (4)* and Modbus Plus *(3)* PCMCIA modules, in-rack Ethway modules				
64/80 Kwords program and data *(8)*			96 Kwords program and data	
80/96 Kwords data *(8)* 384 Kwords program			176 Kwords data 512 Kwords program (992 Kwords with PL7 V4.4 or higher)	
640 K words + 2048 K words			2048 K words (640 K words + 2048 K words with PL7 V4.4 or higher)	
128 Kwords			256 Kwords (384 Kwords with PL7 V4.4 or higher)	
100…240 V ∿, 24 V ⎓ non-isolated and 24…48 V ⎓ isolated power supply modules. A power supply is required for each rack.				
See page 9/6				
See pages 9/8 and 9/18				
	TSX P57 303AM ⬈			
	TSX P57 3623AM ⬈ *(10)* ★★			
TSX P57 353LAM *(11)*	**TSX P57 353AM** ⬈ ★★★		**TSX P57 453AM**	
				TSX P57 4823AM *(10)*

1/19

(8) Premium PL7 range processors are equipped with 32-bit architecture microprocessors, except for **TSX P57 1●3** *processors which have 16-bit architecture processors.*
(9) The **TSX P57 153M** *processor does not support the CANopen bus PCMCIA module.*
(10) The integrated Ethernet port requires 1 of the available network connections.
(11) Processor reserved for updating configurations with **TSX P57 352M** *PL7 (old version) processors.*

⬈ Processor can be migrated from PL7 to Unity Pro by means of a simple update of the processor's operating system (included on the Unity Pro software CD-ROM).

Modicon Premium automation platform
PL7 processors

Presentation

Premium **TSX P57 ●●3M/3AM** and **TSX P57 ●●23M/23AM** automation 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 via Bus X or a fieldbus

TSX P57 processors

The types of processor available are divided into different capacities according to memory, in-rack I/O, communication, and processing speed. Depending on the model:
- 4 to 16 racks
- 512 to 2040 discrete I/O
- 24 to 256 analog I/O
- 8 to 64 application-specific channels. Each application-specific module (counter, motion control, serial link or weighing) accounts for 1 or more application-specific channels.
- 1 to 4 networks (Ethernet Modbus/TCP, Fipway, Ethway, Modbus Plus), 2 to 8 AS-Interface sensor/actuator buses, 1 to 2 fieldbuses (CANopen, INTERBUS, Profibus DP), 0 or 1 Fipio fieldbus, serial links (Modbus, Uni-Telway)
- 10 to 20 process control channels

Integrated communication

Depending on the model, Premium processors include:
- A 10 or 100 Mbit/s Ethernet Modbus/TCP port (RJ45 connection)
- A 1 Mbit/s Fipio bus link (bus manager)
- Communication via 2 terminal ports (TER and AUX) using Uni-Telway or character mode protocol (typically a 19 or 115 Kbit/s programming terminal and an operator dialogue terminal)

Each processor has a slot for a type III PCMCIA card, which can accommodate a network card (Fipway, Modbus Plus), bus (CANopen *(1)*, Fipio Agent) or serial links (Modbus, Uni-Telway, character mode).

Application design and installation

Different software licences are available for PL7 Junior/Pro version V4.5 depending on requirements:
- Single-station
- Multistation 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 more than 10 stations).

These licences are compatible with PC terminals running Windows 2000 Professional or Windows XP operating systems.

Configurations with old generation processors

The **TSX P57 353LAM** processor can be used as a replacement for old version **TSX P57 ●●0M/●●1M/●●2M** single-format processors and for **T PCX 57 203M/353M** Atrium slot PLCs. Replacement of these processors or slot-PLCs requires reconfiguration of the PLC with the **TSX P57 353LAM**, but no modification of the application program is required. It may be necessary to update the PL7 Pro software (**TLX RCD PL7P P45M**).

Migration of Premium processors

Some Premium **TSX P57 ●●3M/3AM** processors that are compatible with PL7 software can be migrated for compatibility with Unity Pro software without any need for hardware modifications. This migration from PL7 to Unity Pro is achieved by means of the following software updates:
- Processor operating system
- Integrated Ethernet TCP/IP port operating system

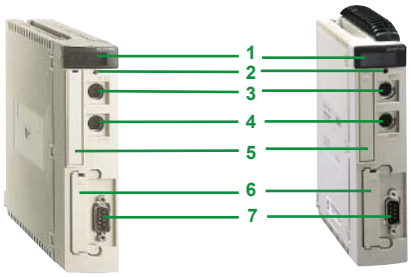
This update is carried out using the OS-Loader tool, included in the Unity Pro software (see page 6/13). Once migrated, PL7 processors are equivalent to corresponding Unity processors.

The following PL7 processors can be migrated to Unity Pro (software migration):
- **TSX 57 2●**: **TSX P57 203M/253M/2623M** become **TSX P57 204M/254M/2634M** respectively.
- **TSX 57 3●**: **TSX P57 303M/353M/3623AM** become **TSX P7 304M/354M/3634M** respectively (migration supported by Unity Pro version ≥ 3.0).

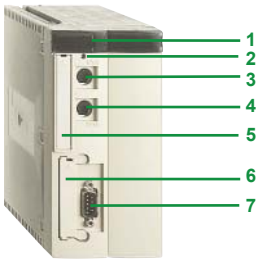
Note: *Processor migration requires use of the new PCMCIA memory references* **TSX MRP P/C** *and* **TSX MFP P/C**. *See the equivalence table on page 1/20.*

(1) Except with processor **TSX P57 153M**.

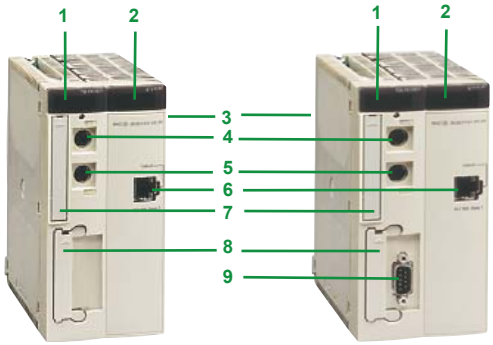
Modicon Premium automation platform
PL7 processors



TSX P57 1●3M *TSX P57 353LAM*



TSX P57 2●3M/3●3AM/453AM



TSX P57 2623M *TSX P57 2823M*
TSX P57 3623AM *TSX P57 4823AM*

Presentation (continued)

Migration of Premium processors (continued)

Migration offers involving the replacement of the processor are available for other product references. Please contact your Customer Care Centre for more information about these offers, which are only available for a limited period of time. They concern the following PL7 processors:

- **TSX P57 2823M** for migration to **TSX P57 254M** with **TSX ETY 4103** *(1)*.
- **TSX P57 453AM** for migration to **TSX P57 454M**
- **TSX P57 453AM** for migration to **TSX P57 554M**
- **TSX P57 4823AM** for migration to **TSX P57 4634M**
- **TSX P57 4823AM** for migration to **TSX P57 5634M**
- **TSX P57 4823AM** for migration to **TSX P57 454M** with **TSX ETY 4103** *(1)*.
- **TSX P57 4823AM** for migration to **TSX P57 554M** with **TSX ETY 4103** *(1)*.

Description

Processors without integrated Ethernet port

Single-format **TSX P57 1●3M/353LAM** processors and double-format **TSX P57 2●3M/3●3AM/453AM** processors feature the following on the front panel:

1 A display block with 5 LEDs:
- □ RUN LED (green): processor in operation (program running)
- □ ERR LED (red): Fault on the processor or its on-board devices (PCMCIA memory card and PCMCIA communication card)
- □ I/O LED (red): Faults occurring on another station module or configuration fault
- □ TER LED (yellow): Activity on the terminal port
- □ FIP LED (red): Activity on the integrated Fipio bus

2 A RESET button causing a cold start of the PLC when pressed.

3 An 8-way female mini-DIN connector marked TER for connecting a programming or adjustment terminal.

4 An 8-way female mini-DIN connector marked AUX for connecting a peripheral device

5 A PCMCIA slot (no. 0) for a memory extension card

6 A PCMCIA slot (no. 1) for a communication card or 4 Mb SRAM memory extension card for storing additional data

7 A 9-way SUB-D connector (on **TSX P57 153M/253M**, **TSX P57 353 LAM** and **TSX P57 353M/453AM** models) for Fipio bus manager communication

Processors with integrated Ethernet port

Double-format **TSX P57 2623M/2823M** and **TSX P57 3623AM/4823AM** processors with integrated Ethernet port feature the following on the front panel:

1 A display block with 5 LEDs:
- □ RUN LED (green): processor in operation (program running)
- □ ERR LED (red): Fault on the processor or its on-board devices (PCMCIA memory card and PCMCIA communication card)
- □ I/O LED (red): Faults occurring on another station module or configuration fault
- □ TER LED (yellow): Activity on the terminal port
- □ FIP LED (red): Activity on the integrated Fipio bus

2 A display block relating to the integrated Ethernet port featuring 5 LEDs:
- □ RUN LED (green): Ethernet port ready
- □ ERR LED (red): Ethernet port fault
- □ COL LED (red): Collision detection
- □ STS LED (yellow): Ethernet link diagnostics
- □ Two TX and RX LEDs (yellow): Transmission/reception activity

3 A RESET button causing a cold start of the PLC when pressed.

4 An 8-way female mini-DIN connector marked TER for connecting a programming or adjustment terminal.

5 An 8-way female mini-DIN connector marked AUX for connecting a peripheral device

6 An RJ45 connector for connection to the Ethernet network

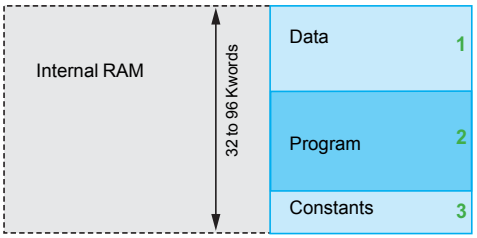
7 A PCMCIA slot (no. 0) for a memory extension card

8 A PCMCIA slot (no. 1) for a communication card or 4 Mb SRAM memory extension card for storing additional data

9 A 9-way SUB-D connector (on **TSX P57 2823M/4823AM** models) for Fipio bus manager communication

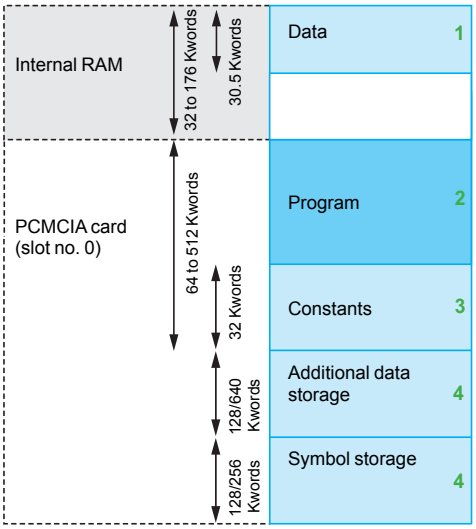
(1) The **TSX ETY 4103** *Ethernet Modbus/TCP module offered features the same functions as the integrated Ethernet port on* **TSX P57 2823M/ 4823AM** *processors. However, the combined processor and Ethernet module use one slot more than the PL7 processor to be migrated. Therefore, this type of migration requires a free slot in the Premium rack and modification of the converted Unity Pro application.*

Modicon Premium automation platform
PL7 processors



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

Processors without 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 PCMCIA card model.

Processor with PCMCIA card

Memory structure

The application memory is divided into memory areas, which are physically distributed across the internal RAM memory and the PCMCIA memory extension card(s):
- The application data area is always in the internal RAM.
- The application program area is in the internal RAM or the PCMCIA memory card
- The constants area is in the internal RAM or the PCMCIA memory card.

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

Application in internal RAM

The application is completely loaded into the processor's battery-backed internal RAM *(1)*, the capacity of which depends on the processor model (32 to 96 Kwords).
For example, the **TSX P57 1●3M** processor has 7.5 Kwords of application data and 24.5 Kwords of program, constants and system data *(2)*.
The memory space (32 Kwords) is shared between the application data, the program, the constants and the system data *(2)*.

Application in the PCMCIA card (slot no. 0)

The internal RAM is then reserved for the application data.
The PCMCIA card contains the program and constants (64 to 512 Kwords).
The file storage area of 128 K or 640 Kwords (depending on the model of PCMCIA card) can be used in remote applications, for storing information such as production data, production recipes, etc.
The symbols storage area of 128 K or 256 Kwords (depending on the model of PCMCIA card) enables the application symbols database to be stored on the PLC.

Extension of the additional data storage area (slot no. 1)

This area, containing 128 or 640 Kwords, can be extended up to 2688 Kwords by using an SRAM **TSX MRP DS 2048P / MFP 004M** PCMCIA memory card. This card is inserted into the lower slot on **TSX P57 2●3M/2●23M**, **TSX P57 3●3M/3623M/453M/4823AM** processors and can be used in conjunction with memory extension cards (type 1 in the upper slot).

Data in internal RAM

The data area can be extended to up to 30.5 Kwords. It is only supported by the PLC's internal RAM.
PL7 Junior/Pro software helps the application designer to manage the structure and organize how the memory space on the Premium PLC is occupied.

Protecting the application

Regardless of the PLC memory structure (whether the application is located in the internal RAM or on the PCMCIA card), it is possible to protect the application so that it cannot be accessed (for the purpose of reading or modifying the program) in online mode under PL7 Junior/Pro.
A memory protection bit, set in configuration mode, is also available to prevent any program modification (via the programming terminal or downloading).

Premium processor references

TSX 57 10/20/30/40 processors are equipped with:
- A PCMCIA slot (no. 0) that can accommodate a memory extension or SRAM memory card for storing additional data
- A PCMCIA slot (no. 1) that can accommodate a communication or memory extension card for storing additional data
- Two terminal ports (8-way female mini-DIN type), Uni-Telway or character mode.

TSX 57 processors are double-format modules (except **TSX P57 1●3M and TSX P57 353LAM** processors, which are single-format).
TSX 57 30/40 processors support the loading of programs, via the terminal port, at a maximum speed of 115 Kbit/s (limited to 19.2 Kbit/s for **TSX 57 10/20** processors).
The integrated Fipio link (bus manager) on **TSX 57 20/30/40** processors supports a maximum of 127 connection points. The link on the **TSX P57 153M** processor is limited to 63 connection points.

(1) The internal RAM is protected by an optional battery with a life of 3 years, which is located in the power supply module.
(2) The system has a minimum reserve RAM memory area of around 5 Kwords. Please refer to the PL7 Micro/Junior/Pro reference manual.

Modicon Premium automation platform
PL7 processors


TSX P57 103M


TSX P57 153M


TSX P57 203M


TSX P57 353LAM


TSX P57 253M
TSX P57 353AM
TSX P57 453AM


TSX P57 2623M
TSXP57 3623AM


TSX P57 2823M
TSX P57 4823AM

TSX 57 processors

I/O capacity (1)	Capacity		Maximum number of bus/network modules	Integrated Ethernet Modbus/TCP	Reference	Weight kg
	Memory	Control channels				
TSX 57 10 4 racks (2)						
512 discrete I/O **24 analog I/O** **8 application-specific channels**	32 Kwords integrated 64 Kwords max. on PCMCIA	0	1 network 2 AS-Interface buses 1 CANopen bus	–	**TSX P57 103M**	0.380
			1 integrated Fipio 1 network 2 AS-Interface buses	–	**TSX P57 153M**	0.420
TSX 57 20 16 racks (2)						
1024 discrete I/O **80 analog I/O** **24 application-specific channels**	48 Kwords integrated 160 Kwords max. on PCMCIA	10	1 network 4 AS-Interface buses 1 CANopen bus (3) 1 fieldbus (3)	–	**TSX P57 203M**	0.520
			4 AS-Interface buses 1 CANopen bus (3) 1 fieldbus (3)	1 Ethernet	**TSX P57 2623M**	–
	64 Kwords integrated 160 Kwords max. on PCMCIA	10	1 integrated Fipio 1 network 4 AS-Interface buses 1 CANopen bus (3) 1 fieldbus (3)	–	**TSX P57 253M**	0.560
			1 integrated Fipio 4 AS-Interface buses 1 CANopen bus (3) 1 fieldbus (3)	1 Ethernet	**TSX P57 2823M**	–
TSX 57 30 16 racks (2)						
1024 discrete I/O **128 analog I/O** **32 application-specific channels**	64 Kwords integrated (4) 384 Kwords max. on PCMCIA	15	3 networks 8 AS-Interface buses 1 CANopen bus (3) 2 fieldbuses (3)	–	**TSX P57 303AM**	0.520
			2 networks 8 AS-Interface buses 1 CANopen bus (3) 2 fieldbuses (3)	1 Ethernet	**TSX P57 3623AM**	–
	80/96 Kwords integrated (4) 384 Kwords max. on PCMCIA	15	1 integrated Fipio 3 networks 8 AS-Interface buses 1 CANopen bus (3) 2 fieldbuses (3)	–	**TSX P57 353LAM** (5)	0.420
					TSX P57 353AM (5)	0.560
TSX 57 40 16 racks (2)						
2040 discrete I/O **256 analog I/O** **64 application-specific channels**	96/176 Kwords integrated (4) 512/99 Kwords (6) max. on PCMCIA	20	1 integrated Fipio 4 networks (7) 8 AS-Interface buses 1 CANopen bus (3) 2 fieldbuses (3)	–	**TSX P57 453AM**	0.560
				1 Ethernet	**TSX P57 4823AM**	–

Accessories for connecting to the PC programming terminal

Description	Application	Reference	Weight kg
Universal Bluetooth® interface (UBI) for terminal port (TER)	Application: see page 1/11. The kit comprises: ■ a Universal Bluetooth® interface (UBI), ■ an RJ45/mini-DIN cable (length 1 m), ■ an RJ45/RJ45 cable (length 1 m), ■ a fixing clamp for installation inside the enclosure, ■ a CD with configuration software and user manual.	**TCS WAAC 13FB**	0.320

PCMCIA memory extension cards

Premium processors can support up to 2 memory extension cards. However, usable memory capacity is limited to the maximum size defined for the processor model.
References, see pages 1/20 and1/21.

(1) Cumulative maximum values. The number of remote I/O on the bus is not included.
(2) 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.*
(3) Using the CANopen bus reduces the number of possible fieldbuses (InterBus/Profibus DP) by 1.
(4) The second value corresponds to the integrated memory capacity when the processor is equipped with a PCMCIA memory card.
(5) Single-format processor for **TSX P57 353LAM**, *double-format processor for* **TSX P57 353AM**.
(6) 992 Kwords with PL7 Junior/Pro software V4.4 or higher.
(7) 3 networks with **TSX P57 4823AM** *processor.*