BMX XBE 1000 rack extender module

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At a Glance

Goal of this Chapter

The goal of this Chapter is to introduce the rack extender module and its installation.

What's in this Chapter?

This chapter contains the following topics:

Rack Extender Module Introduction

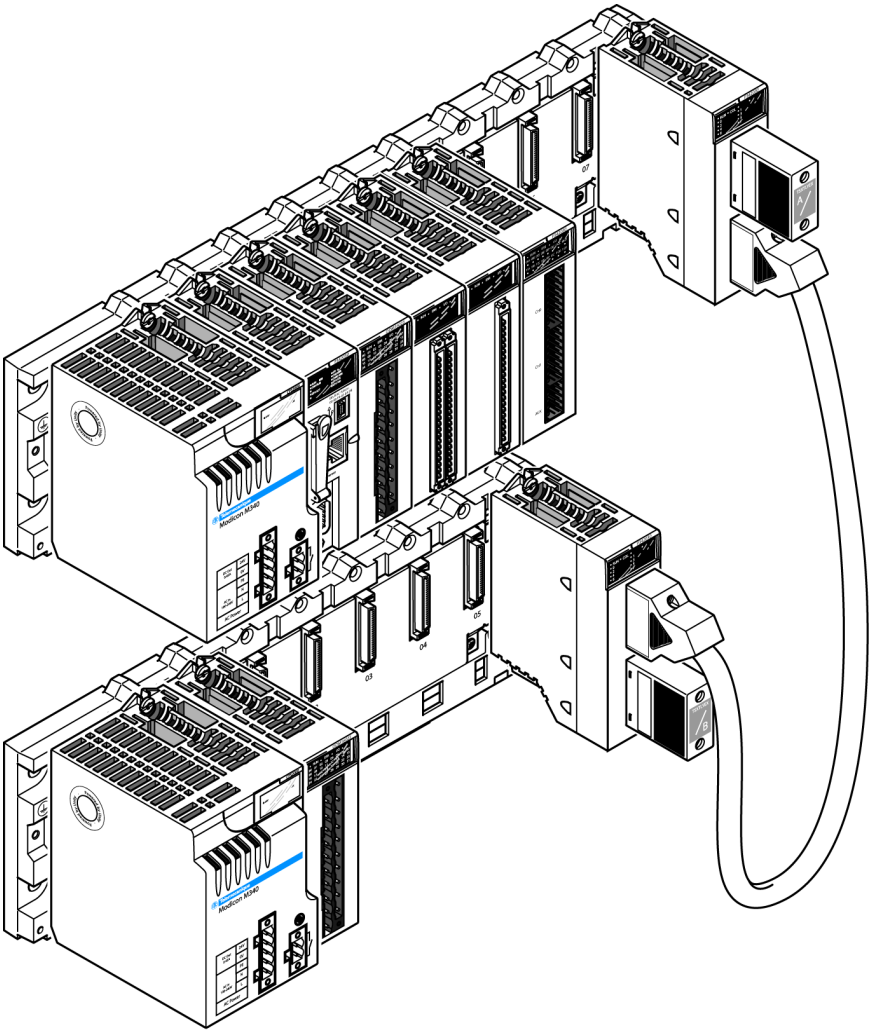
General

The Modicon PLC rack extender module makes it possible to connect a maximum of 4 racks, depending on the CPU, distributed along a maximum length of 30 meters. The racks are daisy chained together via the extension modules.

Example of topology

A typical system consists of:

- A rack extender module (BMX XBE 1000) in each rack,
- A power supply module in each rack,
- One CPU for the complete system,
- 2 line terminators, TSX on the first rack and TLY on the last.



Module consumption	Consumption on 3.3 VDC power supply: 22 mA. Dissipated power on the 3.3 VDC rack power supply : 73 mW. Consumption on 24 VDC rack power supply : 160 mA Dissipated power on the 24 VDC rack power supply : 3.84 W

Rack Extender Module Physical Description

Illustration

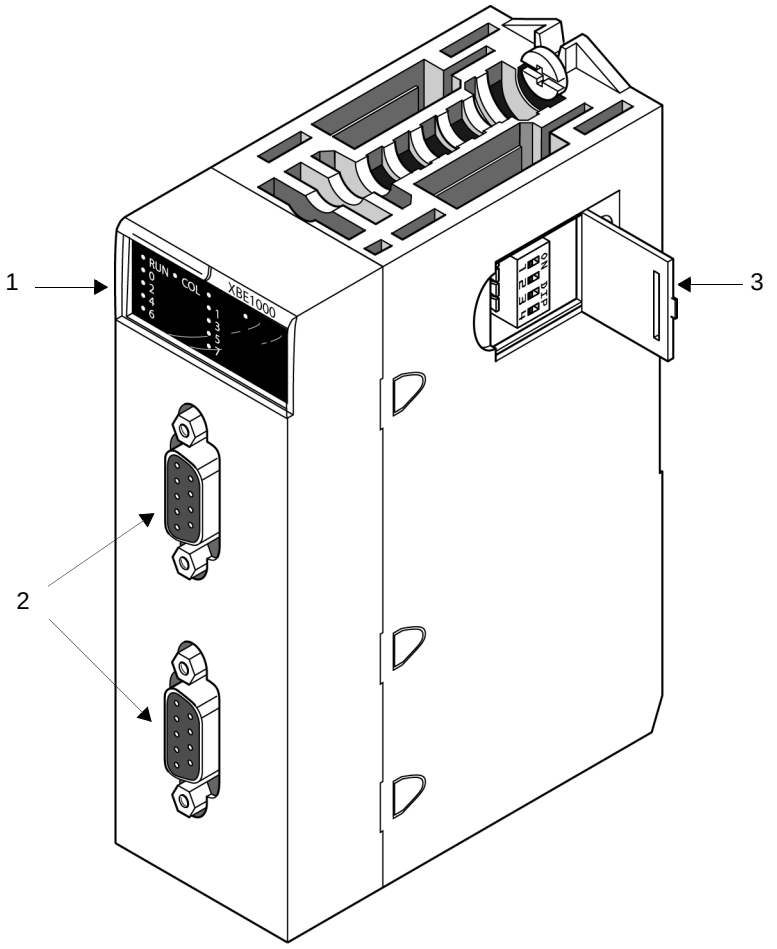


Table of labels

The BMX XBE 1000 module is composed of the following elements:

Label	Description
1	Module status LEDs on the front: ● **RUN** LED: indicates the operating status of the module, ● **COL** LED: indicates a collision error of the module, ● **0** to **3** LEDs: indicates the rack address of the module.
2	Two female SUB.D 9 pin connectors for bus cables or terminators.
3	Coding switches.

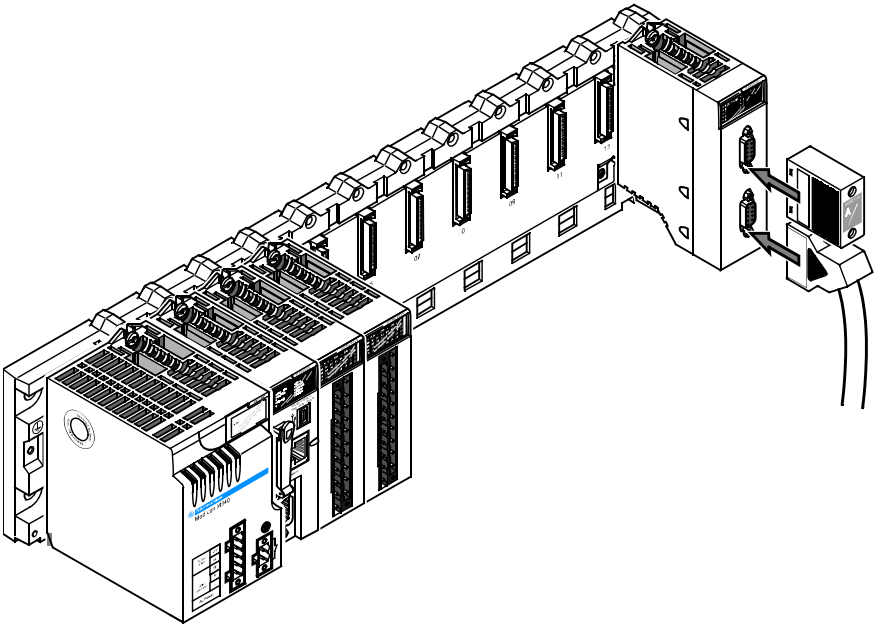
Rack Extender Module Installation

Installation

The following modules must be placed in these slots:

- The BMX XBE 1000 module is installed on each BMX XBP •••• rack in the slot marked XBE.
- Each rack must include a power supply module, in position CPS.
- The processor must be installed in the main rack (rack 0) in position 00.

The following illustration shows the installed the BMX XBE 1000 extender module with power supply, processor and two I/O modules in the main rack (rack 0):



⚠ DANGER

HAZARD OF ELECTRIC SHOCK

Disconnect all power sources before installing the module.

Failure to follow these instructions will result in death or serious injury.

Assembly

The assembly of the BMX XBE 1000 module is similar to the assembly of the BMX P34 •••• processors (see *Fitting of Processors, p. 78*), and generally speaking, similar to the assembly of the other modules.

Leave 12 mm of free space on the right side of the rack to insure a free flow of air for cooling. Leave 35 mm in front of the module for the local bus connector and terminator.

Grounding of the Rack Extender Module

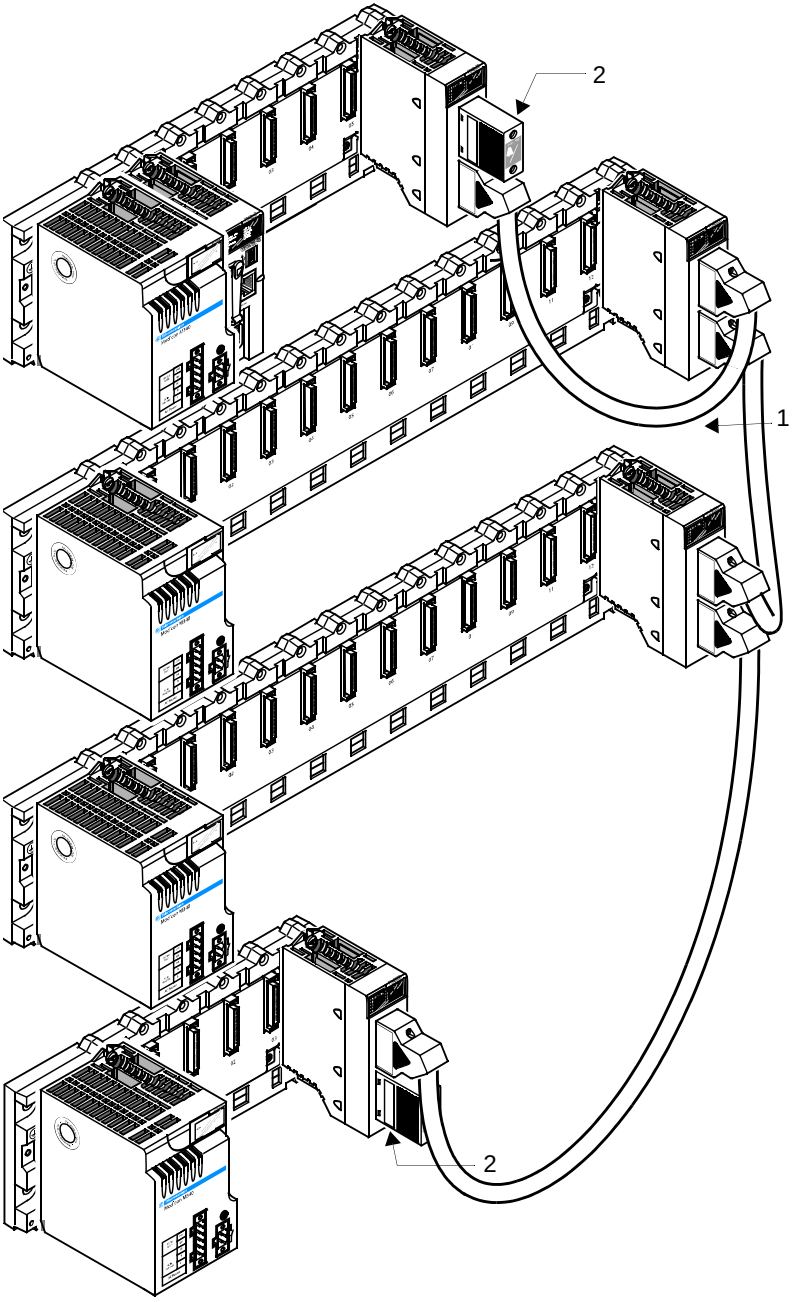
The BMX XBE 1000 module is equipped with ground connection contacts (see *Grounding of Installed Modules, p. 29*).

Building a Modicon M340 Station Using BMX XBP •••• Racks

The BMX XBP •••• racks can be used to build a PLC station that contains a maximum of:

Station		**Maximum number of racks**
Processor	**OS Version**	
For a BMX P34 1000/2010/2020/2030 station	01.00	1 BMX XBP •••• racks
For a BMX P34 1000 station	>= 02.00	2 BMX XBP •••• racks
For a BMX P34 2000/2010/2020/2030 station	>= 02.00	4 BMX XBP •••• racks

Diagram:



- **(1)** The same station can contain 4, 6, 8 and 12 position racks that are interconnected by Extension cables (see *Rack Extender Module Accessories, p. 207*).
- **(2)** The local bus must have a Line terminator (see *Rack Extender Module Accessories, p. 207*) fitted at each end.

Note: The cumulative length of all the BMX XBC •••K or TSX CBY •••K cables used in a PLC station must not exceed 30 meters.

Extension Cable

Racks are connected by means of BMX XBC •••K or TSX CBY •••K extension cables which are connected to the 9-pin SUB-D connectors situated on the BMX XBE 1000 module of each main and extension rack.

Line Terminators

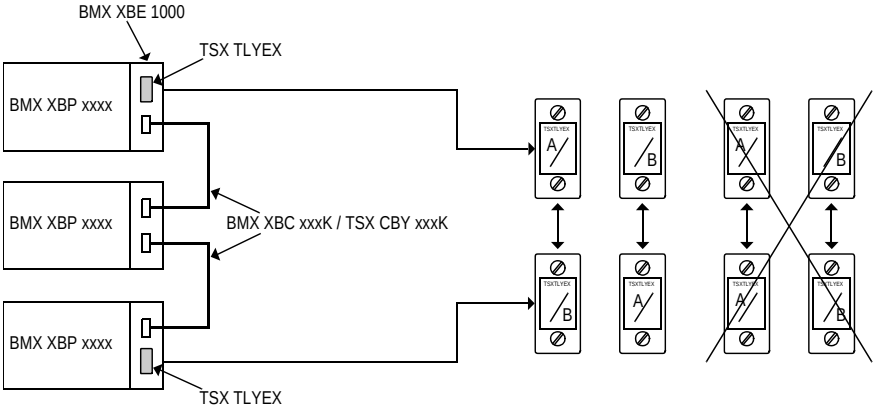
The BMX XBE 1000 modules of the two racks situated at the start and at the end of the chain **must always** be fitted with TSX TLY EX line terminators on the unused 9-pin SUB-D connectors.

Line terminators are labeled **A/** or **/B**. A PLC station that uses extension modules must use one line terminator labeled **A/** and one labeled **/B**.

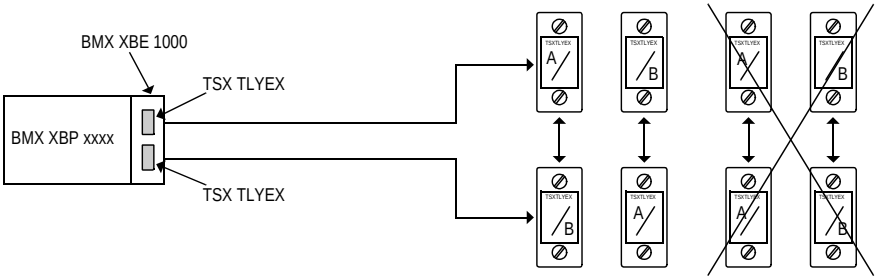
For example, if the extension module in the first rack of the chain contains a terminator labeled **A/**, then the extension module in the last rack must contain a terminator labeled **/B**

Positioning of Line Terminators on a Modicon M340 Station

Positioning on a PLC station containing several BMX XBP •••• extension racks:



Positioning on a PLC station containing a single BMX XBE 1000 extension module:



Rack extender Module Configuration

At a Glance

The rack extender modules are configured using microswitches on the side of the modules. The configuration of the module must be done before mounting the module on the rack.

PLC station rack addressing depends on the number of racks used:

- PLC station built with a single rack,
- PLC station built with extension racks.

Station built with a single rack

If the PLC station is built with a single rack, the rack address is implicit and has a value of 0.

If a rack extender module is installed in this rack, line terminators must be connected to the local bus connectors, and the microswitches on the side of the module must be configured for rack 0 (refer to the table of rack addresses in the next paragraph).

Station built with extension racks

For a PLC station built with extension racks, an address must be assigned for each station rack. This address is coded using 3 microswitches on the side of the module.

Microswitches 1 to 3 are used to code the rack address on the local bus (address 0 to 3).

Diagram showing the microswitches:

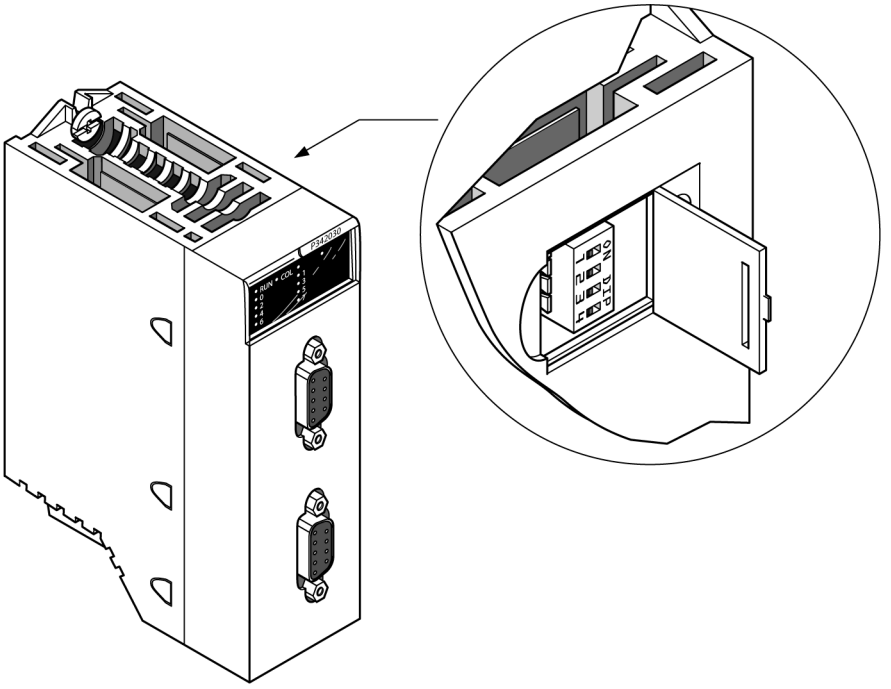


Table of rack addresses:

Switch	**Rack Address**			
	0	**1**	**2**	**3**
1	OFF	OFF	OFF	OFF
2	OFF	OFF	ON	ON
3	OFF	ON	OFF	ON
4	Not applicable			

Note: On delivery, all the microswitches are delivered in the OFF position (address 0).

Assigning addresses to different racks

Address 0: this address is always assigned to the rack which supports the BMX P34 1000/2000/2010/2020/2030 processor.

This rack can be located in any position in the chain.

If two or more racks are configured with address 0, only the rack supporting the processor will function correctly.

Addresses 1 to 3: can be assigned in any order to all the other extension racks in the station.

If two or more racks are configured with the same rack address (other than 0), the behavior depends on the position of the modules in those racks:

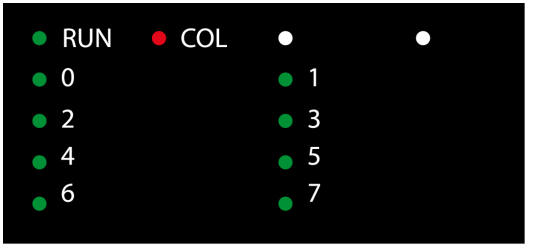
- If each module position is only used once, the modules will function correctly.
- If modules are mounted in the same position on two or more racks, those racks will not function, the access to them will be blocked.

Rack Extender Module Diagnostics

BMX XBE 1000 Module LEDs

The BMX XBE 1000 module display panel, located on the front of the module, is used for diagnostics.

Illustration:display panel (see *Rack Extender Module Physical Description, p. 195*)



Description

The following table describes the different LEDs and their meanings:

LED	Pattern	Indication
RUN (green): operational state	on	Module functioning normally
	off	• The power supply is no longer present, or • Internal module detected error
COL (red): collision error detected	on	Two or more racks are coded with the same rack address, and either: • Rack address is 0: this rack does not contain the processor; modules are mounted in the same rack position on each rack. There will be no communication on the local bus for this rack **or** • Rack address is not 0: modules are mounted in the same rack position on each rack. There will be no communication on the local bus for this rack.
	off	The rack addresses are correct.
0 to 3 (green):	on	Rack address

To resolve a collision error detected, carry out the following actions:

Step	Action
1	Power off the principal supply of the racks in collision.
2	Correct the rack address.
3	Power on the principal supply.

Rack Extender Module Accessories

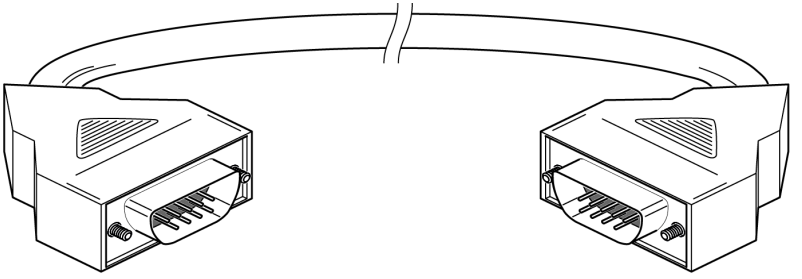
Extension Cable BMX XBC •••K and TSX CBY •••K

These cables of predetermined length are used to chain BMX XBP •••• racks and to transport the different local bus signals.

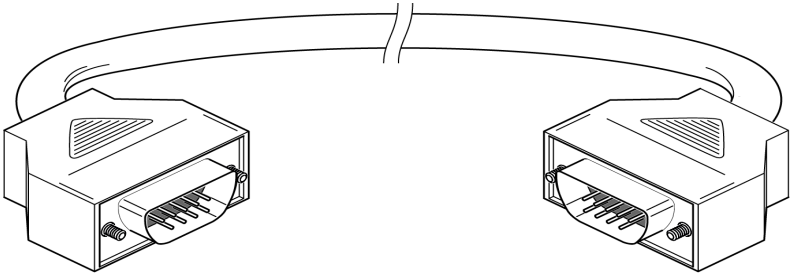
They are equipped at each end with a male 9-pin SUB D connector, which connect to the female 9-pin SUB D connector on the rack extender modules.

The BMX XBC •••K cables use connectors angled at 45°.

BMX XBC •••K



TSX CBY •••K



Note: The cumulative length of all the cables used in a PLC station is limited to 30 meters.

⚠ CAUTION

INRUSH CURRENT

Insertion and extraction of a BMX XBC •••K or a TSX CBY •••K cable must only be done with all the station's elements switched off (racks, PC, etc.)

Failure to follow these instructions can result in injury or equipment damage.

Summary table of different cable types available:

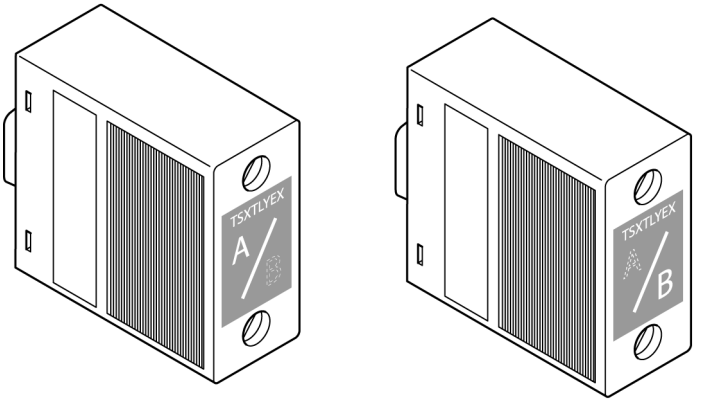
Reference		**Length**
Modicon M340 cable	BMX XBC 008K	0.8 m
	BMX XBC 015K	1.5 m
	BMX XBC 030K	3 m
	BMX XBC 050K	5 m
	BMX XBC 120K	12 m
Premium cable	TSX CBY 010K	1 m
	TSX CBY 030K	3 m
	TSX CBY 050K	5 m
	TSX CBY 120K	12 m
	TSX CBY 180K	18 m

Line Terminators TSX TLY EX

The local bus must be fitted with a line terminator at each end.

Line terminators are made up of a 9-pin SUB D connector and a cover containing the adaptation components. They are mounted on the 9-pin SUB D connector on the extension module at each end of the line.

Illustration



TSX TLY EX line terminators are provided in pairs marked **A/** and **/B**. The must be fitted with a terminator **A/** at one end and a terminator **/B** at the other end.

⚠ CAUTION

INRUSH CURRENT

Insertion or extraction of a line terminator must only be done with all the station's racks switched off.

Failure to follow these instructions can result in injury or equipment damage.

BMX XBP xxxx Rack Functions

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At a Glance

Subject of this Section

This section describes the different functions of the BMX XBP •••• racks.

What's in this Chapter?

This chapter contains the following topics:

Module Addressing

Introduction

For all racks, the module address is geographic. It is based on its position on the rack.

Module Addressing

The following table shows the module addresses depending on the rack used.

Rack reference	Number of slots available for the modules	Module address
BMX XBP 0400	4	00 - 03
BMX XBP 0600	6	00 - 05
BMX XBP 0800	8	00 - 07
BMX XBP 1200	12	00 - 11

Installing the Power Supply Modules, Processors and Other Modules

General

A rack must house one power supply module and one processor.

Module Installation Rules

The rules for installing modules on a rack are as follows:

- The power supply module must always be installed in the slot marked CPS.
- The processor must be installed in the slot marked 00.
- The I/O and application-specific modules are installed in slots marked 01 to n (n varies according to the rack, see below table).
- The extension module is always installed in the slot marked XBE.

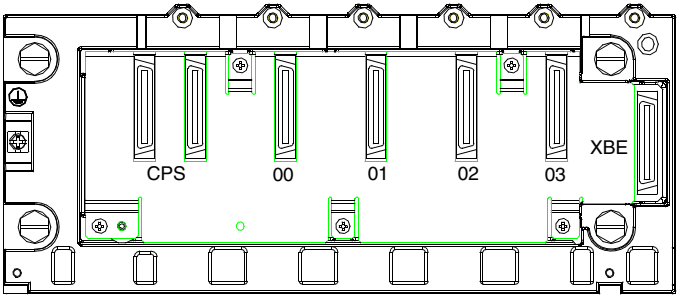
⚠ WARNING

UNEXPECTED EQUIPMENT OPERATION

Check that the processor module is installed in slot 00 before powering up the system. Otherwise unexpected equipment operation can result.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The following illustration shows the BMX XBP 0400 rack with the module slot numbers:



It is possible to connect three I/O and application-specific modules to this rack using the connectors marked 01 to 03.

The following table describes the slot numbers to which the I/O and application-specific modules may be connected on BMX XBP •••• racks.

Rack	Module slot number (n)
BMX XBP 0400	01 - 03
BMX XBP 0600	01 - 05
BMX XBP 0800	01 - 07
BMX XBP 1200	01 - 11