

Presentation

The Modicon X80 modules platform is compatible with two types of backplanes:

- Dual Ethernet and X-bus backplanes
- X-bus backplanes (1).

One Ethernet switch is embedded inside the backplane with connectivity to some slots on the backplane, and not all slots have Ethernet connectivity.

X-bus functionality is preserved and conforms to the legacy implementation and specification. The X-bus will be used in a subset of modules on the Ethernet backplane.

The backplanes provide the power supply for the modules in the rack.

BMXXBP●●00 racks are basic elements in Modicon X80 modules platform single-rack and multi-rack configurations. They assign a rack number to X-bus slots. They also perform the following functions:

- **Mechanical function:** They are used to install modules in a PLC station (power supply, processor, discrete, analog, and application-specific I/O). These racks can be mounted on a panel or a plate:
 - Inside enclosures
 - On machine frames, etc.
- **Electrical function:** The racks incorporate X-bus (proprietary bus). They are used to:
 - Distribute the power supplies required for each module in the same rack
 - Distribute data and service signals for the entire PLC station
 - Hot swap modules during operation

BMEXBP●●00 racks provide the following services to X-bus slots:

- Supply a rack number
- Supply the interconnection for the slots in the main and extended backplanes

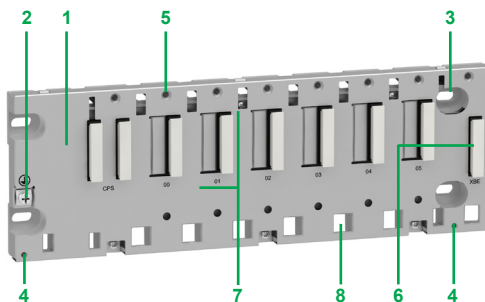
BMEXBP●●02 are dual power supply racks with two CPS slots for two redundant power supplies. They feature:

- Compatibility only with redundant power supplies
- Security of power supply in high-availability applications

The Ethernet interface is the main communication medium in the Ethernet backplane. The Ethernet modules on the Ethernet backplane are attached to one of several ports. The modules connect to the Ethernet switch chip embedded in the Ethernet backplane.

The Ethernet backplane provides the following services to ETH slots:

- ETH connection to ETH slots
- Point-to-point connection



BMXXBP0600 rack with 6 slots

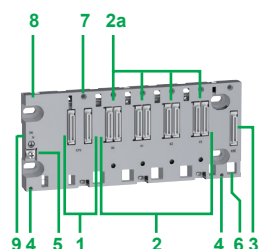
Description

X-bus backplanes

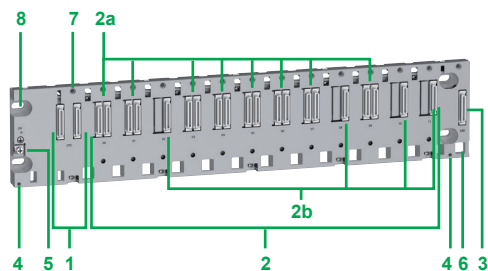
BMXXBP●●00 racks are available in 4, 6, 8, or 12-slot versions and comprise:

- 1 A metal frame with the following functions:
 - Holds the X-bus electronic card and helps it withstand EMI and ESD type interference
 - Holds the modules
 - Gives the rack mechanical rigidity
- 2 A ground terminal for grounding the rack
- 3 4 holes (big enough for M6 screws) for mounting the rack on a frame
- 4 2 fixing points for the shielding connection bar
- 5 Tapped holes to take the locking screw on each module
- 6 A connector for a rack expansion module, marked **XBE**
- 7 40-way female ½ DIN connectors forming the electrical connection between the rack and each module, marked **CPS, 00...11** (the rack is delivered with each connector protected by a cover, which needs to be removed before inserting the module)
- 8 Slots for anchoring the module pins

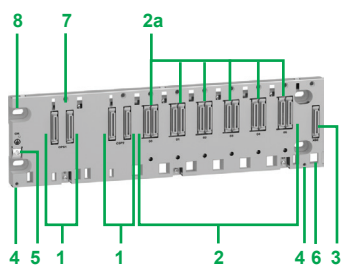
(1) Mandatory PV02 version or later.



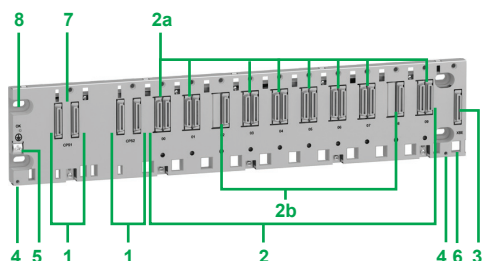
BMEXBP0400 backplane



BMEXBP1200 backplane



BMEXBP0602 backplane



BMEXBP1002 backplane

Description (continued)

Dual Ethernet and X-bus backplanes

The number of X-bus and Ethernet slots found on a backplane depends on the backplane size.

BMEXBP0400/BMEXBP0800 are 4/8-slot dual Ethernet and X-bus backplanes with:

- 1 CPS slot for power supply
- 2 4 slots (**BMEXBP0400**)/8 slots (**BMEXBP0800**) with:
 - 2a 4/8 Ethernet and X-bus connectors for mixed modules
 - 2b Extension: 1 connector for a X-bus backplane expansion
- 3 2 fixing points for the shielding connection bar
- 4 Protective ground screw
- 5 Slots for anchoring the module pin
- 6 Tapped holes for the locking screw on each module
- 7 4 holes for M4, M5, M6, or UNC #6-32 screws (4.32 mm to 6.35 mm/0.17 to 0.25 in.)
- 8 Rack fastened to 35 mm/1.38 in. wide and 15 mm/0.59 in. deep DIN rails. Mounting on a 35 mm/1.38 in. wide and 7.5 mm/0.295 in. deep DIN rail is also possible (in this case, the product withstands less mechanical stress).

BMEXBP1200 is a 12-slot dual Ethernet and X-bus backplane with:

- 1 CPS slot for power supply
- 2 12 slots with:
 - 2a 8 Ethernet and X-bus connectors for mixed modules
 - 2b 4 X-bus connectors for X-bus modules
- 3 Extension: 1 connector for an X-bus backplane expansion
- 4 2 fixing points for the shielding connection bar
- 5 Protective ground screw
- 6 Slots for anchoring the module pin
- 7 Tapped holes for the locking screw on each module
- 8 4 holes for M4, M5, M6, or UNC #6-32 screws (4.32 mm to 6.35 mm/0.17 to 0.25 in.)

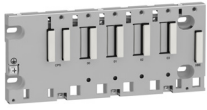
Dual power supply backplanes

BMEXBP0602 is a 6-slot dual Ethernet and X-bus backplane with:

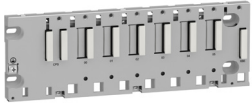
- 1 2 CPS slots for **BMXCPS4002** redundant power supply only
- 2 6 slots with:
 - 2a 6 Ethernet and X-bus connectors for mixed modules
 - 2b Extension: 1 connector for an X-bus backplane expansion
- 3 2 fixing points for the shielding connection bar
- 4 Protective ground screw
- 5 Slots for anchoring the module pin
- 6 Tapped holes for the locking screw on each module
- 7 4 holes for M4, M5, M6, or UNC #6-32 screws (4.32 to 6.35 mm/0.17 to 0.25 in.)
- 8 Rack is fastened to 35 mm/1.38 in. wide and 15 mm/0.59 in. deep DIN rails. Mounting on a 35 mm/1.38 in. wide and 7.5 mm/0.295 in. deep DIN rail is also possible (in this case, the product withstands less mechanical stress).

BMEXBP1002 is a 10-slot dual Ethernet and X-bus backplane with:

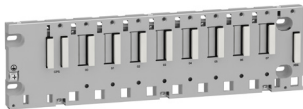
- 1 2 CPS slots for **BMXCPS4002** redundant power supply only
- 2 10 slots with:
 - 2a 8 Ethernet and X-bus connectors for mixed modules
 - 2b 2 X-bus connectors for X-bus modules
- 3 Extension: 1 connector for an X-bus backplane expansion
- 4 2 fixing points for the shielding connection bar
- 5 Protective ground screw
- 6 Slots for anchoring the module pin
- 7 Tapped holes for the locking screw on each module
- 8 4 holes for M4, M5, M6, or UNC #6-32 screws (4.32 to 6.35 mm/0.17 to 0.25 in.)



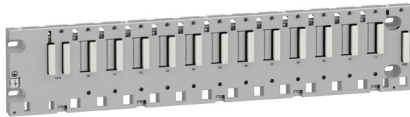
BMXXBP0400



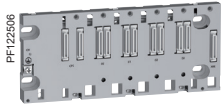
BMXXBP0600



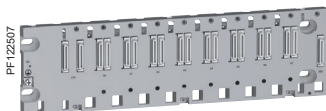
BMXXBP0800



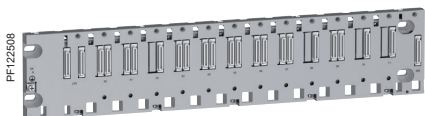
BMXXBP1200



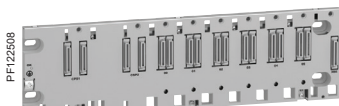
BMEXBP0400



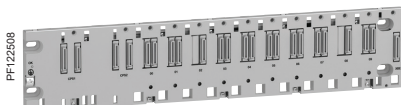
BMEXBP0800



BMEXBP1200



BMEXBP0602



BMEXBP1002

X-bus racks

Description	Type of module to be inserted	No. of slots (1)	Power consumption (2)	Reference	Weight kg/lb
X-bus racks	BMXCPS power supply, BMXP34 or BMEP58 processor, I/O modules, communication modules and application-specific modules (counter, motion control, and serial)	4	1 W	BMXXBP0400	0.630/1.389
		6	1.5 W	BMXXBP0600	0.790/1.742
		8	2 W	BMXXBP0800	0.950/2.094
		12	–	BMXXBP1200	1.270/2.780

Ethernet + X-bus racks (3) (4)

Description (5)	Type of module to be inserted	Ethernet connectors	X-bus connectors	Power consumption (6)	Reference (3)	Weight kg/lb
4-slot Ethernet + X-bus backplane	BMXCPS power supply, BMEP58/BMEH58 processor, I/O modules, communication modules and application-specific modules (counter, motion control, and serial)	4	4	2.8 W	BMEXBP0400	0.719/1.500
8-slot Ethernet + X-bus backplane		8	8	3.9 W	BMEXBP0800	1.064/2.350
12-slot (8 Ethernet + X-bus/4 X-bus) backplane		8	12	3.9 W	BMEXBP1200	1.398/3.080
6-slot Ethernet + X-bus dual power supply backplane	BMXCPS4002 redundant power supply, BMEP58/BMEH58 processor, I/O modules, communication modules and application-specific modules (counter, motion control, and serial)	6	6	3.9 W	BMEXBP0602	1.377/3.036
10-slot (8 Ethernet + X-bus/2 X-bus) dual power supply backplane		8	10	3.9 W	BMEXBP1002	1.377/3.036

(1) Number of slots taking the processor module, I/O modules, communication modules, and application-specific modules (excluding power supply module).

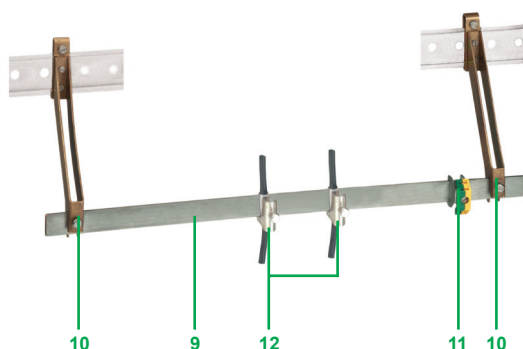
(2) Power consumption of anti-condensation resistor(s).

(3) In an M580 architecture, Ethernet backplanes can be used for R/O drop Ethernet (E/O) but not as expansion racks anywhere. For expansion racks, it is necessary to use BMXXBP0400/0600/0800/1200 racks.

(4) For multi-rack configuration, see [page 2/6](#).

(5) Number of slots for maximum number of modules excluding power supply rack expansion modules.

(6) Power consumption of anti-condensation resistor(s).



BMXXSP cable shielding connection kit

Description

Dual Ethernet and X-bus backplanes

To be ordered separately:

A **BMXXSP** cable shielding connection kit, used to help protect against electrostatic discharge when connecting the shielding on cordsets for connecting:

- Analog, counter, and motion control modules
- A Magelis XBT operator interface to the processor (via **BMXXCAUSBH** shielded USB cable)

The **BMXXSP** shielding system comprises:

- 9 A metal bar that takes the clamping rings and the grounding terminal
- 10 Two sub-bases to be mounted on the rack
- 11 A grounding terminal (not included)
- 12 Not included in the shielding connection kit, the **STBXSP30** clamping rings (sold in lots of 10, cross-section 1.5...6 mm²/16...10 AWG or 5...11 mm²/10...7 AWG)



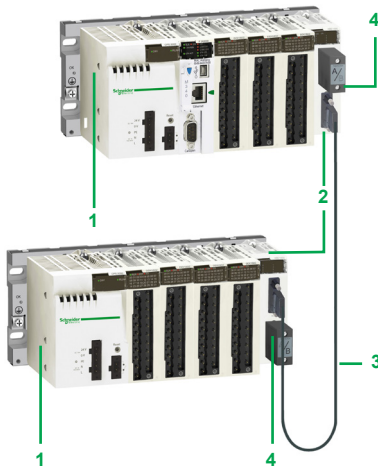
STBXSP3000 + STBXSP30

Accessories

Description	For use with	Reference	Weight kg/lb
Shielding connection kits comprising: - 1 metal bar - 2 support sub-bases	BM●XBP0400 rack	BMXXSP0400	0.280/ 0.617
	BMXXBP0600 rack	BMXXSP0600	0.310/ 0.683
	BMEXBP0602 rack	BMXXSP0800	0.340/ 0.750
	BM●XBP0800 rack	BMXXSP1200	0.400/ 0.882
	BMEXBP1002 rack		
Spring clamping rings <i>Sold in lots of 10</i>	Cables, cross-section 1.5...6 mm ² /16...10 AWG	STBXSP3010	0.050/ 0.110
	Cables, cross-section 5...11 mm ² /10...7 AWG	STBXSP3020	0.070/ 0.154
Protective covers (replacement parts) <i>Sold in lots of 5</i>	Unoccupied slots on BMXXBP●●00 rack	BMXXEM010	0.005/ 0.011

(1) The grounding terminal is not included in the shielding connection kits.

2



Modicon M340 + expansion rack



Modicon M580 + expansion rack



Modicon X80 drop + expansion rack

Composition of a multi-rack configuration

Multi-rack configurations are made up of **BM●XBP●●00** racks (1). They comprise:

- 2 racks maximum for a station with a **BMXP341000** processor
- 4 racks maximum for a station with a **BMXP3420●●●** or **BMXP3420●●●CL** processor
- 4 racks maximum for a station with a **BMEP581020** or **BMEP5820●0** processor
- 8 racks maximum for a station with a **BMEP5830●0**, **BMEP5840●0**, **BMEP585040**, or **BMEP586040** processor

Each rack is equipped with:

- 1 A **BMXCPS●●●●●** power supply or two **BMXCPS4002** redundant power supplies (2)
- 2 A **BMXXBE1000** rack expansion module. This module, inserted in the right-hand end of the rack (XBE slot, see [page 2/2](#)) does not occupy rack slots 00...11 (4, 6, 8, or 12 slots are still available).
- 3 The **BMXXBE1000** rack expansion modules, which are connected to each other by X-bus cordsets

X-bus

The racks, distributed on the X-bus, are connected to each other by X-bus extension cordsets 3 with a maximum total length of 30 m/98.42 ft.

The racks are connected in a daisy chain using **BMXXBC●●0K** (3) X-bus extension cordsets connected to the two 9-way SUB-D connectors 7 and 8 on the front panels of the **BMXXBE1000** rack expansion modules 2.

Line terminators 4

Both expansion modules at the ends of the daisy chain must have a line terminator

4 **TSXTLYEX** on the unused 9-way SUB-D connector.

Note: The processor module is always positioned in the rack at address 0. However, in an X-bus daisy chain, the order of the racks has no effect on operation. For example, the order of the daisy chain can be 0-1-2-3, 2-0-3-1, or 3-1-2-0, etc.

Composition of an expansion backplane configuration

The Modicon M580 standalone processor supports 4 to 8 local racks (depending on the CPU performance level), using existing X80 I/O modules and accessories. The Modicon M580 CPU can be installed in the first rack (0) and this can be a dual bus rack. The M580 PLC will support up to 7 **BMXXBP●●●●●** PV02 or later backplanes (racks) of 4, 6, 8, or 12 slots. The main backplane (rack 0) will support the CPU.

To extend the configuration using additional racks, users can use a bus extender module (**BMXXBE1000**) and X-bus cables. The backplane extender should be plugged into the dedicated connector on the right side of the backplane. It does not occupy any module slot. The XBE extender module is not hot-swappable, like the rest of the X80 modules platform. Each backplane has to include a power supply module and will support up to 12 modules.

An expansion rack can be connected to the main backplane and the X80 drop (EIO).

The rack address is assigned as follows:

- Each rack will be assigned a physical address using 4 microswitches located in the bus extender module.
- The main rack containing the CPU will be assigned address 0.
- The other racks will be assigned addresses 1 to 7.

Each rack is equipped with:

- 1 A **BMXCPS●●●●●** power supply or two **BMXCPS4002** redundant power supplies (2)
- 2 A **BMXXBE1000** rack expansion module. This module, inserted in the right-hand end of the rack (XBE slot) does not occupy rack slots 00...11 (4, 6, 8, or 12 slots are still available).
- 3 The **BMXXBE1000** rack expansion modules, which are connected to each other by X-bus cordsets
- 4 Line terminators: Both expansion modules at the ends of the daisy chain must have a line terminator 4 **TSXTLYEX** on the unused 9-way SUB-D connector.

(1) **BMEXBP●●●●●** is only supported on M580 processor based platforms.

(2) **BMXCPS4002** redundant power supply is only compatible only with the **BMEXBP0602** and **BMEXBP1002** dual power supply backplane.

(3) **BMXXBC●●0K** extension cordsets, length 0.8 m/2.62 ft, 1.5 m/4.92 ft, 3 m/9.84 ft, 5 m/16.4 ft, or 12 m/39.4 ft, with angled connectors or **TSXCBY●08K** extension cordsets, length 1 m/3.28 ft, 3 m/9.84 ft, 5 m/16.4 ft, 12 m/39.4 ft, 18 m/59 ft, or 28 m/92 ft, with straight connectors.

Ethernet racks

Modicon M580 CPUs support dual bus backplanes (Ethernet and X-bus), as well as Ethernet ring or star architectures on their Ethernet port.

BME●58●●2● CPUs support Ethernet star or ring architectures (RSTP loop is supported on ports 2 and 3). The embedded scanner allows scanning of distributed equipment. The CPU directly drives these devices ("NOC" embedded function).

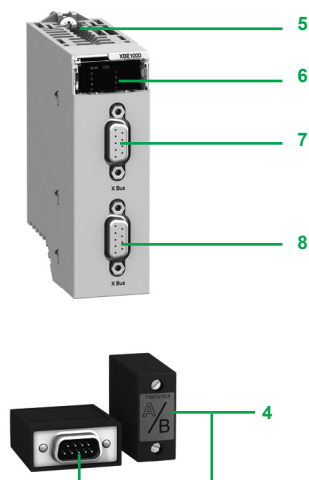
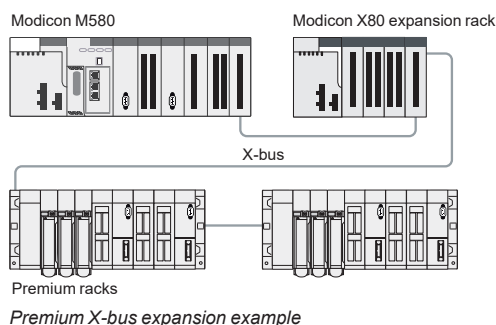
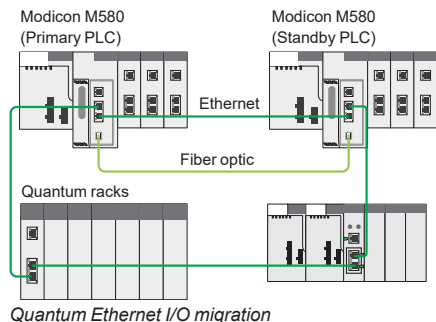
BME●58●●4● CPUs support an embedded scanner that allows scanning of X80 drops on Ethernet RIO (EIO) and distributed equipment.

Modicon M580 CPUs have an additional third Ethernet port dedicated to the connection of a service tool such as a PC, HMI, or network analyzer. This port is labeled "ETH 1". It does not support RSTP.

Modicon M580 CPUs can communicate on the main Ethernet backplane. They cannot be installed in an expansion rack.

It is necessary to use an Ethernet backplane:

Reference	Description
BMEXBP0400	Standard 4-slot backplane
BMEXBP0800	Standard 8-slot backplane
BMEXBP1200	Standard 12-slot backplane
BMEXBP0602	Dual power supply 6-slot backplane
BMEXBP1002	Dual power supply 10-slot backplane
BMEXBP0400H	Ruggedized 4-slot backplane
BMEXBP0800H	Ruggedized 8-slot backplane
BMEXBP1200H	Ruggedized 12-slot backplane
BMEXBP0602H	Ruggedized dual power supply 6-slot backplane
BMEXBP1002H	Ruggedized dual power supply 10-slot backplane



Quantum Ethernet I/O migration

Modicon M580 CPUs levels 4 and above (**BMEP584040**, **BMEP585040**, and **BMEP586040**) support Quantum I/O using the Quantum Ethernet remote drop adapter **140CRA31200**. The number of Remote I/O drops allowed (up to 31) depends on the M580 processor model.

The Quantum Ethernet drop is configured using EcoStruxure Control Expert (1) software. Each Quantum I/O can be configured with the X80 I/O model (Device DDT) or the Quantum model ("State ram" :%I, %IW, %M, %MW) to simplify the reuse of legacy applications.

The compatibilities of Quantum I/O in an Ethernet Quantum drop are identical in a Quantum processor based architecture. See [page 1/8](#) for more information.

In addition, the Modicon LL984 legacy language is supported by some CPU models; please refer to the M580 product catalog for more information.

Premium X-bus extension

The Modicon M580 CPU supports revamping of an existing Premium installation by replacing the Premium rack 0 (CPU and communication modules) with an M580 rack. It is also possible to combine Premium racks **TSXRKY4EX/6EX/8EX/12EX** with X80 I/O based on an X-bus rack. The majority of existing configurations are supported. The number of expanded racks allowed depends on which CPU is being used:

- The **BMEP581020**, **BMEP582020**, and **BMEP582040** CPUs support a main local rack and up to 3 expansion racks. If you are using 4, 6, or 8-slot Premium expansion racks, you can install 2 physical racks at each assigned rack address, allowing up to 6 Premium expansion racks (up to 6 backplanes and 100 m/328 ft between 2 drops).
- The **BMEP583020**, **BMEP583040**, **BMEP584020**, and **BMEP584040** CPUs support a main local rack with up to 7 expansion racks. If you are using 4, 6, or 8-slot Premium expansion racks, you can install 2 physical racks at each assigned rack address, allowing up to 14 Premium expansion racks.

The maximum number of supported X-bus drops is as follows:

- 4 for **BMEP581000/2000**
- 8 for **BMEP583000/4000**

The maximum number of X-bus drops is calculated as follows:

- Max number = 1 for CPU rack (**BMXXBP0000** or **BMEXBP0000**)
+ ½ the number of **TSXRKY4/6/8EX** racks + the number of **TSXRKY12EX** racks
+ the number of **BMXXBP0000** racks

Description

The front panel of the **BMXXBE1000** rack expansion module comprises:

- 5 A screw for locking the module in its slot (at the far right-hand end of the rack)
- 6 A display block with 5 LEDs:
 - RUN LED (green): Module running
 - COL LED (red): Several racks have the same address, or rack address 0 does not contain the **BMXP340000** or **BMXP580000** processor module
 - LEDs 0, 1, 2, and 3 (green): rack address 0, 1, 2, or 3
- 7 A 9-way female SUB-D connector, marked X-bus, for the incoming X-bus cordset **3** connected to the upstream rack, or if it is the first rack, for the **A/** line terminator included in the **TSXTLYEX 4** pack
- 8 A 9-way female SUB-D connector, marked X-bus, for the outgoing X-bus cordset **3** to the downstream rack, or if it is the last rack, for the **/B** line terminator included in the **TSXTLYEX 4** pack

On the right-hand side panel

A flap for accessing the 3 rack addressing microswitches: 0...3

Installation rules for **BMXXBP0000** racks

Rules for installing racks in enclosures (see our website www.se.com).

(1) EcoStruxure Control Expert software continues the Unity Pro range of software and corresponds to versions ≥ 14 of Unity Pro.



BMXXBE1000



BMXXBC008K



TSXTLYEX

Rack expansion

Description	Use	Reference	Weight kg/lb
Modicon X80 I/O rack expansion module	Standard module for mounting in each rack (XBE slot) and used to interconnect: - Up to 2 racks with BMXP341000 processor module - Up to 4 racks with BMXP342000 processor module - Up to 3 racks with BMEP581020/20000 processor module - Up to 7 racks with BMEP583000/4000/5000/6000 processor module - 1 rack with X80 drop (EIO)	BMXXBE1000	0.178/ 0.392
Modicon X80 I/O rack expansion kit	Complete kit for 2-rack configuration comprising: - 2 BMXXBE1000 rack expansion modules - 1 BMXXBC008K extension cordset, length 0.8 m/2.62 ft - 1 TSXTLYEX line terminator (set of 2)	BMXXBE2005	0.700/ 1.543

Cordsets and connection accessories

Description	Use	Composition	Type of connector	Length m/ft	Reference	Weight kg/lb
X-bus expansion cordsets total length 30 m/98 ft max (1).	Between 2 BMXXBE1000 rack expansion modules	2 x 9-way SUB-D connectors	Angled	0.8/ 2.62	BMXXBC008K	0.165/ 0.363
				1.5/ 4.92	BMXXBC015K	0.250/ 0.551
				3/ 9.84	BMXXBC030K	0.420/ 0.926
				5/ 16.4	BMXXBC050K	0.650/ 1.433
				12/ 39.4	BMXXBC120K	1.440/ 3.175
			Straight	1/ 3.28	TSXCBY010K	0.160/ 0.353
				3/ 39.4	TSXCBY030K	0.260/ 0.573
				5/ 16.4	TSXCBY050K	0.360/ 0.794
				12/ 39.4	TSXCBY120K	1.260/ 2.778
				18/ 59	TSXCBY180K	1.860/ 4.101
				28/ 92	TSXCBY280KT (2)(3)	2.860/ 6.305
Cable reel (1)	Length of cable to be equipped with TSXCBYK9 connectors	Cable with ends with flying leads, 2 line testers	—	100/ 328	TSXCBY1000	12.320/ 27.161

Description	Use	Composition	Sold in lots of	Reference	Weight kg/lb
Line terminators	Required on both BMXXBP0000 modules located at either end of the daisy chain	2 x 9-way SUB-D connectors marked A/ and /B	2	TSXTLYEX	0.050/ 0.110
X-bus straight connectors	For TSXCBY1000 cables	2 x 9-way SUB-D straight connectors	2	TSXCBYK9	0.080/ 0.176
Connector assembly kit	For fixing TSXCBYK9 connectors	2 crimping pliers, 1 pen (3)	—	TSXCBYACC10	—

(1) Module and cordsets do not operate properly at temperatures lower than -25 °C/-13 °F.

(2) Cable supplied with a set of 2 TSXTVSY100 electrical transient suppressors.

(3) To fix the connectors to the cable, you also need a wire stripper, a pair of scissors, and a digital ohmmeter.