BX ME MPUs

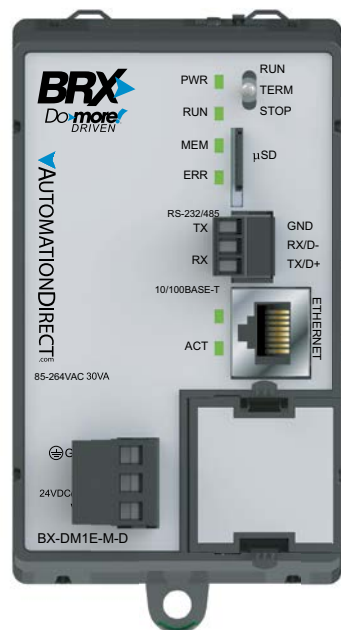## BX-DM1E-M-D

BRX MPU with Do-more! DM1 technology
- 24VDC required
- Serial port, RS-232/485 with removable 3-Pin connector
- Ethernet port, 10/100 Mbps
- microSD slot
- No on-board I/O

CPU Specifications	
Program Memory Type	FLASH memory
User Data Memory Type	Battery-backed RAM, user configurable
Ethernet Port	RJ-45, 10/100 Mbps
Serial Port	RS-232/RS-485 software selectable
Pluggable Option Module	RS-232, RS-485, Ethernet 10/100 BASE-T (1 Mbps throughput max), USB 2.0 Type B
Data Logging/File Management	microSD card slot (32G max)
Expansion Modules	8 expansion modules max
Real Time Clock Accuracy	±2.6 s per day typical at 25°C ±8s per day max at 60°C
Programming Software	Do-more! Designer – Ver. 2.0 or higher
Programming Cable Options	BX-PGM-CBL
MPU Weight	171g (6 oz)

| Power Supply Specifications	
Nominal Voltage Rating	12–24 VDC
Input Voltage Range (Tolerance)	10–36 VDC
Maximum Input Voltage Ripple	< ±10%
Maximum Input Power	30W
Cold Start Inrush Current	5A, 2ms
Maximum Inrush Current (Hot Start)	5A, 2ms
Internal Input Protection	Reverse Polarity Protection and Undervoltage
Heat Dissipation	3.2 W Max
Voltage Withstand (dielectric)	1500VAC Power Inputs to Ground applied for 1 minute
Replacement Connector	ADC Part # BX-RTB03

Input Wiring

Pin	Connection
1	GND
2	PWR –
3	PWR +

Removable Connector Included
ADC Part # BX-RTB03

Class 2 or LPS
User Supplied Power

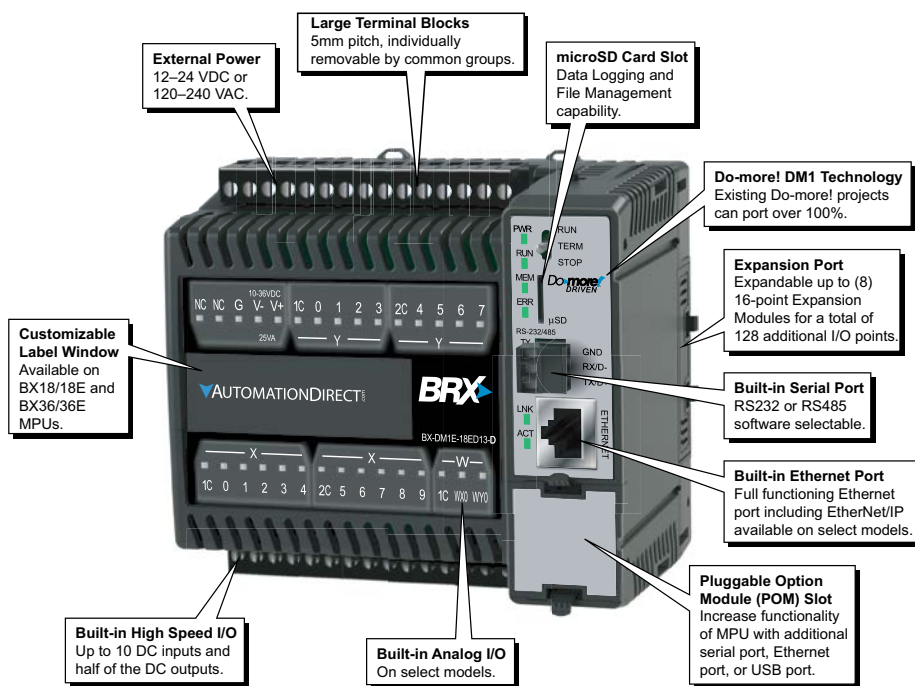DC Power In
12–24 VDC

GND
PWR-
PWR+
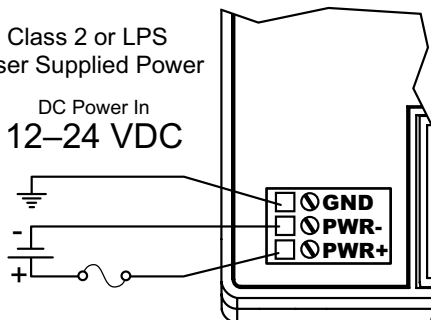
BRX Micro PLC Overview

The BRX platform enables you to choose from various communications ports. All BRX MPU models have a built-in RS232C/485 (software-selectable) serial port. However, an RJ45 Ethernet port (10/100 Mbps) is provided on select units. With support for EtherNet/IP, Modbus TCP, Modbus RTU, ASCII, K-sequence (DirectLOGIC users) and custom protocols, the BRX MPU platform provides supreme

versatility for any application. BRX hardware is built to last and is engineered, assembled and supported right here in America; designed and fabricated by industrial automation veterans with hardware facilities in Tennessee and Florida. The compact modular architecture results in an outstanding controller package, with high performance, a small footprint, at a very low cost. The BRX

platform has built-in high-speed I/O, motion control, on-board analog I/O, and many other features that enable you to build the ideal controller for your application. Below is a quick look at some of the standard features available on the BRX Platform.

External Power
12–24 VDC or 120–240 VAC.

Large Terminal Blocks
5mm pitch, individually removable by common groups.

microSD Card Slot
Data Logging and File Management capability.

Do-more! DM1 Technology
Existing Do-more! projects can port over 100%.

Expansion Port
Expandable up to (8) 16-point Expansion Modules for a total of 128 additional I/O points.

Customizable Label Window
Available on BX18/18E and BX36/36E MPUs.

Built-in Serial Port
RS232 or RS485 software selectable.

Built-in Ethernet Port
Full functioning Ethernet port including EtherNet/IP available on select models.

Built-in High Speed I/O
Up to 10 DC inputs and half of the DC outputs.

Built-in Analog I/O
On select models.

Pluggable Option Module (POM) Slot
Increase functionality of MPU with additional serial port, Ethernet port, or USB port.

General Specifications	
Operating Temperature	0° to 60°C [32° to 140°F]
Storage Temperature	-20° to 85°C [-4° to 185°F]
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Enclosure Type	Open Equipment
Agency Approvals	UL61010-2 - UL File # E185989 Canada and USA
	CE Compliant EN61131-2*
Noise Immunity	NEMA ICS3-304
EU Directive	See the "EU Directive" topic in the Help File

*Meets EMC and Safety requirements. See the D.O.C. for details.

2 Year Warranty
All BRX PLCs are covered under a 2- year warranty.

BRX Micro PLC Overview

Built-in RS-232/485 Port Specifications

Port Name *	RS-232/RS-485 Serial Port
Description	Non-isolated serial port that can communicate via RS-232 or RS-485 (software selectable). Includes ESD protection and built-in surge protection.
Supported Protocols	Do-more Protocol (Default) Modbus RTU (Master & Slave) K-Sequence (Slave) ASCII (In & Out) Programming and Monitoring
Data Rates	1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200
Default Settings	RS-232, 115200 bps, No Parity, 8 Data Bits, 1 Stop Bit, Station #1
Port Type	3-pin terminal strip 3.5 mm pitch
Port Status LED	Green LED is illuminated when active for TXD and RXD
RS-485 Station Addresses	1-247
Cable Recommendations	RS-232 use L19772-XXX from AutomationDirect.com RS-485 use L19827-XXX from AutomationDirect.com
Replacement Connector	ADC Part # BX-RTB03S

Removable connector included.
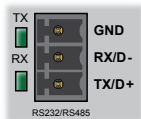
Pinout	RS232	RS485
1	GND	GND
2	RXD	D-
3	TXD	D+

TX — GND
RX — RX/D-
— TX/D+
RS232/RS485

When using RS-485 a termination resistor is available and is software selectable.

CPU Status Indicators

Indicator	Status	Description
PWR	OFF	Base Power OFF
	Green	Base Power ON
	Yellow	Low Battery
RUN	OFF	CPU is in STOP Mode
	Green	CPU is in RUN Mode
	Yellow	Forces are Active
MEM	OFF	No ROM Activity, No SD Card
	Yellow	ROM Activity (Flash or SD Card)
	Green	SD Card Installed and Mounted
	Red	SD Card Installed and Not Mounted
ERR	OFF	CPU is functioning normally
	Red	CPU Fatal Hardware Error or Software Watchdog Error

CPU Mode Switch

RUN	CPU is forced into RUN Mode if no errors are encountered.
TERM	RUN, PROGRAM and DEBUG modes are available. In this position, the mode of operation can be changed through the Do-more! Designer Software.
STOP	CPU is forced into STOP Mode.

RUN
TERM
STOP

microSD Specifications

Port Name	microSD Card Slot			
Description	Standard microSD socket for data logging or file read/write			
Maximum Card Capacity	32GB			
Transfer Rate (ADATA microSDHC Class 4 memory card)	Mbps	Minimum	Typical	Maximum
	Read	14.3	14.4	14.6
	Write	4.8	4.9	5.1
Port Status LED	Green LED is illuminated when card is inserted/detected			
Optional microSD Card	ADC Part # MICSD-16G			

Pin	SD
1	DAT2
2	CD/DAT3
3	CMD
4	VDD
5	CLK
6	VSS
7	DAT0
8	DAT1

AC Power Supply Specifications

Nominal Voltage Rating	120–240 VAC
Input Voltage Range (Tolerance)	85–264 VAC
Rated Operating Frequency	47–63 Hz
Maximum Input Power	40VA
Cold Start Inrush Current	1.5A, 2ms
Maximum Inrush Current (Hot Start)	1.5A, 2ms
Internal Input Fuse Protection	Micro fuse 250V, 2A Non-replaceable
Isolated User 24VDC Output	24VDC @ 0.3 A max, <1V P-P Ripple, Integrated self-resetting short circuit protection
Voltage Withstand (dielectric)	1500VAC Power Inputs to Ground applied for 1 minute 1500VAC Ground to 24VDC applied for 1 minute

DC Power Supply Specifications

Nominal Voltage Rating	12–24 VDC
Input Voltage Range (Tolerance)	10-36 VDC
Maximum Input Voltage Ripple	<± 10%
Maximum Input Power	30W (14W for BX 10/10E MPUs)
Cold Start Inrush Current	5A, 2ms
Maximum Inrush Current (Hot Start)	5A, 2ms
Internal Input Protection	Reverse Polarity Protection and Undervoltage
Voltage Withstand (dielectric)	1500VAC Power Inputs to Ground applied for 1 minute

BX ME MPUs

Overview

The BX ME Micro PLC Unit (MPU) includes two different versions. Both have the same appearance and basic features, the only difference being that one unit is externally powered with 12–24 VDC and the other unit is externally powered with 120–240 VAC.

The units have no built-in I/O points. This allows you to customize the I/O to meet the needs of your application by adding selected BRX expansion modules. All BX ME MPUs can extend their capability with the addition of as many as eight (8) BRX expansion modules, allowing more flexibility while keeping control cost down.

Features

- Serial port - RS232/485 communications
- RJ45 port - Ethernet communications
- MicroSD slot
- Pluggable Option Module (POM) for an additional communications port
- Support for 8 additional expansion modules

Power Supply Connector

The power supply terminal block connectors are included with this MPU. The power supply connectors are a screw type, removable terminal block.
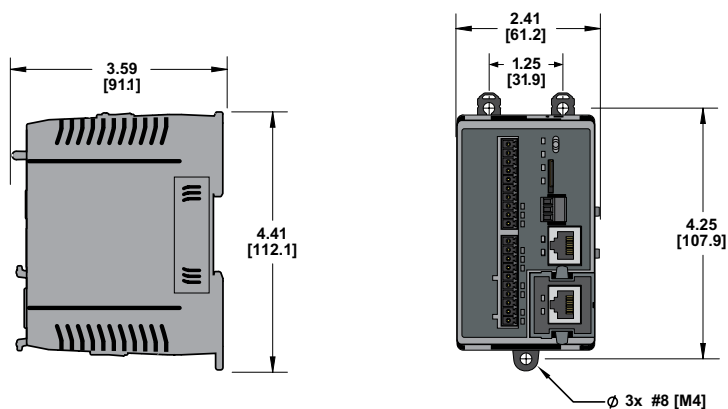

BX-DM1E-M Micro PLC Unit (MPU)
120–240 VAC

BX-DM1E-M-D Micro PLC Unit (MPU)
12–24 VDC

BX ME MPUs							
Part Number	Price	External Power	Discrete Input	Discrete Output	Analog Input	Analog Output	Expansion Modules
BX-DM1E-M		120–240 VAC	N/A	N/A	N/A	N/A	8
BX-DM1E-M-D		12–24 VDC	N/A	N/A	N/A	N/A	8

Built-in Ethernet Specifications (BX-DM1E-M-D Only)	
Port Name	ETHERNET
Description	Standard transformer isolated Ethernet port with built-in surge protection.
Transfer Rate	10 Mbps (Yellow LED) and 100 Mbps (Green LED)
Port Status LED	LED is solid when network LINK is established. LED flashes when port is active (ACT).
Supported Protocols	
	Port:
Do-more! Protocol	28784, UDP
Modbus TCP	502, TCP
TCP/IP	User-defined, TCP
Custom Protocol	User-defined
SNTP (Time Server)	123, TCP
SMTP (Email)	25, TCP
MQTT	1883, TCP
MQTTS	8883, TCP
HTTP	80, TCP
HTTPS	443, TCP
FTP (Client)	21, TCP
EtherNet/IP: Explicit (Client, Server), Implicit (Server)	44818, TCP
DHCP	67,68, UCP
Ethernet Remote I/O	28784, UDP
programming and monitoring	
Cable Recommendation	C5E-STxxx-xx from AutomationDirect.com
Port Type	RJ45, Category 5, 10/100 BASE-T, Auto Crossover

BX ME MPUs

Dimensions, inches[mm]

3.59
[91.1]

4.41
[112.1]

2.41
[61.2]

1.25
[31.9]

4.25
[107.9]

∅ 3x #8 [M4]

Clearances and Mounting Restrictions

2" (50mm)
Minimum from
Enclosure

2" (50mm)
Minimum
from Wire Duct

2" (50mm) Minimum
from Enclosure

2" (50mm) Minimum
from Enclosure

2" (50mm)
Minimum from
Enclosure

2" (50mm)
Minimum
from Wire Duct

OK

AIRFLOW
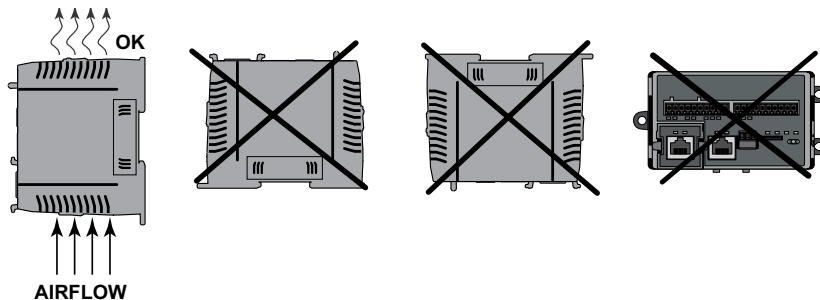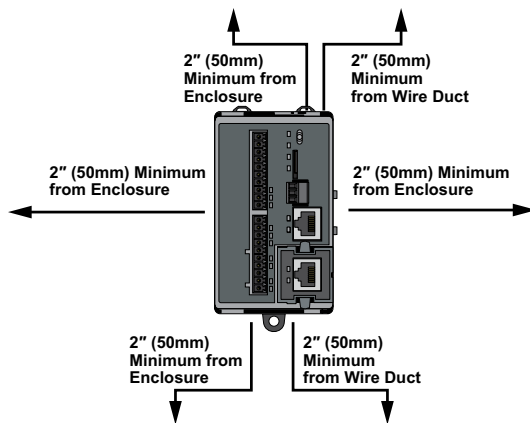
BX ME MPUs Accessories

Replacement Terminal Block Connectors

A 5mm removable screw type 90-degree terminal block is included with each BX ME unit. The power connector

replacement connector specifications are listed in the 2 charts below. Also listed in the tables are an optional spring

clamp terminal block and a screw type 180-degree terminal block that can also be used and are sold separately.

BX-DM1E-M AC Power Supply Connector Specifications			
Part Number	BX-RTB05 (included with unit)	BX-RTB05-1	BX-RTB05-2
Price (each)			
Connector Type	Screw Type-90 deg	Spring Clamp Type-180 deg	Screw Type-180 deg
Wire Exit	180 deg	180 deg	180 deg
Pitch	5.0 mm	5.0 mm	5.0 mm
Screw Size	M2.5	N/A	M2.5
Recommended Screw Torque	< 3.98 lb·in (0.45 N·m)	N/A	< 3.98 lb·in (0.45 N·m)
Screwdriver Blade Width	3.5 mm	3.5 mm	3.5 mm
Wire Gauge (Single wire)	28–12 AWG	28–14 AWG	28–14 AWG
Wire Gauge (Two wire)	28–16 AWG	28–16 AWG (Dual Wire Ferrule Required)	28–16 AWG (Dual Wire Ferrule Required)
Wire Strip Length	0.3 in (7.5 mm)	0.37 in (9.5 mm)	0.37 in (9.5 mm)
Equiv. Dinkle P/N	5ESDV-05P-BK	5ESDSR-05P-BK	5ESDSR-05P-BK

BX-RTB05   BX-RTB05-1   BX-RTB05-2

BX-DM1E-M-D DC Power Supply Connector Specifications			
Part Number	BX-RTB03	BX-RTB03-1	BX-RTB03-2
Price (each)			
Connector Type	Screw Type-90 deg	Spring Clamp Type-180 deg	Screw Type-180 deg
Wire Exit	180 deg	180 deg	180 deg
Pitch	5.0 mm	5.0 mm	5.0 mm
Screw Size	M2.5	N/A	M2.5
Recommended Screw Torque	< 3.98 lb·in (0.45 N·m)	N/A	< 3.98 lb·in (0.45 N·m)
Screwdriver Blade Width	3.5 mm	3.5 mm	3.5 mm
Wire Gauge (Single wire)	28–12 AWG	28–14 AWG	28–12 AWG
Wire Gauge (Two wire)	28–16 AWG	28–16 AWG (Dual Wire Ferrule Required)	28–16 AWG
Wire Strip Length	0.3 in (7.5 mm)	0.37 in (9.5 mm)	0.3 in (7.5 mm)
Equiv. Dinkle P/N	5ESDV-03P-BK	5ESDSR-03P-BK	5ESDF-03P

BX-RTB03   BX-RTB03-1   BX-RTB03-2

BRX Pluggable Option Modules (POM)

Overview

All BRX Do-more! MPUs have an available slot to receive one BRX Pluggable Option Module (POM). Available POM configurations are:

- RS-232 3-pin serial port
- RS-232 5-pin serial port
- RS-232 RJ12 port
- RS-422 5-pin serial port
- RS-485 serial port
- Ethernet port (RJ45)
- USB Type B Port

POM modules are hot swappable giving you the ability to utilize different communication options while the system is running. For example, you can configure the system using a POM RJ45 Ethernet port to talk with a C-more panel. Then hot swap to the USB POM for programming. When programming is complete hot swap back to the RJ45 Ethernet POM without needing to power cycle or reconfigure the system.

NOTE: Pluggable Option Modules cannot be installed in BRX Remote I/O modules (e.g., BX-DMIO, BX-MBIO, BX-EBC100).

BX-P-SER2-TERM
RS-232 Port
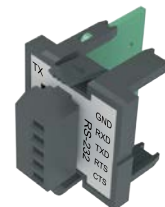
BX-P-SER2-TERMFC
RS-232 Port
w/ Flow Control

BX-P-SER4-TERM
RS-485 Port

BX-P-SER422-TERM
RS-422 Port

BX-P-SER2-RJ12
RS-232 Port (RJ12)

BX-P-ECOMLT
Ethernet Port (RJ45)

BX-P-ECOMEX
Ethernet Port

BX-P-USB-B
USB Type B Port

BRX Programmable Option Modules

Expansion Module Part No.	Price	Description
BX-P-SER2-TERM		Non-isolated Serial port for communication via RS-232. Includes ESD protection and built-in surge protection.
BX-P-SER2-TERMFC		Non-isolated Serial port for communication via RS-232, with flow control. Includes ESD protection and built-in surge protection.
BX-P-SER4-TERM		Non-isolated Serial port for communication via RS-485. Includes ESD protection and built-in surge protection.
BX-P-SER422-TERM		Non-isolated Serial port that can communicate via RS-422. Includes ESD protection and built-in surge protection.
BX-P-SER2-RJ12		Non-isolated Serial port for communication via RS-232 Includes ESD protection and built-in surge protection.
BX-P-ECOMLT		Standard transformer isolated Ethernet port (1 Mbps throughput max) with built-in surge protection.
BX-P-ECOMEX		General-purpose standard transformer isolated Ethernet port (10/100 Mbps) with built-in surge protection.
BX-P-USB-B		USB Type B Port for programming.

General Specifications

General specifications common to all the POM modules are listed in the table below.

General Specifications

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 85°C (-4° to 185°F)
Humidity	5% to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Enclosure Type	Open equipment
Agency Approvals	UL 61010-2 - UL File # E185989 Canada and USA CE Compliant E185989*
Noise Immunity	NEMA ICS3-304
EU Directive	See the "EU Directive" in Appendix B of the User Manual or topic DMD0331 in the Help File.
Weight	7g (0.25 oz)

*Meets EMC and Safety requirements. See the D.O.C. for details.

BRX POM Capabilities

	BX-P-SER2-TERM	BX-P-SER2-TERMFC	BX-P-SER4-TERM	BX-P-SER422-TERM	BX-P-SER2-RJ12	BX-P-ECOMLT*	BX-P-ECOMEX	BX-P-USB-B
Monitoring & Programming	X	X	X	X	X	X	X	X
Do-more! Protocol	X	X	X	X	X	X	X	
Modbus RTU Master	X	X	X	X	X		X	
Modbus RTU Slave	X	X	X	X	X		X	
Modbus TCP (Server)						X	X	
HTTP							X	
MQTT Client							X	
FTP							X	
EtherNet/IP							X	
K-Sequence (Slave)	X	X	X	X	X	X	X	
ASCII (In & Out)	X	X	X	X	X		X	
Custom Protocols	X	X	X	X			X	

* Limited to 1 Mbps throughput max

BRX Programming Software & Cable Assembly

Do-more! Designer Programming Software

Free Download
Part No. DM-PGMSW
Part No. DM-PGMSW-USB

Do-more! Designer Programming software is a full-featured programming software for all BRX Series PLCs, Do-more! H2 Series PLCs and Do-more! T1H Series PLCs. Do-more! Designer Software is free. It can be downloaded from Automationdirect.com, or can be purchased on CD-ROM or USB.

FREE

BX-PGM-CBL

The programming cable assembly connects your PC to any BRX MPU and enables you to program and configure the BRX MPU using the free Do-more! Designer software. BX-PGM-CBL includes (1) BX-P-USB-B USB POM module and (1) USB-CBL-AB6 standard USB Type A to USB Type B connector cable.

Filler Module

BRX - Programmable Controller   tBRX-198

BRX Accessories

Replacement Battery

D0-MC-BAT

A battery is included with all BRX MPUs and is used to retain the time and data along with any tagnames values that are set up as retentive. It is recommended that the battery be replaced once every five years or when one year of cumulative OFF time has been exceeded.

Battery	
D0-MC-BAT	Coin type, 3.0V Lithium battery, number CR2032

BRX Blank Custom Slot Labels

BX-LBL-1

BRX Blank custom slot labels, package of 10. For use with 18-point and 36-point BRX PLCs. (10) labels and (1) custom label slot cover included.

BRX Access Cover Kit

BX-ACC-1

BRX Access cover kit, replacement. For use with all BRX PLCs. Includes (1) battery cover, (1) expansion slot cover, (1) blank POM slot insert and (1) custom label slot.