

# BX 10/10E MPUs

## BX-DM1-10ED1-D \$314.00

### BRX MPU with Do-more! DM1 technology

- 24VDC required; serial port; microSD slot
- Discrete input: 6-point, sink/source
- Discrete output: 4-point, sinking

### CPU Specifications

<b>Program Memory Type</b>	FLASH memory
<b>User Data Memory Type</b>	Battery-backed RAM, user configurable
<b>Serial Port</b>	RS-232/485 3-Pin, Software selectable
<b>Pluggable Option Module</b>	RS-232, RS-485, Ethernet 10/100 BASE-T (1 Mbps throughput max), USB 2.0 Type B
<b>Data Logging/File Management</b>	microSD card slot (32G max)
<b>Expansion Modules</b>	8 max, as long as the MPU power budget is not exceeded
<b>Real Time Clock Accuracy</b>	±2.6 s per day typical at 25°C ±8s per day max at 60°C
<b>Programming Software</b>	Do-more! Designer – Ver. 2.0 or higher
<b>Programming Cable Options</b>	<a href="#">BX-PGM-CBL</a>
<b>MPU Weight</b>	169g [6oz]

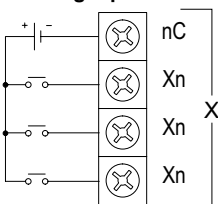
### Discrete Input Specifications

<b>Input Type</b>	Sink/Source
<b>Total Inputs per Module</b>	6 High Speed (All Inputs may be used as standard Inputs)
<b>Commons</b>	2 (3 points/common) Isolated
<b>Nominal Voltage Rating</b>	12–24 VAC/DC
<b>Input Voltage Range</b>	9–30 VAC/DC
<b>Maximum Voltage</b>	30 VAC/DC
<b>DC Frequency</b>	0–250kHz - High Speed
<b>Minimum Pulse Width</b>	0.5 µs - High Speed
<b>AC Frequency</b>	47–63 Hz (60–240Hz filter must be set in software for AC operation)
<b>Input Impedance</b>	3kΩ @ 24VDC
<b>Input Current (typical)</b>	6mA @ 24 VAC/DC
<b>Maximum Input Current</b>	12mA @ 30 VAC/DC
<b>Minimum ON Current</b>	5.0 mA (9V required to guarantee ON state)
<b>Maximum OFF Current</b>	2.0 mA
<b>ON Voltage Level</b>	> 9.0 VAC/VDC
<b>OFF Voltage Level</b>	< 2.0 VAC/VDC
<b>Status Indicators</b>	Logic Side, Green

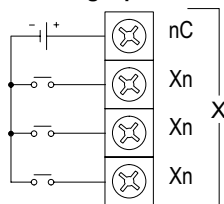
### I/O Wiring

#### Discrete Input Wiring

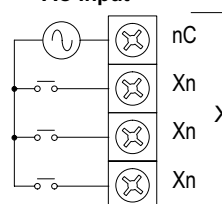
##### Sinking Input



##### Sourcing Input

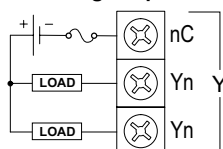


##### AC Input

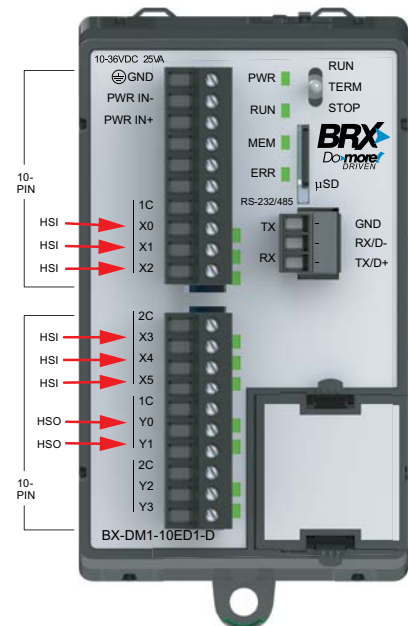
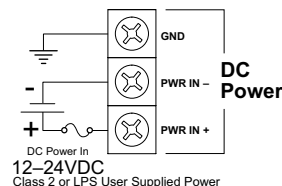


#### Discrete Output Wiring

##### Sinking Output



#### Supply Power Wiring



**I/O Terminal Blocks sold separately.**  
(See Removable Terminal Block Specifications Table on BX 10/10E MPU Accessories page.)

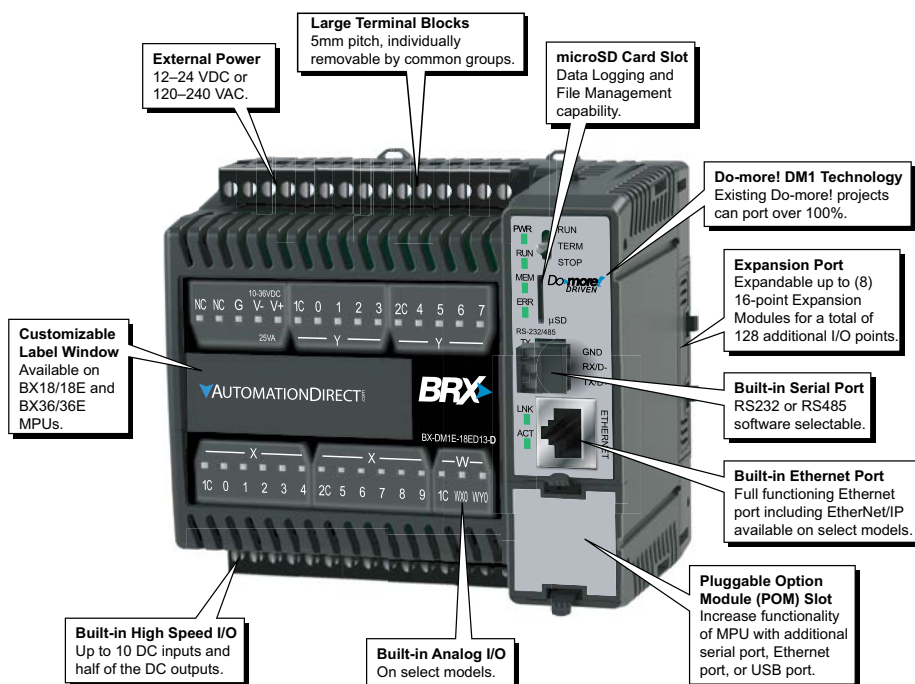
Discrete Output Specifications	
<b>Output Type</b>	Sinking
<b>Total Outputs per Module</b>	4 Total – 2 High Speed (Y0...Y1)* 2 Standard (Y2...Y3) *All outputs may be used as standard outputs
<b>Commons</b>	2 (2 points/common) Isolated
<b>Maximum Current per Common</b>	1A
<b>Nominal Voltage Rating</b>	12–24 VDC
<b>Operating Voltage Range</b>	5–36 VDC
<b>Maximum Voltage</b>	36VDC
<b>Minimum Output Current</b>	0.1 mA @ 24VDC
<b>Maximum Output Current</b>	0.5 A per output, no derating over temperature range
<b>Maximum Leakage Current</b>	10µA
<b>Maximum Switching Frequency</b>	1m cable 250kHz
	10m cable 100kHz
<b>Status Indicators</b>	Logic Side, Green

# 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.



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

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

Removable connector included.



Pinout	RS232	RS485
1	GND	GND
2	RXD	D-
3	TXD	D+

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

## CPU Status Indicators

Indicator	Status	Description
<b>PWR</b>	OFF	Base Power OFF
	Green	Base Power ON
	Yellow	Low Battery
<b>RUN</b>	OFF	CPU is in STOP Mode
	Green	CPU is in RUN Mode
	Yellow	Forces are Active
<b>MEM</b>	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
<b>ERR</b>	OFF	CPU is functioning normally
	Red	CPU Fatal Hardware Error or Software Watchdog Error

## CPU Mode Switch

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



## 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

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

## DC Power Supply Specifications

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

# BX 10 MPUs

## 10 Discrete I/O Points: 6 Inputs, 4 Outputs

### Features

- All units are externally powered by a nominal 12–24 VDC
- Models with DC inputs have:
  - 6 high speed inputs up to 250kHz
  - can accept 12–24 nominal voltages AC or DC
  - can be wired as sinking or sourcing
- Models with AC inputs can accept 120–240 nominal voltages
- Output types available are DC sinking, DC sourcing, and relay
- Models with DC outputs have 2 high speed outputs up to 250kHz
- Support for up to 8 additional Expansion Modules as long as the power budget is not exceeded.
- Onboard RS-232/485 port with removable 3-Pin connector
- microSD card slot

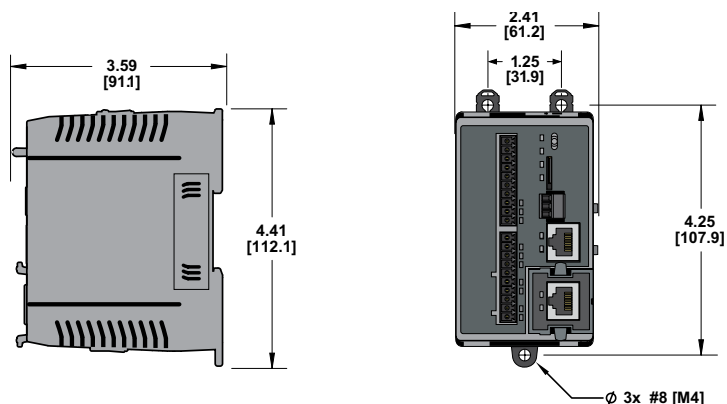


**BX 10 Micro PLC Unit (MPU)**  
(No Built-in Analog or Ethernet port)

BX 10 MPUs					
Part Number	Price	External Power	Discrete Input	Discrete Output	Expansion Modules
<a href="#"><u>BX-DM1-10ED1-D</u></a>	\$314.00	12–24 VDC	6 High-Speed, Sinking or Sourcing	2 High-Speed 2 Standard DC Sinking	8, as long as the MPU power budget is not exceeded
<a href="#"><u>BX-DM1-10ED2-D</u></a>	\$314.00			2 High-Speed 2 Standard DC Sourcing	
<a href="#"><u>BX-DM1-10ER-D</u></a>	\$307.00			4 Form A Relay	
<a href="#"><u>BX-DM1-10AR-D</u></a>	\$199.00		6 Standard AC		

# BX 10/10E MPU<sub>s</sub>

## Dimensions, inches[mm]



## Clearances and Mounting Restrictions



# BX 10/10E MPUs Accessories

## BX 10/10E MPU Wiring Termination Selection

The BX 10/10E MPUs ship without wiring terminals. This enables you to select the termination solution that best fits your

application. Several wiring options are available, including removable screw terminal connectors,

removable spring clamp terminal connectors and prewired **ZIPLink** cable solutions.

## Terminal Block Connectors

The terminal block connectors are provided in kits and can be easily ordered as a single part number to receive all the terminal block connectors needed. Each

kit for the BX 10/10E MPU comes with two (2) 10-pin 3.8 mm terminal blocks. On the BX 10/10E MPUs the terminals are organized into groups consisting of

3 inputs with an isolated common and 2 outputs with an isolated common. For example, inputs X0-X2 are in a group with their common terminal.

### BX-RTB10 Screw Terminal Block Kit

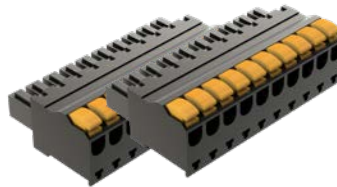
This terminal block kit includes 2 10-pin 3.8 mm terminal blocks (BX-RTB10). These are 90-degree screw terminal blocks. Wire is 180-degree pass through.



**BX-RTB10**

### BX-RTB10-1 Screw Terminal Block Kit

This terminal block kit includes 2 10-pin 3.8 mm terminal blocks (BX-RTB10-1). These are 90-degree screw terminal blocks. Wire is 180-degree pass through.



**BX-RTB10-1**

### BX-RTB10-2 Screw Terminal Block Kit

This terminal block kit includes (2) 10-pin 3.8 mm terminal blocks (BX-RTB10-2). These are 180-degree screw terminal blocks. Wire is 180-degree pass through.



**BX-RTB10-2**

## Removable Terminal Block Specifications

Part Number	<b>BX-RTB10</b>	<b>BX-RTB10-1</b>	<b>BX-RTB10-2</b>
<b>Price (pkg)</b>	\$21.50	\$24.00	\$27.00
<b>Connector Type</b>	Screw Type-90-degree	Spring Clamp Type-180-degree	Screw Type-180-degree
<b>Wire Exit</b>	180-degree	180-degree	180-degree
<b>Pitch</b>	3.81 mm	3.81 mm	3.81 mm
<b>Screw Size</b>	M2	N/A	M2
<b>Recommended Screw Torque</b>	<1.77 lb·in [0.2 N·m]	N/A	<1.77 lb·in [0.2 N·m]
<b>Screwdriver Blade Width</b>	2.5 mm	2.5 mm	2.5 mm
<b>Wire Gauge (Single Wire)</b>	28–16 AWG	28–18 AWG	30–16 AWG
<b>Wire Gauge (Dual Wire)</b>	28–16 AWG	30–20 AWG (Dual Wire Ferrule Required)	30–18 AWG
<b>Wire Strip Length</b>	0.24 in [6mm]	0.35 in [9mm]	0.26 in [6.5 mm]
<b>Equiv. Dinkle part #</b>	EC381V-10P-BK	ESC381V-10-BK	EC381F-10P-BK



# Wiring Solutions

## ZIPLink Pre-Wired Cable Solutions

**ZIPLink**s eliminate the normally tedious process of wiring between devices by utilizing prewired cables and DIN-rail mount connector modules. It's as simple as plugging in a cable connector at either end or terminating wires at only one end. Prewired cables keep installation clean and efficient, using less space at a fraction of the cost of standard terminal blocks. **ZIPLink** prewired cables can connect

directly to a **ZIPLink** remote terminal block module, or with the pigtail option they can allow for a convenient solution to wire the BRX platform to third-party devices. For the BX 10/10E MPUs, one cable and one feedthrough module is needed to connect to all the onboard wiring termination points.

Two feedthrough module options are available, the [ZL-RTB20](#) and the [ZL-RTB20-1](#). The [ZL-RTB20](#) is a standard feedthrough terminal module and the [ZL-RTB20-1](#) is a compact feedthrough terminal block module having a compact footprint taking up less space in the control cabinet.

BX 10/10E ZIPLink Selector				
MPU Part Number	Component Type	Module Part Number	Cable Part Number*	Max Quantity Needed
<a href="#">BX-DM1-10ED1-D</a>	Feedthrough	<a href="#">ZL-RTB20</a> (Standard) OR <a href="#">ZL-RTB20-1</a> (Compact)	<a href="#">ZL-BX-CBL20</a> <a href="#">ZL-BX-CBL20-1</a> <a href="#">ZL-BX-CBL20-2</a>	1
<a href="#">BX-DM1-10ED2-D</a>				
<a href="#">BX-DM1-10ER-D**</a>				
<a href="#">BX-DM1-10AR-D**</a>				
<a href="#">BX-DM1E-10ED13-D</a>				
<a href="#">BX-DM1E-10ED23-D</a>				
<a href="#">BX-DM1E-10ER3-D**</a>				
<a href="#">BX-DM1E-10AR3-D**</a>				

\* Select the cable length: Blank = 0.5 m, -1 = 1.0 m, -2 = 2.0 m.

Available pigtail cables: [ZL-BX-CBL20-1P](#) = 1.0 m, [ZL-BX-CBL20-2P](#) = 2.0 m.

\*\* The relay outputs are derated not to exceed 2A per common when used with the **ZIPLink** wiring system.





# Wiring Solutions

## ZIPLink Pre-wired Cables

Custom molded **ZIPLink** prewired cables allow for fast and easy connection of field wiring to the BRX platform. The prewired

cable is 0.5 meter in length. Pigtail cables are used to connect the BRX platform directly to third-party devices, reducing

your wiring time and cost. The pigtail cable is 1 meter in length.



Pre-wired ZIPLink Cable



ZIPLink Pigtail Cable

## ZIPLink Remote Feedthrough Modules

Remote feedthrough modules provide low-cost and compact field wiring screw termination solutions for quickly connecting with the BRX platform. Two

(2) modules are available for use with the BRX platform, the **ZL-RTB20** and the **ZL-RTB20-1**. The **ZL-RTB20** is a standard 2-row, 20-pin, DIN-rail mountable

feedthrough module. The **ZL-RTB20-1** is a compact 3-row, 24-pin, DIN-rail mountable feedthrough module with a smaller footprint design.

ZIPLink Module Specifications		
Part Number	<b>ZL-RTB20</b> (Maximum of 4 needed)	<b>ZL-RTB20-1</b> (Maximum of 4 needed)
Number of positions	20 screw terminals, 2 rows	24 screw terminals, 3 rows
Screwdriver Width	1/8 in [3.8 mm] maximum	
Screw Torque	4.4 lb·in [0.5 N·m]	4.4 lb·in [0.5 N·m]



**ZL-RTB20**



**ZL-RTB20-1**



# 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
<b><u>BX-P-SER2-TERM</u></b>	\$76.00	Non-isolated Serial port for communication via RS-232. Includes ESD protection and built-in surge protection.
<b><u>BX-P-SER2-TERMFC</u></b>	\$79.00	Non-isolated Serial port for communication via RS-232, with flow control. Includes ESD protection and built-in surge protection.
<b><u>BX-P-SER4-TERM</u></b>	\$77.00	Non-isolated Serial port for communication via RS-485. Includes ESD protection and built-in surge protection.
<b><u>BX-P-SER422-TERM</u></b>	\$79.00	Non-isolated Serial port that can communicate via RS-422. Includes ESD protection and built-in surge protection.
<b><u>BX-P-SER2-RJ12</u></b>	\$76.00	Non-isolated Serial port for communication via RS-232. Includes ESD protection and built-in surge protection.
<b><u>BX-P-ECOMLT</u></b>	\$99.00	Standard transformer isolated Ethernet port (1 Mbps throughput max) with built-in surge protection.
<b><u>BX-P-ECOMEX</u></b>	\$119.00	General-purpose standard transformer isolated Ethernet port (10/100 Mbps) with built-in surge protection.
<b><u>BX-P-USB-B</u></b>	\$46.00	USB Type B Port for programming.

## General Specifications

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

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

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

## BRX POM Capabilities

	<b>BX-P-SER2-TERM</b>	<b>BX-P-SER2-TERMFC</b>	<b>BX-P-SER4-TERM</b>	<b>BX-P-SER422-TERM</b>	<b>BX-P-SER2-RJ12</b>	<b>BX-P-ECOMLT*</b>	<b>BX-P-ECOMEX</b>	<b>BX-P-USB-B</b>
<b>Monitoring &amp; Programming</b>	X	X	X	X	X	X	X	X
<b>Do-more! Protocol</b>	X	X	X	X	X	X	X	
<b>Modbus RTU Master</b>	X	X	X	X	X		X	
<b>Modbus RTU Slave</b>	X	X	X	X	X		X	
<b>Modbus TCP (Server)</b>						X	X	
<b>HTTP</b>							X	
<b>MQTT Client</b>							X	
<b>FTP</b>							X	
<b>EtherNet/IP</b>							X	
<b>Embedded Web Server: HTTP (Unsecure)</b>							X	
<b>K-Sequence (Slave)</b>	X	X	X	X	X	X	X	
<b>ASCII (In &amp; Out)</b>	X	X	X	X	X		X	
<b>Custom Protocols</b>	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-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](http://Automationdirect.com), or can be purchased on CD-ROM or USB.

FREE  
\$13.00



### [BX-PGM-CBL](#) \$49.00

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.



# BRX Accessories

## Replacement Battery

### D0-MC-BAT     \$3.00

A battery is included with all BRX MPUs and is used to retain the time and data along with any tag names 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	
<u><b>D0-MC-BAT</b></u>	Coin type, 3.0V Lithium battery, number CR2032

## BRX Blank Custom Slot Labels

### BX-LBL-1     \$36.50

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     \$11.00

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.

