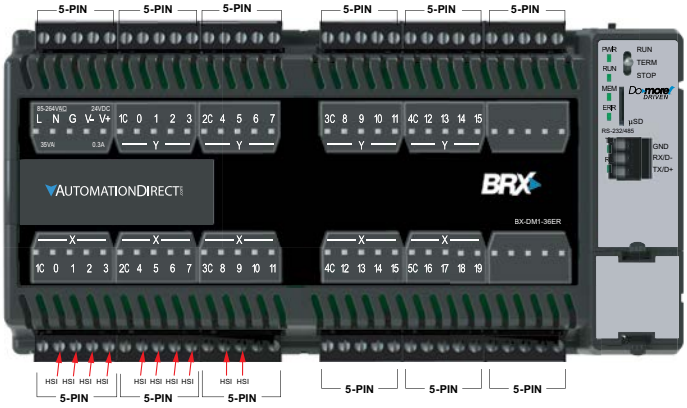
BX 36/36E MPUs

BX-DM1-36ER $012a1:

BRX MPU with Do-more! DM1 technology

- 120VAC required; serial port; microSD slot
- Discrete input: 20-point, sink/source
- Discrete output: 16-point, relay



I/O Terminal Blocks sold separately.
(See Removable Terminal Block Specifications Table on BX 36/36E MPU Accessories page.)

CPU Specifications	
Program Memory Type	FLASH memory
User Data Memory Type	Battery-backed RAM, user configurable
Serial Port	RS-232/485 3-Pin, 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 max, as long as the MPU power budget is not exceeded
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
Custom Label Window Size	0.75" x 2.25" [19mm x 57.2 mm]
MPU Weight	488g [17.2 oz]

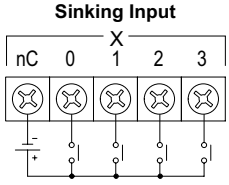
Discrete Input Specifications	
Input Type	Sink/Source
Total Inputs per Module	20 Total – 10 High Speed (X0...X9)* 10 Standard (X10...X19) *All inputs may be used as standard inputs
Commons	5 (4 points/common) Isolated
Nominal Voltage Rating	12–24 VAC/DC
Input Voltage Range	9–30 VAC/DC
Maximum Voltage	30 VAC/DC
DC Frequency	0–250kHz - High Speed
Minimum Pulse Width	0.5 µs - High Speed
AC Frequency	47–63 Hz (60–240Hz filter must be set in software for AC operation)
Input Impedance	3kΩ @ 24VDC
Input Current (typical)	6mA @ 24 VAC/DC
Maximum Input Current	12mA @ 30 VAC/DC
Maximum OFF Current	2.0 mA
ON Voltage Level	> 9.0 VAC/VDC
OFF Voltage Level	< 2.0 VAC/VDC
Status Indicators	Logic Side, Green

Discrete Output Specifications	
Output Type	Relay Form A (SPST)
Total Outputs per Module	16 Relay
Commons	4 (4 points/common) Isolated
Maximum current per common	8A
Nominal Voltage Ratings	12–48 VDC, 24–240 VAC
Operating Voltage Range	5–60 VDC, 5–264 VAC
Maximum Voltage	60VDC, 264VAC
Minimum Output Current	0.1 mA @ 24VAC/DC
Maximum Output Current	2A
Maximum Leakage Current	1uA (DC) 300uA (AC) due to RC Snubber Circuit
Maximum Switching Frequency	10Hz
Status Indicators	Logic Side, Green

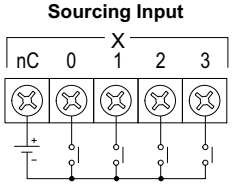
I/O Wiring

Discrete Input Wiring

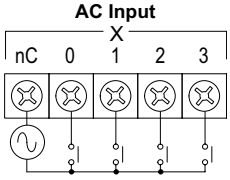
Sinking Input



Sourcing Input

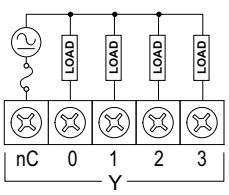


AC Input

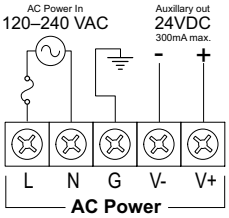


Discrete Output Wiring

Relay Output

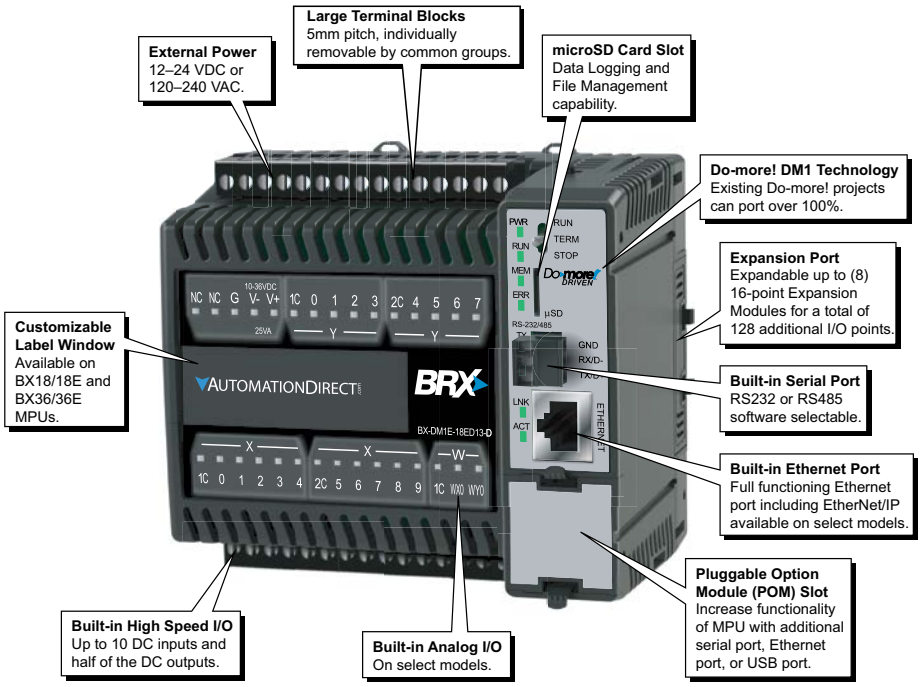


Supply Power Wiring



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	
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.**

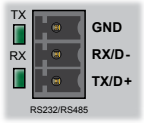
2 Year Warranty
All BRX PLCs are covered under a 2- year warranty.

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+

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.

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

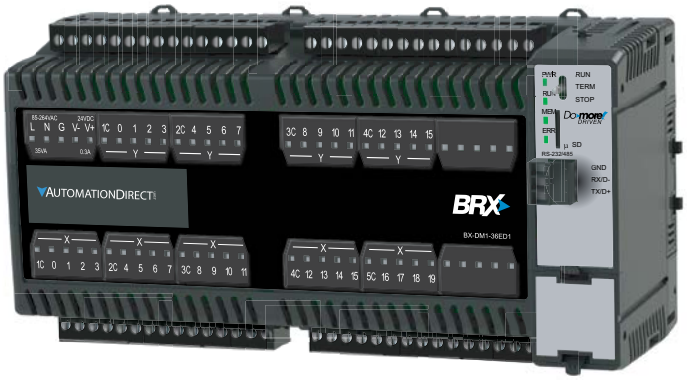
Nominal Voltage Rating	12–24 VDC
Input Voltage Range (Tolerance)	10-36 VDC
Maximum Input Voltage Ripple	<± 10%
Maximum Input Power	30W (14W for BX 10/10E MPUs)
Cold Start Inrush Current	5A, 2ms
Maximum Inrush Current (Hot Start)	5A, 2ms
Internal Input Protection	Reverse Polarity Protection and Undervoltage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

BX 36 MPUs

36 Discrete I/O Points: 20 Inputs, 16 Outputs

Features

- Models with DC inputs:
  - have 10 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 8 high-speed outputs rated 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



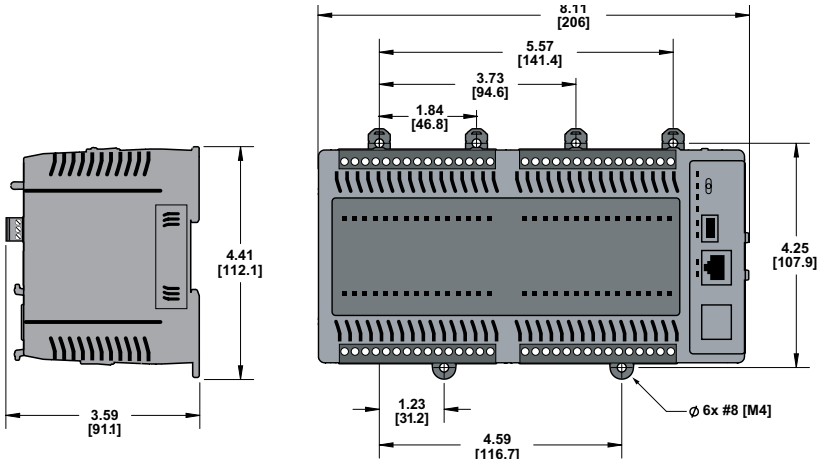
BX 36 Micro PLC Unit (MPU)

(No Built-in Analog or Ethernet port)

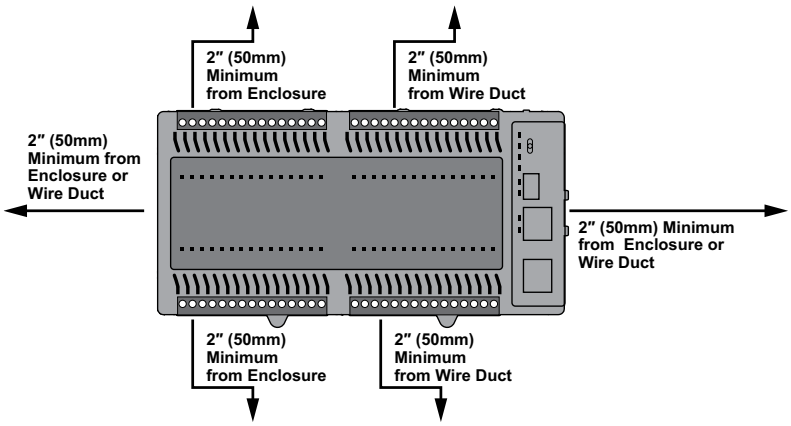
BX 36 MPUs					
Part Number	***Price***	***External Power***	***Discrete Input***	***Discrete Output***	***Expansion Modules***
BX-DM1-36ED1	$;0129,:	120–240 VAC	10 High-speed 10 Standard DC Sinking or Sourcing	8 High-speed 8 Standard DC Sinking	8, as long as the MPU power budget is not exceeded
BX-DM1-36ED1-D	$012a3:	12–24 VDC			
BX-DM1-36ED2	$012a0:	120–240 VAC		8 High-speed 8 Standard DC Sourcing	
BX-DM1-36ED2-D	$012a4:	12–24 VDC			
BX-DM1-36ER	$012a1:	120–240 VAC		16 Form A Relay	
BX-DM1-36ER-D	$012a5:	12–24 VDC			
BX-DM1-36AR	$012a2:	120–240 VAC	20 AC		

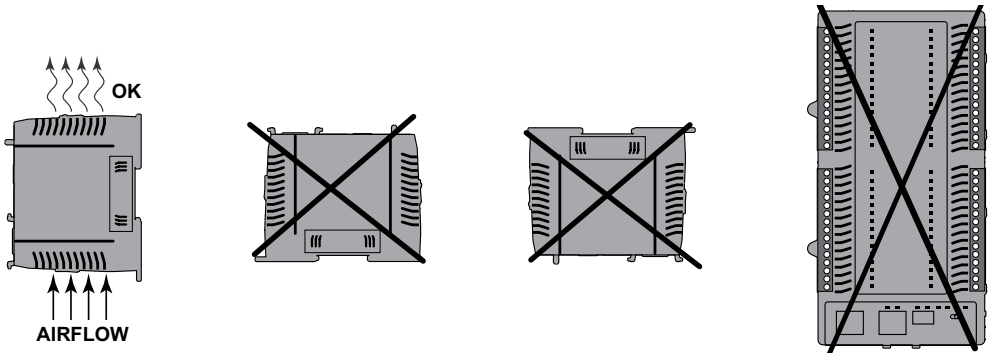
BX 36/36E MPUs

Dimensions, inches[mm]



Clearances and Mounting Restrictions





BX 36/36E MPUs Accessories

BX 36/36E Wiring Termination Selection

The BX 36/36E MPUs ship without wiring terminals. This enables you to select the termination type that best suits your application. Several removable terminal block options are available, including screw terminals, spring clamp terminals, as well as pre-wired ***ZIP***Link module and cable solutions.

Terminal Block Connectors

The terminal block connectors are provided in kits and can be easily ordered as a single part number. Each kit contains all the terminal block connectors required: (12) 5-pin 5mm terminal blocks.

The BX 36/36E MPUs terminals are configured into groups consisting of 4 inputs and 4 outputs each with an isolated common. For example, inputs X0–X3 are grouped with a common terminal. The groups are isolated such that a single 5-pin connector can be removed without affecting another group of I/O or the external power source.

BX-RTB36

BX-RTB36 Screw Terminal Block Kit

This terminal block kit includes (12), 5-pin 5mm, 90-degree screw terminal blocks with 180-degree wire pass through. It fits all BRX 36-point MPUs.

BX-RTB36-1

BX-RTB36-1 Spring Terminal Block Kit

This terminal block kit includes (12) 5-pin, 5mm, 180-degree spring clamp wire terminal blocks. It fits all BRX 36-point MPUs.

Removable Terminal Block Specifications		
Part Number	***BX-RTB36***	***BX-RTB36-1***
Price	$1291:	$1298:
Connector Type	Screw Type-90-degree	Spring Clamp Type-180-degree
Wire Exit	180-degree	180-degree
Pitch	5.0 mm	5.0 mm
Screw Size	M2.5	N/A
Screw Torque	< 3.98 lb·in [0.45 N·m]	N/A
Screwdriver Blade Width	3.5 mm	3.5 mm
Wire Gauge (Single Wire)	28–12 AWG	28–14 AWG
Wire Gauge (Dual Wire)	28–16 AWG	28–16 AWG (Dual wire ferrule required)
Wire Strip Length	0.3 in [7.5 mm]	0.37 in [9.5 mm]
Equiv. Dinkle P/N	5ESDV-05P-BK	5ESDSR-05P-BK

Wiring Solutions

*ZIP*Link Pre-Wired Cable Solutions

ZIPLinks eliminate the normally tedious process of wiring between devices by utilizing prewired cables and DIN-rail mount connector modules. ***ZIP***Links are as simple as plugging in a cable connector at either end or terminating wires at only one end. Pre-wired cables keep installation clean and efficient, using less space at a fraction of the cost of standard terminal blocks. ***ZIP***Links pre-wired cables connect directly from the MPU to a ***ZIP***Links remote terminal block module or with the pigtail cable option, that enables for a convenient solution to wire the BRX platform to third-party devices. For the BX 36/36E MPUs four (4) cables and four (4) ***ZIP***Links feedthrough modules are needed to connect all the onboard wiring termination points.

There are two (2) feed-through module options available, the ZL-RTB20 and the ZL-RTB20-1.

The ZL-RTB20 is a standard feedthrough terminal module while the ZL-RTB20-1 is a feedthrough terminal block having a more compact footprint, requiring less space in the control cabinet.

BX 36/36E *ZIP*Link Selector

MPU Part Number	*Component Type*	*Module Part Number*	*Max Quantity Needed*	*Cable Part Number**	*Max Quantity Needed*
BX-DM1-36ED1	Feedthrough	ZL-RTB20 (Standard) OR ZL-RTB20-1 (Compact)	4	ZL-BX-CBL15 ZL-BX-CBL15-1 ZL-BX-CBL15-2	4
BX-DM1-36ED1-D					
BX-DM1-36ED2					
BX-DM1-36ED2-D					
BX-DM1-36ER*					
BX-DM1-36ER-D*					
BX-DM1-36AR*					
BX-DM1E-36ED13					
BX-DM1E-36ED13-D					
BX-DM1E-36ED23					
BX-DM1E-36ED23-D					
BX-DM1E-36ER3*					
BX-DM1E-36ER3-D*					
BX-DM1E-36AR3*					

*** Select the cable length: Blank = 0.5 m, -1 = 1.0 m, -2 = 2.0 m.**
Available pigtail cables: ZL-BX-CBL15-1P = 1.0 m, ZL-BX-CBL15-2P = 2.0 m.
**** The relay outputs are derated not to exceed 2A per common when used with the *ZIP*Link wiring system.**

Wiring Solutions

*ZIP*Link Pre-wired Cables

Custom molded ***ZIP***Link pre-wired cables allow for fast and easy connection of field wiring to the BRX platform. The prewired cables are available in 0.5 meter, 1 meter and 2 meter lengths. Pigtail cables are used to connect the BRX platform directly to third-party devices, reducing your wiring time and cost. The pigtail cables are available in 1 meter and 2 meter lengths.

Pre-wired *ZIP*Link Cable

***ZIP*Link Pigtail Cable**

*ZIP*Link Feedthrough Modules

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.

***ZIP*Link Module Specifications**		
Part Number	***ZL-RTB20 (Maximum of 4 needed)***	***ZL-RTB20-1 (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]

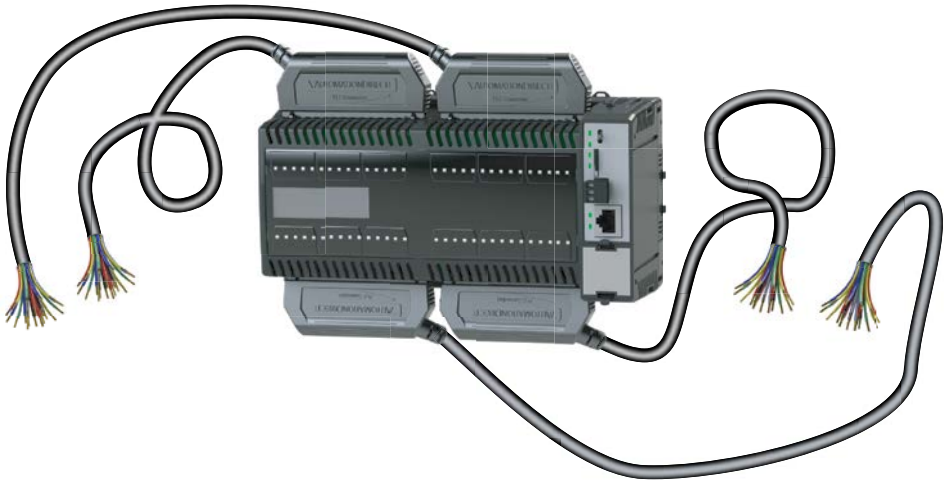
ZL-RTB20

ZL-RTB20-1

*ZIP*Link System Examples

BX 36 MPU with ***ZIP***Link pre-wired cables and ZL-RTB20 feedthrough modules.

BX 36 MPU with ***ZIP***Link pigtail cables installed.



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.

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

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

BRX Programmable Option Modules		
Expansion Module Part No.	***Price***	***Description***
BX-P-SER2-TERM	$12ag:	Non-isolated Serial port for communication via RS-232. Includes ESD protection and built-in surge protection.
BX-P-SER2-TERMFC	$-4gi3:	Non-isolated Serial port for communication via RS-232, with flow control. Includes ESD protection and built-in surge protection.
BX-P-SER4-TERM	$12ah:	Non-isolated Serial port for communication via RS-485. Includes ESD protection and built-in surge protection.
BX-P-SER422-TERM	$-4gi4:	Non-isolated Serial port that can communicate via RS-422. Includes ESD protection and built-in surge protection.
BX-P-SER2-RJ12	$;12af:	Non-isolated Serial port for communication via RS-232 Includes ESD protection and built-in surge protection.
BX-P-ECOMLT	$-012aj:	Standard transformer isolated Ethernet port (1 Mbps throughput max) with built-in surge protection.
BX-P-ECOMEX	$;04t?z:	General-purpose standard transformer isolated Ethernet port (10/100 Mbps) with built-in surge protection.
BX-P-USB-B	$-12ai:	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	
Embedded Web Server: HTTP (Unsecure)							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-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
$1oc9:

BX-PGM-CBL $1288:

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 $;6t8:

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 $1oc7:

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 $1oc8:

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.