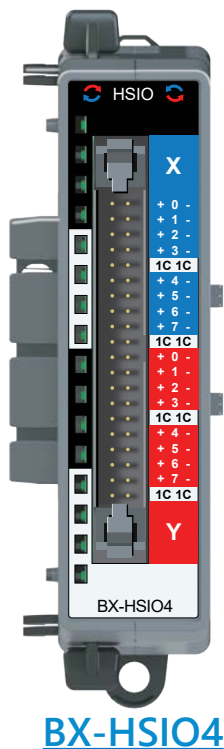# BX-HSIO4 High Speed Input/Output

BX-HSIO4

8-pt Sinking/Sourcing Input,
8-pt Sinking/Sourcing Output

NOTE: This device requires *ZIP*Link Wiring Systems

NOTE: Cannot be used in Remote I/O Bases.

High Speed Input/Output Specifications	
High Speed Input Specifications	
Type	High Speed TTL Differential or Single Ended
Total Input Points per Module	8
Commons	1
Nominal Voltage Range	5VDC
Input Voltage Range	-5.5 to 5.5 VDC
Maximum Voltage	5.5 VDC
DC Frequency	0–2 MHz
Minimum Pulse Width	125ns
Input Impedance	694Ω @ 5VDC
Input Current (typical)	±7mA @ 5VDC
Maximum Input Current	10mA @ 5.5 VDC
ON Voltage Level	> +2.5 VDC differential
OFF Voltage Level	< +1.0 VDC differential
Hysteresis	50mV typical
Status Indicators	Logic Side, Green
OFF to ON Response	<125ns
ON to OFF Response	<125ns
High Speed Output Specifications	
Type	High Speed TTL Differential
Total Output Points per Module	8
Commons	1
Maximum Current per Common	160mA
Power Supply	Internal +5VDC
Maximum Voltage	5.5 VDC
Minimum Output Current	1µA
Maximum Load Current	20mA per Output
Maximum Leakage Current	±20µA
Differential Output Voltage	>3.0 VDC
Status Indicators	Logic Side, Green
OFF to ON Response	<125ns
ON to OFF Response	<125ns
Maximum Switching Frequency	2MHz
Overcurrent, Short Circuit Protection and Short to Ground	Protected
Overcurrent Trip Level	150mA maximum
Fuse Type	User-supplied external fuse
General	
Backplane Power Consumption	2.6 W
Heat Dissipation	3.0 W
Weight	85g (3oz)
Software Version Required	Do-more! Designer v2.8 or later

* Class 2 or LPS Power Supply required.

IMPORTANT! ⚠️

Hot-Swapping Information
Note: This device cannot be Hot Swapped.

BX-HSIO4 High Speed Input/Output, continued

ZIPLink Terminal Block Wiring Connections for BX-HSIO4

Wiring Connections for ZL-RTB40 Terminal Block																					
MODULE	**LABELS**																				**LEVEL**
BX-HSIO4	IN 0-	IN 1-	IN 2-	IN 3-	COM	IN 4-	IN 5-	IN 6-	IN 7-	COM	OUT 0-	OUT 1-	OUT 2-	OUT 3-	COM	OUT 4-	OUT 5-	OUT 6-	OUT 7-	COM	UPPER
	IN 0+	IN 1+	IN 2+	IN 3+	COM	IN 4+	IN 5+	IN 6+	IN 7+	COM	OUT 0+	OUT 1+	OUT 2+	OUT 3+	COM	OUT 4+	OUT 5+	OUT 6+	OUT 7+	COM	LOWER

TERMINAL BLOCK LABEL SHEET FOR ZIPLINK CABLE ZL-BX-CBL-40-xS

Wiring Connections for ZL-RTB40-1 Terminal Block																	
MODULE	**LABELS**																**LEVEL**
BX-HSIO4	COM		COM		COM		COM		COM		COM		COM		COM		UPPER
	IN 0-	IN 1-	IN 2-	IN 3-	IN 4-	IN 5-	IN 6-	IN 7-	OUT 0-	OUT 1-	OUT 2-	OUT 3-	OUT 4-	OUT 5-	OUT 6-	OUT 7-	MIDDLE
	IN 0+	IN 1+	IN 2+	IN 3+	IN 4+	IN 5+	IN 6+	IN 7+	OUT 0+	OUT 1+	OUT 2+	OUT 3+	OUT 4+	OUT 5+	OUT 6+	OUT 7+	LOWER

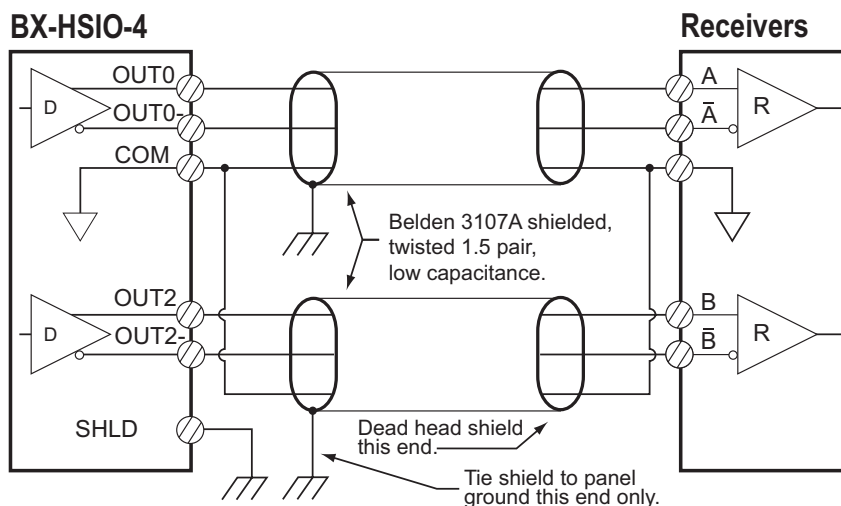TERMINAL BLOCK LABEL SHEET FOR ZIPLINK CABLE ZL-BX-CBL-40-xS

Differential 5V Encoder Input to BX-HSIO4

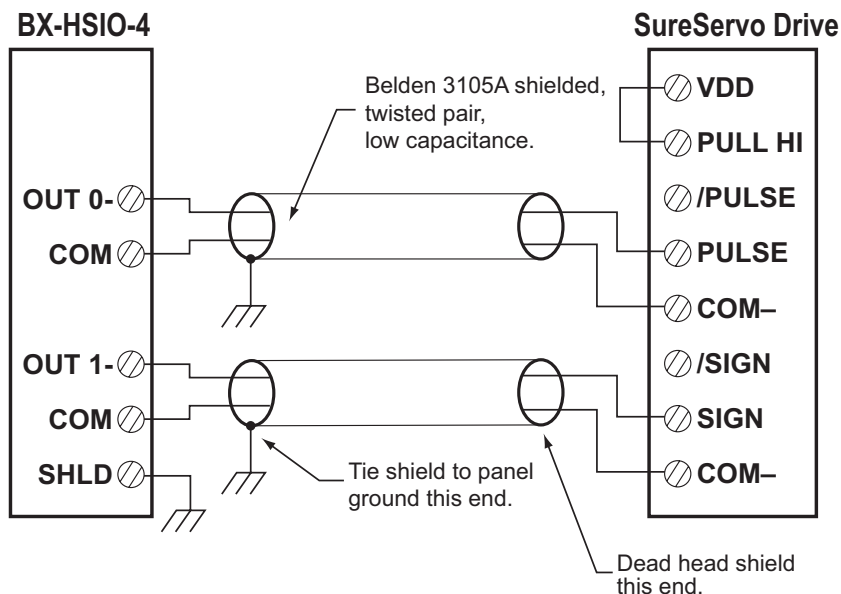To prevent damage to 5V inputs,
do not exceed 6.8V or 30 mA on inputs
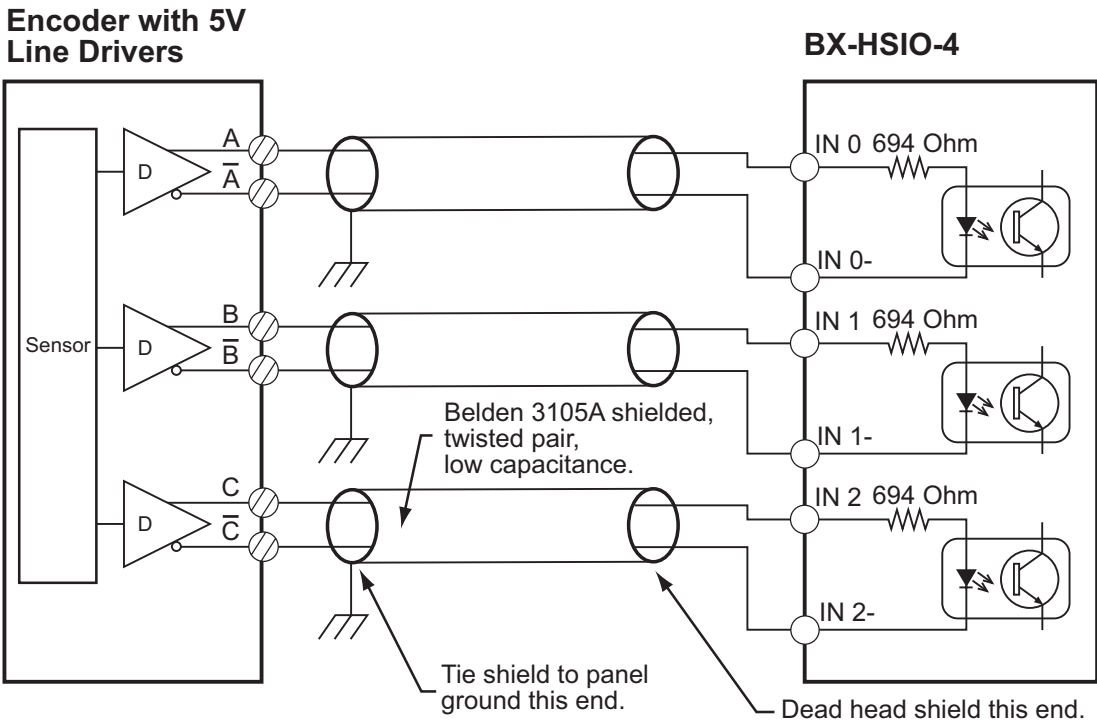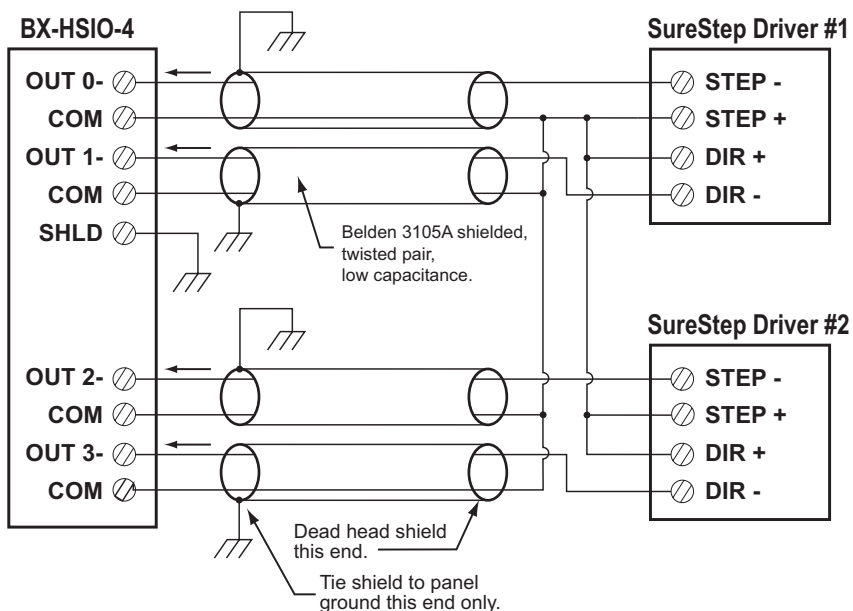
BX-HSIO4 High Speed Input/Output, continued

Line Driver Pulse Output from BX-HSIO4

BX-HSIO-4

Receivers

OUT0
OUT0-
COM

A
Ā
R

Belden 3107A shielded,
twisted 1.5 pair,
low capacitance.

OUT2
OUT2-

B
B̄
R

SHLD

Dead head shield
this end.

Tie shield to panel
ground this end only.

BX-HSIO4 to SureServo

BX-HSIO-4

SureServo Drive

Belden 3105A shielded,
twisted pair,
low capacitance.

VDD
PULL HI
/PULSE
PULSE
COM–

OUT 0-
COM

OUT 1-
COM
SHLD

/SIGN
SIGN
COM–

Tie shield to panel
ground this end.

Dead head shield
this end.

BX-HSIO4 to SureStep

BX-HSIO-4

SureStep Driver #1

OUT 0-
COM
OUT 1-
COM
SHLD

STEP -
STEP +
DIR +
DIR -

Belden 3105A shielded,
twisted pair,
low capacitance.

SureStep Driver #2

OUT 2-
COM
OUT 3-
COM

STEP -
STEP +
DIR +
DIR -

Dead head shield
this end.

Tie shield to panel
ground this end only.

BRX - Programmable Controller tBRX-175

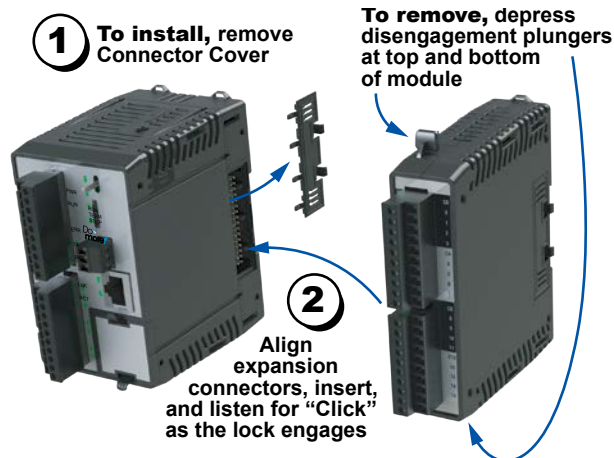# BRX Motion Control, Communications and Specialty Expansion Modules

Overview

One of the unique features of the BRX platform is its ability to expand its capability to fit your application solution. One of the ways the BRX platform can do this is by using expansion modules that conveniently "snap on" to the side of any BRX MPU. Once the expansion module has been snapped into place and is added to the project, it instantly adds I/O to the MPU with little to no additional setup required.

The specialty expansion modules give you the ability to add additional high-speed I/O or serial communications as needed. On the front panel of the expansion modules a color scheme and a symbol are used to denote the module type.

High-speed I/O modules have 8-point sinking/sourcing inputs and are available with 8-point sinking or sourcing outputs, all with switching frequencies up to 250kHz. The serial communications modules have 4 serial ports.

The high-speed I/O modules ship without wiring terminals. This allows you to select the termination style that best suits your application. Several wiring options are available, including screw terminal connectors and spring clamp terminal connectors. The serial communications modules ship with a terminal connector installed in each port.

① **To install,** remove Connector Cover

To remove, depress disengagement plungers at top and bottom of module

② **Align expansion connectors, insert, and listen for "Click" as the lock engages**

Hot-Swapping Information
Note: This device cannot be Hot Swapped.

General Specifications

All BRX high-speed input/output modules and serial communications modules have the same general specifications 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
Noise Immunity	NEMA ICS3-304
EU Directive	See the "EU Directive" topic in the BRX Help File
Agency Approvals	UL 61010-2 File E185989, Canada and USA, CE Compliant EN61131-2

Dimensions

3.25" [82.6mm]

4.57" [116.2mm]

4.24" [107.8mm]

1.08" [27.5mm]

1.00" [25.4mm]

2X Ø #8 Thru all
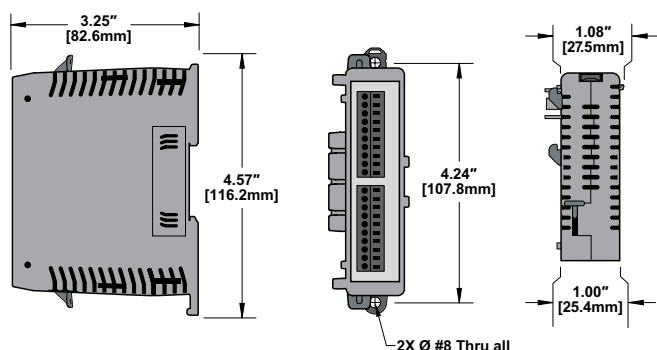
NOTE: When removing an expansion module make sure there is room for the module to slide away from the system. Failure to do so will result in difficulty removing the module.

# BRX Motion Control, Communications and Specialty Expansion Modules
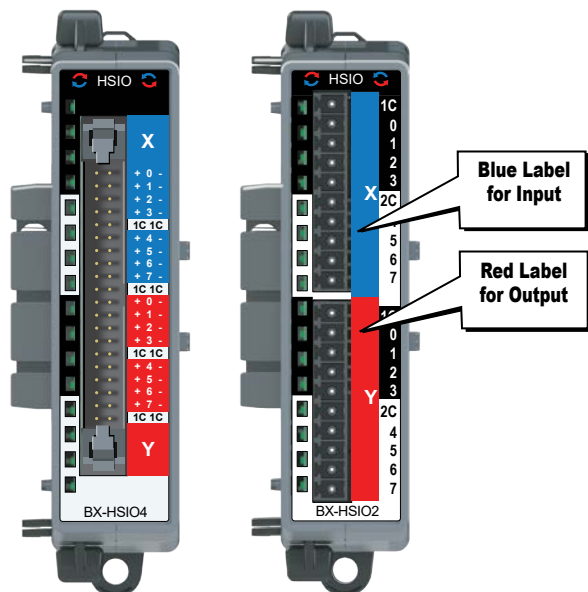
High-speed Input/Output Modules

Three (3) high-speed input/output modules are available, with eight inputs and eight outputs each. High-speed I/O module faceplates have blue and red terminal bar sections to distinguish input and output terminals, respectively, and have the ⟳ symbol to signify high-speed I/O.

Blue Label for Input

Red Label for Output

High-Speed Input/Output Modules

Part Number	Input Points	Output Points	Output Type	Switching Speed	Price
BX-HSIO1	8	8	12–24 VDC Sinking	Up to 250kHz	
BX-HSIO2	8	8	12–24 VDC Sourcing	Up to 250kHz	
BX-HSIO4	8	8	2.5–5 VDC Sinking/Sourcing	Up to 2MHz	

Serial Communications Module

Three (3) serial communications modules are available, with four serial ports each. Serial communications module faceplates have black and white terminal sections to distinguish serial terminals, and have the ⇄ symbol to signify serial I/O.
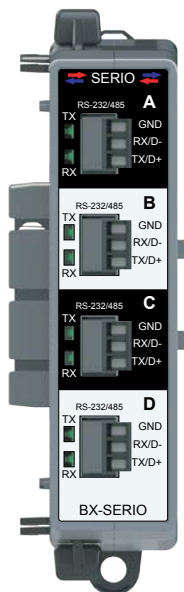
Serial Communications Module

Part Number	Ports	Port Type	Price
BX-SERIO	4	RS-232 / RS-485	
BX-SERIO-2	4	RS-232 with Flow Control	
BX-SERIO-4	4	RS-422	

Expansion Module Support by Controller

Controller Type	# Expansion Modules
BX-DM1E-M	8
BX-DM1-10	2
BX-DM1E-10	2
BX-DM1-18	4
BX-DM1E-18	8
BX-DM1-36	4
BX-DM1E-36	8
BX-DMIO*	8
BX-EBC100*	8
BX-MBIO*	8

* Remote I/O controllers do not support Motion Control and Communications Modules.

BRX Wiring Termination Options

Terminal Block Connectors

The terminal block connectors are provided in kits of multiple connectors that are ordered as a single part number. There are 2 different types of kits to choose from; one kit for the five (5), eight (8) and 12-point discrete, and one kit for the analog modules and 16-point discrete modules. The five (5), eight (8) and 12-point discrete module kits each have (3) 5-pin 5mm connectors. The 8-point modules will use only 2 of the 5-pin connectors.

The five (5) and 12-point modules will use all three connectors. The analog and 16-point digital module kits include (2) 10-pin 3.81 mm connectors.

Terminal Block Connectors, 5, 8 and 12-Point Discrete Modules

Terminal Block Kits for 5-point, 8-point and 12-point Expansion Modules

BX-RTB08 (Kit - 3 pieces)

BX-RTB08-1 (Kit - 3 pieces)

BX-RTB08-2 (Kit - 3 pieces)

Terminal Block Specifications 5-, 8- & 12-Point Type			
Part Number Single Block Set of 3 Blocks	BX-RTB05 BX-RTB08	BX-RTB05-1 BX-RTB08-1	BX-RTB05-2 BX-RTB08-2
Price (Single Block)			
Price (Kit)			
Connector Type	Screw Type - 90-degree	Spring Clamp Type - 180-degree	Screw Type - 180-degree
Wire Exit	180-degree	180-degree	180-degree
Pitch	5.0 mm	5.0 mm	5.0 mm
Screw Size	M2.5	N/A	M2.5
Screw Torque Recommended	< 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 (Dual 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-05P-BK	5ESDSR-05P-BK	5ESDF-05P-BK

Terminal Block Connectors, Analog Modules and 16-Point Discrete Modules

Terminal Block Kits for Analog and 16-point Discrete Expansion Modules

BX-RTB10 (Kit - 2 pieces)
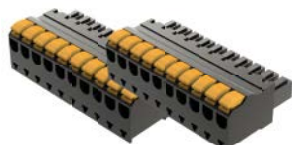
BX-RTB10-1 (Kit - 2 pieces)

BX-RTB10-2 (Kit - 2 pieces)

Terminal Block Specifications 16-Point Type			
Part Number	BX-RTB10	BX-RTB10-1	BX-RTB10-2
Price (Kit)			
Connector Type	Screw Type 90-degree	Spring Clamp Type 180-degree	Screw Type 180-degree
Wire Exit	180-degree	180-degree	180-degree
Pitch	3.81 mm	3.81 mm	3.81 mm
Screw Size	M2	N/A	M2
Screw Torque Recommended	<1.77 lb·in (0.2 N·m)	N/A	<1.77 lb·in (0.2 N·m)
Screwdriver Blade Width	2.5 mm	2.5 mm	2.5 mm
Wire Gauge (Single Wire)	28–16 AWG	26–18 AWG	30–16 AWG
Wire Gauge (Dual Wire)	28–18 AWG	30–20 AWG (Dual Wire Ferrule Required)	30–18 AWG
Wire Strip Length	0.24 in (6mm)	0.35 in (9mm)	0.26 in (6.5 mm)
Equiv. Dinkle P/N	EC381V-10P-BK	ESC381V-10-BK	EC381F-10P-BK

NOTE: BX-RTB10 terminal blocks are included with Temperature Input modules.