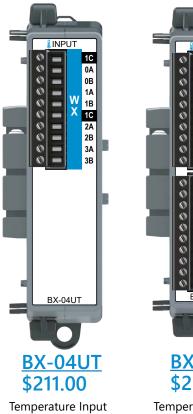
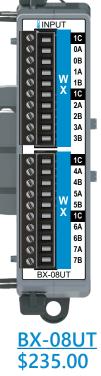
1-800-633-0405 For the latest prices, please check AutomationDirect.com. BX-xxUT Universal Temperature Input





Temperature Input Expansion Module 4-pt Universal Temperature Input Temperature Input Expansion Module 8-pt Universal Temperature Input

BX-RTB10 Terminal Blocks Included. The <u>BX-RTB10-1</u> or <u>BX-RTB10-2</u> (purchased separately) can also be used.



NOTE: This device does not support *ZIP*Link Wiring Systems

IMPORTANT!



	perature Input Spec		
	BX-04UT BX-08UT		
Input Channels	4 Differential 8 Differential		
Commons	1		
Input Impedance	>5	MΩ	
	24-bit, 0.	1°(C or F)	
Resolution		Specifications table	
All Channel Update Rate	1s max (4 thermocouples enabled) 700ms max (4RTD/NTX/mV enabled)	2s max (8 thermocouples enabled) 1.4 s max (4RTD/NTX/mV enabled)	
Sample Duration Time	17:	5ms	
Open Circuit Detection Time	With	nin 5s	
Maximum Ratings	-0.3 V to +5	5.3 V, <15mA	
Common Mode Range		o +5.3 V	
Common Mode Rejection		130dB@60Hz	
Conversion Method	Sigma-Do	elta, 24-bit	
Backplane Power Consumption	1.	5 W	
Heat Dissipation	1.5	5 W	
Weight	98g [3.5 oz]	
Agency Approvals	UL 61010-2 File E185	989, Canada and USA	
Software Version Required	Do-more! Desi	gner 2.7 or later	
Thermocouple Parameters			
Thermocouple Input Ranges	Type J: -210° to 1200 Type K: -265° to 1372 Type E: -265° to 1300 Type R: -265° to 1300 Type R: -50° to 1768 Type S: -50° to 1768 Type B: 40° to 1820 Type T: -265° to 4000	2°C [-445° to 2502°F] 0°C [-445° to 1832°F] 0°C [-445° to 2372°F] 0°C [-58° to 3214°F] 3°C [-58° to 3214°F] 3°C [-58° to 3214°F] 0°C [104° to 3308°F]	
I Ingar Voltago Innuit Pangos	-31.25 to 31.25 mVDC -31.25 to 62.5 mVDC	-31.25 to 125mVDC 0 to 1.0 VDC	
Cold Junction Compensation	Auto	omatic	
Thermocouple Linearization	Auto	omatic	
Max. Inaccuracy–Thermocouple	±(0.2°C + 3%	of °C reading)	
Maximum Inaccuracy–Voltage	±25	50µV	
RTD/Thermistor Parameters			
RTD Input Ranges (RTD Types)	10, 50, 100, 200, 500, 1000Ω Pt Platinum RTD 0.00385 European Curve: -200° to 850°C [-328° to 1562°F] 120Ω Ni N120 Nickel RTD 0.00672 Curve:		
Thermistor Input Ranges	2.252 kΩ @ 25°C: - 3 kΩ @ 25°C: - 5 kΩ @ 25°C: - 10k-AN Type 3 @ 25°C: -	[-112° to 500°F] 40° to 150°C [-40° to 302°F] 40° to 150°C [-40° to 302°F]	
RTD Excitation Current	RTD 10, 100, 120, 200: RTD 500: RTD 1000:	1mA 500μΑ 250μΑ	
Thermistor Excitation Current	NTC 2.252k, NTC 3k: 10μA NTC 5k, NTC 10k: 5μA NTC 30k: 1μA		
Thermistor Linearization	Automatic		
Maximum Inaccuracy	±0.	2°C	

BX-xxUT Universal Temperature Input, continued

Data Range Specifications					
Thermocouple Selection	Temperature Range	Resolution			
Thermocoupie Selection	Temperature nanye	WXn	RXn		
Туре Ј	−210 to 1200 °C −346 to 2192 °F				
Туре К	−265 to 1372 °C −445 to 2502 °F				
Туре Е	−265 to 1000 °C −445 to 1832 °F				
Type R	−50 to 1768 °C −58 to 3214 °F	Degrees x10 (One Implied Decimal) ¹	24-Bit Floating ¹		
Type S	−50 to 1768 °C −58 to 3214 °F				
Туре В	40 to 1820 °C 104 to 3308 °F ³				
Туре Т	−265 to 400 °C −445 to 752 °F				
Voltage Selection	Voltage Range	WXn ²	RXn		
-31.25 to 31.25 mVDC	Bipolar 31.25 mVDC	0.95 µV per count (−32768 to 32767)			
-31.25 to 62.5 mVDC	Bipolar 62.5 mVDC	1.9 µV per count (−16384 to 32767)	User Scaled		
-31.25 to 125 mVDC	Bipolar 125 mVDC	3.8 µV per count (-8192 to 32767)	User Scaled		
0 to 1.0 VDC	Unipolar 1.0 VDC	30.5 µV per count (0 to 32767)			
RTD Selection	Temperature Range	WXn	RXn		
10, 50, 100, 200, 500, 1000Ω Pt Platinum RTD 0.00385 European Curve	−200 to 850 °C −328 to 1562 °F	Degrees x10 (One Implied	24-Bit Floating ¹		
120Ω Ni N120 Nickel RTD 0.00672 Curve	−80 to 260 °C −112 to 500 °F	Decimal) ¹	24-bit Fioaling		
Thermistor Selection	Temperature Range	WXn	RXn		
Thermistor 2.252 kΩ @25°C					
Thermistor 3kΩ @25°C	40 4 450 00				
Thermistor 5kΩ @25°C	−40 to 150 °C −40 to 302 °F	Degrees x10 (One Implied Decimal) ¹	24-Bit Floating ¹		
Thermistor 10k-AN Type 3 @25°C		Doomary			
Thermistor 30kΩ @25°C					

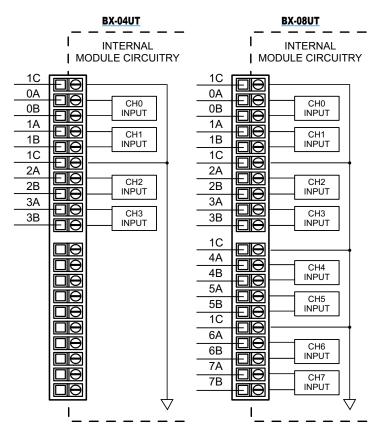
1. Temperatures reported in rounded integer to WXn and as scaled floating point 24bits resolution to RXn.

2. Raw Counts = -32768 to 32767.

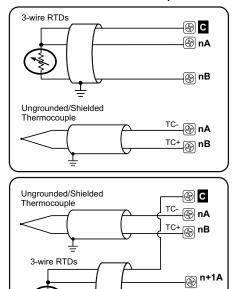
3. Maximum value displayed in WXn is 32767. RXn will display the full range of 3308.0.

BX-xxUT Universal Temperature Input, continued

Analog Thermocouple/Voltage Input Wiring



Mixed Resistive and Thermocouple Sensors





Notes for maximum accuracy:

- 1. All wires to an RTD must be equal length and type. Refer to RTD manufacturer's recommendations.
- **2.** Do not use cable shield as sensing wire.
- When applicable, connect shield to RTD common only, otherwise connect to module common only. Do not connect shield to both ends.

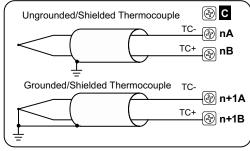


🚱 n+1B

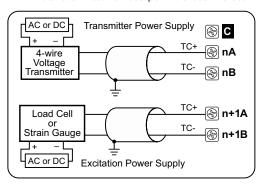
4. Jumper unused inputs.

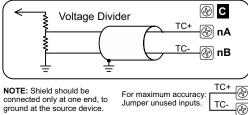
1-800-633-0405 **BX-xxUT Universal Temperature Input,** continued

Thermocouple and Voltage Sensors



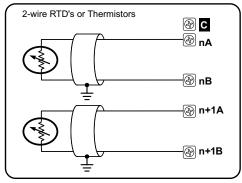
NOTE: Thermocouple extension wire and proper thermocouple terminal blocks must be used to extend thermocouples. AutomationDirect thermocouple wire is recommended.

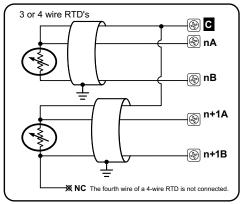




connected only at one end, to ground at the source device.

Resistive and Thermistor Sensors





1-800-633-0405 For the lates BRX Analog Expansion Modules

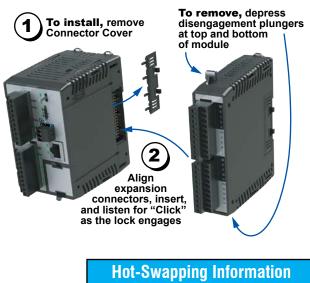
Overview

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 in place and is added to the project, it instantly adds I/O to the MPU with little to no additional setup required.

The analog expansion modules give you the ability to add analog I/O as needed and are identified as an analog input module, temperature input module, or analog output module. On the front panel of the analog I/O expansion modules, a color scheme and a symbol are used to denote the module type.

Analog modules are available with current inputs or outputs, unipolar/bipolar voltage inputs or outputs, thermocouple inputs, RTD inputs and thermistor inputs. Input/output combination modules are also available.

With the exception of temperature input modules, the modules ship without wiring terminals. This allows you to select the termination style that best fits your application. Several wiring options are available, including screw terminal connectors, spring clamp terminal connectors and pre-wired **ZIP**Link cable solutions.



Note: This device cannot be Hot Swapped.

General Specifications

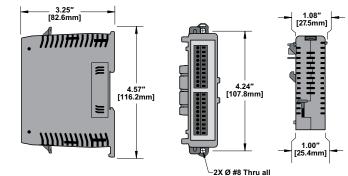
All BRX analog input and output modules and temperature input modules have the same general specifications listed in the table below.

General Specifications				
Storage Temperature	-20° to 70°C [-4° to 158°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 (unless otherwise noted on individual module specifications)	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)			

Operating	Temperature I	Range
Operating Temperature	0° to 45°C [32° to 113°F]	0° to 60°C [32° to 140°F]
Module	Module R	evision*
BX-08AD-1		
BX-08AD-2B	Rev A	Rev B
<u>BX-04THM</u>	(Prior to May 2018)	(After May 2018)
BX-08DA-1		
<u>BX-08DA-2B</u>	Rev B (Prior to May 2018)	Rev C (After May 2018)
All other Analog and Temperature Expansion Module part numbers	N/A	Rev A (After May 2018)

* Module Revision can be found in the last letter (last or second-to-last character) of the module serial number.

Dimensions



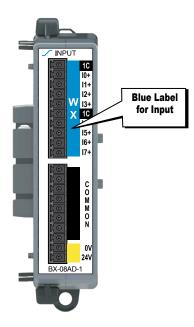


NOTE: When removing an expansion module, make sure there is room for the module to slide away from the system. Failure to do so will result in difficulty removing the module.

BRX Analog Expansion Modules

Analog Input Modules

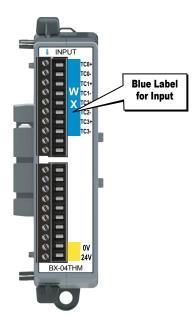
Nine (9) analog input modules are available, with current or voltage inputs. Analog input module faceplates have a blue terminal bar to distinguish them as inputs, with symbols \checkmark or \checkmark to signify current or voltage, respectively.



Analog Input Modules							
Part Number	Points	Input Type	Resolution	Price			
<u>BX-04ADM-1</u>	4	Current Sink 0–20 mA, 4–20 mA	14-bit	\$182.00			
<u>BX-04AD-1</u>	4			\$230.00			
<u>BX-08AD-1</u>	8	Current Sink 0–20 mA, 4–20 mA	16-bit	\$255.00			
<u>BX-16AD-1</u>	16	0 20 110 (, 4 20 110 (\$363.00			
BX-04AD-2B	4	Voltage	16-bit	\$230.00			
<u>BX-08AD-2B</u>	8	± 10VDC, ± 5VDC,		\$255.00			
<u>BX-16AD-2B</u>	16	0–5 VDC, 0–10 VDC		\$363.00			
<u>BX-04AD-3</u>	4	Current Sink 0–20mA, 4–20mA	16-bit	\$182.00			
<u>BX-08AD-3</u>	8	Voltage ±10VDC, ±5VDC, 0–5VDC, 0–10VDC	TO-DIL	\$212.00			

Temperature Input Module

Six (6) temperature input modules are available, with thermocouple, RTD, and/or thermistor inputs. The thermocouple input modules can also be configured for millivolt-level voltage inputs, and the RTD input module can also be configured for resistance input. Temperature module faceplates have a blue terminal bar to distinguish them as inputs, and \$ symbol to signify temperature.



Temperature Input Modules				
Part Number	Points	Input Type	Price	
BX-04THM	4	Thermocouple	\$241.00	
<u>BX-08THM</u>	8	Thermocouple	\$269.00	
BX-06RTD	6	RTD	\$255.00	
BX-08NTC	8	Thermistor	\$269.00	
<u>BX-04UT</u>	4	Universal Temperature (Thermocouple, RTD, Thermistor supported)	\$211.00	
<u>BX-08UT</u>	6	Universal Temperature (Thermocouple, RTD, Thermistor supported)	\$235.00	

BRX Analog Expansion Modules

Temperature/Analog Combo Module

Three (3) combination modules are available, with thermocouple, RTD or universal temperature inputs and current sourcing outputs. The thermocouple input modules can also be configured for millivolt-level voltage inputs, and the RTD input module can also be configured for resistance input. The Input/Output faceplate terminal bar is in blue and red, making it easy to distinguish between inputs and outputs, and the l and \checkmark symbols signify temperature and current, respectively.

	Tem	Temperature Input / Analog Output Combo Modules						
UT	David Murrishan	Points		1	0.4.47.4	Drine		
R0+ R0-	Part Number	Input	Output	Input Type	Output Type	Price		
1C R1+ R1- 2C	<u>BX-4RTD4DA-1</u>	4	4	Resistance Temperature Detector (RTD)	Current Source 0–20mA, 4–20mA	\$472.00		
R2+ R2- 3C	BX-4THM4DA-1	4	4	Thermocouple	Current Source 0–20mA, 4–20mA	\$472.00		
R3+ R3- 4C	<u>BX-4UT4DA-3</u>	4	4	Universal Temperature	Current Source: 0–20mA, 4–20mA Voltage:±10VDC, ±5VDC, 0–5VDC, 0–10VDC	\$412.00		



12+

13+

 S
 5C

 0V
 0V

 24V

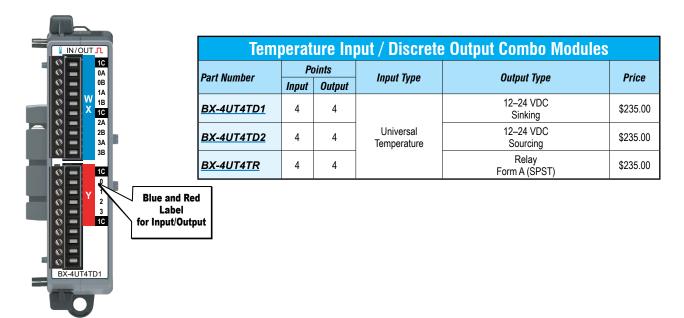
 BX-4RTD4DA-1

Blue and Red

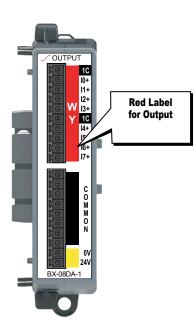
Label

for Input/Output

Three (3) combination modules are available with universal temperature inputs and DC sinking, sourcing or relay outputs. The thermocouple inputs can also be configured for millivolt-level voltage inputs, and the RTD inputs can also be configured for resistance input. The Input/Output faceplate terminal bar is in blue and red, making it easy to distinguish between inputs and outputs, and the $\$ and Π symbols signify temperature and discrete signals, respectively.



1-800-633-0405 For the lates BRX Analog Expansion Modules



Analog Output Modules

Six (6) analog output modules are available, in current and voltage outputs. Analog output module faceplates have a red terminal bar to distinguish them as outputs, with symbols \checkmark or \checkmark to signify current or voltage, respectively.

Analog Output Modules					
Part Number	Points	Output Type	Price		
<u>BX-04DA-1</u>	4	Current Source	\$269.00		
BX-08DA-1	8	0–20 mA, 4–20 mA	\$350.00		
BX-04DA-2B	4	Voltage	\$269.00		
<u>BX-08DA-2B</u>	8	± 10VDC, ± 5VDC, 0–5 VDC, 0–10 VDC	\$350.00		
<u>BX-04DA-3</u>	4	Current Source 0–20mA, 4–20mA	\$231.00		
<u>BX-08DA-3</u>	8	Voltage ±10VDC, ±5VDC, 0–5VDC, 0–10VDC	\$294.00		

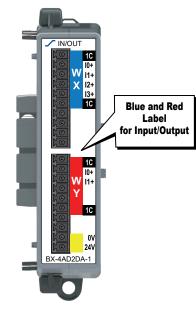
Analog Combo Input / Output Modules

Six (6) analog input/output combo modules are available with current or voltage inputs and outputs. The Input/Output faceplate terminal bar is in blue and red, making it easy to distinguish between inputs and outputs. Symbols \checkmark and \checkmark signify current and voltage, respectively.

Analog Combo Input / Output Modules					
Part Number	Points		Innut Tuno	Output Tuno	Drico
Part Number	Input	Output	Input Type	Output Type	Price
<u>BX-2AD2DA-1</u>	2	2	Current Sink	Current Source	\$309.00
BX-4AD2DA-1	4	2	0–20mA, 4–20mA	0–20mA, 4–20mA	\$378.00
BX-2AD2DA-2B	2	2	Voltage	Voltage	\$309.00
BX-4AD2DA-2B	4	2	±10VDC, ±5VDC, 0–5VDC, 0–10VDC	±10VDC, ±5VDC, 0–5VDC, 0–10VDC	\$378.00
<u>BX-2AD2DA-3</u>	2	2	Current Source 0–20mA, 4–20mA	Current Source 0–20mA, 4–20mA	\$269.00
BX-4AD4DA-3	4	4	Voltage ±10VDC, ±5VDC, 0–5VDC, 0–10VDC	Voltage ±10VDC, ±5VDC, 0–5VDC, 0–10VDC	\$330.00

Expansion Module Support by Controller				
Controller Type	# Expansion Modules			
BX-DM1E-M	8			
BX-DM1-10	8			
BX-DM1E-10	8			
BX-DM1-18	8			
BX-DM1E-18	8			
BX-DM1-36	8			
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	<u>BX-RTB05</u> BX-RTB08	<u>BX-RTB05-1</u> BX-RTB08-1	<u>BX-RTB05-2</u> BX-RTB08-2				
Price (Single Block)	\$8.50	\$7.00	\$10.00				
Price (Kit)	\$15.00	\$14.50	\$18.00				
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

Termin	Terminal Block Specifications 16-Point Type							
Part Number	<u>BX-RTB10</u>	<u>BX-RTB10-1</u>	BX-RTB10-2					
Price (Kit)	\$21.50	\$24.00	\$27.00					
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: <u>BX-RTB10</u> terminal blocks are included with Temperature Input 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)