Analog Universal Current/Voltage Sinking Output Specifications

Outputs per Module	4
Commons	1
Signal Resolution	16-bit
Output Type	Voltage outputs sourcing/sinking at 10mA (example 10V @ 1kΩ load).
	Current Sink/Source up to 5V
Output Value in Fault Mode	Voltage outputs 0V (Unipolar or Bipolar), Current 0mA
Minimum Load Impedance (Voltage)	1kΩ
Allowed Load Type	Grounded
Maximum Continuous Overload	Indefinitely
Maximum Load Impedance (Current)	250Ω
Allowed Load Type	Grounded
All Channel Update Rate	1.0 ms
Maximum Inaccuracy	±0.1% of HW full scale (65 counts)
Maximum Full Scale Calibration Error	±0.1% of HW full scale (65 counts)
Conversion Method	Amplified Divide-by-2 Resistor String
Linearity Error (end to end)	±0.1% of HW full scale (65 counts)
Output Stability and Repeatability	±0.02% of full range (12 counts) after 10 minute warmup (typical)
Output Settling Time	10µs
Channel to Backplane Isolation	1800VAC applied for one second
Channel to Channel Isolation	None
Loop Fusing (External)	Fast-acting 0.032A recommended
Backplane Power Consumption	2.65 W

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
Heat Dissipation	2.5W
Weight	98g (3.5 oz)
Software Version	Do-more! Designer 2.7 or later

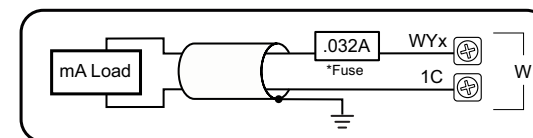*Meets EMC and Safety requirements. See the D.O.C. for details.

Terminal Block Connector Specifications

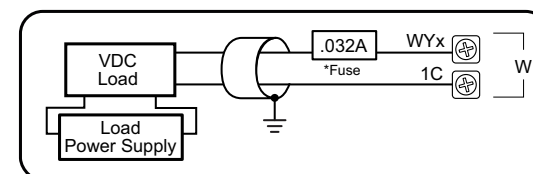| Part Number	BX-RTB10 (Included)	BX-RTB10-1*	BX-RTB10-2*
Connector Type	Screw Type-90°	Spring Clamp Type-180°	Screw Type-180°
Pitch	3.81mm	3.81mm	3.81mm
Recommended Screw torque	<1.77 lb·in (0.2 N·m)	N/A	<1.77 lb·in (0.2 N·m)
Screwdriver Blade Width	2.5mm	2.5mm	2.5mm
Equiv. Dinkle part #	EC381V-10P-BK	ESC381V-10-BK	EC381F-10P-BK

*Sold separately

NOTE: This module is not compatible with Ziplink wiring solutions.

BRX Expansion Module

IN / OUT
1C
0A
0B
1A
1B
1C
2A
2B
3A
3B
1C
0
1
2
3
1C
BX-4UT4DA-3

BX-4UT4DA-3 Temperature Combo

4-pt. Universal Temperature Input, 4-pt. Analog Output ±20mA or ±10V

I/O Terminal Blocks included. (See Terminal Block Connector Spec.table inside). Not compatible with the ZIPLink Wiring System

I/O Wiring

Analog Current Source Output Circuit

mA Load | .032A *Fuse | WYx | 1C | W

Analog Voltage Output Circuit

VDC Load | .032A *Fuse | WYx | 1C | W
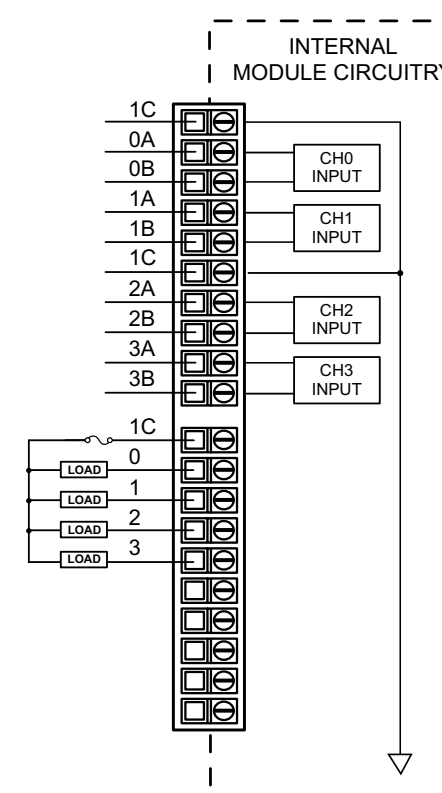
Load Power Supply

NOTE: Shield should be connected only at one end, to ground at the source device.

*An Edison S500-32-R 0.032A fast-acting fuse is recommended for all analog voltage inputs, analog outputs, and current loops.

I/O Wiring

INTERNAL MODULE CIRCUITRY

1C
0A
0B — CH0 INPUT
1A
1B — CH1 INPUT
1C
2A
2B — CH2 INPUT
3A
3B — CH3 INPUT
1C
0 — LOAD
1 — LOAD
2 — LOAD
3 — LOAD

WARNING: To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call Technical Support at 770-844-4200.

This publication is based on information that was available at the time it was printed. At AutomationDirect.com® we constantly strive to improve our products and services, so we reserve the right to make changes to the products and/or publications at any time without notice and without any obligation. This publication may also discuss features that may not be available in certain revisions of the product.

Do-more BRX Manual available at http://www.automationdirect.com/pn/doc/manual/BX-USER-M

IMPORTANT!

Hot-Swapping Information

Note: This device cannot be Hot Swapped.

Document Name	Edition/Revision	Date
BX-4UT4DA-3	1st Ed. RevA	1/25/2021

Thermocouple Data Range Specifications

Thermocouple Selection	Temperature Range	Resolution	
	Degrees	WXn	RXn
Type J	−210 to 1200 °C −346 to 2192 °F	Degrees x10 (One Implied Decimal)[1]	24 Bit Floating[1]
Type K	−265 to 1372 °C −445 to 2502 °F		
Type E	−265 to 1000 °C −445 to 1832 °F		
Type N	−265 to 1300 °C −445 to 2372 °F		
Type R	− 50 to 1768 °C − 58 to 3214 °F		
Type S	− 50 to 1768 °C − 58 to 3214 °F		
Type B	40 to 1820 °C 104 to 3308 °F[3]		
Type T	−265 to 400 °C −445 to 752 °F		

Voltage Selection	Voltage Range	WXn[2]	RXn
−31.25 to 31.25 mVDC	Bipolar 31.25mVDC	1.0 µV per Count	User Scaled
−31.25 to 62.5 mVDC	Bipolar 62.5 mVDC	1.9 µV per Count	
−31.25 to 125 mVDC	Bipolar 125 mVDC	3.8 µV per Count	
0 to 1.0 VDC	Unipolar 1.0 VDC	30.5 µV per Count	
Maximum Inaccuracy for Thermcouples		±(0.2°C+0.3% of °C reading)	
Cold Junction Compensation		Automatic	
Thermocouple Linearization		Automatic	
Maximum Inaccuracy for Voltage Inputs		±250µV	

[1] Temperatures reported in rounded integer to WXn and also as scaled floating point 24bits resolution to RXn
[2] Raw Counts = −32768 to 32767
[3] Max value displayed in WXn is 32767. RXn will display the full range of 3308.0

Thermistor Data Range Specifications

Thermistor Selection	Degrees	WXn	RXn
Thermistor 2.252kΩ @25°C	−40 to 150 °C −40 to 302 °F	Degrees x10 (One Implied Decimal)[1]	24 Bit Floating[1]
Thermistor 3kΩ @25°C	−40 to 150 °C −40 to 302 °F		
Thermistor 5kΩ @25°C	−40 to 150 °C −40 to 302 °F		
Thermistor 110k-AN Type 3 @25°C	−40 to 150 °C −40 to 302 °F		
Thermistor 30kΩ @25°C	−40 to 150 °C −40 to 302 °F		
Thermistor Linearization	Automatic		
Thermistor Excitation Current		NTC 2.252k	10µA
		NTC 3k	10µA
		NTC 5k	5µA
		NTC 10k	5µA
		NTC 30k	1µA
Maximum Inaccuracy for Thermistors	±0.2°C		

[1] Temperatures reported in rounded integer to WXn and also as scaled floating point 24bits resolution to RXn
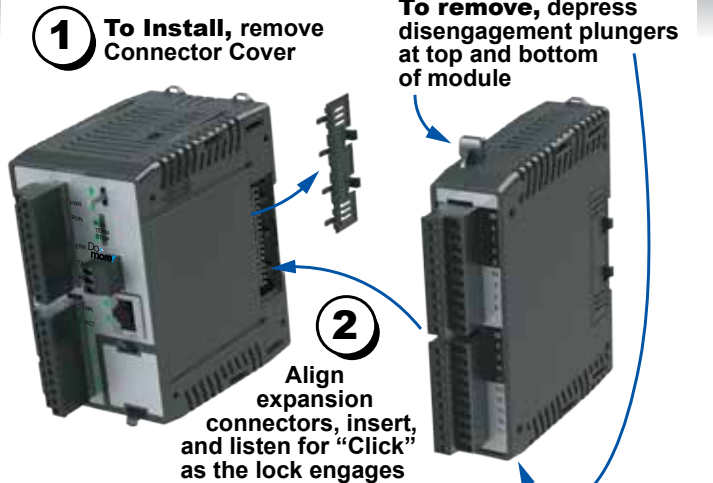
Universal Temperature Input Specifications

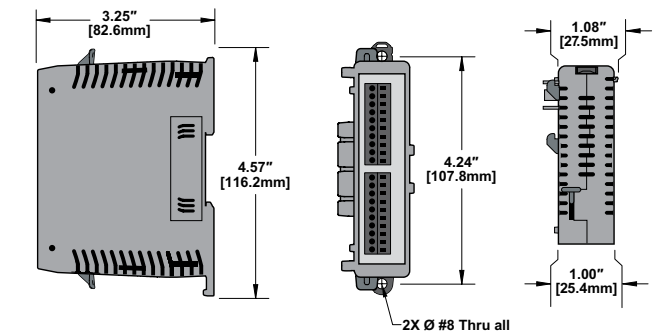|	
Input Channels	4 Differential
Commons	1
Input Impedance	>5MΩ
Resolution	24-bit, ±0.1° (C or °F)
All Channel Update Rate	1s max (4 thermocouples enabled) 700ms max (4RTD/NTC/mV enabled)
Sample Duration Time	175ms
Open Circuit Detection Time	Within 5s
Maximum Ratings	-0.3V to +5.3V, <15mA
Common Mode Range	-0.3V to +5.3V
Common Mode Rejection	100dB @ DC and 130dB @ 60Hz
Conversion Method	Sigma-Delta, 24-bit
Backplane Power Consumption (Max)	2.65W

RTD Data Range Specifications

RTD Type	Degrees	1 degree Integer	24 Bit Floating
10, 50, 100, 200, 500, 1000Ω Pt Platinum RTD 0.00385 European Curve	−200 to 850°C −328 to 1562 °F	WXn	RXn
120Ω Ni Ni120 Nickel RTD 0.00672 Curve	−80 to 260 °C −112 to 500 °F	WXn	RXn
Maximum Inaccuracy for RTDs	±0.2°C		
RTD Linearization	Automatic		
RTD Excitation Current	RTD 10, 100, 120, 200	1mA	
	RTD 500	500uA	
	RTD 1000	250uA	

Module Installation

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

Dimensional Information

3.25" [82.6mm]
4.57" [116.2mm]
1.08" [27.5mm]
4.24" [107.8mm]
1.00" [25.4mm]
2X Ø #8 Thru all

Thermocouple and Voltage Source Wiring

Ungrounded/Shielded Thermocouple
TC- nA
TC+ nB

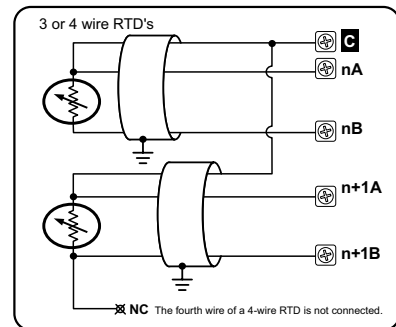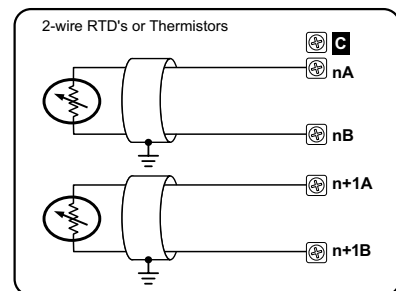Grounded/Shielded Thermocouple
TC- n+1A
TC+ n+1B
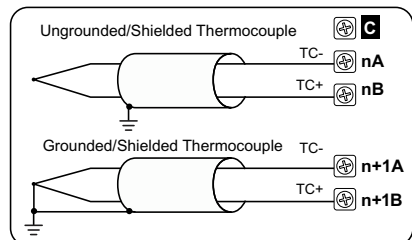
NOTE: Thermocouple extension wire and proper thermocouple terminal blocks must be used to extend thermocouples. AutomationDirect thermocouple wire is recommended.
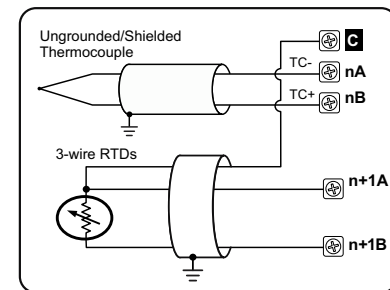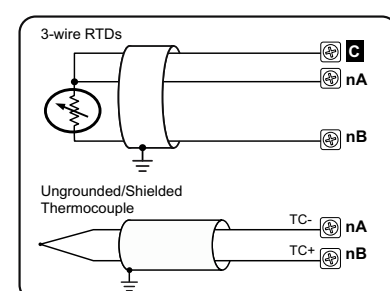
AC or DC — Transmitter Power Supply
4-wire Voltage Transmitter
V+ nA
V- nB

Load Cell or Strain Gauge
V+ n+1A
V- n+1B
AC or DC — Excitation Power Supply

Voltage Divider
V+ nA
V- nB
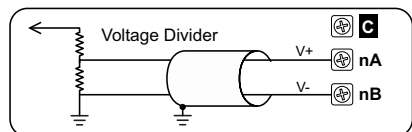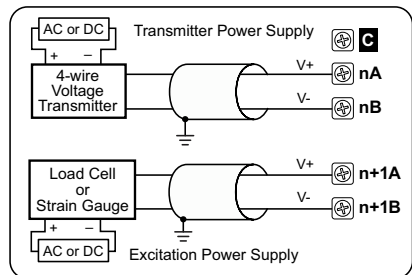
NOTE: Shield should be connected only at one end, to ground at the source device.

For maximum accuracy: Jumper unused inputs.
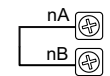TC+
TC-

RTD/Thermistor Wiring

2-wire RTD's or Thermistors
C
nA
nB
n+1A
n+1B

3 or 4 wire RTD's
C
nA
nB
n+1A
n+1B

✗ **NC** The fourth wire of a 4-wire RTD is not connected.

Mixed Resistive and Thermocouple Wiring

3-wire RTDs
C
nA
nB

Ungrounded/Shielded Thermocouple
TC- nA
TC+ nB

Ungrounded/Shielded Thermocouple
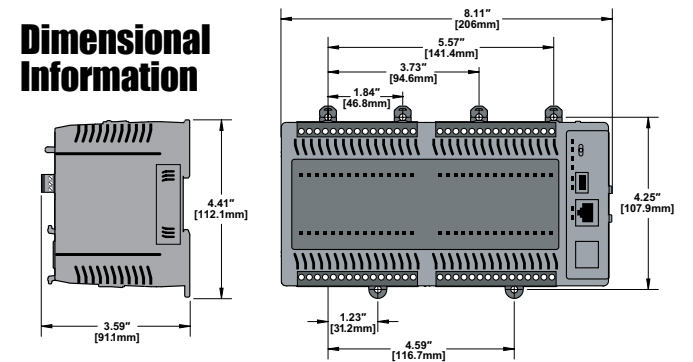C
TC- nA
TC+ nB

3-wire RTDs
n+1A
n+1B

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.
3. When applicable, connect shield to RTD common only, otherwise connect to module common only. Do not connect shield to both ends.
4. Jumper unused inputs.

nA
nB

Dimensional Information

8.11" [206mm]
5.57" [141.4mm]
3.73" [94.6mm]
1.84" [46.8mm]
4.41" [112.1mm]
4.25" [107.9mm]
3.59" [91.1mm]
1.23" [31.2mm]
4.59" [116.7mm]

Mounting Restrictions

OK
AIRFLOW
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
2" (50mm) Minimum from Enclosure