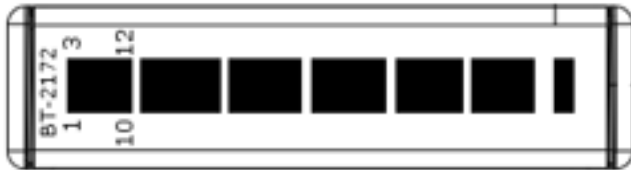# BT-2172 Datasheet

72 DO, 0v to 30v, Sinking, 1ms

- 3 Row 0.1" Spacing Header Connection (RC Servo Style Connector)
- Sink up to 60mA per Channel
- 30 VDC Max Input Voltage

The BT-2172 is a digital output module for National Instruments Compact RIO systems. Each channel is capable of sinking 60mA and compatible with signals up to 30 VDC. The BT-2172 is specifically designed to interface with low power industrial logic and electromechanical and solid-state relays. The BT-2172 features a closure counter in the form of an Odometer and a resettable Tripmeter for each channel.

A recommended accessory (BT-8103) includes 25 (3 Pin Connectors) of which 12 are tricolored 1m twisted cables, 12 are tricolored 2m twisted cables, and 1 black 2m twisted cable (for GND). This kit allows for easy connection and integration into a cRIO system, and makes integration simple by allowing the end user to wire three devices per connector instead of 24 or 32.

Package Contents:

1 x BT-2172 cRIO Module

1 x Drivers USB Stick

1 x QuickRef Guide

Recommended Accessories:

1 x BT-8103 Connection Kit for BT-2172 (1m & 2m)

Connector Pinouts

CON0		
Pin	Relay Address	Relay Number
1	A0	0
2	A1	1
3	A2	2
4	A3	3
5	A4	4
6	A5	5
7	A6	6
8	A7	7
9	A8	8
10	A9	9
11	A10	10
12	A11	11

CON1		
Pin	Relay Address	Relay Number
1	A12	12
2	A13	13
3	A14	14
4	A15	15
5	B0	16
6	B1	17
7	B2	18
8	B3	19
9	B4	20
10	B5	21
11	B6	22
12	B7	23

CON2		
Pin	Relay Address	Relay Number
1	B8	24
2	B9	25
3	B10	26
4	B11	27
5	B12	28
6	B13	29
7	B14	30
8	B15	31
9	C0	32
10	C1	33
11	C2	34
12	C3	35

CON3		
Pin	Relay Address	Relay Number
1	C4	36
2	C5	37
3	C6	38
4	C7	39
5	C8	40
6	C9	41
7	C10	42
8	C11	43
9	C12	44
10	C13	45
11	C14	46
12	C15	47

CON4		
Pin	Relay Address	Relay Number
1	D0	48
2	D1	49
3	D2	50
4	D3	51
5	D4	52
6	D5	53
7	D6	54
8	D7	55
9	D8	56
10	D9	57
11	D10	58
12	D11	59

CON5		
Pin	Relay Address	Relay Number
1	D12	60
2	D13	61
3	D14	62
4	D15	63
5	E0	64
6	E1	65
7	E2	66
8	E3	67
9	E4	68
10	E5	69
11	E6	70
12	E7	71

GND		
Pin	Function	Relay Number
1	GND	N/A
2	GND	N/A
3	GND	N/A

BT-2172
1 3
10 12
CON0 -
CON1 -
CON2 -
CON3 -
CON4 -
CON5 -
GND --

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TECHNOLOGIES LLC
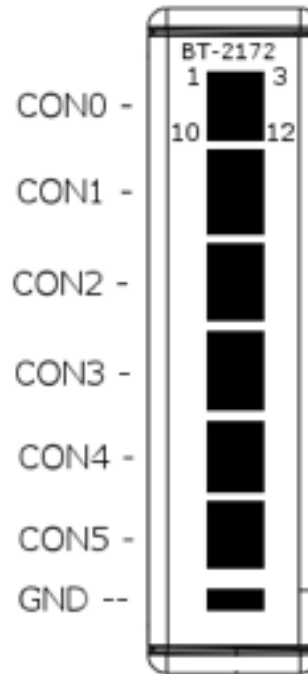
BT-2172 Software / Methods

Drivers are provided on a USB stick and must be installed before the module can be added to the FPGA Target. The module will identify as 'BT-2172' when adding the module.

Accessing the DO by Relay Number – IO Node

After adding the module to your LabVIEW project, click and drag the IO Node in the project list onto the Block Diagram. Wire in the state of the output and when the software executes that part of the code, the output will change on the selected DO Channel.
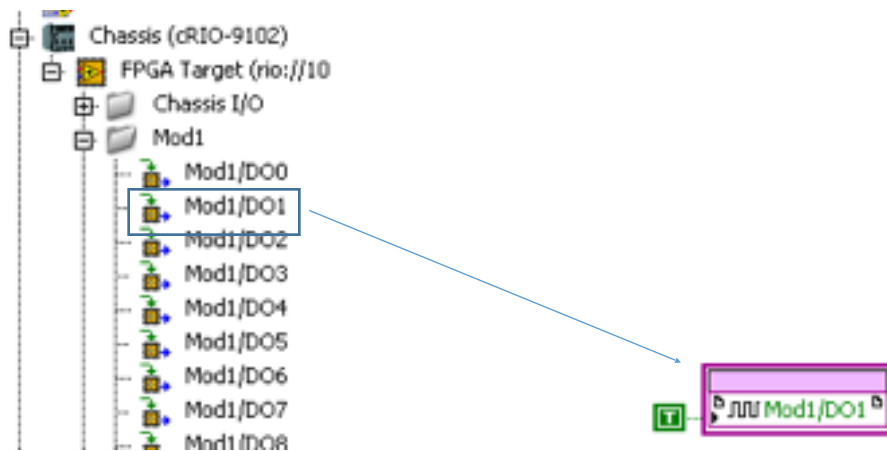
(In Project Explorer)   (On Block Diagram)

Accessing the DO by Relay Address – Method Node

Create a method node and wire in the Module reference. Select 'Output By Address' from the method list and wire the node. Use an ASCII table to convert 'A', 'B', etc. to its ASCII number. Relay Addresses can be found in 'Connector Pinouts'.

(On Block Diagram)

Reading the Odometer by Relay Number

The odometer is a non-resettable closure counter available on each channel. The Odometer is automatically read out when an output is accessed via the 'Output By Address' Method node. The odometer can also be read without changing the state of the output by using the 'Read Odometer' method.

Select the 'Read Odometer' method to read the current value of the Odometer for the specified Relay Number.


Reading the Tripmeter by Relay Number

The Tripmeter is a resettable closure counter available on each channel. Every time an output changes from 'F' to 'T', an internal counter is incremented. These counters are stored in non-volatile NVSRAM, so the value is retained even if the system is powered off.

Select the 'Read Tripmeter' method to read the current value of the Tripmeter for the specified Relay Number.

Reading / Resetting the Tripmeter by Relay Address

Select the 'Tripmeter By Address' method to read the current value of the Tripmeter for the specified Relay Address. The Tripmeter can be reset by wiring the 'Reset Trip?' to a 'T'.
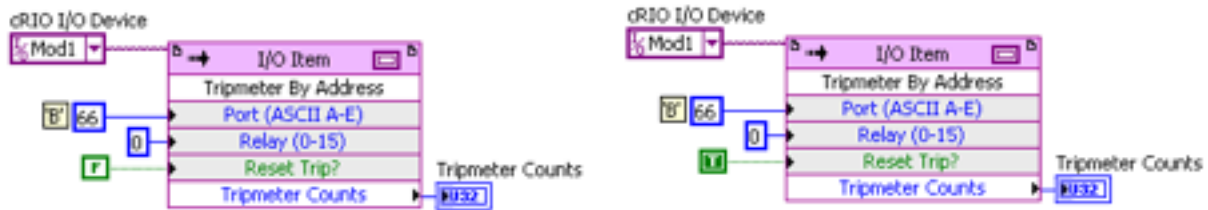
Resetting a Single Relay Tripmeter

Select the 'Reset Single Tripmeter' method and input the Relay Address to clear the Tripmeter of the relay number entered. This will reset the internal closure counter.

Resetting all Relay Tripmeters

Select the 'Reset All Tripmeters' method and confirm the operation by wiring a 'T' to the 'Reset All?' input. This will reset the internal closure counters of every output channel.
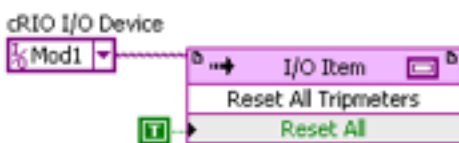
Additional SubVI's

Additional VI's are provided which will help with integration of the BT-2172 into LabVIEW projects. These SubVI's can be found on the included USB Device in the 'SubVI' Folder.

BT-2172 Circuitry
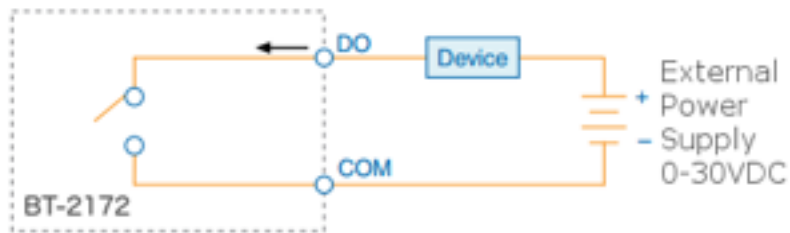
The BT-2172 has sinking digital outputs. Sinking outputs drive current from the inputs (A0-15…E0-7) to GND when the channel is on.

BT-2172 Specifications

The following specifications are typical for the standard operating temperature range. (-40C to 70C)

CAUTION *Do not operate the BT-2172 in a manner not specified in this document. Product misuse can result in hazard or unsafe conditions.*

Output Characteristics

Number of Channels	72
Output type	Sinking
Power-on output state	Outputs OFF
Output Voltage	I * R
Power Supply Range	0VDC to 30VDC
Continuous Output Current (I)	
Per Channel	60mA
Per Module	4.3A
Output Impedance (R)	2.5 Ohms
Reverse-Voltage Protection	NONE
Short-Circuit Protection	NONE
Maximum Update Rate	1ms

Output Timing

Outputs are changed in a sequential fashion one output at a time regardless of how the output structure is setup in LabVIEW. This means that it takes 1ms to change each output. The output change is processed as follows:

- Software Sets a Single Output High or Low

- Module Sets a Single Output High or Low

- Module Increments Odometer and Tripmeter if Needed.

- Module Waits for Next Output Change.

Power Requirements

Power Consumption from Chassis	
Active Mode	300mW
Sleep Mode	1mW
Thermal Dissipation (@70C)	
Active Mode	900mW
Sleep Mode	1mW

Physical Characteristics

If you need to clean the module, wipe it with a dry cloth.

TIP *For two-dimensional drawings and three-dimensional models of C Series modules and connectors, visit ni.com/dimensions*

Weight	200g (7.05oz)

Safe Voltages

Connect only voltages that are within the following limits:

Channel-to-GND	30 VDC Maximum
Isolation	
Channel-to-channel	NONE
Channel-to-earth ground	
Continuous	30 VDC Maximum

FCC Product Certification

For information regarding FCC Part 15b Declaration of Conformance (DoC), please contact info@bitgen.tech

Environmental

Refer to the chassis you are using for more information about meeting these specifications.

Operating Temperature	-40C to 70C
Storage Temperature	-40C to 70C
Ingress Protection	IP40
Operating Humidity	10%RH to 90%RH Non-Condensing
Storage Humidity	5%RH to 90%RH Non-Condensing
Pollution Degree	2
Maximum Altitude	2,000m

Indoor use only.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers *At the end of product life cycle, all BitGen Technologies LLC products must be disposed of according to local laws and regulations.*

For additional information or technical support regarding the BT-2172, please contact support@bitgen.tech.