BusBlock Digital I/O Module
for DeviceNet™

BBK-4045-1 0204 **TECHNICAL DATA**

Description

The Holjeron BusBlock I/O Module is designed to handle small amounts of I/O in a limited amount of space. The BusBlock I/O Module comes in two versions: twelve inputs/eight outputs and eight inputs/six relay outputs. All I/O is optically isolated from the bus.

Field terminations are captive screw terminals. Each input and output has its own LED indication for immediate verification of I/O states.

Specifications

Part Numbers	12 Input/8 Output		BBK-DNT128
	8 Input/6 Relays		BBK-DNT086
Electrical	DeviceNet™ Voltage Range		11-25 VDC
	Current Consumption		60 mA
	Data Rates		125, 250, and 500 kbps
Inputs	Type		Current Sinking (Sourcing load)
	Number	BBK-DNT128	Twelve (12)
		BBK-DNT086	Eight (8)
	Voltage Range		10-28 VDC
	Maximum Current		20 mA per input
	Isolation		1500 Vrms
Outputs -DNT128	Type		Current Sinking
	Number		Eight (8)
	Voltage Range		10-28 VDC
	Maximum Current		200 mA
	Isolation		1500 Vrms
-DNT086	Type		Relay
	Number		Six (6)
	Voltage Range		10-125 VDC, 24-240 VAC
	Maximum Current		2 Amps @ 115 VAC
	Isolation		1500 Vrms
Environmental	Temperature	Storage	-30° to 70° C (-22° to 158° F)
		Operating	0° to 60° C (32° to 140° F)
	Humidity		5-95% RH, non-condensing
	Vibration		2G at 10 to 500 Hz
	Shock		10G
Physical	Dimensions		5.50" H x 3.48" W x 1.00" D
	Weight		12 oz
	Color		Bone Gray
	Case Material		Polycarbonate
	Mounting		DIN Rail or foot mount
	Terminations		Captive Screw Terminal
	Indication	Power	Green
		Error	Red
		Activity	Green
		I/O	Green

Warranty/Remedy

Seller warrants its products to be free from defects in design, material and workmanship under normal use and service. Seller will repair or replace without charge any such products it finds to be so defective on its return to Seller within 18 months after date of shipment by Seller. **The foregoing is in lieu of all other expressed or implied warranties (except title), including those of merchantability and fitness for a particular purpose.** The foregoing is also purchaser's sole remedy and is in lieu of all other guarantees, obligations, or liabilities or any consequences incidental, or punitive damages attributable to negligence or strict liability, all by way of example.

While Holjeron provides application assistance, personally and through our literature, it is up to the customer to determine the suitability of the product in the application.

All information contained herein, including illustrations, specifications and dimensions, is believed to be reliable as of the date of publication, but is subject to change without notice.

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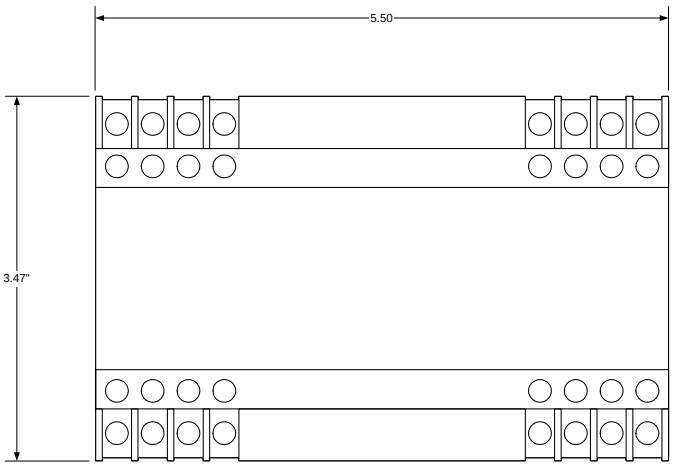
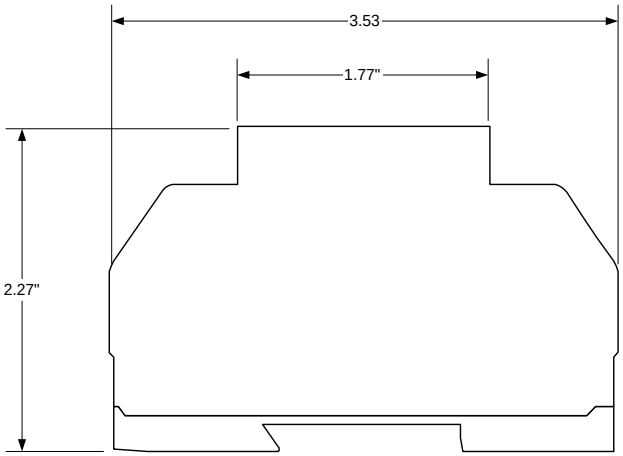
Dimensions

TOP VIEW

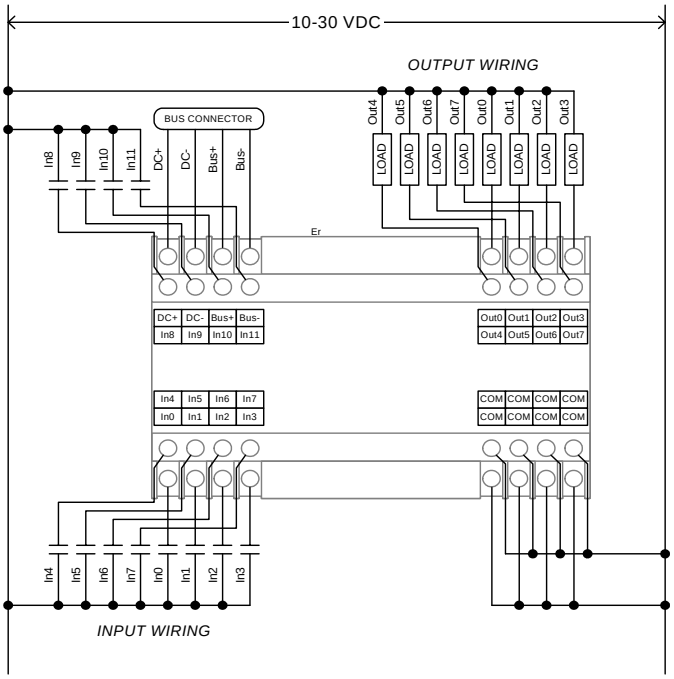


END VIEW

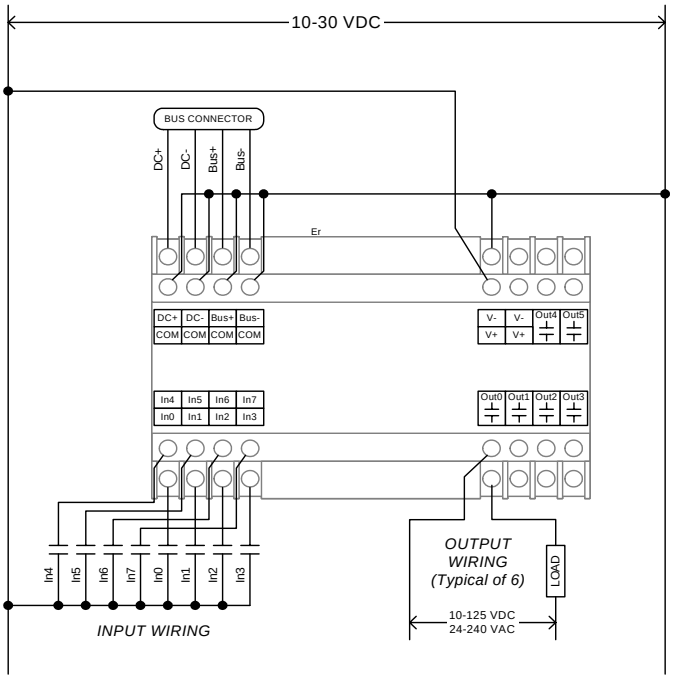


Wiring

BBK-DNT128



BBK-DNT086



Configuration

A BusBlock module can be configured using several tools. Please consult the documentation for the specific tool for details.

Quick Start

The following steps are the minimum steps to configure BusBlock module. Default values are shown in bold typeface.

Set MAC ID

Using one of the tools described above, change the device address from the default. All units are shipped from the factory as **MAC ID 63**.

Note

Set the address before attaching any component to a complete bus. This will help prevent duplicate MAC IDs on a bus.

Operation

The BusBlock I/O Module is a general purpose discrete I/O device functioning as a "Group 2 Only Server". In addition to explicit messaging, polled I/O and change-of-state/cyclic I/O is supported for the transfer of input and output information. Once a polled connection is established, the module expects a poll at least every 10 seconds, otherwise the module will time out and take action as specified in the watchdog timeout action attribute. The connection timeout can be altered by changing the Expected Packet Rate (EPR) for the polled connection, which is contained in Object 5, Instances 1, attribute 9.

The BusBlock I/O Module also supports Offline Connection Set messaging.

Input Variable

The Input Variable is contained in the **Assembly Object (Object 4, Instance 4)** and is a collection of discrete inputs. The Input Variable gets passed to the host controller as an array of 2 bytes in the BBK-DNT128 and as a single byte in the BBK-DNT086.

The inputs can be configured using the **Discrete Input Object (Object 8, Instances 1-n).**

Bit	Name	Notes
0	Input 0	
1	Input 1	
2	Input 2	
3	Input 3	
4	Input 4	
5	Input 5	
6	Input 6	
7	Input 7	
8	Input 8	BBK-DNT128 Only
9	Input 9	BBK-DNT128 Only
10	Input 10	BBK-DNT128 Only
11	Input 11	BBK-DNT128 Only
12	Reserved	BBK-DNT128 Only
13	Reserved	BBK-DNT128 Only
14	Reserved	BBK-DNT128 Only
15	Reserved	BBK-DNT128 Only

Discrete Input Object

Input State
Attribute 3

The current state of the input.

This attribute maps to bits 0-7 in the input variable of the BBK-DNT086 and bits 0-11 in the input variable of the BBK-DNT128.

Input NO/NC
Attribute 100

When the Input NO/NC is set to a value of 1 the state of the input reported in the input variable will be inverted from the physical input state.

Output Variable

The Output Variable is contained in the **Assembly Object (Object 4, Instance 34)** and is a collection of discrete outputs as defined by the **Discrete Output Object (Object 9, Instance 1-4)**.

Bit	Name	Notes
0	Output 0	
1	Output 1	
2	Output 2	
3	Output 3	
4	Output 4	
5	Output 5	
6	Output 6	BBK-DNT128 Only
7	Output 7	BBK-DNT128 Only
8	Flasher 0	
9	Flasher 1	
10	Flasher 2	
11	Flasher 3	
12	Flasher 4	
13	Flasher 5	
14	Flasher 6	BBK-DNT128 Only
15	Flasher 7	BBK-DNT128 Only

Discrete Output Object

Output State
Attribute 3

The current state of the output.

This attribute maps to bits 0-5 in the output variable of the BBK-DNT086 and 0-7 in the BBK-DNT128.

Fault Action
Attribute 5

If the Fault Action is set to 0 when a fault occurs, the output will be set to the state defined in the Fault Value. When set to 1, the outputs will be held at their last state.

Fault Value
Attribute 6

The value for the output when a fault occurs and the Fault Action is set to 0.

Idle Action
Attribute 7

When the BusBlock I/O Module is in an idle state (unallocated) and the Idle Action is set to a value of 0, the associated output will be set to the state defined in the Idle Value. If set to a value of 1 the output will be held in its last state.

Idle Value
Attribute 8

The value for the output when idle and the Idle Action is enabled.

Flasher Enable
Attribute 10

When the Flasher Enable is set to a value of 1 the associated output will flash when turned on.

This attribute maps to bits 8-15 in the output variable.

Flasher Rate
Attribute 11

The Flasher Rate is the frequency which the output will flash when enabled and on. The rate is Hertz (cycles per second).

Common Services

Common Services are explicit messaging services for DeviceNet™ with request/response parameters and a defined behavior. Not all Common Services are supported by every object.

Service Code	Service Name	Description
1 (01_{hex})	Get_Attributes_All	Returns a pre-defined listing of attributes within an object. Request data includes the object and instance.
5 (05_{hex})	Reset	Invokes the reset service for the device. Request data includes the object, instance and a single parameter.
14 ($0E_{hex}$)	Get_Attribute_Single	Returns the value of a specific attribute within an object. Request data includes the object, instance and attribute number.
16 (10_{hex})	Set_Attribute_Single	Modifies the value of an attribute within an object that is defined with GET/SET access. Request data includes the object, instance, attribute number and the new value.
17 (11_{hex})	Find_Next_Object_Instance	Returns a list of all instance ID's for existing instances of a specific object.
24 (18_{hex})	Get_Member	Returns the contents of a specific member within an attribute.

Identity Object

Class 1, Instance 1

The Identity Object provides status and general information about a device. The Identity Object is required in all DeviceNet™ products.

Attributes

Attribute	Description	Data Type	Access	Default Value
1	Vendor ID	UINT	Get	693
2	Device Type	UINT	Get	
3	Product Code	UINT	Get	
4	Revision	USINT [2]	Get	1,1
5	Status	WORD	Get	See table below
6	Serial Number	UDINT	Get	
7	Product Name	STRING	Get	BusBlock I/O Module

Attribute 5 - Status

Bit	Name	Bit Meaning	
		0	1
0	Owned	Not Owned	Allocated
1	Reserved		
2	Configured		
3	Reserved		
4	Reserved		
5	Reserved		
6	Reserved		
7	Reserved		
8	Minor Recoverable Fault	No Fault	Fault
9	Minor Unrecoverable Fault	No Fault	Fault
10	Major Recoverable Fault	No Fault	Fault
11	Major Unrecoverable Fault	No Fault	Fault
12	Reserved		
13	Reserved		
14	Reserved		
15	Reserved		

Message Router Object

Class 2, Instance 1

There are no defined attributes for the Message Router Object in the BusBlock I/O Module, nor are there any Common Services.

DeviceNet Object

Class 3, Instance 1

Attributes

Attribute	Description	Data Type	Access	Default Value
1	MAC ID (0-63)	USINT	Get/Set	63
2	Baud Rate	USINT	Get/Set	0 (125K)
3	BOI	BOOLEAN	Get/Set	1
4	Bus-Off Counter	BYTE	Get/Set	
5	Allocation Information	BYTE [2]	Get	

Assembly Object

Class 4, Instance 4 (Inputs)
Class 4, Instance 34 (Outputs)

Attributes

Attribute	Description	Data Type
3	Input Variable	See the section on Input Variable for mapping and configuration.
3	Output Variable	See the section on Output Variable for mapping and configuration.

Connection Object

Class 4,
Class 5, Instances 1, 2 and 4

Attributes

Attribute	Description	Data Type	Access	Default Value
1	State	BYTE	Get	01h
2	Instance Type	BYTE	Get	01h
3	Transport Class Trigger	BYTE	Get	82h
4	Produced Connection ID	BYTE	Get	
5	Consumed Connection ID	BYTE	Get	FFFFh
6	Initial Communications Characteristics	BYTE	Get	01h
7	Produced Connection Size	INTEGER	Get	
8	Consumed Connection Size	INTEGER	Get	
9	Expected Packet Rate	INTEGER	Get/Set	00
12	Watchdog Timeout Action	BYTE	Get/Set	00
13	Produced Connection Path Length	UINT	Get	
14	Produced Connection Path		Get	
15	Consumed Connection Path Length	UINT	Get	
16	Consumed Connection Path		Get	
17	Production Inhibit Time	UINT	Get/Set	00

Discrete Input Object

Class 8, Instances 1-8 (BBK-DNT086)
Class 8, Instances 1-12 (BBK-DNT128)

Attributes

Attribute	Description	Data Type	Access	Default Value
3	Input State	BOOLEAN	Get	
100	Input NO/NC	BOOLEAN	Get/Set	0 [disabled]

Discrete Output Object

Class 9, Instances 1-6 (BBK-DNT086)
Class 9, Instances 1-8 (BBK-DNT128)

Attributes

Attribute	Description	Data Type	Access	Default Value
3	Output State	BOOLEAN	Get/Set	
5	Fault Action	BOOLEAN	Get/Set	0 [Fault Value attribute]
6	Fault Value	BOOLEAN	Get/Set	0
7	Idle Action	BOOLEAN	Get/Set	0 [Idle Value attribute]
8	Idle Value	BOOLEAN	Get/Set	0
10	Enable Flash	BOOLEAN	Get/Set	0 [disabled]
11	Flash Rate (Hertz)	BYTE	Get/Set	