

**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**

**Warranty/Remedy**

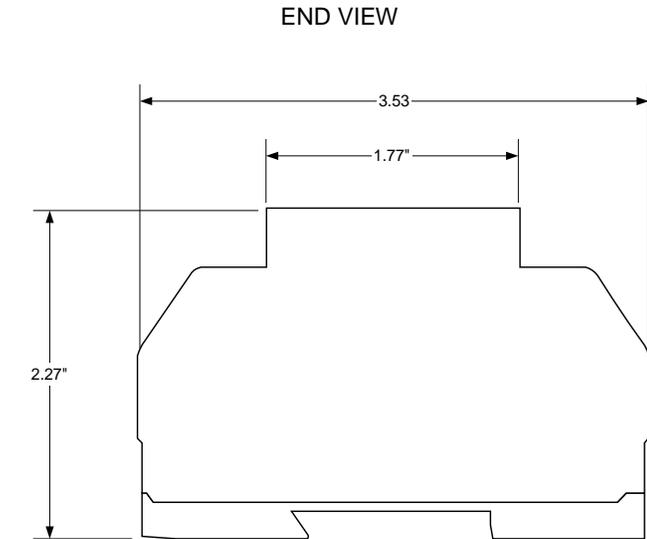
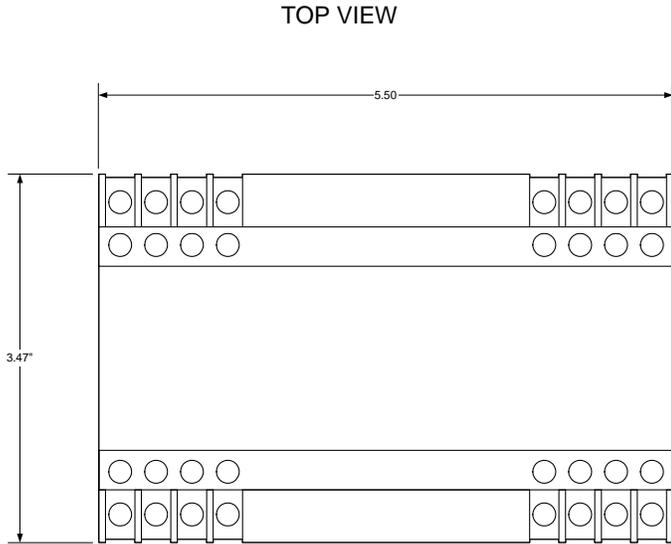
Seller warrants its products to be free from defects in design, material and workmanship under normal use and service. Seller will repair or replace without charge any such products it finds to be so defective on its return to Seller within 18 months after date of shipment by Seller. **The foregoing 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.

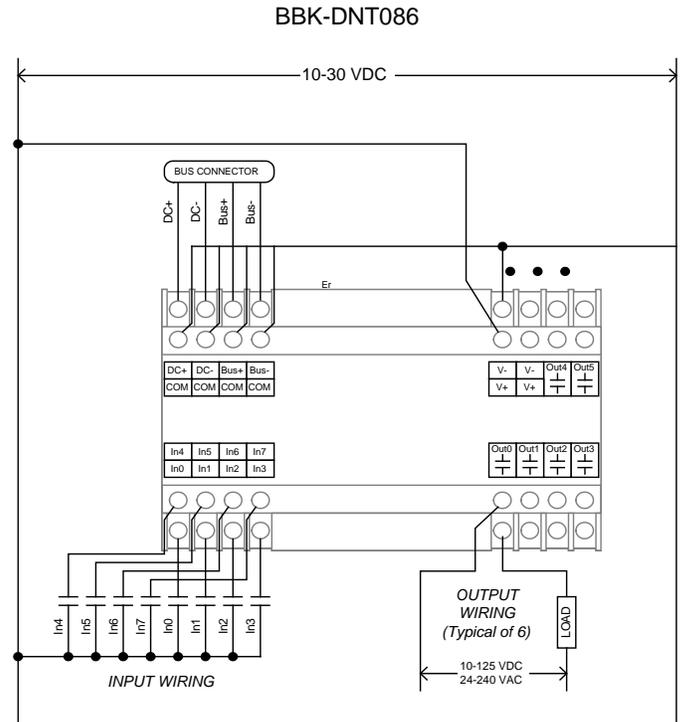
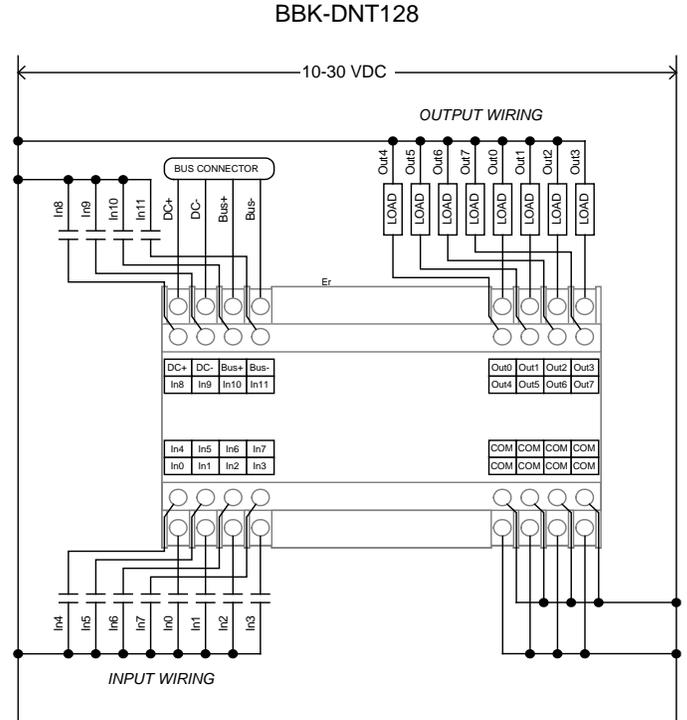
All information contained herein, including illustrations, specifications and dimensions, is believed to be reliable as of the date of publication, but is subject to change without notice.

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

**Dimensions**



**Wiring**



## 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 <sub>hex</sub> )	Get_Attributes_All	Returns a pre-defined listing of attributes within an object. Request data includes the object and instance.
5 (05 <sub>hex</sub> )	Reset	Invokes the reset service for the device. Request data includes the object, instance and a single parameter.
14 (0E <sub>hex</sub> )	Get_Attribute_Single	Returns the value of a specific attribute within an object. Request data includes the object, instance and attribute number.
16 (10 <sub>hex</sub> )	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 <sub>hex</sub> )	Find_Next_Object_Instance	Returns a list of all instance ID's for existing instances of a specific object.
24 (18 <sub>hex</sub> )	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 5 (Inputs) Class 4, Instance 35 (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	