## 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.

## 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.

## Specifications

| Part Numbers | 12 Input / 8 Output | | BBK-DIG128 |
|---|---|---|---|
| | 8 Input / 6 Relays | | BBK-DIG086 |
| **Electrical** | SDS Voltage Range | | 11-25 VDC |
| | Current Consumption | | 60 mA |
| | Data Rates | | 125, 250, 500 and 1000 kbps |
| **Inputs** | Type | | Current Sinking (Sourcing load) |
| | Number | BBK-DIG128 | Twelve (12) |
| | | BBK-DIG086 | Eight (8) |
| | Voltage Range | | 10-28 VDC |
| | Maximum Current | | 20 mA per input |
| | Isolation | | 1500 Vrms |
| **Outputs** **-DIG128** | Type | | Current Sinking |
| | Number | | Eight (8) |
| | Voltage Range | | 10-28 VDC |
| | Maximum Current | | 200 mA |
| | Isolation | | 1500 Vrms |
| **-DIG086** | 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 |
| | | SDS | Green |
| | | I/O | Green |

## Dimensions

## Wiring

### TOP VIEW
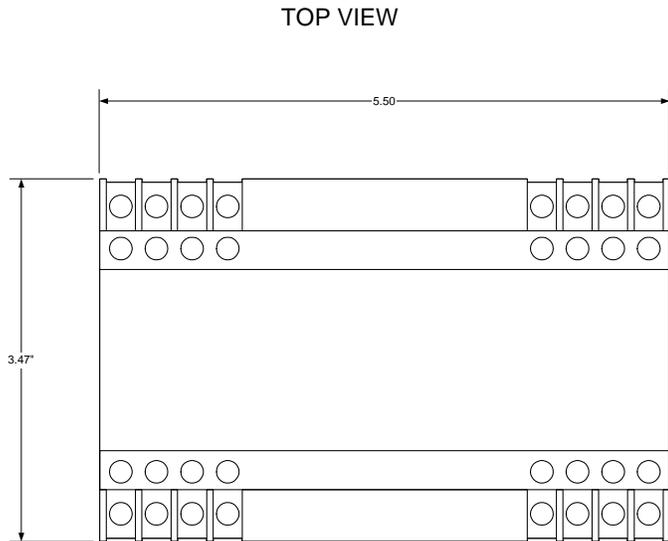


### END VIEW
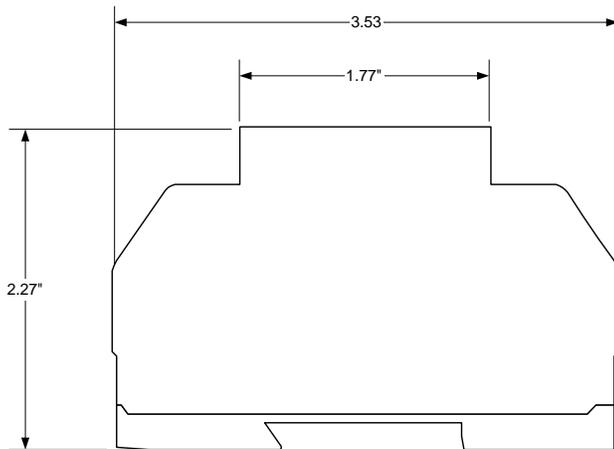


BBK-DIG128
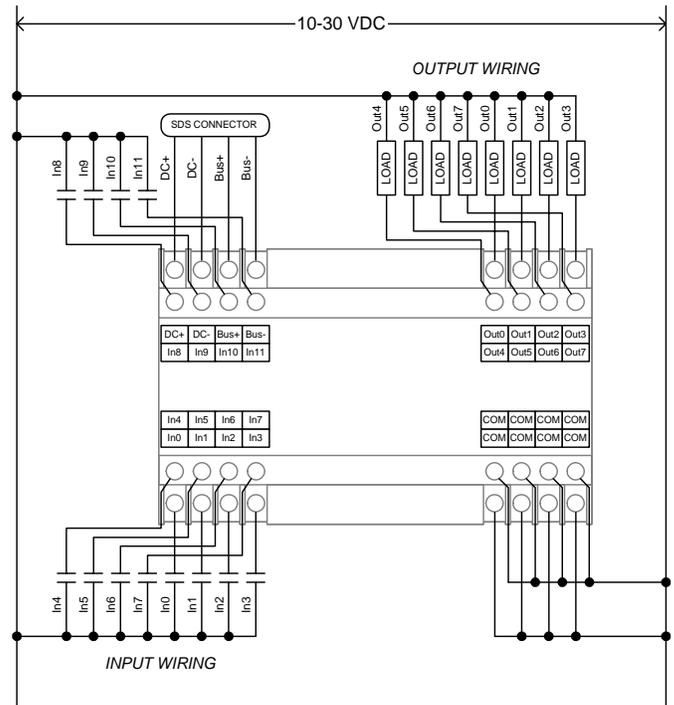


BBK-DIG086
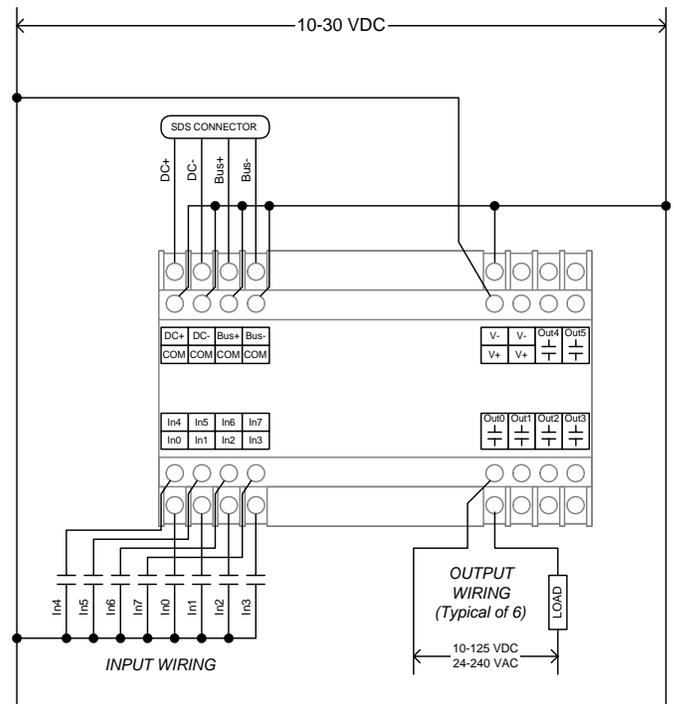
## Configuration

A BusBlock module can be configured using several tools. The information below summarizes the configuration tools available and hardware requirements for each tool.

### Holjeron Device Manager for SDS

Requires an HSIM Portable (RS-232 to CAN converter) that connects to the serial port of a personal computer. The bus **or** the HSIM Portable must have power.

### Honeywell hand-held activator

The Honeywell activator may not supply enough power by itself. The SDS bus might require external power to be applied.

### Think & Do Software

Requires a Honeywell PC Interface Card with separate bus power. Follow the instructions for installing the SDS Driver in I/O View.

## Quick Start

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

### Set Device Address

Using one of the tools described above, change the device address from the default. All units are shipped from the factory as **address 126**.

> **Note**
>
> *Set the address before attaching any component to a complete bus. This will help prevent duplicate addresses on a bus.*

## Operation

BusBlock modules are simple digital input/output devices. Each input and output is available to the host controller. There are minimal configuration options to affect the behavior of the BusBlock Module, as described on the following pages.

> **Note**
>
> *When using a packaged control system, such as Think & Do Software, it is not necessary to explicitly read input and output variables. The SDS I/O Driver and Interface Card perform this function. All that is required is to map inputs and outputs as described in the software user manual.*

![Holjeron logo] **Holjeron** *smart. moves.*

# BusBlock Digital I/O Module
### for the Smart Distributed System

BBK-4040-5                    Page 4                    **TECHNICAL DATA**

## Inputs

| Bit | Name | Description |
|-----|------|-------------|
| 0 | In0 | Input 0 |
| 1 | In1 | Input 1 |
| 2 | In2 | Input 2 |
| 3 | In3 | Input 3 |
| 4 | In4 | Input 4 |
| 5 | In5 | Input 5 |
| 6 | In6 | Input 6 |
| 7 | In7 | Input 7 |
| 8 | In8 | Input 8 (-DIG128 Only) |
| 9 | In9 | Input 9 (-DIG128 Only) |
| 10 | In10 | Input 10 (-DIG128 Only) |
| 11 | In11 | Input 11 (-DIG128 Only) |

The BusBlock Digital I/O module processes inputs as follows:
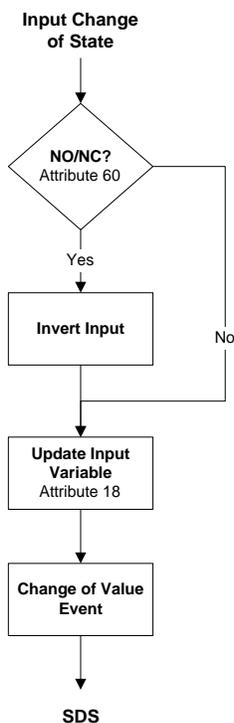


### Input Variable

**Attribute 18** functions as the input attribute for the BusBlock Digital I/O Module. Whenever an event is generated that reports the state of inputs, the data in attribute 18 will be passed.

### Input Event Mode

Most systems will require a BusBlock I/O Module to generate an event whenever one or more inputs change state. This requires the **Unsolicit Mode (attribute 6)** be enabled by setting its value to **1**. Other options are to disable change of value events (Unsolicit Mode = 0) or use the **Cyclic Timer (Attribute 10)** by setting it to some non-zero value. The Cyclic Timer will transmit the input variable on an interval equal to the value in the Cyclic Timer attribute times 10 milliseconds (0.01 seconds).

### Input NO/NC

The BusBlock Digital I/O Module can be configured to invert the state of an incoming input point by turning on the corresponding bit in **Input NO/NC (attribute 60)**.

## Outputs

| Bit | Name | Description |
|-----|------|-------------|
| 0 | Out0 | Output 0 |
| 1 | Out1 | Output 1 |
| 2 | Out2 | Output 2 |
| 3 | Out3 | Output 3 |
| 4 | Out4 | Output 4 |
| 5 | Out5 | Output 5 |
| 6 | Out6 | Output 6 (-DIG128 Only) |
| 7 | Out7 | Output 7 (-DIG128 Only) |

Outputs received by the BusBlock from the host controller are processed per the chart below:
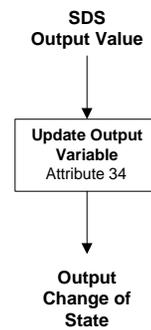


### Output Variable

**Attribute 34** functions as the output attribute for the BusBlock Digital I/O Module. Whenever the host controller changes the state of an output it is writing to attribute 34.

## Diagnostics

The Diagnostics Register (**attribute 9**) is one byte and contains the minimum diagnostics required for the Smart Distributed System.

*Diagnostic Register Bit Definitions Byte 0*

| Bit | Name | Description |
|-----|--------|------------------------|
| 0 | CHKSUM | ROM checksum error |
| 1 | WDOG | Output watchdog timer expired |
| 2 | BUSOFF | Off us communications error |
| 3 | DEVERR | Fatal component error |
| 4 | NODE | Missing node detected |
| 5 | RSVD | Reserved |
| 6 | RSVD | Reserved |
| 7 | EPRM | EEPROM error detected |

SDS host controllers are equipped to receive a diagnostic event, then automatically obtain the information from the **Diagnostic Register (attribute 9)**. Consult the documentation for the host controller being used to determine how errors are handled.

### CHKSUM

A ROM checksum error is generated on power up if there is a memory error test.

### WDOG

The WDOG diagnostic occurs whenever the **Output Watchdog Timer (attribute 50)** times out.

The Output Watchdog Timer is reset whenever the BusBlock module receives a message over SDS. If a message is not received in the time entered any point configured as an output will be set to the state for that bit in the **Default Output (attribute 51)**.

The Output Watchdog Timer is entered in increments of 10 milliseconds (0.01 seconds). For example, a value of 100 equals 1 second.

### BUSOFF

The CAN controller on the BusBlock module counts error messages. Every error message increments a counter by 8, every good message decrements the counter by 1. If the counter reaches 128 then the module will go BUSOFF, and will need to be reset by the host controller.

### DEVERR

The DEVERR diagnostic bit will be set if a fatal error is detected within the component.

### NODE

The host controller will report the node is missing using the NODE bit.

### EPRM

The EPRM error will occur when the microprocessor on the BusBlock module is unable to read or write EEPROM.

### Other Useful Diagnostics

BusBlock modules are equipped with two attribute settings for managing the service life of the module.

The first, **Reset Count (attribute 53)** is the number of times the module has been reset. This can be due to a power cycle, or to some other external factor. A product on a network that is being reset more often than other products on the same network is experiencing difficulties and should be replaced.

The second, **Service Time (attribute 54)** is the number of hours the module has been in operation.

# BusBlock Digital I/O Module
## for the Smart Distributed System
### TECHNICAL DATA

**Attributes**

| ID | Description | R/W | Data Type | Size | Count | Default |
|----|-------------|-----|-----------|------|-------|---------|
| 0 | Network Data Descriptor | R | Unsigned | Byte | 6 | Dependent on product |
| 1 | Baud Rate | R | Unsigned | Byte | 1 | 0 [autobaud] |
| 2 | Object Model | R | Unsigned | Byte | 4 | 1, 41, 5, 4 |
| 3 | Vendor Id | R | Unsigned | Word | 1 | 9 [Holjeron] |
| 4 | Logical Address | R | Unsigned | Byte | 1 | 125 |
| 6 | Unsolicit Mode | W | Boolean | Undef | 1 | 1 [enabled] |
| 7 | Software Version | R | Character | Undef | 12 | |
| 8 | Diagnostic Counter | R | Unsigned | Byte | 1 | |
| 9 | Diagnostic Register | W | Unsigned | Byte | 1 | |
| 10 | Cyclic Timer | W | Unsigned | Word | 1 | 0 [disabled] |
| 11 | Serial Number | R | Unsigned | Long | 1 | |
| 12 | Date Code | R | Character | Undef | 4 | |
| 13 | Catalog Listing | R | Character | Undef | 32 | BBK-DIG128 (086) |
| 14 | Vendor | R | Character | Undef | 32 | Holjeron |
| 15 | Description | W | Character | Undef | 32 | BusBlock I/O Module |
| 18 | Input Variable | R | Boolean | Undef | 12/8 | |
| 34 | Output Variable | W | Boolean | Undef | 8/6 | 00h |
| 50 | Output Watchdog Timer | W | Unsigned | Word | 1 | 0  [disabled] |
| 51 | Default Output | W | Boolean | Undef | 8/6 | 00h |
| 53 | Reset Count | R | Unsigned | Word | 1 | |
| 54 | Service Time | R | Unsigned | Word | 1 | |
| 55 | Manufacturing Codes | R | Unsigned | Byte | 1 | 140 |
| 56 | Tag Name | W | Character | Undef | 32 | |
| 60 | Input NO/NC | W | Boolean | Undef | 12/8 | 000h (N.O.) |

**Actions**

| ID | Description | Request Data | Response Data |
|----|-------------|--------------|---------------|
| 0 | NOOP | --- | --- |
| 1 | Change Address | New logical address (0…125) | |
| 2 | Self Test | --- | --- |
| 6 | Clear All Errors | --- | --- |
| 8 | Enroll Logical Device | Address | Vendor Id, Serial Number |
| 10 | Change Baud Rate | New baud rate (0…4) | |
| 51 | Force State | Input variable value (0…4095) | |
| 52 | Remove Forced States | | |
| 53 | Read Attribute Descriptor | Attribute Id (0…255) | Attribute ID, Attribute Descriptor |
| 57 | Password | Password | |
| 60 | Reset Factory Defaults | | |

**Events**

| ID | Description | Event Data |
|----|-------------|------------|
| 0 | Diagnostic Event | Number of diagnostic bits enabled in attribute 9 |
| 3 | End-Of-Timer | Attribute, Input variable |
| 6 | Change of Value | Attribute, Input variable |
| 7 | NOOP | --- |