Description

The Holjeron BusBlock Digital I/O Module is designed to handle small amounts of digital inputs and/or outputs in a limited amount of space. The BusBlock Digital I/O Module has 8 points. Each point can be configured as either an input or an output.

Field terminations are captive screw terminals.

Other BusBlock products include analog input, analog output and frequency modules.

Specifications

Part Number	8 Point Digital I/O Module		BBK-DIG108
Electrical	SDS Voltage Range		11-25 VDC
	Current Consumption		60 mA
	Data Rates		125, 250, 500 and 1000 kbps
Inputs	Type		Current Sourcing (PNP devices)
	Number		Up to eight (8)
	Voltage		10-30 VDC
	Maximum Current		20 mA per input
	Isolation		1500 Vrms
Outputs	Type		Current Sinking (NPN Loads)
	Number		Up to eight (8)
	Voltage		10-30 VDC
	Maximum Current		2.5 Amps per output
	Isolation		1500 Vrms
Environmental	Temperature	Storage	-40° to 85° C (-40° to 185° F)
		Operating	-25° to 70° C (-13° to 158° F)
	Humidity		5-95% RH, non-condensing
	Vibration		2G at 10 to 500 Hz
	Shock		10G
Physical	Dimensions		2.95" H x 2.17" W x 4.33" D
	Weight		12 oz
	Color		Bone Gray
	Case Material		Polycarbonate
	Mounting		DIN Rail or foot mount
	Terminations		Cage Clamp Screw Terminal
	Indication	Power	Green
		Error	Red
		SDS	Green
		I/O Power	Green

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

Dimensions
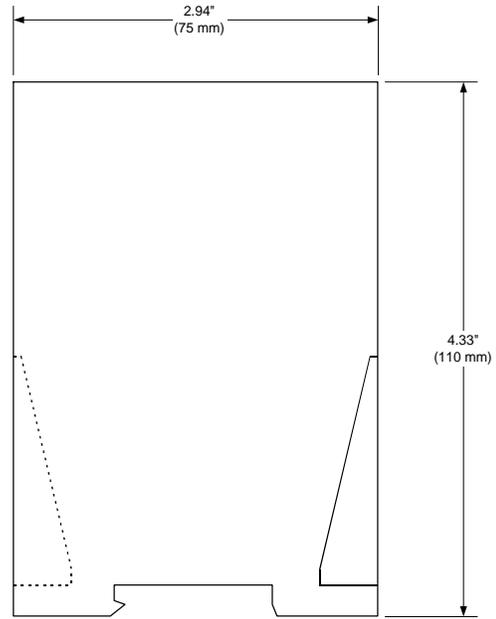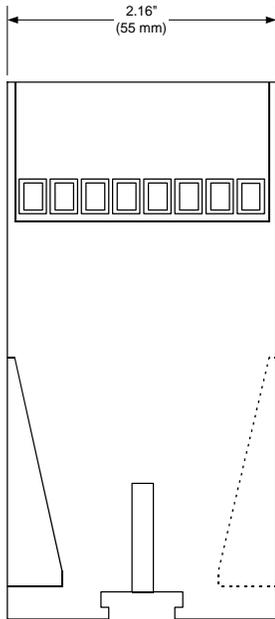
Wiring
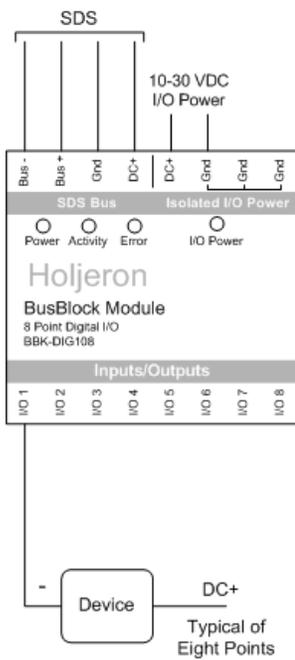
Configuration Tools

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.

Tag Name

Tag Name (attribute 56) is a 32-character string that the user can enter to describe the functionality and/or location of each channel of the BusBlock Digital I/O Module.

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

Operation

The BusBlock Digital I/O module reads inputs and writes outputs using the processes defined below.

Input Change of State

NO/NC?
Attribute 60

Yes

Invert Input

No

Update Input Variable
Attribute 18

Change of Value Event

SDS

SDS Output Value / **Error Message**

Output?
Attribute 62

No

Yes

Update Output Variable
Attribute 34

Output Change of State
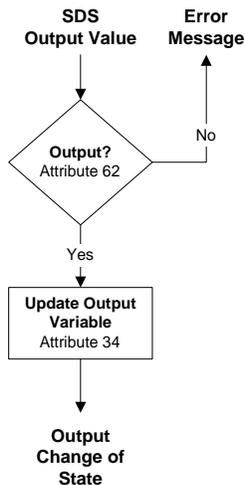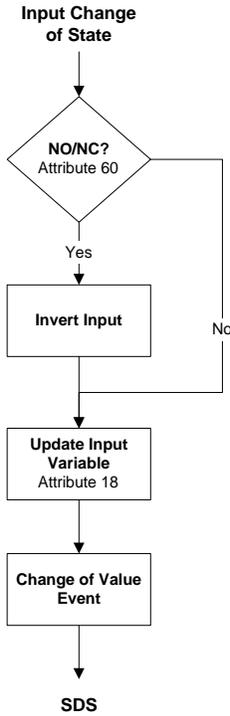
Input NO/NC

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

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.

> **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.*

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).

Output Configuration

Each point on the BusBlock Digital I/O Module can be used as an input or an output. By default, each point is an input. Configuring a point as an output requires setting a corresponding bit to a value of 1 in the **Output Mast (attribute 62)**. The table below lists each bit and its associated numeric value. Adding the values for each bit that is to be used as an output will provide a numeric entry for the attribute value.

I/O Point	Value
0	1
1	2
2	4
3	8
4	16
5	32
6	64
7	128

For example, if the first four points are to be used as outputs the value for the attribute would be 15 (1+2+4+8).

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 two bytes and contains the minimum diagnostics required for the Smart Distributed System, plus additional diagnostics specific to the BusBlock Digital I/O module.

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

Diagnostic Register Bit Definitions Byte 1

Bit	Name	Description
0	SRVLIFE	Service Life exceeded
1	RSVD	Reserved
2	IOERR	I/O error
3	RSVD	Reserved
4	RSVD	Reserved
5	RSVD	Reserved
6	RSVD	Reserved
7	RSVD	Reserved

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 **NO/NC (attribute 60)**.

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.

SRVLIFE

BusBlock modules are equipped with two attribute settings for managing the service life of the module. The first, **Service Time (attribute 63)** is the number of hours the module has been in operation. The second, **Service Life (attribute 64)** is set by the user, and is the number of service hours before the unit requires maintenance and/or replacement. When the Service Time value reaches the Service Life setting then an SRVLIFE diagnostic is transmitted.

IOERR

The IOERR diagnostic is enabled when the microprocessor on the BusBlock encounters communication errors with the digital I/O controller.

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	3	12h,01h,07h,22h,81h,07h
1	Baud Rate	R	Unsigned	Byte	1	0 [autobaud]
2	Object Model	R	Unsigned	Byte	5	1, 41, 5, 2, 2
3	Vendor Id	R	Unsigned	Word	1	9 [Holjeron]
4	Logical Address	R	Unsigned	Byte	1	125
6	Un/solicited Mode	W	Boolean	Undef	1	1
7	Software Version	R	Character	Undef	12	
8	Diagnostic Counter	R	Unsigned	Byte	1	
9	Diagnostic Register	W	Unsigned	Byte	2	
10	Cyclic Timer	W	Unsigned	Word	1	0
11	Serial Number	R	Unsigned	Long	1	
12	Date Code	R	Character	Undef	4	
13	Catalog Listing	R	Character	Undef	32	BBK-DIG108
14	Vendor	R	Character	Undef	32	Holjeron
15	Description	W	Character	Undef	32	8 Point Digital I/O
18	Input Variable	R	Boolean	Undef	8	
34	Output Variable	W	Boolean	Undef	8	
50	Output Watchdog Timer	W	Unsigned	Word	1	0 [disabled]
55	Manufacturing Codes	R	Unsigned	Byte	1	0
56	Tag Name	W	Character	Undef	32	
60	NO/NC	W	Boolean	Undef	8	00h
62	Output Mask	W	Boolean	Undef	8	00h
63	Service Time	R	Unsigned	Word	1	
64	Service Life	W	Unsigned	Word	1	5000

Actions

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

Events

ID	Description	Event Data
0	Diagnostic Event	Number of diagnostic bits set in Attribute 9
3	End of Timer	Attribute, Input Variable
6	Change of Value	Attribute, Input Variable
7	NOOP	---