Description

The Holjeron Quad Digital I/O Board is designed to handle small amounts of digital inputs and/or outputs in a limited amount of space. The Quad Digital I/O Board has 4 points. Each point can be configured as either an input or an output.

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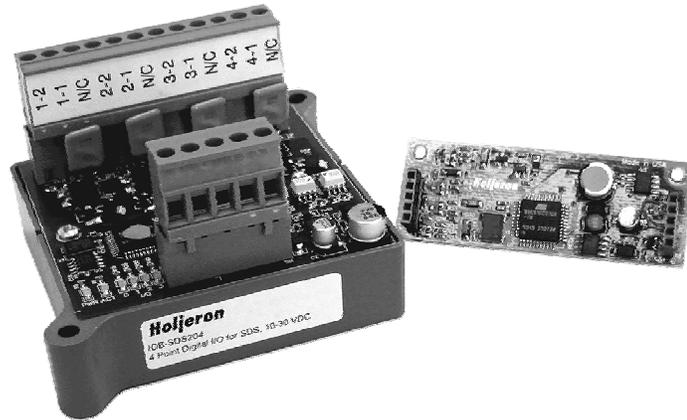
Warranty/Remedy

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 Number	4 Point Digital I/O Board		IOB-SDS204
	4 Point Interface Board, No I/O		IOB-SDS001
Electrical	SDS Voltage Range		11-25 VDC
	Current Consumption		60 mA
	Data Rates		125, 250, 500 and 1000 kbps
Inputs (204 only)	Type		Current Sinking (PNP devices)
	Number		Up to four (4)
	Voltage		10-30 VDC
	Maximum Current		20 mA per input
	Isolation		1500 Vrms
Outputs (204 only)	Type		Current Sinking
	Number		Up to four (4)
	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	IOB-SDS204	3.38" H x 3.38" W x 2.00" D
		IOB-SDS001	2.69" H x 1.00" W
	Weight		oz
	Color		Bone Gray
	Case Material		Polycarbonate
	Mounting		DIN Rail or Foot mount
	Terminations		Plug-In Screw Terminal
	Indication	Power	Green
		Activity	Green
		I/O	Red

Dimensions

IOB-SDS204
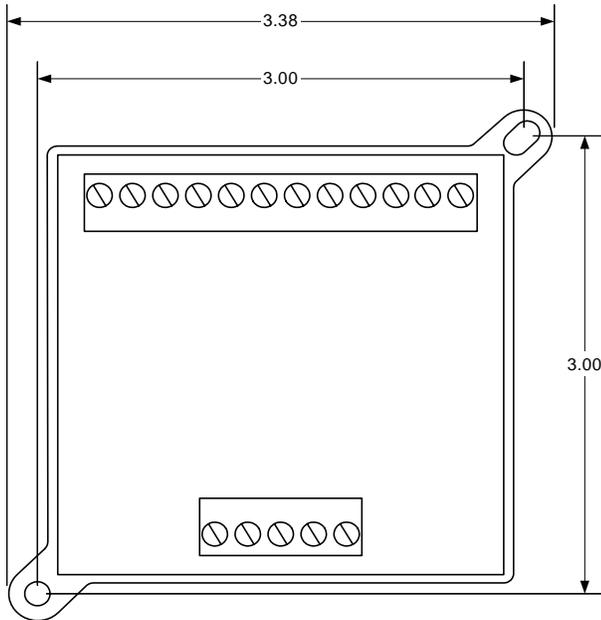
IOB-SDS001
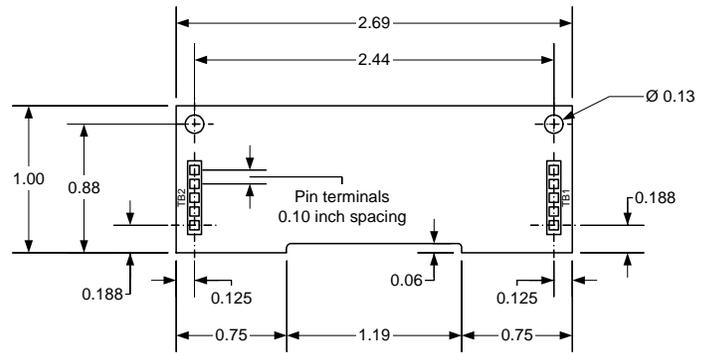
Wiring

Equivalent Circuit
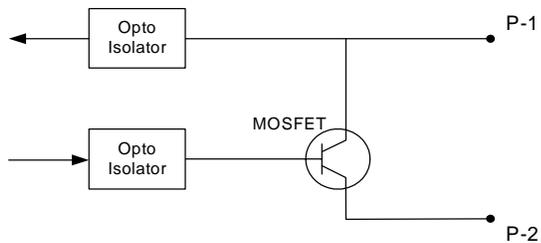
Configuration Tools

A Quad Digital I/O Board 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 a Quad Digital I/O Board. 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, 125, 124 and 123**.

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

Number of Modules

Number of Modules (attribute 58), is the number of I/O points being used (1 – 4). When the Device Model Type is set to multiple address, this attribute permits for unused slots to not consume an SDS address.

Device Model

Device Model Type (attribute 59), when set to 1, configures the Quad Digital I/O Board as four separate SDS addresses. When set to 0, the Quad Digital I/O Board consumes a single SDS address with four I/O points. The default is 0 (multiple addresses).

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 Quad Digital I/O Board.

Operation

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

Input Change of State
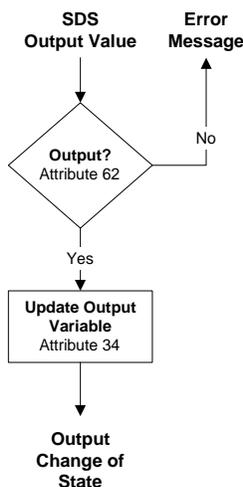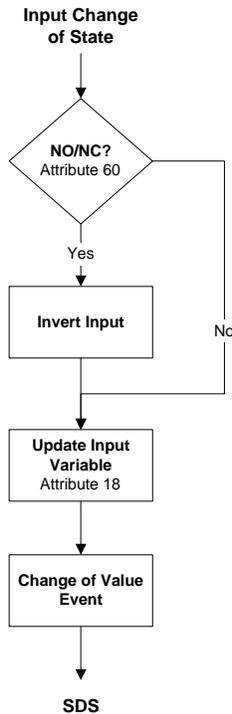
Input NO/NC

The Quad Digital I/O Board 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 Quad Digital I/O Board. 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 Quad I/O Board 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 Quad Digital I/O Board can be used as an input or an output. By default, each point is an input. Configuring a point as an output requires setting the **Configuration Register (attribute 61)** to value of 1

Output Variable

Attribute 19 functions as the output attribute for the Quad Digital I/O Board. Whenever the host controller changes the state of an output it is writing to attribute 19.

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

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 10)** times out. This is only active for I/O points configured as an output.

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 Quad I/O Board 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 Quad I/O Board is unable to read or write EEPROM.

Input Attributes

Device Model Type = 1
Configuration = 0

ID	Description	R/W	Data Type	Size	Count	Default
0	Network Data Descriptor	R	Unsigned	Byte	6	18h,01h,00h,00h,00h,00h
1	Baud Rate	R	Unsigned	Byte	1	0 [autobaud]
2	Object Model	R	Unsigned	Byte	4	1, 1, 1, 3
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	Byte	1	0
11	Serial Number	R	Unsigned	Long	1	
12	Date Code	R	Character	Undef	4	
13	Catalog Listing	R	Character	Undef	32	IOB-SDS204
14	Vendor	R	Character	Undef	32	Holjeron
15	Description	W	Character	Undef	32	Quad Digital I/O
18	Input Variable	R	Boolean	Undef	8	
56	Tag Name	W	Character	Undef	32	
58	Number of Slots	W	Unsigned	Byte	1	4
59	Device Model Type	W	Unsigned	Byte	1	1
60	NO/NC	W	Boolean	Undef	1	0
61	Configuration Register	W	Boolean	Undef	1	00h

Output Attributes

ID	Description	R/W	Data Type	Size	Count	Default
0	Network Data Descriptor	R	Unsigned	Byte	3	18h,01h,00h,00h,00h,00h
1	Baud Rate	R	Unsigned	Byte	1	0 [autobaud]
2	Object Model	R	Unsigned	Byte	5	1, 3, 1, 1
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	Watchdog Timer	W	Unsigned	Byte	1	0
11	Serial Number	R	Unsigned	Long	1	
12	Date Code	R	Character	Undef	4	
13	Catalog Listing	R	Character	Undef	32	IOB-SDS204
14	Vendor	R	Character	Undef	32	Holjeron
15	Description	W	Character	Undef	32	Quad Digital I/O
19	Output Variable	W	Boolean	Undef	1	
56	Tag Name	W	Character	Undef	32	
58	Number of Slots	W	Unsigned	Byte	1	4
59	Device Model Type	W	Unsigned	Byte	1	1
60	NO/NC	W	Boolean	Undef	1	0
61	Configuration Register	W	Boolean	Undef	1	00h

Attributes

Device Model Type = 0

ID	Description	R/W	Data Type	Size	Count	Default
0	Network Data Descriptor	R	Unsigned	Byte	6	18h,01h,00h,00h,00h,00h
1	Baud Rate	R	Unsigned	Byte	1	0 [autobaud]
2	Object Model	R	Unsigned	Byte	4	1, 1, 1, 3
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	Byte	1	0
11	Serial Number	R	Unsigned	Long	1	
12	Date Code	R	Character	Undef	4	
13	Catalog Listing	R	Character	Undef	32	IOB-SDS204
14	Vendor	R	Character	Undef	32	Holjeron
15	Description	W	Character	Undef	32	Quad Digital I/O
18	Input Variable	R	Boolean	Undef	8	
56	Tag Name	W	Character	Undef	32	
58	Number of Slots	W	Unsigned	Byte	1	4
59	Device Model Type	W	Unsigned	Byte	1	1
60	NO/NC	W	Boolean	Undef	1	0
61	Configuration Register	W	Boolean	Undef	1	00h

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	---