SNAP High-Density Digital I/O Modules

Features

⟱ 16 or 32 digital input points or output points in one compact SNAP module

⟱ Up to 16 high-density digital modules on a SNAP rack, making up to 512 digital points available on one rack

⟱ Convenient pluggable wiring harness, breakout racks, and header cables (available separately)

⟱ Rugged packaging

⟱ Operating temperature: 0 to 70 °C

SNAP-IDC-32 high-density digital input module

Description

SNAP high-density digital (HDD) modules from Opto 22 provide 16 or 32 digital input or output points in one compact SNAP module. All HDD modules work with the SNAP PAC System, which consists of SNAP PAC controllers and brains, SNAP PAC racks, SNAP I/O modules, and PAC Project software.

SNAP high-density digital modules are ideal for OEMs and for anyone who has high point-count applications. The high-density point configuration reduces per-point costs of digital I/O systems by providing up to eight times as many I/O points in the same space.

The following high-density digital modules are available:

- The **SNAP-IDC-32** digital input module, with 32 input points, can be used to sense on/off status for 10–32 VDC inputs from sources such as proximity switches, limit switches, push buttons, and pilot switches.

- The **SNAP-IDC-16** digital input module offers 16 points with channel-to-channel isolation. It can sense on/off status for 10–32 VDC/VAC loads.

- **SNAP-IAC-16** and **SNAP-IAC-A-16** digital input modules each have 16 points with channel-to-channel isolation. These modules sense on/off status for 90–140 VAC (SNAP-IAC-16) or 180–280 VAC (SNAP-IAC-A-16).

- SNAP-ODC-32-SRC and SNAP-ODC-32-SNK digital output modules have 32 points and can switch on and off 5–60 VDC loads, either sourcing or sinking.

All HDD input modules feature automatic counting and latching. The DC models are ideal for detecting low-voltage auxiliary contacts.

Part Numbers

Part	Description
Modules	
SNAP-IDC-32	SNAP 32-point digital input module, 10–32 VDC
SNAP-IDC-16	SNAP isolated 16-point digital input module, 10–32 VDC/VAC
SNAP-IAC-16	SNAP isolated 16-point digital input module, 90–140 VAC/VDC
SNAP-IAC-A-16	SNAP isolated 16-point digital input module, 180–280 VAC/VDC
SNAP-ODC-32-SRC	SNAP 32-point digital output module, 5–60 VDC load sourcing
SNAP-ODC-32-SNK	SNAP 32-point digital output module, 5–60 VDC load sinking
Accessories	
SNAP-HD-ACF6	6 ft. (1.8 m) wiring harness assembly for SNAP 16-point digital modules
SNAP-HD-CBF6	6 ft. (1.8 m) wiring harness for SNAP 32-point digital modules
SNAP-HD-BF6	6 ft. (1.8 m) header cable for SNAP 32-point digital modules and breakout racks
SNAP-IDC-HDB	Fused breakout rack for SNAP 32-point digital input modules
SNAP-ODC-HDB	Fused breakout rack for SNAP 32-point output modules
SNAP-HD-G4F6	6 ft. (1.8 m) header cable for SNAP-ODC-32-SNK digital modules and G4PB16 mounting racks
OPTOTERMINAL-G20	Terminal with operator controls for use with SNAP high-density digital modules

Comparing SNAP High-Density and 4-Channel Digital Modules

Item	SNAP High-Density Digital Modules	4-Channel SNAP Digital Modules
Number of points on module	16 or 32, depending on module	4
Isolation and fusing	**16-point input modules:** Each point is optically isolated from other points on the module. **32-point input and output modules:** The module is divided into four groups of eight points. Groups are isolated from each other, but points within a group are not isolated from each other. Groups must be externally fused.	**Input modules:** Each point is optically isolated from other points on the module. **Most output modules:** Points are not isolated from each other. Points share a common fuse. For isolated modules, see the *SNAP Digital Ouput Modules Data Sheet* (form #1144).
Status LEDs	None; use the handheld OptoTerminal-G20 for module diagnostics and commissioning, or for 32-point modules, connect to an optional breakout rack.	One for each point, located on top of module.
Polling time from I/O processor to module[1]	2–30 ms typical[2]	0.5–2 ms typical[2]
Module turn-on/off time[1]	16-point input modules: 15–20 ms 32-point input modules: 6 ms Output modules: 100 microseconds	Varies by module. Examples: • SNAP-IDC5-FAST: 25 microseconds • SNAP-IDC5: 5 ms turn-on, 15 ms turn-off
On/off status	Yes	Yes
Input latching	Yes	Yes
Counting on digital input modules	Counting occurs on the module.[3] Counting is available with any compatible I/O processor (including SNAP-PAC-R2 and SNAP-PAC-EB2). Counting speeds: On 32-point modules, 0–50 Hz @ 50% duty cycle On 16-point modules, 0–25 Hz @ 50% duty cycle	High-speed counting occurs on the I/O processor (brain or on-the-rack controller) and can be configured for any point. (High-speed counting is available on SNAP-PAC-R1 and SNAP-PAC-EB1 processors.) Counting speed varies based on the processor and the speed of the module. Example: SNAP-PAC-EB1 brain with SNAP-IDC5-FAST: up to 20 KHz
Watchdog timer	Firmware 8.1 and higher, yes. Firmware 8.0 and lower, no.	Yes
On-pulse and off-pulse measurement	Firmware 8.1 and higher, yes. Firmware 8.0 and lower, no.	Yes
Pulse generation	Yes	Yes
Digital events	Firmware 8.1 and higher, yes. Firmware 8.0 and lower, no.	Yes

1 Actual turn-on and turn-off times equal the polling time plus the module time.
2 Polling time varies based on the SNAP I/O processor (brain or on-the-rack controller), processor configuration, and Ethernet host communication activity.
3 The high-density digital module uses a 16-bit counter, but the processor used with the module accumulates counts to 32 bits by periodically getting and clearing the module's counts and adding to current values. Update time varies based on number of modules and Ethernet communication demands.

SNAP High-Density Digital I/O Modules

Specifications

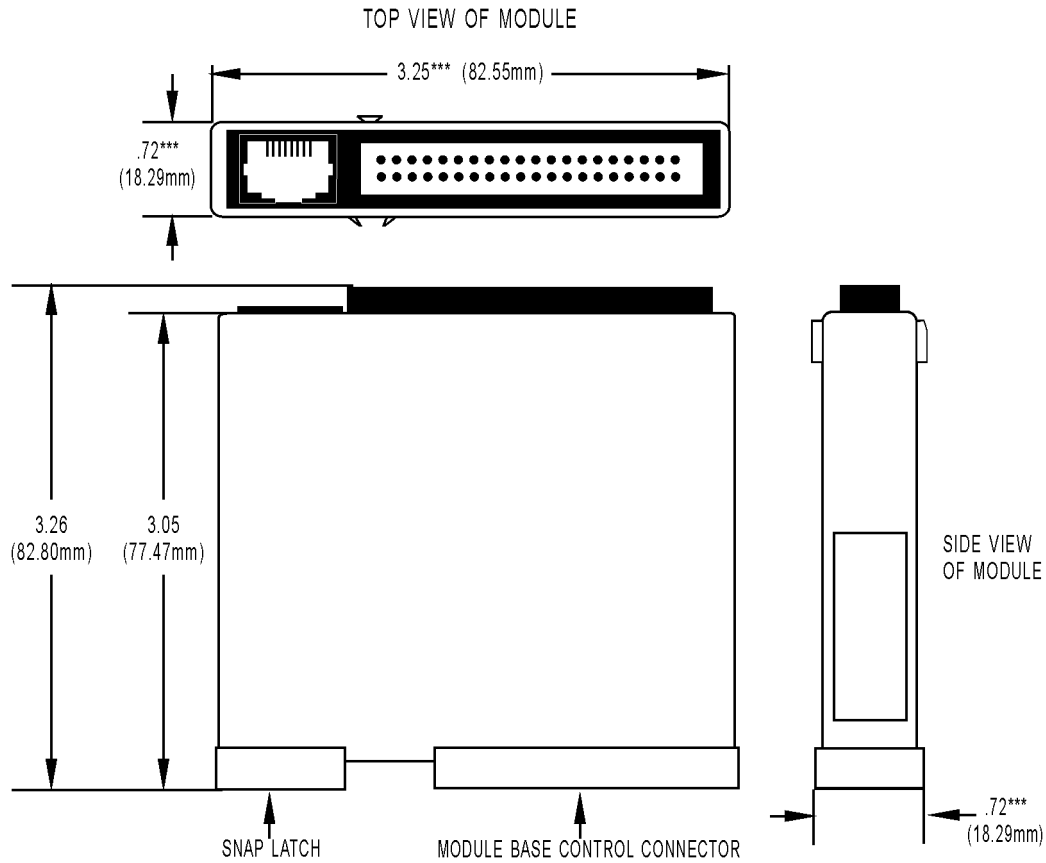|	SNAP-IDC-32	SNAP-IDC-16	SNAP-IAC-16	SNAP-IAC-A-16
Input Range	10–32 VDC	10–32 VDC/VAC	90–140 VAC/VDC	180–280 VAC/VDC
Nominal Voltage Range	24 VDC	24 VDC	120 VAC	240 VAC
Input Resistance	20 K ohms	44 K ohms	300 K ohms	940 K ohms
Logic Voltage and Current	5 VDC ± 0.1 @ 150 mA	5 VDC ± 0.1 @ 150 mA	5 VDC ± 0.1 @ 150 mA	5 VDC ± 0.1 @ 150 mA
Input Arrangement	32 input channels; 4 groups of 8 inputs each (Points in each group share a common negative connection.)	16 isolated input channels	16 isolated input channels	16 isolated input channels
Channel-to-Channel Isolation	No channel-to-channel isolation; 100 V group-to-group isolation	250 V working, 1500 V transient	250 V working, 1500 V transient	250 V working, 1500 V transient
Maximum Number of HDD Modules on One Mounting Rack	16	16	16	16
Indicators	None; use optional OptoTerminal-G20 diagnostic display or breakout rack.	None; use optional OptoTerminal-G20 diagnostic display.	None; use optional OptoTerminal-G20 diagnostic display.	None; use optional OptoTerminal-G20 diagnostic display.
ON Voltage	10 VDC @ 0.5 mA	10 VDC @ 0.230 mA	90 VAC/VDC @ 0.3 mA	180 VAC/VDC @ 0.191 mA
OFF Voltage	3 VDC @ 0.1 mA	3 VDC @ 0.05 mA	40 VAC/VDC @ 0.135 mA	40 VAC/VDC @ 0.043 mA
Polling time from I/O processor to module[1]	2–30 ms typical[2]	2–30 ms typical[2]	2–30 ms typical[2]	2–30 ms typical[2]
Input Turn-On/Off Time	6 ms	15 ms turn-on time 20 ms turn-off time	15 ms turn-on time 20 ms turn-off time	15 ms turn-on time 20 ms turn-off time
Counting Frequency (DC input)	0–50 Hz @ 50% duty cycle	0–25 Hz @ 50% duty cycle	0–25 Hz @ 50% duty cycle	0–25 Hz @ 50% duty cycle

1 Affects turn-on and turn-off determination
2 Time varies based on the SNAP PAC I/O processor (brain or on-the-rack controller), processor configuration, and Ethernet host communication activity.

SNAP High-Density Digital I/O Modules

Dimensional Drawings

SNAP 32-Point Digital Modules

TOP VIEW OF MODULE

3.25*** (82.55mm)

.72***
(18.29mm)

3.26
(82.80mm)

3.05
(77.47mm)

SNAP LATCH

MODULE BASE CONTROL CONNECTOR

SIDE VIEW
OF MODULE

.72***
(18.29mm)

TOLERANCES LEGEND
* +/- .010"   ** +/- .020"
*** +/- .030"   **** +/- .060"
NO * REFERENCE ONLY

Dimensional Drawings (continued)

SNAP High-Density Digital Modules

NOTE: CONSIDER
NECESSARY DIMENSIONS
FOR WIRING HARNESS

SNAP PAC BRAIN

MODULE

3.26***
(82.80mm)

SNAP I/O
MODULE

MODULE
RETENTION
RAIL

BRAIN

3.70***
(93.98mm)

SNAP
I/O RACK
BOARD

RACK

.75***
(19.05mm)

FOR DIN CLIP ADD ADDITIONAL
.06" TO OVERALL HEIGHT

SNAP RACK DIN RAIL ADAPTER

CUSTOMER SUPPLIED
35mm DIN RAIL
NOTE: BE SURE TO CONSIDER
DIN RAIL DIMENSIONS.
(DIN RAIL MUST BE MOUNTED
HORIZONTALLY TO USE SNAP I/O
WITHOUT MODULE HOLD-DOWN SCREWS)

SNAP RACK
BASE EXTRUSION

TOLERANCE LEGEND
* +/- .010"
** +/- .020"
*** +/- .030"
**** +/- .060"
NO * REFERENCE ONLY