SNAP-SCM-ST2 PULSE OUTPUT MODULE

Features

- Suited for pulse/direction applications with a frequency range of 0.13–50,000 Hz
- Dual outputs
- Software configurable

SNAP-SCM-ST2 Module

DESCRIPTION

The SNAP-SCM-ST2 pulse output module is a two-channel serial communication module that provides pulse and direction signals for stepper motor drives. Each channel is isolated from the logic side. The module can either output a constant frequency, or it can ramp from one frequency to another.

The SNAP-SCM-ST2 links up to two stepper motors which can be controlled by a SNAP PAC controller running a PAC Control™ strategy. LED indicators are provided to indicate activity on each port.

The module snaps onto an Opto 22 SNAP PAC mounting rack. SNAP PAC racks accommodate up to 4, 8, 12, or 16 I/O modules, with a maximum of 8 serial modules (including SNAP-SCM-ST2) on any one rack. Because the SNAP-SCM-ST2 module is mounted on these standard racks with other SNAP I/O modules, you can use the combination of analog, digital, and serial modules required by your application at the location where they are needed.

SNAP racks have a retention rail locking system. Use two 4-40 by ½-inch standard machine screws to hold each module securely in position on the SNAP rack.

NOTE: SNAP-SCM-ST2 modules require a SNAP PAC EB-series brain or R-series controller with firmware R9.1a or newer. These modules do not work with SNAP PAC SB-series brains nor with legacy brains or controllers.

Commands Supported

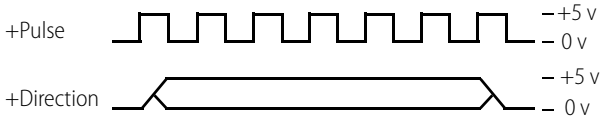
The SNAP-SCM-ST2 module supports the following pulse output commands in PAC Control:

- **SetPulseFrequency** outputs a set frequency until instructed to do otherwise.
- **SetPulseSequence** ramps from one frequency to another.
- **ReadPulseFrequency** returns a string representing a channel's current frequency. *This command requires SNAP-SCM-ST2 module firmware version R1.0d or newer.*

These pulse output commands are entered in PAC Control using the Transmit/Receive String command. For more information, see "Using the SNAP-SCM-ST2 Module Commands" in the *SNAP Serial Communication Module User's Guide* (form 1191).

How the SNAP-SCM-ST2 Outputs Data

The SNAP-SCM-ST2 outputs a specified frequency based on the command received, as shown here.



The Direction pin can be either +5 VDC or 0 VDC, as determined by the parameters of the command executed. See "Using the SNAP-SCM-ST2 Module Commands" in the *SNAP Serial Communication Module User's Guide* (form 1191).

Part Numbers

Part	Description
SNAP-SCM-ST2	SNAP 2-Channel Pulse Output Module

SPECIFICATIONS

Frequency Range	0.13–50,000 Hz
Pulse Width Range[1]	3.84 Sec to 10 µSec
Pulse Width Resolution	0–2 Hz, 2–30 Hz, 30–50,000 Hz (See resolution graphs on page 3)
Output Frequency Accuracy	To calculate error (in Hz) for the desired frequency, use this equation and the resolution graphs on page 3the next page: `Frequency Error (+/-) = Desired Frequency - (1 ÷ (Pulse Width Resolution + (1 ÷ Desired Frequency)))`
Output Format	CMOS/TTL Compatible
Logic Supply Voltage	5.0 VDC
Logic Supply Current	200 mA
Compatible I/O Processors	SNAP PAC R-series controllers and EB-series brains with R9.1a or newer firmware
Duty Cycle	Fixed at 50%
Number of Ports per Module	2
Operating Temperature Range	-20–60 °C
Storage Temperature Range	-30–85 °C
Torque, hold-down screws	Not to exceed 1 in-lb (0.11 N-m)
Torque, connector screws	5.22 in-lb (0.59 N-m)
Agency approvals	CE, RoHS, DFARS
Warranty	30 months from date of manufacture

[1]Pulse Width is equal to one-half the period.

Pin Assignments

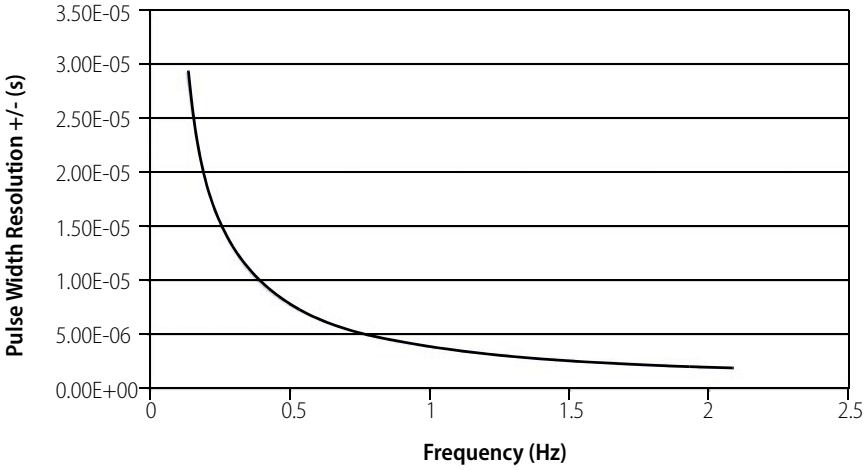
Pin	Port	Use	Description
1	A	Pulse	Frequency output
2		Ground	Isolated from logic side
3		Direction	+5 VDC when asserted 0 VDC when deasserted
4		Ground	Isolated from logic side
5	B	Pulse	Frequency output
6		Ground	Isolated from logic side
7		Direction	+5 VDC when asserted 0 VDC when deasserted
8		Ground	Isolated from logic side

See diagram on page 4 for location of pin 1.

LED Indicators

LED	Description
1	Blinks when outputting pulses on channel 1
2	Positive/Negative direction indicator on channel 1
3	Blinks when outputting pulses on channel 2
4	Positive/Negative direction indicator on channel 2

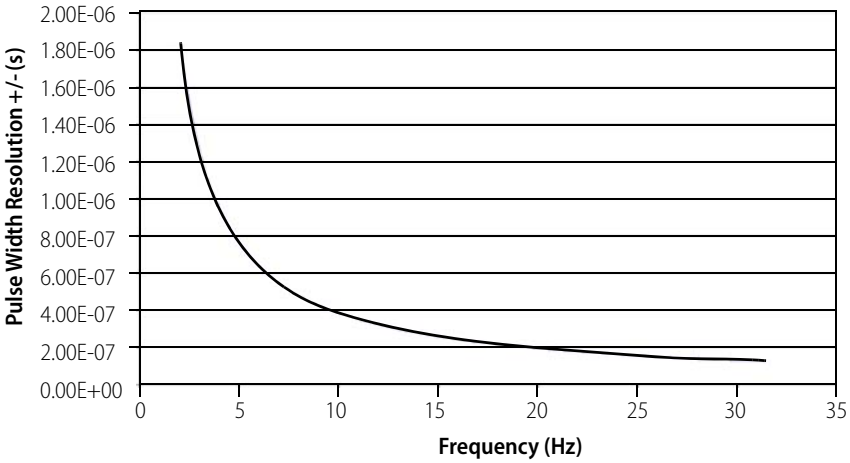
Pulse Width Resolution for Frequencies from 0–2 Hz



Equation

$$\text{Resolution} = \frac{3.871 \times 10^{-6}}{\text{Frequency}^{0.993}}$$

Pulse Width Resolution for Frequencies from 2–30 Hz



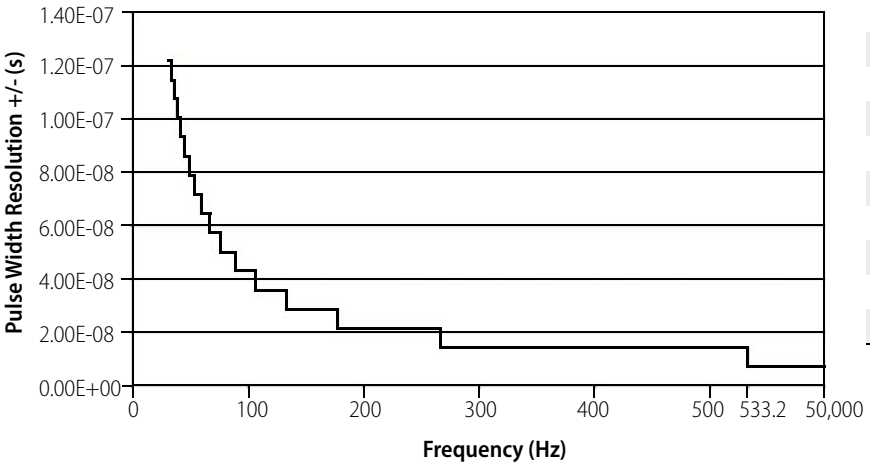
Equation

$$\text{Resolution} = \frac{3.795 \times 10^{-6}}{\text{Frequency}^{0.993}}$$

Transition Points

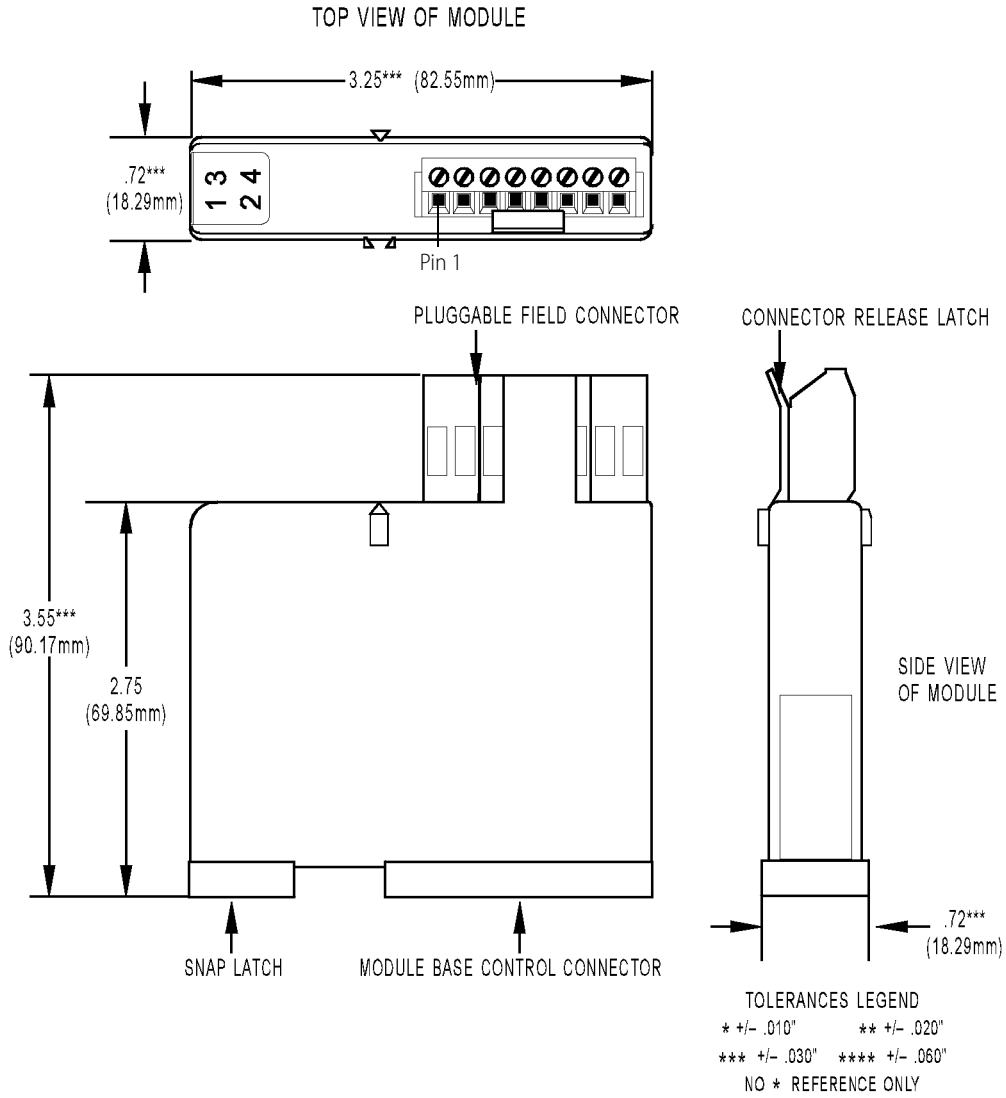
Frequency	Resolution +/- (s)
533.20	7.15430×10^{-9}
266.60	1.43086×10^{-8}
177.73	2.14629×10^{-8}
133.30	2.86172×10^{-8}
106.64	3.57715×10^{-8}
88.87	4.29258×10^{-8}
76.17	5.00801×10^{-8}
66.65	5.72344×10^{-8}
59.24	6.43887×10^{-8}
53.32	7.15430×10^{-8}
48.47	7.86973×10^{-8}
44.43	8.58516×10^{-8}
41.02	9.30060×10^{-8}
38.09	1.00160×10^{-7}
35.55	1.07315×10^{-7}
33.33	1.14469×10^{-7}
31.36	1.21623×10^{-7}
29.62	1.28777×10^{-7}

Pulse Width Resolution for Frequencies from 30–50,000 Hz



DIMENSIONS

SNAP-SCM-ST2 Pulse Output Module



More about Opto 22

OPTO 22

PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products. Industrial automation, process control, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov RIO®

groov RIO edge I/O offers a single, compact, PoE-powered industrial package with web-based configuration and IIoT software built in, support for multiple OT and IT protocols, and security features like a device firewall, data encryption, and user account control.

Standing alone, *groov* RIO connects to sensors, equipment, and legacy systems, collecting and securely publishing data from field to cloud. Choose a universal I/O model with thousands of possible field I/O configurations, with or without Ignition from Inductive Automation®, or a RIO EMU energy monitoring unit that reports 64 energy data values from 3-phase loads up to 600 VAC, Delta or Wye.

You can also use *groov* RIO with a Modbus/TCP master or as remote I/O for a *groov* EPIC system.

groov EPIC® System

Opto 22's *groov* Edge Programmable Industrial Controller (EPIC) system gives you industrially hardened control with a flexible Linux®-based processor with gateway functions, guaranteed-for-life I/O, and software for your automation and IIoT applications.

groov EPIC Processor

The heart of the system is the *groov* EPIC processor. It handles a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

In addition, the EPIC provides secure data communications among physical assets, control systems, software applications, and online services, both on premises and in the cloud. No industrial PC needed.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution color touchscreen. Authorized users can manage the system locally on the touchscreen, on a monitor connected via the HDMI or USB ports, or on a PC or mobile device with a web browser.

groov EPIC I/O

groov I/O connects locally to sensors and equipment. Modules have a spring-clamp terminal strip, integrated wireway, swing-away cover, and LEDs indicating module health and discrete channel status. *groov* I/O is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Software

The *groov* EPIC processor comes ready to run the software you need:

- Programming: Choose flowchart-based PAC Control, CODESYS Development System for IEC61131-3 compliant programs, or secure shell access (SSH) to the Linux OS for custom applications
- Node-RED for creating simple IIoT logic flows from pre-built nodes
- Efficient MQTT data communications with string or Sparkplug data formats
- Multiple OPC UA server options
- HMI: *groov* View to build your own HMI viewable on touchscreen, PCs, and mobile devices; PAC Display for a Windows HMI; Node-RED dashboard UI
- Ignition or Ignition Edge® from Inductive Automation (requires license purchase) with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications

Older products

From solid state relays, to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and working hard at thousands of installations worldwide. You can count on us for the reliability and service you expect, now and in the future.

QUALITY

Founded in 1974, Opto 22 has established a worldwide reputation for high-quality products. All are made in the U.S.A. at our manufacturing facility in Temecula, California.

Because we test each product twice before it leaves our factory rather than testing a sample of each batch, we can afford to guarantee most solid-state relays and optically isolated I/O modules for life.

FREE PRODUCT SUPPORT

Opto 22's California-based Product Support Group offers free technical support for Opto 22 products from engineers with decades of training and experience. Support is available in English and Spanish by phone or email, Monday–Friday, 7 a.m. to 5 p.m. PST.

Support is always available on our website, including free online training at OptoU, how-to videos, user's guides, the Opto 22 KnowledgeBase, and OptoForums.

PURCHASING OPTO 22 PRODUCTS

Opto 22 products are sold directly and through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at **800-321-6786** (toll-free in the U.S. and Canada) or **+1-951-695-3000**, or visit our website at www.opto22.com.

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