

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

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.



SNAP-SCM-ST2 Module

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.

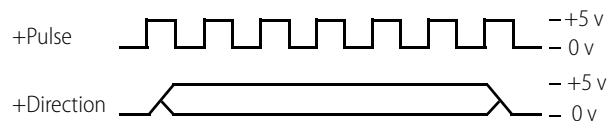
SetPulseSequence ramps from one frequency to another.

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 3 the 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	4 in-lb (0.45 N-m)
Torque, connector screws	5.26 in-lb (0.6 N-m)
Agency approvals	CE, RoHS, DFARS
Warranty	30 months from date of manufacture

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

Pin Assignments

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

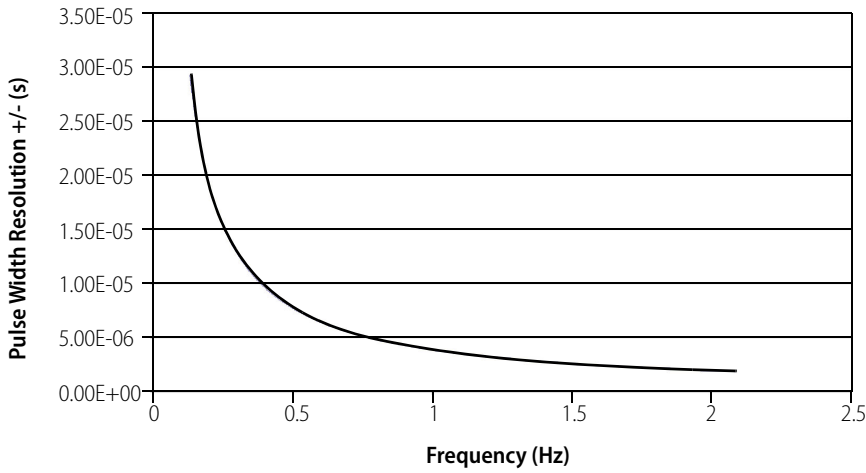
See diagram on [page 4](#) for location of pin 1.

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



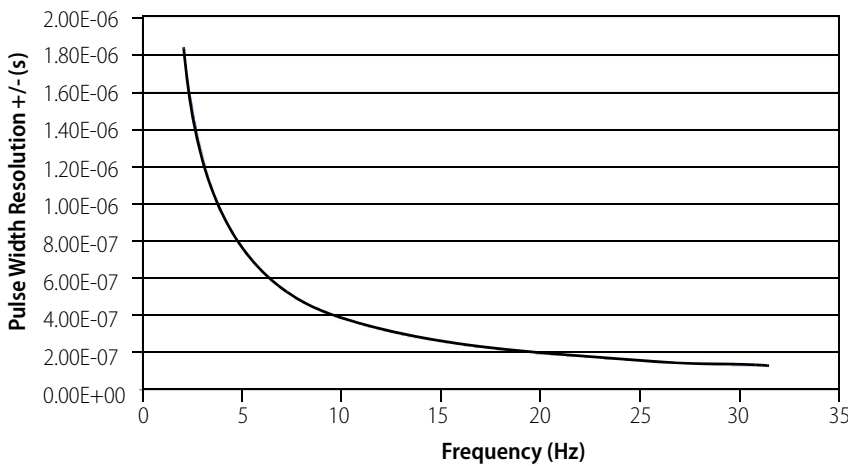
Pulse Width Resolution for Frequencies from 0-2 Hz



Equation

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

Pulse Width Resolution for Frequencies from 2-30 Hz



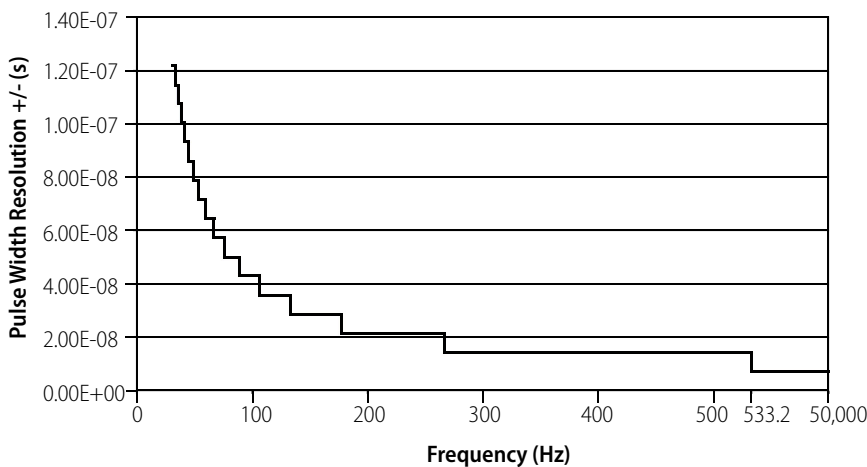
Equation

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

Transition Points

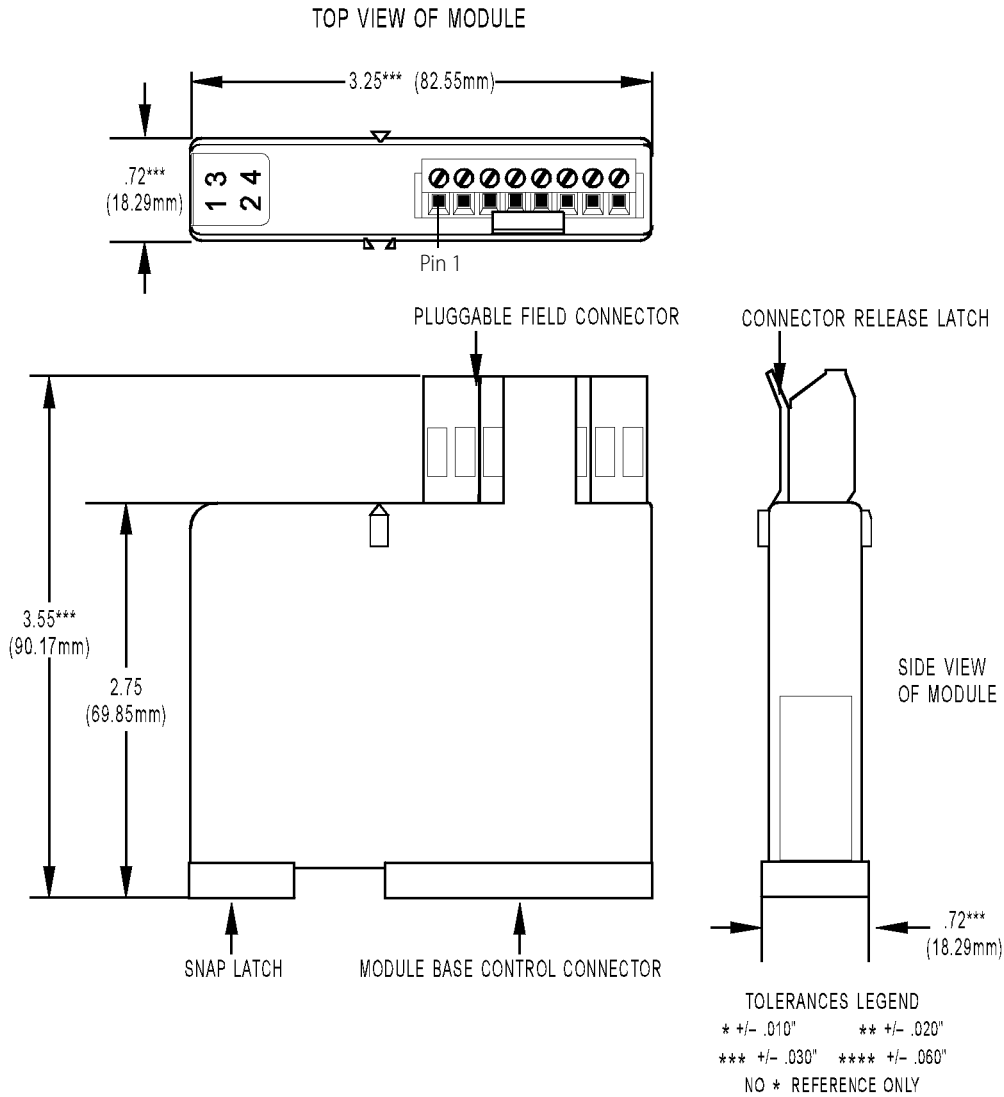
Frequency	Resolution +/- (s)
533.20	7.15430×10 ⁻⁹
266.60	1.43086×10 ⁻⁸
177.73	2.14629×10 ⁻⁸
133.30	2.86172×10 ⁻⁸
106.64	3.57715×10 ⁻⁸
88.87	4.29258×10 ⁻⁸
76.17	5.00801×10 ⁻⁸
66.65	5.72344×10 ⁻⁸
59.24	6.43887×10 ⁻⁸
53.32	7.15430×10 ⁻⁸
48.47	7.86973×10 ⁻⁸
44.43	8.58516×10 ⁻⁸
41.02	9.30060×10 ⁻⁸
38.09	1.00160×10 ⁻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



PRODUCTS

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

groov EPIC® System

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

groov EPIC I/O

groov I/O connects locally to sensors and equipment with up to 24 channels on each I/O module. 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 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.

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 or on a monitor connected via the HDMI or USB ports.

groov EPIC Software

Software included in the *groov* EPIC processor:

- PAC Control engine to run PAC Control and PAC Display
- CODESYS Runtime engine to run IEC61131-3 compliant programs built with CODESYS Development System
- Optional access to the Linux operating system through a secure shell (SSH) to download and run custom applications
- groov* View for building your own device-independent HMI, viewable on the touchscreen, PCs, and mobile devices
- Node-RED for creating simple logic flows from pre-built nodes
- Ignition Edge® from Inductive Automation®, with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications with Sparkplug for efficient IIoT data transfer

groov RIO

groov RIO revolutionizes remote I/O by offering a single, compact, PoE-powered industrial package with web-based configuration, commissioning, and flow logic software built in, plus support for multiple OT and IT protocols.

Standing alone, it meets the needs of small, variable I/O count applications, especially those that require data logging or data communications, commonly found in IIoT applications. *groov* RIO can also be used with a Modbus/TCP master or as remote I/O for a *groov* EPIC system.

Older products

From solid state relays (our first products) to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and still

doing the job at thousands of installations worldwide. You can count on us to give you 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.

