SA420 Version 4.00 Advanced Mode of Operation

The SA420 now includes the following features.

- Quadrature (directional decoding)
- Bipolar voltage output (units now include +/- 5 VDC and +/- 10 VDC)
- Optional higher NPN input signal trip point (improves operation through IS barrier)
- Programmable lower analog output setpoint (Previously fixed at 0 Hz, now includes forward and reverse offsets) [PR (00)]
- Programmed to power up and display in the following units PR (04):
    - Hz (default)
    - Percent of maximum output
    - User defined units
- Programmable minimum frequency cutoff. [PR(05)] (Decide where the unit zeroes out for faster updating)
- Security lock variables (viewable but not changeable while locked)

Because most users will not utilize the new advanced features; the SA420 is defaulted to start up in the standard three-variable menu structure. To enable the advanced features, hold down the decimal key and left arrow key simultaneously while powering on the unit. Then change PR (09) from zero (0) to one (1) and press enter. The advanced features menu will remain when restarting the unit.

If you were previously using the SA420 for your application, it is unnecessary to use the advanced menu features. To better help you keep conformity between the advanced and standard units we recommend using the standard mode.

If you have an application that would benefit from the advanced features, keep in mind that advanced features will be retained if you switch from the advanced mode back to the standard until you reset the unit. (If you change PR (09) back to zero (0) the variables will remain but only PR (01) – PR (03) will be viewable).

Variable functions

PR (00) Analog Lower Setpoint*

Setpoint for 4mA and 0 VDC value. (-5 or -10VDC if selected). To represent a reverse rate, increment the left most digit until the rate icon flashes. **

PR (01) Analog Upper Setpoint*

Setpoint for 20mA and 10 VDC value. (5 VDC or 10 VDC if selected). To represent a reverse rate, increment the left most digit until the rate icon flashes. **

PR (02) Sensor Type and Level

User can select sensor type. (NPN, PNP, etc.)

PR (03) Buffer Size

Ring buffer filtering up to 16 pulses. It is a first-in-first-out configuration.

PR (04) User Units

Value to be displayed when operating at PR (01) frequency. (FPM, RPM, etc.)

PR (05) Frequency Cutoff

User can set the frequency cutoff to zero the unit faster.

PR (06) Analog Response

Some applications need slower analog response rates. (See table for response rate selection)

PR (07) Signal Type**

Programming of PR (07) determines single or quadrature operation.

PR (08) Voltage Output Type

Controls the type of voltage output from the unit.

PR (09) Menu Option

Controls what program menu is used.

PR (10) Display Option

User can set how the feedback is displayed.

PR (11) Security PIN

PR (12) Security Password

User can lock variables. Making PR (12) different from PR (11) will lock the variables and make PR (12) unviewable. It is important to remember the number entered in PR (12).

*Users can program the analog to go up or down as the frequency increases by swapping the lower setpoint [PR (01)] with their upper setpoint [PR (00)].

**Reverse numbers are represented by a flashing “rate” icon and cannot be programmed until PR (07) is set for quadrature operation.

SA420 Advanced Mode Variables

Variable Number and Name	Default Value	Value Range	Coded Numbers	Move Decimal	User Values
(00) ANALOG_LOWER_SP_VAR	0	any number *		yes	
(01) ANALOG_UPPER_SP_VAR	240.0	any number *		yes	
(02) SENSOR_TYPE_VAR	4	0-5	**0 = NPN (2.5 VDC trip level)** **1 = PNP (2.5 VDC trip level)** **2 = Mag (75 mVDC trip level)** **3 = Logic (2.5 VDC trip level)** **4 = NPN (6 VDC trip level)**** **5 = PNP (6 VDC trip level)****	no	
(03) BUFFER_SIZE_VAR	8	0-16		no	
(04) USER_UNITS_VAR	1800	any number *		yes	
(05) FREQUENCY_CUTOFF_VAR	1.0	0.0-10.0 Hz		no	
(06) ANALOG_RESPONSE_VAR	0	0-11	**0 = 0.00 seconds 6 = 0.60 seconds** **1 = 0.02 seconds 7 = 1.20 seconds** **2 = 0.04 seconds 8 = 2.50 seconds** **3 = 0.08 seconds 9 = 5 seconds** **4 = 0.16 seconds 10 = 10 seconds** **5 = 0.30 seconds 11 = 20 seconds**	no	
(07)SIGNAL_TYPE_VAR	0	0-1	**0 = Single channel operation** **1 = Quadrature operation**	no	
(08) VOLTAGE_OUTPUT_TYPE VAR	1	0-3	**0 = 0-5 VDC** **1 = 0-10 VDC** **2 = +/- 5 VDC** **3 = +/- 10 VDC**	no	
(09) MENU_OPTION_VAR	0	0-1 ***	**0 = Standard menu** **1 = Advanced menu**	no	
(10) DISPLAY_OPTION_VAR	0	0-2	**0 = Hz** **1 = Percent output** **2 = User units**	no	
(11) SECUR_PIN_VAR 420	0420	1-9999		no	
(12) SECUR_PASS_VAR420	0420	1-9999		no	

** When the 'rate' icon is flashing, the number being programmed is a reverse direction value. A value can only be displayed as a reverse direction value AFTER the unit is programmed to operate in quadrature mode. This prevents errant reverse values from being entered into a single-channel unit.*

*** Recommended quadrature setting for NPN or PNP.*

**** To access the advanced menu, hold down the decimal key and the left arrow key simultaneously while powering on the unit. Changes can be made at this time. If PR (09) is not changed, the standard menu will return after powering down. For the unit to remain in advanced mode, PR (09) must be changed to a one (1).*

*****The filter range times shown above approximate the time it takes to get from 0 to 100 percent.*

Additional information

Pertinent formula

Frequency (Hz) = (RPM * PPR)/60

Example: A customer has a motor rotating at 1200 RPM and wants the SA420 to output 20mA at 1250 RPM using a Hall Effect sensor and an ESI 255 disc.

Since the Hall Effect sensors turns on with a south field and off with a north field, the 255 disc's 8 north and 8 south fields will produce 8 PPR (Pulses Per Revolution). Insert 8 into the equation for PPR.

F = (1250 * 8)/ 60

F = 166.7 Hz [Value used in PR (01)]

Additional wiring data

Sensor channel B input is on terminal 11