

Control Solutions Flex NCP
Flexible I/O Using BAS-700 Series Hardware
 NCP – No Configuration Properties – October 2005

Flex NCP provides the majority of the functionality of Flex 56 without the need to access any configuration property file. The configuration has been minimized and made accessible via network variables.

Flex NCP provides the following functional blocks:

- 16 Analog Inputs
- 16 Discrete Inputs
- 16 Discrete Outputs
- 4 Analog Outputs

The network variable list is as follows:

NV Index	Type	Program Name	Function
0	SNVT_obj_request	nviRequest	Object request
1	SNVT_count	nviBoardIndex	Board configuration index 1..8
2	SNVT_count	nviBoardModel	0 if empty, or any valid model number (714, 718, 734, etc.)
3	SNVT_state	nviConfigMask1	Config bit mask 1
4	SNVT_state	nviConfigMask2	Config bit mask 2
5	SNVT_obj_status	nvoStatus	Object status
6-21	SNVT_lev_percent	nvoAnalogInput[16]	Analog input value
22-37	SNVT_switch	nviDiscreteOutput[16]	Discrete output state
38-53	SNVT_switch	nvoDiscreteInput[16]	Discrete input state
54-57	SNVT_lev_percent	nviAnalogOutput[4]	Analog output value
58	SNVT_lev_percent	nciSendDelta	Send on delta level
59	SNVT_time_sec	nciMinSendTime	Min send time
60	SNVT_time_sec	nciMaxSendTime	Max send time

To configure a board position, enter the position number in NV1 (nviBoardIndex), then enter its model number in NV2 (nviBoardModel). For analog inputs and outputs you also need to enter a bit mask in NV3, and optionally in NV4 for inputs.

Board model numbers recognized are:

- Analog Inputs 734, 738
- Discrete Inputs 742
- Discrete Outputs 722, 724, 728
- Analog Outputs 742

The configuration bit mask #1 for analog inputs has one bit per channel selecting either voltage or current input. The bit should be 1 for current, or 0 (default) for voltage input. The hardware jumpers must be set in the position corresponding to this selection.

The bit mask appears as 0,0,0,0,0,0,0,0,0,0,0,0,0,0 in the LonMaker browser. The first bit in this string is the first channel (on the left when looking at the terminal block of the board). Therefore, to set only channel 1 to current (all others to voltage), the bit mask would be 1,0,0,0,0,0,0,0,0,0,0,0,0,0. If your network tool uses a 4-digit hex number to represent this, the value would be 0x8000. If the tool shows unsigned decimal, it will be 32768. Note that the last 8 bits (right most bits) are not used in configuration masks.

The configuration bit mask #1 works the same for analog outputs, and is ignored for discrete I/O. Configuration bit mask #2 is only used with analog inputs. If a bit in this mask is set to 1, the corresponding channel will measure temperature (hardware jumpered for thermistor) and the voltage/current setting of mask #1 will be ignored for that position only.

SNVT_lev_percent for analog I/O corresponds to 0 to 100% of scale, whether 0-10V or 4-20mA. A value of 0% will produce 4mA while 100% produces 20mA in the current setting.

To avoid having to change network variable types, SNVT_lev_percent is also used to represent temperature. The reading in percent will be the degrees Fahrenheit. Thus a reading of 77.50% really means 77.5 degrees F. Note that the 0.005% resolution of SNVT_lev_percent means 77.50% is a raw binary data value of 15,500. (100% is 20,000).

Send on delta applies to the analog input's network output variables (nvoAnalogInput). This SNVT_lev_percent determines the minimum change that must occur before the new value will be transmitted to the network.

Min and Max send times apply to all network output variables. These values are set in tenths of seconds, and the same setting applies to all NVO's. Other than this blanket grouping, the min/max send times work as defined for LonMark use.

The details noted above describe those features of Flex NCP that vary from the LonMark certified Flex 56. All of the input/output software scaling, and hardware features, are otherwise identical to Flex 56. Please refer to those user guides for further information.