Allen-Bradley

SLC 500™ Analog Input Modules

Catalog Numbers 1746-NI16I and 1746-NI16V

User Manual

Rockwell Automation

Overview

This chapter describes the 1746-NI16 analog input module and explains how the SLC 500 processor gathers analog input data from the module. Included is information about:

- the module's hardware and diagnostic features
- an overview of system operation

General Description

The module receives and stores digitally converted analog data into its image table for retrieval by all fixed and modular SLC 500 processors. The modules, 1746-NI16V and 1746-NI16I, support connections for up to 16 voltage or current analog sensors.

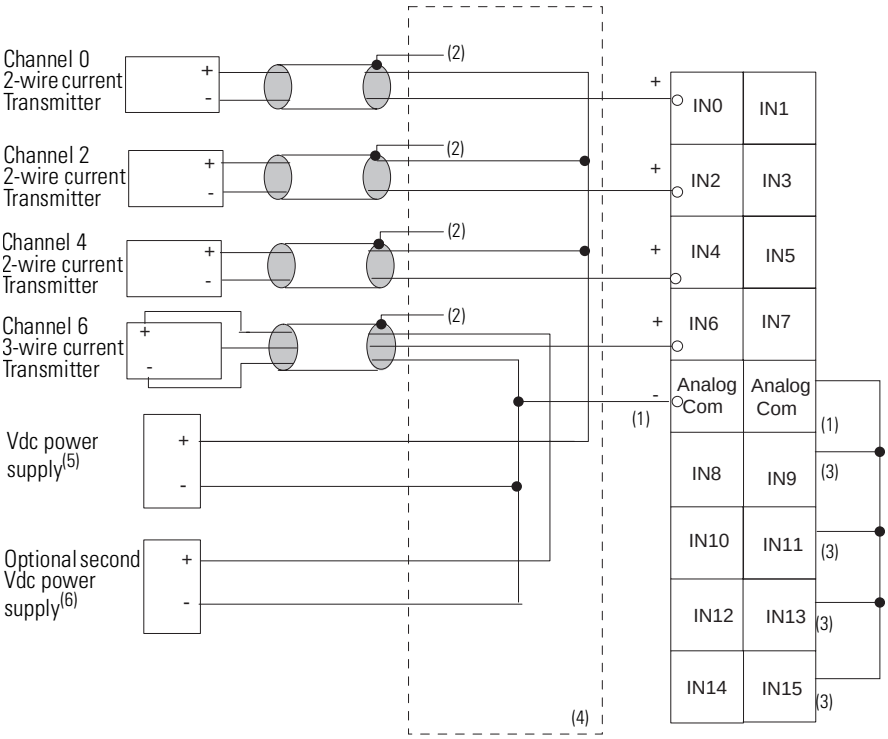
The 1746-NI16 is a multi-class (Class 1 or Class 3) single-slot module. Class 1[(1)] configuration utilizes 8 input words and 8 output words. Class 3 configuration utilizes 32 input words and 32 output words. Fixed and SLC 5/01 processors can only operate as Class 1. When the module is used in a remote I/O chassis with a 1747-ASB, it can only operate in Class 1 mode. The SLC 5/02, SLC 5/03, SLC 5/04 and SLC 5/05 processors can be configured for either Class 1 or Class 3. When the module is used in a remote ControlNet™ chassis with a 1747-ACN(R), it can also operate in either Class 1 or Class 3 mode. Operate the module in Class 3 mode whenever possible.

The 16 high-impedance input channels can be wired as single-ended inputs. The module provides a direct interface to the following input types:

- ±10V dc
- 1 to 5V dc
- 0 to 5V dc
- 0 to 10V dc
- 0 to 20 mA
- 4 to 20 mA
- ±20 mA
- 0 to 1 mA

(1) Requires use of block transfer in a remote configuration.

1746-NI16I



(1) There are two common terminals for all of the 16 current inputs. These two analog common terminals are connected internally.

(2) All shield wires should be connected to chassis mounting screws.

(3) Unused channels should be connected to the analog common terminals (0 Volts).

(4) If separate shielded cables are used for each analog input channel, interposing terminal blocks are needed to terminate up to 16 common wires. Then 1 to 4 common wires should be wired from the interposing terminal block to the 2 common terminals on the 1746-NI16I module.

(5) The module does not provide loop power for analog inputs. Use a power supply that matches the transmitter specifications.

(6) More than one power supply can be used if all supplies are class 2.

Preliminary Operating Considerations

This chapter explains how the analog input module and the SLC 500™ processor communicate through the module's input and output image. It lists the preliminary setup and operation required before the module can function in a 1746 I/O system. Topics discussed include how to:

- enter the module ID code
- select the Class 1 or Class 3 interface
- address your 1746-NI16 module
- select the proper input filter for each channel
- calculate the module update time
- interpret the module response to slot disabling

Module ID Code

The module identification code is a unique number encoded for each 1746 I/O module. The code defines for the processor the type of I/O or specialty module residing in a specific slot in the 1746 chassis.

Catalog Number	ID Code
1746-NI16I	Class 1 interface 3504 Class 3 interface 10403
1746-NI16V	Class 1 interface 3505 Class 3 interface 10406

Calibration

The module should be calibrated to the following values to adhere to the "Module Error Over Full Temperature Range" specifications in Appendix A.

	Calibration Voltage or Current Range	
Module Type	Low Calibration Value	High Calibration Value
1746-NI16V	-0.005 V to +0.005 V	+10.245 V to +10.255 V
1746-NI16I	-0.03 mA to +0.03 mA	+20.97 mA to +21.03 mA

Calibration Sequence

The module returns a faulty calibration error if the order of the calibration sequence is not performed as expected. The calibration sequence is as follows:

1. Disable the channel to be calibrated by setting bit 15 to 0.
2. Set bit 9 equal to 1 in the configuration word to enter the calibration mode.
3. Apply a low calibration value from the appropriate range, according to the table above.
4. Set bit 10 to 1 to accept this input as the new low calibration value.
5. Verify that bit 8 in the appropriate status word has changed to a 1, signifying that the low value calibration was accepted.
6. Change bit 10 in the calibration word back to a 0.
7. Apply a high calibration value to the channel to be calibrated from the appropriate range according to the table above.
8. Set bit 11 to 1 to accept this input as the new high calibration value.
9. Verify that bit 9 in the appropriate status word has changed to a 1 signifying the high value calibration was accepted.
10. Change bit 11 in the calibration word back to a 0.
11. Change bit 9 in the configuration word back to a 0 to exit the calibration mode.

Existing calibration values can be overwritten to re-calibrate a channel.