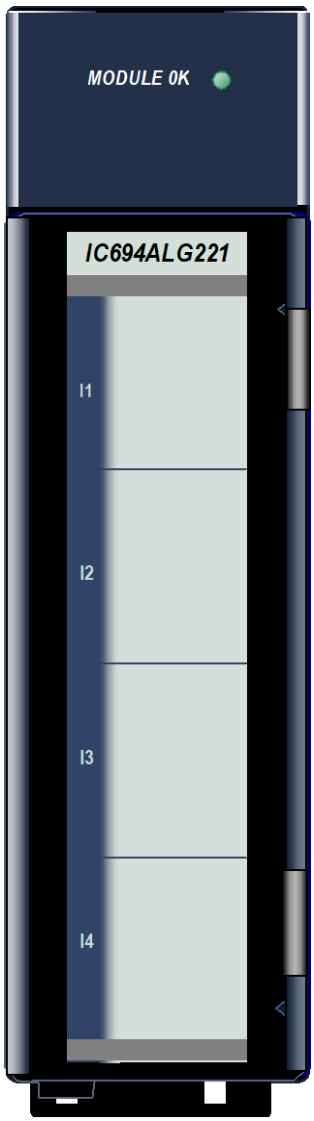
9.3 Analog Input Module 4-Channel Differential Current: IC694ALG221

Figure 265: IC694ALG221



The ***4–Channel Analog Current Input*** module, IC694ALG221, provides four analog input channels. This module has two possible input ranges:

4 to 20 mA
0 to 20 mA

Two range jumpers are provided with Module; one for channels one and two, and the other for channels three and four.

Conversion speed for each of the four channels is one–half millisecond. This provides an update rate of two milliseconds for any channel. Resolution of the converted signal is 12-bit binary (1 part in 4096) over either range.

Input protection for Module is sufficient for operation with reduced performance with up to 200 V common–mode. Module provides electrical isolation of externally generated noise between field wiring and the backplane through the use of optical isolation.

This module can be installed in any I/O slot of an RX3i system.

Module does not support insertion into or removal from an RX3i Universal Backplane which is under power (see *Hot Insertion and Removal Not Supported*

Hot Insertion and Removal Not Supported*)*.

9.3.1 LEDs: ALG221

Module **OK** LED is ON when Module power supply is operating.

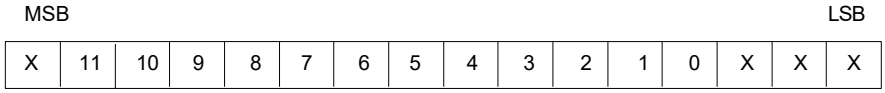
9.3.2 Specifications: ALG221

ALG221	Specifications
Input Current Ranges	4 to 20 mA and 0 to 20 mA
Calibration	Factory calibrated to 4 µA per count
Update Rate	2 milliseconds (all four channels)
Resolution at 4–20 mA	4 µA (1 LSB = 4 µA)
Resolution at 0–20 mA	5 µA (1 LSB = 5 µA)
Absolute Accuracy[48]	0.1% full scale + 0.1% reading
Common Mode Voltage	200 volts
Linearity	< 1 Least Significant Bit
Isolation, Field to Backplane (optical) and to frame ground	250 Vac continuous; 1500 Vac for 1 minute
Common Mode Rejection	> 70dB at DC; >70dB at 60Hz
Cross–Channel Rejection	> 80dB from DC to 1kHz
Input Impedance	250Ω
Input Filter Response	325 Hz
Internal Power Consumption	100 mA from the isolated +24Vdc supply 25 mA from +5Vdc bus on the backplane

For product standards and general specifications, refer to Appendix A:.

9.3.3 Data Format: ALG221

Module data is stored in the PLC CPU in 16–bit 2's complement format as displayed in the following figure.



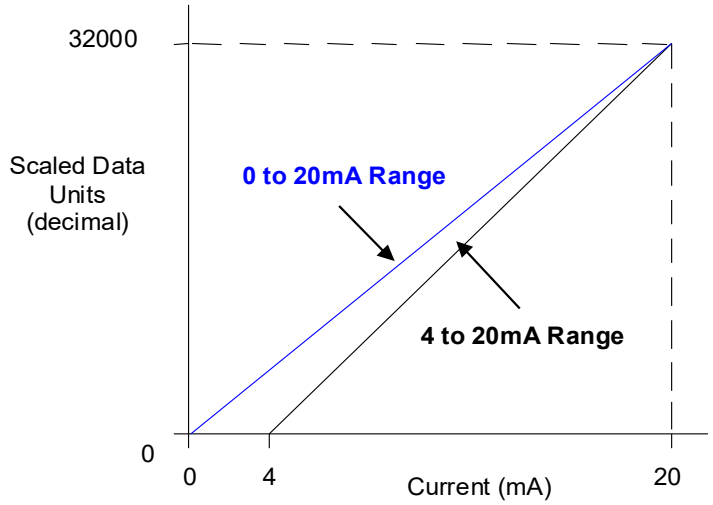
[48] *In the presence of severe RF interference (IEC 801–3, 10V/m), accuracy may be degraded to ±0.5% FS.*

Current Inputs, A/D Data and Scaled Units: ALG221

The default range for each input is 4 to 20 mA, scaled so that 4 mA corresponds to a count of 0 and 20 mA corresponds to a count of 32000 with each 1000 counts representing 0.5 mA.

When a jumper is added to the I/O terminal board, the input range for a PAIR of inputs is changed to 0 to 20mA. In 0 to 20 mA range, 0 mA corresponds to a count of 0 and 20 mA corresponds to a count of 32000 with each 800 counts representing 0.5 mA.

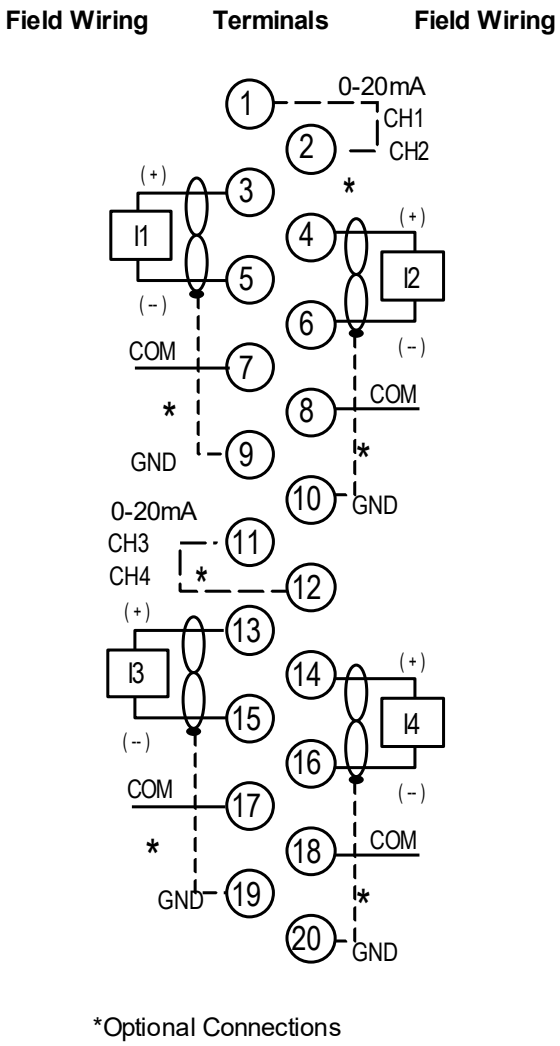
Figure 266: Input Current Scaling ALG221



If the current source is reversed into the input or is less than the low end of the current range, Module provides an input data word corresponding to the low end of the current range (0000H in PLC memory). If an input is greater than 20 mA, Module provides an input data value at full scale (7FF8H in PLC memory).

9.3.4 Field Wiring: ALG221

Figure 267: Field Wiring ALG221



Terminal	Connection
1	0-20mA Jumper for Channels 1 & 2
2	0-20mA Jumper for Channels 1 & 2
3	Channel 1 +
4	Channel 2+
5	Channel 1-
6	Channel 2 -
7	Common
8	Common
9	Shield Termination Point for Channel 1
10	Shield Termination Point for Channel 2
11	0-20mA Jumper for Channels 3 & 4
12	0-20mA Jumper for Channels 3 & 4
13	Channel 3 +
14	Channel 4+
15	Channel 3-
16	Channel 4 -
17	Common
18	Common
19	Shield Termination Point for Channel 3
20	Shield Termination Point for Channel 4

To minimize the capacitive loading and noise, all field connections to Module should be wired using a good grade of twisted, shielded instrumentation cable. The shields can be connected to either COM or GND. The COM connection provides access to the common of the analog circuitry in Module. The GND connection provides access to the Backplane (frame ground).

To limit common–mode voltages, each current source common line may also be tied to its associated COM terminal if the source is floating. These optional connections are shown above.