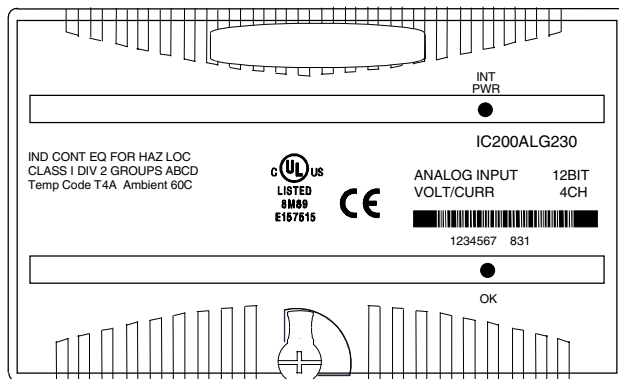


IC200ALG230 **Analog Input Module, 12 Bit Voltage/Current 4 Channels**

Analog input module IC200ALG230 provides an interface to 4 voltage inputs or 4 current inputs. The inputs are single-ended, with all inputs sharing a common return.



The module receives power from the backplane power supply. No external power source is required for module operation. Power for the user's transceivers must be supplied from an external source.

Intelligent processing for this module is performed by the CPU or NIU. The module provides 4 words of analog input data.

LED Indicators

The green INT PWR LED indicates the presence of internally-generated field power for the analog field-side circuits.

The green OK LED is on when backplane power is present to the module.

Diagnostics

The module reports a Loss of Internal Power fault for field-side circuits.

Configuration Parameters

Two jumpers on the carrier terminals can be used to configure voltage or current mode and unipolar or bipolar operation in voltage mode. One jumper selects either voltage or current operating mode. With this jumper connected, the module accepts current inputs in the 4mA to 20mA range. With no jumper installed the module accepts -10VDC to +10VDC inputs.

In voltage mode, a different jumper on the carrier can be used to select the 0 to 10VDC range.

IC200ALG230

Analog Input Module, 12 Bit Voltage/Current 4 Channels

Module Specifications

Module Characteristics	
Channels	4 single ended, one group
Module ID	FFFF9004
Isolation:	
User input to logic (optical) and to frame ground	250VAC continuous; 1500VAC for 1 minute
Group to group	Not applicable
Channel to channel	None
LED indicators	INT PWR LED indicates internally-generated field power is present OK LED indicates backplane power is present
Backplane current consumption	5V output: 125mA maximum
External power supply	None
Thermal derating	None
Configuration parameters	Range select, Mode select (jumpers on carrier)
Diagnostics	Loss of Internal Power
Input Characteristics: Voltage Mode (default)	
Input voltage:	
Bipolar	+/-10VDC (default)
Unipolar	0 to 10V (configurable)
Input Impedance	126kOhms maximum
Accuracy at:	
25 degrees C*	+/-0.3% typical of full scale, +/-0.5% maximum of full scale
0 to 60 degrees C	+/-1% maximum of full scale
Resolution:	
Bipolar mode:	2.5mV = 8 counts
Unipolar mode:	2.5mV = 8 counts
Filter response	5.0ms
Update rate per module	0.4ms
Common mode voltage	0 V
Channel-to-channel crosstalk rejection	30dB minimum
Input Characteristics: Current Mode	
Input current	4 to 20mA
Input Impedance	200 Ohms maximum
Accuracy at:	
25 degrees C*	+/-0.3% typical of full scale, +/-0.5% maximum of full scale
0 to 60 degrees C	+/-1% maximum of full scale
Resolution	4μA = 8 counts
Filter response	5ms
Update rate per module	0.4ms
Channel-to-channel crosstalk rejection	30dB minimum

* In the presence of severe RF interference, (IEC 1000-4-3, 10V/m), accuracy may be degraded to +/-3%.

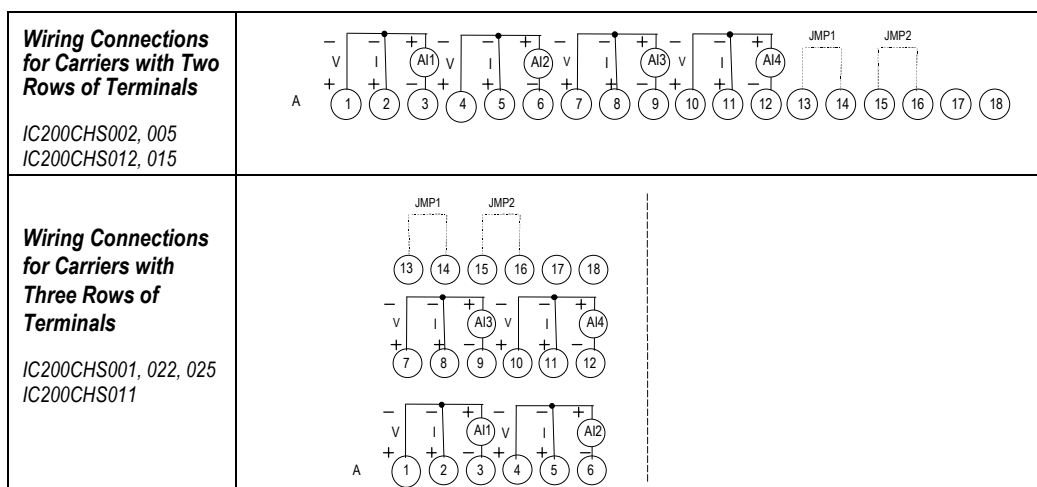
IC200ALG230

Analog Input Module, 12 Bit Voltage/Current 4 Channels

Field Wiring

Number	Connection	Number	Connection
A1	V1	B1	No connection
A2	I1	B2	No connection
A3	Return (common)	B3	No connection
A4	V2	B4	No connection
A5	I2	B5	No connection
A6	Return (common)	B6	No connection
A7	V3	B7	No connection
A8	I3	B8	No connection
A9	Return (common)	B9	No connection
A10	V4	B10	No connection
A11	I4	B11	No connection
A12	Return (common)	B12	No connection
A13	JMP1-A	B13	No connection
A14	JMP1-B	B14	No connection
A15	JMP2-A	B15	No connection
A16	JMP2-B	B16	No connection
A17	NC	B17	No connection
A18	NC	B18	No connection

Note: All inputs are single-ended, and share a common return. Either voltage or current devices may be connected per channel (not both).



IC200ALG230

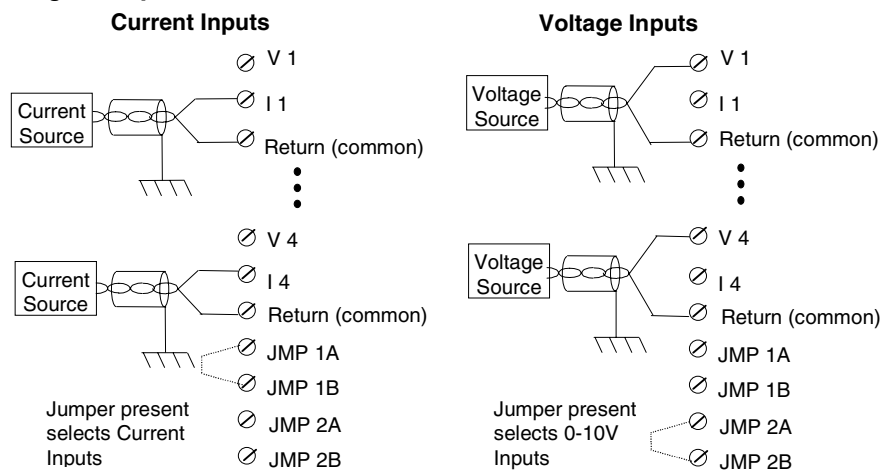
Analog Input Module, 12 Bit Voltage/Current 4 Channels

Jumper Selections

Jumpers on JMP 1 and JMP 2 select voltage or current operation and voltage range. In current mode, JMP2 is ignored.

Jumper	Range
None	+/-10V
1	4-20mA
2	0-10V
1 & 2	Not recommended

Wiring Examples



An external source is needed to power input transceivers.

IC200ALG230 Analog Input Module, 12 Bit Voltage/Current 4 Channels

Cable Shield Connections

If possible, the cable should be grounded at the source device. If that is not possible, the cable shield must be grounded at the source device. If that is not possible, the cable shield must be grounded at the I/O module. This can be done using an Auxiliary I/O Terminal (IC200TBM001, 002, or 005).

If the module is installed on a Terminal-style I/O Carrier (IC200CHS001, 002, or 005), shield connections can be made on an Auxiliary I/O Terminal that is attached to the I/O carrier.

If the module is installed on a Compact Terminal-style I/O Carrier (IC200CHS022, 025), shield connections can be made on an Auxiliary I/O Terminal that is mounted near the I/O carrier. Be sure to ground the Auxiliary I/O Terminal Strip if you plan to use it for this purpose.

If the module is installed on a Connector-style I/O Carrier (IC200CHS003), the cable shield can be connected directly to an Interposing Terminal (IC200CHS011, 012, 015). Be sure to ground the Interposing Terminal. It is recommended to use a shielded interposing cable as well between the Interposing Terminal and the Connector Base. A custom shielded cable can be made using the Connector kit (IC200ACC302). In addition, a custom shield braid can be wrapped around standard Interposing Cables (IC200CBL105, 110, 120, 230). If this approach is used be sure to ground the braid.

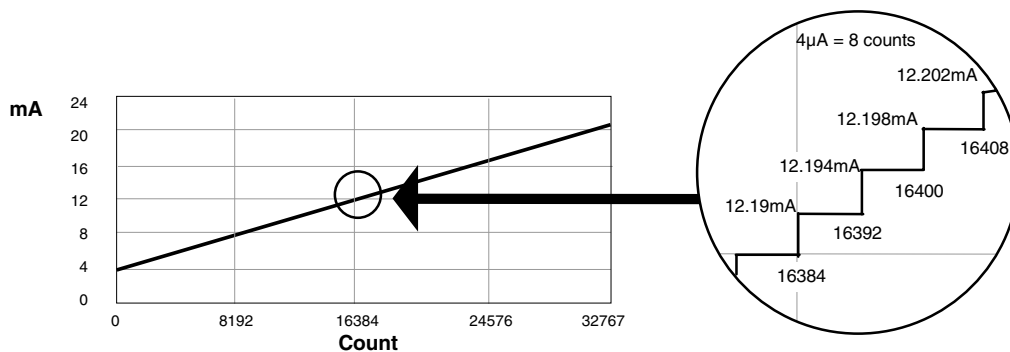
IC200ALG230

Analog Input Module, 12 Bit Voltage/Current 4 Channels

Scaling

The graphs below show the relationship between the input voltage or current measured at the field terminals and the data that is output by the module.

Count and Input Current



The following equation can be used to calculate counts values:

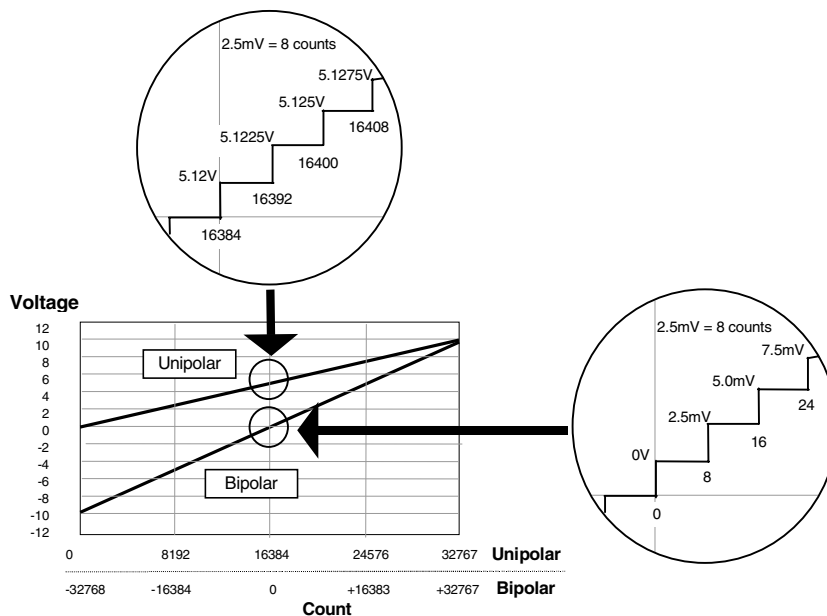
$$\text{Counts} = (\text{Current in mA} - 4\text{mA}) \times (32768 / 16.38\text{mA})$$

For a change in the reported count value to be seen, input current must be increased by at least 4µA. If the module receives an increase less than 4µA, the previous count value is still reported. For example:

Current	Count
12.190mA	16384
12.192mA	16384
12.194mA	16392

IC200ALG230 Analog Input Module, 12 Bit Voltage/Current 4 Channels

Count and Input Voltage



The following equations can be used to calculate counts values:

Bipolar voltage: $\text{Counts} = (\pm \text{Voltage In}) \times (3200)$

Unipolar voltage: $\text{Counts} = (+ \text{Voltage In}) \times (3200)$

For a change in the reported count value to be seen, input current must be increased by at least 2.5mV. If the module receives an increase less than 2.5mV, the previous count value is still reported. For example:

Voltage	Count
5.1200V	16384
5.1220V	16384
5.1225V	16392

Input Defaults

The module's analog input (%AI) data can be configured to either hold last state or to go to a configured value if an error causes the inputs to default.

If the module is autoconfigured, the input default is 0.