IQ201

Panel Mount Universal Process Indicator

Data sheet – English 1.01

mA
Volts
mV
Frequency
Counting
Thermocouples
Ohms
RTD
Potentiometer
Event Timer
Real Time Clock
Manual Analog Out Station

- 14 Segment LED Displays
- 0-10V, 0-20mA, 4-20mA Analog Re-Transmission
- 4 Alarm Setpoints
- Sensor Excitation
- High Resolution ADC
- High Resolution DAC
- RTU, ASCII Modbus™ Communications
- RS232 & RS485
- FW Field upgradeable Firmware
- RTC Option
- Advanced Digital Filtering

Introduction

The IQ201 panel mount universal process indicator is a precision digital indicator for interfacing to and measuring most process variables. The IQ201 is capable of measuring and processing variables such as mA, Volts, Potentiometers, Frequency, Counting, Ohms, mV, Thermocouples, RTDs and also has built in functions such as an Event Timer, Real Time Clock (RTC option required) and a manual analog output station (Analog out option required). The IQ201 also includes a multiple output excitation voltage selection for sensor excitation of 2 or 3 wire transmitters, encoders, potentiometers and many more.

Calibration of the analog process variables is simply done by either entering in the display range selection or by direct sensor injection calibration.

The high bright 6-digit 14 segment LED displays make for easy setup and readability. A simple menu system with built in help hints allows for easy configuration of display and sensor settings.

A universal mains switch mode power supply (85-264VAC) is provided as standard but an optional low voltage (10-30VDC) isolated power supply or a high voltage (25-70VDC) isolated power supply can be installed.

RS232 communications is supplied as standard with the MODBUS™ RTU and MODBUS™ ASCII protocol. A simple ASCII out protocol is also provided for serial printing and communicating to large displays. A second communication RS485 interface can be added in conjunction with the standard RS232 interface.

The IQ201 also has an analog out or an isolated analog out option to generate a precision 0/4-20mA and 0-10V analog output signal.

The IQ201 also includes advanced features such as user input linearisation, max/min recording, programmable front push buttons, programmable digital inputs, security menu lockout, advanced digital filtering, plus many more to provide a truly universal process indicator.

Features

- High bright 6-digit 14 segment LED displays for easy setup and calibration
- Inputs for mA, Volts, Potentiometer, Frequency, Counting, mV, Thermocouples, Ohms & RTDs.
- Built in functions such as an Event Timer, Real Time Clock (RTC option required), manual setpoint station (Analog output option required)
- Multiple output excitation voltage for transmitter and sensor excitation.
- High precision 24 bit ADC front end circuitry (Bi-polar input circuitry)
- -199999 to +999999 display counts
- Easy calibration of analog process variables from display ranges or by direct sensor injection
- RS232 communications standard (MODBUS™ RTU/ASCII and an Infiniteq ASCII out protocol)
- Type 4X, NEMA 4X front panel. 96X48 ABS/Polycarbonate enclosure
- Universal mains switch mode power supply (85-264VAC) standard with built in EMI and fuse protection
- 2x Programmable digital inputs (pull up or pull down field jumper selectable)
- 3x Programmable front panel push buttons
- 16 Point lineariser on analog process variables (mA, V, mV, Potentiometer)
- Up to 4 front panel LED indicators for alarm set point status (Mechanical or solid-state option required)
- Maximum/Minimum recording
- Built in menu help hints
- Field upgradable firmware via the RS232 interface
- 1 Year Warranty

Additional hardware options include:

- Up to 4 Mechanical (FORM-C) or solid state (FORM-A) alarm set points
- 16 Bit analog output (0/4-20mA, 0-10V)
- 16 Bit Isolated analog output (0/4-20mA, 0-10V)
- Second communication RS485 interface
- RTC (Real Time clock) option for time and date stamping
- Low voltage 10-30VDC Isolated power supply
- High voltage 25-70VDC Isolated power supply

Specifications

General:	
Display	6-Digit, 13.8mm (0.543") 14 segment high brightness red LED
Display range	-199999 to +999999
Status LEDS	5 LEDs (SP1 to SP4 & Totaliser)
Digital Inputs	2 Programmable digital inputs Built in hysteresis, filter and input over voltage protection Maximum input voltage <30VDC Input logic is field jumper selectable (Pull up, sinking inputs) - 10kΩ internal resistor to 5V (Pull down, sourcing inputs) – 10kΩ internal resistor to common Active/Non-Active input trigger: <1.9V Non-Active/Active input trigger: >2.3V
Keypad	4 keys total, 3 programmable keys
Memory storage	Non-volatile EEPROM, 100000 write cycles minimum
Warm up time	15 minutes
Power Requirements:	
AC Power Supply	85-264VAC, 50/60Hz or 120-370VDC Isolation: 3000VAC/1min
DC Power Supply, 10-30VDC (Optional)	10-30VDC input Reverse and over voltage protected Isolation: >1000V/1min
DC Power Supply, 20-70VDC (Optional)	25-70VDC input Reverse and over voltage protected Isolation: >1000V/1min
Power Consumption	<6W (Depending on options selected)
Fuse (Built in)	2A Slow Blow (Wickmann 3721200000) RS components part number 226-6599
Environmental:	
Operating temperature	-10°C to 50°C (14°F to 122°F)
Storage temperature	-40°C to 80°C (-40°F to 176°F)
Operating and storage humidity	<85% RH non-condensing
Enclosure:	
Overall Dimensions	96x48x112mm (LxHxD) (3.78x1.89x4.41") (Depth includes connectors)
Mounting	92x45mm (3.62x1.77")
Enclosure Material	Rear ABS plastic, Front Polycarbonate
Front Facia Rating	IP65, with o-ring supplied as standard
Wiring connections	Removable terminal blocks
Input:	
ADC Resolution	24 bit Delta-sigma
Input	Bi-polar on all inputs
mA Input:	
Measurement range	+-27mA (Bi-polar)
Programmable range	All ranges have a programmable zero, span and decimal point 0 to 20mA 4 to 20mA Direct sensor calibration
Accuracy	<= 0.05% of reading +-4uA (Typically 0.02%)
Temperature Coefficient	<= +-0.4uA/°C
Input impedance	18Ohms

Decimal point	Programmable on all digits
Filter	Moving average digital filter with programmable input step detection
Conversion rate	10 updates/second
Increment size	1, 2, 5, 10, 20, 50, 100, 200
Lineariser	16 Point
Voltage Input:	
Measurement ranges	+-23V (Bi-polar)
Programmable range	All ranges have a programmable zero, span and decimal point 0-2V 0-5V 1-5V 0-10V 2-10V 0-15V 3-15V 0-20V Direct sensor calibration
Accuracy	0.05% of reading +-20uV (Typically 0.02%)
Temperature Coefficient	<= +-2uV/°C
Input impedance	>1Mohm
Decimal Point	Programmable on all digits
Filter	Moving average digital filter with programmable input step detection
Conversion rate	10 updates/second
Lineariser	16 Point
mV Input:	
Measurement range	+-100mV (Bi-polar)
Accuracy	<= 0.05% of reading +-4uA (Typically 0.02%)
Temperature Coefficient	<= +-2uV/°C
Input impedance	>20Mohm
Decimal point	Programmable on all digits
Filter	Moving average digital filter with programmable input step detection
Conversion rate	10 updates/second
Increment size	1, 2, 5, 10, 20, 50, 100, 200
Lineariser	16 Point
Frequency Input:	
Maximum Frequency	250KHz, RF noise filter plus Schmitt-trigger based input
Input voltage	Typical 5V, Maximum 24V, NPN / PNP 4k7 Ohm Jumper Selectable
Factor	Programmable (999.999)
Scale	Selectable 0.001, 0.010, 0.1, 1.0, 10.0, 100.0
Decimal Point	Programmable on all digits
Filter/Gate time	0.5 Seconds 1 Second 5 Seconds
Counting Input:	
Maximum Frequency	250KHz, RF noise filter plus Schmitt-trigger based input
Input voltage	Typical 5V, Maximum 24V, NPN / PNP 4k7 Ohm Jumper Selectable
Factor	Programmable (999.999)
Scale	Selectable 0.001, 0.010, 0.1, 1.0, 10.0, 100.0
Modes	Up or Down Counter
Decimal Point	Programmable on all digits
Reset/Preset	Via an external digital input Via a front panel push button

Potentiometer Input:	
Minimum resistance of Potentiometer	1K Ohm
Accuracy	0.05% of reading +-20uV (Typically 0.02%)
Temperature Coefficient	<= +-2uV/°C
Input impedance	>1Mohm
Decimal Point	Programmable on all digits
Filter	Moving average digital filter with programmable input step detection
Conversion rate	10 updates/second
Lineariser	16 Point

Thermocouple Input:

Type	Min Value	Max Value	Standard	Accuracy	Temperature Coefficient
B	0°C	1820°C	IEC 60584-1	<= +-2°C	<= +-0.2°C/°C
C	0°C	2310°C	IEC 60584-1	<= +-1°C	<= +-0.2°C/°C
D	0°C	2310°C	IEC 60584-1	<= +-1°C	<= +-0.2°C/°C
E	-270°C	1000°C	IEC 60584-1	<= +-1°C	<= +-0.05°C/°C
J	-210°C	1200°C	IEC 60584-1	<= +-1°C	<= +-0.05°C/°C
K	-270°C	1372°C	IEC 60584-1	<= +-1°C	<= +-0.05°C/°C
L	-200°C	900°C	DIN 43710	<= +-1°C	<= +-0.05°C/°C
N	-270°C	1300°C	IEC 60584-1	<= +-1°C	<= +-0.05°C/°C
R	-50°C	1767°C	IEC 60584-1	<= +-2°C	<= +-0.2°C/°C
S	-50°C	1767°C	IEC 60584-1	<= +-2°C	<= +-0.2°C/°C
T	-270°C	400°C	IEC 60584-1	<= +-1°C	<= +-0.05°C/°C
U	-200°C	600°C	DIN 43710	<= +-1°C	<= +-0.05°C/°C

Input impedance	>20Mohm
Display Resolution	0.1 or 1 °C/°F/K
Cold Junction Compensation (CJC)	Via internal sensor (Accuracy: +-2°C) or via manual entry
Unit	°C, °F or ABS (Kelvin)
Sensor error detection	Yes, on all TC types
Sensor error detection current	When detecting 2uA else 0uA
Lineariser	10 updates/second

RTD Input::

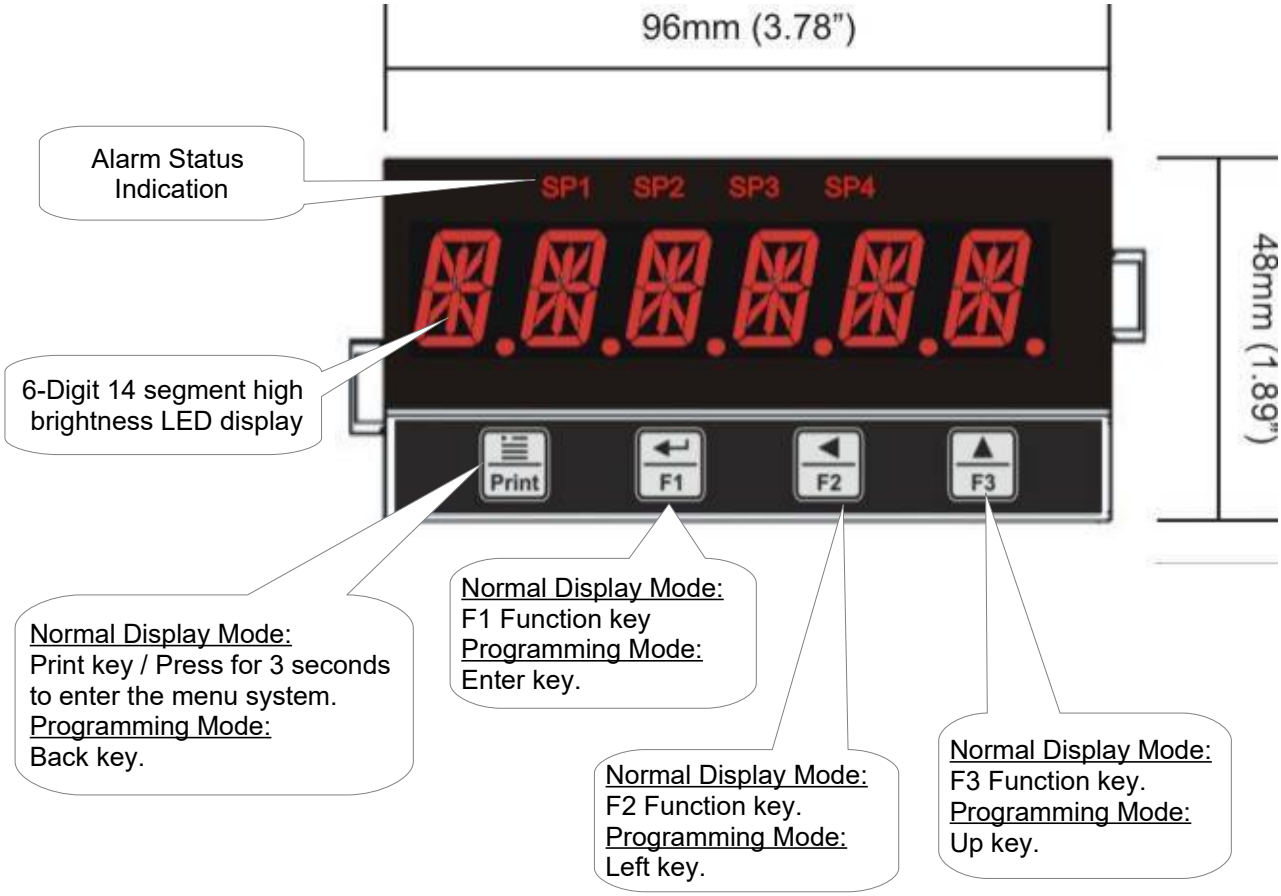
Type	Min Value	Max Value	Standard	Accuracy	Temperature Coefficient
Pt50	-200°C	850°C	IEC 60751	<= +-0.2°C	<= +-0.05°C/°C
Pt100	-200°C	850°C	IEC 60751	<= +-0.2°C	<= +-0.05°C/°C
Ni100	-60°C	250°C	DIN 43760	<= +-0.3°C	<= +-0.05°C/°C
Ni120	-60°C	250°C		<= +-0.3°C	<= +-0.05°C/°C

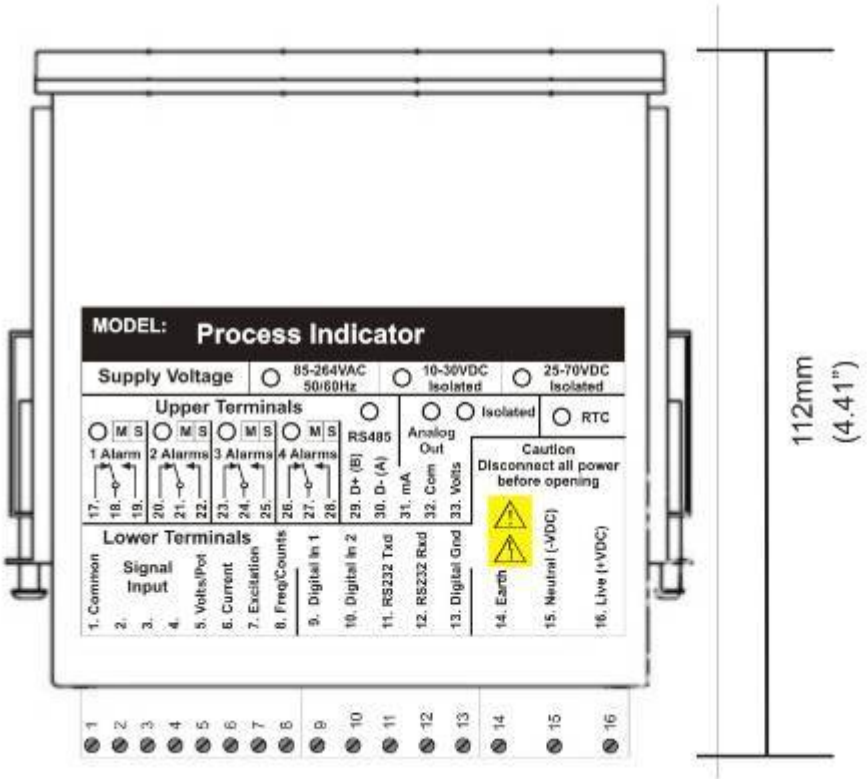
Measurement technology	24 bit Delta-sigma Ratiometric
RTD sensors	2 and 3 wire supported. (Pin 3 and 4 on the input connector must be linked for 2 wire RTDs)
Display Resolution	0.1 or 1 °C/°F/K
Unit	°C, °F or ABS (Kelvin)
Sensor error detection	Yes, on all RTD types
RTD sensor current	500uA
Conversion rate	10 updates/second
Ohms Input:	
Measurement technology	24 bit Delta-sigma Ratiometric
Ohm connection	2 and 3 wire supported (Pin 3 and 4 on the input connector must be linked for 2 wire Ohms measurement)
Temperature Coefficient	<= +-2uV/°C
Input impedance	>1Mohm
Decimal Point	Programmable on all digits
Filter	Moving average digital filter with programmable input step detection
Ohm sensor current	500uA
Conversion rate	10 updates/second
Lineariser	16 Point
Event Timer:	
Time mode:	HHHH.MM HH.MM.SS SSSSSS SSSSS.S SSSS.SS
Reset / Preset / Start / Stop	Via an external digital input
Manual Analog Output Station: (Optional with analog out option)	
Decimal Point	Programmable on all digits
Sensor Excitation Voltage: (Jumper selectable)	
Excitation Voltage	+2.048V, Max 2mA +5VDC, Max 50mA +12VDC, Max 50mA +24VDC, Max 50mA
Analog Out: (Optional)	
Ranges (Selectable through menu)	0-20mA 4-20mA 0-10V
DAC Resolution	16 Bit
Update rate	10 updates/second
Current output compliance (maximum load)	500Ω (Current is source, not sink)
Voltage output compliance (minimum load)	1kΩ
Current open loop detection	Display flashes “mA.Loop” error message
Linearity	<0.02% of full scale
Accuracy	0.05% of full scale
Isolation (Optional)	1000VDC @ 1mA for 1 minute
Communications:	
Protocol	MODBUS RTU MODBUS ASCII ASCII In (Infiniteq Protocol)

	ASCII Out (Infiniteq Protocol)
RS232 Communications (Standard)	Baud rate: 1200,2400,4800,9600,19200,38400,57600,115200 Data bits: 7 or 8 bits Parity: Odd, Even or None Stop bits: 1 or 2 stop bits Non isolated
RS485 Communications (Optional)	Baud rate: 1200,2400,4800,9600,19200,38400,57600,115200 Data bits: 7 or 8 bits Parity: Odd, Even or None Stop bits: 1 or 2 stop bits Internal 120Ω field jumper selectable termination resistor Max 32 instruments per line
SetPoints: (Optional, Up to 4 can be fitted) **Electro-mechanical Relays:**	
Contact rating	3A@250VAC or 30VDC (Resistive load)
Type	FORM-C (Change over contact (NO/NC))
Life expectancy	>100K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads
Solid-State Relays (SSR):	
Contact rating	120mA@400VAC/DC
Dielectric strength	>1000VAC for 1 minute
Type	FORM-A (Normally open)
RTC (Real Time Clock): (Optional)	
Battery	CR2032
Accuracy	Better then 2 seconds per day (Temperature dependent)

Installation

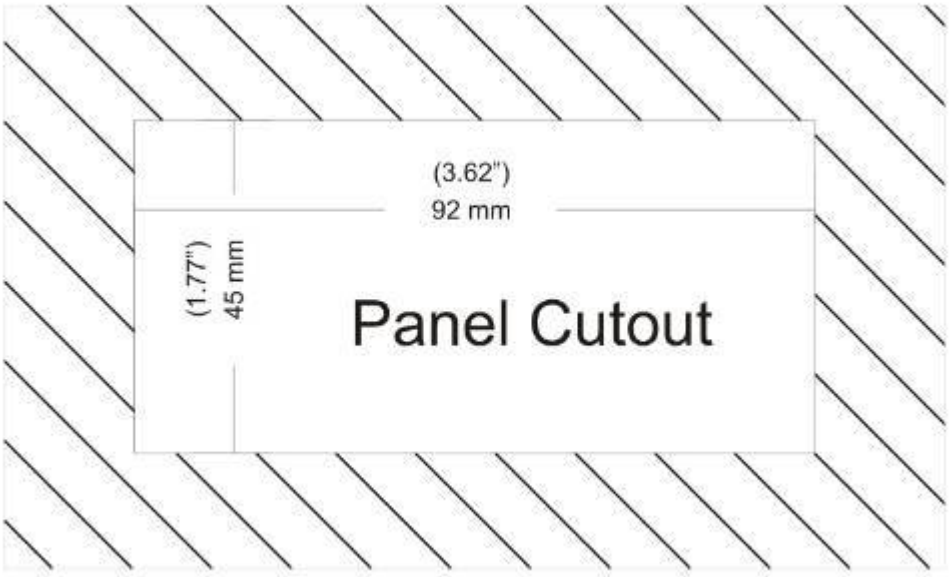
Dimensions & Front panel layout



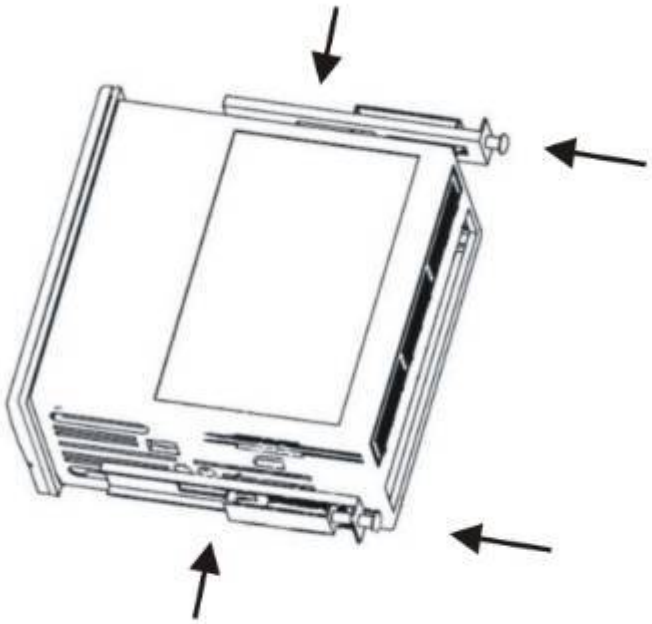


Panel Cutout

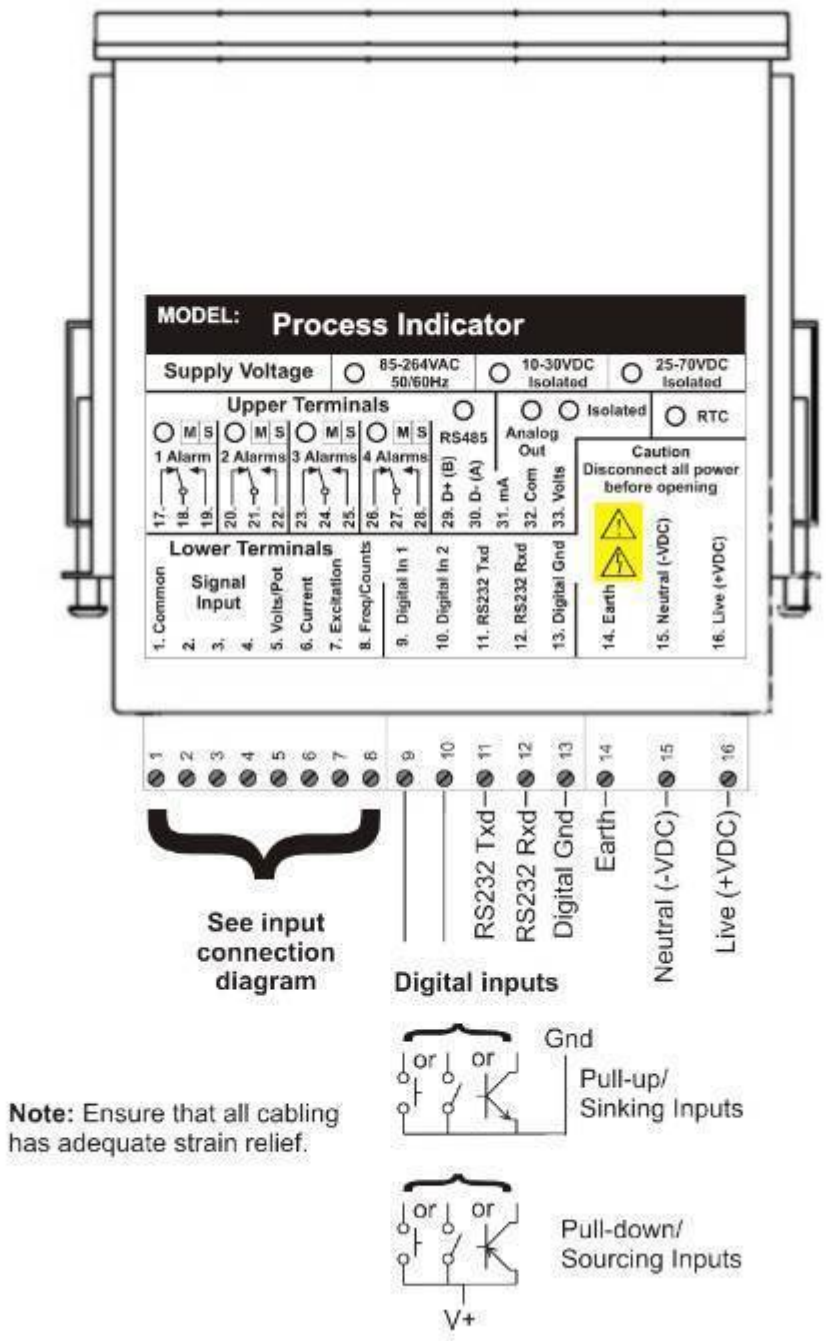
A rectangular cutout measuring 92x45mm (3.62”x1.77”) must be made in the mounting enclosure. The IQ201 instrument should preferably be mounted in a grounded metal enclosure.



The supplied o-ring must be attached to the front cover to provide sealing between the indicator and the mounting enclosure. The two supplied fastening metal side clips must be attached to either side as in the diagram below. Do not over tighten the screws.

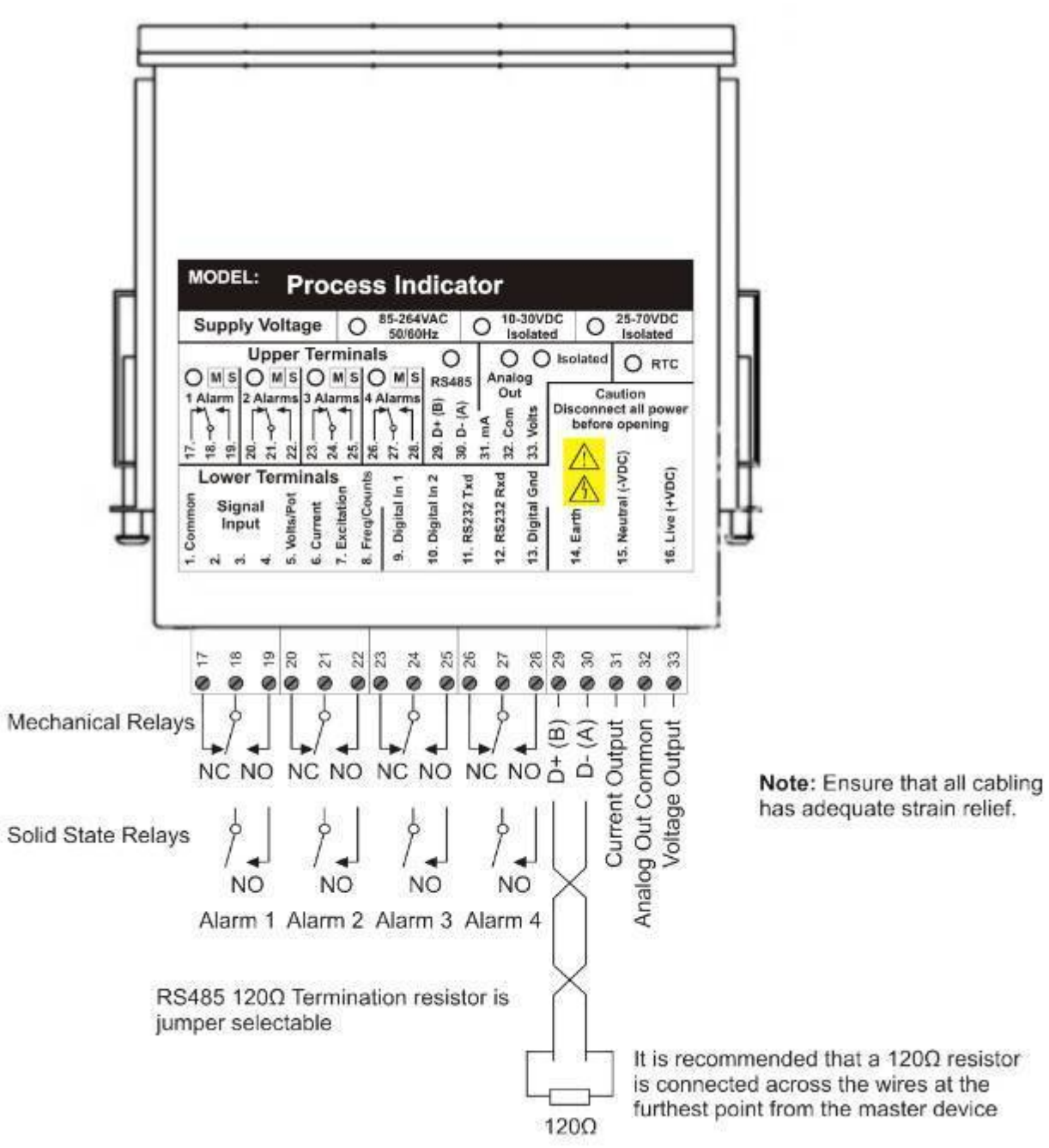


Hardware Connection (Lower Terminals)



Note: Ensure that all cabling has adequate strain relief.

Hardware Connection (Upper Terminals – Option PCB)



Note: Ensure that all cabling has adequate strain relief.

Cleaning

The unit should not be cleaned with any abrasive substances. The screen is very sensitive to certain cleaning materials and should only be cleaned using a clean, damp cloth.

Ordering Information

Add option codes to suffix of model number separated by hyphens.

Example:
(IQ201 Process indicator with 2 mechanical relays, analog output and an additional RS485 interface)

IQ201-711-730-740

Option part numbers:

700 - Low voltage 10-30VDC isolated power supply
701 - High voltage 25-70VDC isolated power supply
710 - 1 Mechanical relay
711 - 2 Mechanical relays
712 - 3 Mechanical relays
713 - 4 Mechanical relays
720 - 1 Solid-state relay
721 - 2 Solid-state relays
722 - 3 Solid-state relays
723 - 4 Solid-state relays
730 - 16 Bit Analog Output (0/4-20mA, 0-10V)
731 - 16 Bit Isolated Analog Output (0/4-20mA, 0-10V)
740 - Second communication RS485 interface
750 - RTC (Real Time Clock)
760 - Panel mount engineering units
761 - Power connector protective cover
762 - 115VAC Inductive load suppressor
763 - 230VAC Inductive load suppressor
764 - 2A Slow blow replacement fuse
765 - R-C Snubber noise and arc suppressor
766 - Transparent protective front cover

Notice

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Warranty

This product carries a warranty for a period of one year from date of purchase against faulty workmanship or defective materials, provided there is no evidence that the unit has been mishandled or misused. Warranty is limited to the replacement of faulty components and includes the cost of labor. Shipping costs are for the account of the purchaser.

Note: Product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies and or sensors, and damage caused by inductive loads.

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