Signal Converters

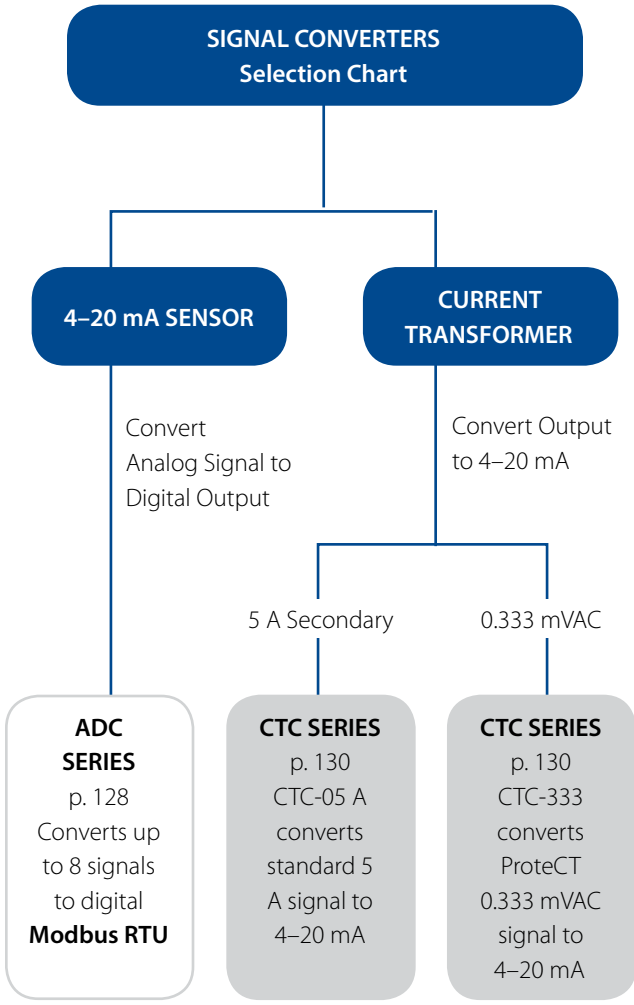
NK Technologies' ADC series signal converters use sensor outputs (4–20 mA, 0–5 and 0–10 VDC) and convert these to digital RS485 outputs. The CTC series accept either 5 A secondary current from current transformers or 0.333 VAC secondary voltage from our ProteCT™ series sensors and convert them to 4–20 mA loop-powered output for use with PLCs, panel meters or data loggers.

Features:

- DIN rail mounting makes installation a snap
- Industry standard outputs

ADC SERIES
Analog to Digital Converter.....page 128

CTC SERIES
Signal Converter.....page 130



ADC SERIES
Analog to Digital Converters

The ADC Series Signal Converter connects up to eight analog sensors, or up to eight separately powered analog output sensors, or up to four of each. This will produce a digital signal representing 0–100% of each sensor output. It is the perfect solution for photovoltaic power production system monitoring. The ADC converter allows for individually-ranged devices to interface with the industry-standard **Modbus RTU** serial protocol. The device can accept analog signals from current, voltage or temperature sensors, allowing the installer great versatility and higher accuracy. It was designed and built to meet NK Technologies' trusted standards of reliability and ease of use.

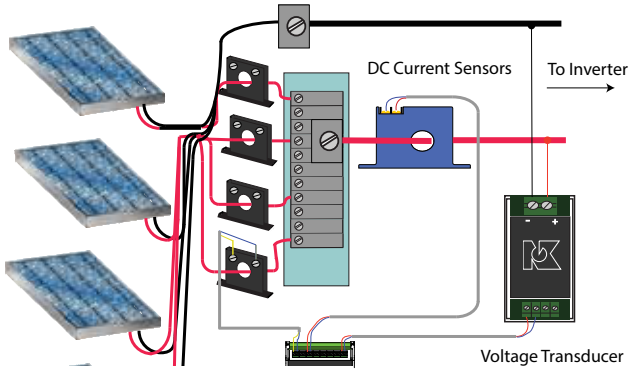
Signal Converter Applications

Photovoltaic Power Production
- Measure current output accuratley using a sensor sized appropriately.
- Measure current from a panel and after the combiner with the same device.
- Measure voltage output, temperature, or any parameter sensor 4–20 mA, 0–5 VDC or 0–10 VDC output.

Machine Control
- Combine several analog signals into a single **Modbus** address to enable web viewing of data.

SCADA System
- Report and record current, voltage, power, pressure, frequency and flow by using existing sensors but adding network communication easily.

Analog Sensor to Digital Network Conversion



Signal Converter Features

Eight Points of Data
- Convert up to eight analog, sensor outputs using a single network address.
- Sensor loop power is supplied by the converter: No DC power supply is required.
- Models for 8 loop-powered (2-wire) and 8 externally powered (4-wire) or 4 of each type.

Fast and Easy Installation
- DIN rail mount converter* with finger-safe terminals clearly marked for field installation speed.

Application Versatility
- Convert any standard sensor output to **Modbus RTU** digital network format.

Choice of Power Supplies
- ADC converter can be factory set for 120 VAC, 240 VAC or 24 VDC power supplies.

Communication Baud Rate Choices
- Field-selectable 9600 or 19200 baud rate speeds.

*For information on the DIN rail accessories kit, see page 140.

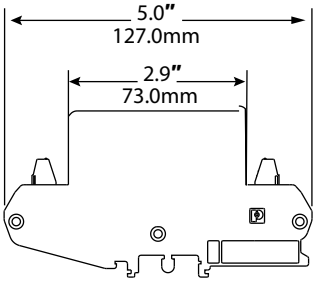
Use any 4–20 mA, 0–5 VDC or 0–10 VDC output sensor as an input to the NK Technologies' ADC analog-to-**Modbus** converter: Current, voltage, temperature, or any parameter that the application calls for. With the digital **Modbus** output scaled for zero to 100 percent the signal will represent whatever you may need to measure.

For additional Application Examples, go to www.nktechnologies.com/applications

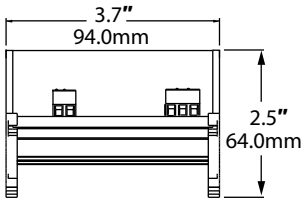
NK Technologies
3511 Charter Park Drive • San Jose, CA 95136
800.959.4014 • www.nktechnologies.com • sales@nktechnologies.com

Signal Converter Dimensions

Side View



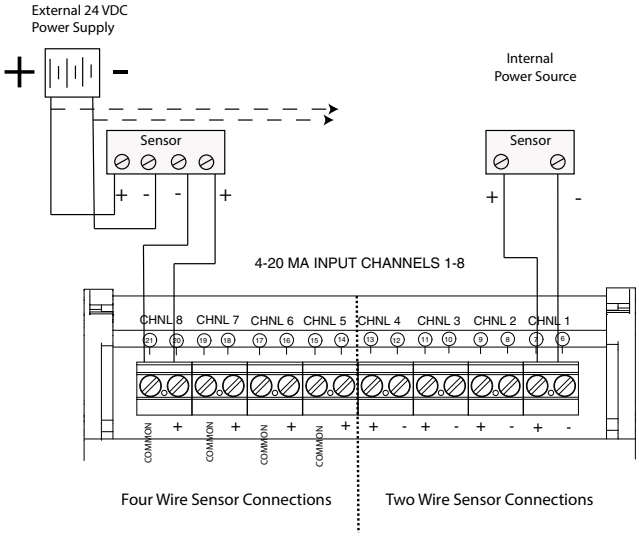
End View



Signal Converter Specifications

Power Supply	• 120 VAC (108–132 V) • 240 VAC (216–264 V) • 24 VDC (22–26 V)
Power Consumption	• 120 VAC: <50 mA • 240 VAC: <25 mA • 24 VDC: <200 mA
Output	**Modbus RTU** Slave 8 Channels (RS485)
Output Protocol	1 start bit, 8 data bits (LSB first), 1 bit for even parity, 1 stop bit
Output Functions	Function 04, "Read Input Registers"
Output Range	0–120% (4 mA = 0, 20 mA = 100%)
Input Range	• 4–20 mA (power from converter or external) • 0–5 VDC (externally powered) • 0–10 VDC (externally powered)
Accuracy	1.0% FS
Indication	Green Power On LED, yellow Busy LED, red Fault LED
Addressing	8 wide binary switch (1 to 247)
Environmental	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings	UL/cUL

Signal Converter Connections



Wiring Notes for Installation:

1. Connect sensors to input channel teminals 6–21.
2. Set **Modbus** network address 1–247.
3. Connect 120 VAC power (240 VAC optional).

Signal Converter Ordering Information

Sample Model Number: ADC1-420-120-MOD-DIN
Eight-channel 4–20 mA input converter, 120 VAC powered.

	(1)		(2)		(3)		(4)		(5)		
ADC		–			–		–	M O D	–	D I N	

(1) Input channels

1	Eight 4–20 mA loop-powered input channels
2	Four loop-powered, four external powered (4-wire)
3	Eight external-powered inputs

(2) Sensor Input Type

420	4–20 mA inputs
005	0–5 VDC
010	0–10 VDC as inputs available

(3) Power Supply

120	120 VAC
240	240 VAC
24D	24 VDC

(4) Output Type

MOD	Modbus RTU

(5) Case Style

DIN	DIN rail mounting

OEMs **Test & Evaluation Units for OEMs**
Free program expedites evaluation process. See page 3 for details.

CTC SERIES
Signal Converters

CTC Series Signal Converters allow you to use an existing standard 5 A secondary or low-voltage ProteCT™ current transformer over a conductor to produce an industry standard 4–20 mA two-wire, loop-powered signal. The signal is proportional to the current in the primary circuit. The CTC series snaps onto a standard DIN rail. The sensor output is connected to the load (PLC or panel meter, etc.) and a 24 VDC power source, and the current transformer is connected to the input terminals.

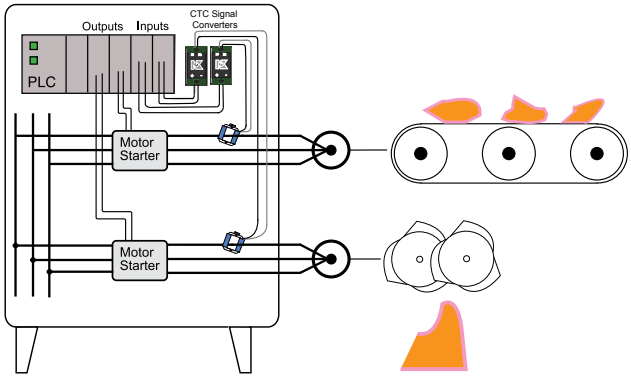
Signal Converter Applications

Adding Current Monitoring for System Upgrades
- Measure an entire plant current consumption or individual machine usage.

Detect Problems Before Failure Occur
- Detect bearing failures on drive motors and open discharge lines on pumps.

Tool Monitoring and Jam Protection
- Measure drive motor HP to determine tool travel or contact with work.
- Monitor motor current use to provide an indication of motor jams.
- Use existing current transformers to monitor the current, and transmit 4–20 mA industry standard output.

Crusher/Grinder/Shredder Motor Interlocks



For additional Application Examples, go to www.nktechnologies.com/applications

Signal Converter Features

Uses any Standard 5 A Current Transformer or the Safer ProteCT™ Low Voltage Design
- Produces a 4–20 mA signal proportional to the AC current through the CT based on CT ratio.
- Two wires in, two wires out: Couldn't be easier.

Fast and Easy Installation
- DIN rail mountied* and 24 VDC loop-powered supply allows for quick and easy two-wire installation.

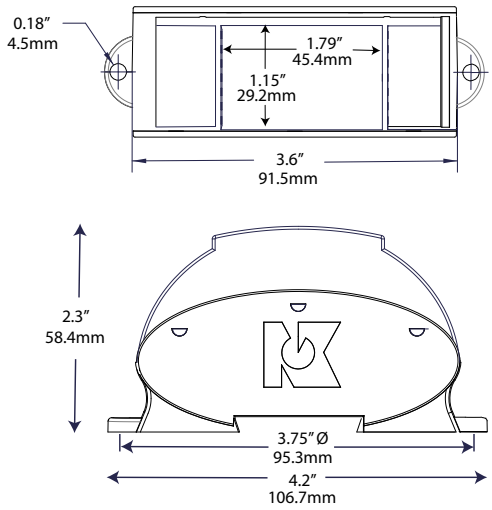
No Calibration Needed
- The primary current transformer ratio provides the scaling required without any other installer intervention.

UL/cUL Approved
- Accepted worldwide.

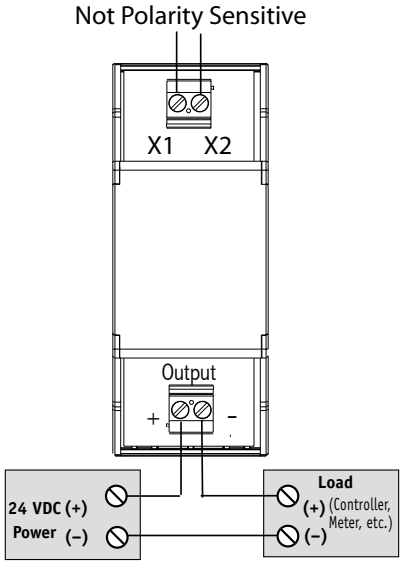
*For information on the DIN rail accessories kit, see page 140.

NK Technologies
3511 Charter Park Drive • San Jose, CA 95136
800.959.4014 • www.nktechnologies.com • sales@nktechnologies.com

Signal Converter Dimensions



Signal Converter Connections



Notes:

With 5 A secondary current transformers, the secondary must be connected to a load (NK Technologies' CTC converter or other load) when energized.

With ProteCT™ type (low voltage output) current sensors, there is no chance that dangerous voltages will result if the secondary is open when there is current through the sensing window.

OEMs **Test & Evaluation Units for OEMs**
Free program expedites evaluation process. See page 3 for details.

Signal Converter Specifications

Power Supply	24 VDC loop-powered (12–30 V)
Output	4–20 mA proportional to max. current
Output Impedance	<500Ω
Input Range	Based on current sensor ratio
Input Burden	1.67 VA max. for stated accuracy
Accuracy	1.0% FS
Response Time	100 ms (to 90% step change)
Max. Inrush Current	300% FS (6 sec. duration)
Frequency Range	10–100 Hz
Environmental	-4 to 122°F (-20 to 50°C) 0–95% RH, non-condensing
Listings	UL/cUL

Signal Converter Ordering Information

Sample Model Number: CTC333-420-24L-DIN
Transducer accepts 333 VAC inputs from ProteCT™ current sensors, and produces a corresponding 4–20 mA signal.

	(1)				(2)			(3)				(4)		
CTC				–	4	2	0	–	2	4	L	–	D	I	N

(1) Input CT Type

333	0.333 VAC low voltage ProteCT™
05 A	5 A secondary

(2) Output Signal

420	4–20 mA

(3) Power Supply

24L	24 VDC loop-powered

(4) Case Style

DIN	DIN rail mounting