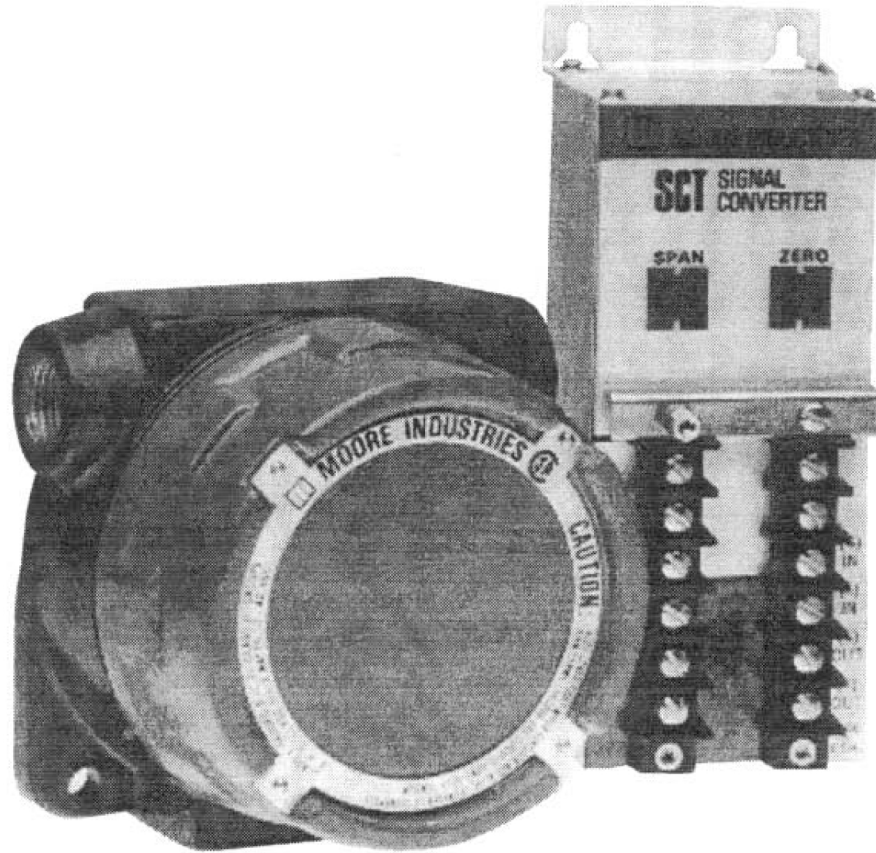


SCT/DSCCT

Signal Converter/Dual Signal Converter

SCT/DSCCT
Signal Converter
Dual Signal Converter



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Introduction

Moore Industries' SCT and Dual SCT (DSCT) are isolating converters. They accept voltage or current process variable inputs and provide isolated outputs converting the input variable to a different process variable type or scaled value, if required.

This manual contains the information necessary to calibrate, install, operate, maintain, and troubleshoot the SCT. It includes a brief unit description, a table of performance and operational specifications, and an explanation of Moore Industries' model number-based product data tracking system.

The following guidelines are used throughout the manual:

WARNING – Hazardous procedure or condition that could injure the operator.

Caution – Hazardous procedure or condition that could damage or destroy the unit.

Note – Information that is helpful for a procedure, condition, or operation of the unit.

Description

The SCT accepts dc voltage or current input and provides isolated output. With the appropriate configuration, it converts the input to a different process variable type and range. The DSCT accepts two separate inputs and provides two isolated outputs. The input to these signal converters is isolated from the output and power, but does not necessarily have to be converted to a different signal type or range. The signal conversion is factory-set. The Ordering Information Table lists the standard types and ranges of inputs and outputs that can be processed.

Specifications

<p>Performance</p> <p>Calibration Capability: $\pm 0.1\%$ of span (includes linearity and repeatability)</p> <p>Frequency Response: 5Hz max at the -3dB point</p> <p>Common Mode Rejection: $>120\text{dB}$ @ 60Hz with a limit of 500Vrms</p> <p>Ripple: 10mV P/P at maximum span and maximum load resistance</p> <p>Load Effect: $\pm 0.01\%$ of span from 0 to max. load resistance (current output)</p> <p>Line Voltage Effect: ac or dc; $\pm 0.005\%/1\%$ line change</p>	<p>Performance (continued)</p> <p>Accuracy: $\pm 0.1\%$ of span (includes linearity and repeatability)</p> <p>Output: Operational amplifier feedback current source; output limited to 150% of maximum output</p> <p>Isolation: Input, output, and power input are transformer isolated with no dc connections (standard for both ac and dc powered units). Common mode rejection exceeds 120dB at 60Hz with a limit of 500Vrms.</p>	<p>Ambient Condition Ratings</p> <p>Temperature Range: -20°C to $+82^{\circ}\text{C}$ (-4°F to $+180^{\circ}\text{F}$)</p> <p>Effect: $\pm 0.003\%/^{\circ}\text{C}$ over above range ($\pm 0.005\%/^{\circ}\text{F}$ over above range)</p> <p>Adjustments</p> <p>Type: 22 turn potentiometers</p> <p>Zero: With minimum input, adjusts output to $0\% \pm 10\%$ of span</p> <p>Span: With fullscale input, adjusts output to $100\% \pm 10\%$ of span</p>
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SCT/DSCT

Ordering Information

Unit	Input	Output	Power	Options	Housing
SCT	1-5MA into 200Ω nominal 4-20MA into 50Ω nominal 10-50MA into 20Ω nominal SC Selectable Current input 0-5VDC 1-5VDC 10MΩ minimum input impedance 0-10VDC 200K impedance standard with -ATL, 10MΩ optional with -ATH	1-5MA into 0-4800Ω load 4-20MA into 0-1200Ω load (0-1800Ω optional) 10-50MA into 0-480Ω load SC Selectable Current output 0-5V 1-5V standard into 20KΩ minimum 0-10V standard into 40KΩ minimum	24DC 24Vdc±10% 45DC 45Vdc±10% 117AC* 220AC* * Not available with PC housing Consult factory for other available options.	-ATH Maintains 10MΩ input impedance for 10V inputs -ATL Low-impedance (200KΩ) attenuated input for any voltage over 5V -EO Power selection of 117Vac or 24Vdc (not available with PC housing) -FU 400mA power fuse for -PC housing (SCT only) for STD housing, C/F -HI High current output (20mA maximum) for voltage outputs -RF Patented filter assembly for RFI protection -RO Reverse output, current or voltage (SCT only) -TX Two-wire transmitter excitation (SCT only)	AB Angle bracket mounting CP Conduit-plate for use with standard units DCM DIN clip mount EX Explosion-proof enclosure, Single Unit, DIV 1 GP General-purpose enclosure, single unit, NEMA 1 PM Panel mount enclosure TCE Transparent cover enclosure, NEMA 4 UB U-back bracket WT Watertight enclosure, single unit, NEMA 4
Unit	Input	Output	Power	Options	Housing
DSCT	1-5V4-20MA 4-20MA1-5V 2X1-5V 2X4-20MA 2X0-5V	1-5V4-20MA 4-20MA1-5V 2X1-5V 2X4-20MA	24DC 24Vdc±10%	See above	PC Plug-in card

Housing Options

Several housing options are available for the SCT. The two most common are the U-back (UB) and the Plug-in Card (PC). The UB housing is equipped with a U-back bracket that provides extra protection for the SCTs aluminum housing and allows mounting on flat, sturdy surfaces. UB housing is available in several mounting options. The PC housing is designed to be mounted in either the RMR or SMR card rack from Moore Industries.

The EX housing is a unit that has been modified to fit in a high-dome, explosion-proof enclosure. On EX units, the electrical connections are on the bottom of the unit. A mating connector is supplied with EX units for making the electrical connections. The bottom of the SCT housing is fitted with pins that mate with the connector in the base of the explosion-proof enclosure.

Each housing style functions identically and is designed for a different mounting application. Housing style selection should be based on the application and the environment in which the unit will be used.

Note:

Not all features and options are available for all housing styles. For example, the UB unit can operate from a dc or an ac power source, but the PC unit operates on dc power only.

The basic SCT has no visual indicators, and features only two adjustments (ZERO and SPAN), which are located on the front panel of each unit (including the EX Housing). The ZERO adjustment is used to set the zero-percent output of the unit, while the SPAN adjustment is used to set the 100-percent output.

Options

The SCT is available with several optional features. The following are brief descriptions of them:

ATH Option. Provides a high-impedance attenuated input — 10 M Ω (0-10 Vdc input only)

ATL Option. Provides a low-impedance attenuated input — 200 k Ω (0-10, 0-24, or -10 to +10 Vdc inputs only).

EO Option. Provides "Either/Or" power. EO-equipped units automatically switch from 117Vac to 24Vdc, as required. (Not available with PC housing).

FU Option. 400mA power fuse for PC housing (SCT only). For UB housing, C/F.

HI Option. High current output (20mA maximum) for voltage outputs (1-5V, 0-1V, 0-2V, 0-5V, 0-10V and 0-20V).

RF Option. RFI/EMI protection; 50 V/m – abc \leq 0.1% of full-scale as defined by SAMA Standard 33.1; this option also provides 500 Vdc input-to-output isolation (not available with EX, PC, or PM housing).

RO Option. Reverse output, current or voltage (SCT only). Output goes up when input goes down, and vice-versa.

TX Option. Provides a transmitter excitation voltage of 30 Vdc at 25 mA. Use for powering 2-wire, 4-20 mA transmitters (not available for DSCT).

For information on availability of other SCT options please contact your local Moore Industries' Sales Representative or the factory.

SCT Model Numbers

To order additional or replacement modules for your system, refer to the Ordering Information table and "build" a model number using the information in bold text. Specify the following in order:

Product / Input / Output / Power / Option [Housing]

For an SCT with 1-5Vdc input, 4-20mA output, 117ac power and the RF option enclosed in U-back housing, order:

SCT / 1-5VDC / 4-20MA / 117AC / -RF [UB]

For a DSCT with dual 1-5Vdc inputs, dual 4-20mA outputs, using 24Vdc power with the FU option and the plug-in card housing, order:

DSCT / 2X1-5VDC / 2X4-20MA / 24DC / -FU [PC]

SCT/DSCT

Calibration

Prior to shipment, every SCT is subjected to rigorous testing by our team of skilled technicians. Every product Moore Industries manufactures, sells and services is guaranteed to meet the strict quality standards that have become synonymous with our name.

Before placing your SCT into service, a bench check of basic operation is recommended to ensure that the unit hasn't sustained any damage during transit, and to set zero and span for your application.

Every unit should be:

- Checked to verify that the appropriate SCT model has been ordered for the intended application.
- Connected in a calibration setup (described later in this section) and checked for desired output.
- Adjusted for desired zero and span.

Even if a unit has been configured to your specifications by the factory (factory calibration), it is a good idea to perform this calibration as a simple bench check. The procedures provide a safe means to uncover any unit damage that may have occurred during shipping, and offer a simple familiarization with SCT operation in the safety of a testing environment, separate from the intended process or application.

These procedures should be carried out in an environment considered appropriate for general testing of electronic equipment, rather than in the field. Use a technician's bench or a similar, lab-type environment.

SCT Controls

The basic SCT has two adjustments: ZERO and SPAN. Both of these potentiometers are accessible at the front panel of all housing styles. The ZERO potentiometer adjusts the output for the zero-percent rating of the unit. The SPAN potentiometer adjusts the output for the 100-percent rating of the unit.

The DSCT has separate zero and span adjustments for each of its two channels. Channel 1 is controlled by ZERO 1 and SPAN 1, and channel 2 uses ZERO 2 and SPAN 2.

All potentiometers on the SCT are equipped with a slip-clutch that prevents the potentiometer from being damaged should you turn the adjustment beyond the wiper stop. The use of each of these controls is explained in the calibration procedure later in this section.

SC Input and Output. The Selectable Current (SC) input and output feature of the SCT is controlled by a resistor that is connected across specific terminals to yield a predetermined input or output configuration. Units ordered with either of these selections receive three resistors with different resistances. The difference in resistance yields a different current range for the input or output. The ranges are 1-5 mA (200 Ω , 5%), 4-20 mA (50 Ω , 5%), and 10-50 mA (20 Ω , 5%). Before calibrating a unit with an SC input or output, verify the value of the resistor and its location.

Calibration Setup

The equipment listed in Table 1 is needed when calibrating the SCT. These items are not supplied by Moore Industries, but should be available in most testing labs.

Be sure to use calibrated test equipment when performing the bench check and zero/span adjustment of the SCT. The use of inaccurate test equipment will result in unreliable settings and costly process down-time.

Table 1. SCT Calibration Equipment

Equipment	Specifications
Adjustable Signal Source	Capable of simulating specified input type (i.e., current or voltage) and input range
DC Power Source (for dc units only)	24 or 45 Vdc, $\pm 10\%$ (as required per unit configuration)
Voltmeter & Load Resistor (optional)	Accuracy of 0.05% or better
Multimeter (optional)	Accuracy of 0.05% or better
Screwdriver	Head width no greater than 2.54 mm (0.1 inch)

Setting up the UB unit on a shop or laboratory bench for bench check/calibration is relatively easy. The wiring terminals for the UB unit are easily accessible on the front of the unit. Making connections to the PC and EX units is slightly more involved.

The PC unit can be bench checked in its intended rack location by connecting the calibration equipment to the terminal strip. Performing a bench check in the rack can be cumbersome, but it allows you to verify the wiring connections of individual card slots of a card rack.

Calibrating the SCT with the PPS

The PC unit can be bench checked and calibrated on a bench top using the appropriate mating connector. You can build your own test fixture or special connector for this purpose. However, we recommend using Moore Industries' Process Power Supply (PPS) with the CT Option. The PPS (with CT Option) is designed to accept the PC unit and provides terminals for connecting calibration equipment. The terminals on the PPS are numbered in the same manner as the terminals on the rear of the card rack. Connections are made to these terminals as they are to the card rack terminals. The PPS supplies 24 Vdc to the SCT and allows for connection of other equipment and the temperature compensating resistor (or diode) that normally connects to the rear terminals of the card rack.

The EX unit is an explosion-proof enclosure with a terminal block secured to the base. To prepare for bench-top calibration, remove the top of the enclosure and pull the SCT out to separate it from the terminal block. Individual terminal screws are used to make electrical connections at each of the terminals.

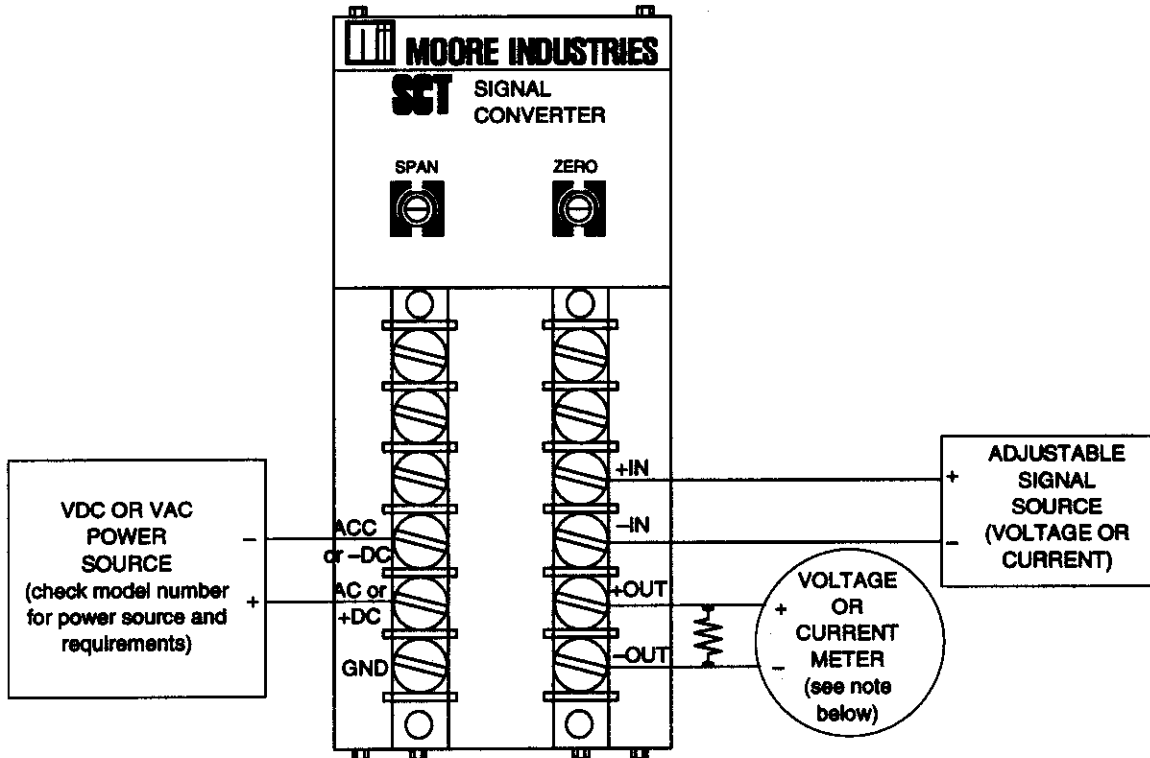
Calibration Procedure

Before beginning this procedure, check the model number of the unit to be calibrated to verify the unit's power requirements and its input and output configurations. The following procedure is suitable for all SCTs.

Refer to Table 1 for a list of calibration equipment and use Figure 1, 2, or 3, as applicable. Figure 1 shows the calibration hookups for the basic SCT (UB). The calibration hookups for the unit with Ex housing are shown in Figure 2. Figure 3 shows the calibration hookups for the SCT unit with PC housing.

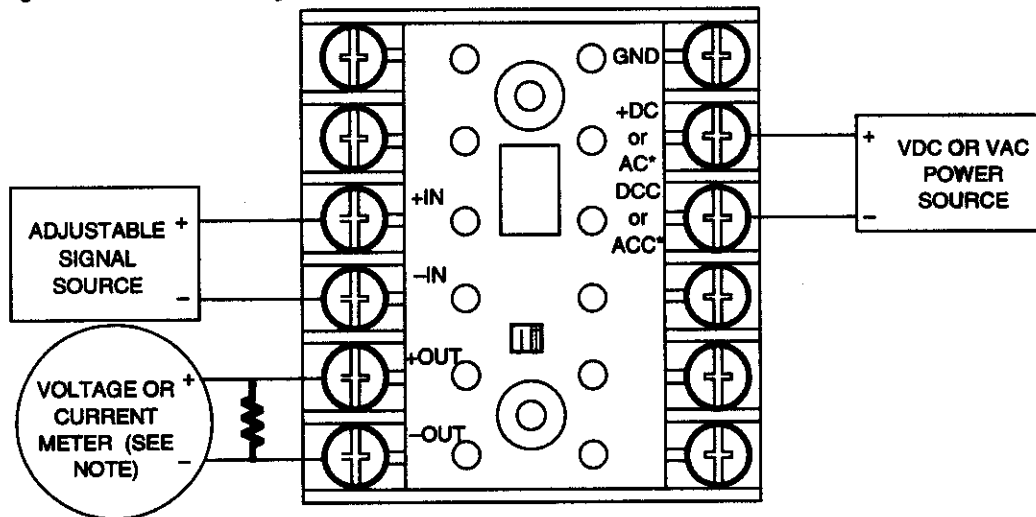
SCT/DSC

Figure 1. Calibrating the SCT with UB or AB Housing



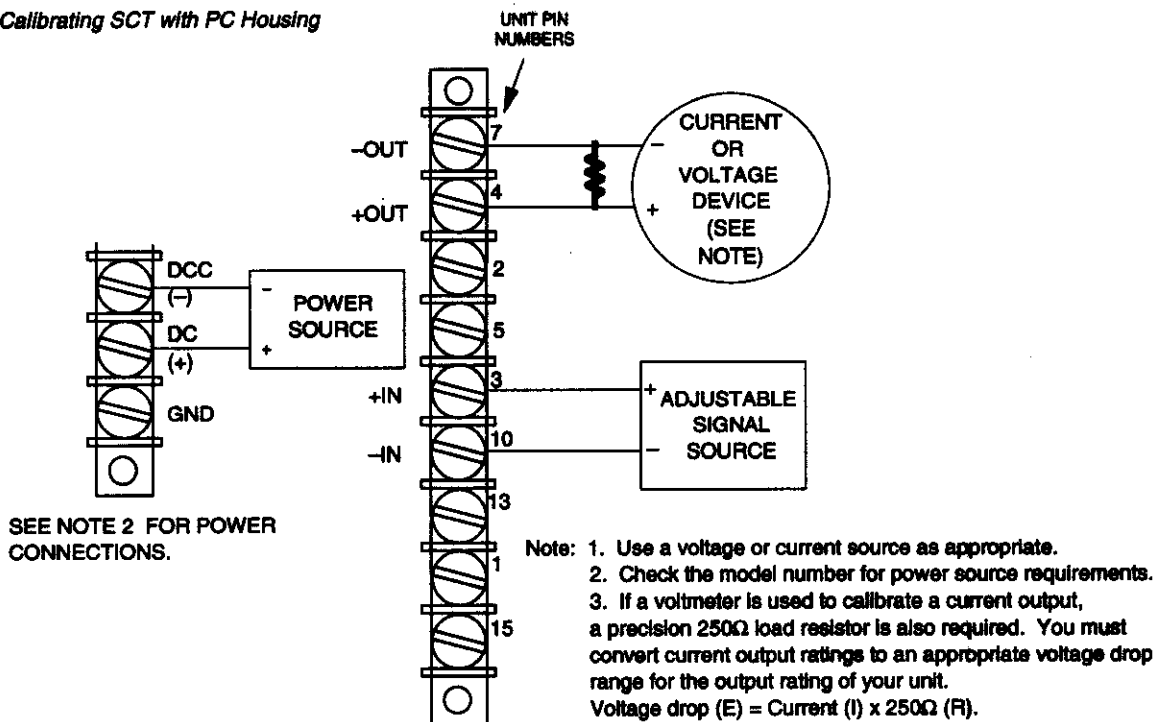
NOTE: If a voltmeter is used, a precision 250Ω load resistor is required. You must convert current output ratings to an appropriate voltage drop range for the output rating of your unit. Voltage drop (E) = Current (I) x 250Ω (R)

Figure 2. Calibrating the SCT with EX Housing



- Note:
1. Use a voltage or current source as appropriate.
 2. Check the model number for power source, requirements.
 3. If a voltmeter is used, a precision 250Ω load resistor is also required. You must convert current output ratings to an appropriate voltage drop range for the output rating of your unit. Voltage drop (E) = Current (I) x 250Ω (R).

Figure 3. Calibrating SCT with PC Housing



To calibrate the SCT:

WARNING

Power terminals are exposed on the STD Housing when the plastic safety cover is removed. To reduce the risk of electrical shock, replace the safety cover after completing wiring connections and before applying power.

1. Connect the SCT and calibration equipment as shown in figures 1, 2, and 3.
2. Apply power and allow the SCT to warm-up for 5 minutes.
3. Set the adjustable input source to minimum input setting as stated in model number.
4. Monitor output with a multimeter (or voltmeter with load resistor) to verify zero-percent output is correct ($\pm 0.1\%$ of span).
5. Adjust ZERO potentiometer to bring the zero-percent output to required setting.
6. Set the adjustable input source for 100-percent input as stated in model number.
7. Monitor output to verify 100-percent output is as stated in model number ($\pm 0.1\%$ of span).
8. Adjust SPAN potentiometer to bring 100-percent output to required setting.
9. Since zero and span are interactive, repeat steps 3 through 8 until zero- and 100-percent outputs are stable when the input is changed from minimum to maximum.
10. Remove power and disconnect equipment.

SCT/DSCT

Installation

To install the SCT, mount the unit and make the electrical connections. Before installing the SCT, bench check it to ensure that it is configured for its intended application.

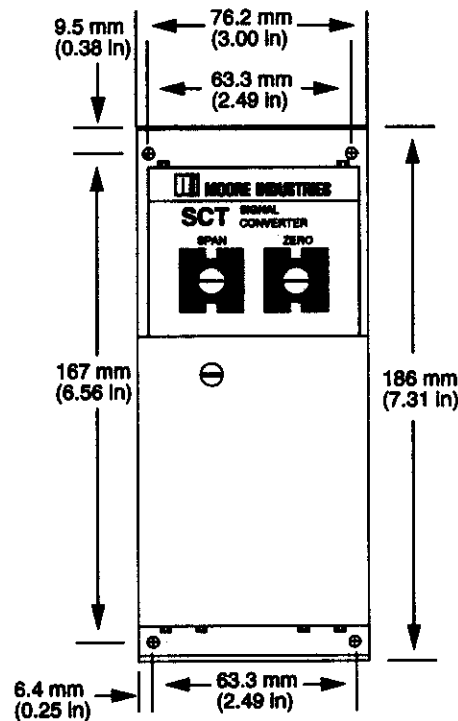
Mounting the SCT

The SCT is available in several housing styles. The two primary styles are the UB and the PC housings.

The UB dimensions are shown in Figure 4. For housing styles similar to the UB housing, the dimensions shown for the aluminum enclosure itself are the primary dimensions to consider. Different variations of the UB housing allow for mounting on racks, rails, flat surfaces, and instrument panels. The EX housing mounts directly inside an explosion-proof enclosure.

Figure 5 shows the dimensions for the PC housing. This housing style is designed for mounting in one of Moore Industries' standard card racks (RMR or SMR). Figure 6 shows the dimensions of the SCT with EX housing. Ask your Moore Industries' Sales Representatives for data sheet #12.40 and 12.60 for information on RMR and SMR card racks.

Figure 4. UB Housing Dimensions



SCT/DSC

Figure 5. PC Housing Dimensions

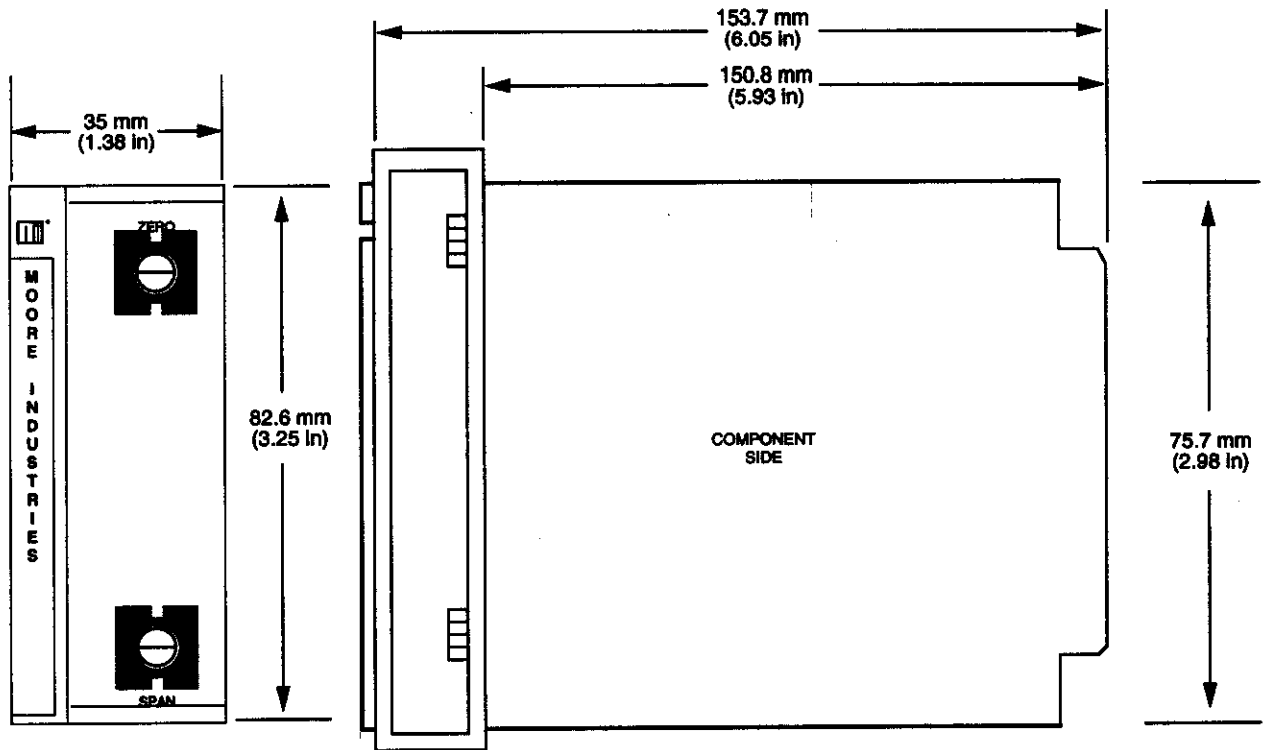
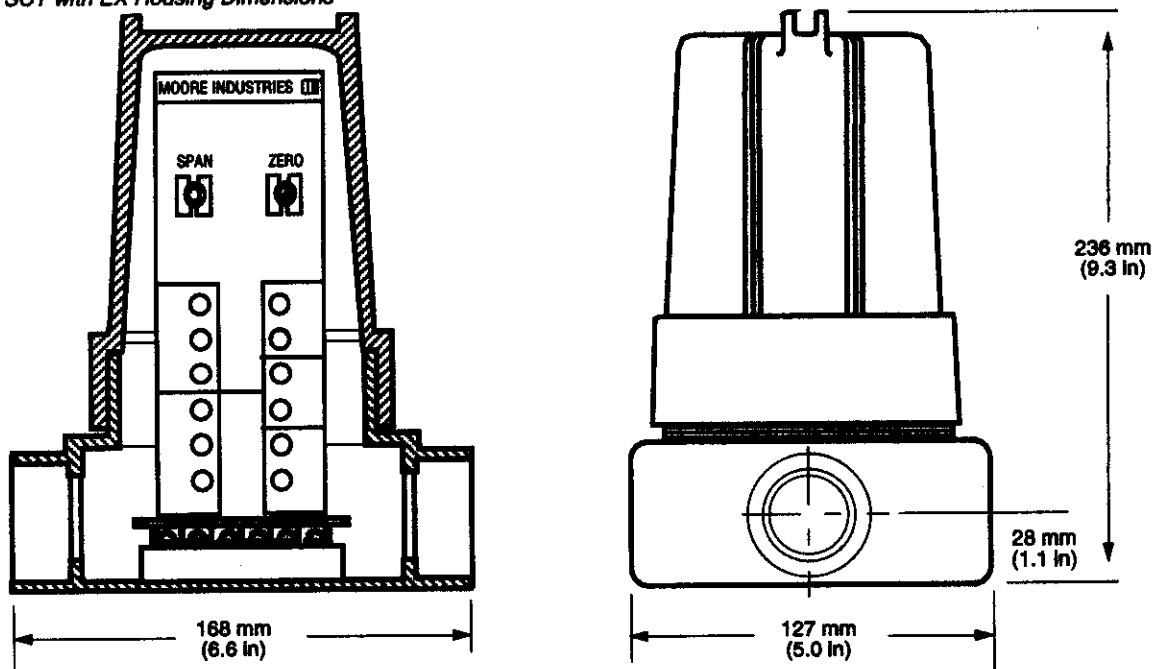


Figure 6. SCT with EX Housing Dimensions



SCT/DSCT

Making the Electrical Connections

Electrical connections to UB and EX units are made to individual terminals. Figure 7 shows the hookups for the UB SCT, Figure 8 shows the hookups for the SCT with the SC option, and the hookups for the TX model of the SCT are shown in Figure 9. Connections for the SCT with EX housing are shown in Figures 10, 11, and 12. Figure 10 shows the connections for the standard SCT with EX housing, the connections for the SCT with EX housing and SC option are shown in Figure 11, and Figure 12 shows the connections for the EX housing SCT with the TX option.

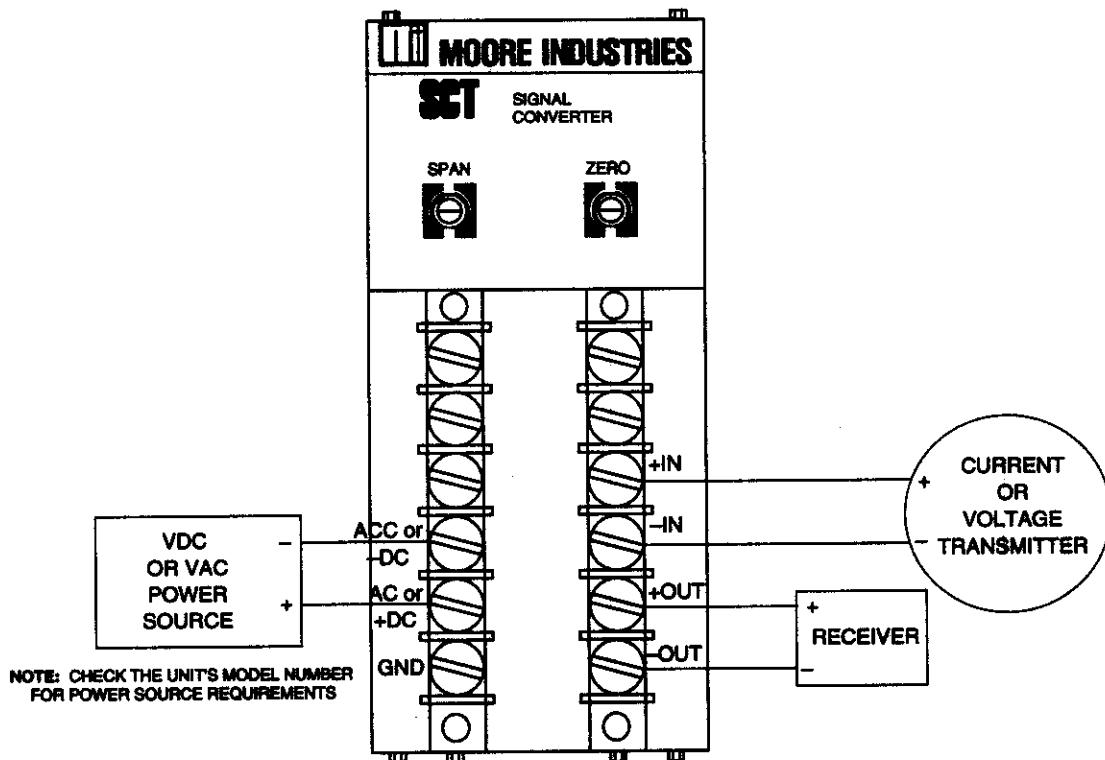
UB units are powered by either an ac or a dc power source. The power requirements for each unit is contained in its model number.

For units configured with an SC input or output, ensure that the value of the resistor used is appropriate for your application, and that it is connected to the proper terminals.

PC units slide into card slots in Moore Industries' 19-inch card racks. Each unit has contacts on its rear edge that mate with an edge connector at the back of the rack. Each connector is connected to individual terminal strips that are accessible at the rear panel. The numbers adjacent to each terminal strip correspond to the edge connector contacts for each unit. Power is supplied to each unit by the power connections to the rack and internal bussing. PC units operate on dc power ONLY, which is specified in each unit's model number. DC power is not present at the rear panel terminal strips.

Figure 13 shows the hookups for the PC housing SCT, the connections for the SCT with PC housing and SC option are shown in Figure 14, the connections for the SCT with PC housing and TX option are shown in Figure 15 and Figure 16 shows the DSCT.

Figure 7. Installing the SCT



SCT/D SCT

Figure 8. Installing the SCT with SC Input or Output

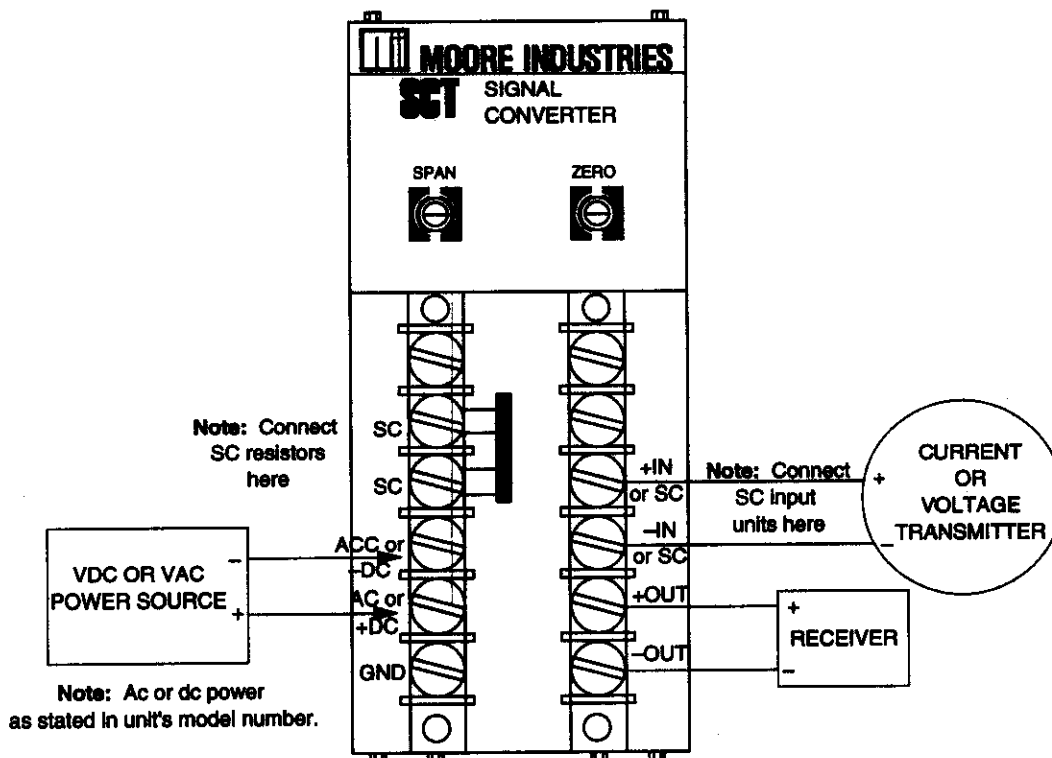
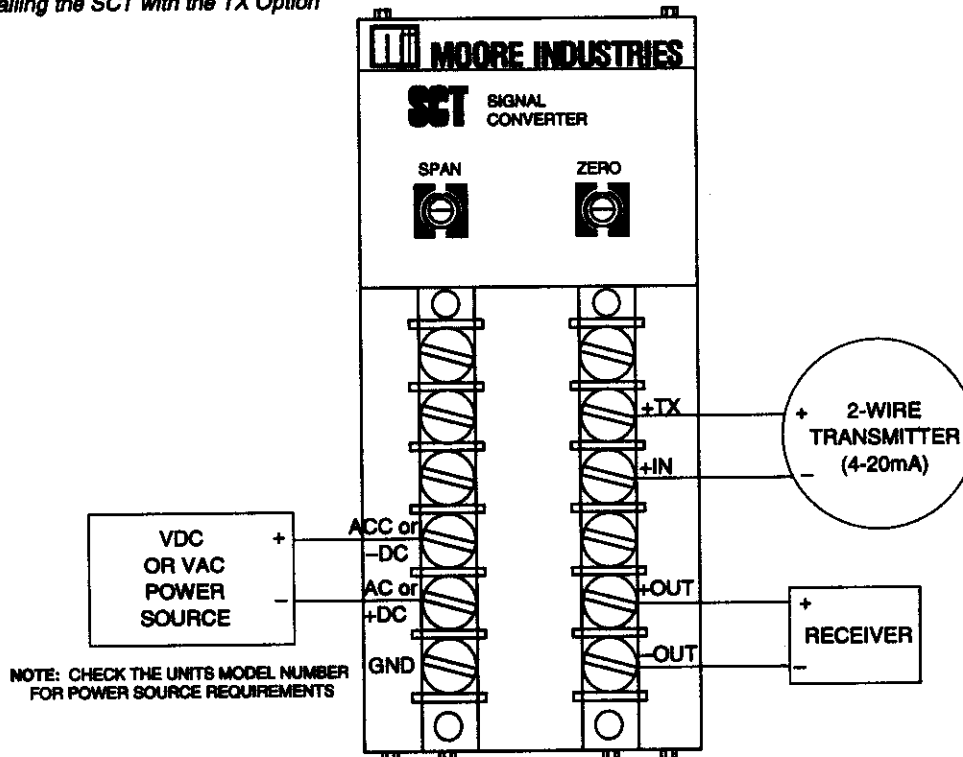
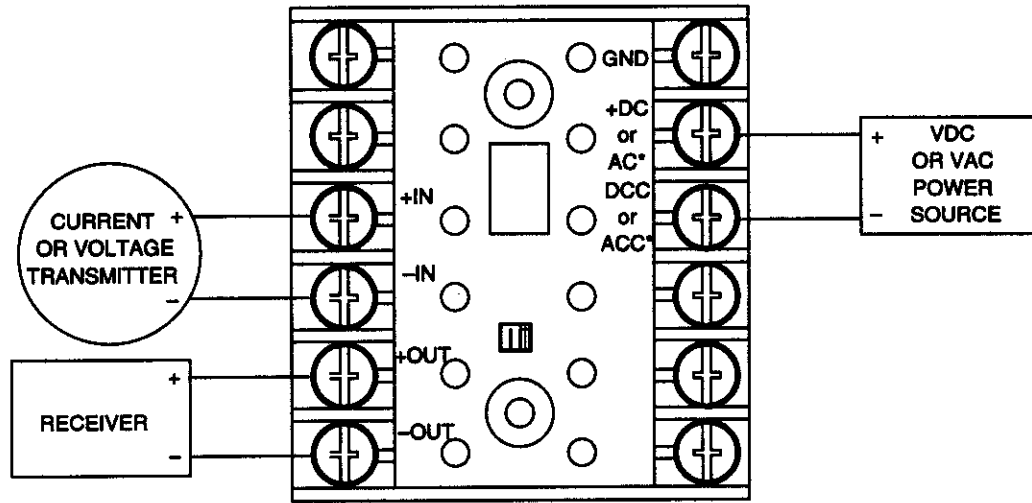


Figure 9. Installing the SCT with the TX Option



SCT/DSCT

Figure 10. Installing SCT with EX Housing

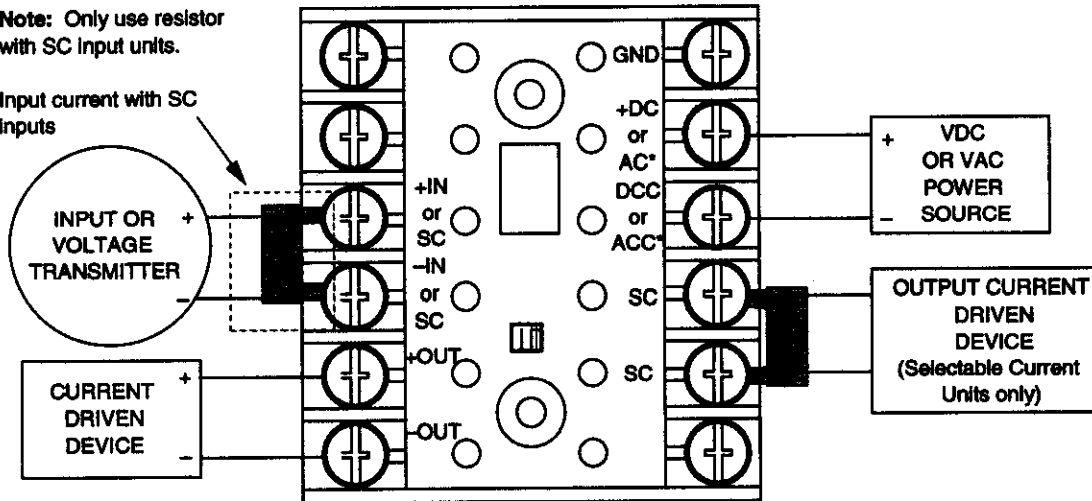


*Check the unit's model number for its power requirements.

Figure 11. Installing the SCT with EX Housing and SC Input or Output

Note: Only use resistor with SC input units.

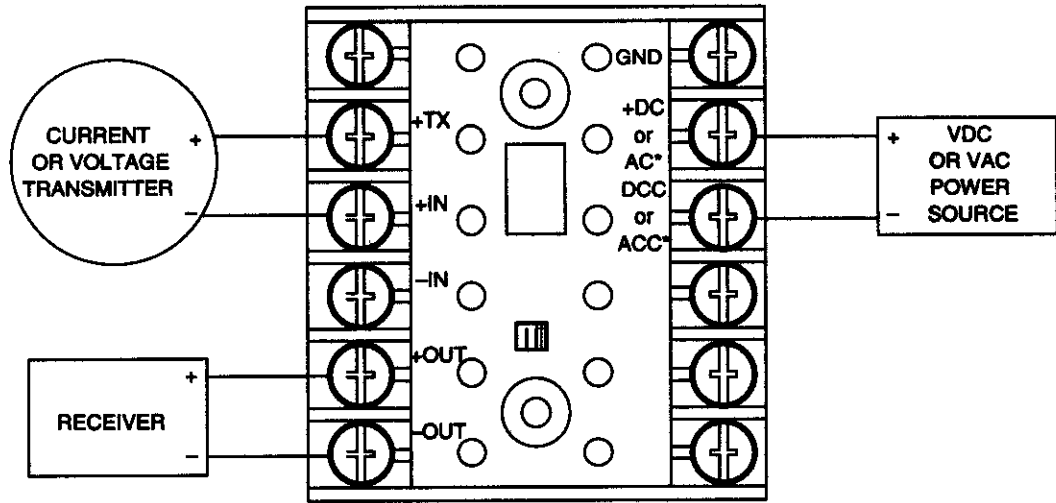
Input current with SC inputs



*Check the unit's model number for its power requirements.

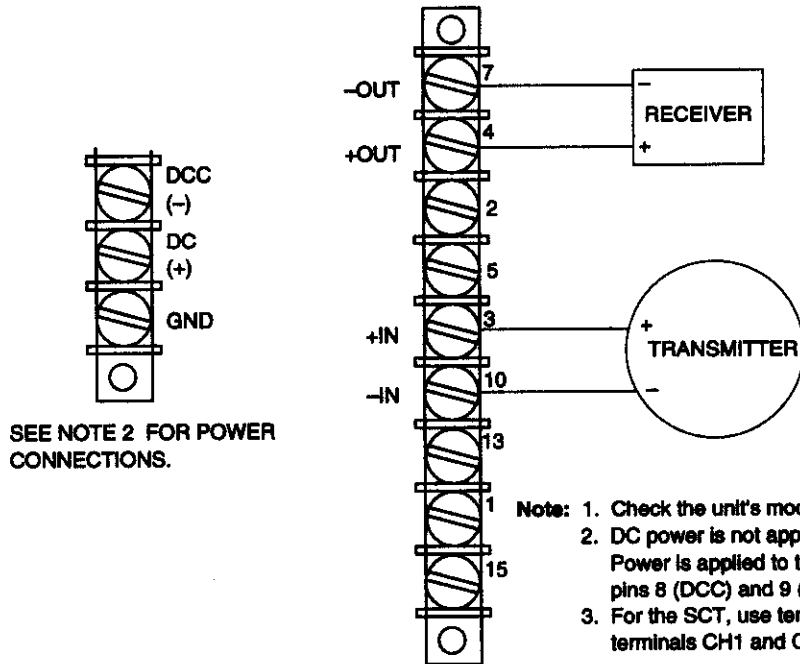
SCT/DSCT

Figure 12. Installing the SCT with EX Housing and TX Option



*Check the unit's model number for its power requirements.

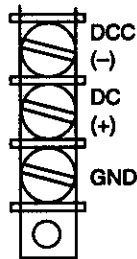
Figure 13. Installing the SCT with PC Housing



- Note:**
1. Check the unit's model number for its dc power requirements.
 2. DC power is not applied to the rear terminal strip. Power is applied to the PCB edge connector at pins 8 (DCC) and 9 (+DC).
 3. For the SCT, use terminals marked CH1; for DSCT, use terminals CH1 and CH2.

SCT/DSCT

Figure 14. Installing the SCT with PC Housing and SC input or output



SEE NOTE 2 BELOW FOR POWER CONNECTIONS.

- Note:**
1. Check the unit's model number for its dc power requirements.
 2. DC power is not applied to the rear terminal strip. Power is applied to the PCB edge connector at pins 8 (DCC) and 9 (+DC).
 3. For the SCT, use terminals marked CH1; for DSCT, use terminals CH1 and CH2.

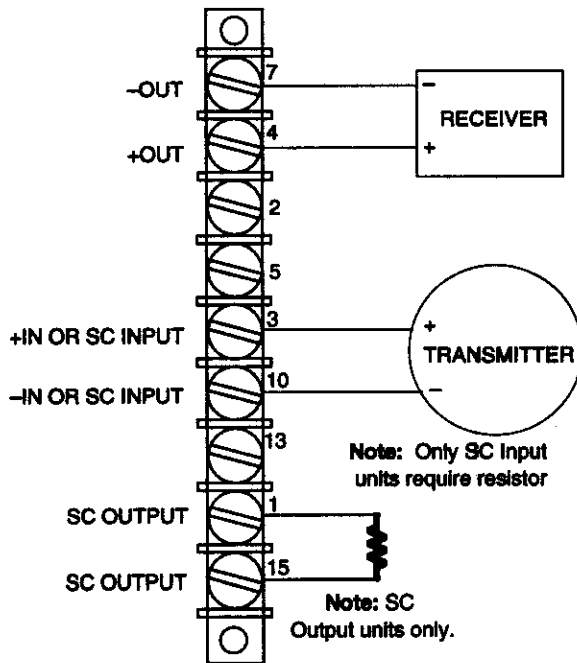
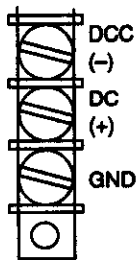
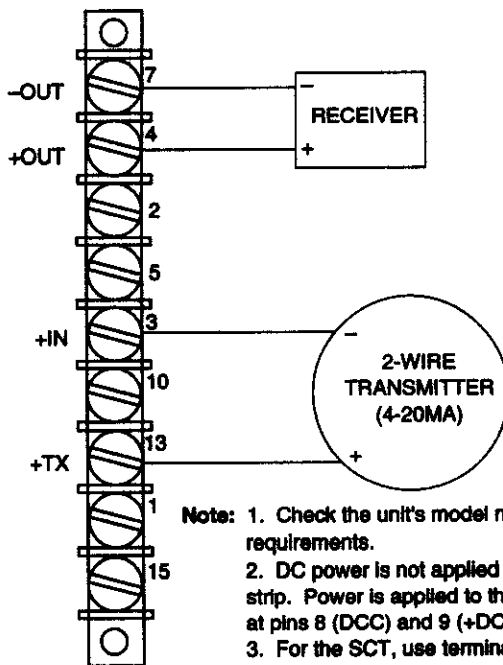


Figure 15. Installing the SCT with PC Housing and the TX Option

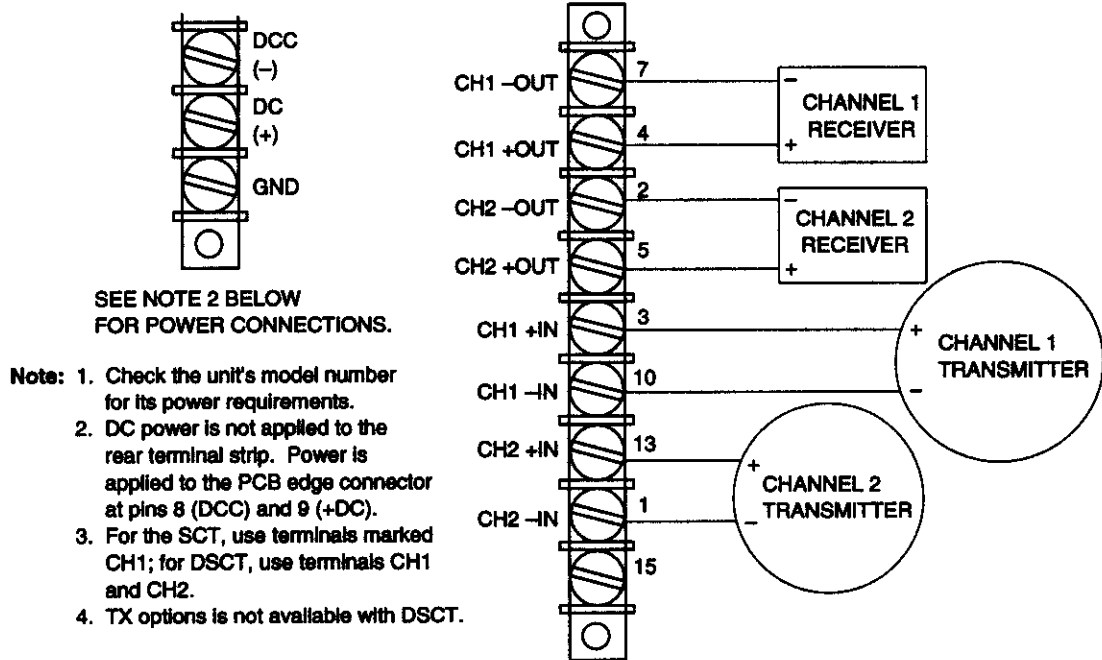


SEE NOTE 2 BELOW FOR POWER CONNECTIONS.



- Note:**
1. Check the unit's model number for its power requirements.
 2. DC power is not applied to the rear terminal strip. Power is applied to the PCB edge connector at pins 8 (DCC) and 9 (+DC).
 3. For the SCT, use terminals marked CH1; for DSCT, use terminals CH1 and CH2.
 4. TX options is not available with DSCT.

Figure 16. Installing the DSCT

**Recommended Ground Wiring Practices**

The following ground wiring practices must be followed to ensure proper performance of the SCT:

- Any Moore Industries product in a metal case or housing should be grounded.
- All input signals to, and output signals from Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground at the unit itself.
- The maximum length of any unshielded input and/or output signal wiring is 2 inches.

CE Conformity

Installation of any Moore Industries products that carry the CE certification (Commission Electrotechnique) **must** adhere to the guidelines above in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directives (EN55011, EN 50082-1, EN50082-2, etc.)

Consult the factory for the most current information on products that have been CE certified.

SCT/DSCT

Maintenance

Once the SCT is calibrated and installed, it will operate for extended periods of time without requiring further attention. Routine maintenance of the SCT is limited to keeping the unit clean and ensuring terminal connections are secure and free of oxidation. We recommend that you visually inspect the unit at least once every six months to ensure its physical condition is acceptable.

Periodically, you may wish to check the performance of the SCT to ensure that it is operating within the desired parameters. To check its operational performance, take the unit off-line and set it up for a bench check by using the calibration equipment and hookup information contained in the Calibration Section of this manual. Apply a known input to the SCT and monitor its output for a predictable result. If the output is out of tolerance or at an unacceptable level, recalibrate the unit.

The schedule for in-service bench checks depends on your facility's maintenance practices and on indications of need. We recommend that you bench check the SCT about once a year. If there is no indication of variation in performance, you may elect to let the SCT remain on-line for longer periods.

Customer Support

Moore Industries is recognized as the industry leader in delivering top quality to its customers, in products and services. We perform a battery of stringent quality assurance checks on every unit we ship. If any Moore Industries product fails to perform up to rated specifications, call us for help. Our highly skilled staff of trained technicians and engineers pride themselves on their ability to provide timely, accurate, and practical answers to your process instrumentation questions. Factory phone numbers are on the back cover.

If problems involve a particular SCT, there are several pieces of information you can gather **before** you call the factory that will help our staff to get you answers more efficiently. When you call, please have:

- The model number of the unit in question.
- The serial number of the unit in question.
- The job number (if available).
- The purchase order under which the unit was shipped (if available).

Supplement

Low Voltage Directive

The following guidelines must be followed in order to comply with EN 61010-1 (Low Voltage Directive). These items affect the AC versions of the following products: DCA, DPS-240, DPS1200, ECA, ECS, ECT, FCA, FDT, IST, PIT-4W, PWT, RBA, SCT, SMP, SPA-CE. If these products are to be used in a non-CE environment, this supplement may be disregarded.

WARNING:

If this unit is used in a manner not specified by Moore Industries, the protection provided by the equipment may be impaired.

Switches and Circuit Breakers

A switch or circuit breaker must be wired in series with the AC power conductors. This switch or circuit breaker must be located within three meters of the unit.

WARNING:

Terminals on this unit may be connected to hazardous voltages. Before making ANY connections to this unit, ALL hazardous voltages must be de-energized.

The circuit breaker or switch will only remove power to the unit, hazardous voltages may still be connected to other terminals on the unit.

Installation Category

All terminals are rated CAT II, except for terminals with the -RF option. These terminals are rated CAT I.

Equipment Ratings

Moore Industries transmitters do not generate hazardous voltages. They measure voltage or current inputs, and generate low voltages and currents (<42Vdc and <50mAdc). Products connected to Moore Industries transmitters should be designed to receive these inputs.

Moore Industries alarms do not generate any hazardous voltages. Alarm contacts are wired in series with power sources and their intended loads. The correct load should be selected for the power source.

Supply Wiring

All power connections shall be made with 14 or 16 AWG (.083mm or .064mm) wire.

The end of each conductor should be stripped no more than 8mm. The end of the stripped wire should be tinned with solder or inserted into a ferrule and crimped before being placed into a terminal block.

Conductors connected to screw type connections must have a ring or spade lug crimped on the end of the wire.

Protective Earth Conductor

The Protective Earth Conductor shall be of equal or larger size wire than the other two power conductors.

The Protective Earth Conductor shall be the first conductor connected to the unit when the unit is being wired. It shall be the last conductor removed when the unit is being un-wired.

Supplement

Maximum Working Voltage

Table 1-s shows the maximum working voltage for Moore Industries' low voltage products.

Table 1-s. Maximum Working Voltage

Input Type	Maximum Working Voltage
Millivolt, Thermocouple, and RTD	48Vdc
DC Voltage Inputs	48Vdc
AC Voltage Inputs	264Vac
Analog Outputs	48Vdc
Relay Contacts	264Vac
117Vac Power Terminals	129Vac
240Vac Power Terminals	264Vac
Contact Closure Outputs	30Vdc

Accessories

Contact Moore Industries for information on suitable accessories for our products.

Mounting

When mounting the unit or installing it into an application, ensure that the unit can be easily removed for maintenance or repairs.

Cleaning and Maintenance

Maintenance on Moore Industries' products is limited to keeping the unit clean and the wire terminals free of oxidation. This is best accomplished by installing the unit in an area protected from dust, heat, moisture, and corrosive atmospheres. Yearly visual inspections should be performed to ensure that the unit is clean and the electrical connections are in good repair.

Replacement of Consumable Materials

No consumable materials are used in the Moore Industries products covered by EN 61010-1.

Symbols

Table 2-s shows the symbols used on Moore Industries' products, the corresponding IEC/ISO symbol, and its definition.

Table 2-s. Symbols on Moore Industries' Products

IEC/ISO Symbol	Symbol on Moore Industries Product	Definition
	+PS -PS DCC	Direct Current
	AC ACC	Alternating Current
	AC or DC	Direct and Alternating Current
	GND 	Protected Earth Terminal
		Protective Conductor Terminal
		Equipment protected throughout by double insulation or reinforced insulation (equivalent to Class II of IEC 536)
		Caution (See manual for information)
Not Specified	+IN -IN	Positive Input Negative Input
Not Specified	+OUT -OUT	Positive Output Negative Output
Not Specified	NO NC CM	Normally Open Normally Closed Common
Not Specified	UNO UNC	Upper Normally Open Upper Normally Closed
Not Specified	LNO LNC	Lower Normally Open Lower Normally Closed
Not Specified	TX	Transmitter Excitation

RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

Warranty Repair –

If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

Non-Warranty Repair –

If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
 - a) A note listing the symptoms that indicate the unit needs repair
 - b) Complete shipping information for return of the equipment after repair
 - c) The name and phone number of the person to contact if questions arise at the factory
3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.
4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

WARRANTY DISCLAIMER

THE COMPANY MAKES NO EXPRESS, IMPLIED OR STATUTORY WARRANTIES (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY GOODS OR SERVICES SOLD BY THE COMPANY. THE COMPANY DISCLAIMS ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR TRADE USAGE, AND ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY ACKNOWLEDGES THAT THERE ARE NO WARRANTIES IMPLIED BY CUSTOM OR USAGE IN THE TRADE OF THE BUYER AND OF THE COMPANY, AND THAT ANY PRIOR DEALINGS OF THE BUYER WITH THE COMPANY DO NOT IMPLY THAT THE COMPANY WARRANTS THE GOODS OR SERVICES IN ANY WAY.

ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY AGREES WITH THE COMPANY THAT THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY WARRANTY CONCERNING THE GOODS OR SERVICES SHALL BE FOR THE COMPANY, AT ITS OPTION, TO REPAIR OR REPLACE THE GOODS OR SERVICES OR REFUND THE PURCHASE PRICE. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES EVEN IF THE COMPANY FAILS IN ANY ATTEMPT TO REMEDY DEFECTS IN THE GOODS OR SERVICES, BUT IN SUCH CASE THE BUYER SHALL BE ENTITLED TO NO MORE THAN A REFUND OF ALL MONIES PAID TO THE COMPANY BY THE BUYER FOR PURCHASE OF THE GOODS OR SERVICES.

ANY CAUSE OF ACTION FOR BREACH OF ANY WARRANTY BY THE COMPANY SHALL BE BARRED UNLESS THE COMPANY RECEIVES FROM THE BUYER A WRITTEN NOTICE OF THE ALLEGED DEFECT OR BREACH WITHIN TEN DAYS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH, AND NO ACTION FOR THE BREACH OF ANY WARRANTY SHALL BE COMMENCED BY THE BUYER ANY LATER THAN TWELVE MONTHS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH.

RETURN POLICY

For a period of thirty-six (36) months from the date of shipment, and under normal conditions of use and service, Moore Industries ("The Company") will at its option replace, repair or refund the purchase price for any of its manufactured products found, upon return to the Company (transportation charges prepaid and otherwise in accordance with the return procedures established by The Company), to be defective in material or workmanship. This policy extends to the original Buyer only and not to Buyer's customers or the users of Buyer's products, unless Buyer is an engineering contractor in which case the policy shall extend to Buyer's immediate customer only. This policy shall not apply if the product has been subject to alteration, misuse, accident, neglect or improper application, installation, or operation. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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