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# SCT 502

## Isolated Voltage/Current Transmitter

### Instruction Manual

#### 1.0 INTRODUCTION

These instructions refer to the above model. Supplementary sheets are attached if the unit has special options or features. For detailed specifications, see page 4 or refer to the Data Bulletin. All ADTECH instruments are factory calibrated and supplied with a label detailing the calibration. Adjustments are normally not necessary. A simple check should be performed to verify calibration before installation to ensure that it matches the field requirement.

#### 2.0 GENERAL DESCRIPTION

The ADTECH SCT 502 is an Isolated Signal Transmitter that accepts process input signals such as 4-20 ma dc and converts it into a standard control signal output such as 4-20 ma dc.

The input is electrically isolated from the output and the power supply by 600 volts ac or 1000 vdc peak. The output is a true current source and provides process signals such as 4-20 ma dc or alternatively, a voltage signal of 5 vdc full scale. Refer to page 3 for types of input/output signals and tables.

An isolated 24 VDC at 30 mA DC output is provided as standard for a loop two-wire transmitter.

#### 3.0 INSTALLATION

The instrument is supplied in a DIN rail mount general purpose enclosure as standard. Installation area/location must agree with the supplied instruments including operating temperature and ambient conditions.

##### Mounting

Refer to Section 10 for outline and mounting drawing and clearance dimensions. The instrument is surface mounted by means of DIN rails types G and T 32mm and 35mm respectively.

##### Electrical Connections

The wire used to connect the instrument to the control system I/O should be a twisted pair(s) and sized according to normal practice. Shielded cable is not normally necessary (if used, the shield must be grounded at the input negative of the ADTECH instrument and left floating at the sensor).

A 12 position compression terminal block is provided for I/O and power connection. A housing ground terminal is not required due to non-metallic housing.

##### Controls

Multiturn ZERO and SPAN controls are provided to calibrate the instrument. The multiturn controls are accessible through the instrument front panel and are clearly marked for ease of use.

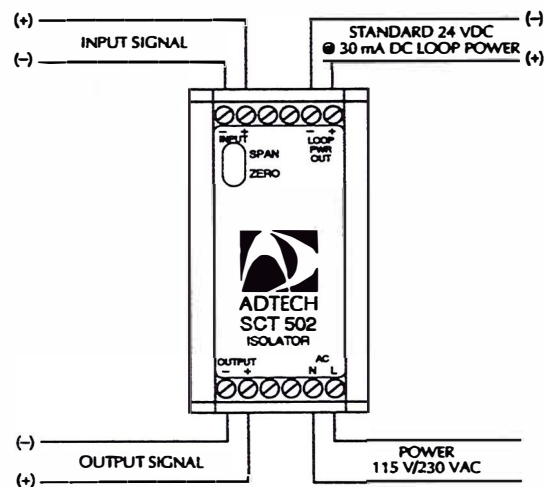
Pin jumpers for SPAN and ZERO are provided for ease of recalibration to other standard or optional inputs. Refer to tables on page 3.

#### 4.0 MAINTENANCE

These instruments are electronic and require no maintenance except periodic cleaning and calibration verification. If the unit appears to be mis-operating it should be checked as installed per section 6.0 or removed for a bench check per sections 6.0-7.0. MOST problems are traced to field wiring and/or associated circuits. If the problem appears to be with the instrument, proceed to sections 6.0 and 7.0.

#### 5.0 CONNECTIONS

Standard connections are shown below and on the instrument face plate, Data Bulletin or on attached supplementary sheets.



Note: See page 2 for loop power connection to a field transmitter.

## 6.0 SET UP AND CALIBRATION

All ADTECH units are factory calibrated per your instructions. Usually, a complete recalibration is not required unless it is required to change input types, output types or the range of the unit. Most calibrations will only require a ZERO and SPAN adjustment.

The calibration process is broken into three separate steps as follows:

- Input Configuration..... Sec 6.1
- Output Configuration ..... Sec 6.2
- Calibration ..... Sec 6.3

### 6.1 INPUT CONFIGURATION

The ADTECH Series SCT 502 Isolated Voltage/Current Transmitter accepts either current or voltage inputs. **IMPORTANT:** refer to the connection diagram for the appropriate connections to the unit.

If you want to change the factory set type of input configuration, header jumpers J1, J2 and J3 may need to be changed for any of the standard inputs shown in Table 1.

For inputs not listed in Table 1, some removal and replacement of resistor values will be required. Consult Table 3 for the appropriate changes.

### 6.2 OUTPUT CONFIGURATION

The ADTECH SCT 502 allows the user to change the factory set output configuration. To select any of the outputs shown in table 2, simply select the plug in jumpers J4 and J5 per the table.

For outputs not listed in Table 2, some removal and replacement of some resistor values will be required. Consult Table 4 for the appropriate changes.

### 6.3 CALIBRATION

To perform a calibration check or re-calibration of the instrument follow this procedure.

- A. Make sure the unit I/O wiring is properly connected and that the correct power source per the label is also connected. The instrument must be at normal power for a minimum of 2 minutes before proceeding to B.
- B. The input signal source(s) must be adjustable from 0 to 100% in steps of 10% or at least 25%. The source(s) should be either precalibrated or an accurate meter must be used to monitor the input(s).
- C. The output may be monitored either as a direct voltage for a voltage output signal or as a current that can be represented as a voltage across a resistor shunt for a current output signal.
- D. Set the input source to minimum input value and adjust the multiturn potentiometer marked ZERO to provide the minimum calibrated output (e.g.) 4.00 ma  $\pm$  0.01 ma dc. (Note: For zero based outputs set input at 10% of span and adjust for 10% of span output.)

- E. Set the input source to maximum value and adjust the multiturn potentiometer marked SPAN to provide the maximum calibrated output (e.g.) 20.00 ma  $\pm$  0.01 ma dc.
- F. Repeat steps D and E until readings are within calibration.
- G. The instrument should now be checked at 25-50-75% of span minimum.
- H. This completes the calibration.

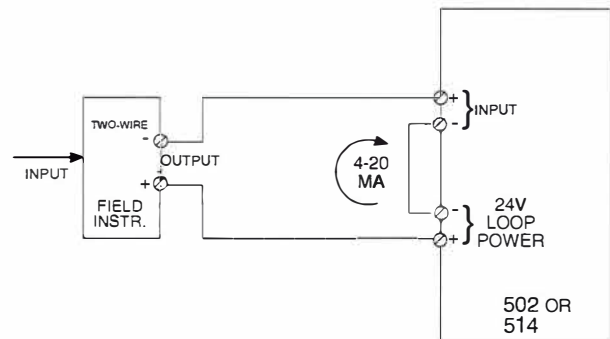
## 7.0 FIELD TROUBLE SHOOTING GUIDE

This section offers a simple, first level trouble-shooting aid for an apparent instrument malfunction.

<u>SYMPTOM</u>	<u>CORRECTIVE ACTION</u>
No output	<ol style="list-style-type: none"> <li>1. Check the input and output connections carefully.</li> <li>2. Check that the power supply polarity is correct and that power is present on the instrument terminals.</li> <li>3. Check that the input source(s) is correct and that it changes magnitude between zero and full scale values when so adjusted.</li> <li>4. If the output is a current signal (4-20 ma, etc.), make sure the output loop is complete and that the correct meter range is selected.</li> </ol>

All external checks are complete. Problem seems to be internal.

If the problem seems to be internal, replace the instrument with a spare and return the defective instrument to ADTECH for prompt check out and repair. To avoid unnecessary delays always send a cover note with name and telephone number of the contact and return address. Along with a brief description of what the unit is doing when it fails.



24V-LOOP POWER CONNECTION TO FIELD TRANSMITTER

## 8.0 TABLES, PCB LAYOUT

### Standard Inputs/Outputs

**TABLE 1  
STANDARD INPUTS**

INPUT	J1	J2	J3
4-20 mA DC	B	A	A
0-20 mA DC	A	A	A
1-5V DC	B	B	B
0-5V DC	A	B	B

**TABLE 2  
STANDARD OUTPUTS**

OUTPUT	J4	J5
4-20 mA DC	A	B
0-20 ma DC	B	B
1-5V DC	A	A
0-5V DC	B	A

### Alterable Inputs/Outputs

(Some pcb component changes required)

**TABLE 3  
ALTERABLE INPUTS**

INPUT	J1	J2	J3	R16	R12
0-1 mA DC	A	A	A	200	NC
0-10 mA DC	A	A	A	20	NC
0-10 V DC	A	B	B	NC	20K

NOTE A: "NC" = No change from standard unit configuration.

NOTE B: All resistors are 1%, Metal Film, 1/4W, 50 ppm.

NOTE C: To go back to table 1, ranges change  
R16 to 10  $\Omega$  1% MF  
R12 to 41.2 K  $\Omega$  MF

**TABLE 4  
ALTERABLE OUTPUTS**

OUTPUT	J4	J5	R15	R9
0-1 mA DC	B	B	NC	1K
0-10 mA DC	B	B	NC	100 $\Omega$
0-10 V DC	B	A	499	NC

NOTE A: "NC" = No change from standard unit configuration.

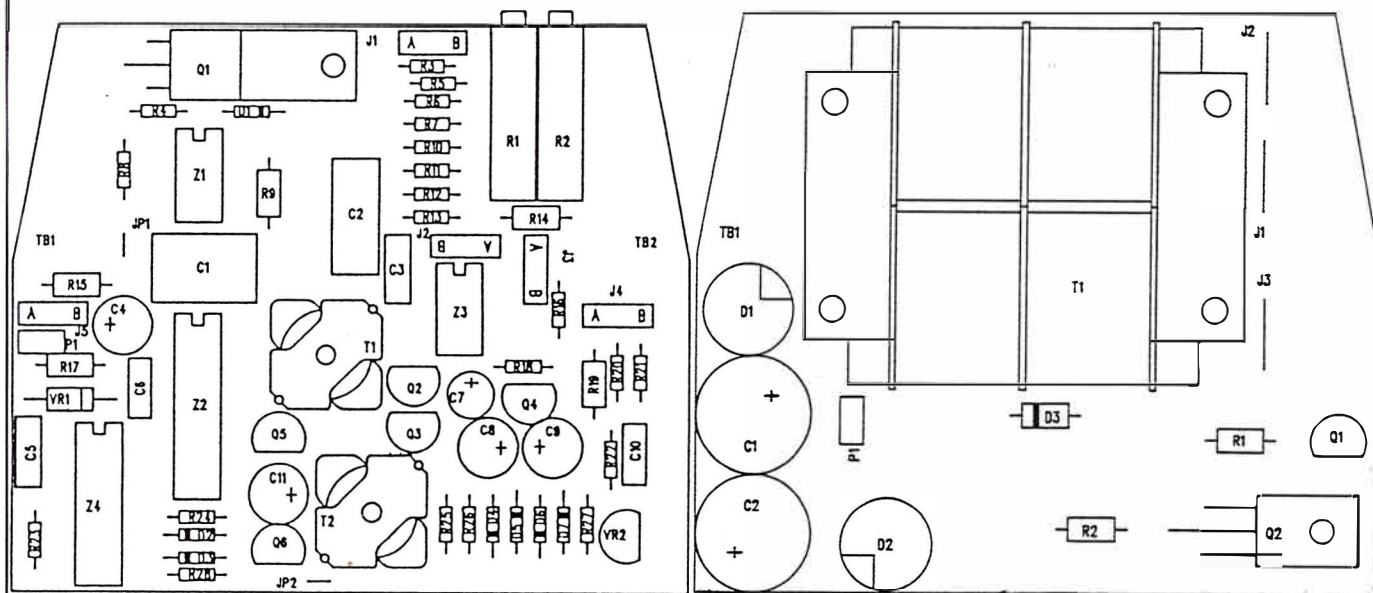
NOTE B: All resistors are 1%, Metal Film, 1/4W, 50 ppm.

NOTE C: To go back to table 2, ranges change  
R15 to 249  $\Omega$   
R9 to 49.9  $\Omega$

**TABLE 5**

115V	J1, J2 IN; J3 OUT
230 V	J3 IN; J1, J2 OUT

Jumpers on power supply PCB



## 9.0 SPECIFICATIONS

### INPUT/OUTPUT

#### INPUT SIGNALS—STANDARD

- a. 4-20 mA dc (Z in 10 ohm)
- b. 0-20 mA dc (Z in 10 ohm)
- c. 1-5 VDC (Z in 1 meg ohm min)
- d. 0-5 VDC (Z in 1 meg ohm min)

#### INPUT SIGNALS—ALTERABLE

- a. 0-1 mA (Z in 200 ohm)
- b. 0-10 mA (Z in 20 ohm)
- c. 0-10 VDC (Z in 1 meg)
- d. Any Zero based voltage from 100 mV to 200 VDC

#### OUTPUT SIGNALS—STANDARD

- a. 4-20 mA DC 900 ohms max.
- b. 0-20 mA DC 900 ohm max.
- c. 1-5 VDC 1 meg ohm min.
- d. 0-5 VDC 1 meg ohm min.

#### OUTPUT SIGNALS—ALTERABLE

- a. 0-1 mA DC 20 k ohms max.
- b. 0-10 mA DC 1800 ohm max.
- c. 0-10 VDC 1 meg ohm min.

### PERFORMANCE

- a. **Calibrated Accuracy:**  $\pm 0.1\%$
  - b. **Linearity:**  $\pm 0.1\%$  maximum,  $\pm 0.04\%$  typical
  - c. **Repeatability:**  $\pm 0.05\%$  maximum
  - d. **Temperature Stability:**  $\pm 0.01\%/^{\circ}\text{F}$  maximum,  $\pm 0.004\%/^{\circ}\text{F}$  typical
  - e. **Load Effect:**  $\pm 0.01\%$  zero to full load
  - f. **Output Ripple:** 10 mv P/P typical
  - g. **Response Time:** 150 milliseconds (2.3 Hz band width)
  - h. **Temperature Range:**  $0^{\circ}$  to  $140^{\circ}\text{F}$  ( $-18^{\circ}$  to  $60^{\circ}\text{C}$ ) operating  
 $-40^{\circ}$  to  $185^{\circ}\text{F}$  ( $-40^{\circ}$  to  $85^{\circ}\text{C}$ ) storage
  - i. **Power Supply Effect:**  $\pm 0.05\%$  for a  $\pm 10\%$  power variation
  - j. **Common Mode Rejection:** 100 db @ 60 Hz
  - k. **Isolation:** Input/output/power 600 vac, 50/60 Hz, 1000 vdc
- Note: All accuracies are given as a percentage of span

### POWER

- a. 115 vac:  $\pm 10\%$ , 50/60 Hz, 2 watts (standard)
- b. 230 vac:  $\pm 10\%$  50/60 Hz 2W (selectable)

## 10.0 OUTLINE & MOUNTING

