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SCX 202 Isolated Two Wire Signal 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, refer to page 4 or the Data Bulletin. All ADTECH instruments are factory calibrated. Unless otherwise marked the SCX 202 is calibrated for specified input and 4-20 ma output in dc powered loop. 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 SCX 202 is a two wire transmitter isolator that accepts a 4-20 ma, 1-5 vdc or bipolar input signal and provides an isolated 4-20 ma output signal powered by 8-42 vdc. The input signal is electrically isolated from the output receiving device, thus making it possible to interface instrumentation that is at different ground potential.

The SCX 202 derives its operating power from the output power supply.

The input/output connections are shown in section 5.0.

The standard mounting is din rail types 'G' and 'T' 32mm and 35mm respectively. *Many optional mounting configurations are provided as shown in Section 10.0.*

The primary features of the SCX 202 are:

- Low input voltage drop of 200 mvolts for 20 mA input
- No recalibration required over full load range
- Extremely high accuracy: $\pm 0.1\%$ including linearity, repeatability, hysteresis and resolution
- Reverse polarity protection on input
- Extremely compact – less than 1 inch wide
- Din mount – standard
- High input-output isolation – 600 vac, 1000 vdc

3.0 INSTALLATION

The instrument is supplied in a non-metallic general purpose Din rail mount enclosure as standard. NEMA 4, 7 or 12 enclosures are optionally available. Installation area/location must agree with the supplied instruments including operating temperature and ambient conditions. For detailed mounting and installation refer to page 4 inside.

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.

Six (6) position compression terminals are provided for I/O connections. Refer to the I/O connections given below.

Controls

The SCX 202 is supplied with two multiturn ZERO and SPAN controls that are provided to calibrate it. The controls are accessible through the instrument front panel for ease of adjustment. Range change jumpers are provided as listed in the table on page 3.

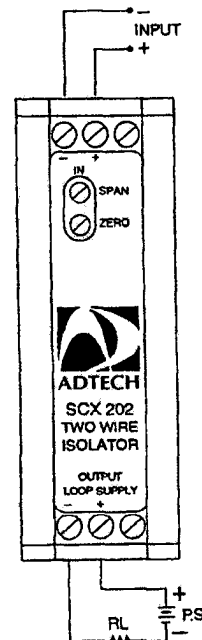
Six Jumpers are provided on the pc board for selection of various input ranges.

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 removed and checked on the bench. If defective, it should be replaced with a known good spare and the defective one returned for factory test and service for total reliability check.

5.0 CONNECTIONS

Common standard connections are shown below and on the instrument face plate and also on the Data Bulletin.



6.0 CALIBRATION

The calibration can be performed as follows and needs high precision input source, 5 digit DVM and a 250 ohm $\pm 0.01\%$ shunt. If recalibration to the existing range is desired, proceed to Section 6.2.

6.1 INPUT CONFIGURATION

- A. This step is required only if a new input range is selected.
- B. If the input range must be changed, select the appropriate position of Jumpers J2 to J8 on the larger PCB inside.
- C. Close-up the enclosure and follow Section 6.2 to calibrate.

6.2 CALIBRATION

To perform a calibration check or recalibration of the instrument, follow the procedure below.

- A. Make sure the input output wiring is connected properly per diagram below.
- B. Select jumper settings from table 1 corresponding to the input. (Refer to page 3.)
- C. The input signal source must be adjustable from 0-100% in steps of at least 25%. The source must be either precalibrated or a precision millammeter be used to monitor the input.
- D. Monitor the output across a 250 Ω $\pm 0.01\%$ shunt.
- E. Set the input source to zero value and adjust the multi-turn control marked ZERO to provide 4.000 $\pm .01$ mA (1.000 vdc) within desired accuracy.
- F. Set the input source to full scale value and adjust the multi-turn potentiometer control marked SPAN to provide 20.000 mA (5.000 vdc across the shunt).
- G. Repeat steps E and F until desired accuracy is achieved.
- H. Check linearity at input of 25%, 50% & 75%.
- I. This completes the calibration.

7.0 FIELD TROUBLE SHOOTING GUIDE

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

SYMPTOM CORRECTIVE ACTION

- | | |
|-----------|---|
| No output | <ol style="list-style-type: none">1. Check the input and output connections carefully.2. Check that the power supply polarity is correct and that the output loop power is present on the indicated terminals.3. Check that the input source is correct and that it changes magnitude between zero and full scale values when so adjusted.4. Make sure the output loop is complete and that the correct meter range is selected. |
|-----------|---|

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

Troubleshooting beyond the above may be difficult without special equipment. We do not recommend attempting repair of the unit in the field. ADTECH offers a very responsive repair policy. Contact the factory at:

Phone: 716-383-8280

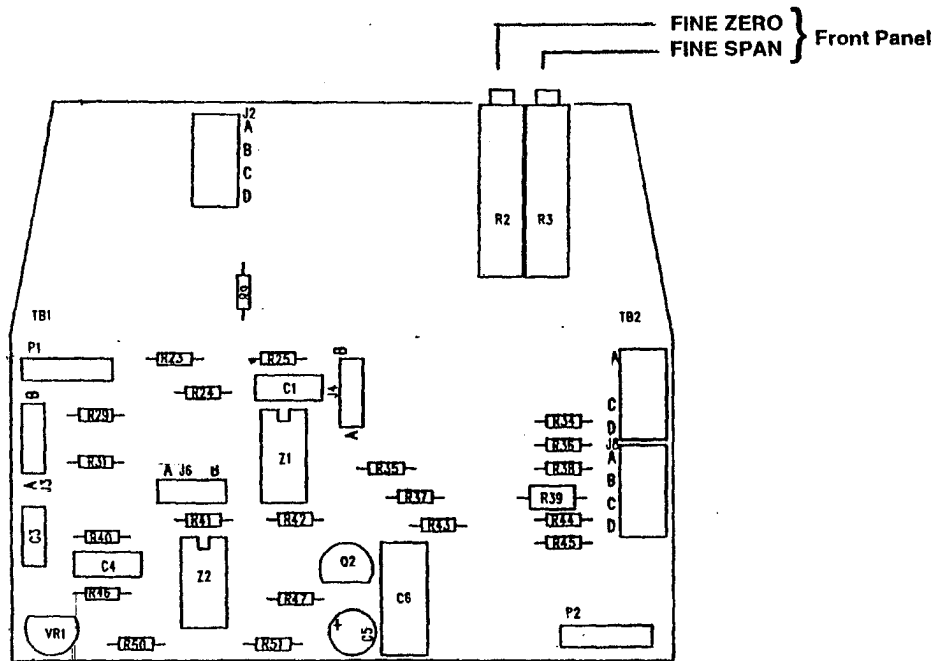
FAX: 716-383-8386

8.0 TABLES, PCB LAYOUT

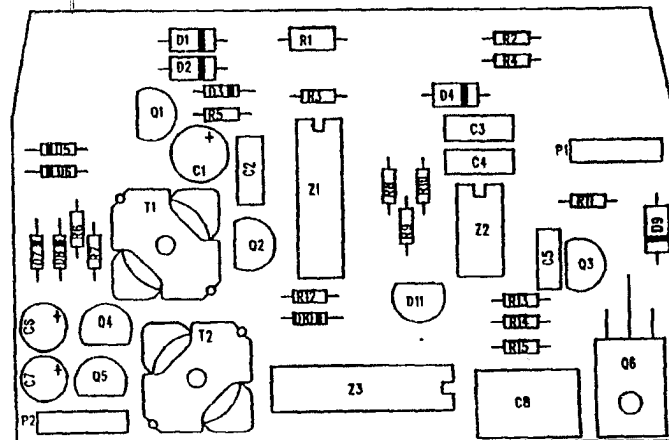
TABLE 1 - INPUT CONFIGURATION

| INPUT | J2 | J3 | J4 | J6 | J7 | J8 |
|-------------|----|----|----|----|----|----|
| 4 - 20 mA | A | B | B | A | B | A |
| 0 - 20 mA | A | B | A | A | B | A |
| 0 - 10 mA | A | B | A | A | C | A |
| 0 - 1 mA | A | B | A | A | D | A |
| 0 - ± 20 mA | D | A | A | A | B | A |
| 0 - ± 10 mA | D | A | A | A | C | A |
| 0 - ± 1 mA | D | A | A | A | D | A |
| 1 - 5 V | A | B | B | A | A | B |
| 0 - 5 V | A | B | A | A | A | B |
| 0 - 10 V | A | B | A | A | A | C |
| 0 - ± 5 V | D | A | A | A | A | B |
| 0 - ± 10 V | D | A | A | A | A | C |

INPUT PCB



OUTPUT PCB



NOTE: All components shown may not be required by this model.

9.0 SPECIFICATIONS

INPUT/OUTPUT

Input Signals:

- a. 4–20 mA DC, 0-20 or ± 20 mA DC (Z in 10 ohms)
- b. 0–10 mA DC or 0– ± 10 mA DC (Z in 20 ohms)
- c. 0–1 mA DC or 0– ± 1 mA DC (Z in 200 ohms)
- d. 1–5 vdc, 0-5 vdc or ± 5 vdc (Z in 1 meg ohm)
- e. 0–10 vdc, or 0– ± 10 vdc (Z in 1 meg ohm)
- f. Any zero or bipolar voltage from 100 mv to 200 vdc

Output Signal:

4–20mA DC

Output Loop Drive Capability

$$R \text{ (ohm)} = \frac{(V \text{ supply} - V \text{ minimum}) 1000}{I \text{ out max. ma}}$$

V minimum = 8.0 vdc

| I out | 4-20 ma | | | |
|----------|---------|-----|------|------|
| V supply | 12 | 24 | 36 | 42 |
| R (ohms) | 200 | 800 | 1400 | 1700 |

POWER

8 to 42 VDC standard

PERFORMANCE

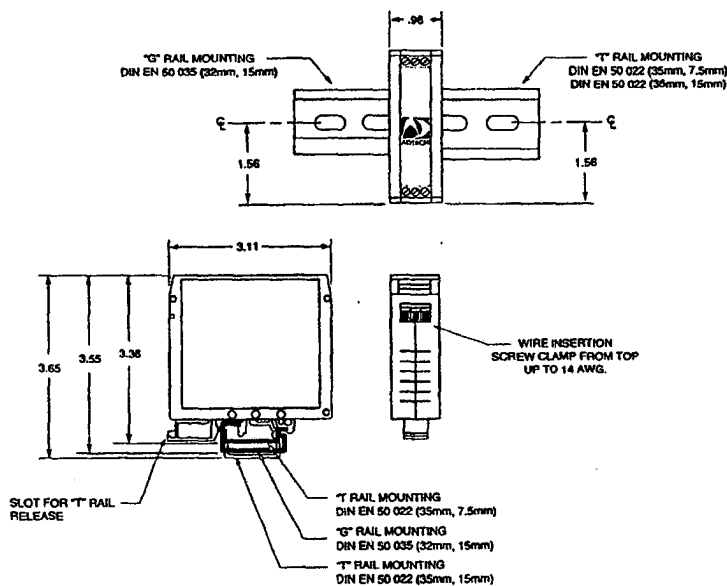
- a. **Calibrated Accuracy:** $\pm 0.1\%$
 - b. **Linearity:** $\pm 0.025\%$ max., $\pm 0.01\%$ typical
 - c. **Repeatability:** $\pm 0.005\%$ maximum ± 0.002
 - d. **Temperature Stability:** $\pm 0.007\%/^{\circ}\text{C}$ max. Zero TC
 $\pm 0.008\%/^{\circ}\text{C}$ max. Span TC
 - e. **Load Effect:** $\pm 0.005\%$ zero to full load
 - f. **Output Ripple:** 10 mV P/P maximum
 - g. **Response Time:** 110 milliseconds (10 to 90% to step response)
Bandwidth: (-3db): 3.2 Hz
 - h. **Temperature Range:** -25° to 185°F (-31°C to 85°C) operating; -40°F to 200°F (-40°C to 93°C) storage
 - i. **Power Supply Effect:** $\pm 0.005\%$ for operating range
 - j. **Common Mode Rejection:** 100 db @ 60 Hz
 - k. **Isolation:** Input/output 600 VAC, 50/60 Hz, 1,000 VDC
- Note:** All accuracies are given as a percentage of span.

MECHANICAL

- a. **Electrical Classification:** General purpose
- b. **Connection:** Screw, compression type, accepts up to 14 AWG
- c. **Controls:** Two front access multiturn potentiometers for fine zero and span control,
: Jumpers for input range selection.
- d. **Mounting:** DIN, Surface, Snap-Track, or NEMA 4, 7 or 12
- e. **Weight:** Net Unit: 4 oz. (115 grams)
Shipping: Nominal 7 oz. (200 grams)

OPTIONS

| Option Number | Description |
|--------------------|---|
| H 15D through H 30 | Mounting |
| LPI 40D | Loop Indicates |
| 114 | Voltage input to 200 vdc Current inputs to 100 ma. |



OPTIONAL MOUNTINGS – see separate drawings provided or request from the factory

- | | | |
|--------|------|--|
| Option | H-15 | D Explosion Proof, Class 1, Group B, C & D |
| Option | H-25 | Snap Track Mounting N/C (Specify) |
| Option | H-26 | Surface Mounting N/C (Specify) |
| Option | H-27 | NEMA 4 Enclosure |
| Option | H-29 | T35 DIN T rail 2 Ft. Long |
| Option | H-30 | T32 DIN G rail 2 Ft. Long |