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# FSM 55

## Non-Isolated Frequency Scaling Module

### 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 FSM 55 is a Non-Isolated Frequency Scaling Module that converts/scales the pulse rate of primary sensors to convenient engineering units for display on a totalizing counter. Two (2) decades of scaling are standard; four (4) or six (6) decades are optional.

#### 3.0 INSTALLATION

The instrument is supplied in a general purpose enclosure as standard. NEMA 4, 7 or 12 and plug in chassis enclosures are optionally available. Installation area/location must agree with the supplied instruments including operating temperature and ambient conditions.

##### Mounting

Refer to the appropriate outline drawing for mounting and clearance dimensions. The instrument is surface mounted with two #10-32 screws on 8.00 inch centers.

##### 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 barrier terminal block with #6-32 screws and 3/8" spacing is provided for I/O and power connection. A housing ground terminal marked G is also provided.

##### Controls

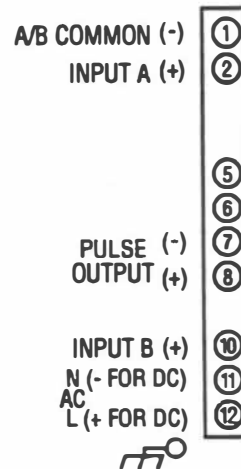
Multiturn SENSITIVITY and Internal or optional External 10 POSITION DECADE SWITCH controls are provided to calibrate the instrument. The multiturn controls are accessible through the instrument front panel and are clearly marked for ease of use.

#### 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.



## 6.0 CALIBRATION

- A. Make sure the 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 calibration.
- B. If the 10 position Decade switches are internal carefully remove the instrument from the housing to gain access to the switches, observing normal safety and equipment precautions.
- C. The input frequency signal source must be adjustable from 0-100% in steps of 10% or at least 25%. The source should be either precalibrated or an accurate meter must be used to monitor the input(s).
- D. The output should be monitored using a high accuracy frequency meter, with an input pulse magnitude capability of 30 volts.
- E.\* Set the input source to maximum frequency value and set switches S1-S6 (depending on the number of Decades) to equal the scaling factor (K) and read the output frequency to verify that it is equal to the desired output. e.g. for a multiplier ratio of 0.9876654 set SW#1 to position 9, SW#2 to position 8 and so on.

### \*NOTE:

For 2 decade scaling there are only two switches to be set and for 4 decade scaling there are 4 switches.

## 7.0 FIELD TROUBLE SHOOTING GUIDE

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

### SYMPTOM

### CORRECTIVE ACTION

No output

1. Check the input and output connections carefully.
2. Check that the power supply polarity is correct and that power is present on the instrument terminals.
3. Check that the input source(s) is correct and that it changes magnitude between zero and full scale values when so adjusted.

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

The following information is provided for a qualified technician or serviceman as check points for use in internal troubleshooting.

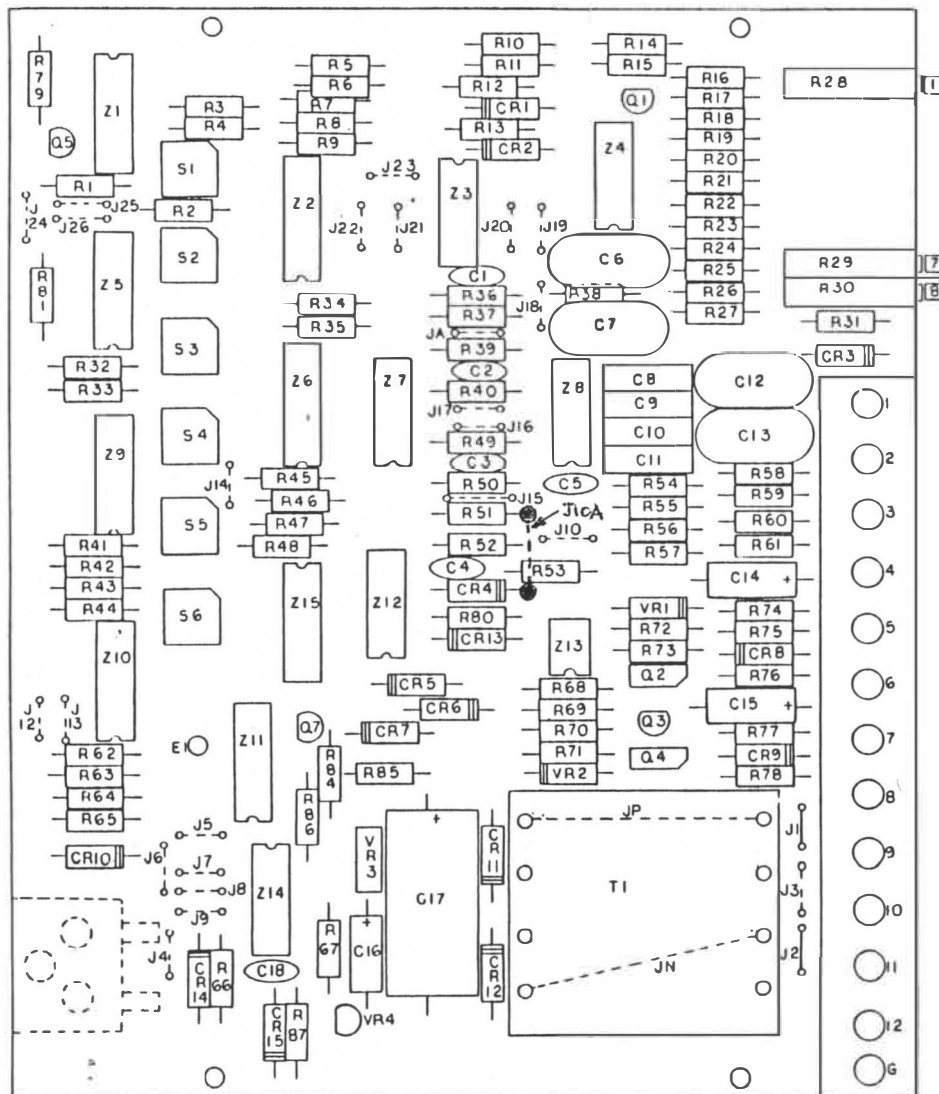
<u>CHECKPOINT/ COMPONENT</u>	<u>VOLTAGE/ RANGE</u>
(across) C16	12 ± 0.6 vdc
(across) C17	26 ± 4 vdc
(from 0 V) +VR4	6.9 ± 0.35 vdc
(from 0 V) Q3 - COLL.	24 V pulses of output rate

## 8.0 TABLES, PCB LAYOUT

NOTE: For a scaling factor of 1.000, add jumper J10A and disconnect one end of CR6.  
 For other factors, delete J10A and connect CR6.

NOTE A: Components as shown may or may not be present on the p.c. board due to design updates or options.

FSM 55



## 9.0 SPECIFICATIONS

### INPUT/OUTPUT

#### INPUT SIGNALS

- a. **Voltage:** sine or square wave 100 mV to 100 V rms
- b. **Frequency range:** DC to 100 KHz full scale
- c. **Contact:** Dry, 2 mA @ 24 vdc rating: specify

#### OUTPUT SIGNALS

- a. 24 vdc pulses nominal into 100 ohms minimum. 50 milliseconds pulse width nominal, for up to 10 Hz output. Pulse width decreases for higher frequency outputs.

#### SCALING RANGE

- a. Two (2) decades, scaling factor of 0.01 through 0.99.
- b. Four (4) decades optional, scaling factor of 0.0001 through 0.9999 (Option I 34).
- c. Six (6) decades optional, scaling factor of 0.000001 through 0.999999 (Option I 35).

#### PERFORMANCE

- a. **Calibrated Accuracy:** Exact all-digital counting
- b. **Repeatability/Resolution:** Exact all digit counting
- c. **Temperature Stability:** No effect over temperature range f
- d. **Response Time:** Instantaneous
- e. **Discrimination Time:** 0.01 milliseconds
- f. **Temperature Range:** 0° to 140°F (-18° to 60°C) operating  
-40° to 185°F (-40° to 85°C) storage
- g. **Power Supply Effect:** None over rated range

Note: All accuracies are given as a percentage of span

#### POWER

- a. 115 vac: ± 10%, 50/60 Hz, 3 watts, 0.7 Pf (standard)
- b. 24 vdc: ± 10% non-isolated, 3 watts (Option P1)
- c. 24 vdc: ± 10% isolated, 3 watts (Option P2)
- d. 48 vdc: ± 10% isolated, 3 watts (Option P3)
- e. 125 vdc: Nominal (105-140 vdc) isolated, 3 watts (Option P4)
- f. 230 vac: ± 10%, 50/60 Hz, 3 watts, 0.7 Pf (Option P5)

## 10.0 OUTLINE & MOUNTING

