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PSM 57

Non-Isolated Pulse Summing 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 PSM 57 is a Non-Isolated Pulse Summing Module that adds (sums) the pulse rates of two to four primary sensors to provide a single output pulse rate representing the sum of the inputs. The combined sum rate must be higher than the subtract rate. Input D may be added or subtracted.

Inputs A, B and C are normally supplied with two decades of scaling per input and input D has no scaling provision.

The standard input pulse rate is 20 KHz maximum. For high input pulse rates the minimum output pulse will be:

$$\text{Pulse width} = \frac{450}{\text{no. of inputs} \times \text{Fmax (KHz)}} \text{ micro-sec.}$$

where F max = The highest of the input frequencies.

NOTE: If a 50% duty cycle is desired, a divide-by-2 function of the output should be ordered.

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

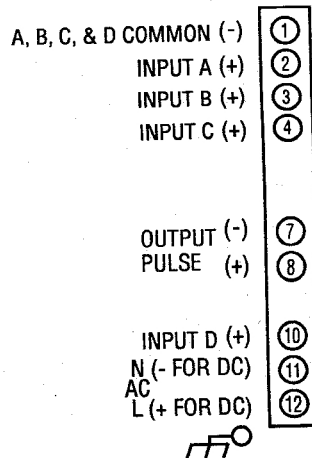
TEN POSITION DECADE SWITCH controls are provided to calibrate the instrument. The controls are normally Internal and are Optionally External.

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* (see Note)

- A. Carefully remove the instrument from its housing to gain access to the range switches, observing normal safety and equipment precautions.
- B. 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 C.
- C. The input signal source should be adjustable from 0 to 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 pse counter, with an input pulse capability of 30 volts.
- E. Since the PSM 57 operates in the divider factor mode, calculate the value of the divider factor for each input, e.g. in the equation

$$\text{Output (Sum)} = \frac{F_A}{N_1} + \frac{F_B}{N_2} + \frac{F_C}{N_3} \pm F_D$$

N_1 is the divider factor for input A, N_2 is the divider factor for input B and so on.

For two decade divider factor, the value may be from 1 to 100, for three decade the value can be from 1 to 1,000 and so on. the divider factor must be a whole number.

- F. To set the divider factor for input A use switches S_1 and S_2 to set a 2 decade divider.

Example:

DIVIDER FACTOR	SWITCH POSITION	
	S1	S2
1	0	1
95	9	5
100	0	0

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.

CHECKPOINT/ COMPONENT

VOLTAGE/ RANGE

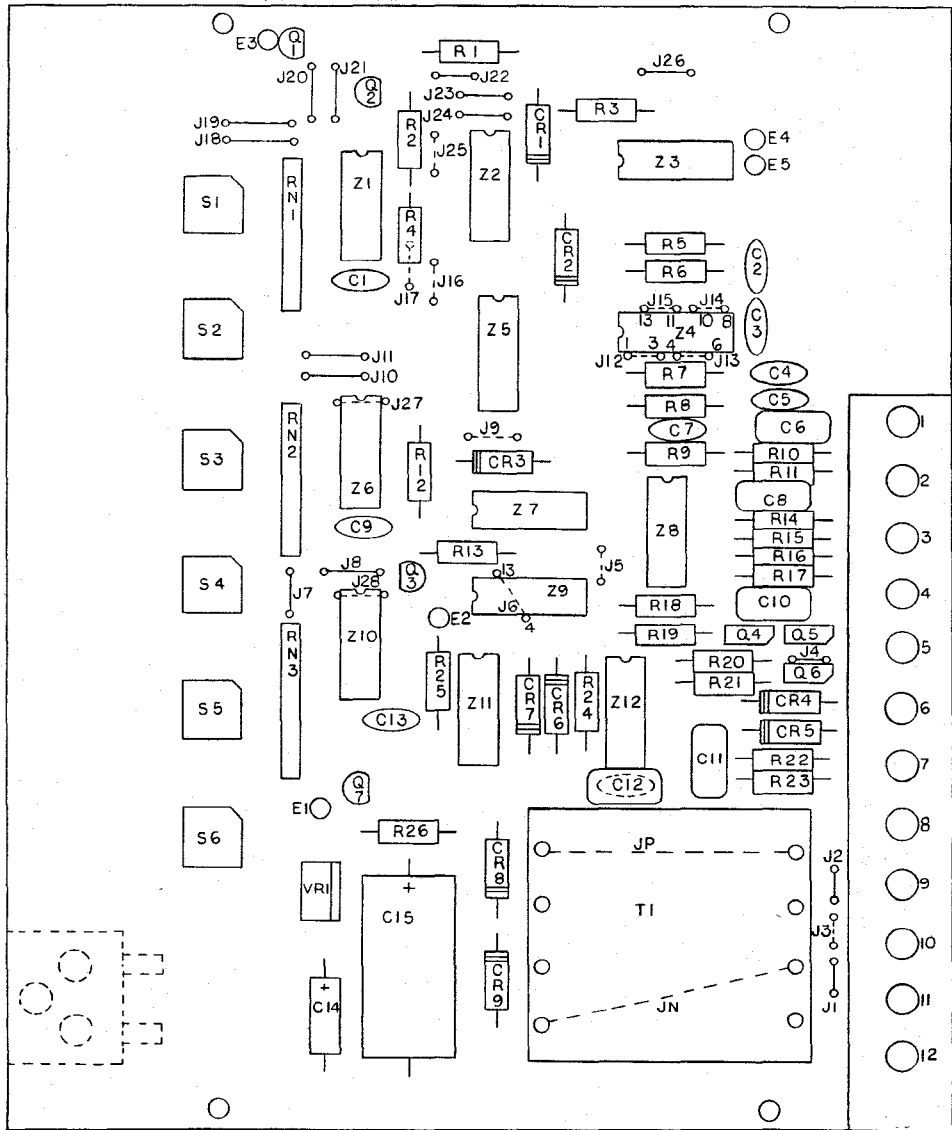
(across)	C14	12 ± 0.6 vdc
(across)	C15	26 ± 4 vdc
(from 0 V)	Z8-pin 12	12 V pulses equal to input rate
(from 0 V)	Z8-pin 2	12 V Sq. Wave

8.0 TABLES, PCB LAYOUT

NOTE: Tables not applicable for this model.

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

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9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS (2, 3 or 4 inputs)

- a. **Voltage:** Sine or square wave 9 volt to 24 volt pulse
Other ranges: consult factory
- b. **Frequency Range:** DC to 20 KHz
- c. **Contact:** Dry, 2 mA @ 24 VDC rating: specify

OUTPUT SIGNALS/OUTPUT DRIVE

- a. 12 VDC nominal pulses into 10K ohms minimum. For pulse width, see page 1. Other voltages and pulse widths optional.
- b. **Scaling Range:** Two (2) decades for up to three (3) inputs adjustable divider of 1 to 99. The unit may be configured as required (ie) 2 decades for each of 3 inputs; 4 decades on one input and 2 decades on the second input.

PERFORMANCE

- a. **Calibrated Accuracy:** Exact all-digital counting.
- b. **Repeatability/Resolution:** Exact all-digital counting
- c. **Temperature Stability:** No effect over temperature range
- 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

