

CIC ENGINEERING

345 CENTER STREET EAST PEORIA, IL 61611-2482 PH.309-699-5214 FAX 309-699-9330

Multi-Purpose Input Simulator (MPIS)

CIC P/N: MPIS

MPIS Overview

The MPIS test box is a general-purpose test box that generates signals used to control the inputs of an electronic control module (ECM) or similar device. A custom printed circuit board designed by CIC Engineering generates all the signals. The MPIS test box is assembled in a sloped Hoffman enclosure. Each MPIS unit is completely tested and calibrated before it ships.

MPIS Features

- 24VDC or 120VAC input power
- 16 sensor outputs – each output is configured with switches:
 - 500 Hz PWM (0-100% duty cycle)
 - 5kHz PWM (0-100% duty cycle)
 - Resistive
 - External signal
 - Open circuit
- 30 switch to battery or switch to ground outputs
- 12 switch to ground outputs
- 5 0-10kHz variable frequency outputs (0-5V)
- 1 0-10kHz variable frequency outputs (0-24V)
- 3 quadrature frequency outputs (0-5V)
- Each output except the switch outputs can be faulted to battery, ground, and open
- Each output has an easily accessible tip jack for monitoring with a scope or meter

MPIS Contents

A MPIS ships with the following items:

Qty 1	MPIS unit
Qty 1	MPIS set of electrical prints
Qty 1	120VAC power cord

MPIS Connections

The MPIS unit can be powered from 120VAC (cord supplied) or from an external 24VDC supply (not supplied). The external power supply is connected using a set of banana jacks on the right side of the unit. There is a switch on the right side of the unit that selects which power source to use. There is an ON/OFF switch that removes power from the internal circuitry of the unit. The external 24VDC power supply is often used to insure all system components are operating with the same supply voltage and common supply ground.

The outputs generated by the MPIS unit are brought to 2 40-pin Deutsch connectors on the right side of the unit. The pinout of these connectors are documented in the electrical prints shipped with each unit.

CIC ENGINEERING

345 CENTER STREET EAST PEORIA, IL 61611-2482 PH.309-699-5214 FAX 309-699-9330

MPIS Operation

PWM Outputs

The PWM section (section A and section B on the electrical prints) of the unit is capable of producing a 500Hz PWM, 5kHz PWM, or resistive load. The output can also be configured to accept an external signal or can be completely disconnected. A 4-position rotary switch in combination with switches select which type of signal the unit provides.

The PWM duty cycle is controlled using a 10-turn potentiometer. The duty cycle can range is 0% to 100%. The frequency of the PWM signal is selected using a toggle switch.

The resistive load has a range of 0-500 ohm or 0-1000 ohm depending on whether section A or section B is being used.

The outputs can also be configured to pass an externally supplied signal to the ECM input. The external signal is connected through a front panel BNC connector. This mode is often used to connect a device (such as a control joystick) that generates a PWM signal.

Each output can be faulted to one of three conditions. An output can be faulted to ground, to battery, or can float open. Two switches control the faulting. One switch controls the type of fault (battery, ground, or open) and the other switch controls whether to apply the fault.

Switch Outputs

There are 42 switch (section C and section D) outputs available. There are two general types of switch outputs. A switch to ground connects the ECM input to the DC common of the MPIS unit. A switch to battery connects the ECM input to the battery voltage of the MPIS unit.

30 of the switches (C1-C15, D1-D15) are 3-position switches that select between short to battery, short to ground, and an open circuit.

14 of the switches (C16-C21, D16-D21) are 2-position switches used to generate harness code inputs and can only be shorted to ground or open.

Single Ended Frequency Outputs

There are six variable frequency outputs available (section E and section F). The frequency generators are capable of producing a 0-10kHz square wave at 50% duty cycle. The frequency is adjusted using a 10-turn potentiometer.

Five of the frequency generators (E1-E3, F1-F2) produce a signal from 0-5V.

One of the frequency generators (F3) produces a 0-24V signal. This signal can be used to simulate the R-term or alternator signal.

Each output can be faulted to one of three conditions. An output can be faulted to ground, to battery, or can float open. Two switches the control faulting signals. One switch controls the type of fault (battery, ground, or open) and the other switch controls whether to apply the fault.

Quadrature Frequency Outputs

There are three quadrature frequency outputs (F4-F6). A quadrature frequency signal shifts the base signal by 180 deg, 90 deg, and 270 deg. All the phase shifts are available on different pins of the Deutsch connector. A 2-position switch is available that will swap the 90 and 270 signal to simulate a direction change in the signal.

Each phase-shifted signal can be faulted to one of three conditions. An output can be faulted to ground, to battery, or can float open. Two switches control the faulting signals. One switch controls the type of fault (battery, ground, or open) and the other switch controls whether to apply the fault.

CIC ENGINEERING

345 CENTER STREET EAST PEORIA, IL 61611-2482 PH.309-699-5214 FAX 309-699-9330

