CD90 CARRIER DEMODULATOR – MCI SYSTEM



The CD90 is a very high gain, dual output, Carrier Demodulator plug-in module for use with Validyne's MC1 System. The unit is used to provide transducer excitation and to amplify and demodulate the output of carrier excited strain gage bridges and transducers, variable reluctance transducers, potentiometric transducers, linear and rotary variable differential transformers (LVDT/RVDT).

The CD90 will operate with full-bridge or half-bridge transducers delivering 10 Vdc output for inputs of 0.1 mV/V. A 10-position gain switch and 10-turn vernier potentiometer allows use of input signals from 0.1 mV/V to 500 mV/V.

The CD90 has a high-low balance range control. Additionally, a reference phase control (±90°) is provided for long line and reactive source operation. A front panel calibration switch provides + shunts calibration.

A 3-position frequency response control selects the appropriate output low-pass filter (30 Hz, 150 Hz and 750 Hz).

The CD90 may be operated with any carrier frequency from 400 Hz to 20 kHz by changing a plug-in control board.

FEATURES:

- ✓ Compact: may be used on bench top or mounted in existing enclosures
- ✓ Regulated against line voltage variation
- ✓ Solid state reliability

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SPECIFICATIONS

GENERAL SPECIFICATIONS

INPUT SENSITIVITY:
0.1 mV/V for 10 Vdc output (equivalent to 5 micro strain per volt of output, using a 4 active arm strain gage bridge with a gage factor of 2)

GAIN SWITCH STEPS:
0.1, 0.25, 0.5, 1.0, 2.5, 5.0, 10, 25, 50 and 100mV/V

INPUT ATTENUATOR:
Calibrated 10-turn potentiometer 0 to 100%

MAXIMUM INPUT:
500 mV/V (2.5 Vrms) with gain switch at 100 mV/V and attenuator at 20%

BRIDGE CONFIGURATION:
2 or 4 arm strain gage (min. 100 Ω), variable reluctance, variable differential transformers (LVDT) and similar transducers

BRIDGE EXCITATION:
Buffered, grounded center tap 5 Vrms 3 kHz into min. 100 Ω load. (See "Alternate Carrier Frequency Operation".)

BALANCE CONTROLS:
Calibrated 10-turn in phase (R) balance.
Screwdriver adjustable 15-turn quadrature (C) balance

BALANCE RANGE:
High range +25 mV/V, R & C balance
Low range +2-5 mV/V, R & C balance

REFERENCE PHASE ADJUSTMENT:
+90°, single turn screwdriver phase adjustment

THIRD HARMONIC FILTER:
Adjustable low level third harmonic filter allows high gain operation with inductive devices having large third harmonic content in their output

OUTPUT FILTERS:
Switch selectable low pass filter bandwidths of 1/100. 1/20, or 1/4 times the carrier frequency, with 5-pole response in the wideband position.
(See Alternate Carrier Frequency Operation.)

OUTPUT A & B:
±10 Vdc at 100 mA, short circuit proof.
Maximum output ±15V

OUTPUT IMPEDANCE:
A: Less than 10 Ω
B: 100 Ω standard

LINEARITY:
Less than ±0.05% full scale

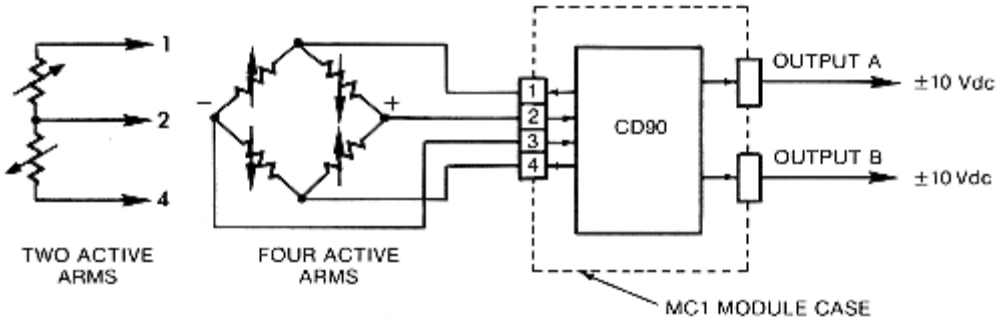
OUTPUT NOISE:
Less than 10 mV rms with 750 Hz filter, less than 1 mV rms with 150 Hz or 30 Hz filter

CALIBRATION:
Front panel jack for plug-in shunt calibration resistor
Toggle switch for plus-off-minus calibrator control

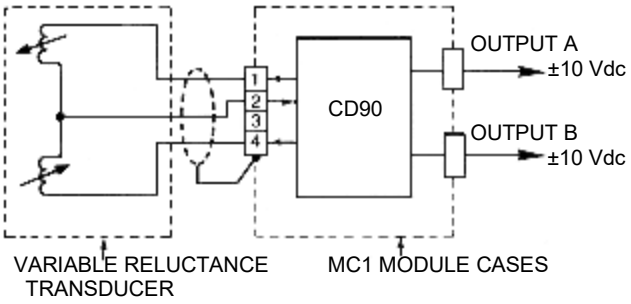
CARRIER:
Buffered grounded center-tapped bridge excitation, provides 5 Vrms into 100 Ω load. Requires 2.5 Vrms single-ended from module case (or external oscillator). Input impedance is 12.4 kΩ shunted by 220 pf

ALTERNATE CARRIER FREQUENCY OPERATION:
The CD90 may be operated with carrier frequencies from 400 Hz to 20 kHz. At each carrier frequency a separate "Frequency Matching" plug-in assembly (7722) and "Output Filter" plug-in assembly ("7723] are required Plug-in assemblies are available for carrier frequencies of: 400 Hz. 3 kHz. 5 kHz. 10 kHz and 20kHz, which are easily changed in the field. Unless otherwise specified, the CD90 is shipped with 3 kHz carrier plug-in assemblies.

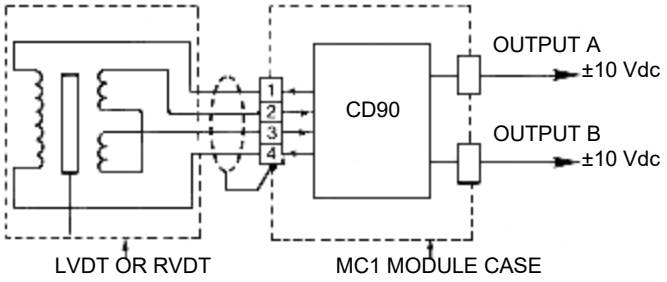
TYPICAL APPLICATIONS



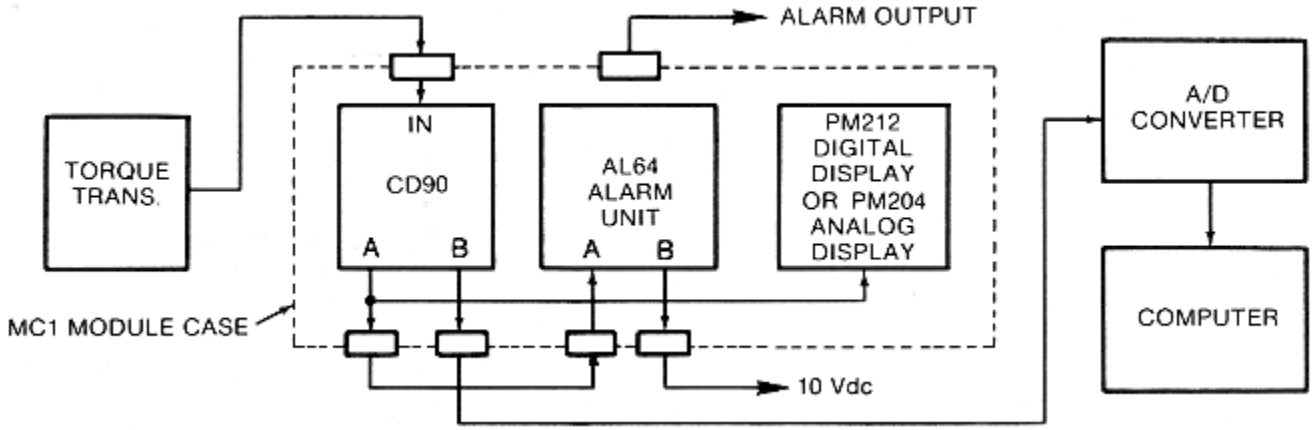
STRAIN GAGE INPUTS



VARIABLE RELUCTANCE INPUT



LVDT INPUT



TORQUE MEASUREMENT AND ALARM SYSTEM WITH OUTPUT B TIED TO COMPUTER INTERFACE

ACCESSORIES:

1. P/N 7616-2 Plug-In Module Extender Card
2. P/N 7722-“X” – CD90 Frequency Matching Plug-In Assembly
3. Required to match a CD90 to a specific MC1 carrier frequency. See following table for “-X” frequency designation
4. P/N 7723-“X” – CD90 Output Filter Plug-In Assembly
5. Required to match CD90 filter characteristics to specific MC1 carrier- frequency. See following table for “-X” frequency designation.

FILTER DASH NUMBER (X) IDENTIFICATION TABLE

“-X”	Carrier Frequency
-1	3 kHz
-2	5 kHz
-3	10 kHz
-4	20 kHz
-5	400 kHz

UPDATED 4/16/2025