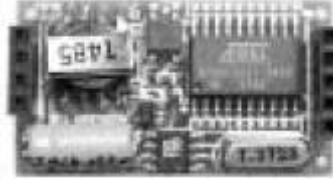


Future Design Controls 200 Series DIN Controls Optional Retransmission Module CM92-2

1. Features:

- High Precision: 15-Bit resolution
- High Linearity: +/- 50 PPM of Range
- High Stability: +/- 25PPM/C
- 4-20mA / 0-20 mA Programmable
- Digital Calibration: Without variable resistor
- Input / output optical isolated
- Serial Data Input: Minimize pin consumption



CM92-2 Module

2. Introduction

The CM92-2 is an optional retransmission module for the following 200 Series products: FDC-9200 & 2220. The modules accept a serial digital data input from the 200 Series internal microprocessor converting the data into an analog current output.

The modules contain a 15-bit digital to analog converter, a dc-to-dc voltage converter, photo-coupler for input/output isolation and digital calibration circuit. Each module is calibrated during production. The calibration data are store permanently in re-programmable flash ROM to prevent long-term drift. The modules can generate 4-20mA as well as 0-20mA signal output according to a programmable input data format. The conversion characteristics are shown in the following diagrams.

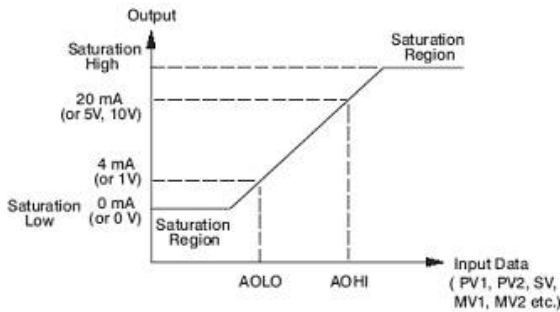


Fig.1 4-20mA Characteristic

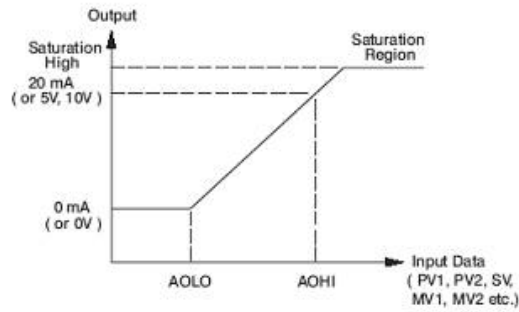


Fig.2 0-20mA Characteristic

Note:

The LOSC is low scale value preset by the user.
The HISC is high scale value preset by the user.

The output signal is determined by the following formulas:

(1) 4-20mA, PV or SV conversion

$$\text{mA} = 4\text{mA} + \frac{\text{PV (or SV)} - \text{LOSC}}{\text{HISC} - \text{LOSC}} \times 16 \text{ mA}$$

(3) 0-20 mA, PV or SV conversion

$$\text{mA} = \frac{\text{PV (or SV)} - \text{LOSC}}{\text{HISC} - \text{LOSC}} \times 20 \text{ mA}$$

(2) 4-20mA, MV1 or MV2 Conversion

$$\text{mA} = + \frac{\text{MV1 (or MV2)}}{100.0} \times 16 \text{ mA}$$

(4) 0-20 mA, MV1 or MV2 conversion

$$\text{mA} = \frac{\text{MV1 (or MV2)}}{100.0} \times 20 \text{ mA}$$

3. Setup procedures

- (1) Select a correct part number of the retransmission module for the specific product. Fits the module in the product.
- (2) Adjust ADDR for CM92-2:

ADDR	193	193	194	195	196	197	198	199
Output	4-20mA	4-20mA	4-20mA	4-20mA	0-20mA-0-10V	0-20mA-0-10V	0-20mA-0-10V	0-20mA-0-10V
Retransmit	PV	SV	MV1	MV2	PV	SV	MV1	MV2

- (3) Adjust LOSC value for CM92-2 to meet the desired output zero (corresponding to 4mA, 0mA).
- (4) Adjust HISC value for CM92-2 to meet the desired output span. (corresponding to 20mA).
- (5) Check if the function and accuracy are acceptable.

4. Re-calibration

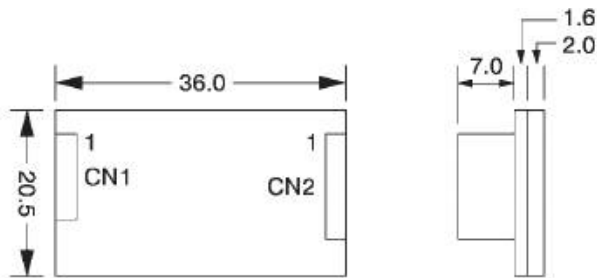
The modules are calibrated during production. Since there are no variable resistors the modules cannot be calibrated without a specific calibration system. If the user intends to change the output value adjust LOSC value for output zero and adjust HISC value for the output span. The procedure should be performed several times until the output values meet the requirements because the span adjustment may affect the zero value. The user also can apply the previous formulas to solve the equations and obtain the new values of LOSC and HISC directly to prevent a trial and error process. The above re-calibration method cannot apply for the MV1 or MC2 retransmission because zero and span for MV1 and MV2 are fixed (i.e. 0 and 100.0%).

5. Specifications

Resolution: 15 bits
 Accuracy: +/- 0.05% of span +/- 0.0025% / C
 Load Resistance: 0-250 ohms (for current output)
 Output Regulation: 0.01% for full load change
 Output Settling Time: 0.1 sec. (stable to 99.9%)

Isolation Breakdown Voltage: 1000VAC min.
 Integral Linearity Error: +/- 0.005% of span
 Temperature Effect: +/- 0.0025% of span / C
 Saturation Low: 0 mA
 Saturation High: 22.2mA min.
 Linear Output Range: 0-22.2 mA (0-20ma or 4-20mA)

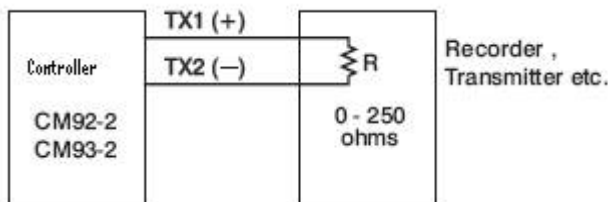
6. Mechanical Data and Pin Assignment – CM9202



Pin Function: CN1-1:
 CN1-2:
 CN1-3: TX1(+) (Output +)
 CN1-4: TX1(-) (Output -)

 CN2-1:
 CN2-2: VCC (+5V Power In)
 CN2-3: GND(Power Return)
 CN2-4: SI (Serial Data In)
 CN2-5:

7. Connection Diagram



8. Ordering Information

Part No	CM92-2
Function	0-20MA / 4-20mA
Applicable Products	FDC-9200 & 2220