GENERAL

The Model 380Z Characterizer Module accepts a 0 to 5V dc input signal and provides a milliamp output signal which is related to the input by some mathematical function. The most typical application is providing a linear output for a non-linear input. It can also provide a non-linear output for a linear input.

The module provides current output ranges of either 0 to 20 mA or 0 to 50 mA. The zero offset adjustment is used to achieve the standard output ranges of 4 to 20 or 10 to 50 mA. Voltage outputs are achieved by placing a resistor across the output terminals.

Current inputs can be used by connecting a precision resistor across the Enclosure input terminals; this permits removal of the module without breaking the input current loop.

SPECIFICATIONS

Input:
Voltage Range - 0 to 6V dc maximum
Current Range - 0 to 50 mA dc maximum
See Service Instruction SD3801, for details on conditioning resistors.

Shaping Circuits:
Number of circuits - 8
Breakpoint Adjustment Range - 10 mV to 5V dc (each circuit)
Gain Adjustment Range - Each segment has a gain of ± 2
which is continuously adjustable
-8 mA/Volt to +8 mA/Volt (20 mA output range)
-20 mA/Volt to +20 mA/Volt (50 mA output range)
Segments 4 and 8 have a gain of ± 10

Response Time (Step Input) - 800 mSec to reach 98% of final output value

Repeatability - ±0.1% of Span

Output:
Range - field selectable, either 0 to 20 mA or 0 to 50 mA

<table>
<thead>
<tr>
<th>Load - Range</th>
<th>AC Powered Cases</th>
<th>DC Powered Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20 mA</td>
<td>0 to 900 Ohms</td>
<td>0 to 700 Ohms</td>
</tr>
<tr>
<td>0 to 50 mA</td>
<td>0 to 360 Ohms</td>
<td>0 to 28 Ohms</td>
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</tbody>
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MOORE PRODUCTS CO., Spring House, Pa. 19477
Load Effect - Output will change less than 0.1% of span as the load is changed over the entire range.

Current Limiting - The output current will limit at about 200% of full scale when input is overdriven.

Zero Adjustment - 0 to 100% of full scale output

INSTALLATION

The Model Series 380 Card Cage Enclosures are equipped with safety keys that must be set by the user at the time of installation. Using the Card Cage Enclosure instructions for reference (Service Instruction SD3801), set the keys in the slot the module is to be used in as follows:

Left Key: V (vertical)
Right Key: V (vertical)

If the module is factory calibrated, insert the module into the proper slot in the Card Cage Enclosure and make the electrical connections shown in the connection diagram. If it is not factory calibrated, refer to the CALIBRATION section of this instruction.

The module accepts 1 to 5V dc (typical) input signals. If current input signals are to be used, refer to the Card Cage Enclosure Instructions (SD3801) for details on input signal conditioning resistors.

CALIBRATION

GENERAL

Define your Characterizer Module output curve in terms of output current vs. input voltage. A sketch of this curve, indicating breakpoints and slopes, is useful when calibrating the module. Figure 1 is a sample curve.

The pots used to set the breakpoints are labeled B1 thru B8. The corresponding gain (slope) pots are labeled G1 thru G8.

The gain of each segment is continuously variable between ±2 (-8 mA/Volt to +8 mA/Volt). The gain of segments 4 and 8 (G4 and G8 respectively) are 5 times (±10) that of the other segments. G4 and G8 can be reduced to the gain of the other segments by cutting jumpers J2 and J3 respectively.

It is not necessary to use all eight segments if the application does not require it. However, the breakpoint adjustment of all unused segments must be set completely counterclockwise. Furthermore, the segments can be used in any sequence. If an application requires an unusually steep slope for the first breakpoint, segments 4 or 8 should be used to utilize their higher gain.

Clockwise rotation of a gain pot increases the gain (slope). When the pot wiper is centered, there will be no change in output with a change in input.

The pot marked Z is the offset adjustment that sets the output current at a point between 0 and 100% of the output span.
Notes:
1. 1-5V dc signals are standard inputs. For process current inputs, refer to Service Instruction, SD3801 for proper input conditioning resistors.
2. The negative input terminal is common with the cage DC power supply.
3. See output specifications for load limits.

FIGURE 1 Sample Curve
PROCEDURE

1. Select the output current range by arranging jumper J1 as follows:
   
   20 mA Output Range: Jumper J1 Out
   50 mA Output Range: Jumper J1 In

2. Turn all breakpoint pots counterclockwise until the end of each pot is reached

3. Connect a milliammeter to the output terminals and an adjustable voltage source to the input terminals.

4. Set the input voltage to zero and adjust the offset pot (marked Z) until the output reaches the desired minimum output current.

5. Set the input voltage to the level desired for the first breakpoint (V1).

6. Select the segment to be used for the first breakpoint (from your curve) and adjust the corresponding gain pot fully clockwise if the slope is positive, or fully counterclockwise if the slope is negative.

7. Rotate the corresponding breakpoint pot until the output current starts to change. Try to set this pot at the position where the output just begins to change.

8. Increase the input voltage to the next breakpoint voltage (V2 in Figure 1).

9. Adjust the gain pot corresponding to the first breakpoint until the output reaches the desired level of the second breakpoint.

10. Repeat steps 6 thru 9 for the remaining segments.

MAINTENANCE

These instruments are solid state and require no maintenance on a regular basis, except for annual cleaning, blowing out dirt, and verifying calibration. If the module is not operating properly, remove it and give it a full bench check-out. Most problems are in field wiring or peripheral circuitry. If the problem is traced to the unit itself, conventional electronic troubleshooting methods suffice
OPTIMAL SEE INSTRUCTIONS

OFFSET ADJUST
BREAK POINT ADJUST 1
GAIN ADJUST 1
BREAK POINT ADJUST 2
GAIN ADJUST 2
BREAK POINT ADJUST 3
GAIN ADJUST 3
BREAK POINT ADJUST 4
HIGH GAIN ADJUST 4

OUTPUT RANGE JUMPER
4-20mA
10-50mA
J1 OUT
J1 IN

CUT JUMPER TO REDUCE GAIN
BP4 - J2
BP8 - J3

NOTE: JUMPERS J1 & J2 ARE LOCATED ON FOIL SIDE OF MAIN PC BOARD. J3 IS ON THE COMPONENTS SIDE OF THE TOP BOARD.