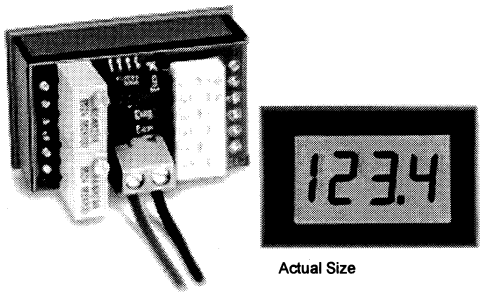
KLAY-INSTRUMENTS B.V.

"MANUAL"

INDICATOR SERIES "8000"



Actual Size

DMS-20LCD-4/20 Series

4-20mA Input Loop-Powered
Ultra-Low 1.8V Loop Drop, 3½ Digit
LCD-Display Process Monitors

Features

- **Super-low loop drop: 1.8V typical, 2.0V max.**
- **Self-powered, no separate supply required**
- **Unipolar, Bipolar, and Positive Reading Models**
- **Subminiature package—Less than 0.90" behind-the-panel depth**
- **Large, 0.37"/9.4mm high, sunlight-viewable LCD display**
- **Non-interacting gain (span) and offset (zero) 20-turn potentiometers**
- **DIP-switch selectable range and decimal points**
- **Hundreds of different input/readout combinations**
- **Vibration-resistant package; reliable screw-terminal input connections**

The DMS-20LCD-4/20 Series produces the lowest loop voltage-drop of any comparably priced, 4-20mA input, 3½ digit LCD-display process monitors: 1.8V typical, 2.0V max. This super-low drop means its nominal loop resistance (burden) is less than 100 Ohms! All operating power is derived solely from the 4-20mA loop current—no separate power source is required! The simple 2-wire hookup allows the DMS-20LCD-4/20 Series to be connected ***anywhere*** in the loop

All decimal-point and range-change selections are made via a six-position DIP switch featuring vibration-resistant, gold-plated contacts—there are no jumpers or solder gaps to ever open or close. Both gain (span) and offset (zero) adjustments are performed with precision, 20-turn potentiometers.

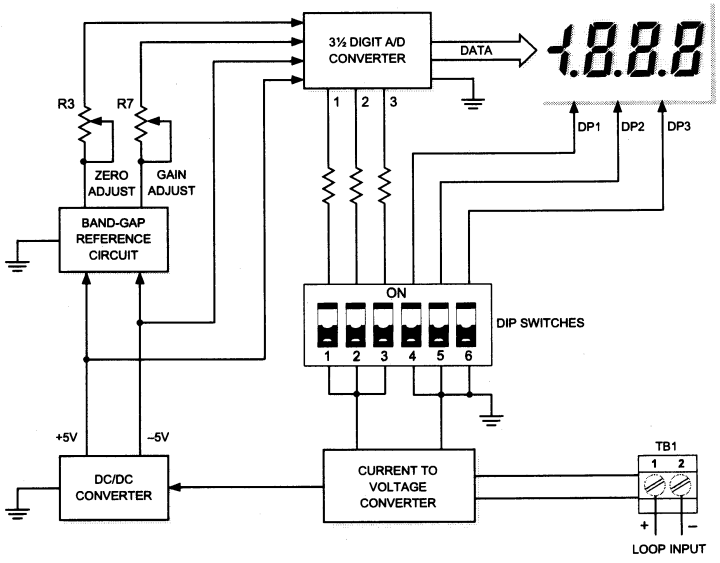


Figure 1. DMS-20LCD-4/20 Series Simplified Schematic

KLAY-INSTRUMENTS B.V.

Nijverheidsweg 5
P.O. Box 13
Web-site: www.klay.nl

7991 CZ Dwingeloo
7990 AA Dwingeloo

The Netherlands

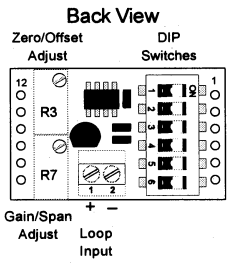
TEL: +31 521-591550
FAX: +31 521-592046
E-mail: info@klay.nl

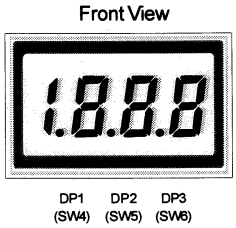
DMS-20LCD-4/20 3½ DIGIT, LCD DISPLAY, 4-20mA LOOP-POWERED METERS

Performance/Functional Specifications

Typical at T_A = +25°C, unless otherwise noted.

Current Loop Input	Min.	Typ.	Max.	Units
Full Scale Input Range	+3.8	—	+20.4	mA
Input Impedance	—	80	100	Ω
Voltage Drop	—	1.8	2.0	Volts
Overcurrent Protection	—	—	±40	mA
Performance				
Sampling Rate	2.5 readings per second			
Accuracy (1 minute warm–up)	±0.05%FS ±1 Count			
Temperature Drift (0 to +60°C)	—	±0.15	±0.3	Cnts/°C
Display				
Display Type and Size	3½ digit LCD, 0.37"/9.4mm			
Polarity Indication	"–" for negative readings			
Overrange Indication	"–1___" for negative inputs "1___" for positive inputs			
Physical/Environmental				
Operating Temperature	0	—	+60	°C
Storage Temperature	–20	—	+75	°C
Humidity (Non–condensing)	0	—	95	%
Case Material	Polycarbonate			
Weight	0.6 ounces (17 grams)			





Operating and Setup Instructions

DMS-20LCD-4/20S (Unipolar Reading Model)

As shipped, the DMS-20LCD-4/20S is factory calibrated to read "000" for a 4mA input and "1000" for a 20mA input. The following worst-case procedure assumes the DMS-20LCD-4/20S is completely mis-adjusted, i.e., both potentiometers and the DIP switches are randomly set. When performing DIP-switch settings, be sure the DIP switch's small actuators are firmly engaged in their fully-ON or fully-OFF positions.

1. Set R7 (full scale span/gain adjust) and R3 (zero/offset adjust) fully clockwise, roughly 22 turns, and place SW1-SW6 to OFF.
2. Select DIP switch setting #2.
3. Apply a precision 4mA input, with proper polarity, and adjust R3 until the meter's display reads "000".
4. Apply a precision 20mA input and adjust R7 until the meter's display reads "1000". Repeat steps 3 and 4 to make sure the adjustments do not affect one another.
5. Select the appropriate decimal point by setting SW4, SW5 or SW6 to ON (DP1, DP2 or DP3 respectively).

NOTE: If a display reading other than "000" to "1000" is desired, refer to DIP–Switch Settings Table 1 for SW1–SW3 settings.

Table 1. DMS-20LCD-4/20S (Unipolar Model) DIP-Switch Settings

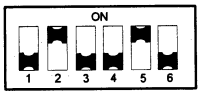
Display Reading 4mA	20mA	SW1	SW2	SW3
1. 000 to	1050-1999	Off	Off	Off
2. 000 to	650-1350	On	Off	Off
3. 000 to	450-800	Off	On	Off
4. 000 to	300-500	Off	Off	On
5. 000 to	200-300	On	On	On

When looking up DIP-switch settings in the Tables and the desired display readings can be achieved with either of two different settings, using the higher setting # will produce less sensitive offset (R3) and span (R7) adjustments. Please keep in mind that the DMS-20LCD standard meter (from which the DMS-20LCD-4/20 is derived) has an accuracy specification of ±2 counts (max.). Thus, it may not always be possible to obtain the exact desired display reading.

Examples (DMS-20LCD-4/20S-Unipolar Model)

1. Desired display readings are:

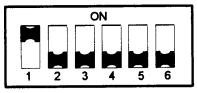
   4mA = "0.00"
   20mA = "6.00"



   Use DIP-switch setting #3 in Table 1 and enable decimal point DP2 via SW5. Apply 4mA and adjust R3 so the display reads "0.00". Apply 20mA and adjust R7 so the display reads "6.00".

2. Desired display readings are:

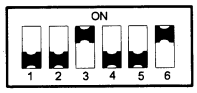
   4mA = "000"
   20mA = "800"



   Use DIP-switch setting #2 in Table 1. Apply 4mA and adjust R3 so the display reads "000". Apply 20mA and adjust R7 so the display reads "800". For these display readings, no decimal points are used. Set SW4, SW5 and SW6 to OFF.

3. Desired display readings are:

   4mA = ".000"
   12mA = ".250"



   This example is not as straightforward as the previous two. Notice that 12mA is exactly halfway between 4mA and 20mA. If we assume that the input could go up to 20mA, the display reading would then be: 2 x .250 or ".500". From Table 1 we can now select DIP-switch setting #4 and enable DP1 via SW4. Apply 4mA and adjust R3 so the display reads ".000". Apply 12mA and adjust R7 so the display reads ".250".