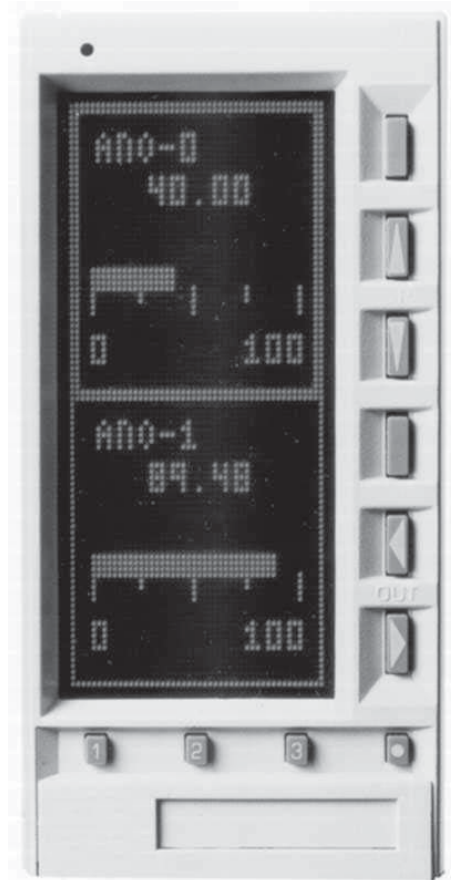# MicroMod
AUTOMATION

Micro-DCI™
53ML5100 Manual Loader

- Two process variable inputs

- Two manually controlled current outputs

- Multiple Display Formats: Dual Channel Manual Loader, Single Channel Manual Loader, Manual Loader with Analog Input, Analog Input w/Manual Setpoint

- Configuration via the front display

- Password Security

53ML5100 Manual Loading Station

53ML5100
Micro-DCI™ Manual Loading Station

The 53ML5100 manual loading station provides manual adjustment of two independent current outputs. Each output is independently configurable as a 0-20 mA or 4-20 mA signal. The manual loading station can accept two input process variables that are each presented on separate displays. The two input process variables have independent configurable input current / voltage ranges (0-20 mA, 4-20mA, 0-5V, 1-5V), with square root signal extraction and smoothing selections from 0 seconds to 1638 seconds. (first order filtering)

A suite of six operator displays is used to monitor the two input process variables and the two manually controlled current outputs. The displays are a mix of dynamic bar graphs that include a dual channel manual loader (Channels 1 & 2), a single channel manual loader display (Channel 1 only), two manual loader with analog input displays (Channels1 & 2), two analog input indicator with setpoint displays (Channels1 & 2). The presentation order of the six operator displays is configurable. The 53ML5100 has the ability to show individual tagnames, input range, and user specified engineering units for each channel. The descriptive displays allow you to observe the condition of the process at a glance. From the standard library of six preconfigured displays you can use one (or a group of displays) that best represents your application. Push buttons on the front panel allow access to all the datapoints in the instrument. This ensures quick, easy, and low cost configuration of the parameters.

Dual Channel Manual Loader Display -

(Channels 1 & 2) - Figure 1 shows a 53ML5100 with its standard two channel horizontal bar graph display. Both channels outputs are presented as horizontal bar graphs with tagnames and digital readouts of the output percentage. Channel 1 (Analog Output 0, ANO-0) occupies the lower half of the display. A thick border shown around the perimeter of the upper or lower display half indicates a selected channel for manual output control.

The thick border alternately appears on the upper or lower display halves each time the 3 push button is pressed.

A digital readout located in the center quadrant of the two display segments indicates the percentage of control signal output.

As shown in Figure1, the manual loading station contains a graphical dot matrix display; horizontal and vertical keypads; a MINI-DIN RS-232 configuration port connector concealed behind the front panel pull down door; terminals for signal input/output wiring and power wiring; and a compact instrument case that protects the instrument main printed circuit board and internal power supply
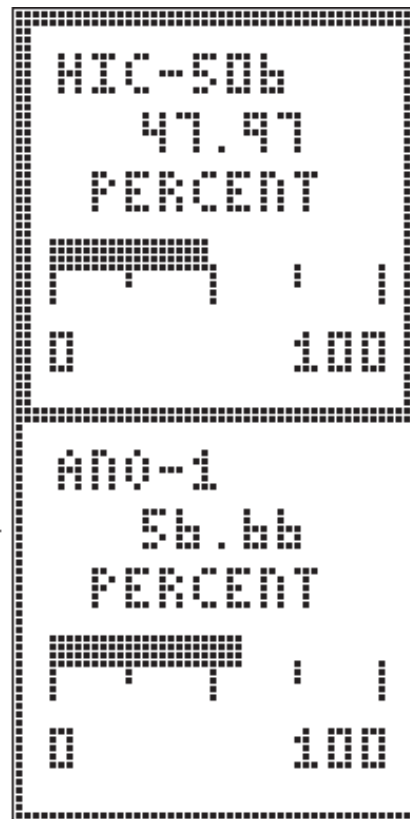

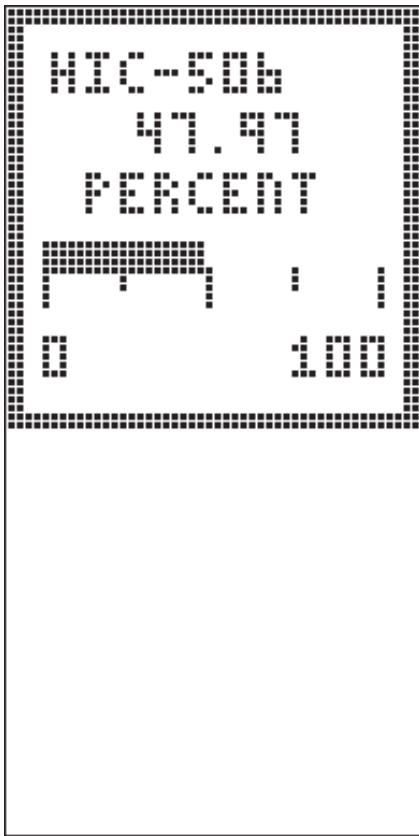Figure1. Two Channel Horizontal Bar Graph Manual Loading Display

Figure 2. Single Channel Horizonal Bar Graph Manual Loader

Figure 3. Vertical Bar graph Manual Loading Function with the analog input being indicated

Single Channel Manual Loader Display -

Figure 2   (Channels 1 & 2) - Both channel outputs are presented as a horizontal bar graph with a tagname and digital readout of the output percentage. The display has a permanent thick border surrounding it to indicate selection for manual output control. This display is used when a single output is required and focuses attention on that output.

Manual Loader with Analog Input Displays -

Figure 3 (Channels 1 & 2) - Each display has a vertical bar graph for analog input process variable (PV) indication and a horizontal bar graph for analog output manual control. The vertical bar graph has a 50 segment axis and the horizontal bar graph has a 40 segment axis. The vertical bar graph has a numeric range (zero and span) and the horizontal axis has the forward /reverse valve indicators (C for close, O for open). An input channel tag name appears in the upper left corner of the display.
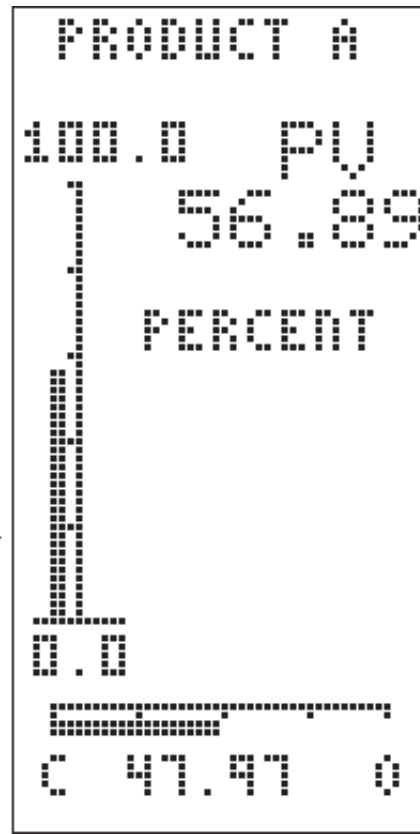
A digital readout with measured units for the analog input channel appears under the letters PV in the upper half of the display. A digital readout for the analog output channel appears under the horizontal bar graph.

Analog Input Indicator with Setpoint Displays -
Figure 4 (Channels 1 & 2) Each display has a vertical bar graph for analog input process variable (PV) indication and a setpoint (SP) arrowhead for analog output manual control indication. The vertical bar graph appears on the left side, parallel to a 50 segment vertical axis. The setpoint arrowhead appears on the right side of the vertical axis. The vertical axis has a numeric range (zero and span) an input channel tag name appears in the upper left corner of the display. A digital readout for the analog input measured units tagname in the middle of the display and beneath it a digital readout appears under the letters PV.
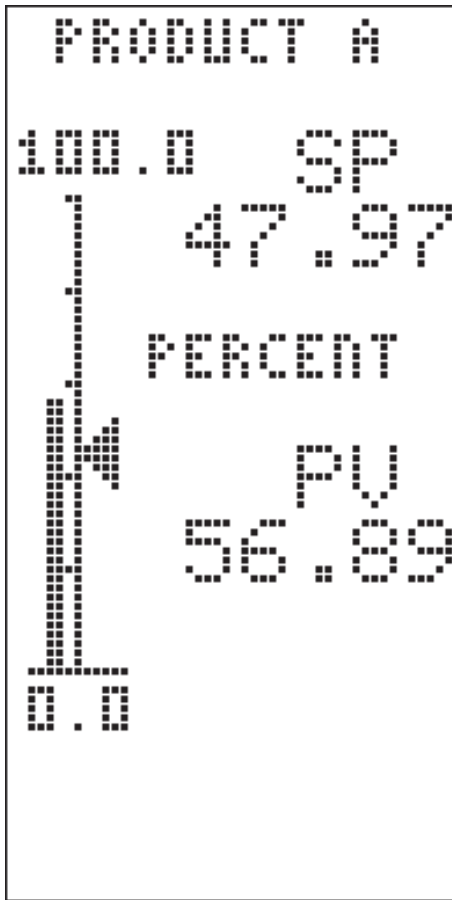
Figure 4. Analog Input Indicator with
Setpoint display

Each manual loading station contains a graphical dot matrix display, horizontal and vertical keypads; a MINI-DIN configuration port connector concealed behind the front panel pull-down door; terminals for signal input/output wiring and power wiring; and a compact instrument case that protects the instrument main printed circuit board and internal power supply.

Each display has individually configurable tagnames and engineering units. You can select either forward or reverse (default) output reaction in relation to the final element. Each output channel can be configured as either a 0-20 mA or 4-20 mA output source. All of the selectable entries for the manual loading station are parameter entries to the database. The database of the instrument is divided into modules composed of datapoints that activate/ deactivate/enter operating characteristics for the instrument to use as the instrument performs its functions. The database allows instrument functionality to be refined to specific process applications.

The display is a 96 X 48 gas discharge dot matrix , contrasted orange on black to enhance visibility. The intensity of the instruments' display is adjustable from 0 to 7, with 0 being the brightest setting.

The 53ML5100 has a built in 24Vdc transmitter power supply providing up to 80 mA. Terminals for the power supply are located on a rear terminal block.

Configuration of the instrument is accomplished using the MicroMod Automation Micro-Tools configuration software, or by direct entry through the front panel vertical and horizontal keypads. Both keypads have functioning push buttons that are dependent on the instruments' mode of operation. Modes of operation are operator mode and engineering mode. Mode selection is made with the mode button (●) push button on the horizontal keypad. Engineering mode is entered to make the necessary selections for the operator displays; otherwise, the instrument is left in operator mode for process applications.

All of the selectable entries for the Manual Loading Station are parameter entries to the database. The databse is subdivided into modules composed of datapoints that are accessed by the instruction code as the instrument performs its functions. The database allows instrument functionality to be refined to specific process applications, as display attributes can be altered and input / output signal characteristics can be defined.

A parameter can be any one of five data types. Each data type represents a specific data format: integers, alphanumeric text strings, floating point values with 15 bit resolution, and high resolution 31 bit floating point values.

ENGINEERING SPECIFICATIONS

OPERATING CHARACTERISTICS

Power Requirements:
    24 Vdc +/ - 2 Vdc
    120 Vac + / - 10% @ 50-60 Hz
    220/240 Vac + / - 10% @ 50-60 Hz

Power Consumption: AC operation: 15 VA

Internal Power Supply

Available Power Output for Transmitters:
    24-26 Vdc, 80 mA, short circuit protected

Output Ripple: 200 mV p-p maximum

ENVIRONMENTAL CHARACTERISTICS

Enclosed temperature controlled locations
    (class A and B per ISA S71.01 1985)

Ambient Temperature Limits: 4 to 52° C
                     (40- 125 ° F)
Relative Humidity Limits: 10 to 90% maximum

Temp. Effect on Accuracy: +/- 0.28% per 28° C
   (50 °F) from reference temperature
   of 25° C(77° F)

Analog Inputs

Quantity: 2
Signal Range: 0-5 or 1-5 V linear or square root
Input Impedance: 1 megohm minimum for voltage
                 inputs; value of ranging resistor for
                 current signals.

Measurement Accuracy: + / - 0.1% of span

Note: The standard rear terminal board has the
       appropriate resistors on ANI0 and ANI1.
        If the input signal is voltage, the resistors
       should be removed.

PHYSICAL CHARACTERISTICS

Case:	Steel
Finish:	Baked enamel, Lt. Gray - RAL9002
Circuit Boards:	Glass epoxy
Bezel:	ULTEM® 1000 UL-94 5 V
Dimensions:	DIN case
	(72 W x 144 H x 329 mm L)
	(2.8 W x 6.6 H x 12.9 in L)
Electrical Connection:	
Rear of Case:	Compression type screw terminals
Display:	96 x 48 Pixel
Push Buttons:	10 (Tactile membrane switches)

MICROPROCESSOR SAMPLING & UPDATE

Input Signal Sampling Rate

Analog:	50 ms for all inputs, outputs
Display Update:	100 ms

Analog Outputs

Quantity:	2
Signal Range:	0-21.84 mA dc
	(4-20 mA dc typically)
Accuracy:	+ / - 0.2% of span
	(Current output is updated
	every 0.3 seconds.
	The output slew rate is
	40 mA/sec.)
Load Resistance:	0 -750 ohms

Model Number Designation

53ML51   A   2   1   A   B

Power Requirements
AC (120, 240 Vac 50, 60 Hz) 1
DC (24 Vdc) 2

Functional Requirements
Standard 1
Standard with Factory Configuration 2

Design Level .... A

Enclosure Type
DIN 72 x 144 mm 2
  (2.844W x 6.656 H x 12.906 in. L)

Rear Terminal Board
Standard Rear Terminal Board 1

Chassis
Standard Chassis...A

Safety Classification
Factory Mutual Class 1, Div. 2 .... B

Conformal Coating
None X
 Required .... A

Product Summary

- Two independent output channels
- Six standard user selectable displays
- Intuitive Operator Interface
- Built in 24 Vdc 80 mA Transmitter Power Supply
- Selectable functions such as Forward or Reverse acting outputs
- DIN case
- Two Analog Inputs
- Two Analog Outputs
- Fully configurable Inputs & Outputs

www.micromodautomation.com

MicroMod
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Application-smart control solutions

S-DCI-53ML5100_1