

CLI100

MULTI CHANNEL LEVEL INDICATOR



OVERVIEW

These CLI100 instruments are extremely rugged and versatile multi-channel level measurement instruments. These level indicators can be used for a wide variety of applications where accuracy and dependability are essential. CLI100 can be factory set to measure upto 16 channels of level and volume. CLI100 has a high precise 24 bit analog to digital converter, which has a high data rate. CLI100 can measure level and also volume. Unique feature in the CLI100 ensures that the level to volume calculation can either be a linear calculation or a non-linear calculation for nonuniform tanks. CLI100 can be used for volume measurement for non-uniform tanks.

The CLI100 provides a complete solution for level and volume sensing applications. CLI100 can also control 8 relays according to the user settable set points. CLI100 has inbuilt logging feature for the channel data separately and alarm event separately. Since the CLI100 is featured with a real time clock with separate battery back up, all the logged data has a time stamp with it. In addition, all these instruments are field programmable and have nonvolatile backup memory that does not need cumbersome batteries.

The instruments have both LED and LCD display indication. The LED display ensures that the level information can be seen from far. The LCD display can be used to show higher resolution volume as well as any alarms present in the system. These instruments also have the capability to switch on relay(s) based on user settings. The 7 segment LED indicates the channel data and channel number in a scrolling fashion, The LCD displays the channel data, system alarms, date and time and other additional information.

FEATURES

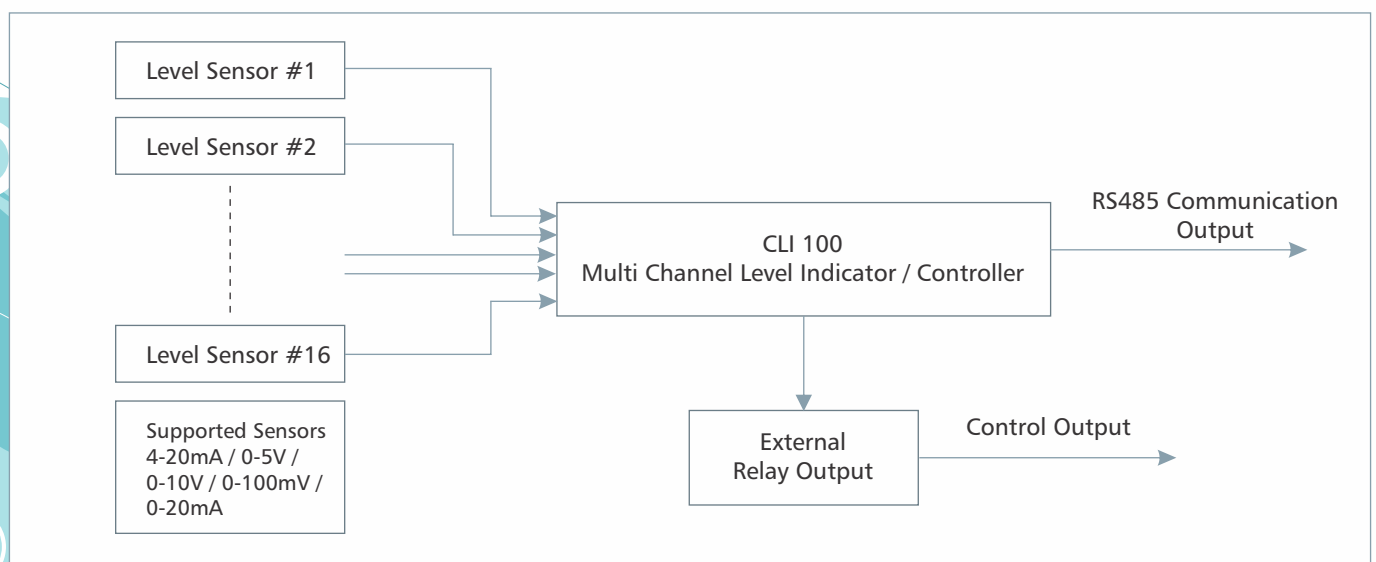
- 4 Digit bright red LED display for channel data and 2 LEDs for channel number
- 16 Character 2 line Backlit LCD
- 8 LEDs for Alarm Indication
- 16 Channel Inputs.
- Inputs from level sensors - 4-20mA ,0-5V, 0-10V
- 24 Bit Accuracy in conversion ensures highest accuracy of readings
- Provision to enter density of liquid while using pressure transmitters
- Internal Temperature Sensor
- 0.1% Accuracy over working temperature range
- Linear / Square root / Lookup table conversion
- Field Programmable parameters
- Non-volatile memory for saving parameters
- 2 Wire / 3 Wire sensors
- 16 Programmable set points
- 8 Relay output
- Programmable relay outputs.
- RS 485/ MODBUS



SPECIFICATIONS

Power Supply	12VDC
Power Consumption	TBD
Parameters Indicated	<ol style="list-style-type: none"> 1. Level information in user programmable units 2. Volume information in user programmable units 3. Alarms corresponding to programmable set-points 4. Alarms corresponding to sensor failure 5. Programmable parameters and settings 6. Periodic storage of data at programmed intervals with time stamp
Indication	4 Digit LEDs to display channel data 2 Digit LEDs to display channel number 16 Char 2 line backlit LCD display 8 LEDs for alarm indication
No. of Channels	16 - configurable from 4 to 16
Signal Type	4-20mA / 0-5V / 0-10V / 0-100mV / 0-20mA
Resolution	24 Bit
Range	User programmable from -30000 to + 30000
Conversion Mode	Linear / Square root / Lookup table
Height Vs Volume	32 entries maximum per channel
Real Time Clock	Built-in
Memory	32KB
Memory Type	Non volatile EEPROM. No power required for backup
Operating Temperature	0-50 °C
Storage Temperature	0-60 °C
Humidity	0-80% Non-condensing
Accuracy	Level: 0.1% of full scale Volume: Depends on scaling and conversion type
Program Variables	Saved in non-volatile EEPROM. Data retention 100 years max.
Programming Method	From keypad provided in the instrument
Housing	Panel Mount
Communication	RS485 / RS232 / USB - Factory configurable only
Relay	8 Channel relay module

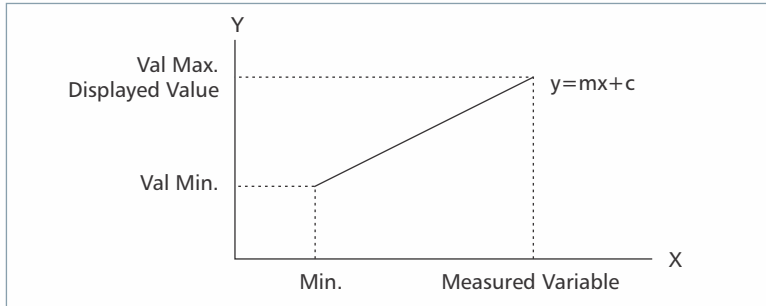
TYPICAL APPLICATION



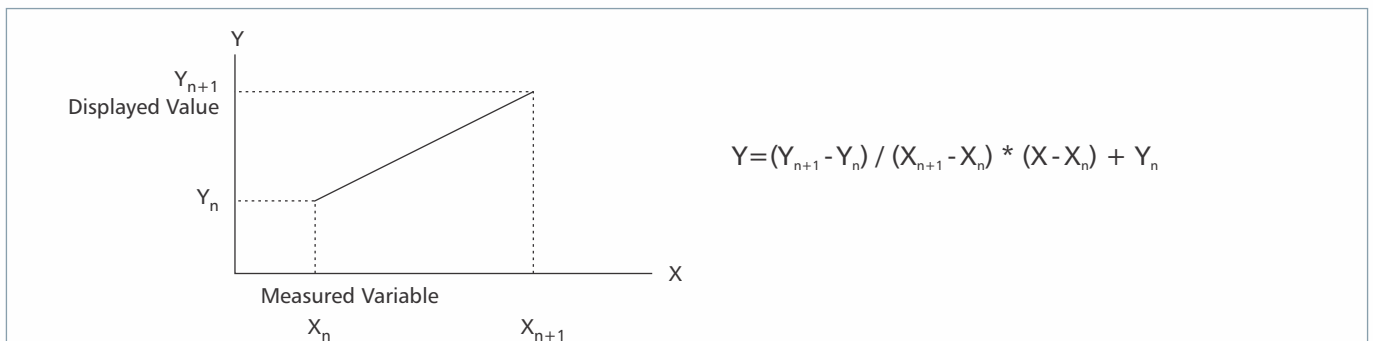
FUNCTIONAL SPECIFICATIONS

CONVERSION METHOD

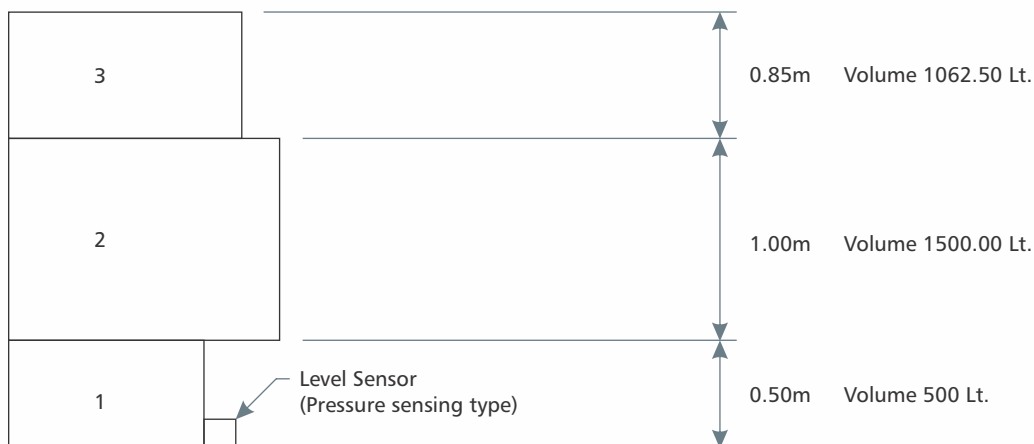
Linear – Linear conversion based between lower and upper Programmed values



Lookuptable Linearization – This is best suitable for non-uniform tanks. Value shown is based on a 16 point lookup table. The values in the lookuptable are field programmable. CLI100 fits a piecewise linear segment between two programmed point in the lookup table.



E.g. Typical Example for non-uniform tank volume calculation See tank shape typical in ships. Tanks are shaped according to availability of space rather than tank uniformity.



The bottom of the tank is marked as 1 which typically has a level to volume ratio of 1cm:10 Litres. The portion marked 2 has a ration of 1cm:15 Litres. The upper portion of the tank marked 3 has a ration of 1cm:12.5 Litres. Level is measured from the bottom of the tank using a pressure sensor.

As you can see now the volume is a function of the level and it is a non-uniform scale.

The following table explains the volume variation in the tank.

User can program a Height/Volume chart inside the CLI100. This information is used to calculate the actual volume of liquid in the tank. The internal chart will be programmed as shown below (Table B).

Table A

Level	Volume
0 < Level < 0.5m	Volume = Level (in cm) * 500
0.5m < Level < 1.5m	Volume = 500 + (Level - 50) * 15
1.5m < Level < 2.35m	Volume = 500 + 1500 + (Level - 200) * 12.5

Table B

Level in cm	Volume in Litres
0	0
50	500
150	2000
235	3062.50

With the above table CLI100 can calculate the actual volume based on the level sensors input. CLI100 uses the piece wise linear calculation to calculate the volume accurately.

This Height Vs Volume chart can be measured and entered for any continuously variable non-uniform tank also. This means that the volume can be measured within reasonable accuracy for continuously variable non-uniform tanks also. A Typical example is a cylindrical tank lying on its side. The volume results will be accurate based on the number of readings of Height Vs Volume in such cases. The table is limited to 32 in CLI100 per channel.

DISPLAY OPTIONS

CLI100 has two display options. They are six 7segment LEDs and one LCD. The 6 digit LEDs are divided into 2 and 4. The top 2 digit LEDs displays the channel number and the 4 digit LEDs at the bottom displays the channel data. This keeps on scrolling at a periodic interval of 3 seconds. This helps the user to get the channel information from a longer distance.

The bottom LCD has three modes. The first mode shows the date and time in the first line and the alarms in the second line. The alarms helps the user to know which channel value is exceeded its set point limits. The second mode shows the channel data – two channels in two lines. The user can make the display to auto scroll the channel information or manually change the channel information. The third mode displays the date and time of the latest alarm event in the first line and alarm in the second line.

In addition the CLI100 incorporated 8 LEDs to display the alarm. If the 1st LED glows it means that there is a error at channel 1 or channel 9. This follows for all the other LEDs respectively. If the LED blink then it means that there is a alarm at both the channel.

RELAY MODULE

CLI100 can be interfaced with 8 channel relay module which operates through RS485 communication in a separate channel. The relay can be activated according to the user programmable set points.

COMMUNICATION OPTIONS

CLI100 can communicate via a multidrop RS485 network as a MODBUS slave. CLI100 supports the MODBUS RTU protocol for data transfer. The Slave ID's can be programmed into the CLI100

Speed	9600 Baud or 19200 Baud
No. of Data Bits / No. of Stop Bits	8 / 1
Parity	Odd
Standards	EIA RS485
Max. Communication Distance	1000m
Communication Method	2 Wire Half Duplex
Protocol	MODBUS RTU



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