

**CTI 7304 ANALOG DISPLAY STATION
INSTALLATION AND OPERATION GUIDE**

**Version 2.1
CTI Part #062-00007**



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PREFACE

This *Installation and Operation Guide* provides installation and operation instructions for the CTI 7304 Analog Display Station. The 7304 Analog Display Station is an analog operator interface that provides two channel monitoring capability to most process control systems. The 7304 is a member of the 7300 series family of products. It allows continuous monitoring of critical loop information. This Installation and Operation Guide introduces the reader to the 7304 characteristics, theory of operation, installation and use.

This *Installation and Operation Guide* is organized as follows:

Chapter 1 provides a general description of the module

Chapter 2 covers operation and displays

Chapter 3 covers module configuration

Chapter 4 covers installation and wiring

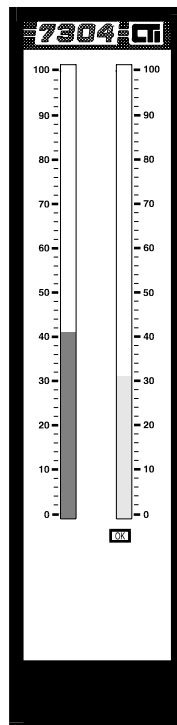


Figure 1 *The 7304 Analog Display Station*

USAGE CONVENTIONS

NOTE:

Notes alert the user to special features or procedures.

CAUTION:

Cautions alert the user to procedures which could damage equipment.

WARNING:

Warnings alert the user to procedures which could damage equipment and endanger the user.

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CHAPTER 1. DESCRIPTION

The 7304 Analog Display Station provides monitoring capability for two independent analog channels. Two bargraphs display the monitored analog signals. One red and one green bargraph permit reading ease from a distance. The 7304 is compatible with any device that outputs an analog signal in the range of 0 to 20 milliamps or 0 to 5 volts. The current or voltage mode, as well as input signal offset, is user selectable. The Display Station's design incorporates a splash-proof front panel with a NEMA 12 rating and a slim-line enclosure that may be panel mounted.

1.1 Front Panel Description

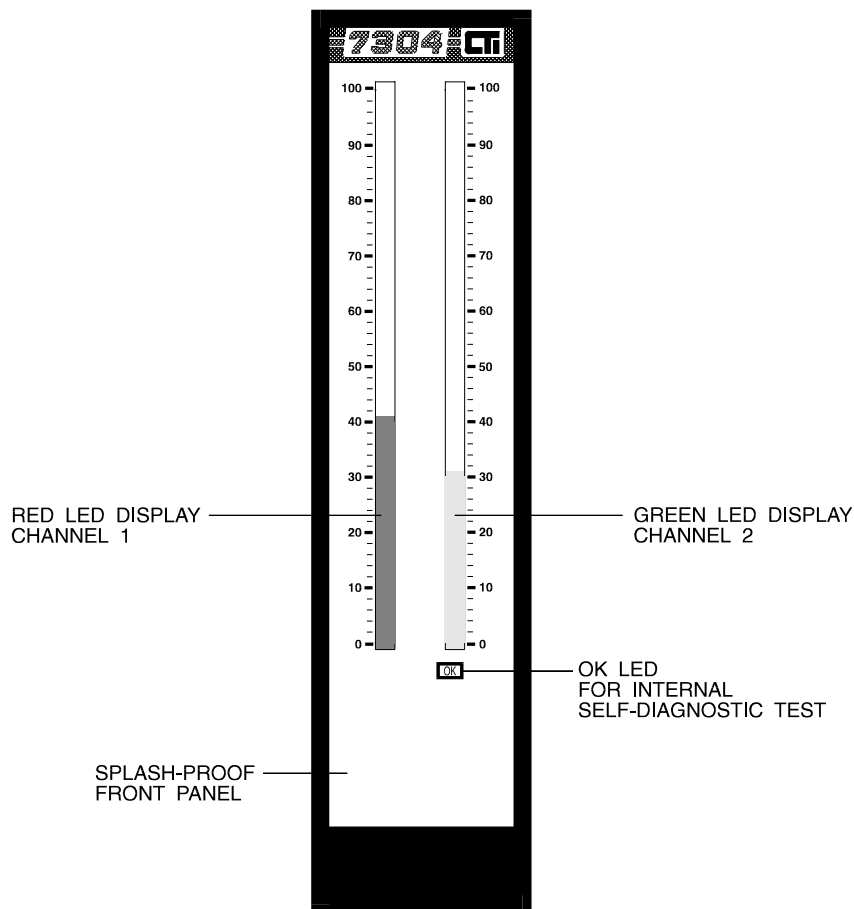


Figure 2 *The 7304 Analog Display Station Front Panel*

CHAPTER 2. OPERATION

The 7304 has no front panel controls and when properly configured and installed requires no operator interaction.

2.1 Displays

The 7304 displays two independent analog signals on 50 segment bargraphs (see Figure 2). The bargraphs indicate 0 to 100 percent of the incoming signals and represents 0 to 20 milliamps or 0 to 5 volts depending on user selection. The current or voltage minimum values may be offset to represent 4 milliamps or 1 volt.

When offset is not selected each segment of the bargraph equals approximately 0.4 milliamps or 0.1 volts. Each segment on the bargraph equals approximately 0.32 milliamps or 0.08 volts when offset is selected.

Both displays may be scaled in various engineering units to fit any application. A sheet of commonly used scales and units on self-sticking Mylar™ is provided with each display station. The scales are to be applied with the major graduations, i.e. 0, 50, 100%, to be corresponding with the center of the LED bars.

An additional LED, the OK light, is lighted when power is applied to the 7304 and the display station satisfactorily completes an internal self-diagnostic test. An unlighted OK LED indicates a power loss. A flashing LED indicates failure of the internal self-diagnostic test. If the OK LED flashes the power should be cycled. If it continues to flash the 7304 should be returned for repair. See Repair Policy, page 15.

CHAPTER 3. CONFIGURATION

User selectable operating features are accessible by removing the side panel. This is accomplished by removing the retaining screw and washer located just below the fuse cap on the rear panel. The side panel may then be moved toward the rear of the unit and removed.

The following configurations may be made with the side panel removed:

- A. Power voltage selection
- B. Current or voltage mode input selection for Channel 1 and Channel 2
- C. Input offset signal selection, 1-5 VDC or 4-20 mA
- D. Reverse acting display

3.1 Voltage Selection

The 7304 operates on 110 VAC at 60 Hz or 220 VAC at 50 Hz. The voltage selection switch is located on the printed circuit board. See Figure 3 for power selection switch location.

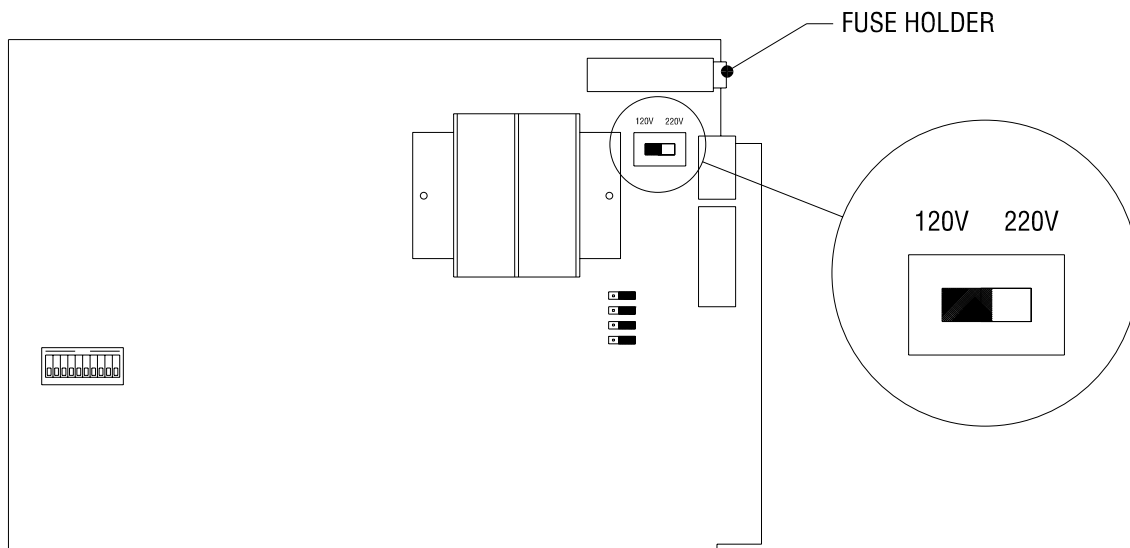


Figure 3 *Power Selection Switch Location*

3.2 Current/Voltage Mode

The current or voltage mode selection is made by jumper plug replacement on the printed circuit board. Jumpers **A** and **B** are associated with channel 1 and jumpers **C** and **D** are associated with channel 2. It is possible to select voltage mode on one channel and current mode on the other. Jumper locations are shown in Figure 4. Jumper plug placement is shown in Figure 5.

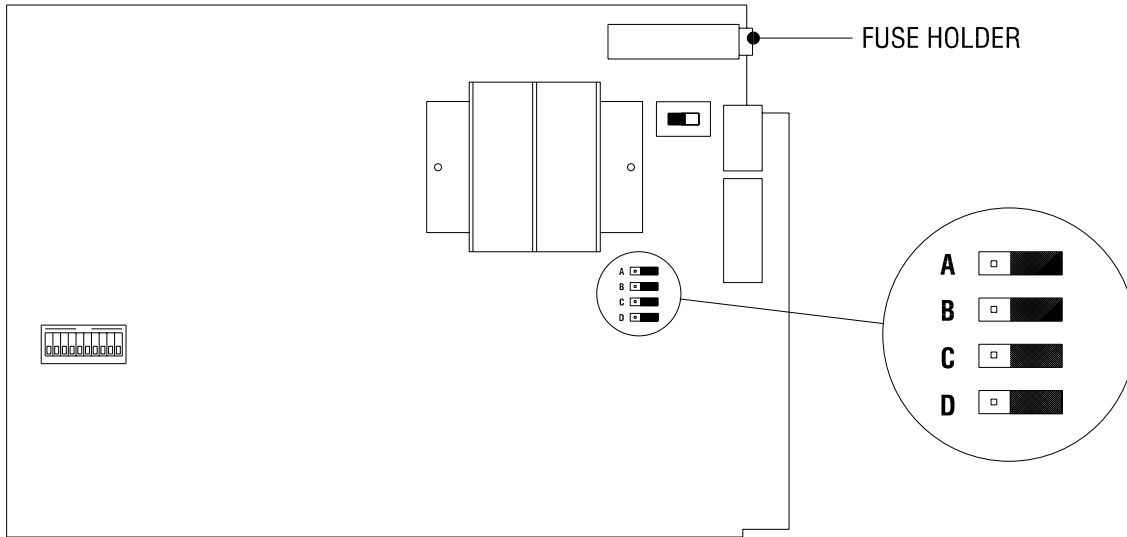


Figure 4 *Jumper Locations*

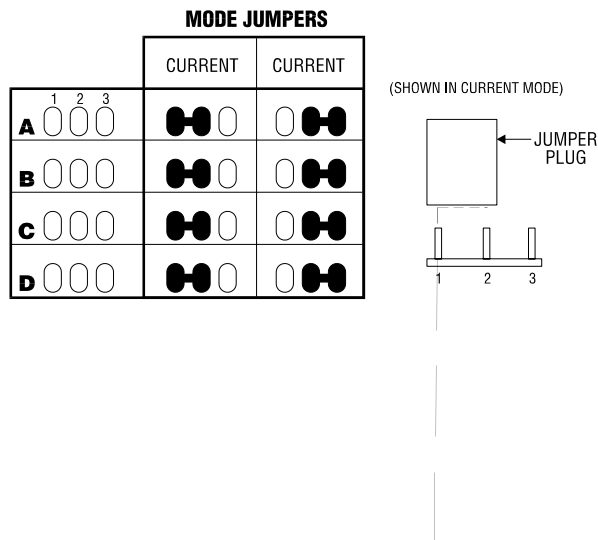


Figure 5 *Jumper Plug Placement*

3.3 Dip Switch Settings

Certain operating features may be selected by the user on the ten position DIP switch located on the printed circuit board. The DIP switch location is shown in Figure 6.

SWITCH	FUNCTION	
1 and 2	NOT USED	
3	ON	Used when the input range is 4 to 20 milliamps or 1 to 5 volts. This switch controls both channels.
	OFF	Used when the input signal range is 0 to 20 milliamps or 0 to 5 volts. This switch controls both channels.
4	ON	Used for a reverse acting channel 1 display, i.e., no bargraph segments lighted represent 20 milliamps or 5 volts.
	OFF	Used for a normal channel 1 display, i.e., all bargraph segments lighted represent 20 milliamp or 5 volts.
5	ON	Used for a reverse acting channel 2 display i.e., no bargraph segments lighted represent 20 milliamps or 5 volts.
	OFF	Used for a normal channel 2 display, i.e., all bargraph segments lighted represent 20 milliamps or 5 volts.
6 through 9	NOT USED	
0	OFF	This switch must be kept on the OFF position.

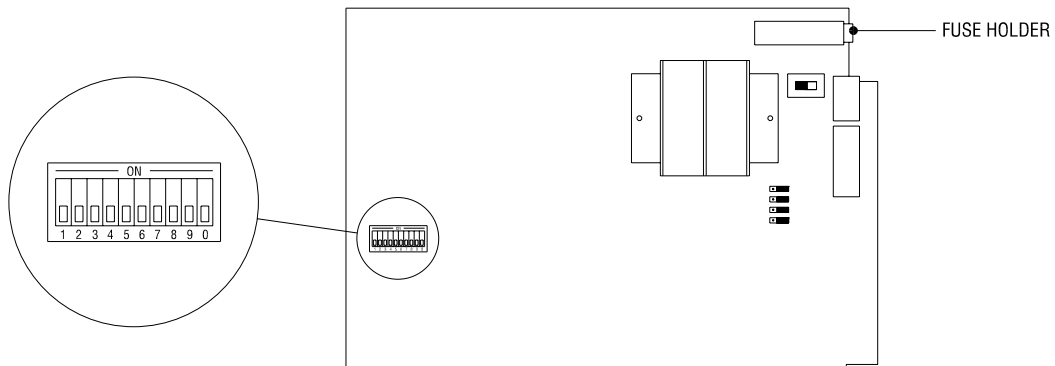


Figure 6 Dip Switch Location

CHAPTER 4. INSTALLATION

The 7304 may be panel mounted. A template is provided for the front panel cutout. Panel mounting is accomplished by sliding bars and retaining screws which are provided with the 7304. A face plate to mounting surface gasket is also provided. See Figure 7 for mounting dimensions.

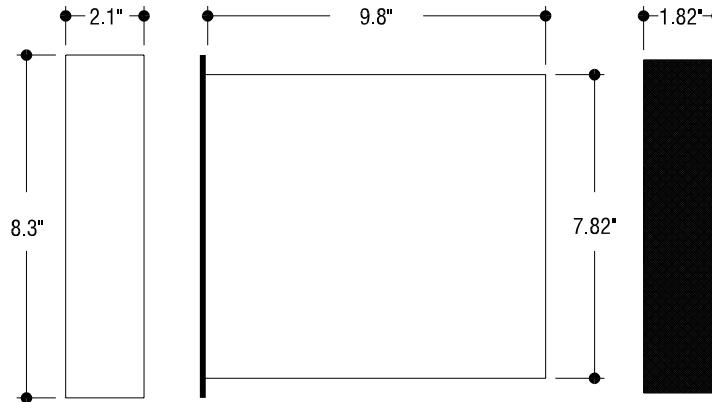


Figure 7 *Mounting Dimensions*

The 7304 uses Phoenix connectors for power and field wiring. The two piece connectors allow removal of power and/or field wiring and are polarized to prevent incorrect placement. See Figure 8 for connector wiring information.

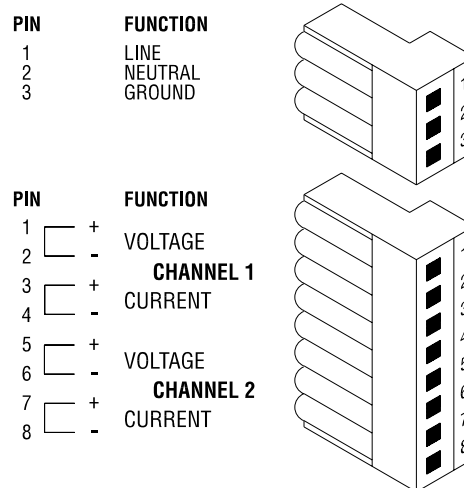


Figure 8 *Power and Field Wiring Connectors*

SPECIFICATIONS

Input

	<u>Current</u>	<u>Voltage</u>
Range	0-20 mA 4-20 mA	0-5 VDC 1-5 VDC
Input Impedance	100 Ohms (max)	500 K Ohms (min)
CMRR (DC)	45 dB (min)	
Maximum Common Mode Voltage		
	<u>Current</u>	<u>Voltage</u>
No Input	25 Volts	25 Volts
Maximum Input	20 Volts	15 Volts
Display Accuracy	2% of Full Scale	2% of Full Scale

Power

Voltage	110 or 220 VAC
Frequency	50 Hz at 220 VAC 60 Hz at 110 VAC
Power	15 Watts (max)

Environmental

Storage Temperature	-40° to 185°F (-40° to 85°C)
Operating Temperature	32° to 140°F (0° to 60°C)
Humidity	5% to 95% R.H. (non-condensing)
Front Panel Rating	NEMA 12

Dimensions - Inches (Centimeters)

Overall (with connectors and mounting rails)	8.45H x 1.8W x 10.8D (21.46H x 4.57W x 27.43D)
Front Panel	8.3H x 2.1W x 0.4D (21.08H x 4.57W x 1.02D)
Envelope (less front panel)	7.8H x 1.8W x 10.4D (19.81H x 4.57W x 26.42D)
Recommended Cutout	7.82H x 1.82W (19.86H x 4.62W)

Weight 4 lbs. (1.8 Kg.)

Specifications subject to change without notice.

LIMITED PRODUCT WARRANTY

CTI warrants that this CTI Industrial Product shall be free from defects in material and workmanship for a period of one (1) year after purchase from CTI or from an authorized CTI Industrial Distributor. This CTI Industrial Product will be newly manufactured from new and/or serviceable used parts which are equal to new in the Product.

Should this CTI Industrial Product fail to be free from defects in material and workmanship at any time during this one (1) year warranty period, CTI will repair or replace (at its option) parts or Products found to be defective and shipped prepaid by the customer to a designated CTI service location along with proof of purchase date and associated serial number. Repair parts and replacement Product furnished under this warranty will be on an exchange basis and will be either reconditioned or new. All exchanged parts or Products become the property of CTI. Should any Product or part returned to CTI hereunder be found by CTI to be without defect, CTI will return such Product or part to the customer.

This warranty does not include repair of damage to a part or the Product resulting from: failure to provide a suitable environment as specified in applicable Product specifications, or damage caused by an accident, disaster, acts of God, neglect, abuse, misuse, transportation, alterations, attachments, accessories, supplies, non-CTI parts, non-CTI repairs or activities, or to any damage whose proximate cause was utilities or utility like services, or faulty installation or maintenance done by someone other than CTI.

Control Technology Inc. reserves the right to make changes to the Product in order to improve reliability, function, or design in the pursuit of providing the best possible Product. CTI assumes no responsibility for indirect or consequential damages resulting from the use or application of this equipment.

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THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

REPAIR POLICY

In the event that the Product should fail during or after the warranty period, a Return Material Authorization (RMA) number can be requested verbally or in writing from CTI main offices. Whether this equipment is in or out of warranty, a Purchase Order number provided to CTI when requesting the RMA number will aid in expediting the repair process. The RMA number that is issued and your Purchase Order number should be referenced on the returning equipment's shipping documentation. Additionally, if under warranty, proof of purchase date and serial number must accompany the returned equipment. The current repair and/or exchange rates can be obtained by contacting CTI's main office at 1-800-537-8398.

When returning any module to CTI, follow proper static control precautions. Keep the module away from polyethylene products, polystyrene products and all other static producing materials. Packing the module in its original conductive bag is the preferred way to control static problems during shipment. **Failure to observe static control precautions may void the warranty.** For additional information on static control precautions, contact CTI's main office at 1-800-537-8398.