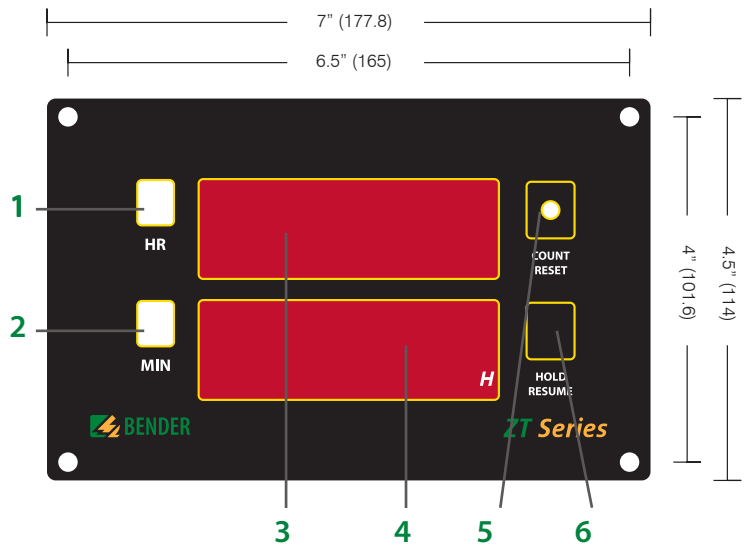
ZT1590 / MK1550

Installation Bulletin / Reference Guide

This document is intended as a reference guide for installing and using a BENDER ZT1590 digital clock and MK1550 clock remote. This document includes installation, setup, and usage instructions for the ZT1590 clock and MK1550 remote.

Only qualified maintenance personnel shall operate or service this equipment. These instructions should not be viewed as sufficient for those who are not otherwise qualified to operate or service this equipment. This document is intended to provide accurate information only. No responsibility is assumed by BENDER for any consequences arising from use of this document.

Front panel and dimensions - ZT1590



1. Hours Pushbutton
2. Minutes Pushbutton
3. Clock Display, Four Digits
4. Elapsed Timer Display, Four Digits
5. Count and Reset Pushbutton
6. Hold and Resume Pushbutton

Figure 1 - ZT1590RS front panel and dimensions

Dimensions - ZT1590RS

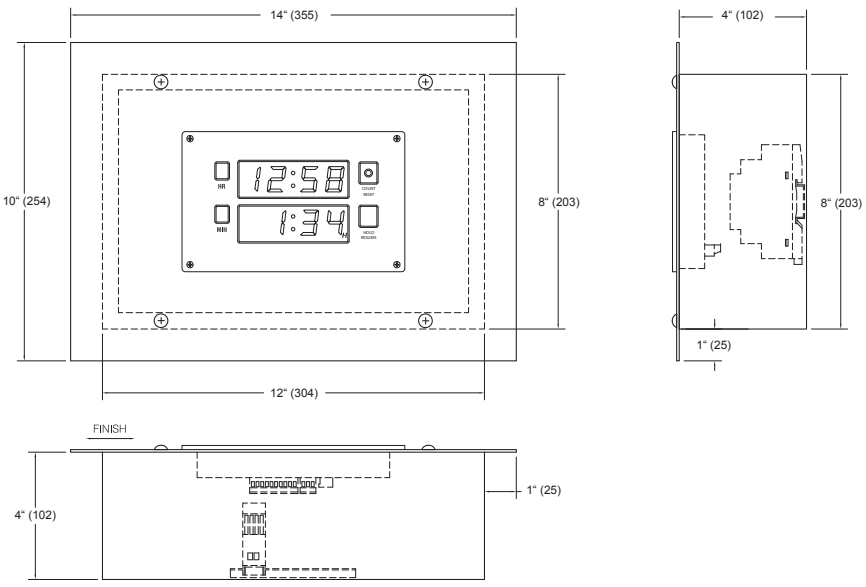


Figure 2 - ZT1590RS front panel and dimensions

Installation - ZT1590

Use this installation section for ZT1590 models NOT purchased pre-wired with backbox and power supply. See section "Installation - ZT1590RS" for installation instructions otherwise.

Mounting

The front plate provides four holes with a diameter of 1/8" (3.2 mm) for screw mounting. Use the provided #4-40 oval head, black oxide finished screws. See figure 1 for dimensions.

DANGER

HAZARD OF ELECTRIC SHOCK OR EXPLOSION

- Disconnect all power before servicing.
- Reference NFPA Bulletin 99 for Installation Standard.

Wiring

The ZT1590 utilizes a 13-pin output that connects to 10-pin connector for the optional remote (Mfgr. Ria, P/N 31114110) and 3-pin connector (Mfgr. Ria, P/N 31114103) for the power supply. Figure 3 shows the connections between the ZT1590 clock and the MK1550 remote, if it is being utilized.

A Class 2 Power Supply rated for 12 VDC and a minimum of 3 VA must be used when connecting to the clock's supply voltage terminals. Wire into the provided plug-in connection terminals. Apply minimum 4 lb-in torque for tightening field wires into the terminal blocks. Use AWG 28 to 16 wires. Plug the connection terminals into the back of the ZT1590. Refer to figure 1 for wiring diagram.

Installation - ZT1590RS

Use this installation section for ZT1590RS models purchased pre-wired in backbox. Otherwise, refer to section "Installation - ZT1590" for instructions.

Mounting

ZT1590RS models are mounted in a backbox with dimensions of 12"W x 8"H x 4"D with 304SS flush-mounted front trim of dimensions 14"W x 10"H. See Figure 2.

DANGER

HAZARD OF ELECTRIC SHOCK OR EXPLOSION

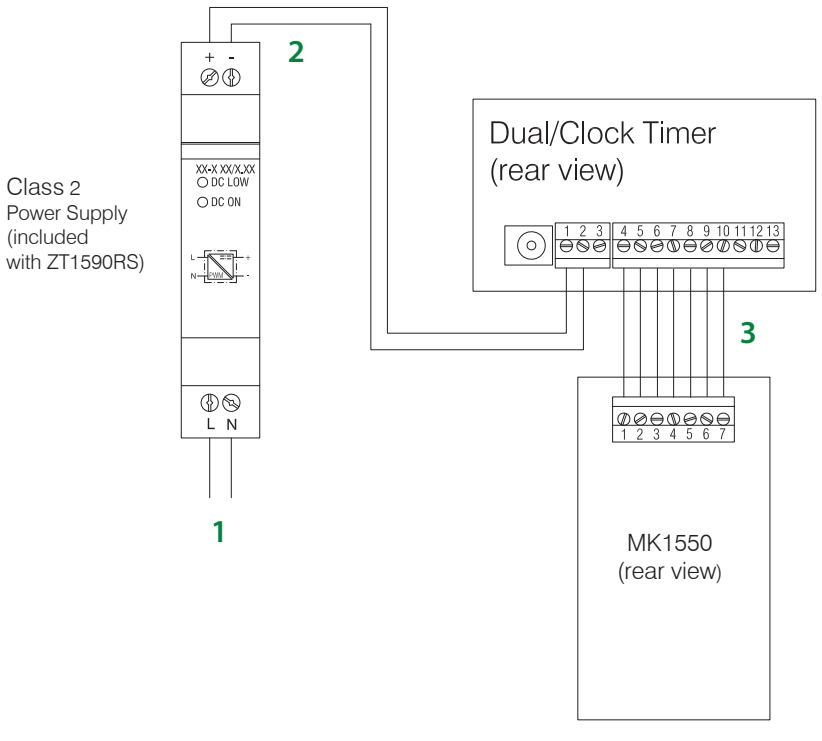
- Disconnect all power before servicing.
- Reference NFPA Bulletin 99 for Installation Standard.

Wiring

Required customer connections are located on a terminal block in the backbox. Connections required include line-side power for the class 2 power supply and connections to the connected MK1550 remote. See section "Installation - MK1550" for more information on connecting the remote.

Wire into the provided terminal block. Apply minimum 4 lb-in torque for tightening field wires into the terminal blocks. Use AWG 24 to 16 wires. See Figure 3 for wiring diagram.

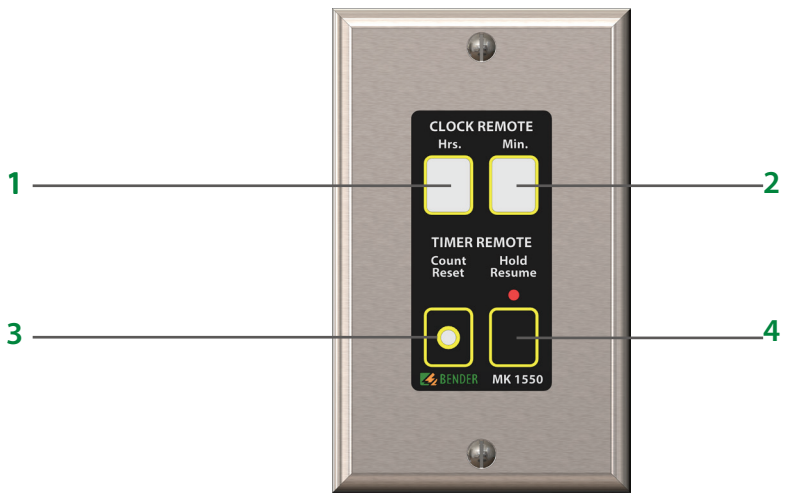
Figure 3: Wiring diagram - ZT1590 and ZT1590RS



1. Customer connections for class 2 power supply: 100-240 VAC. Connection required for both ZT1590 and ZT1590RS.
2. 12 VDC connection from line side of class 2 power supply to clock. This connection is pre-wired with ZT1590RS. A class 2 power supply must be provided and wired with the ZT1590 only.
3. Remote control connections: Required for both ZT1590 and ZT1590RS if remote is being utilized. Refer to reverse side of this document for more information on required remote connections.

Front panel and dimensions - MK1550

The MK1550 uses standard single gang plate dimensions of 2.75" W x 4.5"H (70 x 114 mm).



1. Hours Pushbutton
2. Minutes Pushbutton
3. Count and Reset Pushbutton
4. Hold and Resume Pushbutton

Figure 4 - MK1550 front panel and dimensions

Mounting - MK1550

Refer to figure 5 for mounting installation.

1. Mount remote in enclosure using included #6-32 x 1" stainless steel flathead Phillips machine screw.
2. Attach stainless steel wall plate with included #6-32 x 1/4" stainless steel oval head slotted machine screw.

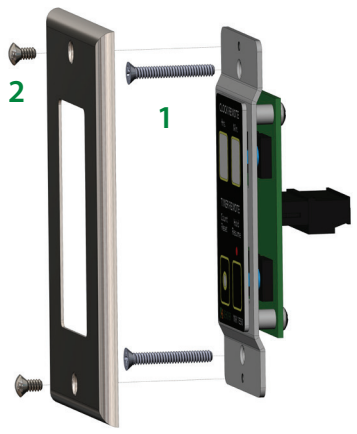


Figure 5 (shiown right) -MK1550 mounting illustration

Wiring - MK1550

The MK1550 utilizes a 7-pin output that connects to a 7-pin connector (Mfgr. Ria, P/N 31114107). Wire into the connector. Apply minimum 4 lb-in torque for tightening field wires into the terminal blocks. Use minimum AWG 24, maximum AWG 16 wires. Plug the connector into the back of the MK1550. Refer to Figure 3 on the reverse side of this document for more information on wiring the MK1550 to the ZT1590 clock.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK OR EXPLOSION

- Disconnect all power before servicing.
- Reference NFPA Bulletin 99 for Installation Standard.

Technical data: MK1550

Operating voltage	5 VDC
Maximum current draw	20 mA
Operating class	continuous operation
Ambient temperature	
Operation	0 - +50 °C
Storage	-10 - +70 °C

Connectors

Number of connections	7
Manufacturer	Ria
Manufacturer part number	31114107
Maximum conductor size	AWG 16

Other / general data

Mounting	#6 -32 oval head machine screws, stainless steel
Weight	< 0.25 lb

Technical data: ZT1590

Supply voltage requirements	Class 2 power supply
Class 2 power supply, voltage rating	12 VDC
Class 2 power supply, power rating	3 VA
Operating temperature	0 - +50 °C
Storage temperature	-10 - +70 °C

Connector

Quantity of connectors	10-pin / 3-pin
Manufacturer	Ria
Manufacturer part numbers	31114110 / 31114103
Conductor sizes	AWG 24 - 16

Other / general data

Mounting	Qty. 4, #4-40 oval head, black oxide finished screws
Weight	< 1.3 lb

Setup, settings, and use

All button functions described may be performed either on the ZT1590 clock or on a connected MK1550 clock remote. The settings below refer to LED designations on the display of the connected ZT1590 clock. Refer to figure 6 for these designations.

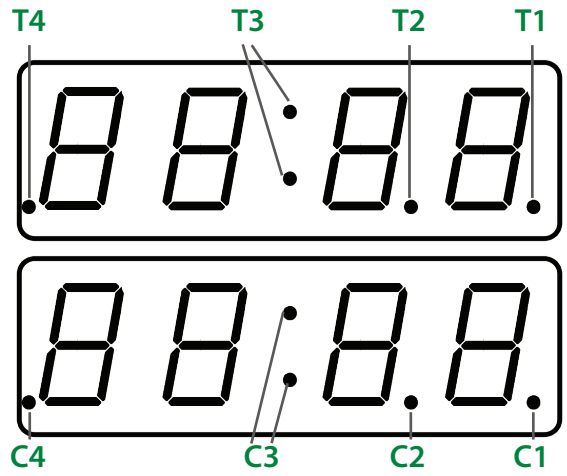


Figure 6 - LED designations for ZT1590 front display

Entering and exiting setup mode

1. Hold MINUTES and HOURS buttons simultaneously for at least 2 seconds. The device will enter setup mode and initially be in "clock time set" mode, with the C4 decimal on.
2. Use the HOLD/RESUME (H/R) and COUNT/RESET (C/R) buttons separately to scroll through the menu options. The HOURS and MINUTES buttons are used to change settings.
3. Once settings are complete, hold MINUTES and HOURS buttons to exit the menu.

Setting clock time

1. The C4 decimal should be on, and the C3, C2, and C1 decimals should be off.
2. Press HOURS button to increment hours, MINUTES button to increment minutes.

NOTE: Setting the clock time will always be in 24 Hour mode.

Setting 12/24 hour mode

1. Press the H/R button to switch to 12/24 hour set mode. The C3 decimal set should be on, and the C4, C2, and C1 decimals should be off.
2. Press HOURS button to toggle between 12 and 24 hour display mode. The AM/PM decimal (T4) should be lit when 12 hour mode is active.

Display selection

1. Press the H/R button to switch to display select mode. The C2 decimal should be on, and the C4, C3, and C1 decimals should be off.
2. Press HOURS button to toggle between three possible settings:
   a. 1 is displayed: Clock and timer enabled
   b. 2 is displayed: Clock enabled, timer disabled
   c. 3 is displayed: Timer enabled, clock disabled

Display brightness

1. Press the H/R button to switch to display intensity adjust mode. The C1 decimal should be on, and the C4, C3, and C2 decimals should be off.
2. Press HOURS button to increase intensity, MINUTES button to decrease intensity.

Functions and operation

All button functions described may be performed either on the ZT1590 clock or on a connected MK1550 clock remote.

Clock display

The top four digit display is a clock that will display the currently set time. It can operate in both 12 and 24 hour time modes. When 12 hour mode is activated, Decimal T4 distinguishes between AM/PM time. When Decimal T4 is active and 12 hour time is active, PM is active. The realtime clock will be active as long as the mode is active in the display selection.

Counter display

The bottom four digit display is an elapsed time counter. The counter is controlled by the COUNT / RESET and HOLD / RESUME buttons. The elapsed time will be displayed during the count and hold modes as long as the mode is active in the display selection.
The counter will count in seconds, displaying minutes and seconds, until it reaches the time of 59:59. Upon rollover, the counter will display 01:00 and will count in minutes, displaying in hours and minutes. Decimal C4 will activate to signify the display is in hours and minutes.

Settings storage

All settings changes are stored in non-volatile memory. Settings will remain if power is lost to the clock.

Power failure / sleep mode

If power is lost to the clock, the realtime clock will be held for up to 24 hours. Upon loss of power, the clock will power down and go into sleep mode. During this time, the display will be shut down. When power is restored, the display will become active and the clock and counter (if active) will resume without loss of time.

Additional technical data: ZT1590RS

Backbox dimensions (H x W x D)	12" x 8" x 4" (305 x 203 x 102 mm)
Weight	< 7.9 lb
Supply voltage U_s	100 - 240 VAC
Frequency range U_s	47 - 63 VAC
Inrush current (115 VAC / 230 VAC)	< 15 A / < 30 A