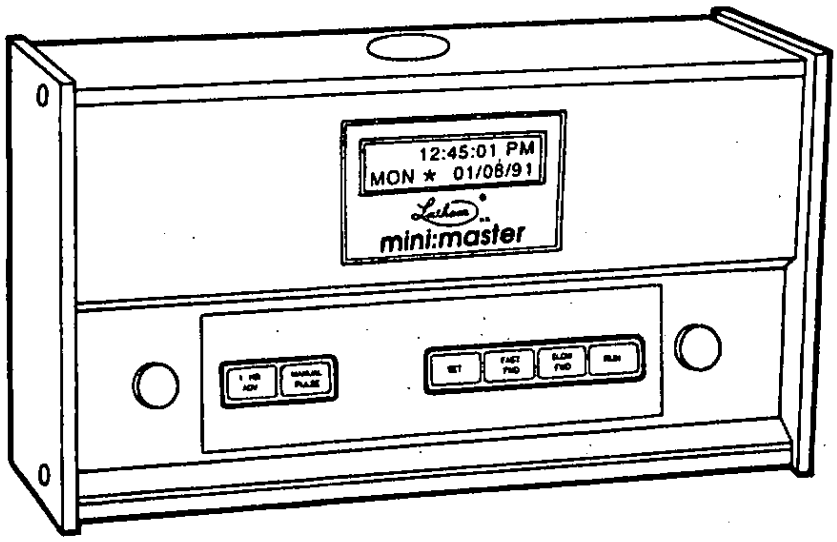
mini:master

Model # LTR Ø



OPERATIONS MANUAL

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SPECIFICATIONS

Input Voltage	115 VAC (220 Optional)
Input Frequency	50/60 Hz, selectable
Input Power	20 Watts Max.
Standby Power	1.2 Ah, 6 V battery
Standby Time	10 days
Timing Accuracy	Same as line frequency
Daylight Savings	Automatic (Disable by dip switch)
Time Display	12 or 24 hr selectable
Comm Ports	RS485 - Transmitter
	RS485 - Receiver
Relays	10 amp Dry Contact (Pluggable)
Temperature Range	0° C to 60° C
Voltage Range	± 10 % of input voltage
Shipping Weight	7 lb. (3.174Kg)
Dimensions	9 3/4" x 3 1/4" x 5 3/8"
	(247.65mm x 82.55mm x 136.53mm)

WARNING: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

INTRODUCTION

The *mini:master* is a master controlling device for secondary clock systems. It can be set up to control a variety of secondary clock types, including Lathem, Dukane, Cincinnati, Stromburg, Simplex and National. The *mini:master* fits easily into your new or existing secondary system.

Special features of the *mini:master* include auto adjustment for Daylight Savings time change and user-programmable security access code.

The liquid crystal display can be set to 12 or 24 hour time format. It shows the time, date, and day of the week, and has indicators for 1-hour advance status, manual pulse activity, and battery backup operation. Use the 6-position keypad to set time and date and to advance secondaries manually.

Timekeeping by the *mini:master* is based on the line frequency of your power source -- each unit can be configured individually to 50 or 60 Hz using an internal dip switch. A 6-volt battery and quartz crystal (for time base) retains time and data for up to 10 days if AC power fails. The battery automatically recharges when AC power resumes.

Wiring to all secondary equipment extends from a terminal block inside the unit.

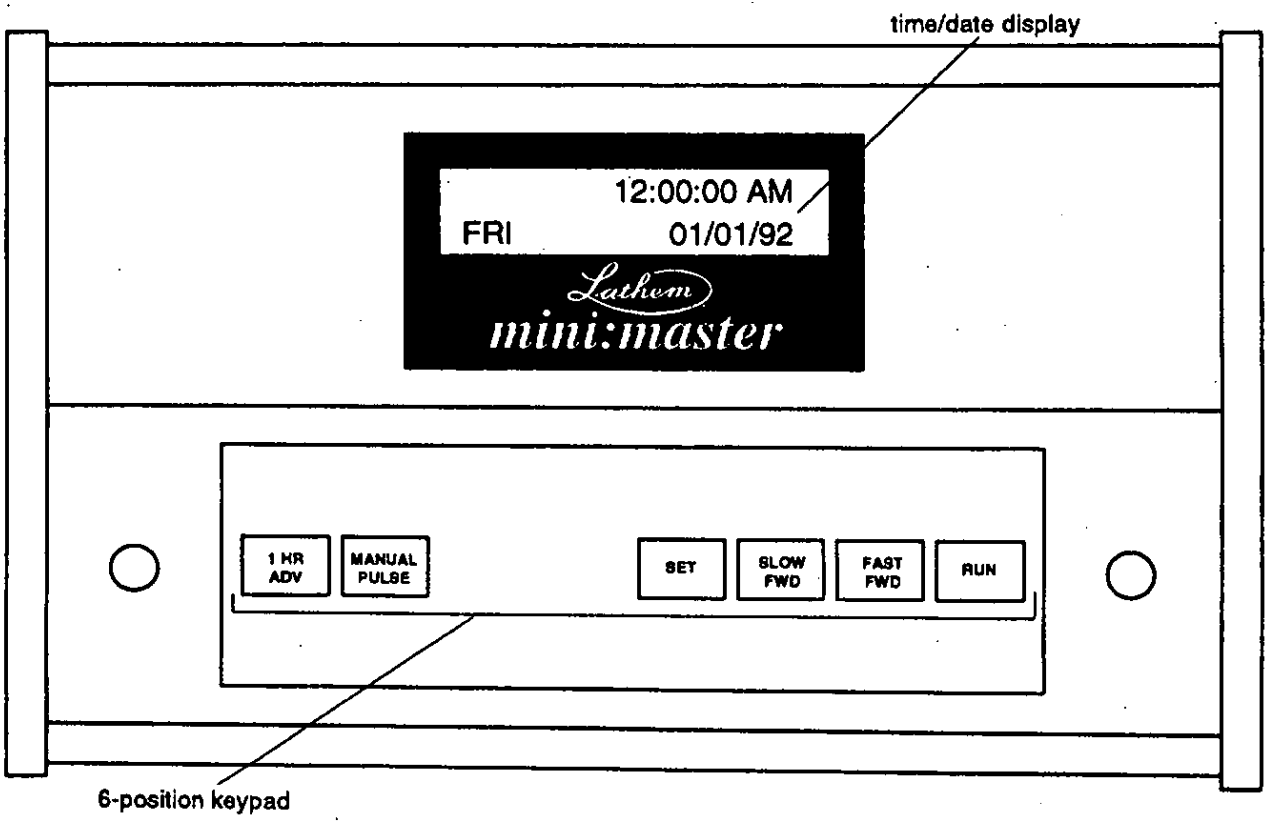


Figure 1 - *mini:master* Front View

INSTALLATION

1) Mount unit on wall. Allow at least 12 inches of space on the left side to provide access and removal of front panel assembly.
2) Remove the two (2) screws that hold the left side panel in place and remove the panel. Slide the front panel assembly to the left.
3) Remove the desired plug on the top, back, or bottom of the unit as needed for wire connections to TB1 for the secondary type used. See appendix for wiring diagrams for each secondary type.
4) Set the dip switch inside the front panel according to your requirements (see table 1):
   (A) Line Frequency - set to 50 to 60 Hz.
   (B) Time Format - set to 12 or 24 hour format.
   Note: This switch is also used for security code and secondary selection. See "Power-up Sequence".
   (C) Auto Daylight Savings - set to enable or disable automatic time change at Daylight Savings Time.
5) Set the power switch located on the power supply board to the UP (ON) position. Slide the front panel assembly back into position. Connect to AC power. Attach the red battery terminal wire to the battery located underneath the front panel (look from the left side underneath the left border of the front panel).

   Note: To turn unit OFF, the battery disconnected, and the power switch must be placed in the DOWN position.

6) Replace the left side panel.
7) Follow instructions for Power-up Sequence and set Time and Date on the following pages.

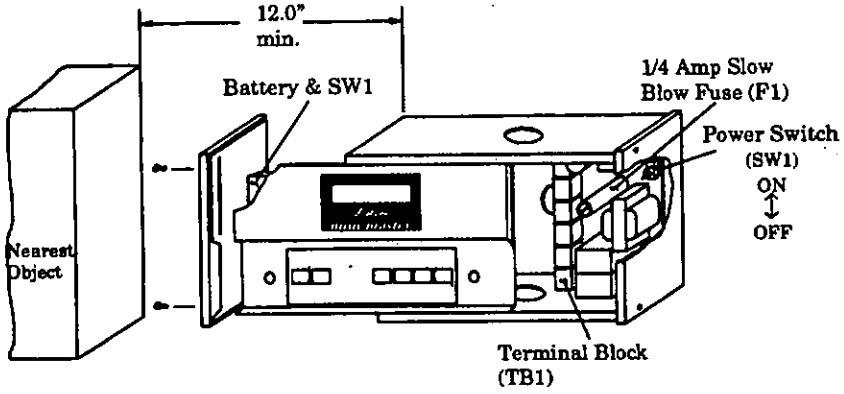


Figure 2 - *mini:master* Exploded View

Switch	Description	ON	OFF
1	Line Frequency	60 Hz	50 Hz
2	Time format	12 Hr	24 Hr
	Security code access and secondary selection		
3	Automatic Daylight Saving Time Change	Enabled	Disabled
4	Not Used	---	---

Table 1 - DIP Switch Settings

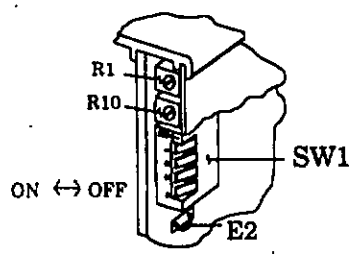


Figure 3 - DIP Switch SW1

POWER UP SEQUENCE

At power up, you are prompted to enter a security code for restricting keypad operations, and to select the secondary clock type you want to control.

1) The unit displays "SECURITY CODE:". Press a seqeunce of 1 - 4 of any keys on the keypad except RUN. This sequence is your security code.

To clear the security code and re-enter, press a fifth key -- the security code on the display disappears.

If no security is required, press RUN with no security code displayed. The unit will advance to secondary selection.

2) With the desired code displayed, press RUN to advance to the next step. The current secondary type displays.
3) Press SLOW FWD to display the desired secondary type. See Appendix for list of secondary types.
4) Press RUN to begin normal operation.

To change or view the security code and the secondary selection:

1) Remove the left side panel.
2) Toggle switch 2 on dip switch SW1 once and return it to the desired time position (12 or 24 hour). The current security code displays.
3) Replace the side panel. To clear the security code, press any key except RUN.
4) Repeat steps 1 - 5 above to enter a new security code or secondary selection, or press RUN to return to time/date display.

SETTING TIME AND DATE

1) Enter the security code if secured. Press RUN. "SELECT FUNCTION" displays.
2) Press SET. "TIME" and the current time displays.
3) Press FAST FWD or SLOW FWD to advance to the correct time. (Seconds are set to zero when either FWD key is pressed.)
4) Press SET to start seconds and advance to the next function, "DAY".
5) Press FAST FWD or SLOW FWD to change the day of the month. (The day of the week is determined based on the date.)
6) Repeat steps above to set MONTH and YEAR. Press RUN at any time during the sequence to save your changes and return to the normal display (in secure mode if a security code is set).

1 HOUR ADVANCE

1) Enter the security code, if used. Press RUN.
2) Press 1 HR ADV to initiate a 1 hour correction for the secondaries. The *mini:master* returns to time/date display, and a carat, "^", indicates the unit is waiting to initiate 1 hour advance.

To cancel 1 hour advance, press RUN with the carat displayed on systems without security code in use. If security is in effect, enter your security code, then press RUN once to cancel 1 hour advance. The time/date displays, with no carat.

MANUAL PULSE (Minute Impulse Secondaries Only)

1) Enter the security code, if used. Press RUN.
2) Press MANUAL PULSE to advance secondaries one minute. "PULSE ON" displays. The display changes to "PULSE OFF" when you release MANUAL PULSE.
3) Press MANUAL PULSE once for each minute to advance.
4) Press RUN to return to time/date display.

BATTERY BACKUP

During an AC power failure, the *mini:master* maintains time for up to 10 days with a 6-volt battery, and uses an internal quartz crystal for the time base. An asterisk, "*", on the display indicates the unit is operating on battery backup. Time and Date can be changed, if necessary, while the unit is on battery backup.

When power is restored:

- If the *mini:master* is connected to synchronous-wired clocks, correction occurs at the next appropriate correction period.
- If the unit is connected to minute impulse clocks, an accumulator in the *mini:master* tracks the duration of the power failure and advances the clocks to the correct time when AC power is restored.

RS485

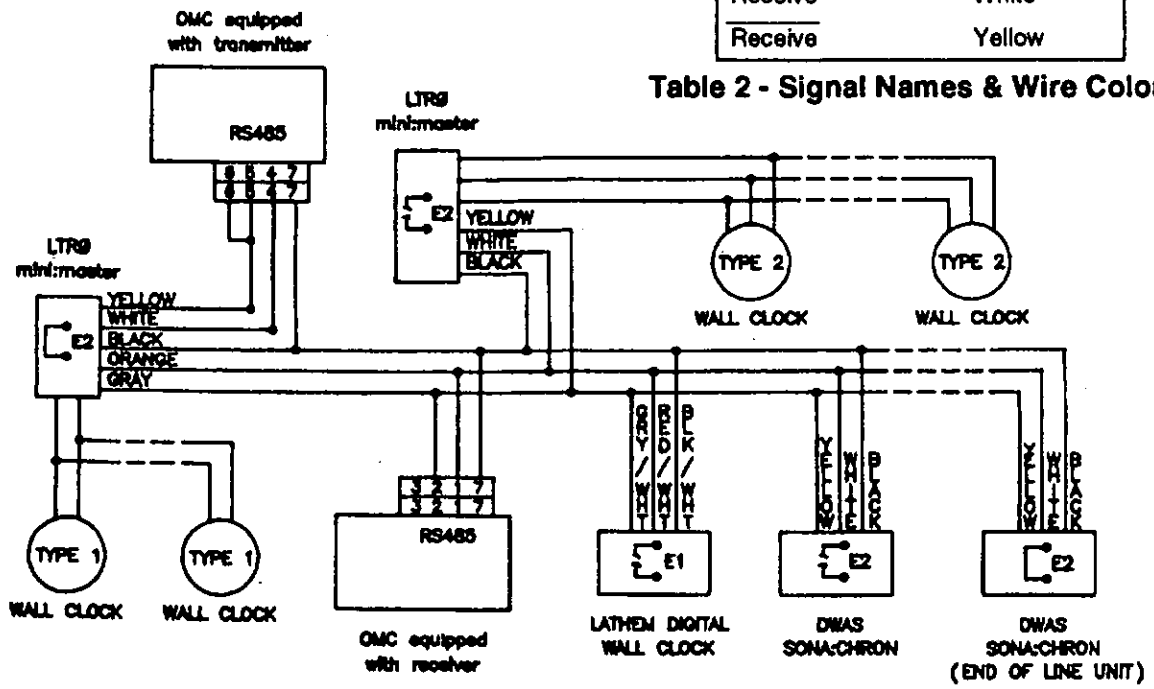
The *mini:master* broadcasts the time and date at the 0 second of every minute. It is equipped with an RS485 transmitter and receiver for synchronizing time and date with other equipment. Five fly leads (2 transmit, 2 receive, 1 ground) are provided on the *mini:master* power supply board for connection to other devices. Table 2 indicates the signal names and corresponding wire colors for the RS485 transmitter and receiver. Note that Signal Ground is shared by the transmitter and receiver.

The cable connecting devices to the *mini:master* should be a minimum of 3 meters (10 feet) long to prevent interference to radio communications as required by FCC regulations. Cables less then 3 meters in length require a Fair-Rite bead (Lathem Part # VII-0058) installed around the cable.

When you install multiple *mini:masters* as receivers, all units EXCEPT the one at the end of the RS485 line require jumper E2 be cut (see Figure 3, page 3). When E2 is intact, a 100 ohm terminating resistor is internally connected across the RS485 line to reduce signal reflection and thereby improve reception. Remove left panel to access E2 on the far left side of the CPU circuit board (see Figure 3, page 3).

SIGNAL	WIRE COLOR
Transmit	Orange
$\overline{\text{Transmit}}$	Grey
Signal Ground	Black
Receive	White
$\overline{\text{Receive}}$	Yellow

Table 2 - Signal Names & Wire Colors



NOTES: 1. IF OMC IS AT END-OF-LINE, JUMPER PINS 3 & 4.
2. IF DWAS IS NOT AT END-OF-LINE, CUT JUMPER E2.
3. IF LTRØ IS NOT AT END-OF-LINE, CUT JUMPER E2.
4. IF DIGITAL WALL CLOCK IS AT END-OF-LINE, SHUNT E1.

Figure 4 - OMC-*mini:master* INTERCONNECTION

APPENDIX

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3-WIRE SYNC (59)
FWD TO CHANGE

This selection is for the following clock types:

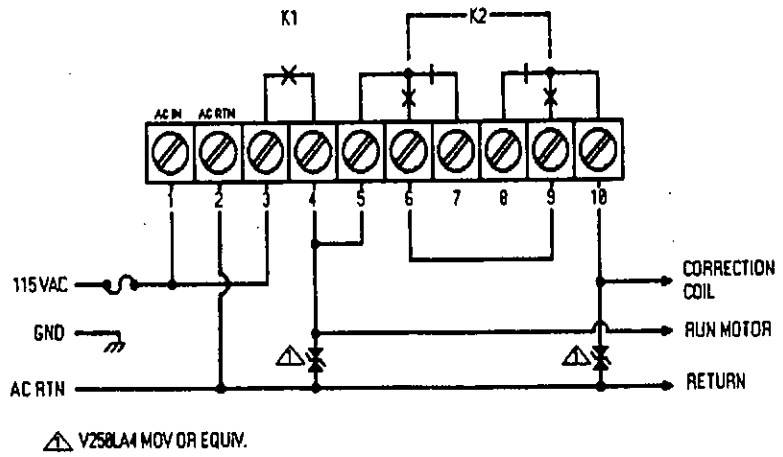
Lathem -Type SS Wall Clocks
Simplex -77 Series, 93-9, 91-9, 941-9, 943-9
Stromberg - 3000
Cincinnati - D10
IBM - 77 Series

CINCINNATI D-8
FWD TO CHANGE

This selection is for the following clock types:

Honeywell - ST402A
Cincinnati - D8
Faraday

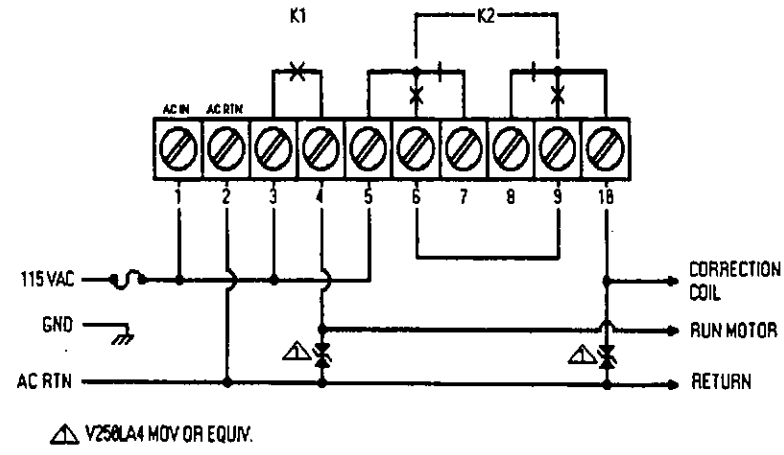
Wiring for these secondary selections:



NATIONAL SYNC.
FWD TO CHANGE

STD. ELEC. SYNC.
FWD TO CHANGE

Wiring for these secondary selections:



Connect ground to grounding stud inside the unit using the green grounding screw provided.

MIN. IMP. (59)
FWD TO CHANGE
3-WIRE

This selection is for the following clock types:

Lathem - Type ISC (3-Wire)
Simplex - 75 Series, 91-4, 93-4, 941-4, 943-4
Cincinnati - D2, D4
Stromberg Impulse
Standard Impulse
Edwards Impulse
Faraday Impulse
IBM - 77 Series

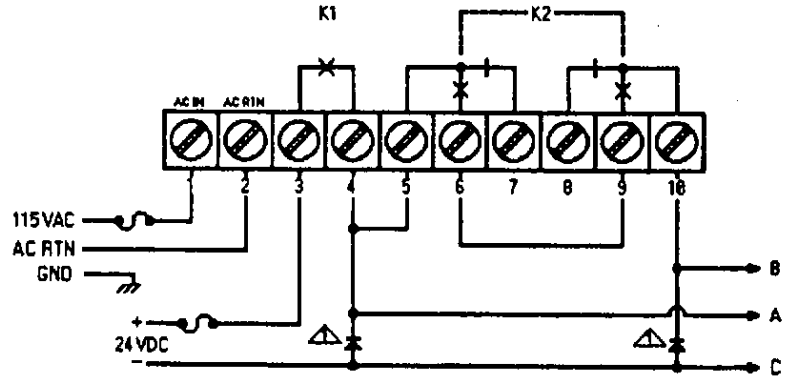
12H MIN. IMP.(59)
FWD TO CHANGE
3-WIRE

This selection is for the following clock type:

Simplex - 91 and 941

MIN. IMP. (58)
FWD TO CHANGE
3-WIRE

Wiring for these secondary selections:



⚠ 1N4884 DIODE OR EQUIV.

MIN. IMP. (59)
FWD TO CHANGE
2-WIRE

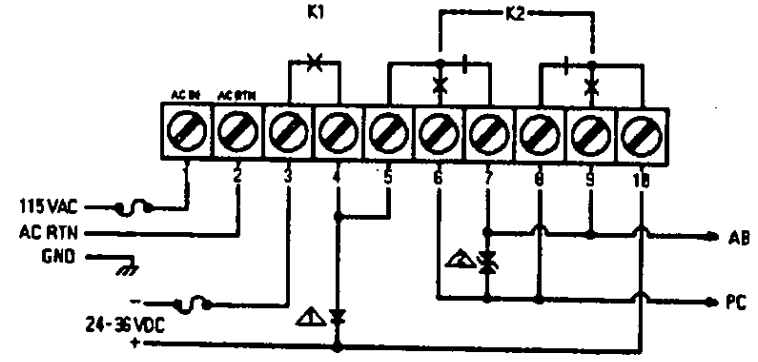
12H MIN. IMP.(59)
FWD TO CHANGE
2-WIRE

MIN. IMP. (58)
FWD TO CHANGE
2-WIRE

CINCINNATI D6
FWD TO CHANGE

PULSE ALTERNATE
FWD TO CHANGE

Wiring for these secondary selections:



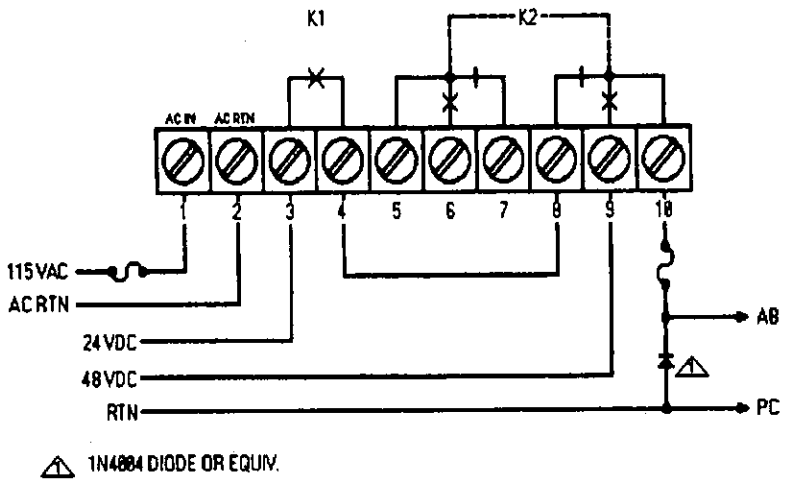
⚠ 1N4884 DIODE OR EQUIV.
⚠ V250LA4 MOV OR EQUIV.

Connect ground to grounding stud inside the unit using the green grounding screw provided.

STD. ELEC. AR-2
FWD TO CHNGE

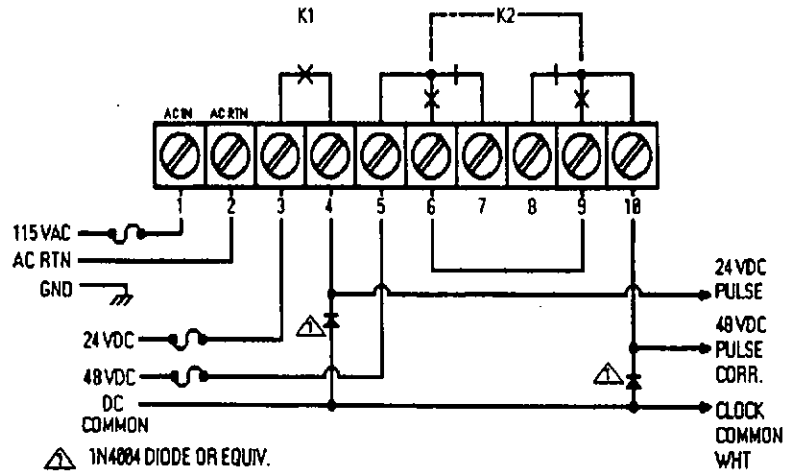
STD. ELEC. AR-2A
FWD TO CHNGE

Wiring for these secondary selections:



STD. ELEC. AR-3
FWD TO CHNGE

Wiring for these secondary selections:

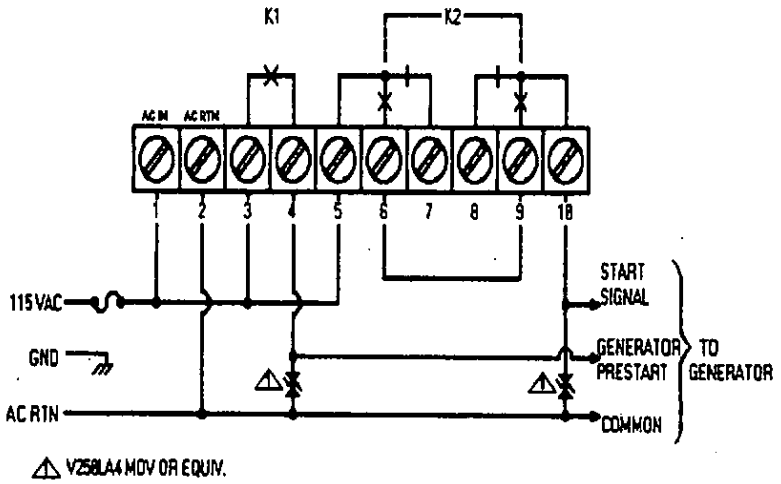


Connect ground to grounding stud inside the unit using the green grounding screw provided.

ELECTRONIC CODED FWD TO CHANGE

STRAIGHT FREQ. FWD TO CHANGE

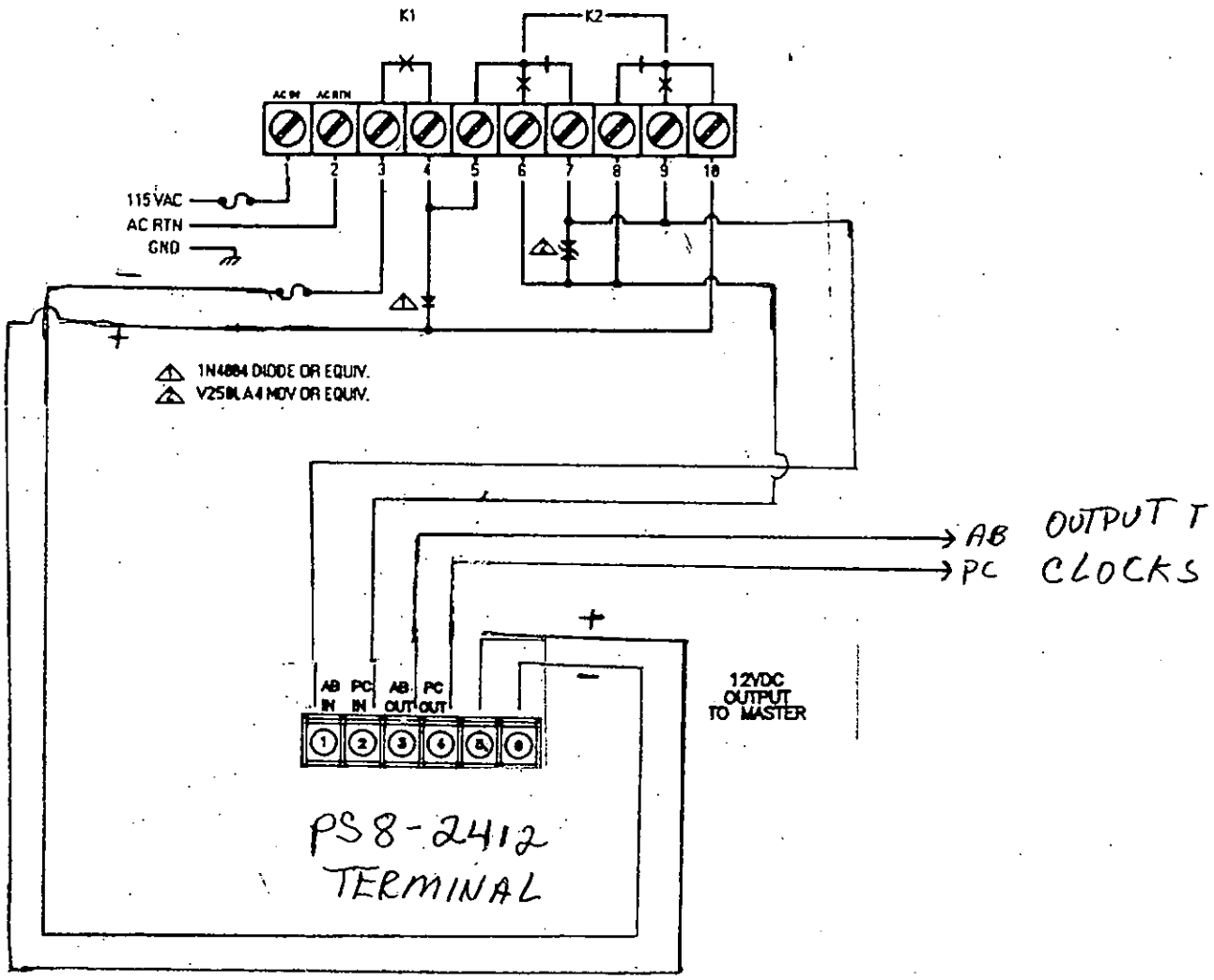
Wiring for these secondary selections:

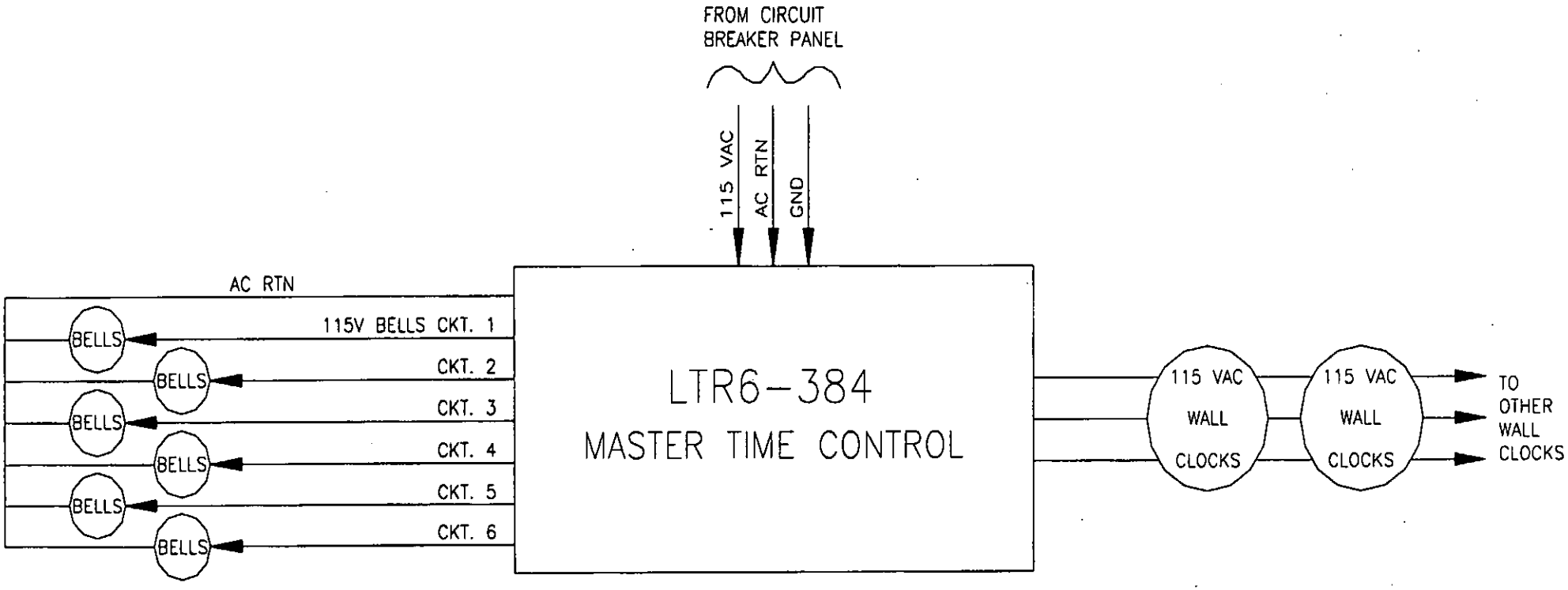


Connect ground to grounding stud inside the unit using the green grounding screw provided.

WIRING FOR 2 WIRE SYSTEMS

LTR-0 TERMINAL





TYPICAL WIRING FOR
LTR6-384 WITH
115 VAC SYNC WIRED
CLOCKS AND BELLS