ETMC/ETMCU Ethernet Time Master Clock

National Time & Signal

Appendix D – Installation Instructions Reference

Model Number	Installation Drawing	Revision
ETMC-2W-WM ETMC-3W-WM ETMC-2W-WM-HV ETMC-3W-WM-HV ETMCU-2W-WM-HV ETMCU-3W-WM-HV ETMCU-2W-WM-HV ETMCU-3W-WM-HV	10957	01/11
ETMC-2W-RM ETMC-3W-RM ETMC-2W-RM-HV ETMC-3W-RM-HV	10932	01/11
ET-RPS6-2W-WM ET-RPS6-3W-WM ET-RPS6-2W-WM-HV ET-RPS6-3W-WM-HV	10955	01/11
ET-RPS6-2W-RM ET-RPS6-3W-RM ET-RPS6-2W-RM-HV ET-RPS6-3W-RM-HV	10951	01/11

Table of Contents

Introduction

The ETMC Series Master Clock is a powerful master clock with the programming ease of a web interface. The secondary clock power supply is built-in simplifying installation. Two 24VAC outputs rated at 3.12A each are power limited which allows installation without conduit in most jurisdictions. (Consult local electrical codes.) Additionally, depending upon the model, two dry contact relay outputs are available to interface to auxiliary devices such as bells, chimes, paging systems etc.

The ETMC provides PC browser based configuration and programming. Without requiring special software to be installed, the programming can be accomplished from any PC on the network with a standard web browser such as Internet Explorer or Firefox. Programming can even be done from a remote location to allow district or city-wide scheduling control.

The ETMC and secondary clocks combine to create a maintenance-free time system automatically synchronizing the clocks with the National Institute of Standards and Technology (NIST) for the most accurate time keeping. Alternately, a local network time server or any PC can be used to keep the clocks and auxiliary events perfectly synchronized with the computer network time. All clocks can be automatically adjusted for daylight savings and power outages.

The ETMC-2W can correct the complete line of National Time & Signal two-wire instant correction clocks such as RDS Series analog clocks and the DLX Series digital clocks.

The ETMC-3W allows the two Clock Circuit outputs to be independently controlled. This allows control of 3-Wire synchronous type clocks which require a RUN output and a RESET output. This leaves only Relay 3 available for auxiliary control.

The ETMCU has the same capabilities as the ETMC Series of Master Clocks with the addition of a user interface. The user interface can display the current time, display the current status of the time server, and provide an alternate method of entering the master clock settings. Auxiliary circuit scheduling will still require access to the web based interface.

Appendix C - Time Zones

When using the NIST time bases such as a LAN time server, NIST website, or a GPS antenna, the ETMCU uses the Universal Coordinated Time (UTC) standard (formerly known as Greenwich Mean Time). To acquire the local time in your area, this time must be adjusted based upon the time zone. The time zone number may be designated either through the WeCAN™ interface or through the ETMCU Tech Menu.

Zone Number	Description
00	UTC (Universal Coordinated Time)
01	UTC -1:00
02	UTC -2:00
03	UTC -3:00
04	UTC -4:00
05	UTC -5:00 (U.S. Eastern Time)
06	UTC -6:00 (U.S. Central Time)
07	UTC -7:00 (U.S. Mountain Time)
08	UTC -8:00 (U.S. Pacific Time)
09	UTC -9:00 (Alaska)
10	UTC -10:00 (Hawaii)
11	UTC -11:00
12	UTC -12:00
13	UTC +1:00
14	UTC +2:00
15	UTC +3:00
16	UTC +4:00
17	UTC +5:00
18	UTC +6:00
19	UTC +7:00
20	UTC +8:00
21	UTC +9:00
22	UTC +10:00
23	UTC +11:00
24	UTC +12:00
25	UTC +13:00
26	UTC -3:30 (Newfoundland)

Appendix B - Clock Types

Secondary Clock Type	Circuit No.	Voltage	Type Code	Wiring Dwg
National Time RD2WS, D/ DX Digital[1]	1,2	24	02	10973
National Time EX(SRAX) Sync. RESET[2]	2	24	03	10974
National Time EX (SRAX) Sync. RUN[2]	1	24	04	10974
Combination EX and RD2WS, D/DX[2]	1	24	02	10974
Simplex 2310-92XX,57, 77,93-9,91-9,941-9,943-9 Series (Low Voltage Only)[3]	2	24	07	10974
IBM 57,62,67,77,82 and 87 Series)[3]	2	24	07	10974
Cincinnati D10 and D12[3]	2	24	07	10974
Lathem SS12 Types[3]	2	24	07	10974
Edwards 010 Synchronous, 2400 Series[3]	2	24	07	10974
Rauland 2460 Series Low Voltage	2	24	03	10974
Dukane 24030,24023,24050,24060,24010[3]	2	24	03	10974
Honeywell St402,403,404,410-413,802-804,810-813 [3]	2	24	08	10974
Faraday 1310,1311,1320,1321 [3]	2	24	08	10974
Cincinnati D8 [3]	2	24	08	10974
Standard/Faraday New Types 2310, 2331[3]	2	24	08	10974
Standard Electric Time 2370, 2380 [3]	2	24	07	10974
ATS CC2000 Series Digital System Clocks[3]	2	24	07	10974
Stromberg 3000[3]	2	24	07	10974
American A4015D10[3]	2	24	07	10974
Combine National RDS/D/DX with any conventional synchronous on same wires. Ckt1 as type 02, Ckt2 as 07,08 etc.	1	24	02	10974
Generic Digital Clock[1]	1,2	24	09	10973

(1)   -2W Series Circuit 1, -3W Series Circuit 1 or Circuit2
(2)   -3W Series Only
(3)   -3W Series Only. Low Voltage Clocks Only. An external 24VAC Relay coil driven by Outputs A & B may be used to convert to 120 Volt control.

Wiring Connections

All wiring connections and connector locations are identified on the appropriate installation instruction drawing for your model. Refer to Appendix D for drawing numbers.

120VAC Power

The ETMCU Master Clock is powered from a standard 120VAC 50/60 Hz power source. A line cord is supplied to simply plug into a standard outlet (-HV version is powered by 230VAC 50/60Hz). This connection supplies the power to run the ETMC as well as power for the 24VAC clock circuit outputs. The connector is located on the back of the Rack Mount version and on the bottom of the Wall Mount.

LAN Connection

The LAN connection is located on the bottom of the Wall Mount version and the front of the Rack Mount version. A Standard RJ45 LAN patch cable is used to connect the ETMC to a network hub, router, or switch. During normal operation, the yellow LED on the connector will be on steady while the green LED will blink when there is network communication.

Clock Circuit Connections

The ETMC(U)-2W provides two (2) outputs that operate in tandem to control National Time instant reset clock series. (For conventional low voltage clock circuit outputs such as 3-wire synchronous, see the ETMC(U)-3W series which allows separate control of the outputs). Each output can drive 3.12 Amps of clocks. The outputs are Power-limited outputs which allow installation without conduit (consult local electrical codes) creating a cost effective installation.

The clock outputs provide power for the clocks as well as transmit time information using National Time's instant correction format. Upon power restoration (or if initiated using the keypad or web interface) time information is transmitted to all of the clocks instantly resetting them to the correct time.

Each output circuit is individually circuit breaker protected for overload events. The circuit breakers are located on the top of the wall mount unit and the front of the rack mount. If for some reason the circuit breakers are ineffective preventing an overcurrent situation, there is fuse protection located beneath the cover plate on the bottom of the unit. **These fuses must be of the GBB Ultra-Fast series**. Remove all power connections before removing the cover or servicing the unit.

Auxiliary Relay Connections

The ETMC(U)-2W also provides two (2) dry contact relay outputs. These relays are "Form A" normally open contacts that can be used to interface with auxiliary devices such as bells, chimes, paging systems etc. Relay outputs numbered 2 and 3 are available for this purpose. (Output 1 is reserved for clock circuit output and controls the 24VAC power outputs). The ETMC(U)-3W only has available Relay 3 for auxiliary control. Event programming is accomplished using the web-based interface common to all National Time web-enabled master clocks. Refer to the WeCAN™ Programming Manual bulletin C-475.

Operation:
Will output a 55 second hour reset pulse each xx:58:05. This circuit will also output 95 second 12-hour reset pulses every other minute between 5:05:00 and 5:21:00.

Manual Control

The circuit programmed for this type can be manually controlled either to OFF (to inhibit all automatic pulses) or to AUTO (normal). The menu is similar to the Type 03 clock type.

09-Digital Clocks

This selection will control digital clocks common to other manufacturers. Refer to Appendix B - Clock Types for specific models.

For National Time D/DX/DU Series digital clocks, refer to Type 02 - On Demand Instant Reset Clocks.

Operation:
This circuit will provide 'RUN' power to clocks.

Each 12:00 midnight, power will be removed for 2 seconds causing clocks to reset to 12:00.

Manual Control

This circuit can be manually turned OFF (which will remove power and inhibit resets) or to AUTO (normal). The manual control menu is similar to the TYPE 02 clock type.

		From the normal time display, Press and release the PROGRAM button.
	 	Choose the Circuit defined as EX Series Run (type 04) by pressing the RIGHT Arrow button. (Usually, Circuit 1 is used for this purpose.) Press ENTER
  	 	The current state of the circuit is displayed. Press the UP Arrow until the desired action is displayed. On: Power is applied to the output (normal). OFF: Will turn off power to the clocks. Then press ENTER.

07-RESET for Synchronous Clocks by others

(-3W Series Only) Program as Circuit 2 if used. This selection will control synchronous clocks common to other manufacturers. Refer to Appendix B - Clock Types for specific models. The circuit programmed as this type will output the reset sequences required for the clocks. The RUN power is supplied by Circuit 1 when programmed as Type 04-National EX Series RUN. Refer to the wiring diagram section for details.

Operation:
Will output an 8 second hour reset pulse each xx:57:54 and a 14 second 12-hour reset pulse each 5:57:54.

Manual Control

The circuit programmed for this type can be manually controlled either to OFF (to inhibit all automatic pulses) or to AUTO (normal). The menu is similar to the Type 03 clock type.

08-Synchronous Clocks by others

(-3W Series Only) Program as Circuit 2 if used. This selection will control synchronous clocks common to other manufacturers. Refer to Appendix B - Clock Types for specific models. The circuit programmed as this type will output the reset sequences required for the clocks. The RUN power is supplied by Circuit 1 when programmed as Type 04-National EX Series RUN. Refer to the wiring diagram section for details.

Front Panel (ETMCU only)

Front Panel
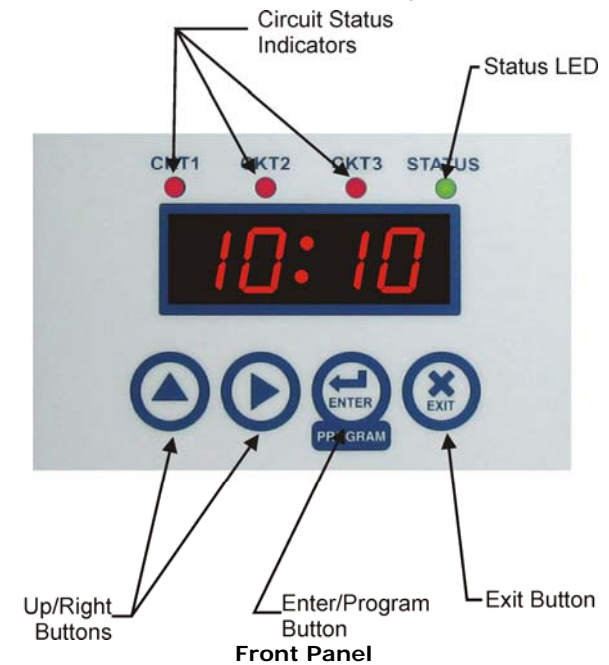
Circuit Indicator LEDs

The circuit indicator LEDs will reflect the status of the respective output. If the circuit is transmitting data or in the process of correcting a clock circuit, the LED will be blinking.

Status LED

The Status LED will indicate the status of the LAN time server.
On Steady: There is LAN or internet time server communication and time on the ETMCU is synchronized.
Blinking: The LAN module is communicating with the ETMCU but there is either no time information available or there is no connection to a network.
OFF: The ETMCU is not configured to use a LAN interface or there is no communication with the LAN module. Check wire connections and that the LAN module is correctly mounted to the ETMCU main board.

Up/Right Buttons

These buttons are used to navigate through the setting menus and to select desired values. The UP arrow can also be used to enter the Manual Auxiliary Control Menu.

Enter/Program Button

This button is used to enter the various program menus of the ETMCU as well as functioning as the Enter button for selecting appropriate values. The Program button will enter 4 levels of menus depending upon how long the button is held. See Programming the ETMCU for details.

Exit Button

This button will return the ETMCU to normal operation at any time. However, any values modified and followed with the Enter button will take effect.

c2:	▶	Choose the Circuit defined as EX Series Reset (type 03) by pressing the RIGHT Arrow button. (Usually, Circuit 2 is used for this purpose.)
	⏎	Press ENTER
Au:to	▲	The current state of the circuit is displayed. Press the UP Arrow until the desired action is displayed.
r5:t		RST: This will activate an Hour reset by turning on for 25 seconds. The clocks will immediately advance to the next hour. (This will not set the clocks to the correct time. This would be used to advance all of the clocks by one hour.)
Au:to		Auto: Will allow automatic resets to be output to the clocks.
OF:F		OFF: Will inhibit resets from being output. (To turn off power to the clocks, the circuit controlling the RUN power is set to OFF.)
	⏎	Then press ENTER. The clocks will reset to the time of day.

04-National Time SRA RUN

(-3W Series Only) Program as Circuit 1 if used. This clock type is used to provide power to a National EX (SRA/SRAX) series clock circuit. This circuit will also provide "drift compensation" to ensure clocks are kept on time as well as daylight savings correction in the fall. If it is desirable to share the circuit with On-Demand clocks, set the RUN output to Type 02 instead.

Operation:
The output will be energized whenever the clock is in the NORMAL timekeeping mode. Drift compensation will turn off the circuit for 1 second each xx:59:00 to keep the clocks behind real time. Daylight savings in the fall will turn off the output for 1 hour at 2am.

Manual Control of National Time (SRA) Run Power

To manually turn off power to the SRAX clock circuit and stop all of the clocks, do the following:

		From the normal time display, Press and release the PROGRAM button.
		Choose the desired Circuit by pressing the RIGHT Arrow button. Press ENTER
		The initial display when the menu is entered reflects the current state of the circuit. (Normally ON is displayed.) Press the UP Arrow until the desired action is displayed. On-D: This will transmit the On-Demand Instant Reset time data to all RDS/D/DX clocks correcting them to the exact time of day. It will then leave the circuit ON. On: Will turn on the power to the circuit. (On-demand clocks will advance to the 12:00 position.) OFF: Will turn off power to the circuit. Then press ENTER. The clocks will reset to the time of day.

03-National Time SRAX RESET

(**-3W Series Only**) Program for Circuit 2 if used. This selection will control the National EX Series (SRAX) synchronous clocks RESET output. The RUN output is individually controlled by a second output programmed as either Type 02 or Type 04.

Operation:
Will output 25 second hour reset pulse each xx:00:00. Will also output 25 minute 12-hour reset pulse each 6:00:00.

Resetting National EX Series Clocks

Reset cycles can be initiated through the WeCAN™ interface from any PC or through the keypad of the ETMCU as follows:

		From the normal time display, Press and release the PROGRAM button.

Connecting to the Network

The ET series master clock will attempt to use DHCP as the default protocol for connecting to your network. Plugging in the network cord and typing http://natscoXXXXXX (where the X's are the last 6 digits of the MAC address found on the label of your ETMC product) in a web browser will bring you to the ET series master clock configuration page. Alternatively, you can type http://natscotimescan[1] to get to the same page [See Figure]. If it does not, your LAN installation may be preventing this method. Consult your IT department and refer to the WeCAN Interface User's Manual. You can find this manual at http://www.natsco.net/sites/default/files/public/wecanhelp/475.pdf. The MAC address block used by the ET series master clocks is 00409D. Informing your IT department of this number will assist them in finding your product quickly on a DHCP table. If you know the IP of your device, you can also navigate to it by typing http://X.X.X.X where X.X.X.X is the IP address.

Changing the Administrative Password

Once connected to the ET series master clock page (see Accessing the ET Series Master Clock):

1) Click on the "Administration" link, and enter the current user name and password when prompted. The default username/password is admin/natsco.

---

[1] This assumes you have only one web enabled National Time product on your network. Web Enabled products include the ET and WeM family of devices.

2) Click on the "Change Password" link.
3) On the page that appears, enter in the old password and type your new password twice. ***Be aware that the password is case-sensitive***.
4) Click "Save Settings" to commit the changes to memory.

Record the password in a secure location. If you forget the password, you will need to reset the unit to its factory defaults. To do this, see the section "Restoring Factory Default Settings" located in the WeCAN Interface User's Manual. (http://www.natsco.net/sites/default/files/public/wecanhelp/475.pdf).

Changing Time Zones

Once connected to the ET series master clock page (see Accessing the ET Series Master Clock):
1) Click on the "Administration" link, and enter your user name and password.
2) Select your time zone from the list of available time zones, then press "Save Settings" to make the update permanent.

Note that the time zone setting also handles daylight savings time corrections.

Changing Time Protocol Settings

Once connected to the ET series master clock:
1) Click on the "Administration" link, and enter your user name and password.
2) Select SNTP or TIME format.

The most common format is SNTP but will depend upon your firewall settings and time server capabilities.

Select the NIST time server, or enter an IP address or domain name for the time server.[2]

The ETMC master clock device can get its time information from either a local time server or a remote time server, such as the NIST atomic clock in Colorado. Depending on your network configuration, one of these options may be more useful than the other. In general, a local time server should be used if one is

---

[2] If you enter a domain name for your time server, you must have a DNS server configured for your device. See "Changing Network Settings" in the WeCAN Interface User's Manual for more information.

		RING will be displayed and the circuit LEDs for each circuit programmed as an auxiliary output will blink. If it is desired to ring all auxiliary outputs, Press (and hold) ENTER for the desired duration. Or, If it is desired to ring an individual output, Press UP Arrow.
		The LED of the first circuit programmed as an auxiliary output will blink. If this is the desired circuit to activate, Press (and hold) ENTER for the required duration. Or, Press the UP Arrow to select the next circuit programmed as auxiliary.
		The LED of the next circuit programmed as an auxiliary output will blink. If this is the desired circuit to activate, Press (and hold) ENTER for the required duration. Or, Press the UP Arrow to select the next circuit programmed as auxiliary.

02-National Time On Demand/ SRAX Run

This is the default selection for Circuit 1 of the ETMC and ETMCU Master Clocks. This selection will provide power and data to Circuit A and B to control National's Instant Reset 2-wire analog or digital clocks as well as the RUN power of EX Series synchronous clocks sharing the same wires. Power to the clocks and time data share the same wires and provide instant resets to the exact time of day.

Operation:
Will provide 'RUN' power to clocks and transmit Instant Reset time data upon power-up, during daylight savings correction and each 12:00am.

Resetting On-Demand Instant Reset Clocks

The On-Demand Instant Reset time data is automatically transmitted following power outages, daylight savings adjustments, and each midnight. If it is desirable to transmit the time data at other times or turn off power to the circuit, follow these steps:

Appendix A - Circuit Types

The type for circuits 1 through 3 can be either configured through the keypad TECH menu or through the WeCAN™ programming interface. For -2W Series, Circuit 1 will control the 24VAC outputs A and B. On -3W Series, Circuit 1 will control Output A and Circuit 2 will control Output B. Therefore, -3W versions only have one Auxiliary Output available (Relay 3). The following section describes the operation of the circuit types.

ETMC-2W and ETMCU-2W:
Circuit 1 controls the 24VAC Outputs A & B in tandem.
Circuit 2 controls Relay 2.
Circuit 3 controls Relay 3.

ETMC-3W and ETMCU-3W:
Circuit 1 controls the 24VAC Output A (Typically RUN).
Circuit 2 controls the 24VAC Output B (Typically RESET).
Circuit 3 controls Relay 3.

00-Disabled

When selected as disabled, the output will be OFF and no automatic resets or scheduled events will be transmitted.

01-Auxiliary

Used when it is desired to activate bells, chimes, tones etc. at scheduled times. This is typically reserved for the Relay outputs, but, it is possible to use the 24VAC output(s) in such a manner.

Manual Control of Auxiliary Circuits

The WeCAN™ web-browser user interface is used for event programming. The output can be activated manually at any time either through the WeCAN™ interface or through the keypad as follows:
To activate circuits programmed as auxiliary:

	From the normal time display, Press and release the UP Arrow button.
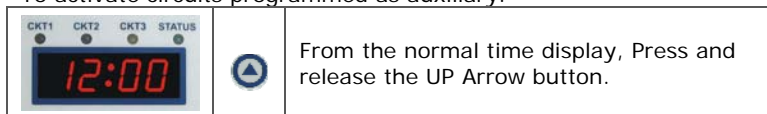
available. If you want to find a local time server, you can click on the "Search for a Time Server" link in the Administration page.

Webpage Circuit Configuration (ETMC or ETMCU)

The circuit configuration is accessed from the ET Series Master Clock web page by clicking on the "Circuits" link. You will then be prompted to enter your user name and password.

-2W Version

Circuit 1 is used to control the clocks connected to Output A and Output B. These outputs operate in tandem. Typically, this circuit is configured as "02-National Time On-Demand / SRAX Run". This will control National Time 2-wire RDS analog clocks as well as DL/DLX/DLU digital clocks. Power and time data will be transmitted over the same pair of wires.
Alternately, use circuit type "09-Digital Clocks" to operate a generic digital clock that will reset to 12:00 when power is interrupted.

Circuits 2 and 3 are used to control the "Relay 2" and "Relay 3" outputs respectively. Configuring these circuits as "Auxiliary" will allow them to be activated via the schedule of events. Events can be scheduled using the Scheduling menu on the ET Series webpage. Configuring as "Disabled" will prevent the Relay(s) from activating.

-3W Version

The -3W versions of the ETMC and ETMCU is used to control conventional 3-wire synchronous clocks manufactured by National Time as well as other manufacturers. The Neutral, Output A, and Output B form a 3-wire synchronous clock circuit.
Circuit 1 is used to control Output A. This output will be used to provide the RUN power to the clocks. For National Time EX Series clocks as well as other manufacturers, (See Appendix A and Appendix B) this circuit is configured as "02-National Time On-Demand / SRAX Run". Not only will this provide the RUN power to any synchronous clock on the circuit, it will also transmit time data to any National Time 2-Wire RDS analog and DL/DLX/DLU digital clocks sharing the same wires. If not using these On-Demand reset clocks on the same wires, select "04-National Time SRA Run".
Circuit 2 is used to control Output B. This output will be used to provide the RESET output to the clocks. For National Time EX Series, configure this circuit as "03 - National Time SRAX Reset". Alternately, circuit types 07 and 08 can be used to reset historical clocks from other manufacturers. See Appendix A and B.

Circuit 3 is used to control "Relay 3". This can be configured as "Disabled" or "Auxiliary" and programmed for scheduled events using the Schedule link on the webpage.

Keypad Configuration (ETMCU)

Circuit and timekeeping settings can be accomplished either from the keypad of the ETMCU or through the WeCAN™ web browser interface from a PC. All scheduling of auxiliary output events, however, must be programmed through the WeCAN™ web browser interface. Refer to the WeCAN™ Programming Manual bulletin C-475. The ETMCU keypad can be used to manually correct the clock circuits as well as manually activate the auxiliary relays.

Programming of the ETMCU through the keypad allows the circuit types and time to be programmed prior to the LAN connection. This often eases the initial commission of the system allowing the clock system wiring and operation to be verified prior to the hand off to the on-site IT department. The final steps of LAN time synchronization and auxiliary programming can then be completed at a later time.

Selecting Menus

The ETMCU has 4 levels of menus that are accessed by pressing and holding the ENTER/PROGRAM button. The duration that the button is held determines which menu is activated. All menus must be accessed from the normal time display. If it is currently in a different menu, press EXIT first.
The menu structure is as follows:

Manual Control Menu

Press PROGRAM once:

The Manual Control Menu is used to initiate a clock reset, turn off the clock circuit(s) or to activate an auxiliary output such as a bell or tone. See the Manual Circuit Control section for details. These functions can also be accomplished through the WeCAN™ web interface.

Display		Description
OF:F	(ENTER)	The OFF selection will turn off the circuit and inhibit any automatic resets. If OFF is desired, press ENTER. Otherwise press UP arrow.
On:	(ENTER)	The ON selection will turn ON the circuit and return the circuit to normal operation. IF ON is desired, press ENTER. Otherwise press UP arrow.
r i:n9	(ENTER)	This selection will allow manual activation of an auxiliary circuit (bells, tones, etc.). The output will activate as long as the ENTER button is held.
On:-d	(ENTER)	The On-Demand Reset selection will turn the output ON and transmit time-data information to the RDS/D/DX clocks resetting them to the actual time. (Depends on circuit type selection.) If this is desired, press ENTER. Otherwise press UP arrow.
Au:to	(ENTER)	The AUTO selection will allow an auxiliary circuit to be controlled by the schedule of the WeCAN™ software.
r5:t	(ENTER)	The RESET selection will allow manual correction of the clock circuit. This will output a reset dependant upon clock type selection. (Not available for all clock types.)
HH:HH	(ENTER)	The XX:XX menu will allow you to enter a time location for certain types of clock circuits. **Not Applicable on ETMC and ETMCU Series**. Press EXIT.

Manual Circuit Control

Manual circuit control is used to override the automatic circuit operation of the ETMC/ETMCU, activate auxiliary circuits, or to manually correct the clocks should they differ from the time as shown on the ETMCU.

Manual override can be accessed using the ET Master Clock webpage (See *Connecting to Network* section) or on the ETMCU can be accessed using the Keypad Display.

Manual Control using Webpage

From the home page of the ET Master Clock webpage, click on the "circuits" link. There will be a "Manual Override" link associated with each circuit to click on.

Select the desired override from the drop down menu. The types of override available will depend upon the circuit definition. For Auxiliary circuit types, there also exists a Quick Access button that will default to the last manual override duration. This is handy for ringing bells or tones on demand.

The Help link on the page will always provide access to the appropriate user's manual for further information.

Manual Control using Keypad (ETMCU)

The options available in the Manual Circuit Control Menu depend upon the circuit type selection. The menu selections and their functions for each circuit type are described in Appendix A - Circuit Types. *There is an alternative method to manually control the auxiliary outputs (bells, tones, etc.). Refer to the Auxiliary Circuit section of Appendix A - Circuit Types.*

To enter the Manual Circuit Control Menu:

Display	Button	Instruction
CKT1 CKT2 CKT3 STATUS — 12:00	PROGRAM	From the normal time display, Press and release the PROGRAM button.
CKT1 CKT2 CKT3 STATUS ● — c 1:	▲ / ENTER	Choose the desired circuit by pressing the UP arrow. When the desired circuit number is displayed, Press ENTER.
CKT1 CKT2 CKT3 STATUS — On:	▲	The current ON or OFF status of the circuit is shown. Choose the desired function by pressing the UP arrow.

Set Time and Date Menu

Press and Hold PROGRAM for 5 seconds:

When pressed and held for at least 5 seconds, the set time/date menu is entered. See the Setting Time and Date section for details.

Tech Menu

Press and Hold PROGRAM for 10 seconds:

When pressed and held for at least 10 seconds, the technician level programming menu is entered. This menu selects installation specific operating parameters of the ETMCU. See the technician level programming section.

Factory Menu

Press and Hold PROGRAM for 15 seconds:

Pressing and holding the button for 15 seconds will enter the factory menu. This menu allows alteration of the memory values to create custom clock reset protocols and are beyond the scope of this manual. Consult the factory for customization since changes to values in this menu may adversely affect clock operation.

CKT1 CKT2 CKT3 STATUS **Yr:06**	▲ ⏎	Select the YEAR using the UP arrow. Press Enter.

Pressing the EXIT button at any time will return to the time display without continuing through all available settings.

Tech Menu

The technician menu is used to configure the output circuits and timekeeping functions of the ETMCU.
These functions would include:
Circuit types for circuits 1, 2, and 3; Daylight Savings (enable/disable); Time Zone selection

CKT1 CKT2 CKT3 STATUS **12:00**	PROGRAM	From the normal time display, Press and hold the PROGRAM button.
CKT1 CKT2 CKT3 STATUS ● (red) **c 1:**	Hold 5sec.	The display will first enter the MANUAL CONTROL Menu; Keep holding until the display changes to the Set Time and Date Menu.
CKT1 CKT2 CKT3 STATUS **10:A**	Hold 5sec. more	The display will enter the SET TIME and DATE MENU; Keep holding until the display changes to the TECH MENU.
CKT1 CKT2 CKT3 STATUS **c 1:02**	▲ ⏎	Select the Clock Type for Circuit 1. See Appendix A for details. Press ENTER.
CKT1 CKT2 CKT3 STATUS **c2:00**	▲ ⏎	Select the Clock Type for Circuits 2 and 3. See Appendix A for details. Press ENTER.
CKT1 CKT2 CKT3 STATUS **dS:E**	▲ ⏎	Enable or Disable DAYLIGHT SAVINGS adjustments by selecting 'E' or 'd' respectively. Press Enter.
CKT1 CKT2 CKT3 STATUS **tn:05**	▲ ⏎	Select TIME ZONE using UP arrow. 05=-5 GMT (Eastern Time). See Appendix C. Press Enter.