

WeM Web Enable Module For the MC100 Master Clock

User's Manual



NATIONAL TIME
& SIGNAL CORPORATION
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WeM-MC100
Internet/LAN Clock System/Auxiliary Control

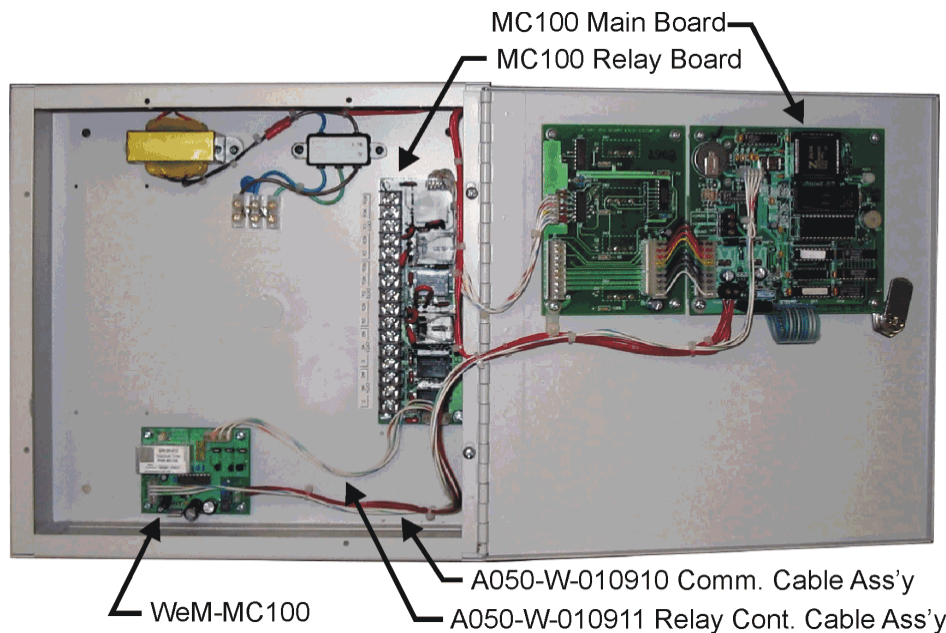
www.natsco.net

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1. Introduction

The WeM Web-Enable module upgrades the MC100 master clock to a web-based interface. This provides an easy-to-use interface to configure auxiliary devices such as bells, chimes, tones, or even clocks; it also ensure that your bells and clocks are precisely synchronized. The WeM operates on any TCP/IP-based Ethernet network, and automatically synchronizes the clock system with any standard NTP or SNTP time server or with the official United States atomic clock time source in Boulder, Colorado. The WeM automatically corrects for daylight savings time and power outages. The WeM can be configured, programmed, and monitored from any PC on the LAN network through a standard browser interface and a dedicated PC is not required during normal operation. The WeM-MC100 module mounts directly into the standard MC100 wall box as shown in the figure.



The WeM-MC100 is connected to the MC100 Main Board with the A050-W-010910 Communications Cable Assembly which provides both power and communication data. The WeM-MC100 controls the relays of the MC100 utilizing the A050-W-010911 Relay Control Cable Assembly which connects directly to the MC100 Relay board as shown. For retrofits and field upgrades, the WeM-MC100 can mount to an adapter plate. Refer to Appendix D for details.

2. Support Information

Installation of the WeM should be straightforward for an information technology professional. However, should some problem arise, please contact National Time & Signal technical support for assistance:

Mail:

National Time and Signal Corporation
28045 Oakland Oaks Ct.
Wixom, MI 48393-3342

Phone:

(248) 380-6264

Fax:

(248) 380-6268

Email:

support@natsco.net

3. Connecting to the Network

Connecting the module to the network should be performed by an IT professional. The WeM is an auto-sensing 10/100 Mbit device, and may be plugged into a standard hub, switch, or router using an RJ-45 twisted-pair Ethernet cable. If a direct connection to a computer is desired, you may connect the module directly to that computer's network card using a standard Ethernet crossover cable.

While the WeM can work on virtually any IP network, there are several factors to keep in mind that will make later steps easier. Firstly, the device should be on the same network segment as the computer that will be used to configure it. Secondly, you should try to ensure that there are not any routers that block NetBIOS packets placed between the device and the computers that will use the web interface. NetBIOS is used to resolve the device name; if NetBIOS is not available, you can still refer to the device using its IP address.

On many networks, the WeM will auto-configure its network address and time server, in which case you do not need to perform any additional configuration. However, to ensure the highest possible clock accuracy, you may want to manually configure the device settings as detailed in the following sections.

4. Assigning a Network Address

To communicate over the network, the WeM needs a network address. By default, the module will attempt to use DHCP, BOOTP, or RARP to automatically find an address¹. If you have DHCP on your network, you may proceed immediately to section 4, because your LAN module will configure itself. BOOTP and RARP users may also proceed to

¹ If all three protocols are enabled, the module will attempt to find an address first using DHCP, followed by BOOTP and then RARP.

the next step, but keep in mind that you may need to change your server's configuration to include the new device.

If your network doesn't support dynamic IP assignment, follow these steps to get your LAN module connected:

- 1) Connect the unit to the network and power up the MC100 (along with the WeM).
- 2) Log onto a computer on the same Ethernet segment as the LAN module.
- 3) In the windows Start->Run dialog, type "cmd"².
- 4) At the command prompt that opens, type:

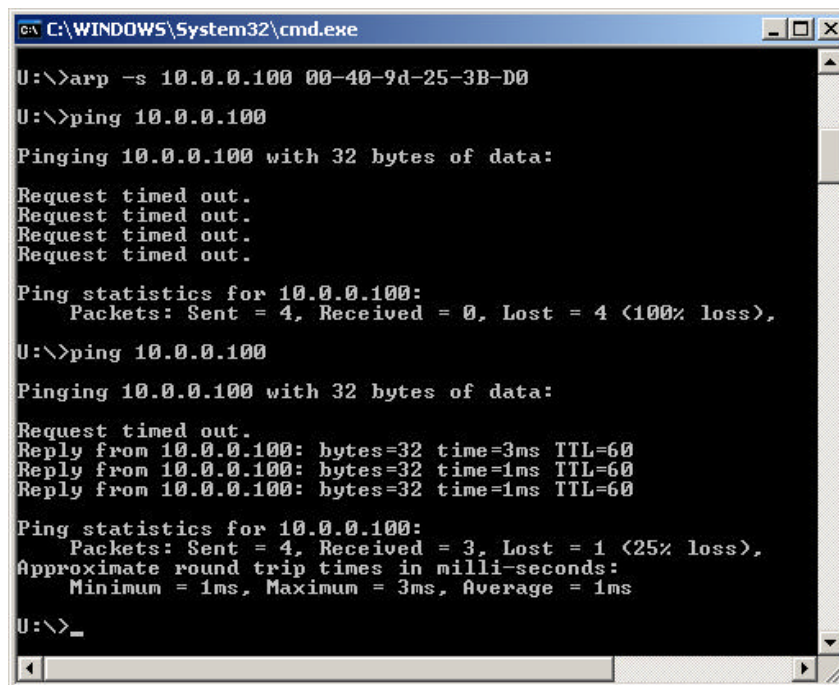
```
arp -s X.X.X.X 00-40-9D-YY-YY-YY <ENTER>
```

where X.X.X.X is the desired IP address and YY-YY-YY is the last six digits of your LAN module's MAC address. The MAC address is printed on a sticker on the module.

- 5) At the command prompt, type:

```
ping X.X.X.X <ENTER>
```

where X.X.X.X is the IP assigned in step (4). Wait a few seconds, and then type the same command. When you start seeing replies to your ping requests, the IP address has been assigned.



```
C:\WINDOWS\System32\cmd.exe
U:\>arp -s 10.0.0.100 00-40-9d-25-3B-D0
U:\>ping 10.0.0.100
Pinging 10.0.0.100 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.0.0.100:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
U:\>ping 10.0.0.100
Pinging 10.0.0.100 with 32 bytes of data:
Request timed out.
Reply from 10.0.0.100: bytes=32 time=3ms TTL=60
Reply from 10.0.0.100: bytes=32 time=1ms TTL=60
Reply from 10.0.0.100: bytes=32 time=1ms TTL=60
Ping statistics for 10.0.0.100:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 1ms
U:\>_
```

² Users of Windows 95, 98, and ME should type "command" instead.

Figure 1: Using Ping-ARP to Assign an IP Address

- 6) In a web browser, type `http://X.X.X.X`, using the same IP as in steps (4) and (5). You should now see the web interface for the device, which will allow you to assign the module a static network address. In most cases, you should set the unit's static IP to be the same as the IP (X.X.X.X) that you used for the preceding ping-ARP procedure. See section "Changing Network Settings" for more information.

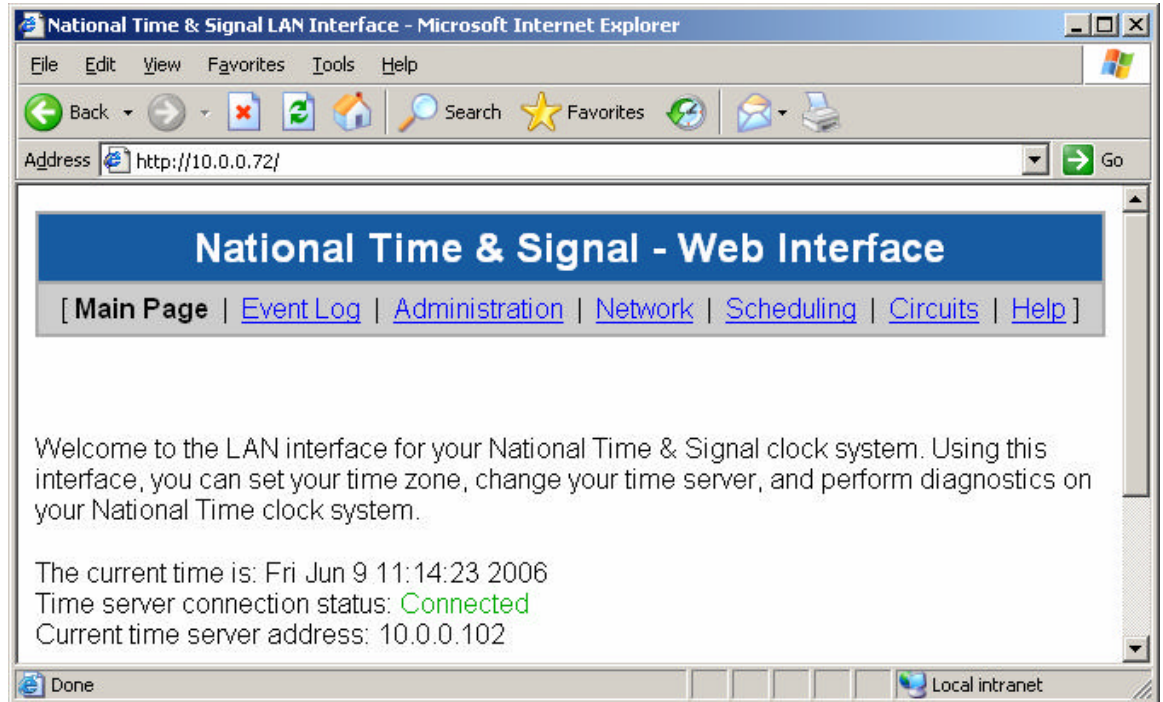


Figure 2: Accessing the Module Using an IP Address

5. Browsing to the Module Configuration Pages

The WeM is configurable via a web interface. In your web browser, go to the page `http://natscoYYYYYY`, where YYYYYY is the last six digits of your device's MAC address. The MAC address is printed on a sticker placed on the LAN module. In the web interface, you can perform several important operations, such as modifying network settings and configuring the time zone and time servers that the device will use.

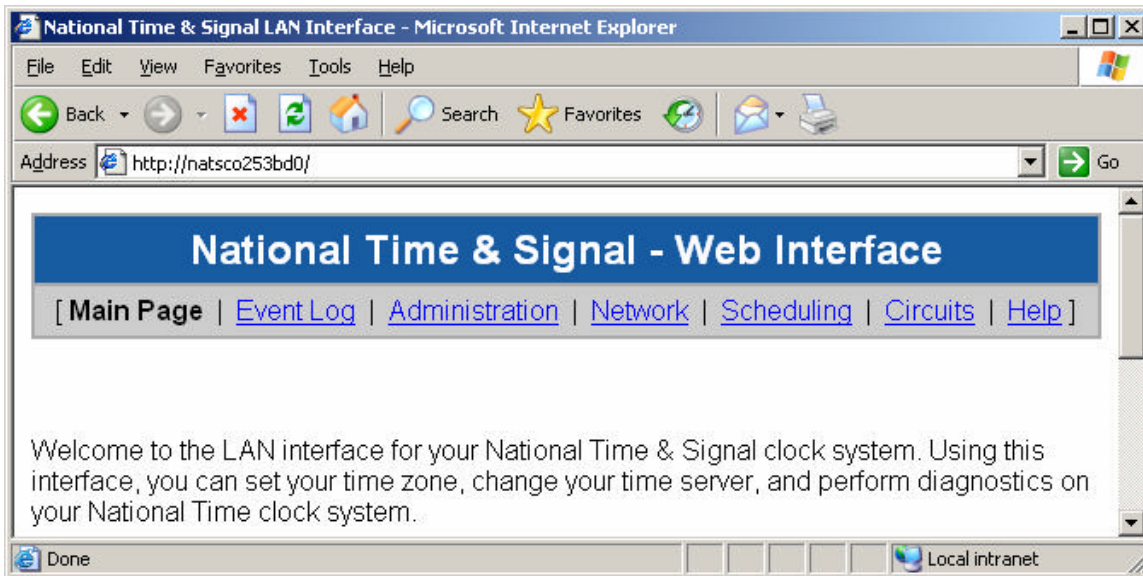


Figure 3: Accessing the Module Configuration

Note that if your unit is configured using AutoIP, RARP, or Ping-ARP, you will need to browse directly to your unit using its IP address. You can do this by typing `http://X.X.X.X`, where X.X.X.X is the IP address of the WeM module.

On the administrative pages, you will use the user name “admin” and the default password “natsco” to gain access to the system. Once you are logged in, you will see your user name and a “Log Off” link in the upper-right hand corner of the page. You have exclusive access to the password-protected pages until you log off. Logging off causes the changes you made to the bell schedule and circuit configuration to be permanently saved to the device’s memory. After five minutes of inactivity, you will be automatically logged off of the system and your changes will be saved.

6. Changing Network Settings

The network configuration settings on the WeM module are similar to the ones that you would find on a standard PC. Before making any changes to the network configuration, consult with your IT manager to make sure that the settings you choose will be compatible with your network.

- 1) Click on the “Network Configuration” link, and enter the current user name and password.
- 2) For most networks, you should keep the default setting, which is to use automatic address configuration. However, if you desire a static network configuration, uncheck the “Use Automatic Settings” box and enter the IP, subnet, and gateway information for your device.
- 3) Enter the hostname of your device. This is a single word with no punctuation or spaces that is less than 16 characters long. On a Windows machine, you

will be able to browse to the web site `http://HOSTNAME` to access your device.³

- 4) Click “Save Settings” and wait for a few seconds. Your device is now configured to use the settings you specified. Click the “restart module” link to restart the LAN module with the new settings.

You can also access the “Advanced Network Settings” page from the network configuration page. The advanced settings are used to pick which automatic address protocols should be used. These settings should only be changed as directed by a network administrator.

³ To access your device in this way, you must have an operating system such as Windows 95 or later that supports NetBIOS. In addition, you must be on the same network segment as the WeM-MC100 module.

7. Changing the Administrative Password

To ensure the security of your LAN module, you should always change the password from the factory default setting to a secure new password of your choosing.

- 1) Click on the “Administration” link, and enter the current user name and password when prompted. The default username/password is admin/natsco.
- 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.
- 5) 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”.

The WeM also comes with a Tech user account for use by National Time service technicians. We do not publish the password for that account, but you may still change the password on the account to something private if you wish.

8. Changing Time Zones

To have the clocks display the correct time, you will need to configure time zone information. To change the time zone:

- 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.

9. Changing Time Protocol Settings

To change the time protocol and the time server, follow these steps:

- 1) Click on the “Administration” link, and enter your user name and password.
- 2) Select SNTP or TIME format.
- 3) Select the NIST time server, or enter an IP address or domain name for the time server.⁴

The WeM 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

⁴ If you enter a domain name for your time server, you must have a DNS server configured for your device. See “Changing Network Settings” for more information.

configuration, one of these options may be more useful than the other. In general, a local time server should be used if one is 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.

10. Circuit Configuration

Combining the features of the WeM and the MC100 creates a very powerful and versatile Master Clock system. The MC100 provides the clock circuit control which supports over 25 clock types of National as well as clocks of other manufacturers. Circuit 1 of the MC100 should be setup for the appropriate clock type through the MC100 SETUP/CKT Menu. Circuits 2, 3, and 4 should be setup for ‘Auxiliary’. Refer to the MC100 User’s Manual for details.

The WeM provides web browser-based user programming of auxiliary circuits 2, 3 and 4 on the MC100 relay board while still allowing manual relay control using the slide switches on the MC100.

When combined in this manner, the web-based schedules of the WeM and the REG, ALT, and HOL schedules of the MC100 operate independently of each other. The MC100 schedules cannot be viewed or modified through the web interface and vice versa. If scheduled events exist for circuits 0, 2, 3, or 4 in the MC100 schedules, the circuits will still activate per that schedule. To avoid confusion, these program events should be deleted and programming should be accomplished using the WeM web-based interface from any PC on the network. See Section 10 for details.

There is no Circuit 1 on the WeM-MC100 web interface since Circuit 1 of the MC100 is reserved as a clock circuit and will be controlled by the MC100 only.

If two clock circuits are desired, the WeM-MC100 control of Circuit 2 can be disabled by moving the CIRCUIT CONTROL OUTA jumper to the OFF position. See Figure 4. Circuit 2 can then be setup to the appropriate clock type in the MC100 SETUP/CKT menu. The OUTA jumper will enable/disable web control of Circuit 2 on the MC100. Jumpers OUTB and OUTC will enable/disable web control of Circuits 3 and 4 respectively.

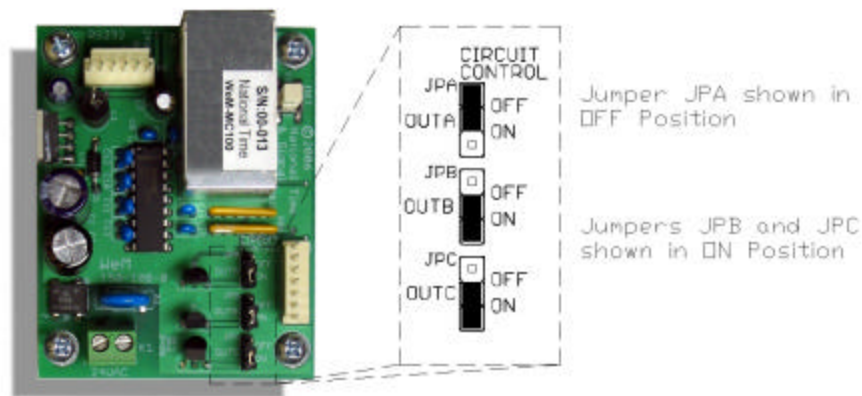


Figure 4: WeM-MC100 Jumper Settings

The auxiliary relay outputs may be manually activated by sliding the desired circuit switch to the ON position. The switch is spring-loaded and will return to the AUTO position when released.

The AUTO position will allow the circuit to be activated by either the MC100 scheduled events or the WeM scheduled events.

The OFF position will inhibit only the MC100 scheduled events. Any events programmed using the WeM interface will still activate the relay outputs. To disable these events, the circuit can be turned off using the web interface. See Section 9.

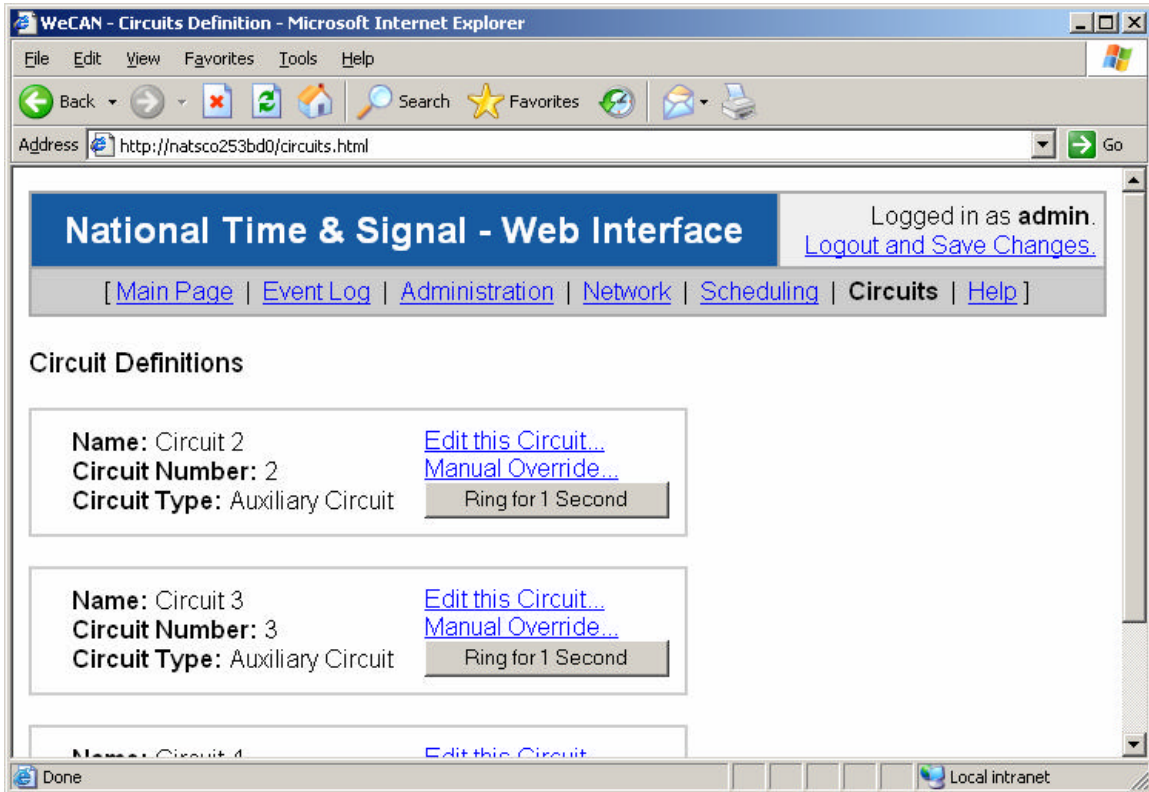


Figure 5: Circuits Configuration

If you need to manually activate or deactivate a bell or some other device through the browser interface, you can use the “Manual Override” function. On the circuits page, click on the “Manual Override” link for the circuit you want to override. Then you can set the override status to “Override Disabled”, “Override to On”, or “Override to Off”. The “Override Disabled” option is normal, and allows the scheduler or clock driver to control the circuit. “Override to On” and “Override to Off” bypass the scheduler and clock driver and force the circuit to be either ON or OFF. Manual overrides are reset if the unit is rebooted or loses power. To permanently turn a circuit on, set the circuit type to “Generic Run Circuit (Always On)”. To make a circuit permanently off, set the type to “Undefined (Always Off)”.

You can also ring an auxiliary circuit by pressing the “Ring for X Seconds” button next to the circuit description. The duration of the ring is determined by the length of the last manual override done on that circuit. Also keep in mind that the bells can also be rung with the switches on the front of the MC100.

11. Scheduling Events

With the WeM's scheduling features, you can schedule events for auxiliary circuits. This allows you to ring bells, activate signals, or run lights throughout the course of a day. The WeM can hold up to 3000 events and up to 20 schedules, and two schedules may be running at the same time. Each schedule can hold up to 500 events, with an option to run certain events only on a particular day or days of the week. *Please Note: Your web browser must have JavaScript enabled in order for the web interface to function correctly.*

To access the scheduler, go to the "Scheduling" tab on the top bar of the web interface. It uses the same "admin" account and password as the rest of the web interface. Once you are logged in, you will have new tabs presented to you: "Current Schedule A", "Current Schedule B", and "Edit Schedules". The "Current Schedule" tabs allow you to view the currently running schedules. There can be two concurrently running schedules at any given time. For example, you might have one schedule controlling lights and the other bells, or perhaps one would be controlling upper school bells while the other controls middle school bells. Both current schedules can control the same bell circuits, so it is possible for a circuit to be activated by an event in either schedule. The "Set the Current Schedule" link allows you to switch the running schedule to a different schedule – for example, to change to an assembly day or holiday schedule. The "Edit this Schedule" link allows you to edit the currently active schedule.

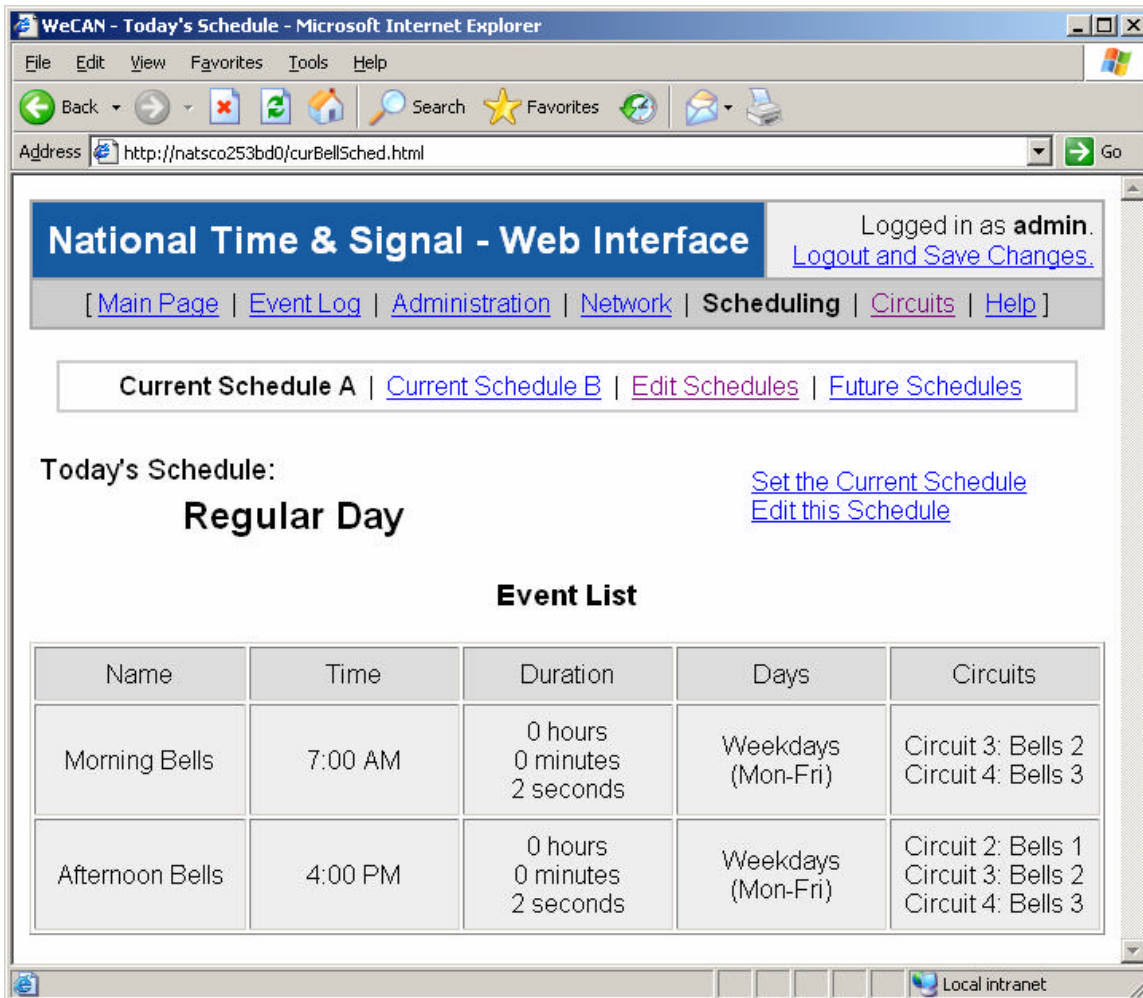


Figure 6: Current Schedule

The “Edit Schedules” pane lets you create, delete, and modify your event schedules. When you first enter this screen it will appear with the first schedule in memory. You may want to select “Edit a Different Schedule” or “Create a New Schedule” first if you want to leave the first schedule alone. Once you are editing the desired schedule, you can look at the event list at the bottom of the page and click “Add an Event” to create a new bell event.

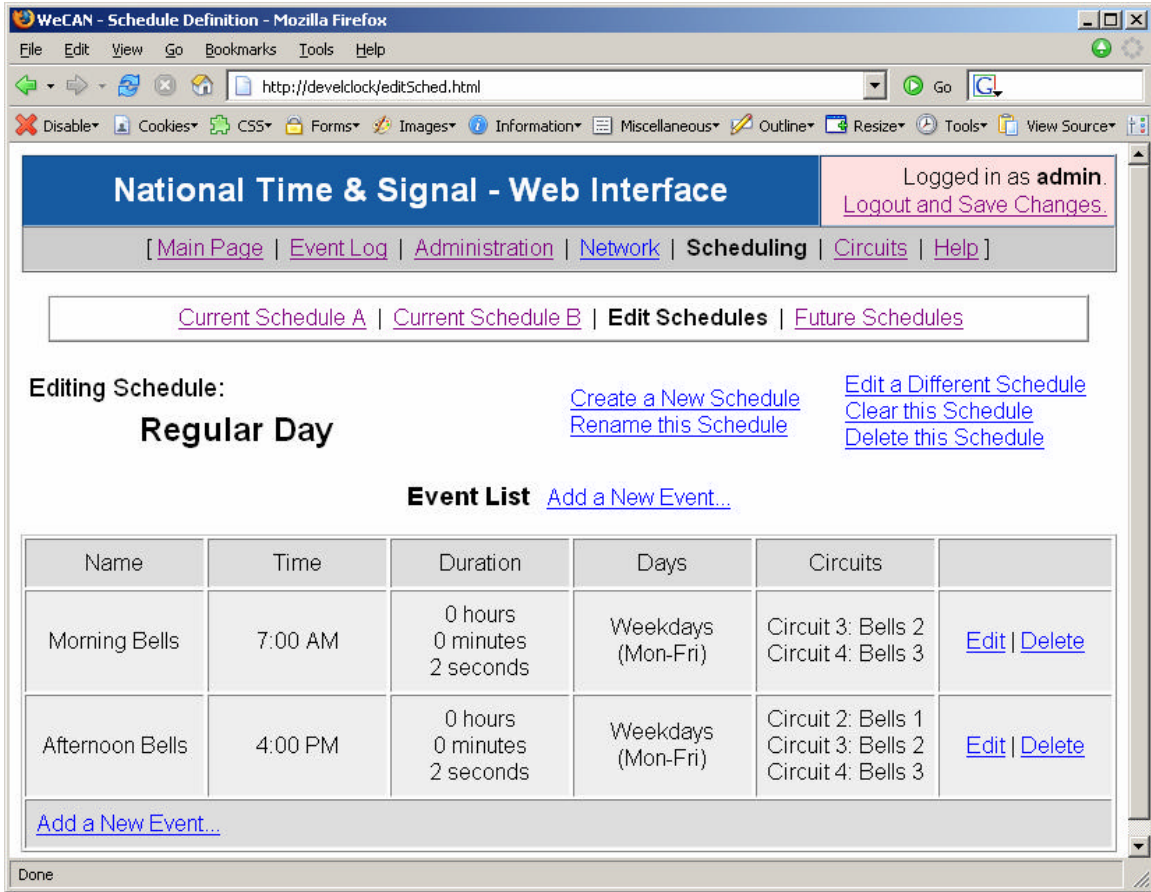


Figure 7: Editing a Schedule

As you add events to the schedule, they are shown in the event list sorted by start time. If you wish to modify or delete an event, you can use the “Edit” and “Delete” links next to the event. On the next page you can see a sample of the event creation and editing interface:

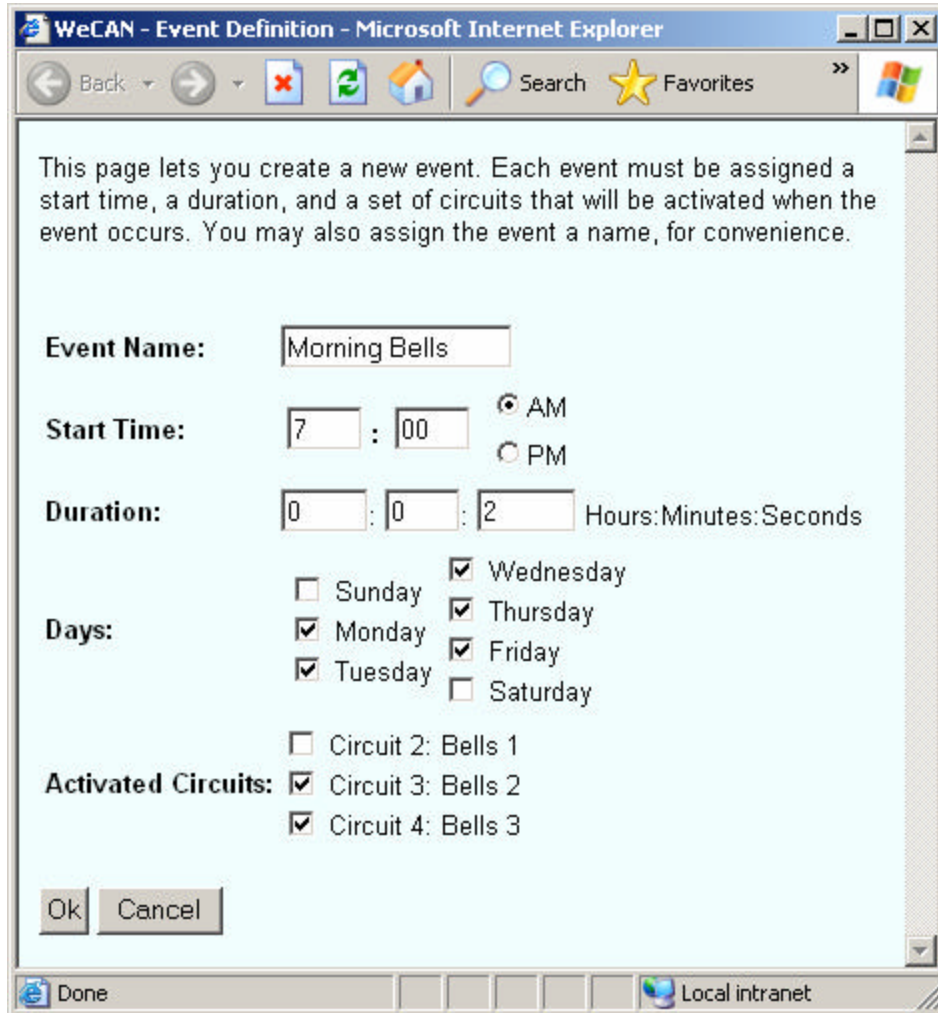


Figure 8: Editing Events

In the above example, the “inside bells” circuit will ring every Tuesday morning at 9:30 for two seconds. By default, events run on every day of the week; using the day checkboxes you can choose to only run an event on certain days of the week. Events may be up to one week long (168 hours). Also, you can specify the seconds field with fractional seconds up to two decimal places, for example, “1.42” seconds. Only the seconds field may contain decimal values.

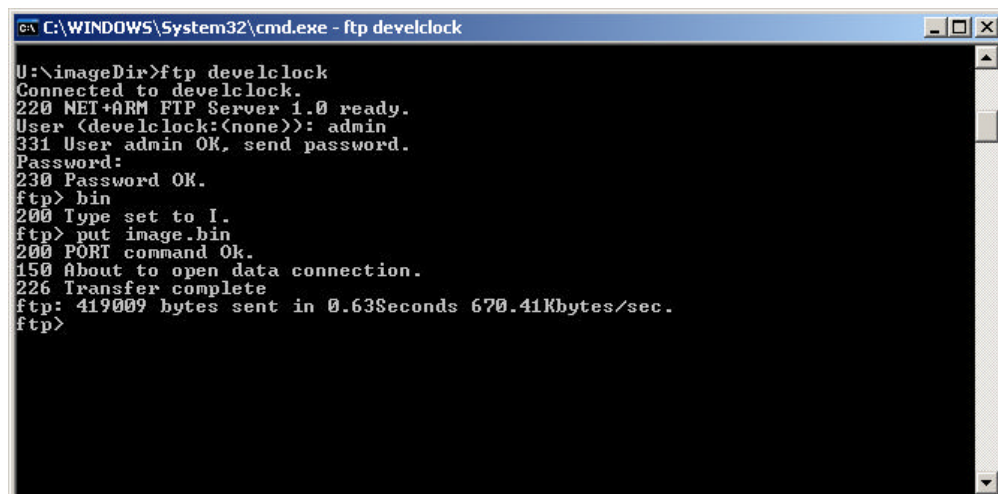
Once you have configured your bell schedules and selected the current schedule, you can logout of the unit by clicking “Logout and Save Changes” in the upper-right corner of the web interface. If you close your browser without logging out, your changes will be automatically saved after five minutes. Before rebooting or powering off the WeCAN device, please use the “Logout and Save Changes” link to ensure that your changes are not lost. If the unit loses power, it will restart the bell schedule from the current time after it has rebooted and acquired time information from the network.

Finally, the “Future Schedules” tab allows you to automatically change to a different schedule at a predetermined point in the future. For example, you could automatically change to a blank schedule on a holiday, or change to a summer schedule at the start of summer. When a future schedule is run, it will run all events that should be active in that schedule, even if the start time for those events is earlier in the week, before the schedule was switched. Meanwhile, long events from the previous schedule will be terminated as soon as the schedule is switched.

11. Updating the Module’s Software

Periodically, National Time & Signal may release new versions of the software that controls the LAN module’s operation. These updates will be in the form of a file called “image.bin”, which you can transfer to your LAN module using FTP.

- 1) In the windows Start->Run dialog, type “cmd”⁵.
- 2) Change directory to the location where you downloaded the latest version of the module software.
- 3) Type “ftp X.X.X.X” or “ftp HOSTNAME” where X.X.X.X is the IP address of the unit, or where HOSTNAME is the host name that you assigned to your unit.
- 4) When prompted, type in “admin” for the user name and then type the LAN module’s password that you entered during the setup process.
- 5) Type “bin” to set the transfer mode to binary.
- 6) Type “put image.bin” to begin the transfer, and then wait until the transfer is complete and the file has been written to the module’s memory. When the process is complete, you will see the message “226 Transfer Complete”.
- 7) Close the command prompt window.



```
C:\WINDOWS\System32\cmd.exe - ftp develclock
U:\imageDir>ftp develclock
Connected to develclock.
220 NET+ARM FTP Server 1.0 ready.
User (develclock:(none>): admin
331 User admin OK, send password.
Password:
230 Password OK.
ftp> bin
200 Type set to I.
ftp> put image.bin
200 PORT command Ok.
150 About to open data connection.
226 Transfer complete
ftp: 419009 bytes sent in 0.638Seconds 670.41Kbytes/sec.
ftp>
```

Figure 9: Uploading New Firmware

⁵ Users of Windows 95, 98, and ME should type “command” instead.

12. Restarting

Before restarting the WeM, please be sure that all downloads of firmware to the unit have halted. The safest way to do this is simply to unplug the Ethernet cable from the unit. Once the cable is unplugged, simply press the switch labeled “SW1” for one second. At this point, the unit will be in reboot mode. The actual reboot begins 10 seconds after the switch is pressed. Once you have pressed the switch, you may plug the network cable back into the module.

The module can also be rebooted from within its LAN interface, as long as it is still plugged in. The reboot option can be found on the administration page. Like the reset switch, there is always a 10 second delay before the actual reset occurs.

The third method of restarting the unit is to cycle the power to the WeM unit. This method is not recommended, as it could result in damage to the unit if someone is uploading new firmware or changing the configuration.

13. Restoring Factory Defaults and Retrieving Lost Passwords

If your network configuration changes or you forget the administrator password, you may not be able to access the configuration pages for the WeM device. In this case, you should restore the unit to the factory defaults and repeat the standard installation steps. The factory default settings are shown in table 1 below. While it is not recommended to do this -- since you lose all network configurations -- it may be the last resort if you have lost your password. If you left the “Tech” account password unconfigured, you can call Natsco technical support for the Tech password; you will need to have your unit’s serial number and MAC address handy.

Setting	Default Value
Time Zone	USA Eastern Daylight Time
Time Protocol	SNTP
Time Server	NIST
Host Name	<i>(blank)</i>
Use Automatic Settings	<i>Checked</i>
Static IP Settings	<i>(blank)</i>
Use DHCP	<i>Checked</i>
Use BOOTP	<i>Checked</i>
Use AutoIP	<i>Not Checked</i>
Use RARP	<i>Checked</i>
Use Ping-ARP	<i>Checked</i>
admin password	Natsco

Table 1: Factory Default Settings

To restore the default configuration, follow these steps:

- 1) Open the WeM to gain physical access to the LAN module.
- 2) Press and hold the switch SW1 on the corner of the unit. Hold the switch for 20 seconds.
- 3) Your unit is now configured with factory-default settings and password. Perform the standard installation steps to bring the module on-line.

14. The Event Log

The event log contains a history of events involving the LAN module, such as startup information, error messages, and firmware update notifications. The information presented on this page can be valuable when attempting to diagnose device or network errors. You can also view the firmware version number in the event log; it is written as an information message when the device boots up. The events are listed chronologically, with the most recent events written at the top of the page. To get to the event log, click the “Event Log” link at the top of any of the web interface pages.

Appendix A: Network Configuration Information

This appendix is meant to assist information technology professionals with configuration of National's WeM clock controller. The module is designed to work on an IPv4 network, and can use several protocols for getting an IP address.

The first addressing method is to use a static IP. The advantage of this method is that configuration is straightforward, and it allows you to assign your device a DNS hostname (via your DNS server). This DNS hostname is important if you want to access the device from a non-Windows machine that doesn't support NetBIOS, or if you have routers that block NetBIOS packets.

The other preferred addressing method is the DHCP protocol, which is enabled by default. Using this protocol, the module will contact your DHCP server and automatically get DNS, gateway, subnet, and IP information. When available, DHCP should always be used, unless your network doesn't support NetBIOS. Note that because DHCP is enabled by default, connecting the device to a DHCP-capable network will result in DHCP being used. After the first bootup, you can disable DHCP using the web configuration interface. If you want to prevent DHCP from being used even on the first bootup of the device, then you can connect the device directly to a single computer (such as a laptop) using a crossover cable.

The Ping-Arp protocol is a fallback protocol for when other addressing schemes fail. As shown in the section "Assigning a Network Address", Ping-Arp can be used to assign an IP to a device that cannot obtain an address using other methods. Ping-Arp defaults to ON, and it should be left that way. DHCP overrides Ping-Arp, so if you have DHCP enabled on your device and on your network, Ping-Arp will not have any effect.

RARP, AutoIP, and BOOTP are provided as legacy support protocols. The other protocols are preferred, but these three protocols can be used if nothing else is available or feasible. Be aware, however, that these protocols do not support assignment of a subnet mask, and will always set the mask to 255.255.0.0. If the other machines do not use the same subnet mask, then NetBIOS host name resolution will not work correctly.

Appendix B: Time Protocol Information

There are two time protocols available on the WeM: TIME and SNTP. SNTP is the default protocol, and it is the most standard time protocol on the Internet. Some time servers, such as NIST, only support SNTP. Windows 2000, XP, and later have a built-in SNTP server, which allows you to use any Windows machine as your local time server. Because Windows machines automatically synchronize with the NIST atomic clocks, an Internet-connected Windows machine generally makes a good choice for a time server. To use SNTP over the Internet, your firewall must allow transmission of UDP packets on port 123.

TIME is a TCP-based format that is provided mainly to support proxy servers that cannot forward UDP packets. Because it is an older protocol, the NIST time servers may drop support for TIME in the future. The TIME protocol uses TCP port 37.

Appendix C: Configuring the Windows Time Service

Many different computing environments have built-in SNTP servers that can be used to provide time information to the WeM. On many systems, the SNTP service will be enabled by default. However, on some systems you will need to activate the time service. On Microsoft Windows NT, Windows 2000, and Windows XP, you can activate the SNTP service as follows:

- 1) In the Start Menu, select “Run...”
- 2) Enter “services.msc /s” and press OK.
- 3) In the window that opens up, locate the “Windows Time Service” entry and double-click it.
- 4) In the dialog that opens, set “Startup Type” to “Automatic”.
- 5) Click the “Start” button to start the service, if it isn’t already started.
- 6) Click “OK” to save the configuration, then click File/Exit to close the services window. You can now use the computer as an SNTP time server for your clocks, as described in the section “Changing Time Protocol Settings”.

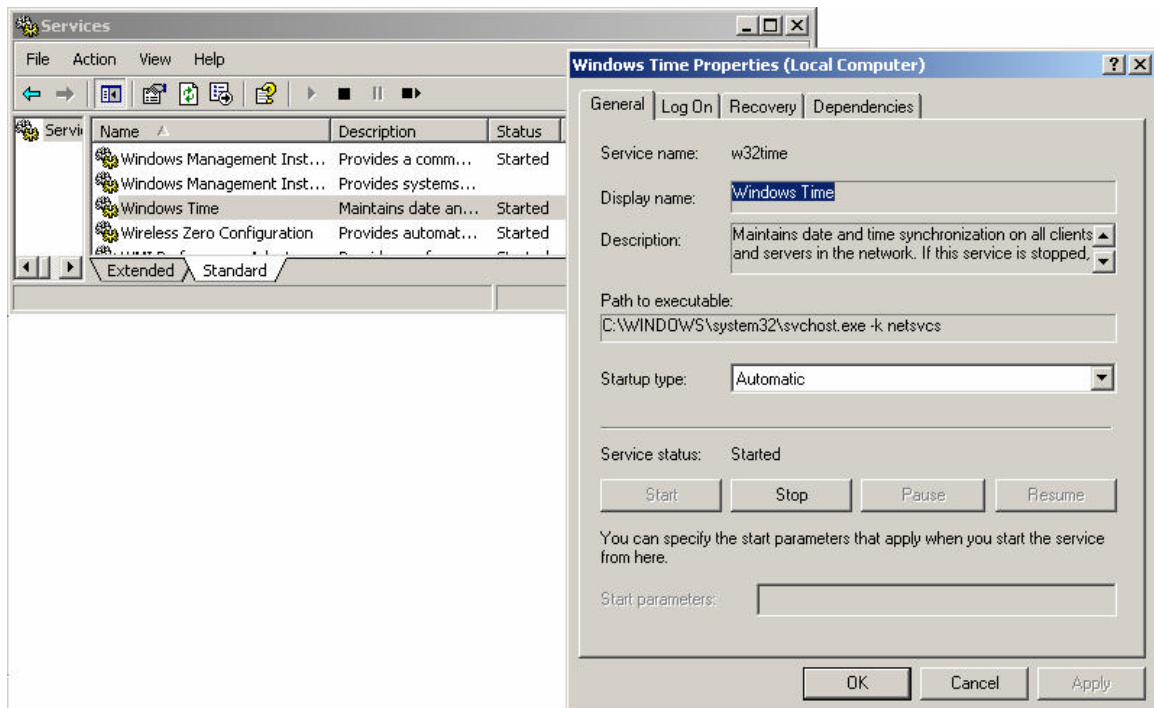


Figure 10: Configuring the Windows Time Service

Appendix D: Connecting the WeM to the MC100 Master Clock

When used with the MC100 Master Clock, the WeM not only provides LAN time base updates to the MC100 but also provides web-based programming for three of the MC100 relay outputs. The WeM may be mounted internal to the MC100 cabinet using mounting plate #A110-100-010277 which would also provide mounting of a PS-DRIVER-2/5A if desired.

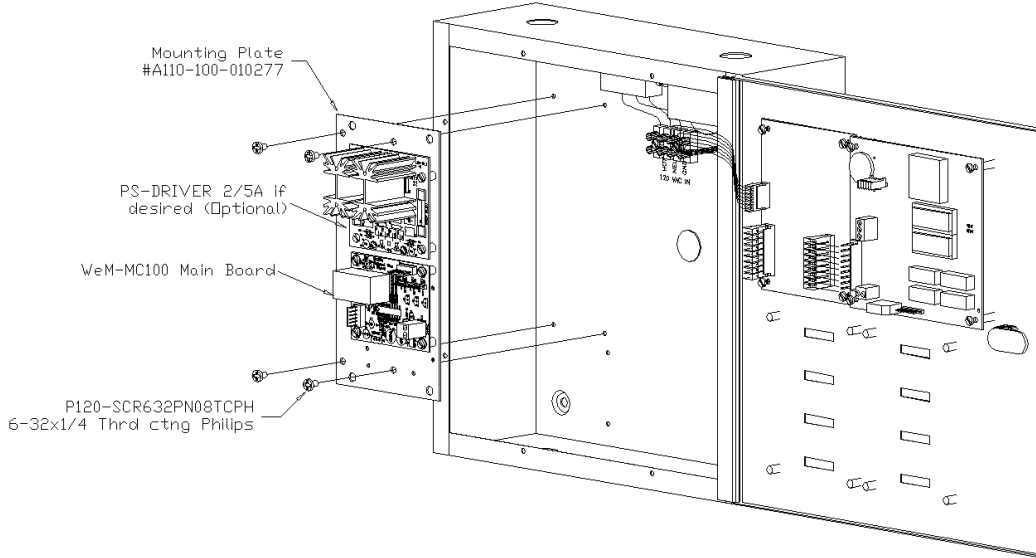


Figure 11: WeM Internal to MC100

Wiring Connections:

The connections to provide power and communications to the WeM main board requires National Time & Signal cable assembly #A050-W-010910 between the MC100 main board and the WeM connectors K2 and K5 as shown in Figure 12.

The #A050-W-010910 cable assembly is wired as follows:

WeM-MC00 Terminal	Wire Color	MC100 CPU Board Terminal
K6 pin 3-Rx	White, Blue Stripe	Block K2: Pin 1
K6 pin 4-Tx	White, Green Stripe	Block K2: Pin 3
K6 pin 2-Gnd	White, Brown Stripe	Block K2: Pin 5
K1- 24VAC-2	Red	K5.2
K1-24VAC-1	Red	K5.1

In addition, on the MC100 CPU board terminal block K3, pins 2 and 4 are connected.

The circuit control wiring connection is accomplished using the cable assembly #A050-W-010911 as shown in Figure 12. This connection allows the WeM to operate the relay outputs 2, 3, and 4 independently of the MC100.

The network connection is made with a standard network cable with the RJ-45 connector located on the side of the WeM main board as shown in Figure 12. On the side of the WeM main board next to the network connector are green and yellow LEDs. The yellow LED will indicate connection to a LAN network while the green LED will indicate the WeM is communicating with the network.

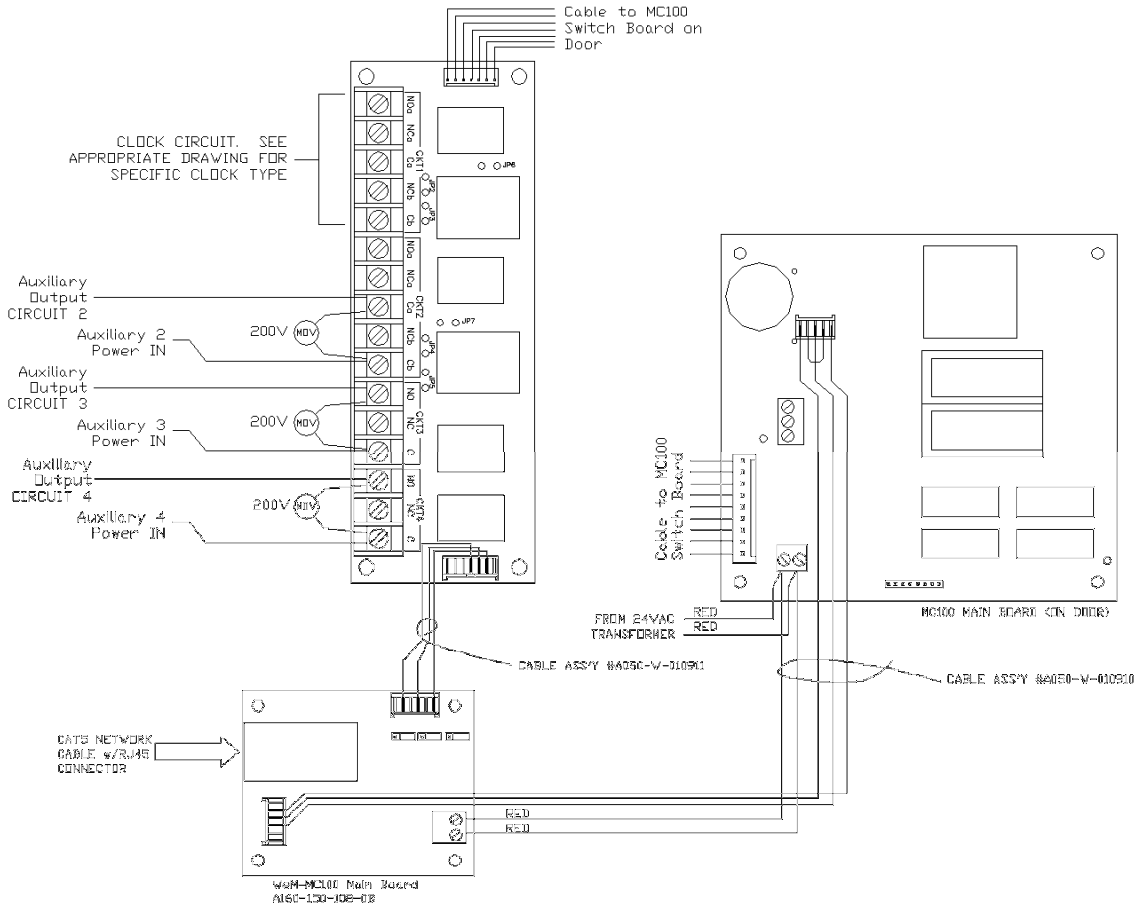


Figure 12: WeM to MC100 Interconnections

The #A050-W-010911 cable assembly is wired as follows:

WeM-MC00 Terminal	Wire Color	MC100 Relay Board Terminal
K5 pin 2	White, Yellow Stripe	K3 pin 4
K5 pin 4	White, Green Stripe	K3 pin 5
K5 pin 6	White, Blue Stripe	K3 pin 6

Once you have verified that the LAN module is correctly connected, you must configure the MC100 to accept time information from the WeM. The time base of the MC100 should be set to LAN in the SETUP menu as follows:

- 1) On the MC100, press the EXIT/SETUP button.
- 2) Enter the CLK menu by Pressing → twice and then ENTER.

- 3) Press \uparrow to change the daylight savings setting to ON or OFF, then press ENTER.
- 4) For the Timebase setting, press the down key until "LAN" is selected.
- 5) Press ENTER, then select the proper time zone offset, such as "-5" for US Eastern Time by using the arrow and number keys. (The '-/+ ' may be changed with the down arrow.) then press ENTER.

The MC100 is now configured to use the LAN module as a timebase. For time updates to occur, the unit must be connected to the network as described in section five.

Every hour, the MC100 queries the LAN/WeM unit for time information. These updates happen at forty minutes past each hour throughout the day. To immediately set the MC100 to the correct time, you can simply set the time to hh:40, where hh is any hour. To do this, press the "SET DATE/TIME" button on the MC100 and scroll right to the minutes setting. When you have selected a time that is forty minutes past any hour, press enter. If the LAN unit is connected to the MC100, the correct time should appear after a few seconds.

Also be aware that the WeM gets time information from the Network once every hour. Between updates, it keeps highly accurate time using an internal crystal. If you change time servers and want to get the updated time immediately rather than waiting for the next update, you can simply reset the unit as shown in section 13. After resetting, wait a minute then set the MC100 time to 40 past the hour to get the time update.

When the WeM is connected to an MC100, you can use the "number of satellites" indicator (to the right of the date on the MC100 display) to determine connection status information. After setting the time to 40 past the hour, the indicator will update to show the network connection status of the WeM. Below is a table of status indicators:

Indicator	Status Information
?	No connection between MC100 and WeM unit. Make sure you have set the time to 40 past the hour. If the indicator stays at '?', there is no connection between the MC100 and the WeM unit. Please check the connections as shown in section 3.
0	Network cable is unplugged from WeM. Be sure the cable is plugged in and that the yellow connection light above the plug is lit. Also be sure that the other end of the cable is plugged into a 10 or 100 Mbps Ethernet hub or switch.
1	Network cable is plugged in, but unit cannot obtain a network address. Refer to section 5 to assign the WeM an IP address.
2	Cable is in and the device has an IP, but it cannot contact a time server. Refer to section 11 to configure a time server. If you cannot find a local time server, use the NIST time server, as shown in section 9.
3	Connection is good and a time update has been received from the network. If the time is not correct, select a more accurate time server as show in section 9.

Figure 13: WeM-MC100 Connection Status Codes