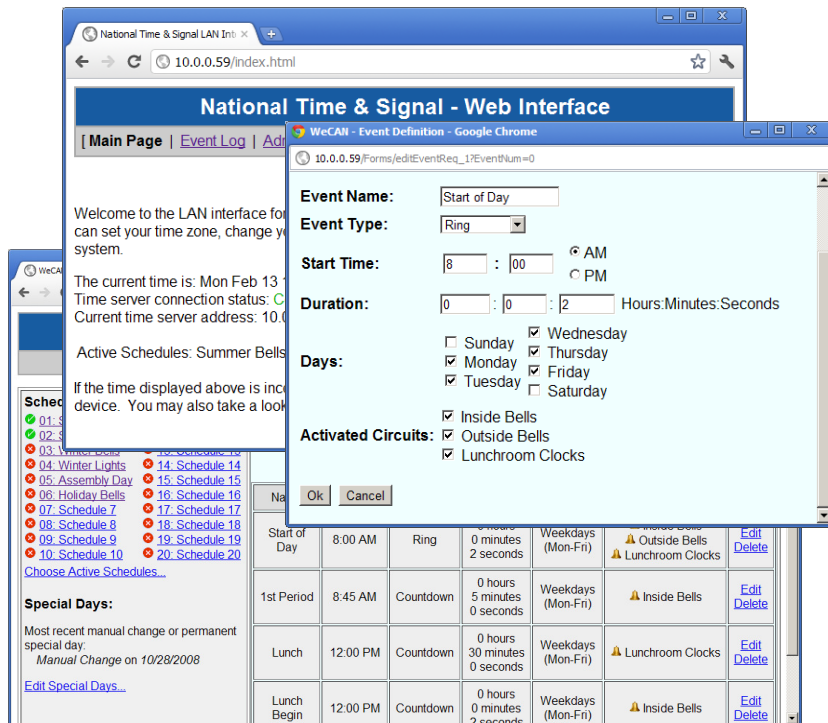


The WeCAN Web Interface

User's Manual



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1. Introduction

National Time and Signal's web-enabled clock devices share a common browser-based interface, called WeCAN. With the WeCAN interface, you can select time zones, configure circuits, and program bell events. This configuration can be done from any computer on your network, without any special software. This guide will show you how to configure a WeCAN device to operate on your network, as well as how to operate your clock/bell controller remotely using your browser.

For information regarding specific hardware and wiring, please consult the product-specific manual for your particular device. This manual deals primarily with the network setup and bell programming aspects of your web-enabled master clock.

2. Support Information

Installation of WeCAN devices 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. Product Capabilities

Several of National Time's products offer the WeCAN web interface. Each device has different capabilities. Certain operations may vary depending on the type of module. In particular, bell and circuit control is not available on the MC100-LAN. Consult the table below for more information.

	MC100-LAN	WeNC	WeMC3	WeM-MC100	ETMC /ETMCU
Description	Network Time Source for MC100	Simple Two-Output Master Clock without Display	Simple Three-Output Master Clock with Display	Full Web Control for MC100 Master	Integrated Network Time Source a Power Supply
Front Panel Display	Integrated with MC100 Master	No	Yes	Integrated with MC100 Master	ETMCU Only
Network Time Source	Yes	Yes	Yes	Yes	Yes
Outputs	via MC100	2	3	Up to 12	3
Web-Based Clock Circuit Control	No	Yes	Yes	Yes – Enhanced with additional Clock Types	Yes
Web-Based Bell Scheduling	No	Yes	Yes	Yes	Yes
TIMEWiSE WiFi Clock Control	No	Yes	Yes	Yes	Yes

4. Setup Overview

The setup for the Master Clock will depend on the device type. Before proceeding with this guide, please consult with the wiring instructions found in the product-specific manuals.

- 1) Wire module to power and Ethernet.
- 2) Power on module and observe network status LEDs.
- 3) Once network connection is established, locate the device on the network or assign an IP address.
- 4) Navigate to the device's page and perform time server setup.
- 5) Enter circuit settings.
- 6) Create bell schedules as desired.

5. Connecting to the Network

Connecting the module to the network should be performed by an IT professional. WeCAN devices are auto-sensing 10/100 Mbit network clients, 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 WeCAN 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 WeCAN device 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 later in the manual. First, we must ensure that the web module has a good connection to the network.

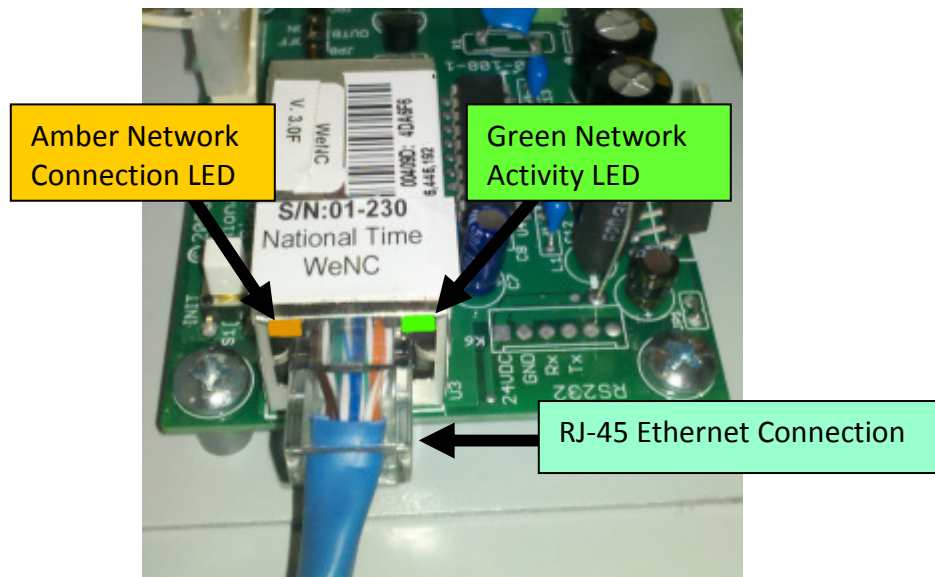


Figure 1: Network Connection

After making the physical connection to the network and powering on the device, you can check the status readouts on the module's display or the network status lights.

6. Network Status Lights

The network status lights show network connection status and network activity. These can be used to verify that the module has correct wiring to the network and that it is functioning properly.

The network status lights are visible immediately above where the Ethernet cable connects the module to the network. On the MC100 you will need to open the front door to see this connection. On the WeMC3 you can remove the metal shroud on the top of the unit to gain access. On the WeNC, just remove the top plate of the box. On the TIMEWiSE supervision server and the ETMC/ETMCU series, the network plug and lights are available on the outside of the main enclosure.

The amber connection light indicates that there is a physical connection between the module and a network switch. If it stays off, there may be a wiring fault somewhere on the system. There could also be a port configuration error on a smart switch.

The activity LED shows network activity. After start up there will be a burst of activity as the module finds a DHCP server and acquires a network address.

The table below lists the various network states and the corresponding LED status.

Status	Connection LED (Amber)	Activity LED (Green)
Startup	Solid	Solid
Normal	Solid	Occasional Flash
No Physical Network Connection	Solid	Occasional Flash
No Power or Damaged Module	Always off (including startup)	Always off (including startup)

7. Network Status Codes

On a MC100LAN and the WeMC100, the MC100's display will show a status indicator to the right of the date indicator. On the WeMC3 or ETMCU, the STATUS light will go solid or flash depending on the connection status. The meanings of those codes are explained below:

WeM-MC100 Indicator	WeMC3 / ETMCU Status	MC100-LAN Indicator	Status Information
"No WeM"	N/A	?	No connection between MC100 and WeCAN 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 WeCAN unit. Please check the connections as shown in section 3.
"No Net"	Off	0	Network cable is unplugged from WeCAN module. 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.
"No IP"	Off	1	Network cable is plugged in, but unit cannot obtain a network address. Refer to section 5 to assign the WeCAN module an IP address.
"No Svr"	Blinking	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 8.
"WeM OK"	Solid	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 8.

Figure 12: Connection Status Codes

8. Assigning a Network Address

To communicate over the network, the WeCAN device 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 or you previously assigned a static IP, proceed immediately to the next section, because your LAN module will already have an IP address assigned. BOOTP and RARP users may also proceed to the next step, but keep in mind that you may need to change your server's configuration to include the new device. If you have a WeM-MC100, you can view the IP address in the *Setup* → *Clk* → *Network Settings* menu on the front display.

If your network does not support dynamic IP assignment, follow these steps to get your LAN module connected. Note that this can only be done if the module has not yet been assigned a DHCP or static address.

- 1) Connect the unit to the network and power up the WeCAN module.
- 2) Log onto a computer on the same Ethernet segment as the WeCAN module.

If possible, use a computer connected through a crossover cable, as this will help eliminate any network issues when doing this programming.

- 3) In the windows Start->Run dialog, type "cmd".
- 4) At the command prompt that opens, type one of the following. This will depend on your version of Windows.

32-bit Windows:

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

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

The Z.Z.Z.Z is your computer's IP address. This is only necessary if you have more than one network interface, such as a hardwire and a Wi-Fi.

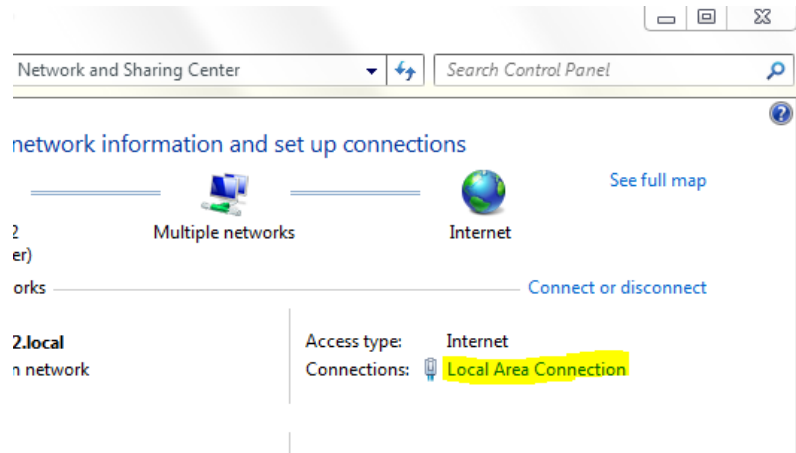
64-bit Windows:

```
netsh interface ipv4 add neighbors "Local Area Connection" X.X.X.X 00-40-9D-YY-YY-YY
```

where X.X.X.X is the desired IP address and YY-YY-YY is the last six digits of your WeCAN module's MAC address. The MAC address is printed on a sticker on the module. "Local Area Connection" is the network card name,

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

and may be different on your PC. You can find it in the Windows “Network and Sharing Center” under “Connections”.



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.

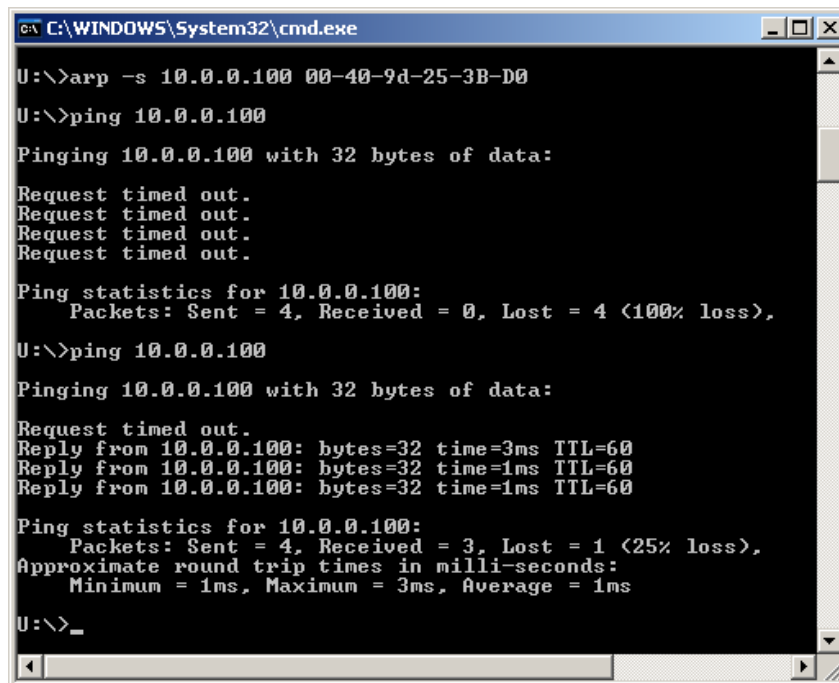


Figure 1: Using Ping-ARP to Assign an IP Address

- 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.

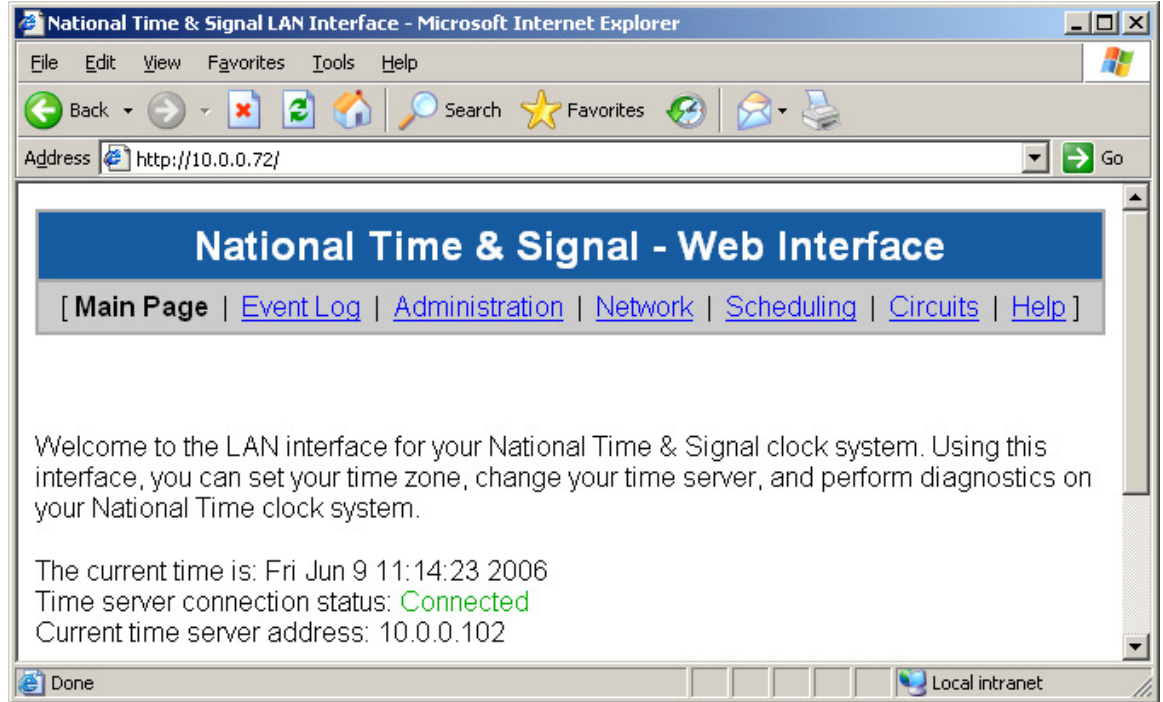


Figure 2: Accessing the Module Using an IP Address

9. Browsing to the Module Configuration Pages

WeCAN devices are 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.

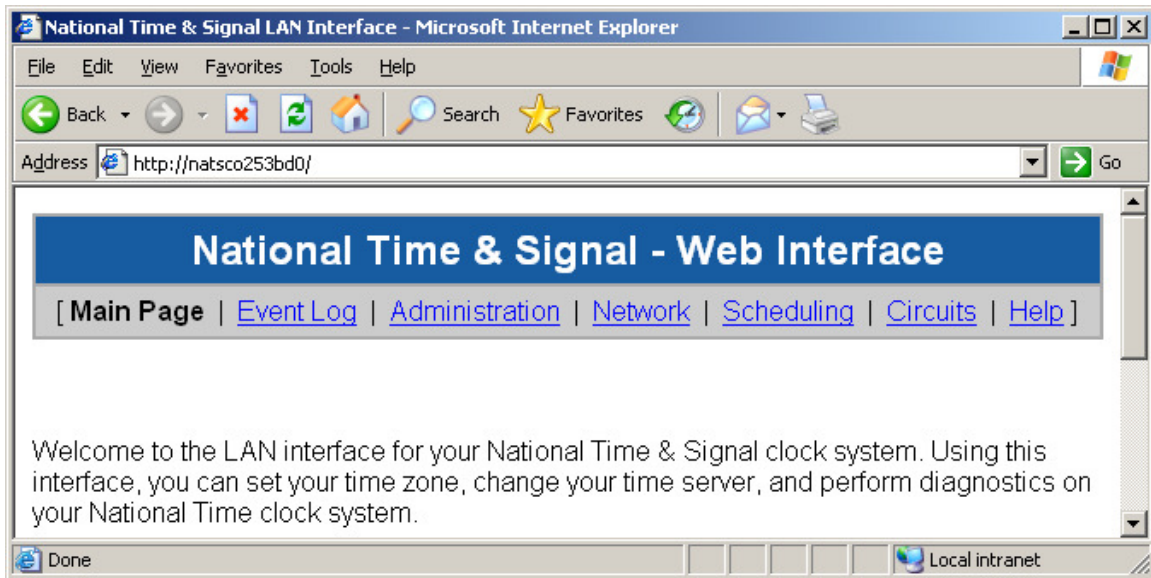


Figure 3: Accessing the Module Configuration

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 WeCAN module.

If the natscoYYYYYY address doesn't work, you might need to connect using the IP address. This can be necessary due to certain network configurations². To find out address assigned from the DHCP server, you can search your DHCP server for the MAC address of the 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.

² For the <http://natscoXXXXX> address to work, the module must be on the same network segment and the network must support NetBIOS name resolution. Sometimes VLAN segmentation or other factors will prevent this from working. In this case, use the DHCP server to find the module's IP, and consider assigning a reserved address through DHCP or a static IP address to make finding the module easier in the future.

10. Changing Network Settings

The network configuration settings on the WeCAN 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.

11. 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.

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 MC100-LAN module.

- 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 WeCAN device 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.

12. 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.

13. 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 WeCAN 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 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.

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.

14. Circuit Configuration

Several WeCAN devices, such as the WeNC, ETMC, WeMC3, and WeM-MC100, allow remote configuration of output circuits to control clocks and bells. WeCAN supports several popular clock reset formats. In most cases, WeCAN devices ship with both output circuits set to auxiliary control. After attaching your WeCAN device to your clock circuits, you must configure the circuit types via the WeCAN web interface. It is vital that you select the proper circuit type for your particular installation. Some clock correction protocols will require both outputs to control the clock circuit such as typical 3-wire synchronous clock systems and most resettable minute impulse systems. 2-wire correction protocols such as National Time & Signal's On-demand Instant reset clocks only require one output allowing the second output to be used for either a second clock circuit or auxiliary control. To control bells or signals with the event scheduler, the circuit type must be set to "Auxiliary".

The default circuit names correspond to physical output on your web-enabled device. To name the circuit or to change the circuit type, just click "Edit this Circuit" and enter the name and clock type.

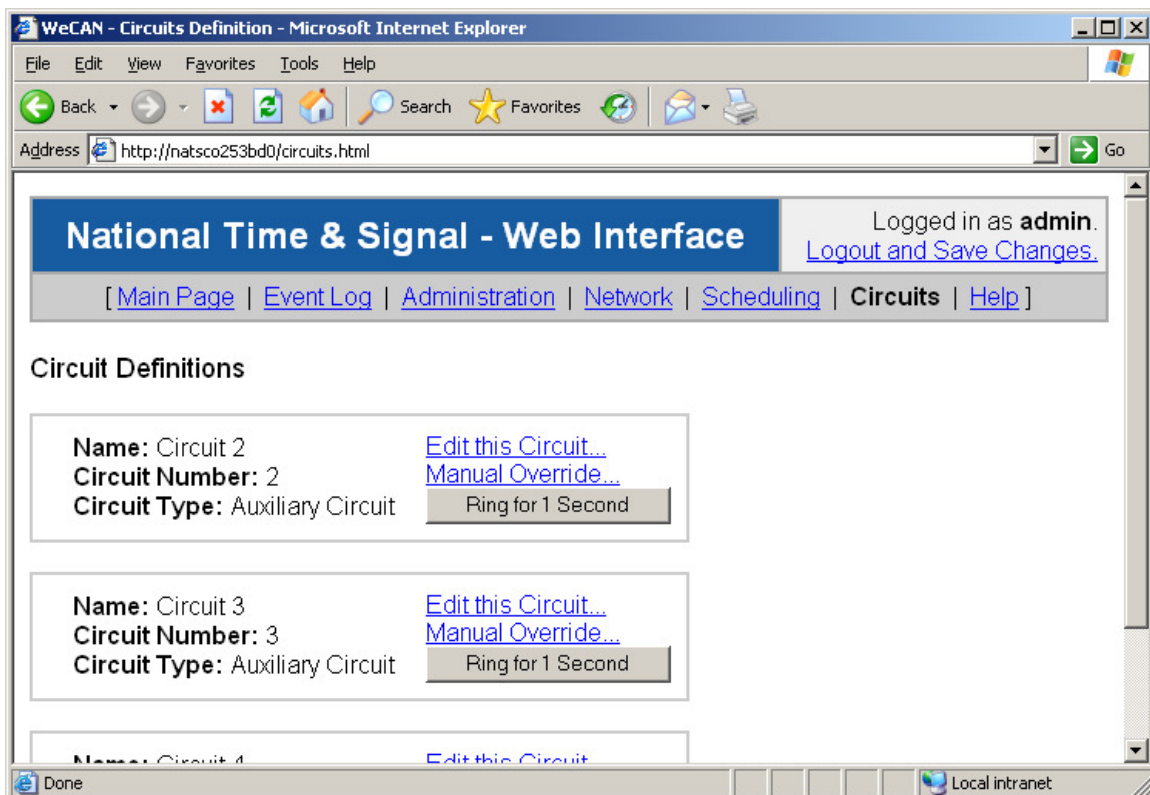


Figure 4: Circuits Configuration

If you need to manually activate or deactivate a bell or some other device, 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.

15. TIMEWiSE Devices

National’s line of WiFi-enabled smart clocks can be configured to talk to a master clock running the WeCAN interface. In this configuration, the master clock supplies a single synchronized time source, as well as a list of TIMEWiSE clocks to allow for easy monitoring of device status. In addition, you can ring beeper outputs or start countdown timers on WiFi digital clocks.

To enter TIMEWiSE configuration, click on the *TIMEWiSE* header at the top of the page.

The screenshot shows the 'National Time & Signal - Web Interface' with the 'TIMEWiSE Modules' section. It includes navigation links like [Main Page], [Event Log], [Administration], [Network], [Scheduling], [Circuits], [TIMEWiSE], and [Help]. Below the navigation, there are links for [Refresh Page], [Reload All Device Settings], [Checkin All Devices], and [Change All Passwords]. The page indicates 'Number of Monitored Modules: 7'.

Serial Number	Address	Name	Last Checkin	Signal	Circuits	
162	10.0.0.81	New WiFi Module	Mon Feb 13 14:06:38 2012	64	Port 1: Ckt 1 Port 2: Ckt 1 Port 3: Ckt 1	Checkin Refresh Settings Change Password Send Time Clear IP Delete
288	10.0.0.142	Test Clock	Fri Feb 10 13:53:31 2012 (Missing)	73	Port 1: Ckt 20 Port 2: Ckt 20 Port 3: Ckt 20	Checkin Refresh Settings Change Password Send Time Clear IP Delete
289	10.0.0.140	2.25 Inch Clock	Fri Feb 10 13:53:38 2012 (Missing)	81	Port 1: Ckt 20 Port 2: Ckt 20 Port 3: Ckt 20	Checkin Refresh Settings Change Password Send Time Clear IP Delete
612	10.0.0.144	New WiFi Module	Mon Feb 13 14:04:14 2012	81	Port 1: Ckt 18 Port 2: Ckt 18 Port 3: Ckt 18	Checkin Refresh Settings Change Password Send Time Clear IP Delete
613	10.0.0.107	New WiFi Module	Mon Feb 13 14:01:56 2012	84	Port 1: Ckt 18 Port 2: Ckt 18 Port 3: Ckt 18	Checkin Refresh Settings Change Password Send Time Clear IP Delete

Figure 7: TIMEWiSE Configuration

There are several operations available on the top row that will act on all TIMEWiSE modules at once:

Operation	Effect
Refresh Page	Refreshes page. Updates any information that has been sent from the modules since the last time the page was refreshed.
Reload All Device Settings	Tells the modules to re-send all of their information such as names, circuits, and signal strengths.
Checkin All Devices	Force all devices to check in immediately. If there are modules marked as missing, this can be used to see if the network error has been resolved.
Change All Password	Allows for changing all of the modules' passwords at the same time.

If you want to update the time on all modules at once, just change the time on the *Set Time* page via the *Administration* tab. You can also *Request Time Update* on that page to get a fresh network time, which will then be transferred to the clocks. The time will also be broadcasted to all devices each hour.

Below the "All Devices" operations is the module status list.

Setting	Meaning
Serial Number	The serial number of the TIMEWiSE module. This is unique to each device and cannot be changed.
Address	The IP address of the module. If you click on this link, it will take you to the TIMEWiSE module's own internal web page. From there, you can control timer functions or update module settings.
Name	The name of the module. You can change this by going to the module's configuration page using the <i>Address</i> link.
Last Checkin	The time and date of the last checkin of this module. If the module goes too long without a checkin, it will be highlighted in red to indicate a possible problem. Click the <i>Checkin</i> link to force an immediate update, and then refresh the page. If it still doesn't check in, it may have lost connection to the network. Consult the TIMEWiSE documentation for more details on troubleshooting wifi connections.
Signal	WiFi signal strength of the module. If this is below 30, the connection is marginal and steps should be taken to reposition the antenna, move the clock, or strengthen the WiFi network in that



	<p>area.</p> <p>If the signal is weak but the module is checking in, the clock will stay on time. However, it might not always receive countdown or beep events if the connection is weak.</p>
Circuits	<p>Each of the ports on the TIMEWiSE modules can be used to connect clocks. TIMEWiSE RELAY modules also have a relay output, which is configured as <i>Port 3</i>.</p> <p>The circuits can be assigned through each module's internal web page.</p>

Finally, there are a few options available to operate on single modules:

Operation	Effect
Send Time	Sends the current time to a single clock. This can be useful when troubleshooting a single clock.
Delete	Removes the module from the list. This can be useful if a module has been replaced with a different serial number or removed from the network permanently.
Clear IP	This operation will clear the IP address from a module. Network outages or server issues can cause a IP address change, in which case clearing the IP may help get the system back in order.

16. Scheduling Bells and Other Events

With WeCAN's scheduling features, you can program events for auxiliary circuits. This allows you to ring bells, activate signals, or run lights at a specific time. WeCAN features 20 schedules, each of which can be programmed with up to 500 events. In addition, you can select which schedules are active on any particular day. *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 see a list of schedules on the left bar. A green  icon in front of a schedule indicates that the schedule is active and that its events will run at the programmed time. A red  icon indicates an inactive schedule – the events in an inactive schedule can be edited, but they will not run until you activate the schedule.

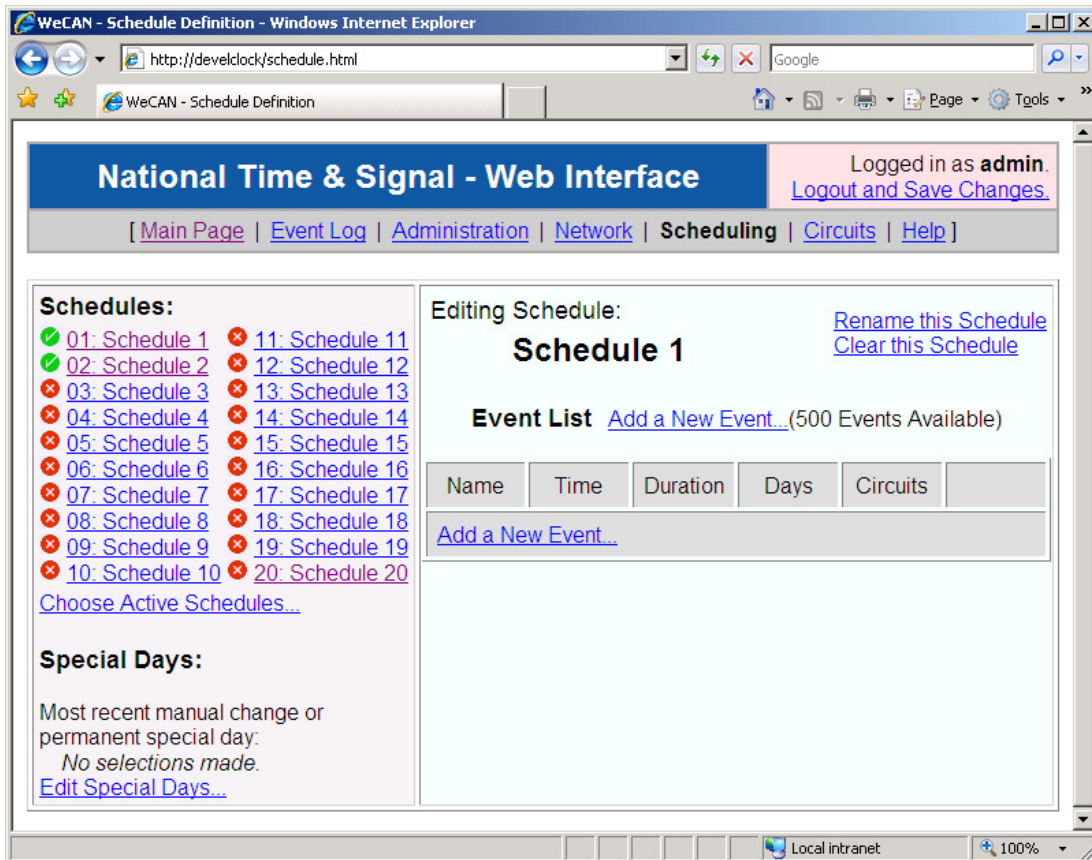


Figure 5: Current Schedule – Schedule 1 & 2 Active

On the right-hand side of the schedule screen, you can edit the currently selected schedule. You can give the schedule a more convenient name with the “*Rename this Schedule*” command, add, edit, and remove events in the event list. Initially, the event list will be empty, so you will need to add a few events that match your facility’s needs. A school might have the schedule presented below:

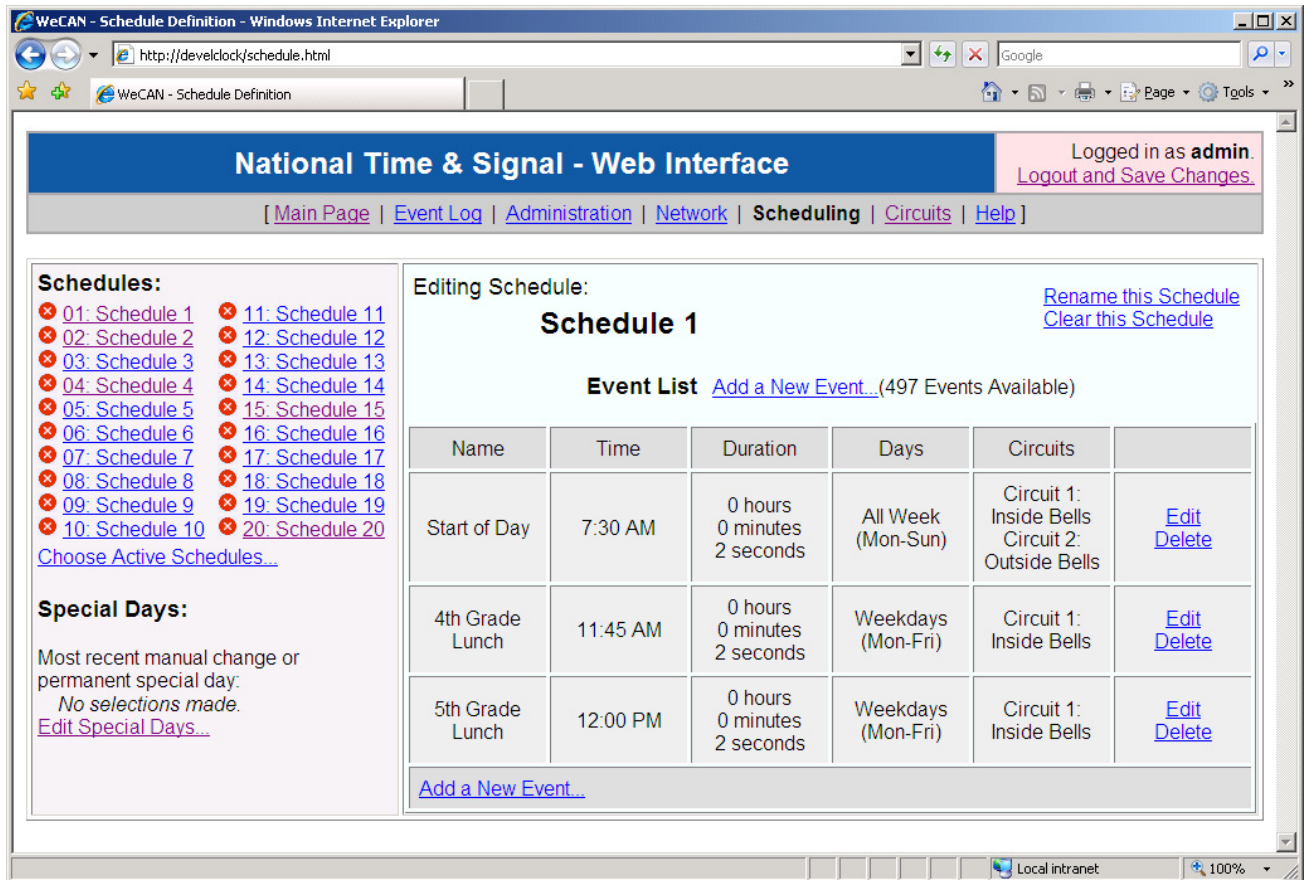


Figure 6: Editing a Schedule

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:

This page lets you create a new event. Each event must be assigned a start time, a duration, and a set of circuits that will be activated when the event occurs. You may also assign the event a name, for convenience.

Event Name:

Event Type:

Start Time: : AM PM

Duration: : :
Hours:Minutes:Seconds

Days:

<input type="checkbox"/> Sunday	<input type="checkbox"/> Wednesday
<input type="checkbox"/> Monday	<input type="checkbox"/> Thursday
<input checked="" type="checkbox"/> Tuesday	<input checked="" type="checkbox"/> Friday
	<input type="checkbox"/> Saturday

Activated Circuits:

<input checked="" type="checkbox"/> Inside Bells
<input checked="" type="checkbox"/> Outside Bells
<input type="checkbox"/> Lunchroom Clocks

Figure 11: Ring Event

This page lets you create a new event. Each event must be assigned a start time, a duration, and a set of circuits that will be activated when the event occurs. You may also assign the event a name, for convenience.

Event Name:

Event Type:

Start Time: : AM PM

Duration: : :
Hours:Minutes:Seconds

Days:

<input type="checkbox"/> Sunday	<input checked="" type="checkbox"/> Wednesday
<input checked="" type="checkbox"/> Monday	<input checked="" type="checkbox"/> Thursday
<input checked="" type="checkbox"/> Tuesday	<input checked="" type="checkbox"/> Friday
	<input type="checkbox"/> Saturday

Activated Circuits:

<input type="checkbox"/> Inside Bells
<input type="checkbox"/> Outside Bells
<input checked="" type="checkbox"/> Lunchroom Clocks

Figure 10: Countdown Event (WiFi)

In the “Ring Event” example, the *inside bells* and *outdoor bells* circuits 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.

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.

In the “Countdown Event” example, a 30-minute countdown on digital WiFi clocks will start at noon every day. Countdown events are only sent to TIMEWiSE digital clocks programmed to be on the specified circuit and set to check-in with the WeCAN master clock.

Saving Your Changes

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.

17. Special Days

The “Special Days” feature allows you to automatically change the bell schedule on a specific day in the future. This ability is well suited for holidays, assembly days, testing days, or any other day when you want to run a specific schedule. By using the special day feature, you can program more than a year of special days at once.

Programming special days is similar to programming a bell event. At the bottom of the left-hand bar on the scheduling screen, click the “Edit Special Days...” link. This will open the special days list:

The screenshot shows the 'National Time & Signal - Web Interface' in a browser window. The user is logged in as 'admin'. The 'Scheduling' menu item is selected. On the left, there is a list of 20 schedules, with '03: Summer Bells' and '04: Summer Lights' marked as active. The 'Special Days' section is highlighted, showing a list of special days. The table below is a representation of the data shown in the screenshot.

Name	Date	Active Schedules	Single Day	
Memorial Day	5/28/2007	Regular Lights, Holiday Bells	Yes	Edit Delete
Start of Summer	6/1/2007	Summer Bells, Summer Lights	No	Edit Delete
Start of School	8/25/2007	Regular Bells, Regular Lights	No	Edit Delete
Labor Day	9/3/2007	Regular Lights, Holiday Bells	Yes	Edit Delete

Figure 8: Special Days Example. Note that specific holidays are marked as “Single Day”.

There are two types of special days. *Single* days change the active schedules for one day only, such as changing to a holiday or assembly schedule. *Permanent* days change the active schedules on the specified day, but the change persists until either you manually change the active schedules or another special day occurs. Permanent changes are useful for longer periods of time such as a week of final examinations, or a summer holiday.

Entering a special day is very similar to entering a bell event:

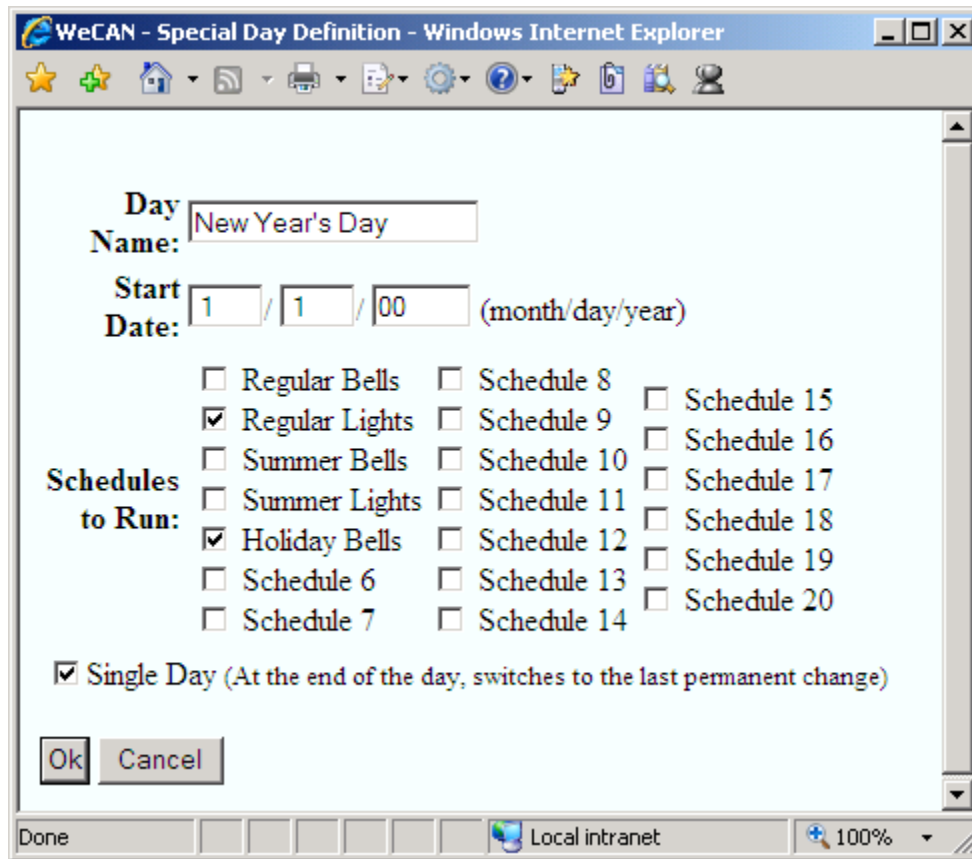


Figure 13: Entering a Special Day. Note that the year is "00", so it becomes wild -- it will run on the first of ANY year.

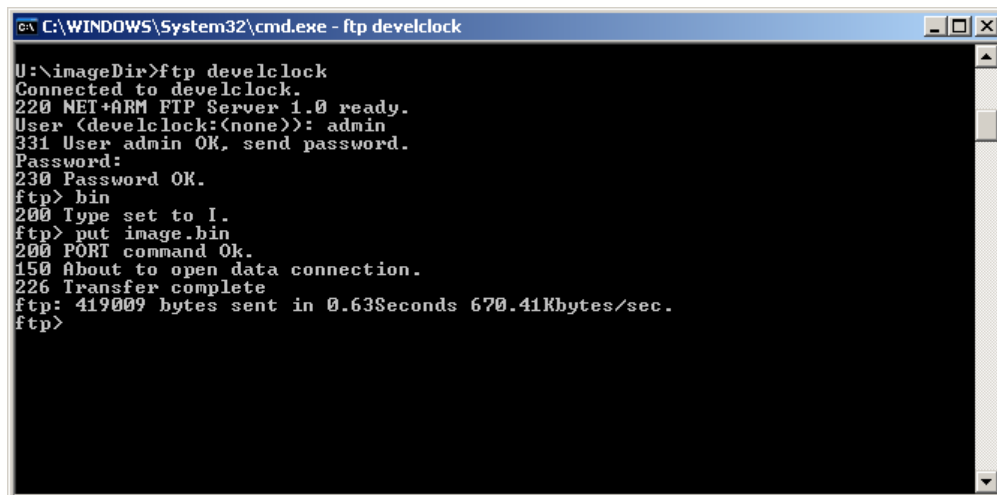
As show above, the special day programming is similar to bell event programming. You simply specify the date of the special day, and which schedules should be running on that day. You also specify whether the event is only going to be a single day or a permanent change. For convenience, you may also assign each special day a name.

In our special day example, we have programmed a *wildcard* event. Because the year is set as "00", *any* year will match this rule. You can also program wild days or months by setting the day or month fields to zero. If a wildcard day and a more specific special day happen to match the same date, then the more specific day will be run instead of the wild day. In our example, the regular lights and holiday bells schedules will run on New Year's day, and then we will switch back to our normal settings on January second.

18. Updating the Module's Firmware

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 0.63Seconds 670.41Kbytes/sec.
ftp>
```

Figure 14: Uploading New Firmware

19. Restarting

Before restarting the WeCAN device, 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

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

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 WeCAN 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.

20. 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 WeCAN 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.

Setting	Default Value
Time Zone	USA Eastern Daylight Time
Time Protocol	SNTP
Time Server	Auto
Host Name	WENC, MC100LAN, WEMC3, or WEMC100
Circuits	Circuits types are retained
TIMEWiSE Device List	WiFi Device list is retained
Bells	Bells events are retained
Serial Format	Natsco
admin password	natsco

Table 1: Factory Default Settings

To restore non-network-related configuration, follow these steps:

- 1) Open the clock controller enclosure to gain physical access to the LAN module. *Be careful to avoid touching any exposed circuitry in the enclosure. Doing so could result in an electrical shock.*

- 2) Press and **hold** the switch SW1 on the corner of the unit for **10 seconds**.
- 3) Wait about a minute for the unit to reboot.
- 4) Your unit is now configured with factory-default settings.

To restore the default **network** configuration, follow these steps:

- 1) Open the clock controller enclosure to gain physical access to the LAN module. *Be careful to avoid touching any exposed circuitry in the enclosure. Doing so could result in an electrical shock.*
- 2) Press and **release** the switch SW1 on the corner of the unit.
- 3) Wait until you see the green and amber LEDs on the network cable jack stay steady on.
- 4) Once the amber and green LEDs are lit, hold down SW1 for 30-40 seconds. You can release the switch when the amber LED is solid and the green LED is blinking to show network activity.
- 5) Press and release the reset button one more time. Wait one minute for it to reboot. Your unit is now configured with factory-default network settings. Perform the standard installation steps to bring the module on-line.

Setting	Default Value
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>

Table 2: Factory Default Network Settings

21. 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.

22. Appendix A: Network Configuration Information

This appendix is meant to assist information technology professionals with configuration of National's WeCAN clock controllers. 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.

23. Appendix B: Time Protocol Information

There are two time protocols available with WeCAN: 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.

24. 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 WeCAN. 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, 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”.

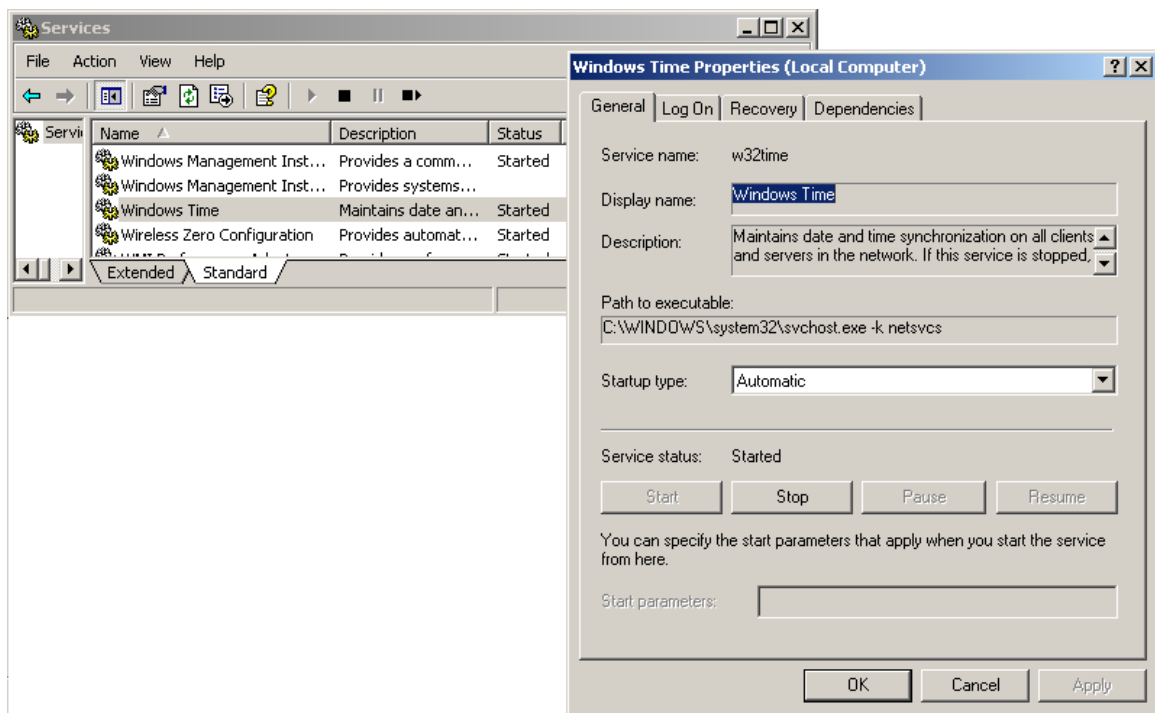


Figure 9: Configuring the Windows Time Service

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