



# **Inova OnTime™ Digital Clock**



**Owner's Manual**

# Inova OnTime™ Digital Clock Owner's Manual

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## Section 1: Introduction to Inova OnTime™ Digital Clocks

The Inova OnTime™ Digital Clock brings all the advantages of Power over Ethernet (PoE) technology to the marketplace in a real-time synchronized system of clocks.

PoE is an exciting and relatively new technology that allows devices to get both power and data over standard network cabling. It's the same technology that powers Voice over IP phones. Delivering both data and power over one set of wires simplifies installation, saves space, and eliminates the need for electrical outlets at the clock mounting locations. Additionally, the option of centralized UPS backup allows PoE devices to continue running even in the event of a power failure.

**Note: The local area network must support IEEE 802.3af Power over Ethernet in order for the PoE clocks to operate.**

This document contains:

- Safety Instructions
- Technical Specifications
- Installation Instructions
- Configuration Procedures
- Troubleshooting Solutions
- Maintenance/Warranty

## Section 2: Safety Instructions

Before installing or operating any OnTime Digital Clock, it's important that you carefully read and understand the following safety considerations.

1. To prevent personal injury, damage to the unit, or other harm, read this manual in its entirety before installing or operating the OnTime Digital Clock.
2. Observe normal safety precautions and use appropriate safety equipment (safety glasses, gloves, ladders, etc.) when installing this product.
3. Never install wiring during a lightning storm.
4. Never install telephone jacks in wet locations unless the jacks are specifically designed for wet locations.
5. Be sure that mounting hardware is suitable for the mounting surface and sufficient to support the weight of the units.
6. This product is safe when installed and operated as described in this Owner's Manual.
7. This product is not a toy! Please keep it out of the reach of children.
8. Operation of this product in a manner inconsistent with the instructions given in this manual may result in personal injury and/or damage to the product and will void the warranty.
9. There are no user-serviceable parts inside the unit. Attempting to open and/or alter the product will void the warranty.
10. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
11. Do not use this product near water, for example, near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
12. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product or to installers.

## Section 3: Technical Specifications

The OnTime Digital Clock is currently available in the models listed in the table below with the following specifications.

Technical Specifications	
Accuracy	+0/-200 milliseconds
Operating Temperature	32° to 104° F (0° to 40° C)
Viewing Distance	The numerals are visible to 150 feet (50 meters)
Operating Humidity	95% maximum, non-condensing
Mounting Options	Surface, Pendant, Cantilever, Flush Inset, Double Sided
Certifications	UL 1950, ELT Listed, CE Marked, RoHS Compliant
Power	IEEE 802.3af Compliant, less than 15.4 watts, Power over Ethernet (PoE)
Network Interface	10/100 BaseT with PoE
Warranty	One (1) year, returned to factory
ONT4 Models	
ONT6 Models	
Display Face	4-Digit, Red 7-segment LEDs
Display Face	6-Digit, Red 7-segment LEDs
Dimensions	12"L X 6"H X 2.2"D (30 cm X 5.6 cm)
Dimensions	17.5"L X 6"H X 2.2"D (44.5 cm X 5.6 cm)
Cabinets	Plastic in Black, Putty, or Off-White, Brushed Stainless Steel
Cabinets	Aluminum in Black, Putty, or Off-White, Brushed Stainless Steel
Weight	Plastic Cabinet: 2 lbs (0.9kg) Steel Cabinet: 3.8 lbs (1.7kg)
Weight	Aluminum Cabinet 2.5 lbs (1.1 kg) Steel Cabinet 5 lbs ( 2.3 kg)

**Table 1: Technical Specifications**



## **Section 4: Unpacking and Installation**

The OnTime Digital Clock arrives fully assembled in a single package. Inspect the clock and report any damage to Inova Solutions, Inc.

Once you have removed and inspected the clock, you have several mounting options to consider. The procedures for surface mounting, pendant mounting, and cantilever mounting are included on the following pages.

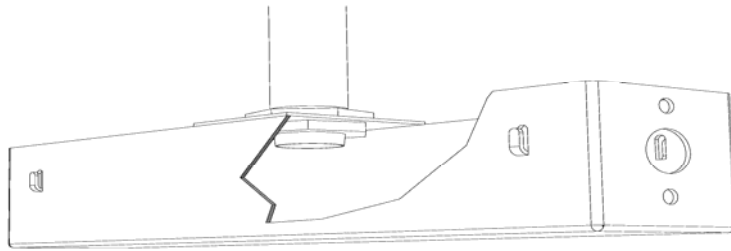
### ***Surface Mounting***

The following is a recommended procedure for surface mounting. No mounting kit is required.

1. Determine the clock mounting location.
2. Mark two points 10" (25.4 cm) apart, level, and centered on the data cable outlet.
3. Insert two flat-head fasteners suitable for the wall surface at the marked points and tighten.
4. Withdraw the fasteners until there is a 1/16" (.16cm) gap between the mounting surface and the back of the fastener head.
5. Insert the data cable into the jack located at the back of the OnTime Digital Clock.
6. Position the keyhole slots located on the rear of the clock over the fastener heads.
7. Pull the clock slightly downward until the unit is seated.

## ***Pendant Mounting – Single or Double***

The following is a recommended procedure for pendant mounting. This procedure requires a mounting kit – Model ONTKIT - and some additional hardware.



**Figure 1: Pendant Mounting**

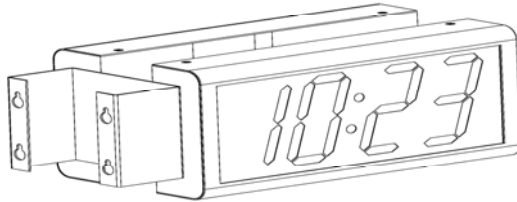
1. Determine the clock mounting location.

The illustration above suggests a recommended mounting means for a pendant mount of one or more OnTime Digital Clock. Supplement the ONTKIT with two suitable locknuts and a length of  $\frac{3}{4}$  " 1.905 cm) pipe or conduit.

2. Mark the location where the clock assembly is to be mounted, making sure that the mounting means is located beneath the data cable outlet.
3. Assemble and tighten the locknuts and pipe length as shown above.
4. Insert about 10 to 12 inches (30 cm) of data cable through the center hole of the mounting kit. Securely attach the mounting means using fasteners suitable for the surface.
5. Lift an OnTime Digital Clock into position and insert the data cable into the jack located on the back of the clock.
6. Position the keyhole slots located on the rear of the clock over the mounting tabs.
7. Pull the clock slightly downwards until the unit is seated.
8. Repeat for the second clock if two clocks are being installed back-to-back.

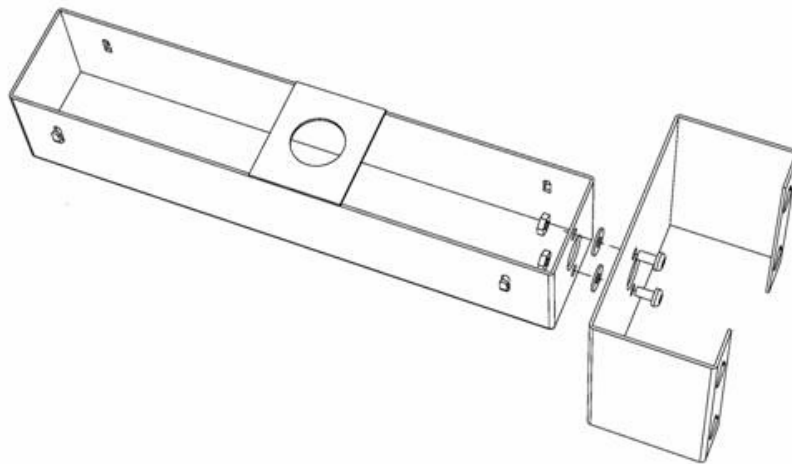
## ***Cantilever Mounting – Single or Double***

The following is a recommended procedure for cantilever mounting. This procedure requires a mounting kit, Model ONTKIT.



**Figure 2: Cantilever Mounting**

1. Determine the clock mounting location.
2. Using the template provided, mark the location where the clock is to be mounted, making sure the center is located over the data cable outlet.
3. Join the Ethernet Clock Mount (Inova p/n 714755) and the Ethernet Clock Cantilever Wall Mount (Inova p/n 714756) using a #2 Phillips screwdriver and a 3/8" (.952 cm) wrench. Make sure that the 2 washers are fitted between the Clock Mount and the Cantilever Wall Mount. Refer to the illustration below.



**Figure 3 - Mounting Kits**

4. Insert 10 to 12 inches (30 cm) of data cable through the center hole of the mounting unit.

5. Securely attach the mounting unit to the wall using fasteners suitable for the wall surface.
6. Lift the clock into place and insert the data cable into the jack located on the back of the clock.
7. Position the keyhole slots located on the rear of the clock over the mounting tabs on the clock mount.
8. Pull the clock slightly downwards until the unit is seated.
9. Repeat for the second clock if two clocks are being installed back-to-back.

## Section 5: Digital Clock Configuration

Once a clock is installed, the next step is to confirm or set the configuration . Though there are a number of settings you can confirm or change on a clock, you should concentrate on four configuration items initially. These include:

- An **IP address** so that the clock can communicate on the network.
- A **network time server** so that the clock knows which computer to synchronize its time with.
- The **local time zone** so that the clock can display the correct local time.
- The **Daylight Saving Time (DST)** rule so that the clock can automatically adapt to local DST.

Before working with these settings, however, you have to consider which configuration method to use. You have three options:

Configuration Method	Description	Reference
The <b>recommended</b> method is to assign both the IP address and all options via a DHCP configuration string.	This method is the only way to address and configure a <b>group of clocks</b> without requiring a telnet session into each clock. Clocks are factory set with DHCP enabled.  Using this method, the DHCP server is set up with a <b>clock configuration string</b> . Clocks will automatically request the configuration string when they request an IP address.	Section 6
The second method is to assign an IP address via DHCP and set individual configuration options via a telnet session.	Clocks are factory set with DHCP enabled. The options may be set using telnet commands.	Section 7
The third method is to assign an IP address and individual configuration options via a telnet session.	Use telnet commands to assign both a static IP address and the appropriate configuration options.	Section 7

**Table 2: Clock Configuration Methods**

To learn more about the recommended method of using the DHCP configuration string, continue with Section 6. To learn more about using a telnet session exclusively, refer to Section 7.

## Section 6: Using DHCP for Addressing and Configuration

### ***Configuration Planning***

The OnTime Digital Clock allows you to benefit from a DHCP option that automatically configures five settings when a clock is booted up. This option reduces the work required to configure multiple clocks, because, rather than configuring each individual clock through a telnet session, the configuration is done one time at the DHCP server. Note that because the DHCP server is likely controlled by your network administrator or IT group, you will want to discuss this topic with them and enlist their help in configuring the DHCP server.

The clocks are factory configured to request DHCP service, and further, to request a configuration string using DHCP private option 230. This DHCP configuration option can be used to establish these required settings:

The DHCP configuration option can be used to set these required settings:

- Time Server - A network time server so that the clock knows which computer to synchronize its time with.
- Time Zone - The local time zone so that the clock can display the correct local time.
- Daylight Saving Time - The DST rule so that the clock can automatically adapt to local DST.

The DHCP configuration option can also be used to establish these optional settings:

- 24 hour – The factory default is 12 hour time. Set this option if 24 hour time is desired.
- Show/hide colon – The factory default is to show a colon as a separator between hours and minutes. In 24 hour time mode, some users prefer to turn the colon separator off (for example, to show 2301 instead of 23:01).

The recommended practice is to load the configuration string into the DHCP server and then try it with one clock by re-booting the clock. As the clock boots, it will send out a query requesting a response from the DHCP server that includes an IP address, subnet mask, gateway information, etc., as well as the configuration string associated with private option 230. When the DHCP server replies to the clock with the command line associated with option 230, the clock will automatically use the command line contents to establish its settings. Once you are confident that the one clock is properly configured using these settings, you can then feel free to add additional clocks to the network knowing that they will automatically receive the proper configuration settings as well.

Here are some things to keep in mind as you set up and use DHCP private option 230:

- A clock must be re-booted to request a new configuration string from the DHCP server. The clock *does not* automatically request a new configuration string at the expiration of the DHCP lease interval.
- If private option 230 is not configured on the DHCP server, this does not cause an error condition on the clock. Rather, the clock will receive an IP address from the DHCP server in the usual fashion but the clock's settings for Time Server, Time Zone, DST, etc. will not change.
- If private option 230 is already in use for another purpose on the DHCP server, it should not interfere with the operation of the clocks. However, in order to use the DHCP configuration feature, the clock must be set (via a telnet session) to request a different private option – e.g., private option 231. See **Setting a Different DHCP Option Number on a Clock** on page 12 for additional information.

## Creating a DHCP Configuration String

The following table describes the five options that can be used in a configuration string when establishing a private DHCP server option for automatically configuring the clock. The format used is **option name=option value**, with the options separated by semicolons in the configuration string. This string is added to the DHCP server, as described in the next section. (See Table 4 for example configuration strings).

Option Name	Option Value	Configuration Setting	Description
timeserver	SNTP Time Server name or IP address	SNTP Time Server (sntp -h command)	Sets the SNTP Time server Host Name or IP address to use for time synchronization. If a Host Name is used, then the DHCP server must also provide a DNS server to use to resolve the Host Name.
timezone	hh:mm time offset	Timezone offset (timezone command)	Sets the number of hours and minutes to offset from UTC time when displaying time. This can be negative. The minutes (:mm) are optional.
dst	none, [rule specification]	Daylight Saving Time (dst command)	<ul style="list-style-type: none"> <li>• none - Disable the Daylight Saving Time adjustment.</li> <li>• Other values parsed based on the DST rule format. See the dst command for more information, the format is 8 numbers in the order: startDOW startDay startMonth startTime endDOW endDay endMonth endTime</li> </ul>
24hour	true, false, t, f	Clock hours display mode (display -t command)	If true the clock uses 24hour (military) time format and disables the AM/PM light, otherwise it uses 12hour time format and enables the AM/PM light.
showcolon	true, false, t, f	Clock colon display mode (display -c command)	If true the colon separator between the hours and minutes is lit.

**Table 3: DHCP Private Option String Parameters**

Table 4 on the next page contains examples of the configuration strings.



Command	Description
<pre>timeserver=ntp.inovasolutions.com; timezone=-5;dst=-1 8 2 2 1 1 10 2</pre>	<ul style="list-style-type: none"> <li>• Sets the time server to ntp.inovasolutions.com.</li> <li>• Sets the time zone to Eastern Standard Time (-5 hours from UTC)</li> <li>• Enables DST for US 2007 rules.</li> </ul>
<pre>timeserver=10.1.128.1; timezone=0; dst= 1 -1 2 1 1 -1 9 1</pre>	<ul style="list-style-type: none"> <li>• Sets the time server to IP Address 10.1.128.1.</li> <li>• Sets the time zone for Western European Time</li> <li>• Enables DST for EU 2007 rules.</li> </ul>
<pre>timeserver=10.1.128.1; showcolon=true ; 24hour = true ; timezone=-5;dst=-1 8 2 2 1 1 10 2</pre>	<ul style="list-style-type: none"> <li>• Sets the time server to IP Address 10.1.128.1.</li> <li>• Enables the colon display and sets the clock to 24 hour mode.</li> <li>• Sets the time zone to Eastern Standard Time (-5)</li> <li>• Enables DST for US 2007 rules.</li> </ul>

**Table 4: Examples of Common DHCP Configuration Strings**

### ***Setting a Different DHCP Option Number on a Clock***

You do not have to use DHCP configuration option 230 for the clocks. You can also create custom options using a different option number. Suppose private option 230 is already in use on your DHCP server and you want to configure your clock to use another private option instead, for example option 231. The **ipconfig** command can be used to set a different DHCP option number on the clock or to disable this feature altogether. The ipconfig command is defined in Appendix A.

### ***Verifying the DHCP Configuration Settings on a Clock***

The **dhcpcfg** telnet command lists all the configuration settings that were retrieved by the clock from the DHCP server and that are currently in effect. If an error arises while parsing the DHCP options received from the server, the error will be shown in the command's output. Look on the next page for an example.

The `dhcpconfig` command output below shows the settings that were received from the DHCP server using the configuration string in the first row of Table 4 above.

```
dhcpconfig
Using Option Code 230 for DHCP based Clock Configuration.
```

The following DHCP based configuration settings are in use:

```
Time Server   : ntp.inovasolutions.com
Time Zone     : -5
DST Rule      : -1 8 2 2 1 1 10 2
```

### ***DHCP Configuration Example for Microsoft Server***

Appendix C contains an example of how to configure private options on a Microsoft DHCP server, such as the one that is bundled with Windows 2003 Server. It is for reference only. It is assumed that skilled IT personnel are the only people authorized to edit DHCP server settings.

## Section 7: Telnet Configuration

You may also choose to configure the digital clock using a telnet session instead of using DHCP. This section describes the telnet commands used in an initial setup. These commands include:

- Accessing Help Commands
- Assigning an IP Address
- Specifying a Time Server
- Testing the Time Server Synchronization
- Selecting the Time Server
- Selecting Time Zones
- Configuring Daylight Saving Time
- Configuring 12/24 Time Format
- Configuring AM/PM Indicator
- Configuring Colons On/Off

A complete list of these telnet commands plus other optional commands can be found in Appendix A.

### ***Accessing Telnet Command Line and Signing In***

To configure your PoE clock, you must know its IP address. If you are uncertain of its address, see Page 24 in Appendix A for information on how to identify it. You can then log into the clock from a PC using telnet:

1. From the Windows Start Menu, choose Run.
2. When the Run window appears, type **cmd** and press Enter.
3. When the command line window appears, type a telnet command like this where you substitute for xxx.xxx.xxx.xxx the known IP address on your network of the PoE clock:  
**telnet xxx.xxx.xxx.xxx**

The clock login prompt appears:

```
Digital Clock  
Welcome to Clock Version xxx  
iclock login:
```

Additionally, the clock's service light begins to blink.

4. Enter the clock's login ID (**iclock**).

The clock's password prompt appears:

```
iclock password:
```

5. Enter the clock's password (the default is **timely**).

The clock's telnet prompt appears:

```
iclock />
```

You are now ready to set configuration using the telnet commands.

## ***Accessing Help Commands***

For help with a specific telnet command, at the prompt, you have two options:

**help** or **?** along with the command.

For example, to see help for the display option:

**display ?** or **help display**

## ***Assigning an IP Address***

There are two options for assigning an IP Address to each OnTime Digital Clock:

- DHCP Address [Factory Default]
- Static IP Address

### **Setting the DHCP Address**

The factory default is DHCP. When connected to the network, the clock will request DHCP service. The letters DHCP may be displayed briefly on the screen. If the DHCP message remains in place, then DHCP service is not available.

## Setting the Static IP Address

To enter a fixed IP address into your clock's firmware, start a telnet session with the clock and use the following command option:

```
ipconfig -a xxx.xxx.xxx.xxx -m yyy.yyy.yyy.yyy -g  
zzz.zzz.zzz.zzz
```

where `xxx.xxx.xxx.xxx` is the IP address, `yyy.yyy.yyy.yyy` is the subnet mask, and `zzz.zzz.zzz.zzz` is the gateway address. All fields must be provided.

**Note: Your IT staff must authorize and provide a static IP address to prevent operational problems which might occur if that address is applied to another device on the network.**

## Specifying a Time Server

The network time server on the LAN, WAN, or on the internet may be specified by IP Address or by Host Name.

- Specifying by IP address is typically only safe if the address of the server is under your IP Group's control. When specifying time servers on the internet, use the Host Name.
- Specifying by Host Name requires that a DNS server is accessible to the clock:
  - If IP addressing is static, the DNS servers must be identified and configured as well.
  - If IP addressing is via DHCP, the DNS servers are typically already automatically configured (do not over configure!)

The process for specifying a time server is the same for both Host Name and IP Address.

1. Log into the OnTime Digital Clock.
2. At the prompt, type: **sntp -h**.
3. Press the spacebar.
4. Enter the Host Name of the time server – e.g.
5. Press the Enter key.

## ***Testing the Time Server Synchronization***

It is always a good idea to test the synchronization between the clock and the time server. To do that, perform these steps:

1. At the prompt, type: **sntp -s** (Be sure there is a space between sntp and -s)
2. Press the Enter key.

The clock displays SNTP settings and immediately attempts a synchronization with the specified host (either the Host Name of the time server on your network or with an outside time standard).

## ***Selecting the Time Server***

The default time server is set to **ntp.inovasolutions.com**. In general, this setting should be changed to an internal time server under IT control. There is more information on NTP, SNTP and time server selection at [www.buyinova.com](http://www.buyinova.com) under the support tab.

## ***Selecting Time Zones***

Coordinated Universal Time (UTC) is a time standard based on the time at zero degrees longitude (also known as Greenwich Mean Time or GMT). Time zones around the world are expressed as positive or negative offsets from UTC. The default time zone setting for the clock is UTC -5, which is the time zone for (GMT -5) Eastern Time (US & Canada). You can change this setting with the following command:

```
timezone -N [or] timezone N  
where N=the time zone offset from UTC, -11 to 12.
```

**Note: If you're not sure what time zone offset to use, check the time zone value used on a Windows PC on your network; double-click the time in the Windows service tray (in the lower-right corner of your screen) and choose the Time Zone tab.**

## Configuring Daylight Saving Time

The following table identifies the process for setting daylight saving time.

No Daylight Saving Time	Type the command to disable DST: <b>dst -none</b> Press the Enter key.
In the U.S. and Canada	Type: <b>dst -rule -1 8 2 2 1 1 10 2</b> Press the Enter key.  Note: <b>dst -raw</b> will work in all clock versions. <b>dst -rule</b> works with Versions 1.1 or 1.2.
For European Daylight Saving Time	Type: <b>dst -rule 1 -1 2 1 1 -1 9 1</b> Press the Enter key.
Other locations	The support web site at <a href="http://www.buyinova.com">www.buyinova.com</a> contains a DST calculator which can compute the correct DST configurations string for you location. Obtain the correct string and enter it with the <i>dst -rule</i> command.

**Table 5: Configurations for Daylight Saving Time**

Three additional time related configuration items should also be set initially. The commands for setting 12/24, AM/PM, and Colons On/Off are identified below.

### Configuring 12/24 Time Format

**display -t 24**

Sets 24 hour display. Note the space before and after -t.

**display -t 12**

Sets 12 hour display. Note the space before and after -t.

### Configuring AM/PM Indicator

**display -p off**

Turns off pm indicator. Note the space before and after -p.

**Display -p on**

Turns on pm indicator. Note the space before and after -p.

### Configuring Colons On/Off

**display -c off**

Turns off colons. Note the space before and after -c.

**display -c on**

Turns on colons. Note the space before and after -c.

## Section 8: Troubleshooting

The following table contains several trouble conditions you may encounter with the OnTime Digital Clock and the recommended actions to take to correct the problem.

**Note: The up-to-date troubleshooting help is available in the FAQ at [www.buyinova.com](http://www.buyinova.com) under the support tab.**

Condition	Solution
Clock Face Dark	<ol style="list-style-type: none"> <li>1. Verify that an Ethernet PoE power injector is present (if required) and is operating.</li> <li>2. Reboot the clock by disconnecting the data cable, counting to five, and reconnecting the cable.</li> </ol>
Clock Shows Incorrect Time	<ol style="list-style-type: none"> <li>1. If the Service Light is illuminated (see below).</li> <li>2. If the minutes past the hour are correct, verify the Time Zone and Daylight Saving Time settings.</li> </ol>
DHCP Message on Clock Face	<ol style="list-style-type: none"> <li>1. The clock has failed to receive an IP address from the DHCP server.</li> <li>2. Contact your IT group responsible for DHCP service.</li> </ol> <p><b>Note: that the clock is reachable through its fixed link-local address for diagnostic or re-configuration purposes. The link-local address is 169.254.0.100</b></p>
Service Light Blinking	<p>The service light is located at the bottom right of the clock face.</p> <ol style="list-style-type: none"> <li>1. There is an active telnet configuration session in progress on the clock.</li> </ol>
Service Light On	<p>The service light is located at the bottom right of the clock face.</p> <ol style="list-style-type: none"> <li>1. Reboot the clock to verify that it properly receives a DHCP address.</li> <li>2. Verify that the SNTP server configuration is valid as the service light will also be illuminated after several missed updates. Refer to the "Testing the Time Server Synchronization" section in Section 7: Telnet Configurations</li> </ol>
Determine the IP Address of a Clock	<p>If the IP Address of each clock has not been recorded during installation, it is suggested to follow this power cycle procedure.</p> <ol style="list-style-type: none"> <li>1. Lift UP gently on the unit to free the keyholes at the rear of the clock from the mounting hardware.</li> <li>2. Disconnect the network cable from the clock in question and count to five.</li> <li>3. Replace the network cable and watch the face of the Inova Digital Clock.</li> </ol> <p>It will display its IP address as it boots.</p>
Clock showing -----	No Time Server/Time Server down
Other Problems	Refer to the FAQ at <a href="http://www.buyinova.com">www.buyinova.com</a> under the support tab.

**Table 6: Troubleshooting OnTime Digital Clock**



## Section 9: Recording Static IP Addresses or Host Names

In order to make the management of your OnTime Digital Clock system as easy as possible, Inova recommends that you record the IP Address/Host Name for each unit in the system as it is installed. Refer to Appendix A to see how to determine the IP Address of a clock.

A table is provided below for recording each IP Address/Host Name as the unit is installed. Record the Clock ID in column 1, the location in column 2, and the IP Address/Host Name in column 3.

The Host Name will be visible in most DHCP servers. It should describe the location so that the IP Address of a particular clock will be easy to locate by matching up the Host Name.

CLOCK ID#	LOCATION	IP ADDRESS/HOST NAME

**Table 7: Recording IP Addresses or Host Names**

## Section 10: Maintenance

The OnTime Digital Clock requires little or no maintenance.

- A minimum of one daily visual inspection at the beginning of each shift is recommended for the entire system.
- With the exception of periodic cleaning of the clock faces with a soft clean cloth, no routine maintenance of the system is required.

**Note: Attempting to repair/replace the Digital Clock internal components may void the warranty on that unit. Instead, during the warranty period, failed units should be sent to Inova for repair, and the failed unit replaced with a spare.**

After the warranty period, you may send the OnTime Digital Clock units to Inova under RMA procedures for repair. See the next section for more information.

## **Section 11: Product Warranty**

Inova Solutions warrants the Inova Digital Clock to be free from defects in material and workmanship during a one-year period. The Warranty begins on the date the unit is shipped from Inova Solutions.

Inova Solutions liability under this Warranty is limited to repairing or replacing, at Inova Solutions' option, the defective equipment and providing upgrade version changes for firmware. In cases of repair, the product must be returned to an authorized Service Center.

This Warranty does not apply if repairs are required due to acts of nature beyond Inova Solutions' control (such as, but not limited to, lightning strikes and power surges), misuse, damage, neglect, or if repairs/modifications have been made or attempted by anyone other than personnel authorized by Inova Solutions.

IN NO EVENT WILL INOVA SOLUTIONS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES FROM THE SALE OR USE OF THIS PRODUCT. THIS DISCLAIMER APPLIES BOTH DURING AND AFTER THE TERM OF THE WARRANTY. INOVA SOLUTIONS DISCLAIMS LIABILITY FOR ANY IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A SPECIFIC PURPOSE.

### ***Repair and Return***

To obtain service under this Warranty, contact Inova Solutions at (888) 637-1079 or at the address below during the Warranty period to receive a Return Material Authorization (RMA) number and shipping instructions. Then ship the product believed to be defective, transportation prepaid, for inspection.

Inova Solutions will not be responsible for dismounting and remounting of Inova Digital Clocks, for unauthorized returns, or for returns that do not list the RMA number and quantity returned on a packing list attached in plain view on the outside of the shipping container.

Ship to:  
Inova Solutions  
110 Avon Street  
Charlottesville, VA 22902  
Attn: RMA XXXXXXX

Typical equipment repair or replacement time is seven (7) business days, plus shipping times. One-way shipping is the Customer's responsibility. Inova Solutions will return ship the equipment by the same means it was received.

## Section 12: Glossary of Terms

Cantilever Mount	This is a wall mount to the left or right side of the OnTime Digital Clock unit, illustrated in Section 4, requiring the Digital Clock Mounting Kit, Inova Part Number ONTKIT.
DHCP	Dynamic Host Configuration Protocol (DHCP) is a communications protocol that lets network administrators manage and automate the assignment of IP Addresses on an organization's network.
DNS	The Domain Name System (DNS) is the way that Internet domain names are located and translated into IP Addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address.
Flush Inset	This model may be backplate-mounted to a customer-supplied enclosure.
GMT	Greenwich Mean Time, since replaced with UTC, the world time standard.
Host Name	Unique identifier for a device on a TCP/IP network. For example: 3rdFlrConfRm
IP Address	Unique identifier for a device on a TCP/IP network. For example: 11.15.55.233
Pendant Mount	This is a ceiling mount, illustrated in Section 4, requiring the Digital Clock Mounting Kit, Inova Part Number ONTKIT.
PoE	Power over Ethernet, IEEE 802.3af
SNTP	Simple Network Time Protocol
Surface Mount	This is a simple flat wall mount identified in Section 4. No mounting kit is required.
Telnet	A network protocol and a software program that allows you to remotely access the command console of a computer over a network.
UTC or GMT	Universal Coordinated Time, formerly Greenwich Mean Time is the World Time Standard. UTC is, by definition, the same at every point on Earth. Local times are indicated by offsets from UTC.

## Appendix A: Digital Clock Configuration

This section summarizes the configuration options available with the Digital Clock.

Condition	Solution
Get help for clock commands	<p><b>? or help</b> To see a list of all the telnet command options for which help is available.</p> <p>To see help for a particular command option, type the command option <b>help</b> followed by <b>?</b>. For example, to see help for the <b>display</b> option:  <b>display ?</b> or <b>help display</b></p>
Determine the IP Address of a Clock	<p>If the IP Address of each clock has not been recorded during installation, it is suggested to follow this procedure.</p> <ol style="list-style-type: none"> <li>1. Lift UP gently on the unit to free the keyholes at the rear of the clock from the mounting hardware.</li> <li>2. Disconnect the network cable from the clock in question and count to five.</li> </ol> <p>Replace the network cable and watch the face of the clock. It will display its IP address as it boots.</p>
Display the configuration settings for clock	<p><b>config</b> Display all configuration parameters except those sent by the DHCP server. Use the DHCP config command to view these superseding options</p>
View or change the Daylight Saving Time (DST) setting	<p><b>No Daylight Saving Time</b> - Type the command to disable DST: <b>dst -none</b>            Press the Enter key.</p> <p><b>US and Canada</b> - Type: <b>dst -rule -1 8 2 2 1 1 10 2</b>            Press the Enter key.</p> <p><b>European</b> - Type: <b>dst -rule 1 -1 2 1 1 -1 9 1</b>            Press the Enter key .</p> <p><b>Other Locations</b> – The support web site at <a href="http://www.buyinova.com">www.buyinova.com</a> contains a DST calculator which can compute the correct DST configurations string for you location. Obtain the correct string and enter it with the <i>dst -rule</i> command.</p>

<p>View or Configure Clock's IP settings</p>	<p><b>ipconfig</b> To view clock's current IP settings:</p> <p><b>ipconfig -o xxx</b> Use DHCP to lease an IP address and request a configuration string where xxx is the private option number. Factory default is 230.</p> <p><b>ipconfig -o - 0</b> will disable the configuration portion of the DHCP process.</p> <p><b>ipconfig -d</b> Use DCHP to lease an IP address and retrieve network settings.:</p> <p><b>ipconfig -a xxx.xxx.xxx.xxx -m yyy.yyy.yyy.yyy -g zzz.zzz.zzz.zzz</b> where xxx.xxx.xxx.xxx is the IP address, yyy.yyy.yyy.yyy is the subnet mask, and zzz.zzz.zzz.zzz is the gateway address. (All the information is ignored if DHCP is enabled.) - To configure a static IP address:</p> <p><b>ipconfig -h hostname</b> where hostname is the new hostname. - To change the hostname of the clock.</p>
<p>View current SNTP settings or Change Time Server setting</p>	<p><b>sntp</b> To view the current time server and other SNTP settings:</p> <p><b>sntp -h xxx.xxx.xxx.xxx</b> where xxx.xxx.xxx.xxx is the hostname or IP address of the desired time server. - To change the time server the clock synchs with.</p> <p><b>sntp -s</b> To trigger an immediate SNTP time synchronization.</p>
<p>Change the Time Zone</p>	<p><b>timezone</b> To view the clock's current time zone setting.</p> <p><b>timezone -N or timezone N</b> To change the clock's time zone setting, (don't use a + sign for positive values) where N = the desired time zone offset in the range -11 to 12.</p> <p>For example, to set the time zone for (GMT -5) Eastern Time (US &amp; Canada), you would use: <b>timezone -5</b></p> <p><b>Note:</b> If you're not sure what time zone offset to use, check the time zone value used on a Windows PC on your network; double-click on the time in the Windows service tray (in the lower-right corner of your screen) and choose the Time Zone tab.</p>
<p>Specifying a Time Server</p>	<p><b>sntp -h hostname</b> where <i>hostname</i> is the hostname of the time server.</p>
<p>Testing the Time Server Synchronization</p>	<p><b>sntp -s</b></p>
<p>Verifying DHCP Configuration settings</p>	<p><b>dhcpcconfig</b> Lists the option settings received from a DHCP server (for verification purposes only).</p>
<p>Display all Address Resolution Protocol (ARP) cache entries</p>	<p><b>arp</b></p>

View log on session screen or enable/disable logging	<p><b>Log</b> To view the log on the session screen.</p> <p><b>log on off</b> To enable/disable logging.</p> <p>When logging is enabled, by typing "log on", the idle session time out feature is disabled.</p>
List all TCP connections	<b>netstat</b>
Display info to diagnose DNS problem with SNTP server	<b>nslookup</b> SNTPServerName where SNTPServerName is the hostname or IP address of an SNTP server.
Configuring the 12/24 Time Format	<p><b>display -t 24</b> Sets 24 hour display. Note the space before and after -t</p> <p><b>display -t 12</b> Sets 12 hour display. Note the space before and after -t</p>
Configuring the AM/PM Indicator	<p><b>display -p off</b> Turns off pm indicator. Note the space before and after -p</p> <p><b>display -p on</b> Turns on pm indicator. Note the space before and after -p</p>
Configuring Colons On/Off	<p><b>display -c off</b> Turns off colons. Note the space before and after -c</p> <p><b>display -c on</b> Turns on colons. Note the space before and after -c</p>
Update clock firmware	Refer to FAQ at <a href="http://www.buyinova.com">www.buyinova.com</a> under the support tab.
Reboot the clock	<b>reboot</b>

**Table 8: Configuration Commands**

## Appendix B: SNTP Basics

SNTP is an acronym for **Simple Network Time Protocol**. SNTP is widely used to synchronize time on computers. Certain computers within a LAN or on the internet have the responsibility of maintaining accurate time in order to provide a time standard for the network. Your network administrator should be able to direct you to an appropriate local time server for your environment.

The OnTime Digital Clock must be configured with the network location of a time server. The default time server is an internet time server operated by Inova.

Periodically, a computer transmits a time query in order to synchronize its time with a time server. Every two hours the OnTime Digital Clock transmits a time query to the time server and the time server replies. With the reply in hand, the clock calculates the time offset, or correction, that it needs to apply to its current time and then makes the update.

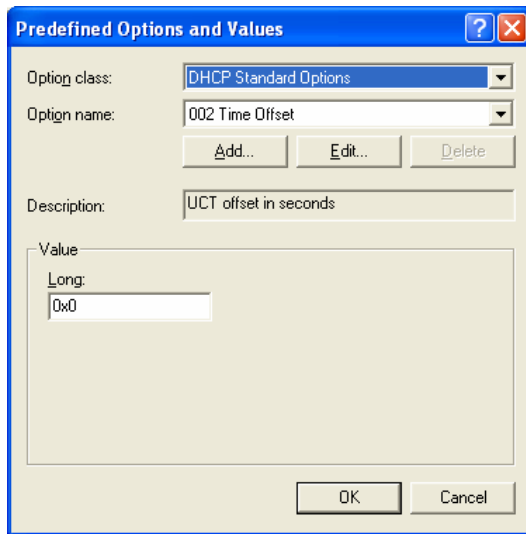
In the event that the time server does not reply, the OnTime Digital Clock continues to display time while it retries the time server. After repeated unsuccessful tries, the clock illuminates its Service Light (an LED dot at the lower right-hand side of the clock), indicating that the displayed time is no longer synchronized.



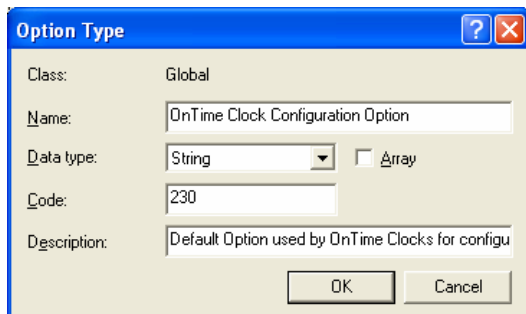
## Appendix C: Configuring DHCP Options for Microsoft Servers

This section details how to configure private options on a Microsoft DHCP server, such as the one that is bundled with Windows 2003 Server. It is for reference only and may not represent the specific options that you may encounter.

1. Launch the DHCP Management Console.
2. Select the DHCP server to configure.
3. Choose the Action "Set Predefined Options..."



4. Choose "Add..." a new option.



5. Set the Data type to 'String'.
6. Use the option code that matches your clock configuration. The default option code is 230.

7. Select either the Server Options or Scope Options and choose "Configure Options...".
8. Select the Option in the list and select the checkbox to enable it.
9. Enter the configuration string you've developed for your unique operating environment and geographic location.

