

# Inova OnTime<sup>®</sup> Clock Installation and User Guide Firmware version 2



Inova OnTime Clock  
Installation and User Guide  
Firmware Version 2

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# Table of Contents

<b>1. OnTime Introduction .....</b>	<b>1</b>
1.1. Clock Identification .....	2
<b>2. Safety Instructions .....</b>	<b>3</b>
<b>3. Technical Specifications.....</b>	<b>4</b>
<b>4. Installation .....</b>	<b>5</b>
4.1. Pre-Installation.....	5
4.2. Unpack the Clock .....	5
4.3. Power over Ethernet Cabling Plan.....	5
4.3.1. Small Scale Installations .....	5
4.3.2. Sites with PoE Enabled Network Equipment .....	6
4.3.3. Sites with no Existing PoE Equipment.....	6
4.4. Surface Mounting the Analog Clock .....	7
4.5. Mounting the Double Sided Analog Clock .....	8
4.6. Surface Mounting the Digital Clock.....	8
4.7. Pendant Mounting the Digital Clock – Single or Double .....	11
4.8. Cantilever Mounting the Digital Clock – Double Sided .....	12
4.9. Recessed Mounting the Digital Clock .....	13
4.10. Power Up and Verification.....	16
<b>5. Configuration.....</b>	<b>17</b>
5.1. Network Parameters.....	17
5.2. Time Parameters .....	18
5.3. Management Parameters .....	18
5.4. Clearing the Configuration .....	19
5.4.1. Digital Clock .....	19
5.4.2. Analog Clock.....	19
<b>6. Automatic Configuration Using DHCP .....</b>	<b>20</b>
6.1. Overview.....	20
6.2. DHCP Configuration Settings .....	21
6.3. DHCP Configuration Test and Rollout .....	21
6.4. Creating a DHCP Configuration String .....	21
6.5. Novanex OnTime Management Settings .....	23

6.6.	Setting Different a DHCP Option Number on a Clock.....	24
6.7.	Verifying the DHCP Configuration Settings on a Clock .....	24
6.8.	DHCP Configuration Example for Microsoft Server .....	25
<b>7.</b>	<b>Manual Configuration Using Telnet.....</b>	<b>26</b>
7.1.	Establishing a Telnet Connection to the Clock .....	26
7.2.	Configuring an IP Address.....	27
7.2.1.	DHCP.....	27
7.2.2.	Assigned Static IPv4 Address .....	27
7.3.	Specifying a Primary or Secondary Time Server .....	28
7.4.	Setting the Time Zone .....	29
7.5.	Configuring Daylight Saving Time .....	30
<b>8.</b>	<b>Troubleshooting.....</b>	<b>31</b>
<b>9.</b>	<b>Warranty and Maintenance.....</b>	<b>33</b>
9.1.	Warranty.....	33
9.2.	Repair and Returns .....	33
<b>10.</b>	<b>Glossary of Terms.....</b>	<b>34</b>
	<b>Appendix A: Clock Configuration.....</b>	<b>35</b>
	<b>Appendix B: Configuring DHCP Options for Microsoft Servers .....</b>	<b>39</b>
	<b>Appendix C: Clock Management System Support.....</b>	<b>41</b>

## 1. OnTime Introduction

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

PoE technology allows devices to get both power and data over standard network cabling. It is the same technology that powers Voice over Internet Protocol (VoIP) 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 Uninterrupted Power Supply (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 PoE for the OnTime Clocks to operate.

This document contains:

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

Novanex maintains a support website for registered customers at [support.novanexsolutions.com](http://support.novanexsolutions.com). This website contains:

- Frequently asked questions
- Support information
- Access to the OnTime Management System to manage your clock system

## 1.1. Clock Identification

This manual applies only to the current firmware version of the OnTime Clock, known as firmware version 2. Refer to the table below to determine which model you have. If you believe that you have an OnTime Clock Firmware Version 1, please refer to [OnTime Support](#) for the appropriate manual.

	Firmware Version 2	Firmware Version 1
<b>Production Years</b>	Mid-2015 to present	2005 to mid-2015
<b>Firmware Versions</b>	2.x	1.x
<b>Organizationally Unique Identifier (OUI), or MAC Address Prefix</b>	00-30-D1	00-60-35
<b>Digital Clock Identification</b>	Observe the firmware version on a reboot or power cycle and look for firmware version 2.x	Observe the firmware version on a reboot or power cycle and look for firmware version 1.x
<b>Analog Identification</b>	No LED Digits on the Rear	Look for LED Digits on the rear, which indicate a firmware version 1 clock

## 2. Safety Instructions

Read and understand all instructions before installing or operating an OnTime Clock. This product is safe when installed and operated as described in this user guide.

- To prevent injury, damage to the unit, or other harm, read this manual in its entirety before installing or operating the clock.
- Observe normal safety precautions and use appropriate safety equipment (safety glasses, gloves, ladders, etc.) when installing this product.
- Never install wiring during a lightning storm.
- Never install data jacks or electrical wiring in wet locations unless the equipment is specifically designed for that purpose.
- Be sure that mounting hardware is suitable for the mounting surface and sufficient to support the weight of the clock.
- Observe all local codes when installing the product.
- This product is not a toy! Please keep it out of the reach of children.
- Operation of this product in a manner inconsistent with the instructions in this manual may result in personal injury and damage to the product and will void the warranty.
- Do not use harsh cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing injury or damage.
- This product is not approved for damp or wet locations; it is certified for dry, indoor installation.
- This clock is PoE only and does not require a battery. A battery may result in battery corrosion or leakage and damage to components. Forcing in a battery will void your warranty.

### 3. Technical Specifications

The OnTime Clock is available in three models with the specifications listed in Table 1.

**Table 1: Technical Specifications**

Technical Specifications			
	Analog	Digital (hh:mm)	Digital (hh:mm:ss)
<b>Display Face</b>	Analog Clock Dial 12" (30 cm)	4-Digit Red or green 7-segment LED	6-Digit Red or green 7-segment LED
<b>Viewing Distance</b>	100 feet (30.5 meters)	150 feet (45.7 meters)	150 feet (45.7 meters)
<b>Standard Cabinet</b>	Black injection molded plastic	Black injection molded plastic	Black painted aluminum
<b>Optional Cabinet</b>	Double sided	Putty or off-white injection molded plastic, Black painted aluminum, Brushed stainless steel	Brushed stainless steel
<b>Accuracy</b>	+/- 1 Second	+0/-200 milliseconds	+0/-200 milliseconds
<b>Power Consumption</b>	PoE, IEEE 802.3af /at compliant Single sided: 3W Double sided: 4W	PoE, IEEE 802.3af /at compliant 8W actual consumption	PoE, IEEE 802.3af /at compliant 9.5W actual consumption
<b>Dimensions</b>	<i>Single sided:</i> 12 <sup>3</sup> / <sub>4</sub> " diameter x 1 <sup>7</sup> / <sub>8</sub> "D (29.5 cm x 5.1 cm) <i>Double sided:</i> 12 <sup>3</sup> / <sub>4</sub> " diameter x 4"D (29.5 cm x 10.8 cm)	12"L x 6"H x 2.28"D (30.5 cm x 15.2 cm x 5.8 cm)	17.5"L x 6"H x 2.28"D (44.5 cm x 15.2 cm x 5.8 cm)
<b>Weight</b>	<i>Single sided:</i> 1.6 lbs (0.73 kg) <i>Double sided:</i> 7 lbs (3.2 kg)	<i>Plastic Cabinet:</i> 1.6 lbs (0.7 kg) <i>Aluminum Cabinet:</i> 2.2 lbs (1.0 kg) <i>Stainless Steel Cabinet:</i> 4.1 lbs (1.85 kg)	<i>Aluminum Cabinet:</i> 3.25 lbs (1.47 kg) <i>Stainless Steel Cabinet:</i> 5.6 lbs (2.5 kg)
<b>Recessed Mount Option</b>	Not available	Black or stainless steel	Black or stainless steel
<b>Network Interface</b>	10/100 BaseT		
<b>Operating Temperature</b>	32° to 104° F (0° to 40° C)		
<b>Operating Humidity</b>	95% maximum, non-condensing		
<b>Certifications</b>	UL/CSA 60950-1, ETL Listed, CE Marked, RoHS Compliant		
<b>Warranty</b>	Three (3) years, returned to factory. Refer to Section 9 for warranty details.		



## 4. Installation

### 4.1. Pre-Installation

Before installing any clock, you should:

- Obtain all necessary permissions from facilities managers or property owners.
- Develop a LAN diagram showing the desired location of each unit.
- Plan the Power over Ethernet (PoE) power solution.
- Select a mounting method for the clock.
- Acquire tools and materials including assorted screwdrivers, power drill, and other materials necessary to ensure that mounting brackets are installed in compliance with building codes and restrictions.

### 4.2. Unpack the Clock

When the clock shipment arrives, inspect all packing boxes for damage. Unpack all clocks and inspect them so that you can report any damage to Novanex.

### 4.3. Power over Ethernet Cabling Plan

The OnTime Clocks require connection to PoE enabled network equipment that can source power in compliance with IEEE 802.3af. PoE power is commonly used to power devices such as wireless Access Points and IP telephones; it is usually injected into the LAN using either PoE enabled Ethernet switches or Mid Span power injectors. Consult with your IT group to make sure that the required PoE equipment is in place.

#### 4.3.1. Small Scale Installations

Single port PoE power injectors are the best means of powering PoE devices for a demonstration system or a small scale deployment. Novanex offers a single port PoE injector for sale to support these systems (see Figure 1). Refer to the [OnTime Store](#) for more information on this part.

A power injector is typically installed in the communications room, and passes Ethernet communications through while also injecting power in accordance with the IEEE 802.3af standard. The 48 VDC power is only supplied to devices that request it through a handshake mechanism, so normal Ethernet devices are not damaged if connected to a standard PoE port. Note that a power injector requires a connection to AC power, and may be connected to a battery backed uninterruptable power supply (UPS).

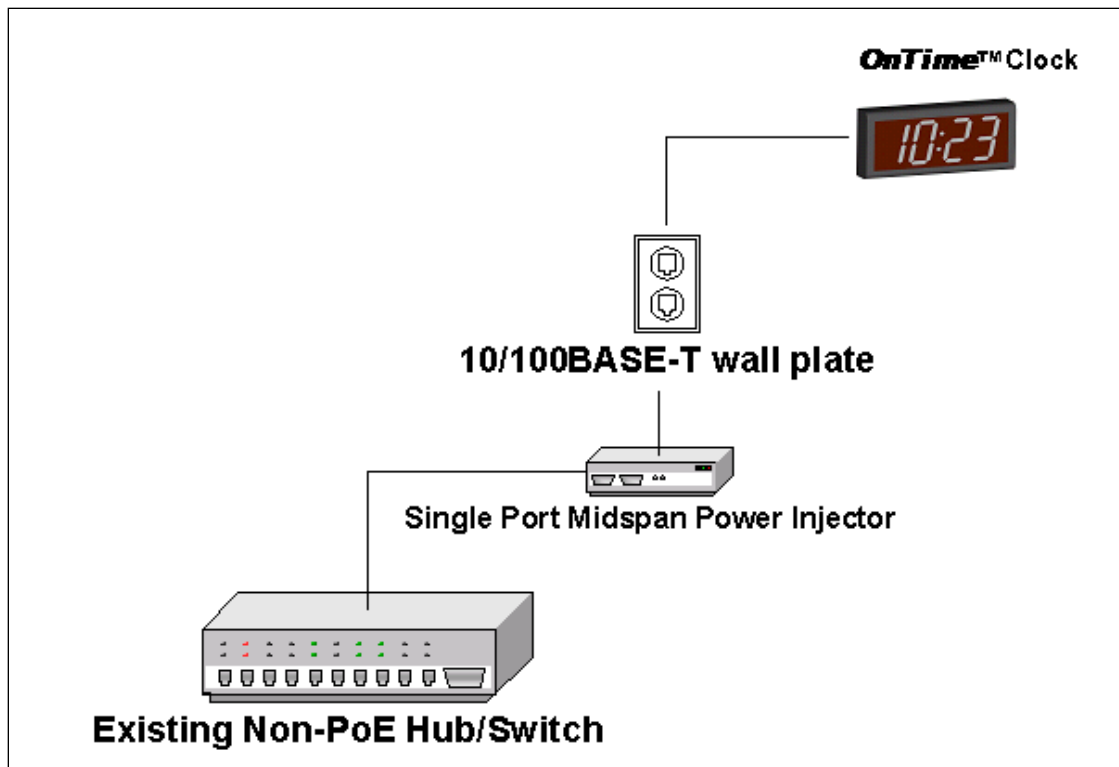


Figure 1: PoE Cabling Plan

#### 4.3.2. Sites with PoE Enabled Network Equipment

Sites that are already equipped with PoE enabled network equipment are most likely already compatible with the OnTime Clock. The OnTime Clock will automatically request and receive power from a PoE enabled switch that conforms to the IEEE 802.3af standard.

If the site plan calls for a significant number of clocks to be powered from a single piece of network equipment, it may be useful to verify that that piece of equipment can deliver the necessary power. Some PoE enabled switches cannot deliver the full IEEE 802.3af power of 15.4 Watts per port or may require certain power options to do so. Refer to the specifications in Table 1 for the actual power consumption of all of the units and to the manual for your particular PoE enabled power sourcing equipment.

#### 4.3.3. Sites with no Existing PoE Equipment

Sites that are not currently equipped with PoE enabled network equipment are typically best served by Midspan Power Injectors. The Midspan Power Injector is a multi-port rack mounted device that looks a lot like an Ethernet Switch. Typically it is installed in the rack near the existing Ethernet switch, and any ports that require PoE service are routed through the Midspan Power Injector. These units are typically available in 6

port, 12 port, 24 port, or 48 port configurations. The [OnTime Store](#) offers a single port PoE injector for sale to support demonstration systems. *Note that Midspan Power Injectors can also be configured for battery backup.*

The OnTime Clocks require connection to a PoE enabled LAN. PoE power is usually injected into the LAN using either PoE enabled Ethernet switches or Mid Span power injectors. Consult with your IT group to make sure that the required PoE equipment is in place.

#### 4.4. Surface Mounting the Analog Clock

The following is a recommended procedure for surface mounting the analog clock:

1. Determine the clock mounting location.
2. Mark the Mounting Point location.

*Note that the Mounting Point is located 1" (2.54 cm) below the top of the clock rim.*

3. Refer to Figure 2 to install the junction box for the data cable (if required) centered 2 1/2" (5 cm) to the right of the Mounting Point.

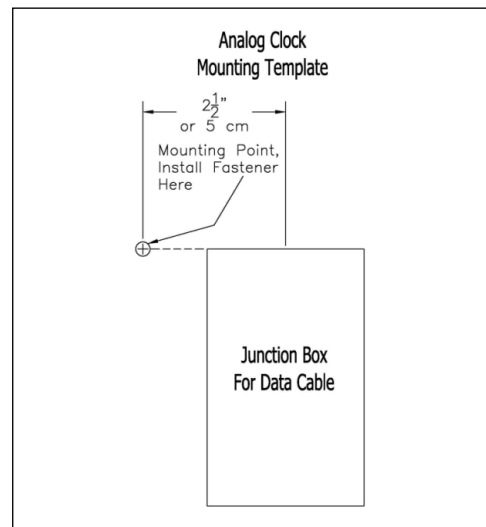


Figure 2: Analog Clock Mounting Template

4. Insert a flat-head fastener suitable for the wall surface at the marked point and tighten.
5. Withdraw the fastener until there is a 1/8" (or a little more than 1/2 cm) gap between the mounting surface and the back of the fastener head.
6. Insert the data cable into the jack located at the back of the OnTime Clock.
7. Position the keyhole slot located on the rear of the clock over the fastener head.
8. Pull the clock slightly downward until the unit is seated securely.

## 4.5. Mounting the Double Sided Analog Clock

1. Determine mounting location. There should be a solid stud or post for mounting a solid masonry type junction box and to hold the weight of the double sided clock.
2. Mount a solid masonry junction box, two gang size, (item 1 in Figure 3) to the stud or post in accordance with local regulations.

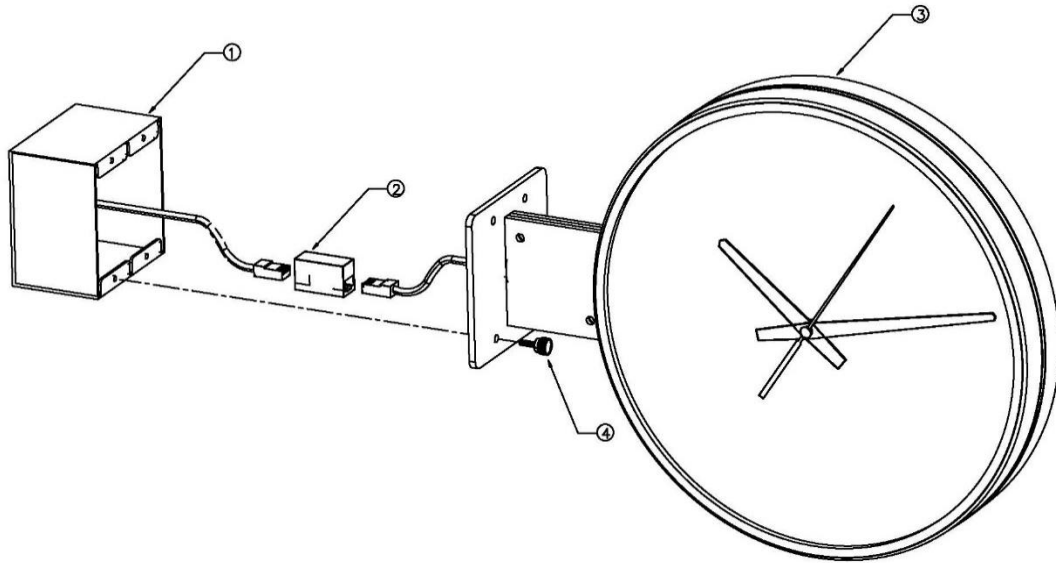


Figure 3: Analog Clock Double Mount Assembly

3. Route the data cable to the junction box in accordance with local regulations.
4. Plug the data cable into the connector (item 2 in Figure 3).
5. Mount the clock assembly (item 3 in Figure 3) to studs on the junction box and secure the unit with the knurled screws provided (item 4 in Figure 3).
6. For ceiling mount applications, the orientation of the clocks can be corrected by gripping each clock face one at a time and rotating approximately 15° counterclockwise so that it comes free. Then, turn the clock to the desired orientation and reinstall it by rotating in clockwise until you feel the detent.

## 4.6. Surface Mounting the Digital Clock

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

1. Determine the clock mounting location.

2. Mark two points 10" (25.4 cm) apart which are level and centered on the data cable outlet.

*Note that both models are mounted with a ten inch distance between screw hole centers; however, the best location for the wall jack varies. Refer to the templates in Figure 4 and Figure 5 to ensure that you line the wall jack up with the recess in the back of the unit.*

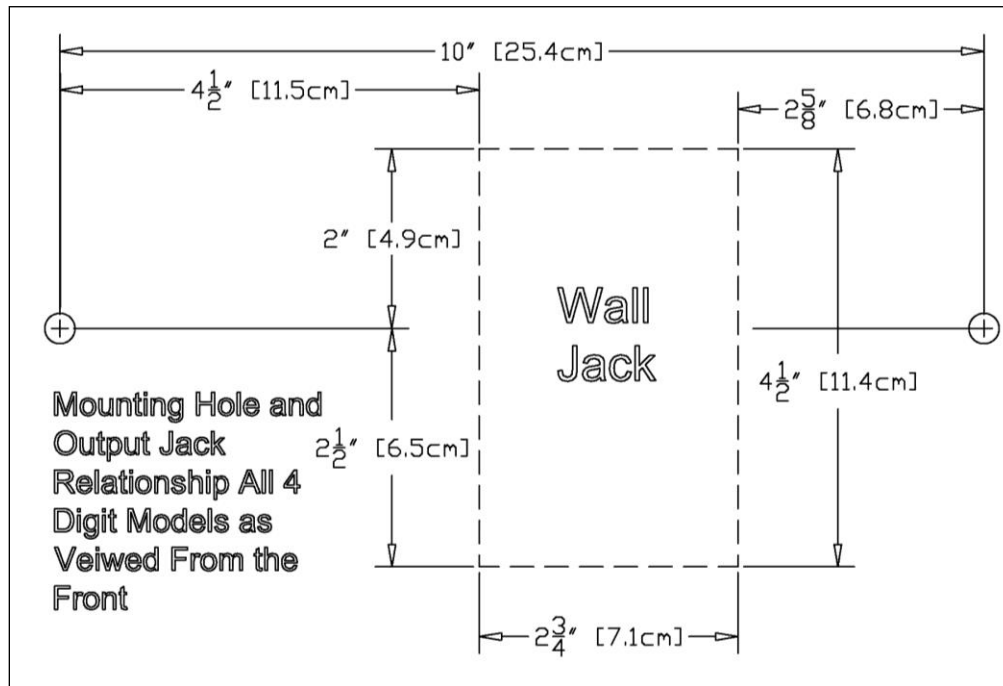


Figure 4: Mounting Template for 4-Digit Clocks

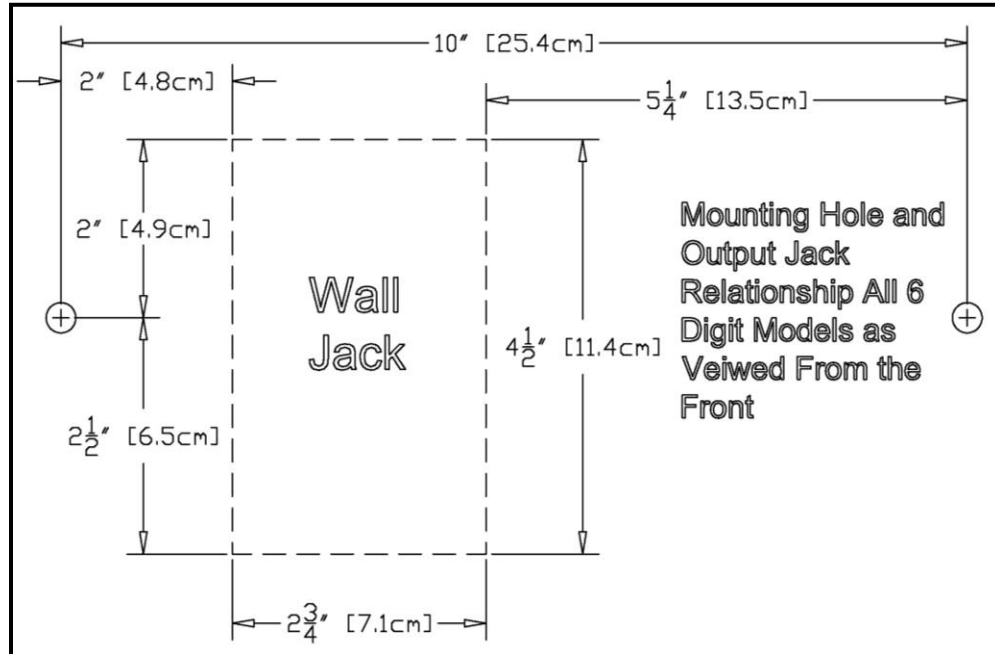


Figure 5: Mounting Template for 6-Digit Clocks

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 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 securely.

## 4.7. Pendant Mounting the Digital Clock – Single or Double

The following is a recommended procedure for pendant mounting. This procedure requires a mounting kit (either ONT4KIT or ONT6KIT) and some additional hardware.

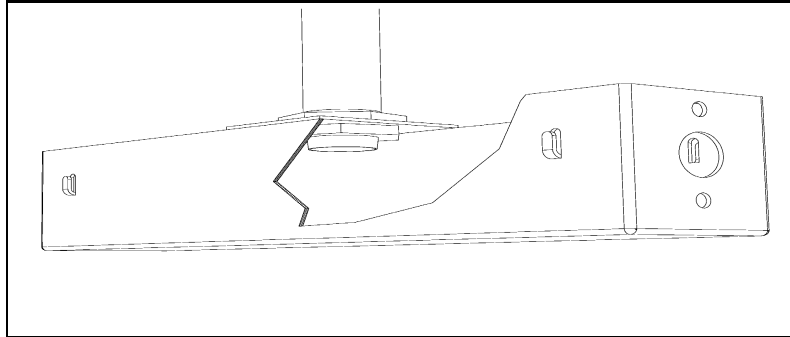
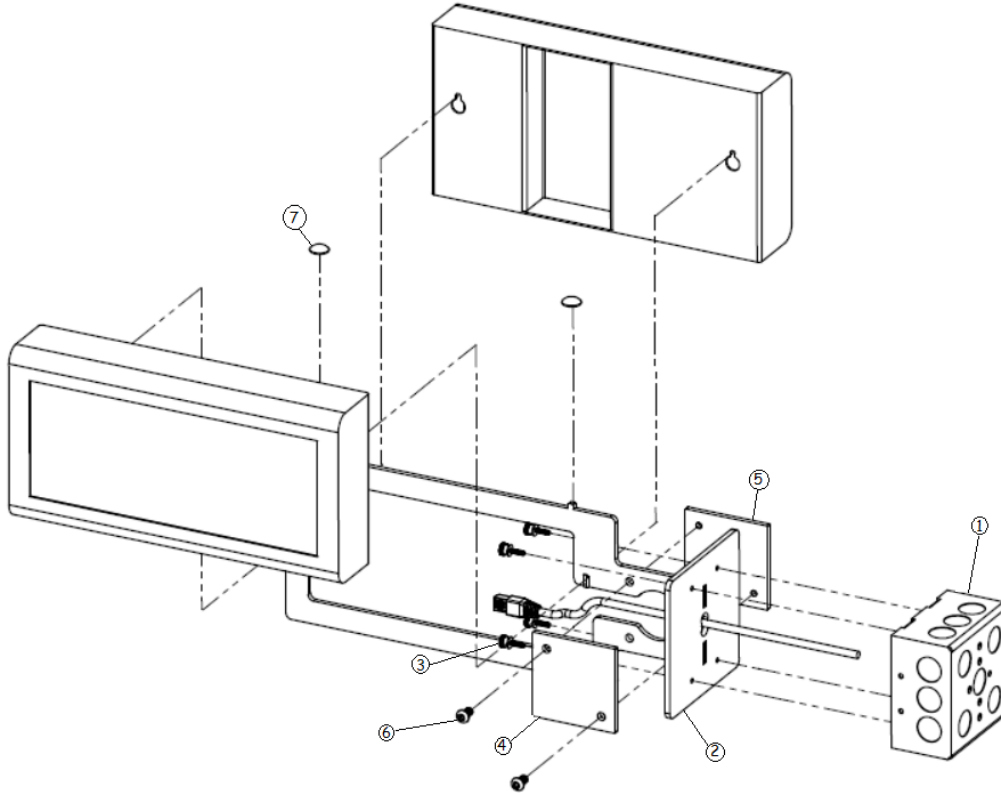


Figure 6: Digital Clock Pendant Mounting

1. Determine the clock mounting location.  
*Note: The illustration above suggests a recommended mounting means for a pendant mount of one or more OnTime Clocks. Supplement the mounting kit with two suitable locknuts and a length of  $\frac{3}{4}$ " (1.9 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 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.

## 4.8. Cantilever Mounting the Digital Clock – Double Sided

The following is a recommended procedure for cantilever mounting. This procedure requires a cantilever mounting kit (either ONT4KIT-W or ONT6KIT-W).



**Figure 7: Digital Clock Cantilever Mounting**

1. Determine the clock mounting location. There should be a solid stud or post for mounting a solid masonry type junction box and to hold the weight of the double sided clock.
2. Mount a solid masonry junction box, two gang size (item 1, Figure 7), to the stud or post in accordance with local regulations.
3. Route the 2 data cables to the junction box in accordance with local regulations, then route the data cables through the hole in the back of the mount (item 2, Figure 7). The 4 digit clocks will require at least 12" (30.48cm) once through the hole and the 6 digit clocks will require at least 18" (45.72cm).
4. Attach mount (item 2, Figure 7) to the junction box using thumbscrews (item 3) provided.
5. Attach cover plates (items 4 and 5, Figure 7) with screws (item 6) using 5/32" allen wrench (provided).



6. One at a time, insert a data cable into the RJ45 jack located in the rear of each clock. Any excess cable can be stowed inside the well in the back of the clock.
7. Position the keyhole slots located on the rear of the clock on the hanger hooks located on the mount.
8. Pull the clock slightly downwards until the unit is seated securely.
9. Install the 2 retention fasteners (item 7, Figure 7) to secure the clocks to the mount.

#### 4.9. Recessed Mounting the Digital Clock

The recessed mounting feature of the OnTime Clock provides an attractive, streamlined mounting that blends with all room decors. This simple system hides the clock body, while still giving full viewing access to the time face with no visible wiring.

The following is the recommended procedure for recessed mounting.

1. Ensure that the location that is chosen for mounting is pre-wired with a data network feed.
2. Cut an appropriately-sized opening into the wall. Refer to Table 2 for appropriate dimensions for the opening.

Model	Horizontal Dimension	Vertical Dimension
4-Digit	12 <sup>3</sup> / <sub>8</sub> " or 31.4 cm	6 <sup>1</sup> / <sub>2</sub> " or 16.5 cm
6-Digit	17 <sup>7</sup> / <sub>8</sub> " or 45.4 cm	

**Table 2: Dimensions for Mounting Digital Clock**

Clearance within the wall should be at least 2 <sup>1</sup>/<sub>2</sub>" (6.4 cm) deep to allow for the clock body.

When cutting the opening please refer to the template provided in *Figure 8 and Figure 9*. This will help ensure that the opening is square as well as the proper size and in the correct location.

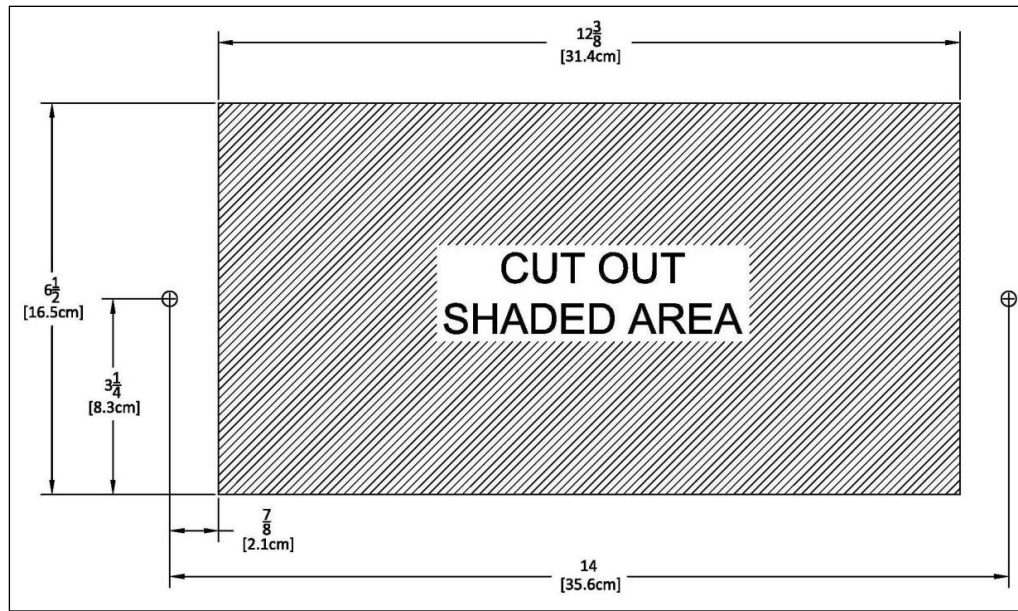


Figure 8: Cut-out Template for 4-Digit Clocks

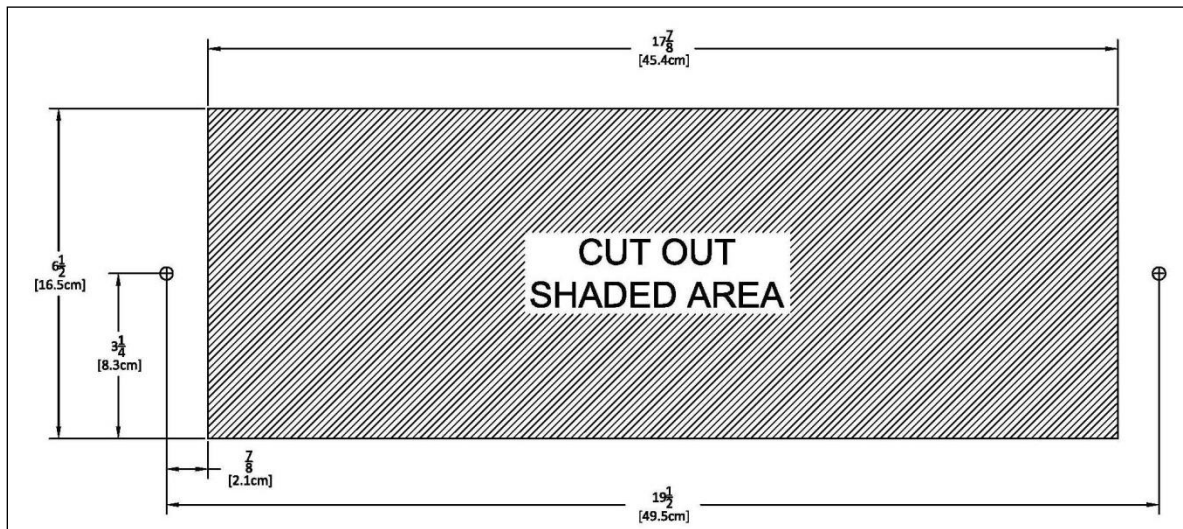
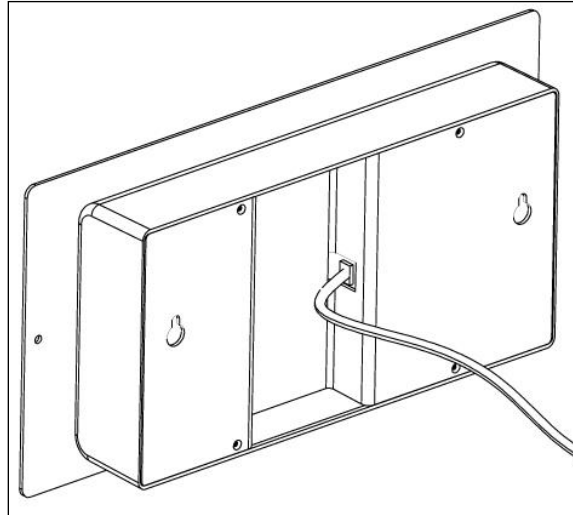


Figure 9: Template for 6-Digit Clocks

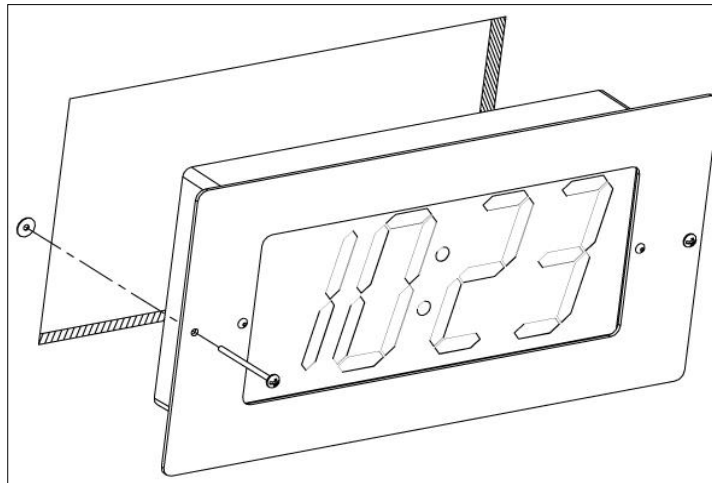
3. Refer to the template provided and locate the holes for the customer supplied hardware.
4. Drill two 5/16" holes.
5. Once holes for the bolts have been made, install #6 molly anchors in the holes, tighten until they expand, and then withdraw the screws.

6. Cut out the shaded area indicated on the template.
7. Install the data cable in the rear of the clock as shown in Figure 10. The clock is now ready for installation.



**Figure 10: Data Cable Installation**

8. Place the clock/recessed mount assembly in the hole and re-install the screws, as seen in Figure 11.



**Figure 11: Clock/Recessed Mount Assembly**

### 4.10. Power Up and Verification

Once the installation is complete, power up the units by connecting them to a PoE enabled Ethernet LAN. The clocks will follow the power up sequence described in Figure 12. *Note that the center column includes two possible scenarios where the power up sequence could stall for the clock.*

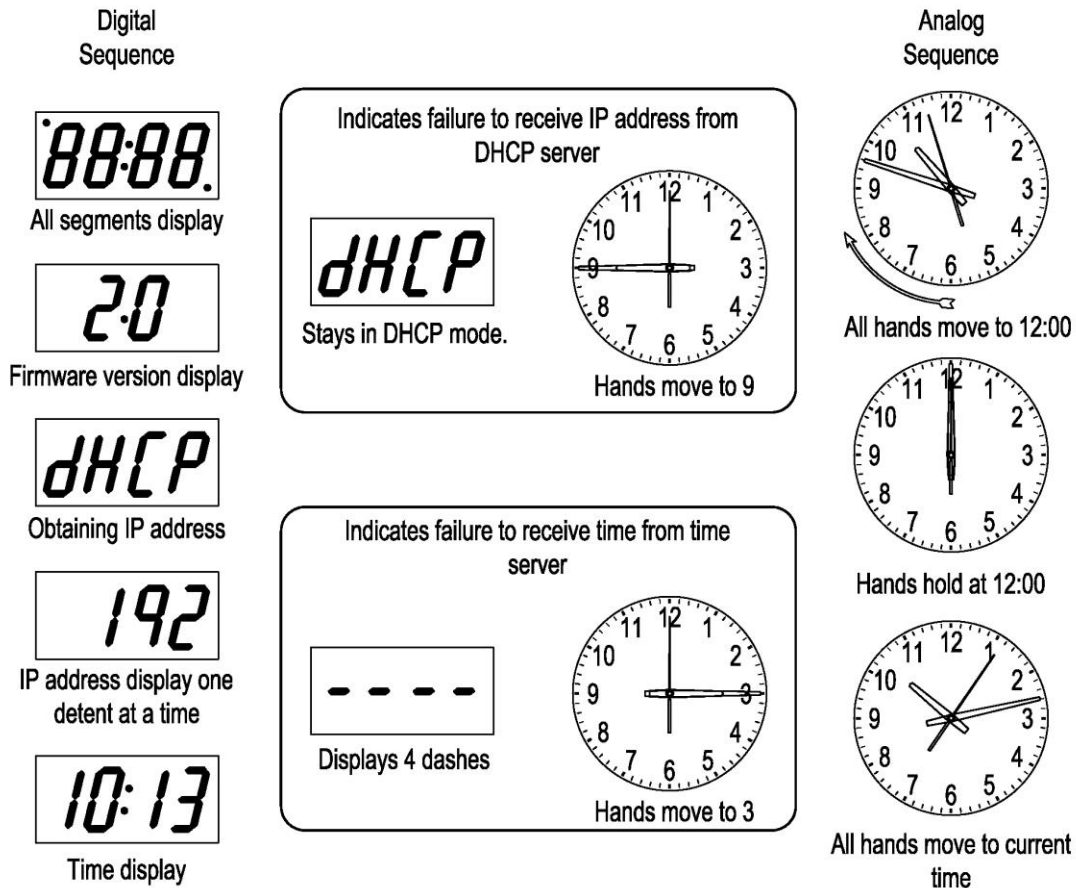


Figure 12: Power Up Sequence

## 5. Configuration

Table 3 describes all of the configuration options for the OnTime Clock. The recommended configuration method is to add private options to the DHCP server so that all the clocks can be configured and reconfigured quickly and easily. (See Section 6.)

	Automatic Configuration, See Section 6	Manual Configuration, See Section 7	
<b>Network Parameters</b>	<i>These settings allow the clock to be part of the local network</i>		
	IP Address	DHCP	Telnet
	Subnet Mask	DHCP Standard option 1	Telnet
	Default Gateway	DHCP Standard option 3	Telnet
	DNS Server	DHCP Standard option 6	Telnet
<b>Time Parameters</b>	<i>These settings allow the clock to access and display network time.</i>		
	Time Server, primary	DHCP Private option 230	Telnet
	Time Server, secondary	Telnet	Telnet
	Time Zone	DHCP Private option 230	Telnet
	Daylight Savings Time (DST)	DHCP Private option 230	Telnet
	Digital Clock, 12/24 hour time	DHCP Private option 230	Telnet
	Digital Clock, show/hide colon	DHCP Private option 230	Telnet
<b>Management Parameters</b>	<i>These settings allow a user to monitor the clocks and set up alerts from the support site.</i>		
	cloudserver	DHCP Private option 231	Telnet
	sitetoken	DHCP Private option 231	Telnet

Table 3: Configuration Options for the OnTime Clock

### 5.1. Network Parameters

The IP Address, Subnet Mask, Default Gateway and DNS Server are required so that the clock can communicate on the network. These parameters are set automatically if you use DHCP.

## 5.2. Time Parameters

- A **network time server** so that the clock knows with which computer it should be synchronized.
- 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.

Simple Network Time Protocol (SNTP) is widely used to synchronize time on computers. The IT group within an enterprise usually designates a local server or set of servers responsible for maintaining accurate time as a time standard for the network. These servers typically synchronize to a reliable external Internet time source.

The OnTime Clock must be configured with the network location of at least one time server; the OnTime Clock supports setting an optional secondary time server to be used in the case that the primary time server is unavailable. The default setting for the primary time server is an Internet time server operated by Novanex, but this is intended for temporary use only because IT groups generally prefer not to have individual clocks connecting to the Internet. Your IT group should specify a local SNTP or NTP time server or router to be the primary and optional secondary time servers with which to synchronize the clock.

## 5.3. Management Parameters

Novanex offers the OnTime Management service through its support site to assist in management of your clock system. This service is available to registered customers and is described at [support.novanexsolutions.com](http://support.novanexsolutions.com) under *OnTime Management*. The service allows you to monitor your clocks and to set up email alerts to be notified of problems with time synchronization.

There are two management parameters to set on the OnTime clock: *cloudserver* and *sitetoken*. These parameters can be set on the clock (*refer to Appendix A: Clock Configuration*) or via a DHCP server option code using the *mgmt -o <option code>* command (*Refer to Section 6.5*).

- **cloudserver** – Set using the *mgmt -c* command. This parameter tells the clock where to send its status information; set this parameter to *ontimelistener.inovasolutions.com*, which is the server address for the OnTime Management service.
- **sitetoken** – Set using the *mgmt -t* command. This parameter tells the OnTime Management system the organization to which this clock belongs and under which its status will be reported. Before you start to register your clocks, retrieve your unique Site Token from the Clock Account Information Page of the OnTime Management System. Refer to the [support site](http://support.novanexsolutions.com) FAQs for more detail.

## 5.4. Clearing the Configuration

The recommended configuration method is DHCP based (*refer to Section 6*), where all of the configuration settings are automatically served to the clocks from the DHCP server. In this case, modifying the clock configuration is done at the DHCP server.

If you are using DHCP, but not a DHCP option code to fully configure your clock, the network parameters are set by the DHCP server. The best way to log on to your clock is using the clock Host Name; see Section 7 for details.

If however you have manually modified the clock configuration, and have assigned your clocks static IP Addresses, use the steps below to connect to your clocks and alter the configuration or to recover a factory fresh clock configuration.

### 5.4.1. Digital Clock

The digital clock displays its IP address on start up. Follow the instructions for connecting to a clock via telnet in this manual (Section 7) and reconfigure the clock.

### 5.4.2. Analog Clock

The analog clock has no IP Address display on startup; if a static IP Address has been used, it will be unknown by simply looking at the clock. Here are ways to obtain the IP Address for the clock so that you can reconfigure the clock.

- Check OnTime Management, the clock management system, on the [support site](#) because the IP Address will be shown if the management system is in use (recommended).
- Return the clock to factory default by inserting a straightened paperclip into the small hole on the centerline of the rear of the powered clock and holding the small recessed button down until the hands begin to find their home position (at least 15 seconds). The clock must be powered on for the reset to work.

The clock Host Name can be used once a new IP Address is served by a DHCP server, or you can boot the clock in a lab setting, also called a bench environment, and use the link-local address (169.254.0.100) to connect to the clock.

## 6. Automatic Configuration Using DHCP

### 6.1. Overview

IT groups that use DHCP to assign IP Addresses often use DHCP options to configure PCs and other devices on the network. Typical examples of these options are:

- DHCP Option 1 to specify the subnet mask.
- DHCP Option 3 to specify the router that is the default gateway.
- DHCP Option 6 to specify the DNS Server.

When PCs and other devices come up on the network, all of these parameters are set automatically if they are configured at the DHCP server. In addition, any institutional changes will automatically convey to the devices when they restart.

DCHP options in the range of 128 to 254 are available for use for site-specific purposes. The OnTime Clock takes advantage of the DHCP option slots to enable plug and play installation of clocks. The OnTime Clock is preset to request its local configuration from the DHCP server using DHCP option 230. If option 230 is set up on the DHCP server with a valid configuration string, then the clock can configure itself automatically.

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 all at once at the DHCP server.

The optional OnTime Management settings can be specified via DHCP Option 231. When so configured, the clock will send status updates to the OnTime Management server specified in DHCP option 231.

DHCP server changes are typically made by the IT group.



## 6.2. DHCP Configuration Settings

The OnTime Clock requires these settings to properly display local time:

Setting	Description	Applies to...	
		Digital	Analog
Time Server	Sets the primary network time server so that the clock knows with which computer to synchronize its time.	✓	✓
Time Zone	Sets the local time zone so that the clock can display the correct local time.	✓	✓
Daylight Savings Time (DST)	Sets the DST rule so that the clock can automatically adapt to local DST.	✓	✓
24-hour	Sets a 12- or 24-hour time display. The factory default is 12 hour time.	✓	No effect
Show/hide colon	Determines whether the colon is shown on the clock. The factory default is to show a colon as a separator between hours and minutes.	✓	No effect

Table 4: DHCP Configuration Options

## 6.3. DHCP Configuration Test and Rollout

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. Once you are confident that the one clock is properly configured using these settings, you can then plug in additional clocks to add them to the network, knowing that they will automatically receive the proper configuration settings as well.

*Note: Clocks will retrieve the DHCP option strings periodically, including when the clock reboots and when the DHCP lease is renewed; these will automatically be applied.*

## 6.4. Creating a DHCP Configuration String

Table 5 describes the five settings that can be used in a configuration string when establishing a 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. Any of these five options can be left out of the configuration string, in which case the local setting from the clock will be used. This string is added to the DHCP server, as described in the next section.

Option Name	Option Value	Configuration Setting	Description
<b>timeserver</b>	SNTP Time Server name or IP address	SNTP Primary Time Server (sntp -h command)	Sets the Primary 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.
<b>timezone</b>	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 and are valid only in 15-minute increments (i.e., :00, :15, :30, and :45).
<b>dst</b>	none, [rule specification]	Daylight Saving Time (dst command)	Establishes the Daylight Saving Time rule. none - Disable the Daylight Saving Time adjustment. Other values are parsed based on the DST rule format. The format is 8 numbers in the order: startDOW startDay startMonth startTime endDOW endDay endMonth endTime.
<b>24hour</b>	true, false, t, f	Clock hours display mode (display -t command)	Sets the time format for the digital clock (ignored by the analog clock). If true the clock uses 24hour (military) time format; otherwise it uses 12hour time format.
<b>showcolon</b>	true, false, t, f	Clock colon display mode (display -c command)	Sets the use of the colon on the digital clock (ignored by the analog clock). If true the colon separator between the hours and minutes is lit.

**Table 5: DHCP Private Option String Parameters**

*Note that while the primary time server can be set by DHCP configuration, the secondary time server can only be specified by logging on to the OnTime Clock via telnet and issuing the **sntp -e** command (see Section 7.3).*

Table 6 contains examples of the configuration strings.

Command	Description
timeserver=ntp.inovasolutions.com; timezone=-5;dst=-1 8 2 2 1 1 10 2	<ul style="list-style-type: none"> <li>• Sets the primary 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>
timeserver=10.1.128.1; timezone=0; dst= 1 -1 2 1 1 -1 9 1	<ul style="list-style-type: none"> <li>• Sets the primary 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>
timeserver=10.1.128.1; showcolon=true ; 24hour = true ; timezone=-5;dst=-1 8 2 2 1 1 10 2	<ul style="list-style-type: none"> <li>• Sets the primary time server to IP Address 10.1.128.1</li> <li>• Enables the colon 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 6: Examples of Common DHCP Configuration Strings

## 6.5. OnTime Management Settings

The OnTime Management settings shown in Table 7 can be provided via DHCP Option 231 (or an alternate option number specified on the clock).

Option Name	Option Value	Description
cloudserver (analogous to the mgmt -c command - see Table 14)	ontimelistener.inovasolutions.com	Sets the OnTime Management server Host Name to <i>ontimelistener.inovasolutions.com</i> . The clock configuration must include a DNS server to use to resolve this Host Name (ipconfig -p command or DHCP option 6).
sitetoken (analogous to the mgmt -t command - see Table 14)	Your OnTime Clock Token	Sets the token representing the site to which the clock belongs; for use by the OnTime Management system. The token is a 12-digit text string sent to you via email during the registration process; it is also available on the support site in the <a href="#">My Clocks page</a> .

Table 7: OnTime Management Properties

Table 8 contains a sample OnTime Management configuration string.

Command	Description
cloudserver=ontimelistener.inovasolutions.com; sitetoken=0rhso7006256	Sets the display to send its info to ontimelistener.inovasolutions.com with its organization token as 0rhso7006256

Table 8: Example of OnTime Management Configuration String

## 6.6. Setting Different a DHCP Option Number on a Clock

You do not have to use DHCP configuration options 230 and 231 for the clocks. You can also create custom options using different option numbers. If DHCP option 230 is already in use on your DHCP server, you can configure your clock to use another DHCP option instead, in the range 128-254 (e.g., option 245). The **ipconfig -o** command can be used to set a different DHCP option number on the clock or to disable this feature altogether. Configuring the OnTime clock settings via DHCP can be disabled by setting **ipconfig -o** command on the clock to 0 (zero). The **ipconfig** command is defined in Appendix A.

The OnTime Management settings can be configured via any DHCP option number in the range 128-254, except for 230, by using the **mgmt -o** command on the clock. Configuring the OnTime Management settings via DHCP can be disabled by setting the **mgmt -o** command on the clock to 0 (zero). The **mgmt** command is defined in Appendix A: Clock Configuration.

**Note:** When changing the DHCP private option codes for either timekeeping properties or OnTime Management settings, the clock will automatically read the new settings from the new DHCP private option codes without requiring a reboot; however, this process will take a few minutes. It is usually faster to reboot the clock to force it to read the new option codes you have set.

## 6.7. Verifying the DHCP Configuration Settings on a Clock

The **dhcpconfig** command lists all the configuration settings that were retrieved by the clock from the DHCP server and that are currently in effect. If the clock cannot validate any of the five settings retrieved from the DHCP server, it will ignore just those invalid settings, which will be shown as empty strings in the **dhcpconfig** command output.

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 6.

```
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
```

**Notes:**

- A clock can be re-booted to request a new configuration string from the DHCP server. The clock will automatically request a new configuration string within a few minutes of changing which DHCP option to request; in addition, the clock will request the configuration string at the expiration of each DHCP lease interval.
- If option 230 (or an alternate option code specified on the clock) is not configured on the DHCP server, the clock will receive an IP Address in the usual fashion but the settings for Time Server, Time Zone, DST, etc. will come from the clock's internal configuration (i.e., the settings set via command line in a telnet session or, if none, then the default settings from the factory).

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

*Appendix B: Configuring DHCP Options for Microsoft Servers* 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.

## 7. Manual Configuration Using Telnet

Clocks can be individually configured using a telnet session, though DHCP configuration is simpler and recommended. Each clock needs to be set up with the following minimum configuration.

- An **IP address** so that the clock can communicate on the network. This can be either static or DHCP served.
- A **network time server** so that the clock knows with which computer it should be synchronized.
- 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.

*Appendix A: Clock Configuration*, contains a complete list of telnet commands for reference. You can also refer to the FAQs on the [support site](#) for more configuration assistance.

### 7.1. Establishing a Telnet Connection to the Clock

To establish a telnet connection to your clock, you must first have the Host Name or IP Address. It is preferable to use the Host Name. The Host Name from the factory is *iclock-###* where *###* is the last three characters of the MAC address shown on the label attached to the clock when it ships. For example, a clock with a MAC address of 00:30:D1:00:70:2F has a Host Name of *iclock-02f*. Note that capitalization does not matter in MAC addresses or hostnames.

If you are not using DHCP to assign IP Addresses to your clocks, then it is improbable that your clocks' hostnames have been registered in your DNS server. In this case you will have to use IP Addresses to connect to your clocks. You may substitute the clock's IP Address for its Host Name in the steps below to telnet into your clocks. See Section 5.4 for ways to recover IP Addresses for your clocks.

Once you have the Host Name for your clock, you can establish the telnet connection:

1. Choose *Run* from the Windows Start Menu.
2. When the Run window appears, type **cmd** and press *Enter*.
3. When the command line window appears, type the telnet command **telnet [hostname]**. Refer to the note above to determine the Host Name of your clock.

**Note:** Windows users may need to change the default windows configuration in order to enable telnet. Contact your IT group for assistance.

4. The clock's service light begins to blink and the clock login prompt appears:

```
Inova Solutions OnTime Clock Version xxx  
iclock login:
```

5. Enter the user name: **iclock**.
6. When the clock's password prompt appears (`iclock password:` ), enter the clock's password (the default is **timely**).
7. The clock's telnet prompt appears: `iclock-### />`
8. You are now ready to set configuration using the telnet commands.

For help with a specific telnet command, at the prompt, type **help** followed by the desired command. For example, to see help for the display option, type **help display**.

## 7.2. Configuring an IP Address

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

- DHCP [Factory Default]
- Assigned Static IPv4 Address

### 7.2.1. DHCP

The factory default is DHCP. Refer to Section 6 for more information about DHCP. Refer to *Appendix A: Clock Configuration* for help changing from a Static IP Address to DHCP by using the `ipconfig -d` command.

### 7.2.2. Assigned Static IPv4 Address

**Note:** Your IT staff must authorize and provide a static IPv4 address to prevent operational problems which might occur if that address is applied to another device on the network.

To enter a fixed IPv4 address into your clock's firmware, start a telnet session with the clock and the 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 IPv4 address
- `yyy.yyy.yyy.yyy` is the subnet mask
- `zzz.zzz.zzz.zzz` is the gateway address

All fields must be provided.

You may also have to specify a primary DNS server; if possible, you may also wish to specify a secondary DNS server. In order to sync to an internet time server (see below) you will need to specify at least one DNS server by IP Address.

To enter the primary and secondary DNS servers while also configuring a static IP Address, 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  
-p vvv.vvv.vvv.vvv -s uuu.uuu.uuu.uuu
```

where:

- `xxx.xxx.xxx.xxx` is the IPv4 address
- `yyy.yyy.yyy.yyy` is the subnet mask
- `zzz.zzz.zzz.zzz` is the gateway address
- `vvv.vvv.vvv.vvv` is the primary DNS server IPv4 address
- `uuu.uuu.uuu.uuu` is the secondary DNS server IPv4 address

In order to make the management of your system as easy as possible, Novanex strongly recommends that you record the IP Address for each clock in a table similar to the one below, particularly if you have elected to set a static IP Address.

Clock Name or Location	IP Address

**Table 9: IP Address Reference Table**

### 7.3. Specifying a Primary or Secondary Time Server

Specify by IP Address or Host Name the primary and secondary network time servers on the LAN, WAN, or Internet with which the OnTime Clock will synchronize its time.

*Note that while the primary time server can be set by DHCP configuration (Section 6), the secondary time server can only be specified by logging on to the clock itself.*

- Specifying by IP Address is typically only safe if the address of the server is under your IT 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 by IP Address 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 on the clock is the same for both Host Name and IP Address.

1. Log into the OnTime Clock.
2. At the prompt, type **sntp -h** to specify the primary time server or type **sntp -e** to specify the secondary time server.
3. Press the spacebar. (You need a space between the command and the time server Host Name/IP Address.)
4. Enter the Host Name or IP Address of the time server.
5. Press the Enter key to submit the time server configuration.

It is always a good idea to test the synchronization between the clock and the time server(s). 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 synchronization with the primary time server (if the primary is unavailable and the secondary is defined, it will try the secondary after about 90 seconds).

By default the primary time server is set to **ntp.inovasolutions.com** and the secondary is not set. In general, the primary server setting should be changed to an internal time server under IT control. There is more information on NTP, SNTP, and time server selection at the [support site](#).

## 7.4. Setting the Time Zone

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 (aka GMT -5), which is the time zone for Eastern Time (US & Canada). You can change this setting with the following command:

```
timezone -N [or] timezone N
```

where **N** is the time zone offset from UTC, -12:45 to 12:45.

**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.

**Note:** The timezone command allows for a minutes offset specification as well as hours. This is only needed in a few timezones around the world, if you do not need a minutes offset, there is no need to specify the colon or minutes (as ':00'). For example, the specification of Paris, France's timezone would look like this:

```
timezone 1
```

## 7.5. Configuring Daylight Saving Time

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

DST Setting	Command
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.
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 <a href="#">support site</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 10: Configuration for Daylight Saving Time**

Three additional time related configuration items should also be set initially. The commands for setting 12/24, AM/PM, and Colon On/Off are identified in *Appendix A: Clock Configuration*.

## 8. Troubleshooting

Table 11 and Table 12 contain several trouble conditions you may encounter with the OnTime Clock and the recommended actions to take to correct the problem. The up-to-date troubleshooting help is available in the FAQ on the [support site](#).

Condition	Solution
The Digital Clock face is dark.	Verify that the network port is capable of supplying PoE power. Reboot the clock by disconnecting the data cable, counting to five, and reconnecting the cable. It takes as long as 10 seconds for the clock to go active.
The clock shows incorrect time.	If the minutes past the hour are correct, verify the Time Zone and Daylight Saving Time settings. For Digital Clocks, check if the Service Light is illuminated (see below).
A 'dhcp' message shows on the Digital Clock face for about 4 minutes after booting up.	The clock has failed to receive an IP address from the DHCP server. Contact your IT group responsible for DHCP service. Note: The clock is reachable through its fixed link-local address for diagnostic or re-configuration purposes while the bottom right service light is on. The link-local address is 169.254.0.100.
The Digital Clock service light is blinking.	The service light is located at the bottom right of the Digital Clock face. When the light is blinking, this means that there is an active telnet session in progress on the clock. Note: that this functionality is not present on the Analog Clock.
The Digital Clock service light is on.	The service light is located at the bottom right of the Digital Clock face. When the light is on steady, it usually means that the time server can no longer be reached. Note: that this can also happen if the DHCP served IP Address cannot be renewed. Reboot the clock to verify that it properly receives a DHCP address. Verify that time appears on the clock. If the 'dhcp' message is displayed, the service light signals that the clock can be reached by its fixed link-local address.
Determine the IP Address of a Digital Clock	Lift up gently on the unit to free the keyholes at the rear of the clock from the mounting hardware. Disconnect the network cable and count to five. Replace the network cable and watch the Digital Clock face for the IP Address. Record the IP Address and location.
Digital Clock Face showing '----'	The Time Server is either not properly specified or is unreachable. This can also happen when the digital clock binds the link-local address after about 4 minutes without DHCP service.

**Table 11: Troubleshooting the Digital OnTime Clock**

Condition	Solution
The analog clock hands do not move when power is applied.	Verify that the network port is capable of supplying PoE power. Reboot the clock by disconnecting the data cable, counting to five, and reconnecting the cable. It takes as long as 20 seconds for the hands to begin moving.
The analog clock hands are stuck at 9:45:00.	The clock has failed to receive an IP address from the DHCP server. Contact your IT group responsible for DHCP service. Note: The clock is reachable through its fixed link-local address for diagnostic or re-configuration purposes between DHCP retries. The link-local address is 169.254.0.100.
The analog clock hands are stuck at 3:15:00.	The Time Server is either not properly specified or is unreachable.
Determine the IP address of an Analog Clock.	The analog clock has no IP Address display on startup so the IP Address will generally be unknown. The recommended method to recover a static IP Address is to sign into the clock management system on the <a href="#">support site</a> ; the IP Address will be shown there if the management system is in use. For DHCP addressed clocks you should use the clock's Host Name instead of the IP Address. Alternately, clear the configuration by returning it to factory default.
Clear the configuration of an Analog Clock.	Return the clock to factory default by inserting a straightened paperclip into the small hole on the centerline of the rear of the powered clock and holding the small recessed pushbutton down until the hands begin to find their home position (at least 15 seconds). The clock must be powered on for the reset to work. The IP Address can be then served by a DHCP server or the link-local address can be used in a lab setting.
The clock is ticking and shows incorrect time.	If the minutes past the hour are correct, verify the Time Zone and Daylight Saving Time settings.
The DST transition does not occur immediately.	Analog clocks may require some amount of time to make the automatic adjustment to DST. The clock may continue ticking up to 3 minutes past the DST transition time before the hands begin fast stepping to the new time. It may take as long as 10 minutes for the hands to complete the transition to the new local time.

**Table 12: Troubleshooting the Analog OnTime Clock**

## 9. Warranty and Maintenance

### 9.1. Warranty

Novanex warrants the OnTime Clocks to be free from defects in material and workmanship during a three-year period. The Warranty begins on the date the unit is shipped.

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

This Warranty does not apply if repairs are required due to acts of nature beyond Novanex control such as, but not limited to, lightning strikes, power surges, misuse, damage, neglect, or if repairs/modifications have been made or attempted by anyone other than personnel authorized by Novanex. This Warranty does not apply if the clock is installed in an exterior location.

**In no event will Novanex 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. Novanex disclaims liability for any implied warranties, including implied warranties of merchantability and fitness for a specific purpose.**

### 9.2. Repair and Returns

To obtain service under this Warranty, contact Novanex at (434) 509-1108 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.

Novanex will not be responsible for dismounting and remounting of the OnTime Clock, 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.

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

## 10. Glossary of Terms

Terms	Definitions
Cantilever Mount	This is a wall mount to the left or right side of the OnTime Clock unit, illustrated in Section 4, requiring the Digital Clock Mounting Kit.
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
NTP	Network Time Protocol; most NTP servers will respond to an SNTP time request
Pendant Mount	This is a ceiling mount, illustrated in Section 4, requiring the Digital Clock Mounting Kit, 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.

**Table 13: Glossary of Terms**

## Appendix A: Clock Configuration

This section summarizes the configuration options available with the clock. For help setting up a telnet session, refer to Section 7- Manual Configuration Using Telnet . For additional support, refer to the [support site](#).

Condition	Solution
Get help for clock commands	<b>help</b> - To see a list of all the telnet command names and options for which help is available.  To see help for a particular command, type the <b>help</b> command followed by the command name for which help is desired. For example, to see help for the <b>display</b> option, type <b>help display</b>
Display the configuration settings for clock	<b>config</b> - To display all configuration parameters except those sent by the DHCP server. Use the DHCP config (dhcpconfig) command to view these superseding options
Verify DHCP Configuration settings	<b>dhcpconfig</b> - To list the option settings received from a DHCP server (for verification purposes only). Use the ipconfig -o command to enable retrieving option settings from a DHCP server.
Display all Address Resolution Protocol (ARP) cache entries	<b>arp</b> - Display all Address Resolution Protocol (ARP) cache entries.
View current SNTP settings	<b>sntp</b> - To view the current time server and other SNTP settings
Test the Time Server Synchronization	<b>sntp -s</b> - Display the SNTP settings, then invoke a time server synchronization request and display the results.
Specify the primary Time Server	<b>sntp -h hostname</b> , where <i>hostname</i> is the Host Name of the primary time server; or <b>sntp -h xxx.xxx.xxx.xxx</b> , where <i>xxx.xxx.xxx.xxx</i> is the IP address of the primary time server
Specify the secondary Time Server	<b>sntp -e hostname</b> where <i>hostname</i> is the Host Name of the secondary time server; or <b>sntp -e xxx.xxx.xxx.xxx</b> , where <i>xxx.xxx.xxx.xxx</i> is the IP address of the secondary time server; to be used in the event that the primary server is unavailable

Condition	Solution
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>, then 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 <a href="#">support site</a> contains a DST calculator which can compute the correct DST configurations string for your location. Obtain the correct string and enter it with the <i>dst -rule</i> command.</p>
View or change the Time Zone	<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 -12:45 to 12:45.</p> <p>For example, to set the time zone for (UTC -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>
Configure the 12/24 Time Format  <i>These commands are ignored by the analog clock.</i>	<p><b>display -t 24</b> - Sets 24 hour display. <i>Note the space before and after the -t</i></p> <p><b>display -t 12</b> - Sets 12 hour display. <i>Note the space before and after the -t</i></p>
Configure the AM/PM Indicator  <i>These commands are ignored by the analog clock.</i>	<p><b>display -p off</b> - Turns off pm indicator. <i>Note the space before and after the -p</i></p> <p><b>display -p on</b> - Turns on pm indicator. <i>Note the space before and after the -p</i></p>
Configure Colons On/Off  <i>These commands are ignored by the analog clock.</i>	<p><b>display -c off</b> - Turns off colons. <i>Note the space before and after the -c</i></p> <p><b>display -c on</b> - Turns on colons. <i>Note the space before and after the -c</i></p>



Condition	Solution
View or Configure Clock's IP settings	<p><b>ipconfig</b> - To view clock's current IP settings.</p> <p><b>ipconfig -d</b> - Use DHCP to lease an IP address and retrieve network settings. (Disables static IP addressing)</p> <p><b>ipconfig -o xxx</b> - Use DHCP to lease an IP address and request a configuration string where <i>xxx</i> is the DHCP option number. The factory default is 230.</p> <p><b>ipconfig -o 0</b> - Disable the configuration portion of the DHCP process.</p> <p><b>ipconfig -h hostname</b> - To change the Host Name of the clock, where <i>hostname</i> is the new Host Name.</p> <p><b>ipconfig -b [ on   off ]</b> - Set whether to show IP information at clock bootup. Note that the Analog Clock cannot display an IP Address.</p> <p><b>ipconfig -x</b> - Show all Interface data.</p> <p>The following options are ignored if DHCP is enabled:</p> <p><b>ipconfig -a IP</b> - Use the specified fixed IP address. (Disables DHCP)</p> <p><b>ipconfig -m mask</b> - Set the subnet mask.</p> <p><b>ipconfig -g gateway</b> - Set the gateway address.</p> <p><b>ipconfig -a xxx.xxx.xxx.xxx -m yyy.yyy.yyy.yyy -g zzz.zzz.zzz.zzz</b> - To configure a static IP address, where <i>xxx.xxx.xxx.xxx</i> is the IP address, <i>yyy.yyy.yyy.yyy</i> is the subnet mask, and <i>zzz.zzz.zzz.zzz</i> is the gateway address. (All the information is ignored if DHCP is later enabled.)</p> <p><b>ipconfig -n domainname</b> - Set domain name.</p> <p><b>ipconfig -p IP</b> - Set primary DNS address.</p> <p><b>ipconfig -s IP</b> - Set secondary DNS address.</p> <p><b>ipconfig -t dnstimeout</b> - Set DNS timeout (0 is valid).</p>
View log on session screen	<b>log</b> - To view the log on the session screen.

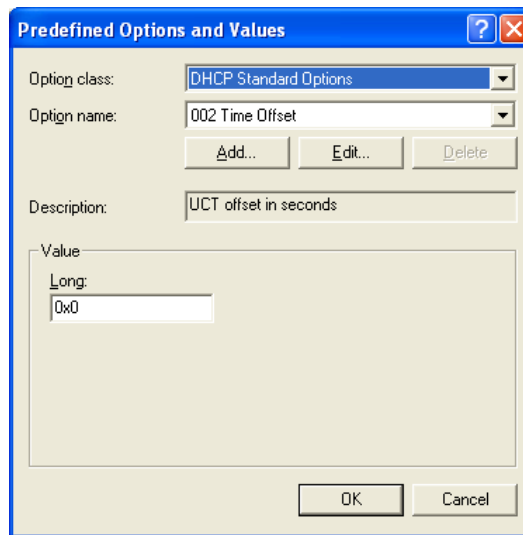
Condition	Solution
View or configure management server settings	<p><b>mgmt</b> - To view the current management server settings.</p> <p><b>mgmt -c</b> - To clear the active management server setting.</p> <p><b>mgmt -c ontimelistener.inovasolutions.com</b> - To set the active OnTime Management server, currently located at the indicated URL. This setting is active when the 'mgmt -o' DHCP option number is specified as zero (0) or when the OnTime Management DHCP 'cloudserver' setting is not specified.</p> <p><b>mgmt -t</b> - To clear the clock management token field.</p> <p><b>mgmt -t Token</b> - To set the site identity token, where <i>Token</i> is your clock registration token assigned by Novanex. This setting is active when the 'mgmt -o' DHCP option number is specified as zero (0) or when the OnTime Management DHCP 'sitetoken' setting is not specified.</p> <p><b>mgmt -o xxx</b> - Use DHCP to request a configuration string for OnTime Management settings, where <i>xxx</i> is the DHCP option number. Specify the DHCP option number as zero (0) to disable requesting OnTime Management settings from DHCP. The factory default is 231.</p>
List all TCP connections	<b>netstat</b> - List all TCP connections to and from the clock. This command is currently not supported on OnTime Clock v2 firmware.
Display info to diagnose DNS problem with SNTP server	<b>nslookup SNTPServerName</b> where <i>SNTPServerName</i> is the fully-qualified Host Name of an SNTP server or other target; for example, <i>ontimelistener.inovasolutions.com</i> , to verify your clock has a route to the OnTime Management server.
Reboot the clock	<b>reboot</b>
Update clock firmware	Refer to the FAQs on the <a href="#">support site</a>

Table 14: Configuration Commands

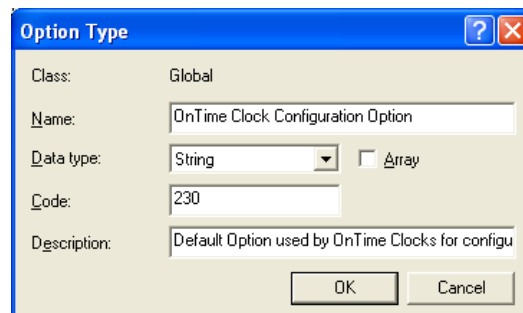
## Appendix B: Configuring DHCP Options for Microsoft Servers

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...”

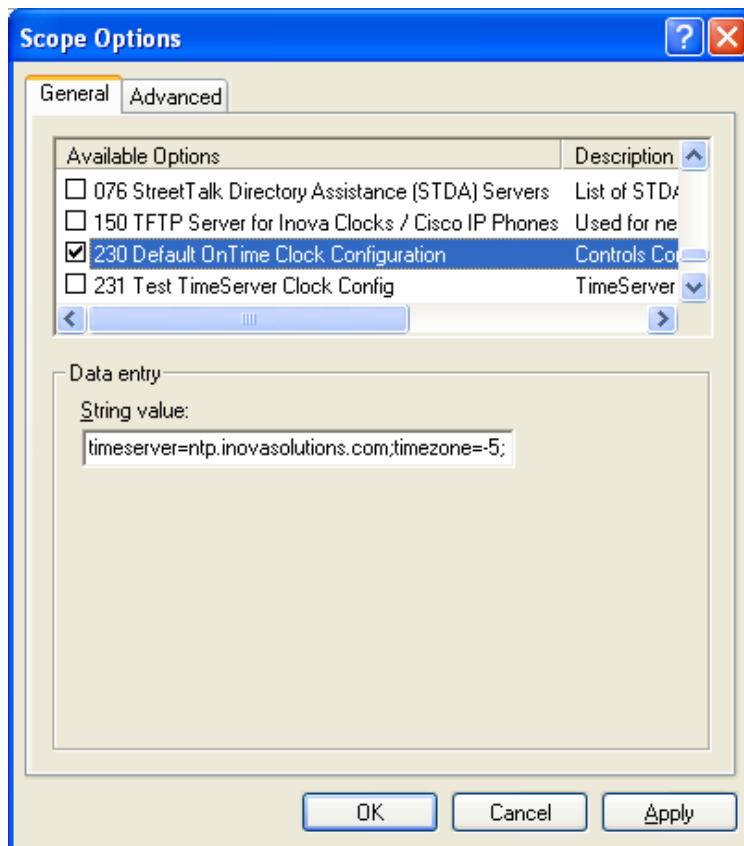


4. Choose “Add...” a new option.



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.



## Appendix C: Clock Management System Support

**Clock Management System.** A clock management system collects status from clocks and provides options for managing a collection of clocks. The mgmt command and associated DHCP options (see Appendix A: Clock Configuration) specify how to configure clocks to communicate with the OnTime Management system.

**OnTime Management System Packet.** When the clock is configured for OnTime Management support, the clock will send to the configured cloudserver address a status packet listing the clock's ethernet (MAC) address, fully qualified Host Name, IP address, clock model, firmware version, clock registration token, and the current NTP synchronization status.