

CLKNTA12
NETWORK TIME PROTOCOL
ANALOG CLOCK
(AC SYNCHRONOUS MOTOR)



USER MANUAL



Disclaimer

The information contained in this document is subject to change without notice. Masterclock[®], Inc. (hereinafter Masterclock) makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Masterclock shall not be liable for errors contained here in or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

See important *limited warranty* information at the end of this document.

Table Of Contents

Introduction.....	1
Installation	1
Operating Environment.....	1
Pre-Installation Checklist	1
Static Networking Configuration	2
Dynamic Networking Configuration	2
Quick Start Information	2
Display Behavior	3
Correction Behavior	3
Status LED	3
Major Feature Overview	4
DHCP/BOOTP Auto-Configuration	4
Time Zone Offsets	5
Daylight Savings Time.....	5
Configuration	5
Reset Factory-Default Configuration	5
Default Password.....	6
Configuration Methods	6
WinDiscovery.....	6
Telnet Terminal Configuration	13
RS-232 Terminal Configuration	16
Troubleshooting Tips	17
SPECIFICATIONS	19
Communications – I/O.....	19
Power Requirements.....	19
Physical.....	19
Power Supply Component Characteristics	19
Operating/Storage Temperature & Humidity	19
OPTIONS – Special Order.....	19
Limited Warranty.....	20
Exclusions.....	20
Warranty Limitations.....	20
Exclusive Remedies	20

INTRODUCTION

The CLKNTA12 is an analog sweep hand clock with an AC synchronous motor drive. It contains a correction mechanism, which is periodically controlled by advanced microprocessor electronics to synchronize the hands on the face of the clock to an accurate time reference. This device has a built in NTP (Network Time Protocol.) client and is designed to display time referenced to an NTP server, using SNTP (Simple Network Time Protocol).

The Masterclock Network clock line includes management software for configuration and maintenance. Other features include:

- Time zone offsets (to one second resolution) support any biasing requirements
 - Complete flexibility in daylight savings time configurations
 - Real-time clock backup retains time during loss of power and/or NTP
 - Primary and secondary NTP source with fault-tolerant switching
 - Supports NTP broadcasts
 - Fully configurable network settings, including DHCP/BOOTP support.
 - Security features include password protection of configuration, encrypted communication, and the ability to disable telnet management access.
 - Status display to remotely ‘see’ clock display through WinDiscovery application.
-
- Sweep second hand
 - Self-correcting after loss of power and/or NTP reference.
 - Hourly and/or 12 hour correction modes for maintaining synchronization.
 - Status LED on clock face, (at 6 o’clock position).

INSTALLATION

Operating Environment

The CLKNTA12 is not water or moisture proof. Treat it as you would any other delicate electronic device and do not expose it to water, excessive heat or physical abuse.

The CLKNTA12 contains an AC synchronous motor and correction mechanism designed to operate at 115V/60Hz (nominal). Do not attempt to operate the device at alternate AC voltages or frequencies as this will damage the unit and void the warranty.

A version [model CLKNTA12-220] is available for use on 220-240Vac, 50Hz systems. Please see the special order options or contact sales@masterclock for details.

Pre-Installation Checklist

Before installing a CLKNTA12, one should be prepared with the following basic configuration information that the device will require. It may be necessary to obtain some or all of this information from a network administrator in your organization.

Static Networking Configuration

- IP address and netmask designation for device
- Primary and secondary DNS (domain name) servers
- Gateway/router
- Primary and secondary NTP time sources

Dynamic Networking Configuration

- Confirm that a DHCP/BOOTP service is accessible on the local network
- Determine if DHCP server will provide NTP server configuration
- Determine if DHCP server will provide time zone configuration

All Masterclock, Inc. network appliances can be provided with a verbose name. The name is arbitrary and may be useful for organizing and managing devices once installed at a facility. By default, device names are the product name abbreviation followed by the device's Ethernet address. Customers may wish to designate names relating to their own organizational requirements. It is recommended that a robust naming scheme be developed before devices are installed to different locations within an organization.

Quick Start Information

Insert the power cord into or wire the power leads for an appropriate AC source. If ordered with the power pigtailed, the wiring is:

Black: AC Line
White: AC Neutral
Green: Ground

After application of power the CLKNTA12 will go through an internal checkout. Time from the real-time clock backup will be applied until the clock is configured to find an NTP server signal and the NTP server signal is acquired. The red LED on the face will be solid ON until an NTP source is found.

Note: The hands of the CLKNTA12 cannot be set manually. The CLNTA12 requires an NTP server reference to display accurate time.

Connect the CLKNTA12 into your network using standard CAT5 cable with RJ45 connectors.

[Note: when configured to obtain network configuration through DHCP, the display may hesitate on startup while DHCP is resolved.]

At this time the clock can be communicated with over the local network using the WinDiscovery application. WinDiscovery can find and identify clocks through the exchange of broadcast messages even when TCP/IP networking parameters are not configured on the same network.

[Note: networks separated by physical routers will often block UDP broadcasts preventing WinDiscovery from locating devices on a remote network. Under such circumstances, WinDiscovery must be operated from a computer within the remote network or routers separating the networks must be configured to pass through (both directions) UDP broadcasts on port 6163.]

Once the clock has a valid network configuration, and known IP address, it can also be accessed via Telnet by computers in the same logical network.

In situations where providing basic network configuration via WinDiscovery application is not practical, the clock can also be configured through an RS232 terminal interface. To use this feature, see the section *RS-232 Terminal Configuration*.

The CLKNTA12 is synchronized to the time reference either hourly at 59 minutes past each hour or twice daily at 05:59A.M/P.M. The scheduling of the correction is a configurable option via software (Telnet or WinDiscovery).

Display Behavior

The CLKNTA12 may take up to 120 minutes to set the time, depending on the current internal [local] time and the hand positions. If the CLKNTA12's hands do not move to the correct time within 120 minutes, check the section entitled *Troubleshooting Tips*.

Correction Behavior

The mechanical correction mechanism of this clock is used to periodically synchronize the time (at XX:58:00 to XX:59:00, factory default – once per hour correction, or at 5:59 twice daily correction) displayed by the hands to the internal time reference. During this time period the red status LED will blink/flash once per second. This is normal operation for the clock.

Upon acquisition of NTP during initial startup, or a change to the internal time reference (as compared to the NTP server) caused by power loss, configuration changes to time zone offset, daylight saving time, or entry into/from daylight savings time will cause the clock to enter a startup correction cycle.

This startup correction cycle may take up to 2 hours to complete. During this time period the red status LED will blink/flash once per second. This is normal operation for the clock.

Status LED

The red LED on the CLKNTA12 clock face (at the 6:00 o'clock position) will indicate its status:

LED STATE	STATUS INDICATION
<i>OFF</i>	The clock has completed synchronizing to the NTP reference. Time is considered accurate.
<i>BLINKING</i>	The clock is in a normal correction cycle and is correcting to the NTP reference time. Time displayed is not currently considered accurate.
<i>ON SOLID</i>	The clock is not able to reference a time server/NTP source. Displayed time is based upon internal time reference (real time clock), and should not be considered accurate.

Major Feature Overview

The NTD/CLKNTA series of network clocks can be configured using one of the following:

- the WinDiscovery software application provided with your clock
- Telnet
- a terminal-style interface accessible via RS-232

Consult the section entitled Configuration for details on how to adjust settings through the aforementioned mediums.

DHCP/BOOTP Auto-Configuration

DHCP (Dynamic Host Configuration Protocol) is a mechanism for automating the configuration of networked devices that use TCP/IP. When DHCP is enabled, DHCP configuration acquisition will overwrite any manual configuration items. A precursor to DHCP is BOOTP. The network clock can obtain configuration from a BOOTP server when no DHCP server is present. *Factory default: DHCP enabled.*

The following RFC2132-defined optional configuration items are, when available, used by the network clock for configuration purposes:

<u>Option</u>	<u>No.</u>	<u>Comments</u>
Time Offset	2	The value provided will be used for the time zone offset configuration, unless it is defined as zero in which case it will be ignored and the network clock will rely on internal configuration. Note: this option does <u>not</u> provide information appropriate for dynamic daylight savings time use.
Router	3	The first IP address provided will be used for router/gateway configuration.
Domain Name Server	6	Up to two server IP addresses may be specified. Network clock will treat addresses as primary and secondary DNS servers.
Network Time Protocol Server	42	Up to two server IP addresses may be specified. Network clock will treat addresses as primary and secondary NTP servers.

[WARNING: A network clock will not function properly if configured to use DHCP services when no DHCP server is present on the network.]

Time Zone Offsets

All network clocks maintain time as UTC (sometimes equated with GMT) internally. A time zone offset (or bias) can be provided to adjust the time for display purposes. A bias can be set as a positive (+) or negative (-) value with a resolution of one second. *Factory default: no offset.*

Daylight Savings Time

A daylight savings time (summer time) adjustment can be configured separately and in addition to a time zone offset.

Network time displays provide flexible configuration options supporting most world daylight time standards. Traditional daylight/summer time is configured as one (1) hour positive bias. For the U.S. and Canada, daylight savings time begins on the first Sunday of April at 2:00AM and ends on the last Sunday of October at 2:00AM.

Daylight time standards vary widely throughout the world. In the European Union, daylight change times are defined relative to the UTC time of day instead of local time of day (as in U.S.). European customers, please carefully consult the section entitled Device Settings for details on setting daylight time.

To ensure proper hands-free year-around operation, daylight time adjustments must be configured using the daylight time option and not with the time zone offset option. *Factory default: daylight savings time is disabled. You must enable and configure the settings.*

CONFIGURATION

The CLKNTA12 maintains its configuration data in non-volatile flash memory so that it is maintained even when power is off. The CLKNTA12 is configured via software control using either Telnet, or WinDiscovery.

The CLKNTA12 ships from the factory with all software configuration options in the OFF setting, to display UTC time.

This factory default configuration:

- no time zone offset,
- no daylight saving time adjustment,
- hourly corrections enabled
- DHCP configuration mode

Reset Factory-Default Configuration

In some situations (such as a lost password) it may be necessary to return the CLKNTA12 to its factory default configuration. A reset button is located beneath an access panel on the rear of the CLKNTA12 network clock chassis, to perform this function. Please refer to the section *RS232-Terminal Configuration* for additional information regarding the access panel.

To reset configuration to factory default –

1. Remove AC power from the device,
2. Open the access panel on the rear of the CLKNTA12
3. Depress and hold the reset button, and
4. Apply power to CLKNTA12 and continue holding the reset button down for five seconds.
5. The network clock device will now be reset, including the password, and the unit will need to be reconfigured.

Default Password

The factory-default password for the network clock is: “*public*”

Configuration Methods

Basic operation of the NTD/CLKNTA series’ network clocks is configured via the WinDiscovery software supplied with the clock, or via Telnet if the IP address of the clock is known. In some circumstances it may be necessary to use the alternate method to configure the network clock using the RS-232 interface. Only one configuration method should be used at a time.

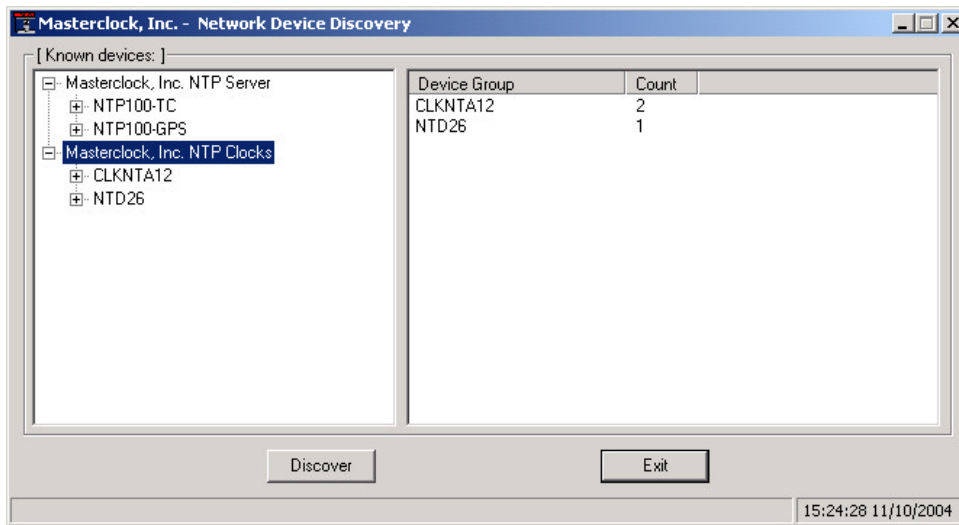
WinDiscovery

The WinDiscovery (WD) program is a Windows based program supplied with the network clock. WinDiscovery is supported under Windows 95/98/Me/NT and 2000 operating systems. To install the WinDiscovery program on your server/workstation/PC, complete the following steps:

1. Insert the software CD that shipped with your network clock.
2. Run the ‘setup.exe’ application from the diskette. Note, if you have your Windows OS configured to autorun applications from a CD when installed, this process will be automatic.
3. By default, the setup utility will suggest installing files to C:\Program Files\WinDiscovery. (Another path may be selected if desired.)

Open the WD program by clicking the shortcut on your desktop (or other fashion dictated by your installation). Only one user should be using WD at a time, and other methods should not be used to manage the clock while using WD. Click the Discover button on the lower left of the screen. All Masterclock, Inc. network appliances accessible on the network will announce their presence. The real-time status bar will display the count of devices found. When complete, a list of device families and groups will be displayed in the left pane of the WD window. NTD clocks are members of the Masterclock, Inc. Digital Displays family. Click on the plus [+] sign to the left of any family or group to open and view device types that were found.

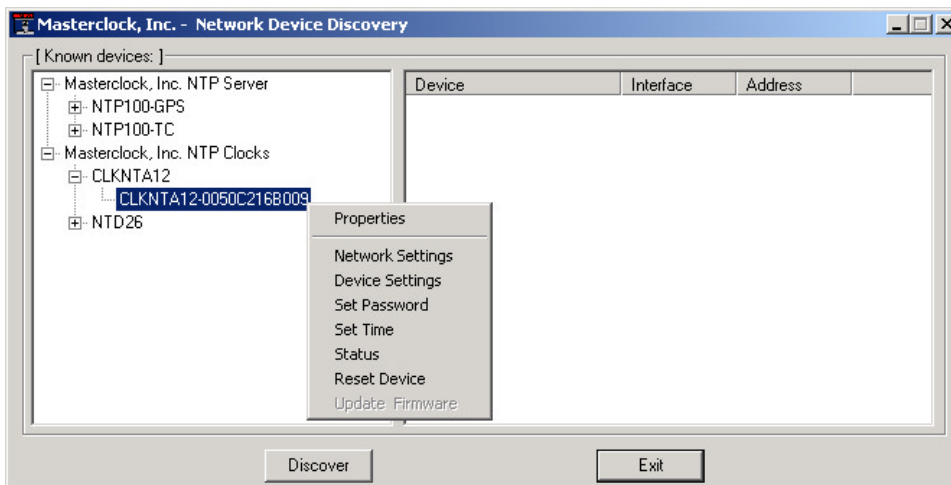
Clicking on any device group will list in the right pane of the WD window all devices of that type found. Only the devices shown in the right window can be managed. To configure another device group, click on the device name in the left window and the device names will then appear in the right window, ready to be managed.



Network Device Discovery screen

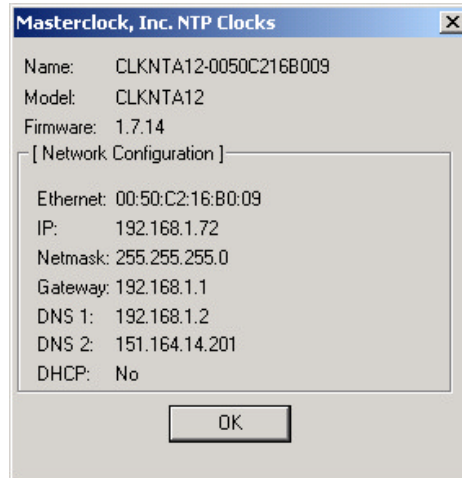
To configure and manage a device shown in the right window, double click or right click the device name and a menu appears. The choices are:

- Properties
- Network Settings
- Device Settings
- Set Password
- Set Time
- Status
- Reset Device



Clicking a menu choice opens a new window for that function. When working in the management windows, use the *Apply* and *OK* button to accept changes that you have made. Use the *Cancel* button to exit the screen without applying changes. **NOTE:** *Cancel* does not undo changes that have been saved using the *Apply* button.

Properties

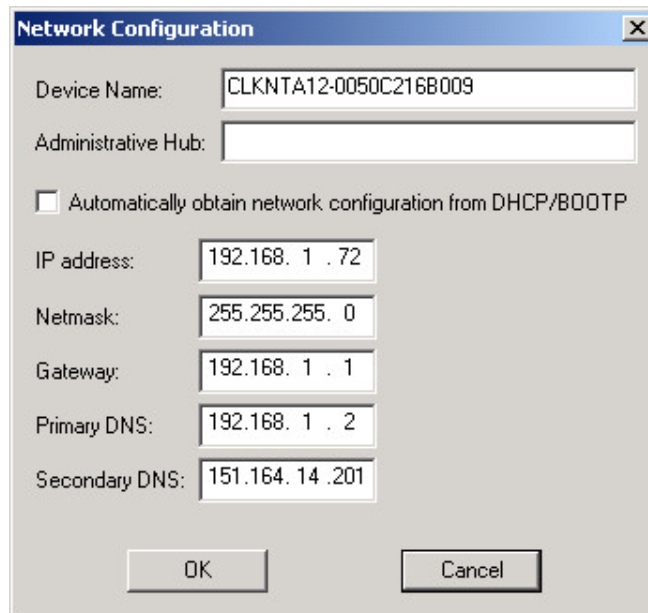


The network configuration may be viewed in a summary form under the *Properties* selection.

Network Settings

The network settings must be established for the clock to operate on the network. You must be a network administrator or have their support to complete these functions. Your network administrator determines the information for the Network Settings.

The default factory setting for network configuration is to use DHCP/BOOTP.



To utilize static IP addressing, de-select the checkbox for “Automatically obtain network configuration from DHCP/BOOTP”. You must enter the IP address, Netmask, Gateway, Primary DNS, and may enter a Secondary DNS.

[Note: the Administrative Hub configuration item is reserved for future use.]

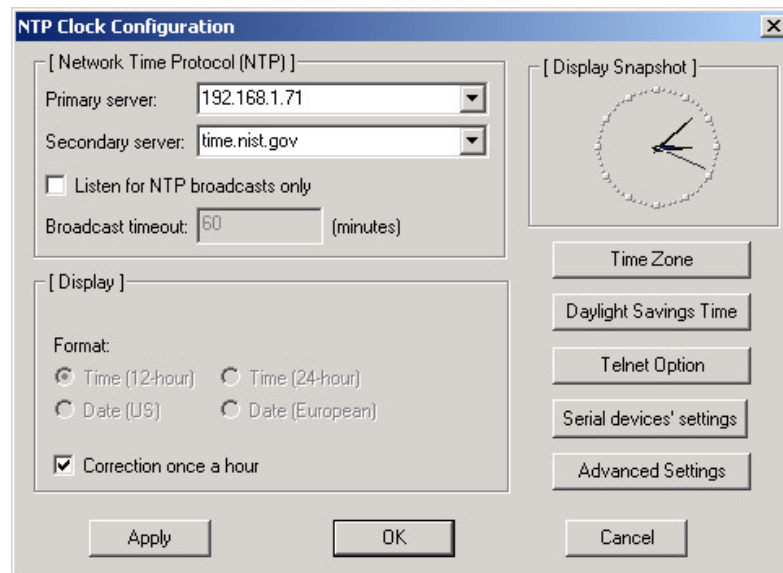
Each clock is programmed at the factory with a factory device name. This name includes the model name and a “MAC address” extension.

[Hint: You can change the device name to one convenient for your site – preferably one that helps you to later identify the exact physical location of the device.]

Device Settings

Each clock can be configured to display time, using time zone offsets and DST settings to completely customize it. These changes are made relative to UTC time.

Any changes made in this window will not be applied until you click the OK button to exit the window or the Apply button to immediately see the changes. The Primary Source must be configured to acquire an NTP source. Enter the IP or Internet address or DNS name for the NTP source.



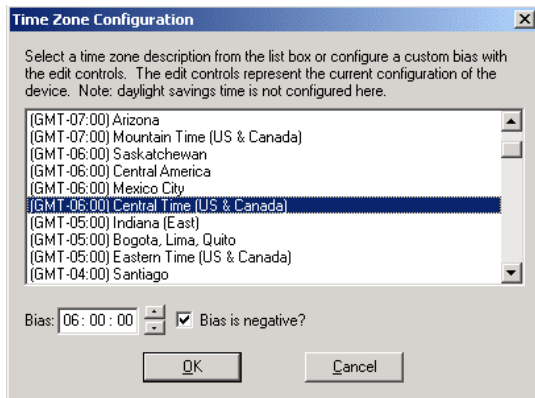
If available, enter a Secondary Source for backup. The top right section of the Window shows a snapshot of the network clock display, constantly updated. This update is not precise, but is meant to give you a view of the clock display for troubleshooting and maintenance purposes.

The network clock can be configured to either listen to NTP broadcasts only, or to query the NTP time server at a selected interval. The default configuration is to query the NTP server at 10-minute intervals. To configure the network clock device to only listen to NTP broadcasts, click the checkbox for “Listen for NTP broadcasts only”, and enter a “Broadcast timeout” in minutes. The default timeout is 60 minutes.

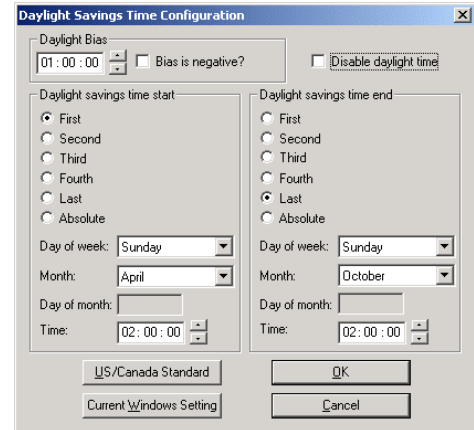
The *[Display]* region of the window configures the face of the network clock. Included in this region is an option for setting the correction mode for the analog clock, by factory default the CLKNTA12 will initiate a correction cycle once per

hour. To select the 12 hour correction mode (twice daily at 5:59), deselect the checkbox for *Correction once an hour option*. Additional options in this configuration region may be grayed out; this indicates invalid or unavailable options for this model of network clock.

The Time Zone and Daylight Savings Time setting buttons, also included in the lower half of the window, give the clock complete flexibility to display any time zone, DST combination. First select the time zone, by clicking the Time Zone button. This opens a new window that gives you a list of time zones, including descriptions to help with the selection. Select the Time Zone and click *OK* to close the window. Changes are not applied until you click *OK* or the *Apply* button on the main Configuration window. Next click the *Daylight Savings Time* button to configure the Daylight Savings Time, if appropriate. Click *OK* to close the Window. The change will be applied when you click *OK* or *Apply* on the Main Configuration Screen.



Time Zone Configuration screen

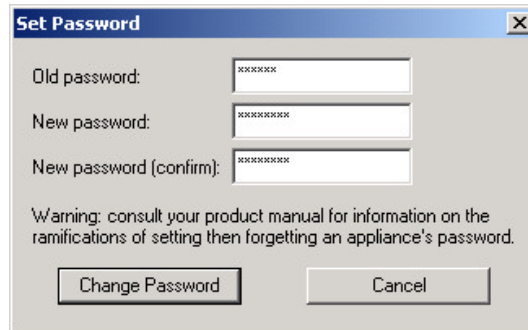


Daylight Savings Time Configuration screen

The *Advanced* button adjusts Telnet configuration. If Telnet is allowed, the port must be defined. The default Telnet port is 23. See your network administrator if you need additional information.

Set Password

The third option on the clock configuration pull down menu allows you to set a password for each individual device. The password must be entered twice to confirm the entry. The password is a maximum of 11 characters and a minimum of 1 character, and is case-sensitive. Click the OK button to save the password or cancel to discard the change. **Warning: If the password is lost, the user must reset the clock using the Reset button on the rear of the clock. This will cause the clock to return all configuration to factory-default settings.**



To remove a password, select the Set Password command. You will be prompted to enter the old password. Do not enter anything into the New Password or Confirm Password fields. Click OK to save. Click Cancel to leave the old password unchanged.

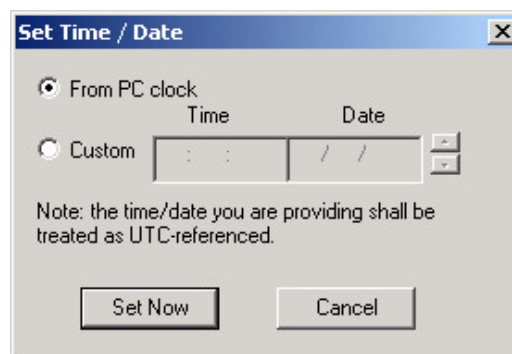
When a password is set for a clock, each time you click OK or Apply for that clock you will be asked for the password. You may enable the ‘Remember this password for the session’ checkbox to eliminate typing the password for each configuration change. WinDiscovery will not remember the password after it is closed so maintain passwords in a safe place.

[Note: the factory default password is: “public”]

Set Time/Date

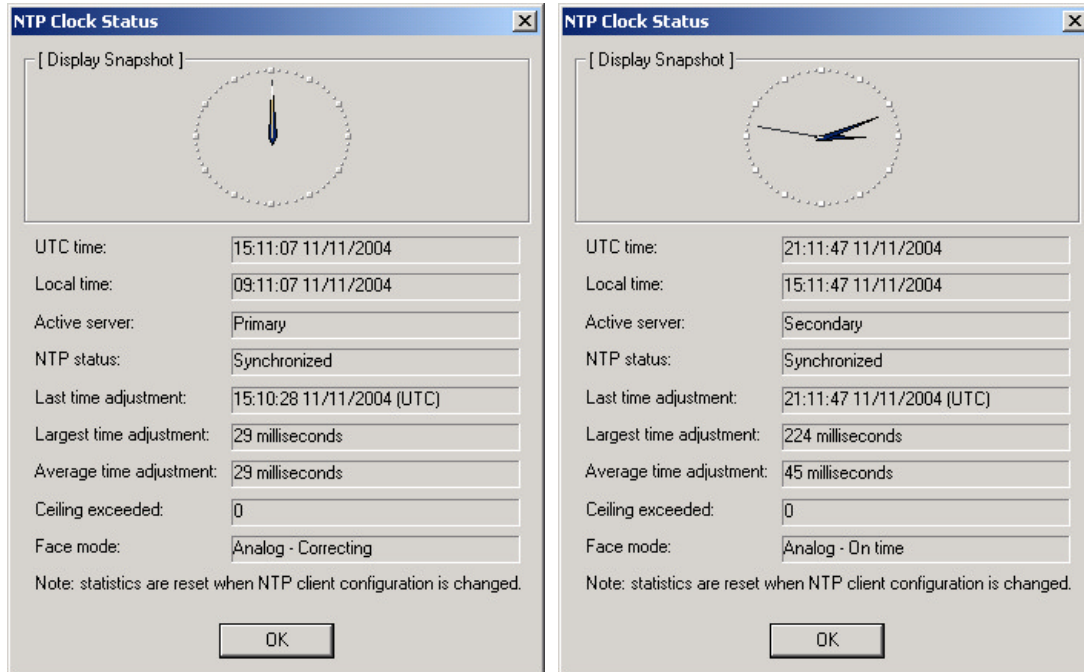
The Set Time/Date menu item lets you manually set the time and date for the clock. The function may be most useful for lab situations as the clocks keep time via their internal precision oscillator and real-time clock when NTP is not present. The time can either be set to the time of the PC or a manual time and date can be entered. When the network clock has access to NTP servers, information obtained via NTP will overwrite any manually established time/date. Therefore, practical use of this feature requires the clock to be removed from the network, or for NTP server configuration to be left undefined.

[Note: for the purpose of refreshing its internal clock, the network clock assumes the time entered is UTC. Any configured time zone/daylight time settings will then be applied to this time for display purposes.]



Status

The Status window is a display-only window that gives you the current information on the network clocks display and synchronization activity. The status window shows a snapshot of the network clock display. This status update is not precise, but is meant to give you a view of the clock display for troubleshooting and maintenance



NTP Clock Status screen

Note : while *correcting*, the analog clock status display snapshot will display 12:00.

purposes. The Status also shows the active NTP server – Primary or Secondary, the current synchronization status, and Time Adjustment information.

Time Adjustments may be caused by

- loss of NTP,
- changing the NTP source, or
- changing Network Configuration settings
- power loss or cycling
- standard correction cycle (CLKNTA12 only)

The Ceiling Exceeded field describes the event where the time adjustment exceeded a value that will be set in the NTP Clock Configuration - Advanced – Ceiling. Note: the statistics will reset if you change the NTP server.

Telnet Terminal Configuration

A terminal-style configuration interface is available via Telnet. To connect with the NTD in this manner use any standard Telnet client application, specifying the IP address of the clock as the server with which to connect. The factory default port is well-known telnet server port 23.

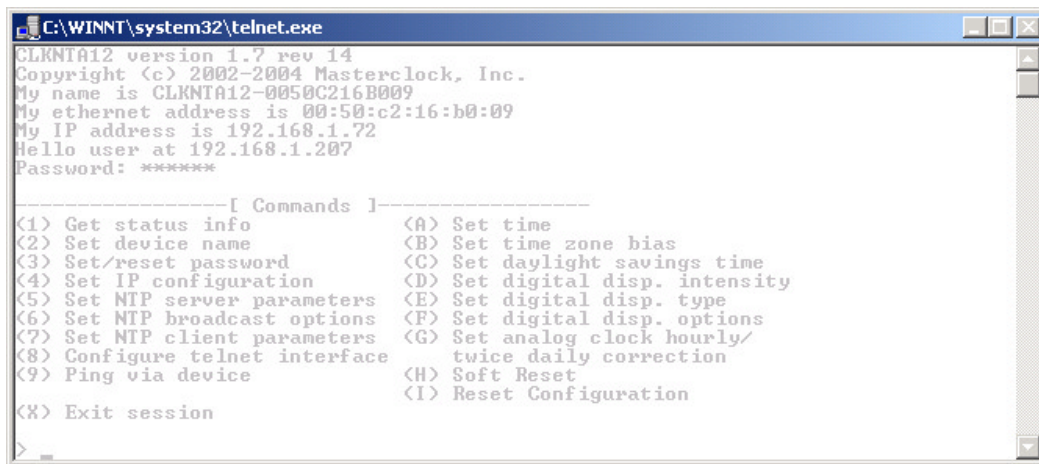
Configuration via Telnet may not be convenient for devices operating with a factory default configuration since the IP address is not known. Use the WinDiscovery application or the RS-232 interface to establish first-time networking configuration.

If you are not familiar with the Telnet application, ask your network system administrator for assistance.

[Note: for security purposes, the Telnet interface can be disabled. When disabled, you will no longer be able to access the device with Telnet. To re-enable the Telnet feature, one of the other configuration methods must be used, or the clock must be reset to factory default configuration.]

Upon entering the network clock via Telnet, the initial screen is shown below. The clock displays its firmware version, its name, Ethernet address, IP address, and the IP address of the PC with which you are accessing it. A login prompt is presented if a password has been configured for the device. The configuration menu will be displayed when the correct password has been provided.

Enter the Number or Alpha Letter corresponding to the command desired and press the enter key. Current configuration or default answers are displayed in brackets. Depressing the 'Enter key only' will retain the current entry/default.



Terminal Menu screen

Get Status Info

Select this menu option to query the device for parameters relating to the clock's current status. This includes information regarding the clocks reference to UTC, local time, displayed time, whether it is synchronized, and its NTP server.

Set Device Name

To set the device name, select this menu option. Enter the desired device name.

Set/Reset Password

To set, change or remove the password, enter '3' for this option. Bear in mind that a lost/forgotten password cannot be recovered.

[Note: the factory default password is: "public"]

Set IP Configuration

To set the IP Configuration, select this menu option. **NOTE: If you select this option, you will be disconnected from the session upon completion, whether you actually change any entries or not.** You have the choice of using DHCP for automatic IP Configuration or entering the data in these screens. If you select DHCP, no other questions will be displayed, you will be disconnected from the session, and you will not be able to Telnet to this clock until you learn the DHCP-provided IP address. To manually enter the IP information, enter 'N' for the DHCP (or Enter for the default), and enter the IP, Netmask, Gateway, Primary DNS and Secondary DNS server.

Set NTP Server Parameters

The network clocks support a Primary and a Secondary NTP source in static IP addressing mode. Select this option to setup or change the NTP reference sources. Enter the name or the IP address for the NTP reference server. Enter the server port for each NTP reference source (normally 123). Note that in DHCP addressing mode, the DHCP server will provide this information.

Set NTP Broadcast Options

The NTD clocks are set to query for NTP on a regularly scheduled basis, factory set to 10-minute intervals. To set the clock to receive broadcasts, set the NTP broadcast option to 'yes' and enter the broadcast port (normally 123). If the clock is set to receive broadcasts, the clock will not query.

Set NTP Client Parameters

The NTD clocks are set to query for NTP on a regularly scheduled basis, factory set to 10-minute intervals. To adjust the settings for query interval and additional NTP client parameters select option F.

Configure Telnet Interface

Select option C to turn off the Telnet access. If Telnet is allowed, define the Telnet port (normally 123). If turned off, the Telnet session will be ended and the user must use WinDiscovery, the RS232 access, or the Reset button to regain access by Telnet. See Clock Configuration, Advanced button.

Ping Via Device

Allows the network clock to ping an IP/DNS address such as that of the NTP server. This is useful in situations where the communication link/path from the network clock to the NTP server is in question.

Set Time

Allows UTC time and date to be set directly into the clock. This is useful in situation where NTP server synchronization is not available but reasonably correct time/date is desired on the display.

Set Time Zone Bias

The Time Zone Bias indicates the offset from UTC. Enter the time in HH:MM:SS format as indicated, including the plus or minus sign to indicate positive or negative bias. Remember that this field can also be set from DHCP, so check with your Network Administrator if you are getting inexplicable results.

Set Daylight Saving Time Parameters

The DST configuration allows you to completely configure the DST (summer hour) settings for your location. To configure the DST, enter Y to 'Perform Daylights Savings Time Adjustments'. For sites requiring US/Canada standard DST, you can indicate yes to the next question and the DST will be configured for you automatically. The US/Canada standard is: 1-hour positive bias, starting at 2:00am on the first Sunday in April, and ending at 2:00am on the last Sunday in October. If you select the US/Canada standard, the configuration is complete. If you indicate 'no' for the US/Canada, then you continue to configure the DST by entering the number of each option and completing the entries (masks are provided for required format of data):

- DST and standard time bias hour, with sign (DST normal bias is -01:00:00 hour, and standard time bias is normally +00:00:00)
- DST start point – can be set as absolute date, i.e. 04/01, or floating day, by entering Month such as 4 for April, Day of week such as Sunday, and week in Month, 1st, 2nd, etc.
- DST end point – can be set as absolute date or floating day

Set Digital Display Intensity (digital display only)

The digital clock display intensity is controlled with a scale of 1 to 14 with 14 being brightest. Enter the value for the desired intensity setting.

Set Digital Display Type (digital 6 digit display only)

Allows configuration for time display (12 and 24 hour) or date display (MM/DD/YY or DD/MM/YY) for 6 digit clocks.

Set Digital Display Options (digital display only)

The digital clock display special options may be adjusted. This includes displaying dashes when an NTP timeserver is not present.

Set Analog Clock Hourly/ Twice Daily Correction

The CLKNTA12 analog clock is synchronized to the time reference either hourly at 59 minutes past each hour or twice daily at 05:59A.M/P.M. The scheduling of the correction is a configurable option via software. Factory default setting is hourly correction.

Enter X to exit the Telnet menu. This will disconnect your Telnet session from the clock.

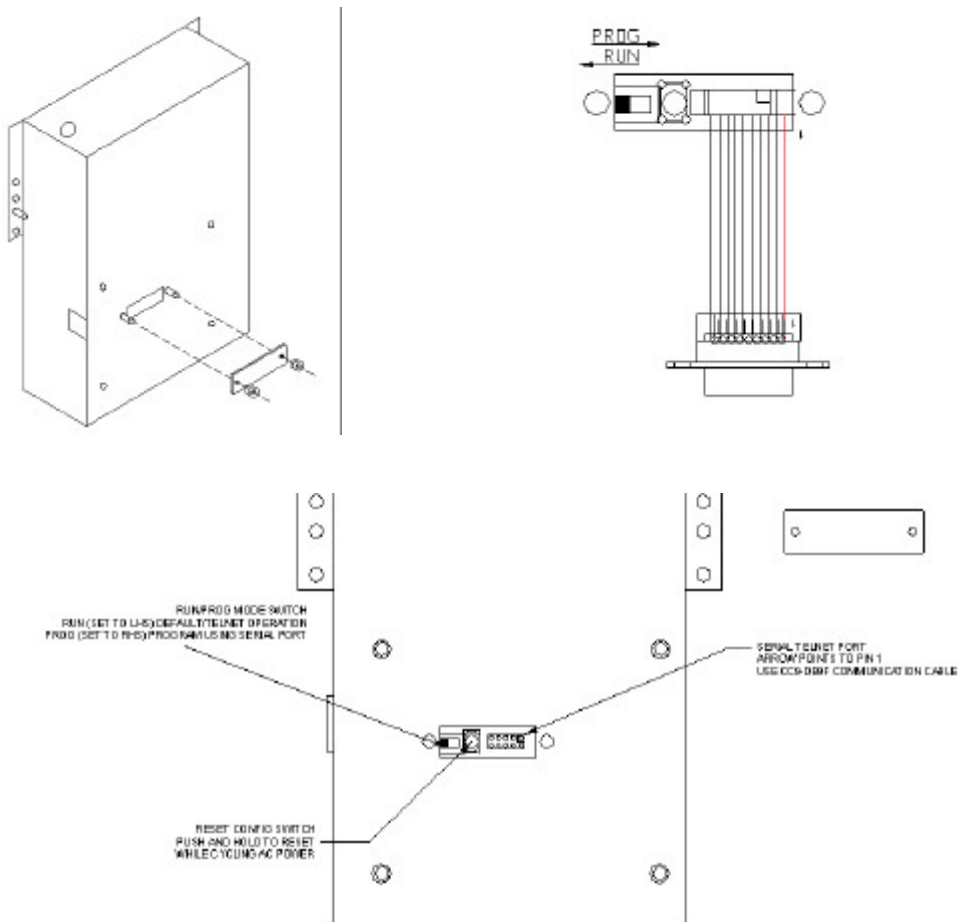
RS-232 Terminal Configuration

The preferred and recommended method of configuring the CLKNTA12 is via the WinDiscovery application or with Telnet. In certain [rare] instances it may become necessary to access the configuration reset switch to return the network clock to its factory default settings or to recover from a non-responsive condition. In addition, the installer may opt to configure or update the firmware for the device using an alternate method than the standard Ethernet port. A serial port interface and a factory default configuration reset switch have been included as provisions. Access to these items can be obtained by opening the access panel on the rear of the CLKNTA12.

The RS-232 configuration interface behaves identically to the Telnet interface. To communicate with the network clock in this manner connect any RS-232 terminal or PC serial port and serial terminal application to the 10-pin header connector beneath the access panel on the rear of the CLKNTA12. A “straight-through” 9-wire communication cable (Masterclock part number CC9DB9F or equivalent) should be used for the CLKNTA12.

The settings for the RS232 port are: 9600, 8 data bits, no parity, 1 stop bit. Once connected, press ENTER once to display the login/menu screen. It may be necessary to restart the unit by recycling AC power to initiate the serial terminal configuration interface after the serial cable has been attached.

Consult the section entitled Telnet Terminal Configuration for details on how to change configuration using the terminal interface.



TROUBLESHOOTING TIPS

Problem: Unable to find the clock on the network with WinDiscovery.

Possible reasons/solutions:

1. Verify that the clock is on the same physical network as the computer from which you are running WinDiscovery. If the computer is separated from the clock by a router (on a remote network) it is likely that the router is blocking communication with the device. Run WinDiscovery from a computer within the remote network, or ask a network system administrator to configure the router in question to pass through (both directions) UDP broadcasts on port 6163.
2. If the clock has been configured to use DHCP for network configuration but no DHCP/BOOTP server is present, the clock will not respond to discovery requests. *[Note: DHCP configuration is enabled as a factory-default.]*
3. Verify that the clock and the computer running WinDiscovery are attached to the network.
4. Verify that all network cables, hubs, etc. are in proper working order. Be sure that Ethernet cross-over cables are not being used where inappropriate.

Problem: Clock is unable to find NTP reference, either Primary or Secondary Source. (colons/LED flashing and/or Status in WD says 'Unsynchronized')

Possible reasons/solutions:

1. Verify that the NTP server(s) specified are reachable, communicating, and are not flagging their reported time as invalid. Use a PC-based NTP client application to verify the server(s) if necessary.
2. Verify that a gateway/router has been configured that allows the clock to communicate outside of its local network.
3. Verify that the IP address configured for the clock is correct.
4. Verify that the clock is connected to the Ethernet LAN.
5. Verify that all network cables, hubs, etc. are in proper working order. Be sure that Ethernet cross-over "patch cables" are not being used where inappropriate.

Problem: Clock is not displaying the correct local time (and/or date).

Problem: Clock did not properly negotiate the Daylight Savings Time to standard time (or vice-versa) transition.

Possible reasons/solutions:

1. Time zone offset has been configured incorrectly. Provide the correct time zone configuration.
2. Daylight savings time has been configured incorrectly. This is configured separately from the time zone configuration. Provide the correct daylight time configuration.
3. If using DHCP/BOOTP for network configuration, consult with your network system administrator to see if the optional *Time Zone* option has been changed. This option as provided by DHCP can override manual settings.

4. If you have used the Set Time function, note that the clock assumes that you have entered UTC and will apply your Time Zone and DST configuration relative to the manually entered time.

Problem: Clock hands appear to freeze periodically.

Problem: The minute hand is running fast (at a rate of 1 revolution per second).

Problem: The red status LED is flashing.

Possible Reasons/solutions:

1. The mechanical correction mechanism of this clock is used to periodically synchronize the time (at XX:58:00 to XX:59:00, factory default – once per hour correction) displayed by the hands to the internal time reference. During this time period the red status LED will blink/flash once per second. This is normal operation for the clock.
2. Upon acquisition of NTP during initial startup, or a change to the internal time reference (as compared to the NTP server) caused by power loss, configuration changes to time zone offset, daylight saving time, or entry into/from daylight savings time will cause the clock to enter a startup correction cycle. This startup correction cycle may take up to 2 hours to complete. During this time period the red status LED will blink/flash once per second. This is normal operation for the clock.

Problem:

You have lost your password.

Possible reasons/solutions:

1. The password cannot be recovered if it is lost. Reset the clock using the procedure described in the [Configuration](#) section.

If these troubleshooting tips do not solve your problem, contact technical support at:

support@masterclock.com

or call: (636) 724-3666

SPECIFICATIONS

Communications – I/O

Ethernet (10mbps) RJ45
Format.....SNTP (Simple Network Time Protocol)/UDP
RS-232 10-pin header

Power Requirements

AC Input Voltage.....100-120 VAC
AC Input Frequency.....60 Hz
Pigtail wiring standard. AC Power Cords available (see *options*).
Power Consumption..... < 10 W

Physical

13.25” (33.7cm) Round Black Metal Case with 12” Face, 3.25” (3cm) high, glass lens.
Weight – 7.6 lbs. (2.45kg)

Power Supply Component Characteristics

Approvals - UL, CSA, IEC & VDE. Built in output power limiting, over voltage and short circuit protection. Input AC fuse protection – internal built in fuse designed to blow if a catastrophic failure occurs. Fuse does not blow on overload or short circuit

Operating/Storage Temperature & Humidity

Operating Temperature 0 to +40°C
Relative Humidity Up to 90% (non condensing @ 25°C)
Storage Temperature -40 to +70° C
Relative Humidity Up to 90% (non condensing @ 25°C)

OPTIONS – Special Order

220VAC, 50Hz operation (CLNTCA12-220) – special order
Power cords for US, UK, EURO, and AUS/NZ – special order

LIMITED WARRANTY

This Masterclock, Inc. (hereinafter Masterclock) product warranty extends to the original purchaser.

Masterclock warrants the CLKNTA12 against defects in materials and workmanship for a period of one year from date of sale. If Masterclock receives notice of such defects during the warranty period, Masterclock will, at its option, either repair or replace products that prove to be defective.

Should Masterclock be unable to repair or replace the product within a reasonable amount of time, the customer's alternate remedy shall be a refund of the purchase price upon return of the product to Masterclock. This warranty gives the customer specific legal rights. Other rights, which vary from state to state or province to province, may be available.

Exclusions

The above warranty shall not apply to defects resulting from improper or inadequate installation or maintenance by the customer, customer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product or improper site preparation and maintenance (if applicable).

Warranty Limitations

MASTERCLOCK MAKES NO OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS PRODUCT. MASTERCLOCK SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

In any state or province which does not allow the foregoing disclaimer, any implied warranty of merchantability or fitness for a particular purpose imposed by law in those states or provinces is limited to the one-year duration of the written warranty.

Exclusive Remedies

THE REMEDIES PROVIDED HEREIN ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MASTERCLOCK BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

In any state or province that does not allow the foregoing exclusion or limitation of incidental or consequential damages, the customer may have other remedies.