



DC-40N Installation Manual

Description

Country of Origin	Made in the U.S.A.
Environment	Indoor, IP20, NEMA 1
Display	4" high, red, 7-segment, 4-digit, LED
Viewing Distance	200 Feet (60.96 Meters)
Function	Time-of-Day Clock
Power Supply (PS-12-1000)	Display: 12 Watts MAX, 12 Volts DC; 1A Power Adapter Source: 100-240 Volts AC, 50-60 Hz, 1 A
Time Base	Crystal Oscillator ± 2 minutes/year (factory Calibrated)
Control	Synchronization to a NTP server
Mounting	Key-holes on back for mounting to handy box, gang box, rough-in four-square box or wall anchors.
Housing	Surface-mount, powder-coated aluminum enclosure with red, polycarbonate lens, 16.25 inches wide x 6.75 inches high x 3 inches deep.
Weight	5 lbs. (2.26 Kg)

DC-Digital

Introduction



The DC-40N is designed to provide a time of day reference that is easy to see from a distance, maintenance free and accurate. The 4 inch high digits with wide stroke offer a viewing distance up to 200 feet. With no moving parts and automatic time change for daylight savings as well as periodic correction with an NTP source, all maintenance tasks have been eliminated. Accuracy is achieved by timekeeping processes done by dedicated hardware in parallel with other electronics, a crystal that has been factory calibrated and periodic correction by modern networking protocols. With a sustained network connection to an accurate NTP source, the DC-40N will keep time within 1 second of atomic, factoring in network latency. If the network is interrupted, the DC-40N will keep time ± 2 minutes a year.

When powered up, the display will cycle through numbers 0-9 on all digits. This test pattern should complete in approximately 10 seconds. After the self-test, it will display the time of day, starting at midnight. During the self-test, the DC-40N will also attempt to establish a connection with the local area network. If successful, it will then attempt to query the NTP server for time. If it receives a valid response from the NTP server, it will update the time. Once the time has been updated, the DC-40N will wait for an interval of real time before querying the NTP server again. If it is unsuccessful in obtaining the time, either on power up or after the update interval, it will make an attempt every 10 seconds until it is successful. The DC-40N has many configuration parameters that can be changed to suit the application where it is deployed. The table at right outlines this default configuration.

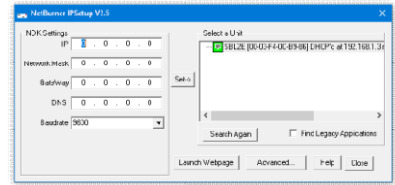
Defaults	
Device Name	DC-Digital-NTP-####
Network Addressing Mode	Dynamic (DHCP)
Time Zone	Eastern
Daylight Savings Change	Observe DST
Hour Format	12-Hour
NTP Server	time.nist.gov
Update Interval	1 minute
User Name	username
Password	password



Configuration

A web server is running inside the DC-40N that provides a few HTML forms useful for changing the configuration. To access these forms, point any web browser that supports HTML5 on any connected device to the IP address of the DC-40N.

1. [IPSetup.exe](#) is a Windows™ program that can be used to discover the IP address of DC-Digital products on a local area network. Once the ZIP file has been downloaded to a Windows computer and unzipped, IPSetup.exe can run without further installation.
2. The Home page contains information about the DC-40N as well as links to the configuration pages. The Username and Password, NTP Server Information and Time Information can be configured on the Clock Settings page. The Network Information can be configured on the Network Settings page.
3. Click on the Clock Settings or Network Settings link to go to that page. **When one of these pages is accessed, the DC-40N will prompt for a Username and Password if it has not already done so.** The default Username is “username” and the default Password is “password”. This can be changed on the clock settings page.



The Home Page

NTP Server Address - is the address of an NTP server that the device queries.

Last Synchronized - is the date and time in local time that the device last successfully synchronized to the NTP Server. This is updated as the time is synchronized with the NTP server.

Last Synchronization Attempt - will state “**Success!**” in green text if the device successfully synchronized on its last attempt or will state “**Network Error!**” in red text if the device was not successful. In addition, a dot will blink in the upper left of the LED display until the device is successful. A network error indicates an error in the settings or in any network entity external to the device, including the NTP server.

Network Configuration - indicates if the network configuration is dynamic (DHCP) or static.

Device Name - is the hostname of the device on the network.

Hour Format - indicates how the device is displaying time.

Current Time Zone – will indicate Standard and Daylight Time and the Time Zone

Current Local Offset - reflects the number of hours of offset from UTC for the local time.

Daylight Savings Change - will indicate if daylight savings change is observed or not.

DC-Digital Home | [Clock Settings](#) | [Network Settings](#) | [Bell Schedule](#)

Information	
NTP Server Information	
NTP Server Address:	time.nist.gov
Last Synchronized:	06 Mar. 2020 14:34:07
Last Synchronization Attempt:	Success!
Synchronize Interval:	1 minutes
Network Information	
Network Configuration:	DHCP
Device Name:	DC-Digital-NTP-B986
Device IP Address:	192.168.1.3
Device Subnet Mask:	255.255.255.0
Gateway IP Address:	192.168.1.1
DNS IP Address:	192.168.1.1
Time Information	
Hour Format:	12-hour
Current Time Zone:	Eastern Standard Time
Current Local Offset:	-5
Daylight Savings Change:	Observe Daylight Savings Time

Formware Version: v1.0 Feb 23 2020



The Clock Settings Page

User Name and Password - is a form to change:

- User Name together with password form a basic HTTP authentication scheme to prevent unauthorized changes to the clock or network settings. Only one user name is stored to grant all access. User name and password must be entered exactly (IE they are case sensitive).
- Password must be repeated exactly or the submitted form will be rejected and the previous user name and password will remain in effect.

NTP Server Settings - is a section to change:

- NTP Server Address can be a domain name or IP address in IPv4 dotted-decimal form.
- Update Interval sets how frequently the server is queried for time.

Time Settings - is a section to change:

- Hour Format, Daylight Savings Change and Time Zone. In 12-hour, midnight and noon is represented as **12:00**, hours advance from 1 to 12 and leading zeros are blank. In 24-hour, midnight is represented as **00:00**, hours advance from 0 to 23 and leading zeros are displayed.
- Daylight Savings Change, if observed, the local time zone switches between Standard and Daylight Time according to the date as established in The Uniform Time Act of 1966 and as amended in The Energy Policy Act of 2005. If not observed, the time will remain Standard Time all year.
- Time Zone may be set to one of 7 US time zones, Atlantic, Eastern, Central, Mountain, Pacific, Alaska, Hawaii-Aleutian.

The Network Settings Page

Device Name - is the hostname of the DC-40N on the network. Each name is unique to that network connection. The default Device Name is a combination of the device function and last four digits of the MAC.

Addressing mode - sets the network configuration to DHCP or Static. **DHCP** means the device will obtain its network settings from a connected

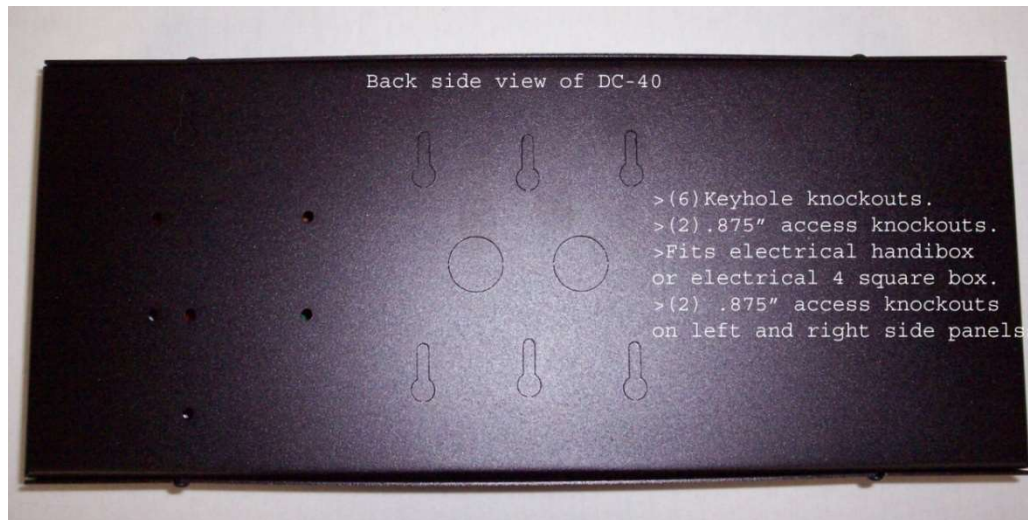
DHCP server, typically a router. **Static** means the Device IP Address, Device Subnet Mask, Gateway IP Address and DNS IP Address can be set by the submitted form and will retain these values. Values for these fields must be non-zero and in IPv4 dotted-decimal form.



Installation

Connections:

- Network - The DC-40N requires connection via Ethernet to an NTP Server. On the right hand side of the display is a female modular jack (RJ-45) for connection to Ethernet via standard Cat V cable.
- Power - The DC-40N is supplied with a PS-12-1000 wall power adapter. This plugs into a standard wall outlet (US NEMA 5-15R receptacle). A coaxial plug on the power adapter connects to the DC-40N via a coaxial receptacle on the right hand side.



Mounting:

Mount the DC-40N in a clean dry dust free area. The DC-40N can be viewed up to 200 feet. It is recommended that you should first test the location of the mounting sight for proper operation before permanently mounting the DC-40T-DN. There are (6) keyhole mounting knockouts for easy attachment to an electrical handi-box or an electrical 4 square box or simply several screws secured to the wall. Also supplied are 4 adhesive backed rubber feet that can be adhered to the enclosure bottom for table or desk top mounting.

For further questions please contact Industrial Electronic Service D.B.A. DC-Digital @ 937-746-9750 or visit us @ www.dc-digital.com.