



Highway Advisory Radio
Digital Communication Controller
Model 3 (DCC-3)

Getting Started Guide

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Overview

This is a getting started guide for use with the M. H. Corbin Inc. Digital Communication Controller Model 3 (DCC-3).

This document describes administration, maintenance, and troubleshooting tasks that are required for continued operation.

Installation

1. Completely power down the BlackMax rack.
2. Remove any IM-1 if present.
3. Ensure the power switch on the front panel of the DCC-3 is OFF (the “O” position).
4. Slide the DCC-3 into the card guide and ensure the backplane connector completely engages.
5. Screw down the unit at the top and bottom of the faceplate with the supplied retainer screws.
6. Attach the network cable to either of the 2 Cat5e Ethernet connectors. They are bridged together, similar to a network switch.
7. Attach the GPS serial cable from the “GPS” port of the faceplate to the “RS-232C” port on the faceplate of the GPS module.
8. Attach the DR1500 serial cable from the “DR1500” port of the faceplate to the “RS-232” port on the faceplate of the DR1500 module.
9. Optional – Attach a Null Modem serial cable from the console port of the faceplate to a laptop with the SRT software installed.
10. Power on the unit and watch for the heartbeat light to flash green.

Network IP Configuration

You will need either a DHCP enabled IPv4 network, or a Windows PC/laptop with an available serial port.

The DCC-3 supports IPv4 networks through DHCP and Static addressing. From the factory, the unit comes with DHCP enabled.

To configure the unit with a static address, there are 2 options:

- 1 – Using DHCP to acquire an initial address** – Place the unit onto a network which



supports DHCP addressing. This will allow the unit to first acquire a temporary address which can be changed through the web interface.

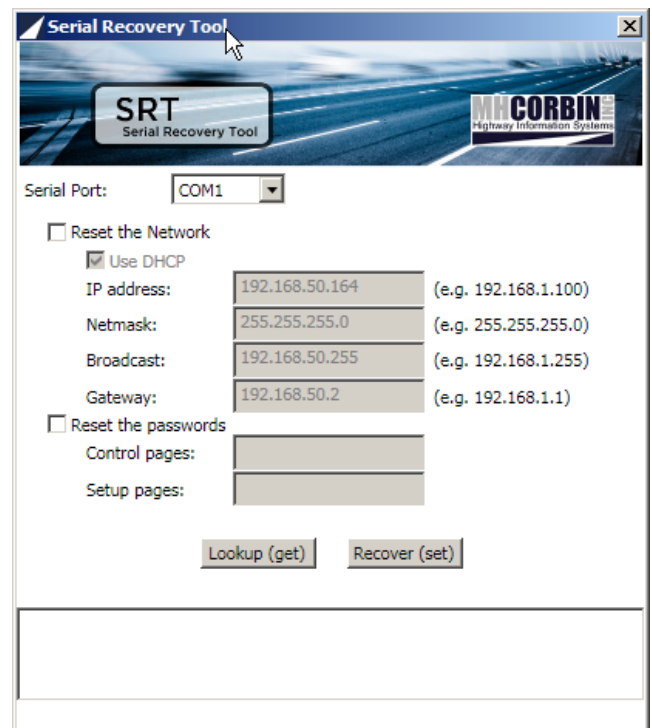
Use the DHCP server tools to determine what address has been assigned to the device. The exact steps to do this vary greatly depending on the DHCP server used. Once the assigned IP address has been determined, skip ahead to the “Operation - Web Interface” section.

2 – Program via serial cable – Program the unit's IP address directly by connecting the DCC-3’s console port to a PC using a NULL modem serial cable and the Serial Recovery Tool (SRT).

The Serial Recovery Tool (SRT) is a Windows application which can be used to configure the DCC-3 when no network connection is available, or when the setup password has been lost. SRT requires a NULL modem serial connection to the device, so the PC/laptop being used must have either an on-board or USB serial port.

The application is available for download under DCC-3 Resources from:
<http://www.mhcorbin.com/products/manufactured-products/highway-advisory-radio>

Once the NULL modem serial cable is connected to the console port, open up the SRT window. You should see several fields with gray text, which you cannot interact with. In the top left corner of the SRT window, there will be a “Reset” option with a clickable box to its left. Click on that box. You should then see the fields in gray become enabled. This will be important because you will then assign DDC-3 an IP address from the IP address field. At the bottom of the window, you should see a Recovery button. Click on that button.



Once the assigned IP address has been set, skip ahead to the “Operation - Web Interface” section.

Operation

Front panel lights

Power – Lights green when the unit is receiving power from the backplane.

SBC Pwr – Lights green when the internal Single Board Computer has powered up.

HDD – Flashes green during disk activity

Heartbeat – Flashes green when the DCC is operating normally. If the light flashes red, an error has occurred. See the web interface for more details.

DR1500 – Lights green when the communication with the DR1500 is successful. Amber indicates active communication (aka ‘busy’), while red indicates an error. See the web interface for more details.

GPS – Lights green when the communication with the GPS unit is successful. Amber indicates that the GPS is communicating, but it does not have a satellite lock. Red means that there is either no communication or an error has occurred. See the web interface for more details.

Streaming – Lights green when audio encoding and/or audio decoding are occurring. Red indicates failure.

Fan – Lights green when the fan is on. This corresponds to the CPU temperature at which the fan should become active. If the light is on and the fan cannot be heard, it is likely a hardware failure.

Stat-1 – See *Descriptions of Functions* below for more detail.

Red (Off Hook) - Indicates that the DR1500 is in the “Off Hook” mode connected over the telephone line.

Green (Answer) - Indicates that the DR1500 is in the “Answer” mode responding to the telephone line.

Amber (Off Hook & Answer) – Indicates that the DR1500 is in both “Answer” and “Off Hook” modes.

Stat-2 - See *Descriptions of Functions* below for more detail.

Red (Future) – reserved for future use

Green (Audio) – Indicates that demodulated audio is present.

Amber (Future) - reserved for future use

Stat-3 - See *Descriptions of Functions* below for more detail.

Red (Fault) - Indicates that a fault condition has been detected by the DR1500.

Green (Busy) - Indicates that the DR1500 is busy processing commands.

Amber (Fault & Busy) – Indicates that the DR1500 is busy and fault conditions.

Stat-4 – Lights red when reading playlists from a connected USB thumb drive.



Web interface

Once the assigned IP address has been determined (DHCP) or set (Static), use a web browser from a computer connected on this same network to open the URL <http://{ipaddress}>.

In the following picture the URL would be <http://192.168.50.128>:



DCC-3 Web interface

Tap on “Login”. You will be prompted for the control password. By default, the login credentials are:

Username: *control*
 Password: *control*

It is imperative that this password be changed.

This is the Control Interface for the DCC. It shows the status of the modules similar to the front panel lights.

Administration of the device is done through the “Setup” pages. Tap on “Setup” in the menu bar. By default, the login credentials are:

Username: *setup*
 Password: *setup*

It is imperative that this password be changed.

Setup – Displays the Linux Kernel version, uptime, serial number, and firmware versions. Also provides a Reboot button for remotely resetting the device.

IP – Allows you to view the device's current IP configuration, as well as change it to

either DHCP or Static addressing modes.

Logging – Displays the software logging for troubleshooting and allows the user to increase or decrease the logging level.

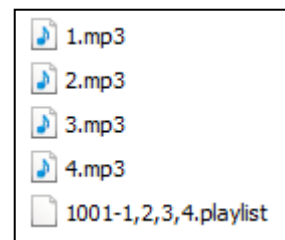
Password – Provides entries used to set new control and setup passwords.

Firmware – Provides a mechanism for remotely upgrading the device firmware.

Activating a Playlist using a USB thumb drive

The DCC-3 supports message downloads and playlist creating by inserting a correctly formatted USB thumb drive. The following requirements must be met:

1. The drive should have a single FAT32 partition. Most new drives come already formatted this way.
2. The message and playlist files must be at the root of the drive's file system, not in subfolders.
3. Message (audio) files must be named “*{message slot number}.{type}*”. The slot number must be in the range 1-999. The type must be .wav, .mp3, .wma, or .aif. For example, valid message filenames would be “1.mp3” and “100.wav”.
4. Playlist files must be named “*{playlist slot number}-{message slot number CSV}.playlist*”. Playlist slot number must be in the range 1001-1025. The message slot number CSV is comma separated message slot numbers. For example, a valid playlist filename would be “1001-1,2,3,4.playlist”. The actual playlist file contents are not used and ignored, therefore a blank file is preferred.
5. There should only be a single playlist file on the drive. If multiple playlist files do exist, only the lowest slot number playlist will be activated.



Once the USB thumb drive has been inserted into the DCC-3 front panel, the following occurs:

1. It may take up to a minute to discover the thumb drive. Sometimes, it's faster than others.
2. The “stat-4” light will illuminate red to indicate the drive has been discovered and is in the correct format
3. Message (audio) files are enumerated and downloaded to the DR1500 in order from the lowest slot number to the highest. Any existing message in that slot will be overwritten.
4. The playlist file is enumerated and created on the DR1500. Once created, the playlist is activated and the transmitter is turned on.
5. The “stat-4” light is turned off and the drive can now be safely removed.

Descriptions of IM-1 Functions

Audio Level and Broadcast Monitor Function

On units equipped with a transmitter demodulator for monitoring the signal, an audio signal is fed to the rear-panel DEMOD AUD IN jack on the DCC-3 board and this signal is converted to a DC signal for monitoring. When modulated audio is coming from the transmitter the Audio LED indicator will be ON and when there is no demodulated audio signal the LED indicator will be OFF. In operation, the rear-panel DEMOD ADJ potentiometer should be adjusted so that the Audio Level Indicator is ON most of the time when there is modulated audio.

The demodulated audio signal is fed to the DR1500 for monitoring and for controlling the broadcast monitor alert flag. (Note that the Audio Level indicator on the DCC-3 board is independent of the audio level sensing functionality on the DR1500.)

Busy Indicator

The busy signal line is used by the DR1500 to inhibit the Digital Communications Controller (DCC) from sending commands to the DR1500 when it is already processing a previously sent command. When the DR1500 is busy, the Busy LED Indicator will be ON. When the DR1500 is not busy or idle, the Busy LED Indicator will be OFF.

Fault Indicator

In systems with an external device, such as a Digital Communications Controller (DCC), the master alert flag and its associated master alert line are used by the DR1500AM to signal to the external device that an alert condition has been detected by the DR1500AM. When the master alert flag is asserted, the FAULT LED indicator on the DCC-3 Interface Module will be ON. When the master alert flag is not asserted, the FAULT LED will be OFF.

For further information about programming the Master Alert Flag, see the DR1500 Operating Manual.

Answer Mode Indicator

In systems with an external digital modem, the system answer mode controls whether the DR1500 or the external modem has a higher priority for answering incoming telephone calls. When the DR1500 answer mode is set to 1 or ON, the DR1500 has a higher priority and the external modem has a lower priority for answering incoming calls. When the system answer mode is set to 0 or OFF, the DR1500 has a lower priority and the external modem has a higher priority. When the DR1500 answer mode is ON the front panel LED on the DCC-3 will be ON and when the DR1500 answer mode is OFF the front panel LED on the DCC-3 will be OFF. For further information about programming the Answer Mode functionality, see the DR1500 Operating Manual.

Off Hook

In telephone jargon the term “Off Hook” means that the handset has been picked up and the telephone is connected to the line. In the context of the DR1500, Off Hook means that the connection to the telephone line is “on” or active. When the DR1500 is Off Hook (equivalent to picking up the phone) the Off Hook LED indicator will be ON and when it is On Hook (equivalent to being hung up) the LED indicator will be OFF.

AC Power Sense Input

The rear-panel AC Power Sense Input jack is used to detect the presence of AC power. (Note that this AC power is not the input power to the DCC-3, which comes through the backplane of the BlackMax rack.) In operation, when there is AC power being applied to the external power module provides a DC voltage at this input. If the AC power fails and the HAR system switches over to battery power, the input voltage will drop to zero, allowing the DR1500 to know that there is a power outage and act accordingly.

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