

**DENON**  
*PROFESSIONAL*

**DN-501C**

**Serial Command Protocol Guide**  
English

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## Introduction

Thank you for purchasing the DN-501C. At Denon Professional, performance and reliability mean as much to us as they do to you. That's why we design our equipment with only one thing in mind—to make your performance the best it can be.

## Support

For the latest information about this product (documentation, technical specifications, system requirements, compatibility information, etc.) and product registration, visit [denonpro.com](http://denonpro.com).

For additional product support, visit [denonpro.com/support](http://denonpro.com/support).

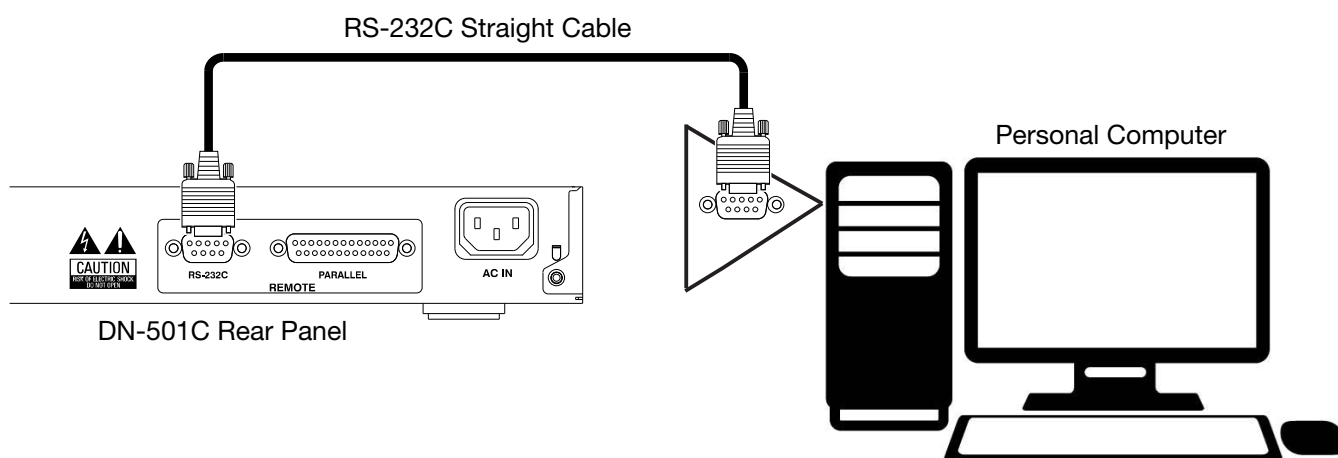
## General Overview

With RS-232C serial remote control, a “host” machine such as a PC can be used to operate your DN-501C. Throughout this document, the equipment used to control DN-501C will be called the **Host**.

To learn more about the different types of serial communication and the code structure it requires, see the [Communication Protocol](#) section that starts on the next page. To view the complete list of serial command codes, see the [Control Command Codes](#), [Status Request Command Codes/Status Information Codes](#), and [Automatic Status Information Codes](#) sections later in this manual.

## Connecting the Host to DN-501C

For serial remote control, you must first connect the host to your DN-501C. Use an RS-232C Straight Cable (9-Pin D-Sub Male) to connect the RS-232C input on the rear panel of your DN-501C to the corresponding input on the host. Make sure that the host is installed with proper software for serial communication.



## Communication Protocol

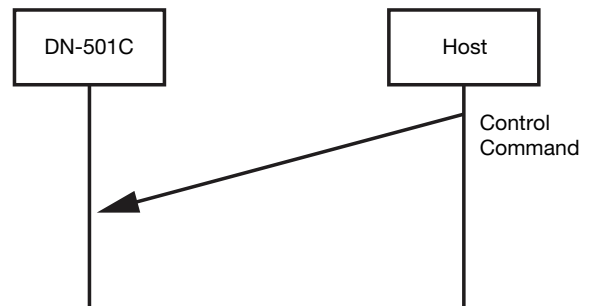
### Types of Serial Communication

Three types of serial communication can be transmitted between the host and DN-501C:

1. Control commands sent to DN-501C from the host

You can use control commands to make DN-501C perform a desired function (such as playing or skipping a track).

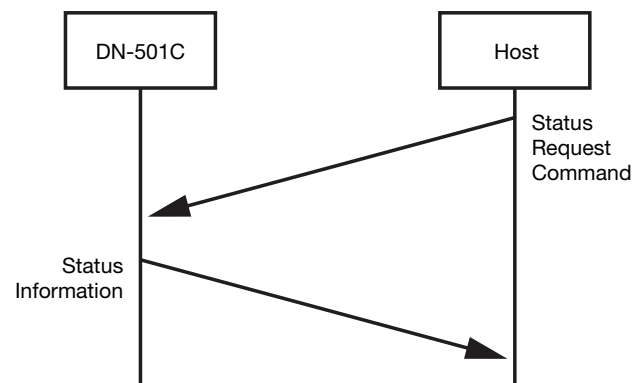
When DN-501C receives a control command from the host, DN-501C executes the command.



2. Status request commands sent to DN-501C from the host

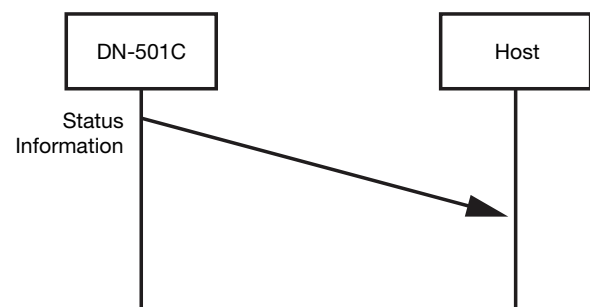
You can use a status request command to determine the current state of one of DN-501C's components (such as whether there is a disc in the CD slot, how many tracks are in the current tracklist, etc.).

When DN-501C receives a status request command from the host, DN-501C answers the host with the requested status information.



3. Status information automatically sent to the host when a change is made from DN-501C

When certain changes to DN-501C are made from the device itself, DN-501C automatically sends status information to the host.



## Structure of the Codes

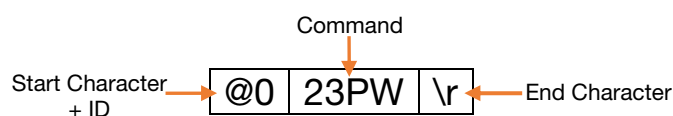
Serial communication between the host and DN-501C uses ASCII Code from 0x20 to 0x7F.

All control command codes, status request command codes, and status information codes require three components that form a “packet.” In order, the components are the **start character + ID**, the **command**, and the **end character** (0x0D):

1. Start Character + ID: @ (0x40) + 0 (0x30)
2. Command: some letters and/or numbers that stand for a controllable feature of DN-501C
3. End Character: \r (0x0D)

The required start character/ID and end character are the same in all codes, whereas the command portion varies with each code.

For example, the full control command code that the host can use to power on DN-501C is **@023PW\r**:



## Rules on Transmitting Command Codes

- When DN-501C receives a control command or status request command from the host, DN-501C should respond within 300 ms.
- When DN-501C successfully executes a command that it receives from the host, DN-501C sends an ACK signal (0x06) to the host (as well as the status information code in the case of a status request command).
- If DN-501C receives an unknown command from the host or if a received command fails for some other reason, DN-501C will send a NACK signal (0x15) to the host.
- When sending consecutive commands from the host, do not send the second command until DN-501C has answered the first with the ACK (0x06) or NACK (0x15) signal. If the second command is sent before the ACK (0x06) or NACK (0x15) signal is received, DN-501C will send the “Busy” status information code (**@0BDERBUSY**) to the host.
- If DN-501C does not receive a command that the host sent within 300 ms, the host will automatically send the same command up to two additional times. If DN-501C still does not receive the command after the second automatic attempt, the process will timeout, and the host will send the end character to DN-501C.
- Do not send a second status request command from the host until DN-501C has responded to the first.
- When sending a command to DN-501C from the host, make sure that no longer than 5 ms passes between entering each character in the command code.
- Wait at least one second after sending the Power On command before sending the next command.
- When status information is automatically sent to the host after a change to DN-501C is made from the device itself, the host will send an ACK (0x06) signal to DN-501C. If DN-501C does not receive the ACK signal within 300 ms, it will automatically send the status information to the host again. If DN-501C then fails to receive the ACK (0x06) signal again, the process will timeout.

## Control Command Codes

Use the codes below to control your DN-501C.

Control Commands (Host → DN-501C)			
CATEGORY	CONTENTS	CODE	DESCRIPTION
<b>Power</b>	Power On	@023PW\r	Powers on DN-501C
	Power Standby	@02312\r	Puts DN-501C in standby
<b>Track Playback</b>	Play	@02353\r	Plays the current track
	Pause	@02348\r	Pauses the current track
	Stop	@02354\r	Stops the current tracklist
	Hot Start Play	@0HPnn\r	Plays the track corresponding to the entered hot start number, where <i>nn</i> (the hot start number) = 01–20
<b>Track Selection</b>	Restart/Previous Track	@02333\r	Restarts the current track or skips to the previous track in the tracklist
	Next Track	@02332\r	Skips to the next track in the tracklist
	Hot Start Cue	@0HCnn\r	Cues up the hot start track, where <i>nn</i> (the track's hot start number) = 01–20
	Select Track Number	@0Trnnnn\r	Selects the track corresponding to the entered file number, where <i>nnnn</i> (the track file number) = 0001–2000
	Select Folder Number	@0Sfnnnn\r	Selects the folder corresponding to the entered number, where <i>nnnn</i> (the folder number) = 0001–2000
<b>Track Searching</b>	Rewind	@02350\r	Rewinds the current track; each entry of the command cycles through the rewind speeds (2x, 10x, 50x, 100x, and 200x)
	Skip Back	@023SB\r	Rewinds the current track by two seconds
	Fast Forward	@02352\r	Fast forwards the current track; each entry of the command cycles through the fast forward speeds (2x, 10x, 50x, 100x, and 200x)
	Activate Frame Mode	@0frON\r	Enters DN-501C in frame search mode; after entering frame search mode, the current track will be paused, and the track will be audible while skipping frame units
	Frame Forward	@0fr00\r	Skips forward one frame unit in the current track
	Frame Reverse	@0fr01\r	Skips back one frame unit in the current track
	Cue	@023CU\r	Skips to the track time position from which playback was last started and pauses the track
<b>Hot Start Setting</b>	Assign Hot Start Number	@hsnnxxx\r	Assigns the track to the hot start number, where <i>nn</i> (the hot start number) = 01–20 and <i>xxx</i> (the track file number) = 0001–2000
	Save Hotlists	@0HSSR\r	Saves all DN-501C's hotlist files to the currently selected media source

## Status Request Command Codes/Status Information Codes

Use the status request command codes below to check on the status of your DN-501C. In response, DN-501C will send a corresponding status information code.

Status Request Commands (Host → DN-501C)		Status Information (DN-501C → Host)		DESCRIPTION
REQUEST	CODE	ANSWER	CODE	
<b>Power Status</b>	@0?PW\r	On	@0PW00\r	The power is on
		Standby	@0PW01\r	DN-501C is in standby mode
<b>Media Status</b>	@0?CD\r	No Media	@0CDNC\r	A CD or USB drive is loaded
		Media In	@0CDCI\r	There is no CD or USB drive loaded
<b>Device Status</b>	@0?ST\r	Playing	@0STPL\r	The current track is playing
		A-B Repeat	@STAB\r	The current track is playing according to the A-B Repeat setting
		Paused	@0STPP\r	The current track is paused
		Repeat Pause	@0STPR\r	The current track is paused (and the Repeat feature is activated)
		Stopped	@0STST\r	The current tracklist is stopped
		Cued	@0STCU\r	A track is currently cued
		Autocued	@0STAC\r	A track is currently autocued
		Rewinding	@0STRW\r	The current track is rewinding
		Fast Forwarding	@0STFF\r	The current track is fast forwarding
		Loading	@0STLD\r	DN-501C is currently loading a file
		Busy	@0STBY\r	DN-501C is currently busy
		File List	@0STFL\r	The file list is currently open
		Menu	@0STED\r	The menu settings are currently open
Error	@0STER\r	There is an operation error		
<b>Track Number</b>	@0?Tr\r	Number of the current track	@0Trnnnn\r	The current track's number within the file list, where <i>nnnn</i> (the track number) = 0000–2000
<b>Tracklist Number</b>	@0?Tt\r	Total number of tracks	@0Ttnnnn\r	The total number of tracks in the current tracklist, where <i>nnnn</i> (the total track number) = 0000–2000
<b>Track Title (current)</b>	@0?ti\r	Title of the current track	@0tixxx\r	The title of the current track, where <i>xxx</i> = up to 64 characters of the title
<b>Track Title (by number)</b>	@0?tnNNNN\r	Title of the track	@0tnxxx\r	The title of the track with the entered file number, where <i>NNNN</i> (the file number) = 0001–2000 and <i>xxx</i> = up to 64 characters of the title
<b>Artist Title</b>	@0?at\r	Title of the artist	@0atxxx\r	The title of the artist for the current track, where <i>xxx</i> = up to 64 characters of the title

Status Request Commands (Host → DN-501C)		Status Information (DN-501C → Host)		DESCRIPTION
REQUEST	CODE	ANSWER	CODE	
<b>Album Title</b>	@0?a\r	Title of the album	@0a1xxx\r	The title of the album for the current track, where xxx = up to 64 characters of the title
<b>Track File Format</b>	@0?af\r	PCM	@0afPMNN\r	The current track is a PCM file, where NN (the bit length) = 16 or 24
		MP3	@0afM3NNN\r	The current track is an MP3 file, where NNN stand for the bit rate in Kbps
		AIFF	@0afALNN\r	The current track is an AIFF file, where NN (the bit length) = 16 or 24
		AAC	@0afACNNN\r	The current track is an AAC file, where NNN stands for the bit rate in Kbps
<b>Track Size</b>	@0?tsnnnn\r	File size of the track	@0tsNNNNNN\r	The size of the track, where nnnn (the track file number) = 0001–2000 and NNNNNN (the file size in KB) = 000001–999999
<b>Track Sample Rate</b>	@0?fs\r	Sample Rate	@0fsNN\r	The sample rate for the current track, where NN (the sample rate in KHz) = 44 (44.1), 48, or 96
<b>Total Folder Number</b>	@0?Tf\r	Number of folders	@0Tfnnnn\r	The total number of folders within the selected folder on the media source, where nnnn (the number of folders) = 0000–2000
<b>Hot Start Number</b>	@0?HP\r	Current track's hot start number	@0HPnn\r	The hot start number for the current track, where nn (the hot start number) = 01–20
<b>Hot Start File Information</b>	@0?Hsnn\r	Information on the current hot start track	@0Hsnnxxx:HHHmmssttt\r	The details for the current hot start track, where nn (the hot start number) = 00–20, xxx stands for the file name, HHH (hours elapsed in the track) = 000–999, mm (minutes elapsed in the track) = 00–59, ss (seconds elapsed in the track) = 00–59, and tt (milliseconds elapsed in the track) = 000–999 <b>Note:</b> The file name will start with a number to indicate the media source: 2 for USB or 3 for CD
<b>Elapsed Track Time</b>	@0?ET\r	Time elapsed in the current track	@0ETHhhmmss\r	The amount of time that has elapsed in the current track, where hhh (hours) = 000 - 999, mm (minutes) = 00 - 59, and ss (seconds) = 00 - 59
<b>Remaining Track Time</b>	@0?RM\r	Time remaining in the current track	@0RMhhhmmss\r	The amount of time remaining before the current track ends, where hhh (hours) = 000 - 999, mm (minutes) = 00 -59, and ss (seconds) = 00 - 59



Status Request Commands (Host → DN-501C)		Status Information (DN-501C → Host)		DESCRIPTION
REQUEST	CODE	ANSWER	CODE	
<b>Folder Name (current)</b>	@0?SF\r	Name of the selected folder	@0SFDXXX\r	The name of the folder containing the current track, where <i>D</i> (media source indicator) = 2–3 and <i>XXX</i> = the folder name <b>Note:</b> 2 indicates USB and 3 indicates CD
<b>Folder Name (by number)</b>	@0?Fnxxxx\r	Name of the folder	@0FnXXX\r	The name of the folder corresponding to the entered folder number, where <i>xxxx</i> (the folder number) = 0001–2000 and <i>XXX</i> stands for the name of the folder
<b>Track Channel</b>	@0?ch\r	Stereo	@0chST\r	The current track is a stereo file
		Mono	@0chMO\r	The current track is a mono file
<b>Language</b>	@0?LN\r	English	@0LNUS\r	The system language is currently set to English
		Japan	@0LNJP\r	The system language is currently set to Japanese

## Automatic Status Information Codes

In the event that a change is made to DN-501C from the device itself, DN-501C may automatically send status information to the host. See below for the status information codes that can be automatically sent to the host.

Automatic Status Information (Host → DN-501C)			
CATEGORY	CONTENTS	CODE	DESCRIPTION
<b>Media Status</b>	Media In	@0CDCI\r	A CD or USB drive was loaded
	Media Ejected	@0CDNC\r	A CD or USB drive was ejected
<b>Device Status</b>	Playing	@0STPL\r	Playback of the current track was initiated
	Paused	@0STPP\r	The current track was paused
	Repeat Paused	@0STPR\r	The current track was paused (and the Repeat feature is activated)
	Rewinding	@0STRW\r	The current track is being rewound
	Fast Forwarding	@0STFF\r	The current track is being fast forwarded
	Stopped	@0STST\r	The current tracklist was stopped
	Cued	@0STCU\r	A track was cued
	Autocued	@0STAC\r	A track was autocued
	Media Loading	@0STLD\r	The media is loading
	Busy	@0STBY\r	DN-501C is currently busy
	File List Opening	@0STFL\r	The file list was opened
	Main Menu Opening	@0STED\r	The main menu was opened
Error	@0STER\r	There is an operation error	
<b>Track Selection</b>	Track Change	@TrNNNM\r	The current track was changed, where NNNN (the file number for the newly selected track) = 0001–2000

## Appendix

### RS-232C Specifications

<b>Connector</b>	9-Pin D-sub Female
<b>Mode</b>	Full Duplex
<b>Transfer Rate</b>	9600 or 38400 bps
<b>Data Length</b>	8 bits
<b>Parity</b>	None
<b>Start Bit</b>	1 bit
<b>Stop Bit</b>	1 bit
<b>Flow Control</b>	None
<b>Maximum Data Length</b>	600 bytes

### Trademarks & Licenses

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