



[DV04] DN-500BD

## Serial Command Protocol Guide

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inMusic Brands, Inc.

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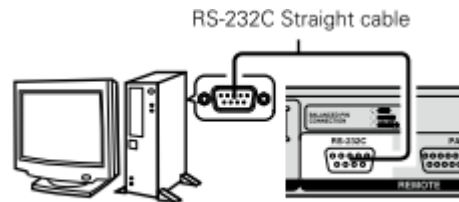
### 1. General

The Serial Remote control function is used by connecting the host machine such as PC to the device (our product). The host can control the device by sending the Control command, and the host can sense the current device status by sending the Status Request command. Two types of the connectivity, RS-232C and IP (Ethernet) is selectable. In addition, in this document, the controlled equipment is called the “Device” (our product) and the controlling equipment is called the “Host (PC etc.)”.

#### 1-1. RS-232C Control

The host can control the device by connecting the RS-232C straight cable to the D-sub 9 pins connector on the device surface as shown in the following diagram.

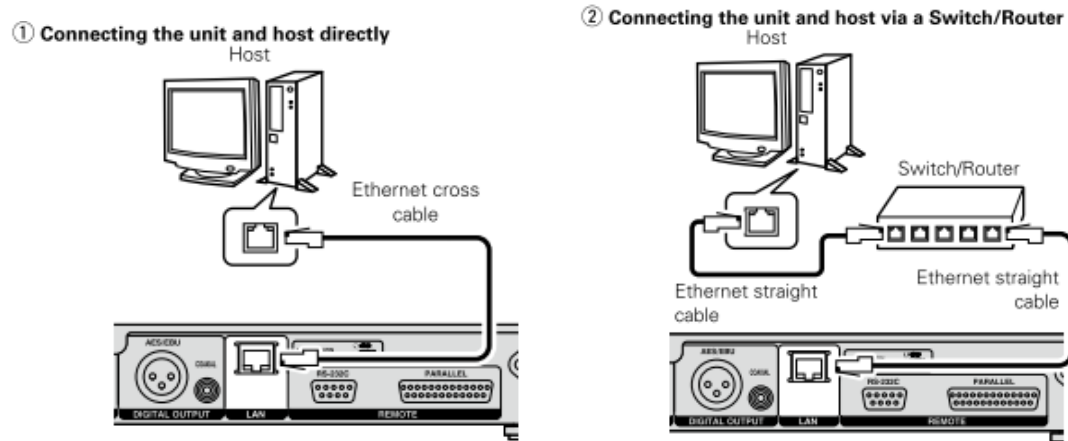
**Figure 1-1 RS-232C Connection**



## 1-2. IP Control (Ethernet)

The host can control the device by connecting the Ethernet cable to the RJ-45 connector on the device surface as shown in the following diagram.  
(10BASE-T / 100BASE-TX)

Figure 1-2 IP Control Connection



### 【Three main features】

1. A device is controlled by a host.
2. A device sends status of the device to host by receiving the status request command from the host
3. Automatic ally a device sends status notification to the host to notify of the device status change

## 2. Specification

### 2-1. RS-232C Control

- Transmission type : Asynchronous / Full duplex
- Connector type : 9 pin D-sub female connector (Straight cable)
- Transfer rate : 9,600 / 38,400/ 115, 200 bps Selectable (via “Serial Bit Rate” in the “System Setting” menu). **Set the BAUD rate to 115,200 for all the serial command to work properly.**
- Clock accuracy : < +/- 2.0%
- Data length : 8 bits
- Parity : None
- Start bit : 1 bit
- Stop bit : 1 bit
- Flow Control : None
- Maximum data length : 600 Bytes (Start character to End character is included.)

**Figure2-1 Pin arrangement**

Pin Number	Signal Name
1	GND
6	NC
2	TxD
7	RTS*
3	RxD
8	NC
4	NC
9	NC
5	S. GND

\*5V/500mA power supply can be used for RTS.

### 2-2. IP Control (Ethernet)

- Transmission type : Full duplex
- Transfer speed : 10 Mbps / 100 Mbps
- TCP port No. : 9030
- Maximum data length : 600 Bytes (Start character to End character is included.)

### 3. Communication Protocol

#### 3-1. Packet Structure

A packet must be started with the Start Character '@' and terminated with the End Character '\r' (0x0D).

**Figure 3-1 Packet Structure**



There are three kinds of packet, "COMMAND", "REQUEST", and "ANSWER /NOTIFICATION/ERROR".

#### 3-2. ACK (Acknowledge) and NACK (Not Acknowledge)

The device sends ACK or NACK to a host according to the following table.

##### 3-2-1. ACK [ Acknowledgement]:

It is an affirmative reply sent to a host from a device. When data transfer completes properly, a device notify of that to a host.

##### 3-2-2. NACK [Negative Acknowledgement]:

It is a negative reply sent to a host from a device. When data transfer does not complete properly, a device notify of that to a host.

**Table 3-1 ACK and NACK**

Name	Value (HEX)	Transmission Requirement
ACK	0x06	The device acknowledged that the command was received normally from the host.
NACK	0x15	<ul style="list-style-type: none"> <li>· The device received the End Character '\r'(0x0D) before receiving the Start Character '@(0x40)'.</li> <li>· The device does not receive ID'0(0x30)' just after Start Character '@(0x40)'</li> <li>· The device receives an unknown character just after Start Character '@ (0x40)' and ID'0 (0x30)'</li> <li>· The device receives an unknown command just after Start Character '@ (0x40)' and ID'0 (0x30)'.</li> <li>· Parameter is out of range.</li> <li>· The size of data is abnormal.</li> <li>· 5msec passed before the device receives the next code necessary to complete the command.</li> </ul>



### 3-3. Communication Rules

#### 3-3-1. Initiative of Communication

In the communication between a host and a device, the host must have the initiative. However, the Status Information notification automatically from the device is an exception.

When the device receives a command from the host, the device returns the following.

- When receiving the command which doesn't require a status information      ACK
- When receiving the command which requires a status information      ACK + Status information (ANSWER)
- For the communication failure or an unknown commands etc.(Refer to Table 3-2):      NACK

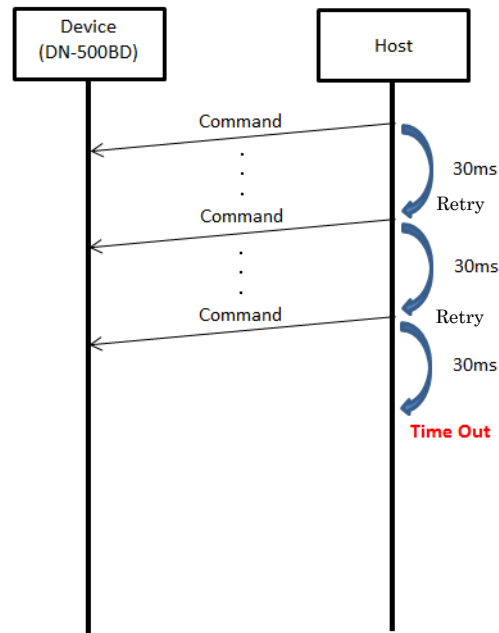
#### 3-3-2. Communication Sequence

The host must not send any new command after the previous command before the host receives ACK or NACK, or the timeout (see "3-3-3 Timeout") has expired.

#### 3-3-3. Timeout

After a host sends a message to a device, the host waits for a reply from the device for 30ms(IP Control)/300ms(RS-232C). When the host does not receive a reply over 30ms(IP Control)/300ms(RS-232C) from the device, the host sends the same message to the device. However, when the host does not receive a reply from the device after sending the same message 3 times (that means Tim Out), the host sends End character 'r' (0x0D) to the device. After that, the host should execute the recovery process such as retry.

Figure 3-3 Time Out



### 3-3-4. ACK

Refer to "[3-2-1 ACK \[Acknowledgement\]](#)".

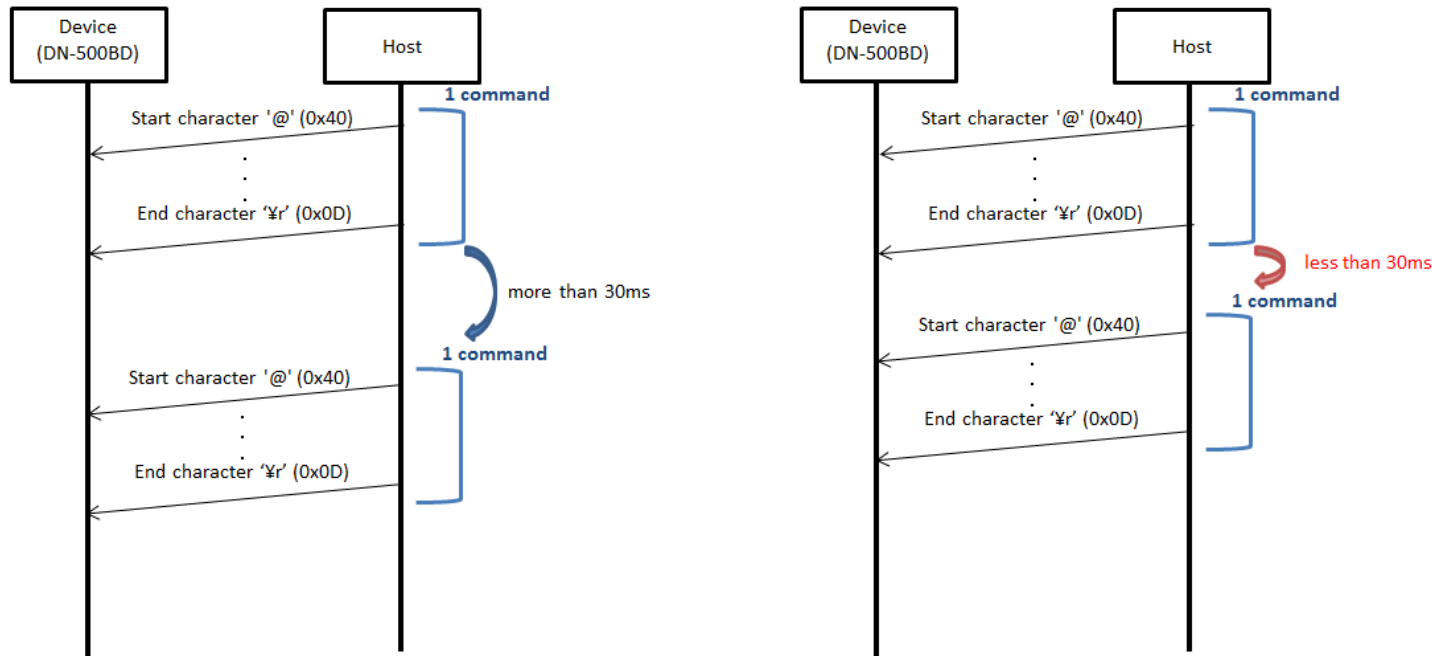
### 3-3-5. NACK

The device returns a NACK immediately after detecting a failure in the communication with the host (see ("[3-2-2 NACK \[Negative Acknowledgement\]](#)"). If the host receives a NACK, it must stop sending the current remaining command immediately and execute the recovery process such as retry.

### 3-3-6. Command Interval time

- Interval time between Characters from a host must be less than 5ms. The device sends NACK when 5msec passed before the device receives the next character code.
- Interval time between Commands is more than 30ms.

**Figure 3-4 Interval time between each command**



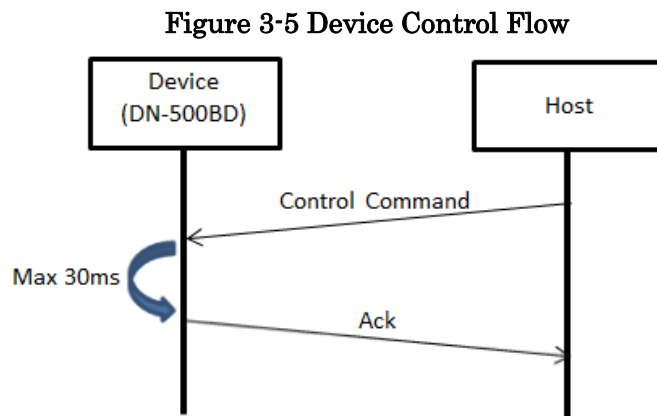
In case of less than 30ms as interval time between commands,

- 1) Executing the subsequent command is not guaranteed.
- 2) When there are buffer spaces of a device for a command, the device will execute the command.
- 3) When there is no buffer space of a device for a command, the device does not execute the command, and will send Busy (@BDBERBUSY) to the host instead.

### 3-4. Basic Control Flow

#### 3-4-1. Device Control Flow

The device sends the host an ACK (Acknowledgement) and executes that command when the device receives a Control command from the host. The list of the Control command is shown in “[Control Command List](#)”.

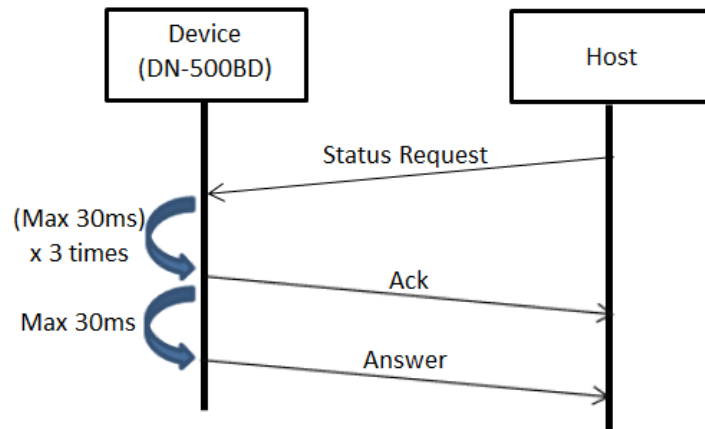


If the device receives an unknown command or an End Character ‘r’ (0x0D) without a Start Character ‘@’, it causes transmission failure and the device returns a NACK (Not Acknowledgement). Refer to “[3-2-2 NACK \[Negative Acknowledgement\]](#)” about NACK transmission condition.

### 3-4-2. Status Request Flow

The device returns an ACK and the ANSWER requested by the host when the device receives the Status Request from the host. The list of the Status Request and the corresponding answer is shown in “[Status Request List](#)”.

**Figure 3-6 Status Request Flow**



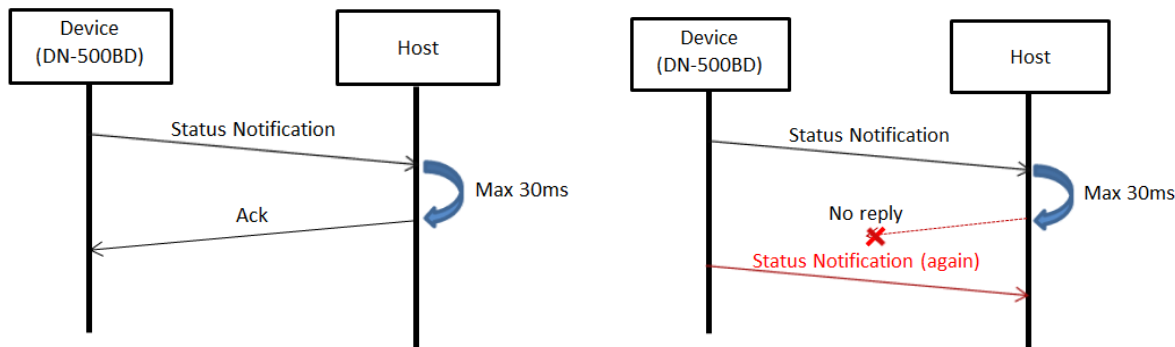
When a device receives Status Request from a host, the device sends an ACK to the host. After that, the device gets the current status, and then sends it to the host.

If the device receives an unknown command or an End Character ‘\r’ (0x0D) without a Start Character ‘@’, it causes transmission failure and the device returns a NACK (Not Acknowledgement). Refer to “[3-2-2 NACK \[Negative Acknowledgement\]](#)” about NACK transmission condition.

### 3-4-3. Status Notification Flow

A device notifies of Status Information listed in “Status Information List” whenever the status of the device is changed, such as the transport status, the current track, the storage media status, and other status.

**Figure 3-7 Status Notification Flow**



A device sends Status Notification to a host. The host replies ACK to the device. The device waits for the ACK for Max 30ms. When the device does not receive the ACK from the host, the device sends the same Status Notification to the host again. After that, the device does not send the same Status Notification even if it does not receive an ACK from the host.

The Status Information is same as the answer for the Status Request listed in “Status Request List”.

### 4. Command Table

*Italic characters of command mean parameter.* (Ex: Frame “@0fr*XX*Yr” -> Parameter: *XX*)

\*Note- “Track” means “Chapter” during the DVD or BD playback. “Group” means “Title” (DVD or BD playback) and “Folder” (USB and other Playback).

#### 4-1. Control Command/ Status Request Command List

##### 4-1-1. Key Control

#	Function	Command/Response	Status	Description
1.	Power On	@0PW00		Power On
2.	Power Off	@0PW01	-	Power Off
3.	Stop	@02354	-	Stop
4.	Play	@02353	-	Play
5.	Play Pause	@02348	-	Playback is Paused
6.	Track/Chapter Jump	@0Tr <i>nnnn</i>	-	<i>nnnn</i> : Track No ('0001'-'2000')
7.	Track/Chapter Jump Next	@02332	-	Track skip forward
8.	Track/Chapter Jump Prev	@02333	-	Track skip reverse
9.	Group/Title Jump	@0PCG <i>nnnn</i>	-	<i>nnnn</i> : Group/Title No ('0001'-'2000')
10.	Group/Title Jump Next	@0PCGPNX	-	Group/Title skip forward
11.	Group/Title Jump Prev	@0PCGPPV	-	Group/Title skip reverse
12.	Lock Panel's Key	@023KL	-	Key lock front panel
13.	Unlock Panel's Key	@023KU	-	Key lock front panel buttons.
14.	IR Lock	@0PCIRLK <i>XX</i>	@0?PCIRLK	Toggles “IR Remote Lock” setting. XX: IR Lock On/Off

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				'00': IR Lock on. '01': IR Lock off.
15.	Set A for A-B Repeat (On the fly)	@0PCRPAF	-	Sets A point for A-B repeat
16.	Set B and Start Repeat for A-B Repeat (On the fly)	@0PCRPF	-	Sets B point, and starts A-B repeat.
17.	Exit A-B Repeat	@0PCEXP	-	Exits A-B repeat
18.	Program Mode	@0PCPMPXX	@0?PCPMP	XX: On/Off '00': On '01': Off
19.	Random Mode	@0PCPMR	@0?PCPMR	The reply message from device to host, the status command message should be @0PCPMRXY X: Shuffle or Random 'S': Shuffle, 'R': Random YY: Mode 'OF': Off 'SI': Sub Item 'IT': Item 'AL': All
20.	Time Mode Code	@0PCTMDXX	@0?PCTMD	XXXX: Time Mode Code 'TL': Total Elapsed, 'TR': Total Remain, 'EL': Elapsed, 'RM': Remain,



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21.	Hide OSD	@0DVHOSDXX	@0?DVHOSD	Complete hiding of the icon displayed on the screen. XX: On/Off '00': OSD on. '01': OSD off.
22.	Setup Menu	@0PCSU	-	Shows Setup menu.
23.	Top Menu (Disc Menu)	@0DVTP	-	Playback title menu in the disc.
24.	Option Menu	@0DVOP	-	Playback option menu.
25.	Pop Up Menu	@0DVPU	-	Shows Pop Up Menu in the disc.
26.	Return	@0PCRTN	-	Return to the previous setup menu screen in the BD/DVD disc.
27.	Audio Dialog	@0DVADLGX	-	Selects dialog in the BD/DVD disc. X: Audio stream code '+' : Primary '-' : Secondary
28.	Subtitle	@0DVSBTLX	-	Selects subtitle language in the BD/DVD disc. X: Subtitle stream code (DV04: Fixed to '1') '1': Primary.
29.	Angle	@0DVANGL+	@0?DVANGLX	Command: Forward the angle in the DVD disc. Status: Return the angle No. X: Angle No.
30.	Cursor	@0PCCUSRX	-	X: Moves highlight area of initial setting screen.

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				'1':Left, '2':Right, '3':Up, '4':Down
31.	Enter	@0PCENTR	-	Decides selected item in the setup menu screen, etc. in the BD/DVD disc.
32.	Disc Tray	@0PCDTRYXX	-	Controls Disc Tray. XX: Disc Tray Open/Close 'OP': Open 'CL': Close
33.	Video Resolution (Specified resolution)	@0DVVRX	@0?DVVR	Changes the resolution of HDMI X: Resolution '1': Auto, '2': 480/576i, '3': 480/576P, '4': 720P '5': 1080i, '6': 1080P
34.	Display/Info	@0DVDSIF	-	Shows information on screen display.
35.	Function/Color	@0DVFCLR	-	Carries out a function peculiar to a disc. X: Color '1':Red, '2':Green, '3':Blue, '4':Yellow
36.	Mode/Option	@0DVMO	-	Change PIP mode cyclic.
37.	Home	@0PCHM	-	Shows HOME menu screen of the unit.
38.	Ten Key	@0PCTKEYX	-	Inputs 0-9 X: Number '1': 1, '2': 2, '3': 3, '4': 4, '5': 5, '6': 6, '7': 7, '8': 8, '9': 9, '0': 0
39.	Slow/Search	@0PCSLSDs	@0?PCSLSDs	d: Direction 'F' : Forward s: Search Speed

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				'f' : fast 's' : slow
40.	MUTE	@0mtXX	@0?mt	XX: On/Off '00': Mute on. '01': Mute off.

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### 4-1-2. Menu Setting

No	Item	Command	Status Request	Response	Description
1.	DVD/CD Auto Play	@0PCAP00	@0?PCAP	@0PCAP00	On
		@0PCAP01		@0PCAP01	Off
		@0PCSR00		@0PCSR00	Off
2.	Auto Resume	@0PCAR00	@0?PCAR	@0PCAR00	On
		@0PCAR01		@0PCAR01	Off
3.	BD/DVD Ratings	@0DVPCRTXXXXYYY	@0?DVPCRT	@0DVPCRTYYY	XXXX: current Password YYY (Variable): Rating 'OFF', 'KIDSAFE', 'G', 'PG', 'PG13', 'R', 'NC-17', 'ADULT'
4.	Area Code	@0DVPCACXXXXYYYY	@0?DVPCAC	@0DVPCACYYYY	XXXX: current Password YYYY (Variable): Contry name
5.	Change Password	@0DVPCCPXXXXYYYY	-	-	XXXX: current Password YYYY: new Password
6.	OSD Language	@0DVLGOSXXX	@0?DVLGOS	@0DVLGOSXXX	XXX:Language 'OFF': Off
7.	Disc Menu Language	@0DVLGDMXXX	@0?DVLGDM	@0DVLGDMXXX	
8.	Audio Language	@0DVLGADXXX	@0?DVLGAD	@0DVLGADXXX	
9.	Subtitle Language	@0DVLGSTXXX	@0?DVLGST	@0DVLGSTXXX	
10.	PIP Mark	@0DVPIP00	@0?DVPIP	@0DVPIP00	On
		@0DVPIP01		@0DVPIP01	Off
11.	Brightness	@0DVPABNXXX	@0?DVPABN	@0DVPABNXXX	XXX: Level ex) '-16' : -16 '000' : 0

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					'+16' : +16
12.	Contrast	@0DVPACTXXX	@0?DVPACT	@0DVPACTXXX	XXX: Level ex) '-16' : -16 '000' : 0 '+16' : +16
13.	Hue	@0DVPAHUXX	@0?DVPAHU	@0DVPAHUXX	XX: Level ex) '-9' : -9 '00' : 0 '+9' : +9
14.	Saturation	@0DVPASRXX	@0?DVPASR	@0DVPASRXX	XX: Level ex) '-9' : -9 '00' : 0 '+9' : +9
15.	3D Output	@0DV3DAT	@0?DV3D	@0DV3DAT	Auto
		@0DV3D01		@0DV3D01	Off
16.	TV Aspect Ratio	@0DVAr9W	@0?DVAr	@0DVAr9W	16:9 Wide
		@0DVAr9A		@0DVAr9A	16:9 Wide/Auto
		@0DVAr3P		@0DVAr3P	4:3 pan&scan
		@0DVAr3L		@0DVAr3L	4:3 letterbox
17.	TV System	@0DVFMNT	@0?DVFM	@0DVFMNT	NTSC
		@0DVFMPL		@0DVFMPL	PAL
		@0DVFMMS		@0DVFMMS	Multi-system
18.	1080p 24 Conversion	@0DV1K2400	@0?DV1K24	@0DV1K2400	On

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		@0DV1K2401		@0DV1K2401	Off
19.	DVD 24p Conversion	@0DV24pC00	@0?DV24pC	@0DV24pC00	On
		@0DV24pC01		@0DV24pC01	Off
20.	HDMI Color Space	@0DVCSR	@0?DVCS	@0DVCSR	RGB Video Level
		@0DVCSR		@0DVCSR	RGB PC Level
		@0DVCSY4		@0DVCSY4	YCbCr 4:4:4
		@0DVCSY2		@0DVCSY2	YCbCr 4:2:2
21.	HDMI Deep Color	@0DVDC48	@0?DVDC	@0DVDC48	48 Bits
		@0DVDC36		@0DVDC36	36 Bits
		@0DVDC30		@0DVDC30	30 Bits
		@0DVDCOF		@0DVDCOF	Off
22.	CC Attribute	@0DVCCAT	@0?DVCC	@0DVCCAT	Auto
		@0DVCCCT		@0DVCCCT	Custom
23.	Font Color	@0DVFCWT	@0?DVFC	@0DVFCWT	White
		@0DVFCBK		@0DVFCBK	Black
		@0DVFCRD		@0DVFCRD	Red
		@0DVFCGR		@0DVFCGR	Green
		@0DVFCBL		@0DVFCBL	Blue
		@0DVFCYL		@0DVFCYL	Yellow
		@0DVFCMA		@0DVFCMA	Magenta
		@0DVFCY		@0DVFCY	Cyanide
		@0DVFCDF		@0DVFCDF	Default
24.	Font Size	@0DVFSDF	@0?DVFS	@0DVFSDF	Default
		@0DVFSST		@0DVFSST	Standard

		@0DVfSSM		@0DVfSSM	Small
		@0DVfSLG		@0DVfSLG	Large
25.	Font Style	@0DVfTMNS	@0?DVfT	@0DVfTMNS	Monospace with serifs
		@0DVfTMNN		@0DVfTMNN	Monospace without serifs
		@0DVfTPTS		@0DVfTPTS	Proportiona with serifs
		@0DVfTPTN		@0DVfTPTS	Proportiona without serifs
		@0DVfTCAS		@0DVfTCAS	CASUAL
		@0DVfTCUR		@0DVfTCUR	CURSIVE
		@0DVfTSCA		@0DVfTSCA	small capital
		@0DVfTDEF		@0DVfTDEF	Default
26.	Font Opacity	@0DVfOSD	@0?DVfO	@0DVfOSD	Solid
		@0DVfOTL		@0DVfOTL	Translucent
		@0DVfOTP		@0DVfOTP	Transparent
27.	Font Edge	@0DVfENN	@0?DVfE	@0DVfENN	None
		@0DVfERS		@0DVfERS	Raised
		@0DVfEDP		@0DVfEDP	Depressed
		@0DVfEUF		@0DVfEUF	Uniform
		@0DVfELS		@0DVfELS	Left Drop
		@0DVfERD		@0DVfERD	Right Drop
		@0DVfEDE		@0DVfEDE	Default
28.	Font Edge color	@0DVfcWT	@0?DVfc	@0DVfcWT	White
		@0DVfcBK		@0DVfcBK	Black
		@0DVfcRD		@0DVfcRD	Red
		@0DVfcGR		@0DVfcGR	Green

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29.	BG Color	@0DVBCWT	@0?DVBC	@0DVBCWT	White
		@0DVBCBK		@0DVBCBK	Black
		@0DVBCRD		@0DVBCRD	Red
		@0DVBCGR		@0DVBCGR	Green
30.	BG Opacity	@0DVBOSD	@0?DVBO	@0DVBOSD	Solid
		@0DVBOTL		@0DVBOTL	Translucent
		@0DVBOTP		@0DVBOTP	Transparent
31.	Window Color	@0DVWCWT	@0?DVWC	@0DVWCWT	White
		@0DVWCBK		@0DVWCBK	Black
		@0DVWCRD		@0DVWCRD	Red
		@0DVWCGR		@0DVWCGR	Green
32.	Window Opacity	@0DVWOSD	@0?DVWO	@0DVWOSD	Solid
		@0DVWOTL		@0DVWOTL	Translucent
		@0DVWOTP		@0DVWOTP	Transparent
33.	Secondary Audio	@0DVSA00	@0?DVSA	@0DVSA00	On
		@0DVSA01		@0DVSA01	Off
34.	HDMI Audio	@0DVHAST	@0?DVHA	@0DVHAST	STEREO
		@0DVHALP		@0DVHALP	LPCM
		@0DVHABS		@0DVHABS	Bitstream
35.	Coaxial/Optical Output	@0DVDO48	@0?DVDO	@0DVDO48	48k LPCM
		@0DVDO96		@0DVDO96	96k LPCM
		@0DVDO19		@0DVDO19	192k LPCM
		@0DVDOBS		@0DVDOBS	Bitstream



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36.	Speaker Configuration Down Mix Mode	@0DVSCChXX		@0DVSCChXX	XY: Speaker /Woofer Number (Woofer Number is fixed to 1.) (except 'LR': LT/RT 'ST' : Stereo) ex) '21': 2.1Ch '31': 3.1Ch '71' : 7.1Ch
37.	SC Speaker Setting	@0DVSCStdsvvvvddd	@0?DVSCStd	@0DVSCStdsvvvvddd	d:Type 'C': cnter 'L': L 'R': R 'l': Ls 'r': Rs s:Size '0':Large, '1':Small vvv: Level ex) '-01': -1dB, '+10': +10dB ddd: Delay 0005: 5msec
38.	Crossover	@0DVCOXXX	@0?DVCO	@0DVCOXXX	XXX: Frequency 'OFF': Off ex) '100': 100Hz
39.	Dynamic Range Control	@0DVDRAT	@0?DVDR	@0DVDRAT	Auto
		@0DVDR00		@0DVDR00	On
		@0DVDR01		@0DVDR01	Off

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40.	Output Volume	@0DVOVXXX	@0?DVOV	@0DVOVXXX	XXX: Level 'inf' : Infinity ex) '-90': -90dB '+10': +10dB '000': 0dB
		@0DVOVFX		@0DVOVFX	Fixed
41.	Maximum Volume	@0DVMVXXX	@0?DVMV	@0DVMVXXX	XXX: Level '-10' : -10dB '-06': -6dB '+06': +6dB '+10': +10dB
42.	Firmware Upgrade	@0DVFUUS	-	-	Via USB
		@0DVFUDS		-	Via Disc
		@0DVFUNT		-	Via Network
43.	MAC Address Information	-	@0?MA	@0MAXXXXXXXXXXXXXX	Mac Address
44.	Remote Control Code	@0DVRCC1	@0?DVRC	@0DVRCC1	Code1
		@0DVRCC2		@0DVRCC2	Code2
		@0DVRCC3		@0DVRCC3	Code3
45.	HDMI CEC	@0DVHDCH1	@0?DVHDC	@0DVHDCH1	HDMI1
		@0DVHDCOF		@0DVHDCOF	Off
46.	Backup Settings	@0DVBS	-	-	-
	Restore Settings	@0DVRS	-	-	-
47.	Reset Factory Defaults	@0DVFD	-	-	-

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48.	BD-Live Network Access	@0DVBDLNA00	@0?DVBDLNA	@0DVBDLNA00	On
		@0DVBDLNALT		@0DVBDLNALT	Limited
		@0DVBDLNA01		@0DVBDLNA01	Off
49.	BUDA Size	-	@0?DVBUDASZ	@0DVBUDASZXXX	XXX: free size
50.	BUDA Setting	@0DVBUDAIN	@0?DVBUDA	@0DVBUDAIN	On Borad
		@0DVBUDAEX		@0DVBUDAEX	External
51.	IP Address	@0IpAUTO00000000	@0?Ip	@0IpAUTO00000000	Auto (DHCP)
		@0IpXXXXXXXXXXXX		@0IpXXXXXXXXXXXX	XXXXXXXXXXXX: IP address ex) '192168000100': 192.168.0.100
52.	Subnet mask	@0SMXXXXXXXXXXXX	@0?SM	@0SMXXXXXXXXXXXX	XXXXXXXXXXXX: Subnet mask
53.	Gateway	@0GWXXXXXXXXXXXX	@0?GW	@0GWXXXXXXXXXXXX	XXXXXXXXXXXX: Gateway IP
54.	DNS Server	@0DNXXXXXXXXXXXX	@0?DN	@0DNXXXXXXXXXXXX	XXXXXXXXXXXX: DNS IP
55.	Proxy Setting	@0PCPXXXXXXXX:PPPPP	@0?PCPX	@0PCPXXXXXXXX:PPPPP	XXXX: Proxy Host PPPPP: Proxy port '00000' to '65535'
		@0PCPXOF		@0PCPXOF	Off
56.	Network Interface	@0PCNIET	@0?PCNI	@0PCNIET	Ethernet
		@0PCNIWF		@0PCNIWF	Wi-Fi
57.	Wifi Setting	T.B.D.			
58.	Connection Test	-	@0?PCCT	@0PCCT00	Success
				@0PCCT01	Fail



### 4-1-3. Current Status Information

#	Request	Command	Answer	Command	Description	Notification
1.	Power Status	@0?PW	On	ACK	<u>See "Key Control"</u>	No
			Off	No response		
2.	Media Status	@0?CD	No Disc	@0CDNC	There is not media	
			Disc In	@0CDCI	There is media.	
			Un format	@0CDUF	Mounted media is unformatted.	
			Tray Opening	@0CDTO	Disc tray is opening or open	
			Tray Close	@0CDTC	Disc tray is closing or closed	
			Tray Error	@0CDTE	Disc tray error	
3.	Status	@0?ST	Play	@0STPL	<u>See "Key Control"</u>	No
			Pause	@0STPP	<u>See "Key Control"</u>	
			Slow Play	@0STDV SX	Show scanning in process. X: Direction 'R' : Reverse, 'F': Forward	
			Fast Play	@0STDVFX	Show scanning in process. X: Direction 'R' : Reverse, 'F': Forward	
			Step play	@0STDVSP	Step play	
			FS Play	@0STDVFS	FS Play	
			Menu	@0STED	Menu Setting is displayed	
			FS Play	@0STDVFS	FS Play	
			Setup	@0STDV SU	Setup mode.	

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			Track Menu	@0STDVTR	Track Menu (Root Menu) playback in process.	
			Home	@0STDVHM	Home menu mode.	
4.	Total Track Number(4digit)	@0?Tt	Total Track Number	@0TtXXXX	XXXX: Total Track '0000' to '9999' 'UNKN': Unknown	No
5.	Track Number	@0?Tr	Track Number	@0TrXXXX	XXXX: Track No '0000' to '9999' 'UNKN': Unknown	No
6.	Total Group Number	@0?PCTG	Total Group Number	@0?PCTGXXXX	XXXX: Total Group '0000' to '9999' 'UNKN': Unknown	No
7.	Group Number	@0?PCGp	Group Number	@0?PCGpXXXX	XXXX: Group No. '0000' to '9999' 'UNKN': Unknown	No
8.	Elapse Time	@0?ET	Elapse Time	@0ET <hhmmss< td=""> <td><i>hhmmss</i>: Time</td> <td>No</td> </hhmmss<>	<i>hhmmss</i> : Time	No
9.	Remain Time	@0?RM	Remain Time	@0RM <hhmmss< td=""> <td><i>hhmmss</i>: Time</td> <td>No</td> </hhmmss<>	<i>hhmmss</i> : Time	No
10.	Media Type	@0?PCTYP	Media Type	@0PCTYPXXXX	XXXX: Disc Type 'DVV': DVD_VIDEO, 'DVA': DVD_AUDIO, 'CDA': CDDA, 'CDR': CD-ROM, 'UKN': UNKNOWN, 'SAC': SACD,	No

					'DVR': DVD_VR, 'BDM': BDMV, 'BDA': BDAV, 'AVH': AVCHD, 'DLN': DLNA, 'EXT': External Memory	
11.	Audio Format Code	@0?PCAFMT	Audio Format	@0PCAFMTXXX	XXX: Audio Format Code 'DBD': DOLBY DIGITAL, 'DTS': DTS, 'MPG': MPEG, 'LPC': LPCM, 'PPC': PPCM, 'UKN': UNKNOWN, 'DSD': DSD, 'DD+': DD+, 'DTH': DTS-HD, 'DLH': DOLBY True HD, 'MP3': MP3, 'AAC': AAC, 'WMA': WMA, 'UKN': Unknown	No
12.	Audio Channel Code	@0?PCACH	Audio Channel	@0BDACHXXX	XXX: Audio Channel '1CH': 1ch	No

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					'2CH': 2ch	
					'21C': 2.1ch	
					'3CH': 3ch	
					'31C': 3.1ch	
					'4CH': 4ch	
					'41C': 4.1ch	
					'5CH': 5ch	
					'51C': 5.1ch	
					'6CH': 6ch	
					'61C': 6.1ch	
					'7CH': 7ch	
					'71C': 7.1ch	
					'8CH': 8ch	
					'L/R': L/R CD/VCD/MP3	
					'RCH': CD/VCD	
					'LCH': CD/VCD	
					'UKN': UNKNOWN,	



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13.	Audio Dialog Code	@0?PCDGX	Audio Dialog Code	@0PCDGXYYY	X: Primary/Secondary '+' : Primary '-' : Secondary YYY: Audio Dialog Code ISO 639-2 Code 'UKN' Unknown	No
14.	Subtitle Code	@0?DVSTC	Subtitle Code	@0DVSTCXXX	XXX: Subtitle Code ISO 639-2 Code 'UKN' Unknown	No
15.	Model Information	@0?VN	Model Information	@0VNXXXXXXXXXXXXXXXXXXXX	Version No. & Model Name XXXXXXXX: Version No. (8digit) MMMMMMMM: Model Name	No
16.	Current Track Time	@0?tl	Current Track Time	@0tMMMMSSFF	MMM: Minute ('00'-'999') SS: Second ('00'-'59') FF: Frame ('00'-'74')	No
17.	Current Track Fs	@0?fs	Current Track Fs	@0FsXX	XXX: fs (Variable) XXX:XXXKHz, 'UKN': Unknown,	No
18.	Artist of Current Track	@0?at	Artist name	@0atxxx	xxx: Artist (64 bytes max, *Note-1)	No
19.	Title of Current Track	@0?ti	Title	@0titxxx	xxx: Title (64 bytes max, *Note-1)	No

20.	Album of Current Track	@0?al	Album name	@0alxxx	xxx: Album  (64 bytes max, *Note-1)	No
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(Note-1: Please refer to [5 Appendix](#))

### 4-2. Error message

The following error message commands are sent from the device when an error occurs in the device.

#	Title	Command	Parameter	Description
1	Error message	@0BDERBUSY	-	There is no space of buffer for a command.

### 5. Appendix

#### 5-1. Acceptable Character

The acceptable character set is ISO/IEC 8859-1.

##### 5-1-1. Acceptable Character Type1

- Acceptable characters are shown in Table 5-1. (The characters that are colored in gray are not acceptable.)

Table 5-1-1 Acceptable Character

	X0	X1	X2	X3	X4	X5	X6	X7	X8	X9	XA	XB	XC	XD	XE	XF
0X																
1X																
2X	<i>SP</i>	!	“	#	\$	%	&	‘	( )	*	+	,	-	.	/	
3X	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4X	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5X	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6X	`	a	B	c	D	e	f	g	h	I	j	k	l	m	n	o
7X	p	q	R	s	T	u	v	w	x	Y	z	{		}	~	<i>DEL</i>
8X																
9X																
AX	<i>NBSP</i>	ı	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
BX	°	±	²	³	´	µ	¶	·	,	ı	°	»	¼	½	¾	¿
CX	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
DX	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
EX	à	á	â	ã	Ä	å	æ	ç	è	É	ê	ë	ì	í	î	ï
FX	ð	ñ	ò	ó	Ô	õ	ö	÷	ø	Ù	ú	û	ü	ý	þ	ÿ

### 5-2. Folder name/File name

#### 5-2-1. Absolute Folder or File name

Folder name or File name must be specified in full-path from the root folder. (Root folder is expressed in 0x2F ( '/') of the top, and the separator is 0x2F ( '/').)

Ex) Folder name: /NewFolder, File name: /NewFolder/NewFile.wav

#### 5-2-2. Folder or File name without folder path

Folder name or File name is specified without folder path.