# OPPO DIGITAL

# OPPO BDP-83 Blu-ray Disc Player
# RS-232 Control Protocol
## (Version 2, March 31, 2010)

**Note:** This document is a revision to the original BDP-83 RS-232 control protocol. The commands and responses listed here require MCU firmware MCU83-27-0326 or newer and main firmware BDP83-50-0330 or newer. The revision is backwards compatible to the original BDP-83 RS-232 control protocol so existing controllers do not have to be reprogrammed.

The OPPO BDP-83 Blu-ray Disc Player can be ordered with an RS-232 option for wired remote control. The RS-232C port is configured as a DCE device using a female 9-pin D-Sub type connector.

**RS-232 Pin Configuration:**

The pin out of the BDP-83 RS-232C port is as the following:

| Pin | 2 | 3 | 5 |
|---|---|---|---|
| **Signal** | TXD | RXD | GND |

This pin configuration allows a PC running a serial terminal program (such as Hyper Terminal) to communicate with the player using a straight-through DB9 9-pin RS-232 serial cable. Do NOT use a "Null-Modem" type cable for PC connection. For connection to a remote control system, please refer to the documentation that comes with the remote control system.

**Communication Settings:**

| Baud Rate | Data Bits | Parity | Stop Bit | Flow Control |
|---|---|---|---|---|
| 9600 | 8 | None | 1 | None |

**Command Structure:**

Each command starts with a # sign (ASCII 0x23), followed by a 3-character command code. If there are any parameters for the command, the parameters are given in text format, separated by a space (ASCII 0x20) from the command code. The # character (ASCII 0x23) must never appear in the parameters. A carriage return (ASCII 0x0d) indicates the end of the command. Each command must not exceed 25 bytes including the start of command and end of command bytes.

The illustration of the command structure is as the followings:

<Command> = <Start of Command><Command Code>[<sp><Parameters>]
          <End of Command>
<Start of Command> = #, ASCII 0x23
<Command Code> = <byte><byte><byte>
<sp> = space, ASCII 0x20

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<Parameters> = command-specific
<End of Command> = CR, ASCII 0x0d

**Response Structure:**

Upon receiving a command, the player shall try to execute the command and send back a response. Two response formats are supported: the short response and the verbose response. The short response is used by default. If the verbose mode (See command reference for SVM) is set, the verbose response will be used instead.

The response starts with an "@" sign (ASCII 0x23), followed by the original command code and a space (ASCII 0x20) if the verbose response is in use, and a result code, either "OK" or "ER". If there are any parameters or additional message, the parameters or message is given in text format, separated by a space (ASCII 0x20) from the result code. The @ character (ASCII 0x40) must never appear in the parameters or message. A carriage return (ASCII 0x0d) indicates the end of response. Each response must not exceed 25 bytes including the start of response and the end of response bytes.

The illustration of the response structure is as the followings:

<Short Response> = <Start of Response><Result Code>[<sp><Parameters>]
                <End of Response>
<Verbose Response> = <Start of Response><Command Code><sp><Result Code>
                [<sp><Parameters>]<End of Response>
<Start of Response> = @, ASCII 0x40
<Command Code> = <byte><byte><byte>
<Result Code> = OK|ER
<sp> = space, ASCII 0x20
<Parameters> = command-specific
<End of Response> = CR, ASCII 0x0d

**Status Update Messages Structure:**

If the verbose mode is set to 2 or 3, the player will send status update messages automatically. These messages are not a response to any particular command. Any status change caused by commands from RS232, front panel buttons, IR remote control, or playback progress may trigger status update messages.

The status update messages have the following structure:

<Update> = <Start of Update><Status Code>[<sp><Parameters>]<End of Update>
<Start of Update> = @, ASCII 0x40
<Status Code> = <byte><byte><byte>
<sp> = space, ASCII 0x20
<Parameters> = status-specific
<End of Response> = CR, ASCII 0x0d

**Command Sequence:**

Commands are executed in the order they are received. The host should wait for a response from the player before sending the next command.

If the player receives a new command before executing the previous command, the player may discard the previous command.

If the host does not receive a response from the player 10 seconds after the command is issued, the host may consider the command or response lost during transmission, and can retransmit the command.

**Command List:**

   A.  Command that maps to a remote control button

This group of commands maps directly to the infrared remote control keys.  No parameters are needed for these commands.  The player handles the commands as if it receives the same IR remote commands.  For actions that require a multiple-key sequence, such as go to a certain chapter (GOT command followed by multiple numeric key commands and the SEL command), the player responds to each command individually until the last command is received.  At that time the player shall respond with either OK or ER depending on the result of the action.

| Command Code | Remote Key | Function | Response Example |
|---|---|---|---|
| POW | POWER | Toggle power STANDBY and ON | OK ON<br>OK OFF |
| SRC | SOURCE | Go to Home Menu to select media source | OK |
| EJT | OPEN | Open/close the disc tray | OK OPEN<br>OK CLOSE |
| PON | ON | Discrete on | OK ON |
| POF | OFF | Discrete off | OK OFF |
| SYS | P/N | Switch output TV system: NSTC, PAL or MULTI(AUTO) | OK NTSC<br>OK PAL<br>OK AUTO |
| DIM | DIMMER | Dim front panel display | OK ON<br>OK DIM<br>OK OFF |
| PUR | PURE AUDIO | Pure audio mode (no video) | OK ON<br>OK OFF |
| VUP | VOL + | Increase volume | OK n (n is the volume number, 0 – 100) |
| VDN | VOL - | Decrease volume | OK n (n is the volume number, 0 – 100) |
| MUT | MUTE | Mute audio | OK MUTE<br>OK UNMUTE |
| NU1 | 1 | Numeric key 1 | OK |
| NU2 | 2 | Numeric key 2 | OK |
| NU3 | 3 | Numeric key 3 | OK |
| NU4 | 4 | Numeric key 4 | OK |
| NU5 | 5 | Numeric key 5 | OK |
| NU6 | 6 | Numeric key 6 | OK |

| NU7 | 7 | Numeric key 7 | OK |
|---|---|---|---|
| NU8 | 8 | Numeric key 8 | OK |
| NU9 | 9 | Numeric key 9 | OK |
| NU0 | 0 | Numeric key 0 | OK |
| CLR | CLEAR | Clear numeric input | OK |
| GOT | GOTO | Play from a specified location | OK |
| HOM | HOME | Go to Home Menu to select media source | OK |
| PUP | PAGE UP | Show previous page | OK |
| PDN | PAGE DOWN | Show next page | OK |
| OSD | DISPLAY | Show/hide on-screen display | OK |
| TTL | TOP MENU | Show BD top menu or DVD title menu | OK |
| MNU | POP-UP MENU | Show BD pop-up menu or DVD menu | OK |
| NUP | Up Arrow | Navigation | OK |
| NLT | Left Arrow | Navigation | OK |
| NRT | Right Arrow | Navigation | OK |
| NDN | Down Arrow | Navigation | OK |
| SEL | ENTER | Navigation | OK |
| SET | SETUP | Enter the player setup menu | OK |
| RET | RETURN | Return to the previous menu or mode | OK |
| RED | RED | Function varies by content | OK |
| GRN | GREEN | Function varies by content | OK |
| BLU | BLUE | Function varies by content | OK |
| YLW | YELLOW | Function varies by content | OK |
| STP | STOP | Stop playback | OK |
| PLA | PLAY | Start playback | OK |
| PAU | PAUSE | Pause playback | OK |
| PRE | PREV | Skip to previous | OK |
| REV | REV | Fast reverse play | OK 1X |
| FWD | FWD | Fast forward play | OK 1X |
| NXT | NEXT | Skip to next | OK |
| AUD | AUDIO | Change audio language or channel | OK |
| SUB | SUBTITLE | Change subtitle language | OK |
| ANG | ANGLE | Change camera angle | OK a/b (a: current angle number, b: total available angles) |
| ZOM | ZOOM | Zoom in/out and adjust aspect ratio | OK (zoom ratio text) |
| SAP | SAP | Turn on/off Secondary Audio Program | OK (audio track information) OK Off |
| ATB | AB REPLAY | Repeat play the selected section | OK A- OK A-B OK OFF |

| | | | |
|---|---|---|---|
| RPT | REPEAT | Repeat play | OK Repeat Chapter<br>OK Repeat Title<br>OK OFF |
| PIP | PIP | Show/hide Picture-in-Picture | OK (PIP program info)<br>OK Off |
| HDM | RESOLUTION | Switch output resolution | OK |
| SUH | SUBTITLE (hold) | Press and hold the SUBTITLE key.  This activates the subtitle shift feature | OK |
| NOP | | No operation. | OK |

B.  Query Commands

This group of commands issues queries to the player.  The player shall respond according to its current status.

| Command Code | Function | Response Example |
|---|---|---|
| QVM | Query verbose mode | OK 0<br>OK 1<br>OK 2<br>OK 3 |
| QPW | Query power status | OK ON<br>OK OFF |
| QVR | Query firmware version | OK BDP83-14-0306 |
| QVL | Query volume | OK 100<br>OK MUTE |
| QHD | Query HDMI resolution | OK 480P<br>OK 720P50<br>OK 1080P60<br>OK AUTO |
| QPL | Query playback status | OK NO DISC<br>OK LOADING<br>OK OPEN<br>OK CLOSE<br>OK PLAY<br>OK PAUSE<br>OK STOP<br>OK STEP<br>OK FREV<br>OK FFWD<br>OK SFWD<br>OK SREV<br>OK SETUP<br>OK HOME MENU<br>OK MEDIA CENTER |
| QTK | Query Track/Title | OK 2/10 |
| QCH | Query Chapter | OK 3/3 |
| QTE | Query Track/Title elapsed time | OK 0:1:34 |

| QTR | Query Track/Title remaining time | OK 1:20:23 |
|-----|-----|-----|
| QCE | Query Chapter elapsed time | OK 0:1:34 |
| QCR | Query Chapter remaining time | OK 0:12:22 |
| QEL | Query Total elapsed time | OK 0:5:12 |
| QRE | Query Total remaining time | OK 1:34:44 |
| QDT | Query disc type | OK BD-MV<br>OK DVD-VIDEO<br>OK DVD-AUDIO<br>OK SACD<br>OK CDDA<br>OK HDCD<br>OK DATA-DISC |
| QAT | Query audio type | OK DD 1/1<br>OK DD 1/5 English<br>OK DTS 2/5 English<br>OK LPCM<br>OK DTS-HD 1/4 English |
| QST | Query subtitle type | OK OFF<br>OK 1/1 English |
| QSH | Query subtitle shift | OK -5<br>(valid returns are -5 .. 00 ..<br>05) |
| QOP | Query OSD position | OK 0<br>(valid returns are 0 .. 5) |
| QRP | Query Repeat Mode | OK 00 Off<br>(OK followed by a repeat<br>mode code and text:<br>00 Off<br>01 Repeat One<br>02 Repeat Chapt.<br>03 Repeat All<br>04 Repeat Title<br>05 Shuffle<br>06 Random) |
| QZM | Query Zoom Mode | OK 00 Off<br>(OK followed by a zoom<br>mode code and text:<br>00 Off<br>01 Stretch<br>02 Full<br>03 Underscan<br>04 1.2<br>05 1.3<br>06 1.5<br>07 2<br>08 3<br>09 4<br>10 1/2<br>11 1/3<br>12 1/4) |

C. Advanced Commands

This group of commands instructs the player to perform an advanced operation in a single step.

| Command Code | Parameters | Function | Response Example |
|---|---|---|---|
| SVM | 0<br>1<br>2<br>3 | 0 – Set Verbose Mode to off<br>1 – Commands are echoed back in the response<br>2 – Enable unsolicited status update. Only major status changes are reported.<br>3 – Enable detailed status update. When content is playing, the player sends out playback time update every second. | OK 0<br>OK 1<br>OK 2<br>OK 3 |
| SHD | SDI<br>SDP<br>720P<br>1080I<br>1080P<br>SRC<br>AUTO | Set HDMI output resolution.<br>SDI – Standard definition interlaced (480i/576i)<br>SDP – Standard definition progressive (480p/576p)<br>SRC – Source Direct | OK 480P<br>(OK followed by the original parameter) |
| SPN | NTSC<br>PAL<br>AUTO | Set output TV system | OK NTSC<br>OK PAL<br>OK AUTO |
| SZM | 1<br>AR<br>FS<br>US<br>1.2<br>1.3<br>1.5<br>2<br>1/2<br>3<br>4<br>1/3<br>1/4 | Set zoom ratio.<br>AR – Aspect ratio correction (Stretch, Letterbox or Pillarbox)<br>FS - Full Screen<br>US - Underscan<br>For HDMI Output: 1, AR, FS, US, 1.2, 1.3, 1.5, 2, 1/2;<br>For Component Ouput: 1, 2, 3, 4, 1/2, 1/3, 1/4) | OK 1.2<br>(OK followed by the zoom ratio)<br>ER INVALID |
| SVL | 0 – 100<br>MUTE | Set volume control | OK 100<br>OK MUTE |
| SRP | CH<br>TT<br>ALL<br>OFF<br>SHF<br>RND | Repeat chapter<br>Repeat title or CD track<br>Repeat all<br>Repeat off<br>Shuffle<br>Random | OK CH<br>(OK followed by the repeat mode)<br>ER INVALID |

| SRH | T3 | Search to Title 3 | OK |
| | C10 | Search to Chapter 10 | ER INVALID |
| | C 0:00:34 | Search to 0:00:34 of the current chapter or track | |
| | T 0:12:13 | Search to 0:12:13 of the current title or disc | |
| | 0:12:13 | Search to 0:12:13 of the current title or disc | |
| DPL | | Direct play | OK |
| RST | | Reset RS232 Command – Clean all command buffers, do not wait for any pending/executing commands. Start over again. | OK |
| SSH | -5 .. 5 | Set subtitle shift | OK -5 (OK followed by the shift level) ER INVALID |
| SOP | 0 .. 5 | Set OSD position | OK 5 (OK followed by the position value) ER INVALID |

**Status Update Messages:**

The following status update messages are sent by the player automatically when the verbose mode is set to 2 or 3.

Verbose Mode 2:

**UPW** - Power Status Update:
       Sent when there is a change of power on/off status.
       *Possible parameters*: 1 digit
             1 – Player is turned on
             0 – Player is going off
       *Example*: @UPW 1

**UPL** - Playback Status Update:
       Sent when there is a change of playback status.
       *Possible Parameters*: 4 chars
             DISC – No disc
             LOAD – Loading disc
             OPEN – Tray is open
             CLOS – Tray is closing
             PLAY – Playback is starting
             PAUS – Playback is paused
             STOP – Playback is stopped
             STPF – Forward frame-by-frame step mode
             STPR – Reverse frame-by-frame step mode
             FFWn – Fast forward mode. Where n is a number of 1..5 to indicate the speed level

FRVn – Fast reverse mode.  Where n is a number of 1..5 to indicate the speed level

SFWn – Slow forward mode. Where n is a number of 1..5 to indicate the speed level (1 = ½, 2 = ¼, 3 = 1/8, 4 = 1/16, 5 = 1/32)

SRVn – Slow reverse mode. Where n is a number of 1..5 to indicate the speed level (1 = ½, 2 = ¼, 3 = 1/8, 4 = 1/16, 5 = 1/32)

HOME – in home menu

MCTR – in media center

*Example*: @UPL PLAY

**UVL** - Volume Level Update:

Sent when there is a change in volume level or mute status.

*Possible Parameters*: 3 chars

MUT – Mute is engaged

000 .. 100 – Current volume level.  Also sent when mute is cancelled.

*Example*: @UVL 095

**UDT** - Disc Type Update:

Sent when a new disc type is detected.

*Possible Parameters*: 4 chars

BDMV  - Blu-ray Disc

DVDV – DVD-Video

DVDA – DVD-Audio

SACD

CDDA

HDCD

DATA – Data disc

VCD2 – VCD 2.0

SVCD - SVCD

*Example*: @UDT DVDV

**UAT** - Audio Type Update:

Sent when a new audio track is encountered.

*Parameters*: Type (2 chars), space, number (01/99, 5 chars), space, language (3 chars), space, channels (2 chars)

*Type code*:

DD – Dolby Digital

DP – Dolby Digital Plus

DT – Dolby TrueHD

TS – DTS

TH – DTS-HD High Resolution

TM – DTS-HD Master Audio

PC – LPCM

MP – MPEG Audio

CD – CD Audio

UN – Unknown

*Number*: current audio track / available audio tracks in 2-digit number format. For example, 01/99 means the first of 99 available tracks; 02/05 means the second of 5 available tracks.  If only one track is available, it is 01/01.

*Language*: Three-character language code: ENG for English, FRA for French, and so on (ISO3166). UNK for unknown.

*Channels*: 1.0 for mono, 2.0 for stereo, 5.1 or 7.1 for 5.1-channel or 7.1-ch surround, 0.0 for unknown.
*Example*: @UAT DD 01/05 ENG 5.1

**UST** - Subtitle Type Update:
Sent when a new subtitle is selected.
*Parameters*: number (01/99, 5 chars), space, language (3 chars)
*Number*: current subtitle track / available subtitle tracks in 2-digit number format. For example, 01/99 means the first of 99 available tracks; 02/05 means the second of 5 available tracks.  If subtitle is set to off, use 00/xx where xx is the number of available subtitle tracks.  If no subtitle is available, use 00/00.
*Language*: Three-character language code: ENG for English, FRA for French, and so on (ISO3166). UNK for unknown.
*Example*: @UST 02/05 ENG

Verbose Mode 3:

**UTC** - Time Code Update:
Sent every second when the playback time advances. The time information is the same as the front panel display.  To switch to a different type of time information, please refer to the STC command.
*Parameters*: Title (3 digits), space, Chapter (3 digits), space, Type (1 chars), space, time (8 chars HH:MM:SS)
*Title*: Current title number.  For example, 001.  For discs without title numbers (CD), 001 is always used.
*Chapter*: Current chapter or track number.  For example, 003.
*Type Code*:
> E – Total Elapsed time
> R – Total Remaining time
> T – Title Elapsed time
> X – Title Remaining time
> C – Chapter/track Elapsed time
> K – Chapter/track Remaining time

*Example*: @UTC 001 001 C 00:01:23

**UVO** - Video Resolution Update:
Sent when the source content resolution or the output resolution is changed.
*Parameters*: Source resolution (7 chars), space, Output resolution (7 chars)
*Resolution Names*:
> _480I60 – 480i 60/59.94Hz
> _480P60 – 480p 60/59.94Hz
> _576I50 – 576i 50Hz
> _576P50 – 576p 50Hz
> _720P60 – 720p 60/59.94Hz
> _720P50 – 720p 50Hz
> 1080I60 – 1080i 60/59.94Hz
> 1080I50 – 1080i 50Hz
> 1080P60 – 1080p 60/59.94Hz
> 1080P50 – 1080p 50Hz
> 1080P24 – 1080p 24Hz
> 1080P23 – 1080p 23.97Hz

**Examples:**

The following are examples of playing a Blu-ray movie using the RS-232 control protocol.  The comments are placed after the semicolon.

Example 1 – No verbose mode in use.  Backwards compatible to the original version of the RS232 control protocol.

```
#PON                           ; Turn on power
@OK ON                         ; Player is turned on
#QPW                           ; Check power status
@OK OFF                        ; Player is still doing power-on initialization
(Wait for a while)
#QPW                           ; Check power status
@OK ON                         ; Player is powered on and ready
#EJT                           ; Eject the tray
@OK OPEN                       ; Tray opens
(Place a disc on the tray)
#PLA                           ; Start playback
@OK PLAY                       ; You may get "ER OVERTIME" message due to the
                               ; mechanical delay.  This is normal
#QDT                           ; Check disc type
@OK LOADING                    ; Player is still loading
(Wait for a while)
#QDT                           ; Check disc type again
@OK BD-MV                      : Disc is a Blu-ray disc.
#QPL                           ; Check playback status
@OK PLAY                       : Playback is in progress
(Watch the movie)
#STP                           ; Stop playback
@OK STOP                       : Playback has stopped
#EJT                           ; Eject the tray
@OK OPEN                       ; Tray opens
(Take out the disc)
#POF                           ; Turn off power
@OK OFF                        ; The player turns off
```

Example 2 – Verbose mode 2.  The player provides important status updates.

```
#SVM 2                         ; Set verbose mode to level 2
@SVM OK 2                      ; Response to confirm the verbose mode.  Notice the
                               ; SVM command code is now included in the response.
#PON                           ; Turn on power
@PON OK ON                     ; Player is turned on
@UPW 1                         ; Player provides a status update to indicate the new power
                               ; status
@SVM OK 2                      ; This is a repeat of the SVM response because the main
                               ; processor comes on line.
@UPL DISC                      ; Player indicates that there is no disc
#EJT                           ; Eject the tray
```

```
@EJT OK OPEN               ; Tray opens
@UPL OPEN                  ; Player indicates that the tray is open
(Place a disc on the tray)
#PLA                       ; Start playback
@PLA OK PLAY               ; Player confirms playback action
@UPL CLOS                  ; Player indicates that the tray is closing
@UPL LOAD                  ; Player indicates that the disc is loading
@UDT BDMV                  ; Player indicates that the disc type is Blu-ray
@UAT DT 01/01 ENG 5.1      ; Current audio is Dolby TrueHD English 5.1ch
@UST 00/00 UNK             ; Current subtitle is none
@UPL PLAY                  ; Current status is playing
(Watch the movie)
#STP                       ; Stop playback
@STP OK STOP               ; Player confirms stop action
@UPL STOP                  ; Player indicates that playback has stopped
@UPL STOP                  ; It is normal to see repeated status update
#EJT                       ; Eject the tray
@UPL STOP
@EJT OK OPEN               ; Tray opens
@UPL OPEN                  ; Status update to show that the tray is open
(Take out the disc)
#POF                       ; Turn off power
@POF OK OFF                ; Player confirms the action
@UPL CLOS                  ; The tray is closing
@UPL LOAD                  ; Player is trying to read the disc
@UPW 0                     ; Player reports that the power is turned off
```

Example 3 – Verbose mode 3.  The player provides more detailed status updates.

```
#SVM 3                     ; Set verbose mode to level 2
@SVM OK 3                  ; Response to confirm the verbose mode.  Notice the
                           ; SVM command code is now included in the response.

#PON                       ; Turn on power
@PON OK ON                 ; Player is turned on
@UPW 1                     ; Player provides a status update to indicate the new power
                           ; status
@SVM OK 3                  ; This is a repeat of the SVM response because the main
                           ; processor comes on line.
@UPL DISC                  ; Player indicates that there is no disc
#EJT                       ; Eject the tray
@EJT OK OPEN               ; Tray opens
@UPL OPEN                  ; Player indicates that the tray is open
(Place a disc on the tray)
#PLA                       ; Start playback
@PLA OK PLAY               ; Player confirms playback action
@UPL CLOS                  ; Player indicates that the tray is closing
@UPL LOAD                  ; Player indicates that the disc is loading
@UDT BDMV                  ; Player indicates that the disc type is Blu-ray
@UTC 000 000 T 00:00:00    ; Player indicates that the current counter is all 0 and
                           ; play back is about to begin
```

```
@UVO 1080P23 1080P60    ; Player indicates that the source program resolution is
                        ; 1080p 23.976Hz, and the output resolution is 1080p60
@UAT DT 01/01 ENG 0.0   ; Current audio is Dolby TrueHD English with unknown ;
                        ; number of channels
@UST 00/00 UNK          ; Current subtitle is none
@UTC 126 002 T 00:01:27 ; Playback resumes at Title 126, Chapter 2, title elapsed
                        ; time 00:01:27
@UPL PLAY               ; Current status is playing
@UAT DT 01/01 ENG 5.1   ; Current audio is Dolby TrueHD English 5.1ch
@UTC 126 002 T 00:01:28 ; Player provides continuous counter updates
@UTC 126 002 T 00:01:29
@UTC 126 002 T 00:01:30
@UTC 126 002 T 00:01:31
@UTC 126 002 T 00:01:32
@UTC 126 002 T 00:01:33
@UTC 126 002 T 00:01:34
@UTC 126 002 T 00:01:35
@UTC 126 002 T 00:01:36
@UTC 126 002 T 00:01:37
@UTC 126 002 T 00:01:38
@UTC 126 002 T 00:01:39
#PAU                    ; Pause
@PAU OK PAUSE           ; Confirm pause operation
@UPL PAUS               ; Current status is paused
#PLA                    ; Play again
@PLA OK PLAY            ; Confirm play operation
@UPL PLAY               ; Current status is playing
@UTC 126 002 T 00:01:40 ; Counter updates continue
@UTC 126 002 T 00:01:41
@UTC 126 002 T 00:01:42
(Watch the movie)
#STP                    ; Stop playback
@STP OK STOP            ; Player confirms stop action
@UPL STOP               ; Player indicates that playback has stopped
@UPL STOP               ; It is normal to see repeated status update
#EJT                    ; Eject the tray
@UPL STOP
@EJT OK OPEN            ; Tray opens
@UPL OPEN               ; Status update to show that the tray is open
@UVO 1080P60 1080P60    ; Resolution change – the background screen is 1080p60
                        ; and the output is also 1080p60

(Take out the disc)
#POF                    ; Turn off power
@POF OK OFF             ; Player confirms the action
@UPL CLOS               ; The tray is closing
@UPL LOAD               ; Player is trying to read the disc
@UPW 0                  ; Player reports that the power is turned off
```

- - -