Reference System Supplement

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1 About This Document

The purpose of this document is to describe how to use the Reference System in the development of PlayStation®3 applications. In particular, those methods and procedures in which multiple tools should be used together will be described, as these discussions are not within the scope of the documentation of individual tools and libraries.

2 Main Functions of the Administration Tool

Various settings of the Reference Tool (DECR-1000/DECR-1000A) are available from the Administration Tool when the Reference Tool (DECR-1000/DECR-1000A) is accessed with a Web browser. The following is a list of the main functions in the Administration Tool. For instructions on how to operate the Administration Tool, refer to Reference_Tool_Instruction_Manual_Appendix_e.pdf in the SDK library package.

Setup Menu (Visible Only with Administrator Log-in)

Menu	Description
Administrator password	Change the administrator password
User password	Change the user password
Reset of setting	Initialize settings
Save & load	Save settings and read saved settings
Network	Configure network settings
Update of CP	Update the software for the Communication Processor in the Reference Tool (DECR-1000/DECR-1000A)
Restart of dtnetm	Reboot the program for communication with the development computer (via the DECI protocol)
Date & time	Set current time and time zone
Self-diagnostic program	Perform a diagnostic test for the Reference Tool (DECR-1000/DECR-1000A)

Show Status Menu

Menu	Description
Network	Display network settings
Software version of CP	Display the version of the Communication Processor software
Target	Operate on and display status of the development target
Boot parameters	Set the boot parameters
BD emulator	Configure the BD Emulator

The following boot parameters are available.

Boot Mode

Setting	Description
Debugger Mode	Application programs are executed under the control of the remote debugger by connecting the debugger to the target system. In this mode, the system software's GUI is not shown
System Software Mode	The GUI menu of the system software appears when the target system is started, and you can perform various settings (for graphics, sound, network, etc.) with the GUI in this mode. In addition to starting up game discs, you can launch game applications located in the remote file system on the host computer. It is also possible to later attach the started game application to the remote debugger in this mode
Release Mode	This mode is not available with the Reference Tool because it is a boot mode for the Debugging Station

User Process Memory Size

Setting	Description
Tool Mode	Standard memory allocation with the Reference Tool
Console Mode	Restrict main memory size to equivalent of game console

Blu-ray Disc Access

Setting	Description
BD Emulator (DEV)	Access the image file stored on the built-in HDD(DEV) of the Reference Tool (DECR-1000/DECR-1000A)
BD Emulator (USB)	Access the image file stored on the USB mass storage
BD Drive	Access the Blu-ray Disc drive

Transfer Rate Pacing for BD Emulator

Setting	Description
HDD Native	Transfer data using the native HDD data transfer rate, without making any adjustments
Equiv. to BD Drive	Transfer data by adjusting transfer rate to equal that of the Blu-ray Disc drive

Release Check Mode

Setting	Description
Development Mode	Access files on the host PC and execute fself of the target HDD
Release Mode	Provide an environment similar to the console for the final test

HOSTFS Network

Setting	Description
DEV LAN	Use the development network for the HOSTFS
LAN	Use the network of the target for the HOSTFS

Target Model

Setting	Description
PS3 HDD 60GB Model / PS3 HDD 20GB Model	Select model of target machine for developing software using the Reference Tool (DECR-1000/DECR-1000A). Device drivers (for example) will enable the Reference Tool (DECR-1000/DECR-1000A) to operate like each of the target machine models.

Power On Beep

Setting	Description
Yes	Beep sound at boot is enabled.
No	Beep sound at boot is disabled.

3 Update the Communication Processor Software

The procedure for updating the Communication Processor (CP) software is written in the file Reference_Tool_Instruction_Manual_Appendix_e.pdf.

When the update is successful, a new number will be displayed as the version of the Administration Tool. If the old version is displayed, carry out the update again.

After updating the CP software, update the flash memory of the target system as well.

Warning

- Do not press the “Setting” button more than once for the update.
- Do not turn off the power during the update process.
- The Administration Tool screen will not automatically be updated when the update completes (there is no notification of the completion). While the update is in progress, the STATUS LED of the Reference Tool (DECR-1000/DECR-1000A) will blink. When the update completes, the STATUS LED will remain lit.
- When updating CP software, the power of the target system (main board) must be turned off.

Restore Initial Settings

To restore the factory settings of the CP software, hold down the SYSTEM INIT switch and press the POWER switch.

After carrying out this process, always update the CP software. Without this update process, the target system will not boot when the POWER switch is pressed.

4 Shutdown

If the system will not shut down properly due to a problem with the software, use one of the methods below to either force the power off or reset the system.

Turn Off the Power

- Hold down the POWER switch for 10 seconds
- Execute the `dtpoff` command with the `-f` option
  Example `> dtpoff -f -d Tool_IP_address`
- Select the "Target" screen of the Administration Tool, check the "without shutdown sequence of software" box and press the Shutdown button

Reset

- Press the RESET switch of the Reference Tool (DECR-1000/DECR-1000A)
- Execute the `dtpreset` command with the `-f` option
  Example `> dtpreset -f -d Tool_IP_address`
- Select the "Target" screen of the Administration Tool, check the "without shutdown sequence of software" box and press the Reboot button

5 Audio, Video, and Network Settings at Boot

The audio, video, and network settings that will be valid at boot can be configured by booting the system software (GUI version).

There are three ways to boot the system software as shown below.

(1) Reset switch

When the main power of the Reference Tool (DECR-1000/DECR-1000A) is on and the power of the target system is off (when the Power LED is lit red), the system software mode can be set by pressing the RESET switch of the Reference Tool (DECR-1000/DECR-1000A).

(2) Administration Tool: “Boot parameters” screen

Select the “Boot parameters” screen of the Administration Tool, and set “System Software Mode” for “Boot Mode”.

(3) dt commands

Configure the settings using one of the following `dt` commands. (For more information, refer to the document “Reference Tool Software Setup Guide”.)

```
> dtcparam [-d hostname[:port]] boot=sys

> dtpon [-d hostname[:port]] [-q] boot=sys

> dtpreset [-d hostname[:port]] [-f] [-q] boot=sys
```

Audio and video settings at boot can also be set using setmonitor.self. Network settings can be configured after starting the system software on Reference Tool (DECR-1000/DECR-1000A). For details, refer to the ”System Software Overview” and ”NP for Development User's Guide”.

The system software does not support video output modes with refresh rates of 50Hz and VESA type monitors (monitor types 720(p) and 1080(p)). To use such modes or monitors, setmonitor.self must be used.

6 Boot a Program from the Blu-ray Disc Drive

The following two methods can be used to boot a program in the game master disc (BD-R/BD-RE) that is inserted into the Blu-ray Disc drive:

Note
Disc Image Generator for PlayStation®3 is provided as a tool to create a game master disc. Please always use the latest version.

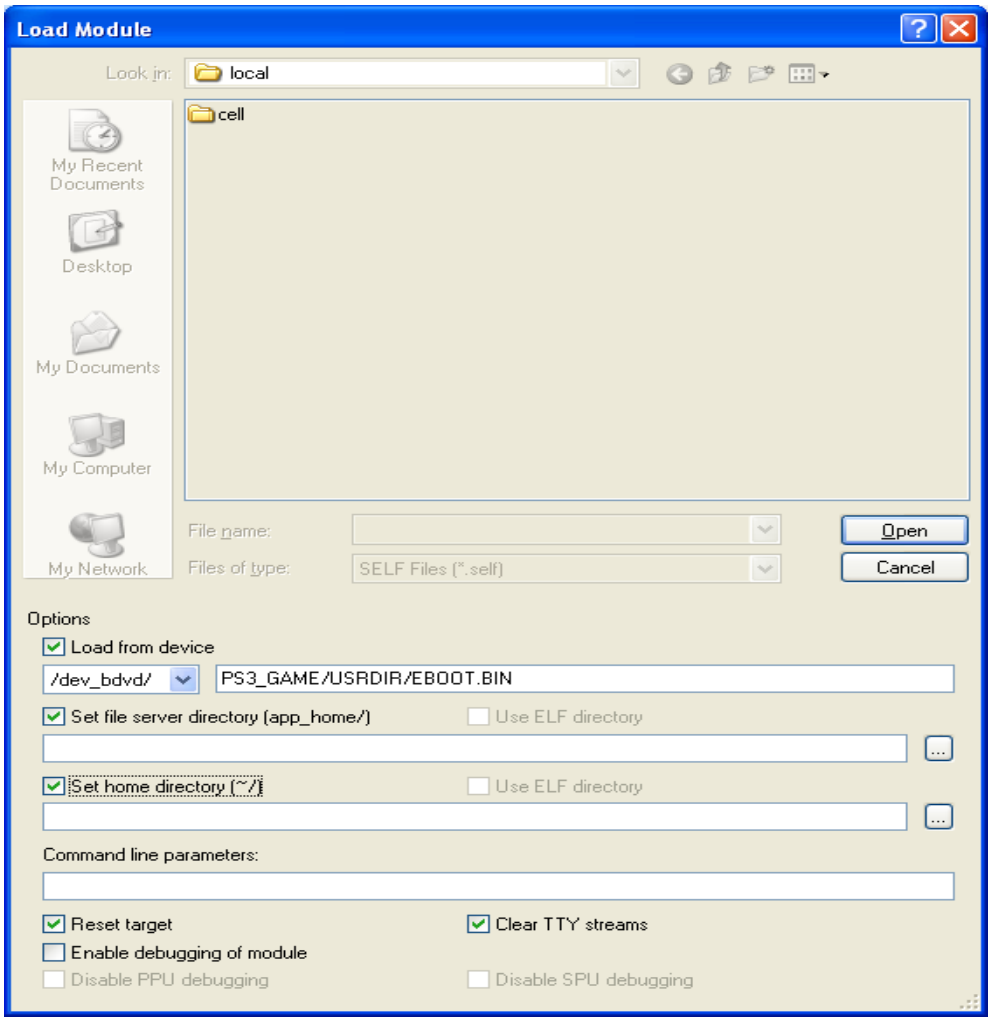
(1) Using system software GUI

When a game master disc is inserted in the Blu-ray Disc drive, an icon is displayed in the “Games“ column of the system software. Select the icon and press the Enter button to boot the boot program (/PS3_GAME/USRDIR/EBOOT.BIN) on the game master disc.

Please refer to the “System Software Overview” for more details on how to debug a program that is booted using this procedure, etc.

(2) Using ProDG Target Manager for PlayStation®3

To boot the boot program (/PS3_GAME/USRDIR/EBOOT.BIN) on a Blu-ray Disc from the ProDG Target Manager for PlayStation®3, select "Load & Run Executable..." from the "Target" menu. In the next dialog, tick the "Load from device" checkbox under Options and select "/dev_bdvd/" from the dropdown list. Type "PS3_GAME/USRDIR/EBOOT.BIN" in the field next to "/dev_bdvd/", and then click the "Open" button. This will launch the boot program on the Blu-ray Disc.



It is possible to have the game termination request event triggered by disc ejection even when the program is booted by the ProDG Target Manager for PlayStation®3 or debugger. Go to the "Debug Settings" column of the system software and select "Game Type (Debugger)" -> "Disc Boot Game". Refer to the document "Application Requirements" for more information regarding disc ejection.

Access to Files in the Disc

To read a file from the disc into the program, specify `/dev_bdvd/PS3_GAME/USRDIR/`*`filename`*.

7 Handling the Controller

Connecting the Controller

The wireless controller supports both wired connection using a USB cable, and wireless connection using Bluetooth®. When connected by a USB cable, the wireless controller can be used as a wired controller; when the USB cable is removed, it can be used as a wireless controller. Handling of the controller by a game application via libpad is the same either way.

Given Bluetooth® specifications, it is necessary for both target devices to have the ID of the other registered before a connection can be established. Because of this, first connect the wireless controller using a USB cable and start up the system. The system will be in a state where it is waiting for ID registration, and the port LED (4 LEDs near the USB connector) will flash. Press the PS button in this state. When ID registration completes and a connection via Bluetooth® is established, the appropriate port LED will illuminate (or flash if recharging). This will enable you to use the wireless controller (either with a wired connection or a wireless connection), without having to press the PS button to register the ID.

Charging the Battery

The wireless controller is equipped with a built-in battery for wireless connection. The battery is charged automatically when the target system is turned on and a connection is established via a USB cable. If a port has been assigned, the port LED will flash while the battery is being charged, and illuminate once the battery is fully charged. If a port has not been assigned, all port LEDs will flash during the charging, and come off when the charging completes.

8 Handling the Hard Disk Drive

The Reference Tool (DECR-1000/DECR-1000A) has two built-in hard disk drives (HDDs). One is for the BD emulator, and the other is for game applications (equivalent to the internal HDD on the PlayStation®3). For functions and usage of the BD emulator, refer to "Chapter 9: BD Emulator" of this document.

Initializing

Before using the HDD, initialize them from the system software GUI.

Ejecting

On the Reference Tool (DECR-1000/DECR-1000A), it is possible to take out the HDD. To do so, press the Eject button when the target system is turned off (shut down).

Accessing the HDD for Game Applications

Accessing from a Game Application

There are two ways a game application uses this HDD: the game application can handle game data on the HDD, or handle the system cache on the HDD.

In the former case, the game application accesses the HDD via the libfs-provided CFS (Cell File System) using the save data utility or game content utility. Specify the mount point of the HDD as `SYS_DEV_HDD0`.

Note that a directory by which data on the HDD can be read/written from the game application must be created beforehand using the game content utility. For details, refer to the "Game Content Utility Overview" and "Game Content Utility Reference".

In the latter case, the game application accesses the HDD via the libfs-provided CFS (Cell File System) using the system cache utility. In this case, specify the mount point of the HDD as `SYS_DEV_HDD1`.

When using the HDD system cache, note that the directory from where data is to be read/written from the game application must be the directory returned by the system cache utility. For details, refer to the "System Cache Utility Overview" and "System Cache Utility Reference".

Access Method When Developing a Game Application (cellftp.self)

cellftp.self is a utility program for reading/writing the contents of the HDD for game applications. For details, refer to the "libfs Utility User's Guide".

Setting HDD Access Speed

The HDD of the Reference Tool is of higher performance than the HDD of PlayStation®3 or Debugging Station. Because of this differences in application behavior may arise for processing that is affected by transfer rate to the HDD – for example, being able to play back a movie installed to game data on the Reference Tool, but having a problem of frame skips on PlayStation®3.

The "Fake HDD Access Speed" feature available from the "Debug Settings" column of the system software can be set "On" to decelerate the average HDD transfer rate to one that is equivalent to PlayStation®3. This feature can be used to test the behavior of the application. Note that, however, this feature does not emulate latency differences or changes.

9 BD Emulator

Purpose and Characteristics

The BD emulator enables to read data written onto the HDD for the BD emulator as if the data is written onto the Blu-ray Disc. From SDK200 onwards, the USB mass storage can be used as the HDD for the BD emulator so that the BD emulator feature can be used on the Debugging Station. On the Reference Tool (DECR-1000/DECR-1000A), not only the built-in HDD for the BD emulator , but also the USB mass storage can be switched to and used as the HDD for the BD emulator.

The programs required for using the BD emulator are as follows:

- Disc Image Generator for PlayStation®3
- System software
- Host command `dtcfsutil` (Supported only by the Reference Tool (DECR-1000/DECR-1000A))
- CP package(Administration Tool) (Supported only by the Reference Tool (DECR-1000/DECR-1000A))

This chapter describes how to use the BD emulator with these programs. Please refer to each corresponding document for more details on the system software, Disc Image Generator for PlayStation®3 and Administration Tool.

Selecting the HDD for the BD Emulator to Use on the Reference Tool (DECR-1000/DECR-1000A)

On the Reference Tool (DECR-1000/DECR-1000A), the selection can be made between the built-in HDD for the BD emulator and the USB mass storage to use as the HDD for the BD Emulator. To use the built-in HDD for the BD emulator, it should be specified as follows:

```
> dtcparam bdemuhdd=dev
```

To use the USB mass storage, it should be specified as follows:

```
> dtcparam bdemuhdd=usb
```

Connection Port for the USB Mass Storage

The USB mass storage is recognized as the HDD for the BD emulator when it is connected to a specific USB port. On the Debugging Station and the Reference Tool (DECR-1400J/DECR-1400A), connect the storage to the innermost USB port. On the Reference Tool (DECR-1000/DECR-1000A), connect the storage to the upper port in the middle among the 3 rows with 2 USB ports in each row.

Debugging Station (DECHA00J/DECHA00A), Reference Tool (DECR-1400J/DECR-1400A)

Debugging Station (DECHJ00J/DECHJ00A)

Debugging Station (DECH-2000J/DECH-2000A)

Reference Tool (DECR-1000/DECR-1000A)

Writing Image Data onto the HDD for the BD Emulator

The following two methods are available for writing image data onto the HDD for the BD emulator.

- Write the data onto the HDD for the BD emulator on the Reference Tool (DECR-1000/DECR-1000A) via the network using the `dtcfsutil command`
- Connect the HDD for the BD emulator directly to the Windows PC and write the image data directly using the Disc Image Generator for PlayStation®3

How to write the image data via the network using the `dtcfsutil` command is described in the following section "Writing Data onto the Reference Tool (DECR-1000/DECR-1000A)".

Writing Data onto the Reference Tool (DECR-1000/DECR-1000A)

(1) Create an image file

Create an image file using the Disc Image Generator for PlayStation®3. When writing data onto the USB mass storage, use only the image file for the BD emulator because the image file for the Blu-ray Disc master disc cannot be used. When writing data onto the built-in HDD for the BD emulator on the Reference Tool (DECR-1000/DECR-1000A), both the image file for the BD emulator and for the Blu-ray Disc master disc can be used.

In the steps below, TEST-00060.emu is the image file.

(2) Start the host file server

```
> start dtcfilesv
```

(3) Turn on the power of the target

```
> dtpon
```

(4) Transfer file

Execute the `dtcfsutil` command from the command prompt to transfer the image file to the Reference Tool (DECR-1000/DECR-1000A).

```
> dtcfsutil cp /app_home/TEST-00060.emu /dev_bdemu/0
```

The arguments of the `dtcfsutil` command are passed in the following format.

```
dtcfsutil [-d <target>] cp source destination
```

For the source, specify the file on the host file server with the path as seen from the target system.

The destination can be selected from the following 4 locations. In other words, a maximum of 4 image files can be on the target system at one time.

- /dev_bdemu/0
- /dev_bdemu/1
- /dev_bdemu/2
- /dev_bdemu/3

(5) Select entry

Use a Web browser to open the Administration Tool and click on "BD emulator". The transferred image files will be displayed as entries. Select the entry (the image file number) to use.

Notes Regarding Transfers of the Image Data to the BD Emulator

- It is possible for image data created in a Windows environment to become very large in size. Use a Gigabit Ethernet network (if available) to connect the Reference Tool (DECR-1000/DECR-1000A).
- Use the Windows Task Manager to check the transfer progress.

Using the Windows Task Manager to check the transfer progress

(1) Start the Task Manager.

(2) To check the transfer rate, select the Networking tab.

(3) To check the amount transferred, select the Processes tab and then "Select Columns" of the View menu. In the dialog that will be displayed, check "I/O Read Bytes" and the file size read by dtcfilesv will be shown. This is the transferred amount.

Writing the Image File Directly Using the Disc Image Generator for PlayStation®3

There is also another method to write the image data onto the HDD for the BD emulator. Remove the built-in HDD for the BD emulator on the Reference Tool (DECR-1000/DECR-1000A), and connect it to the Windows PC, then write the image file directly using the Disc Image Generator for PlayStation®3. The image file can be also written directly onto the USB mass storage when it is connected to the Windows PC. These procedures are described below:

(1) Initialize the HDD for the BD emulator

Select "Format BD Emulator HDD" in the "Debug Settings" column of the system software beforehand and perform "Quick Format".

(2) Remove the HDD for BE emulator

In the case of the built-in HDD for the BD emulator, press the eject button at the right of the HDD(DEV) while the target system is switched off, and pull the handle.


In the case of the USB mass storage, disconnect it from the USB port.

(3) Connect to the Windows PC

In the case of the built-in HDD for the BD emulator, connect it to the PC via a commercially available SATA cable. The picture shows an example connection of the SATA-USB2.0 adaptor cable and PC.


In the case of the USB mass storage, directly connect it to the PC.

(4) Write an image file from Disc Image Generator for PlayStation®3

Please refer to the document of Disc Image Generator for PlayStation®3

(5) Reattach the HDD for the BD emulator

Remove the HDD from the PC and reattach to the Reference Tool (DECR-1000/DECR-1000A) or the Debugging Station. Make sure that the target system is switched off when reattaching.

Connect the HDD to the Reference Tool (DECR-1400J/DECR-1400A) following the same procedure as when you connect it to the Debugging Station.

Enabling the BD Emulator Feature

Setting the Boot Parameter

On the Debugging Station and the Reference Tool, set "Blu-ray Disc Access" in the Debug Settings column of the system software to "BD Emulator (USB)". On the Reference Tool (DECR-1000/DECR-1000A), it can be set from the system software and also on the Administration Tool. In the "Boot parameters" screen, select "BD Emulator (DEV)" for "Blu-ray Disc Access".

Note:
On the Debugging Station and Reference Tool, "BD Drive" is selected by default.

After this setting is completed, reset the target system to enable the BD emulator. To use the USB mass storage as the HDD for the BD emulator, connect it to the system before resetting.

Accessing from the Game Application

The game application can access under the mount point "/dev_bdvd".

Emulating the Ejection of a Disc (Reference Tool (DECR-1000/DECR-1000A) only)

The `dtcfsutil` command can be used to emulate disc ejection and insertion operations with the BD Emulator.

```
> dtcfsutil eject /dev_bdemu
```

Call as follows to cancel the disc-ejected state. Note also that the disc-ejected state will be cancelled when the target is reset.

```
> dtcfsutil insert /dev_bdemu
```

Emulating the Ejection of a Disc When the USB Mass Storage is Used

When the USB mass storage is used as the HDD for the BD emulator, only disc ejection operation can be emulated. To emulate disc ejection operation, disconnect the USB mass storage from the USB port of the Reference Tool or the Debugging Station. Once it is disconnected, the storage will not be recognized as the HDD for the BD emulator until the Reference Tool or the Debugging Station is turned on again or reset.

Image Switching (Reference Tool (DECR-1000/DECR-1000A) only)

The disc images can be switched by ejecting the disc.

```
> dtcfsutil eject /dev_bdemu
```

Call as follows to change the image to /dev_bdemu/1.

```
> dtcfsutil insert /dev_bdemu/1
```

Initializing the Built-in HDD for the BD Emulator

Prior to changing the user of the Reference Tool (DECR-1000/DECR-1000A), it is necessary to initialize the built-in HDD for the BD emulator following the steps below.

(1) Start up the system software

(2) Initialize the Built-in HDD for the BD Emulator

Select "Format BD Emulator HDD" in the "Debug Settings" column.

There are two ways to initialize the HDD. One method is the full formatting, where all sectors of the HDD are cleared with 0s. The other is quick formatting, where only the management information regarding the emulator is cleared with 0s. The full format takes approximately three hours.

Full Formatting

Select "Full Format" from "Format BD Emulator HDD".

Quick Formatting

Select "Quick Format" from "Format BD Emulator HDD".

Restrictions

Note that the following restrictions apply regarding usage of the BD emulator.

- On the Reference Tool (DECR-1000/DECR-1000A), the HDD can be removed when the target system is switched off. The HDD described as “HDD(DEV)” is used as the built-in HDD for the BD emulator.
- On the Debugging Station and the Reference Tool (DECR-1400J/DECR-1400A), it is not possible to switch between disc images in the USB mass storage. Specify the image when writing with the Disc Image Generator for PlayStation®3 or connect the storage to the Reference Tool (DECR-1000/DECR-1000A) and switch between the images on the Administration Tool.
- On the Reference Tool (DECR-1000/DECR-1000A), an image cannot be copied by the `dtcfsutil` command while the corresponding entry is being used. Eject using `dtcfsutil` or the Administration Tool and then copy the image.
- In the USB mass storage, 50GB is required for a single image. Up to 4 images are supported. For example, in the 60GB mass storage, 50GB and 10GB images can be used.

10 Specifications of the Reference Tool and the Debugging Station

	Reference Tool		Debugging Station		
	DECR-1000/ DECR-1000A	**DECR-1400J/ DECR-1400A**	**DECHA00J/ DECHA00A**	**DECHJ00J/ DECHJ00A**	**DECH-2000J/ DECH-2000A**
Cell Broadband Engine™ - Clock	3.2GHz				
Main memory size	512MB		256MB		
RSX™ - Core clock - Memory clock - Local memory size	500MHz 650MHz 256MB				
Hard disk drives (HDDs) - For the BD emulator - For game applications	400GB 400GB	- 160GB	- 60GB	- 40GB	- 120GB
Blu-ray Disc drive	Slot-in model				
Number of USB ports	6	4		2	
SD Memory Card slots	Available	Not available	Available	Not available	
Supported SDK versions	Depends on shipment date - 1.0.0 and later - 2.3.0 and later	2.6.0 and later	Depends on shipment date - 1.0.0 and later - 1.5.0 and later - 1.6.0 and later	2.1.7 and later	2.8.5 and later
PlayStation®3 game titles	Supported				
PlayStation®2 game titles	Not supported		Supported	Not supported	
PlayStation® game titles	Not supported		Supported		
Others (Restrictions)		- HDD read/write speed is slower than DECR-1000/DECR-1000A			

11 FAQ

I cannot connect the host PC to the Reference Tool (DECR-1000/DECR-1000A). What could be the problem?

Try executing "Repair" from the list of options displayed when right-clicking the icon for "Local Area Connection" (name used for connection) from "My Network Places" and "View Network Connections". This is especially effective when browser access is unstable, or when the host PC is unstable because it has been transferring data for an extensive period of time.

Can the Debugging Station start up a self file from the host PC via the debugger?

The Debugging Station that is equipped with the system software of SDK2.0.0 or later can start up the self file via the debugger.

Can I play a commercially sold PlayStation®3 game title on the Reference Tool?

Yes, it is possible.

Can I play back a commercially sold Blu-ray Disc movie title on the Reference Tool?

No, it is not possible.

Can I use the updater file included in the game title to update the system software of the Debugging Station?

The updater file included in a game disc is an updater file for the PlayStation®3. You cannot use this updater file to update the system software of the Debugging Station.

I cannot receive video signals from the Reference Tool or the Debugging Station. Is there a way to reset video output?

For both the Reference Tool and the Debugging Station, turn the power on by pressing the front POWER button until you hear two beeps. Video output will be initialized to a standard output of 4:3. Output will be in NTSC if the "Region Settings" of the system software's "System Settings" is set to Japan or North America, or PAL if this is set to Europe or UK. When an HDMI cable is connected, a confirmation dialog will be displayed on whether to display video in HDMI.

The game application automatically starts up when the power is turned on when a game title is inserted.

To disable automatic startup of a game application, set "Disc Auto-Start" to "Off" from the system software's "System Settings".

The Reference Tool or the Debugging Station does not boot correctly.

Try booting in safe mode. Safe mode has a variety of features that help the Reference Tool/Debugging Station boot correctly. For more information regarding safe mode, refer to the document, "Reference Tool Software Setup Guide". Safe mode boots are supported from system software 2.60 onwards.