

Reference Tool Software Setup Guide

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1 General

This document describes the procedure for setting up the Reference System with DECR-1000 / DECR-1000A (collectively referred to as the Reference Tool in this document) to build and run programs.

Instructions are provided for installing the SDK, configuring the Reference Tool, updating the software, connecting the host PC (and using remote control), and building and executing the sample programs in the SDK, along with methods of solving common problems. There is also an overview of the PlayStation®3 Developer Network website (DevNet).

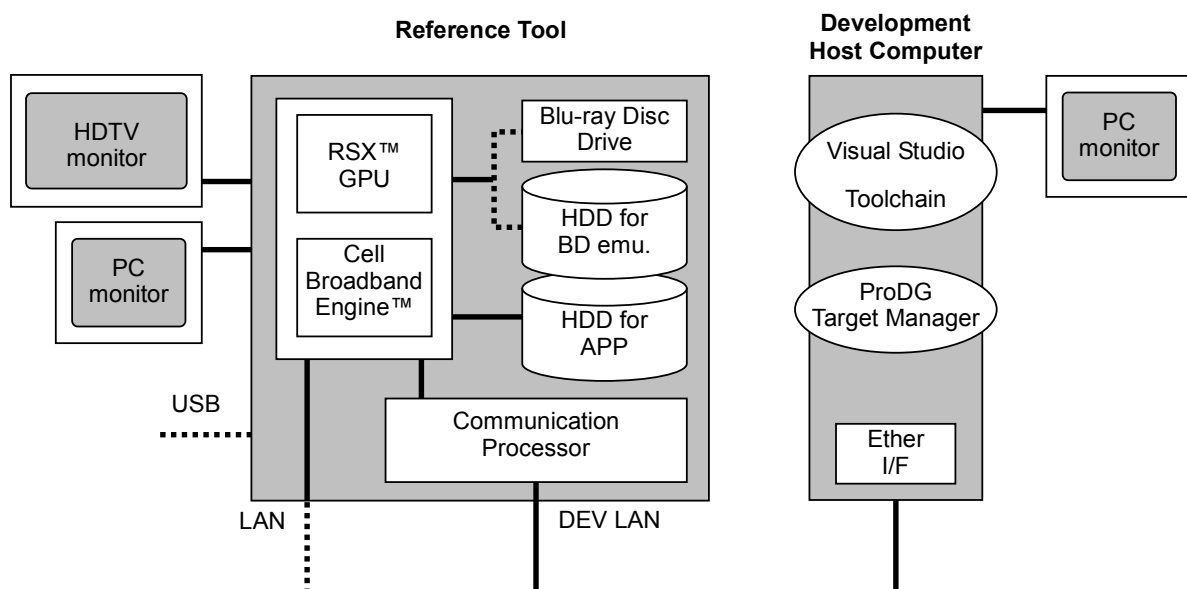
Note

Details of DECR-1400J and DECR-1400A can be found in the document "Reference Tool (DECR-1400J/DECR-1400A) Software Setup Guide".

Overview of Reference System

The following is a schematic drawing of the Reference System architecture.

Figure 1 Architecture of Reference System



Reference Tool

The Reference Tool includes the following:

- Target system
This is a system equivalent to the PlayStation®3, and implements the Cell Broadband Engine™ (Cell/B.E.), RSX™, and various I/O interfaces.
- Communication Processor (CP)
This processor is in charge of the communication between the target system and the development host computer.

The Reference Tool has 2 network connectors. One is the LAN connector (for the target system) and the other is the DEV LAN connector (for the Communication Processor).

For more information regarding the Reference Tool, refer to the instruction manual that is packaged together with the Reference Tool. It is also available as a PDF file in the SDK package.

Monitor

The Reference Tool is equipped with the AV MULTI OUT connector, HDMI output connector, and monitor output connector (D-Sub). Refer to the instruction manual for the Reference Tool and connect the monitor to the correct connector.

Development Host Computer

Coding, compiling and debugging should be performed on a separate development host computer, which may be an ordinary personal computer. Requirements for the development host computer are listed below.

Requirements

- Ethernet must be supported.

Other recommended functions and performance levels are described in the table below.

Item	Feature/Specification
OS	Windows XP Professional SP3 Windows Vista SP2 32-bit Edition Windows Vista SP2 64-bit Edition
CPU	Pentium III 1GHz equivalent or higher
Memory	At least 1Gbyte
Integrated development environment	Visual Studio 2005 Standard Edition or higher Visual Studio 2008 Standard Edition or higher

Reference System Setup Outline

The steps for setting up the system are outlined below.

- (1) Install the development software onto the development host computer. (See "2 Installing the Development Software".)
- (2) Connect the monitor, controller, and power cable to the Reference Tool. After booting the Reference Tool, connect the network cable.
- (3) Configure settings using the Communication Processor's Administration Tool. (See "3 Setting Up Using Communication Processor's Administration Tool".)
 - Configure the network for the Communication Processor on the Reference Tool to enable communication with the development host computer
 - Update the Communication Processor software
 - Set boot parameters of the target system
- (4) Update the flash memory of the Reference Tool target system. (See "5 Updating Flash Memory".)
- (5) Compile and run sample programs. (See "6 Compiling and Running Sample Programs".)

Outline of the Development Software

Development software is provided in the form of compilers, libraries, sample programs, and other tools. The main ones are listed below.

- C/C++ compiler
ppu-lv2-gcc and spu-lv2-gcc are compilers based on GCC and customized for the PPU and the SPU, respectively.
- Libraries
The libraries are provided as part of the SDK. Libraries must always be downloaded and installed in order to develop PlayStation®3 applications.
- Sample programs
Various sample programs are provided. Always refer to these when developing applications.

- **Extra SDK samples**
These samples are provided separate from the SDK package.
- **Sample showcase**
A digest for introducing sample programs that can be easily utilized by game titles is provided as a movie file.
- **Debugger (ProDG for PlayStation®3)**
ProDG for PlayStation®3 is a package including the add-in Visual Studio Integration (VSI) to integrate the SN Systems ProDG Debugger for PlayStation®3 and ProDG Debugger with Visual Studio. A license file is required in order to use the ProDG Debugger. For details, refer to the page "Licensing SN Systems tools" on DevNet (<https://ps3.scedev.net/projects/prodg/docs/68>).
- **Performance tuning tools (Tuner for PlayStation®3/GPAD)**
Various performance tuning tools (which will not be described in this document) are provided. Download and install these tools as necessary.
 - **Tuner for PlayStation®3** (<https://ps3.scedev.net/projects/tuner>)
Tuner is a tool for capturing and visualizing program behaviour, to help you eliminate conflicts and bottlenecks in your code.
 - **GPAD** (<https://ps3.scedev.net/projects/gpad>)
GPAD is an RSX™ command buffer debugger based on libgcm. It is a performance analyzer tool that integrates the features of GCM Replay and RSX™ Tools (which were previously provided as independent tools).

Directory Configuration

The directories under the top directory `cell\` are configured as follows:

<code>\info\</code>	Notes, known defects, changes from the previous version, etc.
<code>\SDK_doc\</code>	Various documents.
<code>\samples\</code>	Various sample programs.
+ <code>\sdk\...</code>	Samples of the modules provided in the SDK
+ <code>\tutorial\...</code>	Tutorials regarding the given techniques and tips
+ <code>...</code>	Other sample programs
+ <code>\mk\</code>	Common make rules for sample programs
<code>\sample_data\</code>	Sample data for sample programs
<code>\host-common\</code>	Programs, etc. that run on the development host computer
<code>\host-win32\</code>	Programs, etc. that run on the development host computer
+ <code>\bin\</code>	Host file server (dtcfilesv), terminal program (dtccons), and other utilities.
+ <code>\etc\</code>	Setting files etc.
+ <code>\ppu\...</code>	Directories for GCC of PPU.
+ <code>\spu\...</code>	Directories for GCC of SPU.
+ <code>\Cg\</code>	Cg compiler
+ <code>\sn\</code>	ps3ppuld and SNC_PPU_toolchain
+ <code>\rsxtools\</code>	RSXTOOLS
<code>\HW_doc\</code>	Hardware documentation
<code>\license\</code>	Information of trademarks and licenses relevant to the software included in the development tool and SDK packages
<code>\NP\ *1</code>	PlayStation®Network files
<code>\CP_Update\</code>	.bin file for updating the Communication Processor software

\target\	Headers, libraries, etc. for the target system.
+ \ppu\	Directory for PPU
+ \include\	Header files for PPU programs
+ \lib\	Libraries to be linked to PPU programs
+ \spu\	Directory for SPU
+ \include\	Header files for SPU programs
+ \lib\	Libraries to be linked to SPU programs
+ \common\	Directory for common use by PPU and SPU
+ \include\	Header files for common use by PPU programs and SPU programs
+ \images\	System files, etc. used when application programs are executed
+ \bootrom\	Image file to be written to flash memory
+ \updater\	Update data for the "system update" operation
\Tools\ *1	Various tools for selection by the user. The Tools directory configuration depends on the tools installed.
+ \GPAD\ *1	Zip installer and Windows installer for GPAD, RSX™ tools
+ \PAMF Tools\ *1	PAMF tools
+ \ps3gen\ *1	Generator tools
+ \ps3chk\ *1	Disc Image Checker for PlayStation®3
+ \Sound Tools\ *1	Sound tools
+ \CELP Tools\ *1	Tools for encoding/decoding CELP
+ \MultiStream Tools\ *1	MultiStream tools
+ \PS3at3tool\ *1	Tools for encoding/decoding ATRAC3plus™
+ \SCREAM Tools\ *1	SCREAM tools
+ \SEdit\ *1	SEdit tool to output sound data
+ \Sulpha\ *1	Sulpha PC tools and Sulpha showcase
+ \VAG Previewer\ *1	VAG Previewer sound previewer
+ \VAGconverter\ *1	VAGconverter sound converter
\TRC\ *1	TRC (Technical Requirements Checklist)
+ \Brand Guideline\ *1	Brand Guideline
+ \NC\ *1	Product Group Naming Conventions

*1 This directory is created if the SDK Installer is used for setting up the development environment.

Note

The directory configuration may be slightly different depending upon the version. For details, refer to the readme files and release notes in the SDK package, and the package descriptions displayed in the SDK Installer.

2 Installing the Development Software

The procedure for installing the development software to the development host computer will be described in this chapter. The SDK Installer available on DevNet greatly simplifies this installation process.

Before Installation

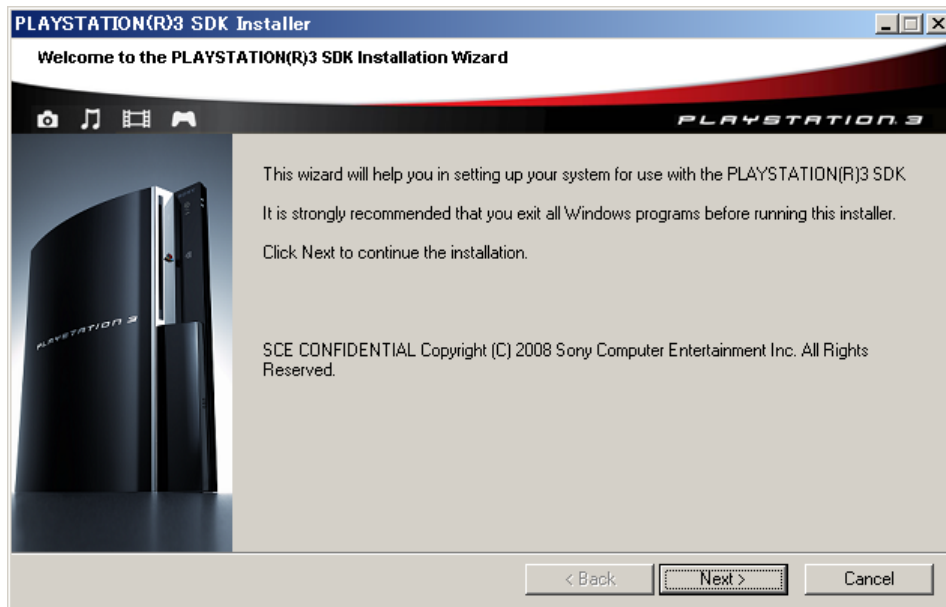
Log onto Windows with an administrator account.

Install Visual Studio, and boot it at least once.

Installation with the SDK Installer

Install development software as follows.

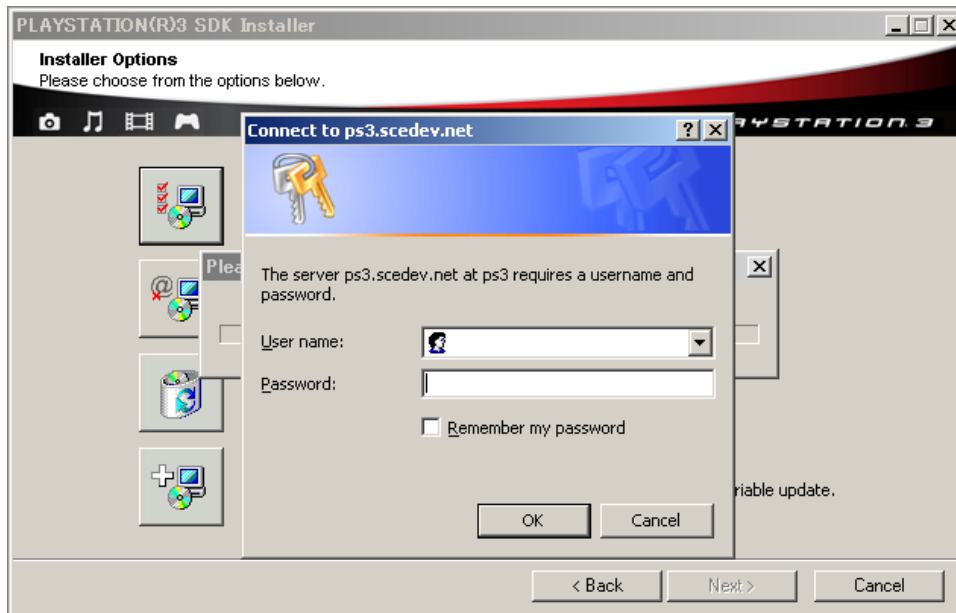
- (1) Download the SDK Installer from the SDK Installer download page on DevNet (<https://ps3.scedev.net/projects/ps3sdkinstaller>).
- (2) Boot the SDK Installer.



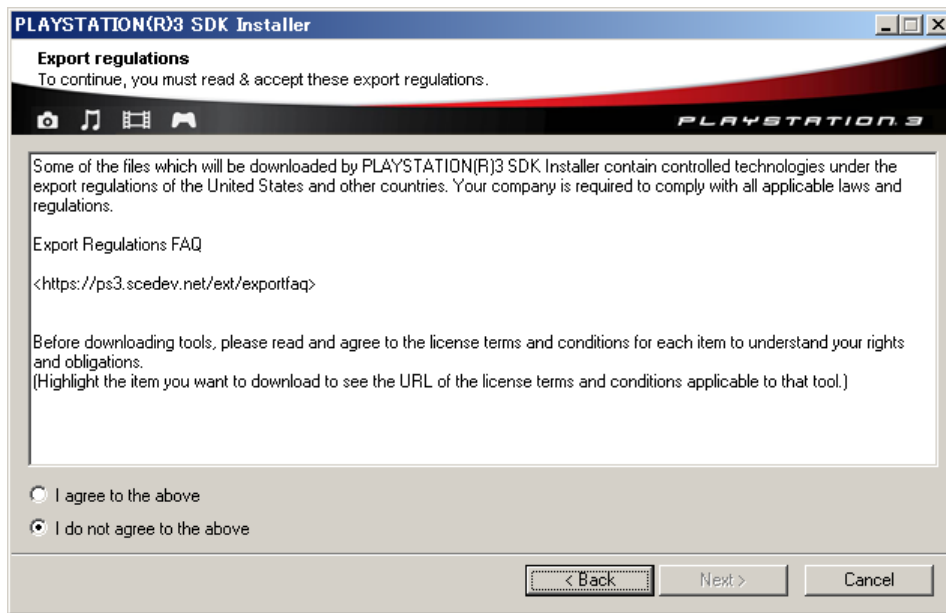
- (3) Click "Next" and select the installer options. Select "Install (online)".



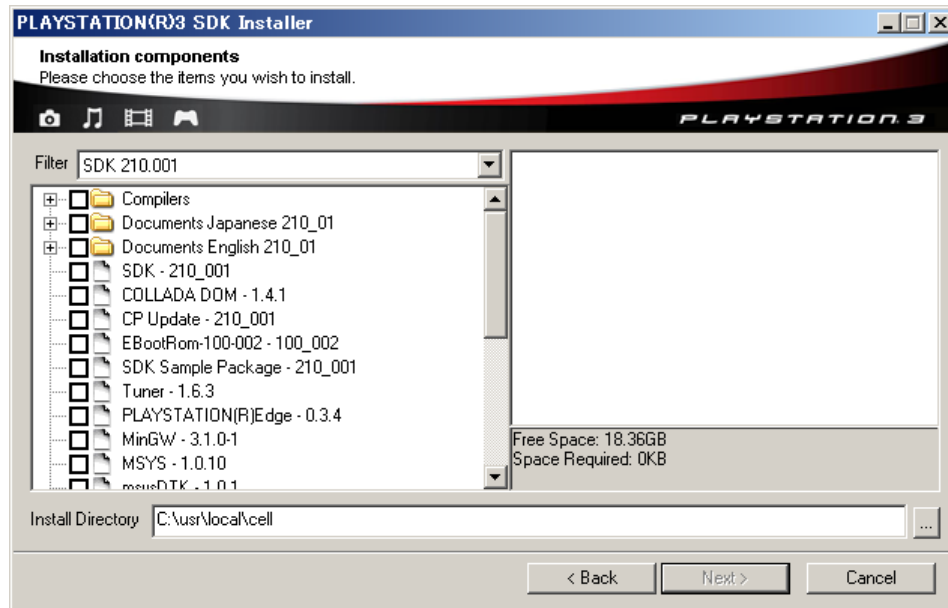
- (4) Log onto DevNet by entering the correct user name and password.



- (5) Read the Export regulations displayed. To agree to the export regulations and start the download and installation of components, select "I agree to the above" and click on "Next".



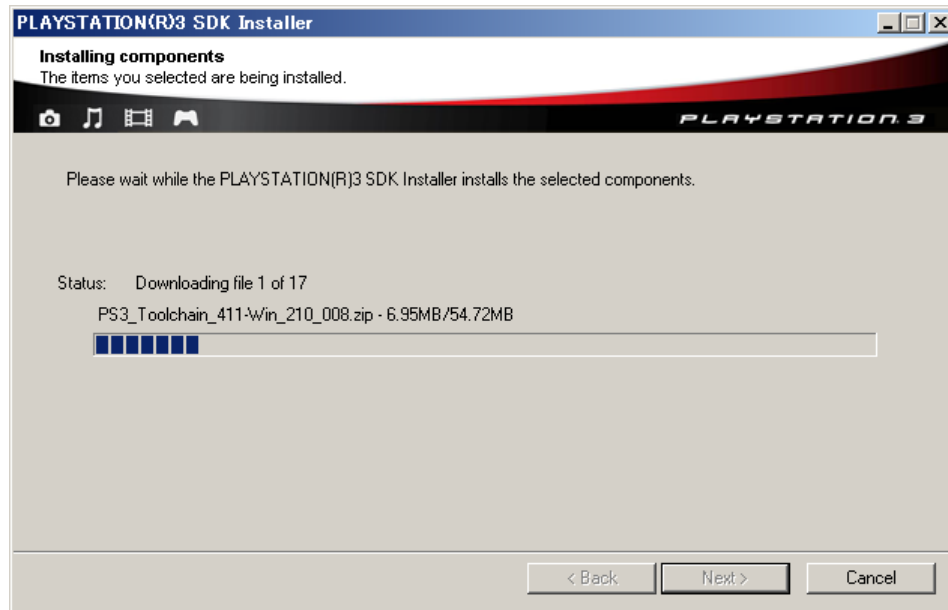
- (6) Select the components to install.



Select the latest version for the following components. (For all other components, select the versions necessary.)

- **Toolchain (Compiler)**
GCC4.1.1 Toolchain is a ZIP file with `ppu-lv2-gcc` and `spu-lv2-gcc`, the GCC-based compilers customized for PPU and SPU. GCC Toolchain is the primary compiler for SPU.
- **SNC PPU Toolchain for PlayStation®3**
SNC PPU Toolchain is a ZIP file with a C/C++ compiler, linker, and binary utility. This is the primary compiler for the PPU toolchain.
- **Documentation**
SDK documents are provided in CHM, PDF, HTML, and Help2 formats. Select the most convenient format.
- **SDK**
This is a ZIP file that includes the software development kit for developing PlayStation®3 applications.
- **CP Update**
This is a ZIP file with the Communication Processor update file for the Reference Tool.
- **Update data (for Reference Tool)**
This is a ZIP file with the update data for the Reference Tool system software.
- **Update data (for Debugging Station)**
This is a ZIP file with the update data for the Debugging Station system software.
- **SDK Sample Package**
This is a ZIP file with the sample program package. Various samples and Visual Studio solution files are included.
- **Tools - SN Tools - ProDG**
This is an install package with the SN Systems debugger, ProDG for PlayStation®3, and Visual Studio Integration. In order to install Visual Studio Integration, Visual Studio must be booted at least once beforehand.

- (7) Click on "Next". Check the summary to see if the selected components are correct. Click "Install" to start the download and installation. A confirmation dialog will appear for components that require the End User License Agreement (like PlayStation®Edge). To start the download of such components, select "I agree to the above" in the confirmation dialog.



Components that have installers (such as ProDG) will automatically start installation of the software.

With these steps, `c:\usr\local\cell` and `c:\Program Files\SN Systems\PS3` will be set up.

Manual Installation

The general procedure for software setup without using the SDK Installer is as follows.

- (1) Set environment variables
- (2) Install the SDK (compilers, etc.)

Environment Variable Settings

Set the environment variables as described below. Enter the variable names exactly as written, since unlike most Windows software, some of the tools using these variables are case-sensitive..

- (1) Right-click the "My Computer" icon and choose "Properties".
- (2) Click the "Advanced" tab.
- (3) Click "Environment Variables".
- (4) Edit "System variables" as follows.

New System Variable

Variable name: CELL_SDK

Variable value: /c/usr/local/cell

New System Variable

Variable name: SCE_PS3_ROOT

Variable value: c:/usr/local/cell

New System Variable

Variable name: LANG

Variable value: C

New System Variable

Variable name: DTNETM

Variable value: Hostname or IP address of the Reference Tool

Edit System Variable

Variable name: PATH

Variable value: Add the following (with no line breaks) to the existing values.

c:\usr\local\cell\host-win32\bin;

c:\usr\local\cell\host-win32\ppu\bin;

c:\usr\local\cell\host-win32\spu\bin;

c:\usr\local\cell\host-win32\Cg\bin

Note

Environment variables can also be set from [Start]-->[Settings]-->[Control Panel]-->[System]-->[Advanced].

User Variables

In certain cases, it may be more convenient to set the environment variables per user. To do this, edit the "User Variables for..." section of the dialog instead of "Environment Variables". For the "PATH" variable, especially, it is probably more convenient to type in the values in the "User Variables for..." section, instead of adding them to the numerous existing values in the "Environment Variables" section. (Adding user variables has the same effect as adding values after the last value in the system environmental variables.)

Checking Environment Variables

Check that the environment variables (especially the "PATH" variable) are correctly set by carrying out the following procedure.

- (1) Select [Start] -> [Run].
- (2) Enter `cmd` and press Enter.
- (3) Enter `path` in the Windows command prompt window that opens up and press Enter.
Check the value of the "PATH" variable displayed.
- (4) Enter `set SCE_PS3_ROOT` and press Enter.
Check the value of the "SCE_PS3_ROOT" variable displayed.
- (5) Enter `set LANG` and press Enter.
Check the value of the "LANG" variable displayed.

SDK Installation

Install the development software provided by SCE as described below.

- (1) Download the SDK, Toolchain, documents, and other packages from DevNet.
- (2) Create the directory `c:\usr\local\cell` and unpack the SDK, Toolchain, and documents packages.
Right-click on each downloaded zip file in the Explorer and choose "Extract All...". The Extraction Wizard will start. Specify `c:\usr\local` for the destination.
- (3) Execute `c:\usr\local\cell\host-win32\bin\vcredist_x86.exe` to install the runtime routine of the Visual C++ library.
- (4) Install the tools with installers (such as ProDG) in appropriate directories.

3 Setting Up Using Communication Processor's Administration Tool

Using the Reference Tool requires first configuring the network for the Communication Processor (CP) to enable communication with the development host computer over a debugging network. After that, updating of CP software and setting of the target system are required with the use of CP's Administration Tool.

Note

This step is not necessary for Reference Tool DECR-1400J / DECR-1400A. (These models do not have CP.)

Configuring Network for Communication Processor

Referring to the instruction manual for the Reference Tool, configure the network setting for the CP to make CP Administration Tool menus accessible from the host computer via a web browser.

Connect the host computer and the Reference Tool via the debugging Ethernet, and then access the factory default IP address of the Reference Tool to change the network settings.

Refer to the instruction manual for the Reference Tool for details of the procedure.

Note

Depending on the network environment, it may be necessary deselect "Use Proxy Server" in the Web browser settings for the IP address of the Reference Tool.

Updating Software for Communication Processor

If the SDK release you are using includes an update package of CP software, be sure to update CP software.

The versions of the CP software and the SDK must be compatible. (Otherwise, it may cause troubles such as communication failure or command failure at the host computer side.)

Access the Reference Tool using a web browser, click "Update of CP" in the CP's Administration Tool menu, and proceed with the onscreen instructions. Note the following points.

- Turn off the power of the target system.
- Do not press the "Setting" button more than once.
- Never turn off the main power during the update.
- Even when the update completes, the screen of the CP Administration Tool remains unchanged (there is no notification of completion). When the update is in progress, the STATUS LED of the Reference Tool will blink. When the STATUS LED stops blinking and lights up, this means that the update completed.

For more information, refer to the instruction manual of the Reference Tool. Always read the Important Changes file in the `info` directory of the SDK package and the readme of the CP update package.

Setting Boot Parameters for Target System

Clicking the "Boot Parameters" menu on the CP's Administration Tool displays the screen to set the following items. Select the options depending on how the Reference Tool will be used.

Item	Options	Description
Boot Mode	Debugger Mode [default]	Mode to execute application programs 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	Mode in which the GUI menu of the system software appears when the target system is started. You can perform various settings for graphics, sound, network, etc. with GUI in this mode. It is possible, also in this mode, to attach the remote debugger afterwards to a running user application.
User Process Memory Size	Tool Mode [default]	Reference Tool's standard memory allocation
	Console Mode	To limit memory capacity to game-console-equivalent size (for purposes such as test)
Blu-ray Disc Access	BD Emulator (DEV)	To read data from an image file for the BD emulator stored on HDD (DEV).
	BD Emulator(USB)	To read data from an image file for the BD emulator stored on USB mass-storage device. Note that there is a specific port designated for connecting USB mass-storage devices.
	BD Drive [default]	To read data from the Blu-ray Disc drive.
Release Check Mode	Development Mode [default]	To access files on the host computer, and execute fsself on the target HDD
	Release Mode	The above operations are not possible. To prepare files for the final test environment
HOSTFS Network	DEV LAN [default]	To access HOSTFS via the development network
	LAN	To access HOSTFS via the target network
Transfer Rate pacing for BD Emulator	None [default]	To specify whether to enable adjustment of the rate of data transfer from the HDD for BD emulator.
	Equiv. to BD Drive	
Target Model	PS3 HDD 60GB Model [default]	To select the target model. Software such as device drivers will enable the Reference Tool to behave as the target model.
	PS3 HDD 20GB Model	

The boot parameters can also be set using the [dtcparam command](#) or the ProDG Target Manager for PlayStation®3 GUI instead of the CP Administration Tool. It is also possible to configure some of the settings from the system software GUI. Also, it is possible to switch between system software mode and debugger mode by pressing the RESET switch when the main power is on and the power of the target system is off (when POWER LED has a red light).

Details of the system software can be found in the document "System Software Overview". Information of the BD emulator is available in the document "Reference System Supplement".

4 Setting the ProDG Target Manager for PlayStation®3

This chapter describes how to configure the ProDG Target Manager for PlayStation®3, a useful tool for managing the Reference Tool. The procedure registers a target Reference Tool to ProDG Target Manager.

Installing ProDG Target Manager

ProDG Target Manager is included in the ProDG for PlayStation®3 package. When ProDG for PlayStation®3 is installed, ProDG Target Manager is also installed.


On DevNet, ProDG Target Manager is also available as an independent package. Select this install package if necessary. A license file is not required if only the Target Manager will be used.

For information regarding how to use ProDG Target Manager, refer to the document "User Guide to Target Manager for PlayStation®3". This document can be found on the Target Manager download page on DevNet (https://ps3.scedev.net/projects/target_manager).

(1) Start ProDG Target Manager

Execute `c:\Program Files\SN Systems\PS3\bin\PS3TM.exe` to launch ProDG Target Manager.

(2) Add a Target

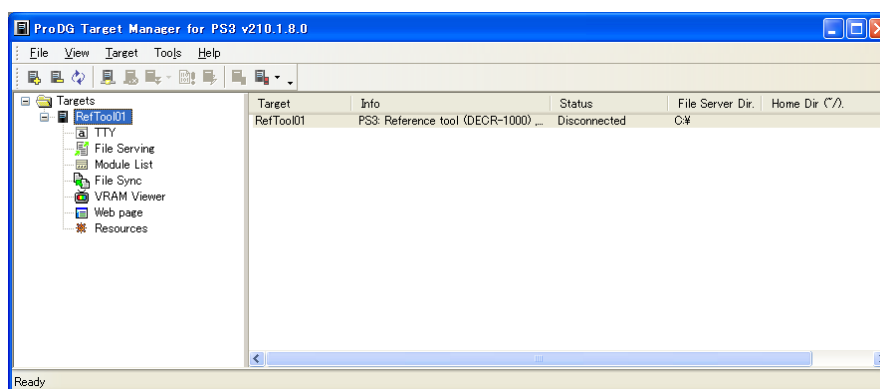
Click on "Add Target" (), and select the name of the target on ProDG Target Manager, and the target model "Reference tool (DECR-1000)". Any name can be given to the target on ProDG Target Manager; here it will be called "RefTool01".

Click "Next" to set the connection properties.

(3) Set the IP Address of the Target

In the default factory settings of the Reference Tool, the IP address is either set to 192.168.0.2 or automatically allocated with DHCP. If the IP address of the target is not known, switch off the main power switch on the back panel, and then wait a few seconds to switch it back on. The IP address will be displayed on the monitor connected to the Reference Tool.

Do not change the default port number (8530) and click "Next". Check if the settings are correct and click "Finish". This step completes the registration of the target.



(4) Connect to the Target

Switch on the main power switch on the back panel of the Reference Tool and check that the STATUS LED on the front panel has a green light.

In the ProDG Target Manager GUI, select the target "RefTool01" and click "Connect" () to establish a connection with the Reference Tool. If an error occurs at this point, check if the network cable of the Reference Tool is connected properly, and if the IP address is correct. It may also be necessary to check the Windows firewall settings.

5 Updating Flash Memory

The Cell OS kernel and the system software are stored in the flash memory on the Reference Tool target system. After installing an SDK, update the flash memory by following the procedure below.

Note

Note that updating the flash memory is different from updating the CP software.

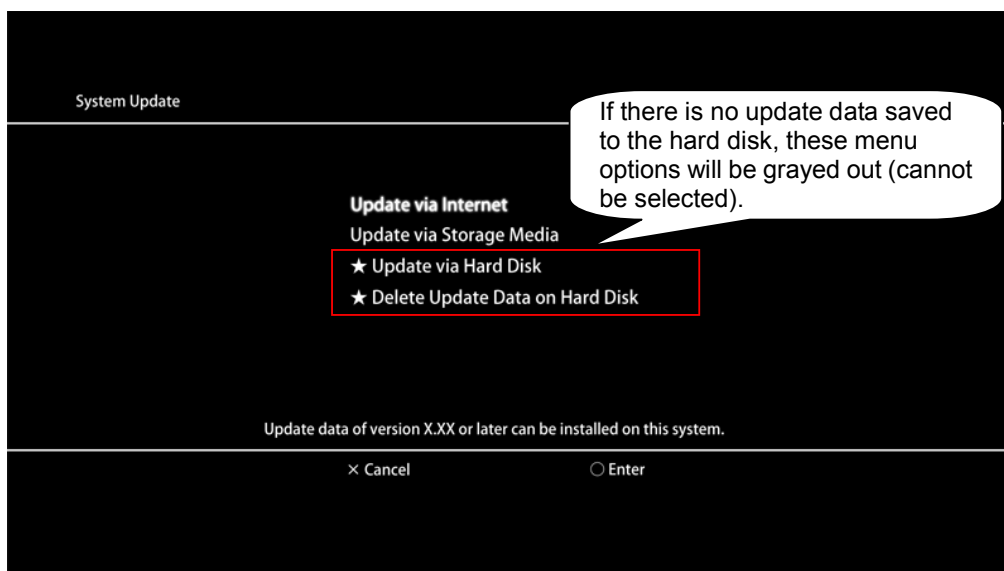
Updating from SDK Release 1.0.0

For a target system installed with SDK release 1.0.0 (or later), there are two ways to update the flash memory.

- Select "System Update" in the "Settings" column of the system software GUI menu
- Use ProDG Target Manager for PlayStation®3 over the network from the host computer (Multiple targets can be updated via the network.)

"System Update" in the "Settings" column of the system software GUI menu provides the following menu.

- Update via Internet
-> System update using the HTTP server
- Update via Storage Media
-> System update using storage media such as Memory Stick PRO™
-> System update using the host file server (/app_home)
- Update via Hard Disk
-> System update using the hard disk (SDK release 2.5.0 or later)
- Delete Update Data on Hard Disk
-> This allows the user to delete update data saved on the hard disk.



It is also possible, up to a certain point, to use the "System Update" function to downgrade. This means the flash memory can be set back to an earlier SDK release.

Note

In a few of the update procedures, the filename of the update data can be specified by the user. Only use ASCII code alphanumeric characters (a-z, A-Z, 0-9), periods, hyphens, and underscores in the filenames and directory names.

Note

It is not possible to update a version earlier than SDK release 1.0.0 directly to a version later than SDK release 1.0.0. Always update to SDK release 1.0.0 first. For more information, refer to the section "Updating to SDK Release 1.0.0".

Note

The flash memory of the Debugging Station can also be updated in this manner. Note that the update data differs from that of the Reference Tool.

System Update Using a Storage Media

The flash memory can be updated by storing the update data in a storage media such as, the Memory Stick PRO™, and connecting it to the target system. This method enables updates without using the network.

The update data is %SCE_PS3_ROOT%\target\updater\ref-tool\PS3UPDAT.PUP.NNN.0xx.NNN represents the version number digits and 0xx represents the build number digits.

Note

The update data for the Debugging Station is as follows.

%SCE_PS3_ROOT%\target\updater\debugging_station\PS3UPDAT.PUP.NNN.0xx.forDEX.release.yyyymmdd

NNN represents the version number digits, 0xx represents the build number digits, and yyyymmdd represents the release date.

The following storage media can be used.

- A Memory Stick PRO™ or a Memory Stick PRO Duo™, with a capacity of at least 256 MB
- An SD memory card or miniSD memory card, with a capacity of at least 256 MB
- A CompactFlash®, with a capacity of at least 256 MB
- A disc (update data must be placed in /PS3_UPDATE/PS3UPDAT.PUP in order to distinguish it from PS3_GameDisk)
- A USB mass storage device, with a capacity of at least 256 MB (which can be connected to any USB connector)

If multiple storage media are connected, the media are searched in the following order for update data. The system update will be attempted from the storage media where update data is found.

- (1) Memory Stick PRO™ or Memory Stick PRO Duo™
- (2) SD memory card or miniSD memory card
- (3) CompactFlash®
- (4) Disc
- (5) USB mass storage device (searched in order of USB connectors. The first USB mass storage device found is applicable.)
- (6) /app_home

To store update data to storage media, perform the following steps on the host computer:

- Make a directory named PS3 in the root directory of the storage medium, and then make a sub-directory UPDATE in it.
- Store the update data to the created /PS3/UPDATE/ directory in the medium.
- Remove the ".NNN.0xx" portion from the file name (to rename it to PS3UPDAT.PUP).

When using SDK release 2.5.0 or later, carry out the following when selecting update data from multiple update data. In addition to PS3UPDAT.PUP, the SEARCH directory can be searched for update data.

- Create /PS3/UPDATE/SEARCH on the storage media (except discs)
- Store update data (any filename) under /PS3/UPDATE/SEARCH

Note

It is possible to create directories under SEARCH, but the scope of the search is limited to two levels.

OK: PS3/UPDATE/SEARCH/ReferenceTool/250/PS3UPDAT.PUP.242.001

Cannot be searched: PS3/UPDATE/SEARCH/ReferenceTool/250/No3/PS3UPDAT.PUP.242.001

Set "System Software Mode" for the "Boot Mode" parameter, as described in "Setting Boot Parameters for Target System" in Chapter 3, and then press the POWER switch of the Reference Tool (or execute the [dtpon command](#)) to start up the target system in system software mode.

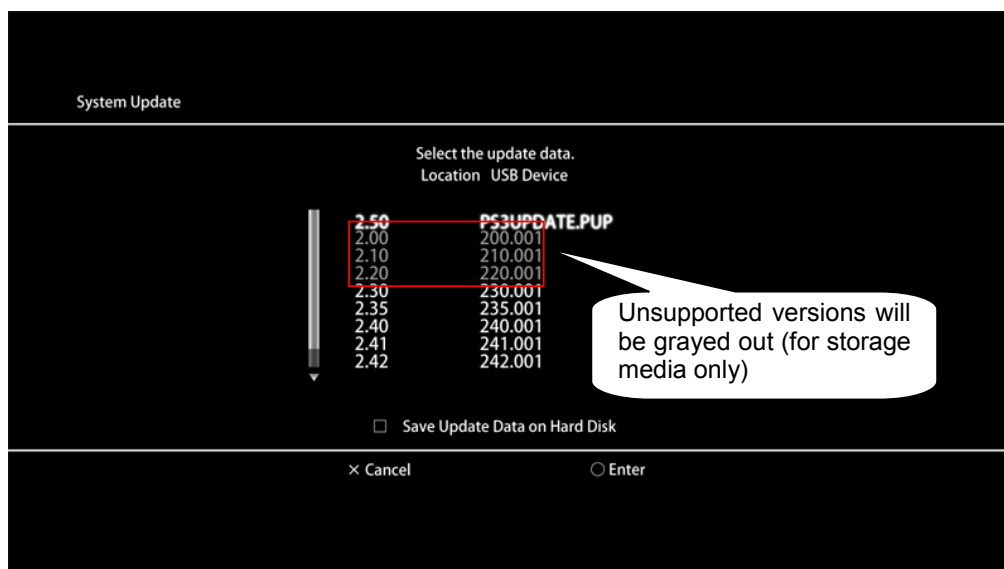
Insert the storage media with the update data, and then select "System Update" in the "Settings" column of the system software GUI menu. Select "Update via Storage Media" in the menu that appears.

If update data is found, the location and the update data are displayed. If for example a USB mass storage device is used, "USB Device" will be displayed for the location, and update data will be shown below it. If a SEARCH directory was created to save multiple update data to the storage media, a list of update data will be shown. If necessary, select the "Save Update Data on Hard Disk" checkbox and select the applicable update data. Then follow the onscreen instructions.

Note

Up to 20 items will be shown in the list of update data. Beyond this limit, any update data found will be ignored.

If there is a file in /PS3/UPDATE/PS3UPDAT.PUP, it will always be displayed first in the list. Other files (in the SEARCH directory) will be shown in the order the various file systems were searched.

**System Update Using the Hard Disk**

If SDK release 2.5.0 or later is used, up to 20 update data can be saved to the hard disk during system updates.

Once update data is saved to the hard disk, it can be specified for use in a system update. This can save on the time required for updates since it will not be necessary to copy the update data to the hard disk.

When no longer needed, update data can be deleted from the hard disk. This method is described later in this chapter.

Note

The version of update data saved to the hard disk is not checked. Note that it is possible to save multiple copies of the same version to the hard disk.


Starting the Update Program from ProDG Target Manager for PlayStation®3

The "Update target flash" feature in ProDG Target Manager can be used to update the flash memory of the Reference Tool. For information regarding configuring the ProDG Target Manager, refer to "4 Setting the ProDG Target Manager for PlayStation®3".

- (1) Launch ProDG Target Manager.

Execute `c:\Program Files\SN Systems\PS3\bin\PS3TM.exe` to launch ProDG Target Manager.


- (2) Connect to the target.

When the connection is established, the icon in front of the target name () will be highlighted in green.

If an error occurs at this point, check the network cable and IP address.


Multiple targets can be selected at once by selecting the top level of the tree.

- (3) Switch on the Reference Tool.

Click the "Switch Power On" button () in the ProDG Target Manager GUI. This is the same as pressing the POWER button on the front panel of the Reference Tool.

- (4) Reset the Reference Tool.

Click the "Reset" button () in the ProDG Target Manager GUI. This resets the Reference Tool.

- (5) Click the "Update target flash" button ()

Specify the file paths of `PS3ToolUpdater.self` and `PS3UPDAT.PUP`. The default paths are as follows:

- `c:\usr\local\cell\target\images\PS3ToolUpdater.self`
- `c:\usr\local\cell\target\updater\ref-tool\PS3UPDAT.PUP`

When multiple targets are selected, they will all be updated at the same time.

- (6) Click "OK".

The flash window will open, and the flash memory will be updated.

Note

The version of the host computer SDK must be the same as the version of the system software before the update.

System Update Using the Host File Server (/app_home)

To use the host file server, have the update data ready for access at `/app_home/PS3_UPDATE/PS3UPDAT.PUP`.

If the update data is located on the host computer at `c:\works\PS3_UPDATE\PS3UPDAT.PUP`, for example, connect to the target system as follows.

```
> cd c:\works
> dtcfilesrv [-d <host>[:port]]
```

Alternatively, it is possible to connect to the target system using ProDG Target Manager for PlayStation®3 and specifying `c:\works` for the file server directory.

When selecting update data from multiple update files, create the directory `/app_home/PS3_UPDATE/SEARCH` and store the update files (as when using storage media for updates).

After setting "Boot Mode" to "System Software Mode" as described in "Setting Boot Parameters for Target System" in Chapter 3, press the POWER switch of the Reference Tool (or use the [dtpon command](#)) to boot the target system in system software mode.

Select "System Update" in the "Settings" column of the system software GUI menu. Select "Update via Storage Media" in the menu that appears. If update data is found, the location ("APP_HOME") and the update data are displayed. If a `SEARCH` directory was created to save multiple update data to storage

media, a list of update data will be shown. If necessary, select the "Save Update Data on Hard Disk" checkbox and select the applicable update data. Then follow the onscreen instructions.

System Update Using an HTTP Server

The flash memory can also be updated by storing the update data on an HTTP server with a fixed IP address, and performing the update via the network. This method is useful when using numerous target systems, because the update data can be managed all together. However, SDK release 2.0.0 or later must be installed on the applicable target systems. To select the applicable data from multiple update files, it is necessary for SDK release 2.5.0 or later to be installed.

(1) Preparation: Store the Update Data on the HTTP Server

Create an arbitrary directory on the HTTP server and store the update data in this folder.

The update data is %SCE_PS3_ROOT%\target\updater\ref-tool\PS3UPDAT.PUP.NNN.0xx, where NNN represents the version number digits and 0xx represents the build number digits. The filename, including the extension, is arbitrary – it can be changed to a name that is easy to manage. However, make sure that the pathname, including the server URL, does not exceed 255 characters.

Note

The update data for the Debugging Station is as follows.

%SCE_PS3_ROOT%\target\updater\debugging_station\PS3UPDAT.PUP.NNN.0xx.forDEX.release.yyyymmdd

NNN represents the version number digits, 0xx represents the build number digits, and yyyymmdd represents the release date.

(2) Preparation: Create an Image List File

An image list file is a file in which the path of an update data that is stored on the HTTP server is written in a designated format. Refer to the "Image List File Format" section below and create the image list file. Store this file in an arbitrary directory on the HTTP server. It can be in the same directory as the update data, or in a different one. The filename, including the extension, is arbitrary. However, make sure that the pathname, including the server URL, does not exceed 255 characters.

(3) Preparation: Set the URL of the Image File List to the Target System

Start up the target system in the system software mode. Select "Debug Setting" from the "Settings" column of the system software GUI menu. Open the "Update Server URL". Enter the URL (including the image list file), and press the Enter button to save it.

(4) Execute the System Update

Select and launch the "System Update" from the "Settings" column of the system software GUI menu. Select "Update via Internet" for "Select an update method". A list of update data stored on the HTTP server will be displayed onscreen, and the selected update data will be installed. Follow the instructions shown on the screen from then on.

Note

Information of error codes can be found in the section "Error Codes for System Updates Using the HTTP Server" in Chapter 8.

Image List File Format

The format of the image list file is as follows. <CR><LF> is a line feed code, and does not have to be written.

```
# comment<CR><LF>
Dest=targetType;ImageVersion=FFFFFFFF;SystemSoftwareVersion=version;CDN=url;
CDN_Timeout=seconds;<CR><LF>
```

The image list file is a text file in which one update data is described per line. The length of one line can be up to 1024 characters (including the linefeed characters). Lines that exceed this length will be ignored. The maximum size of the file itself is 65,535 bytes. For the linefeed characters, use <CR><LF> or <LF>.

Each line is a series of "Key=Value;" format parameters. The semicolon ";" at the end of each line can be omitted.

Each line must contain one of every designated parameter. Lines with missing designated parameters or with overlapping designated parameters, and lines with parameters other than the designated parameters, will be ignored. The beginning of each line must have the Dest parameter. There is no restriction on the order of subsequent parameters.

Lines beginning with # will be ignored as comments.

Designated parameters are as follows.

Key=Value;	Description
Dest=targetType;	Specify whether the update data is for the Reference Tool or the Debugging Station. Write "Dest=81;" for the Reference Tool and "Dest=82;" for the Debugging Station. If there are multiple items of the same targetType in an image list file, the first 20 will be shown onscreen. These can be used in the system update. Update data beyond this limit will be ignored.
ImageVersion=FFFFFFFF;	Version number to be used internally. Specify as indicated.
SystemSoftwareVersion=version;	Version number to be listed onscreen when the update is executed on the target system. The format is one numeric character + period + four numeric characters, and it can be different from the update data version. If the third and fourth numbers after the period are 00, these will be omitted upon display, and only the first and second numeric characters will be shown onscreen.
CDN=url;	URL of the update data. Enter the full path beginning with "http://".
CDN_Timeout=seconds;	Time out time for the processing to open the update data in seconds

Example of Image List File (<CR><LF> is a line feed code, and does not have to be written)

```

Dest=81;ImageVersion=FFFFFFFF;SystemVersion=2.4000;CDN_Timeout=30;CDN=http:/
/192.168.0.20/images/PS3UPDAT.PUP.240.001<CR><LF>

Dest=81;ImageVersion=FFFFFFFF;SystemVersion=2.4100;CDN_Timeout=30;CDN=http:/
/192.168.0.20/images/PS3UPDAT.PUP.241.001<CR><LF>

Dest=81;ImageVersion=FFFFFFFF;SystemVersion=2.4200;CDN_Timeout=30;CDN=http:/
/192.168.0.20/images/PS3UPDAT.PUP.242.001<CR><LF>

Dest=82;ImageVersion=FFFFFFFF;SystemVersion=2.4100;CDN_Timeout=30;CDN=http:/
/192.168.0.20/images/PS3UPDAT.PUP.241.001.forDebuggingStation <CR><LF>

Dest=82;ImageVersion=FFFFFFFF;SystemVersion=2.4200;CDN_Timeout=30;CDN=http:/
/192.168.0.20/images/PS3UPDAT.PUP.242.001.forDebuggingStation<CR><LF>

```

In this example, there are five update data files. The first three files are for the Reference Tool (Dest=81) and are stored to the HTTP server (IP address: 192.168.0.20) in the `images` directory under the `DocumentRoot` directory. They are named `PS3UPDAT.PUP.***.***`.

The other two files are for the Debugging Station (Dest=82) and are also stored to the HTTP server (IP address: 192.168.0.20) in the `images` directory under the `DocumentRoot` directory. They are named `PS3UPDAT.PUP.***.***.forDebuggingStation`.

When this image list file is accessed, the following information will be shown onscreen during the update.

Reference Tool

SystemVersion	Filename written in CDN with "PS3UPDAT.PUP" removed
2.40	240.001
2.41	241.001
2.42	242.001



Debugging Station

SystemVersion	Filename written in CDN with "PS3UPDAT.PUP" removed
2.41	241.001.forDebuggingStation
2.42	242.001.forDebuggingStation

**Image List File Parsing Errors**

Errors that occur while parsing the image list can be output to storage media.

To obtain a log, create the directory `/PS3/UPDATE/LOG` on the storage media. (For `/app_home`, the correct directory is `/PS3_UPDATE/LOG`.) The order in which the various storage media are searched is the same as when searching for update data. The log `NET_ERR_LOG.txt` will be output to the first `/PS3/UPDATE/LOG` directory found. If a file of the same name exists, it will be overwritten. If there are no errors in the image list file, there will be no log file. Network errors will be shown onscreen instead of being output to a file.

The following image list parsing errors are possible.

Error (xxxx is the line number)	Description
line xxxx parse error: Mandatory "Key" is not found.	Required Key does not exist.
line xxxx parse error: "Value" of "ImageVersion" is illegal.	Invalid value specified to ImageVersion
line xxxx parse error: Unknown "Key" is find.	Unknown Key was found.
line xxxx parse error: Illegal parameter.	Invalid value is specified or the same parameter is specified multiple times.

Downgrading the Flash Memory

If SDK release 2.0.0 or later is installed on the target system, the flash memory can be downgraded to an earlier version of the SDK release using the "System Update" function.

However, direct downgrade is only possible to an SDK with a release number that is within a 0.2 decrement of the currently installed SDK. For example, if the SDK release 2.0.0 is currently installed, it is possible to downgrade to the SDK release 1.8.0 or SDK release 1.8.1; however, a downgrade to SDK release 1.7.0 is not possible (if required, install the SDK release 1.0.0 first, and then upgrade to SDK release 1.7.0). Downgrades may not always be possible with the update data included in a release. Update data that allows downgrades can be downloaded from DevNet.

Note that downgrading entails some of the system settings to be reset. Settings for the following items are not affected (these are items that can be set with the system software of the SDK release 1.0.0). All other items will be initialized – set them as necessary after the downgrade.

- System settings – System language, Character set, NP Environment, Game Output Resolution, HDCP, and Region Settings
- Date and time settings
- Display settings
- Sound settings
- Network settings

Deleting Update Data Saved to the Hard Disk

During updates, update data can be saved to the internal hard disk drive of the target system (the hard disk drive for the application).

To delete this data, go to "System Update" in the "Settings" column of the system software GUI menu. Note that this is the only way available to delete update data saved to the hard disk.

Select "Delete Update Data on Hard Disk", select the update data to delete, and select the OK button.



Updating to SDK Release 1.0.0

To set up a Reference Tool that has a version earlier than SDK release 0.9.6 installed, first install SDK 1.0.0. (For current target systems, this installation is not usually necessary.)

Preparation

First, configure the network settings of the Communication Processor (as described in the section "Configuring Network for Communication Processor" in Chapter 3) and make sure that communication with the development host computer is enabled via the debugging network.

Set "Debugger Mode" for the "Boot Mode" parameter (refer to the section "Setting Boot Parameters for Target System" in Chapter 3). Also, set `lcns1=on` (if set to `lcns1=off`) with the [dtcparam command](#).

Updating the Flash Memory of the Target System

- (1) Power off the target system (if it is on) by pressing the POWER switch. (Refer to the instruction manual for the Reference Tool.)
- (2) Move to the directory (usually `%SCE_PS3_ROOT%\target\bootrom`) with the flash memory image file `ebootrom.100.0xx` and check that the image file exists. `0xx` is the build number and depends on the SDK release.

After checking that the image file is in the current directory, start up the logical console server (`lcns1srv`) with the following command.

```
> cd %SCE_PS3_ROOT%\target\bootrom\  
> lcns1srv -at -ip xx.xx.xx.xx -rom ebootrom.100.0xx
```

To `xx.xx.xx.xx`, specify the IP address of the Reference Tool set for the debugging Ethernet. Specify the image file with a relative path, as shown.

- (3) Press the POWER switch and switch on the target system.
The target system will boot, and multiple terminal windows will open on the host PC. Start the flash memory update software, load the image file on the host PC via the debugging network, and write to the flash memory.
- (4) When the update completes, the message "System update: SUCCESS" will be displayed in the window with the title "lcterm lpid:1 lcld:10", and the target system will power off automatically.
- (5) Set `dtcparam lcns1=auto`.

This completes the flash memory update.

The new flash memory image will be used from the next time the target system is booted.

6 Compiling and Running Sample Programs

The procedure for building sample programs and running them on the Reference Tool target system is described below. The procedure is common to all Reference Tool models unless otherwise specified. If the sample programs run properly, this means that the development environment is set up correctly.

First, check that "Debugger Mode" is set for "Boot Mode" and "DEV LAN" is set for "HOSTFS Network" in [the target system boot parameters](#).

Also, make sure that "Release Check Mode" in the system software GUI menu ("Settings" -> "Debug Settings" -> "Release Check Mode") is set to "Development Mode". The explanations in this chapter will assume these settings.

Building Sample Programs

The procedure for building and executing %SCE_PS3_ROOT%\samples\sdk\lv2\event_flag will first be described. This sample uses PPU-to-PPU and PPU-to-SPU event flags.

Launch Visual Studio and open %SCE_PS3_ROOT%\samples\sdk\lv2\lv2.sln.

Note

With Visual Studio 2008, the conversion wizard will launch. Convert the project file for Visual Studio 2008.

Select the project event_flag and set it as the startup project.

If Visual Studio Integration is installed, executing "Build" --> "Build event_flag" will build the sample program. If the build finishes successfully, the following will be created: %SCE_PS3_ROOT%\samples\sdk\lv2\event_flag\event_flag.ppu.self.

Running Programs from ProDG Target Manager for PlayStation®3

Sample programs thus built can be executed with ProDG Target Manager.

- (1) Launch ProDG Target Manager.
Execute %SN_PS3_PATH%\bin\PS3TM.exe to launch ProDG Target Manager.
- (2) Connect to the target. Refer to "4 Setting the ProDG Target Manager for PlayStation®3" for details.
- (3) Execute the lv2 sample program.

Click the "Load & Run executable" button () . A dialog for selecting the module will appear. Select %SCE_PS3_ROOT%\samples\sdk\lv2\event_flag\event_flag.ppu.self and click "Open".

If this is successful, the following message will appear on the "ALL" tab of the TTY.

```
/app_home/c:\usr\local\cell\samples\sdk\lv2\event_flag\event_flag.ppu.s
elf is starting.
Master is starting.
Worker[0] is starting.
Worker[1] is starting.
Worker[2] is starting.
Worker[3] is starting.
Worker[4] is starting.
Worker[0] is exiting.
Worker[1] is exiting.
Worker[2] is exiting.
Worker[3] is exiting.
Worker[4] is exiting.
SPU Worker finished my job
Master is exiting.
```

```
/app_home/c:\usr\local\cell\samples\sdk\lv2\event_flag\event_flag.ppu.s
elf is exiting.
```

Building and Running Graphics Samples

This section describes the procedure for building and running graphics sample programs.

(1) Set the Resolution

Before running a graphics program on the Reference Tool target system for the first time, it is necessary to configure and save resolution settings. This procedure can be executed from the system software GUI menu or in the monitor settings utility program `setmonitor.self`.

When using the GUI menu, set the two items "Display Settings" -> "Video Output Settings" and "Debug Settings" -> "Game Output Resolution" as appropriate for the monitor connected to the Reference Tool.

To use `setmonitor.self`, launch ProDG Target Manager for PlayStation®3, check that the IP address of the Reference Tool is set as the target, and

```
execute %SCE_PS3_ROOT%\target\images\setmonitor.self.
```

Open the PPU tab properties, and select the check box next to "Echo TTY input to screen" in "General".

Follow the menu displayed in the PPU tab of the TTY and set the rendering resolution and monitor mode.

Note

When the monitor mode is set, it is possible for undefined signals to be output from the output connectors unused in that mode. Make sure to use only the output connectors defined for the mode.

Reset the Resolution Settings

If the target system is booted by pressing the POWER switch on the front panel of the Reference Tool for 5 seconds or more, the resolution settings will be reset, following a short beep and a brief blink of the POWER LED. When the resolution is reset, video is output to all the output connectors: HDMI output connector, AV MULTI OUT connector (component, D terminal, composite), and monitor output (D-Sub) connector.

(2) Build a Sample

Below, the `1_BasicCg` sample in `%SCE_PS3_ROOT%\samples\sdk\graphics\psgl\PSGL_samples` will be used as an example.

Open `%SCE_PS3_ROOT%\samples\sdk\graphics\psgl\PSGL_samples.sln`, specify `1_BasicCg` as the startup project, and build the project.

All the projects in the solution will be built.

The executable file of the `1_BasicCg` sample will be created with the

```
name %SCE_PS3_ROOT%\samples\sdk\graphics\psgl\Tutorial\1_BasicCg\PS3_PPU_Debug
\1_BasicCg.ppu.self.
```


(3) Run the Sample

- (1) Launch ProDG Target Manager for PlayStation®3.

Execute `%SN_PS3_PATH%\bin\PS3TM.exe` to launch ProDG Target Manager.

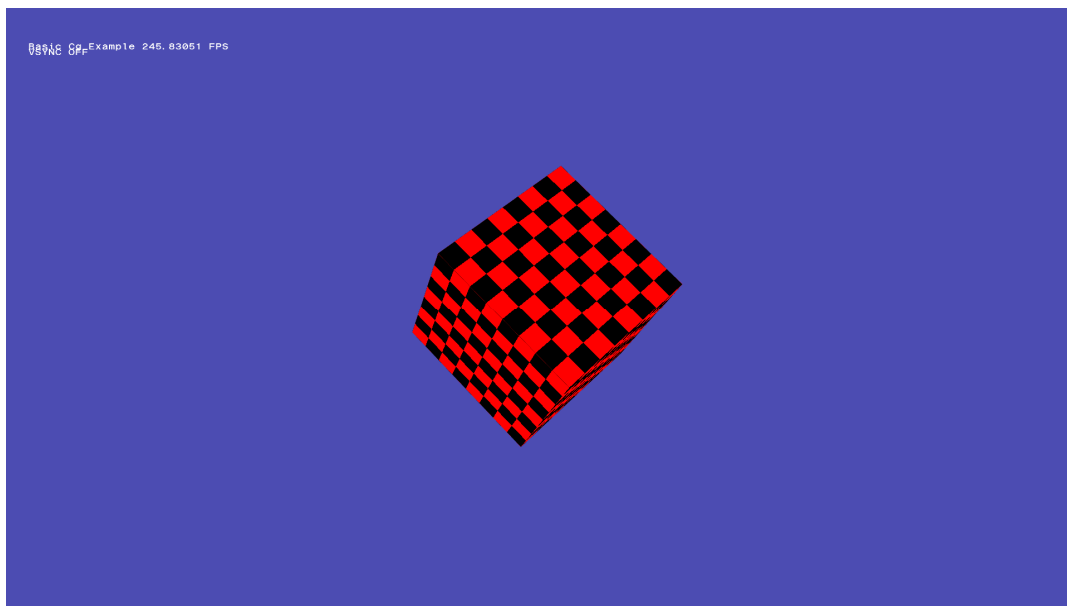
- (2) Connect to the target

In the ProDG Target Manager GUI, select the target "RefTool01". (If it is not created, refer to

"4 Setting the ProDG Target Manager for PlayStation®3" to create it.) Click **Connect** button () to establish a connection with the Reference Tool. If an error occurs, check to make sure that the network cable of the Reference Tool is properly connected, and that the IP address is correct.

- (3) In Visual Studio Integration, click the tool chip "Execute ELF file" ().
When executed properly, the following will appear on the monitor connected to the Reference Tool.

Figure 2 Output of the 1_BasicCg Sample



7 Remote Control of the Target System

The following commands can be executed from the Windows command prompt on the development host computer to show/configure the boot parameters of the Reference Tool target system, switch its power on and off, and execute other controls.

Command	Function
dtcparam	Display/set target boot parameters
dtpon	Power on the target system
dtppoff	Power off the target system
dtppreset	Reset the target system
dtppstat	Get the power status of the target system
dtlreset	Restart the Cell OS Lv-2 of the target system
dtndlist	Display the connection status between the target and the host
dtndkill	Kill the connection between the target and the host
dtndcons	Display the status of the target communication manager on CP (dtndtm) and display the log
dtcfutil	Operate the BD emulator

Common Command Options

-d Option	Host Name	Port Number
-d <hostname>	<hostname>	8530
-d <hostname>[:<port>]	<hostname>	<port>

When the -d option is not specified, the values specified with the environment variable DTNETM will be used.

dtcparam

dtcparam is a command for displaying / setting boot parameters of the target system.

This program allows command-based operation equivalent to the "Boot Parameter" menu's displaying/setting. (See "Setting Boot Parameters for Target System" in Chapter 3.) It also allows displaying / setting of other auxiliary parameters.

Execution Method

```
> dtcparam [-d <hostname>[:<port>]] [boot parameter settings] [aux parameter settings]
```

The format of the *boot parameter settings* is as follows:

```
[boot={dbg|sys}] [memsize={tool|console}] [bd={emu|drive}]
[hddspeed={native|emulated}] [hostfs={dev|target}]
[targetmodel={ps3-hdd60|ps3-hdd20}]
[bdemuhdd={dev|usb}]
```

The format of the *aux parameter settings* is as follows:

```
[lcns1={auto|off|on}] [showip={auto|off}] [relchk={dev|rel}]
```

Without *boot parameter settings* or *aux parameter settings*, this command displays the current values of the boot parameters and auxiliary parameters.

With *boot parameter settings* or *aux parameter settings*, it sets the specified items of the parameters. Unspecified parameter items retain their values. The settings of the parameters will take effect from the next bootup.

Options

The common option `-d` is available.

Boot Parameters	
<code>boot=dbg</code>	Sets "Debugger Mode" for "Boot Mode" parameter.
<code>boot=sys</code>	Sets "System Software Mode" for "Boot Mode" parameter.
<code>boot=rel</code>	Sets "Release Mode" for "Boot Mode" parameter. (This is handled as <code>boot=sys</code> on the Reference Tool.)
<code>memsize=tool</code>	Sets "Tool Mode" for "User Process Memory Size" parameter. (Supported only on the Reference Tool.)
<code>memsize=console</code>	Sets "Console Mode" for "User Process Memory Size" parameter. (Supported only on the Reference Tool.)
<code>Bd=emu</code>	Sets "BD Emulator (DEV)" for "Blu-ray Disc Access" parameter.
<code>Bd=drive</code>	Sets "BD Drive" for "Blu-ray Disc Access" parameter.
<code>hddspeed=native</code>	Sets "HDD Native" for "Transfer Rate pacing for BD Emulator" parameter
<code>hddspeed=emulated</code>	Sets "Equiv. to BD Drive" for "Transfer Rate pacing for BD Emulator" parameter
<code>hostfs=dev</code>	Sets "DEV LAN" for "HOSTFS Network" parameter
<code>hostfs=target</code>	Sets "LAN" for "HOSTFS Network" parameter
<code>targetmodel=ps3-hdd60</code>	Sets "PS3 HDD 60GB Model" for "Target Model" parameter. (Supported only on the Reference Tool.)
<code>targetmodel=ps3-hdd20</code>	Sets "PS3 HDD 20GB Model" for "Target Model" parameter. (Supported only on the Reference Tool.)
<code>bdemuhdd=dev</code>	Uses the internal HDD as the HDD for the BD emulator. (Supported only on the Reference Tool.)
<code>bdemuhdd=usb</code>	Uses the USB mass storage as the HDD for the BD emulator. (Supported only on the Reference Tool.)
Auxiliary Parameters	
<code>lcns1=auto</code>	Auto-detection at target system startup (default) Connects the logical console only when the logical console server is running at startup of the target system. (Supported only on the Reference Tool.)
<code>lcns1=off</code>	No logical console connection Keeps the logical console disconnected even when the logical console server is operating. Turning the main power switch off resets the setting to the default. (Supported only on the Reference Tool.)
<code>lcns1=on</code>	Connect logical console Connects the logical console at startup of the target system. If the logical console server is not running at startup, the startup procedure will not complete until a connection becomes available. Turning the main power switch off resets the setting to the default. (Supported only on the Reference Tool.)

Auxiliary Parameters	
showip=auto	Use IP address displaying mode (default, supported only on the Reference Tool) Enters IP Address Displaying mode at such times when the target system is started for the first time after the main power is turned on or after changing IP address setting. (Due to changes in the IP address display mode in system software 2.60, this setting no longer needs to be configured.)
showip=off	Suppress IP address displaying mode (Supported only on the Reference Tool) Disables IP address displaying mode. To disable the mode, set this value with the dtcparam command after the main power is supplied and then start the target system. Turning the main power switch off resets the setting to the default. (Due to changes in the IP address display mode in system software 2.60, this setting no longer needs to be configured.)
relchk=dev	Sets "Development Mode" to "Release Check Mode".
relchk=rel	Sets "Release Mode" to "Release Check Mode".

dtpon

dtpon is a command for turning on the power of the target system.

Execution Method

```
> dtpon [-d <hostname>[:<port>]] [-q] [boot parameter settings]
```

Options

The common option -d is available.

The -q option specifies an early completion of the command without waiting for the system-bootup acknowledgement issued by the target Reference Tool.

This command also allows you to set boot parameters using the same format as the dtcparam command. The settings take effect immediately.

dtppoff

dtppoff is a command for turning off the power of the target system.

This program, by default, initiates the software shutdown procedure, and turns off the power of the target system after waiting for the procedure to complete.

Execution Method

```
> dtppoff [-d <hostname>[:<port>]] [-f] [-q]
```

Options

The common option -d is available.

The -f option omits the software shutdown procedure, turning off the power of the target system immediately and forcibly.

The -q option specifies an early completion of the command without waiting for the system-shutdown acknowledgement issued by the target Reference Tool.

dtppreset

dtppreset is a command for resetting the target system.
It is equivalent in effect to a successive execution of dtppoff and dtpon.

Execution Method

```
> dtppreset [-d <hostname>[:<port>]] [-f] [-q] [boot parameter settings]
```

Options

The common option -d is available.

The -f option omits the software shutdown procedure, resetting the target system immediately and forcibly.

The -q option specifies an early completion of the command without waiting for the system-bootup acknowledgement issued by the target Reference Tool.

This command also allows you to set boot parameters using the same format as the dtcparam command. The settings take effect immediately.

Note

Operations equivalent to the dtpon, dtppoff, and dtppreset commands can be executed from the screen that appears by clicking "Target" in the CP Administration Tool menu.

dtppstat

dtppstat is a command for inquiring and displaying the power status of the target system.
It displays either "power off" or "power on".

Execution Method

```
> dtppstat [-d <hostname>[:<port>]]
```

Option

Only the common option -d is available.

dtlreset

dtlreset is a command for rebooting only Cell OS Lv-2.

Execution Method

```
> dtlreset [-d <hostname>[:<port>]] [-f] [-q] [boot parameter settings]
```

Options

The common option -d is available.

The -f option omits the software shutdown procedure, rebooting immediately and forcibly.

The -q option specifies early completion of the command without waiting for the system-bootup acknowledgement issued by the target Reference Tool.

This command also allows you to set boot parameters using the same format as the dtcparam command. The settings take effect immediately.

dtnlist

dtnlist is a command for displaying the status of the connection between the target and the host.

Execution Method

```
> dtnlist [-d <hostname>[:<port>]]
```

Options

The common option -d is available.

dtnkill

dtnkill is a command for dropping the connection between the target and the host.

Execution Method

```
> dtnkill [-d <hostname>[:<port>]] {protocol name | protocol number[:protocol  
port number]}...
```

Options

The common option -d is available.

For protocol names and protocol numbers, refer to DECI3 documents.

dtncons

dtncons is a console program for controlling the target communication manager (dtnetm) on the CP. It can display the current status and output operation logs.

Execution Method

```
> dtncons [-d <hostname>[:<port>]]
```

Options

The common option -d is available.

dtcfsutil

dtcfsutil is a host program for performing operations related to the BD Emulator. It transfers data to be used to the HDD for the BD Emulator, emulates media insertion and ejection, and clears contents of the HDD for the BD Emulator.

For instructions on using this program, refer to the "BD Emulator" section in the "Reference System Supplement" document.

Execution Method

```
> dtcfsutil [-d <hostname>[:<port>]] cp source /dev_bdemu/{0|1|2|3}  
> dtcfsutil [-d <hostname>[:<port>]] eject /dev_bdemu  
> dtcfsutil [-d <hostname>[:<port>]] insert /dev_bdemu  
> dtcfsutil [-d <hostname>[:<port>]] format [-q] /dev_bdemu
```

Options

The common option -d is available.

The -q option specifies "quick format" to erase the TOC information only.

Notes

- For *source*, specify the file on the host file server with the path as seen from the target system.
- It takes a long time to perform a complete erase of the HDD.
- When using an MSYS terminal, keep in mind that paths can be automatically converted to unintended path names. Refer to "Use of Absolute Paths (When Using MSYS)" in the Restrictions section of Chapter 8.

Logical Console Server

The logical console mechanism is a host-target communication method that has been used since early SDK versions.

A logical console is a virtual bidirectional channel that connects between the development host computer and a logical partition running on Cell OS Lv-1 (e.g. Cell OS Lv-2's logical partition). The logical console server is a server program that operates on the development host computer. In cooperation with the Cell OS Lv-1 running on the Reference Tool target system, the logical console server provides mechanisms to construct multiple logical consoles on the physical console (physical channel) between the Reference Tool and the development host computer.

The logical console server monitors a specific port, waiting for a connection request from a program such as a terminal program (hereafter referred to as client). When the server receives a connection request, it first obtains information to identify the logical console to be constructed from the client, and then constructs the logical console according to the information. A logical console is identified by the combination of the logical partition ID and the logical console ID.

Once a logical console is constructed, the logical console server handles sending and receiving of data between the client and the physical console. When receiving data from the client, the logical console server assembles the data into packets with header and then transmits them to the physical console (multiplex). Conversely, when receiving packets from the physical console, it analyzes the destination information in the header and then transmits the data part to the client (demultiplex). The same mechanism is also provided by Cell OS Lv-1, thus allowing the client to transmit/receive data to/from Cell OS Lv-2 via the logical console.

Operating Procedure

First, you start up the logical console server, and then you start up clients. As an example of starting up a client, the following is the procedure to start up the `lcterm` program, which is provided with `lcnslsrv`.

- (1) Start up the logical console server. Specify the IP address of the Reference Tool as an argument.

```
> lcnslsrv -ip xx.xx.xx.xx
```

- (2) Then, open another terminal window and start up `lcterm`.

```
> lcterm /lpid=logical_partition_id /lcid=logical_console_id
```

Specify the logical partition ID with `-lpid` and the logical console ID with `-lcid`. When you type characters in the `lcterm` window, they are transmitted to the corresponding logical console on the Cell OS Lv-1 side and data transmitted from the logical console is output on the `lcterm` window.

- (3) Using different sets of logical partition IDs and logical console IDs, multiple `lcterm` sessions can be active concurrently on multiple terminal windows.
- (4) With the `-at` option in effect, when data is transmitted from a logical console of the Cell OS Lv-1 side during the time no corresponding `lcterm` session is active, the logical console server will automatically open a new terminal window and activate a `lcterm` session on it.

```
> lcnslsrv -at -ip xx.xx.xx.xx
```

In this implementation, logical partition IDs and logical console IDs are assigned as follows:

- `lpid=1, lcid=2` system use (Cell OS Lv-1 internal)
- `lpid=1, lcid=10` system use (Cell OS Lv-1 services)
- `lpid=2, lcid=1` for application (Cell OS Lv-2)

Once the logical console server is started up, it can continue to run without rebooting even after a reboot of the Reference Tool target system. When the Reference Tool target system is rebooted, the logical console server automatically reestablishes the connection with Cell OS Lv-1.

Running Multiple Logical Console Servers on Single Host Computer

It is possible to run multiple logical console servers on a single host computer to control multiple Reference Tools. However, using them with the default setting causes an error because by default the same communication port number (default: 8520) is given to all sets of the logical console server and the clients (`lcterm` terminals). To avoid such a conflict, the `-p` option must be specified for the second and subsequent logical console servers to define a port number that is unique to their respective communication channel. Note that the setting of a channel-specific port number is required also for each client.

(Note) However, when the `.lcnslsrv.ini` configuration file described later is used, one user can use only one logical console server.

Option Lists

Option	Argument	Description
<code>-at</code>	None	When data is received from a logical console, automatically activates a <code>lcterm</code> terminal.
<code>-ip</code>	IP address or host name	Specifies the IP address or host name of the target Reference Tool.
<code>-f</code>	Configuration file name	Reads option settings from the specified configuration file.
<code>-hd</code>	Directory name	Specifies the home directory for file transfers. The default is the current directory.
<code>-p</code>	Port number (decimal)	Specifies a TCP port number to be monitored for a connection request from a client. (Default: 8520) Connecting a <code>lcterm</code> terminal with the port specified in this way (i.e. without specifying associated logical partition ID and logical console ID) requires specifying the <code>-lpid</code> and <code>-lcid</code> options in <code>lcterm</code> .
	Port number: Logical partition ID: Logical console ID: (all decimal)	Specifies a TCP port number to be monitored for a connection request from a client and a pair of logical partition ID and logical console ID associated with the logical console to be created. These arguments are delimited with colons. When a client connects this type of port, the logical console server specifies these logical partition ID and logical console ID given as the arguments. Connecting a <code>lcterm</code> terminal with this type of port requires using the <code>-s</code> option in <code>lcterm</code> .
<code>-rom</code>	File name	When updating flash memory, specifies its image file.
<code>-guard</code>	None	Ignores shutdown requests from other <code>lcnslsrv</code> .
<code>-dl</code>	An alphabetical character	Specifies the drive letter. The default is C.
<code>-h/-help</code>	None	Displays the usage.

Configuration File

Option setting for the logical console server can be specified in a file. The logical console server reads the `lcnslsrv.ini` file in the directory indicated by the `HOMEDRIVE` and the `HOMEPATH` environmental variables at startup.

Using the `-f` option allows explicit specification of a configuration file.

Each line in the configuration file should be either an attribute represented in the "option_item_name=value" format or a comment that starts with a "#".

Item	Value	Description
AutoTerminalOpen	on	Equivalent to the use of the <code>-at</code> option.
	Otherwise	This line will be ignored.
AutoTerminalOpenByScreen	on	Available only for Linux. (Equivalent to the use of the <code>-screen</code> option.)
	Otherwise	This line will be ignored.
DeviceFile	Device file name	Equivalent to the use of the <code>-d</code> option. Currently unused.
IPAddress	IP address or host name	Equivalent to the use of the <code>-ip</code> option.
HomeDirectory	Directory name	Equivalent to the use of the <code>-hd</code> option.
Port	Port number (decimal)	Equivalent to the use of the <code>-p</code> option with only a port number specified.
	Port number: Logical partition ID: Logical console ID: (all decimal)	Equivalent to the use of the <code>-p</code> option with a set of logical partition ID and logical console ID specified besides a port number.

Configuration File Example

```
AutoTerminalOpen=on
#AutoTerminalOpenByScreen=on

IPAddress=123.45.67.89

#Port=8520
#Port=8521:2:20
#Port=8522:3:20
```

8 Troubleshooting

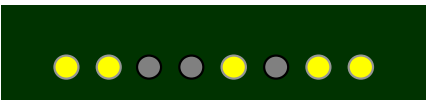
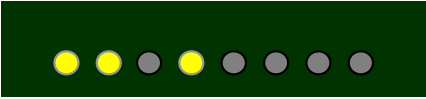
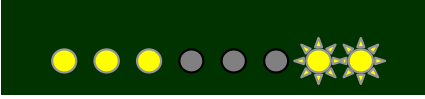
I cannot find any PDF file for the instruction manual of the Reference Tool.

The PDF files of the Reference Tool instruction manuals are included and released in the SDK package. Refer to the files available in the following locations.

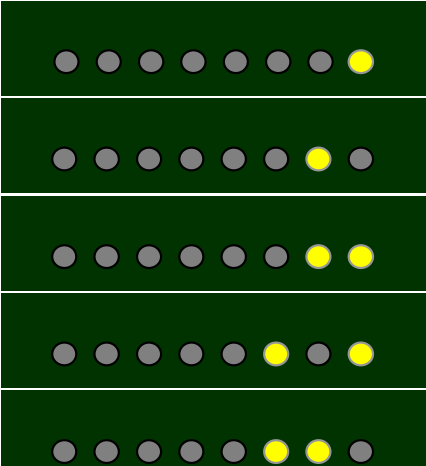
- DECR-1000A:
%SCE_PS3_ROOT%\SDK_doc\en\pdf\development_basic\Reference_Tool-Instruction_Manual_D
ECR-1000A_e.pdf.
- DECR-1400A:
%SCE_PS3_ROOT%\SDK_doc\en\pdf\development_basic\Reference_Tool-Instruction_Manual_D
ECR-1400A_e.pdf.


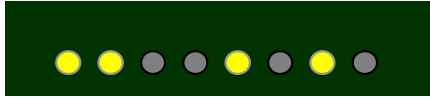
The Reference Tool hangs during the boot sequence.

Take the necessary steps described according to the "GPO" LEDs on the front panel. (Refer to the instruction manual for the Reference Tool.)

	<p>The system is in a mode to connect with logical consoles and waiting for connection with the logical console server.</p> <p>To use a logical console, start up the logical console server appropriately.</p> <p>If you do not want to use logical consoles, change the setting of the <code>lcns1</code> parameter using the dtcparam command.</p>
	<p>See later sections, "Communication with the development host computer cannot be established." and "Debugger cannot be connected."</p>
	<p>Updating of flash memory may have terminated abnormally. Retry the updating.</p>

If the LEDs are in one of the following conditions, hardware failure may be the cause. Confirm and record the condition of the LED status and contact our person in charge of the Reference Tools.

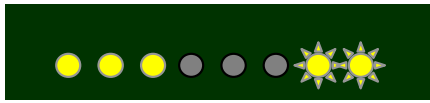
	<p>Abnormality has been detected during the DRAM initialization process.</p>
---	--

	Abnormality on the DRAM interface has been detected.
	Abnormality on the internal interface board has been detected.

The system hanged when updating flash memory.

Check the indication of the "GPO" LEDs on the front panel (Refer to the instruction manual for the Reference Tool).

When the "GPO" LEDs are in the following condition, retry the updating procedure. If it hangs up again, hardware failure may be the cause. Confirm and record the condition of the LED indication and contact our person in charge of the Reference Tools.

	Abnormality has been detected when accessing flash memory.
---	--

When the logical console server is used to update flash memory, it is possible for the following error message to be displayed and then for the update to end in abnormal termination.

"System update: Invalid image file"

The file specified by the `-rom` option of `lcnslsrv` cannot be accessed.

Confirm the name, presence, and the access permission of the flash memory image file.

Delete or rename the `.lcnslsrv.ini` file, if any, in the home directory.

"System update: Invalid image file format"

The flash memory image file does not match the Reference Tool.

The file used may be for other models.

The "STATUS" LED on the front panel is blinking fast in red.

It means that an abnormality (e.g. power failure, abnormal temperature, hardware abnormality) is detected. In many cases, pressing the RESET switch (Refer to the instruction manual for the Reference Tool.) on the front panel restores the system. If this action does not work, turn off the main power switch on the back panel. (Refer to the instruction manual for the Reference Tool.)

Communication with the development host computer cannot be established.

Check that the communication channel to the Communication Processor (CP) is working properly. (Refer to the troubleshooting section in the instruction manual for the Reference Tool.) The channel is normal if the CP Administration Tool menu can be accessed with a web browser.

If the CP Administration Tool menu cannot be accessed, check if the IP address is correct using the `ping` command.

If the CP Administration Tool menu can be accessed but communication is not possible, try using ProDG Target Manager for PlayStation®3 to connect to the target. Sometimes the problem may become clear; for example, another user can already be connected to the target.

Debugger cannot be connected.

- Check the [CP Administration Tool boot parameters](#). "Boot Mode" must be set to "Debugger Mode" and "HOSTFS Network" must be set to "DEV LAN". If "Boot Mode" is set to "System Software Mode", or "HOSTFS Network" is set to "LAN", the debugger cannot be connected.
- Try using ProDG Target Manager for PlayStation®3 for connections and resets.
- Check that the command program on the host is of the latest SDK version. Older versions can sometimes hinder normal communication.
- Check that the version of the Communication Processor and the SDK version match. If the versions do not match, this can prevent normal communication and normal operation of the commands on the host computer.

View and Configure the Communication Processor Version

Refer to the Reference Tool instruction manual for information regarding updating the Communication Processor version and restoring default settings.

View and Configure Debugging Network Settings

Switch off the power using the main power switch on the back panel of the Reference Tool, wait for the POWER LED to turn completely dark, and then start the target system again with the main power switch. The IP address and other settings will be displayed to the monitor connected to the Reference Tool, and the following string will be returned to TTY.

```
IP address displaying mode
```

This information will also be displayed if "Boot Mode" in the [CP Administration Tool boot parameters](#) is set to "Debugger Mode" and the power is switched on, or if a hard reset is executed.

Refer to the Reference Tool instruction manual for information regarding how to change debugging network settings and restoring default settings.

After this information is displayed, the operation is the same as normal Debugger Mode, and programs can be executed. (Previously it was necessary to execute a reset, but this reset is no longer necessary starting with system software 2.6.0.)

The IP address is not displayed with soft resets and quick resets.

Switch the Boot Mode without Connecting the Host Computer

With the main power on, but the target system power off (the POWER LED has a red light), press the RESET switch to change the Boot Mode settings in the [CP Administration Tool boot parameters](#). The number of beeps will indicate the new mode.

- System software mode: One beep
- Debugger mode: Two beeps

Power Does Not Shut Off with the POWER Switch on the Front Panel

When the POWER switch is pressed, the software will start shutting down the system. The shutdown will take some time, during which the POWER LED will blink in a green light.

If the powering off does not complete even after some time has passed, it is possible that the system hanged with a problem with the OS, for example. In such cases, try one of the following:

- Execute the [dtpoff command](#) with the `-f` option on the host computer
- Connect with ProDG Target Manager for PlayStation®3, and try a reset, or click the Power Off button
- Hold down the POWER switch (10-20 seconds)
- Press the RESET switch and reboot

Graphics sample programs do not operate normally.

It is most likely that settings necessary for graphics programs are not completed correctly. Confirm the correct settings described in "Building and Running Graphics Samples" in Chapter 6

When I attempt to run a sample program, the debugger cannot load the file and an error occurs.

If an error indicates that the file does not exist even when the specified filename is correct, check "Release Check Mode" in the [CP Administration Tool boot parameters](#). Unless it is set to the default value of "Debugger Mode", programs on the host PC cannot be executed. Also, check that the value of the HOSTFS Network is appropriate.

System Software Does Not Start

If the system software does not boot properly in system software mode, try booting in safe mode for the menu items "Restore File System" or "Rebuild Database". For more information, refer to Chapter 9: "Using Safe Mode for System Recovery".

Error Codes for System Updates Using the HTTP Server

When the HTTP server is used for system updates (as described in "System Update Using an HTTP Server" of "5 Updating Flash Memory"), the possible error codes are as follows. Errors in the image list file must be output to storage media.

Error Code	Description	Example Handling
Codes Indicating Network Errors		
80028e01	HTTP status error was returned from the server. The URL specified for the HTTP server may be incorrect.	Check if the URL set to [Update Server URL] or to the CDN parameter of the image list file is correct.
80028e02	No response from the server for Content-Length. This is likely to be a problem with server operation.	Check if the server is running correctly.
80028e03	Size of image list file is larger than 64KB.	Check the file size of the image list file.
80028e04	Content-Length of image list file and the file size that can actually be received are invalid. This is likely to be a problem with server operation.	Check if the server is running correctly.

Error Code	Description	Example Handling
80028e05	Format of image list file is invalid. There is a problem with the image list file. The URL specified may not point to the image list file.	Check if the content of the image list file is correct. Also check if the URL set to [Update Server URL] is correct.
80028e06	Image list file does not include the Dest parameter that indicates the destination. There is a problem with the content of the image list file.	Check if the image list file is written correctly. Note that if there is a problem with a parameter other than the Dest parameter, the Dest parameter cannot be read.
80028e07	Frequent disconnections by the server while downloading the updater. This is likely to be a problem with server operation or network traffic.	Check if the server is running correctly and check the network status.
80028ea1 - 80028ead	Problem with network settings or network status. This is likely to be a problem with network settings (such as DNS and Proxy settings).	Check if the information shown onscreen is correct and handle the situation accordingly.
Codes Indicating Other Errors		
80029c9c	Update data does not support downgrades. This can occur, for example, when trying to downgrade from SDK2.0.0 to SDK1.5.4.	Use update data that supports the version of the destination.
8002f029	Invalid update data. This can occur, for example, when trying to use update data meant for the Reference Tool on the Debugging Station.	Use update data that supports the destination type.
80029c68	Error occurred while checking update data. There may be a problem with the update data used.	Retry the update, or try using other update data.
8002f828		
8002f82b		
8002f997		
80029c41	Error occurred while accessing the HDD. HDD access or HDD mount has failed.	Retry the update. The situation may improve by reformatting the HDD or replacing it altogether.
80029c44		
80029c48		
80029c54		
80029c55	Error occurred while accessing storage media. Media access or read has failed.	Retry the update, or try using another storage media.
80029c65		
80029c75		
Other error codes	Error occurred on the destination. There may be a problem with the hardware.	If the situation does not improve after retrying the update, contact SCE via DevNet.

Restrictions

Use of Absolute Paths (When Using MSYS)

When MSYS is used as the console program on Windows, a problem can occur with the automatic path conversion feature in MSYS.

If the macro passed as an argument to `ppu-lv2-gcc` to generate a filename includes an absolute path on the target system, the macro content will be converted automatically and the result will not be the intended filename. When specifying an absolute path on the target system for the filename, write the path in the source code.

Also, if the command argument entered in MSYS will be parsed as an absolute path or a drive letter, it will be passed to the command program after it is converted to a Windows raw path.

Example:

```
/home/usr/a --> c:/msys/1.0/home/usr/a  
/c:aaa/bbb --> c:aaa/bbb
```

Note, furthermore, that it is possible for file paths on the target system (and other non-MSYS file paths) to be unintentionally converted and lead to unexpected results.

Length of the Command Line

Windows XP limits the command line length to approximately 8 KB, which can cause the linking of larger projects using one command line to fail. As a workaround, utilize the "response file" feature provided in the Toolchain.

9 Using Safe Mode for System Recovery

When the Reference Tool is booted in safe mode, a system recovery menu will appear. If the system software does not boot properly, try booting in safe mode to solve the problem.

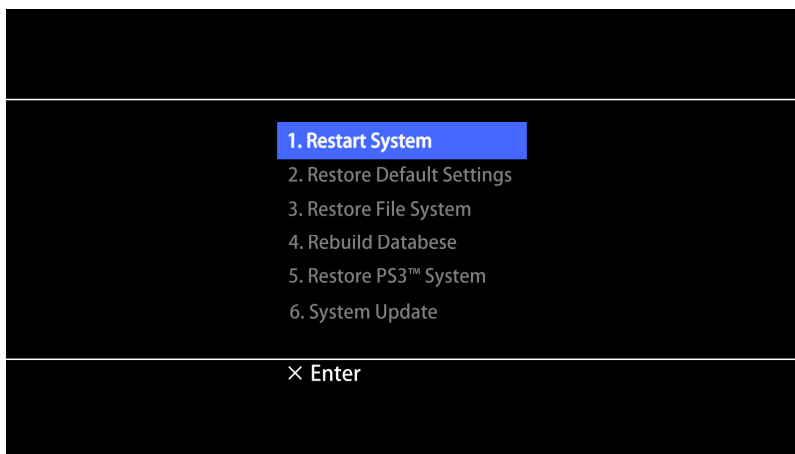
Safe mode can be used for system software 2.60 and onwards.

Safe Mode Boot Procedure

Boot the Reference Tool in safe mode as follows.

- (1) Switch off the power of the Reference Tool by using the main power switch on the back panel, and then switch on the power again.
- (2) Press the POWER button on the front panel to turn on the power, and hold down the POWER button.
- (3) There will be a beep after 5 seconds. Ignore this beep and continue to hold down the POWER button.
- (4) After 10 seconds, there will be a beep and the system will shut down. Release the POWER button.
- (5) Press the POWER button on the front panel again and turn on the power, and hold down the POWER button.
- (6) There will be a beep after 5 seconds. Ignore this beep and continue to hold down the POWER button.
- (7) After 7 seconds, there will be two beeps. Release the POWER button. The menu screen of the safe mode will be displayed.

Safe Mode Menu



The safe mode menu screen is as follows.

1. Restart System

This executes a normal reboot.

2. Restore Default Settings

This is an enhanced version of "Restore Default Settings" of System Settings in the system software Settings column. In addition to initializing the items in "Restore Default Settings", the following steps are carried out.

- Initializes PlayStation®Network account information
- Deletes PlayStation®Network game DRM information

3. Restore File System

This item can be used to attempt a recovery when the file system meta data of the internal hard disk drive on the target system has been corrupted, and there is save data or game data that cannot be deleted. However, it is also possible for files to be completely lost in this procedure.

The file system can be corrupted, for example, when the main power switch on the back panel is switched off while the target system is running.

4. Rebuild Database

The following data saved in the internal hard disk drive of the target system will be deleted and the database will be rebuilt.

- Messages sent/received
- Playlists
- Data edited in content information screens
- Photo trimming data
- Video thumbnails
- Play/resume information

It is possible for the system software to start booting correctly again if the database is rebuilt. However, rebuilding the database can take a long time.

5. Restore PS3™ System

This is an enhanced version of "Restore PS3™ System" of System Settings in the system software Settings column. All settings and content will be deleted and completely initialized.

6. System Update

If the system software no longer boots correctly because of a problem with the system, a system update can be attempted.

System updates in safe mode use update files from recordable media such as Memory Stick PRO™. Note that updates via the network using HTTP or ProDG Target Manager for PlayStation®3 are not possible.

10 PlayStation®3 Developer Network

PlayStation®3 Developer Network (DevNet) is a website with a multitude of information regarding PlayStation®3 application development.

Available Content

The following information and services are provided on DevNet.

Useful Information

This is information crucial to PlayStation®3 application development. The main items are the current TRC version and SDK roadmaps.

Private Support

Questions and problems regarding PlayStation®3 application development can be sent to Technical Support. Please read "Obtaining Support" first.

Technotes

Very important information regarding development is here. Please keep up-to-date on this information.

SDK, Development Tools, and Documents for Downloading

The SDK, samples, documentation, and various tools can be downloaded here. Export regulations apply to some of the content; handle the downloaded files carefully and appropriately.

Operation Status of the PlayStation®Network Development Server

The status of the PlayStation®Network development server is shown in real time. Maintenance information is available in "Notices".

Forums

A public forum is available for developers. Please use this forum to exchange information with other people involved in PlayStation®3 application development.

Access to DevNet

To access DevNet, use a Web browser to open the following URL. Accesses to DevNet are restricted through a strict management of IP addresses and user accounts.

- <https://ps3.scedev.net/>