

SLS USB Mass Storage Solution Using SD Card

Quick Start Guide



System Level Solutions, Inc. (USA)
14100 Murphy Avenue
San Martin, CA 95046
(408) 852 - 0067

<http://www.slscorp.com>

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Introduction

This document describes the steps for evaluating reference design of SLS USB Mass Storage Solution Using SD Card.

Table below shows the revision history of this document.

Version	Date	Description
1.1	June 2015	Updated steps and figures for USB Mass Storage reference design
1.0	April 2015	First release





How to Contact SLS

For the most up-to-date information about SLS products, go to the SLS worldwide website at <http://www.slscorp.com>. For additional information about SLS products, consult the source shown below.

Information Type	E-mail
Product literature services, SLS literature services, Non-technical customer services, Technical support.	support@slscorp.com

Typographic Conventions

The document uses the typographic conventions shown as below.

Visual Cue	Meaning
Bold Type with Initial Capital Letters	All Headings and Sub Headings Titles in a document are displayed in bold type with initial capital letters; Example: Introduction
Bold Type with Italic Letters	All Definitions, Figure and Table Headings are displayed in Italics. Examples: Figure 1. USB Mass Storage using SD Card
1. 2.	Numbered steps are used in a list of items, when the sequence of items is important. such as steps listed in procedure.
• ■	Bullets are used in a list of items when the sequence of items is not important.
	The hand points to information that requires special attention.
	The caution indicates required information that needs special consideration and understanding and should be read prior to starting or continuing with the procedure or process.
	The warning indicates information that should be read prior to starting or continuing the procedure or processes.
	The feet direct you to more information on a particular topic.

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Getting Started With SLS USB Mass Storage using SD Card

This document explains about USB Mass Storage solution using SD Card and step for evaluating the reference design.

Hardware Requirements

Hardware Requirements for evaluating the reference design:

- [Altera MAX 10 FPGA Evaluation Kit](#)
- [SLS MAX 10 Evaluation Kit Add On board](#)
- USB Mini Cable
- USB Blaster



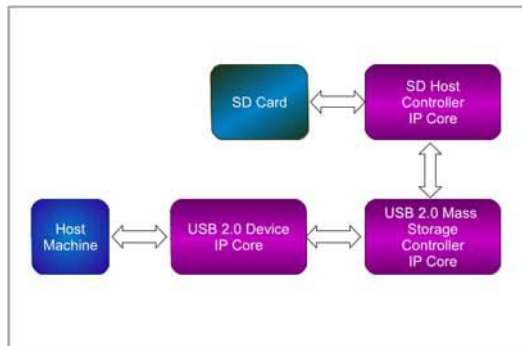
Please [contact us](#) for evaluation License regarding SLS IP Cores.

Below section describes the details of USB Mass Storage using SD Card.

USB Mass Storage using SD Card

Aim of this bridge is to provide the external USB Mass storage device. The MAX10 Evaluation Kit Add On Board is having a SD Card interface to implement the mass storage bridge. As shown in [Figure 1.](#), this design uses SLS USB 2.0 Device IP Core and SLS SD Host Controller IP Core to implement the USB mass storage solution. On successfully enumeration of the device, it appears as a new drive in the Host machine. This allows to read/write the data to/from the SD card using the USB interface.

Figure 1. USB Mass Storage using SD Card Architecture



Follow the steps to evaluate the reference design.

1. Connect the MAX 10 Evaluation Kit Add On Board on MAX 10 Evaluation Kit.
2. Connect the USB Blaster to the board.
3. Plug the SD card in SD connector CON2.
4. Power ON the board.
5. Go to <MAX10 EV Kit AOB Installation Path>/hardware/demo/usb_mass_storage_sd_max10ev folder.
6. Double click on **usb_mass_storage_sd_max10ev.bat** file. This will program SOF file on the board. You will see the message as shown in [Figure 2](#).

Figure 2. Console Message Window for USB Mass Storage

```

C:\Windows\system32\cmd.exe
File sdhc_ms_max10_time_limited.sof contains one or more time-limited megafuncti
ons that support the OpenCore Plus feature that will not work after the hardware
evaluation time expires. Refer to the Messages window for evaluation time detail
s.
Info (210040): SRAM Object File sdhc_ms_max10_time_limited.sof contains time-lim
ited megafunction that supports OpenCore Plus feature -- Vendor: 0x5750, Product
: 0x0002
Info (210040): SRAM Object File sdhc_ms_max10_time_limited.sof contains time-lim
ited megafunction that supports OpenCore Plus feature -- Vendor: 0x5750, Product
: 0x0C00
Info:
Info: Running Quartus II 64-Bit Programmer
Info: Version 14.1.0 Build 186 12/03/2014 SJ Full Version
Info: Copyright (C) 1991-2014 Altera Corporation. All rights reserved.
Info: Your use of Altera Corporation's design tools, logic functions
Info: and other software and tools, and its AMPP partner logic
Info: functions, and any output files from any of the foregoing
Info: (including device programming or simulation files), and any
Info: associated documentation or information are expressly subject
Info: to the terms and conditions of the Altera Program License
Info: Subscription Agreement, the Altera Quartus II License Agreement,
Info: the Altera MegaCore Function License Agreement, or other
Info: applicable license agreement, including, without limitation,
Info: that your use is for the sole purpose of programming logic
Info: devices manufactured by Altera and sold by Altera or its
Info: authorized distributors. Please refer to the applicable
Info: agreement for further details.
Info: Processing started: Mon Jun 22 16:18:11 2015
Info: Command: quartus_pgm -n jtag -o dsdhc_ms_max10_time_limited.sof
Info (213945): Using programming cable "USB-Blaster (USB-01)"
Info (213811): Using programming file sdhc_ms_max10_time_limited.sof with checks
um 0x00395E70 for device 10M08S0AE144C0GES01
Info (209060): Started Programmer operation at Mon Jun 22 16:18:12 2015
Info (209016): Configuring device index 1
Info (209017): Device 1 contains JTAG ID code 0x031820DD
Info (209007): Configuration succeeded -- 1 device(s) configured
Info (209011): Successfully performed operation(s)
Info (209061): Ended Programmer operation at Mon Jun 22 16:18:12 2015

```

After successful download, connect the USB 2.0 mini cable at connector CON1 of the MAX10 EV AO board.

7. This will enumerate the USB device as a mass storage device in the Host machine.
8. New drive appear in the Host machine. Double click to format the drive with default settings.
9. Once formatted, you will be able to read/write the files in the SD card.