SURF1286 User Guide

Version 2.1.0
Document Version: v.2.1.0.9
August 2012

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1. About this Guide

This manual provides a detailed guidance for the SURF1286. It includes the description of the product, its functionality, features, and how it is configured, operated and used.

Feedback:

The SURF Technical Support Center is at your service. You may access Warranty Service through our Web Request Form by using the following link: support@surfsolutions.com

We are committed to constant and never-ending improvement. Your input will greatly help us in our endeavor.

2. Surf1286 Overview

SURF1286 is a Low Profile PCI Express DSP-farm board, designed to provide powerful and cost-effective multimedia-processing capabilities. SURF1286 is a RoHS-compliant, single-lane, low-profile PCI Express card, hosting 12 powerful DSP cores. Optimized for mobile applications, SURF1286 provides convergence of audio, video and data across wireless and wire-line networks.

The highly-efficient SURF1286 offers low power consumption, and supports all of SURF's advanced multimedia software solutions.

The SURF1286 supports application development from prototype through production, and can be integrated as a standalone board requiring only power and Ethernet connections:

- SURF1286 hosts 12 powerful DSP cores
- Provides a complete media processing solution for video, data, fax, voice and audio
- The field-proven, cost-effective SURF1286 saves resources and reduces R&D efforts
- Ensures dedicated customer service, and fast time-to-market
- Provides built-in diagnostics, providing easier troubleshooting and better application control
- Can be provided as a hardware-only solution for DSP multimedia applications

When packaged together with SURF Motion, the SURF1286 provides an intuitive high-level API, and offers a complete solution for creating multimedia applications, including VoIP signaling and multimedia processing.

3. Installation Instructions

For installation, follow the following steps:

Step 1: Follow the safety and environmental precautions

Follow all standard safety precautions for electrical appliances to prevent electric shock. Before handling the SURF1286, discharge static electricity by touching a grounded metal structure or by using any commercially available ESD (Electrostatic discharge) grounding strap.

SURF1286 must be installed in a standard fire-safe and electrically safe enclosure server/PC environment and maximum ambient temperature of 40°C.

Step 2: Follow the server/PC requirements

Verify that the server/PC complies with the SURF1286 board's power requirements. For more details, refer to SURF1286 Hardware Specifications.

Step 3: Unpack the system

The boards are fragile. Use extra care during transportation. Provide adequate antistatic bag wrapping and padding materials when not assembled.

Open the SURF1286 package box and remove the board.

Step 4: Insert the board in the server/PC

Prior the installation, it is highly recommended to familiarize with the front panel LED indicators, as described in SURF1286 hardware manual. To Install the SURF1286 follow the below steps:

- Switch OFF the PC, disconnect the power and open the server/PC tower casing.
- Wait approx. 1 minute for the server/PC's on-board capacitors to discharge.
- If the server/PC has an on-board LED, wait for it to turn off.
- Insert the board in a vacant PCIe slot.
- Secure the board's panel to the enclosure by a retaining screw or a fastener.
- Close the server/PC casing.
- Reconnect the power, turn ON the server/PC and verify that the appropriate LED indicators are ok. If one or more LEDs are red, it signals an error state. In such a case, verify that the board is installed correctly in the slot.

To remove the boards from the PC/server:

- Turn OFF the server/PC, disconnect the power and open the server/PC casing.

- Remove the retaining screw holding the board in place and
- Remove the board.

SURF1286’s original IP address (appears on the package’s sticker), should be modified.

4. Changing IP Address

Changing the IP address is performed via serial connection (i.e. HyperTerminal under Windows or under linux with Minicom).

> Note that SURF1286 uses USB serial emulation for the consol interface. When a SURF1286 board is connected for the first time to server/PC by the USB cable, The system recognizes a new USB device and the user needs to install a driver for it. The USB device is called CP2103 (made by Silicon Labs) and its driver is available via the internet at Surf support site or at the Silicon Labs' site (www.silabs.com-http://www.silabs.com/products/interface/usbtouart/Pages/usb-to-uart-bridge.aspx).

In order to change the IP address, follow the following steps:

Step-1: Set the terminal with the following settings:

- Bits per second: 115200
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Step-2: To change the board's IP address, type ppc_ip_config 0 @the new IP . For example: ppc_ip_config 0 @10.112.137.209.

Step-3: Type board_reset.

Step-4: Type "board_info" to list the board's information, as shown below:

```
=>board_info 0
BOARD_INFO 0

Board Serial Number:            #114704104
DSPs (2) type:                  C6486 - frequency: 625 MHz
GMAC-0 MAC Address:             00-15-CB-00-BE-EF
GMAC-0 Mode:                    Auto Negotiation Enabled
Main processor IP Address:      10.10.20.20
Main processor IP Mask:         255.255.255.255
Main processor port range:      XXXX
Main processor control port:    1777
```

5. Orion Software for SURF1286

For software installation, please follow the instructions in this chapter:

Dependencies - Prior to Orion-board's installation, please consider the dependencies below:

Operating system should be Linux rpm-based. CentOS v5.7 is recommended and tested

libxml2.i386			or libxml2.i686
zlib	>=	1.2.3-3	or zlib.i686
screen	>=	4.0.3	
httpd			
kernel	~=	3.0.0.16	
python-webpy	>=	0.32	
mod_wsgi	>=	3.2-2	
python-flup	>=	1.0-2	
php	>=	5.1.6	

Please make sure that:

- The date and the time on your server are correct.

  Run "date" command in shell to check the date and time, and if necessary change their values by running the following command:

  ```
  date MMDDhhmmYY
  ```

  [MM – month, DD – date, hh – hour, mm – minutes, YY – year] - Apply two digits for all the parameters

- The following files exist- /usr/lib/libz.so & /usr/lib/libxml2.so
- httpd is configured to run "mod_wsgi". Enable LoadModule in ***/etc/httpd/conf.d/wsgi.conf*** by uncommenting the following line:

  ```
  LoadModule wsgi_module
  ```

- "AllowOverride All" is set in httpd configuration (/etc/httpd/conf/httpd.conf)
- cron is configured to run minutely. In order to apply this configuration, please add the following line to /etc/crontab:

  ```
  * * * * *  root run-parts /etc/cron.minutely
  ```

- APACHE is allowed to run commands with sudo without password (/etc/sudoers)

Note: As a part of the installation, **SELinux is disabled** either by "setinforce=0" (in /etc/init.d/orion-mcu) or by "SELINUX=disabled" (in /etc/sysconfig/selinux).

Software Installation Steps

Step-0 – Check Ping from the Operating System to the SURF1286 card before proceeding

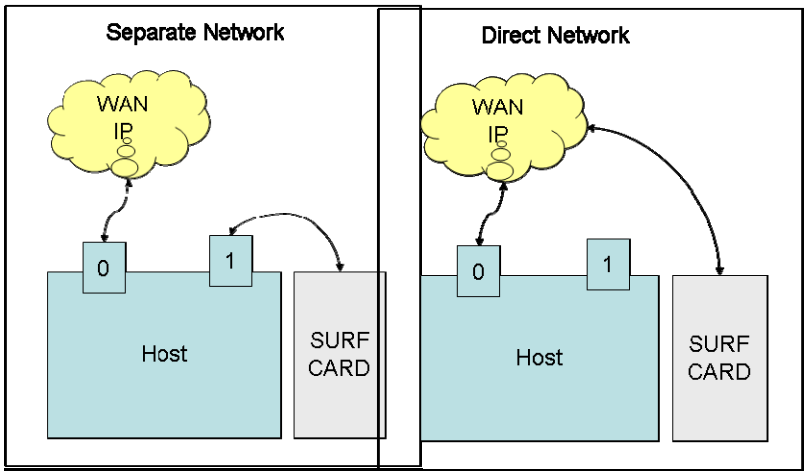
Step-1 - Run the dependencies

```
#!/bin/sh
yum install libxml2 zlib screen httpd python-webpy mod_wsgi python-flup
```

Step-2 – Prepare a "profile" file

The original Orion-board configuration parameters need to be edited in a "profile" file. The following shows an example of a "profile" file and the configuration parameters:

```
############ system general configuration ###########
CONFIG_NETWORK_TOPOLOGY=separate      # separate / direct
CONFIG_WAN_ETH_PORT=eth0              # eth0 / eth1
CONFIG_LAN_ETH_PORT=eth1          # eth0 / eth1
CONFIG_SIP_ETH_PORT=eth0          # eth0 /eth1
CONFIG_SIP_PORT=5060
CONFIG_MEDIA_CARD_TYPE=common         # common / SURF1286
CONFIG_MEDIA_CARD_IP=172.16.200.2
CONFIG_MEDIA_CARD_DSP_IP_FIRST=172.16.200.16     # 172.16.200.16
CONFIG_MEDIA_CARD_SUBNET_MASK=255.255.0.0      # 255.255.0.0 (need to config only in case of direct topology)
CONFIG_MEDIA_CARD_DEFAULT_GATEWAY=172.16.200.1  # 172.16.200.1(need to config only in case of direct topology)
CONFIG_OVERRIDE_HTTP_HOMEDIR=yes          # yes/no
```



Separate– Orion-board is connected to IP network through one of the host's ports and not directly. The host is connected to IP through another port

Direct– The host and the Orion-board are each connected directly and independently to IP network.

CONFIG_WAN_ETH_PORT - <Eth0 or Eth1>
CONFIG_LAN_ETH_PORT - Only applicable in Separate mode <Eth0 or Eth1>
CONFIG_SIP_ETH_PORT - <Eth0 or Eth1> The Ethernet port where the SIP signaling will listen.
CONFIG_SIP_PORT - <default 5060>
CONFIG_MEDIA_CARD_TYPE - <Surf1286 / Surf Express (common) -automatically detect Dockers)>
CONFIG_MEDIA_CARD_IP - <The card IP address>
CONFIG_MEDIA_CARD_DSP_IP_FIRST - <The first IP Address to be allocated>
CONFIG_MEDIA_CARD_SUBNET_MASK=<Subnet mask of media card (change only in direct topology usage>
CONFIG_MEDIA_CARD_DEFAULT_GATEWAY=<Default gatway of media card (change only in direct topology usage>
CONFIG_OVERRIDE_HTTP_HOMEDIR=<Change to No if other web services are running on the same server and use the http homedir>

Step-3 – [Optional] Erase ".htaccess" file

Erase ".htaccess" file from home directory of httpd (default is /var/www/html) to enables the access to the Orion management system by clicking the system's IP address/MCU.

Step-4 – Extract Orion's software package

```
tar xzf orion-mcu-release-2.x.x.x.tar.gz
```

Step-5– Run the install

```
install –f profile
```

Step-6– (and final) Create the startup script

```
cd /etc/init.d/
ln -s /etc/init.d/orion-mcu ../rc3.d/S95orion-mcu
```

6. Rebranding Orion-MCU™

OEM developers have the option to rebranding the Orion-MCU™ in two options.

1. Rebarnd the look and feel of the graphical user interface.
2. Rebrand through developing their own user interface through the Orion-XML API. (Available as a separate document)

6.1 Customizing and Localizing the GUI

Please refer to Orion MCU Localization_Rebranding_Guide_2_1_0 for instructions on customizing and localizing the Orion-MCU.

7. Running Motion™ in Standalone Mode (without Orion-MCU™)

OEM developers can use the Orion-MCU™ as a platform for development of their own multimedia applications based on SURF Motion™.

To use the Orion-MCU™ platform for multimedia development, simply login and disable autoloading of the Orion-MCU™ conferencing application:

1. Login to the system
2. Remove Orion-MCU service from the startup sequence with the following command:

```
chkconfig –del orion-mcu
```

3. Add SURF Motion service to the startup sequence with the following command:

```
chkconfig –add surfmotion
```

4. Change the SURF Motion run levels with the following command:

```
chkconfig –level 345 surfmotion on
chkconfig –level 12 surfmotion off
```

5. Open the following file for editing: /etc/opt/surf/surfmotion-api/surfmotion-api.conf
6. In the [System] section, change the SystemIP paramamter from 127.0.0.1 to 0.0.0.0 – this allows connectivity to SURF Motion from any IP address.
7. Reboot the system.
8. You are now able to connect to Motion via TCP port 9999.

8. Hardware Specifications

Form Factor	Single Lane PCI Express 2 DSPs, TMS320C6486 625MHz, 6 cores each
Interface	Configurable interfaces to each DSP 1x1000Base-T Ethernet interface (RJ-45) All data and control are passed to the DSPs via SURF proprietary high-speed interface
Size	PCIe Low Profile card **Height:** 68.90 mm **Length:** 167.65 mm
Power	Up to 18W per fully populated board
JTAG	-DSP JTAG connector for DSP emulation -FPGA JTAG connector for FPGA booting and programming -Boundary-Scan JTAG
Regulatory Compliance (pending)	**EMC:** **US**: FCC part 15 class A with shielded telecom cables and STP Ethernet cables **Canada**: IECS-003 with shielded telecom cables and STP Ethernet cables **EU**: EN55024:1998 A1: 2001/A2:2003; EM55022:1998 A1:2000/A2:2003, Class B with shielded telecom cables and STP Ethernet cables **Safety** US: UL Std No. 60950-1 Canada: CAN/CSA-22.2 number 60950-1-03 EN: 60950-1: 2001
Operating Requirements	**Operating Conditions** **Temperature:** -0°C - 40°C (32°F - 104°F) **Humidity:** 20% to 80% (non-condensing) **Storage:** -25°C - 85°C (-13°F - 185°F)

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