

User Manual SCS3000

HW-Revision: B

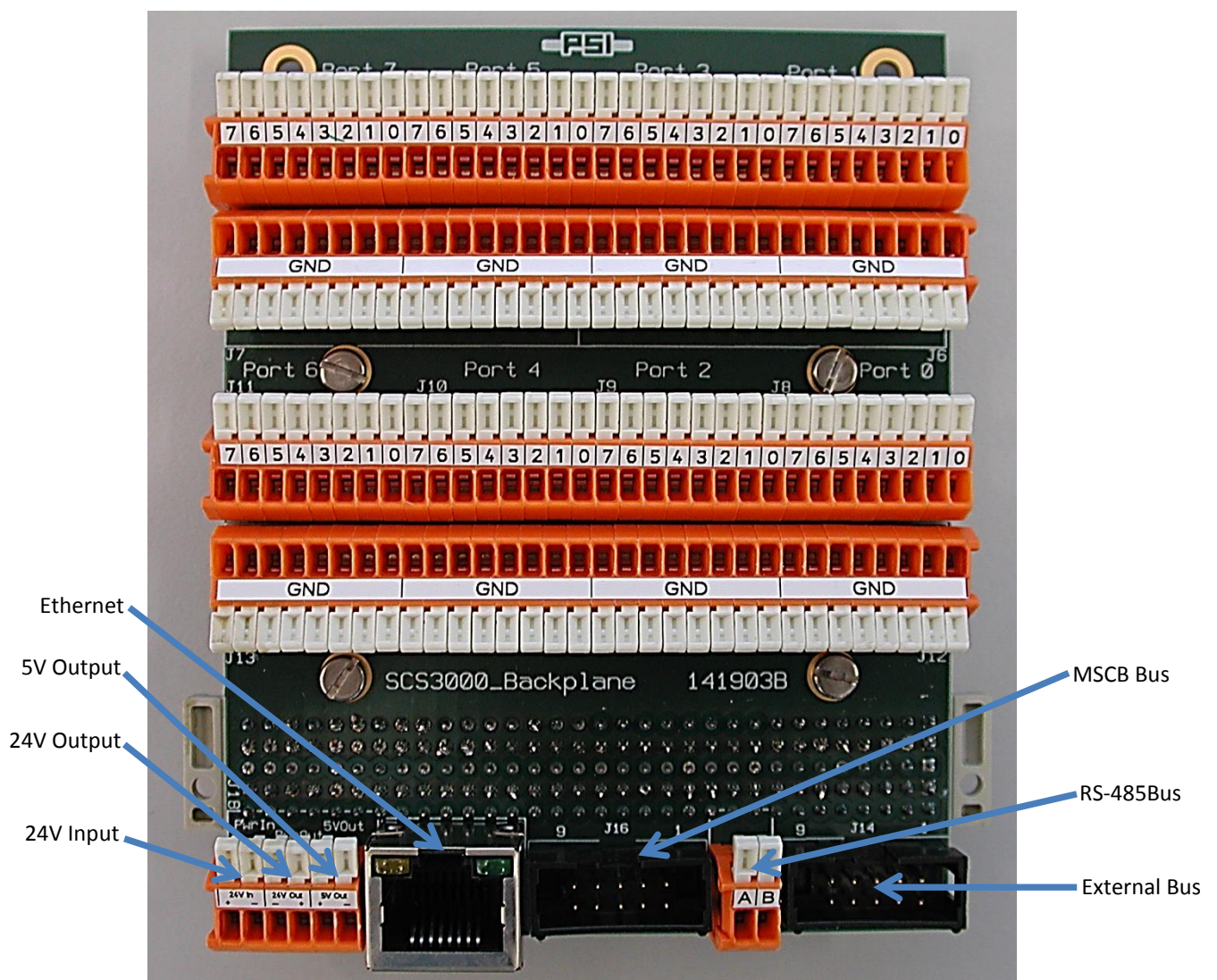
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The following pages describe the basic handling of the SCS3000.

**CONNECTING THE BACKPLANE**

The following picture shows how to connect the power supply to the backplane. Make sure you connect the supply with the correct polarity (see marking on the backplane). Each slot / port has has numbered connector pins (0 to 7) and corresponding low impedance gound pins beneath. When inserting a wire, make sure you don't overspan the clamp. Wires with  $> 0.5\text{mm}^2$  width are not suited, and should not be used.



**Ethernet vs. MSCB**

Use the MSCB Bus connection only for short (<10m) distances (connections within a crate). For long connections, please use ethernet.

## Ethernet Shield

The shield of the ethernet connection is connected to the system ground by default. If you don't want a connection to the system ground, remove the resistors R1 and R2 from the bottom side of the backplane.

## USER INTERFACE

### LEDS

The SCS3000 has 5 Leds to signalize its state:

MSCB Tx	LED is on, while sending via the MSCB-Bus
MSCB Rx	LED is on, while receiving via the MSCB-Bus
System State Ok	LED blinks with 1Hz to signalize the heartbeat
System State Info	LED is on, if new (not already read) log entries are available
System State Failure	LED blinks with 5Hz to signalize a system failure (over- / undervoltage etc.)

If the system is in failure mode, also the beeper is active.

## MENU

### LOG

The log stores all events happened since the last "clear log". New and not already read log entries are marked with a red sign in the main menu. Up to 16 log entries of the same type are stored since the last reboot. Further log entries are dropped. Up to 455 logs can be stored. The logs are displayed in a short form on the device display. To read the full log information, use **cmd log** from the command line interface.

### USER VARIABLES

User defined variable can be accessed with pressing the **UVars** button in the main menu. If there are no user variables, the button will be grayed out.

### LOCK

With **pressing the PSI Logo** on top right in the main menu, the device will be locked. To unlock the device, tap on the screen and insert the device password. The default password corresponds to it's default submaster host name (even if it's not configured in submaster mode): MSCB300 -> password: mscb300

To changing the password go to the Configuration menu, select **Change Password** and insert your new password. The password equals the submaster password.

## CONFIGURATION MENU

The configuration gives the ability to make some device specific configuration:

Submaster Enable:	<b>Yes</b> to enable the submaster functionality, <b>No</b> to disable
Reset vars at power on:	<b>Yes</b> to reset all variables at a power on. <b>No</b> , to keep the variable states after a power on, if the slot card configuration is the same as last time.
5V Ext. Enable:	<b>Yes</b> to enable the 5V external power supply output on the backplane. <b>No</b> , to disable.



24V Ext. Enable: **Yes** to enable the 24V external power supply output on the backplane. **No**, to disable.  
Calibrate Touch Screen: Press to calibrate the touch screen. Follow the instructions on the screen.  
System Reboot: Reboots (restarts) the device  
Change Password: Sets a new device password

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## SYSTEM INFORMATION

To show the system information, press the **Sys** button in the man menu.

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## TIME

The actual local time is displayed in the upper left corner. The correct time must be set once, or after each time shift. To set the time either use the **cmd sync** of the command line interface or set the time manually by tap on the displayed time.

If the SCS3000 is in submaster mode, it gets the correct time every 10s from a NTP-server. After receiving a correct time, the time is sent to its slaves to get synchronized. If the NTP server doesn't respond or the time information is not correct, the SCS3000 selects the next NTP server. If no server responds, it retries all servers after 10 minutes. The current ntp server list contains the following servers:

- pstime1.psi.ch            PSI time server 1
- pstime2.psi.ch            PSI time server 2
- pstime3.psi.ch            PSI time server 3
- pool.ntp.org              general time server for use outside PSI

The time sync algorithm allows a time shift of max. 15 minute. Example: If the time is set correctly you can disconnect the SCS3000 from the network. This leads to a time drift of. This time drift should not be more than 15 minutes. With a total time drift of less than 15 minutes, the SCS3000 can be connected to the network again and it will automatically sync to the correct time. A time shift of more than 15 minutes will lead to an incorrect time.

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## CHANGING THE DEVICE NAME

By pressing on the device name in the middle of the screen, you can set a user define name.

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## SETTING THE NODE/GROUP ADDRESS

The node/group address can be set, with pressing the current node/group address field in the main menu. The valid range of the address is from 0 to 65535.

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## SETTING THE SUBMASTER HOST NAME

Please **do not change** the **submaster host name** by your own, because the name corresponds to a MAC address. Changing the host name will also change the MAC address of the device. This could potentially lead to a network conflict if another device with the same name/MAC-address is present.

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## ERASE SLOT CARD

By pressing the slot button for more than 3 seconds gives you the ability to erase the ID of the slot card. A menu will pop up to confirm the erasing of the slot card. Erasing a slot card causes a system reboot.

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## PROGRAM SLOT CARD ID

Unprogrammed / uninitialized slot cards are showed in red. Press the corresponding slot to select the desired cards. Only supported cards are listed. Select the desired card and press save. This causes a system reboot.

## DISPLAY VARIABLES

To display the variables of a slot card, select the desired slot in the main menu. Now all variables from this slot are listed. The variable number is showed on the left side.

## SET VARIABLES

To set the variables of a slot card, first select the desired slot card from the main menu. Then press the variable to set for more than 1 second. A new screen will appear. Set the variable to the desired value. Only allowed inputs are accepted.

## FIRMWARE MIRRORING / UPGRADE WHILE RUNNING

The SCS3000 contains a firmware mirroring feature. In fact the firmware is stored twice on two independent flash banks. If the firmware of the executing bank is corrupt, the device automatically switches to the other bank to maintain the operation. The firmware on both flash banks is checked several times per second using a CRC32 algorithm. This feature also allows firmware upgrade while the device is running and fully working. Furthermore, the SCS3000 is able to repair the corrupt code. To show the actual selected bank, go to the system information menu.

**Remark:** After upgrading when running on bank 2 (change from bank 2 to bank 1), the old firmware on bank 2 will be updated after 7 seconds since reboot (upgrading foreces reboot). Due to this, the mirroring feature is not present in these first 7 seconds. Thereafter the mirroring feature is working normally. This problem arises from an unsolved FW/HW issue.

## FACTORY DEFAULT

The following steps will reset the device to its factory default:

1. Press and hold SW3 (factory default button)
2. Press and release SW1 (reset button)
3. Release SW3

### Factory Default Settings:

Node address:	65535
Group address:	65535
Device Name:	SCS-3000
Ethernet Host Name:	MSCBFFF
(Ethernet) Password:	-
Ethernet MAC Address:	00 50 C2 46 DF FF
System Time (RTC):	2000-01-01 00:00:00
Error Log:	log cleared
Touchscreen:	calibration at first startup
Reset Counters:	0
Boot Bank:	Bank 1
Submaster enable:	No
Reset Variable at power on	No
5V ext. enable	No
24V ext. enable	No

After a factory reset, the ethernet hostname and password have to be set correctly (do not use the default setting).

**Remark:** Ethernet is only available in Submaster mode (submaster enabled). Hostname correlates with ethernet MAC address.



## DELIVERY STATE

On receipt, the following configuration is already done:

Ethernet Host Name:	MSCBxxx
(Ethernet) Password:	mcbxxx
Ethernet MAC Address:	00 50 C2 46 Dx xx
System Time (RTC):	set to the actual local time
Touchscreen:	calibrated
Submaster enable:	Yes
Beeper:	enabled (SW4)

All other settings are unchanged (factory default).

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