

Industriefunkuhren



Technical Manual

**LAN Management Board/Module
For System 6844RC**

Model 6844MNG

ENGLISH

Version: 08.00 – 28.10.2019

SET	IMAGE	H8-FIRMWARE
	(6844MNG)	(6844MNG)
Valid for	Version: 08.xx	Version: 03.xx

Version Numbers (SET / Firmware / Description)

THE TERM **SET** DEFINES THE FIXED RELATIONSHIP BETWEEN THE IMAGE VERSION AND THE ASSOCIATED H8 FIRMWARE VERSION.

THE FIRST TWO DIGITS OF THE TECHNICAL DESCRIPTION VERSION NUMBER, THE **SET** VERSION AND THE IMAGE VERSION **MUST BE THE SAME!** THEY DESIGNATE THE SHARED FUNCTIONAL IDENTITY BETWEEN DEVICE, SOFTWARE AND TECHNICAL DESCRIPTION.

THE VERSION NUMBER OF THE IMAGE AND THE H8 SOFTWARE CAN BE READ IN THE WEBGUI OF FG6844MNG (SEE **CHAPTER 6.4.6.1 DEVICE INFORMATION**).

THE TWO DIGITS AFTER THE DOT IN THE VERSION NUMBER DESIGNATE CORRECTIONS TO THE FIRMWARE AND/OR DESCRIPTION WHICH HAVE NO EFFECT ON FUNCTIONALITY.

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Symbols and Characters



Operational Reliability

Disregard may cause damages to persons or material.



Functionality

Disregard may impact function of system/device.



Information

Notes and Information.



Safety regulations

The safety regulations and observance of the technical data serve to ensure trouble-free operation of the device and protection of persons and material. It is therefore of utmost importance to observe and compliance with these regulations.

If these are not complied with, then no claims may be made under the terms of the warranty. No liability will be assumed for any ensuing damage.



Safety of the device

This device has been manufactured in accordance with the latest technological standards and approved safety regulations

The device should only be put into operation by trained and qualified staff. Care must be taken that all cable connections are laid and fixed in position correctly. The device should only be operated with the voltage supply indicated on the identification label.

The device should only be operated by qualified staff or employees who have received specific instruction.

If a device must be opened for repair, this should only be carried out by employees with appropriate qualifications or by **hopf** Elektronik GmbH.

Before a device is opened or a fuse is changed all power supplies must be disconnected.

If there are reasons to believe that the operational safety can no longer be guaranteed the device must be taken out of service and labelled accordingly.

The safety may be impaired when the device does not operate properly or if it is obviously damaged.

CE-Conformity



This device fulfils the requirements of the EU directive 2014/30/EU "Electromagnetic Compatibility" and 2014/35/EU "Low Voltage Equipment".

Therefore the device bears the CE identification marking
(CE = Communautés Européennes = European communities)

The CE indicates to the controlling bodies that the product complies with the requirements of the EU directive - especially with regard to protection of health and safety for the operator and the user - and may be released for sale within the common markets.

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1 General

The LAN management card / module 6844MNG (referred to later in **FG6844MNG**) has been developed specifically for the **hopf**GPS System 6844RC.

FG6844MNG turns the **hopf** 6844RC System into a Remote Management System, particularly interesting for companies where the System needs to be administrated via a control center. This saves costs for labor and time.

Thus the secured access to System 6844RC is guaranteed via each suitable TCP-IP workstation.

FG6844MNG is equipped with a 10/100 Base-T (auto-sensing) Ethernet interface. It can be installed at any desired point on the network.

The **hopf** Management Console (**hmc**) enables the complete remote configuration and monitoring of System 6844RC via the network. The communication between **hmc** and FG6844MNG is carried out only encoded.

A variety of management and monitoring functions are available (e.g. SNMP traps, email notification, Syslog messages).

Extensive parameters are provided to suit the conditions of individual applications by means of a variety of access / configuration channels.

- The accessibility of the FG6844MNG in the network can be established via the **hopf** Base System menu or **hopf** Management Console (**hmc**).
- The FG6844MNG is configured via Ethernet by means of a web browser via:
 - HTTP/HTTPS WebGUI (**G**raphical **U**ser **I**nterface)
 - Or text-based menus via Telnet and SSH
- Various protocols (e.g. IPv4, http, https, Telnet etc.) are available for the Ethernet connection.

The data of System version 6844RC is not managed directly by FG6844MNG but is supplied via internal communication through control board 6844RC, e.g. the MAC address of the LAN interface of FG6844MNG is not related to the board, but to the control board 6844RC.

2 FG6844MNG Basic Functions

Network Protocols

- HTTP
- HTTPS
- DHCP
- Telnet
- SSH
- SNMP

Configuration Channel

- HTTP-WebGUI (Browser Based)
- HTTPS-WebGUI (Browser Based)
- Telnet
- SSH
- External LAN Configuration Tool
- **hopf** 6844RC - System Keypad and Display

Ethernet Interface

- Auto negotiation
- 10 Mbps half-/ full duplex
- 100 Mbps half-/ full duplex

Features

- HTTP (status, control)
- SNMPv2c, SNMP Traps (MIB-II, Private Enterprise MIB)
- E-mail notification
- Syslog Messages to External Syslog Server
- Update via TCP/IP
- Status LED
- Fail-safe
- System-Management

3 FG6844MNG Construction

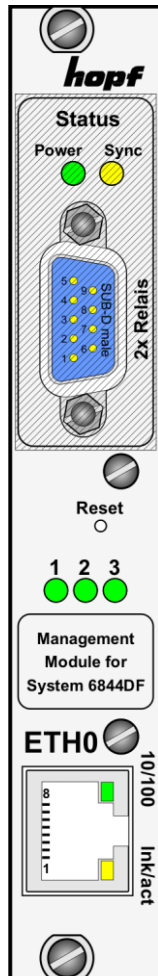
This Chapter describes the hardware components of FG6844MNG.

3.1 Design for 6844DF (DekaFlex)

The LAN Management Module 6844MNG is a permanently installed system component in Systems 6844DF.

3.1.1 Front Panel

3U Front Panel



These Elements are described in the standard description

MNG Reset - Board Reset

LED 1 - Readiness for Operation

LED 2 - Boot Status

LED 3 - Access to the Internal System Bus

Ink/act-LED - Activity with the Ethernet

10/100-LED - 10/100 MBit Ethernet

ETH0-RJ45 socket - Ethernet LAN interface

3.1.2 Power Supply

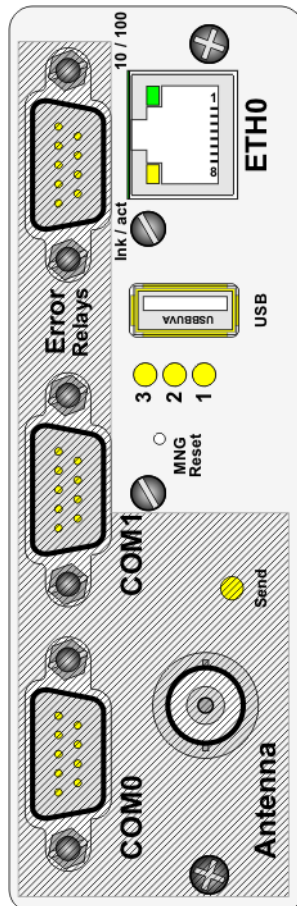
The power supply is integrated in the housing via the respective power supply.

3.2 Design for Slim Line (1U)

The LAN Management Module 6844MNG is a permanently installed system component in Slim Line (1U) Systems.

3.2.1 Front Panel

1U Front Panel



ETH0-RJ45 socket - Ethernet LAN interface

Ink/act-LED - Activity with the Ethernet

10/100-LED - 10/100 MBit Ethernet

USB - Without function at present

LED 1 - Readiness for Operation

LED 2 - Boot Status

LED 3 - Access to the Internal System Bus

MNG Reset - Board Reset

All further elements like:

- **Send LED**
- **BNC connector female**
- **COM0/COM1**
- **Error Relays**

are described in d the standard description

3.2.2 Power Supply

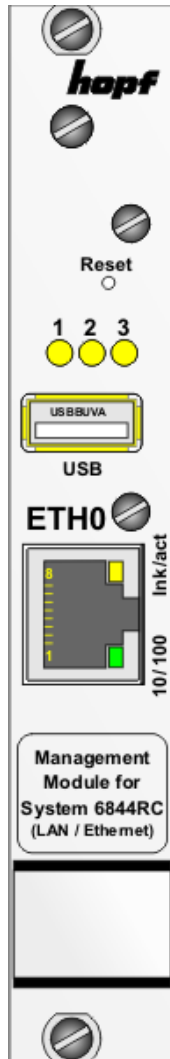
The power supply is integrated in the housing via the respective power supply.

3.3 Design for 19" Systems (3U/4HP)

3.3.1 Front Panel

FG6844MNG has a 3U/4HP front panel for 19" systems. It is equipped with the following components:

3U/4HP Front Panel



Reset Button - Board Reset

LED 1 - Readiness for Operation

LED 2 - Boot Status

LED 3 - Access to the Internal System Bus

USB - Without function at present

ETH0-RJ45 socket - Ethernet LAN interface

Ink/act-LED - Activity with the Ethernet

10/100-LED - 10/100 MBit Ethernet

3.3.2 Power Supply

The power supply is integrated in the housing via the respective power supply.

3.4 Status LEDs of FG6844MNG

FG6844MNG has Status LEDs on the front panel. These facilitate detection of the operating status of installed boards.

The LEDs represent the following Board conditions:

LED 1 (yellow)	Readiness for Operation
Off	not ready for operation.
Flashing	Standard condition – FG6844MNG is principle ready for operation

LED 2 (yellow)	Boot operation
Off	Fault
Flashing (1Hz.)	Boot operation (duration approx. 2 minutes).
Flashing (3Hz.)	Fault by Boot operation.
On	Standard condition – Boot operation is ready

LED 3 (yellow)	Access to the Internal System Bus
Off	Fault
Flashing (1Hz.)	System bus available – invalid time from system bus
ON	Standard condition – access to the internal system bus



The FG6844MNG is fully operationally when all 3 LEDs (LED 1-3) are in standard condition.

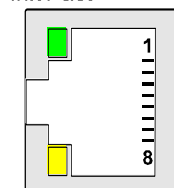
Ink/act LED (green)	Description
Off	There is no LAN connection to a network.
On	LAN connection available.
Flashing	Activity (send / receive) on network.

10/100 LED (yellow)	Description
Off	10 MBit Ethernet detected.
On	100 MBit Ethernet detected.

3.5 RJ45 Socket (ETH0)

ETH0

Ink / act



10 / 100

Pin No.	Assignment
1	Tx+
2	Tx–
3	Rx+
4	Not in use
5	Not in use
6	Rx–
7	Not in use
8	Not in use
9	Not in use



The meanings of the RJ45 socket LEDs are described in **Chapter 3.4 Status LEDs of FG6844MNG**.

3.6 Reset Button

The Reset button is activated by means of a thin object through the hole in the front panel next to the "Reset" inscription (see **Chapter 4.2 Reset Button**).

4 FG6844MNG System Performance

Behaviour of FG6844MNG when switching on and resetting the Base System and when activating the default button on the front panel.

4.1 Delayed Operation after Power On / Reset

When turning on FG6844MNG it is not immediately operable. At first the board needs to boot its operating System and wait for the complete time information and parameter from control board 6844RC.

Only then the Web Server of FG6844MNG via LAN is available.



In case the correct time information is not shown when obtaining first access, the display has to be refreshed via the Web browser.



The FG6844MNG is fully operationally when all 3 LEDs (LED 1-3) are in **standard condition** (see **Chapter 3.4 Status LEDs of FG6844MNG**).

4.2 Reset Button

FG6844MNG can be reset or placed in default status with the aid of the default button which is located behind the Board's front panel. The default button can be accessed by means of a thin object through the small hole in the front panel.

Briefly pressing the reset key releases a reset on FG6844MNG.



After a reset the LAN Management Board/Module FG6844MNG is not immediately accessible (see **Chapter 4.1 Delayed Operation after Power On / Reset**).

5 Creating the Network Connection



Ensure that the network parameters of the LAN Board/Module are configured in accordance with the local network before connecting the LAN Board/Module to the network (see **Chapter 5.1 Network Configuration for ETH0 via the Base System**).



Connecting a network to an incorrectly configured LAN Board/Module (e.g. duplicated IP address) may cause interference in the network.



Request the required network parameters from your network administrator if you do not know them.

The network connection is made via a LAN cable and RJ45 plug (recommended cable type: CAT5 or better).

5.1 Network Configuration for ETH0 via the Base System and *hmc*-software

The only configuration that is carried out on FG6844MNG via the Base System is to enable it to be reachable on the network. All other configurations on the Board/Module are carried out via the WebGUI.

FG6844MNG is configured via the keyboard or remote software of the respective Base System. The necessary network parameters such as IP address, Gateway, Netmask and general control bytes are configured.

The Technical Description of the respective Base System 6844RC is the basis for configuration. In the following only the board-specific menus of the appropriate base system will be explained.



After they have been entered fully, the LAN parameters configured through the system menu are transferred to the control board by pressing the **ENT** key. In order for the LAN parameters to be transferred from the control board to the LAN Board and to be stored there it is necessary to exit the menu by pressing the **BR** key.

Generally the network basis parameter setting can be done via the so called *hmc* software. This software scans the local sub-net into existing *hopf* LAN components (see **Chapter 5.1.2 Network Parameter Configuration via hmc Software**)

IP Address (IPv4)

AN IP address is a 32 bit value divided into four 8 bit numbers. The standard presentation is 4 decimal numbers (in the range 0...255) separated from each other by dots (dotted quad notation).

Example: 192.002.001.123

The IP address consists of a leading network ID followed by the host ID. Four common network classes were defined in order to cover different requirements. Depending on the network class, the last one, two or three bytes define the host while the rest define the network (network ID) in each case.

In the following text the "x" stands for the host part of the IP address.

Class A Networks

IP addresses 001.xxx.xxx.xxx to 127.xxx.xxx.xxx

There is a maximum of 127 different networks in this class. This allows the possibility to connect a very high number of devices (max. 16.777.216)

Example: 100.000.000.001, (Network 100, Host 000.000.001)

Class B Networks

IP addresses 128.000.xxx.xxx to 191.255.xxx.xxx

Each of these networks can consist of up to 65534 devices.

Example: 172.001.003.002 (Network 172.001, Host 003.002)

Class C Networks

IP addresses 192.000.000.xx to 223.255.255.xxx

These network addresses are the most commonly used. Up to 254 devices can be connected.

Class D Networks

The addresses from 224.xxx.xxx.xxx - 239.xxx.xxx.xxx are used as multicast addresses.

Class E Networks

The addresses from 240.xxx.xxx.xxx - 254.xxx.xxx.xxx are designated as "Class E" and are reserved.

Gateway Address

The gateway or router address is required in order to be able to communicate with other network segments. The standard gateway must be set to the router address which connects these segments. This address must be within the local network.

5.1.1 Network Basis Parameterizing via Basis-System

This chapter describes the basis configuration of the FG6844MNG via the Basis System 6844RC.



After they have been entered fully, the LAN parameters configured through the system menu are transferred to the control board by pressing the **ENT** key. In order for the LAN parameters to be transferred from the control board to Board 7271/7272 it is necessary to exit the respective menu by pressing the **BR** key.

5.1.1.1 Inputting the Static IPv4 Address / DHCP Mode

The IP address and DHCP mode for the LAN interface ETH0 are entered via the following selection frames:

Selection frame:

S	E	T	L	A	N	_	M	N	G		
I	P	-	A	D	R	.			Y	/	N

After entering **Y** the display changes to the input frame (LAN 1 in this case):

Input frame:

	L	A	N	_	M	N	G	I	P	-	A	D	R	.
>	1	9	2	.	1	6	8	.	0	0	1	.	0	1

Static IPv4 Address

The IPv4 address is entered in 4 groups of digits configurable from 000 to 255. They are separated by a dot (.). Input must be in the form of 3 digits (e.g.: 2 ⇒ 002).

In the case of an implausible entry (such as 265), an INPUT ERROR is sent and the complete entry is rejected.

DHCP / Static IP Address Assignment

For the use of DHCP, the IP address are all to be fully set to **>000.000.000.000<** (invalid IP address).

All other addresses are interpreted as static IP addresses.

5.1.1.2 Inputting the Gateway Address

The gateway address for the LAN interfaces is entered via the following selection frames:

Selection frame:

		S	E	T		L	A	N	_	M	N	G		
G	A	T	E	W	A	Y	-	A	D	R	.	Y	/	N

After entering **Y** the display changes to the input frame:

Input frame:

	L	A	N	_	M	N	G	G	W	-	A	D	R	.
>	1	9	2	.	1	6	8	.	0	0	1	.	0	1

5.1.1.3 Inputting the Network Mask

The network mask for the LAN interface ETH0 is entered via the following selection frames:

Selection frame:

	S	E	T		L	A	N	_	M	N	G				
	N	E	T	M	A	S	K					Y	/	N	

After entering the display changes to the input frame:

Input frame:

	L	A	N	_	M	N	G		N	E	T	M	A	S	K
>	2	5	5	.	2	5	5	.	2	5	5	.	0	0	0

5.1.1.4 Inputting the Control Byte (Without Function at Present)

Various settings can be made with the control byte.

The control byte is entered via the following selection frames:

Selection frame:

	S	E	T		L	A	N	_	M	N	G				
	C	T	R	L	.	-	B	Y	T	E		Y	/	N	

After entering the display changes to the input frame.

For editing purposes, the individual bits of the new byte are entered on the second line with "0" and "1".

The bits of the parameter byte are numbered consecutively in descending order:

e.g.:

Input frame:

	C	T	R	L	.	-	B		7	6	5	4	3	2	1	0
	L	A	N	_	M	N	G	>	0	0	0	0	0	0	0	0

The entry must be concluded by pressing the key.

Bits 7-1	No function at present
0	These bits should always be set to "0" for reasons of compatibility.

5.1.2 Network Parameter Configuration via *hmc* Software

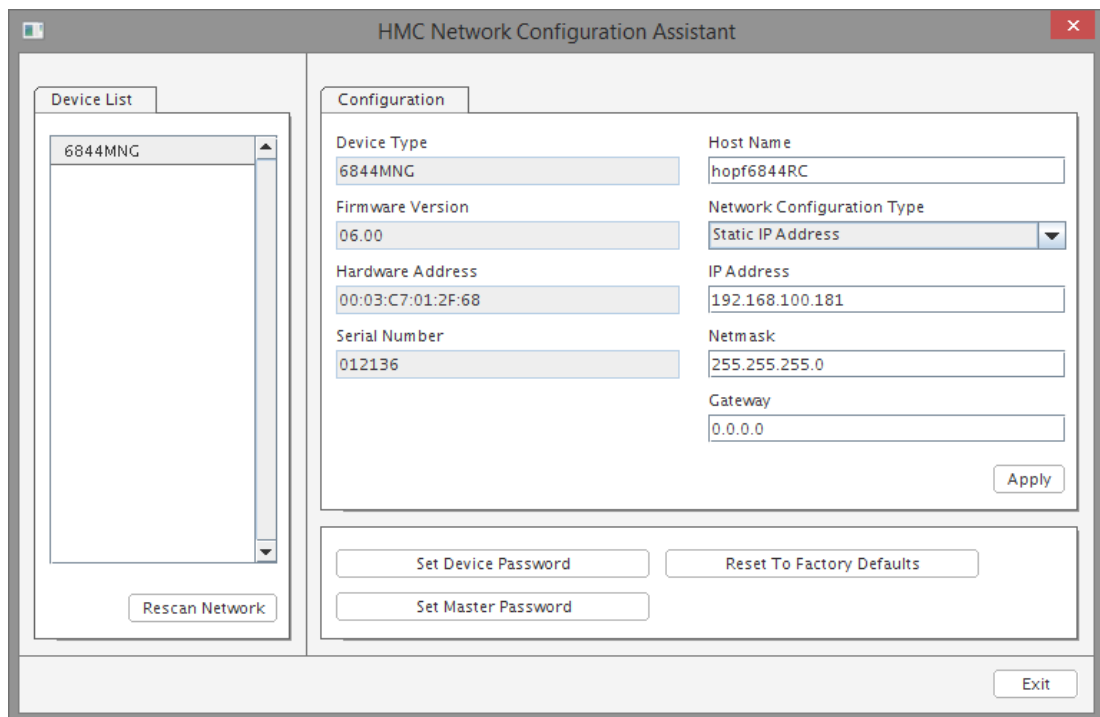
After connecting the system to the power supply and creating a network connection to the FG6844MNG, the base LAN parameter for extended configuration (**WebGUI**) of the FG6844MNG should be adjusted via a browser.

The basis LAN parameters are set via the *hmc* integrated **Network Configuration Assistant**.



After a successful start of the *hmc* **Network Configuration Assistant** and completed search of the *hopf* LAN Modules, the configuration of the base LAN parameters can be done.

The FG6844MNG is listed in the **Device List** as **6844MNG** (**Device Type** in the **Configuration**). The determination of different *hopf* LAN Modules of the same type is made via **Hardware Address**.



For an extended configuration (**WebGUI**) of the FG6844MNG via a browser the following base parameters are mandatory:

- **Host Name** ⇒ e.g. 6844MNG
- **Network Configuration Type** ⇒ **Static IP Address or DHCP**
- **IP Address** ⇒ e.g. 192.168.100.131
- **Netmask** ⇒ e.g. 255.255.255.0
- **Gateway** ⇒ e.g. 192.168.100.1



The **Host Name** should only consist of alphanumeric characters (letters and numbers). The first character should be a letter.



The network parameters for the FG6844MNG should be pre-determined with the network administrator.

After entering the above mentioned LAN parameters they need to be transferred to the FG6844MNG – Button **Apply**.

At the same time the entry of the **Password is requested**:



Password <device> is set in FG6844MNG on delivery, so no further entry is required here – click on the Button **OK** to confirm.

In order to check the transfer of inputs, a scan of the network can be released again by the button **Rescan Network**. After selection of the wished **hopf** LAN Board/Module the new parameters are shown.

6 HTTP WebGUI - Standard HTML Web Browser Configuration Interface



JavaScript and Cookies must be enabled in the browser in order for the WebGUI to display and function correctly.



The WebGUI has been tested with the following browsers:

- MOZILLA Firefox 69.0.3.(64-Bit) and
- Microsoft Edge 44.18362.387.0

Some functions do not run on older versions.

6.1 Quick Configuration

This Chapter briefly describes the basic operation of the WebGUI installed on the Board.

6.1.1 Requirements

- Ready-for-operation **hopf** Base System with implemented FG6844MNG
- Board/Module made accessible to the network (see **Chapter 5.1 Network Configuration for ETH0 via the Base System**)
- PC with installed web browser (e.g. Microsoft Edge) in the sub-network of FG6844MNG

6.1.2 Configuration Steps

- Create the connection to the Board/Module with a web browser by entering the IP address of the FG6844MNG.
- Login as a '**master**' / Password: '*****' see **Chapter 6.3.1 LOGIN and LOGOUT as a User**
- Switch to the tab where the desired configuration is parameterized
- Save the configuration
- Triggering a reset of the FG6844MNG by switching to the "device tab" and clicking on "Reboot Device".
- FG6844MNG is now available with the set functionality



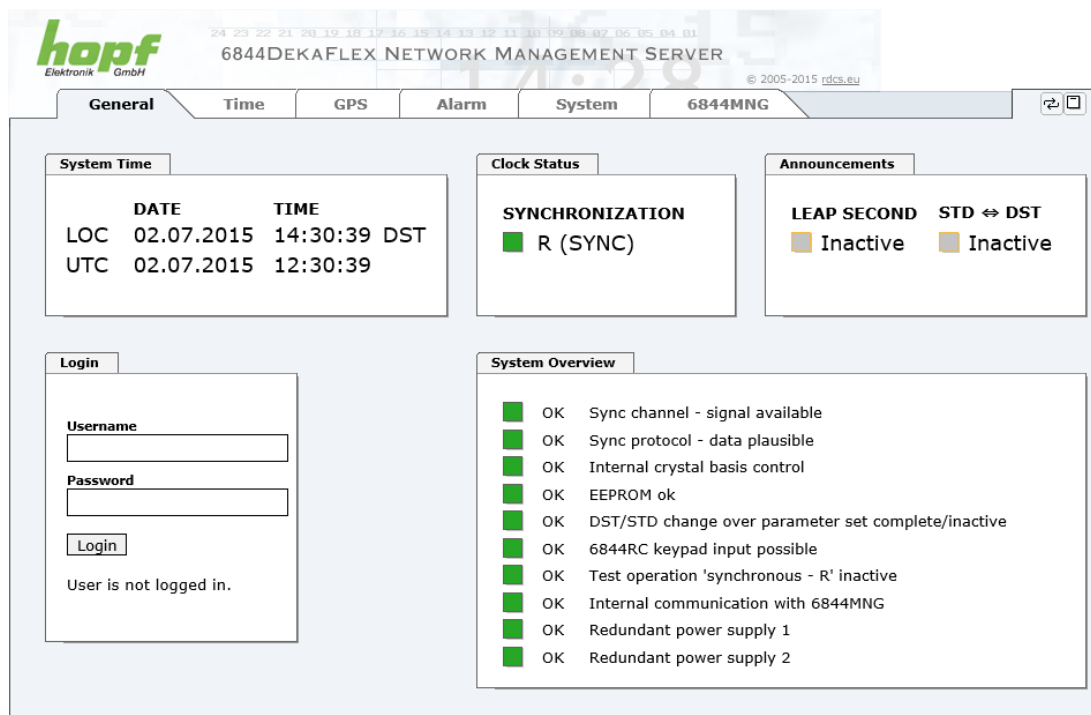
The following detailed explanatory information should be read if anything is unclear while executing the configuration steps.

6.2 General – Introduction

FG6844MNG should be accessible to a web browser if it has been set up correctly. Enter the IP address - as set up on the Board/Module earlier - or the DNS name on the address line <<http://xxx.xxx.xxx.xxx>> and the following screen should appear.



Configuration can only be completed via the Board's WebGUI!



The screenshot shows the WebGUI interface for the 6844DEKAFLEX NETWORK MANAGEMENT SERVER. The interface includes a header with the hopf logo, a navigation bar with tabs for General, Time, GPS, Alarm, System, and 6844MNG. The main content area is divided into several sections:

- System Time:** A table showing local and UTC times and dates.

	DATE	TIME	DST
LOC	02.07.2015	14:30:39	DST
UTC	02.07.2015	12:30:39	
- Clock Status:** A section showing synchronization status.

SYNCHRONIZATION
☒ R (SYNC)
- Announcements:** A section showing leap second and DST status.

LEAP SECOND ☐ Inactive **STD ↔ DST** ☐ Inactive
- Login:** A section with fields for Username and Password, and a Login button. Below the fields, it says "User is not logged in."
- System Overview:** A list of system status checks, all marked as OK.
 - ☒ OK Sync channel - signal available
 - ☒ OK Sync protocol - data plausible
 - ☒ OK Internal crystal basis control
 - ☒ OK EEPROM ok
 - ☒ OK DST/STD change over parameter set complete/inactive
 - ☒ OK 6844RC keypad input possible
 - ☒ OK Test operation 'synchronous - R' inactive
 - ☒ OK Internal communication with 6844MNG
 - ☒ OK Redundant power supply 1
 - ☒ OK Redundant power supply 2

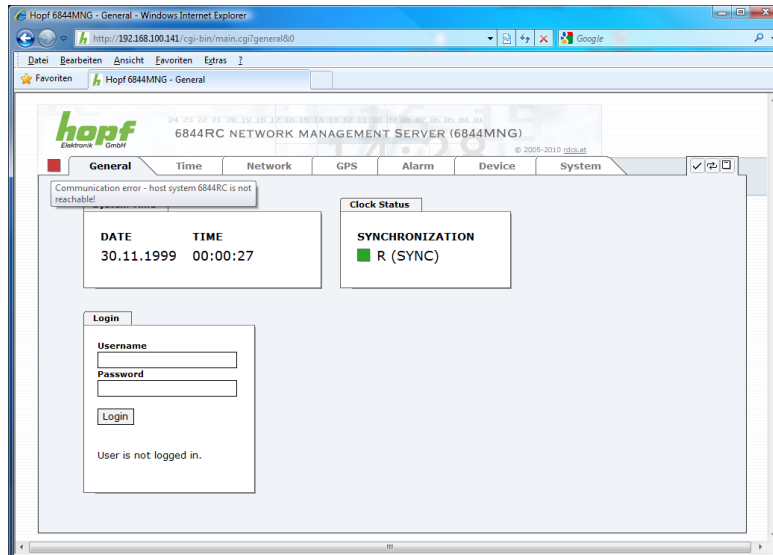


The WebGUI was developed for multi-user read access but not multi-user write access. It is the responsibility of the user to pay attention to this issue.

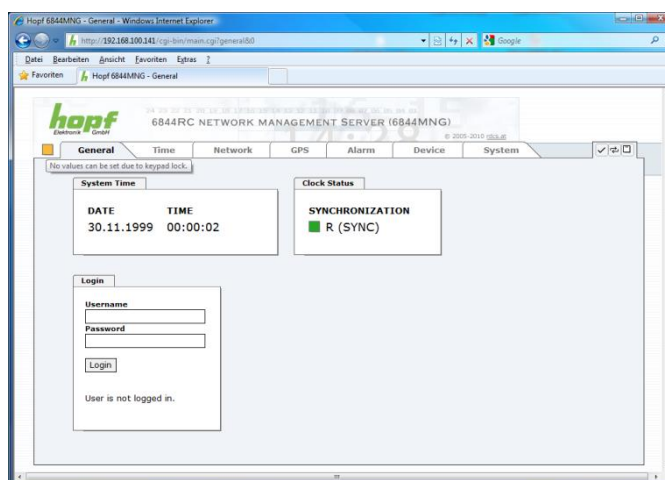
6.3 Communication Error between Basis System and FG6844MNG

In case of any internal System communication between FG6844MNG and the control board 6844RC, there will be indicated a red or rather a yellow failure field on the left side of the General Tab in WebGUI. In this condition FG6844MNG is not able to get current data from basis System and indicates e.g. a wrong System time/System status.

Reasons for the communication failure could be:



- Red:
 - Control board 6844RC blocks the communication due to active serial Remote communication at System
 - Control board 6844RC blocks the communication due to update of 6844RC
 - Hardware failure in System 6844RC



- Yellow
 - Due to operation of System 6844RC via keypad and display the communication to FG6844MNG is actively interrupted. Thus no current parameters from board FG6844MNG could be indicated nor reconfigured.

6.3.1 LOGIN and LOGOUT as a User

All of the Board's data can be read without being logged on as a special user. However, the Board/Module data can only be configured or modified by an authorised user! Two types of user are defined:

- "master" user (user name <master> password <master> is set on delivery)
- "device" user (user name <device> password <device> is set on delivery)

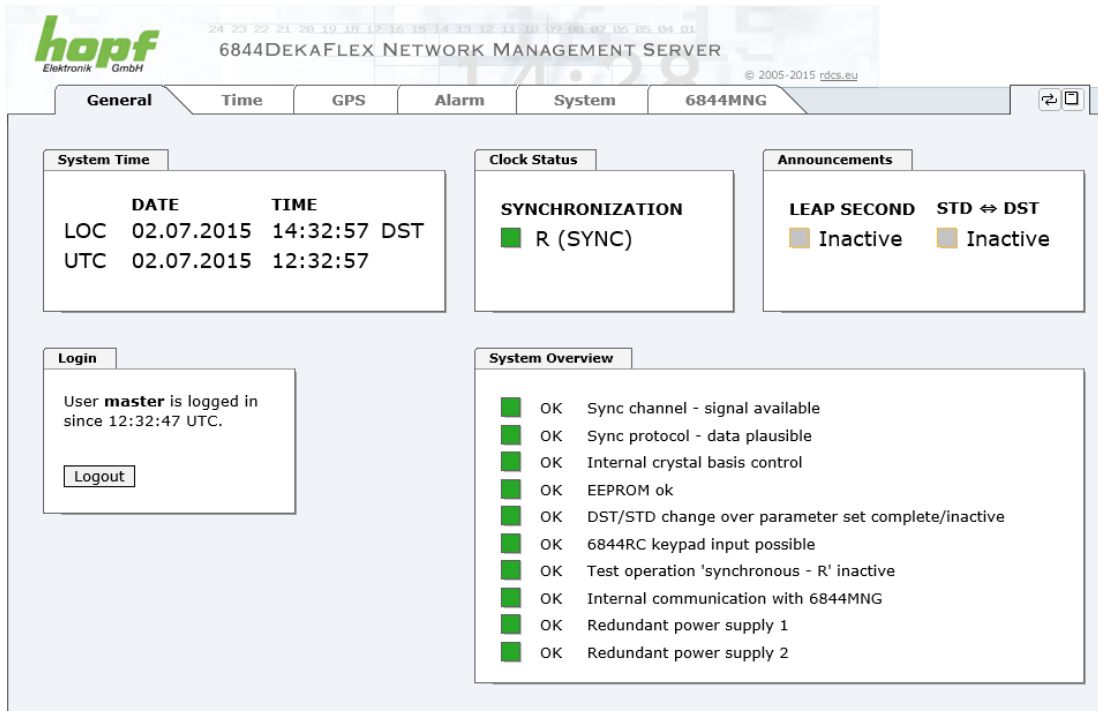


Differentiation is made between **upper and lower case** characters in the password. Alphanumeric characters and the following symbols can be used: [] () * - _ ! \$ % & / = ?



The password should be changed after the first login for security reasons.

The following screen should be visible after logging in as a "master" user:



The screenshot displays the '6844DEKAFLEX NETWORK MANAGEMENT SERVER' web interface. At the top, there's a navigation bar with tabs for 'General', 'Time', 'GPS', 'Alarm', 'System', and '6844MNG'. The 'General' tab is active. Below the navigation bar, the interface is divided into several sections:

- System Time:** A table showing the current date and time for both the local (LOC) and universal time (UTC).

	DATE	TIME	
LOC	02.07.2015	14:32:57	DST
UTC	02.07.2015	12:32:57	
- Clock Status:** A section showing the synchronization status. It indicates 'SYNCHRONIZATION' is 'R (SYNC)' with a green status indicator.
- Announcements:** A section showing the status of 'LEAP SECOND' and 'STD ↔ DST'. Both are marked as 'Inactive' with orange status indicators.
- Login:** A section showing the current user 'master' is logged in since 12:32:47 UTC. There is a 'Logout' button.
- System Overview:** A section showing a list of system components and their status. All components are marked as 'OK' with green status indicators.

Status	Component
OK	Sync channel - signal available
OK	Sync protocol - data plausible
OK	Internal crystal basis control
OK	EEPROM ok
OK	DST/STD change over parameter set complete/inactive
OK	6844RC keypad input possible
OK	Test operation 'synchronous - R' inactive
OK	Internal communication with 6844MNG
OK	Redundant power supply 1
OK	Redundant power supply 2

Click on the **Logout** button to log out. WebGUI is equipped with session management. If a user does not log out, he or she is automatically logged off after 10 minutes of inactivity (idle time).

After successful login, depending on the access level (device or master user), changes can be made to the configuration and saved.

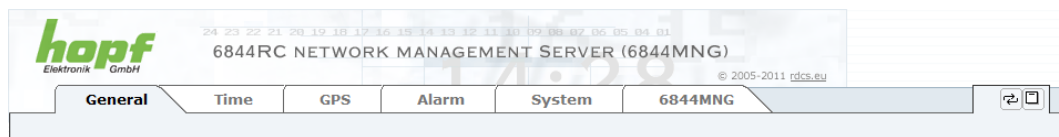
Users logged in as **Master** have all access rights to FG6844MNG.

Users logged in as **Device** do not have access to:

- Set system time
- Trigger reboot
- Trigger factory defaults
- Carry out image update
- Carry out H8 firmware update
- Upload certification
- Change master password
- Download configuration files
- Trigger Hardware Reset

6.3.2 Navigation via the Web Interface

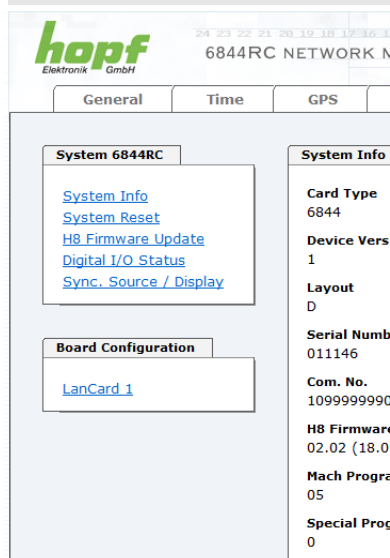
The WebGUI is divided into function tabs. Click on one of these tabs to navigate through the Board. The selected tab is identified by a darker background colour, see the following image (General in this case).



User login is not required in order to navigate through the Board/Module configuration options.



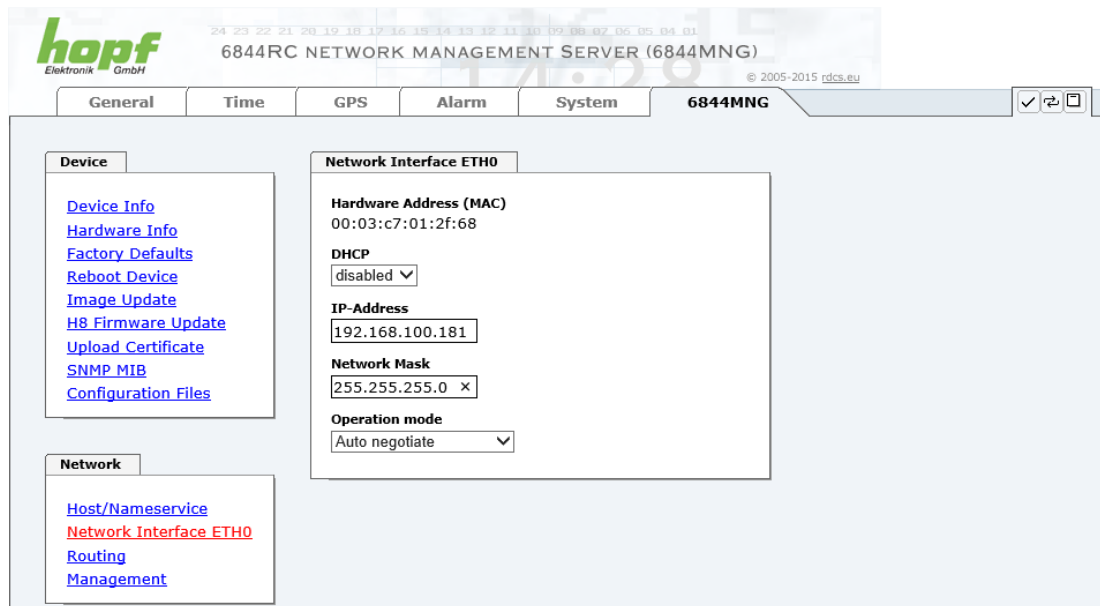
JavaScript should be enabled in the browser in order to guarantee the correct operation of the web interface.



All the links within the tabs on the left hand side lead to corresponding detailed setting options.

6.3.3 Inputting or Changing Data

It is necessary to be logged on as one of the users described above in order input or change data.



After an entry has been made the configured field is marked with a star ' * '. This means that a value has been entered or changed but is not yet stored in the flash memory. It is necessary to be acquainted with the symbols shown below in order to be able to save the configuration or the changed value.



Meaning of the symbols from left to right:

No.	Symbol	Description
1	Apply	Acceptance of changes and entered data
2	Reload	Restoring the saved data
3	Save	Permanent storage of the data in the flash configuration

For permanent storage the value **MUST** first be accepted by the Board/Module with **Apply** and then saved with **Save**.

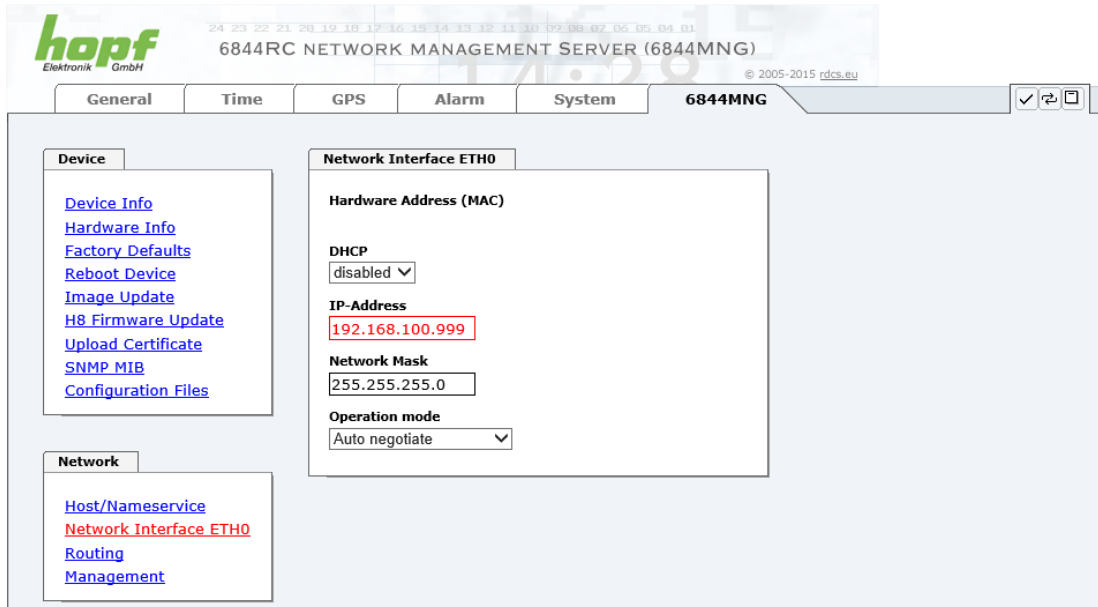
If the data is only to be tested it is sufficient to accept the changes with **Apply**. However, this data is then lost when the **hopf** Base System is switched off or restarted.



For the incorporation of amendments and values merely the relevant buttons in WebGUI should be used.

6.3.4 Plausibility Check during Input

A plausibility check is generally carried out during input.



As can be seen in the above image (field "IP-Address"), an invalid value (e.g. text where a number should be entered, IP address out of a range etc.) is identified by a red border when an attempt is made to accept these settings. It should be noted here that this is only a semantic check and not to test whether an entered IP address can be used on the network or in the configuration! If an error message is displayed it is not possible to save the configuration in the Board's flash memory.



The error check only verifies semantics and the validity of ranges. It is **NOT** a logic or network check for entered data.

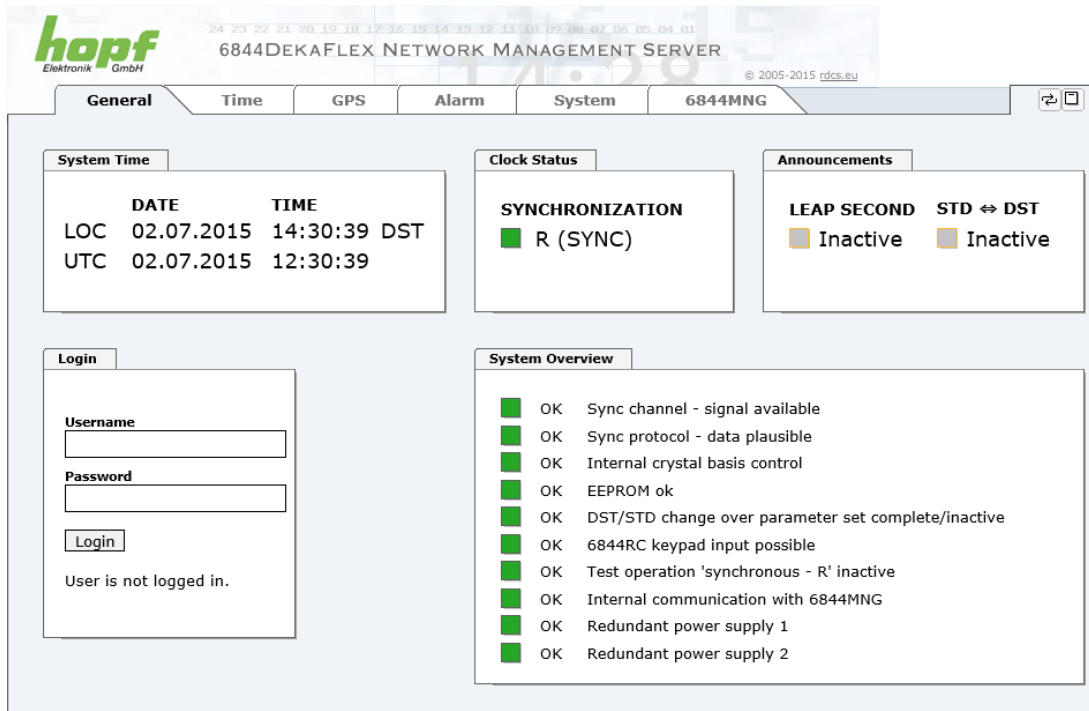
6.4 Description of the Tabs

The WebGUI is divided into the following tabs:



6.4.1 GENERAL Tab

This is the first tab which is displayed when using the web interface.



The screenshot shows the 'General' tab of the hopf 6844DEKAFLEX NETWORK MANAGEMENT SERVER web interface. The interface includes a navigation bar with tabs: General, Time, GPS, Alarm, System, and 6844MNG. The main content area is divided into several sections:

- System Time:** Displays local and UTC time and date.

	DATE	TIME	
LOC	02.07.2015	14:30:39	DST
UTC	02.07.2015	12:30:39	
- Clock Status:** Shows synchronization status.

SYNCHRONIZATION
☒ R (SYNC)
- Announcements:** Shows leap second and DST status.

LEAP SECOND ☐ Inactive **STD ↔ DST** ☐ Inactive
- Login:** A form with fields for Username and Password, and a Login button. Below the form, it says "User is not logged in."
- System Overview:** A list of system status indicators, all marked as OK.
 - OK Sync channel - signal available
 - OK Sync protocol - data plausible
 - OK Internal crystal basis control
 - OK EEPROM ok
 - OK DST/STD change over parameter set complete/inactive
 - OK 6844RC keypad input possible
 - OK Test operation 'synchronous - R' inactive
 - OK Internal communication with 6844MNG
 - OK Redundant power supply 1
 - OK Redundant power supply 2

System Time

This area shows basic information about the current time and date of the **hopf** Basis System. Both local time and UTC time are displayed here.



In case the correct time information is not indicated when first accessing WebGUI, the display via Web Browser needs to be updated.

Clock Status

Display of the actual synchronization status from the **hopf** base system with the possible values:

Invalid (-)

C

invalid time

r

the clock system is in crystal operation (C = crystal)

R

the clock system is synchronous to the synchronisation source

the clock system is synchronous to the synchronisation source with control of the internal quartz basis.



The clock status is only required when the site is accessed. For a current display an update of site is required. Change of status is processed on the minute change.

Announcements

The display fields LEAP SECOND and ST ↔ DST announce that an according happening is processed (inserting a leap second or rather time adjustment summer-/winter time) on the next hour.

System Overview

This overview corresponds with the ERROR-Byte of 6844RC.

Erroneous functions or modules are displayed in the ERROR-Byte for faster fault analysis. "OK" indicates that the function or module is operating perfectly. "ERROR" indicates that there is a fault condition.

WebGUI	ERROR-Byte der 6844RC / 6844DF
Sync channel - signal available	Sync channel - signal available
Sync protocol - data plausible	Sync protocol - data plausible
Internal crystal basis control	Control of the internal Quartz Basis
EEPROM ok	EEPROM error
DST/STD change over parameter set complete/inactive	Daylight Saving Time (DST) Changeover
6844RC keypad input possible	Keypad Input possible
Test operation 'synchronous – R' inactive	Test operation - Simulation System status "synchron - R" aktiv
Internal communication with 6844MNG	LAN MNG Communication (6844RC only)
Redundant power supply 1	Error Redu Power Supply 1
Redundant power supply 2	Error Redu Power Supply 2

Login

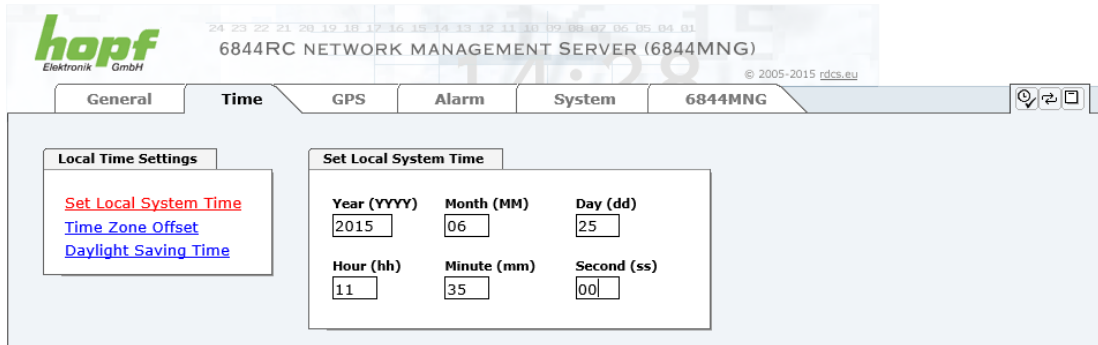
The Login box is used in accordance with **Chapter 6.3.1 LOGIN and LOGOUT as a User.**

6.4.2 Time Tab

6.4.2.1 Set System Time

Setting of the local System time in Basis System.

After entering the local date in the format year, month, calendar day and the local time in hour, minute and second a plausibility check of those data is immediately processed when releasing the memory function and adopted by the basis System afterwards.



The screenshot shows the '6844MNG' web interface with the 'Time' tab selected. The 'Set Local System Time' form contains the following fields:

Year (YYYY)	Month (MM)	Day (dd)
2015	06	25

Hour (hh)	Minute (mm)	Second (ss)
11	35	00

On the left, under 'Local Time Settings', there are links: [Set Local System Time](#), [Time Zone Offset](#), and [Daylight Saving Time](#).

Year

Input of current year (2000- 2099)

Month

Input of current month (01 - 12)

Day

Input of current day (01 - 31)

Hour

Input of current hour (00 - 23)

Minute

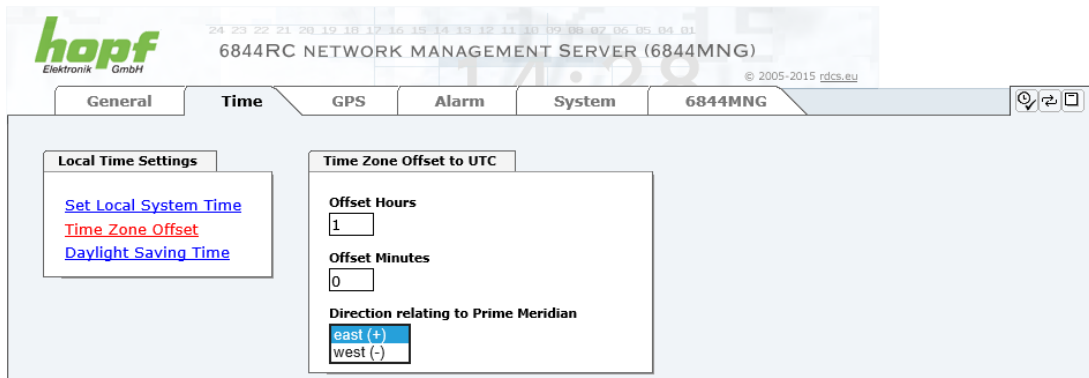
Input of current minute (00 – 59)

Second

Input of current second (00 -59)

6.4.2.2 Time Zone Offset

Setting Difference time (Local time to UTC) in the Basis system.



The screenshot shows the web interface of the 6844MNG Network Management Server. The top navigation bar includes tabs for General, Time, GPS, Alarm, System, and 6844MNG. The 'Time' tab is active. On the left, under 'Local Time Settings', there are links for 'Set Local System Time', 'Time Zone Offset', and 'Daylight Saving Time'. The main area is titled 'Time Zone Offset to UTC' and contains three input fields: 'Offset Hours' (set to 1), 'Offset Minutes' (set to 0), and 'Direction relating to Prime Meridian' (set to 'east (+)').

Offset Hours

Offset input of the full hour (0h - 13h)

Offset Minutes

Offset input of minute (0min - 59min)

Example:

Offset for Germany ⇒ east, 1 hour and 0 minutes (+ 01:00)

Offset for Argentina ⇒ west, 3 hours and 0 minutes (- 03:00)

Direction relating to Prime Meridian

Indicating direction, local time differ from world time:

'east' corresponds to east of Prime meridian,
'west' corresponds to west of Prime meridian (Greenwich)

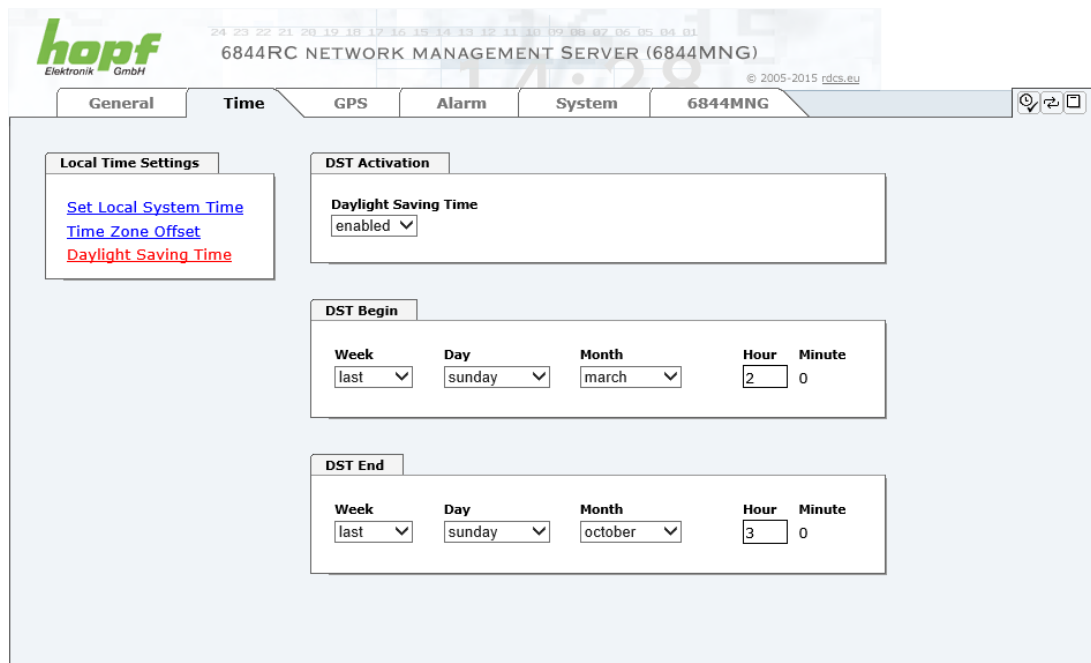


The difference time always relates to the **local standard time (winter time)** even though the commissioning or rather the input of difference time takes place during daylight saving time.

6.4.2.3 Daylight Saving Time

Setting of the changeover times for summer/wintertime in the basis System

These inputs determine the changeover times for switching to summer or wintertime during the year. The hour, day of the week, week of the month and the month for the summer/winter time changeover are determined. So the exact times are automatically calculated for the running year.



DST Activation (enabled / disabled)

DST Begin - Changeover standard time to daylight saving time

DST End - Changeover daylight saving time to standard time

The individual items have the following meanings:

Week	how often the changeover should be processed per day of the week in the month	First - 1. week Second - 2. week Third - 3. week Fourth - 4. week Last - last week
Day	the day of the week when the changeover should be processed	Sunday, Monday... Saturday
Month	the month when the changeover should be processed	January, February... December
Hour Minute	the time in hour and minute when the changeover should be processed	00h... 23h 00min ... 59min

6.4.3 GPS Tab

In this tab the following information are indicated



Important information on the topic "GPS Reception and Display of Satellites" can be read in the manual "System 6844RC".

6.4.3.1 Reception Quality

This tab represents the following GPS information.

Satellites Visible

Theoretical quantity of detected satellites by the GPS receiver.

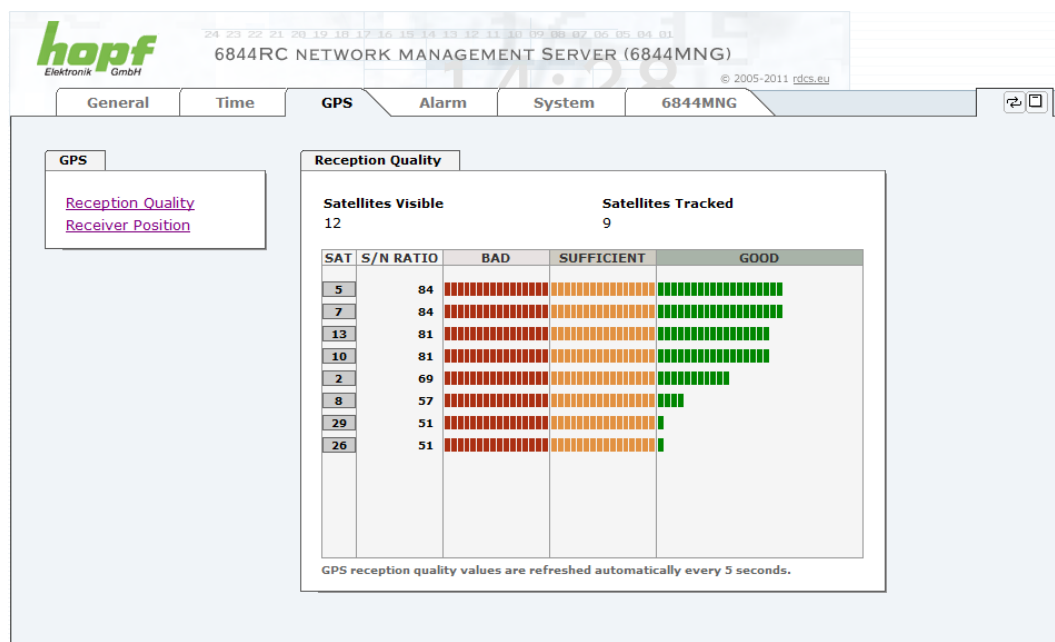
Satellites Tracked

Effective quantity of received satellites used for the synchronization of the base system.

Number of Satellites – S/N Value

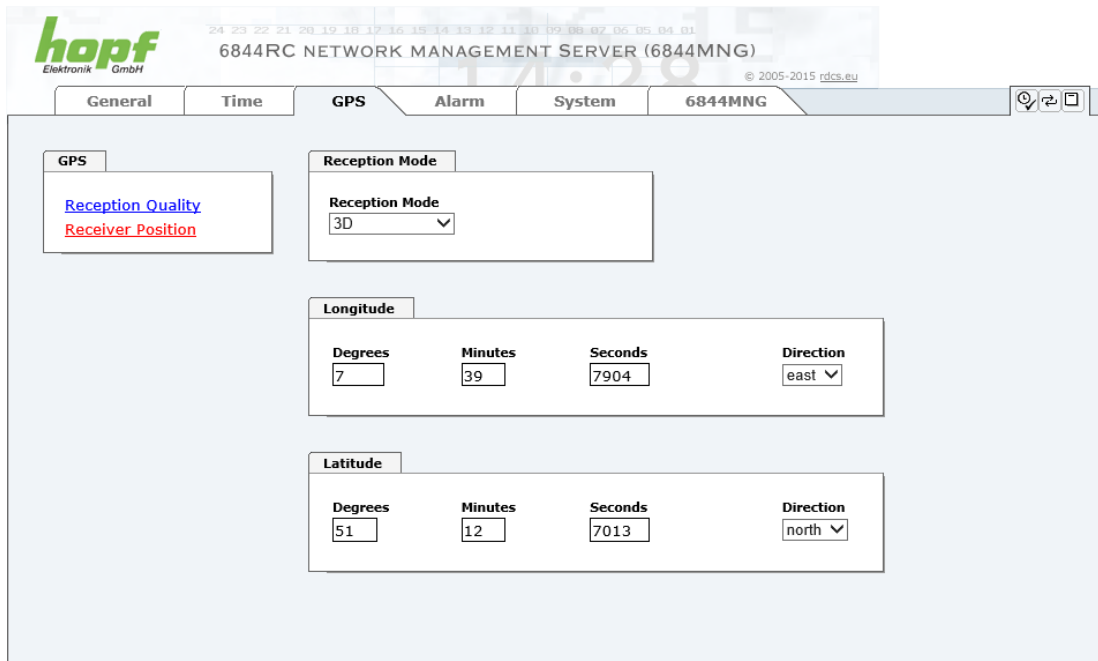
Overview of effectively received GPS satellites with their reception quality and the pertinent interpretation.

green	≥ 48	good reception quality
yellow	33-45	sufficient reception quality
red	0-30	poor reception quality



6.4.3.2 Receiver Position

In this tab the current position and the GPS reception mode is adjusted and displayed.



Reception Mode - GPS-Synchronisationsmodus

3D - Evaluation

The accuracy of the time evaluation is defined by the exact calculation of the installation position. In order to carry out this calculation (3D evaluation) it is necessary to receive information from at least 4 satellites. The signal runtime to several satellites is determined from the calculated position and the precise second mark is produced from their mean value.

Position-fix - Evaluation

In Position-fix mode the system can be synchronized using the data from only one received satellite. The system accuracy is depending on the exactness of the entered position. The second mark is calculated for the input position. If 4 satellites are available in this mode then the evaluation switches automatically into 3D mode and calculates the exact position. In this case, the accuracy with one satellite increases to the same accuracy as in 3D mode.



The Position-fix setting in System 6844DF (DekaFlex) is not possible.

Current Position with Longitude and Latitude

Hereby the geographical position of the system is entered. This is a helpful function referring to the initial commissioning of the system and reduces the first synchronization time of the GPS receiver.

6.4.4 ALARM Tab

All the links within the tabs on the left hand side lead to corresponding detailed setting options.

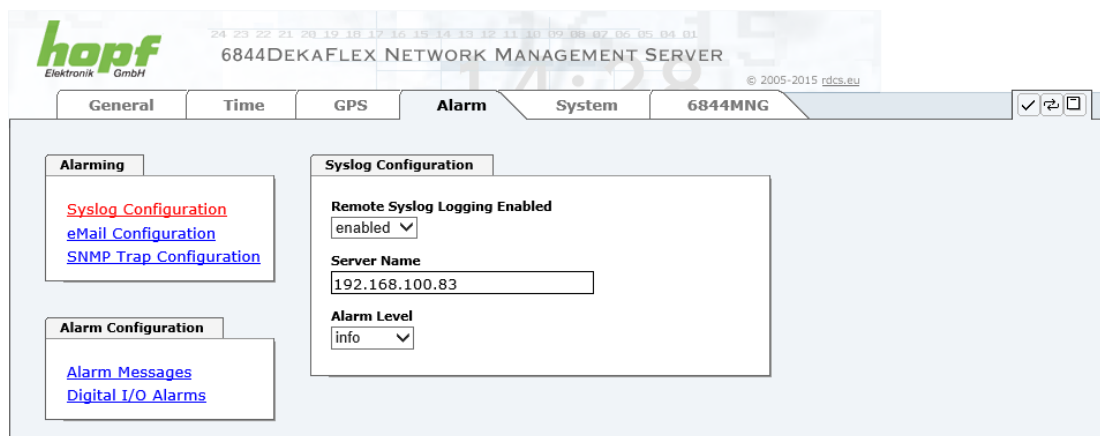
6.4.4.1 Syslog Configuration

It is necessary to enter the name or IP address of a Syslog server in order to store every configured alarm situation which occurs on the Board/Module in a Linux/Unix Syslog. If everything is configured correctly and enabled (dependent on the Syslog level), every message is transmitted to the Syslog server and stored in the Syslog file there.

Syslog uses Port 514.

Co-logging on the Board/Module itself is not possible as the flash memory is not of sufficient size.

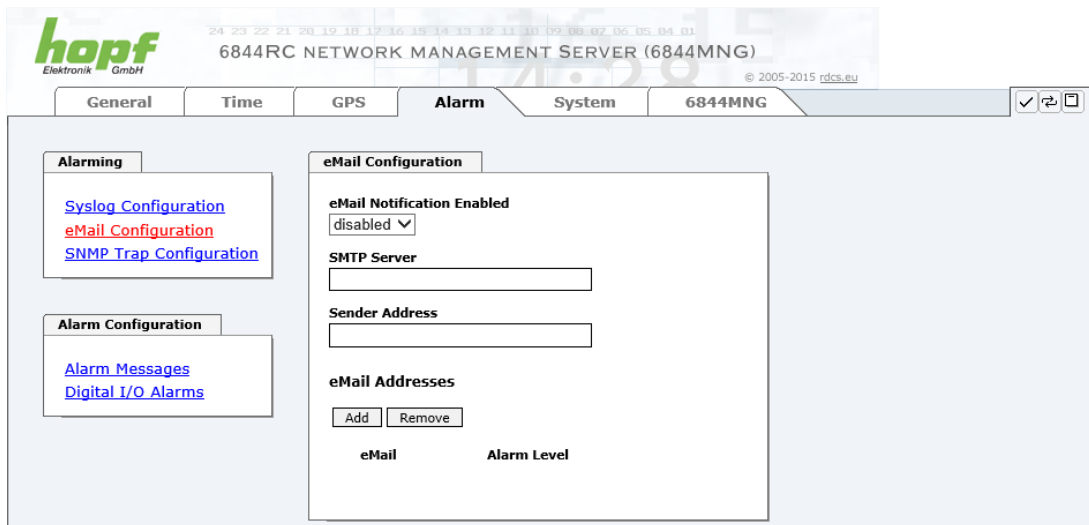
It should be noted that the standard Linux/Unix Syslog mechanism is used for this functionality. This is not the same as the Windows System Event mechanism!



The alarm level designates the priority level of the messages to be transmitted and the level from which transmission is to take place (see **Chapter 6.4.4.4 Alarm Messages**).

Alarm Level	Transmitted Messages
none	no messages
info	info / warning / error / alarm
warning	warning / error / alarm
error	error / alarm
alarm	alarm

6.4.4.2 E-mail Configuration – Error Messages via SMTP



E-mail notification is one of the important features of this device which offer technical personnel the opportunity to monitor and/or control the IT environment.

It is possible to configure various, independent email addresses which each have different alarm levels.

Dependent on the configured level, an email is sent after an error has occurred on the respective receiver.

A valid email server (SMTP server) must be entered for the purpose of correct configuration.

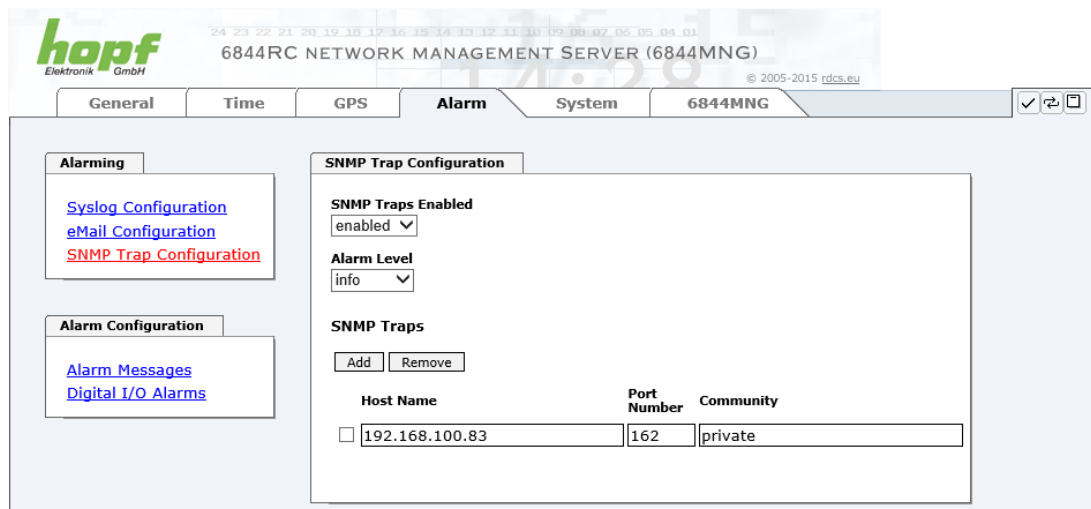
Some email servers only accept messages if the sender address entered is valid (spam protection). This can be inserted in the “Sender Address” field.

The Alarm Level designates the priority level of the messages to be sent and the level from which they are to be sent (see **Chapter 6.4.4.4 Alarm Messages**).

Alarm Level	Transmitted Messages
none	no messages
info	info / warning / error / alarm
warning	warning / error / alarm
error	error / alarm
alarm	alarm

6.4.4.3 SNMP Configuration / TRAP Configuration

It is possible to use an SNMP agent (with MIB) or to configure SNMP traps in order to monitor the Board/Module via SNMP.



SNMP traps are sent to the configured hosts via the network. It should be noted that these are based on UDP and therefore it is not certain that they will reach the configured host!

Several hosts can be configured. However, all have the same alarm level.

The private **hopf** enterprise MIB is also available via the web.

The "Alarm Level" designates the priority level of the messages to be sent and the level from which they are to be sent (see **Chapter 6.4.4.4 Alarm Messages**).

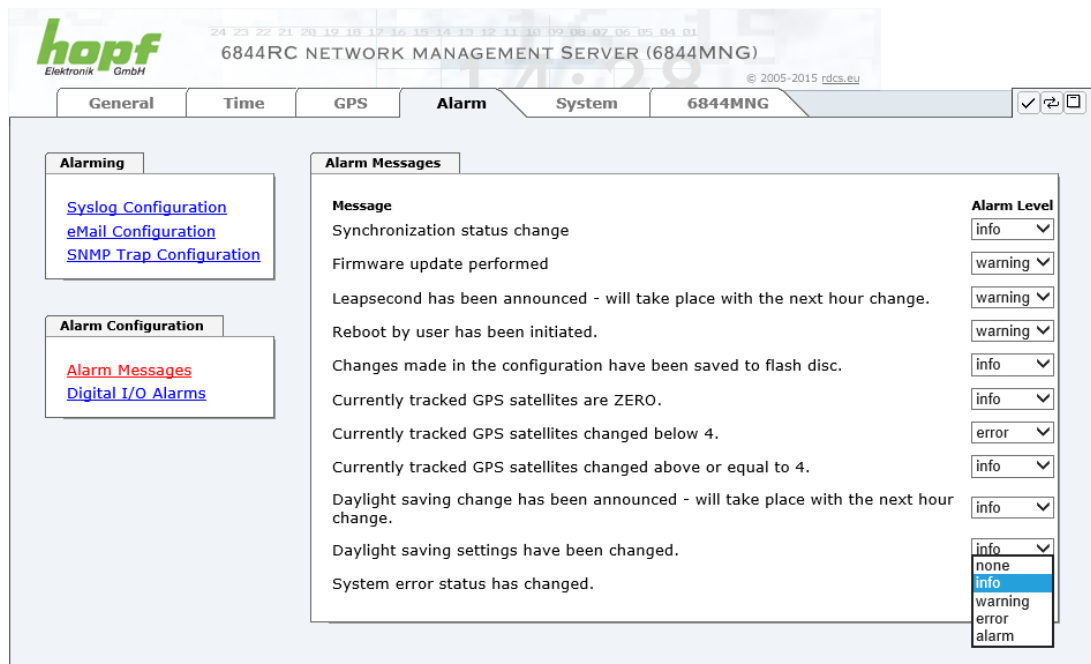
Alarm Level	Transmitted Messages
none	no messages
info	info / warning / error / alarm
warning	warning / error / alarm
error	error / alarm
alarm	alarm



SNMP protocol must be enabled in order to use SNMP

6.4.4.4 Alarm Messages

Every message shown in the image can be configured with the displayed alarm levels. If level NONE is selected this means that this message is completely ignored.



Message	Alarm Level
Synchronization status change	info
Firmware update performed	warning
Leapsecond has been announced - will take place with the next hour change.	warning
Reboot by user has been initiated.	warning
Changes made in the configuration have been saved to flash disc.	info
Currently tracked GPS satellites are ZERO.	info
Currently tracked GPS satellites changed below 4.	error
Currently tracked GPS satellites changed above or equal to 4.	info
Daylight saving change has been announced - will take place with the next hour change.	info
Daylight saving settings have been changed.	info
System error status has changed.	info

Depending on the messages, their configured alarm levels and the configured alarm level of the alarming services, an alarm message will be sent in case of an event



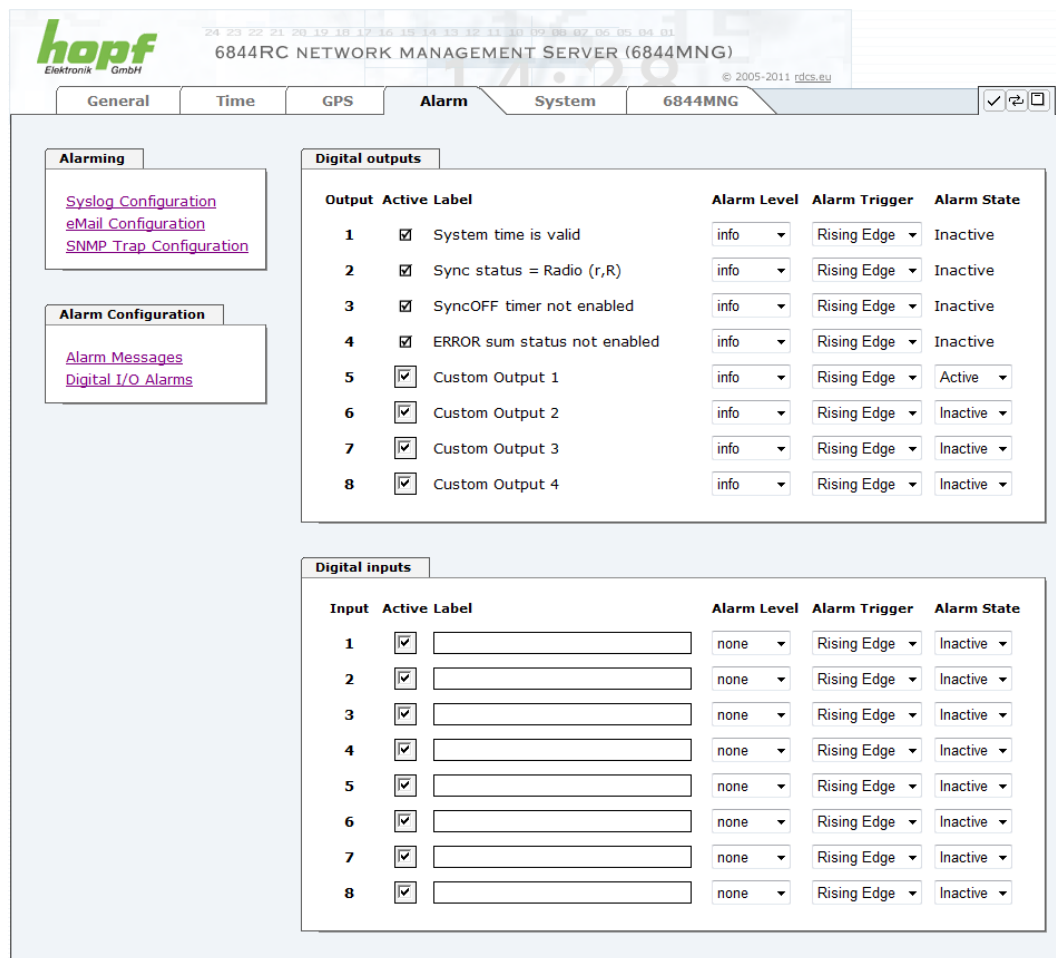
If a value is changed, the saving of the same needs for a permanent safeguarding to be considered unless it will get lost when restarting!



For recording all changes of the System status that are displayed via the system status LEDs of the basis System, the ALARM "System status has changed" needs to be activated.

6.4.4.5 Digital I/O Alarms

System 6844(RC) internally provides 4 (optionally 8) digital status outputs and 4 (optionally 8) status inputs. Depending on the respective signal status 6844MNG is able to generate according alarm messages.



hopf Elektronik GmbH
6844RC NETWORK MANAGEMENT SERVER (6844MNG)
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General Time GPS **Alarm** System 6844MNG

Alarming

[Syslog Configuration](#)
[eMail Configuration](#)
[SNMP Trap Configuration](#)

Alarm Configuration

[Alarm Messages](#)
[Digital I/O Alarms](#)

Digital outputs

Output	Active	Label	Alarm Level	Alarm Trigger	Alarm State
1	<input checked="" type="checkbox"/>	System time is valid	info	Rising Edge	Inactive
2	<input checked="" type="checkbox"/>	Sync status = Radio (r,R)	info	Rising Edge	Inactive
3	<input checked="" type="checkbox"/>	SyncOFF timer not enabled	info	Rising Edge	Inactive
4	<input checked="" type="checkbox"/>	ERROR sum status not enabled	info	Rising Edge	Inactive
5	<input checked="" type="checkbox"/>	Custom Output 1	info	Rising Edge	Active
6	<input checked="" type="checkbox"/>	Custom Output 2	info	Rising Edge	Inactive
7	<input checked="" type="checkbox"/>	Custom Output 3	info	Rising Edge	Inactive
8	<input checked="" type="checkbox"/>	Custom Output 4	info	Rising Edge	Inactive

Digital inputs

Input	Active	Label	Alarm Level	Alarm Trigger	Alarm State
1	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
2	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
3	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
4	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
5	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
6	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
7	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive
8	<input checked="" type="checkbox"/>		none	Rising Edge	Inactive

Digital Outputs

This display picture shows the current condition of the four internal digital status outputs. In addition four more outputs for special customer functions are available.

Output 1	System time is valid
Inactive	Sync.-Status = "-"
Active	Sync.-Status = "C", "r", "R"

Output 2	Sync status = Radio (r, R)
Inactive	Sync.-Status: invalid (-), crystal (C)
Active	Sync.-Status: radio without regulation (r), radio (R)

Output 3	SyncOFF Timer not enabled
Inactive	SyncOFF Timer is running (active / expired)
Active	SyncOFF Timer is not running (not active)

Output 4	Error sum status not enabled
Inactive	Error sum status available (min. one ERROR-Bit is active)
Active	Error sum status is not available (no ERROR-Bit is set)

Digital Inputs

There are optionally inputs for special customer functions available.

Active

Signal inputs and status outputs switched to active are used for generation of alarm messages

Alarm Level

The alarm level indicates the priority level of the generated message.

- None
- INFO
- warning
- Error
- alarm

Alarm Trigger

The alarm trigger indicated the direction of the change of status for generation of the alarm message.

Alarm Trigger	e.g. for Output 2 - Sync status = Radio (r, R)		
Falling Edge	Active Sync.-Status: radio without regulation (r), radio (R)"	⇒	Inactive Sync.-Status: invalid (-), crystal (C)
Rising Edge	Inactive Sync.-Status: invalid (-), crystal (C)	⇒	Active Sync.-Status: radio without regulation (r), radio (R)"
Both Edges	Inactive Sync.-Status: invalid (-), crystal (C)	↔	Active Sync.-Status: radio without regulation (r), radio (R)"

Alarm State

The **alarm state** indicates the current and internal conditions of the status outputs/signal outputs.

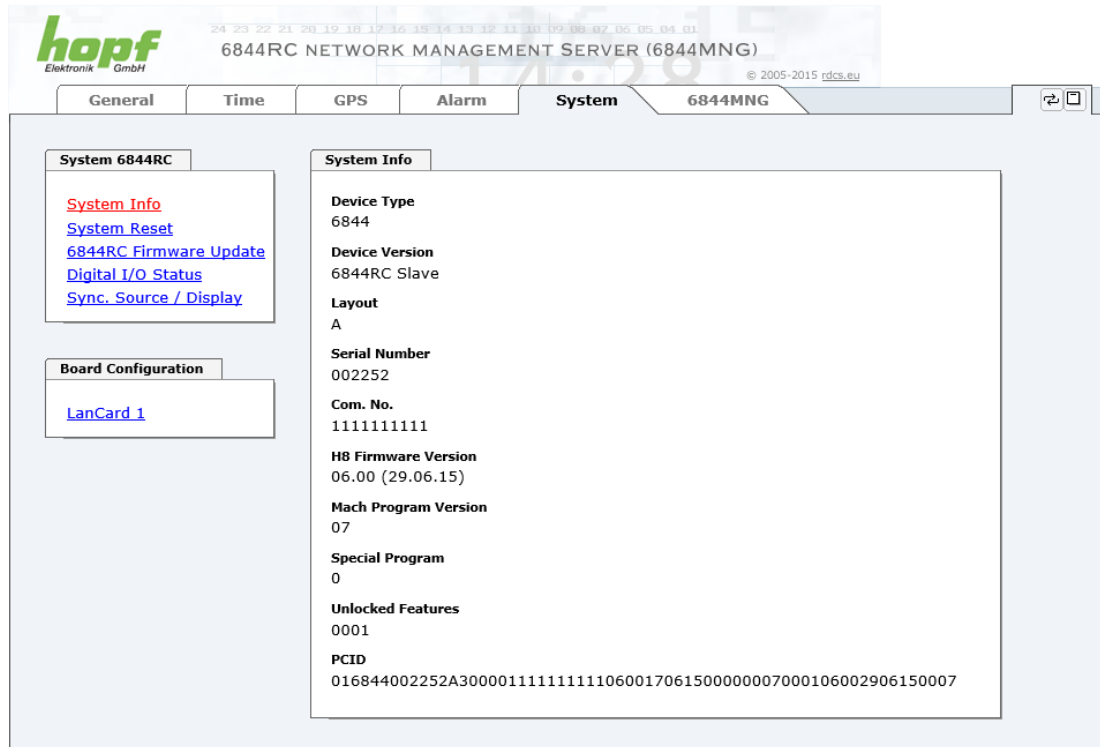
Verification Redu Power Supply



With active optional function "Verification of Redu. power supply" the Digital Inputs 1 and 2 are used permanently. This feature is available ex Stand "6844 H8 program version 06.00".

6.4.5 System Tab

On the left side every link of the navigation is leading to the appropriate system overview.



This tab provides the basic information about the system 6844RC as well as software / firmware.

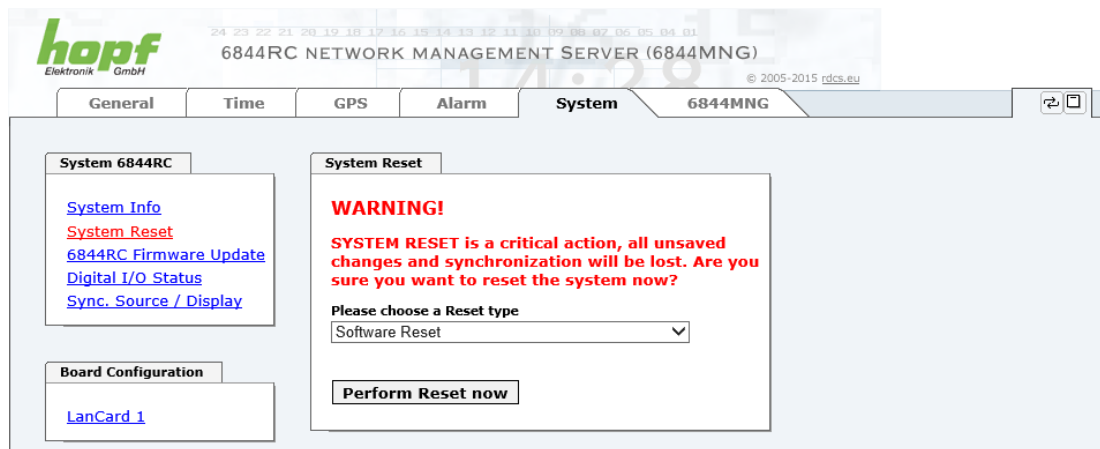
6.4.5.1 System Info

All information is available exclusively in write-protected and read-only form. Information about the Board/Module type, serial number and current software versions is provided to the user for service and enquiry purposes.

- Card Type
- Device Version
- Layout
- Serial Number
- Com. No.
- H8 Firmware Version
- Mach Program Version
- Special Program
- Unlocked Features
- PCID

6.4.5.2 System Reset – Restart Time Source

In System 6844(RC), a reset or default can be triggered in a differentiated way, in the System or in individual components.



- A software-reset is triggered by pressing **Software Reset**.
- A hardware-reset is triggered by pressing **Hardware Reset**
- A default of the GPS receiver is triggered by pressing **Factory Defaults – GPS receiver only**.
- A factory default is triggered by pressing **Factory Defaults – Control Board + GPS receiver**.

Press the "**Perform Reset now**" button and wait until a restart is done. This process can take until one minute. The website will be updated automatically.

6.4.5.2.1 Software-Reset (Control Board 6844(RC) only)

This function triggers a software reset of the System 6844(RC) Control Board. All other Function Boards in the System continue to run (except Function Boards without their own processor).



This function has no effect on the failsafe-stored data.

6.4.5.2.2 Hardware-Reset (Complete System)

This function triggers a hardware reset of the whole System 6844(RC). All Function Boards present in the System 6844(RC) are reset and restarted.



This function has no effect on the failsafe-stored data.

6.4.5.2.3 Trigger the GPS Receiver Default (GPS only)

This function triggers a default of the onboard GPS receiver located on Control Board 6844(RC). All data stored in the GPS receiver, for example leap second information, are deleted and have to be recalculated by the GPS receiver. This may take about 12-13 minutes if there is satellite reception during this time. Failure of satellite reception may extend this time.



This function has no effect on the data stored fail-safe on Control Board 6844(RC).

6.4.5.2.4 Factory Default (Control Board 6844(RC) only)

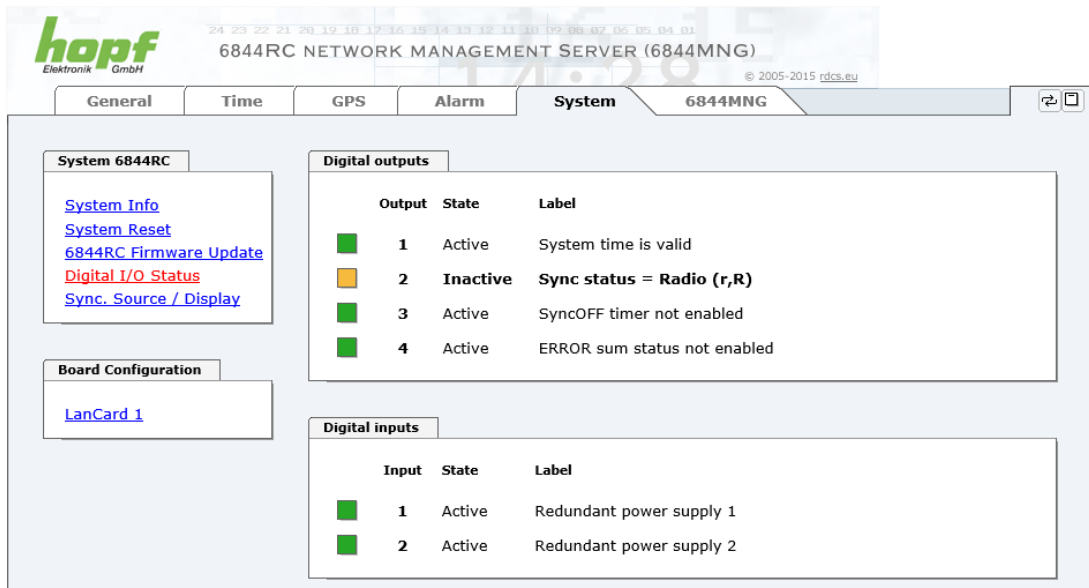
This function triggers a factory default of the entire Control Board 6844(RC) including GPS receiver (if available). Furthermore, all Function Boards present in System 6844(RC) are reset and rebooted.



This function resets **almost every** setting of the Control Board to factory default values.

6.4.5.3 Digital I/O Status

This side displays the current state of the digital signal inputs and digital status outputs.



The screenshot shows the web interface for the 6844RC NETWORK MANAGEMENT SERVER (6844MNG). The interface includes a navigation bar with tabs: General, Time, GPS, Alarm, System, and 6844MNG. The 'System' tab is selected, showing the 'System 6844RC' section. On the left, there are links for 'System Info', 'System Reset', '6844RC Firmware Update', 'Digital I/O Status' (highlighted in red), and 'Sync. Source / Display'. Below these are 'Board Configuration' and 'LanCard 1'. The main content area is divided into two sections: 'Digital outputs' and 'Digital inputs'. The 'Digital outputs' section contains a table with 4 rows, showing output numbers 1 to 4, their states (Active or Inactive), and their labels. The 'Digital inputs' section contains a table with 2 rows, showing input numbers 1 and 2, their states (Active), and their labels.

Output	State	Label
1	Active	System time is valid
2	Inactive	Sync status = Radio (r,R)
3	Active	SyncOFF timer not enabled
4	Active	ERROR sum status not enabled

Input	State	Label
1	Active	Redundant power supply 1
2	Active	Redundant power supply 2

Output / Input: Number of status output / signal input

State: Actual situation of state output / signal input = **active / inactive**

Label: Name / function description

Verification Redu Power Supply



With active optional function "Verification of Redu. power supply" the Digital Inputs 1 and 2 are used permanently. This feature is available ex Stand "6844 H8 program version 06.00".

6.4.5.4 Sync.Source / Display

Using this tab, the various options can be selected to synchronize the system 6844RC. Also the LCD display of system 6844RC is configured.

hopf
Elektronik GmbH

6844RC NETWORK MANAGEMENT SERVER (6844MNG)

© 2005-2015 rdc.eu

General Time GPS Alarm System 6844MNG

System 6844RC

[System Info](#)
[System Reset](#)
[6844RC Firmware Update](#)
[Digital I/O Status](#)
[Sync. Source / Display](#)

Board Configuration

[LanCard 1](#)

Synchronization Source

Synchronization Source
GPS

Display Settings

Time Base
Local Time

Language
German

Choice of Synchronization source

- GPS
- Master/Slave String (COM1)
- Master/Slave String (COM1) with PPS
- DCF77 pulse (CET)
- DCF77 pulse (global)

Display Settings – Adjusting the LCD Display of System 6844RC

Time Base

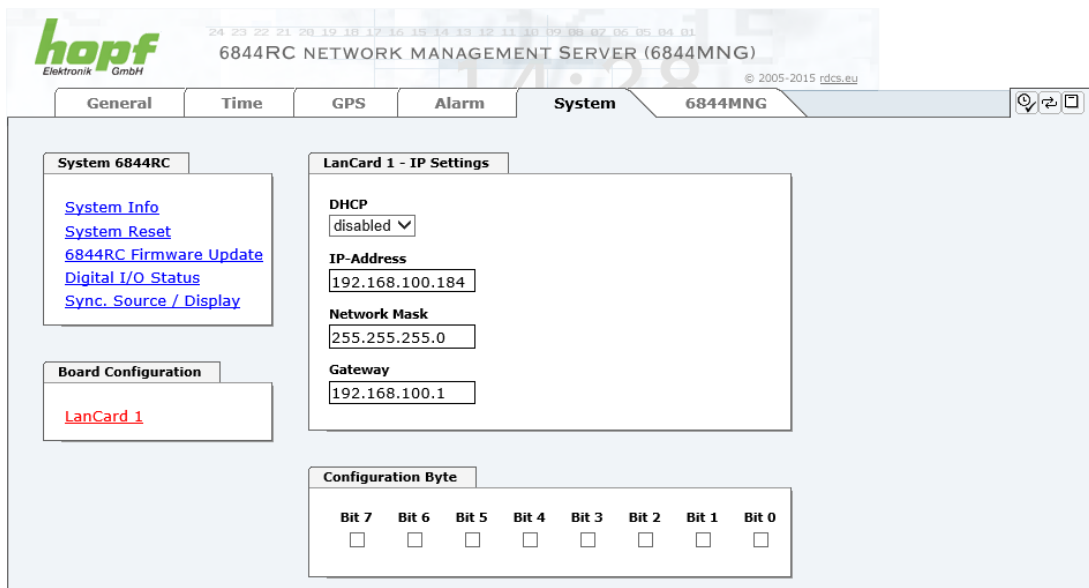
- Local Time
- UTC

Language

- German
- English

6.4.5.5 LanCard 1(2) Parameter

Via the basis System the basic parameters of the LAN board 1(2) are only generated that they are accessible via **ETH0** in the network. All further configurations of the LAN board 1(2) are made via WebGUI.



The screenshot shows the WebGUI interface for the 6844MNG Network Management Server. The top navigation bar includes tabs for General, Time, GPS, Alarm, System, and 6844MNG. The main content area is divided into two sections: System 6844RC and LanCard 1 - IP Settings. The System 6844RC section contains links for System Info, System Reset, 6844RC Firmware Update, Digital I/O Status, and Sync. Source / Display. The LanCard 1 - IP Settings section contains fields for DHCP (disabled), IP-Address (192.168.100.184), Network Mask (255.255.255.0), and Gateway (192.168.100.1). Below these fields is a Configuration Byte section with checkboxes for Bit 7, Bit 6, Bit 5, Bit 4, Bit 3, Bit 2, Bit 1, and Bit 0.

Configuration of:

DHCP

IP-Address

Network Mask

Gateway

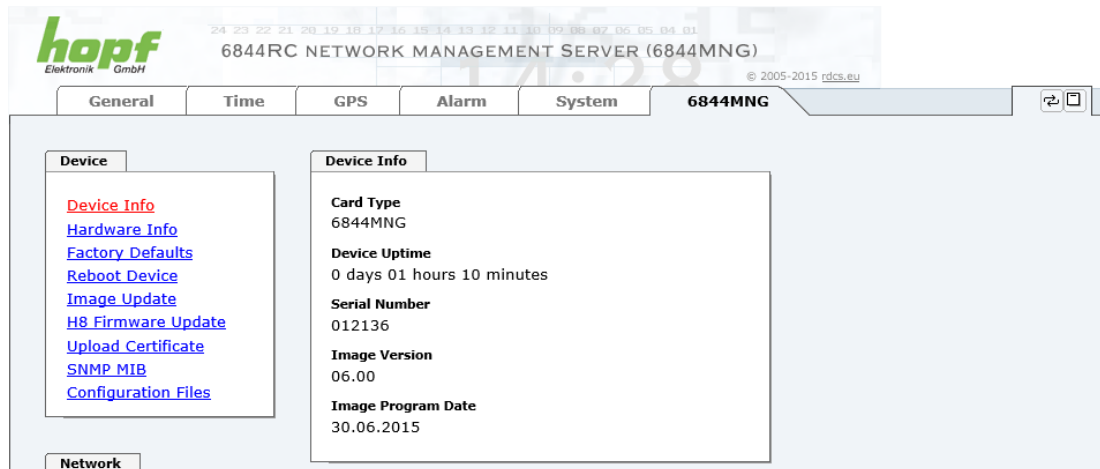
Configuration Byte



The input parameters for the LAN card 2 is similar to LAN card 1

6.4.6 6844MNG Tab

All the links within the tabs on the left hand side lead to corresponding detailed setting options.



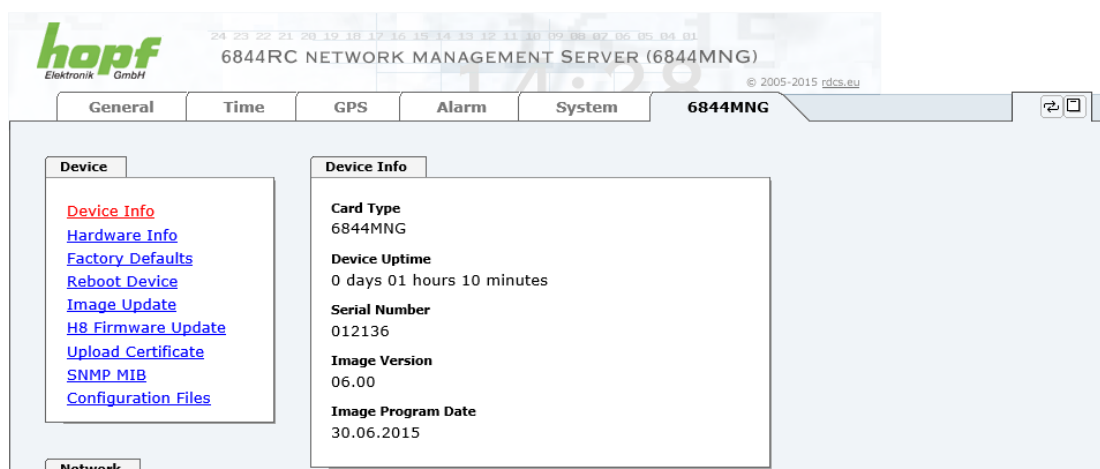
This tab provides the basic information about the Board hardware and software/firmware. Password administration and the update services for the FG6844MNG are also made accessible via this website. The complete download zone is also a component of this site.

In addition, there is the possibility of full parameterizing the network card/module 6844MNG

6.4.6.1 Device Information

All information is available exclusively in write-protected and read-only form. Information about the Board/Module type, serial number and current software versions is provided to the user for service and enquiry purposes.

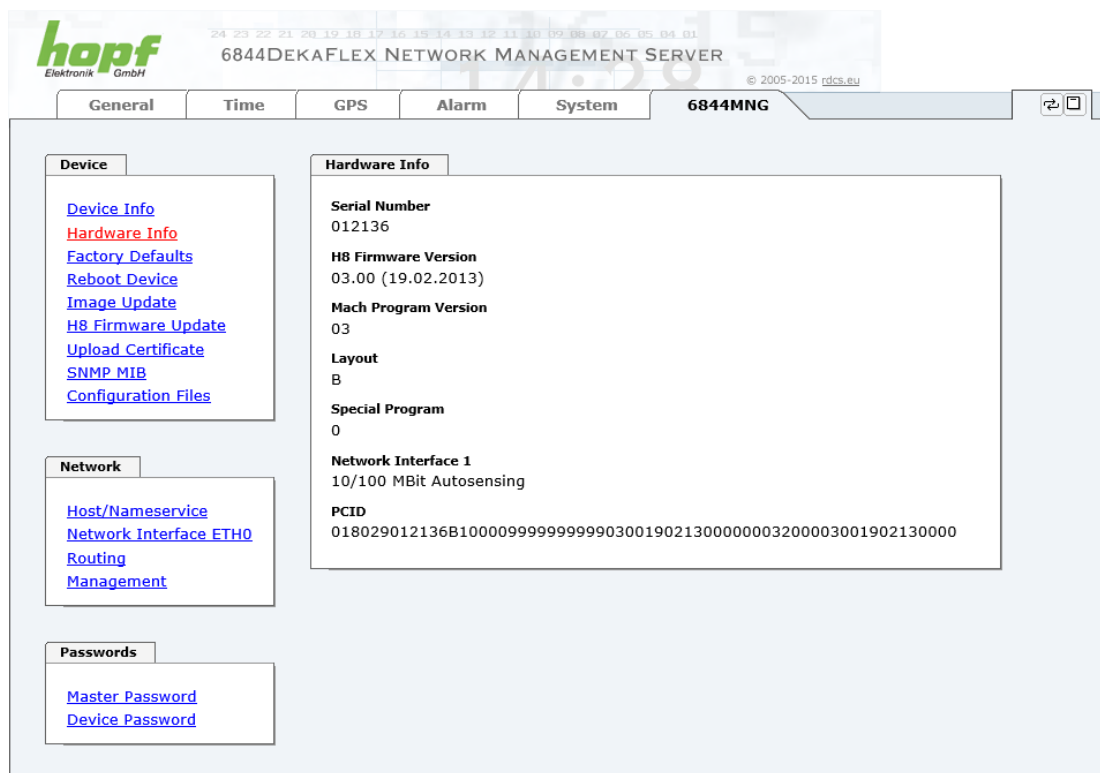
- Card Type
- Device Uptime
- Serial Number
- Image Version
- Image Program Date



6.4.6.2 Hardware Information

Read-only access is provided here in the same way as for device information. The user requires this information in the case of service requests, e.g. MACH version hardware status etc.

- Serial Number
- H8 Firmware Version
- MACH Firmware Version
- Card Layout
- Special Program
- Network Interface 1
- Product-Config-ID (PCID)



6.4.6.3 Restoring the Factory Settings - Factory Defaults

In some cases it may be necessary or desirable to restore all of the Board's settings to their delivered condition (factory defaults).

Factory Defaults

WARNING!
RESET to factory defaults is a critical action, all values will be set to default - the device will be rebooted immediately. Are you sure you want to reset to factory defaults now?

Reset now

This function serves to restore all values in the flash memory to their default values. This also includes passwords. (See **Chapter 9 Factory Defaults**).

Please log in as a "Master" user in accordance with the description in **Chapter 6.3.1 LOGIN and LOGOUT as a User**

Press the "**Reset now**" button and wait until the restart has been completed.

Once this procedure has been triggered there is NO possibility of restoring the deleted configuration.

**WARNING:**

A complete check (and reconfiguration of the Board/Module where appropriate) is required after every **Factory Default** procedure. In particular, the MASTER and DEVICE passwords must be reset.

6.4.6.4 Reboot Device FG6844MNG

Reboot Device

WARNING!
REBOOT is a critical action, all unsaved changes will be lost. Are you sure you want to reboot the device now?

Reboot now

All settings not saved with "**Save**" are lost on reset (see **Chapter 6.3.3 Inputting or Changing Data**).

Please log in as a "Master" user in accordance with the description in **Chapter 6.3.1 LOGIN and LOGOUT as a User**

Press the "**Reset now**" button and wait until the restart has been completed.

This procedure can take up to one minute. The website is not automatically updated.

6.4.6.5 Update 6844MNG -Image / -H8 Firmware

New features, patches and error recovery are provided for the individual Boards by means of updates.

Both the embedded software and the H8 firmware of board 6844MNG can only be downloaded to the board/module via the web interface (login as "Master" user required).



The following points should be noted regarding updates:

- Only experienced users or trained technical personnel should carry out an update after checking all necessary preconditions.
- Check that the update on hand is suitable for your Board. If in doubt please consult a **hopf** engineer.
- Updates are usually executed as a set, i.e. H8 firmware update + image update. Unless specifically defined otherwise in the SET, it is absolutely essential to complete the H8 firmware update first, followed by the image update.
- In order to guarantee a correct update, the "**New version of saved site**" function must be set to "**On each access to the site**" in the Internet browser used.
- During the update procedure, the device **must not be switched off** and **settings must not be saved to the flash memory!**
- Important: **Faulty updates** or **update attempts** may under certain circumstances require the Board/Module to be returned to the factory for rectification at the owner's expense.



Usually the previously configured parameters are kept in System when proceeding an update. If this is not the case, this is specially described in a document belonging to the update.

In order to carry out an update, enter the name and the folder in which the update / firmware image is located in the text field or open the file selection dialogue by pressing the "Browse" button.

Correct image designations are for example:

Image Update of LAN Management 6844MNG

File: upgrade_6844_MNG_v0800.img

Embedded-Image of 6844MNG

(Update duration approx. 3-5 minutes)

H8/6844 Firmware Update of Control Board 6844RC

File: 6844MNG_H8_v0300.img

H8 Firmware of 6844RC

(Update duration approx. 3-5 minutes)

The update process is started by pressing the "**Upload now**" respectively the "**Update now**" button. The update is installed if the transfer and checksum test are successful. A success page is displayed and shows the number of bytes that have been transferred and installed.

H8 Firmware Update

WARNING!
H8 FIRMWARE UPDATE is a critical action. Please ensure not to switch off power during update or upload!

Update file:

An automatic reboot of the card/module is triggered in case of a H8 firmware update of the FG6844MNG.

Image Update

WARNING!
IMAGE UPDATE is a critical action. Please ensure not to switch off power during update! Caution: upload can take more than 10 minutes, please be patient!

Update file:

During the **image update** of FG6844MNG do not leave the WebGUI site. **Wait** and do **not switch** the current WebGUI site during this time until the message "**Please Reboot Device**" appears.

After the image update a restart (reboot) of FG6844MNG needs to be processed. Therefore, log in again in WebGUI of FG6844MNG and release a restart under DEVICE / REBOOT DEVICE

6.4.6.6 Upload Certificate for HTTPS Application (Upload Certificate)

For use of WebGUI via https access a security certificate can be loaded in the Management Board/Module 6844MNG

Upload Certificate

WARNING!
UPLOAD a Certificate is a critical action. Please ensure not to switch off power during upload and reboot after upload!

Update file:


Durchsuchen...

Upload now

6.4.6.7 Download von SNMP MIB

The private **hopf** enterprise MIB is also available via the WebGUI.

SNMP MIB

Download SNMP MIB
 [Click here to download](#)

6.4.6.8 Download of Configurations

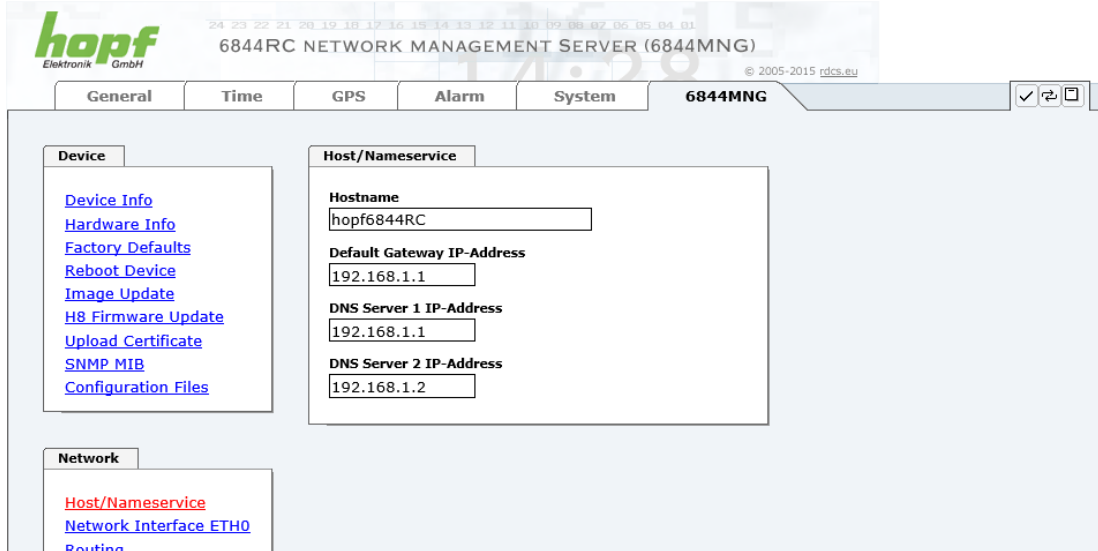
In order to be able to download certain configuration files via the web interface it is necessary to be logged on as a "Master" user. Only the documentation can be downloaded without logging on.

Configuration Files

Download System Configuration
 [Click here to download](#)

6.4.6.9 Network Interface of 6844MNG (Network)

Each link of the network navigation leads to corresponding detailed setting options for the FG6844MNG



6.4.6.10 Hostname / Name Service

Setting for the unique network identification.

Hostname

The standard setting for the Hostname is "**LAN6844**". This name should also be adapted to the respective network infrastructure.

If in doubt, simply leave the standard value in place or ask your network administrator.



The host name is RFC conform. Thus all alphanumeric signs (characters and numbers) and the hyphen (-) can be used. Additionally it should be considered that the first and last sign have to be a character or number.



A BLANK Hostname is not a valid name and can cause the Board/Module to malfunction.

Default Gateway

The standard gateway is generally configured via the Base System menu. However it can also be changed via the web interface.

Contact your network administrator for details of the standard gateway if not known.

If no standard gateway is available (special case), enter 0.0.0.0 in the input field or leave the field blank.

DNS Server 1 & 2

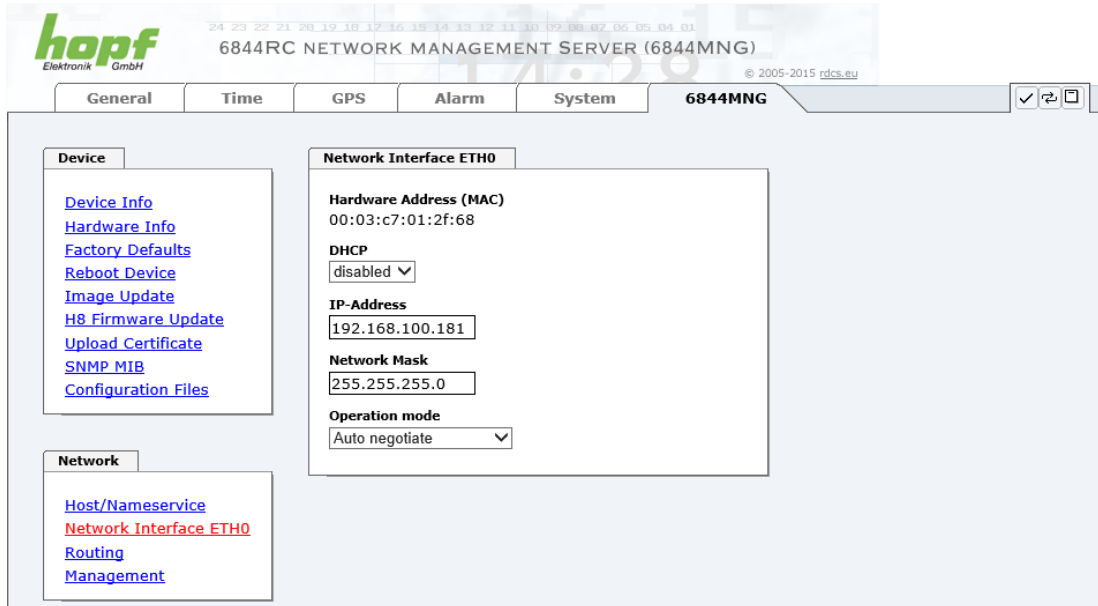
The IP address of the DNS server should be entered if you wish to use complete Hostnames (hostname.domainname) or work with reverse lookup.

Contact your network administrator for details of the DNS server if not known.

If no DNS server is available (special case), enter 0.0.0.0 in the input field or leave the field blank.

6.4.6.10.1 Network Interface ETH0

Configuration of the Ethernet interface ETH0 of FG6844MNG.



The screenshot shows the web interface of the 6844RC NETWORK MANAGEMENT SERVER (6844MNG). The top navigation bar includes tabs for General, Time, GPS, Alarm, System, and 6844MNG. The left sidebar contains a 'Device' menu with links like Device Info, Hardware Info, Factory Defaults, Reboot Device, Image Update, H8 Firmware Update, Upload Certificate, SNMP MIB, and Configuration Files. Below it is a 'Network' menu with links for Host/Nameservice, Network Interface ETH0 (highlighted), Routing, and Management. The main content area is titled 'Network Interface ETH0' and contains the following configuration fields:

- Hardware Address (MAC):** 00:03:c7:01:2f:68
- DHCP:** disabled (dropdown menu)
- IP-Address:** 192.168.100.181
- Network Mask:** 255.255.255.0
- Operation mode:** Auto negotiate (dropdown menu)

Default Hardware Address (MAC Address)

The MAC address can only be read and cannot be changed by the user. It is assigned once-only by **hopf**Elektronik GmbH for each Ethernet interface.



hopfElektronik GmbH MAC addresses begin with **00:03:C7**:xx:xx:xx.

DHCP

If DHCP is to be used, 0.0.0.0 should be entered as the IP address via the **hopf**Base System menu (likewise for gateway and network mask). This change can also be made via the web interface by enabling the DHCP.



Changes to the IP address or the enabling of DHCP take immediate effect when the settings are accepted. The connection to the web interface must be adapted and regenerated.

IP Address

The IP address is generally configured via the **hopf** Base System menu. However it can also be changed via the web interface.

Contact your network administrator for details of the IP address if not known.

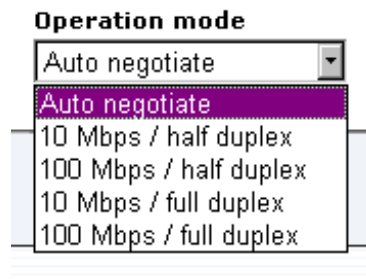
Network Mask

The network mask is generally configured via the **hopf** Base System menu. However it can also be changed via the web interface.

Contact your network administrator for details of the network mask if not known.

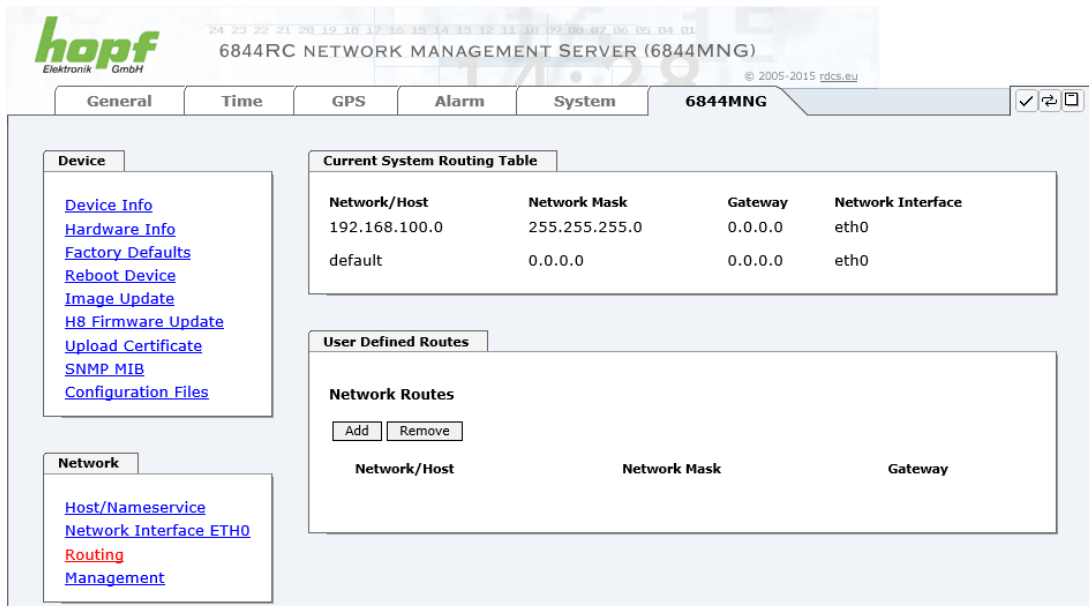
Operation Mode

The network device usually adjusts the speed and duplex mode to the device to which it is connected (e.g. HUB, SWITCH) automatically. If the network device requires a certain speed or duplex mode, this can be configured via the web interface. The value should only be changed in special cases. The automatic setting is normally used.



6.4.6.10.2 Routing

A route must be configured if the Board/Module is to be used in more than the local sub-network.



The screenshot shows the web interface of the 6844MNG Network Management Server. The top navigation bar includes tabs for General, Time, GPS, Alarm, and System. The main content area is divided into two sections: 'Device' and 'Network'. The 'Device' section contains links for Device Info, Hardware Info, Factory Defaults, Reboot Device, Image Update, H8 Firmware Update, Upload Certificate, SNMP MIB, and Configuration Files. The 'Network' section contains links for Host/Nameservice, Network Interface ETH0, Routing, and Management. The 'Current System Routing Table' is displayed, showing the following data:

Network/Host	Network Mask	Gateway	Network Interface
192.168.100.0	255.255.255.0	0.0.0.0	eth0
default	0.0.0.0	0.0.0.0	eth0

The 'User Defined Routes' section is also visible, showing a table with columns for Network/Host, Network Mask, and Gateway. There are 'Add' and 'Remove' buttons above the table.

Routes cannot be used where the gateway / gateway host is not in the local sub-network range of the Board.



This feature is an extended option and can cause problems in the network if it is not configured correctly!

The image above shows every configured route of the Base System Routing Table as well as the User Defined Routes.

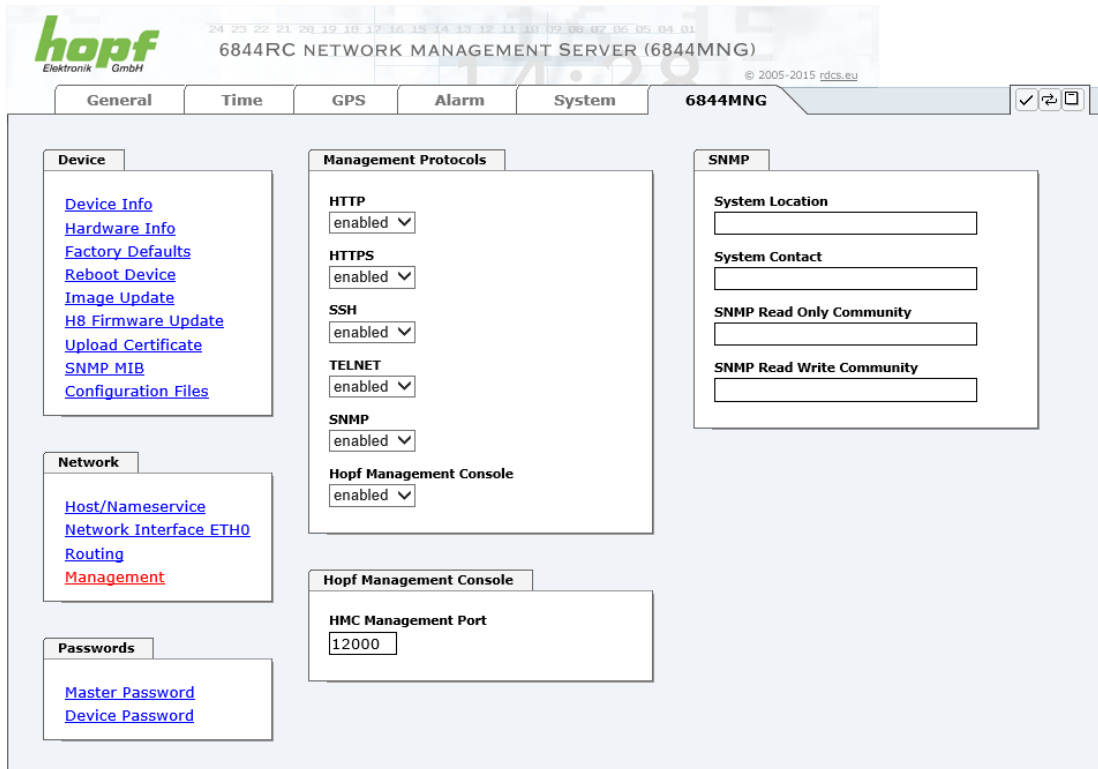


The FG6844MNG cannot be used as a router!

6.4.6.10.3 Management- / *hmc* Management Port / SNMP

Protocols that are not required should be disabled for security reasons. The only protocol that cannot be disabled is the HTTP/HTTPS. A correctly configured Board/Module is always accessible via the web interface.

Changes to the security for a protocol (enable/disable) take effect immediately.



The screenshot shows the web interface for the 6844MNG Network Management Server. The top navigation bar includes tabs for General, Time, GPS, Alarm, System, and 6844MNG. The main content area is divided into three sections:

- Device:** Contains links for Device Info, Hardware Info, Factory Defaults, Reboot Device, Image Update, H8 Firmware Update, Upload Certificate, SNMP MIB, and Configuration Files.
- Management Protocols:** Contains settings for HTTP, HTTPS, SSH, TELNET, and SNMP, each with an "enabled" status and a dropdown arrow. Below this is the "Hopf Management Console" section with an "HMC Management Port" set to 12000.
- SNMP:** Contains fields for System Location, System Contact, SNMP Read Only Community, and SNMP Read Write Community.

On the left side, there are additional sections for Network (Host/Nameservice, Network Interface ETH0, Routing, Management) and Passwords (Master Password, Device Password).

All fields must be completed for the SNMP to operate correctly. Contact your network administrator if you do not have all the data.

The SNMP protocol should be enabled when using SNMP Traps.



These service settings are applicable across the board! Services with "disabled" status are not externally accessible and are not made externally available by the Board!!!

By standard the connection between FG6844MNG and the remote software HMC is made via TCP Port 12000. If this value is changed all HMC-connections are interrupted. They must be re-connected by specification of the new configured ports.



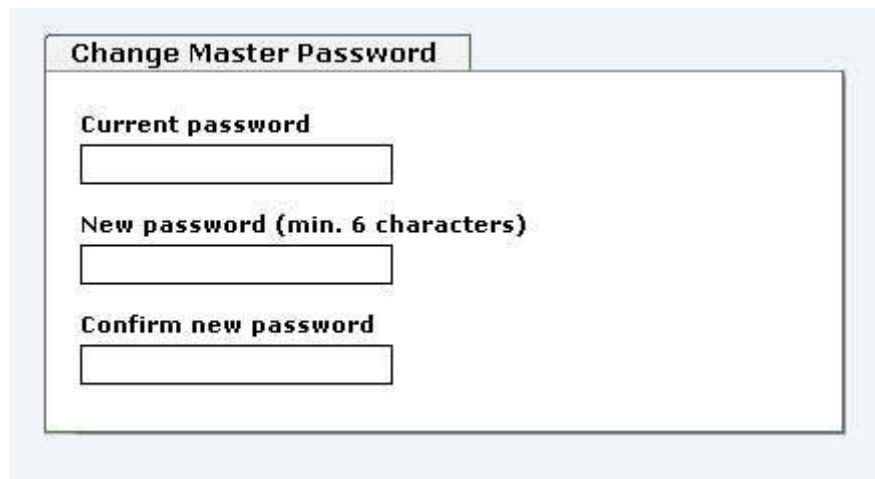
If there is a firewall between HMC and the Board/Module the adjusted port (default 12000) must be unlocked to use TCP.

6.4.6.11 Passwords

Differentiation is made between upper and lower case characters in passwords. In principle, all alphanumeric characters and the following symbols are allowed in passwords:

[] () * - _ ! \$ % & / = ?

(See also **Chapter 6.3.1 LOGIN and LOGOUT as a User**)



The screenshot shows a web browser window with a title bar that says "Change Master Password". Inside the window, there is a form with three input fields. The first field is labeled "Current password". The second field is labeled "New password (min. 6 characters)". The third field is labeled "Confirm new password". All three fields are empty and have a light gray border.

7 SSH and Telnet Basic Configuration



Only basic configuration is possible via SSH or Telnet. The complete configuration of FG6844MNG takes place exclusively via the WebGUI.

It is just as easy to use SSH (Port 22) or Telnet (Port 23) as the WebGUI. Both protocols use the same user interface and menu structure.

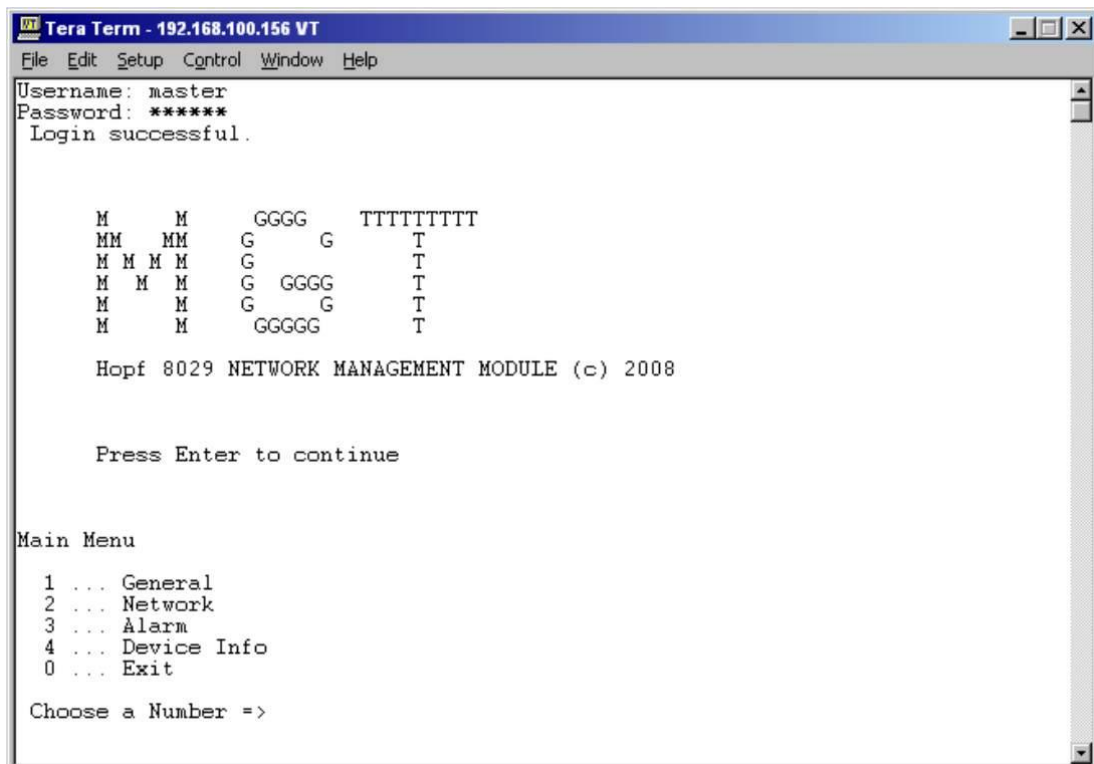
The user names and passwords are the same as on the web and are kept in alignment. (See **Chapter 6.3.1 LOGIN and LOGOUT as a User**)



SSH does not allow blank passwords for safety reasons (however this is the condition as delivered). Therefore, in order to use SSH, a password must have been pre-set via Telnet or the WebGUI.



The corresponding service is to be enabled for the use of Telnet or SSH (see **Chapter 6.4.6.10.3 Management- / hmc Management Port / SNMP**)



```

Tera Term - 192.168.100.156 VT
File Edit Setup Control Window Help
Username: master
Password: *****
Login successful.

  M      M      GGGG  TTTTTTTT
 MM    MM    G      G      T
M M M M    G      G      T
M  M  M    G  GGGG      T
M      M    G      G      T
M      M    GGGGG      T

Hopf 8029 NETWORK MANAGEMENT MODULE (c) 2008

Press Enter to continue

Main Menu
1 ... General
2 ... Network
3 ... Alarm
4 ... Device Info
0 ... Exit

Choose a Number =>

```

Navigation through the menu takes place by entering the respective number associated with the menu option (as can be seen in the above image).

8 Technical Data

Structure	
Type	Euro board 160 x 100 mm with 3U/4HP-Front panel
Voltage Supply	
internal System voltage Vcc	5V DC \pm 5% via System-BUS of Basis System

Temperature range	
Operating	0°C to +50°C
Storage	-20°C to +75°C
Humidity	max. 90%, not condensed

Power Consumption	
normal operating	Approximately 250 mA
Booting	Approximately 350 mA
LAN	
Network connection	Via LAN cable with RJ45 connector (recommended cable type CAT5 or better).
Requests per second	max. 1000 requests
Number of connectable clients	Theoretically unlimited
Network interface ETH0	10/100 Base-T
Ethernet compatibility	Version 2.0 / IEEE 802.3
Isolation voltage (Network to System)	1500 Vrms
MTBF	
MTBF	> 1.250.000 Std.

CE compliant to EMC Directive 89/336/EC and Low Voltage Directive 73/23/EC		
Safety / Low Voltage Directive		DIN EN 60950-1:2001 + A11 + Corrigendum
EN 61000-6-4		
EMC (Electromagnetic Compatibility) / Interference Immunity		EN 610000-4-2 /-3/-4/-5/-6/-11
EN 61000-6-2		EN 61000-3-2 /-3
Radio Interference Voltage	EN 55022	EN 55022 Class B
Radio Interference Emission	EN 55022	EN 55022 Class B

8.1 TCP/IP Network Protocols

- IPv4: Dynamic Host Configuration Protocol - DHCP (RFC 2131)
- HTTP/HTTPS
- Telnet
- SSH
- SNMP

8.2 Configuration

- HTTP/HTTPS-WebGUI (Browser Based)
- Telnet
- SSH
- External LAN Configuration Tool
- **hopf** 6844RC System keypad and display
- **hopf** Management Console (**hmc**)

8.3 Management

- HTTP/HTTPS (status, control)
- SNMPv2c, SNMP Traps (MIB-II, Private Enterprise MIB)
- Email Notification
- Syslog Messages to External Syslog Server
- Update via TCP/IP
- Fail-safe

8.4 Hardware

- Update
- System Management

9 Factory Defaults

FG6844MNG is generally delivered in accordance with the factory defaults.

9.1 Network

Host/Name Service	Setting	WebGUI Presentation
Hostname	hopf6844RC	hopf6844RC
Default Gateway	No change	---
DNS 1	Blank	---
DNS 2	Blank	---
Network Interface ETH0	Setting	WebGUI
DHCP	No change	No change
IP	No change	No change
Netmask	No change	No change
Operation mode	Auto negotiate	Auto negotiate
Routing	Setting	WebGUI
User Defined Routes	Blank	---
Management	Setting	WebGUI
HTTP	Enabled	Enabled
HTTPS	Disabled	Disabled
SSH	Disabled	Disabled
TELNET	Disabled	Disabled
SNMP	Disabled	Disabled
Hopf Management Console	Disabled	Disabled
HMC Management Port	12000	12000
System Location	Blank	---
System Contact	Blank	---
Read Community	Blank	---
Read/Write Community	Blank	---

9.2 ALARM

Syslog Configuration	Setting	WebGUI
Syslog	Disabled	Disabled
Server Name	Blank	---
Alarm Level	Disabled	None
Email Configuration	Setting	WebGUI
Email Notifications	Disabled	Disabled
SMTP Server	Blank	---
Sender Address	Blank	---
Email Addresses	Blank	---
SNMP Traps Configuration	Setting	WebGUI
SNMP Traps	Disabled	Disabled
Alarm Level	Disabled	None
SNMP Trap Receivers	Blank	---
Alarm Messages	Setting	WebGUI
Alarms	All disabled	All none
External Alarms	Setting	WebGUI
Alarms	All disabled	All none

9.3 Digital I/O Alarms

Digital outputs	Settings	WebGUI
Active	All not active	All not active
Alarm Level	All none	All none
Alarm Trigger	All Both Edges	All Both Edges
Alarm State	All active	All active

Digital inputs	Settings	WebGUI
Active	All not active	All not active
Label	Blank	---
Alarm Level	All none	All none
Alarm Trigger	All Both Edges	All Both Edges
Alarm State	All not active	All not active

9.4 DEVICE

User Passwords	Setting	WebGUI
Master Password	master	master
Device Password	device	device

10 Glossary and Abbreviations

10.1 Time-specific expressions

UTC	UTC Time (Universal Time Coordinated) was dependent on the Greenwich Mean Time (GMT) definition of the zero meridian. While GMT follows astrological calculations, UTC is based on the stability and accuracy of the Caesium standard. The leap second was defined in order to cover this deviation.
Time Zone	The globe was originally divided into 24 longitudinal segments or time zones. Today, however, there are a number of time zones which in part apply specifically to certain individual countries only. In relation to the time zones, consideration was given to the fact that local daylight and sunlight coincide at different times in the individual time zones. The zero meridian runs through the British city of Greenwich.
Time Offset	This is the difference between UTC and the valid standard time of the current time zone. The Time Offset will be commit from the local time zone.
Local Standard Time (winter time)	Standard Time = UTC + Time Offset The time offset is defined by the local time zone and the local political regulations.
Daylight Saving Time (summer time)	Offset of Daylight Saving Time = + 1h Daylight Saving Time was introduced to reduce the energy requirement in some countries. In this case one hour is added to the standard time during the summer months.
Local Time	Local Time = Standard Time, if exists with summer / winter time changeover
Leap Second	A leap second is a second which is added to the official time (UTC) in order to synchronise this with Greenwich Mean Time when required. Leap seconds are defined internationally by the International Earth Rotation and Reference Systems Service (IERS) .

10.2 Abbreviations

	English	German
D, DST	Daylight Saving Time	Sommerzeit
ETH0	Ethernet Interface 0	Netzwerk Schnittstelle 0
FW	Firmware	Firmware
GPS	Global Positioning System	Globales Positionssystem
HW	Hardware	Hardware
IF	Interface	Schnittstelle
IP	Internet Protocol	Internet Protokoll
LAN	Local Area Network	Lokales Netzwerk
LED	Light Emitting Diode	Leuchtdiode
NTP	Network Time Protocol (version 3: RFC 1305)	Netzwerk Zeit Protokoll (Version 3: RFC 1305)
NE	Network Element	Device in Telecommunication network
OEM	Original Equipment Manufacturer	Originalgerätehersteller
OS	Operating System	Betriebssystem
PC	Personal Computer	Personal Computer
RFC	Request for Comments	technische und organisatorische Dokumente
SNMP	Simple Network Management Protocol (handled by more than 60 RFCs)	einfaches Netzwerkverwaltungsprotokoll
SNTP	Simple Network Time Protocol (version 4: RFC 2030)	Netzwerk Zeit Protokoll (version 4: RFC 2030)
S, STD	Standard Time	Winterzeit / Standardzeit
TCP	Transmission Control Protocol	Network protocol http://de.wikipedia.org/wiki/Transmission_Control_Protocol
ToD	Time of Day	Tageszeit
UDP	User Datagram Protocol	Network protocol http://de.wikipedia.org/wiki/User_Datagram_Protocol
UTC	Universal Time Coordinated	Koordinierte Weltzeit
WAN	Wide Area Network	großräumiges Netz
msec	millisecond (10^{-3} seconds)	Millisekunde (10^{-3} Sekunden)
µsec	microsecond (10^{-6} seconds)	Mikrosekunde (10^{-6} Sekunden)
ppm	parts per million (10^{-6})	Teile pro Million (10^{-6})

10.3 Definitions

An explanation of the terms used in this document.

10.3.1 DHCP (Dynamic Host Configuration Protocol)

DHCP makes it possible to integrate a new computer into an existing network with no additional configuration. It is necessary only to set the automatic reference of the IP address on the client. Without DHCP, relatively complex settings need to be made. In addition to setting the IP address, other parameters such as network mask, gateway and DNS server would need to be entered. A DHCP server can assign these parameters automatically by DHCP when starting up a new computer (DHCP client).

DHCP is an extension of the BOOTP protocol. A valid IP address is allocated automatically if a DHCP server is available on the network and DHCP is enabled.

The Board/Module is supplied from the factory with DHCP enabled.



See RFC 2131 Dynamic Host Configuration Protocol for further information

10.3.2 SNMP (Simple Network Management Protocol)

Simple Network Management Protocol (SNMP) is a network protocol which was developed by the IETF in order to be able to monitor and control network elements from a central station. This protocol regulates the communication between the monitored devices and the monitoring station. SNMP describes the composition of the data packets which can be transmitted and the communication procedure. SNMP was designed in such a way that every network-compatible device can be monitored. The network management tasks which are possible with SNMP include:

- Monitoring of network components
- Remote control and configuration of network components.
- Fault detection and notification

Due to its simplicity, SNMP has become the standard which is supported by most management programs. SNMP Versions 1 and 2c offer hardly any safety mechanisms. The safety mechanisms have been significantly expanded in the current Version 3.

With the aid of description files known as MIB's (Management Information Base), the management programs are in a position to represent the hierarchical structure of the data of any desired SNMP agent and to request data from them. In addition to the MIB's defined in the RFC's, every software and hardware manufacturer can define his own so-called private MIB's, which reflect the special characteristics of his product.

10.3.3 TCP/IP (Transmission Control Protocol / Internet Protocol)

TCP and IP are generally used concurrently and thus the term TCP/IP has become established as the standard for both protocols.

IP is based on network layer 3 (layer 3) in the OSI Layer Model while TCP is based on layer 4, the transport layer. In other words, the expression TCP/IP signifies network communication in which the TCP transport mechanism is used to distribute or deliver data over IP networks. As a simple example: Web browsers use TCP/IP to communicate with web servers.

10.4 List of RFC's

- DHCP (RFC 2131)
- HTTP (RFC 2616)
- HTTPS (RFC 2818)
- SSH-2 (RFC 4250-4256, 4335, 4344, 4345, 4419, 4432, 4716, 5656)
- TELNET (RFC 854-861)
- SNMPv1 (RFC 1157)
- SNMPv2 (RFC 1213, RFC1901-1908)
- SYSLOG (RFC 5424)
- SMTP (RFC 5321)

10.5 List of Open Source Packages used

Third Party Software

The **hopf** Board 6844MNG includes a numerous of software packages subject to other license conditions. In case the use of such a software package might violate the licence conditions immediately after written notice it is ensured that the underlying licence conditions are met again.

If the underlying licence conditions relating to a specific software package require availability of the source code the package is provided electronically (email, download etc.) on requested.

The following table includes all used software packages with the applicable underlying software license conditions:

Package name	Version	License	License details	Patches
arp-scan	1.9	GPL	v3	no
arptables	0.0.4			no
at91bootstrap 3	3.8.7			no
busybox	1.28.1	GPL	v2	no
bzip2	1.0.6	BSD		no
cifs-utils	6.7	GPL	v3	no
ethtool	4.13	GPL	v2	no
libevent	2.1.8-stable	3-clause BSD		no
libopenssl	1.0.2n	Dual	http://www.openssl.org/source/license.html	no
libpcap	1.8.1	BSD		no
libzlib	1.2.11		Copyright (C) 1995-2017 Jean-loup Gailly and Mark Adler This software is provided 'as-is', without any express or implied warranty. In no event will the authors be held liable for any damages arising from the use of this software. Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the following restrictions:	no

Package name	Version	License	License details	Patches
			<p>1. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgment in the product documentation would be appreciated but is not required.</p> <p>2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.</p> <p>3. This notice may not be removed or altered from any source distribution.</p>	
lighttpd	1.4.48		<p>Copyright (c) 2004, Jan Kneschke, incremental All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> - Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. - Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. - Neither the name of the 'incremental' nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>	no
linux	4.8.6	GPL	v2	no
linux-headers	4.8.6	GPL	v2	no
lzo	2.10	GPL	v2	no
mttd	2.0.1	GPL	v2	no
net-snmp	5.7.3	BSD (mehrere)	http://net-snmp.sourceforge.net/about/license.html	no
ntp	4.2.8p11		<p>Copyright (c) University of Delaware 1992-2011</p> <p>Permission to use, copy, modify, and distribute this software and its documentation for any purpose with or without fee is hereby granted, provided that the above copyright notice appears in all copies and that both the copyright notice and this permission notice appear in supporting documentation, and that the name University of Delaware not be used in advertising or Publicity pertaining to distribution of the software without specific, written prior permission. The University of Delaware</p>	yes

Package name	Version	License	License details	Patches
			makes no representations about the suitability this software for any purpose. It is provided "as is" without express or implied warranty.	
openssh	7.6p1	BSD		no
pcre	8.41	BSD		no
pps-tools	47333f24af8 78f67ce480 22e8af1641 9713aa1ac	GPL	v2	no
uboot	2016.09.01	GPL	v2+	no
uboot-tools	2018.01	GPL	v2+	no
uclibc	1.0.28	GPL	v2	no
util-linux	2.31.1	GPLv2+ GPLv2 LGPLv2+ BSD		no
zip	3.0		Copyright (c) 1990-2007 Info-ZIP. All rights reserved. For the purposes of this copyright and license, "Info-ZIP" is defined as the following set of individuals: Mark Adler, John Bush, Karl Davis, Harald Denker, Jean-Michel Dubois, Jean-loup Gailly, Hunter Goatley, Ed Gordon, Ian Gorman, Chris Herborth, Dirk Haase, Greg Hartwig, Robert Heath, Jonathan Hudson, Paul Kienitz, David Kirschbaum, Johnny Lee, Onno van der Linden, Igor Mandrichenko, Steve P. Miller, Sergio Monesi, Keith Owens, George Petrov, Greg Roelofs, Kai Uwe Rommel, Steve Salisbury, Dave Smith, Steven M. Schweda, Christian Spieler, Cosmin Truta, Antoine Verheijen, Paul von Behren, Rich Wales, Mike White. This software is provided "as is," without warranty of any kind, express or implied. In no event shall Info-ZIP or its contributors be held liable for any direct, indirect, incidental, special or consequential damages arising out of the use of or inability to use this software. Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the above disclaimer and the following restrictions: 1. Redistributions of source code (in whole or in part) must retain the above copyright notice, definition, disclaimer, and this list of conditions. 2. Redistributions in binary form (compiled executables and libraries) must reproduce the above copyright notice, definition, disclaimer, and this list of conditions in documentation and/or other materials provided with the distribution. The sole exception to this condition is redistribution of a standard UnZipSFX binary (including SFXWiz) as part of a self-extracting archive; that is permitted without inclusion of this license, as long as the normal SFX banner has not been removed from the binary or disabled. 3. Altered versions--including, but not limited to, ports to new operating systems, existing ports with new graphical interfaces, versions with modified or added functionality, and dynamic, shared, or static library versions not from Info-ZIP--must be plainly marked as such and must not be misrepresented as being the original source or, if binaries, compiled from the original source. Such altered versions also must not be misrepresented as being Info-ZIP releases--including, but not limited to, labeling of the altered versions with the	no

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			<p>names "Info-ZIP" (or any variation thereof, including, but not limited to, different capitalizations), "Pocket UnZip," "WiZ" or "MacZip" without the explicit permission of Info-ZIP. Such altered versions are further prohibited from misrepresentative use of the Zip-Bugs or Info-ZIP e-mail addresses or the Info-ZIP URL(s), such as to imply Info-ZIP will provide support for the altered versions.</p> <p>4. Info-ZIP retains the right to use the names "Info-ZIP," Zip," "UnZip," "UnZipSFX," "WiZ," "Pocket UnZip," "Pocket Zip," and "MacZip" for its own source and binary releases.</p>	