Industriefunkuhren

hopf Elektronik GmbH

Technical Manual

LAN Management Board/Module
For System 6844RC

Model 6844MNG

ENGLISH

Version: 06.02 – 30.08.2016

	SET	IMAGE (6844MNG)	H8-FIRMWARE (6844MNG)
Valid for	Version: **06.xx**	Version: **06.xx**	Version: **03.xx**

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

Downloading Technical Manuals

All current manuals of our products are available free of charge via our homepage on the Internet.

Homepage: http://www.hopf.com

E-mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

Contents Page

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

3 FG6844MNG Construction

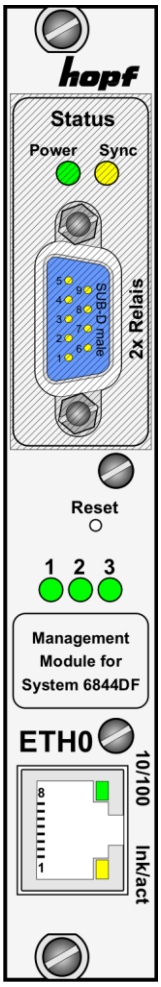
This Chapter describes the hardware components of FG6844MNG.

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

lnk/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.

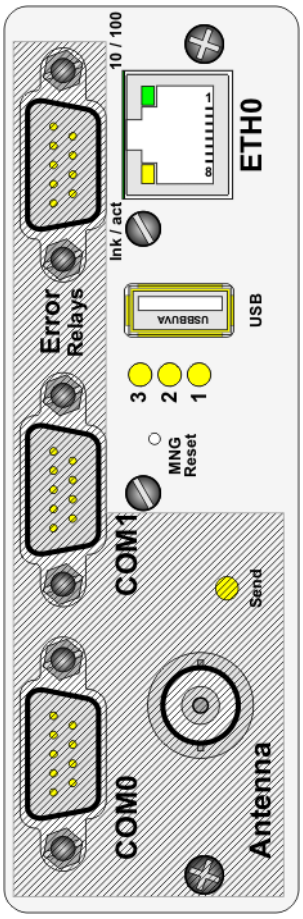
hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

lnk/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.

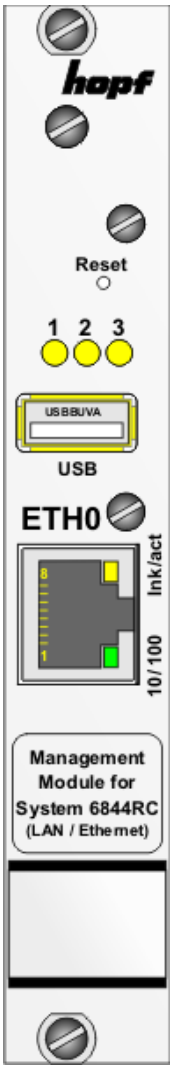
hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

lnk/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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

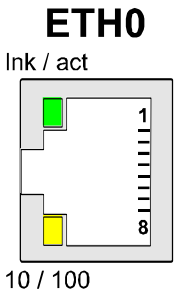
The FG6844MNG is fully operationally when all 3 LEDs (LED 1-3) are in standard condition.

lnk/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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

3.5 RJ45 Socket (ETH0)



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***).

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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***).

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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-s*oftware

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***

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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:

```
  SET LAN_MNG
  IP-ADR.   Y/N
```

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

Input frame:

```
 LAN_MNG IP-ADR.
>192.168.001.010
```

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:

```
  SET LAN_MNG
GATEWAY-ADR. Y/N
```

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

Input frame:

```
 LAN_MNG GW-ADR.
>192.168.001.010
```


hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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:

```
  SET LAN_MNG
  NETMASK   Y/N
```

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

Input frame:

```
 LAN_MNG NETMASK
>255.255.255.000
```

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:

```
  SET LAN_MNG
 CTRL.-BYTE Y/N
```

After entering **Y** 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:

```
CTRL.-B 76543210
LAN_MNG>00000000
```

The entry must be concluded by pressing the **ENT** key.

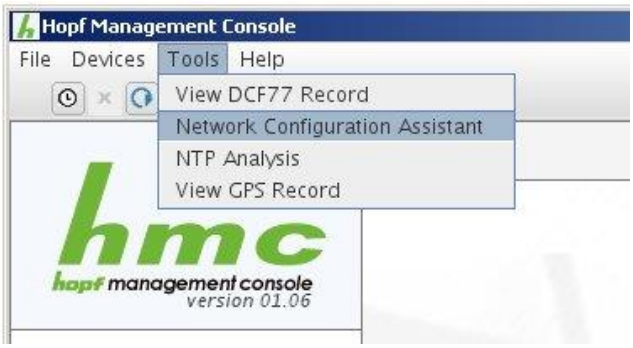
Bits 7-1	No function at present
0	These bits should always be set to **"0"** for reasons of compatibility.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

5.1.2 Network Parameter Configuration via *hmc* Software

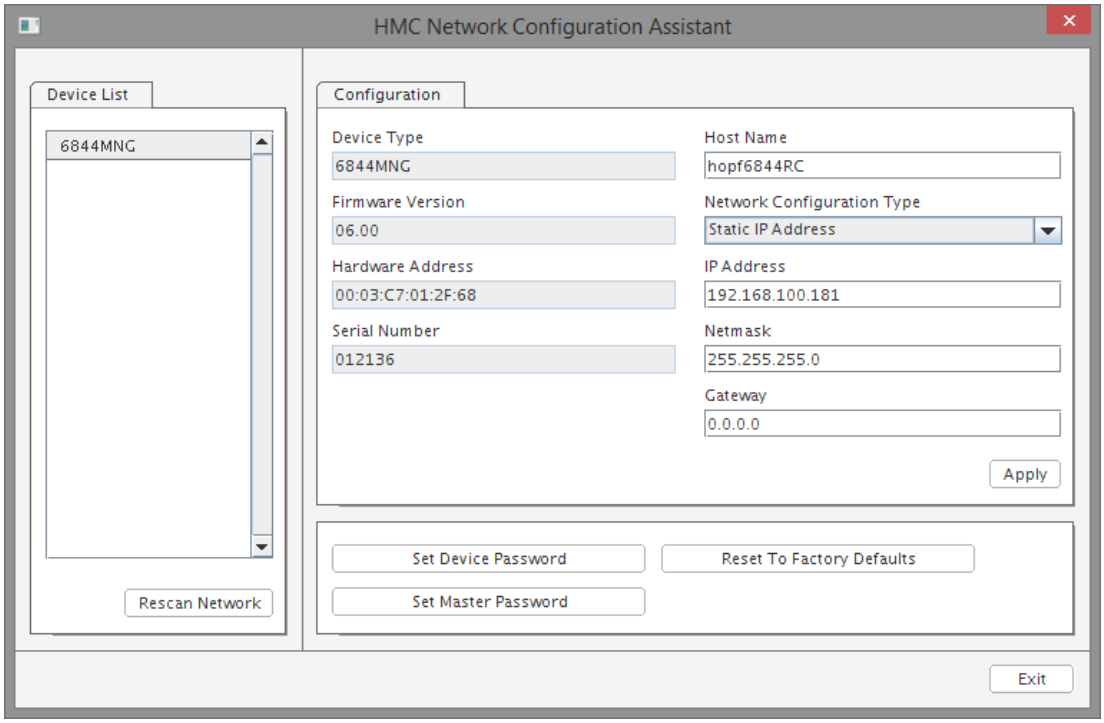
After connecting the system to the power supply and creating a network connection to the FG6844MNG, the base LAN parameter for extended configuration (**WebGUI**) of the FG6844MNG should be adjusted via a browser.

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**.



hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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 3.6/4.0 and IE 8.x/9

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. Internet Explorer) 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

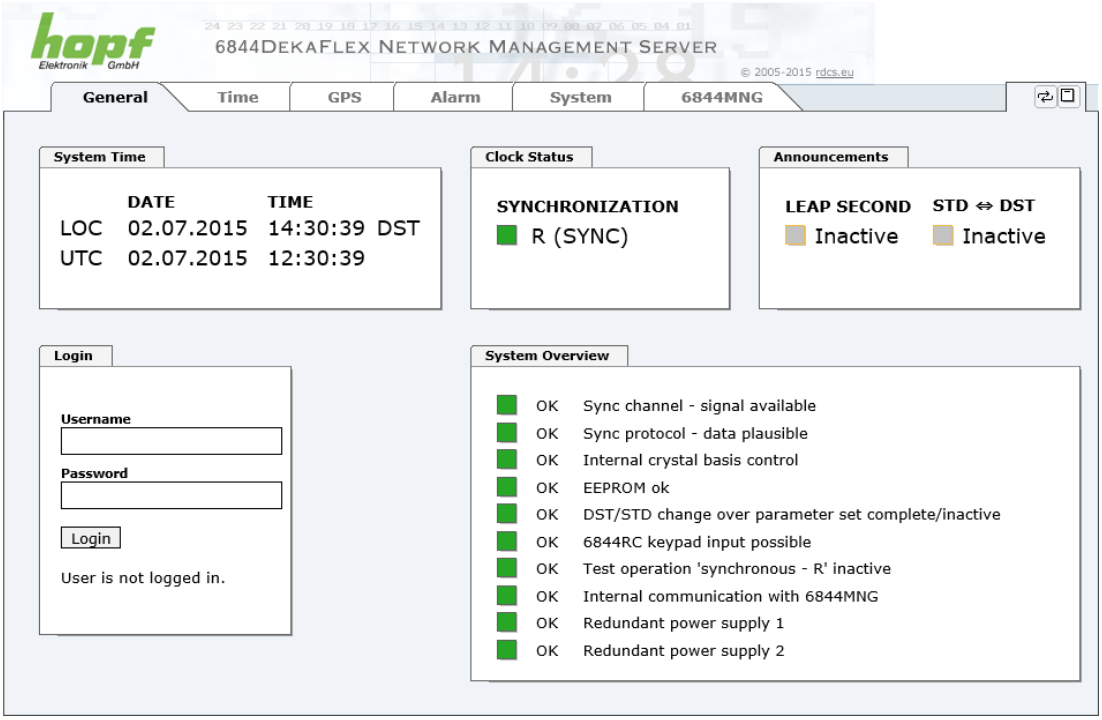
The following detailed explanatory information should be read if anything is unclear while executing the configuration steps.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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!



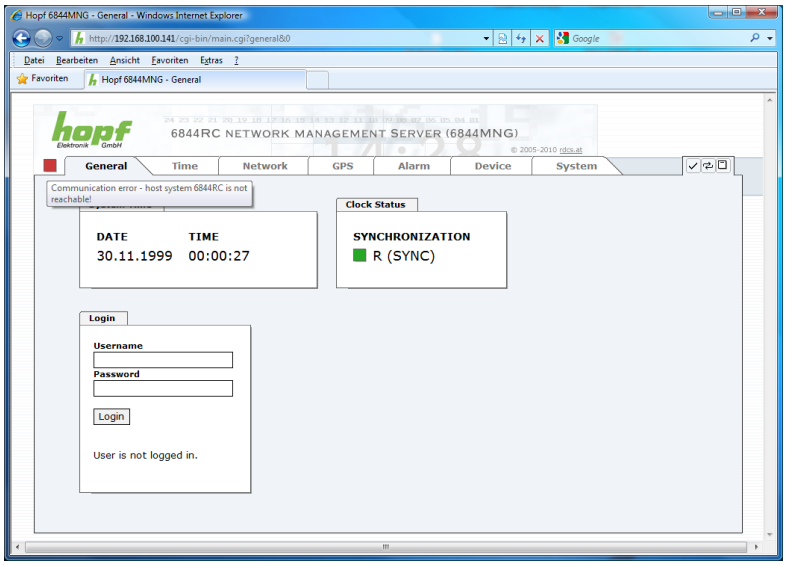
The WebGUI was developed for multi-user read access but not multi-user write access. It is the responsibility of the user to pay attention to this issue.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

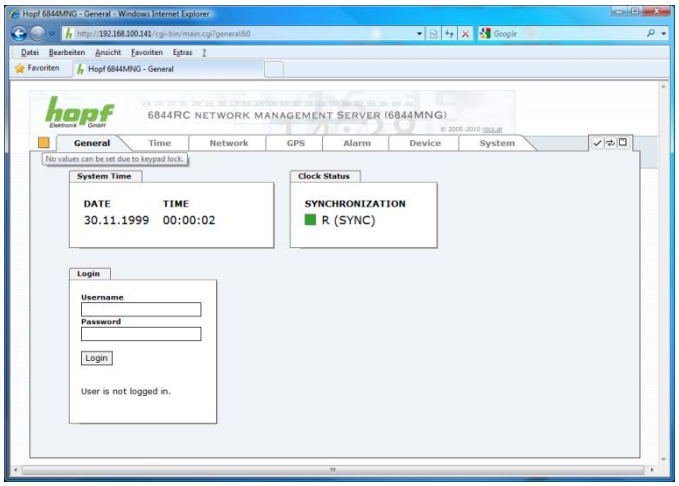
6.3 Communication Error between Basis System and FG6844MNG

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.3.1 LOGIN and LOGOUT as a User

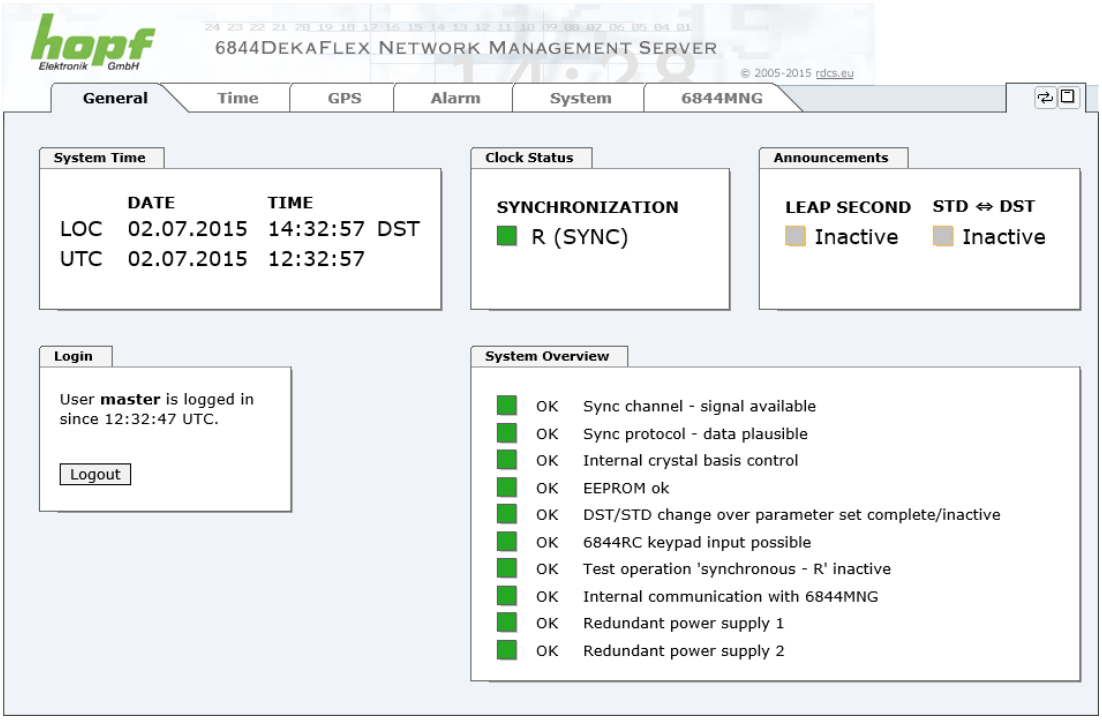
All of the Board's data can be read without being logged on as a special user. However, the Board/Module data can only be configured or modified by an authorised user! Two types of user are defined:

- "**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:



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).

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

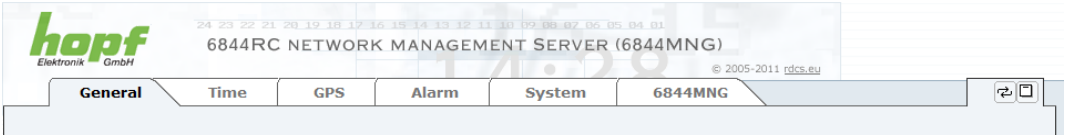
Users logged in as **Master** have all access rights to FG6844MNG.

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

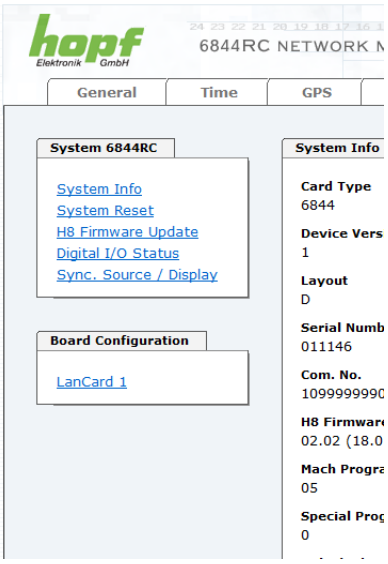
6.3.2 Navigation via the Web Interface

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.

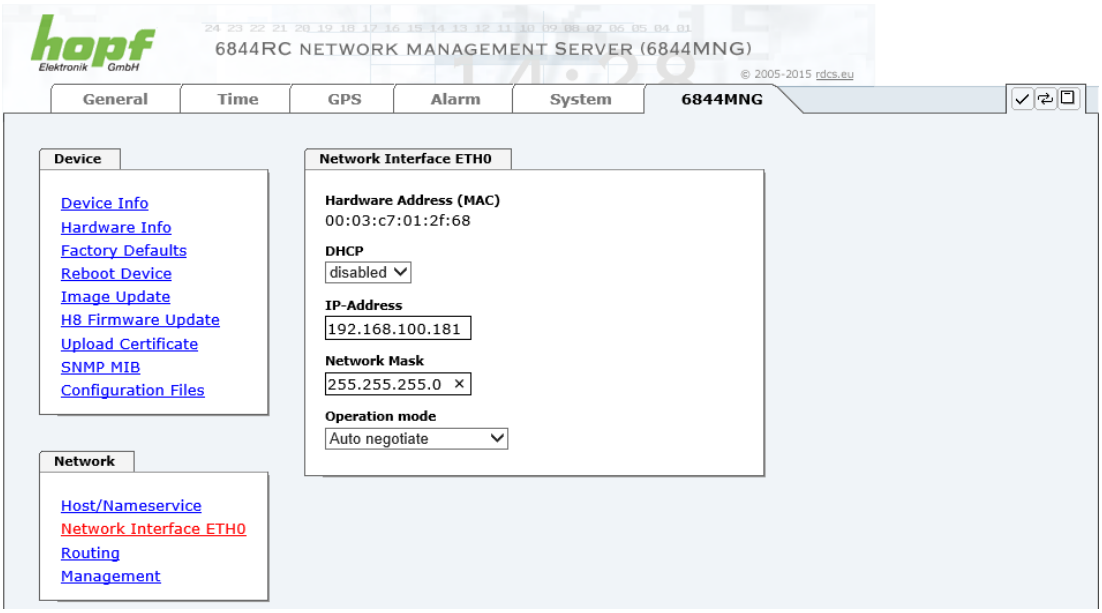


All the links within the tabs on the left hand side lead to corresponding detailed setting options.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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**.

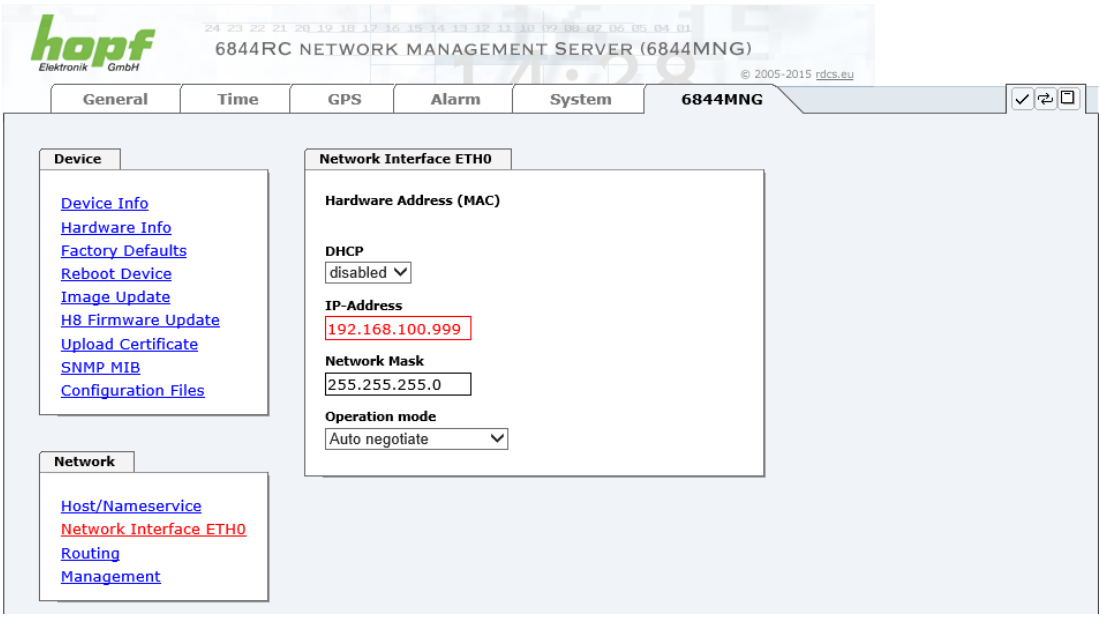
If the data is only to be tested it is sufficient to accept the changes with **Apply**. However, this data is then lost when the ***hopf*** Base System is switched off or restarted.

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

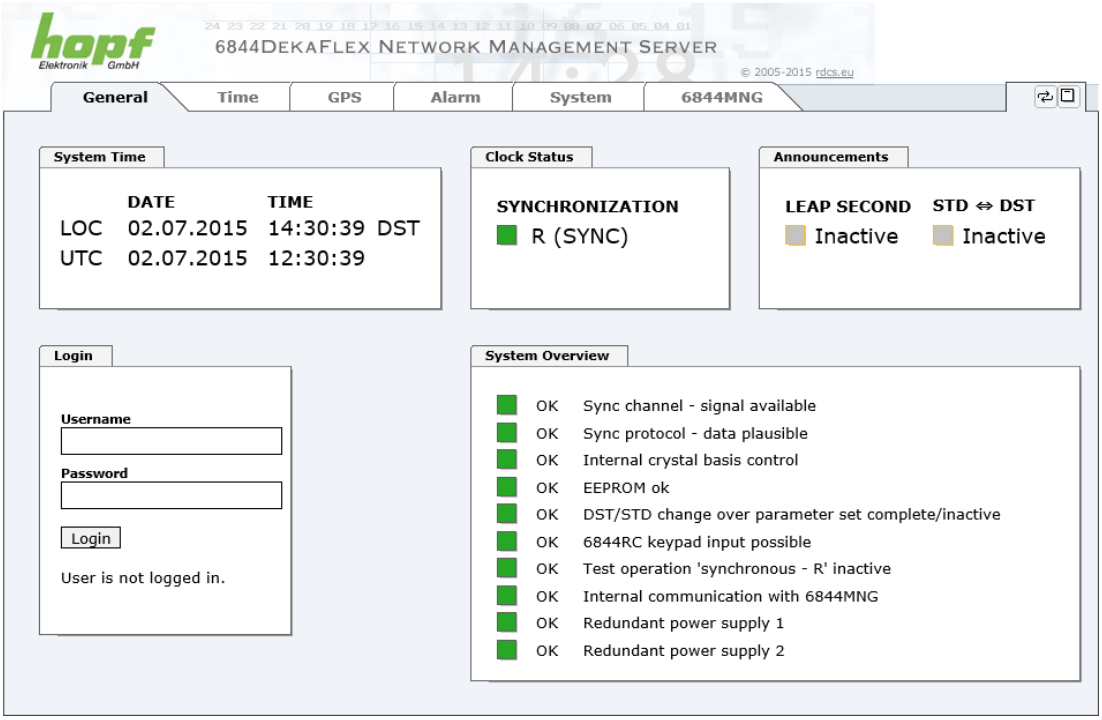
6.4 Description of the Tabs

The WebGUI is divided into the following tabs:

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.1 GENERAL Tab

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



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 (-)	invalid time
C	the clock system is in crystal operation (C = crystal)
r	the clock system is synchronous to the synchronisation source
R	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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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***.

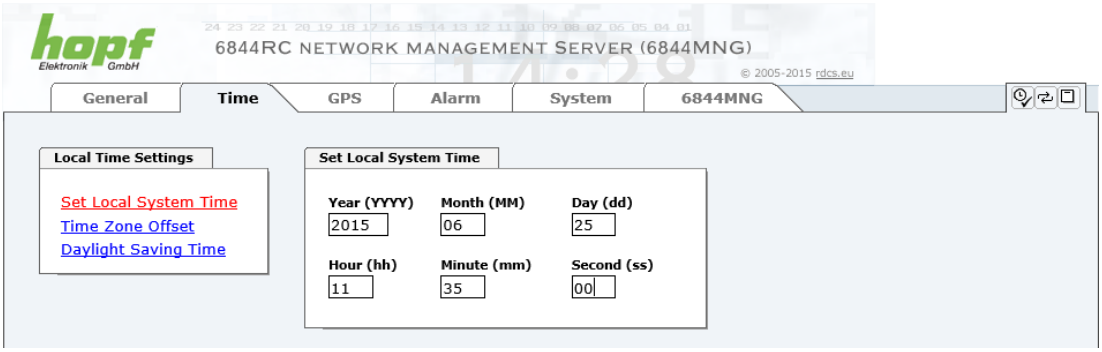
hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.



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)

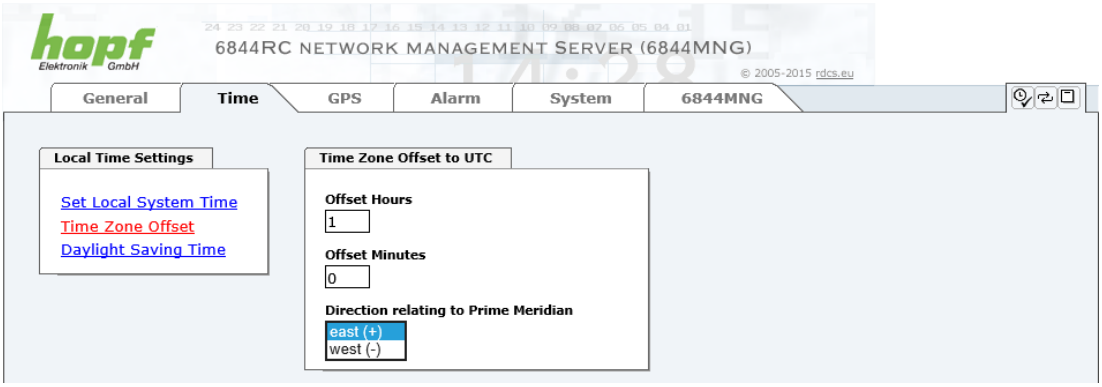
Minute
Input of current minute (00 – 59)

Second
Input of current second (00 -59)

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.2.2 Time Zone Offset

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



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)

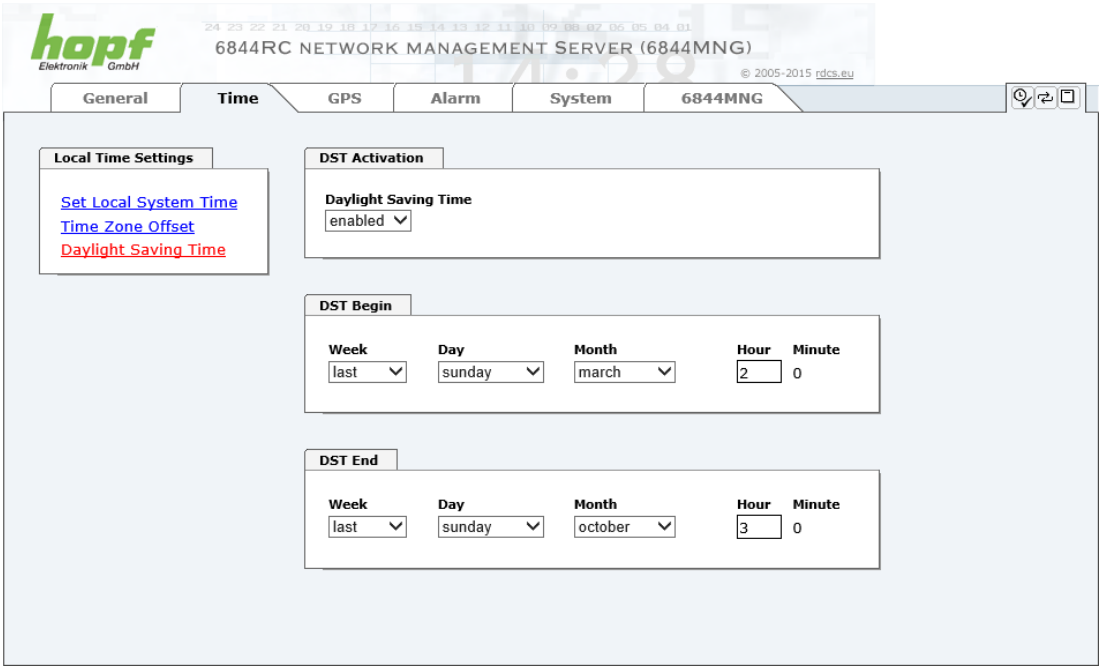
The difference time always relates to the **local standard time (winter time)** even though the commissioning or rather the input of difference time takes place during daylight saving time.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

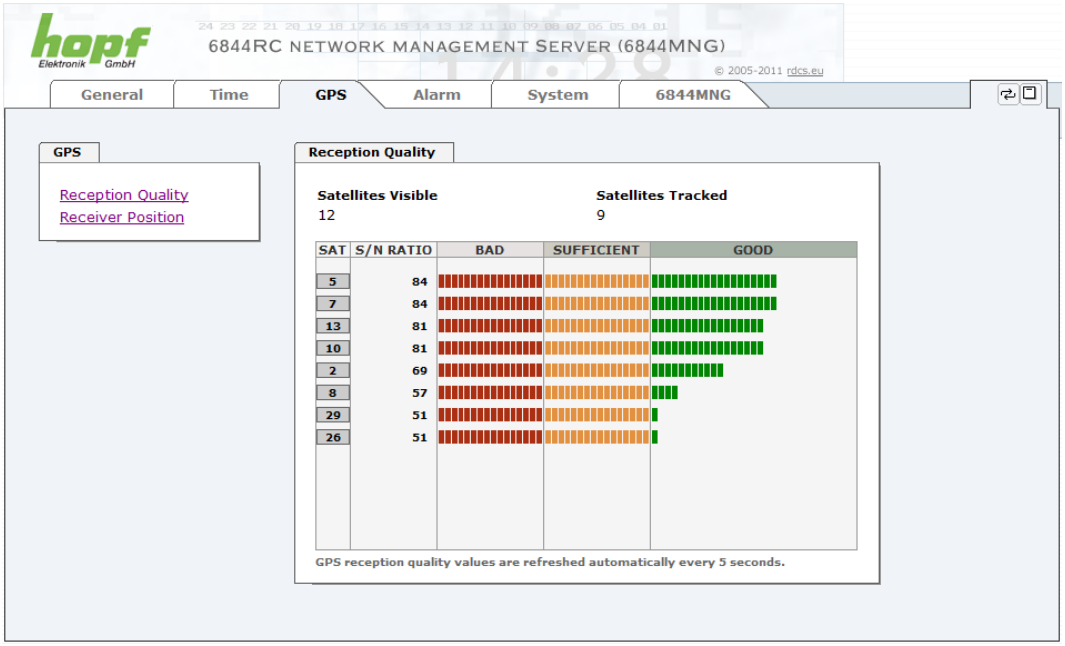
Satellites Tracked

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.

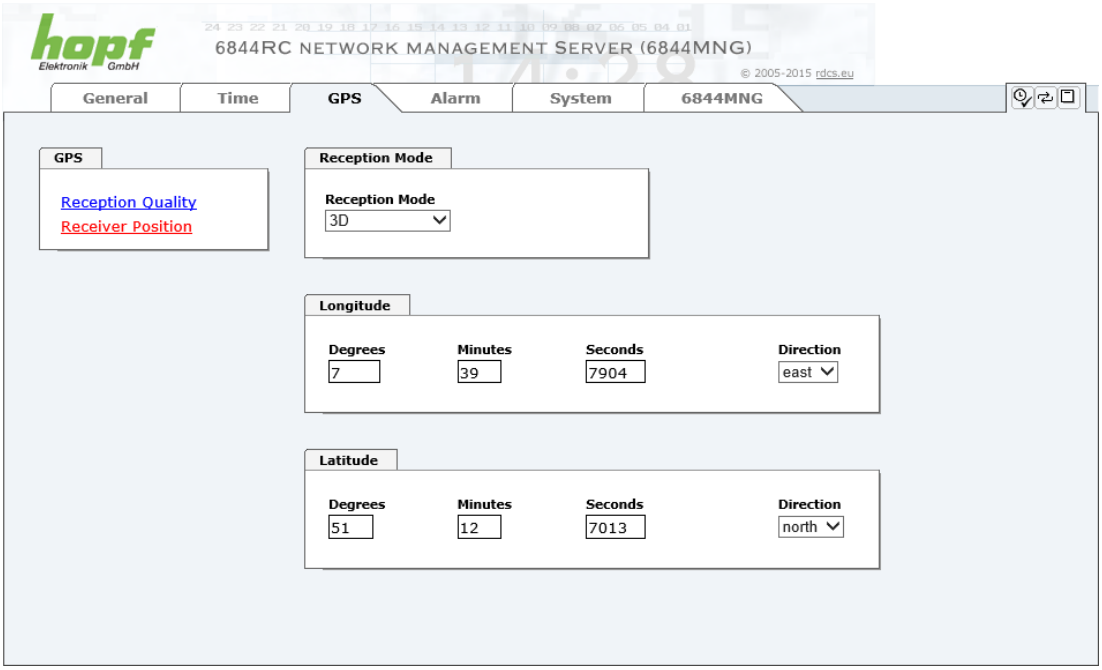
green	≥ 48	good reception quality
yellow	33-45	sufficient reception quality
red	0-30	poor reception quality



hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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 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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.4 ALARM Tab

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

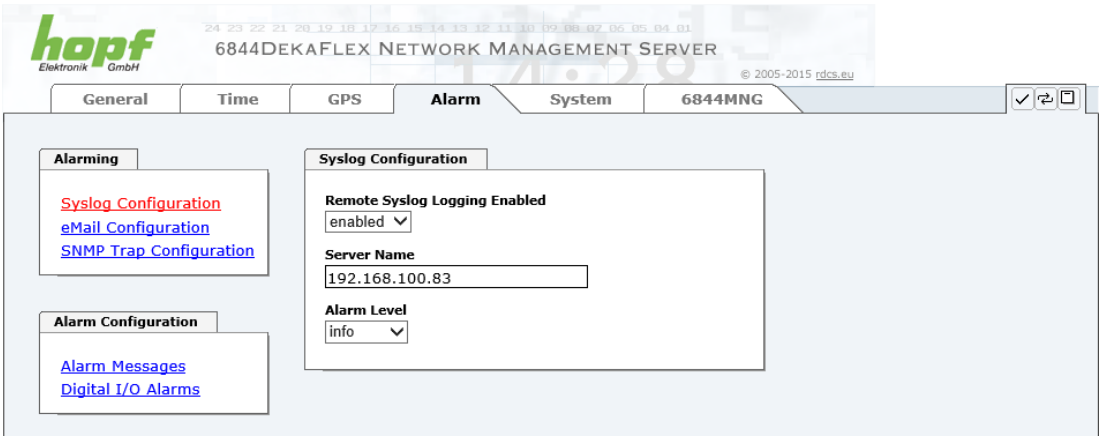
6.4.4.1 Syslog Configuration

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!

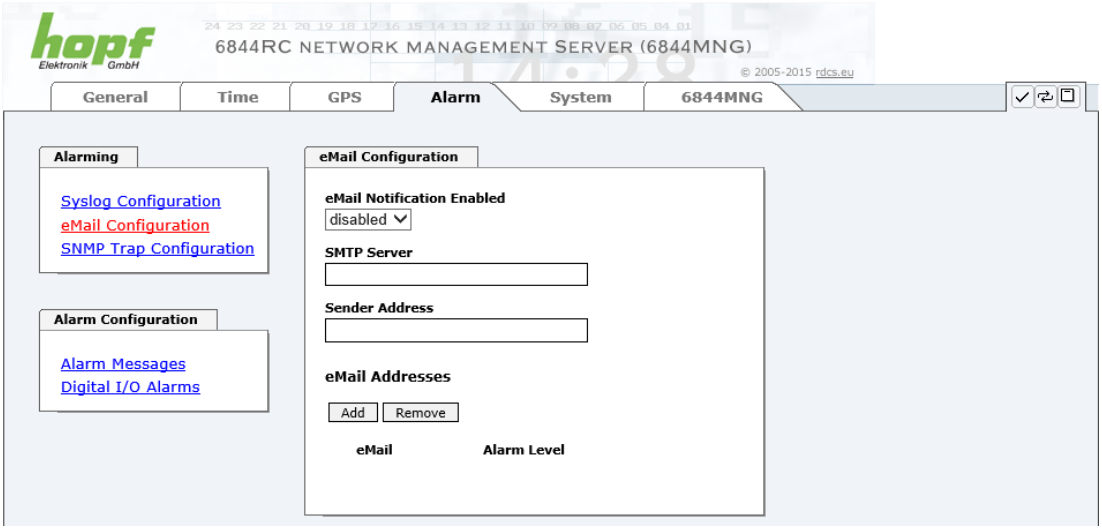


The alarm level designates the priority level of the messages to be transmitted and the level from which transmission is to take place (see ***Chapter 6.4.4.4 Alarm Messages***).

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

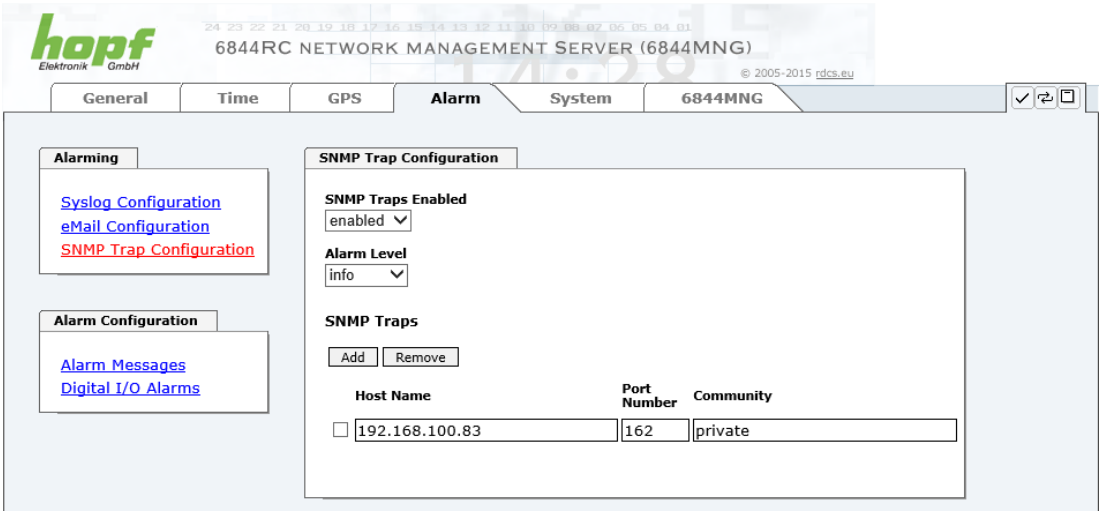
The Alarm Level designates the priority level of the messages to be sent and the level from which they are to be sent (see ***Chapter 6.4.4.4 Alarm Messages***).

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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***).

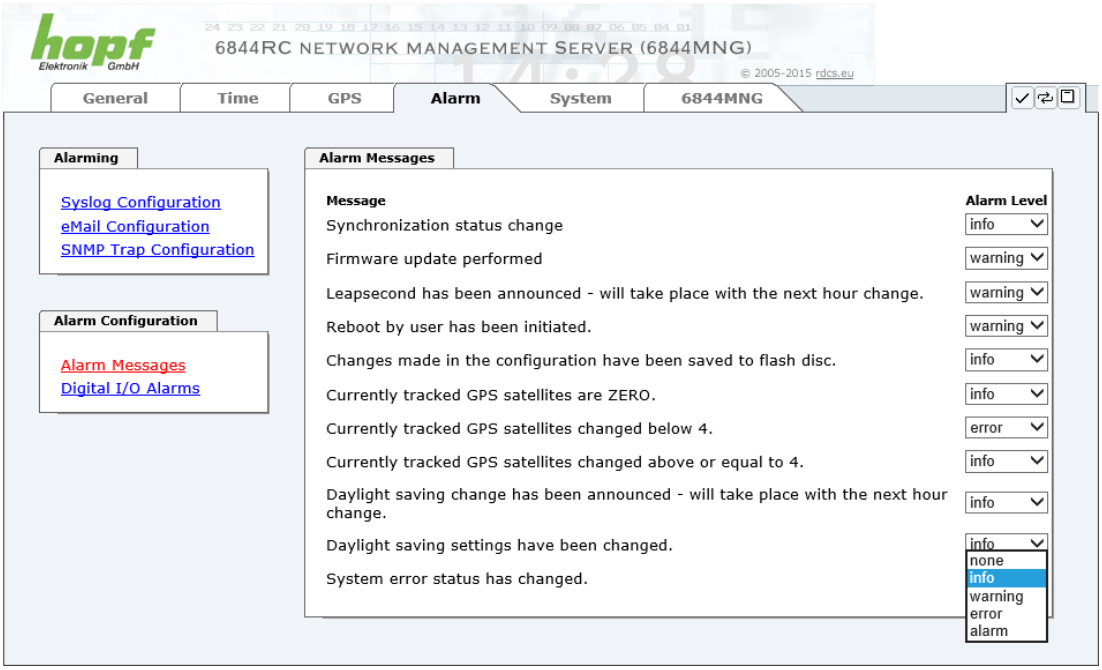
Alarm Level	Transmitted Messages
none	no messages
info	info / warning / error / alarm
warning	warning / error / alarm
error	error / alarm
alarm	alarm

SNMP protocol must be enabled in order to use SNMP

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.



A corresponding action is carried out if an event occurs, depending on the messages, their configured levels and the configured notification levels.

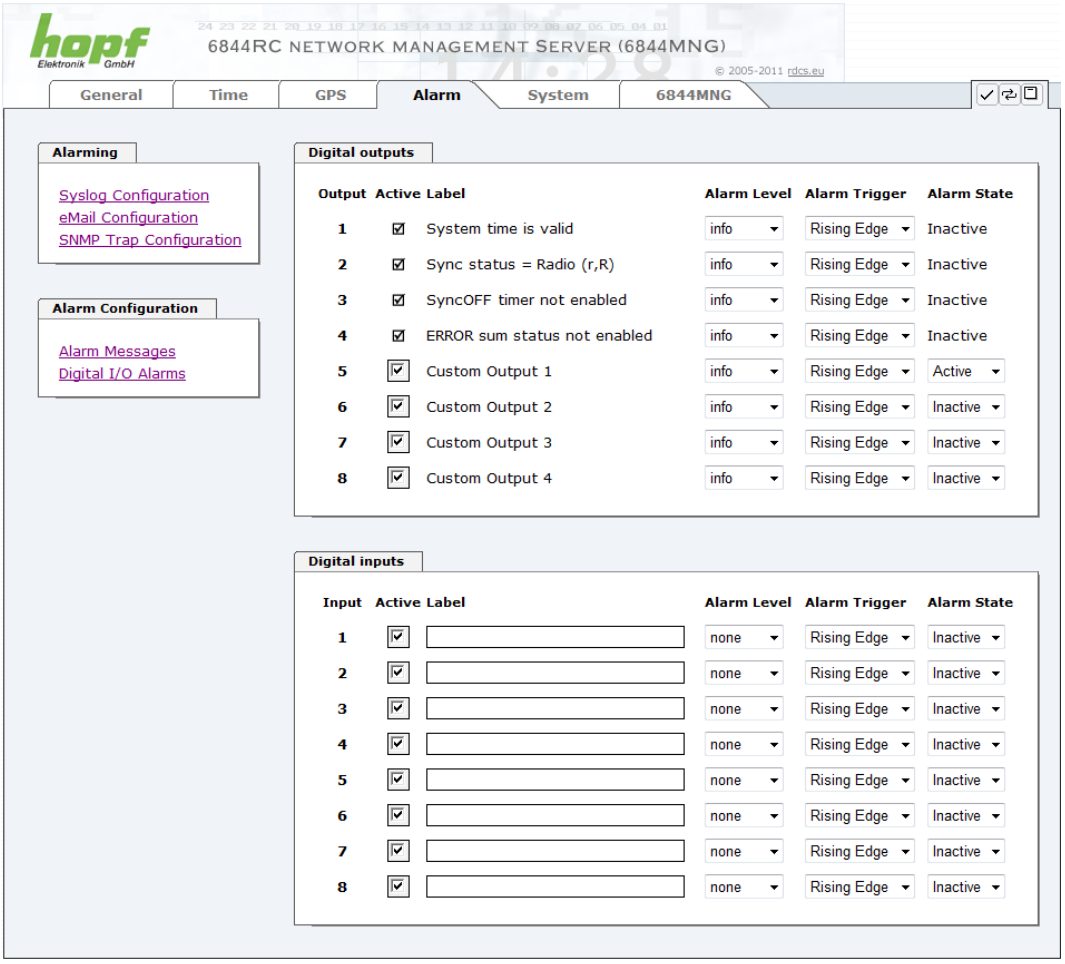
If a value is changed, the saving of the same needs for a permanent safeguarding to be considered unless it will get lost when restarting!

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.



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)

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

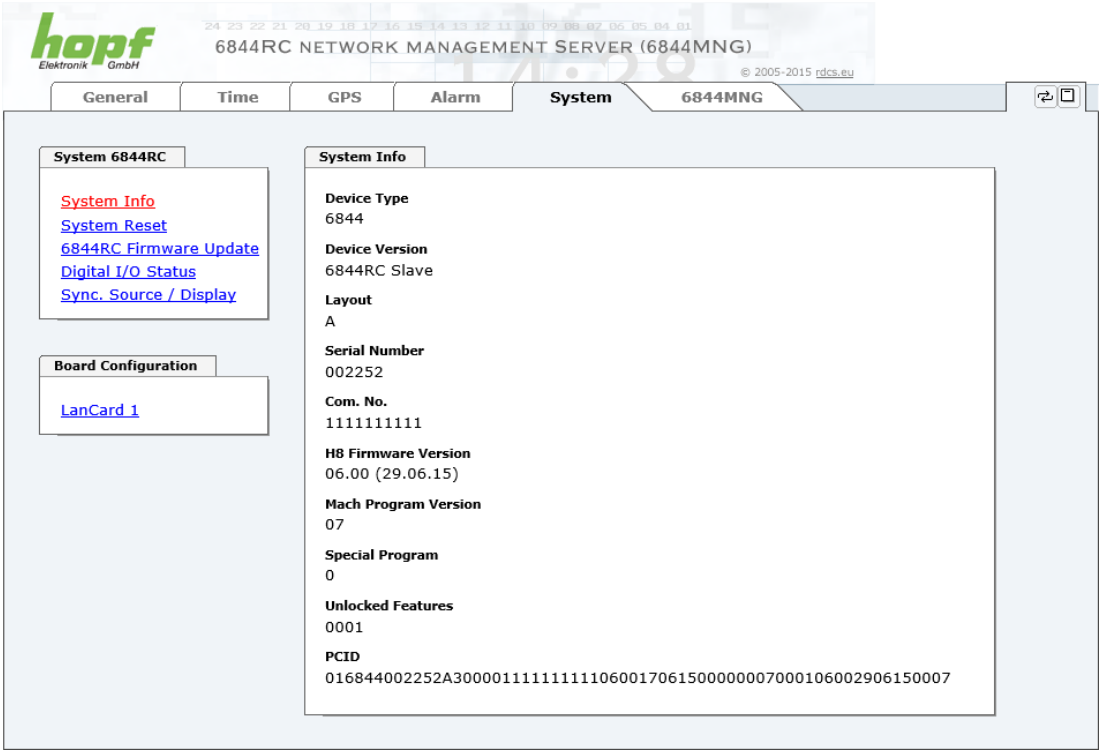
Verification Redu Power Supply

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".

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

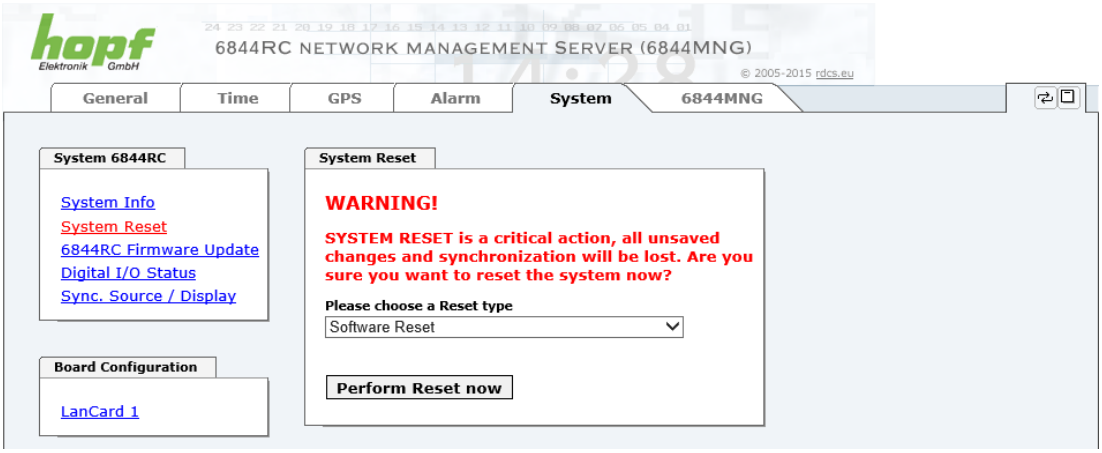
All information is available exclusively in write-protected and read-only form. Information about the Board/Module type, serial number and current software versions is provided to the user for service and enquiry purposes.

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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 Image Update 6844MNG

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

The H8 firmware of control board 6844RC can either be serial downloaded at System 6844RC or via the web interface into control board 6844RC (login as user "**master**" 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.
- 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.
- 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**!

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

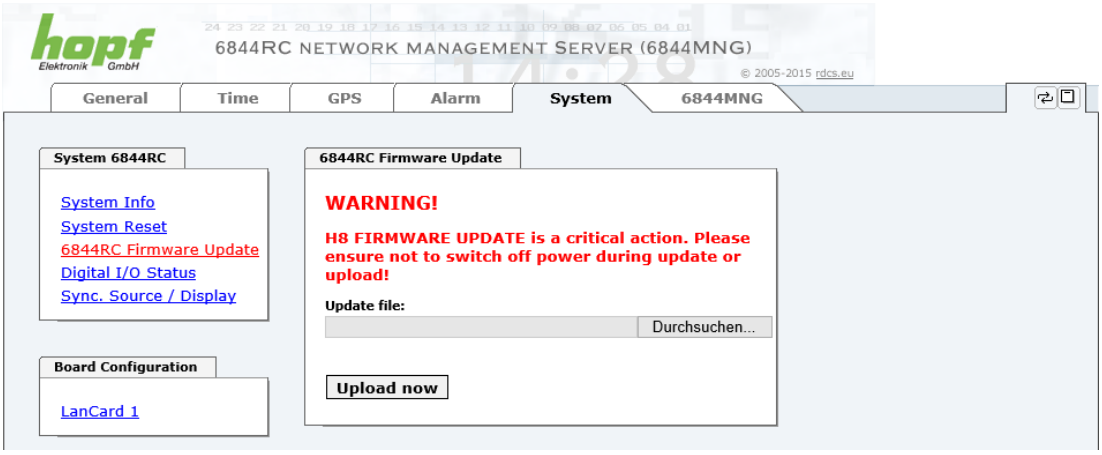
Usually the previously configured parameters are kept in System when proceeding an update. If this is not the case, this is specially described in a document belonging to the update.

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.

H8/6844 Firmware Update of Control Board 6844RC

File: gps_6844.a20
H8 Firmware of Control Board 6844RC / 6844DF (Update duration approx. 3-5 minutes)

The update process is started by pressing 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.

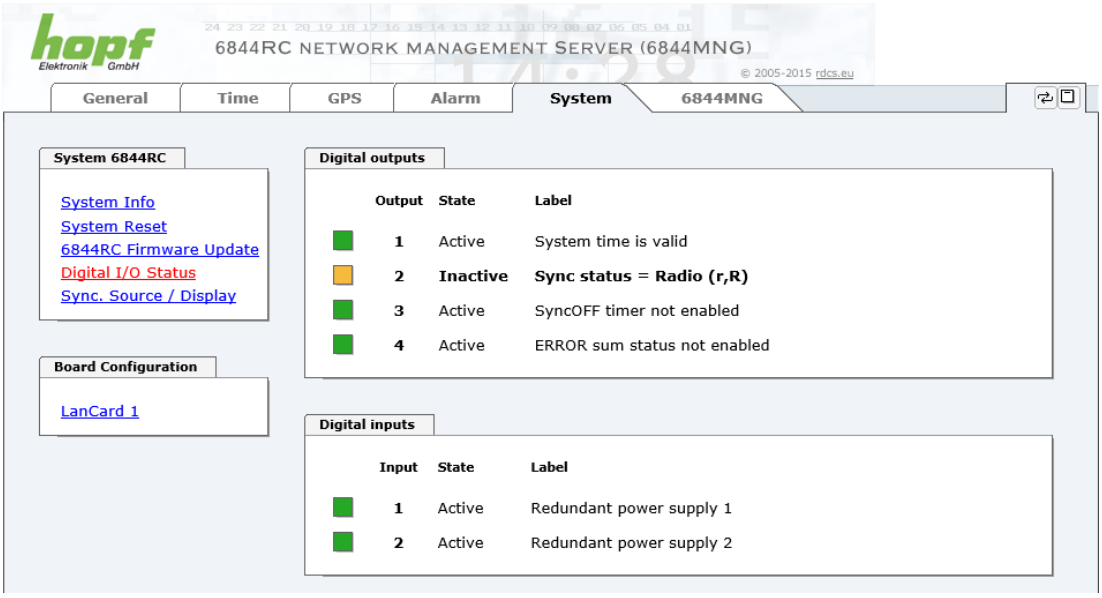


After a H8 firmware update of the control board 6844RC a system wide reset is triggered .

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.5.4 Digital I/O Status

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



Output / Input: Number of status output / signal input

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

Label: Name **/ f**unction description

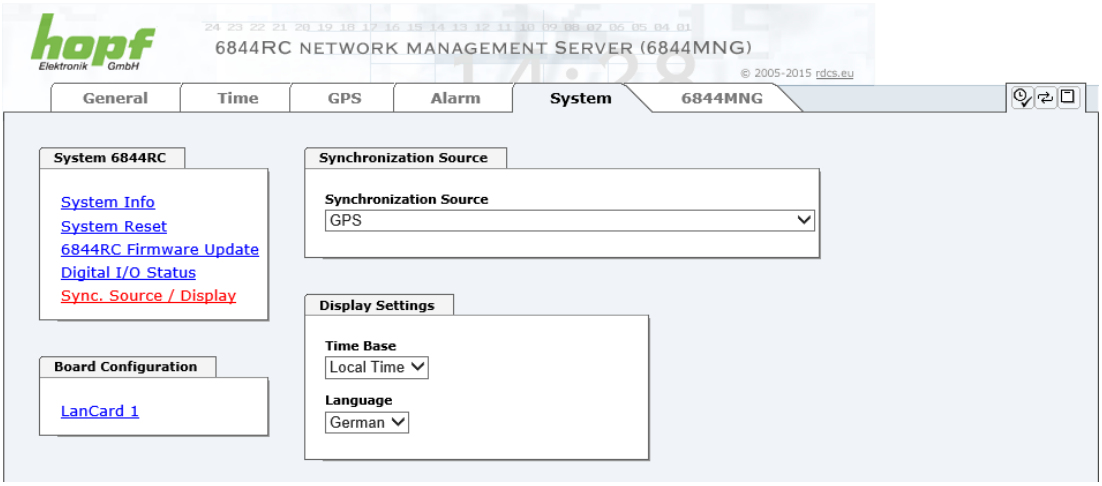
Verification Redu Power Supply

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".

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.5.5 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.



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

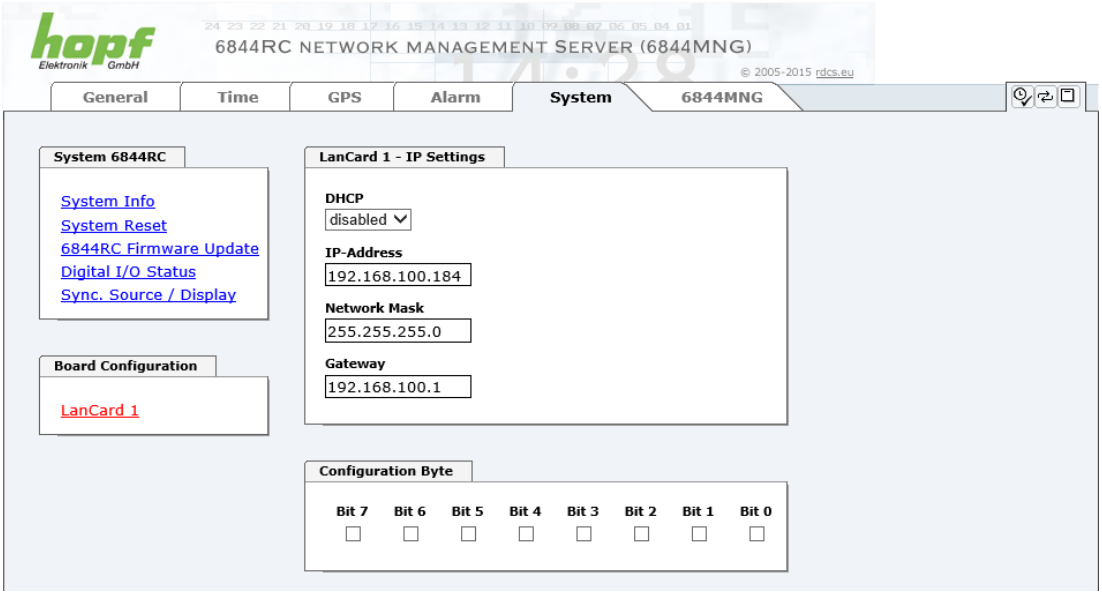
Language

- German
- English

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.5.6 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.



Configuration of:

DHCP

IP-Address

Network Mask

Gateway

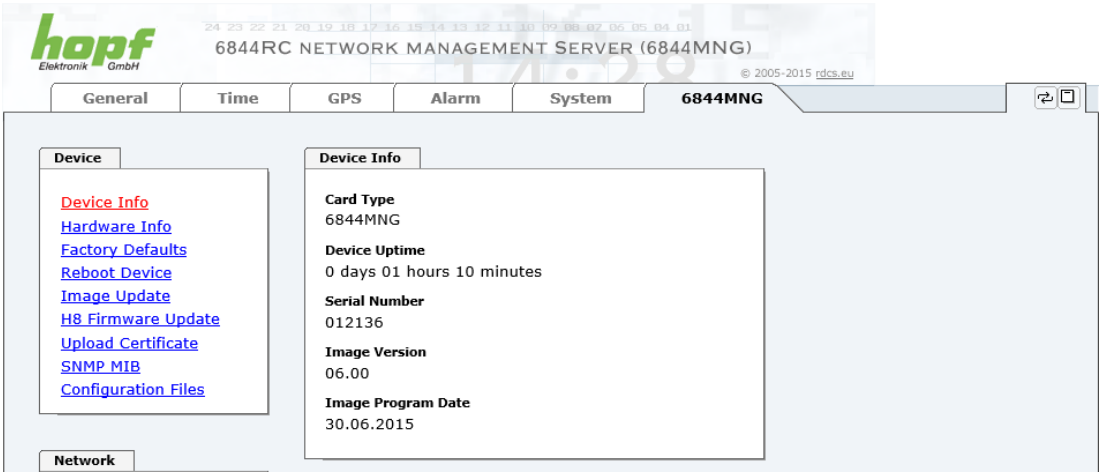
Configuration Byte

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.6 6844MNG Tab

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



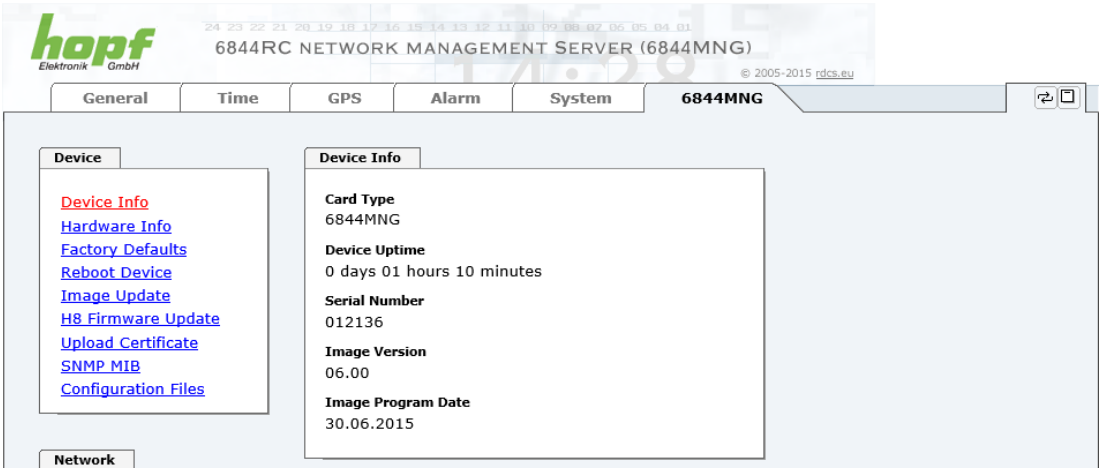
This tab provides the basic information about the Board hardware and software/firmware. Password administration and the update services for the FG6844MNG are also made accessible via this website. The complete download zone is also a component of this site.

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

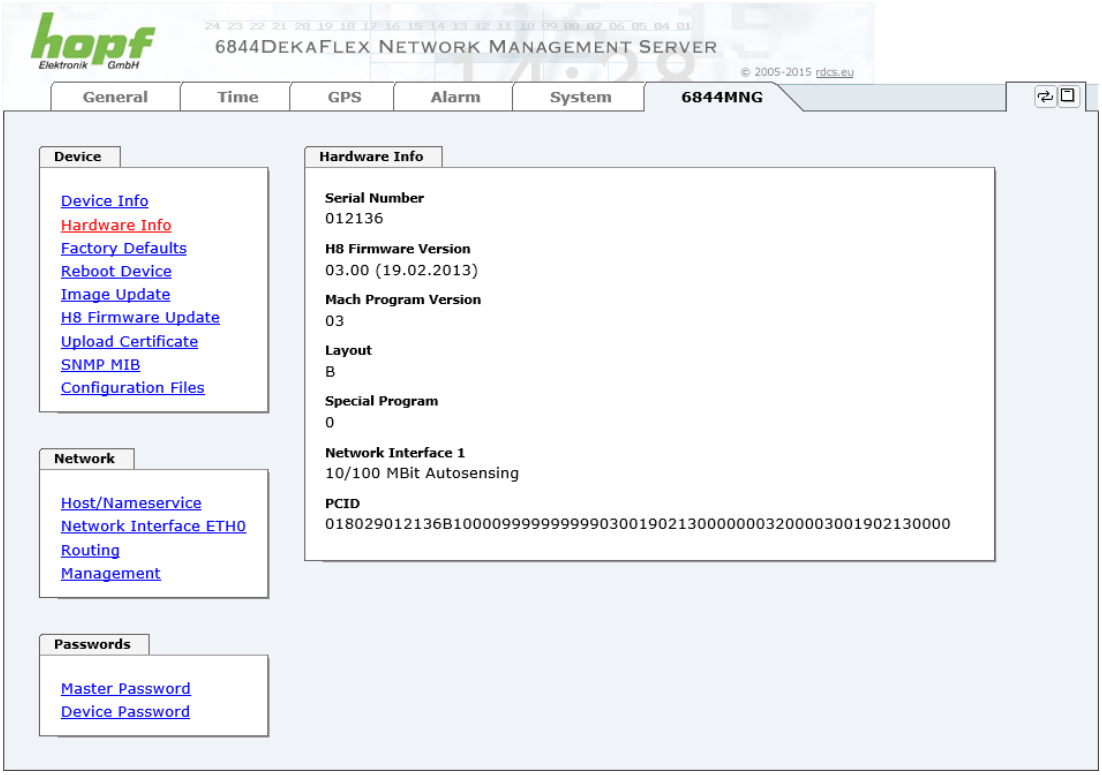


hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

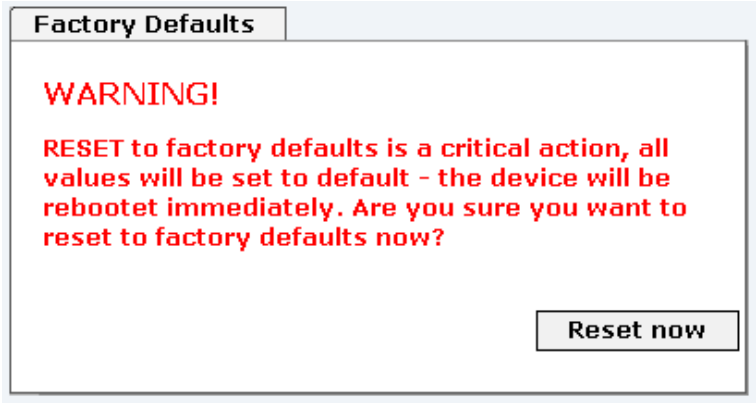
- Serial Number
- H8 Firmware Version
- MACH Firmware Version
- Card Layout
- Special Program
- Network Interface 1
- Product-Config-ID (PCID)



hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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).



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***

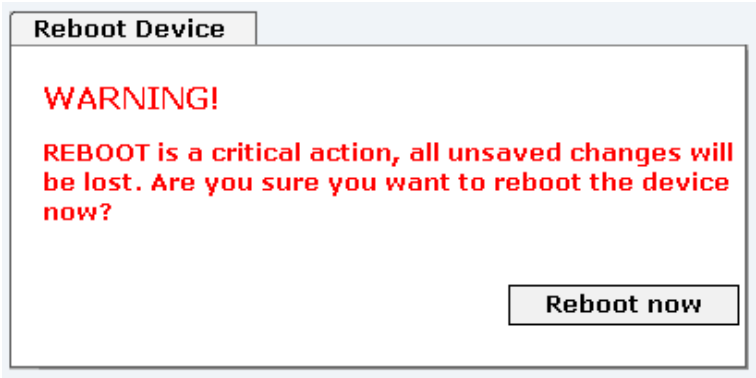
Press the "**Reset now**" button and wait until the restart has been completed.

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



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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

6.4.6.5 Update 6844MNG -Image / -H8 Firmware and update board 6844RC

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

Both the embedded software and the H8 firmware 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

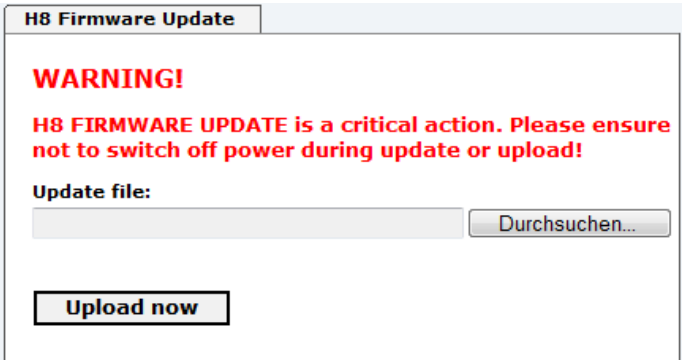
File: upgrade_6844_MNGv0111.img
Embedded-Image of 6844MNG (Update duration approx. 3-5 minutes)

H8/6844 Firmware Update of Control Board 6844RC

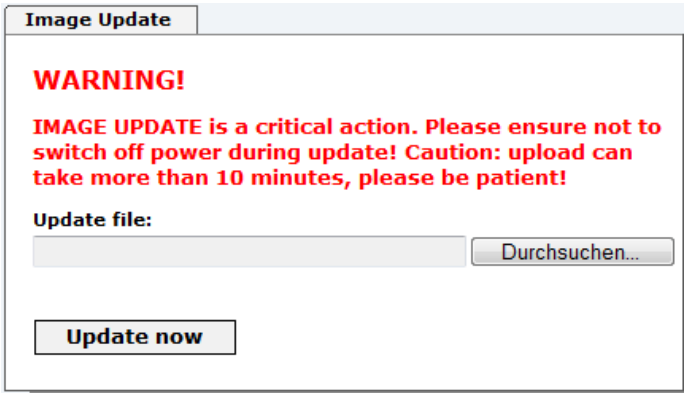
File: 6844MNG_H8_V0007.img
H8 Firmware of 6844RC (Update duration approx. 3-5 minutes)

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.



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



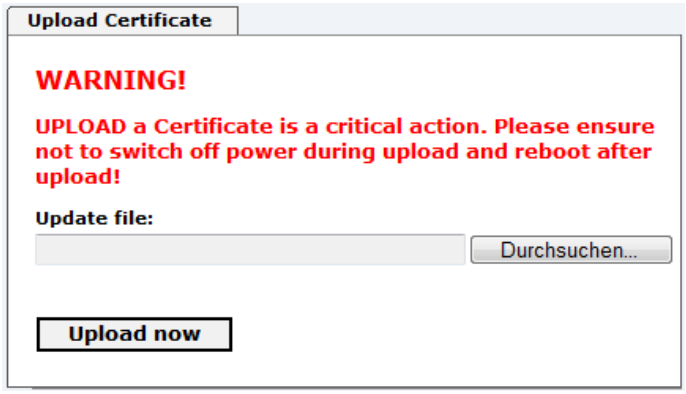
During the **image update** of FG6844MNG do not leave the WebGUI site. **Wait** and do **not switch** the current WebGUI site during this time until the message "**Please Reboot Device**" appears.

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

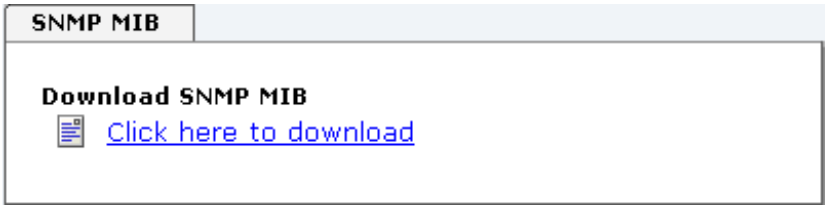
6.4.6.6 Upload Certificate for HTTPS Application (Upload Certificate)

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



6.4.6.7 Download von SNMP MIB

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



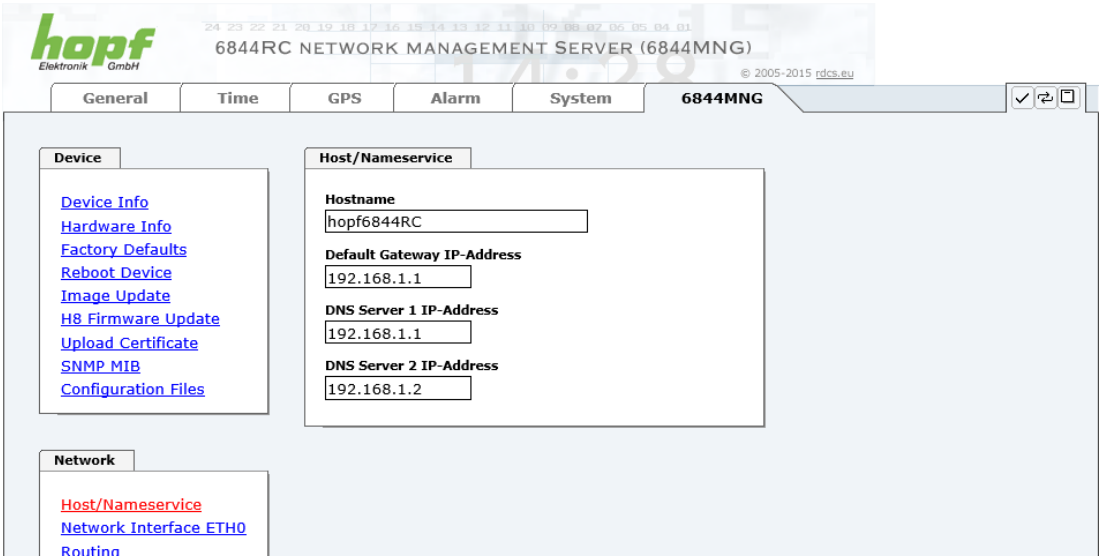
6.4.6.8 Download of Configurations

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

DNS Server 1 & 2

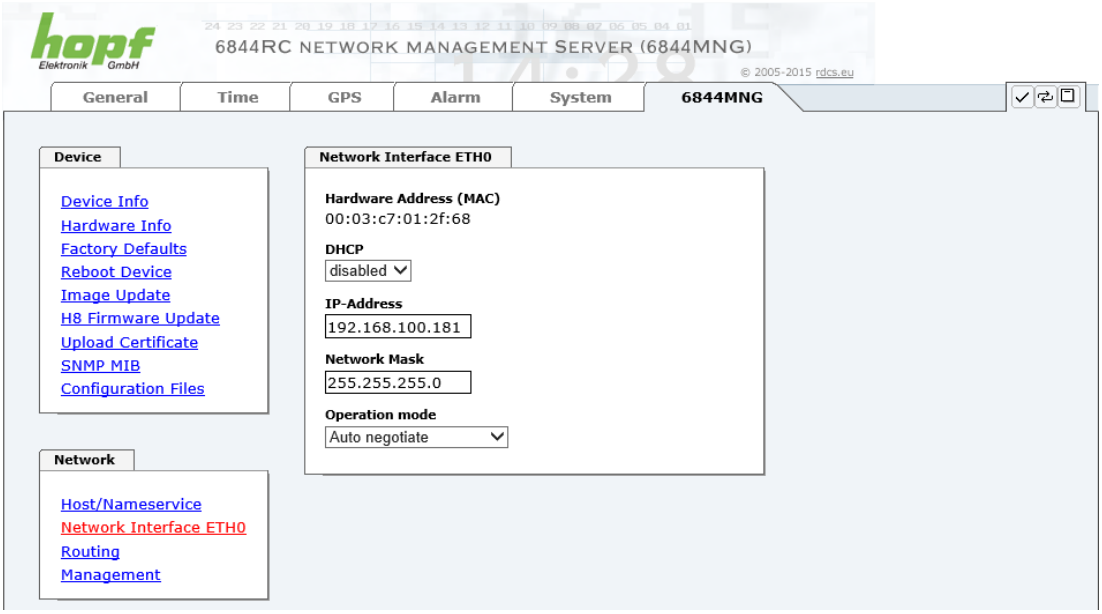
The IP address of the DNS server should be entered if you wish to use complete Hostnames (hostname.domainname) or work with reverse lookup.

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.



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.

hopf Elektronik 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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

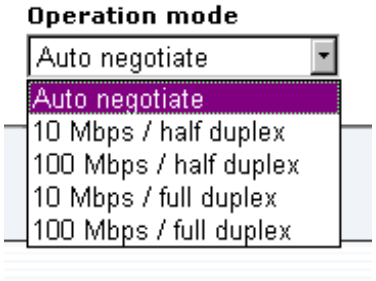
Network Mask

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

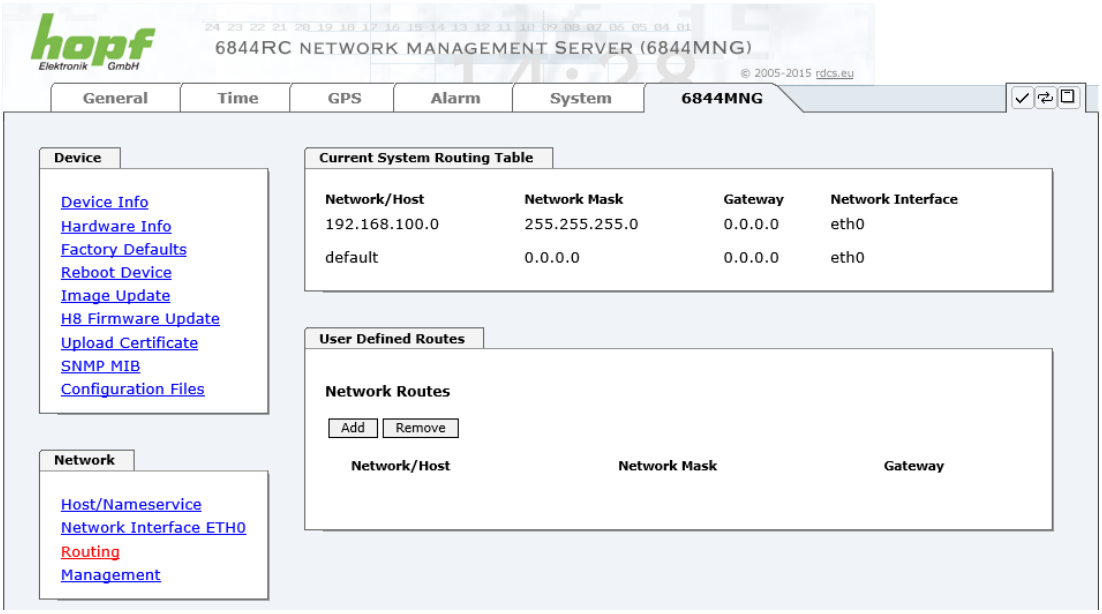
The network device usually adjusts the speed and duplex mode to the device to which it is connected (e.g. HUB, SWITCH) automatically. If the network device requires a certain speed or duplex mode, this can be configured via the web interface. The value should only be changed in special cases. The automatic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



hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.



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.

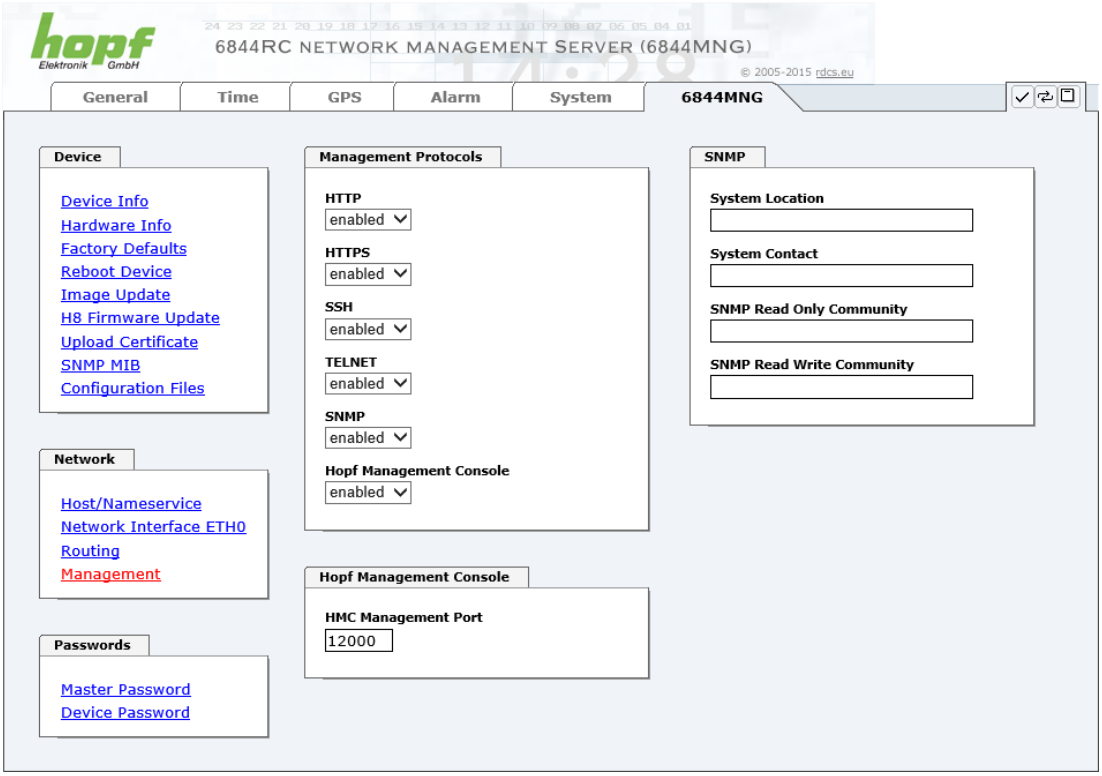
The FG6844MNG cannot be used as a router!

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.



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.

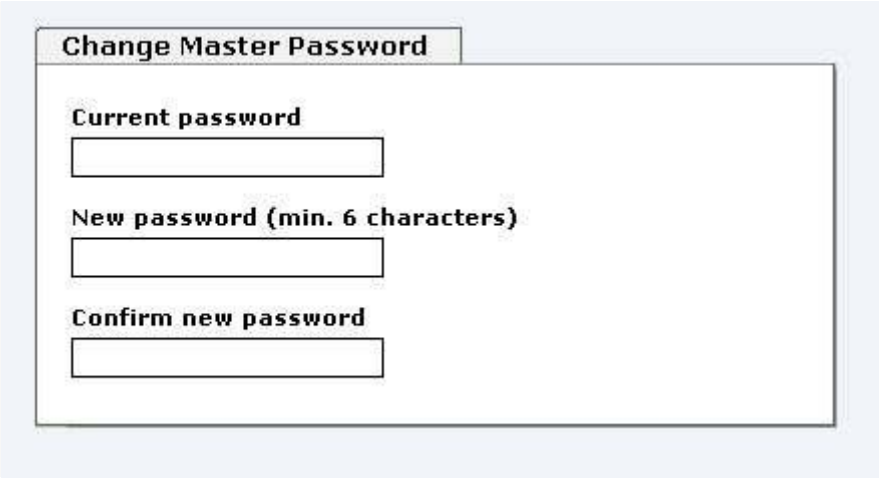
hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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***)



hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

7 SSH and Telnet Basic Configuration

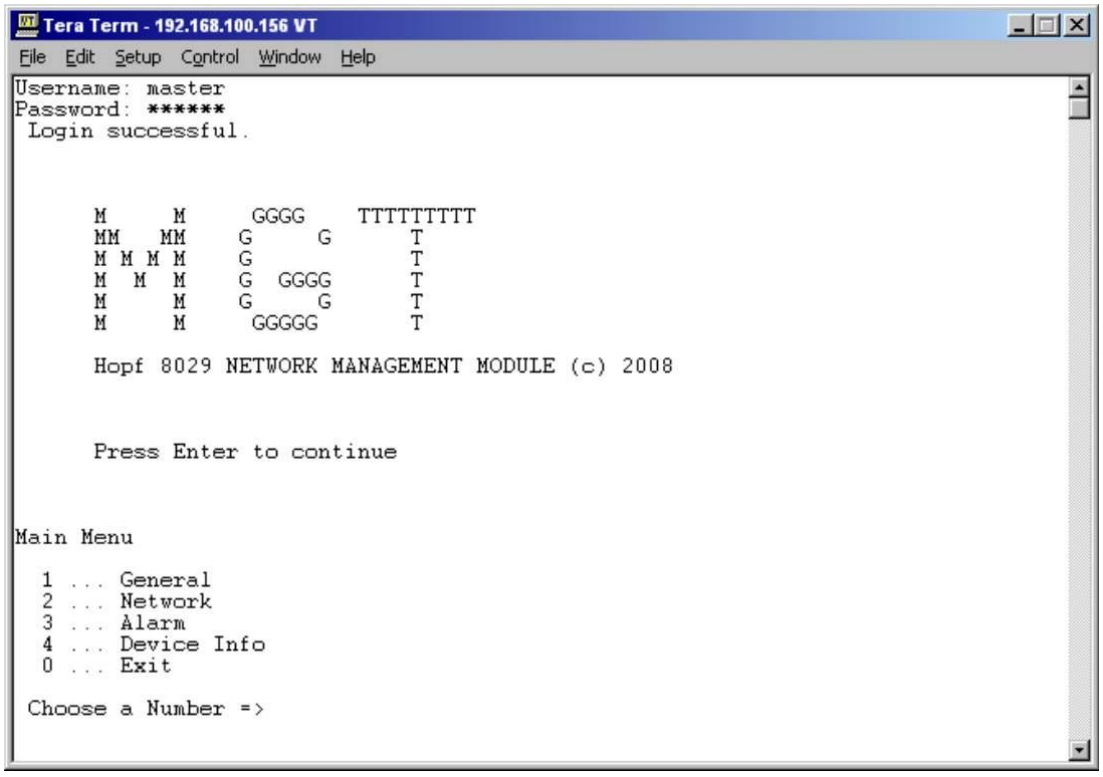
Only basic configuration is possible via SSH or Telnet. The complete configuration of FG6844MNG takes place exclusively via the WebGUI.

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)



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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

8 Technical Data

Structure	
Type	Euro board 160 x 100 mm with 3U/4HP-Front panel
Voltage Supply	
internal System voltage Vcc	5V DC ± 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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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
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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

10 Glossary and Abbreviations

10.1 Time-specific expressions

UTC	**UTC Time** (**U**niversal **T**ime **C**oordinated) 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)**.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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})

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

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.

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com

10.4 List of RFC's

- IPv4:
  Dynamic Host Configuration Protocol - DHCP (RFC 2131)
- Symmetric Key and Autokey Authentication
- Hypertext Transfer Protocol (HTTP):
  HTTP/HTTPS (RC 2616)
- Secure Shell (SSH):
  SSH v1.3, SSH v1.5, SSH v2 (OpenSSH)
- Telnet:
  (RFC 854-RFC 861)
- Simple Network Management Protocol (SNMP):
  SNMPv1 (RFC 1157), SNMPv2c (RFC 1901-1908)
- Simple Mail Transfer Protocol (RFC 2821)

10.5 List of Open Source Packages used

- boa-0.94.13.tar.gz
- busybox-1.00-pre5.tar.bz2
- e100-2.3.43.tar.gz
- ethtool-3.tar.gz
- gmp-4.1.2.tar.bz2
- liboop-1.0.tar.gz
- linux-2.4.21.tar.bz2
- lsh-1.5.3.tar.gz
- mini_httpd-1.19.tar.gz
- mtd-snapshot-20040303.tar.bz2
- net-snmp-5.2.1.2.tar.gz
- openssl-0.9.6l.tar.gz
- passwd.tar.gz
- smc91111.tar.bz2
- sysklogd-1.4.1.tar.gz
- tinylogin-1.4.tar.bz2
- uClibc-0.9.26.tar.bz2
- udhcp-0.9.8.tar.gz
- zlib-1.2.1.tar.bz2

hopf Elektronik GmbH
Nottebohmstr. 41 • D-58511 Lüdenscheid • Tel.: +49 (0)2351 9386-86 • Fax: +49 (0)2351 9386-93 • Internet: http://www.hopf.com • E-Mail: info@hopf.com