Technical Manual
LAN Management Board/Module
For System 6844RC

Model 6844MNG

ENGLISH

Version: 02.02 – 03.09.2012

Valid for Devices 6844MNG with SET
IMAGE Version: 02.xx
and FIRMWARE Version: 02.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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Homepage: [http://www.hopf.com](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.
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 89/336/EWG "Electromagnetic compatibility" and 73/23/EWG "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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Glossary and Abbreviations

Factory Defaults

SSH and Telnet Basic Configuration

Technical Data

Factory Defaults

Glossary and Abbreviations
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 (Graphical User Interface)
  - 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 Slim Line (1U)

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

3.1.1 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

3.1.2 Power Supply

The power supply is integrated in the housing via the respective power supply.
3.2 Design for 19” Systems (3U/4HP)

3.2.1 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

3.2.2 Power Supply

The power supply is integrated in the housing via the respective power supply.
3.3 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:

<table>
<thead>
<tr>
<th>LED 1 (yellow)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Readiness for Operation</td>
</tr>
<tr>
<td>Flashing</td>
<td>Standard condition – FG6844MNG is principle ready for operation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED 2 (yellow)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Boot operation</td>
</tr>
<tr>
<td>Flashing (1Hz.)</td>
<td>Boot operation (duration approx. 2 minutes).</td>
</tr>
<tr>
<td>Flashing (3Hz.)</td>
<td>Fault by Boot operation.</td>
</tr>
<tr>
<td>On</td>
<td>Standard condition – Boot operation is ready</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED 3 (yellow)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Access to the Internal System Bus</td>
</tr>
<tr>
<td>Flashing (1Hz.)</td>
<td>Standard condition – access to the internal system bus</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Ink/act LED (green)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>There is no LAN connection to a network.</td>
</tr>
<tr>
<td>On</td>
<td>LAN connection available.</td>
</tr>
<tr>
<td>Flashing</td>
<td>Activity (send / receive) on network.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10/100 LED (yellow)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>10 MBit Ethernet detected.</td>
</tr>
<tr>
<td>On</td>
<td>100 MBit Ethernet detected.</td>
</tr>
</tbody>
</table>
3.4 RJ45 Socket (ETH0)

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tx+</td>
</tr>
<tr>
<td>2</td>
<td>Tx−</td>
</tr>
<tr>
<td>3</td>
<td>Rx+</td>
</tr>
<tr>
<td>4</td>
<td>Not in use</td>
</tr>
<tr>
<td>5</td>
<td>Not in use</td>
</tr>
<tr>
<td>6</td>
<td>Rx−</td>
</tr>
<tr>
<td>7</td>
<td>Not in use</td>
</tr>
<tr>
<td>8</td>
<td>Not in use</td>
</tr>
<tr>
<td>9</td>
<td>Not in use</td>
</tr>
</tbody>
</table>

The meanings of the RJ45 socket LEDs are described in *Chapter 3.3 Status LEDs of FG6844MNG*.

3.5 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 3.3 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: 

<table>
<thead>
<tr>
<th>SET LAN_MNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP-ADR.</td>
</tr>
<tr>
<td>Y/N</td>
</tr>
</tbody>
</table>

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

Input frame: 

<table>
<thead>
<tr>
<th>LAN_MNG</th>
<th>IP-ADR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;192.168.001.010</td>
<td></td>
</tr>
</tbody>
</table>

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: 

<table>
<thead>
<tr>
<th>SET LAN_MNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATEWAY-ADR.</td>
</tr>
<tr>
<td>Y/N</td>
</tr>
</tbody>
</table>

After entering Y the display changes to the input frame:

Input frame: 

<table>
<thead>
<tr>
<th>LAN_MNG</th>
<th>GW-ADR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;192.168.001.010</td>
<td></td>
</tr>
</tbody>
</table>
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:  

After entering Y the display changes to the input frame:

Input frame:

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:

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:

The entry must be concluded by pressing the [ENT] key.

<table>
<thead>
<tr>
<th>Bits 7-1</th>
<th>No function at present</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>These bits should always be set to &quot;0&quot; for reasons of compatibility.</td>
</tr>
</tbody>
</table>
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**.

![Image of Network Configuration Assistant](image)

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 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.
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.
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:

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:

<table>
<thead>
<tr>
<th>No.</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Apply</td>
<td>Acceptance of changes and entered data</td>
</tr>
<tr>
<td>2</td>
<td>Reload</td>
<td>Restoring the saved data</td>
</tr>
<tr>
<td>3</td>
<td>Save</td>
<td>Permanent storage of the data in the flash configuration</td>
</tr>
</tbody>
</table>

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.

**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.
**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.

<table>
<thead>
<tr>
<th>WebGUI</th>
<th>ERROR-Byte der 6844RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sync channel - signal available</td>
<td>Sync channel - signal available</td>
</tr>
<tr>
<td>Sync protocol - data plausible</td>
<td>Sync protocol - data plausible</td>
</tr>
<tr>
<td>Internal crystal basis control</td>
<td>Control of the internal Quartz Basis</td>
</tr>
<tr>
<td>DST/STD change over parameter set complete/inactive</td>
<td>Daylight Saving Time (DST) Changeover</td>
</tr>
<tr>
<td>6844RC keypad input possible</td>
<td>Keypad Input possible</td>
</tr>
<tr>
<td>Internal communication with 6844MNG</td>
<td>LAN MNG Communication (6844RC only)</td>
</tr>
</tbody>
</table>

**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.

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.

**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:

<table>
<thead>
<tr>
<th>Week</th>
<th>how often the changeover should be processed per day of the week in the month</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1. week</td>
</tr>
<tr>
<td>Second</td>
<td>2. week</td>
</tr>
<tr>
<td>Third</td>
<td>3. week</td>
</tr>
<tr>
<td>Fourth</td>
<td>4. week</td>
</tr>
<tr>
<td>Last</td>
<td>last week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>the day of the week when the changeover should be processed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>Monday... Saturday</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Month</th>
<th>the month when the changeover should be processed</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>February... December</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hour</th>
<th>the time in hour and minute when the changeover should be processed</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h...</td>
<td>23h</td>
</tr>
<tr>
<td>00min</td>
<td>59min</td>
</tr>
</tbody>
</table>
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

![GPS Tab Diagram](image_url)
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.

**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).

<table>
<thead>
<tr>
<th>Alarm Level</th>
<th>Transmitted Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>no messages</td>
</tr>
<tr>
<td>info</td>
<td>info / warning / error / alarm</td>
</tr>
<tr>
<td>warning</td>
<td>warning / error / alarm</td>
</tr>
<tr>
<td>error</td>
<td>error / alarm</td>
</tr>
<tr>
<td>alarm</td>
<td>alarm</td>
</tr>
</tbody>
</table>
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).

<table>
<thead>
<tr>
<th>Alarm Level</th>
<th>Transmitted Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>no messages</td>
</tr>
<tr>
<td>info</td>
<td>info / warning / error / alarm</td>
</tr>
<tr>
<td>warning</td>
<td>warning / error / alarm</td>
</tr>
<tr>
<td>error</td>
<td>error / alarm</td>
</tr>
<tr>
<td>alarm</td>
<td>alarm</td>
</tr>
</tbody>
</table>
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).

<table>
<thead>
<tr>
<th>Alarm Level</th>
<th>Transmitted Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>no messages</td>
</tr>
<tr>
<td>info</td>
<td>info / warning / error / alarm</td>
</tr>
<tr>
<td>warning</td>
<td>warning / error / alarm</td>
</tr>
<tr>
<td>error</td>
<td>error / alarm</td>
</tr>
<tr>
<td>alarm</td>
<td>alarm</td>
</tr>
</tbody>
</table>

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.

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.
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.

<table>
<thead>
<tr>
<th>Output 1</th>
<th>System time is valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive</td>
<td>Sync.-Status = &quot;-&quot;</td>
</tr>
<tr>
<td>Active</td>
<td>Sync.-Status = &quot;C&quot;, &quot;r&quot;, &quot;R&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output 2</th>
<th>Sync status = Radio (r, R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive</td>
<td>Sync.-Status: invalid (-), crystal (C)</td>
</tr>
<tr>
<td>Active</td>
<td>Sync.-Status: radio without regulation (r), radio (R)</td>
</tr>
</tbody>
</table>
### 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.

<table>
<thead>
<tr>
<th>Alarm Trigger</th>
<th>e.g. for Output 2 - Sync status = Radio (r, R)</th>
</tr>
</thead>
</table>
| **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.
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 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!

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 (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.
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 / function description
### 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
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
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).

**WARNING!**

RESTORE 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?

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

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

**WARNING!**

REBOOT is a critical action, all unsaved changes will be lost. Are you sure you want to reboot the device 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 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)
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:**

[Durchsuchen...]

[Upload now]

---

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:**

[Durchsuchen...]

[Update now]

---

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](image)

**WARNING!**

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

**Update file:**

![Upload now](image)

6.4.6.7 Download von SNMP MIB

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

![SNMP MIB](image)

**Download SNMP MIB**

[Click here to download](image)

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](image)

**Download System Configuration**

[Click here to download](image)
6.4.6.9 **Network Interface of 6844MNG (Network)**

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

![Network Interface of 6844MNG](image)

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.

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.
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.

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.

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)
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).
8 Technical Data

**Structure**

<table>
<thead>
<tr>
<th>Type</th>
<th>Euro board 160 x 100 mm with 3U/4HP-Front panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage Supply</strong></td>
<td></td>
</tr>
<tr>
<td>internal System voltage Vcc</td>
<td>5V DC ± 5% via System-BUS of Basis System</td>
</tr>
</tbody>
</table>

**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). |
| 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 61000-4-2 /-3/-4/-5/-6/-11 |
| EN 61000-6-2                  | EN 61000-3-2 /-3 |
| Radio Interference Voltage    | EN 55022 Class B |
| Radio Interference Emission   | 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

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

9.2 ALARM

<table>
<thead>
<tr>
<th>Syslog Configuration</th>
<th>Setting</th>
<th>WebGUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syslog</td>
<td>Disabled</td>
<td>Disabled</td>
</tr>
<tr>
<td>Server Name</td>
<td>Blank</td>
<td>---</td>
</tr>
<tr>
<td>Alarm Level</td>
<td>Disabled</td>
<td>None</td>
</tr>
<tr>
<td>Email Configuration</td>
<td>Setting</td>
<td>WebGUI</td>
</tr>
<tr>
<td>Email Notifications</td>
<td>Disabled</td>
<td>Disabled</td>
</tr>
<tr>
<td>SMTP Server</td>
<td>Blank</td>
<td>---</td>
</tr>
<tr>
<td>Sender Address</td>
<td>Blank</td>
<td>---</td>
</tr>
<tr>
<td>Email Addresses</td>
<td>Blank</td>
<td>---</td>
</tr>
<tr>
<td>SNMP Traps Configuration</td>
<td>Setting</td>
<td>WebGUI</td>
</tr>
<tr>
<td>SNMP Traps</td>
<td>Disabled</td>
<td>Disabled</td>
</tr>
<tr>
<td>Alarm Level</td>
<td>Disabled</td>
<td>None</td>
</tr>
<tr>
<td>SNMP Trap Receivers</td>
<td>Blank</td>
<td>---</td>
</tr>
<tr>
<td>Alarm Messages</td>
<td>Setting</td>
<td>WebGUI</td>
</tr>
<tr>
<td>Alarms</td>
<td>All disabled</td>
<td>All none</td>
</tr>
<tr>
<td>External Alarms</td>
<td>Setting</td>
<td>WebGUI</td>
</tr>
<tr>
<td>Alarms</td>
<td>All disabled</td>
<td>All none</td>
</tr>
</tbody>
</table>
9.3 Digital I/O Alarms

<table>
<thead>
<tr>
<th>Digital outputs</th>
<th>Settings</th>
<th>WebGUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>All not active</td>
<td>All not active</td>
</tr>
<tr>
<td>Alarm Level</td>
<td>All none</td>
<td>All none</td>
</tr>
<tr>
<td>Alarm Trigger</td>
<td>All Both Edges</td>
<td>All Both Edges</td>
</tr>
<tr>
<td>Alarm State</td>
<td>All active</td>
<td>All active</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital inputs</th>
<th>Settings</th>
<th>WebGUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>All not active</td>
<td>All not active</td>
</tr>
<tr>
<td>Label</td>
<td>Blank</td>
<td>---</td>
</tr>
<tr>
<td>Alarm Level</td>
<td>All none</td>
<td>All none</td>
</tr>
<tr>
<td>Alarm Trigger</td>
<td>All Both Edges</td>
<td>All Both Edges</td>
</tr>
<tr>
<td>Alarm State</td>
<td>All not active</td>
<td>All not active</td>
</tr>
</tbody>
</table>

9.4 DEVICE

<table>
<thead>
<tr>
<th>User Passwords</th>
<th>Setting</th>
<th>WebGUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Password</td>
<td>master</td>
<td>master</td>
</tr>
<tr>
<td>Device Password</td>
<td>device</td>
<td>device</td>
</tr>
</tbody>
</table>
# Glossary and Abbreviations

## 10 Time-specific expressions

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTC</td>
<td>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.</td>
</tr>
<tr>
<td>Time Zone</td>
<td>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.</td>
</tr>
<tr>
<td>Time Offset</td>
<td>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.</td>
</tr>
<tr>
<td>Local Standard Time (winter time)</td>
<td>Standard Time = UTC + Time Offset&lt;br&gt;The time offset is defined by the local time zone and the local political regulations.</td>
</tr>
<tr>
<td>Daylight Saving Time (summer time)</td>
<td>Offset of Daylight Saving Time = + 1h&lt;br&gt;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.</td>
</tr>
<tr>
<td>Local Time</td>
<td>Local Time = Standard Time, if exists with summer / winter time changeover</td>
</tr>
<tr>
<td>Leap Second</td>
<td>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).</td>
</tr>
</tbody>
</table>
10.2 Abbreviations

<table>
<thead>
<tr>
<th>English</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>D, DST</td>
<td>Sommerzeit</td>
</tr>
<tr>
<td>ETH0</td>
<td>Netzwerk Schnittstelle 0</td>
</tr>
<tr>
<td>FW</td>
<td>Firmware</td>
</tr>
<tr>
<td>GPS</td>
<td>Globales Positionssystem</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
</tr>
<tr>
<td>IF</td>
<td>Schnittstelle</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protokoll</td>
</tr>
<tr>
<td>LAN</td>
<td>Lokales Netzwerk</td>
</tr>
<tr>
<td>LED</td>
<td>Leuchtdiode</td>
</tr>
<tr>
<td>NTP</td>
<td>Netzwerk Zeit Protokoll</td>
</tr>
<tr>
<td></td>
<td>(Version 3: RFC 1305)</td>
</tr>
<tr>
<td>NE</td>
<td>Device in Telecommunication network</td>
</tr>
<tr>
<td>OEM</td>
<td>Originalgerätehersteller</td>
</tr>
<tr>
<td>OS</td>
<td>Betriebssystem</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
</tr>
<tr>
<td>RFC</td>
<td>technische und organisatorische Dokumente</td>
</tr>
<tr>
<td>SNMP</td>
<td>einfaches Netzwerkverwaltungsprotokoll</td>
</tr>
<tr>
<td></td>
<td>(handled by more than 60 RFCs)</td>
</tr>
<tr>
<td>SNTP</td>
<td>Netzwerk Zeit Protokoll</td>
</tr>
<tr>
<td></td>
<td>(Version 4: RFC 2030)</td>
</tr>
<tr>
<td>S, STD</td>
<td>Winterzeit / Standardzeit</td>
</tr>
<tr>
<td>TCP</td>
<td>Network protocol</td>
</tr>
<tr>
<td>ToD</td>
<td>Tageszeit</td>
</tr>
<tr>
<td>UDP</td>
<td>Network protocol</td>
</tr>
<tr>
<td>UTC</td>
<td>Koordinierte Weltzeit</td>
</tr>
<tr>
<td>WAN</td>
<td>großräumiges Netz</td>
</tr>
<tr>
<td>msec</td>
<td>Millisekunde (10^3 seconds)</td>
</tr>
<tr>
<td>usec</td>
<td>Mikrosekunde (10^6 Sekunden)</td>
</tr>
<tr>
<td>ppm</td>
<td>Teile pro Million (10^6)</td>
</tr>
</tbody>
</table>
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

- 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
- liboob-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
- smc9111.tar.gz
- 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