

Industriefunkuhren



Technical Manual

hopf 7001RC Remote Software

ENGLISH

Version: 02.00 – 24.11.2004

Valid for Devices 7020RC with FIRMWARE Version: **02.xx**
and REMOTE-SOFTWARE Version: **02.xx**

Version number (Firmware / Description)

THE FIRST TWO DIGITS OF THE VERSION NUMBER OF THE TECHNICAL DESCRIPTION AND THE FIRST TWO DIGITS OF THE FIRMWARE VERSION MUST **COMPLY WITH EACH OTHER**.

THE DIGITS AFTER THE DECIMAL POINT IN THE VERSION NUMBER INDICATE CORRECTIONS OF ONLY MINIMAL IMPORTANCE IN THE FIRMWARE / DESCRIPTION AND ARE OF NO SIGNIFICANCE FOR THE FUNCTION.

(Noch offen)

Downloading Technical Descriptions

All current descriptions 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.

**Safety regulations**

The safety regulations and technical data serve to ensure trouble-free operation of the devices and protection of persons and equipment. It is therefore of utmost importance to observe and comply with these regulations. If these are not complied with, then no claims may be made under the terms of the warranty and no liability will be assumed for any ensuing damage.

Contents	Page
1 Commissioning of the <i>hopf</i> 7001RC Remotesoftware	7
1.1 System requirements.....	7
1.2 Cable Connection.....	7
1.3 Installation.....	8
1.4 Uninstalling the Remote Software.....	8
2 Operating of the <i>hopf</i> 7001RC Remotesoftware	9
2.1 Start Functions of the <i>hopf</i> remote software.....	9
2.2 Dialogue.....	9
2.2.1 Cancel.....	9
2.2.2 Send.....	9
2.2.3 Status field	9
2.2.3.1 Response of Saving the Parameter Changes.....	9
2.2.3.2 Remembrance to Save Parameter Changes.....	10
2.2.3.3 Unfiltered saved.....	10
2.2.4 Exit.....	10
2.3 Connection set-up PC - System 7001RC.....	10
2.4 Selection and Configuration of the PC Interface (Port)	12
2.5 No Connection.....	13
2.6 Device	14
2.7 Options.....	15
2.7.1 Request on Parameter Change	15
2.7.2 Permit Parameter Change	16
2.7.3 Request before Discarding Changes	16
2.7.4 Show Checksum Error	16
2.7.5 Show Syntax Error	17
2.8 Help.....	17
2.8.1 Help.....	17
2.8.2 Info / Versions No. <i>hopf</i> 7001RC.....	17
3 Parameterising of the System 7001RC.....	18
3.1 File	18
3.1.1 Configuration of System 7001RC with a File (load config)	18
3.1.2 Save Configuration into a File (save config).....	19
3.1.3 Exit	19
3.2 Controls.....	20
3.2.1 Time and Date.....	20
3.2.1.1 Local Time.....	21
3.2.1.2 UTC-time	21
3.2.1.3 Difference Time (Time Offset).....	21
3.2.1.4 System Status Delay (Status time out reception lost / reception ok).....	21
3.2.2 Change Over Date	21
3.2.3 GPS.....	22

3.2.3.1	GPS Mode 3D/Pos.fix (Mode of Reception).....	23
3.2.3.2	GPS Satellite Reception	23
3.2.3.3	Position.....	23
3.2.4	Quartz Adjustment Value	23
3.2.5	System Bytes	24
3.2.5.1	Function Byte.....	24
3.2.5.1.1	Display 'Screen' Saver	24
3.2.5.1.2	Error Signal	24
3.2.5.1.3	Simulation of the System Status (Status 'synchron')	25
3.2.5.1.4	PPS / Error Message via SUB-D Connector (SUB-D pin 4)	25
3.2.5.1.5	Switching Primary and Secondary Source (Autoswitch off)	25
3.2.5.1.6	Time Base for M/S-String (Sync Base UTC for M/S String)	25
3.2.5.1.7	Special Evaluation of the M/S-String (Special Sync for M/S-String)	25
3.2.5.2	Synchronisation Byte	25
3.2.5.2.1	Synchronisation Source	26
3.2.5.2.2	3D / Pos.fix (GPS)	26
3.2.5.2.3	Internal or external Change Over Dates when not synchronous (Use internal Change over dates when not synchron)	26
3.2.5.2.4	Use always internal Change Over Dates	26
3.2.5.2.5	Detecting of Leaps in Time (Special Sync. Procedure)	26
3.2.5.2.6	Multi Source	27
3.2.6	Reset Control Board.....	27
3.3	Outputs.....	28
3.3.1	Serial Parameter of Control Board 7020RC (COM Parameter (7020RC)).....	28
3.3.2	DCF77 Outputs (DCF77 Simulation)	29
3.4	System	30
3.4.1	RC-Function Board (Boards)	30
3.4.1.1	Start New Scan.....	31
3.4.1.2	Insert new RC-Function Board in System 7001RC (Insert)	31
3.4.1.3	Set RC-Function Board Parameter (Set Parameter).....	31
3.4.1.3.1	RC-Function Board 7112RC	32
3.4.1.3.2	RC-Function Board 7113RC	33
3.4.1.3.3	RC-Function Board 7121RC	34
3.4.1.3.4	RC-Function Board 7122RC	34
3.4.1.3.5	RC-Function Board 7201RC	34
3.4.1.3.6	RC-Function Board 7221RC	35
3.4.1.3.7	RC-Function Board 7245RC	35
3.4.1.3.8	RC-Function Board 7265RC	35
3.4.1.3.9	RC-Function Board 7266RC	36
3.4.1.3.10	RC-Function Board 7270RC	37
3.4.1.3.11	RC-Function Board 7406RC	38
3.4.1.3.12	RC-Function Board 7515RC	39
3.4.1.4	Selecting the Monitoring Mode of "RC-Function Boards" (Set Status).....	40
3.4.1.5	Removal of "RC-Function Boards" (Remove).....	40
3.4.1.6	Indicate the "RC-Function Board" in the System (Show at Device)	40
3.4.1.7	Actualise the Indication of "RC-Function Boards" (Refresh)	40
3.4.2	Parameterisation of the System Error Messages (Error Handling)	41
3.4.2.1	Visualisation of RC-Function Board errors (Board Error Details).....	41
3.4.3	Input of Remote Keyword (Keyword)	42
3.4.4	Reset System.....	42

1 Commissioning of the **hopf** 7001RC Remotesoftware

The **hopf** 7001RC Remotesoftware (**hopf** remote control software) is for configuration of a **hopf** 7001RC master clock system via a serial interface. The serial interface cable included is connected between the personal computer (at a free serial interface) and the Control Board 7020RC at 9-pin SUB-D connector X1 (interface **COM0**).



The following technical manual serves to describe the functions of the **hopf** 7001RC Remotesoftware. The meaning of each setting is described in the technical manuals of the system 7001RC and the implemented function boards.

1.1 System requirements

Depending on the platform the following system requirements are necessary for the remote software and/or the installation programme:

Windows

- Windows 95, 98, NT, 2000, XP
- min. 32 MB RAM (128 MB recommended)
- min. 1 MB free hard disk memory
- screen resolution min. 640x480 (1024x768 recommended)



The user interface of the **hopf** 7001RC Remotesoftware is built up in English language. All operating system depending messages and buttons are displayed in the language of the respective operating system.

1.2 Cable Connection

For the connection between the PC COM port and the COM port of the control board 7020RC the **hopf** cable KA6870 is needed. Alternatively also a cable with the following wiring can be used:

For PCs with 9-pole SUB-D connector:

PC (on the cable: 9-pole SUB-D female connector)	7020RC (connector X1) (on the cable: 9-pole SUB-D female connector)
2	3
3	2
5	5

For PCs with 25-pole SUB-D connector:

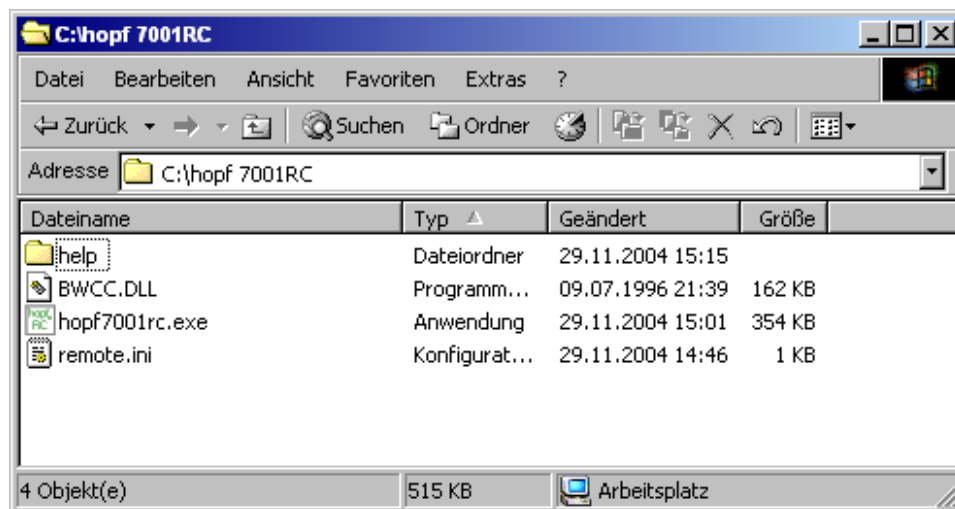
PC (on the cable: 25-pole SUB-D female connector)	7020RC (connector X1) (on the cable: 9-pole SUB-D female connector)
2	2
3	3
7	5



A completely occupied null modem cable may not to be used because there are several signals on the control board 7020RC plug which can prevent a serial communication between the PC and the system 7001RC.

1.3 Installation

Unzip the "**hopf_7001RC_xxxx.zip**" (xxxx = version number of the **hopf** 7001RC remote software) file into a folder on your local hard drive. The following files and sub-directory will be created automatically (entries in the Windows registry are not carried out):



1.4 Uninstalling the Remote Software

To uninstall the **hopf** 7001RC software delete the complete folder "**hopf 7001RC**" on your local hard drive.

2 Operating of the **hopf** 7001RC Remotesoftware

2.1 Start Functions of the **hopf** remote software

Start the application by activating the file "**hopf7001rc.exe**" in the Remotesoftware directory.

2.2 Dialogue

In the most dialog windows of the **hopf** 7001RC Remotesoftware the same buttons and elements are available:

- **Exit** (closing the software),
- **Cancel** (abort),
- **Send** (transmitting the settings to the device),
- **Status field** (indication for the saving PC - System 7001RC).

2.2.1 Cancel

Activating the button "**cancel**" make all unsaved changes undone. All values are set to their previous values.

2.2.2 Send

Activating the button "**send**" transmits the values to be set to the system 7001RC. The status of saving will be shown in the status field (see **chapter 2.2.3 Status field**).

2.2.3 Status field

The status field is located between the buttons "send" and "exit". This status field shows the status of parameter saving between the PC - system 7001RC

2.2.3.1 Response of Saving the Parameter Changes

When there are no changes or the saved data is already saved, the is green status field "data saved" will be displayed.



2.2.3.2 Remembrance to Save Parameter Changes

When parameter changes have not been saved so far in the system 7001RC the **red** status field "**Save Data!**" will be displayed.



2.2.3.3 Unfiltered saved

Some boards have filter functions for their parameters. When the data is send the system first acknowledges the reception of the unfiltered data. At this time the **yellow** status field "**unfiltered saved**" will be displayed until the system 7001RC sends the corrected data back.



2.2.4 Exit

Activating the button "**exit**" closes the window without any action. Unsaved parameter changes will be lost

2.3 Connection set-up PC - System 7001RC

The following points must be ensured for a working connection between the system 7001RC and the **hopf** 7001RC Remotesoftware.

- Identical serial parameters in the control board 7020RC and the **hopf** 7001RC Remotesoftware,
- Usage of a serial cable with the specifications described in **chapter 1.2 Cable Connection**.
- The serial cable has to be connected to that PC COM port which is chosen to communicate with the system 7001RC. The serial interface of the PC can be selected after starting the **hopf** 7001RC Remotesoftware.

After starting the **hopf** 7001RC Remotesoftware it tries to find a connected device at the last used PC COM-port with the last used parameters.

If a device answers, **hopf** 7001RC software configures itself for this device.

```

hopf 7001RC remote software
file controls outputs system port device options help
device:          7001RC
time:           14:56:57 standard RADIO
date:           29/NOV/2004

control board:  7020RC
version:        02.00
date:           15.11.04
serinum:        010203

PC:
port:           COM2
parameter:      9600,N,8,1

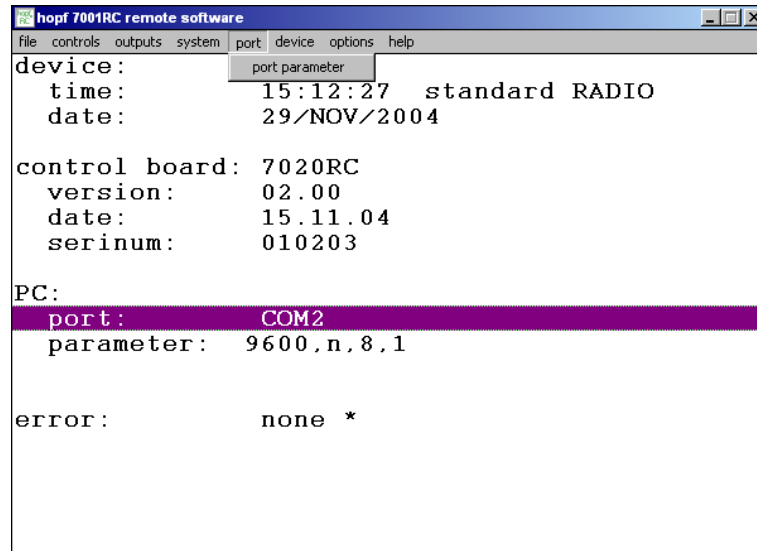
error:          none *

```

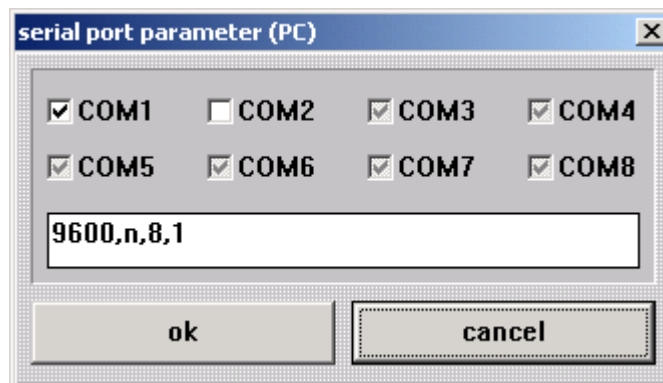
Display	Function
device:	The system identification 7001RC
time:	The local time and status from the system 7001RC
date:	The date from the system 7001RC
control board:	The control board type (only system 7001RC)
version:	The firmware version of control board 7020RC
date:	The firmware date of control board 7020RC
serinum:	The serial number of control board 7020RC
PC port:	The serial port the program uses on the PC
PC parameter:	The parameters of this serial port
error:	The error status from the system 7001RC

2.4 Selection and Configuration of the PC Interface (Port)

The main menu "**port**" contains the submenu "**port parameter**". A change of the setting in this menu can become necessary for example, when the system 7001RC is going to be operated at another PC COM port or with different serial parameters than before.



This function sets the parameters of the PC COM port allocated by the **hopf** 7001RC Remotesoftware.



The port with the black check (for example **COM1**) is the actual COM-port used by the **hopf** 7001RC Remotesoftware. The grey marked ports are not available for the **hopf** 7001RC Remotesoftware (allocated by other software or not existent).

In the edit box the following parameters are shown:

Baud rate (**9600Bd**), parity (**no**), data bits (**8**) and stop bits (**1**).

These parameters have to be given in with comma between them in exact this order. The parameters are saved after every session in the file "remote.ini" in the **hopf** 7001RC Remotesoftware directory and will be used again in the next session.

To ensure a reliable serial transmission the baud rate should not be less than 9600 baud.

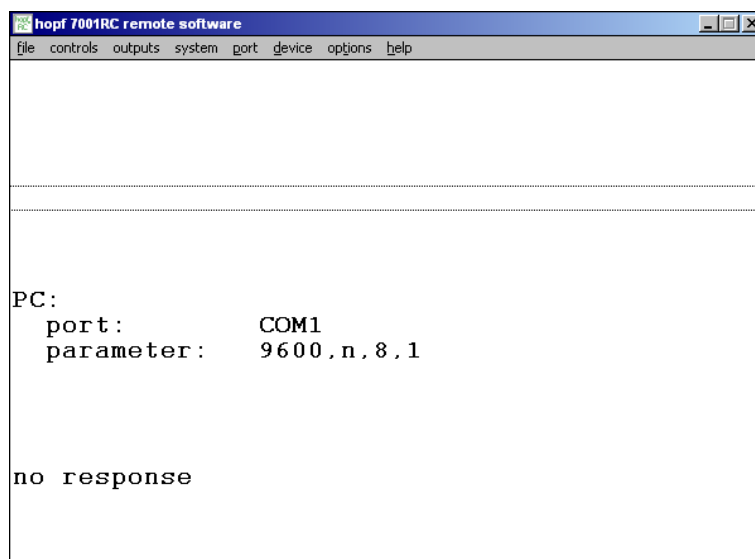


The maximum baud rate supported by the system 7001RC is 19200 baud.

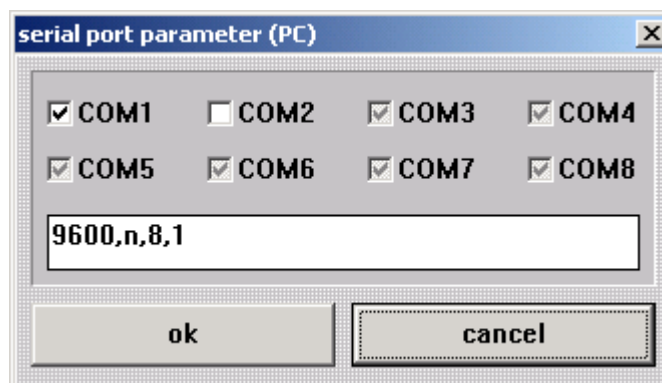
2.5 No Connection

After selecting an adequate PC COM port the **hopf** 7001RC Remotesoftware tries to establish a connection to the attached system 7001RC.

If no connection can be built no system information of the system 7001RC will be shown in the **hopf** 7001RC Remotesoftware.



The following popup window appears in which the serial parameters can be set (see **chapter 2.4 Selection and Configuration of the PC Interface (Port)**)



set COM parameter:

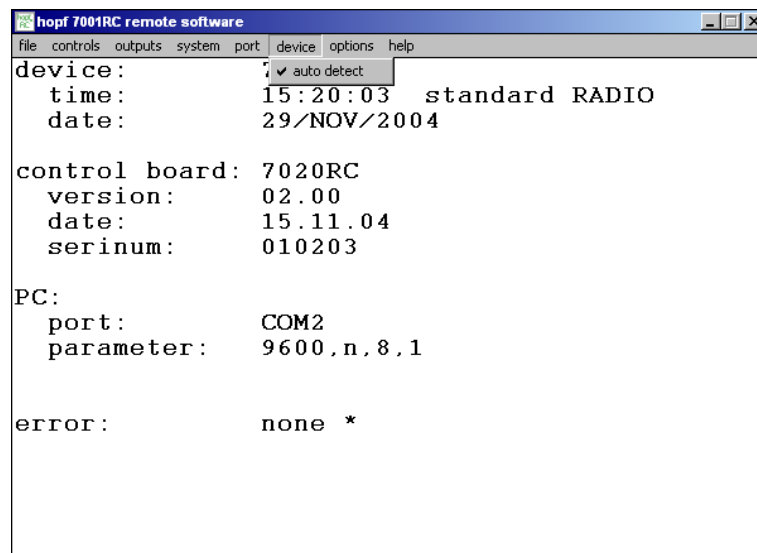
The check box "set com parameter" must be activated for parameterising or changing the PC interface (see **Chapter 2.4 Selection and Configuration of the PC Interface (Port)**).

If no connection can be established furthermore the following steps have to be carried out:

- Check the serial connection between PC and system 7001RC (correct serial cable, connector is not slipped off, correct PC COM port),
- Check that the serial parameters in the system 7001RC (can be checked / set via keypad and display in the system 7001RC, see technical manual of system 7001RC) and the **hopf** 7001RC Remotesoftware are identical.
- Closing of the **hopf** 7001RC Remotesoftware and deleting of the file "remote.ini" in the Remotesoftware directory.

2.6 Device

The "device" menu contains the following sub-menus "auto detect"



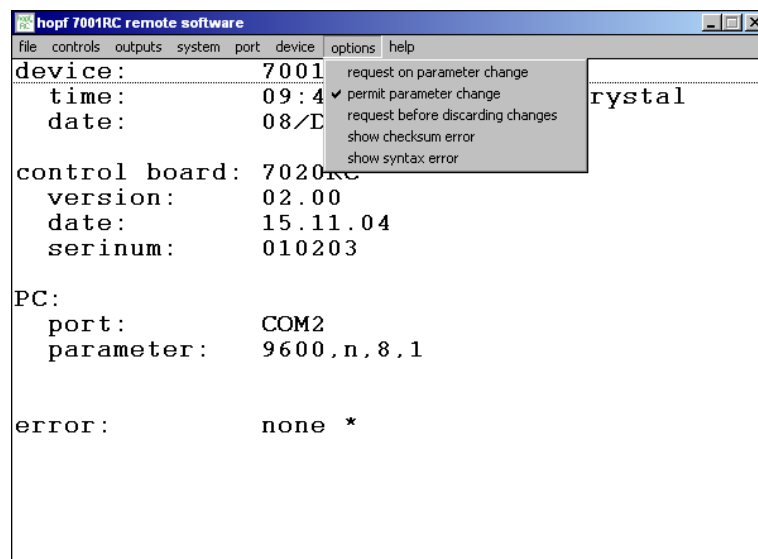
Automatic System Detection

Normally **hopf** 7001RC Remotesoftware automatically detects and identifies the device linked to the used COM-port.

2.7 Options

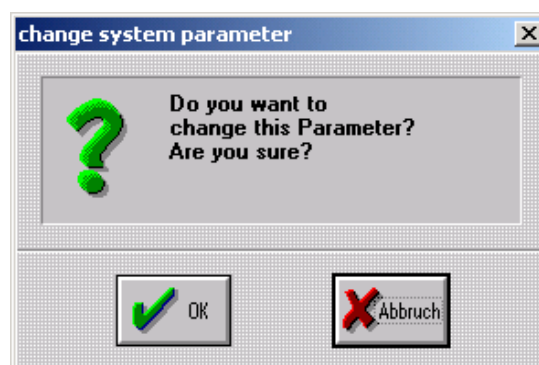
The "options" menu contains the following sub-menus:

- request on parameter change
- permit parameter change
- request before discard changes
- show checksum error
- show syntax error



2.7.1 Request on Parameter Change

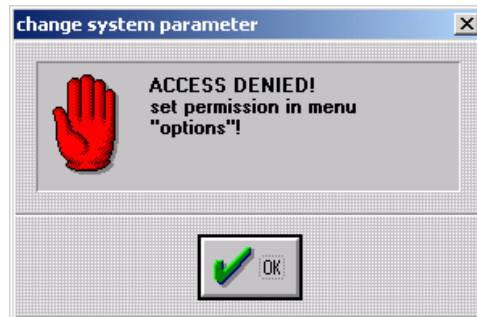
When the option "request on parameter change" is active, every time the "send" button in a dialog window is pressed, this message box will appear:



This safety request should be activated to avoid unintentional setting of values.

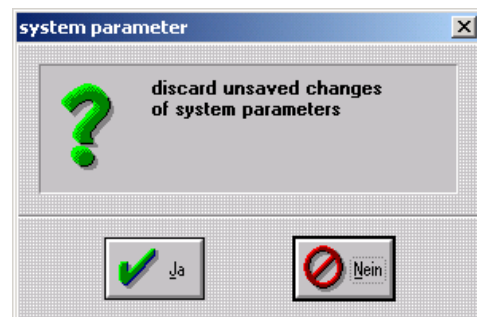
2.7.2 Permit Parameter Change

The parameter in system 7001RC can only be modified by the **hopf** 7001RC Remotesoftware when the option "**permit parameter change**" is activated. Otherwise the modified parameters will not be saved in the system 7001RC and the following window appears:



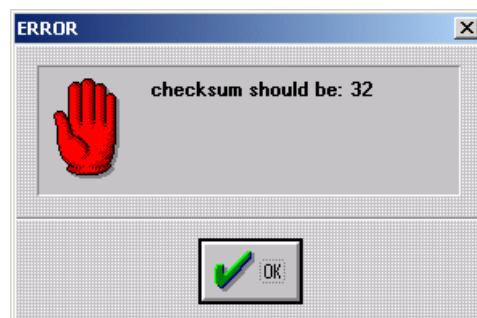
2.7.3 Request before Discarding Changes

When option "**request before discarding changes**" is activated, the following window appears when a modified setting is aborted by 'CANCEL'. Thus can avoid an unintentional reset of the modified settings.



2.7.4 Show Checksum Error

When option "**show checksum error**" is activated, a checksum error message from the device will open this message box:



This function is for **hopf** purposes only and should be deactivated for compatibility.

2.7.5 Show Syntax Error

When option "**show syntax error**" is activated, the following window opens as soon as the **hopf** 7001RC Remotesoftware receives an indefinable string from the system 7001RC.



This function is for **hopf** purposes only and should be deactivated for compatibility.

2.8 Help

The help menu contains the following sub-menus:

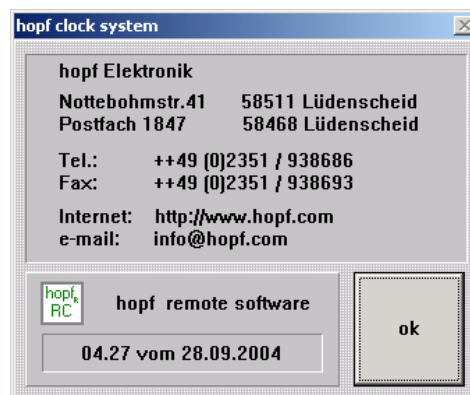
- help
- info

2.8.1 Help

Here the online documentation can be found. The help data are saved into the remote path, so that it is not necessary to use an internet connection. The help can be used with any conventional internet browser.

2.8.2 Info / Versions No. **hopf** 7001RC

This dialog shows the **hopf** Elektronik GmbH contact information and information about the software revision and date.



3 Parameterising of the System 7001RC

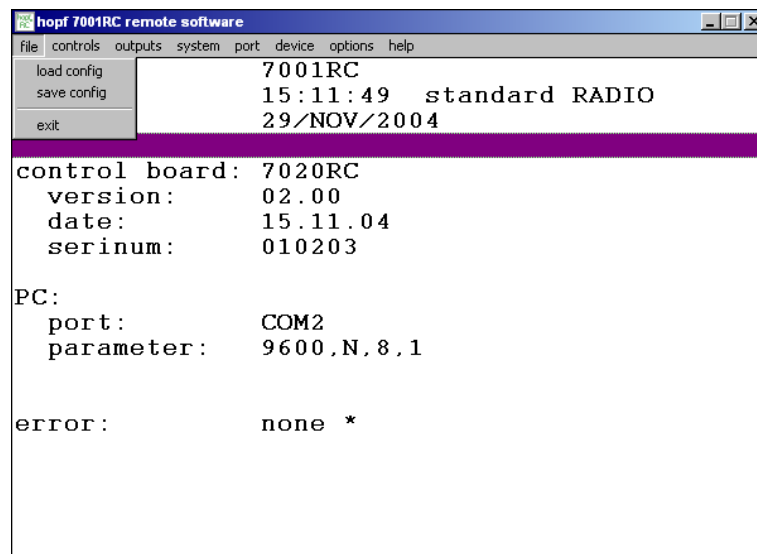
In the menu bar of the **hopf** 7001RC Remotesoftware eight menus are available. Four of these menus serve to parameterise the system 7001RC:

- **file:** Save/load configuration files,
- **controls:** Control and set functions,
- **outputs:** Configuration of the control board 7020RC outputs,
- **system:** Configuration of special system functions and configuration of the implemented "RC-Function Boards"

3.1 File

The file menu contains three sub-menus:

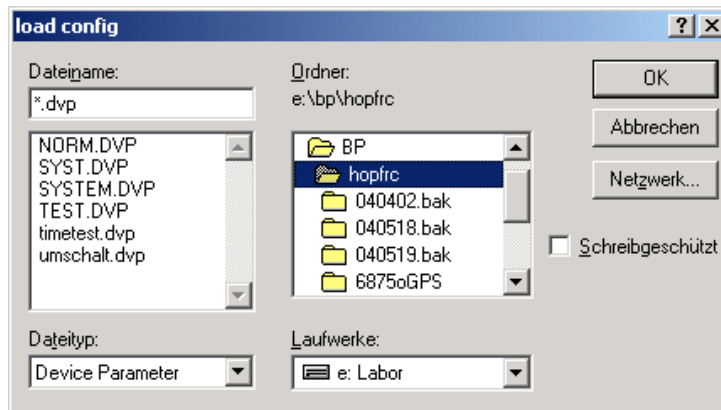
- **load config:**
Load a configuration file (text file) from the hard drive of the PC into the connected system 7001RC.
- **save config:**
Save the configuration of the connected system 7001RC into a text file on the hard drive.
- **exit:**
close the **hopf** 7001RC remote software



3.1.1 Configuration of System 7001RC with a File (load config)

The system 7001RC can be configured with a already saved configuration file. Therefore the submenu '**load config**' has to be selected in the menu **file**. All data except for time and date are transmitted to the system 7001RC.

A dialogue appears in which the configuration file has to be selected. After selecting the file and confirming this with the button "OK" the selected configuration will be transmitted to the system 7001RC.

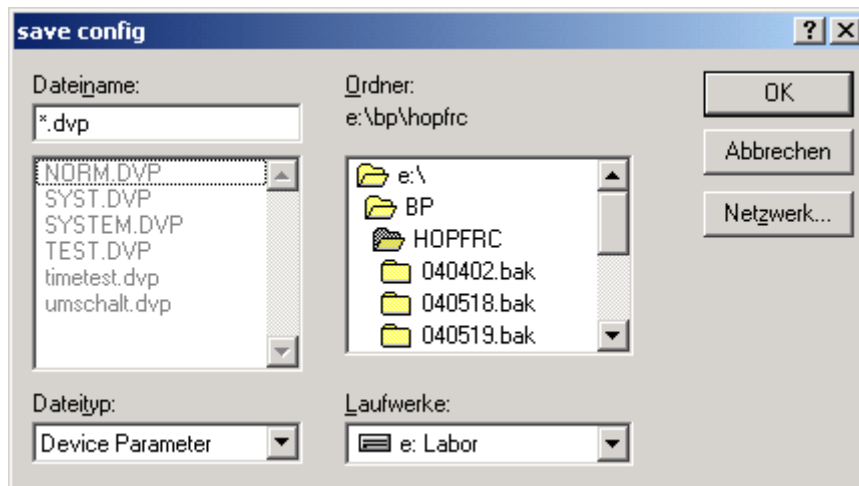


Therefore it is possible to configure another **identical** 7001RC-System with the same data.

3.1.2 Save Configuration into a File (save config)

The system configuration can be saved via the submenu '**save config**' in the menu **file**. After the path and the file name is defined the actual configuration except for time and date will be saved when activated by "OK".

Also the configuration of all implemented "RC-Function Boards" in the system 7001RC will be saved.



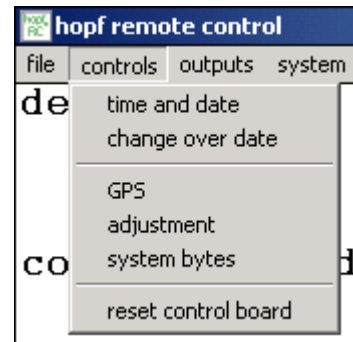
3.1.3 Exit

Close the program with this item or the close box at the top right corner of the main window.

3.2 Controls

The menu 'controls' serves to configure general parameters of the system 7001RC. It contains the following submenus:

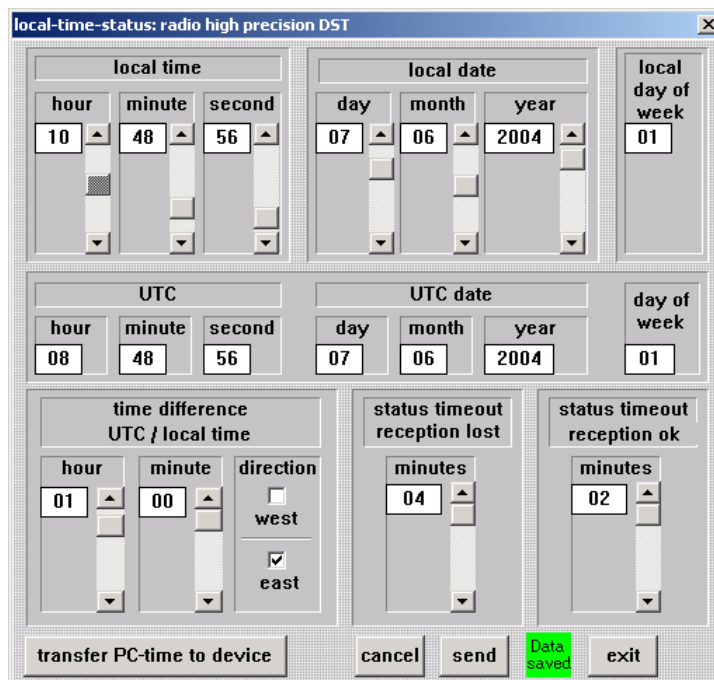
- **time and date**
- **change over date**
- **GPS**
- **Adjustment** (of the internal quartz base)
- **system bytes**
- **reset control board**



To avoid unintentional setting of values a safety request can be activated via the 'options' menu which has to be confirmed before changes in settings are transmitted to the system 7001RC. See *chapter 2.7.1 Request on Parameter Change*.

3.2.1 Time and Date

In this dialog time and date information of the system 7001RC can be set and displayed.



Additionally the difference time between UTC and local standard time (winter time) as well as the delay of the system status 'radio' can be set and displayed.

The dialog contents not only the actual time and date of the device, it also shows the time difference between local time and UTC and the time outs for the status changes.

Adjustable is:

- The local time and date,
- The difference time,
- The delay time for the system status 'radio'
(**status time out reception lost / status time out reception ok**).

3.2.1.1 Local Time

The local time and date is displayed and can be set via sliders if necessary.

The local day of the week can't be set but is calculated automatically (with **1** ⇒ Monday ... **7** ⇒ Sunday) and will be displayed after the transmitting the time/date to the system 7001RC.

The button "transfer PC time to device" transmits the actual PC time to the system 7001RC without the need for pressing the 'SEND' button.



If the safety request for parameter changes is not activated (see **chapter 2.7.1 Request on Parameter Change**) the time/date will be send immediately after pressing the button "transfer PC time to device" to the system 7001RC, even when the system 7001RC is radio synchronous.

3.2.1.2 UTC-time

In this menu the UTC-time is only displayed and can't be manipulated.

The UTC day of the week is calculated automatically (with **1** ⇒ Monday ... **7** ⇒ Sunday) and will be displayed after the transmitting the time/date to the system 7001RC.

3.2.1.3 Difference Time (Time Offset)

This function sets the difference time between the local standard (winter) time and the UTC.

The difference time must be entered with hour and minute. Furthermore the information whether the location is west or east of the 0 meridian (Greenwich) is needed. The configuration software checks the plausibility of the values entered.

<u>Examples:</u>	West (-)	08:00	USA and Canada (Pacific Time)
	East (+)	01:00	Germany (MEZ)

3.2.1.4 System Status Delay (Status time out reception lost / reception ok)

This function will be change the on/off-delay for the system status 'radio' in the system 7001RC

3.2.2 Change Over Date

In this menu the point in time is defined when the 'daylight saving time' / 'standard time' and 'standard time' / 'daylight saving time' changeover takes place.

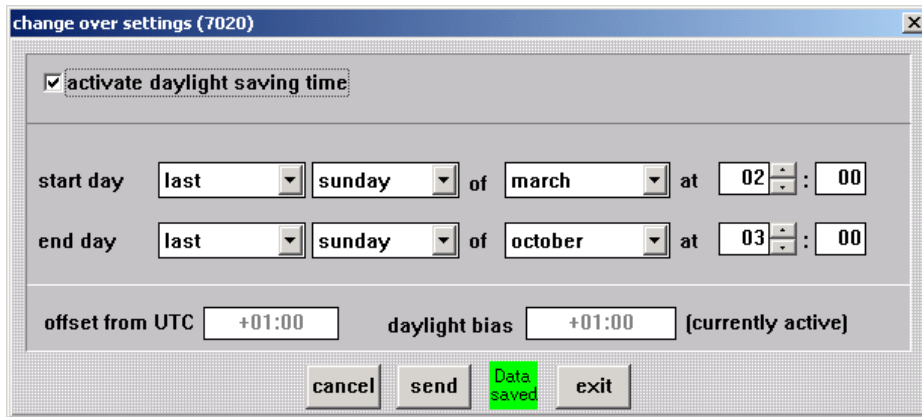
The changeover will only be carried out when the checkbox 'activate daylight saving time' is activated. If no changeover dates are desired the checkbox has to be deactivated.

'Start day' defines the changeover from standard time to daylight saving time. 'End day' defines the changeover from daylight saving time to standard time.

The following information is required to set the changeover times.

The change over takes place:

- At the first, second, third, fourth or last week in a month,
- Day of the week,
- Month,
- Time of day when the changeover shall be executed



The field "offset from UTC" shows the difference time entered in **chapter 3.2.1.3 Difference Time (Time Offset)**.

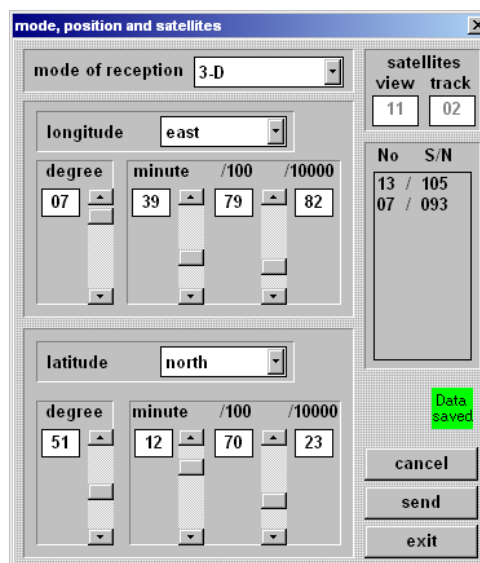
The field "daylight bias" indicates whether the system runs in daylight saving time (**+01:00 - currently active**) or standard time (**+01:00 - currently not active**).

From the addition of both fields results the actual time gap between the local time and the UTC. Examples:

- "offset from UTC" = +01:00, daylight bias = +01:00, **currently not active** ⇒ actual time gap = +01:00 hours
- "offset from UTC" = +01:00, daylight bias = +01:00, **currently active** ⇒ actual time gap = +02:00 hours

3.2.3 GPS

After choosing 'GPS' in the menu controls the following dialog appears:



3.2.3.1 GPS Mode 3D/Pos.fix (Mode of Reception)

This function serves to decide, whether the system 7001RC synchronizes with one (pos.fix) or four (3D) received satellites.

The function pos.fix is useful in case of difficult reception conditions or when commissioning since it can accelerate the first reception.

3.2.3.2 GPS Satellite Reception

In the display for GPS satellite reception the following values are shown:

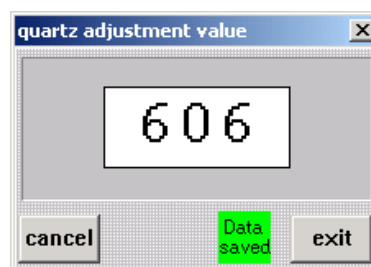
- view:** theoretical number of satellites visible at the given time
- Track:** Quantity of satellites actually received
- No.:** (Pseudo random) number of received satellite
- S/N:** reception quality as **S/N Ratio** (signal to noise ratio) of received satellites

3.2.3.3 Position

This function serves to input/show the geographical position of the system 7001RC. The input of this value can speed up the initialisation time of the receiver the first time. When at least four satellites are being received the geographical position will be calculated by the GPS receiver.

3.2.4 Quartz Adjustment Value

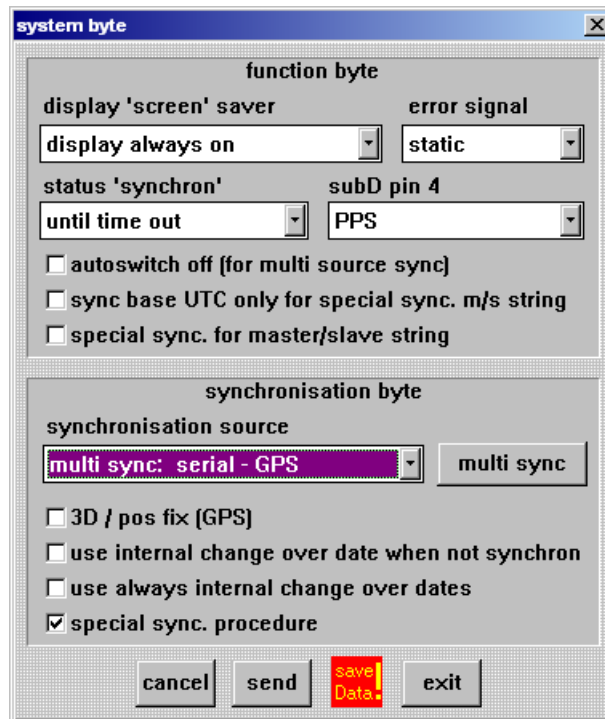
The quartz adjustment value serves to correct the quartz drift caused by aging and temperature. This value can only be manipulated in the QUARZ-mode since the system accuracy is not regulated by external synchronisation sources. In all other system modes this menu only displays the quartz adjustment value.



When the system 7001RC is delivered as a QUARZ system the quartz adjustment value has already been set correctly by the **hopf** Elektronik GmbH and must not be changed without any consultation since this will affect directly the accuracy of the system 7001RC.

3.2.5 System Bytes

This section permits the configuration of internal system functions.



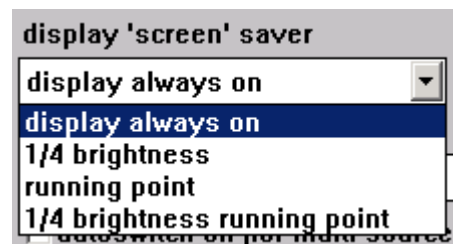
3.2.5.1 Function Byte

In the upper half of the window settings of the function byte can be done.

3.2.5.1.1 Display 'Screen' Saver

With the **display 'screen' saver** the blanking of the display can be controlled. In this way it is possible to delay the loss in brightness of the display (see table).

- Display is always on
- The display is set to ¼ brightness
- The display is turned off, only a running point appears
- The display is turned off. Only a running point with ¼ brightness appears



3.2.5.1.2 Error Signal

Two different Error Messages can distinguished with this bit (see also Error-Priority).

- Static
- PWM ⇒ dynamic

3.2.5.1.3 Simulation of the System Status (Status 'synchron')

By means of this function the control board 7020RC can simulate radio synchronisation.

- status 'synchron' **until time out**: System status is set via the synchronisation source. After a loss of reception the system status 'radio' is simulated until the time out expires. See **chapter 3.2.1.4 System Status Delay (Status time out reception lost / reception ok)**
- status 'synchron' **always (until reset)**: Simulation of the status 'radio' until a reset is released (see **chapter 3.2.6 Reset Control Board** and **chapter 3.4.4 Reset System**) or the system is switched off and on.

3.2.5.1.4 PPS / Error Message via SUB-D Connector (SUB-D pin 4)

With this function the Error Message can be switched between the PPS output and the error message output via the SUB-D connector X1 pin 4 in the front panel of the control board 7020RC.

- PPS pulse at SUB-D connector pin 4
- Error Message at SUB-D connector pin 4

3.2.5.1.5 Switching Primary and Secondary Source (Autoswitch off)

This setting is only valid for the **optional multi source system**.

Activated: Manually multi source switching

Deactivated: Automatically multi source switching

3.2.5.1.6 Time Base for M/S-String (Sync Base UTC for M/S String)

Activated: Time base is UTC in the M/S-String (Master/Slave-String)

Deactivated: Time base is local time in the M/S-String

3.2.5.1.7 Special Evaluation of the M/S-String (Special Sync for M/S-String)

Activated: Special evaluation of the M/S-String (Usage of the internal difference time and change over dates)

Deactivated: Standard evaluation of the M/S-String

3.2.5.2 Synchronisation Byte

In the lower area of the system byte window the settings for the '**synchronisation byte**' are made.

3.2.5.2.1 Synchronisation Source

This function serves to set the synchronisation mode in which the system 7001RC is going to be synchronized, e.g. GPS, DCF77 Pulse, Master/Slave-String, Quartz, ...



The **multi sync.** mode is only selectable with an optionally multi sync. system.

3.2.5.2.2 3D / Pos.fix (GPS)

See *chapter 3.2.3.1 GPS Mode 3D/Pos.fix (Mode of Reception)*

Activated: 3D-evaluation

Deactivated: Position fixed evaluation

3.2.5.2.3 Internal or external Change Over Dates when not synchronous (Use internal Change over dates when not synchron)

Activated: The change over date is controlled by the synchronisation source

Deactivated: The change over date is controlled system internally when the synchronisation source fails.

3.2.5.2.4 Use always internal Change Over Dates

Activated: The change over date is always controlled system internally

Deactivated: No change over date is possible

3.2.5.2.5 Detecting of Leaps in Time (Special Sync. Procedure)

Activated: Suppressing of leaps of time while synchronisation takes place

Deactivated: No change over date is possible.

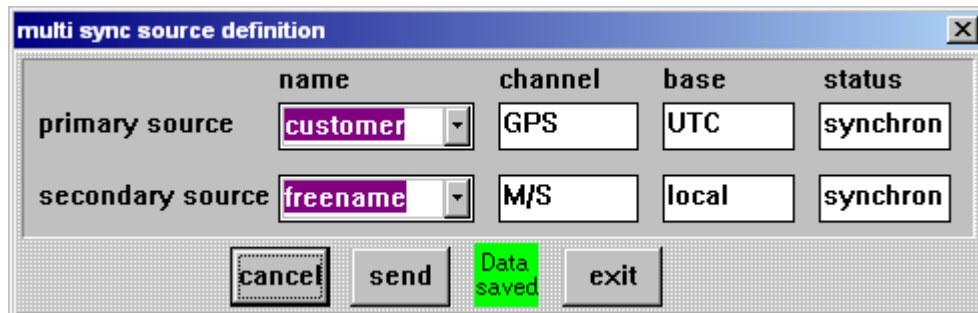
3.2.5.2.6 Multi Source

The multi source systems (multi sync mode) are selected via the menu 'synchronisation source'.



The function **multi sync. source** is only selectable with an optionally multi sync. system.

After selecting a multi source system a button 'multi sync' appears next to the button 'synchronisation source'. The following window appears after activating this button:



	name	channel	base	status
primary source	customer	GPS	UTC	synchron
secondary source	freename	M/S	local	synchron

Buttons: cancel, send, Data saved, exit

This menu shows the synchronisation sources (primary / secondary source) in a multi source system:

Name:

It's a free selectable name for the primary and secondary source.

Channel:

It shows the used synchronisation channel like GPS, DCF77 pulse or Master /Slave-String.

Base:

It shows the time base from the appropriate channel (local time / UTC).

Status:

It shows the actual synchronisation status of the appropriate channel.

3.2.6 Reset Control Board

This function resets the system control board (7020RC) program. All other "function boards" / "RC-Function Boards" implemented in the system 7001RC are not affected.

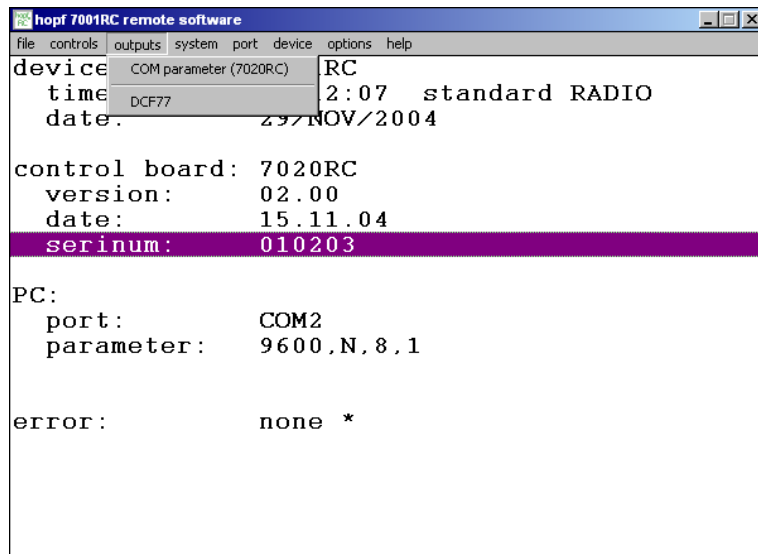


3.3 Outputs

The main menu (outputs) serves to configure the serial interface as well as the DCF77 simulation outputs of the control board 7020RC. Since the control board 7020RC provides the DCF77 pulse for the whole system 7001RC the DCF77 setting influences all "Function Boards" / "RC-Function Boards" which take over the DCF77 pulse from the system bus.

The outputs menu contains the following sub-menus:

- COM parameter (7020RC)
- DCF77

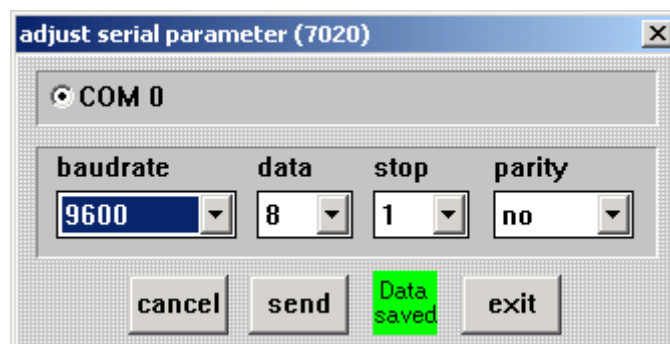


3.3.1 Serial Parameter of Control Board 7020RC (COM Parameter (7020RC))

This function sets the serial parameters in the control board 7020RC. The settings can be modified by selection in the appropriate window.

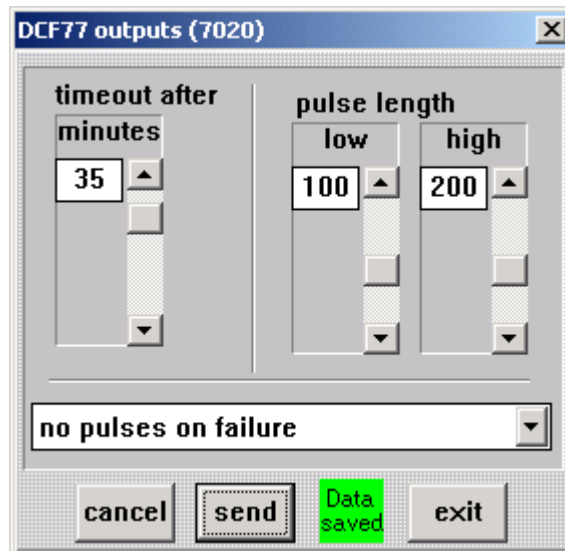


If the parameters are changed, sent and acknowledged by the system, the **hopf** 7001RC Remotesoftware changes the parameters of the serial port of the PC to the same values!



3.3.2 DCF77 Outputs (DCF77 Simulation)

In this section settings can be made for the DCF77 simulation and the DCF77 pulse.



Timeout after:

Delay time for the deactivation of the simulation after a fail of the synchronisation source.

Pulse length high bit:

Pulse length of the high bit in the simulated DCF77 signal/pulse.

Pulse length low bit:

Pulse length of the low bit in the simulated DCF77 signal/pulse.

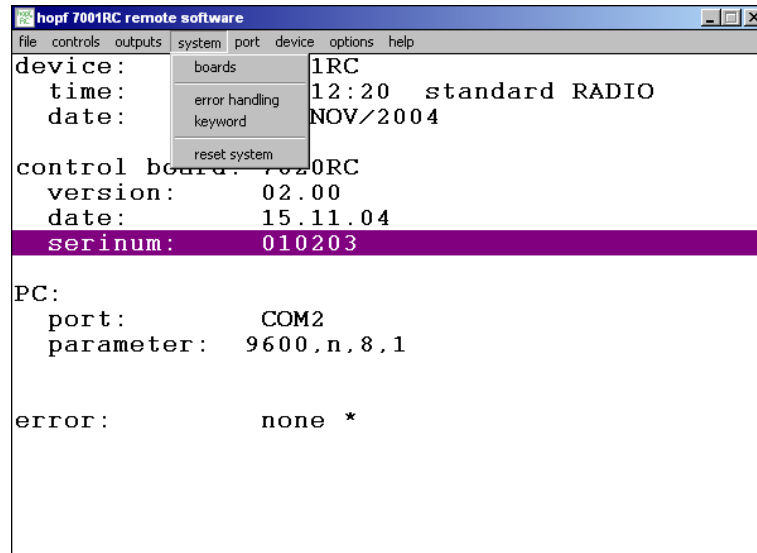
DCF77 Simulation behaviour when deactivated:

- **no pulse on failure**
No signal will be given out when the system status is 'Q' (Quarz) and the time out has been expired
- **2Hz on failure**
A 2Hz signal will be given out when the system status is 'Q' (Quarz) and the time out has been expired
- **always simulation**
A DCF77 simulation will always be given out independently from the system status

3.4 System

The **system** menu contains the following sub-menus:

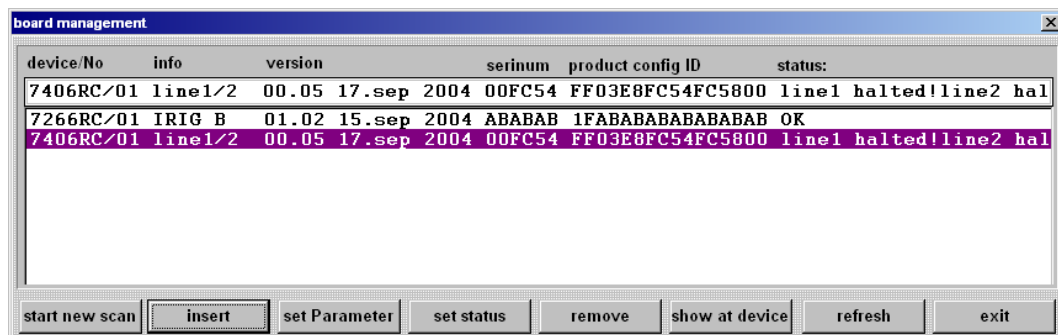
- **boards**
- **error handling**
- **keyword**
- **reset system**



3.4.1 RC-Function Board (Boards)

In this dialog will all "RC-Function Boards" be:

- inserted
- parameterised
- set into monitoring or idle mode
- shown
- and, if necessary, removed.



Each logged board is shown with its:

- type and number,
- firmware version and date,
- serial number,
- product config ID and
- actual status.

3.4.1.1 Start New Scan

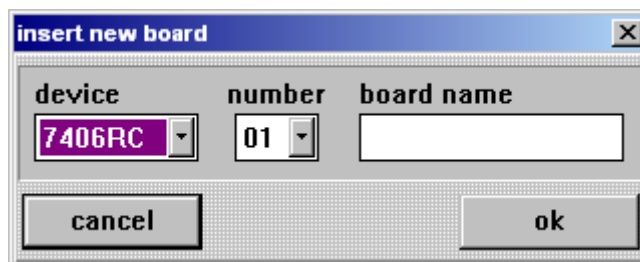
The scan detects boards that are not logged in the system 701RC. They are shown in the board management dialogue. The detected boards are only shown temporarily but can be logged with the **insert** button (see **chapter 3.4.1.2 Insert new RC-Function Board in System 7001RC (Insert)**). The system scan can take a few minutes.

3.4.1.2 Insert new RC-Function Board in System 7001RC (Insert)

This function implements "RC-Function Boards" into the system 7001RC. The implementation can be carried out manually or with the help of the system scan function.

The following data is has to be entered:

- "RC-Function Board" typ
- "RC-Function Board" number (to be set via DIP switch on the "RC-Function Board")
- "RC-Function Board" name (free selectable)



3.4.1.3 Set RC-Function Board Parameter (Set Parameter)

This function opens a dialog to set parameters for the selected "RC-Function Board".

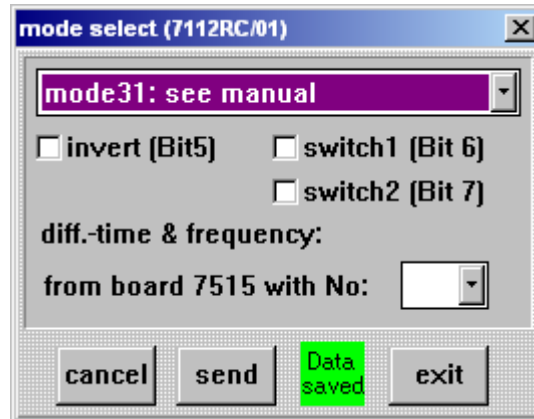
Each board type has its individual dialog.



All "RC-Function Board" parameters and settings are described in the according board manual.

3.4.1.3.1 RC-Function Board 7112RC

The 7112RC optical coupler board has optical coupler outputs through which potential free status information or signals can be output.



Mode

Setting of the output mode.

Invert

Activated: All invertible signals are inverted

Deactivated: No inversion of the output signals.

The invert check box inverts all invertible signals (see manual for non invertible signals).

Switch 1/2

The function of the switches depends on the selected mode.

Activated: Is equivalent to the entry '1' for the appropriate bit in the board menu of the system 7001RC.

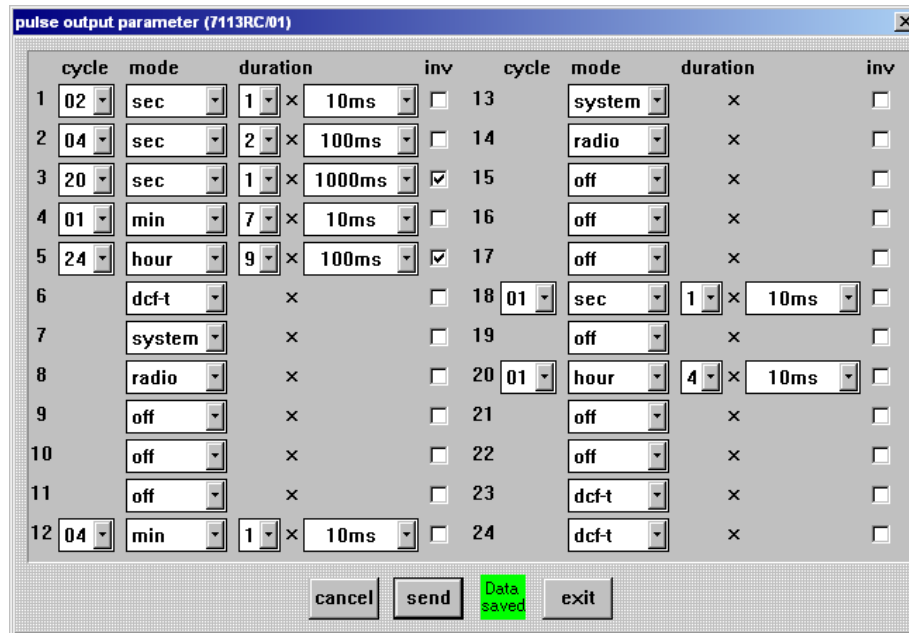
Deactivated: Is equivalent to the entry '0' for the appropriate bit in the board menu of the system 7001RC.

Grid time from source board 7515RC

The board 7112RC put out the grid time and mains frequency from a selected board 7515RC. Therefore the board number of the board 7515RC has to be chosen.

3.4.1.3.2 RC-Function Board 7113RC

This "RC-Function Board" can generate different, independently output signals via optical couplers.



	cycle	mode	duration	inv	cycle	mode	duration	inv
1	02	sec	1 x 10ms	<input type="checkbox"/>	13	system	x	<input type="checkbox"/>
2	04	sec	2 x 100ms	<input type="checkbox"/>	14	radio	x	<input type="checkbox"/>
3	20	sec	1 x 1000ms	<input checked="" type="checkbox"/>	15	off	x	<input type="checkbox"/>
4	01	min	7 x 10ms	<input type="checkbox"/>	16	off	x	<input type="checkbox"/>
5	24	hour	9 x 100ms	<input checked="" type="checkbox"/>	17	off	x	<input type="checkbox"/>
6		dcf-t	x	<input type="checkbox"/>	18	01 sec	1 x 10ms	<input type="checkbox"/>
7		system	x	<input type="checkbox"/>	19	off	x	<input type="checkbox"/>
8		radio	x	<input type="checkbox"/>	20	01 hour	4 x 10ms	<input type="checkbox"/>
9		off	x	<input type="checkbox"/>	21	off	x	<input type="checkbox"/>
10		off	x	<input type="checkbox"/>	22	off	x	<input type="checkbox"/>
11		off	x	<input type="checkbox"/>	23	dcf-t	x	<input type="checkbox"/>
12	04	min	1 x 10ms	<input type="checkbox"/>	24	dcf-t	x	<input type="checkbox"/>

The fields for **cycle** and **duration** are masked out when they are not needed in a selected mode.

Cycle for signal pulse length

Cycle every 1, 2, 3, 4, 5, 6, 10, 12, 15, 20 or 30 x (time unit from the **cycle mode**)

Mode

- Time unit for the pulse cycle in **sec, min, hour**
- DCF77 pulse, System status, Radio reception

Duration for signal pulse length

This function defines the pulse length.

The first value defines the factor (1, 2, 3, ..., 9) for the pulse length, the second value sets the base of the pulse length. These two values add up to the signal pulse length:

$$(\text{signal pulse length}) = (\text{factor}) \times (\text{base of pulse length})$$

Invert

This function inverts the signal output.



The signals system status ('system') and reception status ('radio') are **not** invertible.

3.4.1.3.3 RC-Function Board 7121RC

The dialog is the same as the dialog for the board 7121RC (see **chapter 3.4.1.3.1 RC-Function Board 7112RC**).

The board uses relay instead of optical couplers.



Regarding the durability of the relays it is not advisable to choose second cycled pulses or DCF77 pulses ('dcf-t') on this board.

3.4.1.3.4 RC-Function Board 7122RC

The dialog is the same as the dialog for the board 7121RC (see **chapter 3.4.1.3.1 RC-Function Board 7112RC**).

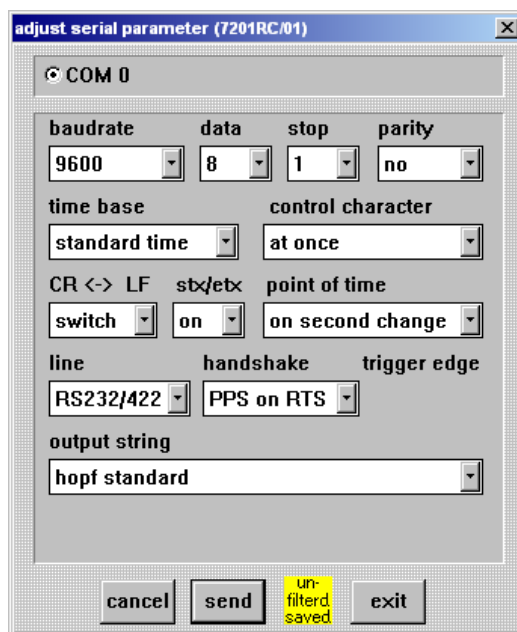
The board uses relay instead of optical couplers.



Regarding the durability of the relays it is not advisable to choose second cycled pulses or DCF77 pulses ('dcf-t') on this board.

3.4.1.3.5 RC-Function Board 7201RC

The serial board 7201RC can put out different serial strings.



Interface parameters:

- **baudrate**,
- **data**,
- **Stopp bits**
- **parity**,
- level RS232/422 (line),
- **handshake**

String parameter:

- **time base** of the string,
- **Point of time** of the string output
- Choice of the **output string**
- **control character**
- swap CR<->LF
- transmit **STX/ETX**

Some strings are transmitted with fixed output parameters. These strings set the correct parameters automatically in the menu. The automatic setting may take some seconds.

3.4.1.3.6 RC-Function Board 7221RC

This board has 8 serial ports which provides all the same data strings with the same parameters.

The dialog is the same as the dialog for the board 7201RC (see **chapter 3.4.1.3.5 RC-Function Board 7201RC**).



Regarding the durability of the relays it is not advisable to choose second cycled pulses or DCF77 pulses ('dcf-t') on this board.

3.4.1.3.7 RC-Function Board 7245RC

This board has 4 serial ports which provides all the same data strings with the same parameters and 4 fixed (not adjustable) pulse outputs.

The dialog is the same as the dialog for the board 7201RC (see **chapter 3.4.1.3.5 RC-Function Board 7201RC**).

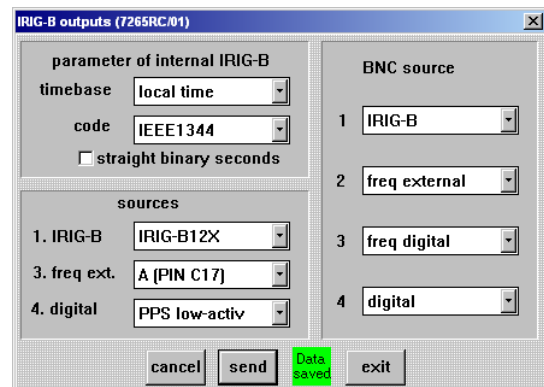


Regarding the durability of the relays it is not advisable to choose second cycled pulses or DCF77 pulses ('dcf-t') on this board.

3.4.1.3.8 RC-Function Board 7265RC

The board 7265RC can generate signals as well as relay signals which are given to its VG ledge. This menu contains three different independently input fields in which these signals can be chosen and parameterised:

- **parameter of internal IRIG-B:** Parameter of the IRIG-B signal generated on the board 7265RC.
- **sources:** Selection of the signals which are provided for an output at the BNC plugs of the board 7265RC.
- **BNC sources:** Selection of a signal chosen under 'sources' for the output at the BNC plugs 1-4.



IRIG-B signal parameter generated by the board 7265RC (Parameter of internal IRIG-B)

- **Time base** of the IRIG-B signal (local time/UTC time)
- Coding (**code**) of the IRIG-B signal (IEEE1344 / AFNOR)
- Binary second of the day (**straight binary second**):
 - Activated:** IRIG-B signal with transmitting of the binary second
 - Deactivated:** IRIG-B signal without transmitting of the binary second

Choice of the transmitting source (Sources)

The sources area selects the signal source for three of the four signals the BNC connectors 1-4 shall provide.

- **IRIG-B** format
IRIG-B00X, IRIG-B 12x or an external source can be selected.
- external frequency source (**freq. ext.**) over the VG-ledge of the board 7265RC
- **Digital:** Different digital pulse outputs (PPS, IRIG-B)

So the board is able to provide the digital B00X and the B12X (analogous) IRIG-B signal at the same time.

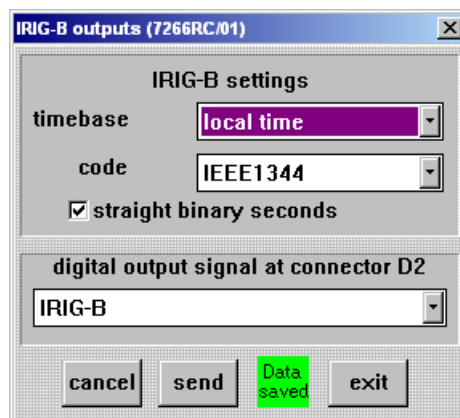
Output at BNC plug (BNC source)

This function selects for each BNC plug 1-4 a signal which has been defined in the field 'sources'.

3.4.1.3.9 RC-Function Board 7266RC

This board has two analogous and two digital output connectors for the providing of IRIG-B signals. Each output provides the IRIG-B signal with the setting in this dialogue. Exception: The digital output D2 if the output of a PPS pulse or the DCF77 pulse output has been selected.

- **IRIG-B settings:** Selection of different IRIG-B settings
- **digital output signal at connector D2:** Selection of digital signals at output D2



IRIG-B settings

- **time base:** Time base of the IRIG-B signal (local / UTC)
- **code:** Coding of the IRIG-B signal (IEEE1344 / AFNOR)

Straight binary second

- **Activated:** IRIG-B signal with transmitting of the binary day second
- **Deactivated:** IRIG-B signal without transmitting of the binary day second

Digital output signal at connector D2

Except the digital output D2 can provide

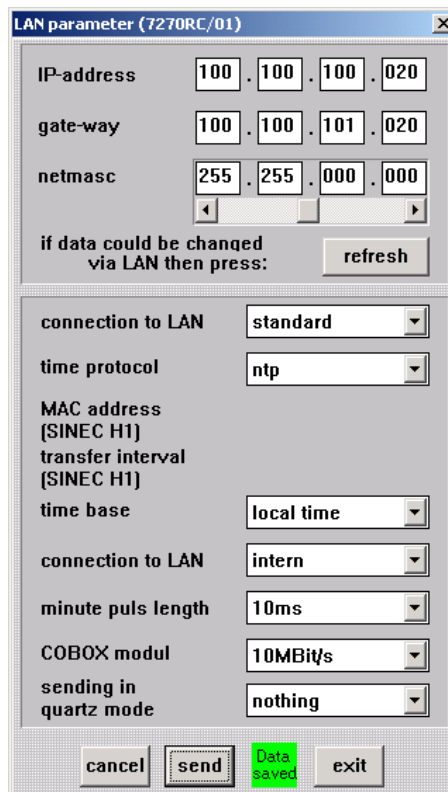
- IRIG-B pulse
- DCF77 pulse
- PPS

3.4.1.3.10 RC-Function Board 7270RC

The "RC-Function Board" 7270RC is an Ethernet LAN Time Server for synchronisation of PC networks.

The first area adjusts the following LAN parameters:

- IP-address
- Gate-way
- Net-mask



LAN parameters changed via the network can be actualised by pressing the **refresh** button.

The second area sets time parameters and special 7270RC LAN settings:

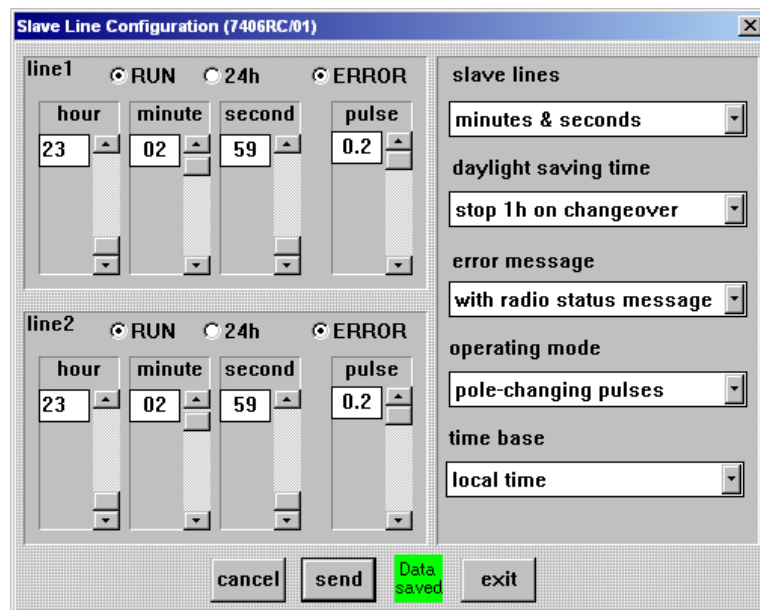
- **time protocol:** Output protocol NTP or SINEC H1
- **MAC address:** MAC address when SINEC H1 protocol is selected
- **transfer interval:** Transfer interval when SINEC H1 protocol is selected
- **minute pulse length:** Minute pulse length at the 9pole Sub-D connector X1 in the front panel of board 7270RC
- **sending in quartz mode:** Output of stratum 1 even when the system status is 'Q' (Quarz)

The following menu items are special **hopf** functions and must not be changed without consultation with **hopf** Elektronik GmbH:

- **connection to LAN:** Prevent connection to LAN
- **COBOX modul:** Selection of LAN-Interface

3.4.1.3.11 RC-Function Board 7406RC

The "RC-Function Board" 7406RC is a slave clock line board. It can be used for monitoring two lines (clock lines) with clocks for pole-changing pulse operation or DCF77 Time Code clocks. The pulse output of both two lines is monitored so that in case of a fault or pulse failure an error message can be generated.



There are three dependent areas of this board dialogue:

- Time and status display of **line 1**
- Time and status display of **line 2**
- Special parameter for line and time control

In the field **line1** and **line2** the following values can displayed/input:

- line status (**RUN**)
 - **Activated:** Line is running
 - **Deactivated:** Line is stopped
- 24/12 hour line (**24h**)
 - **Activated:** 24 hours mode
 - **Deactivated:** 12 hours mode
- line error status (**ERROR**)
- **hour, minute, second:** The actually line time
- **pulse:** Pulse length for the control of the line; only for pole-changing pulse operation

For the setting of the line time the slider have to be used.



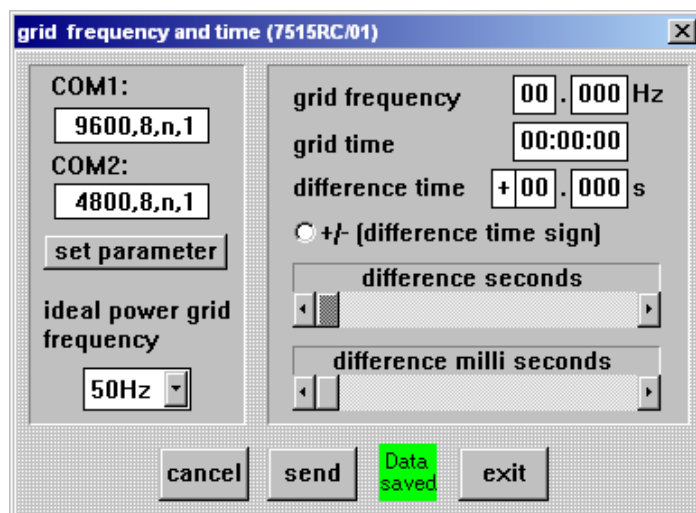
In the DCF77 Time code operation the line time and the pulse lengths can't be modified.

3rd Parameter field (slave lines):

- **slave lines:** Selection of the operation mode (pole changing or DCF77 time code)
- **daylight saving time:** Behaviour of the slave clock lines while a summertime/wintertime changeover takes place. The lines are stopped for one hour or will get ahead 23 hours.
- **error message:** Selection, if the output error message shall contain the system status (synchronous/not synchronous)
- **operating mode:** Selection of the operating mode (pole-changing pulses or DCF77 Time code)
- **time base:** Selection of the output time base. Possible are the local time or the UTC time.

3.4.1.3.12 RC-Function Board 7515RC

The "RC-Function Board" 7515RC contains a measuring and monitoring system for mains frequencies between 45 and 65 Hz.



This menu contains:

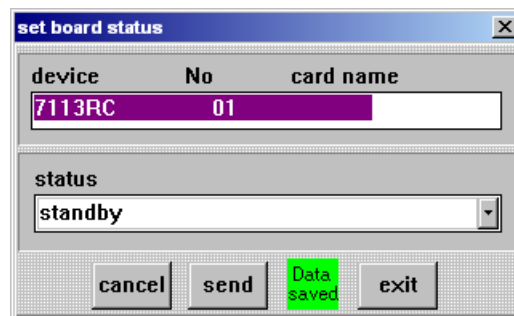
- **COM1 / COM2:** Display of the interface parameter.
- **Set parameter:** For adjusting the interface parameter for COM1/2 this button has to be pressed
- **Ideal power grid frequency:** Selection of the base mains frequency
- **Grid frequency:** Display of the measured grid frequency.
- **Grid time:** Display of the grid time.
- **Difference time:** Display of the difference time between system time and grid time.
- **+/- (difference time sign):** Change of sign for the setting of the difference time. Activated: -, deactivated: +
- **Difference seconds / difference milliseconds:** Setting of the difference time in seconds and milliseconds

3.4.1.4 Selecting the Monitoring Mode of "RC-Function Boards" (Set Status)

This function serves to put the selected "RC-Function Board" into supervision.

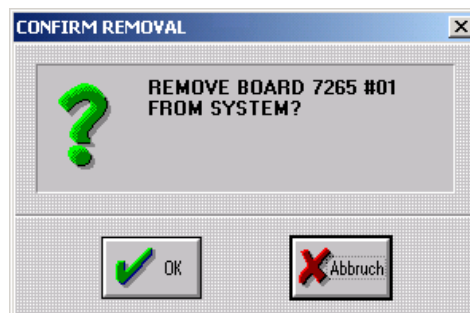
A new implemented "RC-Function Board" has the status "**standby**". This "RC-Function Board" will be operable not until it is set into a different status.

The "RC-Function Board" should not set into supervision (monitoring/idle) until it is fully parameterised (see **chapter 3.4.1.3 Set RC-Function Board Parameter (Set Parameter)**). Otherwise unintentional data outputs may occur which lead to misconduct of connected systems.



3.4.1.5 Removal of "RC-Function Boards" (Remove)

This function serves to delete the "RC-Function Board" from the system 7001RC including their parameters. All parameter settings of this board will be lost.



3.4.1.6 Indicate the "RC-Function Board" in the System (Show at Device)

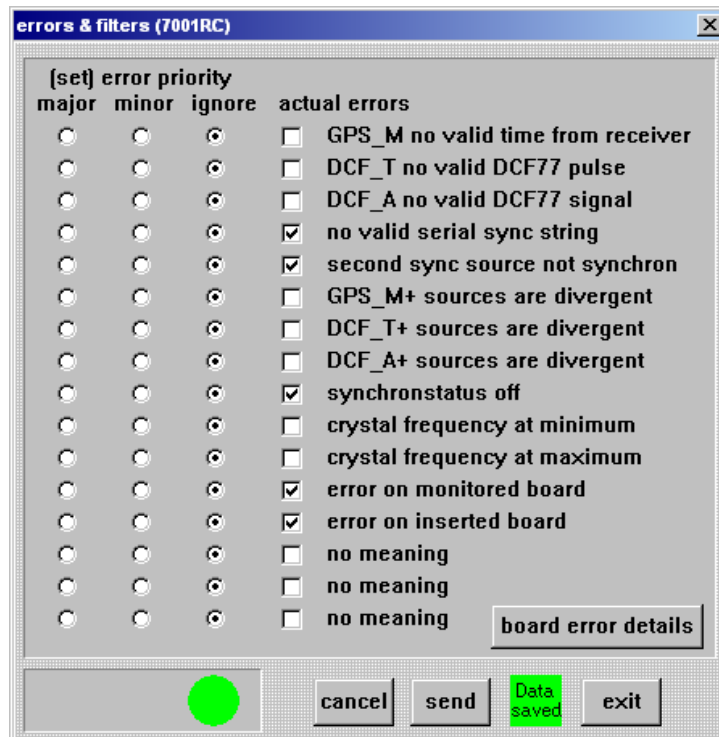
This function indicates the selected "RC-Function Board" in the system 7001RC for approx 20 seconds. In this period only the yellow SEND-LED of the appropriate "RC-Function Board" is blinking. All other SEND-LED of the "RC-Function Boards" turn off. Exception: Control board 7020RC.

3.4.1.7 Actualise the Indication of "RC-Function Boards" (Refresh)

This function actualises the listing of all "RC-Function Boards" implemented in the system 7001RC.

3.4.2 Parameterisation of the System Error Messages (Error Handling)

After selecting 'error handling' in the menu 'system' the following dialogue appears:



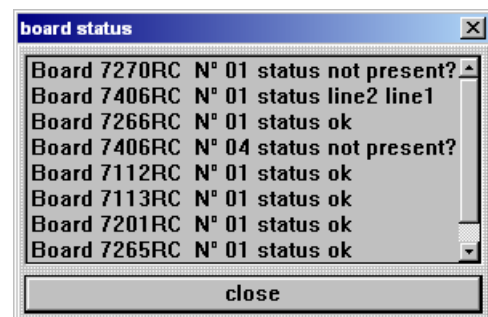
In this dialog the system can assign a priority to each error. Beneath **Major**, **Minor** and **Ignore** the user can assign error priorities individual for each possible appearing error. In the column **actual errors** the actually appeared errors are displayed.

Additionally errors are displayed by means of coloured points:

- A red point is displayed when a **Major-Error** occurred.
- A yellow point is displayed when a **Minor-Error** occurred.
- A green point is displayed when no error occurred or if errors are ignored

3.4.2.1 Visualisation of RC-Function Board errors (Board Error Details)

This function serves to display the error status of all implemented "RC-Function Boards". When a "RC-Function Board" error is detected (**error on monitored board / error on inserted board**) it can be displayed in this menu (**board error details**).



3.4.3 Input of Remote Keyword (Keyword)

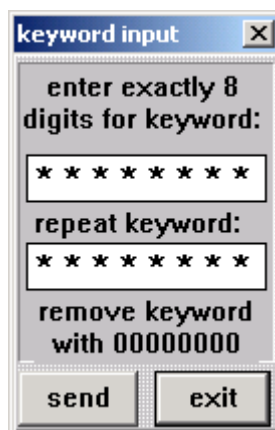
The 8 digit Remote Keyword serves **only** to control the access to the system 7001RC via **hopf** 7001RC Remotesoftware.



This means, that the system 7001RC can be operated via the keypad of the system 7001RC further on. If this access should be also prevented a keyword has to be set in the system 7001RC additionally.

If a remote keyword is active, at the beginning of every session the remote keyword is requested by the **hopf** 7001RC Remotesoftware.

To delete an activated remote keyword the digits "00000000" have to be given in the Remote Keyword menu:



If the Remote Keyword is not available any more it is possible to receive an "UNLOCK" password on a written request from **hopf** Elektronik GmbH (see E-mail address in the footer). Therefore it is absolute necessary to specify the date when the Keyword is going to be deleted since the UNLOCK password changes daily.

3.4.4 Reset System

This function serves to reset the whole system 7001RC including all "RC-Function Boards" and output boards (see also **chapter 3.2.6 Reset Control Board**).

