

**AQR**

**RXC**  
**Service Manual**

**Version 003**

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**BRUKER**

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**P/N: Z31190**

**DWG-Nr: 861 003**

# Contents

<b>1</b>	<b>General Description .....</b>	<b>1</b>
1.1	Introduction .....	1
1.2	Features .....	1
1.3	Installation .....	2
1.4	RXC Connector Pin Assignment (Sub-D, female, 25 Pin to SE451) 4	
1.5	SBS Bus (RS485) Connector Pin Assignment .....	4
1.6	Jumper Settings (ECL00) .....	6
1.7	Jumper Settings (ECL01 or later) .....	6
<b>2</b>	<b>Technical Data .....</b>	<b>9</b>
2.1	DC Specifications .....	9
2.2	Soft- and Hardware Specifications digital uP Part .....	9
<b>3</b>	<b>Function Description .....</b>	<b>11</b>
3.1	RXC Controller Section .....	11
	Microcontroller .....	11
	Address Decoder .....	11
	Non volatile Code Memory .....	12
	RS-485 Interface .....	13
	I2C Interface .....	13
	Reset and Power uP Logic .....	14
	Clock Oscillator .....	14
	LEDs .....	15
<b>4</b>	<b>RXC Service Tool .....</b>	<b>17</b>
4.1	SE451 Transmitter Fx module Filter Structure .....	17
4.2	SE451 Receiver Gain .....	17
4.3	I2C AQR Functions .....	17
4.4	Autodownload .....	17
4.5	3 Channel SE451 Interface .....	18
	Submenu Service .....	19
	BBIS Bruker Board Information System .....	19
	Debug Bitpattern DRG0..DRG7 .....	20
	Debug Bitpattern DRG8..DRG15 .....	20
	Debug Bitpattern DRG16..DRG23 .....	20
	Submenu Gain functions .....	20
	Submenu Diagnostic: .....	20
<b>5</b>	<b>ECL-Information .....</b>	<b>21</b>
<b>6</b>	<b>RXC Software Release Note .....</b>	<b>23</b>

6.1	AD-Release 940614 .....	23
<b>7</b>	<b><i>Test Equipment</i></b> .....	<b>25</b>
7.1	HF-Case Test-Extension .....	25
<b>8</b>	<b><i>RXC Error Messages</i></b> .....	<b>27</b>

# Index

## A

Address Decoder .....	11
AD-Release.....	23
Application Software .....	21
application software .....	12

## B

BBIS.....	1, 11
Boot Software.....	21
boot software.....	11
Bruker Board Information System .....	12
Bugs .....	23

## C

Clock Oscillator .....	14
Config.....	19
Controller Section.....	11
Current .....	9

## D

DC Specifications.....	9
Debug.....	17
Download .....	19
download.....	11

**E**

ECL00 .....	21
ECL01 .....	21
ECL-Information .....	21
EP .....	15
EP_HPPR .....	21
EP_SE451 .....	21
Error 11 .....	27
Error 13 .....	27
Error 20 .....	27
Error 200 .....	29
Error 201 .....	29
Error 204 .....	29
Error 205 .....	30
Error 206 .....	30
Error 207 .....	30
Error 208 .....	30
Error 30 .....	27
Error 31 .....	27
Error 32 .....	28
Error 33 .....	28
Error 34 .....	28
Error 36 .....	28
Error 37 .....	28
Error 38 .....	29
Error 39 .....	29
Error 40 .....	29
Error 41 .....	29
Error 42 .....	29
Error Meassages .....	27

**F**

Features .....	1
FLASH memory .....	11

**G**

Gain settings .....	15
galvanic isolated .....	13
galvanic isolation .....	21

**I**

I2c .....	17, 29
I2C Interface .....	13

**J**

Jumper Settings .....	6
-----------------------	---

Goto

**L**

LED .....	27
LEDs .....	15

**M**

Microcontroller.....	11
----------------------	----

**P**

Power up Logic .....	14
Print Index.....	21
Prototype.....	21

**R**

Release Note .....	23
Reset.....	14
reset .....	13
RS-485 Interface .....	13

**S**

save config .....	12
SE451 Gain.....	17
Service Tool .....	17
Software .....	21, 23
Software Specifications.....	9
Specifications .....	9

**T**

Technical Data .....	9
----------------------	---

**W**

wakeup line .....	13
-------------------	----





# General Description

# 1

## Introduction

**1.1**

The RXC applies for DMX and DSX Spectrometers.

The RXC is just an interface for controlling the SE451 gains and the filter. It's realized as a variant placement of the RX22-Receiver. The same board is used, but only the control-, I/O- and power supply-section are placed and no HF case is used.

With this board the SE451 gain can be set via the RS485 interface.

Calibration and production datas, known as the BBIS are stored in a flash EPROM direct on the board.

The RXC handles a serial I2C Interface for controlling other boards like the 3-Channel SE451.

## Features

**1.2**

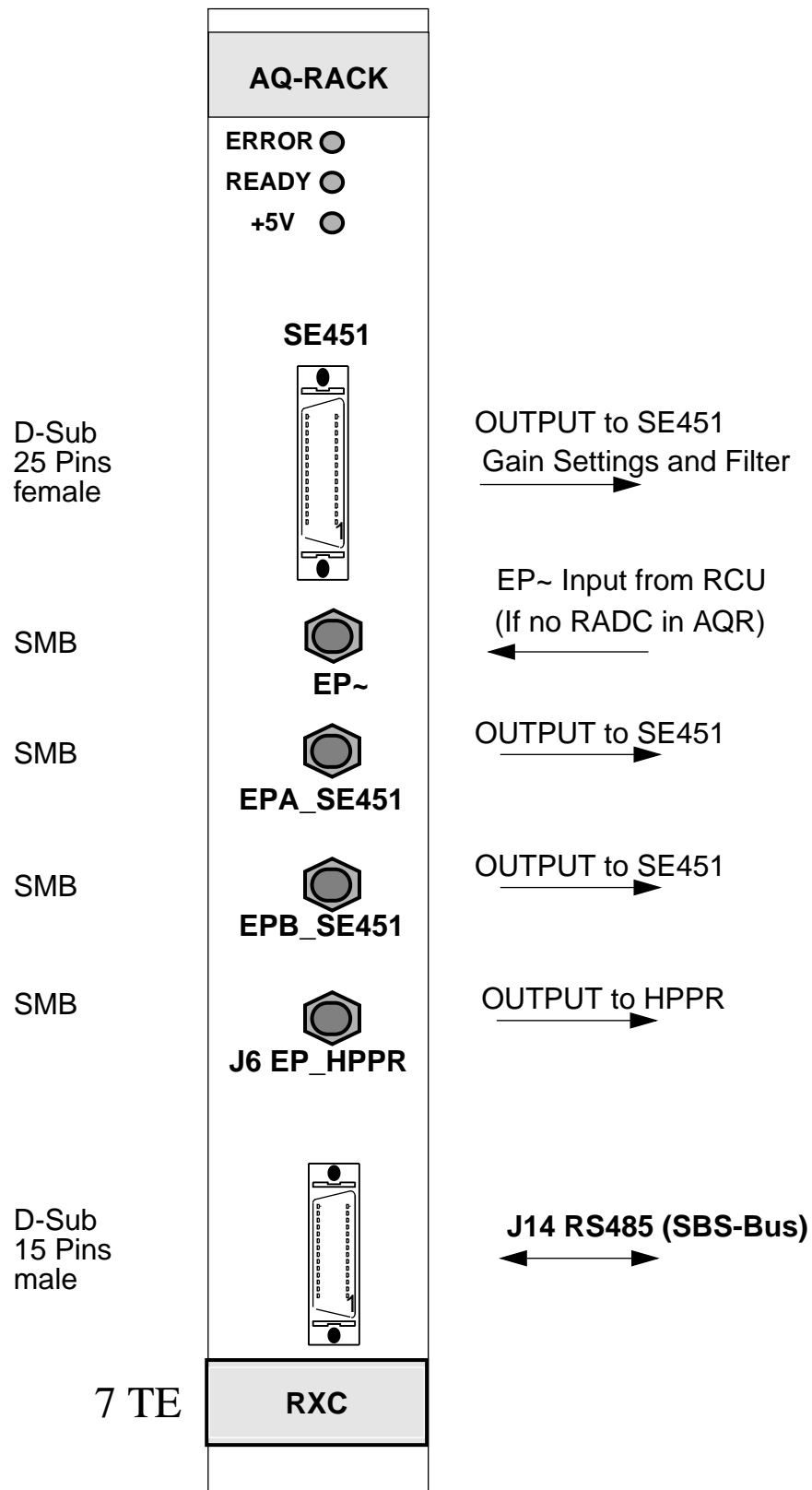
- 6dB Gain Steps
- RS485 Interface
- I2C Interface

***Installation***

**1.3**

---

Figure 1.1. Installation RXC





[Goto](#)

**Jumper Settings (ECL00)**

**1.6**

**Board Z4P2953:**

- Ju15 and Ju16 switch different supply voltages to the RS interface. They must be in the same position.

If they are placed closer to the front panel (Position A) than the RS interface is supplied with an external RS485\_12V supply voltage. This voltage is connected to the RS485 plug on pin14,15 positive 12V and pin 6,7 GND.

If they are placed closer to the back plane (Position B) then the internal digital +5V Voltage supplies the RS interface section. (Caution no galvanic isolation)

- Ju7 and Ju8 select the RS input channel. They must be in the same position.

If the position of both jumpers is closer to the front panel (Position A) than the RXC serves a RS485 interface on the RS485 plug .

If the position of both jumpers is closer to the back plain (Position B) than the RXC serves a RS232 interface on the RS232 pin plug.

**Jumper Settings (ECL01 or later)**

**1.7**

Table 1.1. Jumper Settings:

Jumper	Setting A	Setting B	Factory Configuration
J7	RS485 interface	RS232 interface (if IC36 is placed)	A
J8	RS485 interface	RS232 interface (if IC36 is placed)	A
J15	True galvanic isolation for RS485 interface (If external 12V for RS485 interface is available use setting A)	No galvanic isolation for RS485 interface (If external 12V for RS485 interface is not available use setting B)	B
J16	True galvanic isolation for RS485 interface (If external 12V for RS485 interface is available use setting A)	No galvanic isolation for RS485 interface (If external 12V for RS485 interface is not available use setting B)	B
J17	EP~ from front panel	EP~ from backplane	B
J18	Reserved for further options	Reseved for further options	B
J19	EPA_SE451 and EPB_SE451 low active	EPA_SE451 and EPB_SE451 high active	B
J20	EP_HPPR low active	EP_HPPR high active	B







# Technical Data

# 2

## **DC Specifications**

**2.1**

---

Mean Supply Current (RX_P19V)	100mA
Mean Supply Current (RX_P9V)	250mA

## **Soft- and Hardware Specifications digital uP Part**

**2.2**

---

Software boottime from power up to uP ready	10sec
Hardware Reset from EP inactive to uP ready	0.4sec
Hardware Reset from WUP inactive to uP ready	0.4sec
RS-485 Baudrate	9600Baud
RS-485 Startbit	1
RS-485 Stopbit	1
RS-485 parity	none
uP Clock Frequency	12MHz
I2c Clock Frequency	90KHz
Current RXC Connector to SE451 VDD +15V Pin25	max. 20mA



# Function Description

# 3

---

## **RXC Controller Section**

**3.1**

---

### **Microcontroller**

**3.1.1**

The Microcontroller system consists of a 80C535 12MHz Microcontroller, a 32K \* 8 Bit Static RAM, a 128K \* 8 Bit paged FLASH EEROM and a 12MHz clock generator. The external bus interface of the 80C535 consists of an 8-bit data bus, a 16-bit address bus and five control lines. The address latch enable signal (ALE) is used to demultiplexing address and data of port 0. The program memory is accessed by the program store enable signal (PSEN~) twice a machine cycle. The read or write strobe (RD~, WR~) is used for accessing the external data memory.

---

### **Address Decoder**

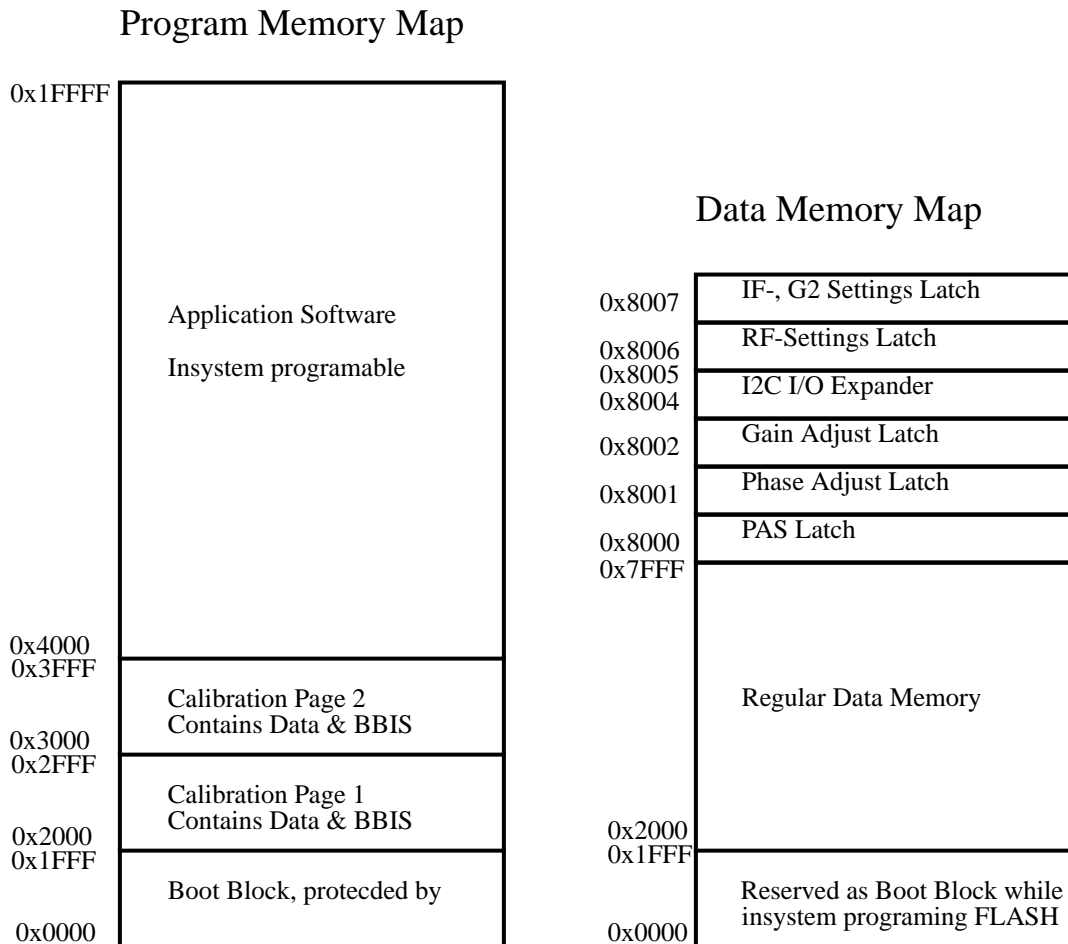
**3.1.2**

The address decoder controls the microcontroller program and data memory accesses. It enables/disables depending on the address and control signals different devices. Normally, the uP boots from the lower page of the FLASH memory and runs its application software from the upper page. The PSEC~ control signal is asserted by the uP while the uP downloads new application software or stores new BBIS or configuration data. This maps the FLASH memory into the data segment and the RAM into code segment. The uP accesses now the RAM as it were a nonvolatile code memory. Therefore, program instructions are copied from the boot partition of the FLASH memory to the RAM before starting the download procedure.

The uP may access several devices as data memory. Its own RAM(Address 0x2000..0x7FFF), the latch for the PAS D/AC(located at 0x8000), the latch for the phase adjustment D/AC(located at 0x8001), the latch for the gain adjustment D/AC(located at 0x8002), the I2C master transmit/receive I/O expander (located at 0x8004, 0x8005), the latch for the RF control signal driver(located at 0x8006) and the latch for the IF and G2 control signal driver(located at 0x8007).

A special mode allows the download of the boot software into the lower page of the FLASH memory. The boot software is copied in the test department from an EPROM to the FLASH. The boot partiton is in normal operation mode protected from unwanted program and erase operations.

Figure 3.1. Memory Map



**Non volatile Code Memory**

**3.1.3**

The RXC SE451 interface controller uses a new FLASH technology, a 128K \* 8 block wide erase/programmable non volatile Memory. The address space is separated into four blocks, each block is insystem erase-, and programmable. Data in the boot block is protected from unwanted erase/program operations if jumper JU2 is not placed (normal operation).

Parameterblock 1 and 2 contain BBIS(Bruker Board Information System) data and values stored with the "save config" command. Only one parameterblock is valid at a time, the other is erased and will be written with the next save config or update BBIS data command.

The uP software manages which parameter block is actual valid.

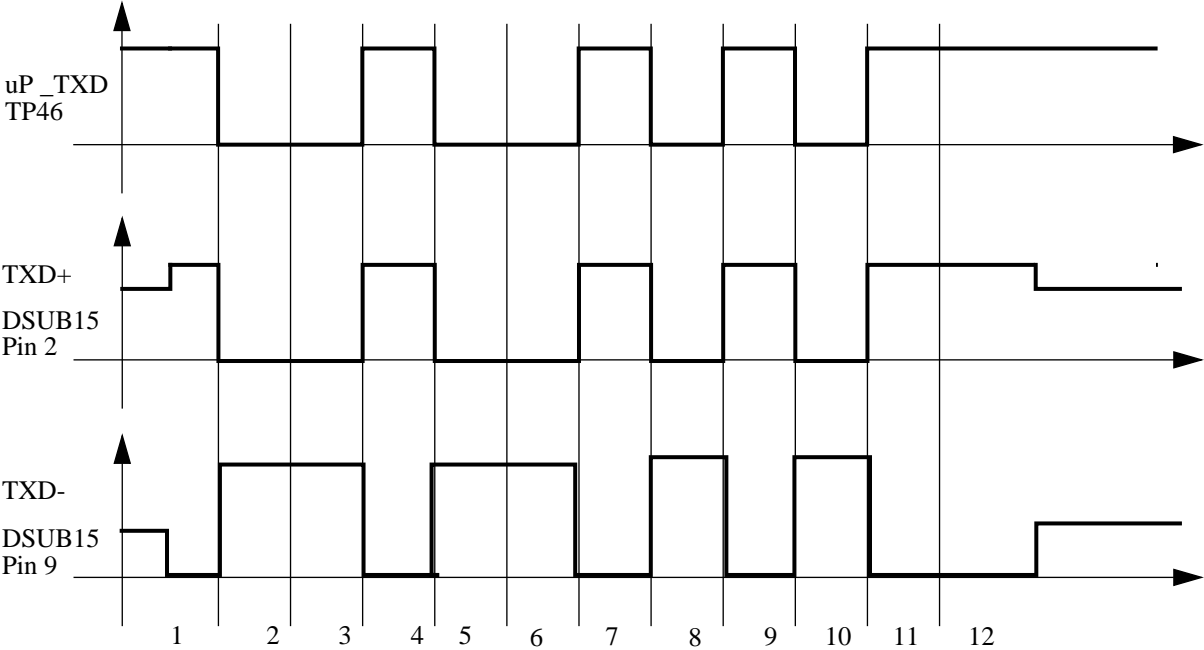
The application or main block contains the application software. It is possible to make an insystem update of the interface controller software version. The download software is stored in the boot block and copied to the low page of the RAM before a download starts. The uP will then disable PSEC (Program SECURITY) and while PSEC is low access the RAM as code memory and the FLASH as data memory (address decoder).

Communication to the RXC SE451 interface controller is achieved via the RS485 interface. The RS485 is a full duplex differential interface which allows to connect several transceivers to the same wires. The interface is realized by separate transmit and receive lines. An extra wakeup line may activate a hardware reset on the RXC. This line is driven from the RS485 master.

All signals in the RS interface are galvanic isolated with optocoupler circuits. The supply voltage for the galvanic isolation delivers the RS485 Master. A voltage regulator placed in the interface section generates +5V Vcc out of the 12V on the RS485 plug. Data collisions in a network with several slaves is avoided with the TX\_EN signal. The uP switches its transmit outputs into tristate (high impedance mode) after the end of each data transmission.

The default baud rate is set to 9600 Baud. One startbit, no parity, one stopbit

Figure 3.2. RS485- Transmission



The RXC I2c interface is not any longer connected to the I2c bus in the AQR rack. The hardware change is made to avoid I2c bus collisions in the AQR. This change is valid from RXC with ECL02.

The RXC drives the SE451 BBIS with an I2C bus defined by Philips. Up to eighth devices may be connected to this bus. The different I2c Components can be selected individually by a unique address identifier. The following hardware addresses of the RXC I2c bus are occupied:

Table 3.1. RXC I2c addresses

I2c hardware address	I2c Device address	Device
0x00	0xA0/0xA1	3 Chanal SE451 BBIS EEPROM

The I2c bus of the RXC must be disconnected from the AQR I2c bus. This is done by cutting the four I2c plug contacts on the back plane plug. (Z3P2953A..Z3P2953C).

## Reset and Power uP Logic

### 3.1.6

A supply voltage controller monitors the digital supply voltage (+5V). If the supply voltage drops below 4.5V a hardware reset automatically takes place. When switching on the power supply, the voltage monitor releases the RESET~ signal after a time delay. This allows the quartz oscillator building-up the 12MHz system clock.

Different reset sources drive the RESET~ signal after the power up. The regular reset switch placed on the board for manual resets, the RS\_WUP~ (RS485 Wake up) and a EP~. All those sources may initiate a hardware reset. The Controller is because of disturbance reasons held in a reset state during the whole acquisition of NMR data(EP~ active).

The uP system boots after each reset. While the uP boots, the RXC does not serve the serial interface. Any data received on the serial RS485 interface is ignored.

The boot time must be considered by any application or testing software.

The boottime consists of two separates time delaies. The hardware delay caused by the Power monitor ~15msec and the boot time of the uP system software.

For exact boot time see Soft- and Hardware Specifications digital uP Part on page 9

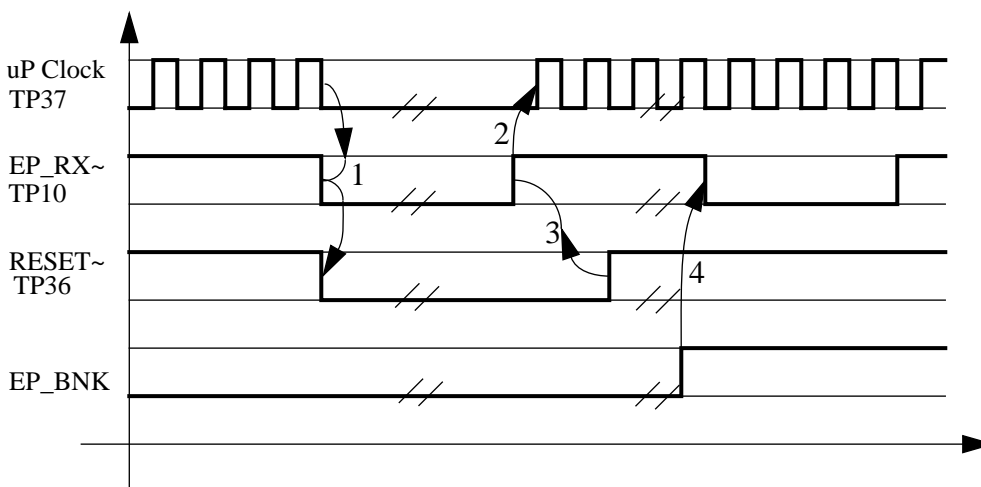
## Clock Oscillator

### 3.1.7

The uP is driven from a 12MHz oscillator. Two possible circuits may be used. If R158 and R194 are placed on the board, the uP uses its internal timing circuits. The uP makes it possible to turn off the clock with a software instruction. Leaving this deep power down mode is achieved with a hardware reset.

If R101, R106 and R108 are placed on the board, the uP uses the external clock oscillator. This oscillator turns off while EP~ is active low. Leaving this mode is achieved with the positive state of the EP~ and a resulting hardware reset through EP~. A special software mode disables the EP~ reset and clock turning off.

Figure 3.3. uP Clock



Explanation:

1. A Acquisition activates EP\_RX~. EP\_RX~ triggers a hardware reset in the reset logic and switches the clock oscillator off.
2. Disabling EP\_RX~ releases the clock oscillator, the clock oscillator starts building up the 12MHz clock frequency.
3. Disabling EP\_RX~ releases the reset logic input, the reset logic pulls RESET~ high after a certain time delay.
4. The uP switches EP\_BNK(EP\_BlANK) on. An EP\_RX~ does not result anything in the uP system. This mode is entered for phase- and gain adjustment only.

LEDs

3.1.8

Some LED's on the front panel of the board signal the state of the RXC. Two LED's display the uP status, one LED monitor the supply voltage. Possible combinations of the READY and ERROR LED are described in table LED Description on page 15. The +5V LED monitors the digital +5V supply. The LED is on when the observed +5V voltage is correct.

Table 3.2. LED Description

Error LED red	Ready LED green	Status
off	off	- power supply not on
off	on	- Normal operating mode - ready for operation
off	single, short-time flickering	- Communication LED. The board has received a command from the RS485 bus master. The LED switches to off as soon as the RXC acknowledges the command.

Error LED red	Ready LED green	Status
blinking	on	The uP disabled the EP reset logic. (tuning, matching and gs procedure) Caution: NMR experiments are not possible in this mode due to disturbances of the uP system.
on	off	Error state. The firmware triggered an error. The error must be acknowledged by the Master. The RXC refuses further operation until the error is cleared.
on	on	- The board was powered up. - An active EP disables any uP operations, the uP system is always in a reset state. Check the polarity of the connected EP pulse



# ***RXC Service Tool***

# **4**

A service tool running under UNIX supports some RXC functions. This tool can be started by typing rxc under UNIX or by opening a shell(term) and typing rxc under openwindows. This tool supports user, service and testing function.

---

## ***SE451 Transmitter Fx module Filter Structure***

**4.1**

The RXC SE451 interface controls an adjustable low-/highpass filter in the SE451 Fx transmitter module. Writing 0 sets the filter structure to lowpass, 1 to highpass. Please note: use the proper command in the 3 channel SE451 interface Submenu when a new 3 channel SE451 is connected to the RXC. All three filters may be set independent for all connected transmitter modules in this Submenu.

---

## ***SE451 Receiver Gain***

**4.2**

The RXC sets a new SE451 Receiver gain. The valid gain range is 1.0..32768.0. The RXC controls the SE451 gain via a plug placed in the front panel of the board.

---

## ***I2C AQR Functions***

**4.3**

The RXC does not support any AQR I2c functions.

---

## ***Autodownload***

**4.4**

The firmware software on the RXC board is automatically checked and if necessary downloaded with the latest firmware version. Dependencies between firmware and hardware are controlled by the tool software. Do always execute an autodownload after receiving a new firmware tape.

**SE-451 Filter Structure 1 Transmitter:**

The RXC drives the filter structure in the first transmit module. Writing 0 sets the filter structure to lowpass, 1 to highpass. (The filter structure depends on the transmitter frequency. Normally: lowpass for all modules with frequencies below 400MHz. highpass for all modules with frequencies above 400MHz.)

**SE-451 Filter Structure 2 Transmitter:**

The RXC drives the filter structure in the second transmit module. Writing 0 sets the filter structure to lowpass, 1 to highpass. (The filter structure depends on the transmitter frequency. Normally: lowpass for all modules with frequencies below 400MHz. highpass for all modules with frequencies above 400MHz.)

**SE-451 Filter Structure 3 Transmitter:**

The RXC drives the filter structure in the third transmit module. Writing 0 sets the filter structure to lowpass, 1 to highpass. (The filter structure depends on the transmitter frequency. Normally: lowpass for all modules with frequencies below 400MHz. highpass for all modules with frequencies above 400MHz.)

**Measure SE451 Temperature:**

The 19" SE451 has a temperature regulator. The RXC monitors the measured temperature. This feature requires RXC boards with hardware index Z3P2953D.

**Measure SE451 Fan Voltage:**

The 19" SE451 has a temperature regulator. The RXC monitors the Fan voltage. Calibrate the temperature regulator in the SE451 with this function. (see manual 19" SE451)  
This feature requires RXC boards with hardware index Z3P2953D.

**Read BBIS Production Page:**

The 19" SE451 is equipped with an serial EEPROM. The EEPROM contains device specific data. This functions displays the BBIS production data on the screen.

**Read BBIS Service Page:**

The 19" SE451 is equipped with an serial EEPROM. The EEPROM contains device specific data. This functions displays the BBIS service data on the screen.

**Read BBIS Device Page:**

The 19" SE451 is equipped with an serial EEPROM. The EEPROM contains device specific data. This functions displays the BBIS device data on the screen.

**Read BBIS Application Page:**

The 19" SE451 is equipped with an serial EEPROM. The EEPROM contains device specific data. This functions displays the BBIS application data on the screen.

**Submenu Service****4.5.1**

This menu contains various functions like debug-, service- and test department function. Some function are reserved for authorized persons and can not be accessed by a regular user.

**Initialize Default Values:**

The RXC SE-451 interface controller initializes itself with default values. New default values can be obtained by the Save Configuration command(see below). Executing an Initialize command sets the configuration as it was saved with the "Save Configuration" command.

**Delete Error**

Some errors may occur during runtime of the RXC SE-451 interface controller, All this errors announced by the RXC must be acknowledged. The RXC SE-451 interface controller refuses operation as long as an error is not deleted. This functions deletes one error.

**Download**

An update of the application software in the RXC SE-451 interface controller is in-system possible. This function starts the download procedure. Normally the application software is loaded in the test department and must not be updated.

**Save Configuration:**

The RXC SE-451 interface controller stores the current settings as its default into a non volatile data memory. The RXC SE-451 interface controller sets the default values after an "Initialize" command or a power up.

**Version Config**

This command gets the RXC SE-451 interface controller hard- and software configuration and displays it on the screen.

**BBIS Bruker Board Information System****4.5.2**

This menupoint contains commands about some board informations. Selecting this menupoint opens a new menu with the following commands:

**Read BBIS to Screen:**

The RXC SE-451 interface controller BBIS(Bruker Board Information System) data is displayed on the screen. BBIS contains production, testing, hard- and software versions data.

## ***Read BBIS to File:***

The RXC SE-451 interface controller BBIS(Bruker Board Information System) data is written to a file and may be edited with a normal ASCII editor like vi or emacs. BBIS contains production, testing, hard- and software versions data.

## ***Write BBIS from File:***

The RXC SE-451 interface controller non-volatile data memory is loaded with new BBIS data. Normally the test department writes valid data to the board after production or repair.

Caution: The BBIS data memory may contain non-valid data if an unauthorized user selects this menupoint. The old data will be irretrievable lost.

For use of authorized persons only!!!

---

## ***Debug Bitpattern DRG0..DRG7***

**4.5.3**

The user can write a value direct to the latch IC47. This value is in hexadecimal notation. The set bitpattern is applied to the SE-451 via the DSUB 25 connector on the front panel of the RXC board

---

## ***Debug Bitpattern DRG8..DRG15***

**4.5.4**

The user can write a value direct to the latch IC48. This value is in hexadecimal notation. The set bitpattern is applied to the SE-451 via the DSUB 25 connector on the front panel of the RXC board

---

## ***Debug Bitpattern DRG16..DRG23***

**4.5.5**

The user can write a value direct to the latch IC49. This value is in hexadecimal notation. The setted bitpattern is applied to the SE-451 via the DSUB 25 connector on the front panel of the RXC board

---

## ***Submenu Gain functions***

**4.5.6**

Some gain functions are implemented to make the tuning and matching procedure as easy as possible. Some of this functions will not set a new SE-451 gain, they do just inform the tuning software about the gain table in the RXC. This menu is for debug reasons only.

The ERROR LED on the frontpanel off the RXC blinks while this submenu is active. This is a warning that the acquired spectra may be disturbed by the uP system.

---

## ***Submenu Diagnostic:***

**4.5.7**

This submenu contains debug functions for bug fixing. More functions will be implemented with later firmware releases.

# ECL-Information

# 5

Table 5.1. ECL information for RXC

ECL	Additional Features	Print Index	Application Software	Boot Software	Tool
Prototype		Z4P2953	rx22ab.hex rx22ac.hex rx22ad.hex	rxbootab.hex	
ECL00		Z4P2953	rx22ab.hex rx22ac.hex rx22ad.hex	rxbootab.hex	
ECL01	-Full galvanic isolation of RS485 interface -Polarity of signal EP_HPPR and EP_SE451 can be selected by jumpers - Heat Sink at voltage regulators - The I2c Bus is separated from the AQR I2c Bus. The RXC serves with the I2c the multi channel SE451.	Z4P2953A	rx22ab.hex rx22ac.hex rx22ad.hex	rxbootab.hex	
ECL02	-Incircuit test points implemented for testing reasons	Z3P2953B	rx22ab.hex rx22ac.hex rx22ad.hex	rxbootab.hex	
ECL03		Z3P2953C	rx22ab.hex rx22ab.hex rx22ad.hex	rxbootab.hex	

Table 5.2. Firmware Versions

Release Tape Version	Firmware Version	Application Date	Application Checksum	Length
---	RX22AB	931203	\$F67B	82735
---	RX22AC	940222	\$B0F0	84021
940614	RX22AD	940531	\$5974	90929

Please refer to the specific firmware release note to get full information about the features and bugs of each release.



# RXC Software Release Note

# 6

AD-Release 940614

6.1

Fixed Bugs:

1. - None

**New Facts:**

2. In normal operation, the digital part of the SE451 interface RXC is shoot down during acquisitions. A special mode is implemented to achieve full operation also when an EP is active. This special mode was made for tuning and matching procedures. When the RXC switches to the "Disable EP Logic mode on", the ERROR LED on the front panel starts blinking. This is a warning for the user, it reminds him that the uP system is working and that the acquired spectra may be disturbed by the uP clock oscillator or other frequency products. The UXNMR enters into the "Disable EP Logic mode" when a tuning or matching procedure or the gs mode is activated.
3. The SE451 interface controller RXC supports BBIS I2c functions for the new 3 channel SE451. The 3 channel SE451 is equipped with a serial EEPROM. The EEPROM contains device specific data for the UXNMR configuration routine. This software feature requires a hardware upgrade. (The RXC I2c bus must be disconnected from the AQR I2c bus driven by the SADC/HADC.)  
See manual I2C Interface on page 13
4. The SE451 interface controller drives three low-/ highpass filter. All filter may be set independent with software instructions. The filters are located on each SE451 transmit module in the new 3 channel SE451.
- 5.





# *Test Equipement*

# 7

## *HF-Case Test-Extension*

## 7.1

---

There is an extension board available if you have to make further hardware measurements. It allows you to check the board out of the Rack. This extension can also be used for all other boards in a HF case with a c/2-connector (48 pins). It's a standard one to one extension.

You may order this extension board at:

SPECTROSPIN AG

Industriestrasse 26

CH-8117 Fällanden

Tel 01/ 825'91'11

as HF-Case Test-Extension, Part Nr.: Z012746



# RXC Error Messages

# 8

Error are also announced with the two LED placed on the front panel. (see chapter LED's on page 26

Table 8.1. Error Messages

ERROR MESSAGE	ERROR DESCRIPTION	
RXC ROM Error Error 11	The RXC has no application software downloaded. Execute a download first. (Tool, Submenu Service, Download)	
RXC Power failed Error 13	The RXC was powered up and not initialized. No commands will be accepted before initiation. (Tool, Submenu, Initialize Default Values).	
RXC Syntax Error Error 20	The RXC received a undefined command. The syntax is not specified and can therefore not be served. You might have a inconsistent system. Establish consistency with the autownload command.	
RXC Error_Startchar Error 30	<p>The RXC SE-451 interface controller application software is a INTEL Hex file. If the starting character of any line in this file violates the format specifications downloading will stop immediately.</p> <p>Your downloaded file may be damaged, contact your local Bruker service agent for a correct RXC SE-451 interface controllerxx.HEX file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
RXC Error_Datacount Error 31	<p>The RXC SE-451 interface controller application software is a INTEL Hex file. If the length of any line in this file violates the format specifications downloading will stop immediately.</p> <p>Your downloaded file may be damaged, contact your local Bruker service agent for a correct RXC SE-451 interface controllerxx.HEX file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	

ERROR MESSAGE	ERROR DESCRIPTION	
<p>RXC Error_Address Error 32</p>	<p>The RXC SE-451 interface controller application software is a INTEL Hex file. If any address in this file is bigger than the uController(80C535) serves with its addressbus(0xFFFF) downloading will stop immediately. Your download file may be damaged, contact your local Bruker service agent for a correct RXC SE-451 interface controllerxx.HEX file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
<p>RXC Error_Rec Type Error 33</p>	<p>The RXC SE-451 interface controller application software is a INTEL Hex file. If any line record type specifier violates the format specifications downloading will stop immediately.</p> <p>Your download file may be damaged, contact your local Bruker service agent for a correct RXC SE-451 interface controllerxx.HEX file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
<p>RXC Error_Checksum Error 34</p>	<p>The RXC SE-451 interface controller application software is a INTEL Hex file. Every line in this file gets a checksum. The RXC SE-451 interface controller calculates for each line its own checksum and compares them. If a checksum differs from the calculated checksum downloading will stop immediately.</p> <p>Your download file may be damaged, contact your local Bruker service agent for a correct RXC SE-451 interface controllerxx.HEX file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
<p>RXC Error_Prommer Error 36</p>	<p>Special algorithms allow an insystem programming of the Flash EPROM. If an erase or program cycle of a memorylocation fails, downloading will stop immediately. If this error happens twice, contact your local Bruker service agent or replace your RXC board.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
<p>RXC Error_Erase Error 37</p>	<p>Special algorithms allow an insystem programming of the Flash EPROM. If an erase cycle of a memorylocation fails, downloading will stop immediately. If this error happens twice, contact your next Bruker service agent or replace board your RXC board..</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	

ERROR MESSAGE	ERROR DESCRIPTION	
RXC Error_NoHexChar Error 38	<p>The RXC SE-451 interface controller application software is a INTEL Hex file. A stopline indicates the end of file. If this end of file line violates the file specification downloading will stop immediately.</p> <p>Your download file i may be damaged, call your local Bruker service agent for a correct RXC SE-451 interface controllerxx.HEX file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
RXC Error_ReCount Error 39	<p>The RXC SE-451 interface controller boots from a lower page of his Flash memory. The bootroutine stored in this page must correspond to the downloaded application software. The downloaded application software conflicts with the boot block. Restart the download with a correct rx22xx.hex file.</p> <p>To restart the download, reset the RXC (Powerdown on AQR rack or initiate an EP pulse) and clear the RXC SE-451 interface controller Errormessage #11.</p>	
RXC VDD12 +12V failed Error 40	<p>The RXC is insystem programmable. Performing this ability requires a positive 12 Volt Voltage. TheRXC observes this voltage during program/erase operations in the Flash memory.</p>	
RXC Error in Flash Command Sequence Error 41	<p>The RXC is insystem programmable. The erase/programmable device (Flase EPROM 28F001) expects a defined command sequence for erase and program commands. This error reports a sequence mismatch.</p>	
RXC Page Mismatch, Storing terminated Error 42	<p>Non volatile data in the Flash memory is protected with a software key from unwanted program/erase operations. This error appears if the valid data conflicts with the new program command. The software refuses further operations in the data segment as long as it can not guarantee data validity. Please reset the RXC, sorry...</p>	
RXC Device is SE451 interface, function is for RX22 receiver only Error 200	<p>The SE-451 interface controller received a command which is not supported in this configuration. The digital part of the board may control either RX22 or RXC application. Configuration is done with a resistor network.</p>	
RXC Device is RX22 Receiver, function is for SE451 interface only Error 201	<p>The RX22 receiver received a command which is not supported in this configuration. The digital part of the board may control either RX22 or RXC application. Configuration is done with a resistor network.</p>	
RXC No Acknowledge received on I2c Bus Error 204	<p>The RXC SE-451 interface controller drives a serial I2c interface. Every data transfer on the serial I2c bus must be acknowledged. The slave is obligated to generate this acknowledge. This error appears if either the I2c bus address is wrong (no device in the I2c bus corresponds to this address) or a hardware problem inhibits a proper transfer on the serial bus (a wrecked I2c device).</p>	

ERROR MESSAGE	ERROR DESCRIPTION	
RXC I2c bus is busy, transmission not possible. Error 205	The RXC drives a serial I2c interface. The I2c specifications allow multi-master applications. Bus arbitration is done with the SCL(Serial CLock). This error appears if a other device initiated a bus request and did not signal the end of transmission or a device pulls either SDA or SCL of the I2c Bus permanent low.(broken device)	
RXC I2c R/W~ bit protocol violation, Bit 2^0 of address must be 1 Error 206	The RXC drives a serial I2c interface. The I2c hardware protocol specifications define bit 2^0 of the device address as Read/Write~ selector. A proper address byte for a read cycle is binary xxxx'xxx1. (eg Deviceaddress is 0x42, this address changes for a read cycle to 0x43)	
RXC I2c R/W~ bit protocol violation, Bit 2^0 of address must be 0 Error 207	The RXC drives a serial I2c interface. The I2c hardware protocol specifications define bit 2^0 of the device address as Read/Write~ selector. A proper address byte for a write cycle is binary xxxx'xxx0. (eg Deviceaddress is 0x42, the address for a write cycle is 0x42)	
RXC Hardware of RXC does not support Temperature Measurements Error 209	Boards with ECL 03 or lower do not support SE451 temperature measurements.	

# Figures

<b>1</b>	<b>General Description</b>	<b>1</b>
Figure 1.1.	Installation RXC .....	3
Figure 1.2.	RXC to SE451 Connector D-SUB 25 Pin Assignment .....	4
Figure 1.3.	RS485 Connector Pin Assignment .....	4
<b>2</b>	<b>Technical Data</b>	<b>9</b>
<b>3</b>	<b>Function Description</b>	<b>11</b>
Figure 3.1.	Memory Map .....	12
Figure 3.2.	RS485- Transmission .....	13
Figure 3.3.	uP Clock .....	15
<b>4</b>	<b>RXC Service Tool</b>	<b>17</b>
<b>5</b>	<b>ECL-Information</b>	<b>21</b>
<b>6</b>	<b>RXC Software Release Note</b>	<b>23</b>
<b>7</b>	<b>Test Equipement</b>	<b>25</b>
<b>8</b>	<b>RXC Error Messages</b>	<b>27</b>





# Tables

<b>1</b>	<b>General Description</b>	<b>1</b>
Table 1.1.	Jumper Settings: .....	6
<b>2</b>	<b>Technical Data</b>	<b>9</b>
<b>3</b>	<b>Function Description</b>	<b>11</b>
Table 3.1.	RXC I2c addresses .....	14
Table 3.2.	LED Description .....	15
<b>4</b>	<b>RXC Service Tool</b>	<b>17</b>
<b>5</b>	<b>ECL-Information</b>	<b>21</b>
Table 5.1.	ECL information for RXC .....	21
Table 5.2.	Firmware Versions .....	21
<b>6</b>	<b>RXC Software Release Note</b>	<b>23</b>
<b>7</b>	<b>Test Equipement</b>	<b>25</b>
<b>8</b>	<b>RXC Error Messages</b>	<b>27</b>
Table 8.1.	Error Messages .....	27

