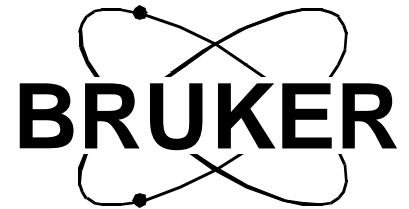


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**BSMS, BSMS/2**

**RCB User Manual**

**Version 003**

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**BRUKER**

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# General Description

# 1

## Introduction

1.1

### Purpose /Function:

The BSMS RCB is a VME-card that allows the connection of two Realtime Control Pulses (RCP) to the BSMS. If enabled, each negative or positive (jumper selectable) edge of the RCP causes an interrupt on the BSMS CPU.

The current BSMS CPU software ignores interrupts on channel B. This channel is for future use.

Interrupts on channel A are used to step through a preset gradient imaging sequence of the three basic shims X, Y and Z. The step rate is guaranteed to reach 10 Hz. Higher step rates are possible but, depending on shim system type and CPU load, the CPU might become overloaded which causes an error message. In this case the old shim values are restored and the imaging sequence is aborted.

### Compatibility:

The BSMS RCB can be used for BSMS and BSMS/2.

Older BSMS CPU software versions don't expect these interrupts. They are treated as spurious interrupts and cause the CPU to reset.

### 2H-TX:

The basic board of the BSMS RCB may be additionally equipped with a deuterium transmitter module. This board is called 2H-TX. Refer to the 2H-TX User Manual for details.

## Jumpers

1.2

The active slope of the two interrupt inputs is jumper selectable. The jumper positions have the following effect:

Position A: negative edge triggered (for AVANCE Series)

Position B: positive edge triggered (for AMX/ARX Series)

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# Hardware Installation

# 2

## General

## 2.1

**Important:** The RCB can be used for all delivered BSMS and BSMS/2. The jumpers are needed for BSMS only, because BSMS/2 has an automatic daisy chain feature.

To equip an AVANCE Series spectrometer (or AMX/ARX Series with BSMS or BSMS/2) with a RCB you need the following items:

Z002766	1	Realtime Control Board (RCB)
3033	9	Jumpers for VME bus ( <b>BSMS only</b> )
Z31390	1	BSMS RCB User Manual (this manual)
	1	BSMS Tool Release V2.1 and later (Distributed with XWIN-NMR 1.3 or later)

## Installation of RCB into a BSMS

## 2.2

Figure 2.1. The location of the RCB in the BSMS Chassis



1. RCB and BSMS contain electrostatically sensitive devices. Please follow the general ESD safety rules: Wear the ESD bracelet found inside all BRUKER

electronic cabinets. Use a conductive surface to handle the boards. Never touch the wires of the electronic components mounted onto the boards.

2. Disconnect all cables of all boards of the BSMS, except the CPU and the Lock-TX and -RX cassettes.
3. Remove the previously disconnected boards and place them on a conductive surface.
4. Remove the blank front cover just to the left of the LCB (Lock Control Board).
5. Put a jumper onto every pin pair (labeled "IACK" on the rear side) of the VME-Bus (see Figure 2.2). The "IACK" jumpers are located on the upper half of the backplane. Only nine jumpers between CPU and RCB have to be placed. The jumper just to the left of the RCB (seen from front) must not be placed.
6. Check the jumpers on the RCB. They have to be in position 'A'.
7. Insert the RCB in the slot between SCB13R and LCB. Insert all boards in their appropriate slots. Reconnect all the cabling.
8. Connect the RCP-cable marked ,Z0' to the upper SMB-Connector (INT A) of the RCB. This cable was originally planned to switch a Z0-compensation in the BSMS Lock. But this feature is obsolete and on later LCB versions the connector has been eliminated. Now the cable is used to control the RCB.

Figure 2.2. Front view of BSMS backplane

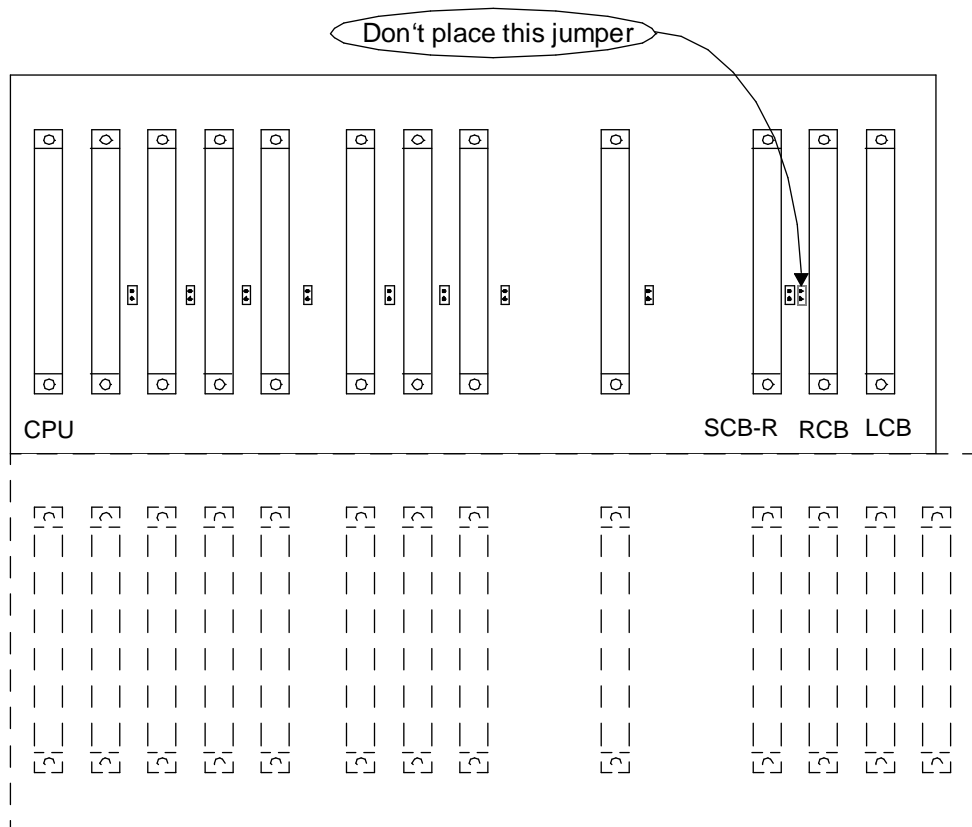
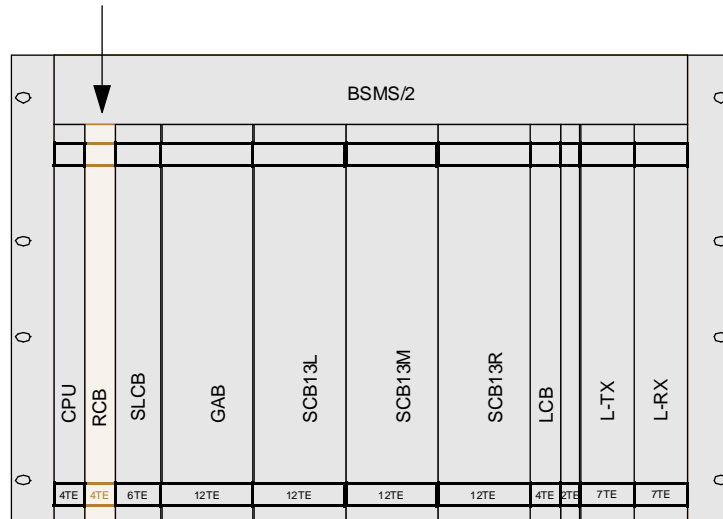




Figure 2.3. The location of the RCB in the BSMS/2 Chassis



1. RCB and BSMS/2 contain electrostatically sensitive devices. Please follow the general ESD safety rules: Wear the ESD bracelet found inside all BRUKER electronic cabinets. Use a conductive surface to handle the boards. Never touch the wires of the electronic components mounted onto the boards.
2. Remove the blank front cover just to the right of the CPU.
3. Check the jumpers on the RCB. They have to be in position 'A'.
4. Insert the RCB in the slot to the right of the CPU.
5. Connect the RCP-cable marked 'Z0' to the upper SMB-Connector (INT A) of the RCB. This cable was originally planned to switch a Z0-compensation in the BSMS Lock. But this feature is obsolete and on later LCB versions the connector has been eliminated. Now the cable is used to control the RCB.

1. Install the XWIN-NMR release 1.3 or later.
2. Type 'bsms download' in a unix shell.

Downloading can take from one minute (if your system is up to date) to one hour (if several boards need to be downloaded).

If the download has been successful and the BSMS RCB is installed correctly the green Ready LED on the RCB is lit.

Try shorting the upper RCP connector with a pointed metal tool to cause a test interrupt. The upper yellow LED has to flash each time you short the connector, indicating the recognition of the interrupt. The BSMS Keyboard reports the error "E 53: BSMS Shim ramp: Void interrupt". This is because you didn't set up a shim ramp before requesting an increment by interrupt. Acknowledge the error message by pressing the StdBy key.

# Troubleshooting

# 3

- Q. Although the download was running for a long time, the Ready LED of my RCB doesn't light
- A. Check the BSMS Tool version. It must be 2.1 or later. Type "bsms" in a unix shell to see the version.
- Q. All I get when shorting the RCP connector is a 'E:70 BSMS Timeout' error.
- A. Probably the yellow interrupt LED is constantly on. Is the Ready LED on? If not, see question above. Probably you didn't place all "IACK" jumpers between CPU and RCB (BSMS only). Place all nine Jumpers. The rightmost jumper (the one closest to the RCB) must **not** be placed.
- Q. I didn't get the power supply wires I always got when installing a new board in the BSMS.
- A. The RCB is an all digital board. Thus it doesn't need any special power supply voltages. All required voltages are available on the VME backplane.



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