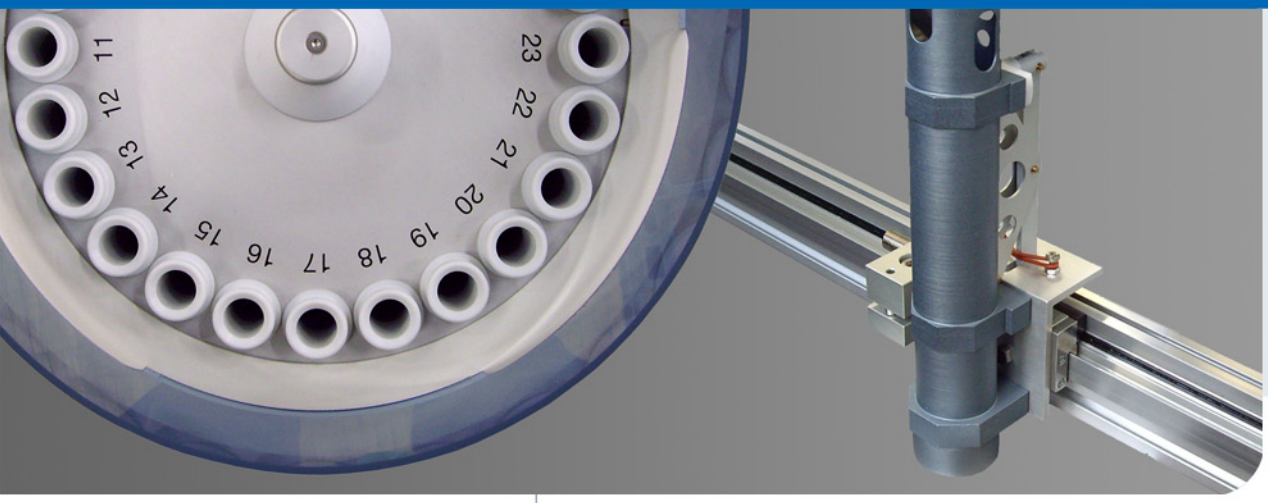
Bruker BioSpin



SampleMail
SampleCase

Users Manual
Revision 02

NMR Spectroscopy

Innovation with Integrity

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Summary

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1 About

1.1 This Manual

This manual is intended to be a reference guide for service technicians. It provides detailed information about the user level maintenance and service and overall use of the Bruker device.

The figures shown in this manual are designed to be general and informative and may not represent the specific Bruker model, component or software/firmware version you are working with. Options and accessories may or may not be illustrated in each figure.

This manual describes parts and procedures relevant to the device version it is delivered with. For older hardware, please refer to the manual supplied at the time.

1.2 Policy Statement

It is the policy of Bruker to improve products as new techniques and components become available. Bruker reserves the right to change specifications at any time.

Every effort has been made to avoid errors in text and figure presentation in this publication. In order to produce useful and appropriate documentation, we welcome your comments on this publication. Support engineers are advised to regularly check with Bruker for updated information.

Bruker is committed to providing customers with inventive, high quality products and services that are environmentally sound.

1.3 Disclaimer of Liability

All specifications and instructions in this manual have been compiled taking account of applicable standards and regulations, the current state of technology and the experience and insights we have gained over the years.

NOTICE

Disclaimer

Bruker is not responsible or liable for any injury or damage that occurs as a consequence of none-approved manipulations on the sample transporters.

► Read the manual carefully before working on/with the sample transporters.

Disrespecting the following rules is at the users own risk and invalidates any and all manufacturers warranties:

- The unit should only be used for its intended purpose as described in this manual.
- Use of the unit for any purpose other than that for which it is intended is done so at the users own risk and invalidates any and all manufacturers warranties.
- Service or maintenance work on the unit must be carried out by qualified personnel.
- Only those persons trained in the operation of the sample transporter should operate them.
- Read this manual before operating the unit. Pay particular attention to any safety related information.

1.4 Symbols and Conventions

Safety instructions in this manual are marked with symbols. The safety instructions are introduced using indicative words which express the extent of the hazard.
In order to avoid accidents, personal injury or damage to property, always observe safety instructions and proceed with care.

DANGER

This combination of symbol and signal word indicates an immediately hazardous situation which could result in death or serious injury unless avoided.

WARNING

This combination of symbol and signal word indicates a potentially hazardous situation which could result in death or serious injury unless avoided.

CAUTION

This combination of symbol and signal word indicates a possibly hazardous situation which could result in minor or slight injury unless avoided.

NOTICE

This combination of symbol and signal word indicates a possibly hazardous situation which could result in damage to property or the environment unless avoided.

SAFETY INSTRUCTIONS

This combination of symbol and signal word indicates a general safety instruction which could result in damage to property or the environment unless avoided.

This symbol highlights useful tips and recommendations as well as information designed to ensure efficient and smooth operation.

1.5 Safety Symbols on the Device

All safety symbols on the device are described in the chapter "Safety Symbols" on page 53.

1.6 Safety Symbols in this Manual

See an index of the safety instructions in the chapter "Warning Signs" on page III in the appendix.

2 Introduction

2.1 General Description

The sample transporter will make your daily work on NMR systems easier. No leader/ stairs climbing for tube submission is necessary anymore since users can operate the system very convenient from floor level. Versions for single tube submission or with a 24 holder storage for automation are available.

Figure 2.1: The SampleCase Version with the 24 Holders

2.2 Sample Transporter Benefits

Benefits	SampleMail Version	SampleCase Version
Very easy handling	X	X
System operation from floor level	X	X
Fits all shielded Bruker standard bore magnets from 300 – 900 MHz[a]	X	X
Immediate sample submission	X	X
Full integration in Topspin	X	X
Full integration in IconNMR	-	X
Number of holders for various type of NMR tubes	1	24

Table 2.1: System Specification Overview

a. Contact Bruker for installation specifications on other magnets

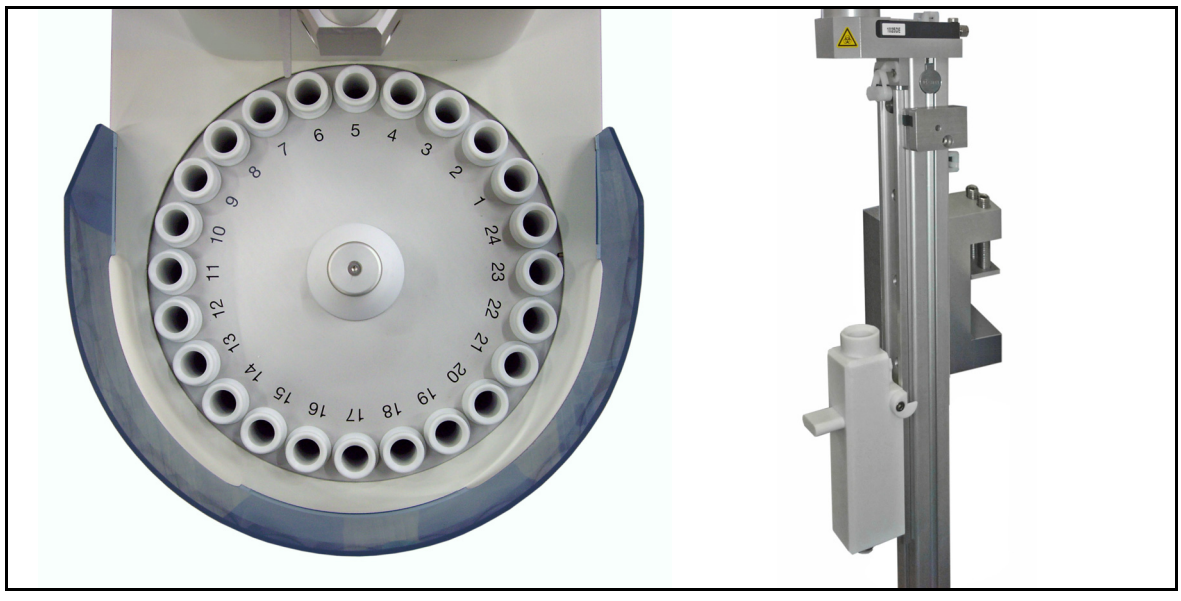


Figure 2.2: Option Carousel or Hand Slider

2.3 The Different Sample Transporters

2.3.1 The SampleMail

The SampleMail system has just one component with either a long or a short axis. For higher magnets starting from 750MHz an extra long vertical pipe has to be ordered.

Description	Number
SM SAMPLEMAIL 610 CPL.[a]	Z133066
SM SAMPLEMAIL 1030 CPL.[a]	Z116802
SM VERTICAL PIPE L=2450 [b]	Z117094

Table 2.2: The SampleMail AH0170

a. Either shorter or longer axis
b. Only required for Magnets > 700MHz

2.3.2 The SampleCase

The SampleCase system has two components. These are either a long or a short axis and the carousel with the 24 holders. For higher magnets starting from 750MHz an extra long vertical pipe has to be ordered.

Description	Number
SM SAMPLEMAIL PLUS 610 CPL.[a]	Z133067
SM SAMPLEMAIL PLUS 1030 CPL.[a]	Z123384
SACA SAMPLECASE CPL.	Z122633
SM VERTICAL PIPE L=2450 [b]	Z117094

Table 2.3: The SampleCase AH0171

a. Either short or long axis
b. Only required for Magnets > 700MHz

2.4 SampleCase Overview

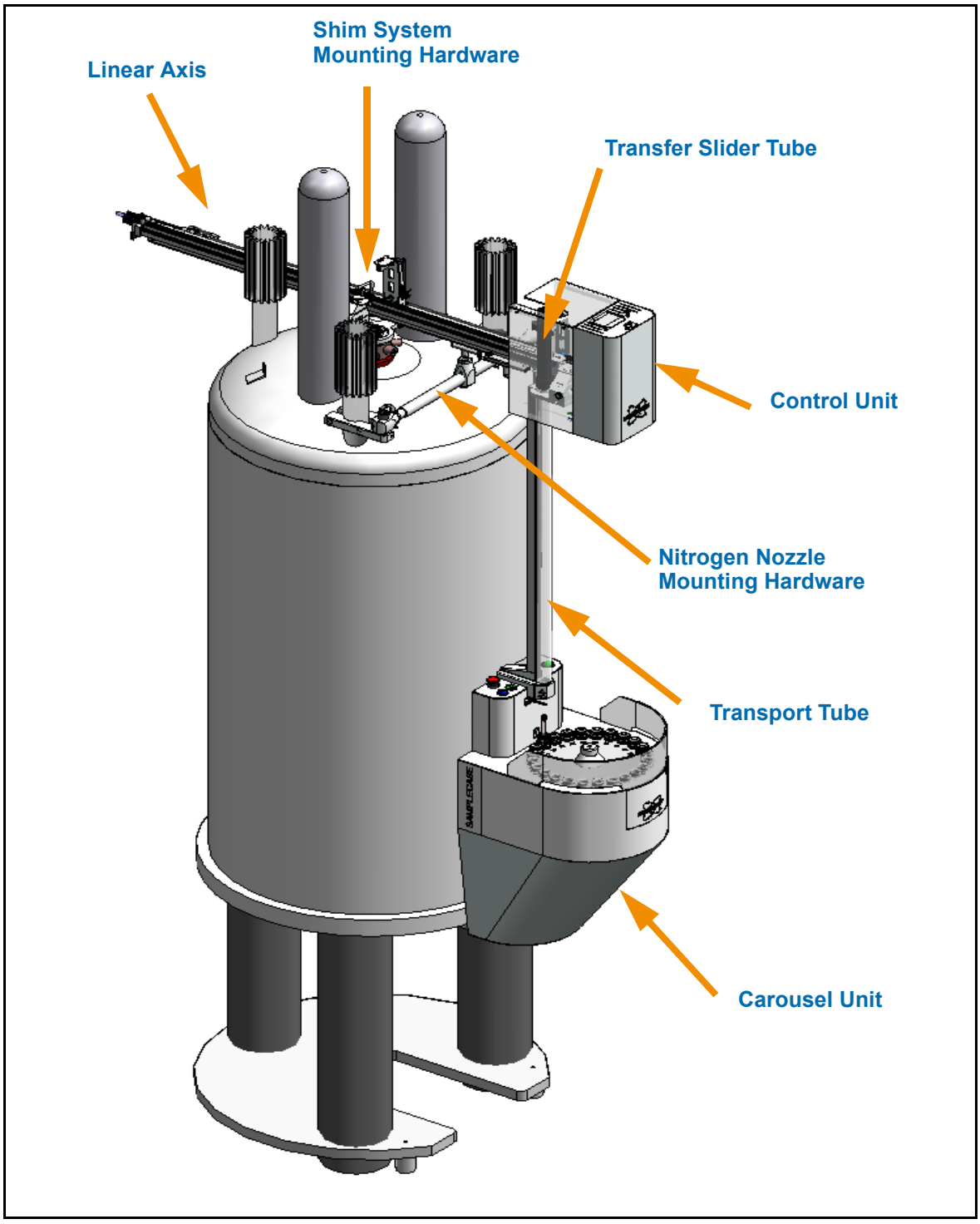


Figure 2.3: The SampleCase Mounted on a Magnet

3 Using the Sample Transporter

3.1 General Use

The Sample Transporters are designed to easily bring the customers NMR tubes into the magnet and back. For this the NMR tube will be transported up and down with the lift gas and shifted horizontally by a pneumatic drive. This is all fully controlled from software and verified trough optical sensors. Users only have to start the transport from the computer or at the hardware and can see the progress on a status LED on the device..

3.1.1 Determine the States

The SampleCase has two redundant, the SampleMail just one very good visible LED lights to indicate its current state. Users should know the meaning of these LED states and state types in order to operate the system correctly and safe. The LED lights are located as shown below.

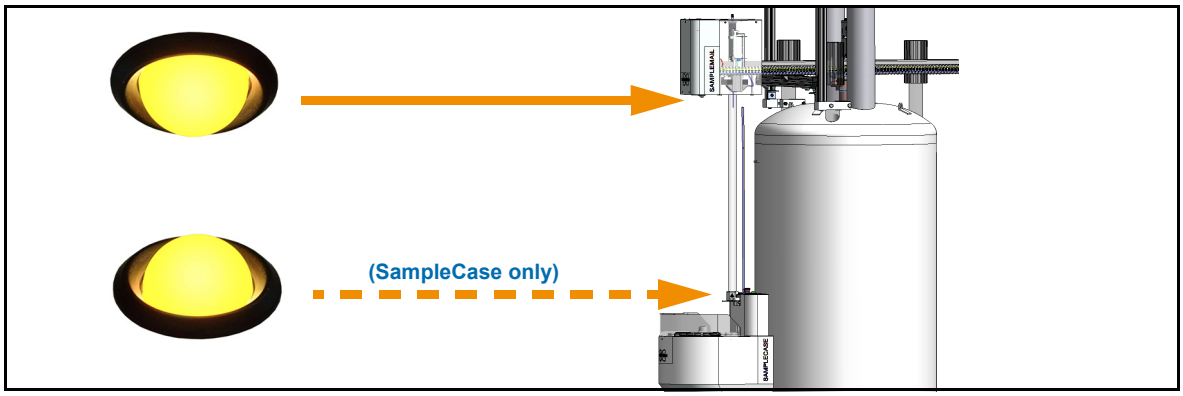


Figure 3.1: The State LED

LED	State Type	Meaning
▬▬▬▬▬	Stable	System is in a stable state with no actions pending
▬ ▬ ▬	Transient	System is in the middle of an action
▬ ▬ ▬ ▬ ▬	Urgent	System is in a time-critical state with actions pending

Table 3.1: Type of Sample Transporter States

⚠ CAUTION

System state not stable

Do never access the system when not in a stable state.

► Always wait until a action is finished and the LED's stops blinking.

LED	State	Meaning
	Idle	System is idle with no sample in magnet
	Busy	System is busy transporting a sample
	Measure	System is Idle with a sample in magnet
	Warning	Check BSMS service web page for more information.
	Attention	System will start soon. Keep hands off.
	Check	System is checking for errors
	Error / Startup	System has detected an error or is starting up

Table 3.2: Specific Sample Transporter States

3.1.2 Allowed Spinners and Shuttles

The sample transporter can transport almost every Bruker Spinner and Shuttle except the older types with no yellow ring on the reflector foil.

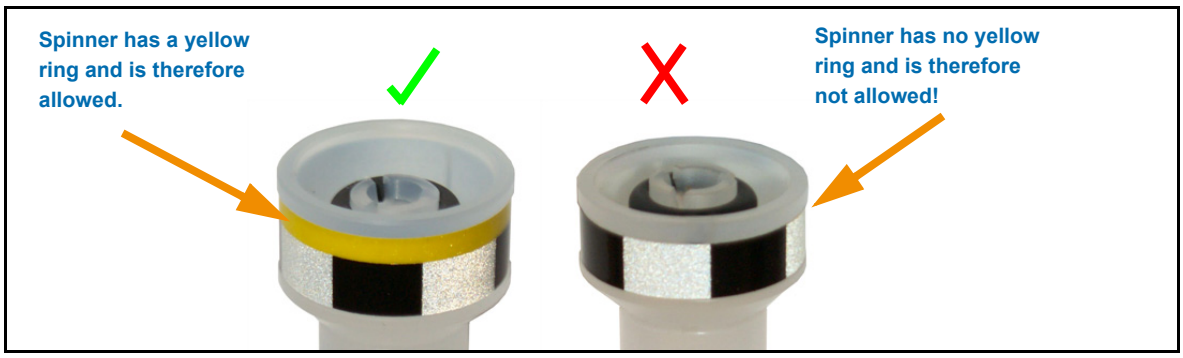


Figure 3.2: Allowed Spinners

3.1.3 Handle Glass Tubes Carefully

NOTICE

Glass tubes may break at any time

Even if the sample transporter is built to handle the tubes carefully glass tubes may break during the transport. Also while loading and removing tubes from the system the tubes may break even without any force or impact.

- ▶ Consider general lab safety (protective gloves, safety goggles, ...) when working with NMR tubes.

3.2 Operating a SampleMail

The SampleMail will be controlled from Topspin only and needs to have the sample ready in the hand slider. Users needs to know very little to operate the device.

3.2.1 At the Hand Slider

To insert a tube with a SampleMail just put the tube with the spinner in the hand slider and close the slider by moving it up until it snaps into place. Depending on the software configuration (see ”Hand Slider Mode” on page 36) the tube will be inserted immediately or after a command from Topspin.

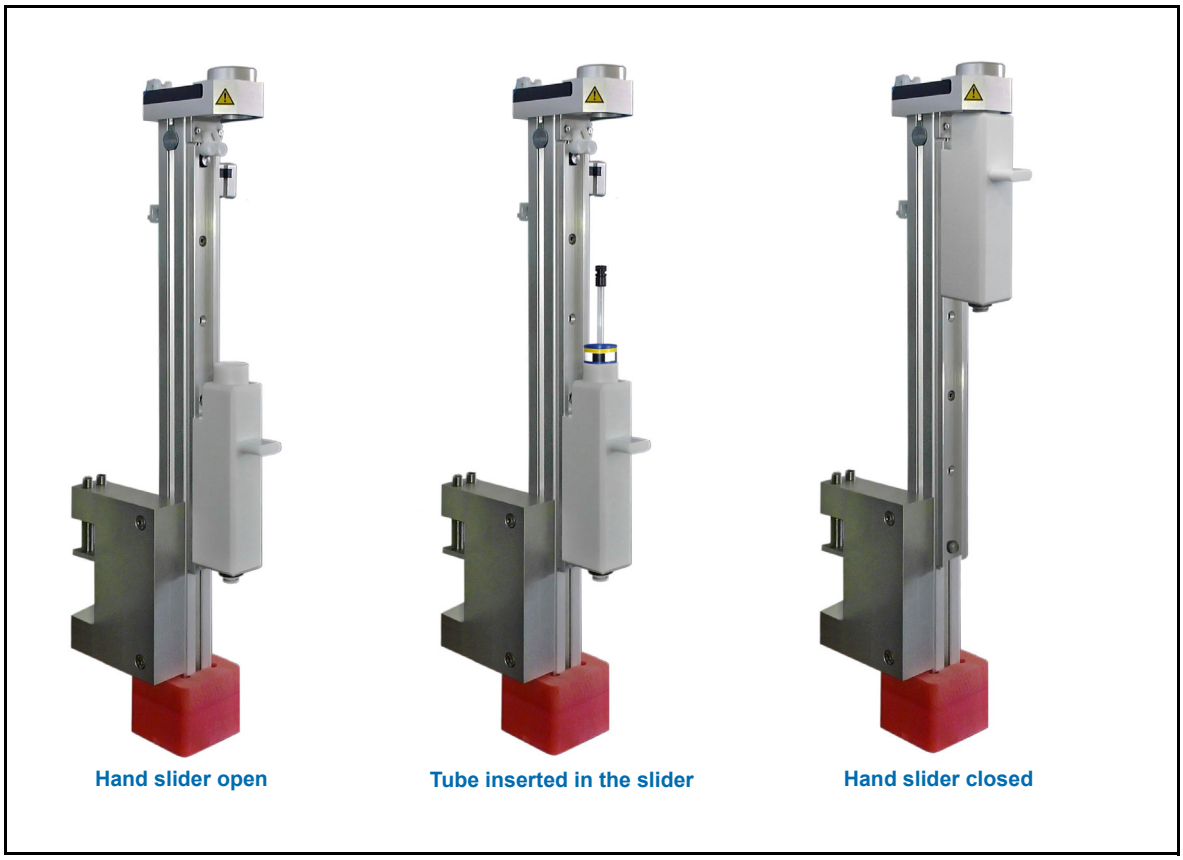


Figure 3.3: Insert a Tube with the SampleMail

NOTICE

Do not open the hand slider during the sample transport

Do never open the hand slider when the system is busy. As long as the tube is on the users end it may unbraked fall out of the port.

- Always wait until the system is idle and status LED turns green before opening the hand slider.
- Double check though the semitransparent vertical transport tube that the spinner is down in the hand slider before open it.

Ejecting a sample with an open hand slider is not possible.

3.2.2 Topspin commands for the SampleMail

Operation an NMR system with a SampleMail is similar to those without one. Just type in the commands in the command line of Topspin or use the graphical „BSMS Display“ to operate the SampleMail.

Command	Meaning
ij	Insert the sample in the hand slider into magnet.
ej	Eject the sample from the magnet and place it back in the hand slider.
bsmsdisp	Opens the graphical interface showing a button to switch on or off the lift. This will have the same effect as the “ij” and “ej” commands.

Table 3.3: Topspin Commands for the SampleMail

3.3 Operating a SampleCase

The SampleCase can be operated stand alone or with the Bruker TopSpin and IconNMR software. This chapter describes both and some general knowledge. Read this chapter to understand the general functionality of the system. Actions beside the normal operation are described in the following chapters.

⚠ CAUTION

Sudden motion

The SampleCase is remote controlled and can start with an action at any time. Before a sudden action starts remote controlled the SampleCase will warn you with the “Attention” or “Busy” state. There is no “Attention” state after a user action on the system itself.

- ► Please keep your hands off the system immediately on “Attention”, “Busy” or if you see or hear an action starting.
- ► Keep you hands off the carousel before pushing one of the push buttons.

NOTICE

Do not force the carousel

Do never force the carousel. When rotating the carousel can be forced to rotate to the wrong direction.

- ► The SampleCase will try to correct the position by continuing rotating.

3.3.1 Hardware Interface Overview

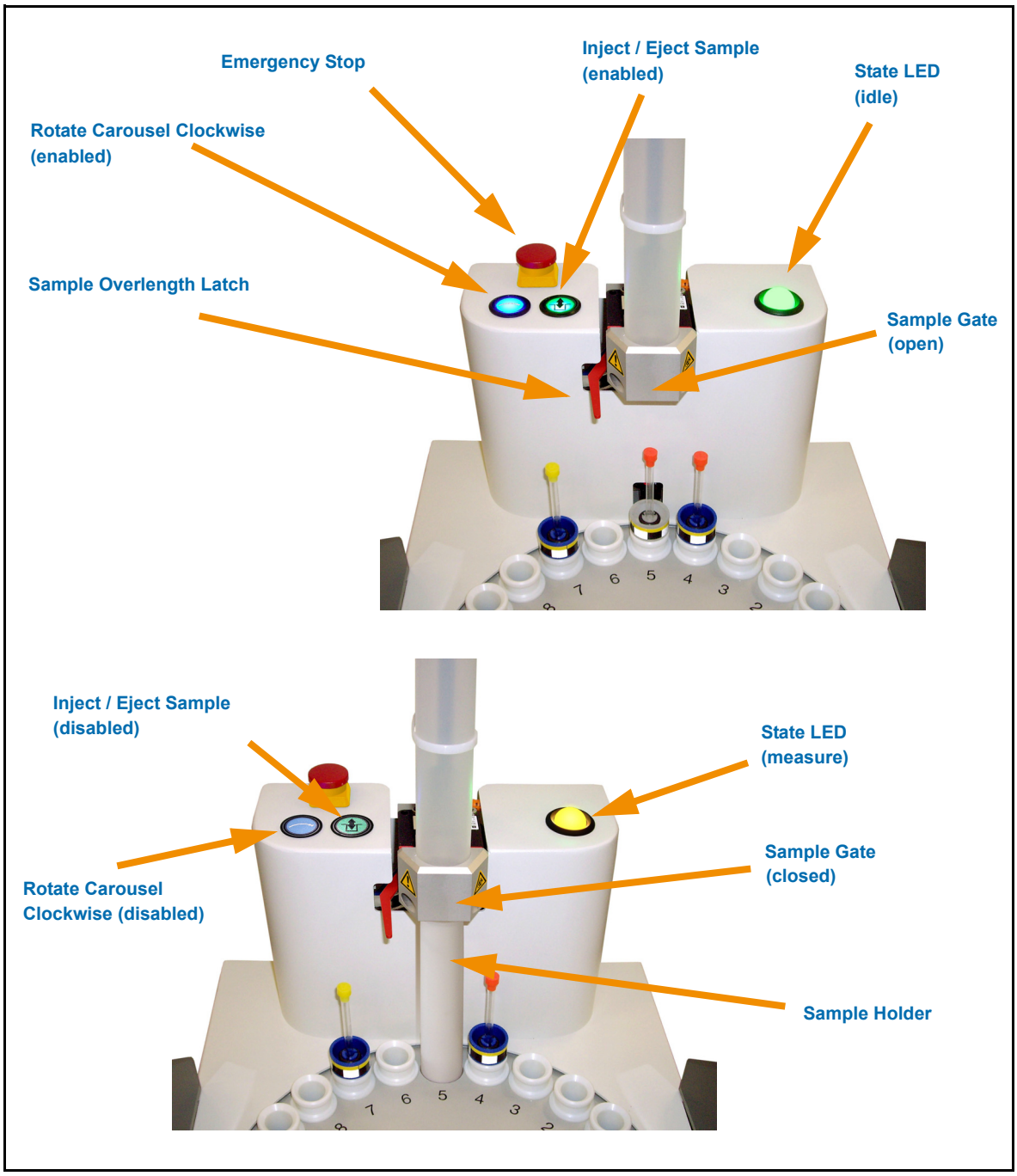


Figure 3.4: The Hardware Interface “idle” and “measure”

3.3.2 Lighted Push Buttons

There are two push buttons on the left side of the system. The light is on if you can trigger their functionality.

Rotate Carousel Clockwise:
This button will rotate the carousel one holder when pressed or continuously when held down. The carousel can rotate only clockwise due to its design. It cannot be rotated if a tube is in the magnet and the sample gate is closed with a holder.

Inject / Eject Sample:
If there is a sample in the current position underneath the sample gate or in the magnet this button is active and will either inject or eject the current sample.

If the push buttons are not illuminated then they are not active. Pressing a dark push button will have no effect.

Ejecting a sample with the “Inject/Eject” button will only work when the spinning of the sample is off. Otherwise the SampleCase assume a running measurement.

3.3.3 Emergency Stop

The emergency stop will not power off the system but will exhaust the compressed gas in the SampleCase. The actors on the system, all pneumatic driven, will stop immediately and the system indicates an “Error” state. Releasing the emergency button will pressurise the system and reset the firmware. The system will go through the “Check” state first.

As long as the emergency button is pressed the system will be in error state and the SampleCase system is disabled. “ij” and “ej” commands from Topspin will then only switch on the BSMS lift for manual sample handling.

Releasing the emergency button will perform a firmware reset.

3.3.4 Sample Overlength Latch

There is an absolute limitation of the sample length in this System given by the distance between the carousel holders and the transport tube inlet. The sample overlength latch will detect those tubes while the carousel is rotating and will bring the system to a stand-still.

NOTICE

Overlength samples

Do not insert too long samples into the carousel.

- The system will detect this and stop. Nevertheless tubes may break.

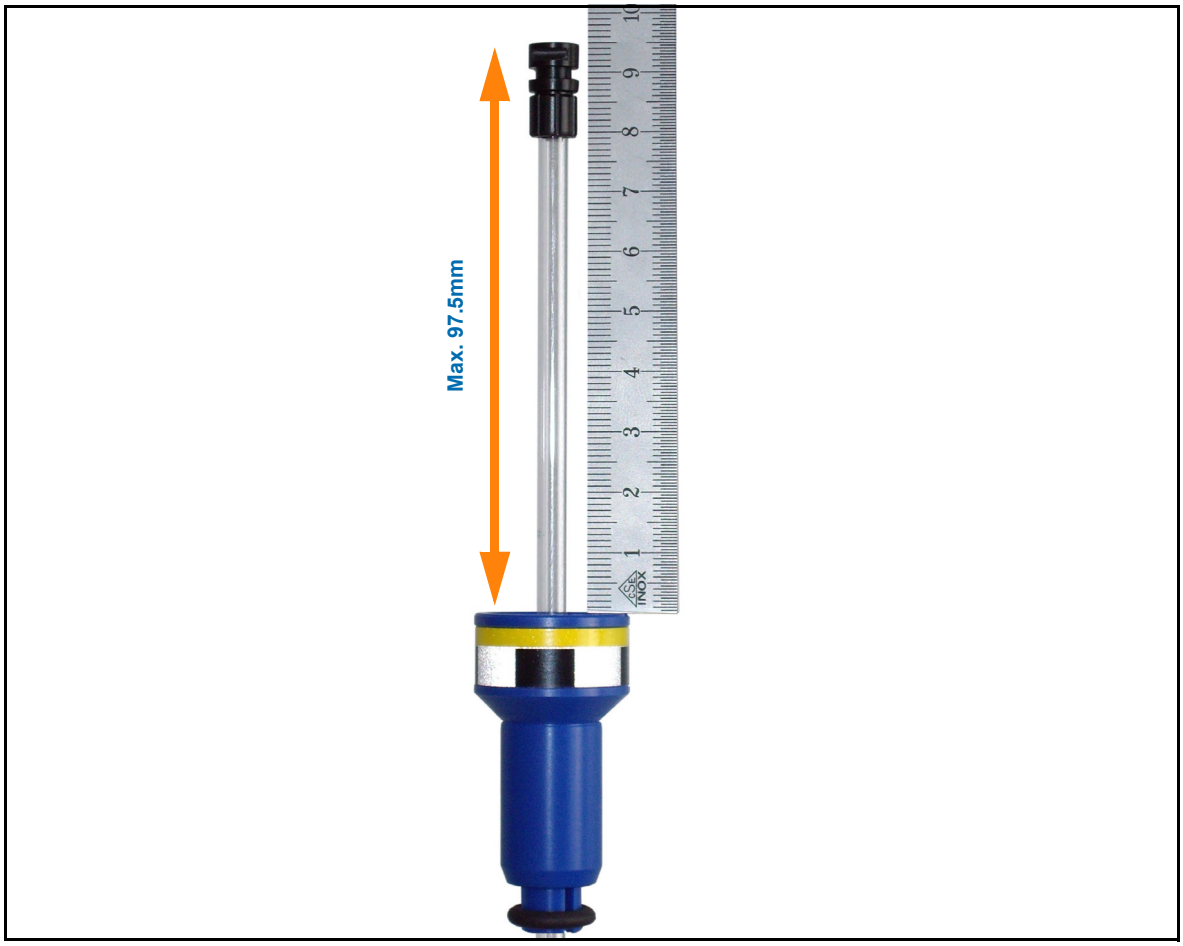


Figure 3.5: The Tube Length Limitation

Remove the Sample manually if the SampleCase stops due to a long tube.

3.3.5 Topspin Commands for the SampleCase

You can easily operate the SampleCase from Topspin by using “sx” commands in the command line or with the “lift” button in the „BSMS Display“ started with “bsmsdisp”. while “sx” commands will insert a specific sample the “lift” button will always insert the sample underneath the gate.

Command	Meaning
sx 1, sx 2, ..., sx 24	Remove the current sample if there is one in the magnet. Then insert the sample in the selected position.
sx ej	Eject the sample from the magnet and place it back in the carousel.
ij	Insert the sample in the current holder into magnet.
ej	Eject the sample from the magnet and place it back in the carousel.
bsmsdisp	Opens the graphical interface showing a button to switch on or off the lift. This will have the same effect as the “ij” and “ej” commands.

Table 3.4: Topspin Commands for the SampleCase

3.3.6 IconNMR with a SampleCase

There are no special functions for the SampleCase in IconNMR. If IconNMR has been configured correctly (”IconNMR setup” on page 41) you can just set up any runs on the 24 holders.

3.4 Disable the Sample Transporter

3.4.1 The Gas Supply Switch

If the sample transporter is not in use the gas may need to be switched off. For this reason there is a gas switch at the supply line that is interrupting the supply and releases the pressure from the system.

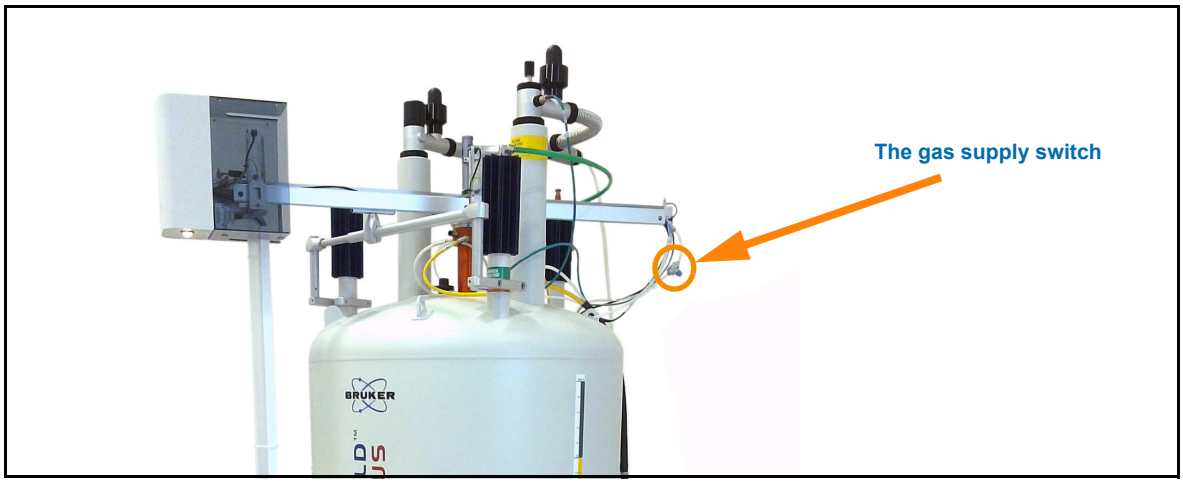


Figure 3.6: The Location of the Gas Switch

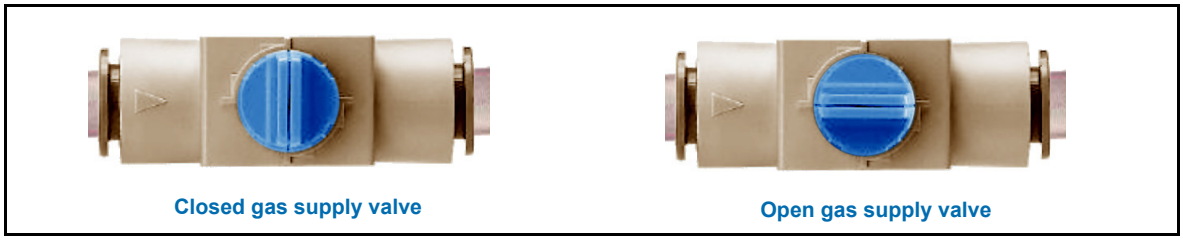


Figure 3.7: Interrupting the Gas Supply

⚠ CAUTION

System is moving after switching on gas supply

As soon as the gas supply is switched on and the system is under pressure parts may start moving immediately.

► Keep hands off the system when switching gas supply on.

3.4.2 Moving the Slider Manually

If the system has no gas pressure, the transfer slider can be moved manually if needed. This has to be done carefully with the force applied close to the axis.

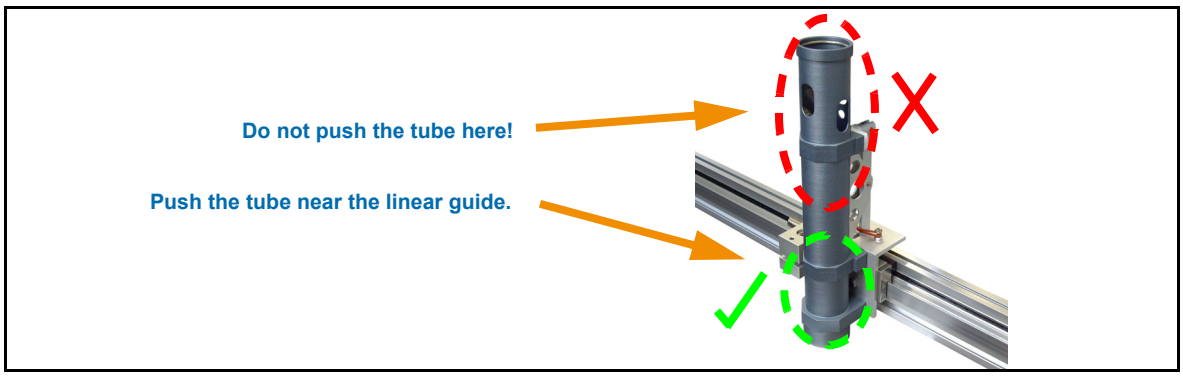


Figure 3.8: Moving Transfer Slider Tube Manually

NOTICE

Moving the transfer slider tube manually

The transfer slider tube will not withstand forces away from the linear guide.

- ► You may void the adjusting of the transfer slider tube.

3.4.3 Shutdown the Sample Transporter

SAFETY SHUTDOWN PROCEDURE

Follow this procedure to shout down the sample transporter completely

1. Press the emergency button (SampleCase only) to stop the software.
2. Interrupt the gas supply by closing the supply valve.
3. Interrupt the power supply by pulling out the power plug.

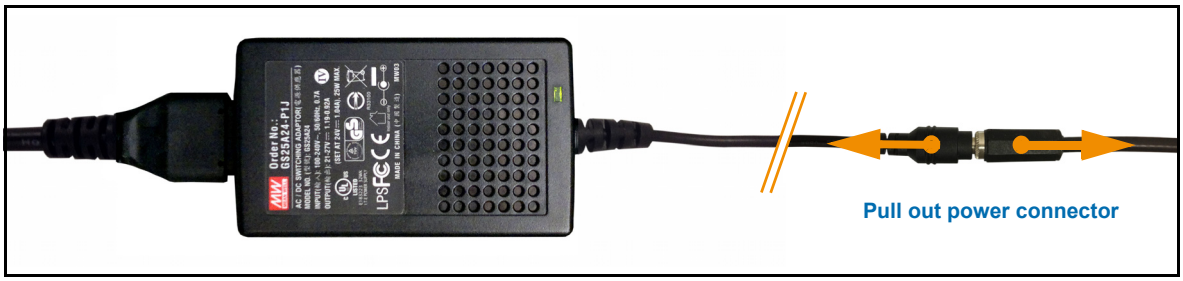


Figure 3.9: Interrupting the Power Supply

3.4.4 Inserting Tubes Manually

Depending on the application there may be situations where the sample transporter is not needed or cannot be used. A system with a sample transporter installed can still be operated by manually inserting tubes.

In these cases follow the 3 steps listed here to bypass the sample transporter:

1. Interrupt the gas supply.
2. If the transfer slider tube is on the magnet side then move the tube away from the magnet bore manually. Always hold the tube close to the linear guide when moving it to prevent tilting the tube.
3. Set the lift mode to “BSMS lift” in the configuration. See details in ”Lift Mode” on page 36.

3.4.5 Usage of MAS Hardware

The sample transporters will provide access for the MAS hardware. Check on the picture below if your MAS hardware is compatible with the sample transporters.

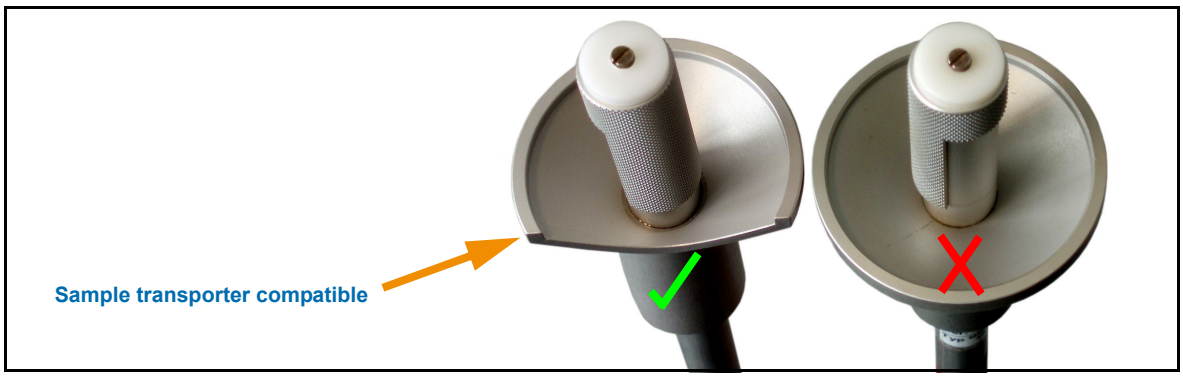


Figure 3.10: Compatible MAS hardware

Bypass the sample transporter as described in ”Inserting Tubes Manually” on page 29 and remove the two rings from the shim system mounting hardware.

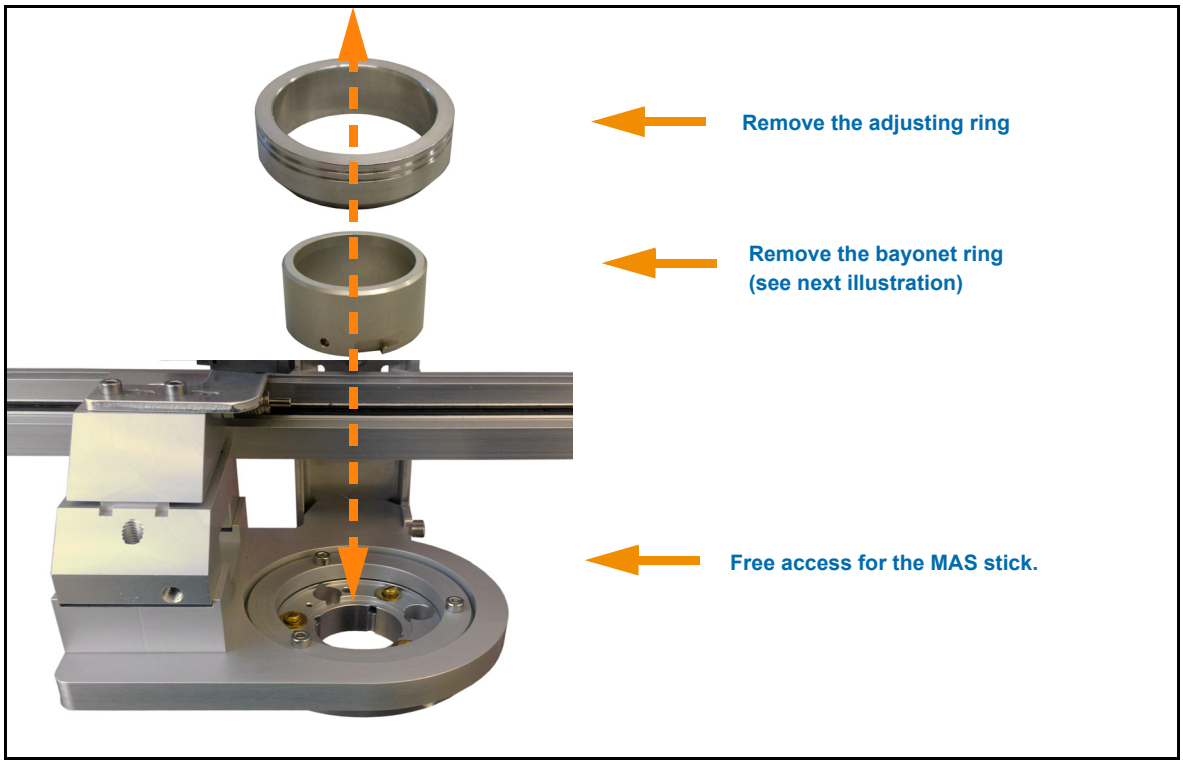


Figure 3.11: Removing the Rings

The the bayonet ring need to be rotated to loose. Check the index holes in the ring and the mounting hardware to see if the ring is loose or tight.

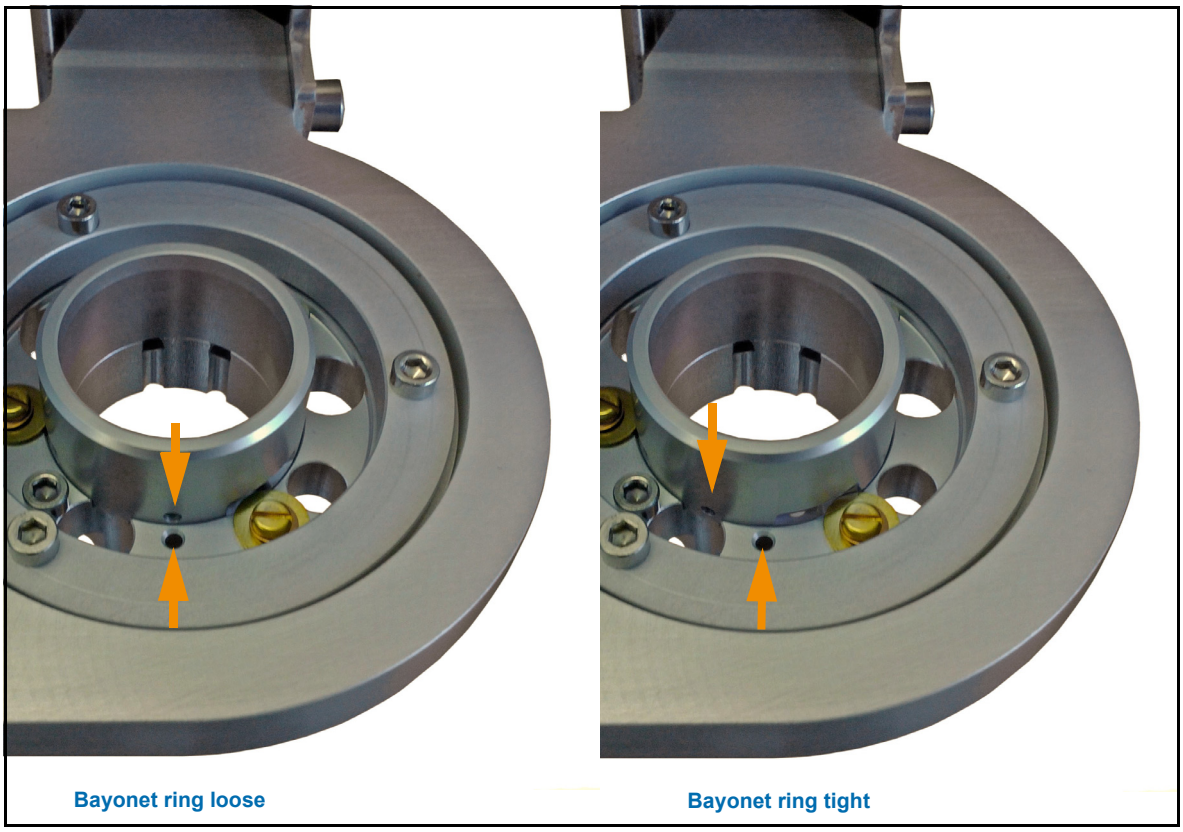


Figure 3.12: The Bayonet Ring

NOTICE

Check the rings before switching on the gas supply

Do never switch on the gas supply when the bayonet ring is not tighten correctly.

Do never run the device if the bayonet ring is not inserted.

Do never switch on the gas supply when the adjustment ring is only partially inserted.

- ► The transfer slider tube may collide with one of the rings.
- ► The sample cannot be transported.

3.5 System Interrupts

3.5.1 Resolve Error Handling

The sample handler tries to resolve all problems itself during the state „check“ when the LED is blinking red. In some cases the system cannot be sure about a certain hardware state and instead of proceeding the system will stop with a failure for safety reason.

In these cases the customer has to resolve the problem manually and tell the system to resume. This has to be done on the BSMS service web page „SampleTransporter Control“ see ”Using the Web Interface” on page 35.

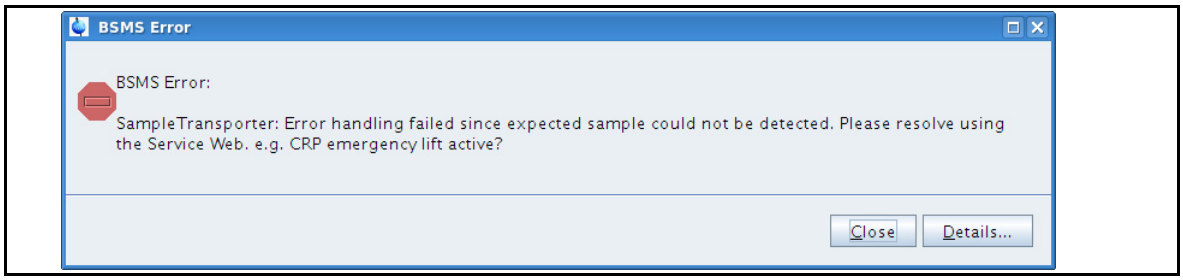


Figure 3.13: Resolving request in Topspin

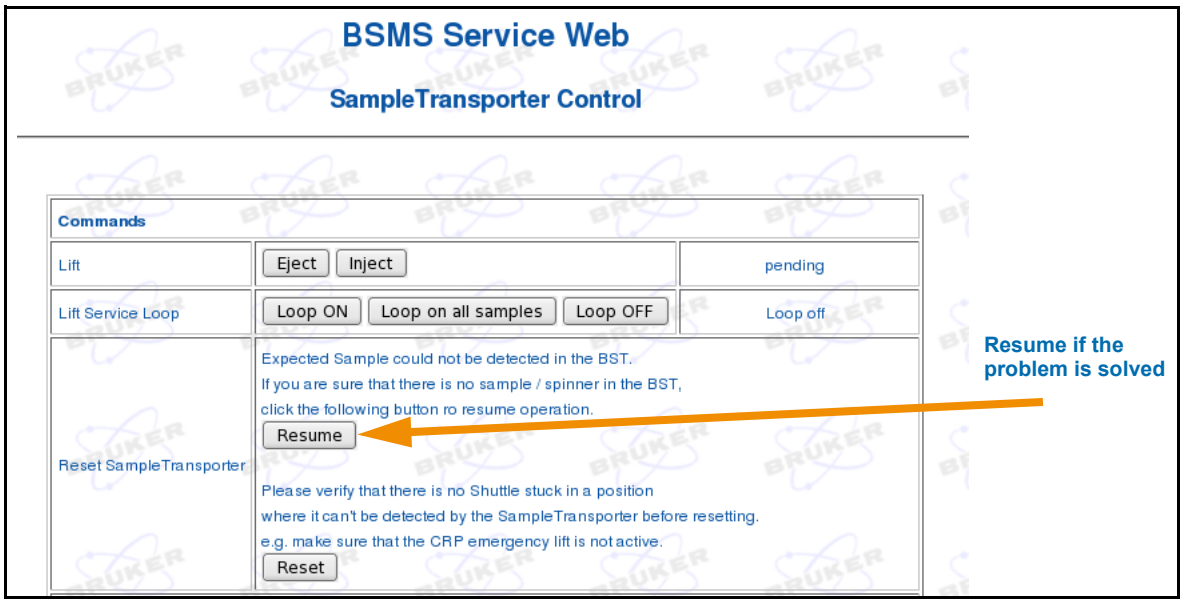


Figure 3.14: Resuming on the BSMS Service Web page

3.5.2 Emergency Lift Behaviour

If the NMR system is equipped with an emergency lift, it will not be affected by the sample transporter. The emergency lift will just blow out the NMR tube into the transfer slider tube where it will float as long as the emergency lift is on. Since the transfer slider is closed on top the NMR tube cannot jump out of this tube and will fall back in position when the emergency lift stops.

4 Configuration

4.1 About the Software Setup

Before the sample transporter can work some configurations needs to be done in the BSMS Service web interface, in Topspin and in IconNMR. The following list shows which steps are needed for which hardware. The configurations will not be possible if not carried out in the given sequence.

Setup	SampleMail	SampleCase
”Lift Mode” on page 36	X	X
”Hand Slider Mode” on page 36	X	-
”Lift Calibration” on page 37	X	X
”Setting up Topspin” on page 39	-	X
”IconNMR setup” on page 41	-	X

Table 4.1: Software Setup Overview

4.1.1 Using the Web Interface

For setup and service action you need to access the sample transporter web pages on the BSMS service web interface. To access these pages use the „ha” command in Topspin to collect all the available ethernet addresses. The BSMS service web interface is then listed and can be opened in a browser.

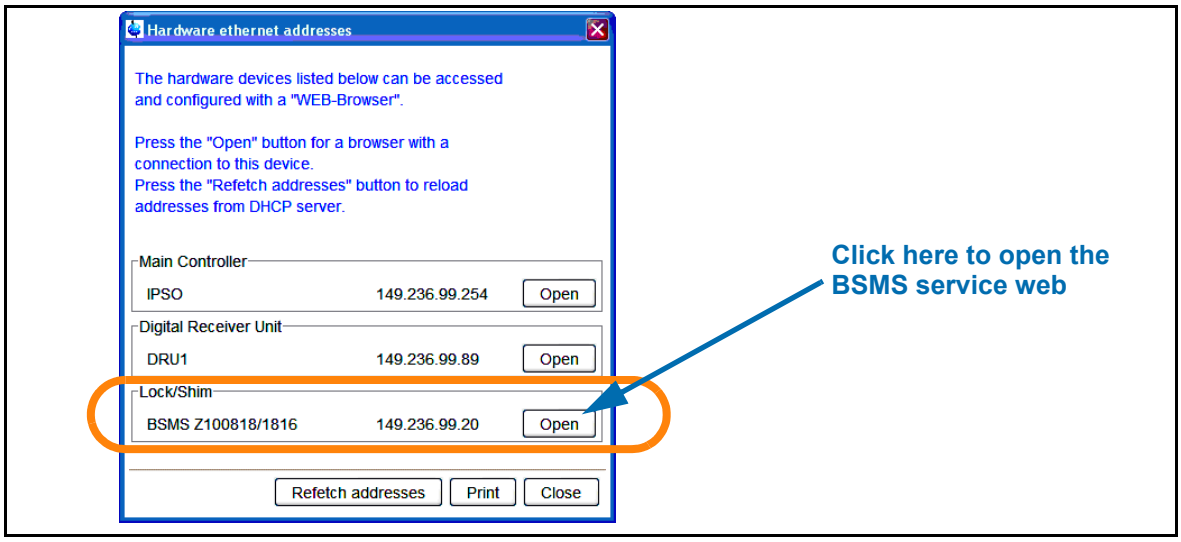


Figure 4.1: Access the BSMS Service Web

4.2 Lift Mode

Switching on and off the sample transporter is done by selecting the lift mode. This is the main software switch to change between manual sample handling and using the sample transporter.

Lift Mode	Meaning
BSMS Lift	The sample transporter is bypassed.
SampleMail PLC on TTY1	The sample transporter will be used.

Table 4.2: Selecting the Lift Mode

Change the lift mode to „SampleMail PLC on TTY1“ for the software configuration to enable the sample transporter and save this setting by pressing the „Set“ button.

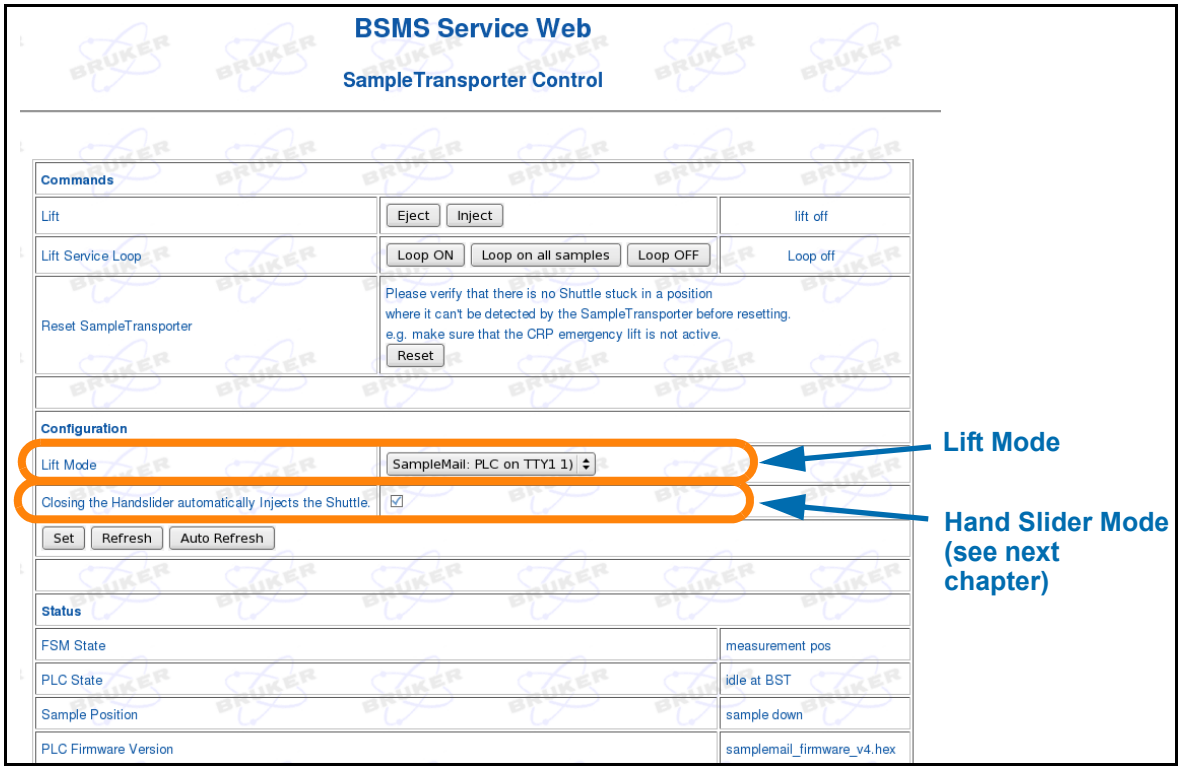


Figure 4.2: The Sample Transporter Control Page

4.3 Hand Slider Mode

There is one setting for the SampleMail that can be selected. This setting describes the behaviour of the system when the hand slider on the SampleMail will be closed with a sample inside. Either the sample will be inserted directly into the magnet or only after the user has switched on the lift.

4.4 Lift Calibration

The gas flow of the lift needs to be calibrated to ensure failure free operation of the system. This needs to be done to get along with different gas supplies in the lab, different length of the shim systems and various mechanical tolerances.

The calibration of the lift has three layers:

1. The lift presetting on the mounting hardware.
2. Lift setup of the BSMS lift.
3. The software lift calibration for the sample transporter.

NOTICE

Repeat the lift calibration when exchanging the probe head

A different probe head may require a new lift calibration.

- ► The sample transport may fail with a different probe head.

The following chapters describes these lift settings and also a workaround to guaranty compatibility for systems with older hardware.

4.4.1 Hardware Lift Presetting

The gas used to blow out a spinner needs to exhaust at the top end of the shim system to decelerate the spinner. Therefore the sample transporter mounting hardware has some bypass holes in it. But if the gas supply is not strong enough those holes needs to be closed with screws to have enough gas to blow the spinners up. Those inserted screws in the bypass holes serves as a presetting for the lift calibration. If the setting of the screws does not match the existing gas supply in the lab the lift calibration will not give any good results and the spinner will not be handled smoothly.

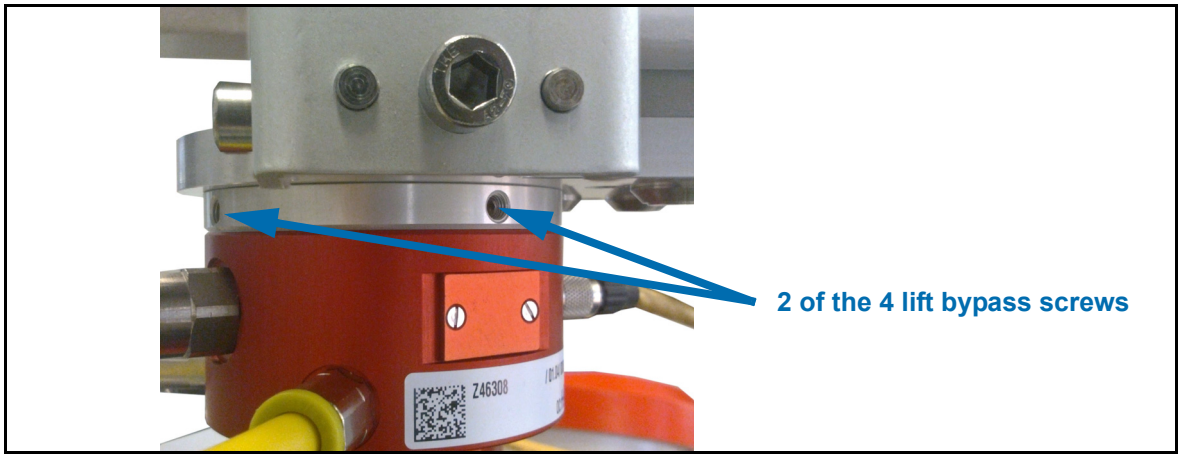


Figure 4.3: Presetting for the Lift Calibration

4.4.2 Software Lift Calibration

The ELCB firmware is able to run the lift calibration fully automated. This will be done on the BSMS service web on the „SampleCase Calibration“ respectively „SampleMail Calibration“ page. Open the page and follow the instructions to calibrate the lift.

As described on the web page you have to do the BSMS lift setup first since this calibration depends on the BSMS lift setup.

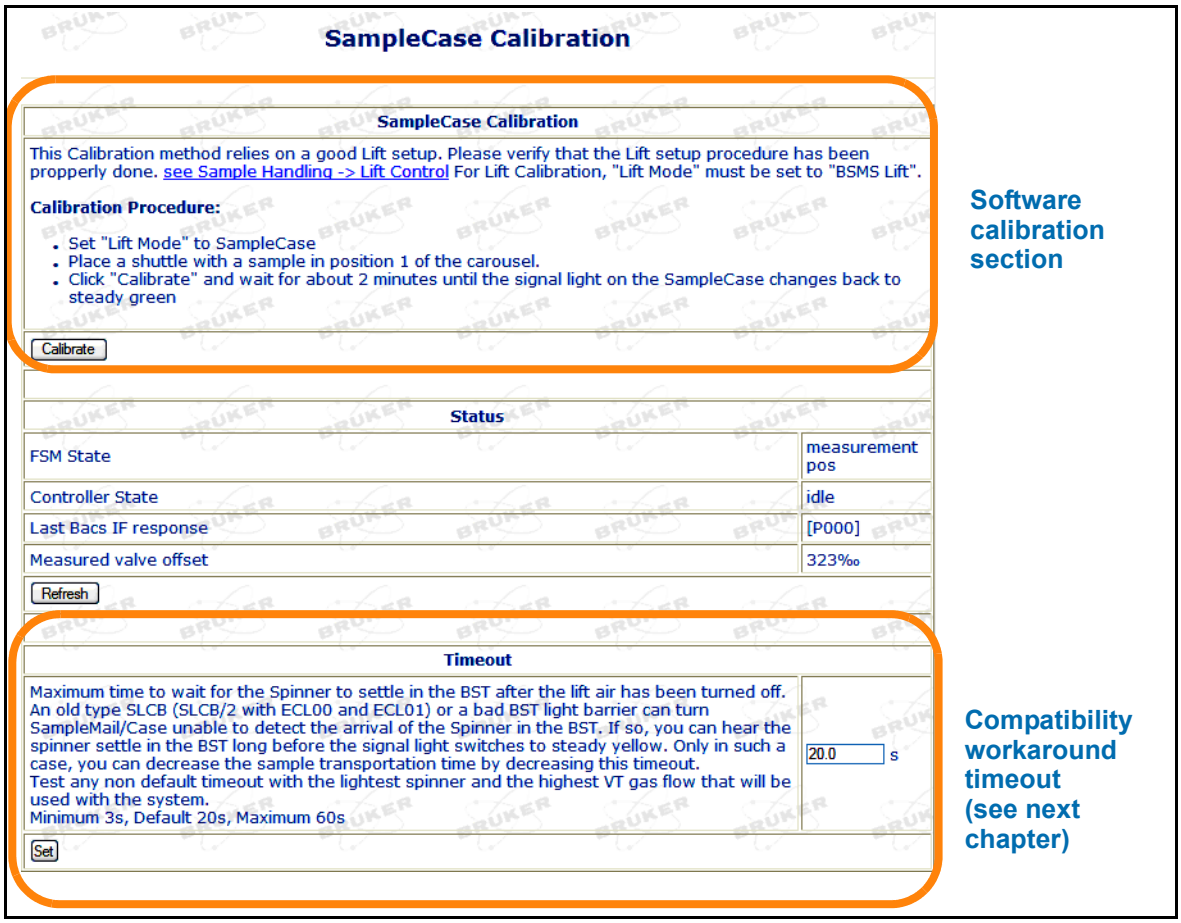


Figure 4.4: SampleCase Lift Calibration

4.4.3 Compatibility Workaround Timeout

If the detection for a sample inside the magnet is not working caused by older hardware or a bad light barrier a timeout will occur. After this timeout the sample transporter will assume that the sample will be down in the magnet. In most cases this timeout will be too long an can be decreased when the sample transporter depends on the timeout only without seeing the spinner with a sensor. See also the detailed description on the SampleCase calibration web page.

4.5 Setting up Topspin

The SampleCase needs an additional setup in topspin to recognize commands for a specific holder position. Start the configuration with the „cf“ command and set the fields as shown. Start with setting the correct „tty“ port in the list of the connected devices.

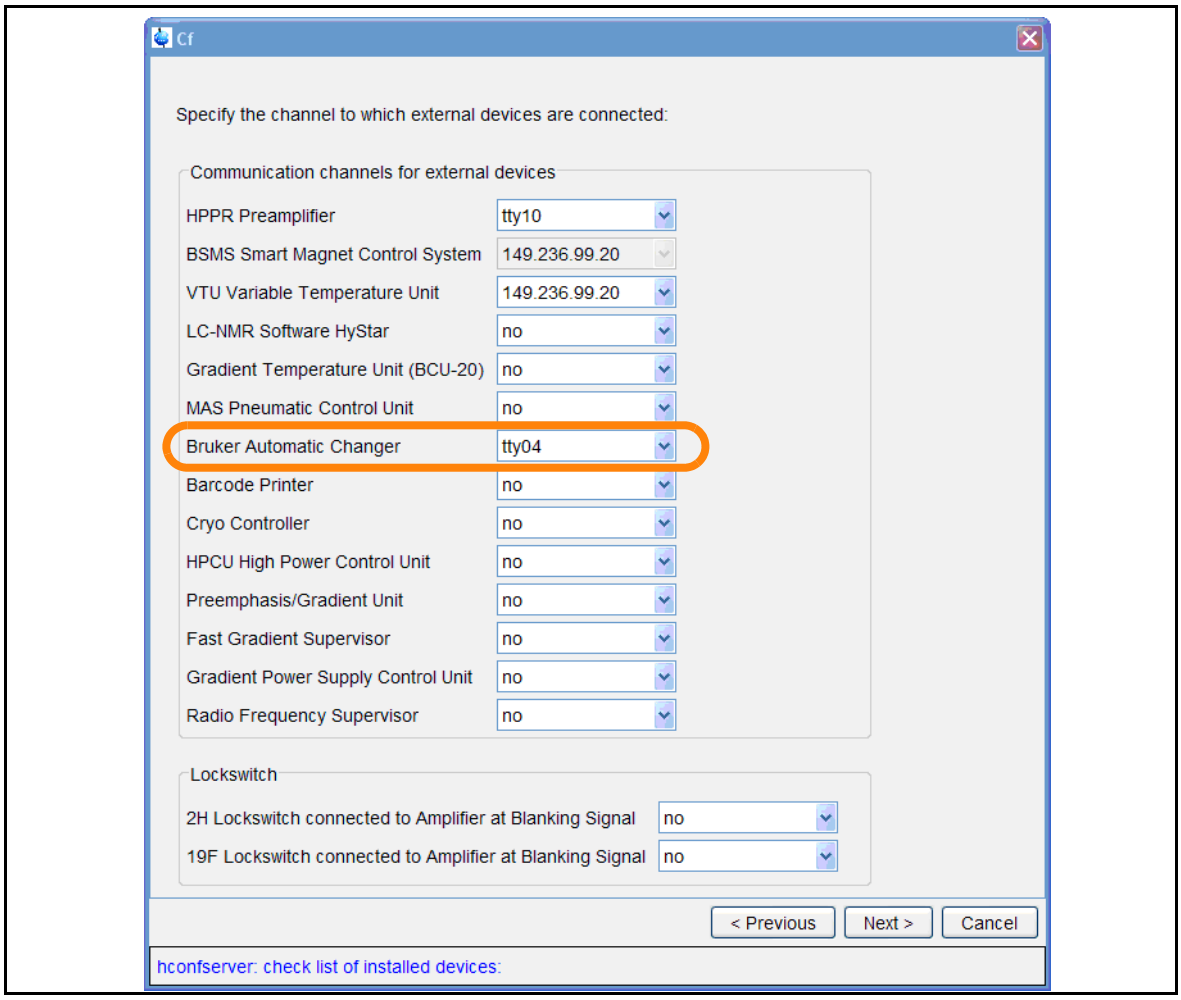


Figure 4.5: SampleCase TTY Settings in “cf”

Then set the options in the sample changer configuration as on the picture.

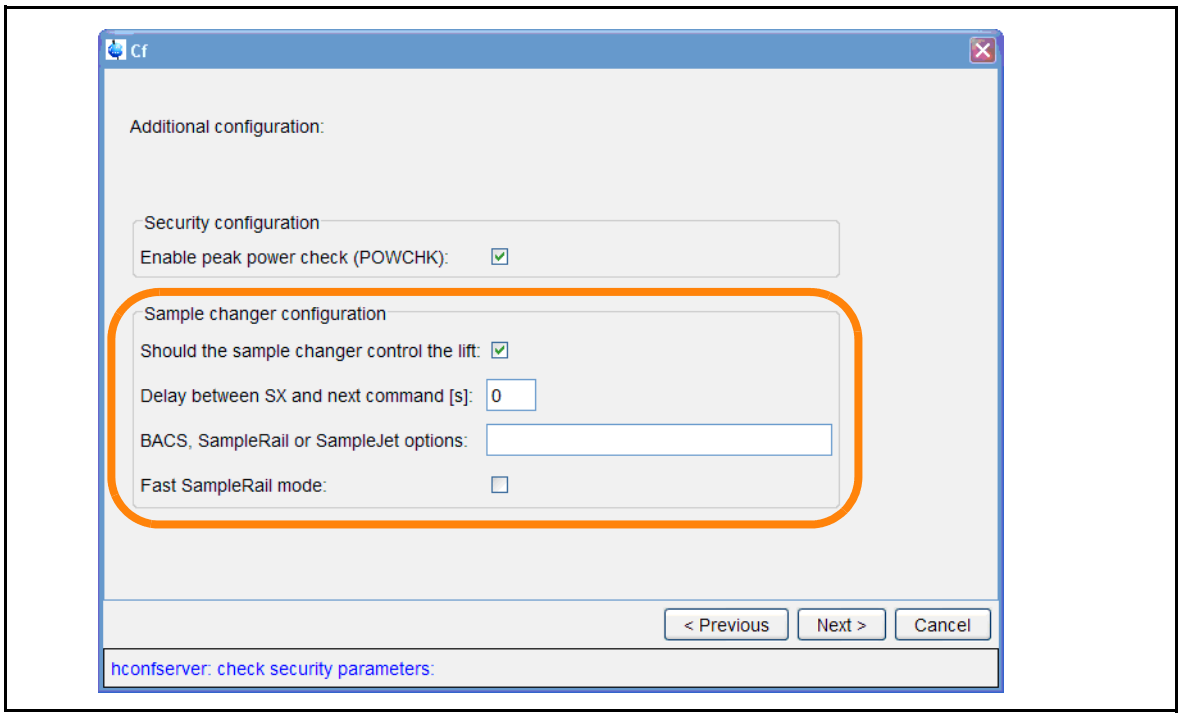


Figure 4.6: SampleCase “cf" Configuration

If the SampleCase was detected you will get the entry in the “cf” summary.

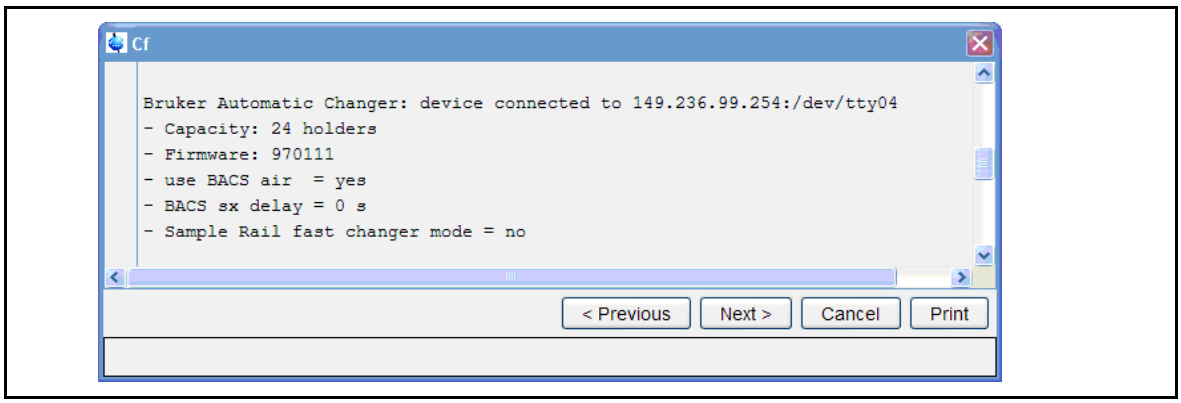


Figure 4.7: SampleCase “cf” Result

4.6 IconNMR setup

There are two settings to set in the IconNMR configuration before the SampleCase can be used. In the menu “Automation” on the page “Master Switches” you have to set the proper device and in the same menu on the page “Automation Window” the number of holders needs to be set to 24.

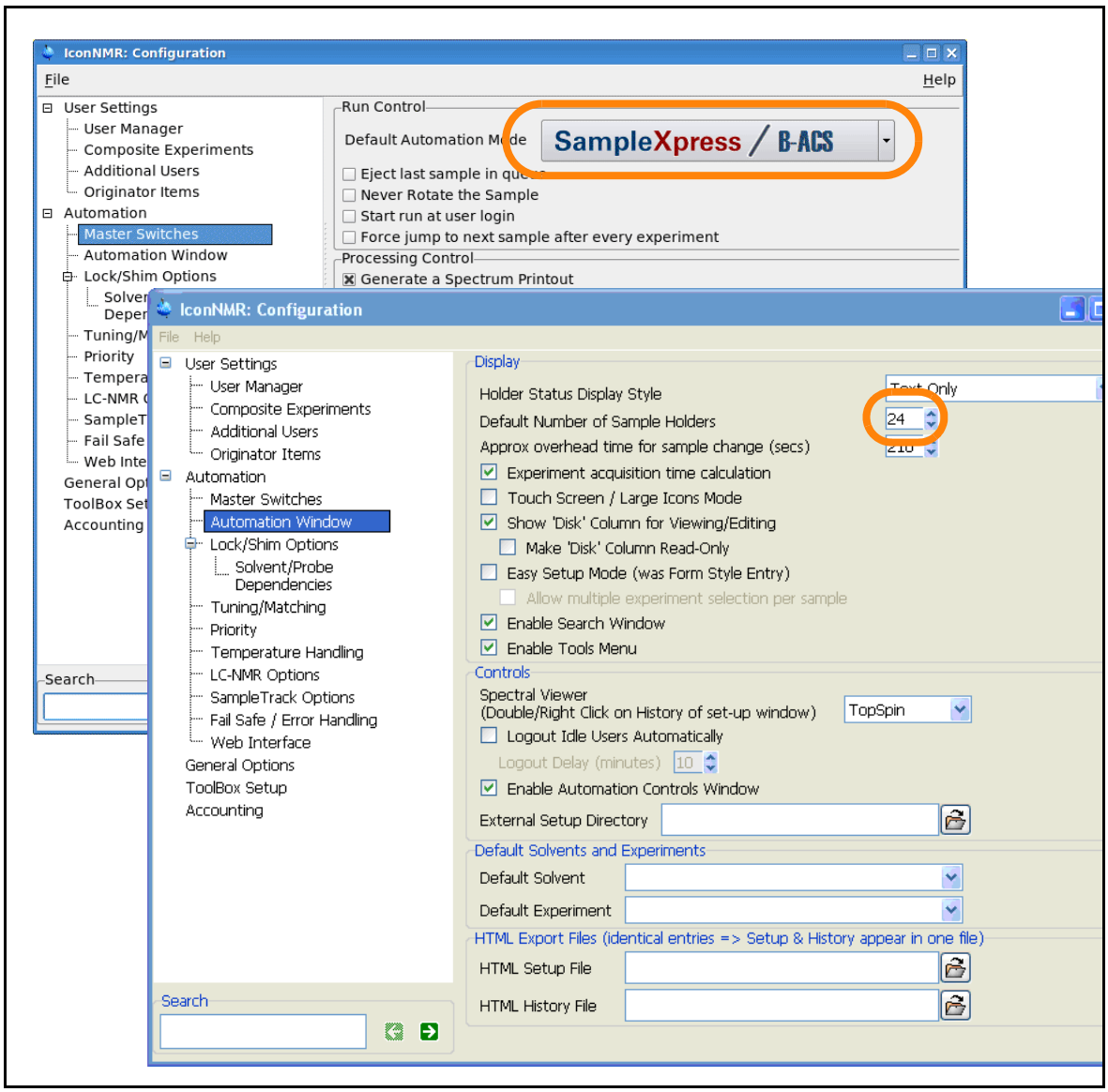


Figure 4.8: IconNMR Setup

Configuration

5 User Service

5.1 Periodical Maintenance

The sample transporter systems needs very few maintenance. The customer can do this on its own or ask the Bruker service for assistance. Proper service will increase the life-time of the system and prevents form failures during operation. These are the two things to do:

- Axis lubrication
- O-ring exchange

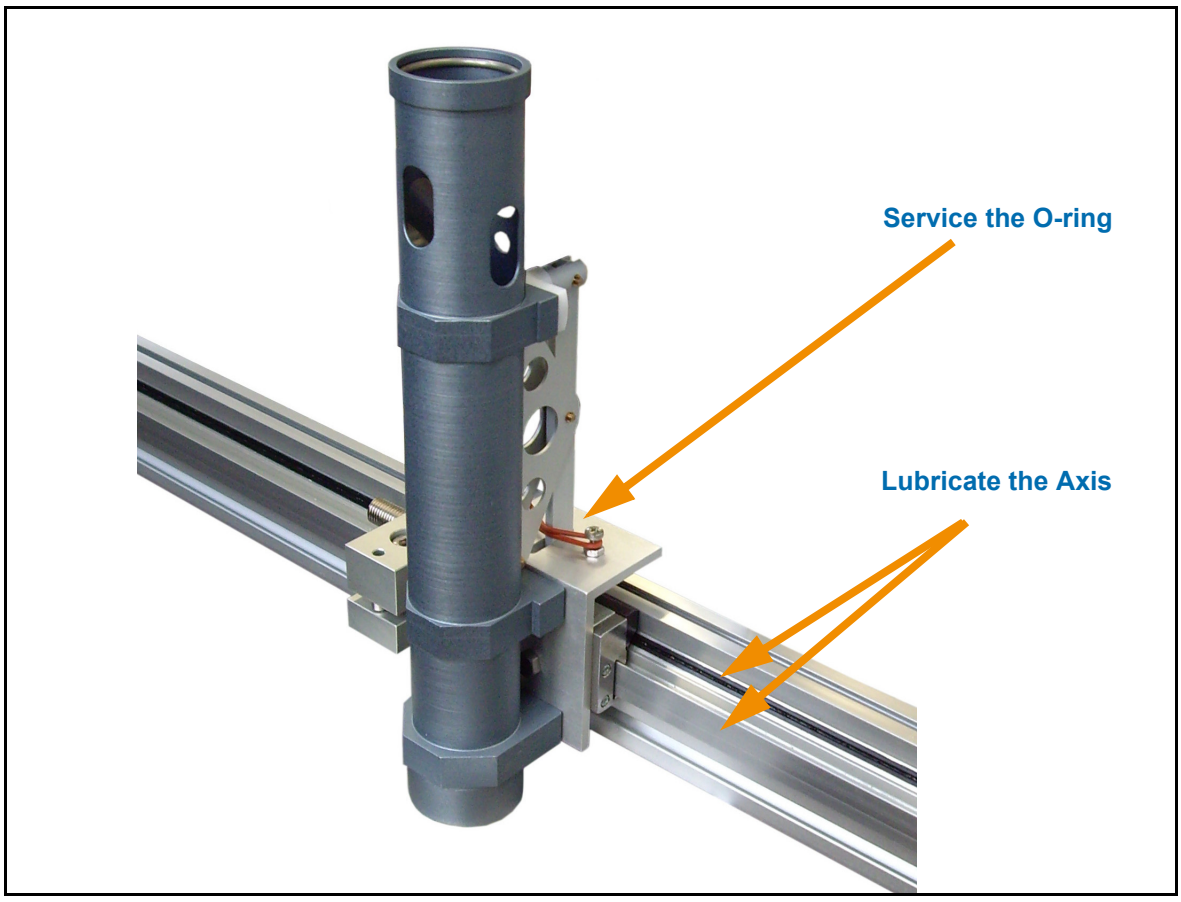


Figure 5.1: Maintenace to do

⚠ WARNING

Use suitable ladder or platform.

For bigger magnets one or more ladders or platforms are needed. Working at an elevated level above ground always bears the risk of falling.

- ► Do only use approved climbing aids.
- ► Wear non-slip shoes.

⚠ CAUTION

De-energize the system for service.

Actuators could move without any warnings as long as the system is supplied with compressed gas.

- ► Switch off gas supply when doing service actions.

5.1.1 Linear Axis Lubrication

The linear axis has some friction areas which needs to be lubricated. This will prevent form wearing out of the axis. Please use only the silicone free grease that comes with the sample transporter . If the grease is missing please ask Bruker service for a replacement.

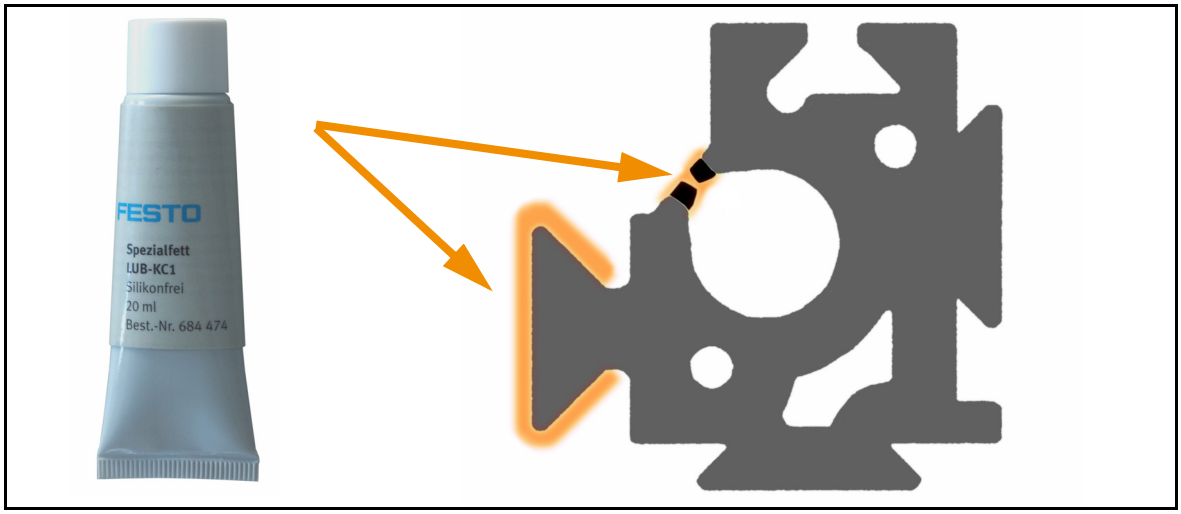


Figure 5.2: Lubricating the Axis

NOTICE

Lubricate the linear axis

The linear axis needs lubrication from time to time or anytime if the axis is starting to make noise while moving.

- If the axis is running dry the lifetime of the axis will be reduced dramatically.

5.1.2 Service of the Red O-Ring

The O-ring will wear out if the system is in use or not. If the rubber rips the tube cannot be captured in the slider. Spare O-rings are delivered with each sample transporter.

NOTICE

Exchange the red O- ring on the slider twice a year

Preventive replace the O-ring on the slider to ensure a failure-free operation.

- If the O-ring breaks the system will fail to transport tubes.
- The tube is not safe anymore and may be destroyed.

6 Technical Data

6.1 Site Considerations

The SampleCase / SampleMail should be setup in a standard laboratory environment. For more information refer to the Avance spectrometer manual on site planning (see appendix E "References") available from Bruker.

6.2 Electrical Specifications

Data	Value	Unit
Mains supply	90-240	VAC
Mains frequency	50-60	Hz
Power consumption	20	W
Device voltage	24V	VDC

Table 6.1: Electrical Specifications

6.3 Pneumatic Specifications

Data	Value	Unit
Medium (dry, oil-free)	nitrogen, air	-
Sample transporter supply pressure	6-8	Bar
Sample transporter supply gas flow	very low	-
Lift (from console) supply gas flow	>100	Nl/min [a] [b]

Table 6.2: Pneumatic Specifications

a. Standard conditions for gas: 20°C, 101.3kPa, 65%rH (ANR norm litres after ISO R558 2.3 and ISO R554 2.2)
b. Work pressure = supply pressure -1bar (Gas flow at work pressure after ISO 1217)

6.4 Temperature Limitations

Data	Value	Unit
Ambient temperature.	See Avance spectrometer manuals on site planning[a].	-
Max. temperature for standard spinners.	Read the limitations in the probe head manual[b].	-
Max. temperature of sample tubes.	Limitations given by the spinners.	-

Table 6.3: Temperature Limitations

a. See Appendix: A.5 References
b. See Appendix: A.5 References

6.5 Shipping Dimensions

Data	Value	Unit
Package 1[a]: Dimensions (LxWxH)	1.89 x 0.52 x 0.27	m
Package 1[a]: Weight	15	kg
Package 2[b]: Dimensions (LxWxH)	0.75 x 0.75 x 0.65	m
Package 2[b]: Weight	15	kg

Table 6.4: Shipping Dimensions

a. Axis for SampleMail or SampleCase (Z133066, Z116802, Z133067 or Z123384)

b. Carousel for SampleCase only (Z122633)

6.6 Hardware Requirements

Name		Version
ELCB		ECL 04.00 or more recent
Either or	SLCB	With PNK variant 3, 3s or 5
	BSVT	SPB or SPB-E

Table 6.5: Hardware Requirements

6.7 Software Requirements

Name		Version
Topspin		2.0 or more recent
ELCB firmware		101206 or more recent
SampleCase firmware		v6
Either or	SLCB firmware	090206 or more recent
	BSVT firmware	all

Table 6.6: Software Requirements

7 Equipment Clearance

7.1 Information Regarding Service

After the complete NMR system or additional subcomponents has been installed and handed over to the customer they are potentially contaminated. This has to be considered whenever Bruker employees are working on NMR systems after the initial installation. Here some examples:

- Service (planed or unplanned)
- Repair (customer or factory site)
- Disposal
- Transfer
- Upgrade (NMR system or its sub components)
- Exchange (egg. loan return)

It is strongly recommended to all Bruker employees to get an equipment clearance through the form ”Safety and Repair Declaration” on page 52 for work at the customer site. For any hardware leaving the customer this form must be used.

⚠ WARNING

Hardware exposed to hazardous substances

The product could be contaminated by hazardous substances by customers.

- ► The customers safety representative needs to declare that product is absolutely free of any hazardous substances with the ”Safety and Repair Declaration” on page 52.
- ► If the product needs to be shipped, attach this declaration to the delivery note on the package exterior.

7.2 Safety and Repair Declaration[1]

Equipment Clearance Form for Service, Repair, Disposal or Transfer:

Use this form, whenever a probe or another unit situated in a magnet room or an analytical instrument might be exposed to hazardous substances by customers, when it is to be returned to Bruker.

Whenever a customer returns a system or its components to Bruker, e.g. for repair, upgrade, loan returns, exchange, etc., the customer accepts the following obligation:

It is the explicit responsibility of the customer to make sure that the returned products are absolutely free of any hazardous substances. In case of omission to do so, Bruker will hold the customer liable for any resulting injuries and/or damages, caused to employees of Bruker and/or to other persons exposed to the hazardous substances. The customer is further liable for all damage caused to Bruker, e.g. decontamination, security measures, etc. The customer is finally liable for all other direct and/or indirect damages caused to Bruker by the hazardous substances.

☐ I ACCEPT THIS OBLIGATION

The repair declaration, completed and signed by the safety representative, has to be attached to the returned product. The declaration must be attached to the delivery note on the package exterior. Any returned product without a properly completed and duly signed declaration cannot be repaired. If we think that there is a risk of damage because of a contaminated returned product, we must dispose the hazardous material at the expense of the customer.

The safety & repair declaration form may be signed by a Bruker service engineer if the system was never operated by the customer (e.g. prior to completion of the installation).

The customer/signatory confirms that the returned product is absolutely free of any hazardous substances (e.g. toxic, corrosive, explosive, biologically dangerous or radioactive).

PRODUCT PART NO:	SERIAL NO:
FAULT DESCRIPTION (reason for return):	
DATE FAILUER OCCURED:	SYSTEM ORDER NO. / DISPATCH NO.:

COMPANY/INSTITUTE:	SIGNATURE:
NAME:	.....
MAILING ADDRESS:	DATE:
CITY / POSTAL CODE:	
COUNTRY:	.....
EMAIL:	

1. This form is a corrected copy of the original form ZFQS0083 version 03

8 Safety Symbols

There are two warning signs on the ports of the devices. If the warnings should be missing please contact Bruker and ask for replacement

.

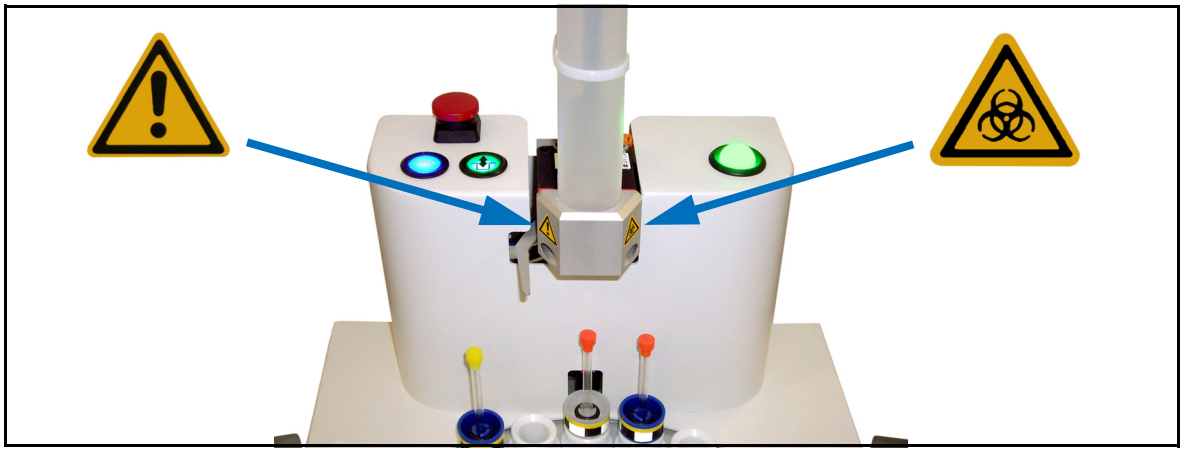


Figure 8.1: The Locations of the Warning Signs

Symbol	Explanation
	**⚠ WARNING** **Warning of biological hazards:** **The SampleCase / SampleMail itself generates no direct biological hazard.** Real danger can arise, however from substances whose hazardous biological content could endanger the operating personnel or other living beings through damage to its protective enclosure (for example, the breakage of a sealed sample glass). As is the case for the manual handling of biologically dangerous substances, no 100% guarantee against damage to the protective enclosure of these substances can be provided for their automatic handling. The operator himself must ensure that all the necessary safety precautions are taken for every NMR experiment in which biologically hazardous substances are used. In the case of the unit becoming contaminated with biologically hazardous substances, the operator must deal with this individually. Depending on the circumstances, this could lead to consequential damage to persons and machine components. It is not possible for BRUKER to draw up decontamination rules for all hazardous substances - and their combinations – that the operator could use in NMR experiments **In case of contamination of the device the customer is responsible for the decontamination before Bruker employes get access to the system according to chapter** **”Equipment Clearance” on page 51****.**

Table 8.1: Explanation of the Safety Symbols on the Device

Symbol	Explanation
	**⚠ WARNING** **Warning of chemical hazards:** **The SampleCase / SampleMail itself generates no direct chemical hazard.** The operator himself must ensure that all the necessary safety precautions are taken for every NMR experiment in which substances are used that could represent a chemical and radioactive hazard or that are easily flammable. In the case of the unit becoming contaminated with hazardous substances, the operator must deal with this individually. Depending on the circumstances, this could lead to consequential damage to persons and machine components. It is not possible for BRUKER to draw up decontamination rules for all hazardous substances - and their combinations – that the operator could use in NMR experiments **In case of contamination of the device the customer is responsible for the decontamination before Bruker employes get access to the system according to chapter** **”Equipment Clearance” on page 51****.** **⚠ CAUTION** **Warning of moving parts** **There are uncovered moving parts on the SampleCase / SampleMail.** Operators and bystanders must be aware of moving parts on the device. Specially hands, arms and eyes are in danger when they are close to those parts.

Table 8.1: Explanation of the Safety Symbols on the Device

9 Contact

Submit your inquiries regarding SampleCase / SampleMail sales and service to your local Bruker Biospin representative. Use the following address to acquire further information.

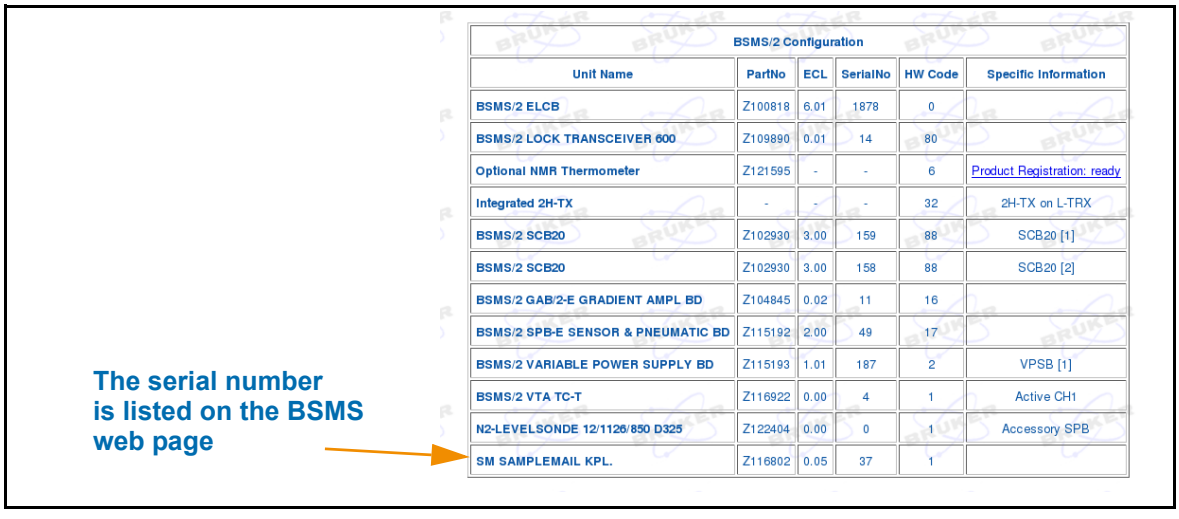
9.1 Manufacturer

Bruker BioSpin
Industriestrasse 26
CH-8117 Fällanden
Schweiz
Phone:+41-44-825-91-11
Fax: +41-44-825-96-96
http://www.bruker.com

9.2 Technical Hotline

Phone:+41-44-825-98-90
samplemail-service@bruker.ch
samplecase-service@bruker.ch

Please refer to the Model No., Serial No. and Internal Order No. in all correspondence regarding the NMR system or components thereof. The serial number can be read on the BSMS „setup“ web page



BSMS/2 Configuration

Unit Name	PartNo	ECL	SerialNo	HW Code	Specific Information
BSMS/2 ELCB	Z100818	6.01	1878	0	
BSMS/2 LOCK TRANSCEIVER 600	Z109890	0.01	14	80	
Optional NMR Thermometer	Z121595	-	-	6	Product Registration: ready
Integrated 2H-TX	-	-	-	32	2H-TX on L-TRX
BSMS/2 SCB20	Z102930	3.00	159	88	SCB20 [1]
BSMS/2 SCB20	Z102930	3.00	158	88	SCB20 [2]
BSMS/2 GAB/2-E GRADIENT AMPL BD	Z104845	0.02	11	16	
BSMS/2 SPB-E SENSOR & PNEUMATIC BD	Z115192	2.00	49	17	
BSMS/2 VARIABLE POWER SUPPLY BD	Z115193	1.01	187	2	VPSB [1]
BSMS/2 VTA TC-T	Z116922	0.00	4	1	Active CH1
N2-LEVELSONDE 12/1126/850 D325	Z122404	0.00	0	1	Accessory SPB
SM SAMPLEMAIL KPL.	Z116802	0.05	37	1	

Figure 9.1 Read the Serial Number

Contact

Appendix

APPENDIX

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Safety

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NMR

Nuclear Magnetic Resonance 13

P

PLC

Programmable Logic Controller 36

T

TTY

Serial Intrface (TeleTYpewriter) 36

APPENDIX

E References

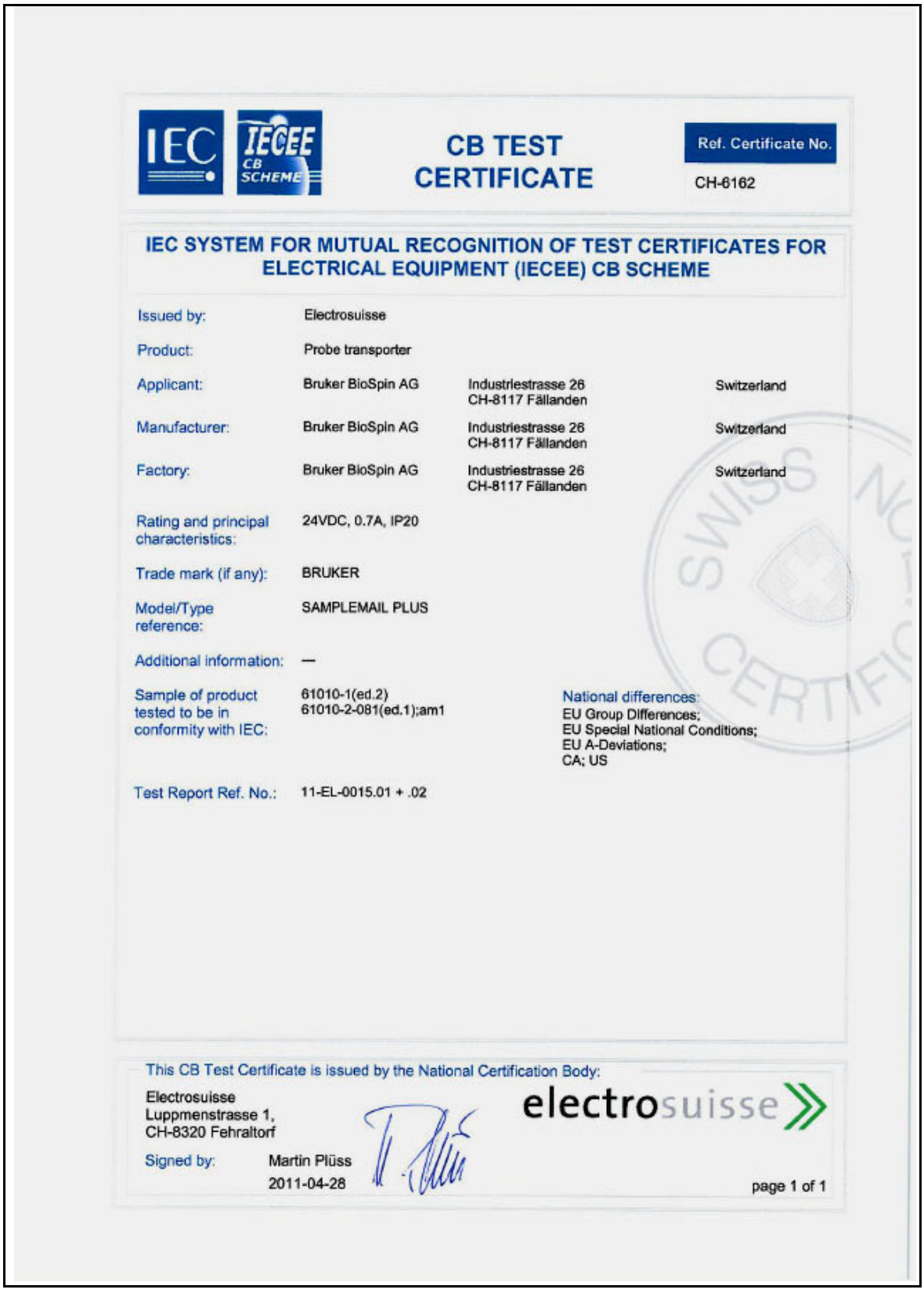
[1] BRUKER Site Planning AVANCE Systems 300-750MHz (Z31276)
Stanley J. Niles / Daniel B. Baumann, September 20, 2011
Bruker Biospin GmbH, Rheinstetten, Germany

[2] BRUKER Site Planning AVANCE Systems 800-950 MHz (Z31686)
Razvan Teodorescu / Stanley J. Niles, September 20, 2011
Bruker Biospin GmbH, Rheinstetten, Germany

[3] BRUKER Probes (Z31339)
D. Marek, R. Triebe, M. Waden, D. Wilhelm July 2, 2009
Bruker BioSpin AG, Fällanden, Switzerland

APPENDIX

F Certifications



CB TEST CERTIFICATE

Ref. Certificate No.
CH-6162

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

Issued by:	Electrosuisse		
Product:	Probe transporter		
Applicant:	Bruker BioSpin AG	Industriestrasse 26 CH-8117 Fällanden	Switzerland
Manufacturer:	Bruker BioSpin AG	Industriestrasse 26 CH-8117 Fällanden	Switzerland
Factory:	Bruker BioSpin AG	Industriestrasse 26 CH-8117 Fällanden	Switzerland
Rating and principal characteristics:	24VDC, 0.7A, IP20		
Trade mark (if any):	BRUKER		
Model/Type reference:	SAMPLEMAIL PLUS		
Additional information:	—		
Sample of product tested to be in conformity with IEC:	61010-1(ed.2) 61010-2-081(ed.1);am1		

National differences:
EU Group Differences;
EU Special National Conditions;
EU A-Deviations;
CA; US

Test Report Ref. No.: 11-EL-0015.01 + .02

This CB Test Certificate is issued by the National Certification Body:

Electrosuisse
Luppmenstrasse 1,
CH-8320 Fehraltorf

Signed by: Martin Plüss
2011-04-28

electrosuisse

page 1 of 1

APPENDIX

G Revision History

Index	Date	Who	Alteration Type
01	15.11.2011	SRE	First release / product launch
02	14.11.2012	SRE	SampleMail added / new hardware

Table G.1: The Revisions of this Manual

APPENDIX

H Index

APPENDIX

Bruker,
your solution partner

Bruker provides a world class, market leading range of analytical solutions for your molecular and material research needs. Our solution-oriented approach enables us to work closely with you to identify your specific needs and determine the best solution package for you from our comprehensive range. Furthermore, we offer you the opportunity to collaborate with us on new developments.

Our ongoing efforts and substantial investment in research and development demonstrate our long term commitment to technological innovation on behalf of our customers. With 50 years of experience in meeting the needs of the scientific community across a range of specialist disciplines, Bruker has built a sound rapport with professionals from the community through understanding specific requirements.

This cooperative relationship with our customers allows us to provide them with effective solutions and a service of unmatched quality.

Bruker Corporation

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