Magnet Information and Control System (MICS)

- User Manual

Version 23

Innovation with Integrity

Accessories

This manual was written by

Rolf Spreiter, Peter Baur and Stephan Heiss

Faellanden, Switzerland

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For further technical assistance on the NMR Magnet System, please do not hesitate to contact your nearest BRUKER dealer or contact us directly at:

BRUKER Switzerland AG
Industriestrasse 26
CH–8117 Faellanden
Switzerland

Phone: + 41 44 825 91 11
FAX: + 41 44 825 96 96
Internet: www.bruker.com

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1 Introduction

The **M**agnet **I**nformation and **C**ontrol **S**ystem (MICS) supports the user to check the state of a magnet system.

1.1 Limitation of Liability

The information in this manual will take into account the current state of the technology. The manufacturer assumes no liability for damages resulting from:

- non-compliance with the instructions and all applicable documentation,
- use for purposes not intended,
- not sufficiently approved persons,
- arbitrary changes or modifications and
- use of not approved spare parts or accessories.

1.2 Installation Requirements

The installation of MICS is done by Bruker Service personnel.

MICS can be used together with TopSpin 3.1 and newer (type 'mics' in the TopSpin command prompt).

To use the full MICS functionality, it is necessary to install MICS together with a BIS file (**B**ruker **I**dentification **S**ystem) that matches the magnet system.

1.3 Supported Platform

MICS supports Windows 10/11 (32/64 bit) and CentOS 7.x/Alma Linux (64 bit only).

Introduction

2 Safety

2.1 Approved Persons

Bruker Switzerland AG identifies the following qualifications for personnel performing tasks on the magnet system or its components:

Approved Customer Personnel

As a result of professional training by Bruker Service personnel, experience and knowledge of applicable regulations these persons are qualified to perform the specific tasks on the magnet system and its components assigned to them in this manual. Approved Customer Personnel are qualified to identify possible hazards and risks associated with the tasks assigned to them and to perform all possible steps to eliminate or minimize these risks.

Bruker Service Personnel

These persons are qualified by appropriate qualification and professional training and experience (including all necessary knowledge of applicable regulations and regulatory requirements) to perform specific tasks on the magnet system and its components. Bruker Service Personnel are qualified to identify possible hazards and risks and to perform all possible steps to eliminate or minimize these risks.

2.2 Intended Use

The Magnet Information and Control System (MICS) is an information utility, designed and intended for support of the user to check the state of a magnet system and its components.

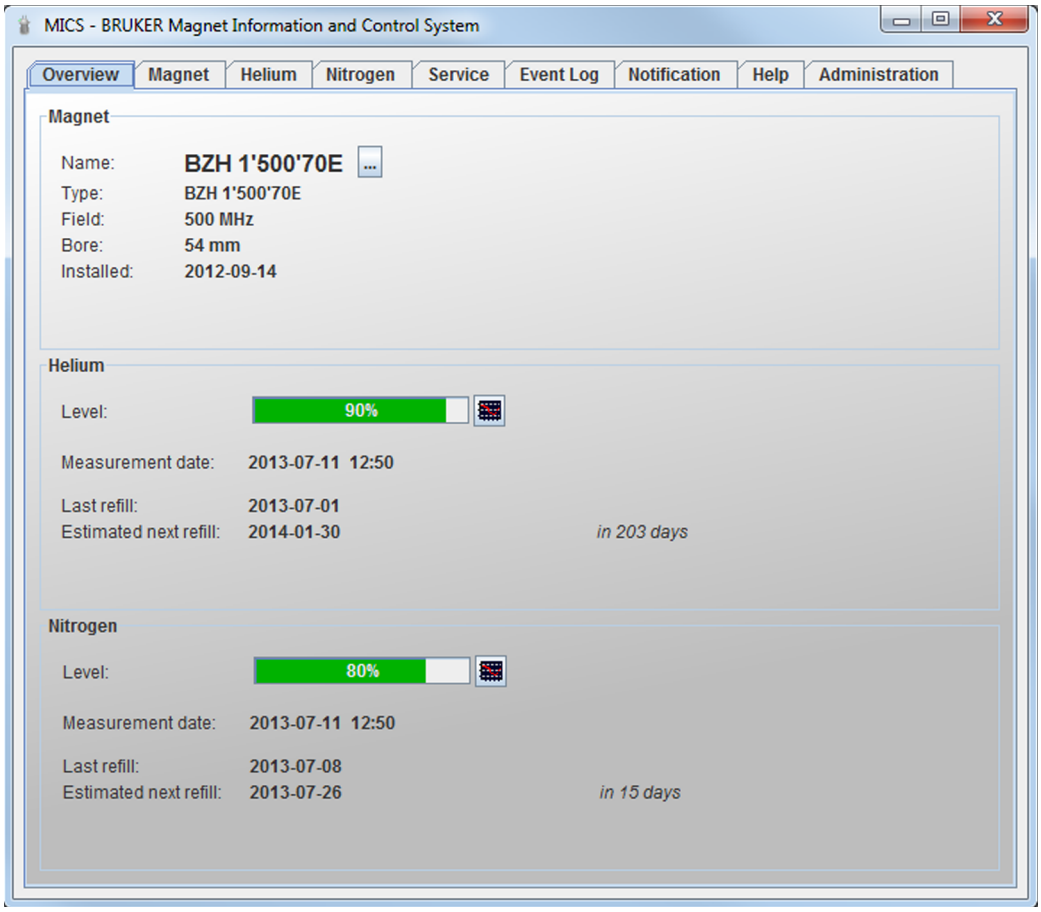
Damage claims from damages caused by other than the intended use of the Magnet Information and Control System are excluded, and the customer is held liable.

MICS is an information utility and not a system service. MICS does not automatically run in the background, but must be started by the user, either manually or via an auto-start script. Note that MICS will be terminated if the user logs out.
Note that MICS can only be started once. If multiple users are logged in at the same time (user switching), MICS can only be used by the user who started MICS and any message dialogs will appear on the screen of this user only.
The user cannot solely rely on MICS to ensure the safety of the magnet system. It is still important to observe and to check regularly the data of the magnet system.

3 Main Functions

Screenshots shown in this manual are meant to be general and informative and may not be representative for the specific magnet type or software version you are working with.

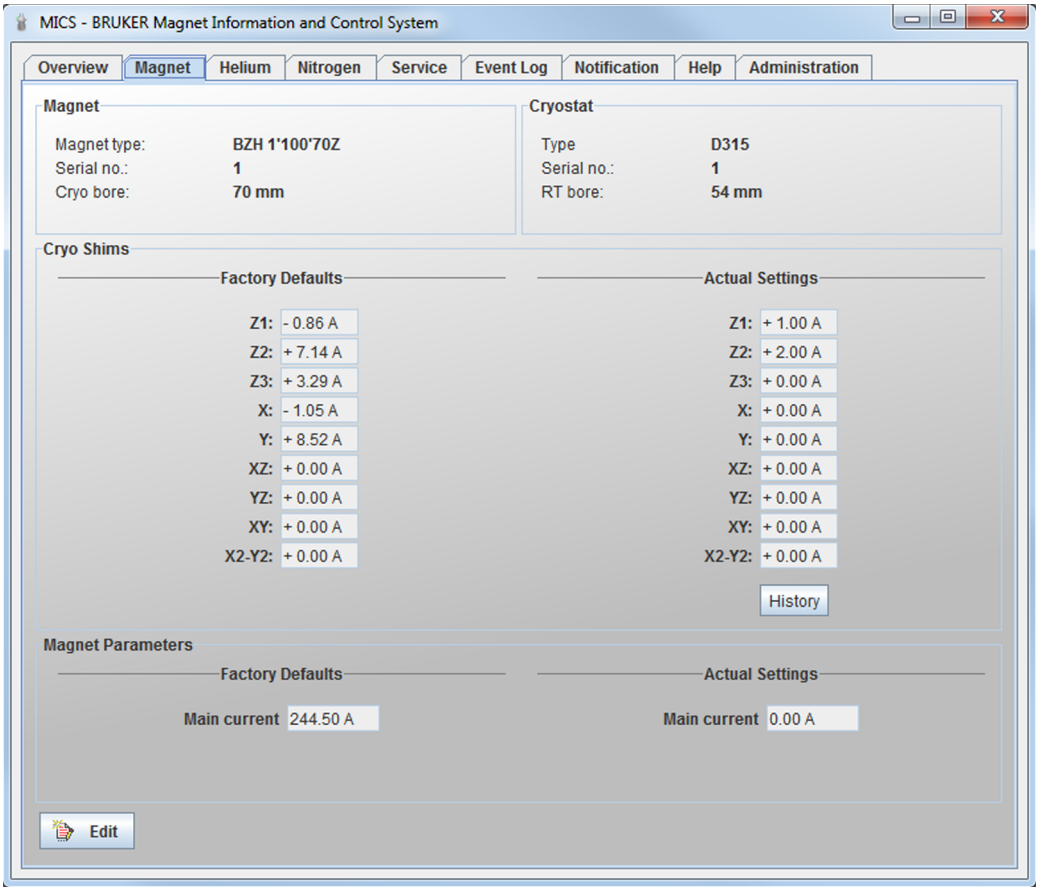
3.1 Overview



The *Overview* tab displays basic magnet information and an overall status of the cryogenic agents of the magnet system. It is possible to change the magnet name according to individual needs. This name will be used in email notifications and other MICS messages.

3.2 Magnet Information

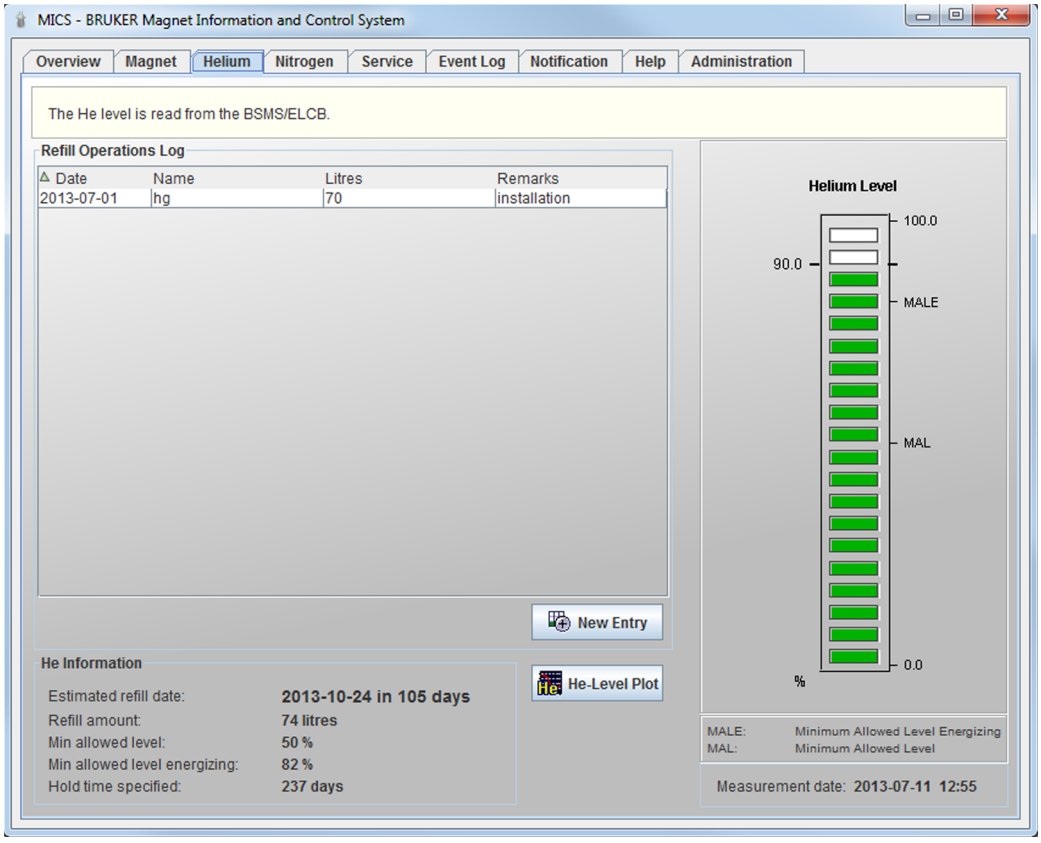
The *Magnet* tab gives detailed information about the magnet system and the cryostat. The section *Cryo Shims* provides data of the factory defaults and an editable table of the actual settings of the cryo shims.



3.3 Helium

The *Helium* tab displays information about the current helium level, the refill history, the helium hold time and other important parameters related to the helium vessel of the magnet system.

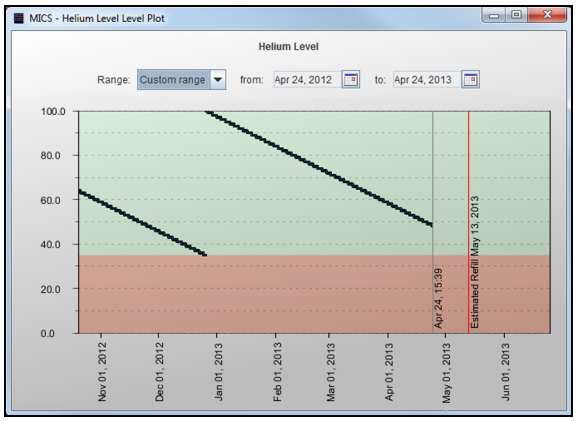
The *Helium* tab does not exist for Aeon RZ magnet systems (refer to section Aeon RZ Systems on page 29).



After helium refill, the refill information needs to be entered on the *Helium* tab. Press the button *New Entry* to access the editor and to enter the helium refill information.

Press the button *He-Level Plot* to display an updated plot of the helium level as a function of time.

The next estimated refill date is calculated based on actual helium levels and on the system specification. It is also displayed in the helium level plot.

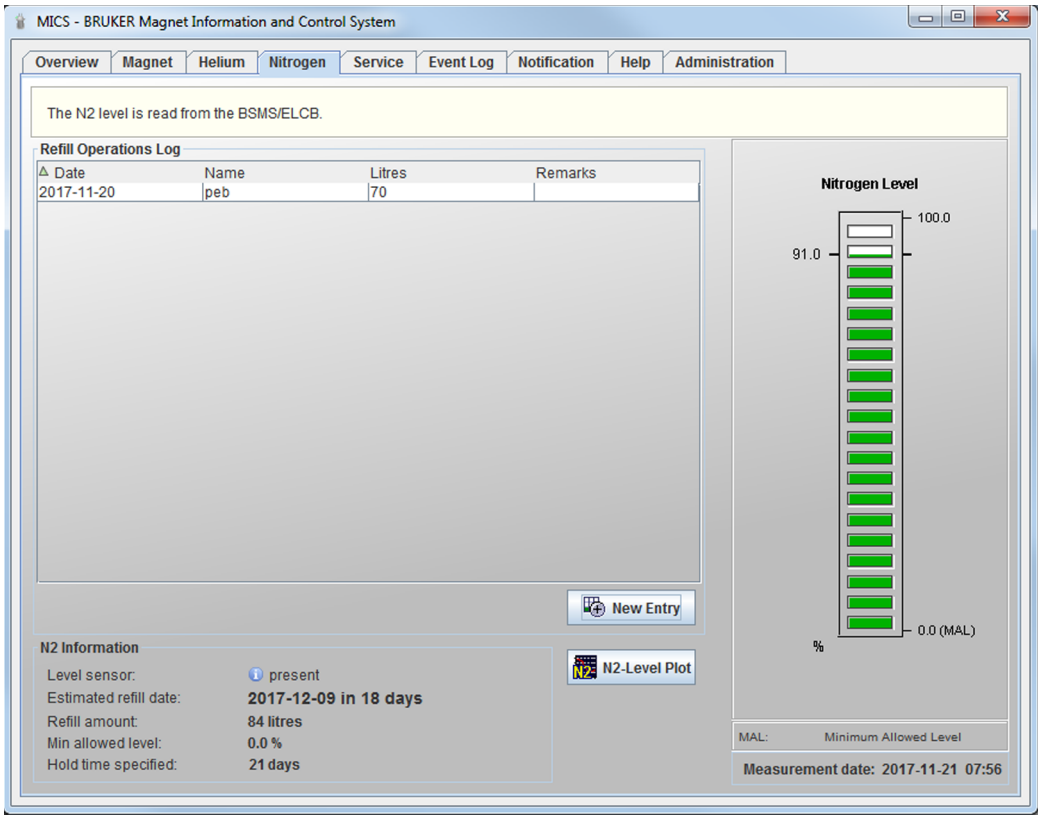


Note that the calculated refill is a rough estimate, which may not always correspond to the specified hold time of the magnet system.
It is important to manually check and observe on a regular basis the level of the cryogenic agents of the magnet system.

3.4 Nitrogen

The *Nitrogen* tab displays information about the current nitrogen level (either calculated or measured), the refill history, the nitrogen hold time and the next scheduled nitrogen refill.

The *Nitrogen* tab does not exist for nitrogen free magnet systems and for magnet systems equipped with a nitrogen liquefier.

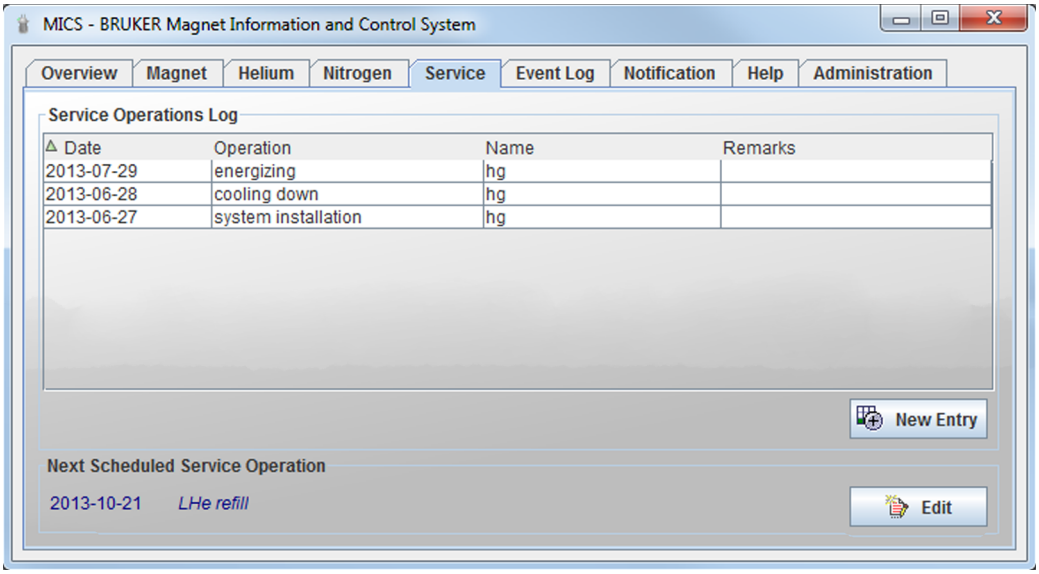


Each time after refilling nitrogen, it is important to enter this information in MICS. Start MICS and select the *Nitrogen* tab. Update the refill table by pressing *New Entry*. This is particularly important if the magnet system is not equipped with a nitrogen level measurement device (see information below).

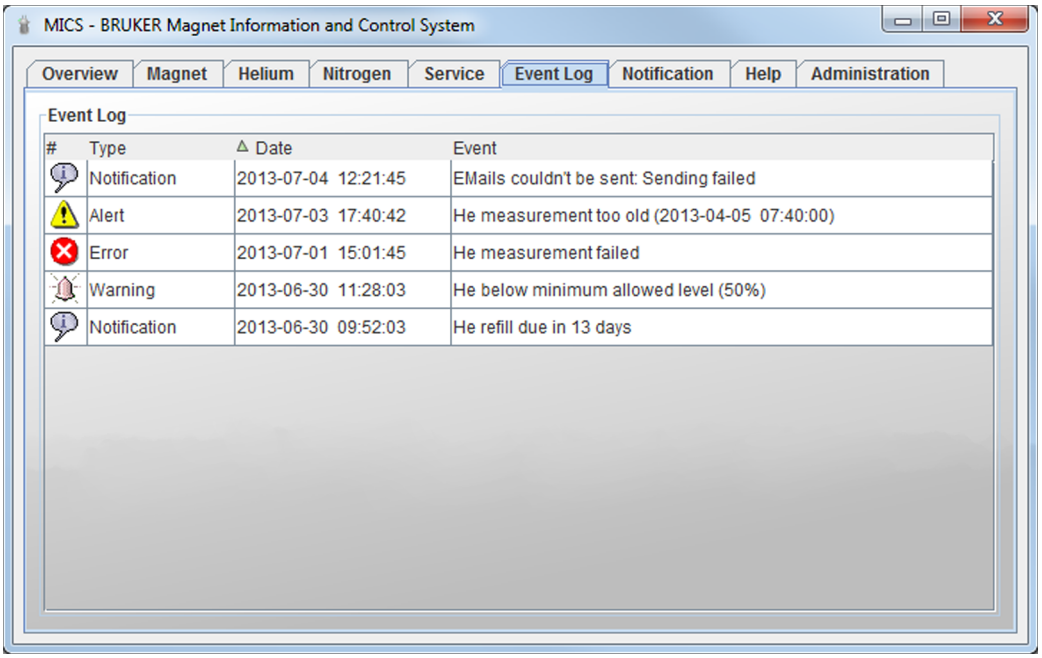
The nitrogen level displayed in the *Nitrogen* tab is a **measured** value only if the magnet system is equipped with a nitrogen level sensor. In magnet systems, that are not equipped with a nitrogen level sensor, the nitrogen level as well as the next pending refill date is a **calculated** value. It is based on the last refill date and on the known nitrogen loss rate of the cryostat.

3.5 Service

The *Service* tab lists all the performed service operations and announces the next scheduled service for the magnet system if any. New entries in the *Service* tab are typically generated only by Bruker Service personnel.



3.6 Event Log



The tab *Event Log* displays the history of all Notifications, Warnings, Alerts and Errors.

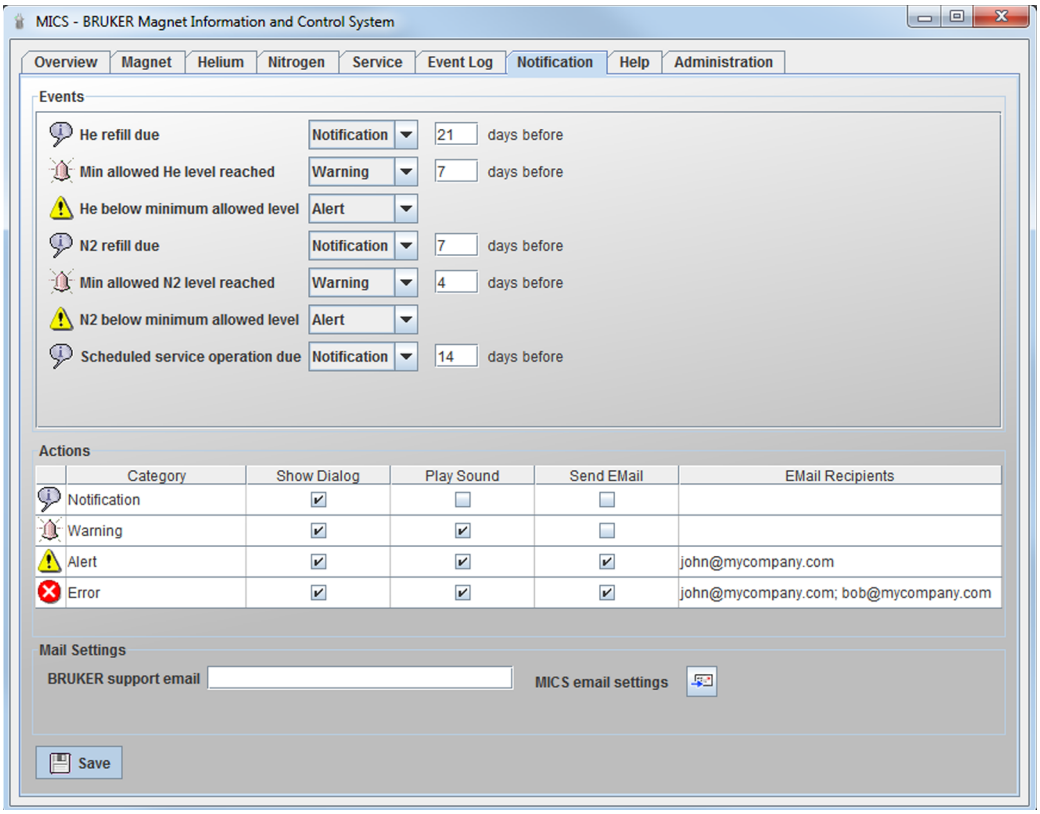
3.7 Notification

The *Notification* tab allows the MICS behavior to be customized according to individual needs.

Select the event category and customize the actions to be taken by the system for each category (notification, warning, alert, error).

To change any of the settings on this tab, press the button *Edit* and insert the changes. The button will then change to *Save*. Press it again to save the changes.

Note that the list of events varies, depending on the system type.



3.7.1 Events

Every event is of a particular category: notification, warning, alert or error. This classification can be changed by the user. The event category defines the notification behavior of MICS (refer to section Actions on page 16).
For some of the events you can define how many days in advance of certain occurrences you want to be informed.
Certain events are raised only once, others are raised every day as long as the problem persists.

3.7.2 Actions

Here you define how you want to be informed if an event of a particular category (notification, warning, alert, error) occurs. To use the email function, an outgoing mail server (SMTP) must be defined (refer to section Mail Settings on page 16). It is possible to enter multiple email recipients in one line, separated by a semi-colon.

3.7.3 Mail Settings

Note that the email function is an important part of the notification concept in MICS. The email function should be configured carefully and it is recommended to send a test email after a configuration change.
A test email can be sent in the *Notification* tab via the  button (Configure MICS EMail).

Bruker Support Email

The Bruker Support address is used to contact Bruker Service in case of problems with the magnet system or with MICS. It should contain the Email address of the local Bruker Service representative. Refer to section Help on page 17 for more information.

MICS Email Settings

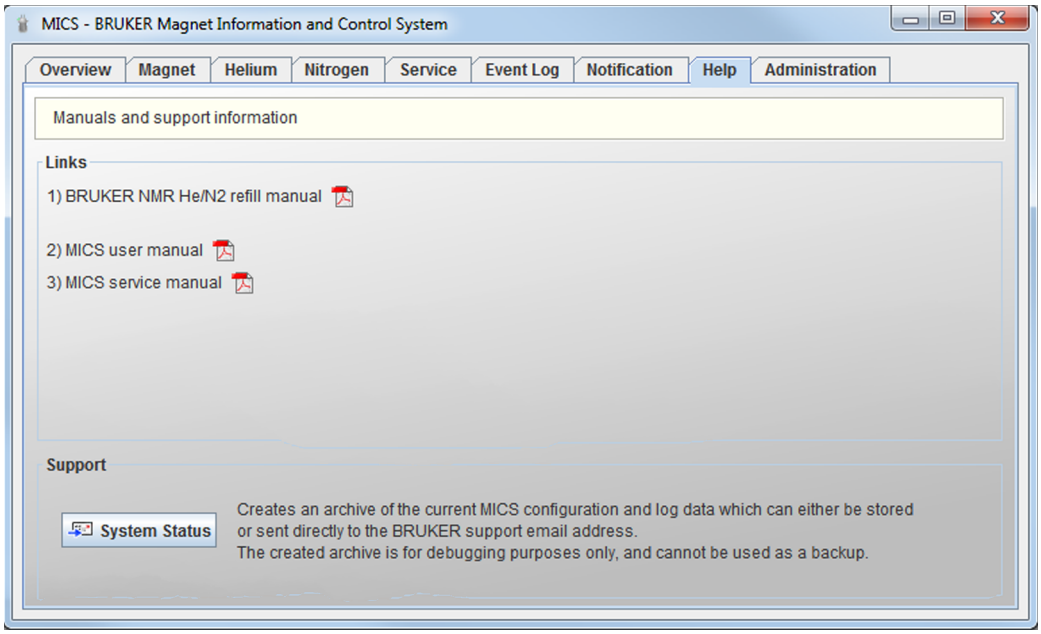
To enable MICS to send emails, an outgoing mail server (SMTP) needs to be configured as well as a valid sender address. Please ask your IT department for the proper configuration and whether authentication and/or encryption is required for SMTP or not.

MICS uses the standard SMTP port 25 to send emails and provides basic support for authentication (SMTP-Auth) and encryption (SSL/TLS).

If your IT environment requires to use authentication:
Be aware that MICS will need to store the password in its configuration file, which might compromise security. It is recommended to use a designated email account for MICS, as opposed to using your personal account credentials.

3.8 Help

This tab provides links to important manuals.



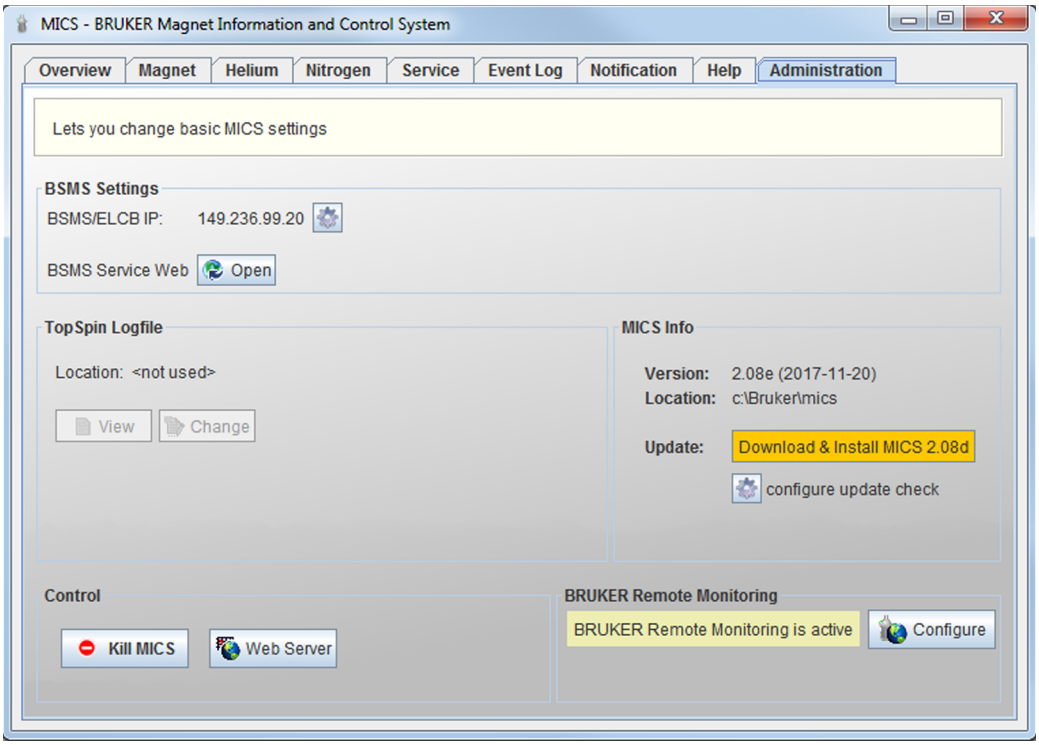
The *Support* section provides a tool to create a zip archive of the current MICS configuration and logfiles. Press the button *System Status* to create an archive containing the following data:

- Your system data as displayed by MICS
- Logfiles (N2, He, etc.)
- Configuration files

The generated archive can either be stored on the disk or can be sent directly to the support email address specified in the *Notification* tab (refer to section Mail Settings on page 16). This is usually the email address of your Bruker Service representative. In addition please also send an email or call Bruker Service to describe your problem.

3.9 Administration

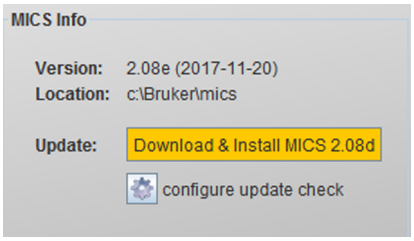
The *Administration* tab displays the basic settings of the MICS configuration. Changes on the MICS configuration can be done through the MICS Installer and are typically done by Bruker Service personnel only. Refer to the MICS Service Manual (Chapter 4.3 Reconfiguration) for details.



Additional information will be displayed in the administration tab, depending on the system configuration.

3.9.1 Automatic Update Check

If automatic updates are activated, an orange button indicates that a new MICS version is available:



It can be installed in one click and without requiring administrative permissions.

Configure automatic updates using the  button. Note that proxy server settings are the same as for remote monitoring.

4 Optional Functions

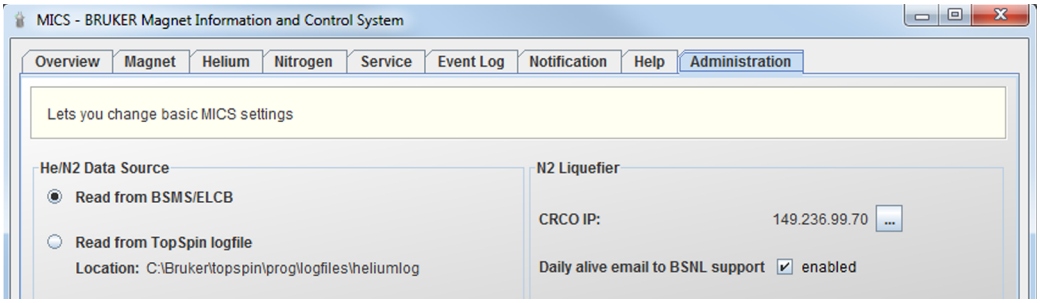
4.1 BSNL – Bruker Smart Nitrogen Liquefier

There are two generations of the Bruker Smart Nitrogen Liquefier (BSNL), the BSNL with Cryo Controller (CRCO) and the BSNL with Cooling Unit 5 (CU5).

4.1.1 BSNL with CRCO

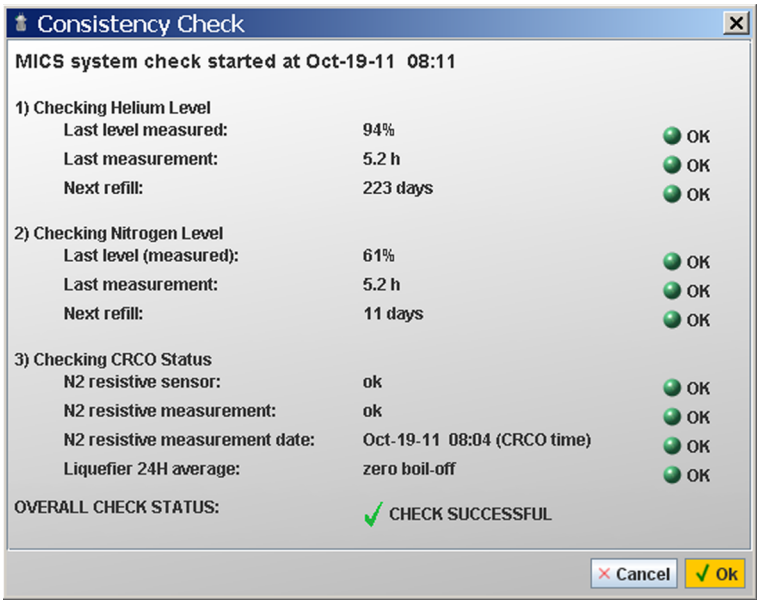
The first generation BSNL is equipped with a CRCO laptop and can exchange data with MICS via FTP.

For these systems it is required to perform a consistency check within MICS every second day. This consistency check is necessary to detect whether the vital parts of the magnet system are working properly. It can be initiated using the Button *Check now* in the *Administration* tab.



The consistency check also connects to the Cryo Controller (CRCO) to make a cross-check of the system status information.

After completion of the consistency check, a summary dialog is displayed which details the current state of the magnet system:

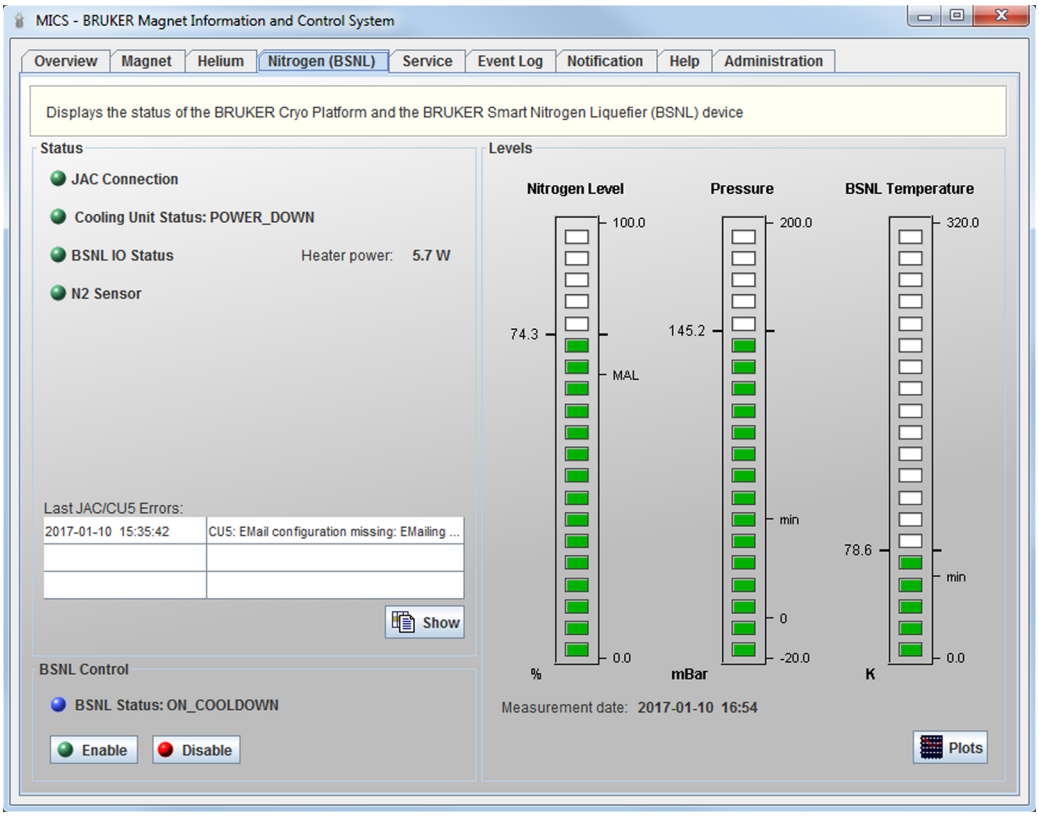


4.1.2 BSNL with CU5

The second generation BSNL is equipped with a Cooling Unit 5 (CU5). MICS displays a *Nitrogen (BSNL)* tab instead of the standard nitrogen tab.

MICS relays messages from the CU5 to the user. The CU5 messages can be configured in the *Notification* tab.

Note that MICS is part of the redundant monitoring design and must be running continuously to ensure mutual supervision between the CU5 and MICS.



MICS can also be used to Enable or Disable the BSNL device.

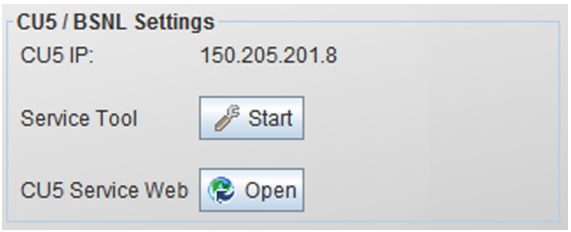
Emails

The Java Controller (JAC) of the CU5 can send emails on its own. This is a fallback strategy and is only used if the JAC detects that MICS is not running.

To configure the email configuration on the JAC device, use the button  *JAC email settings* in the *Notification* tab. Be aware that the email configuration of the JAC device is independent of the MICS email configuration.

Administration

The MICS *Administration* tab provides a CU5 / BSNL section, which displays the current IP address of the CU5 device. It is also possible to open the CU5 Service Web page or start the CU5 Service Tool from there.

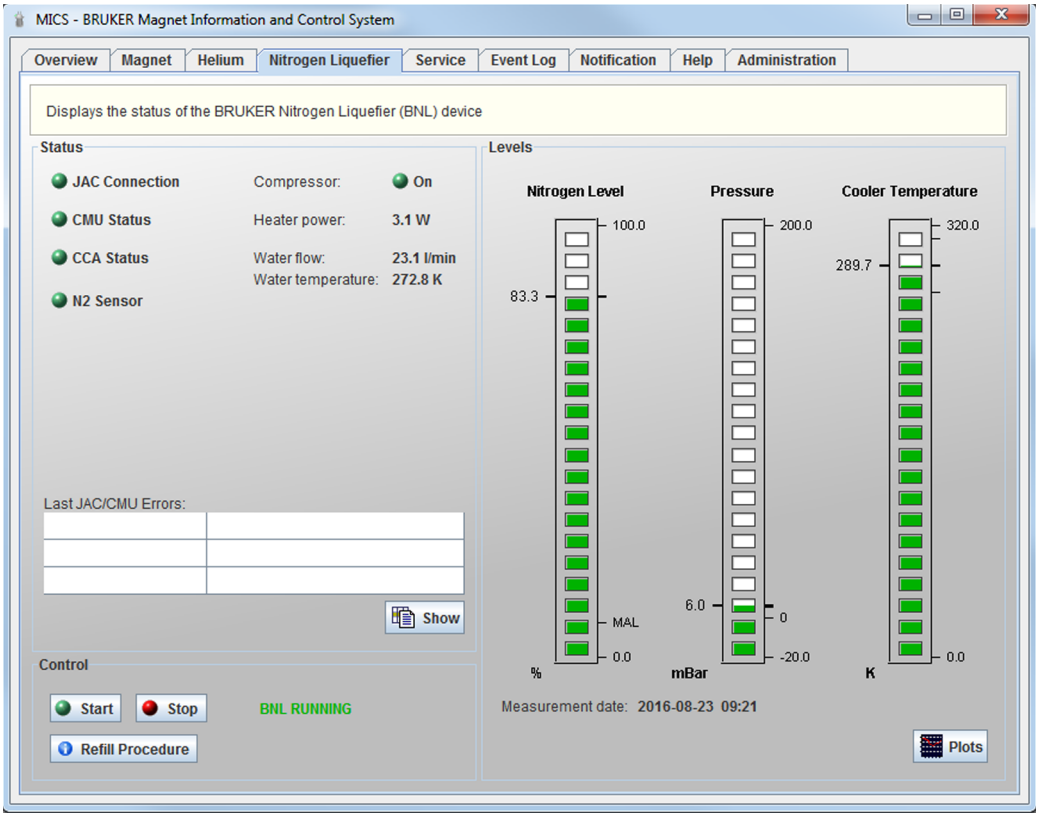


4.2 BNL – Bruker Nitrogen Liquefier

If the magnet system is equipped with a Bruker Nitrogen Liquefier (BNL), MICS displays a *Nitrogen (BNL)* tab instead of the standard nitrogen tab.

MICS relays messages from the CMU to the user. The CMU messages can be configured in the *Notification* tab.

Note that MICS is part of the redundant monitoring design and must be running continuously to ensure mutual supervision between the CMU and MICS.



MICS can also be used to START or STOP the BNL device. Note that the Bruker Service Password is required to STOP the BNL device.

For operating the BNL refer to the supplied BNL User Manual.

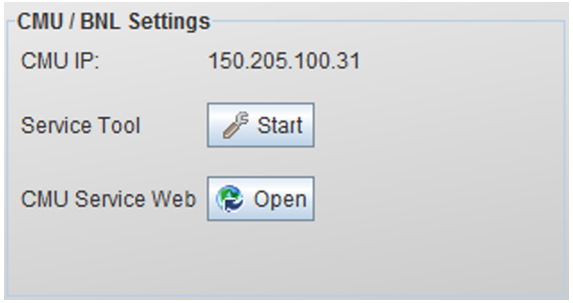
Emails

The Java Controller (JAC) of the CMU can send emails on its own. This is a fallback strategy and is only used if the JAC detects that MICS is not running.

To configure the email configuration on the JAC device, use the button  *JAC email settings* in the *Notification* tab. Be aware that the email configuration of the JAC device is independent from the MICS email configuration.

Administration

The MICS *Administration* tab provides a CMU/BNL section, which displays the current IP address of the CMU device. It is also possible to open the CMU Service Web page or start the CMU Service Tool from there.

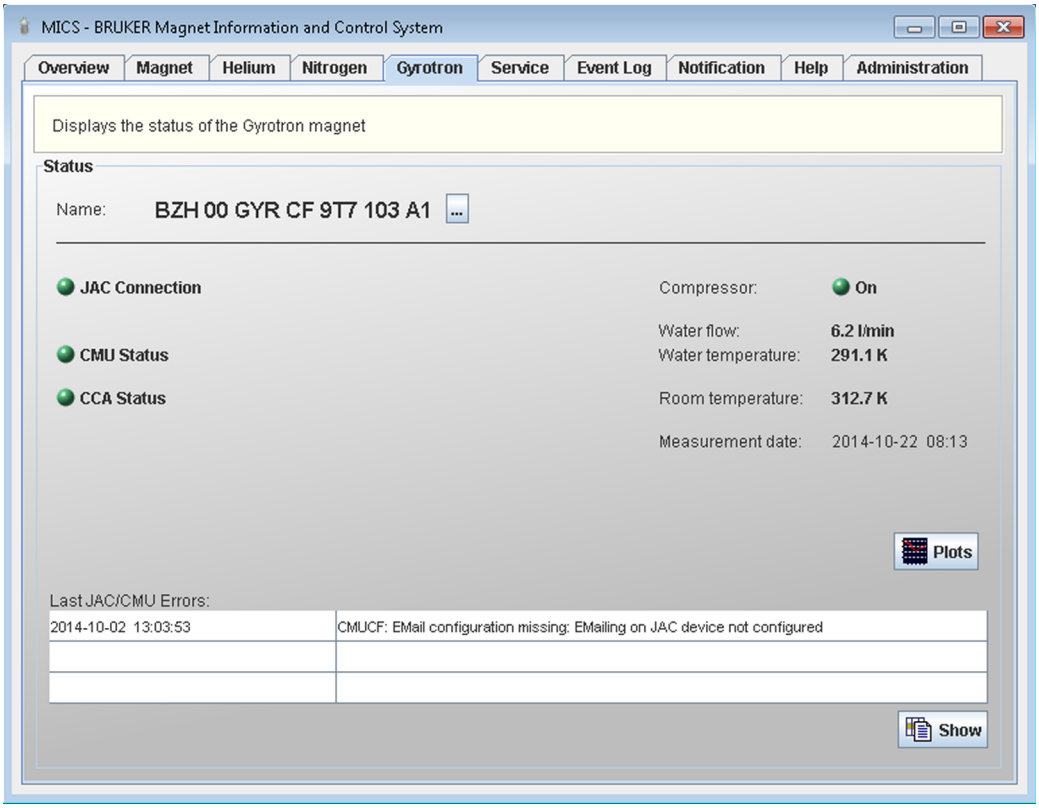


4.3 Gyrotron Magnet

If the magnet system is equipped with an auxiliary magnet for Gyrotron applications, MICS displays an additional *Gyrotron* tab.

MICS relays messages from the gyrotron magnet CMU to the user. The MICS behavior for CMU messages can be configured in the *Notification* tab.

Note that MICS is part of the redundant monitoring design and must be running continuously to ensure mutual supervision between the CMU and MICS.



For operating the gyrotron magnet refer to the supplied Gyrotron User Manual (Z33105).

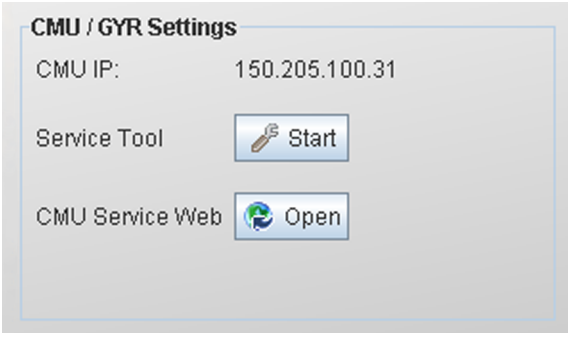
EMails

The Java Controller (JAC) of the CMU can send emails on its own. This is a fallback strategy and is only used if the JAC detects that MICS is not running.

To configure the email configuration on the JAC device, use the button *JAC email settings* in the *Notification* tab. Be aware that the email configuration of the JAC device depends on the MICS email configuration.

Administration

The MICS *Administration* tab provides a CMU/GYR section, which displays the current IP address of the CMU device. It is also possible to open the CMU Service Web page or to start the CMU Service Tool from there.



4.4 Aeon RS Systems

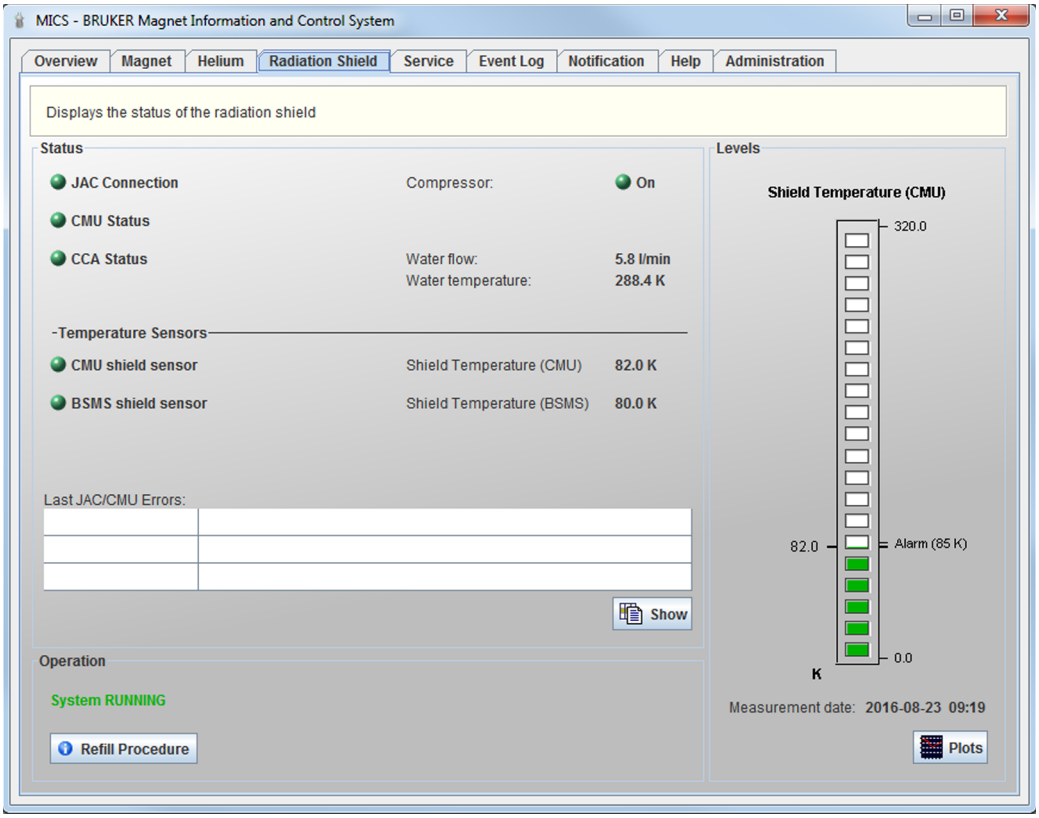
For nitrogen free 4K magnet systems, MICS displays a *Radiation Shield* tab instead of the standard *Nitrogen* tab.

4.4.1 Radiation Shield Temperature Monitoring with CMU

To activate the radiation shield temperature monitoring with CMU in MICS, a BSMS/2 system with BSVT is needed.

MICS relays messages from the CMU to the user. The MICS behavior for CMU messages can be configured in the *Notification* tab.

Note that MICS is part of the redundant monitoring design and must be running continuously to ensure mutual supervision between the CMU and MICS.



MICS displays the radiation shield temperature in Kelvin as a temperature gauge. The shield temperature and other parameters can also be displayed in a 2D plot, using the button *Plots*.

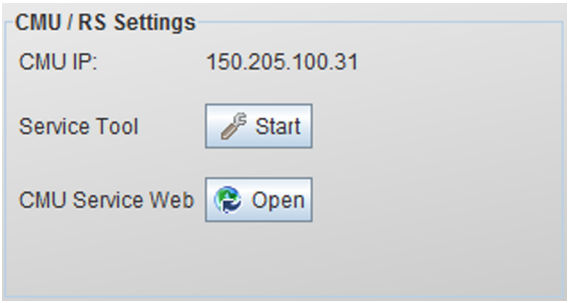
EMails

The Java Controller (JAC) of the CMU can send emails on its own. This is a fallback strategy and is only used if the JAC detects that MICS is not running.

To configure the email configuration on the JAC device, use the button  *JAC email settings* in the *Notification* tab. Be aware that the email configuration of the JAC device is independent from the MICS email configuration.

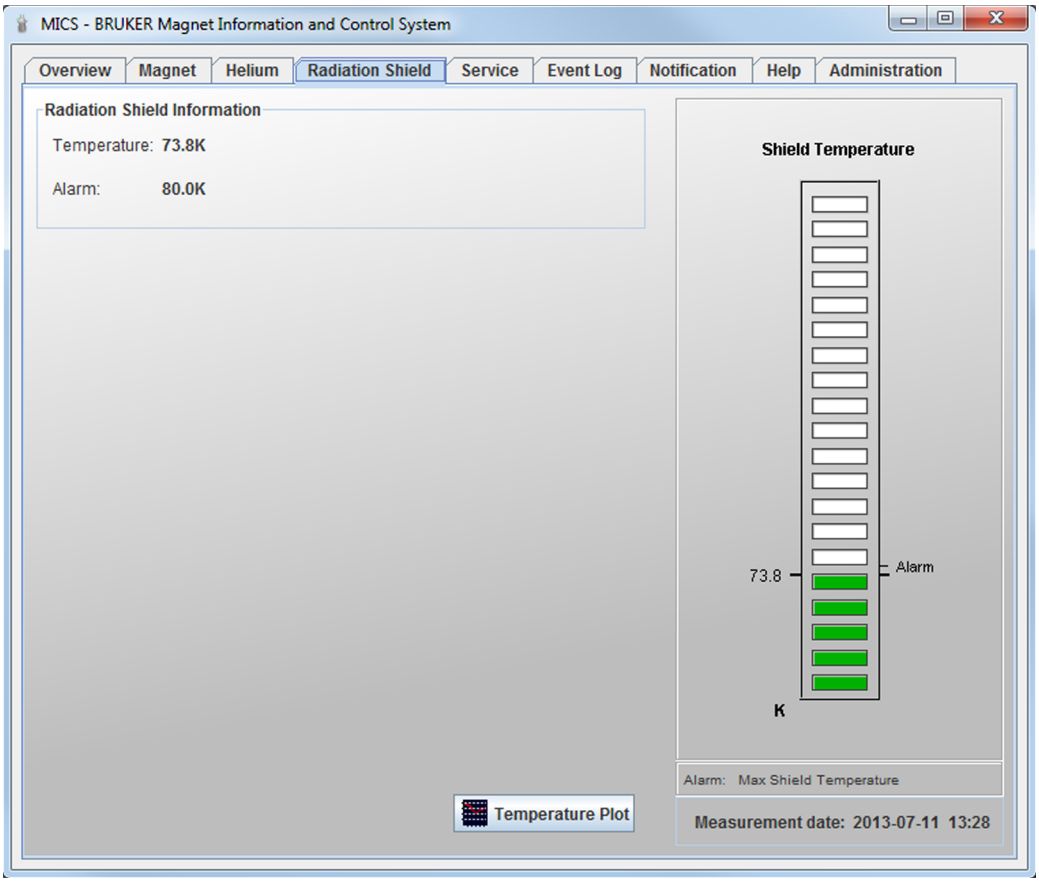
Administration

The MICS *Administration* tab provides a CMU/RS section, which displays the current IP address of the CMU device. It is also possible to open the CMU Service Web page or to start the CMU Service Tool from there.



4.4.2 Radiation Shield Temperature Monitoring without CMU

To activate the radiation shield temperature monitoring in MICS, a BSMS/2 system with ELCB and SLCB/3 is needed.



MICS displays the radiation shield temperature in Kelvin. The shield temperature can also be displayed in a 2D plot, using the button *Temperature Plot*.

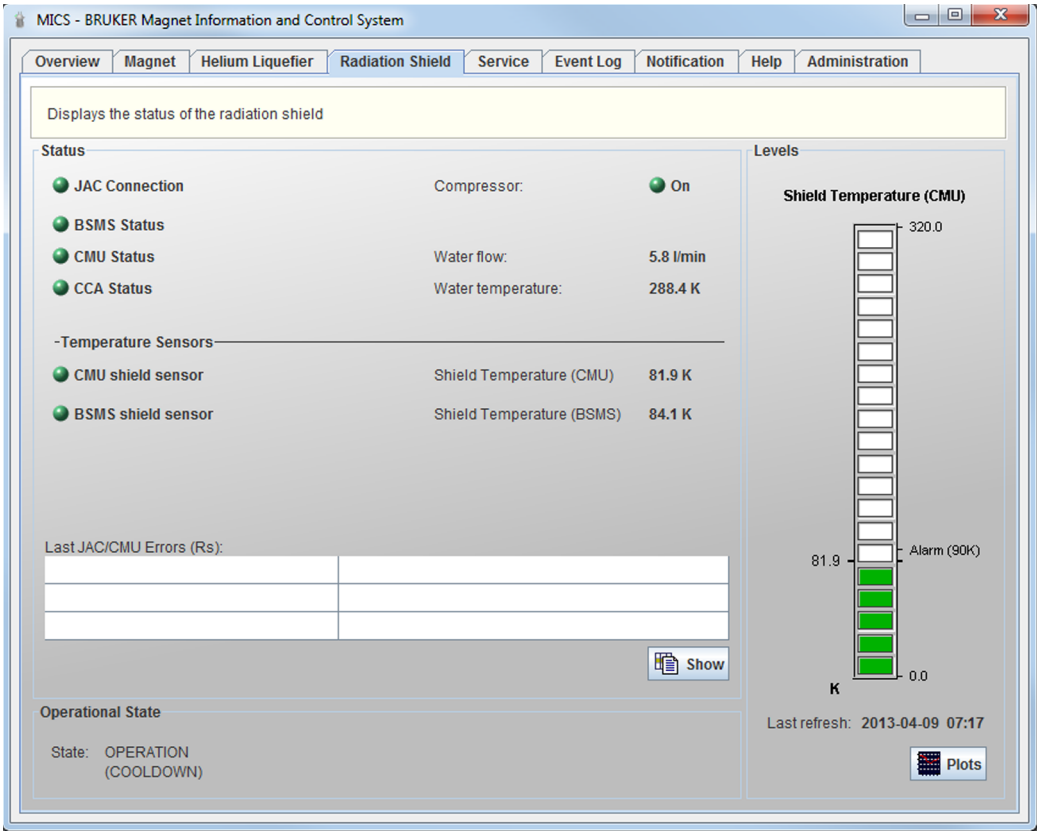
An alarm temperature will be configured during the installation process by the Bruker Service personnel. If the alarm temperature limit is exceeded, the event *Shield temperature too high* will be raised.

4.5 Aeon RZ Systems

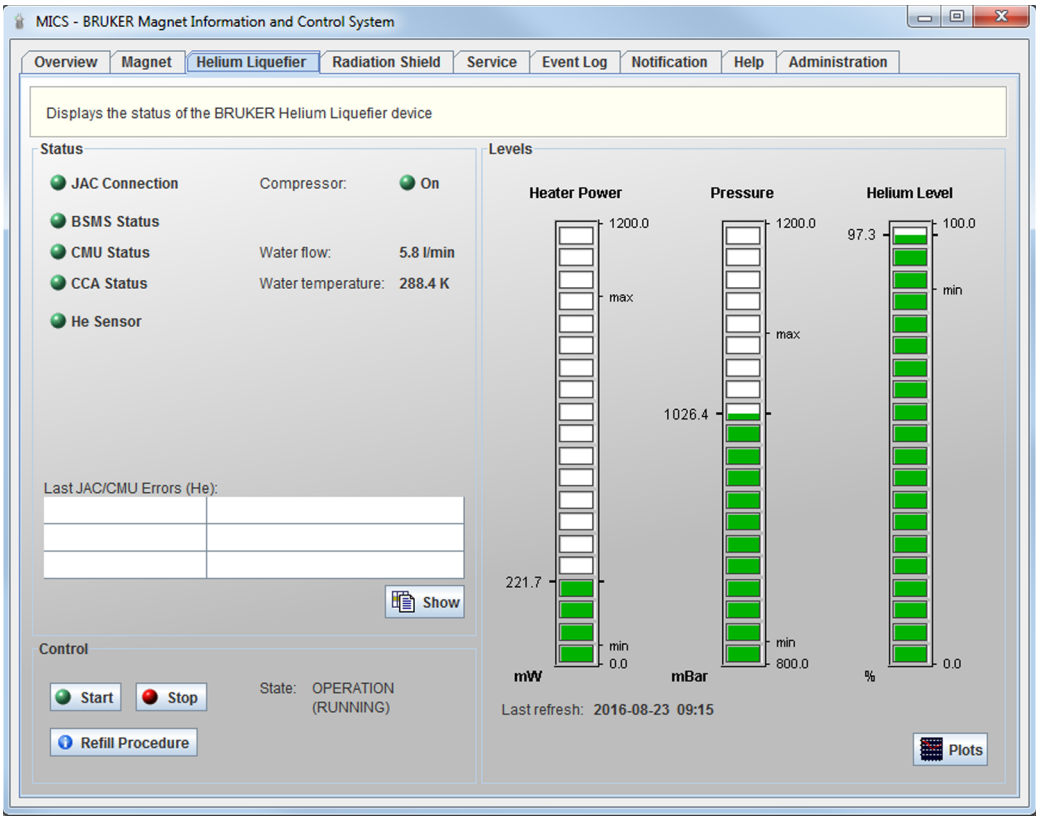
For Aeon RZ systems MICS displays the tabs *Radiation Shield* and *He Liquefaction* instead of the tabs *Nitrogen and Helium*.

MICS relays messages from the CMU to the user. The MICS behavior for CMU messages can be configured in the *Notification* tab.

Note that MICS is part of the redundant monitoring design and must be running continuously to ensure mutual supervision between the CMU and MICS.



MICS displays the radiation shield temperature in Kelvin as a temperature gauge. The shield temperature and other parameters can also be displayed in a 2D plot, using the button *Plots*.



The *He Liquefier* tab displays all relevant information regarding the He liquefaction unit. Heater power, He pressure, He level and other parameters can also be displayed in a 2D plot, using the button *Plots*.

MICS can also be used to START or STOP the He liquefaction. Note that the Bruker Service Password is required to STOP the liquefaction device.

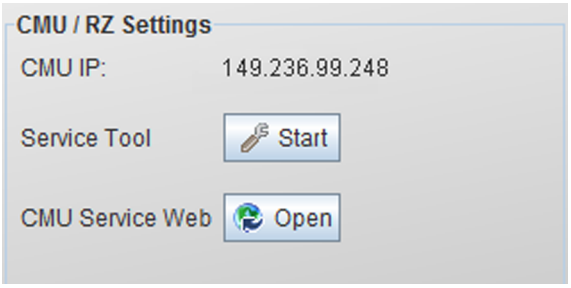
Emails

The Java Controller (JAC) of the CMU can send emails on its own. This is a fallback strategy and is only used if the JAC detects that MICS is not running.

To configure the email configuration on the JAC device, use the button  *JAC email settings* in the *Notification* tab. Be aware that the email configuration of the JAC device is independent from the MICS email configuration.

Administration

The MICS *Administration* tab provides a CMU/RZ section, which displays the current IP address of the CMU device. It is also possible to open the CMU Service Web page or start the CMU Service Tool from there.



4.6 Subcooled Systems

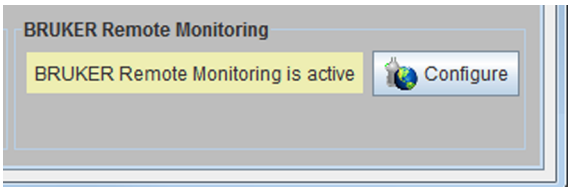
Monitoring and alarming for subcooled 2K systems is done entirely by the BMPC/2 unit. MICS only displays the helium and nitrogen levels as provided by the BSMS/ELCB or the TopSpin logfile. Be aware that nitrogen is only displayed if the system is equipped with a Bruker nitrogen sensor, connected to the BSMS/ELCB unit. Refer to the BMPC/2 Technical Manual (Z31823) for additional information.

4.7 Remote Monitoring Option

For systems equipped with an AVNeo console and TopSpin 4.x, it is recommended to setup AutoDiagnose instead.

For additional information see:
https://www.bruker.com/en/services/labscape-support-solutions/autodiagnose.html

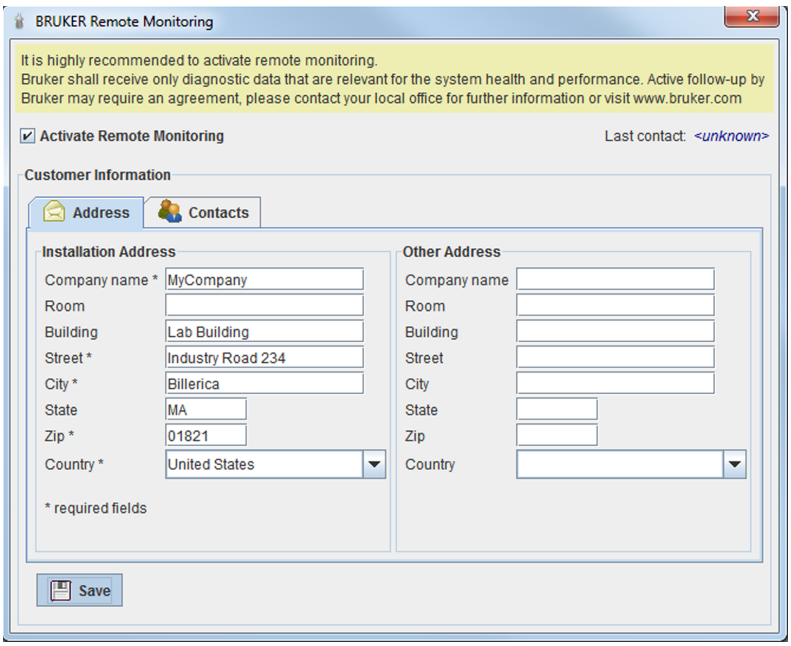
Remote monitoring can be configured in the MICS *Administration* tab as shown below:



Only nitrogen and helium will be monitored. For magnet systems with a nitrogen vessel a nitrogen level sensor is required.

It is highly recommended to enable remote monitoring. Bruker shall receive only diagnostic data that are relevant for the system health and performance. Active follow-up by Bruker may require an agreement, please contact your local Bruker office for further information or visit www.bruker.com/labscape.

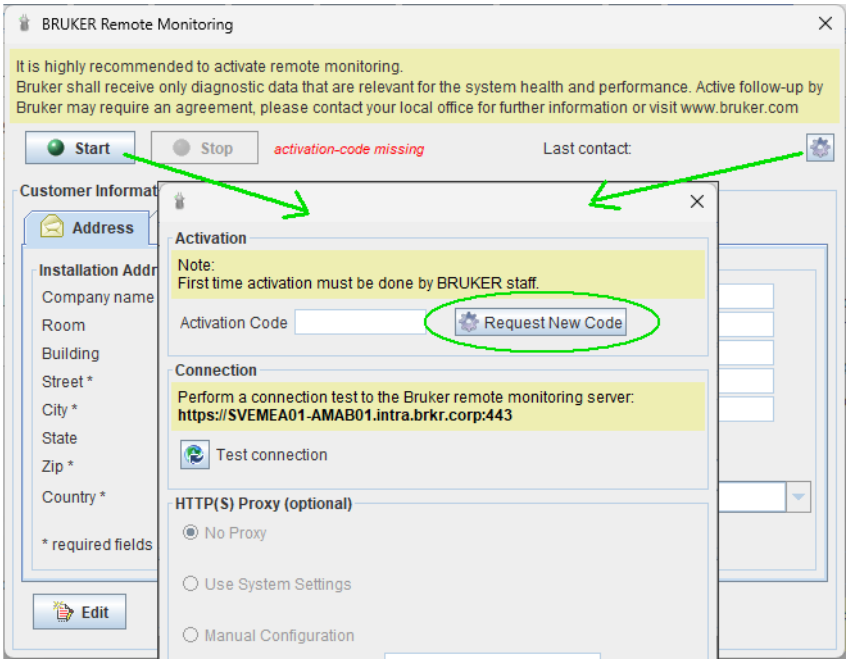
In order to start the remote monitoring function, the installation address and at least one contact need to be defined in the configuration panel. Bruker recommends to enter all responsible persons and deputies.



First-Time Activation

Note: First-time activation requires an activation-code to be entered. This has to be done by Bruker service staff.

Bruker service staff can request an activation-code to be sent via email. Once entered in the Remote-Monitoring settings dialog, MICS will keep it as part of its configuration. No new activation-code is required, if the user starts/stops remote-monitoring later.



Requirements and Limitations

- MICS Version 2.07 or newer
- connected to the internet (allow for outgoing HTTPS secure connections) [1)]
- active user session (user logged in) with MICS running
- up-to-date magnet BIS file [2)]
- BSMS console with ELCB board [3)] or AVNeo
- BZH magnet
  magnets need to have a valid BZH identifier (written on the type label). Non-Bruker magnets or old magnets with BR identifier (manufactured in B-DE) are not supported.

[1)] to monitoring-mrs.bruker.com

[2)] for very old systems this might not be available

[3)] every AVII instrument produced after Q2 2005

Supported System Configurations

Magnet System	Monitored				Remarks
	loss gradient		min level		
	He	N2	He	N2	
BZH magnet	☑	☑	☑	☑	N2: only if sensor present
Aeon RS	☑	☐	☑	☐	
Aeon RZ	☐	☐	☑	☐	
BNL	☑	☐	☑	☑	
BSNL	☑	☐	☑	☑	
Subcooled magnets	not supported				
GYR CF	not supported				

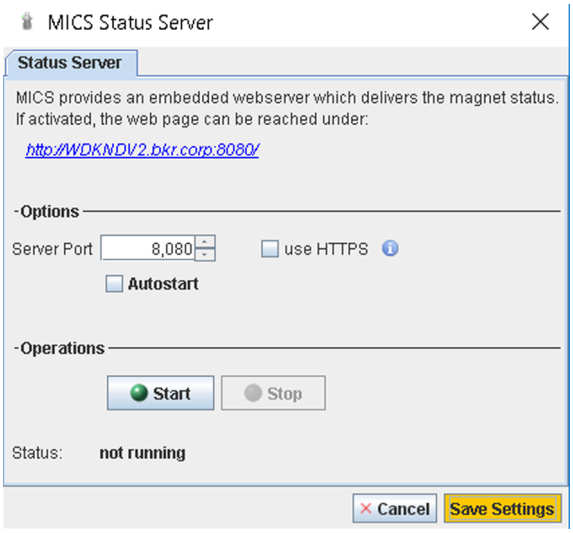
Remote Monitoring requires that MICS is running.
Ensure that MICS is started, either manually or via an autostart script.

Note that MICS will be terminated if the user logs out. See also Intended Use on page 7 and question no. 2 in Frequently Asked Questions on page 37.

4.8 Web Overview

MICS contains an embedded webserver, which allows to monitor the system state with a webbrowser from within your company's network.

It can be enabled in the *Administration* tab as an option.

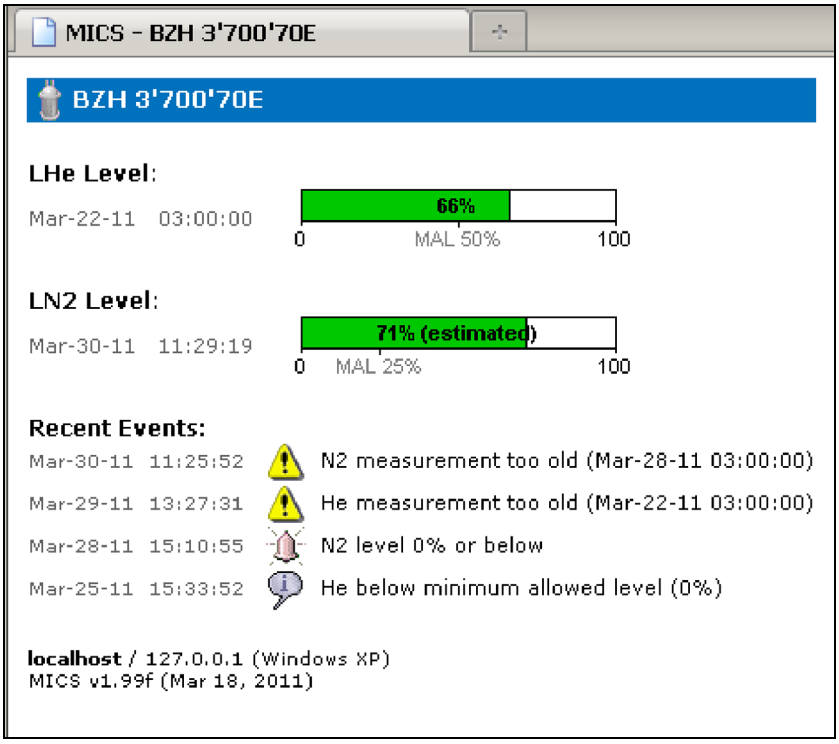


If you change the default port, make sure it is available and the firewall is configured accordingly.

If HTTPS is activated, the root certificate of the webserver needs to be imported into your webbrowser‘s list of trusted certificates.

Click the icon in the settings dialog to get detailed information on the necessary steps.

Example Webpage



5 Frequently Asked Questions

General:

1. How can MICS be started?

   MICS can either be started from within TopSpin or as a standalone application from the Start menu shortcut.

   - To start MICS from TopSpin, invoke the command `mics` in the TopSpin command prompt.

2. Is there any guaranty that MICS issues warnings and alerts if the TopSpin computer is running?

   No. MICS is a Java application designed for informational purposes and not a security tool. It does not run as a system device and therefore needs to be started by the user either manually or by means of a startup script.

3. Which files should I send to Bruker in case of problems with MICS or the magnet?

   In case of any problems, go to the MICS “Help” tab and click on the “System Status” button to create an archive of your configuration (logfiles, etc.). Send this archive to your local Bruker support team for further analysis.

4. Which parameters are being logged by MICS?

   MICS records a lot of different parameters, depending on the system configuration. All logfiles are stored in the folder [MICS_HOME]/logs. Please do not edit the logs or any other MICS configuration file, as this might result in a corrupted MICS installation.

Helium and Nitrogen Levels:

5. My system is not equipped with a nitrogen level sensor. How is the nitrogen level in MICS being calculated?

   MICS calculates the current nitrogen level based on the last refill date and the specified loss. The last refill date needs to be specified by the user in the *Nitrogen* tab.

6. What is the update interval of the He/N2 level displayed in MICS?

   MICS does no real time monitoring of the magnet system and does not trigger any He/N2 measurement by itself. The level data in MICS is updated once an hour. However the actual measurement might be older than that, depending on the measurement interval of the hardware or the TopSpin helium transfer background process.

   If MICS is configured to read the level data directly from the BSMS (recommended), it displays the actual date of the measurement as indicated by the hardware.

   To get an accurate He/N2 level reading it is recommended to initiate a measurement manually (BSMS keyboard or service web).

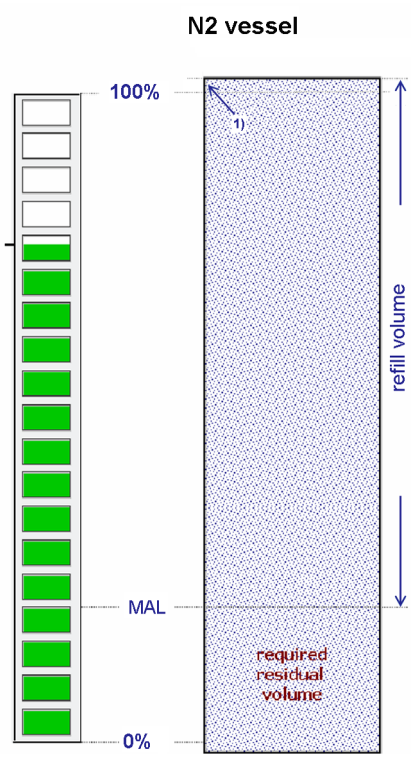
7. How does the level on the MICS N2 gauge correspond with the vessel volume?

Systems with Nitrogen Level Sensor:

For systems with nitrogen sensor, the minimum allowed level (MAL) and therefore the refill and residual volume depend on the information in the magnet BIS file.

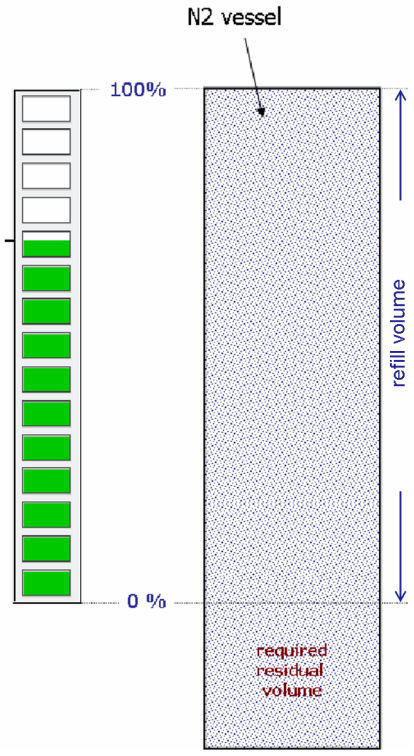
As of MICS version 2.03, the MAL is indicated on the nitrogen gauge.

[1] after a full refill, the indicated holdtime in MICS may be shorter than specified, due to the overfill volume above the sensor range.



Systems without Nitrogen Level Sensor:

As of MICS version 1.74, the required residual volume, which is essential for safe operation of the magnet system, will no longer be part of the volume covered by the level gauge.



BSNL (BRUKER Smart Nitrogen Liquefier):

8. Why am I required to perform a manual check in MICS every couple of days?

   This is a cross-check between MICS and the BSNL Laptop to verify that the various components of the BSNL system are up and running.

9. MICS reports problems with the FTP connection. What can I do?

   For BSNL systems, a working FTP connection between MICS and the FTP server running on the CRCO laptop is needed. Please check the following:

   - check that CRCO ip address configured in MICS matches the CRCO laptop ip.
   - try to ping the CRCO laptop from the MICS computer, using the command 'ping <ip>' (without quotes). If ping is not possible, check the network connectivity and firewall settings.
   - if ping was successful: try to manually connect to the FTP server from the MICS computer. You can use the windows FTP command for this or any other FTP client. Try to login with username 'anonymous' and password 'cryo' (without quotes). If this fails, there might be a firewall problem.

Installation Issues:

10. Why do I have to specify the location of my TopSpin installation?

    For older BSMS consoles, MICS has to rely on the *heliumlog* file, which is written by the TopSpin background process and stored in the TopSpin installation directory.

To make sure MICS is correctly provided with level data, it is essential to check and adjust the path to the TopSpin heliumlog file after each TopSpin installation. This can be done in the MICS Administration Tab.

MICS can be configured to read the level data directly from the BSMS. This is the recommended setting for most systems.

11. E-Mailing in MICS is not working. What can I do?

    Check the settings according to the following procedure:

    a) ask your IT department to confirm the following settings:

    - a) SMTP server (e.g. mail.yourcompany.com)
    - b) Port (e.g. 25, 465 or 587)
    - c) is authentication (Login with username + password) required?
    - d) is encryption required (SSL or TLS)?

    b) based on the information above, check whether a connection to the given server and port on the network layer can be established:

use the command 'telnet smtpserver port' from the commandline to connect to the server (note that on Windows 7 you might need to activate the telnet client first).

If no connection with telnet is possible, the problem seems to be on the network or configuration side. In this case your IT needs to check on this (e.g. security restrictions or wrong settings). If you see the welcome prompt from the mailserver, then quit the telnet connection.

c) if the above test was successful, start MICS, configure it accordingly and try the testmail function.

d) if the testmail fails, select the MICS "Help" tab and click on the "System Status" button to create an archive of your configuration (logfiles, etc.) Send this archive to your local Bruker support team for further analysis.

A Appendix

A.1 Abbreviations

Abbreviation	Description
BIS	Bruker Identification System
BMPC/2	Bruker Magnet Pump Control 2
BNL	Bruker Nitrogen Liquefier
BSMS	Bruker Smart Magnet Control System
BSNL	Bruker Smart Nitrogen Liquefier
BSVT	Bruker Smart Variable Temperature System
CCA	Cryo Compressor Adaptor
CF	Cryogen free
CMU	Cryostat Monitoring Unit
CRCO	Cryo Controller
CU5	Cooling Unit 5
ELCB	Enhanced Lock Control Board
GYR CF	Gyrotron Cryogen Free Magnet System
JAC	Java Controller
MAL	Minimum Allowed Level
MALE	Minimum Allowed Level at Energizing
MICS	Magnet Information and Control System
RS	Radiation Shield
RS	1-stage cooled (N2 free)
RZ	2-stage cooled (N2 free, He reliquefaction)
SLCB	Sample and Level Control Board

Abbreviations

Revision History List

Index:	Date:	Alteration Type:
01	Nov 11, 2006	MICS user manual release.
02	Jan 12, 2007	Release of MICS version 1.1; added security.
03	April 27, 2007	Added description of events.
04	June 19, 2007	Release of MICS version 1.3.3; added support for LN2 measurement and N2 liquefier.
05	March 17, 2009	Release of MICS version 1.8.8; added support for /RS temperature monitoring.
06	April 31, 2010	Release of MICS version 1.9.3; adapted for new BSMS firmware.
07	July 12, 2010	Minor changes (email addresses, screenshots).
08	Sept 10, 2010	Changed support email address.
09	Febr 08, 2011	Completed help section, added new chapter structure.
10	March 03, 2011	Added web overview.
11	Oct 19, 2011	Added BSNL.
12	Febr 02, 2012	Manual layout according to Bruker Corporate Design Guidelines. Added description of *Nitrogen (BNL)* tab.
13	May 25, 2012	Added *Radiation Shield Temperature Monitoring with CMU* chapter, updated BNL chapter, included new cover page layout.
14	November 18, 2013	Added monitoring of Aeon RZ magnet systems.
15	June 12, 2014	Added monitoring of Aeon 2K magnets and monitoring of nitrogen free magnet systems.
16	May 22, 2015	Added description of *Gyrotron* tab.
17	January 11, 2016	Added *Remote Monitoring Option*.
18	December 21, 2016	Updated GUI description and screenshots, extended FAQs.
19	March 22, 2017	Added BSNL with Cooling Unit 5.
20	December 13, 2017	Added automatic update.
21	October 27, 2020	Webserver with HTTPS support.
22	November 8, 2024	Remote-Monitoring activation added. List of supported software versions updated. Additional minor changes.
23	Mai 8, 2025	Minor changes and updates.

Bruker Corporation

info@bruker.com
www.bruker.com

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