Pro
Series

raditeq

Product Manual

RadiSense®

Electric Field Probe

Models:

RSB2110I | RSB2110S | RSB2110M

www.raditeq.com

RadiSense® Product Manual

This product manual pertains to the RadiSense® series.

RadiSense® Models	RSB2110I - RSB2110S - RSB2110M
RadiSense® Laser card:	LPS2001B **- By Raditeq**

Read this manual carefully before operating the product and make sure all the safety instructions are strictly followed.

For your convenience, a Quick Start Guide has been added to this product. This Quick Start Guide contains the basic start-up steps and the safety warnings.

For all specifications of this specific product, please refer to the data sheet of the product which can be found at www.raditeq.com

Please keep this manual close at hand when you operate your new Raditeq product(s).

Please contact your local reseller if you have any questions.

Supplier Information

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WARNINGS & PRECAUTIONS

Read the contents of this product manual carefully and become familiar with the safety markings, the product instructions and the handling of the system. Please refer to the applicable product manual(s) for further information regarding the operation and control of the product(s).

This equipment is designed to be used as a plug-in card for the RadiCentre® series. Do not use this card on its own or in combination with any other mainframe. Using this product with any other mainframe can cause harm and will void warranty.

To make Raditeq's product as safe as possible, all devices fitted inside a RadiCentre® must comply to the safety interlock system of the RadiCentre®. All Raditeq Plug-in cards are designed to work with the interlock fitted on all RadiCentre® systems.

Only Raditeq qualified maintenance personnel is allowed to perform maintenance and/or repair service on the equipment.

This product® contains materials that can be recycled and reused to minimize material waste. At the 'end-of-life', specialized companies can dismantle the discarded system to collect the reusable and recyclable materials. If your product is at its 'end-of-life', please return it to your local reseller or to Raditeq for recycling.

For cleaning, use a clean, dry cloth (or a damp cloth where needed) and wipe the surface of equipment.

This product contains no hazardous substances as described in the RoHS Directive (2011/65/EU).

This product contains embedded software, which is field upgradeable from the RadiCentre® using the USB-A connection port on the backside panel of the RadiCentre®. For more information about updating your Raditeq plug-in card, please read the RadiCentre® manual.

Laser Safety

The RadiSense® system is a closed loop fibre system and therefore classified as a Class 1M laser system according to EN60825-1:2014 and EN60825-2:2005. In order to provide laser safety in case of a fibre failure or accidental disconnection of the fibres, the RadiSense® system is provided with an Automatic Laser Shut-down (ALS) as described in the EN60825-2:2005.

INVISIBLE Laser RADIATION - DO NOT

EXPOSE USERS OF TELESCOPIC OPTICS

Class 1M Laser product

Max. 500 mW at 808 nm

Although the RadiSense® system does not emit any harmful laser light under normal circumstances, never look into any of the fibre optic connectors.

As a safety precaution, products that use a laser can only be turned on using a laser Code. This code can be entered using the touchscreen of the RadiCentre® system (in combination with the RadiCentre® CTR1004B or CTR1009B).

As a safety precaution, the RadiSense® series can be started by following a dedicated starting procedure as described later in the RadiSense® product manual (in combination with the RadiCentre® CTR1001S).

Make sure that the fibre optic cables are installed correctly before activating the system. Do not activate the system if the fibre optic cables show any sign of damage or tampering.

The RadiSense® uses a high-power laser to supply energy to a remote measuring device. The wavelength of this laser is approximately 808 nm. This infrared laser is invisible to the human eye. During normal operation, exposure to laser radiation is not possible because the RadiSense® uses a fibre-coupled closed loop system with Automatic Laser Shut-down (ALS). However, we ask that you comply with the following precautions for your own safety:

- Assign a ‘laser safety officer’ in your company. The ‘laser safety officer’ is responsible for reviewing the safety precautions.
- Check and connect all fibre optic cables before activating the system.
- Do not activate the system if the fibre optic cables show any sign of damage or tampering.
- The RadiCentre® system is equipped with a safety interlock system.
- The safety interlock connection should be connected to an ‘emergency master disconnect’.
- A visual ‘Laser ON’ indicator will light up when the laser is activated. This indicator on the front panel of the RadiCentre® system serves as a reminder to the operator that one or more lasers are switched on.

Introduction

Raditeq

At the core of Raditeq's products and software lies the paradigm of effectiveness, efficiency, and accuracy. We firmly believe in empowering our customers with solutions that deliver unparalleled performance and reliability, without limitations on system extensiveness or compatibility. The RadiMation® software is designed with an open architecture, welcoming compatibility with other brands and ensuring seamless integration with various EM/RF hardware brands. This approach allows our customers the flexibility to leverage RadiMation® alongside other tools and systems, maximizing their capabilities and streamlining their testing processes.

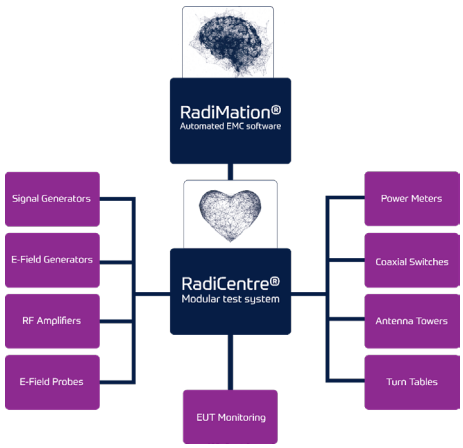
Similarly, Raditeq hardware is engineered with versatility in mind, making it compatible with a wide range of EMC test software available on the market. Our hardware solutions are designed to ensure interoperability and ease of integration with third-party software, enabling customers to use the full potential of their testing setups. With Raditeq, you have the freedom to choose the best combination of hardware and software to achieve your EMC testing objectives with utmost effectiveness, efficiency, and accuracy.

RadiMation® The brain of the system

RadiMation® serves as the central intelligence (The Brain) of Raditeq systems, seamlessly integrating Raditeq's products with a vast array of other brands. With over 6000 individual drivers available, there is a high probability that your device is already supported by RadiMation®. However, if your (whitelisted) device is not yet supported, Raditeq is dedicated to adding support for it at no additional cost. RadiMation® focuses on automating EMC tests and ensuring the quality of the output. Through rigorous driver testing and meticulous command verification, RadiMation® prioritizes accuracy and reliability in delivering results. As a result, it stands as the software with the utmost emphasis on producing correct outputs and achieving precise results, empowering users to conduct EMC testing with confidence and efficiency.

RadiCentre® The Heart of the system

All of Raditeq's products are compatible with the RadiCentre® system, serving as its modular heart in EMC testing setups. The RadiCentre® is a versatile unit capable of accommodating up to eight individual devices, offering unparalleled flexibility in system configuration. With the RadiCentre® at its core, users have the freedom to construct comprehensive EMC testing systems tailored to their specific requirements. Whether it's combining multiple Raditeq devices, the RadiCentre® provides a seamless platform for building extensive and adaptable systems. This modular approach not only maximizes flexibility but also streamlines system management and maintenance. By consolidating multiple devices into a single unit, the RadiCentre® simplifies setup, operation, and troubleshooting, ensuring efficient and reliable performance in EMC testing endeavors.



Compatible RadiCentre®

CTR2001E - Single Slot RadiCentre®
CTR2008A - Eight Slot RadiCentre®
CTR1009B - Seven Slot RadiCentre®
CTR1004B - Two Slot RadiCentre®

The RadiSense® Series

Raditeq brings over 30 years of expertise. Designing both large and small EMC/RF projects for clients in automotive, defense, and aerospace industries, Raditeq offers considerable proficiency in anechoic chamber calibrations and conducting EMC immunity and emission tests. The extensive experience gained over three decades shapes Raditeq's vision in designing E-field probes, with pivotal decisions being made from the user's perspective.

The RadiSense® is a laser-powered electric field strength probe renowned for its exceptional measurement speed and accuracy. This E-field probe is versatile, suitable for immunity testing for EMC purposes, as well as calibrations of measurement setups in various environments. The RadiSense® is a reliable and precise solution backed by a legacy of proven performance.

Streamlined operations

EMC tests and calibrations can be time-consuming and demanding, making ease of use essential. As a pioneer in laser-powered E-field probes with a legacy originating over 25 years ago, the RadiSense® can operate 24/7 without interruptions for battery charging or replacements. Its compact size and dedicated design have minimal impact on probe measurements, and when not in use, it can be conveniently placed in a corner without the need to disconnect cables. The RadiSense® is easily operated manually through the RadiCentre® and supports a set of software commands for configuring embedded functionalities, facilitating test automation. Compatible with multiple software packages from various manufacturers, the RadiSense® seamlessly integrates with Raditeq's own EMC automation software, RadiMation®, providing a comprehensive solution for efficient and simplified testing processes.

Superior accuracy

Measurement errors during EMC tests or calibrations can lead to costly and unnecessary troubleshooting. The RadiSense® 10 is designed to minimize these risks by delivering highly accurate and reliable measurements in demanding test environments. Its compact sensor design helps reduce disturbances by remaining small compared to the wavelength of the measured signal. The precision of the RadiSense® is meticulously determined by its well-thought-out shape, dimensions, and the materials used, effectively minimizing anisotropy and ensuring minimal impact on the uniformity of the generated field. To further optimize accuracy, the RadiSense® 10 is equipped with two antenna elements per axis, six in total. This configuration improves isotropic performance and supports accurate measurements, even when the field direction is unknown or constantly changing. As part of Raditeq's ISO 9001 quality process, each RadiSense® 10 field sensor is factory-adjusted and verified to ensure it meets the highest standards. Adjustment data is stored directly inside the sensor, supporting consistent and dependable performance in every measurement.

User correction - calibration factors

Additionally, the RadiSense® 10 series can store user correction data directly inside the field sensor. By applying calibration factors within the sensor itself, there is no risk of forgetting to apply the correction data during manual or automated tests. Even when switching between test setups or locations, the appropriate correction factors are always applied. Frequency response correction factors determined during the ISO/IEC 17025 accredited calibration of the probe can be stored in the field sensor using the RadiMation® device driver. Once stored, the RadiSense® 10 returns corrected E-field readings without the need for additional calculations. Corrections are applied inside the probe for each individual axis, supporting accurate and reliable measurements in every setup.

RadiSense® RSB2110 Applications

The examples below showcase just a selection of applications for the RadiSense® RSB2110. Many other applications are possible, and Raditeq offers several RadiSense® models to match different test requirements. If you are unsure whether the RadiSense® RSB2110 is the best fit for your application, please contact your local reseller. They can help you select the most suitable solution for your measurement needs.

Radiated immunity field monitoring
This involves monitoring and analysing electromagnetic fields to assess the susceptibility of electronic devices to external electromagnetic interference. It helps evaluate the resilience of devices against electromagnetic disturbances in their operating environment.

Anechoic chambers 16-point calibration
Calibration: Anechoic chambers are specially designed rooms with highly absorptive walls, creating an environment free from reflections. The 16-point calibration process ensures the accuracy of the chamber's performance across different frequencies and orientations.

EMC immunity testing
EMC immunity testing evaluates the device's ability to withstand electromagnetic interference without malfunctioning. The probe can be used as a field reference for these types of tests.

Field homogeneity measurements
This process involves assessing the uniformity of electromagnetic fields within a defined area. It ensures that the field strength remains consistent across the test environment, providing reliable and reproducible testing conditions.

RF broadcast and welding radiation-hazard monitoring
This involves monitoring and analysing RF emissions from broadcasting stations and welding operations to assess potential radiation hazards to nearby electronic devices or personnel. It helps ensure compliance with safety regulations and minimizes interference risks.

Reverberation chamber testing
Reverberation chambers create an environment where electromagnetic waves bounce off walls or stirrers, producing a statistically uniform field. These chambers are widely used for the EMC testing of electronic equipment and components, accurately simulating real-world, multi-path propagation conditions.

Pulse-Modulated signal measurements
Some EMC immunity standards require testing with pulse-modulated RF signals, especially in aerospace and defense. These signals can be challenging to measure using most E-field probes. The RadiSense® RSB2110M is specifically designed for measuring pulse-modulated signals.

RadiSense® Models

The RadiSense® 10 sensor is available in three models:

- RSB2110I 9 kHz to 10 GHz, best isotropy | 100 measurements per second
- RSB2110S 20 MHz to 10 GHz, best isotropy | 100 measurements per second
- RSB2110M 9 kHz to 10 GHz, Pulsed-modulation testing | 100 measurements per second

The RadiSense® sensor can be delivered as single item or as a set.
The RadiSense® set consists of the following items:

RadiSense® E-field sensor (with fixed fibre cables)
Electric field sensors to be used together with the RadiSupply® plug-in card including small probe stand model PST2100A with 10 cm and 15 cm poles.

RadiSupply® plug-in card
Model: LPS2001B
The electric field sensor plug-in card to be used in the RadiCentre® system.

Fibre extension cable
Model: CBL2001-10m
10-meter fibre extension cable with FC/ST connectors on both sides. Other lengths of fibre extension cables are available on request.

Coupling set
Model: CPL2001A
Coupling set consisting of a FC/PC and ST/PC coupling to connect the extension fibre optic cable to the sensor fibre optic cable.

Fibre Optic cleaning Pen
Model: (FCP1001A)

USB stick (Standard)
The USB stick contains the following;
the (digital) product manual and Quick Start Guide.

The calibration certificate for the field sensor (optional)
Only if an ISO/IEC 17025 accredited calibration certification was ordered.

Fibre Optic Cables

Use an extension fibre to connect the field sensor to the plug-in card installed in the RadiCentre®. The extension fibre is a robust duplex fibre optic cable with different connector types to prevent incorrect connections.
Connectors

- FC-connector: Laser power delivery to field sensor.
- ST-connector: Bi-directional data communication to and from field sensor.

Maximum extension cable length

Fibre optic extension cables are available (on request) in different lengths, up to 100 metres. For correct operation, the fibre optic cable can be extended using a maximum of two coupling sets.

Warranty implications

For the RadiSense® system, it is imperative to adhere to the exclusive use of fibre optic cables supplied by Raditeq. The warranty associated with the RadiSense® will be void if non-Raditeq supplied cables are used. Cables from sources other than Raditeq may compromise the integrity of the system, resulting in potential damage.

For questions or further clarification regarding warranty terms and conditions, please contact your reseller or Raditeq directly. Following these requirements helps maintain the reliability, performance, and service life of your RadiSense® system.

Fibre handling and maintenance

Improper handling or poor maintenance can cause deterioration and/or permanent damage. Please read the following maintenance guidelines to ensure the safety and longevity of the RadiSense®.

The mating surfaces of high-power fibre optic connectors are very sensitive to dirt, grease, and/or dust. These contaminations can burn into the fibre optic cable when laser light is transmitted through it, causing permanent damage to the fibre cable also known as Fibre burn-in. To prevent this, follow the guidelines below.

Maintenance guideline

Clean the contact surface of the fibre with the fibre optic cleaning pen before every fibre optic connection is made and after each disconnect. The low power data connection is not as susceptible to burn-in. It is good practice to clean both FC/ST connectors. Always clean both sides of the connection as contamination sits between the mating surfaces.

How to use the fibre optic cleaning pen

For instructions on how to use the fibre optic cleaning pen, please consult the cleaning manual & video available on :

- www.raditeq.com/product/FCP1001A (product information)
- https://youtu.be/d5b--dHgU5k (instruction video)

Fibre Optic Cleaning video

Scan me

Fibre handling guidelines

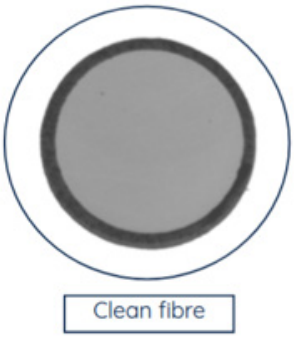
Handling guidelines

- When operating the RadiSense® probe, ensure that all fibre optic connections are cleaned with the supplied cleaning pen before connecting the fibre cables.
- Never drop the fibre optic cable connectors, as this may damage the core surface.
- Never bend the fibre optic cables beyond the minimum bend radius of <5 cm, as this will break the fibre optic cable core.
- Never pull the fibre optic cable connector out of a coupling by its orange jacket, always pull the connector.
- Fasten the connectors by hand only, never use tools.
- Do not stand on or crush the fibres optic cable.
- Do not apply mechanical stress (pull) to the fibres optic cable.
- Switch off the system before detaching the fibres optic cable.

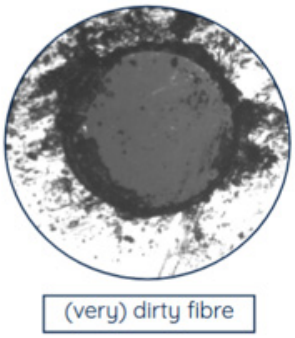
Fibre optic inspection

To inspect the fibre optic cables of RadiSense® probes, a dedicated inspection camera is required. If you do not have access to such a camera, please contact your local reseller for assistance. The reseller can perform a thorough check of the fibre and offer minor repairs if necessary.

These inspection cameras are designed to be placed directly over the ferrule (the white tip of the connector) to display a high-resolution image on a PC or display. When inspecting, it is essential to focus on the cleanliness of the actual fibre core, rather than the surrounding metal parts. Below is an example illustrating the difference between a clean and a contaminated fibre core.



Clean fibre

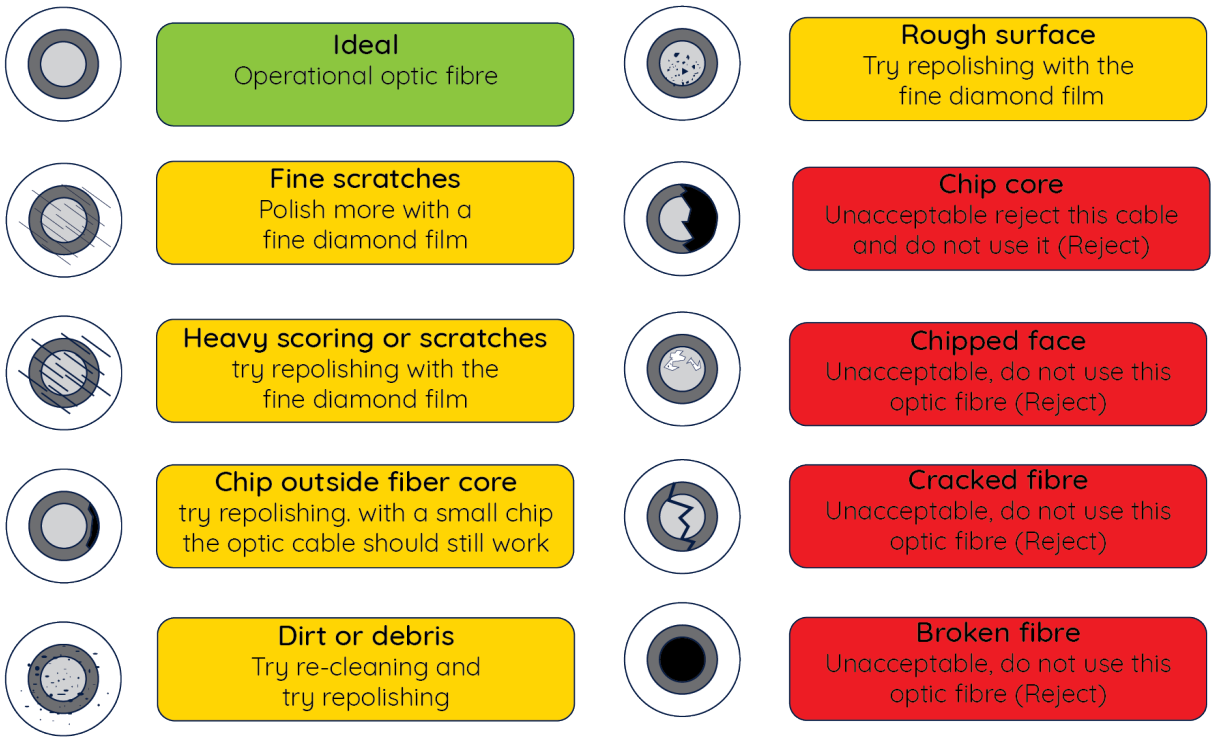


(very) dirty fibre

Fibre conditions

Any deviation from ideal cleanliness will ultimately result in damage to the fibre optic cable or the probe itself. Should the fibre core become contaminated, attempt to clean it using the supplied optic fibre cleaning pen or if nog available some alcohol wipes. However, if cleaning with these wipes proves ineffective, specialized treatment is required.In such cases, please contact your reseller for assistance. They can provide professional cleaning services or facilitate the replacement of a damaged cable.

Important: A “Reject” status indicates that the fibre optic cable is no longer fit for use and must be replaced. Operating the system with a contaminated or damaged cable will cause the probe to malfunction or sustain permanent damage. Prompt action is essential to maintain the integrity and functionality of your RadiSense® system.



It is essential to note that inspecting fibre optic cable connectors requires specialized equipment and training. Attempting maintenance without the necessary expertise or tools may lead to damage or improper handling. If unsure, seek professional assistance to guarantee the integrity of your fibre optic connectors

For any queries related to fibre maintenance, reach out to your local reseller or contact Raditeq directly. They are equipped to provide guidance, answer questions, and offer assistance to ensure the continued reliability and performance of your system.

RadiSupply® Plug-in card Installation

Please follow the instructions below on how to install the Raditeq plug-in card into the RadiCentre® correctly. NOTE: before installing and inserting a new plug-in card make sure that the RadiCentre® is switched OFF and the power cable is unplugged.

Step 1
Choose an empty slot in the RadiCentre® in which the plug-in card can be installed.
Remove the blind panel from the slot by unscrewing the four screws on the panel (two at the top and two at the bottom).

Step 2
Insert the plug-in card in the rail of the empty slot as shown in the picture A. Position the plug-in card into the slot and slowly push it, using the lower part of the plug-in card. When it reached the end of the rail, gently push and secure the plug-in card into the backplane socket.

Step 3
When the plug-in card is inserted correctly into the backplane socket, fix it by tightening the four screws at the top and the bottom of the plug-in card (shown at B). For connection of the panels into the RadiCentre® a screwdriver type Poze, size PZ1 should be used.

Step 4
After installation of the plug-in card, connect the AC mains power cord on the back of the RadiCentre® and switch the ON/OFF button to the ON position. The RadiCentre® can now be started by tapping the touch screen.

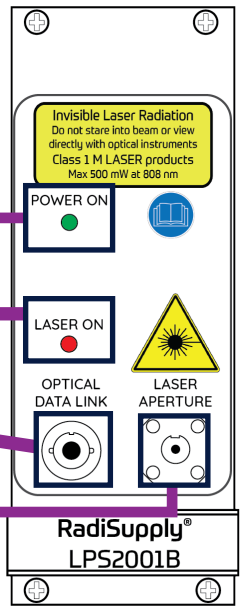
When installed properly, the plug-in card should be recognized and shown automatically on the front screen of the RadiCentre® when turned ON.

POWER ON:
This (green) LED lights up when the power is on and

Laser ON:
This red LED lights up when the laser is active.

Laser APERTURE:
Connect to the E-field sensor through the fibre extension cable equiped with FC connectors.

OPTICAL DATA LINK:
Connect to the E-field sensor through the fibre extension cable equiped with ST connectors.

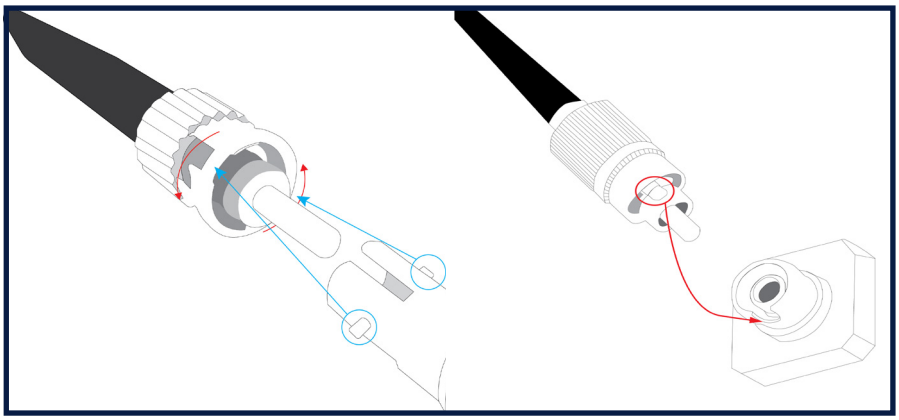


RadiSupply® plug-In card, rear Panel

The following connections and indicators are found at the back panel of the RadiSupply® plug-in card:

Connecting the probe

Clean the ends of the fibre optic cable connectors as described earlier and connect the fibre optic extension cable to both the sensor and the plug-in card. Make sure the latching pin (notch) of the FC and ST connector fits correctly in the slot of the chassis connector (in line coupling).



Installing the small probe stand

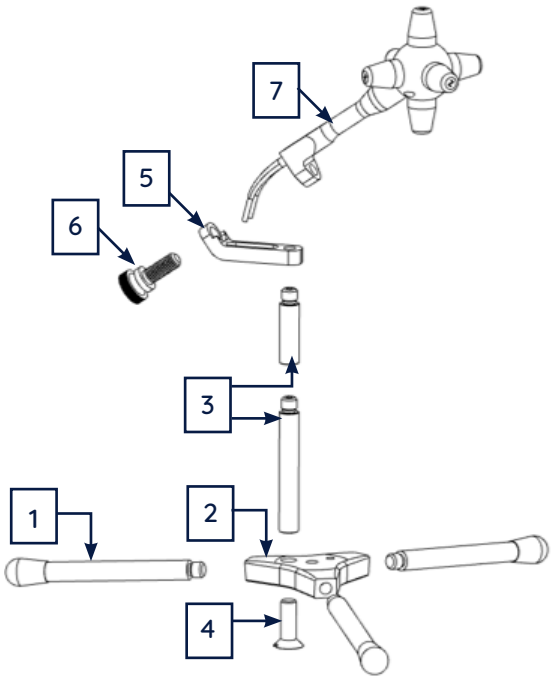
The probe stand is a modular design and can be configured in multiple ways. Feel free to configure the stand in the manner that suits your application best. All mounting treads are UNC ¼”-20 which means the RadiSense® is compatible with lots of mounting equipment.

The probe is provided with a probe stand. This stand can be assembled by screwing the legs [1] in the base [2] by hand.

Use a slotted head screwdriver to screw the Pole [3] on to the base with the provided countersink screw [4].

The angle mount [5] is optional and is used to position the probe in such a way that the probe axis are aligned with a horizontal or vertical field. This screws on to the pole [3].

When isotopic field measurements are conducted the probe [7] can be screwed directly on to the pole [3]. Otherwise, screw the angle-mount [5] on the pole and attach the probe [7] with the provided thumbscrew [6].



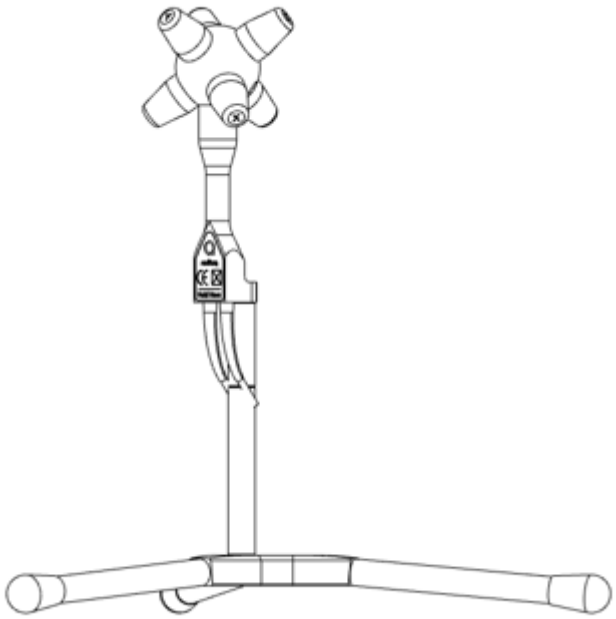
Probe mount setups

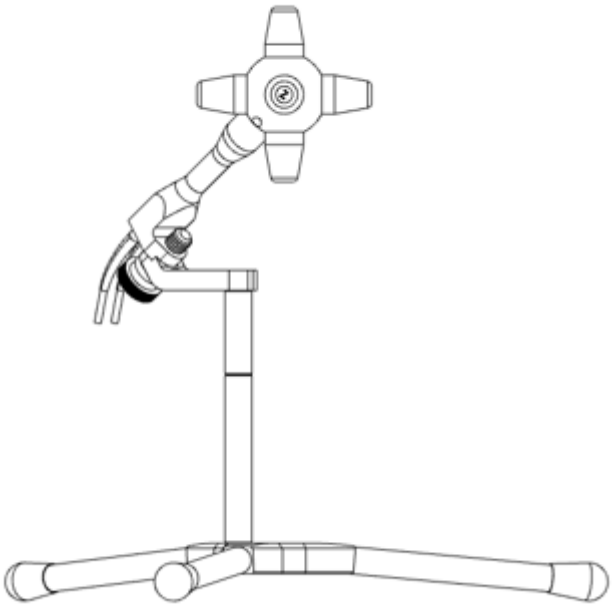
The use of the mounting angle is optional. For isotropic measurements of an electrical field of which the polarization is unknown (for example in reverb- or mode-stirred chamber) the angle-mount is not needed, see left picture below.

For accurate measurements of electrical field with a known polarization, the mounting angle can be used to position the axis of the RadiSense® align to either a horizontal or vertical field. See the right picture below.

In most situations, this is the way an E-field sensor is calibrated, axis by axis. Therefore, the probe is most accurate used in the same way as calibrated, to obtain the most accurate results.

REMARK:
Please be noted that placing dielectric material in close proximity to the field sensor this will influence the field and could cause measurement errors.





Activating the RadiSense®

The RadiSense® electric field probe series. The RadiSense® is a laser-powered probe which is powered from the RadiCentre®. As an additional safety measure the RadiCentre® has a safety feature which needs to be triggered before the laser can be activated. Depending on the type of RadiCentre® used this procedure is as follows.

RadiCentre® CTR1009B and CTR1004B

A 'laser Code' is required to activate the RadiSense® when used in combination with a RadiCentre® CTR1009B and CTR1004B systems. This laser code enables all installed RadiSupply® (laser) modules (Please refer to Chapter 'Laser code' for the default laser code). To prevent accidental activation of the laser, an 'Acknowledge' button will appear directly after the laser 'Start' button is pressed. The laser will only be activated if this button is pressed within a 5 second window.

RadiCentre® CTR2008A and CTR2001E

The RadiCentre® CTR2008A and CTR2001E no not feature a touch-screen thus, a specific activation procedure combined with audible warnings is used to activate the laser of the RadiSense®

To activate the laser in the RadiCentre® Single, follow these steps:

1. Press the 'Laser on' button on the front panel of the RadiCentre® and hold it for at least 3 seconds.
2. Five short 'beep' sounds can be heard.
3. On the fifth 'beep' the laser link is activated and the red 'laser ON' LED (on the RadiCentre® and RadiSupply®) lights up red.
4. Release the 'Laser on' button.

Troubleshooting

If the activation process needs to be interrupted, release the 'Start' button (before the fifth 'beep'). The laser will not be activated. Whenever the activation process is interrupted (and released 'Start' button by accident), the laser will not be activated. To prevent accidental activation of the laser, an auditory warning will alert you of the laser activation procedure (if the 'Start' button is being pressed). To interrupt the activation process, all you must do is release the 'Laser on' button.

Deactivating the RadiSense®

Always deactivate the RadiSense® before disconnecting the fibre optic cable.

RadiCentre® CTR1009B and CTR1004B

Go to the main screen of the RadiCentre® by clicking 'Home' than press the 'Stop Laser' button. Only one probe will deactivate.

RadiCentre® CTR2008A and CTR2001E

Short press the 'Laser on' button. All probes on the system will deactivate.

Connection plugs

Place the RadiSense® E-field sensor where the field strength is to be measured.

Clean the the fibre optic cable connectors and connect the fibre optic cables to both the sensor and the plug-in card. Make sure the latching pin (notch) of the FC and ST connector fits correctly in the slot of the chassis connector (in line coupling).

Connect the RadiCentre® system to the PC using any of the available interfaces of the RadiCentre® system; USB, Ethernet or IEEE-488 (optional).

Interlock

Make sure the interlock safety system is closed, when connecting to the RadiCentre®. If the interlock system loop is not closed/connected the RadiSense® laser will not start. Note that if the interlock loop is broken whilst the laser is active, that the laser of the RadiSense® will be shut off. The Interlock loop needs to be closed or reconnected before the can be restarted again.

The hardware installation for the plug-in card is now complete. The user can control the plug-in card either through the touch-screen on the RadiCentre® system (only available for the 2 and 7-slot versions), or by using the control commands in combination with an external software package such as the RadiMation® EMC test software.

Laser code

As a safety precaution, products that use a laser can only be turned on using a laser code. This code can be entered into the system by use of the touch screen of the RadiCentre®.

This safety feature is linked to the RadiCentre® 2- and 7-slot version. The laser activation and safety is implemented differently in the RadiCentre® Slim.

To meet the laser safety precaution, enter the laser code in the 'Laser Code' screen and press 'OK' for confirmation.

The standard/default Laser code is **3447**

Software configuration

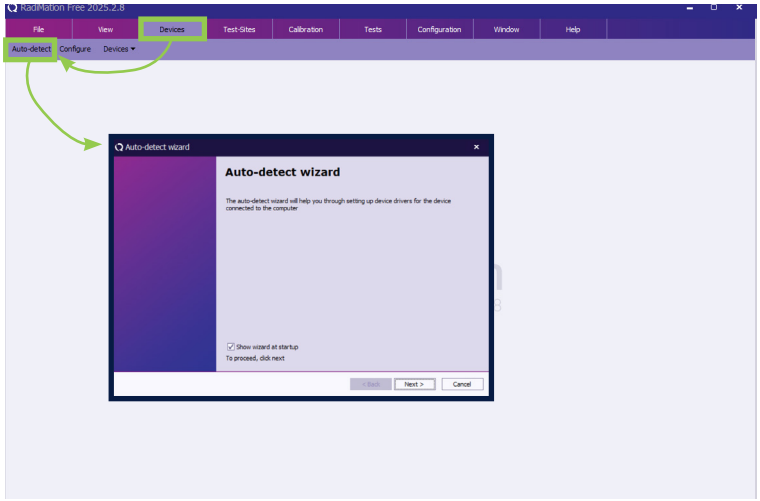
To control the RadiSense® from a computer, one can use either custom software or the RadiMation® EMC software package from Raditeq, which can be downloaded from the Raditeq website. If the RadiSense® is operated manually, this chapter can be skipped.

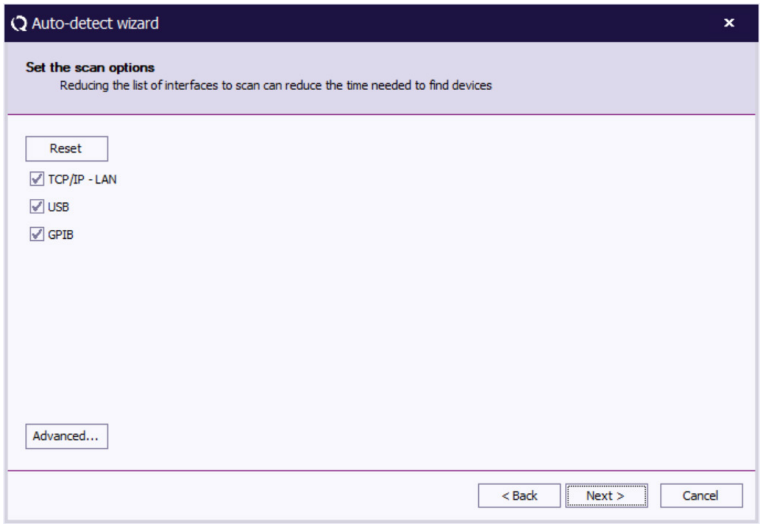
Configuring the RadiSense® in RadiMation®

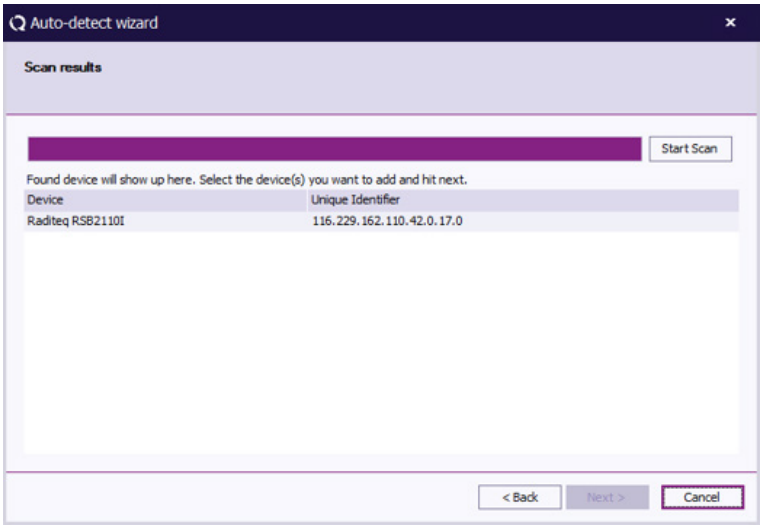
The RadiSense® device driver is part of the field sensor device driver family. Using the Auto-detect function in RadiMation® is the most user-friendly method to connect the RadiSense®. If your RadiSense® is not recognized by this feature, or if you want complete control over the configuration, manual configuration is required.

Automatically configure the RadiSense® in RadiMation®

1. Select the button 'Device' at the top menu bar, followed by clicking 'Auto-detect'. Click Next.
2. Select the method by which your RadiCentre® is connected and click 'Next >'
3. Select the RadiSense® from the found devices and click 'Next >'

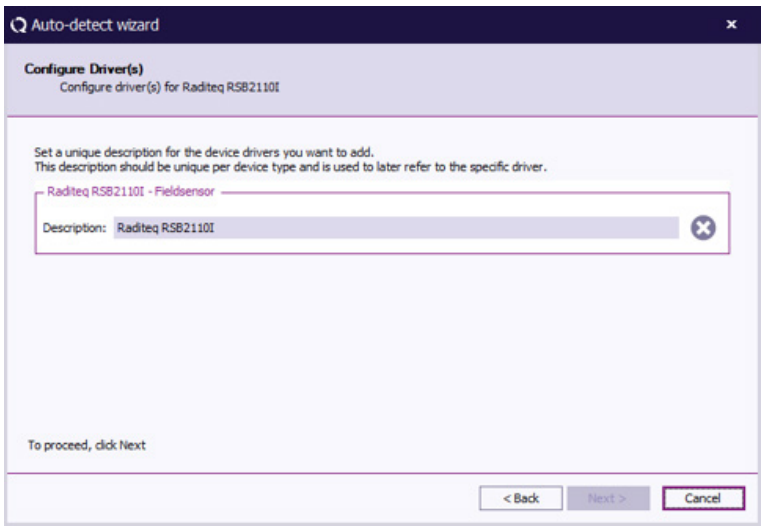


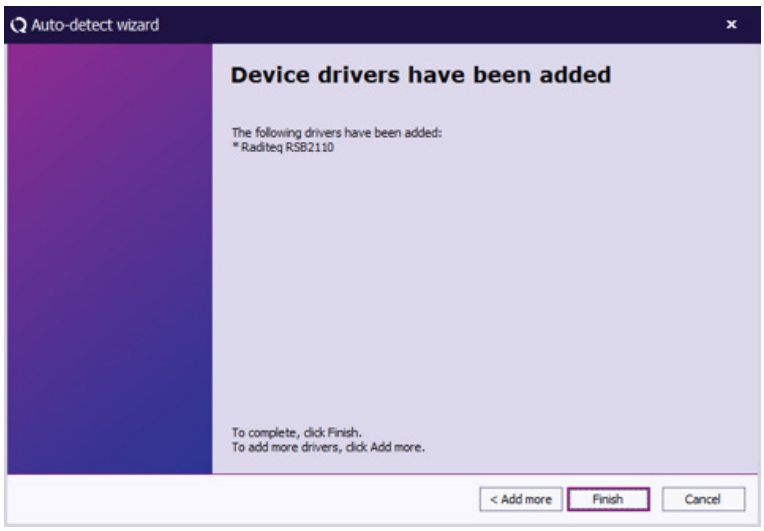




Automatically configure the RadiSense® in RadiMation® continued

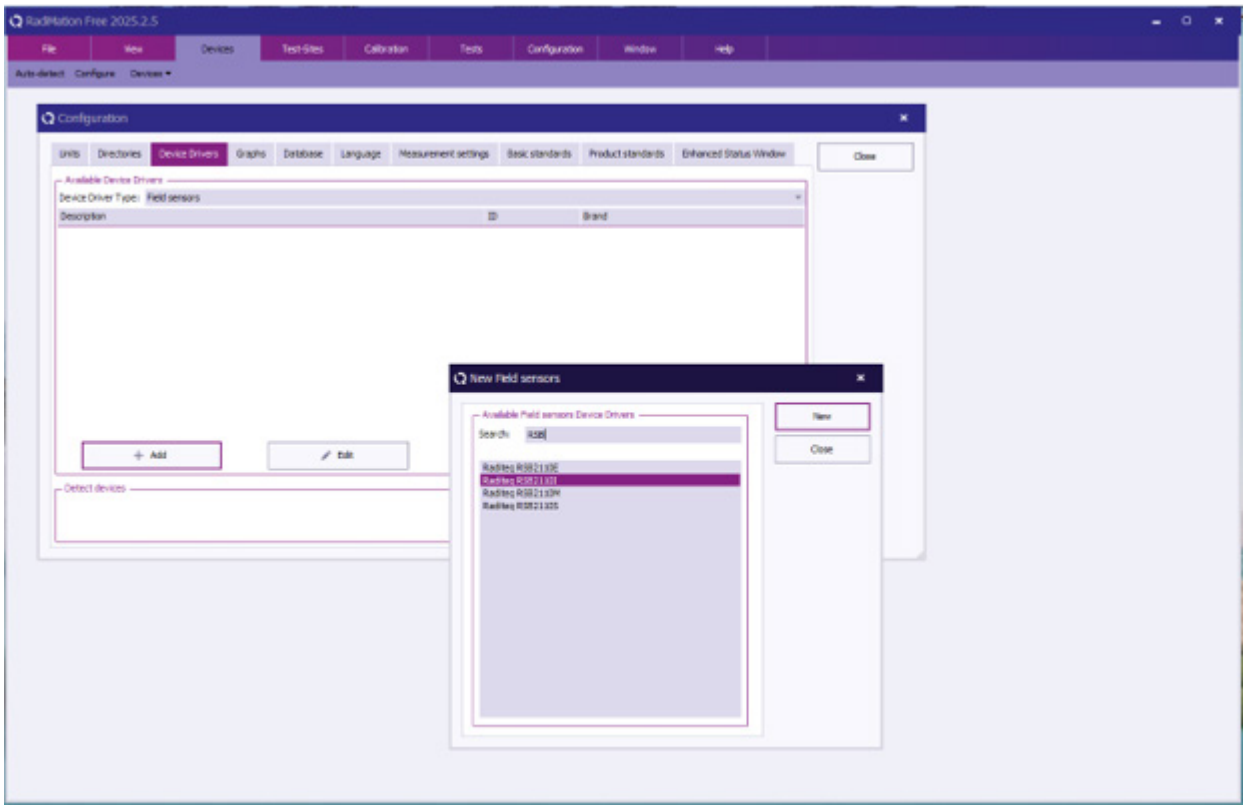
1. Rename the Probe (optional) and click ‘Next >’;
2. Click ‘Finish’;
3. The RadiSense® should now appear under ‘Devices’ -> ‘Devices’ -> ‘Field Sensors’.



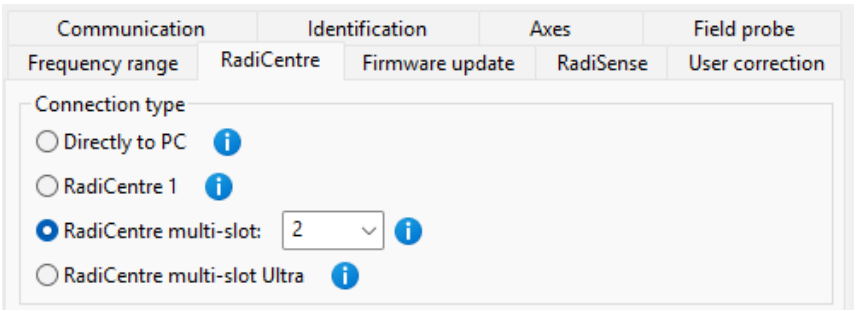


Manually configure the RadiSense® in RadiMation®

1. Start the latest version of RadiMation®;
2. Select the button ‘Devices’ at the top menu bar, followed by clicking ‘Configure’;
3. In the configuration screen select ‘Device Drivers’ and Select ‘Field Sensors’ as driver type;
4. Click the ‘Add’ button to open the selection of available drivers in RadiMation®;
5. Enter ‘RSS’ in the search bar which will show all available RadiSense® drivers;
6. Select the correct driver, double click it (optional, rename it) and press ‘OK’.



1. Select the recently added RadiSense® driver;
2. Select ‘Advanced’;
3. Click on the tab ‘RadiCentre®’;
4. Under device identification select the RadiCentre® slot number the RadiSense® plug-in card is installed in;
5. When the correct slot number is chosen, continue to set the communication of the RadiSense® by clicking ‘Communication tab’.



How to setup the communication of the RadiSense® to the RadiCentre®

1. When in the advanced RadiSense® 10 driver settings, click on the tab 'Communication'
2. Select the interface to be used, for example:
   - GPIB
   - TCPIP
   - USB
   - VISA
3. When these steps are performed, continue to the next steps for checking the communication of the RadiSense®.

How to check whether the RadiSense® is properly connected to RadiMation®

1. Select 'Devices' in the top menu bar;
2. Open 'Device Drivers' and select Device driver type: 'Field Sensors';
3. Double click the recently configured RadiSense® or click 'Edit';
4. Finally select the 'Check' button on the right side of the opened screen;
5. When correctly configured, RadiMation® will notify you that the device is correctly installed.

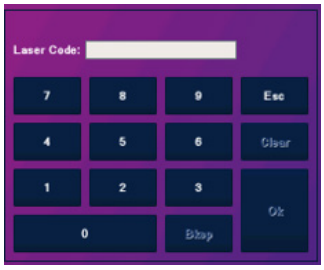
Important information

When you need support with the configuration of your Radi-Product in RadiMation®, please consult the RadiMation® support team at: Support@RadiMation®.com.

It is also advised to visit the RadiMation® Wiki page and the FAQ section, which can be found at: https://wiki.RadiMation®.com

RadiMation® software can be downloaded at: https://www.raditeq.com/emc-test-software/RadiMation®-download

Using the RadiSense®



Manual Control

Once the RadiCentre® is switched on, the RadiSense® can be activated from the 'main' screen on the RadiCentre® touch-screen.

Starting the laser-powered sensor

The laser of the RadiSense® 10 field sensor can be started from the 'main' window of the RadiCentre®. To activate the sensor, press the 'Start' button for the required sensor and, within 4 seconds, the 'ACK' button. A short sound will be audible until the safety loop is closed successfully. As long as the laser is activated, the front and rear 'Laser ON'-indicator will light up to indicate laser operation. Note if the laser code is not entered at the start-up of the RadiCentre® the laser code numpad will pop-up when activating the RadiSense® laser.

Zeroing the probe

The 'Status' box will now indicate "Press this button to zero" (depending on the settings) and after pressing this button the zeroing of the probe will be started. As soon as the probe is zeroed, the 'status' box will display the measured field strength of the probe (see below).

The E-field sensor is now powered on and will return fieldstrength data to the RadiCentre® system. As long as the probe returns data, the laser will continue to power the sensor. If the optical loop is interrupted, the laser will switch off immediately. For maximum accuracy, it is recommended to re-zero the probe whenever the probe temperature changes by more than 5 oC.

Setting the correct measurement frequency

To measure the correct field strength, the current measurement frequency must be sent to the probe. When using the probe manually, in combination with a RadiCentre® or RadiMation®, the frequency can be set in the control window of the RadiCentre® using the button in the left bottom corner:

When using the probe under software control in an automated test setup, the control software must set the correct frequency for each test frequency, using the correct software commands. Please refer to the programming manual how to set the correct frequency. When using RadiMation® EMC software, the device driver of RadiMation® will automatically take care of this.

Select the filter setting

The probe allows the user to select different averaging filters to optimize performance for different applications. The averaging filter can be set between filter 1 and filter 15, where filter 15 is the highest filter setting with approximately 8 second update rate.

Due to the intrinsic non-linear behavior of RF diode detectors typically used in E-field probes, the noise contribution when measuring low field strength values is significantly higher compared to the noise levels when measuring high field strength levels. Therefore, it is recommended to use a higher filter setting when measuring low field strength levels.

Please note that a lower filter setting will increase measurement speed at the cost of increased noise levels. On the other hand, a higher filter setting will reduce measurement speed while reducing the noise.

DYN = dynamic (16 to 128 times depending on value)

1 = 4 times average
2 = 8 times average
3 = 16 times average
4 = 32 times average
5 = 64 times average
6 = 128 times average
7 = 256 times averaging
8 = 512 times averaging
9 = 1024 times averaging
10 = 2048 times averaging
11 = 4096 times averaging
12 = 8192 times averaging
13 = 16384 times averaging
14 = 32768 times averaging
15 = 65536 times Averaging

Reading probe data

Readings from the probe can be taken directly from the display, with the RadiMation® EMC software or any other software package. This is also possible with the Raditeq software: Electric Field Monitor (EFM) software. This program does not need any installation and can be directly activated by clicking the icon. The EFM software can be downloaded from the Raditeq website.

Probe configuration and advanced measurement data

The 'STATUS' box in the main screen of the RadiCentre® only displays the total isotropic field strength (depending on settings). When more advanced data is required (such as field strength of the separate axis, probe temperature, laser current etc.). Access the 'Instrument'-screen by pressing the 'STATUS' box of the required device from the main screen.

The 'Instrument'-screen will display the isotropic field strength in a large font, together with the field strength data of each separate axis. In addition; probe information and laser information are also displayed in the 'Instrument'-screen. The calculation of the isotropic field strength is performed according to the following formula:

$$Etot = \sqrt{Ex^2 + Ey^2 + Ez^2}$$

Performing an Zero

Upon startup a 'Zero' is forced (depending on settings) and also whenever the ambient temperature changes by more than 5 °C. Zeroing compensates for any offset in the measurement electronics and helps maintain a stable and reliable measurement baseline.

A zero should always be performed without an E-field present. Ideally, this is done with the test room or chamber door closed, so the sensor is not influenced by external RF signals or ambient electromagnetic fields. During the zero procedure, the field sensor must remain stationary and should not be exposed to any intentional RF field.

If RF amplifiers are used in the test setup, it is recommended to take them out of operate mode before performing the zero. Even when no test signal is intentionally applied, active amplifiers may increase the noise floor. This can affect the zero reference and may result in less accurate field measurements. After the zero procedure has been completed, the test setup can be returned to its normal operating condition. The sensor is then ready for accurate E-field measurements.

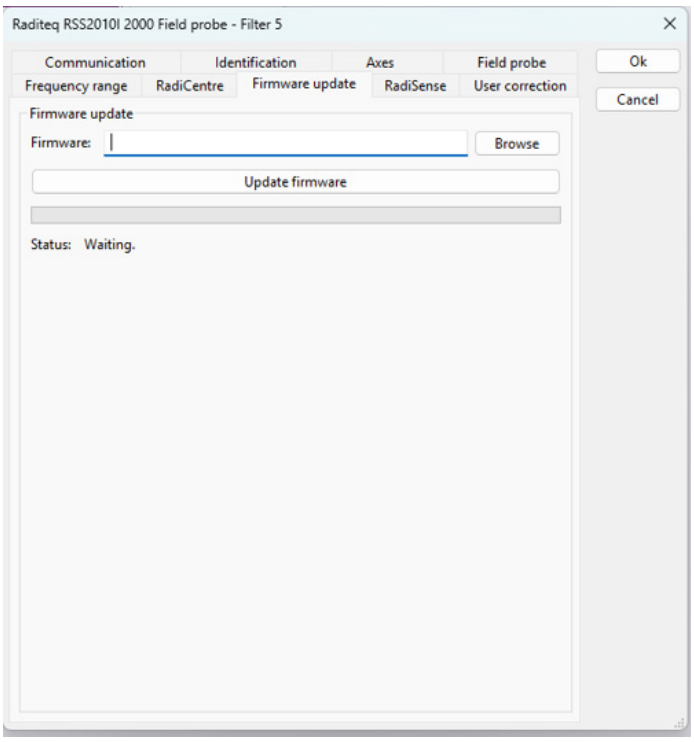
Performing a firmware update using a CTR1009B or CTR1004B

When you are using the RadiSense® in combination with a CTR1009B or CTR1004B, please follow the Firmware update manual:
https://www.raditeq.com/products/modular-test-systems/software-update/

Performing a firmware update using RadiMation®.

To update your RadiSense® using RadiMation® an a.43 format firmware update file is required. Please contact your local reseller for this correct file. Please note that using the wrong file will damage the product.

1. Open RadiMation®
2. Go to Devices -> Configure
3. Device drivers -> Field sensors -> Edit
4. Go to the advanced settings -> Firmware update
5. Browse to the .a43 file
6. Click update. Do not shut-down any equipment during the update.



Warranty Conditions

Raditeq B.V. offers a standard warranty term of three (3) years on their products, calculated from the shipping date.

Return Material Authorization (RMA) & Warranty repair

If a defect occurs to our product within the warranty term, a Return Material Authorization (RMA) 'Warranty Repair' request can be issued using the RMA link at www.raditeq.com/support**.** Upon receipt of the request, an RMA number will be provided. Please do not send the product without this RMA number! The defective product should be shipped to our service department at the following address:

Raditeq B.V. – Service Department
Vijzelmolenlaan 3
3447GX WOERDEN
The Netherlands

There will be no charge for repair services (materials or labour) within the (extended) warranty term.
These warranty terms are not applicable to:

- Normal wear and tear
- Fibre optic cables
- Products that have been improperly used
- Products that have been used outside their specified range
- Products that have been improperly installed and/or maintained
- Products that have been modified without approval of Raditeq
- Calibration and/or re-calibration of the product

Repair services on products that are not covered by the Raditeq warranty will be charged to the customer.

Repairs outside warranty

If a defect is not covered under warranty, an RMA fixed-repair can be ordered on the RMA link: www.raditeq.com/support If a re-calibration is needed after repair, this calibration should be ordered separately. The calibration will be performed at the ISO17025 accredited calibration laboratories of Raditeq, based on the applicable service code / prices.

Warranty after repair

For repairs outside the original warranty period, a limited warranty of six months is applicable on the performed repair. Shipping conditions are the same as with repairs that are covered within the original warranty period.

Shipping

The customer will need to arrange shipping and cover for the costs (like e.g. transportation costs, duties, taxes) for sending the defect product to the service department of Raditeq in The Netherlands. Raditeq will arrange the courier and cover for the costs for the return shipment after repair.

Dimensions in mm