

RELEASE NOTE SUMMARY



Overview

This document provides a compilation of Release Notes that have been published by Industrial Scientific. *Table 1. Document Summary* provides a list of version numbers, release dates, and a brief overview of each Release Notes document. Following Table 1, you will find a copy of the complete version of each document.

Document Summary

Table 1. Release Notes Document Summary

Instrument	Version	Release Date	Summary of Features Added and Issues Addressed
<u>Radius BZ1</u>			
SafeCore™	v4.41	4/26/2023	LENS group letter displayed on screen, datalog memory enhancements, enhanced Always On mode, and IEC CH4 compatibility
SafeCore™	v4.4	10/24/2022	Disable connection lost warnings and mg/m3 unit display, translation fixes, other bug fixes
SafeCore™	v4.3	06/01/2022	Newly introduced sensors (ClO ₂ , HCl, HC IR, CH ₄ IR), datalog, IR sensor, and LENS improvements
SafeCore™	v4.2	06/16/2021	LENS & Wireless communication improvements, Low battery warning threshold, and Simplified Chinese language support
SafeCore™	v4.1	05/28/2020	Version 4.1 supports Radius BZ1 Area Monitor compatibility with SAFER One software.
SafeCore™	v3.2	04/18/2019	This release includes minor bug fixes for the peer alarm indicators and PID sensor.
SafeCore™	v3.1	01/28/2019	Version 3.1 supports CE/RED compliance as well as new and updated instrument settings.



SafeCore™	v3.0	09/03/2018	This release supports compatibility with the RGX™ Gateway.
SafeCore™	v2.0	12/06/2016	Version 2.0 provides LENS™ Wireless connectivity with the Ventis™ Pro Series personal gas monitor and includes interface improvements for LENS Wireless.
SafeCore™	v1.3	10/04/2016	Version 1.3 updates the LENS Wireless radio script.

Radius BZ1

SafeCore v4.41 – released April 26, 2023

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: DSXi v11.1 or above is required to read and update SafeCore v4.41 features using iNet Control.

Upgrade Methods

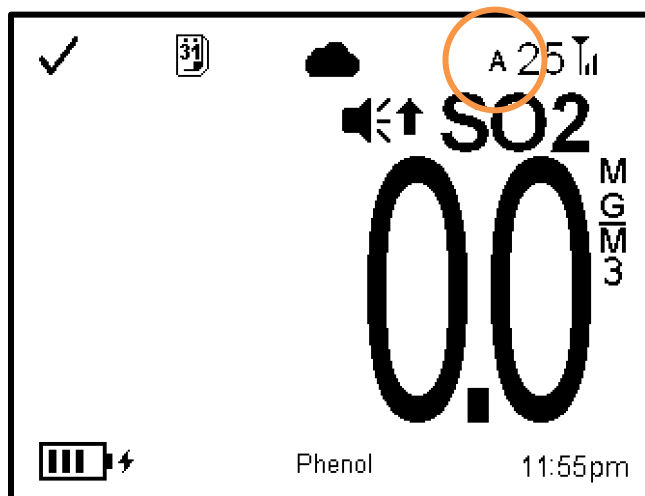
Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What is New in SafeCore v4.41?

SafeCore v4.41 improves performance through various bug fixes and enhancements, listed below.

LENS group letter displayed on screen

When connected to a peer group, the Radius display will show the peer group letter to the left of the peer count. Note: the location of the bump test/calibration overdue icon has been moved further left.



Datalog enhancements

The SafeCore has a potential memory leak when allocating storage for datalogs exceeding 10 Mb. This can occur when a DualSense configuration is used and the SafeCore is not docked for long periods of time. The memory leak issue is fixed, but frequent docking continues to be recommended.

Additional “Always On” capability

The Radius will now allow continued operation while plugged in with non-intrinsically safe (IS) power supply **and** “Always On” mode enabled. Previously, plugging in a non-IS power supply would override “Always On” and begin shutdown procedure. Note: Radius will continue operating when IS power supply is plugged in; this has not changed.

Power Supply	Always On Enabled?	Radius Behavior
Standard (non-IS)	Yes	Continue operating
	No	Shutdown
Intrinsically Safe (IS)	Yes	Continue operating
	No	Continue operating

IEC regulation compatibility

German regulation requires 100% LEL to be 4.4% volume CH₄, compared to NIOSH 5% volume CH₄. LEL mode now has a selection of NIOSH or IEC. Selecting IEC corresponds to 4.4% volume CH₄ and calibration gas concentration 2.2% volume CH₄.

Minor enhancements and bug fixes

Fixed Radius shutdown event not reaching iNet while the charger is plugged in

Fixed peer serial numbers occasionally being corrupted due to memory overwrite

Fixed bump test overdue warning, even after bump testing

SafeCore v4.4 – released October 24, 2022

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: DSXi v10.9 or above is required to read and update SafeCore v4.4 features using iNet Control.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

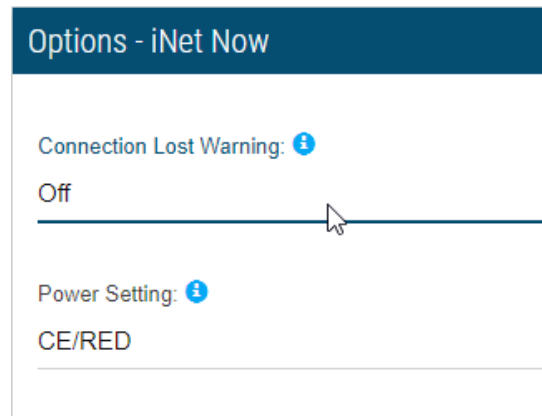
What is New in SafeCore v4.4?

SafeCore v4.4 includes an option to disable connection lost warnings, mg/m³ unit display, translation fixes, and various bug fixes.



iNet Disconnect Alarms

Users with access can set or disable connection lost warnings through iNet, including “Off” and “Audible” options



Mg/m3 Unit Display

Implemented mg/m3 display unit of measure for toxic gas sensors: H2S, CO, NH3, NO2, SO2.

Minor enhancements and bug fixes

Fixed off-centered correlation factor in the display

Fixed LENS placed in fault if GPS setting is edited while LENS is disabled

Minor fixes related to blacklisting and connectivity

SafeCore v4.3 – released June 1, 2022

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: DSXi v10.8 or above is required to read and update SafeCore v4.3 features using iNet Control.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What is New in SafeCore v4.3?

SafeCore v4.3 includes support for the newly introduced sensors (ClO₂, HCl, HC IR, CH₄ IR), datalog, IR sensor, and LENS improvements.

New Sensors

Added functionality and compatibility for four new sensors:

- Chlorine Dioxide (ClO₂)
- Hydrogen Chloride (HCl)



- Hydrocarbon Infrared (HC IR)
- Methane Infrared (CH4 IR)

Datalog

Various datalog fixes have been added, including issues when user disables sensors or datalogs being lost due to an identical time stamp.

IR Sensor

A fix has been added for IR sensor that previously breaks communication on aspirated units, causing errors while docking and preventing calibration.

LENS Improvements

LENS Periodic Message Feature – Fixed closed loop feedback that is created from the SafeCore being "heard" by the RGX to ensure the correct connection cloud icon is displayed on the unit.

Ability to read LENS script version – Embedded enhancements to help verify a LENS script upgrade was successful.

LENS scan mode improvements – Refined conditions to more accurately alert user when LENS connection is lost.

Minor enhancements and bug fixes

Bootloader Update – After address of parallel flash is initialized, memory address in MODBUS received message is not set as parallel flash memory location.

HC IR Sensor Calibration – Improved HC IR calibration setting to read OR when calibrated with 100% LEL and allow for calibration percentage other than 50% LEL.

SafeCore v4.2 – released June 16, 2021**Upgrade Recommendation**

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: DSXi v10.6.1 or above is required to read and update SafeCore v4.2 features using iNet Control.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What is New in SafeCore v4.2?

SafeCore v4.2 includes LENS & Wireless communication improvements, Low battery warning threshold, and Simplified Chinese language support

LENS & Wireless Communication Improvements

This version introduced numerous improvements that are detailed below for LENS, Wireless, and GPS



- **Automatically reconnect to LENS Group:** Functionality has been enhanced to ensure that the device can automatically reconnect to the LENS Group without rebooting or additional user intervention
- **Immediate GPS Update:** functionality has been added to resolve issues where the initial GPS update could take up to 60 Mins
- **Remove need to reboot when enabling GPS or changing wireless mode:** When enabling GPS or changing the LENS mode after the device is powered on a reboot is no longer required
- **Disable “No GPS Signal” Warning:** When using the device with a fixed-location users can now choose to disable the warning to prevent unwanted alarms
- **Group Lost Display:** Ensures that group lost is displayed properly when all peers have been lost

Low Battery Warning Threshold

New functionality has been added to provide users with greater control to determine when a low battery warning will be created. A new setting has been added to trigger the warning when the threshold that is configured in the Alarms menu is reached. The threshold can be set from 5-95%

Simplified Chinese

Support for Simplified Chinese on all menus and screens have been added to provide better support for our Chinese customers

Minor enhancements and bug fixes

- **Ambient Temperature Display:** New ability to alternate the time display with the ambient temperature reading
- **Ability to disable STEL/TWA calculation:** New ability to disable STEL/TWA calculations when they are not needed based on the application to conserve battery life while removing the alarms
- **TGX Gateway connection:** Displayed on SafeCore Screen as “SAT” when using the TGX and the connection to iNet is using Satellite
- **IR Sensor Pressure Compensation:** IR Sensor Pressure Compensation to improve sensor accuracy when calibrated at a higher pressure than the environment where the device will be used
- **NO, Bias, Sensor Wait Period:** Algorithm added to ensure that biased sensors like NO have the proper time to ensure accuracy in readings if left unbiased
- **LENS Radio Corruption:** Added capability for docking station to query LENS script version stored in memory after upgrade for verification and extended capability for docking station to update Safecore Bootloader which addresses root cause of the 'Radio Corrupted' issue
- **Read LENS 927 heartbeat register:** Added capability for Safecore Firmware to read the LENS heartbeat register from the Synapse radio when in the 'Connecting' state and set to Wireless Mode 'Local Only'

SafeCore v4.1 – released May 28, 2020

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.



Note: DSXi v10.1 or above is required to read and update SafeCore v4.1 features using iNet Control.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What's new in SafeCore v4.1?

SafeCore v4.1 includes SAFER One integration support as well as minor enhancements and bug fixes.

SAFER One Integration

Radius BZ1 Area Monitors can now provide real-time gas concentration data to SAFER One, allowing users to create a dynamic dispersion model that quickly identifies the source and predicted path of a hazard following a chemical release. Responders can easily assess the severity and potential community impact of any chemical situation and take control by determining where to shelter workers, whether to evacuate nearby residents, and more. In order to use a Radius BZ1 Area Monitor with SAFER One, three things are required:

- A SAFER One subscription. Contact your local ISC Sales Representative for more information.
- Radius BZ1 Area Monitors equipped with SafeCore Modules that have firmware v4.1 or greater and RGX Gateways equipped with firmware v1.6 or greater.
- All equipment should have the Dynamic Monitoring Mode setting set to *On* in iNet Control. The Dynamic Monitoring Mode setting optimizes the GPS and gas reading interval settings of the unit specifically for use with SAFER One. The setting should not be used when viewing data in iNet Now. (SCRFIRM-120, SCRFIRM-134)

GPS Radio Options

Previous SafeCore firmware allowed for two GPS radio settings - *On* or *Off*. In order to preserve overall Radius BZ1 run time, the *On* setting power cycled the GPS radio. As a result, the GPS radio, at times, reported an inaccurate location to iNet Now. With firmware v4.1, you can now balance run time expectations with GPS accuracy based on your application. There are now three GPS radio settings:

- *Always On* – The GPS radio remains powered on at all times, allowing the unit to prioritize location accuracy over run time. When this setting is selected, the run time of the unit is expected to be decreased by up to 10%.
- *Power Saver* – The GPS radio will perform as it did with the previous “On” setting and will be power cycled, creating a balance between run time and location accuracy. This setting is ideal for applications where the unit is expected to remain in one location for days at a time.
- *Off* – The GPS radio is powered off and the Radius BZ1 is unable to report a location. Note: Radius BZ1 Area Monitors that will remain in one place for long periods of time can have their location pinned in iNet Now and the GPS radio set to *Off*, allowing for maximum run time.

Minor enhancements and bug fixes

- LENS Scan Mode – LENS-enabled Ventis Pro Series and Radius BZ1 Area Monitors are now able to automatically join available LENS groups that are within range.
- Improved iNet Now Connectivity – Minor fixes related to GPS updates and iNet Now connectivity. (SCRFIRM-145, SCRFIRM-154)
- Minor, non-critical bugs were addressed with this firmware update. (SCRFIRM-147, SCRFIRM-59, SCRFIRM-72)



SafeCore v3.2 – released April 18, 2019

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: DSX-i v7.7 or above is required to read and update SafeCore v3.2 features

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What's new in SafeCore v3.2?

SafeCore v3.2 includes minor enhancements and bug fixes.

Minor enhancements and bug fixes

- **Peer alarm indicators** – Corrected issue where manual adjustment of the peer alarm indicators does not apply to the instrument. (SFCORE-34)
- **PID sensor error** – It was found that if a PID sensor was disabled in the field and then later enabled, the sensor would be in an error state. This has been corrected to allow a PID sensor to be disabled and enabled in the field. (SCRFIRM-70)

SafeCore v3.1 – released January 28, 2019

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: DSX-i v7.7 or above is required to read and update SafeCore v3.1 features.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What's new in SafeCore v3.1?

SafeCore v3.1 includes new and updated settings.

- **New options for maintenance indicators** – The dock due option displays a notification when the instrument should be placed on a docking station for calibration, bump testing, or data synchronization (based on the calibration due, bump due, and sync intervals respectively). When enabled, the dock due indicator replaces the bump and calibration due indicators. Radius BZ1 users can now choose to have the dock due indicator trigger based on different alarm conditions



as they occur (i.e. Low, High, TWA, and/or STEL). This can help encourage timely reporting of alarm events regardless of the scheduled intervals between bump tests and calibrations. (SCRFIRM-21)

- **New alarm tone** – Four alarm tones are now available for Radius BZ1 – *Sweep, Dual Tone, Single Tone, and the new Chirp tone.*
- **Confidence indicator intervals** – The confidence indicator emits a signal to indicate to users and others nearby that the instrument is powered on. Radius BZ1 users can now choose the interval of time between signals. More frequent confidence indicator signals will have an impact on instrument runtime. (SCRFIRM-14)

Confidence Indicator Setting	Confidence Indicator Interval	Radius BZ1 Run Time*
Off	N/A	168 hours
Visual only	90 seconds	167 hours
	30 seconds	165 hours
	15 seconds	162 hours
Audible only	90 seconds	168 hours
	30 seconds	167 hours
	15 seconds	165 hours
Both visual and audible	90 seconds	167 hours
	30 seconds	163 hours
	15 seconds	158 hours

*Run time may vary based on in-field conditions and installed components. Run time estimates are based on an instrument with a standard 4-gas configuration, no pump, and with LENS enabled when operated at room temperature.

- **iNet Now lost indicator** – A new indicator has been added allowing Radius BZ1 users to know when connection to iNet Now has been lost. The indicator can be visual only or audible and visual. (SCRFIRM-17)
- **German compliance start-up message** – For German customers, the Compliance Start-Up Message can now be turned on or off. (SCRFIRM-19)
- **Wireless radio power setting for EU/RED compliance** - SafeCore v3.1 allows the adjustment of the LENS radio power to follow CE/RED compliance. The two new settings for this feature are *World Mode* and *CE/RED Compliant*. The setting can be changed directly from the instrument or using iNet Control. (SCRFIRM-15, SCRFIRM-48)

Minor enhancements and bug fixes

Minor, non-critical bugs were addressed during this firmware update. (SCRFIRM-17, -18, -22, -24, -25, -27, -34, -35, -36, -40, -47, -53, and -60)

SafeCore v3.0 – released September 3, 2018

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Note: This firmware upgrade is required to use Radius BZ1 Area Monitors with RGX Gateways.

Upgrade Methods

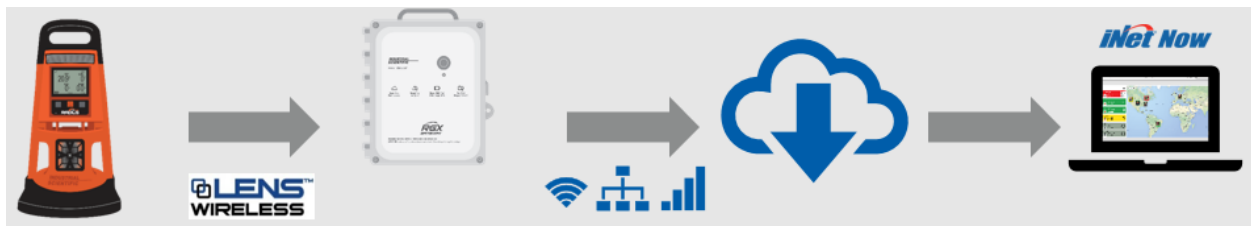


Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What's new in Safecore v3.0?

RGX Compatibility

The Radius BZ1 is now compatible with the RGX Gateway. The RGX Gateway connects with the Radius BZ1 via LENS, providing real-time access to hazardous exposures, panic, man-down situations, and exact locations via text, email, or on-screen alerts. With the RGX Gateway, customers can now use iNet Now features in hazardous locations without the need of a smart device. (SCR-180, SCR-135, SCR-190, SCRQA-93, ZAP-2008, ZAP-2100, SCRQA-108, SCRQA-112, SCRQA-111, ZAP-2013, ZAP-2012, ZAP-2016, ZAP-2019, SCRFIRM-2, ZAP-2022)



Minor enhancements and bug fixes

- SCR-41, -69, -152, -188
- SCRQA-80, -82, -94, -105, -106, -114, -115
- ZAP-2006, -2009, -2014, -2020, -2024, -2025
- SCRFIRM-7

SafeCore v2.0 – released December 6, 2016

Upgrade Recommendation

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Upgrade Methods

Using a DSXi Docking Station, this firmware upgrade can be completed in approximately 8-10 minutes, or you can contact your local Industrial Scientific Service Center for assistance.

What is New in SafeCore v2.0?

LENS™ Wireless connectivity with the Ventis™ Pro Series

Originally released with the Radius™ BZ1 Area Monitor, LENS Wireless is an out-of-the-box, self-configuring, peer-to-peer wireless mesh network that does not require time consuming setup or expensive infrastructure. LENS Wireless users can now join Ventis Pro Series personal monitors to Radius BZ1 groups. (SCR-1)



User interface improvements for LENS Wireless features

Minor enhancements to the user interface for LENS Wireless related features, including better icons, home screen alarm cycling, and transferring pump fault alarms. (SCR-79, SCR-80, SCR-81, SCR-82, SCR-83, SCR-119)

Minor bug fixes

Minor, non-critical bugs were addressed during this firmware update. (SCR-88, SCR-97, SCR-117)

SafeCore v1.3 – released October 4, 2016**Upgrade Recommendation**

- ☐ Critical – All instruments must be upgraded to ensure continued safe operation.
- ☒ Recommended – Industrial Scientific recommends you upgrade the instrument firmware to ensure optimal performance.
- ☐ Optional – Users may upgrade instruments to take advantage of new features.

Upgrade Methods

This firmware upgrade can be completed using a DSXi Docking Station in approximately 8-10 minutes, or contact your local Industrial Scientific Service Center for assistance.

What is New in SafeCore v1.3?

(SCR-113) Process change to update LENS™ Wireless radio script to v1.0.1

Improved LENS Wireless stability for large numbers of instruments (>10 peers) in the same group

No functional changes are in v1.3.

