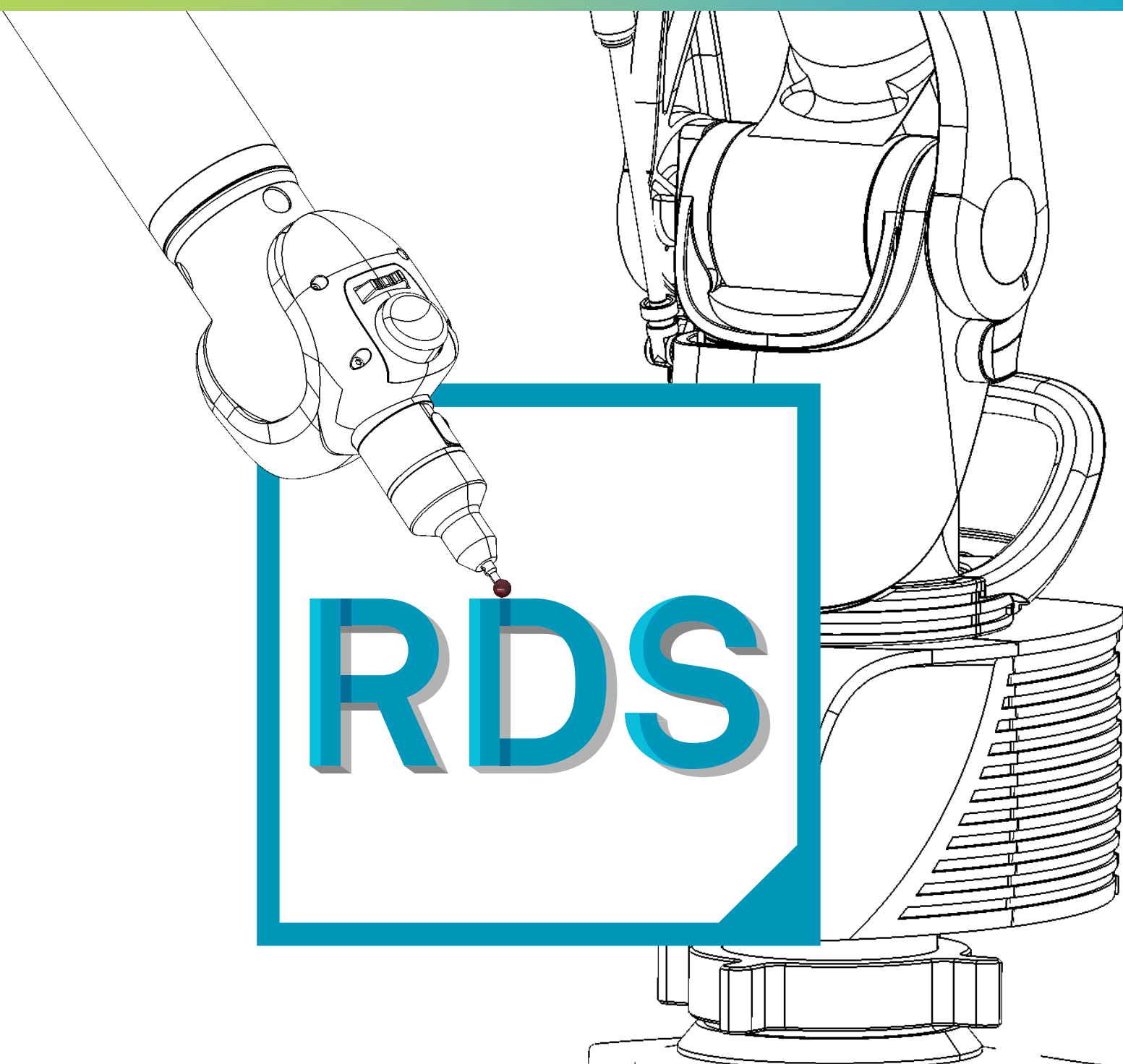


RDS V6

What's New



RDS

What's New in RDS V6.6

Information, support:

www.HexagonMI.com

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INTRODUCTION

Dear RDS user, we are pleased to present you this new intermediate release of RDS.

For further information, please contact your local Hexagon's Manufacturing Intelligence division representative.

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Conventions used in this Guide



Information indicates general advice or links to relevant documentation.

Complete documentation

For more detailed information, please read complete manuals:

Instrument	Absolute Arm Manual
	Leica Absolute Tracker AT930-AT960 User Manual
RDS	RDS Software Manual
Maintenance	Technicians Manuals

1 RDS 6.6

1.1 RDS 6.6 Summary

RDS 6.6 addresses the following new developments and changes:

- [Scanning with AS1 / AS1-XL can provide the greyscale on the point cloud.](#)
- [Easier alignment for the AS1 and AS1-XL on the arm.](#)
- [Faster links to scanners alignment.](#)
- [Possibility to export and import scan profiles.](#)
- [New option to switch on-off the far scanning range for the AS1-XL.](#)
- [New built-in profile for the AS1-XL.](#)
- [New function "Save to Probe" for the tracker.](#)
- [Sounds can be sent to the PC speakers.](#)

Other improvements and corrections:

- [Standard RDS installer unlocked to Nikon arms.](#)
- [Removal of the RA8 gateway configuration \(RED 2014/53/EU – RDS 6.5.2\).](#)
- [Windows 24H2 location permission for Wi-Fi connection \(arms\).](#)
- [Windows server compatibility](#)
- [List of ports and firewall updated in the user manual](#)
- [Executable files removed from the public documents folders](#)
- [.NET updated from .NET 6 to .NET 8](#)
- [Various tracker fixes.](#)
- [Various Installer improvements.](#)
- [Various fixes for Automation issues.](#)

1.1.1 Firmware & software Requirements

The firmware of the instruments and accessories should be always up to date with the following minimum versions.

	RA7		RA8		AT960
System Software			v 2.3.2.142		
Main / Mother Board	v 2.22		v 4.3.1.3397		v 2.3
Mother Board PIC	v 11		-		-
Event Board	Std Wrist v 128	RA8 Wrist v 4.3.0.3388	v 4.1.0.3369		
Display Board	-		v 4.3.0.3388*		-
VT Board			v 4.1.0.3369**		
SMART Board	SMART v1 v 29	SMART v2 v 4.1.0.3369	SMART v1 v 29	SMART v2 v 4.1.0.3369	-
Connection Pack	FP2+/3+ v 17		CP2 / CP3 v 2.3.0.7048	CP-C/B/W v 3.0.0.1044	CB21 v 1.1.0.288
Bluetooth	-		v 1.1.1.0		-
RDS Software Package	v 6.6.0		v 6.6.0		v 6.6.0
RDS API	v 6.6.0		v 6.6.0		v 6.6.0
AP21	-		-		v 1.2.0.1858
RS6			v 1.0.0.207		-
AS1 / AS1-XL	v 1.4.0.1490		v 1.4.0.1490		v 1.4.0.1490
Tube Probe	v4.0		v 4.0		-

Green: new version | *: RA8 v2 only | **: RA8 v3 only



Support for the RS-SQUARED will be stopped on next version.

1.1.2 Computer Requirements

The following information presents the computer **minimum** required specifications depending on the final application. Always ensure that the application software you are using is not requiring higher specifications.

Probing and Tubing

	Tubing / Probing	Probing with CAD
Processor	2 Core / 2 GHz	4 Core / 2 GHz
RAM	2 GB	4 GB min 👍 16 GB
Disk space	30 GB	
Ports	2 x USB Port	
Graphic card	512MB (SVGA graphics card capable of OpenGL representation) 👍 NVIDIA	
Screen	HD1080 (1920x1080)	
Operating System	Win10/Win11 Pro/Enterprise 64-bits Windows Server 2016/2019/2022	
Wi-Fi card	FP2+ / FP3+ CP2 / CP3	Any card supporting IEEE802.11ac (Access Point)
	CP-W	Any card supporting IEEE802.11acx (Access Point)
Internet connection	For SMART data exchange, an internet connection must be available, and firewall allows the connection to RDS Toolbox.	

👍: Recommended for higher performances



It is highly recommended to keep Windows up to date.
Windows10 Enterprise LTSB is not recommended.



Wireless connection to the RA7 with FP2 and FP3 is not more supported.

Scanning

	HP-L-8.9	LAS / LAS-XL	RS2 / RS3 RS4 / RS5	AS1 / RS6 / AS1-XL
Processor	4 Core	4 Core	6 Core (I7-8 th gen)	6 Core (I7-10 th gen) 👉 16 Core (I9-12 th gen)
RAM	16 GB min 👉 32 GB	16 GB min 👉 32 GB	32 GB min 👉 64 GB	64 GB min
Disk space	60 GB 👉 SSD			
Ports				
USB	2x <u>USB 3.0</u> Port			
Ethernet	1 x LAN Port Gigabit (on-board) or provided USB-Ethernet adapter			
Graphic card	SVGA graphics card capable of OpenGL representation (NVIDIA)			
	RTX3000	RTX3000	RTX A3000 👉 RTX A4000	RTX A4000 👉 RTX A4500
Screen	HD1080 (1920x1080)			
Operating System	Win10/Win11 Pro/Enterprise 64-bits Windows Server 2016/2019/2022			
Wi-Fi card	Not supported	Not supported	Any card supporting 802.11ac	Any card supporting 802.11acx (CP-W only)
Internet connection	For SMART data exchange, an internet connection must be available, and firewall allows the connection to RDS Toolbox.			

👉: Recommended for higher performances

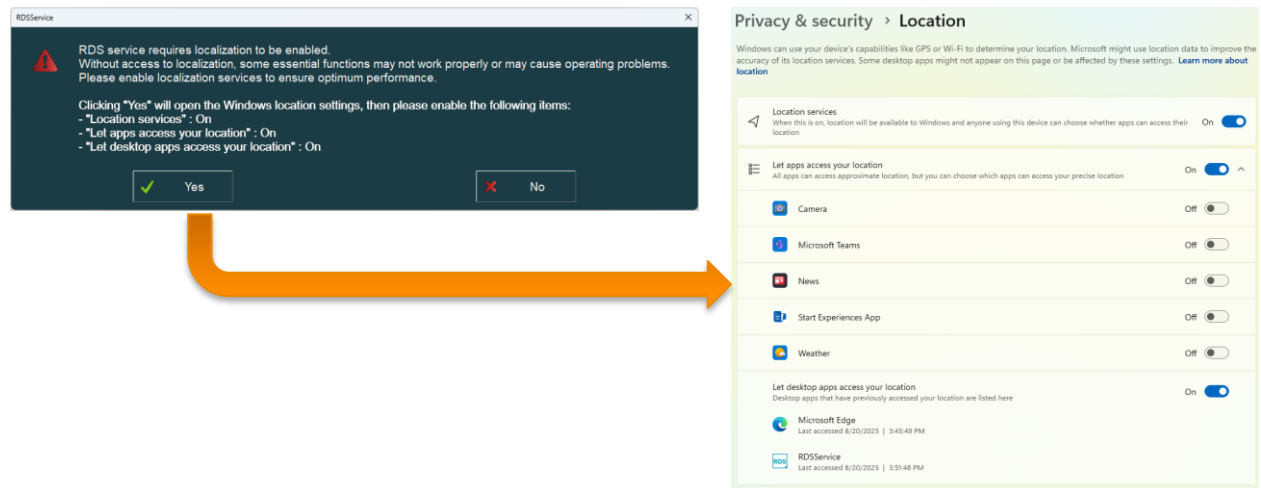
1.2 RDS Installation

Windows 24H2 Location Permission for Wi-Fi Connection (arms)

The recent Windows update to 24h2 (September 2024) has introduced a bug that causes RDS Service to crash when connecting by Wi-Fi.

This is due to a change Microsoft has made to their adapter handling, requiring the activation of the location access for applications.

This Windows requirement remains, but now, trying to connect by Wi-Fi, RDS brings you to the activation of location.



Even in case the location services are not enabled, no more crash will occur, and the connection will remain. However, performance may be affected.

Windows Server Compatibility

The support for Windows operating system has been further extended to include the three Microsoft Windows Server Versions 2016, 2019 and 2022.

List of ports and firewall updated in the user manual

The list of mandatory ports and firewall has been reorganized to provide a clearer view of what is necessary depending on arm, tracker or scanner use.

Executable files removed from the public documents folders

Until RDS 6.5, some unwanted remaining executable (*.exe) files were still installed on the C:\Users\Public\Documents\Romer\RDS\ location. The useless files have been removed and the necessary ones moved to the C:\Program Files\ (RDS) folder.

.NET updated from .NET 6 to .NET 8

Support for .NET Desktop Runtime 6.0 x64 ended in November 2024. To maintain the benefits of security patches, RDS has been upgraded to .NET 8.0 x64.

LMF updated from LMF 1.10 to LMF 2.0

The LMF embedded by RDS has been upgraded to the latest one (2.0).

1.3 Scanners Alignments (arms)

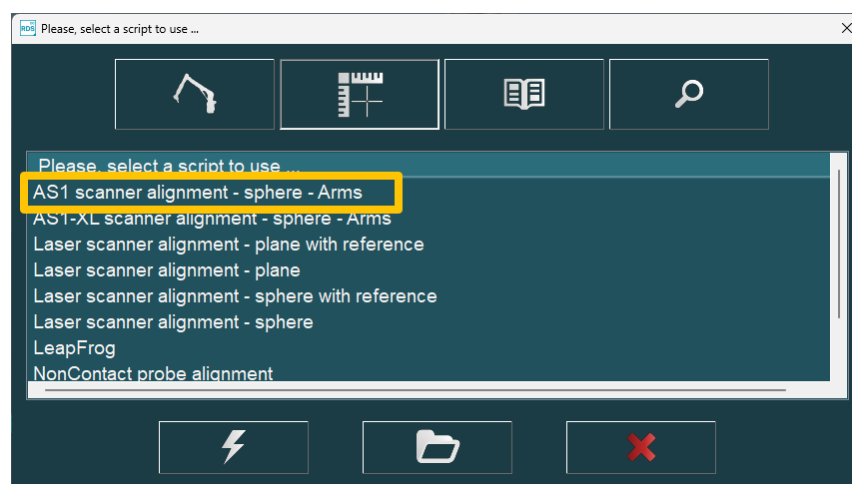
1.3.1 AS1 / AS1-XL Easier Alignments

A new script specific to the AS1 has been created and the one for the AS1-XL updated, to provide easier and faster processes of alignments (time to measure divided by 4).

The process is now the same whatever for arms and trackers.

New Alignment script for the AS1, updated one for the AS1-XL

While the AS1 was using the same scripts as other scanners, a new dedicated script has been added for it. This new script becomes now the default alignment for the AS1 (and RS6).



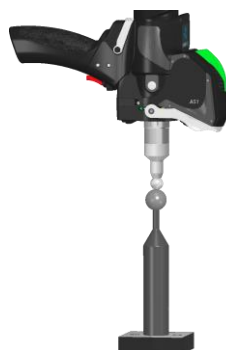
NOTICE

This new script is only for the AS1 and is not suitable for other scanners (RS2, RS3, RS4, RS5, HP-L-8.9...)

No more measurement with reference probe

The preliminary measurement with the 15mm reference probe is no longer needed. The process directly starts by the scanning field of view measurement.

RDS 6.5

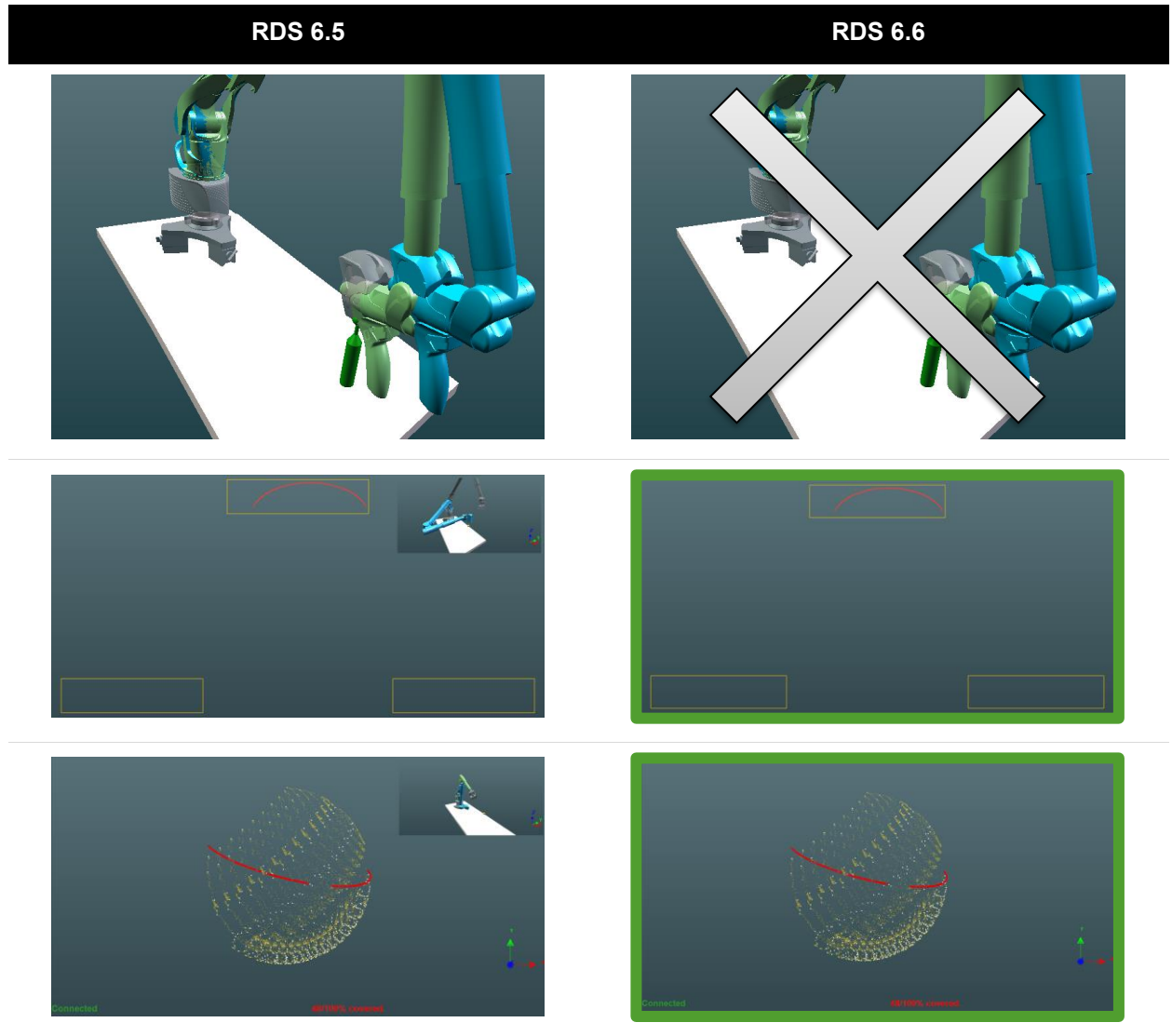


RDS 6.6



Screen directly jumps to Target and Scan Views

The measurement steps of the alignment now skip the 3D view (with the arm) to only display the target view and Scan view. The 3D view is no more used.



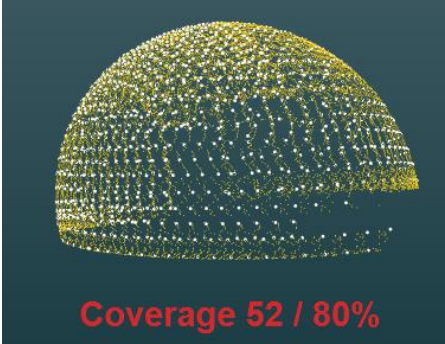
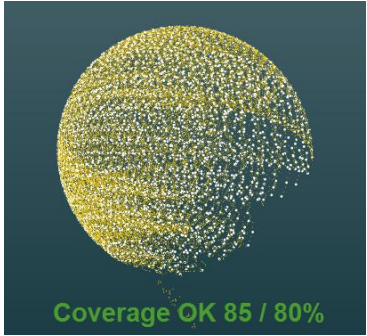
Single Field of View measurement instead of three

The field of view measurement is now requested only once instead of three times (X, Y and Z orientations).



Improvement of the coverage calculation

When running the “Free measurement” step (scan of the global sphere), the coverage percentage could be distorted by outlier points taken on the stem or the table. The coverage is now calculated with only the points on the sphere.

RDS 6.5	RDS 6.6
	 

Script is now stopped if the calculation is cancelled

Until RDS 6.5, if the calculation or the update to the arm were cancelled, the process was anyway continuing with the final checking. As the checking becomes useless in such a case, now RDS stops the process if the alignment calculation or update are cancelled.

1.3.2 Faster Access to the Scanners Alignments

Up to RDS 6.5, the shortcuts for scanner alignment were showing a menu with a choice of several methods. To provide faster access to the appropriate scanner alignments, all the shortcuts now automatically open and run the appropriate script for each scanner.

- RDS Agent shortcuts
- RDS Control Panel shortcuts
- Quick Access Menu

Scanner	Default method
HP-L-8.9	Laser scanner alignment - sphere with reference.sc
RS2, RS3, RS4	
RS5	
AS1, RS6	AS1 scanner alignment - sphere - Arms
AS1-XL	AS1-XL scanner alignment - sphere - Arms



The other (alternative) methods remain available by opening manually RDS Data collector > Accessories scripts.

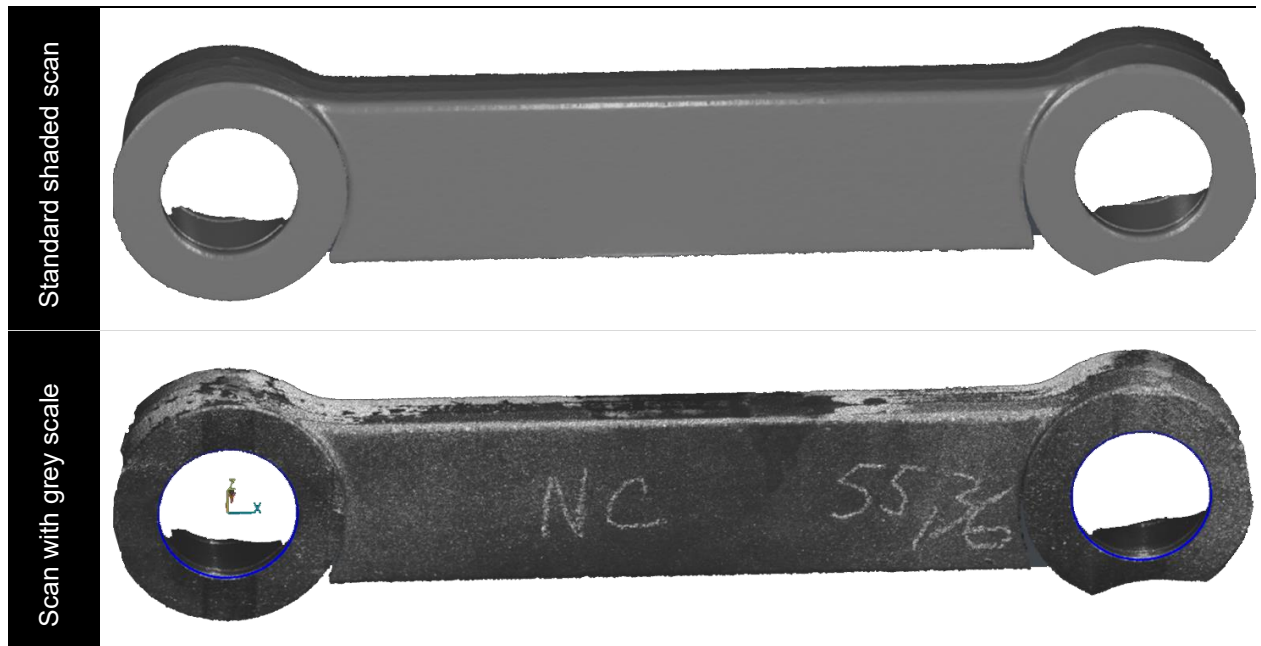
1.4 Scanning with Grey Scale Values (AS1 / AS1-XL)

Digitizing with the AS1 and AS1-XL laser scanners permits now to retrieve the grey scale value on each collected point.

This new feature allows to locate specific areas such as thermic impact on a part, coloured areas, points marked by a cross, scratches...



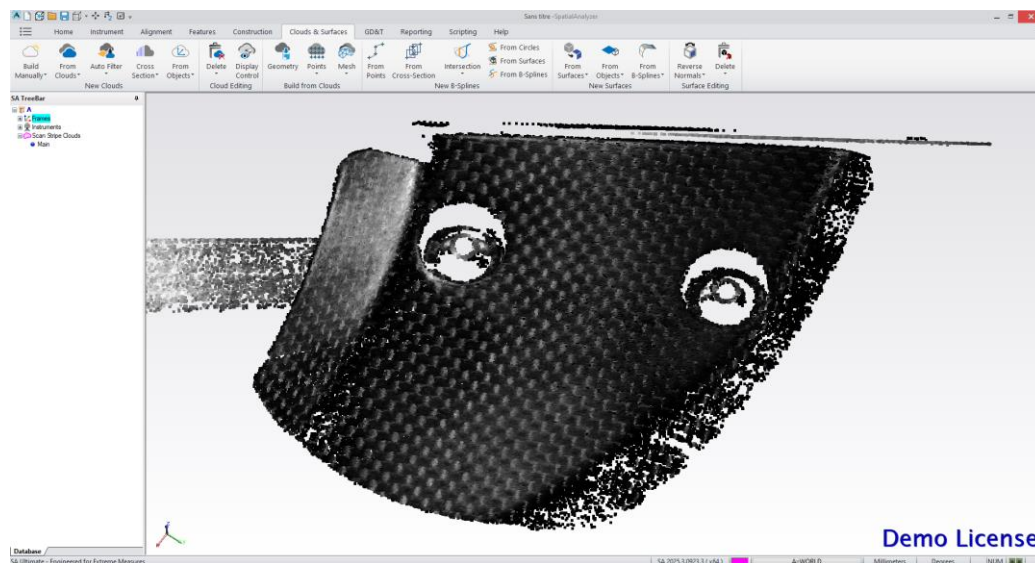
The grey scale feature is not supported by the RS6 scanner.



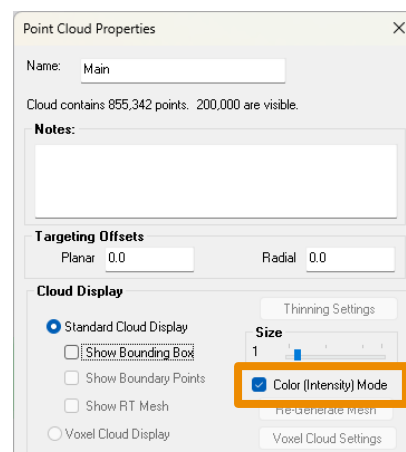
1.4.1 Application Software

Spatial Analyzer

The latest version of Spatial Analyzer (2025.3 or upper) is compatible with grey scale functionality.



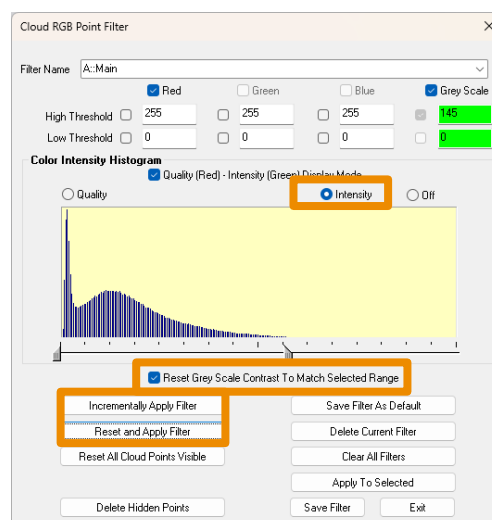
- By default, the cloud is displayed with its intensity. If not, open the properties of the cloud and enable the option “Colour (Intensity) Mode”.



- Filtering tools can be used to select a range of intensity. Right click on the cloud and select “RGB Filtering”.

Select “Intensity”, set the wanted range and press according to your needs “Incrementally Apply Filter” or “Reset and Apply Filter”.

The option “Reset Grey Scale Context To Match Selected Range” can be enabled to modify the grey scale intensity.

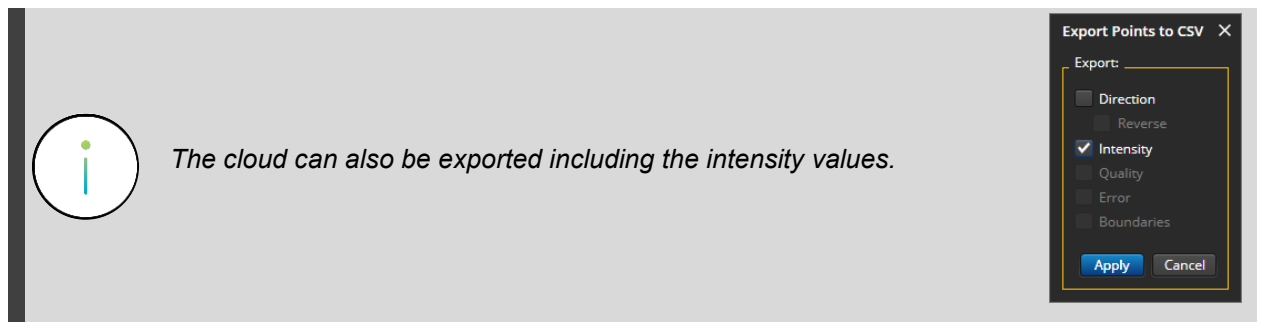
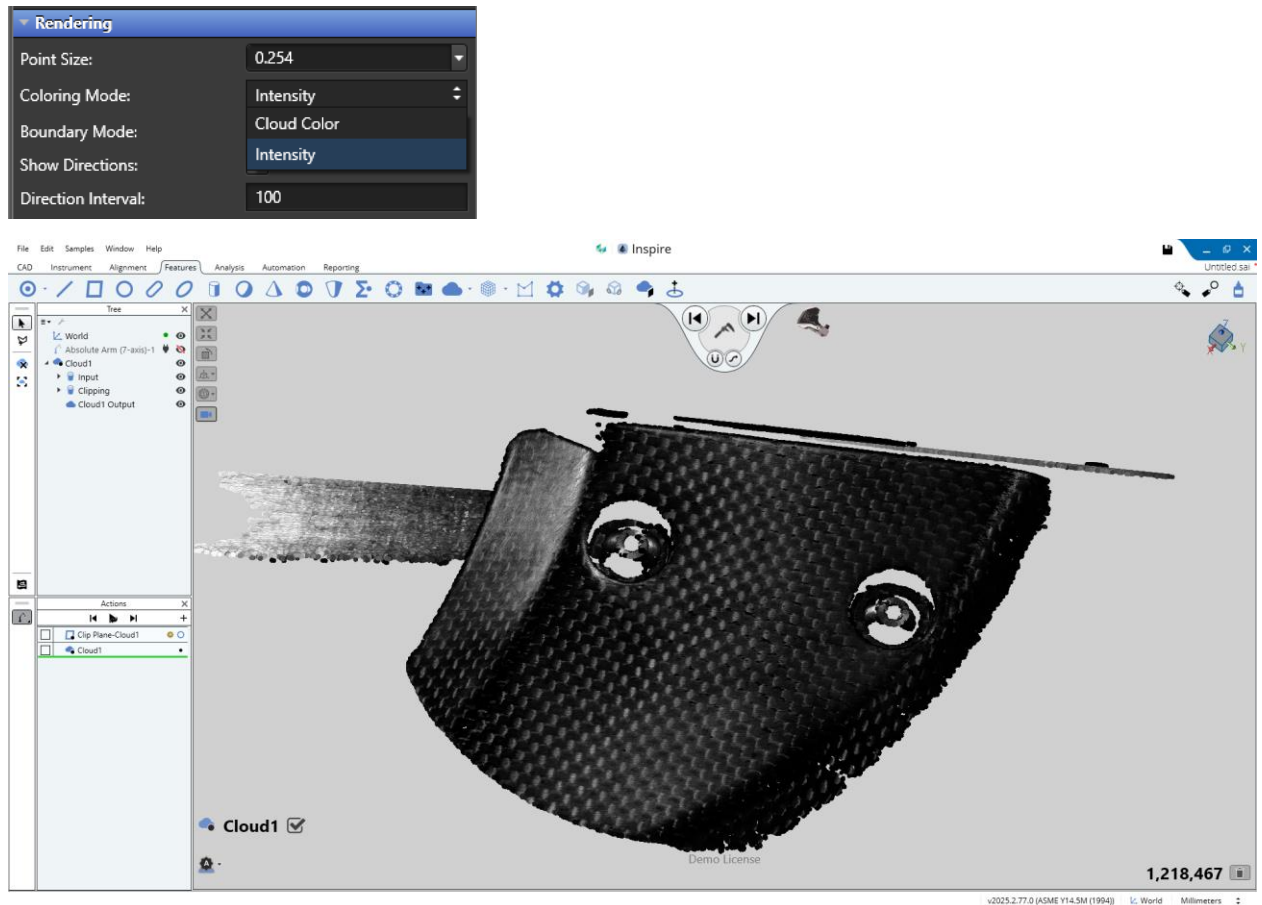


- Then surfaces, splines or geometric features can be extracted from the filtered range of intensity.

Inspire

The latest version of Inspire (2025.2 or upper) is compatible with grey scale functionality.

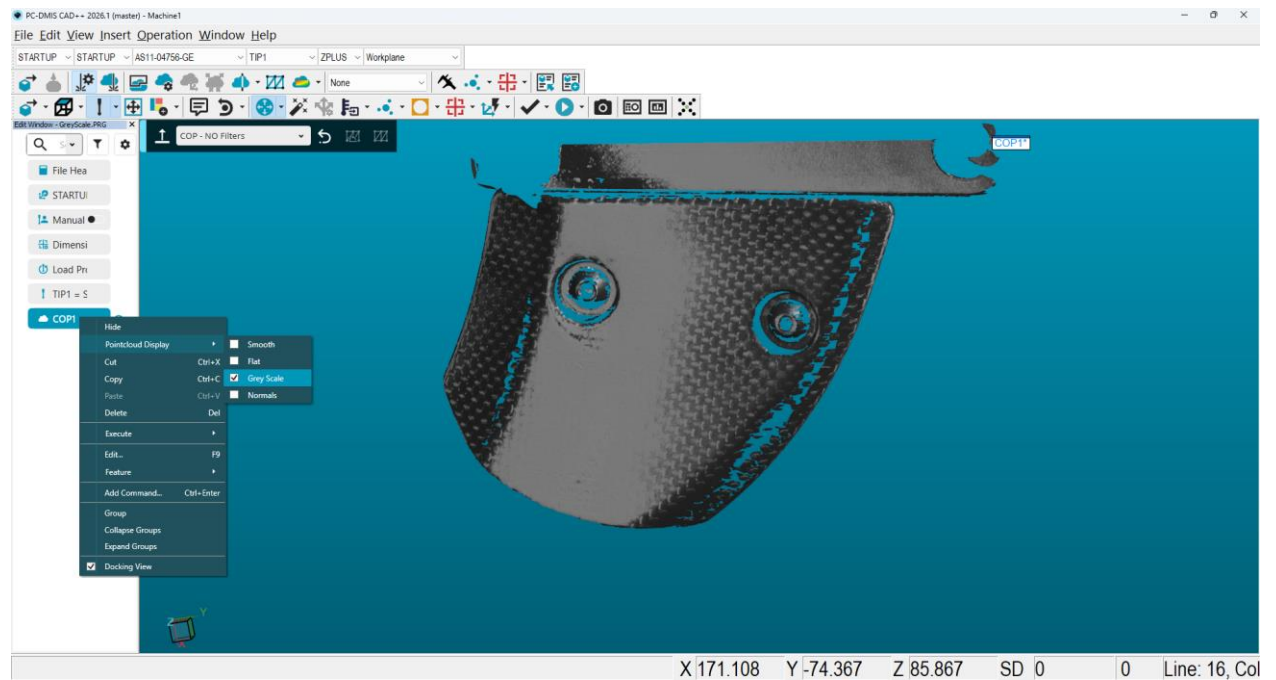
Open the properties of the new cloud and set the Colouring mode to “Intensity”.



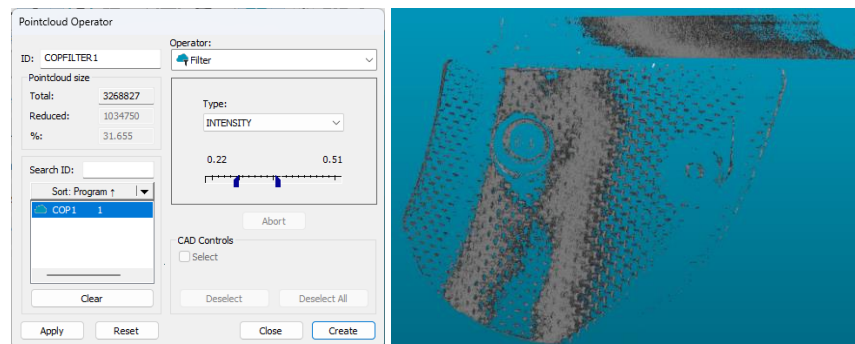
PC-DMIS

The latest version of PC-DMIS (2026.1 or upper) is compatible with grey scale functionality.

Right click on the cloud and set Pointcloud Display > Grey scale.



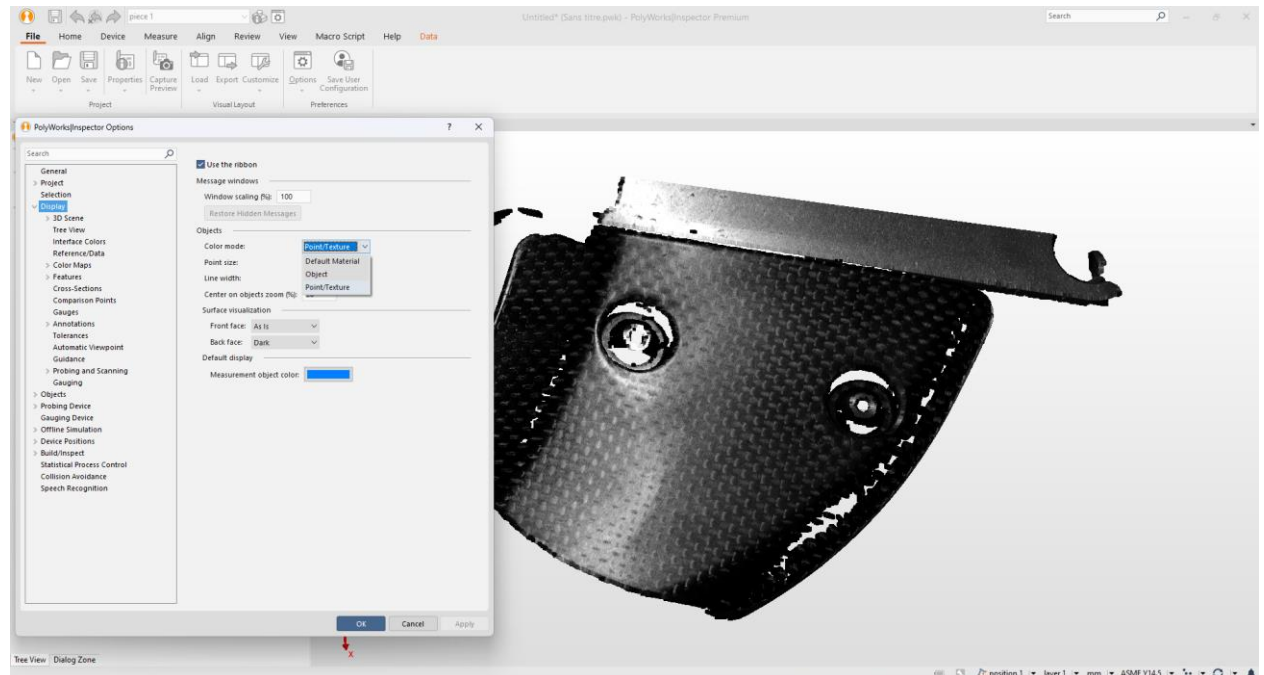
Filtering can then be done on the cloud with the intensity: "Pointcloud Operator".



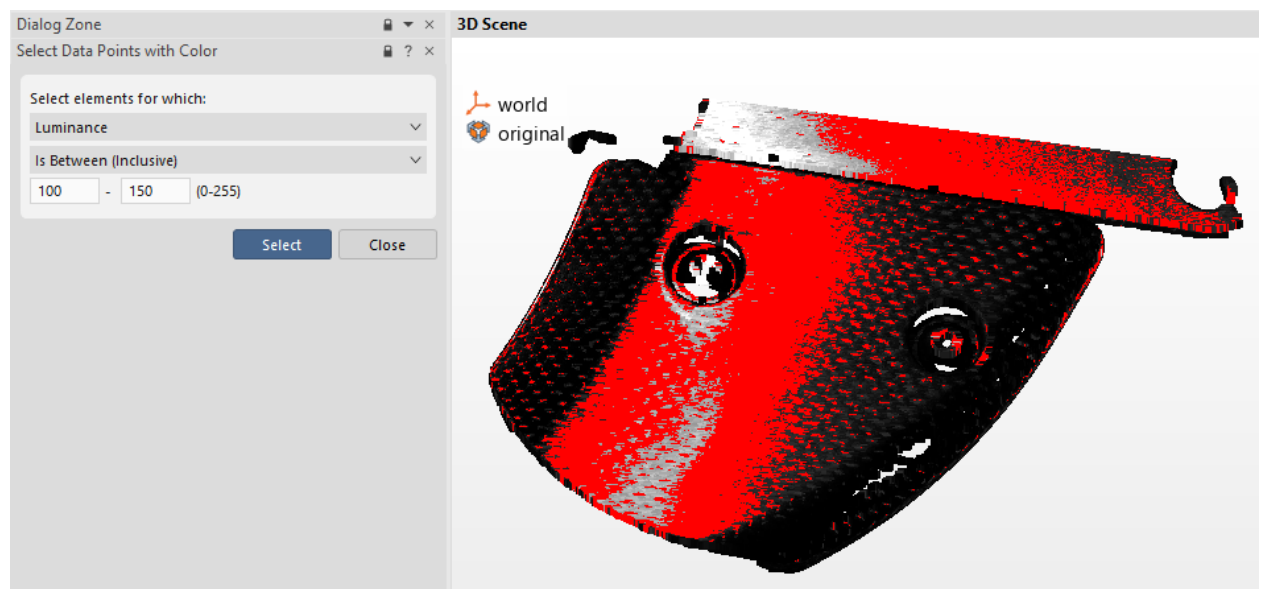
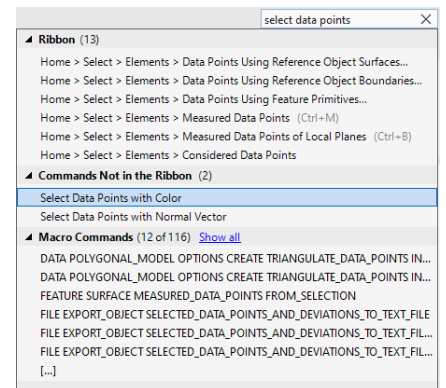
PolyWorks

The latest version of Polyworks (2025 IR7 or upper) is compatible with grey scale functionality.

Open the options Display > Objects and set “Color mode” to “Point/Texture”.

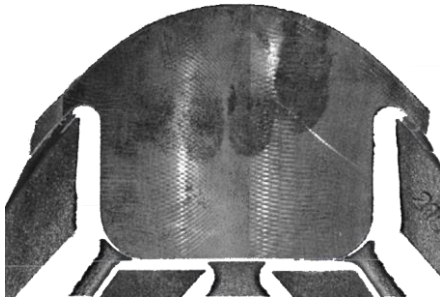


Points can be then filtered: in the menu, search and select “Select Data Points with Color”. Then filter with the luminance.

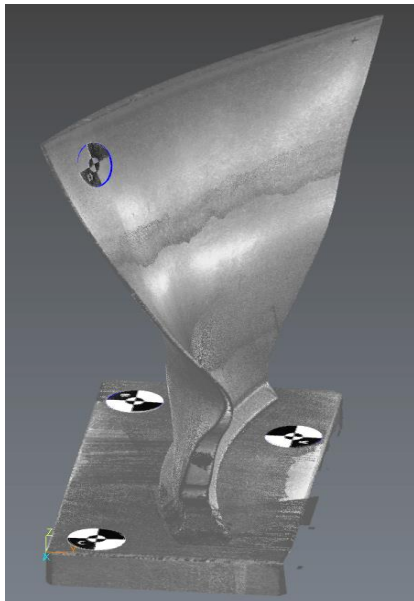


1.4.2 Use Cases for Grey Scale

Fingerprint detection



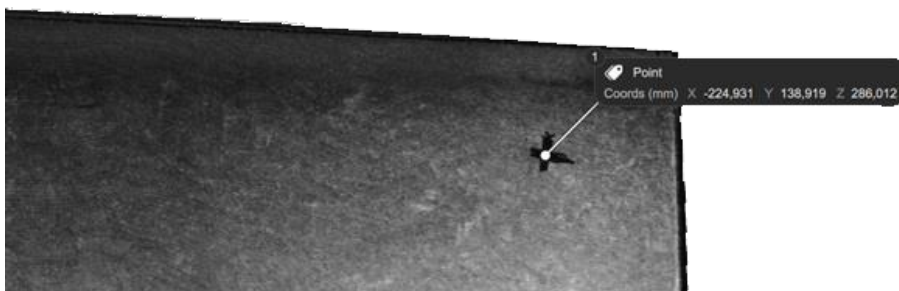
Detection of targets for referencing.



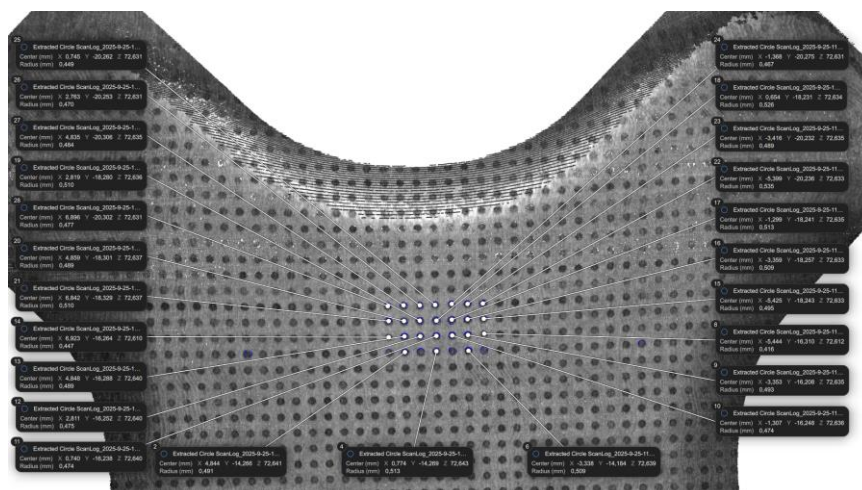
Detection of a chemical impact



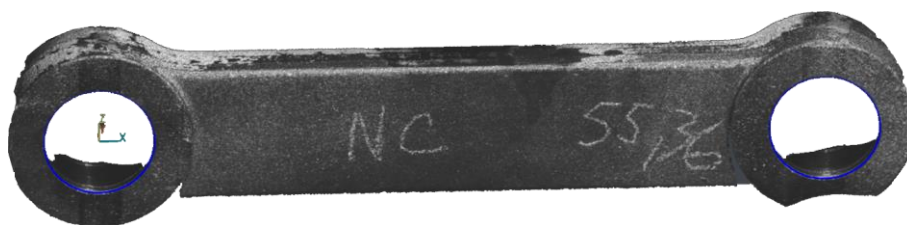
Detection of a point



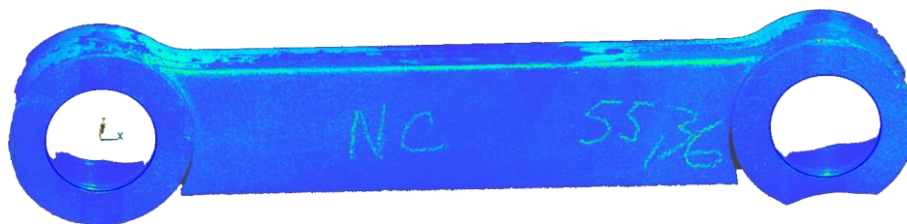
Detection of a Set of Dots



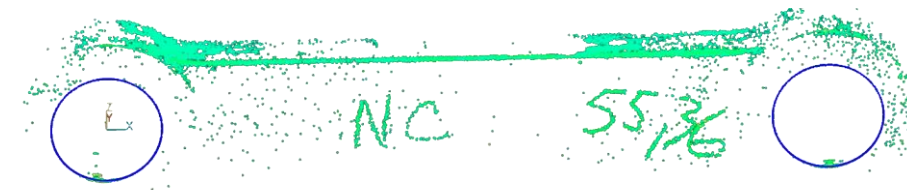
Detection and extraction of writings



Raw grey scale point cloud



Intensification of the wanted points



Extraction of the highlighted points



Labels Location & global 3D Representation



Raw grey scale point cloud



Extraction & colorization of the labels



Mesh and finalization of the 3D view

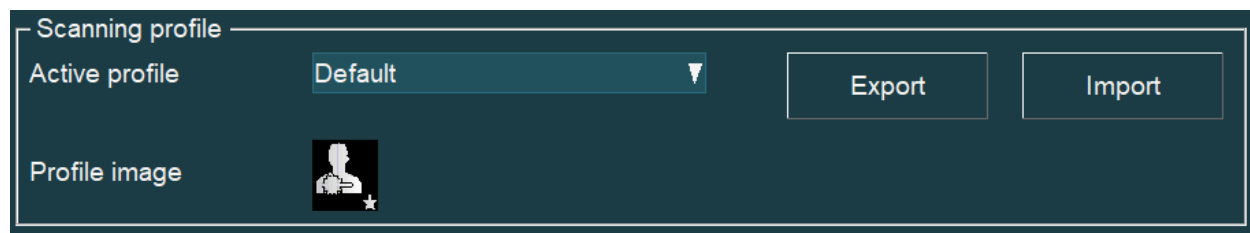
1.5 Scanning Improvements

1.5.1 Scanning Profile Import / Export (RS5 / RS6 / AS1 / AS1-XL)

To facilitate the transfer of scanning profiles from one computer to another or to make backups, thereby avoiding the need to recreate the profiles, it is now possible to export all the customized profiles of the current scanner.

The package of profiles created can then be simply re-imported on the wanted destination PC.

In the RDS Control Panel, Scanner tab, two new buttons permit to export or import packages of profiles.



Exporting the profiles

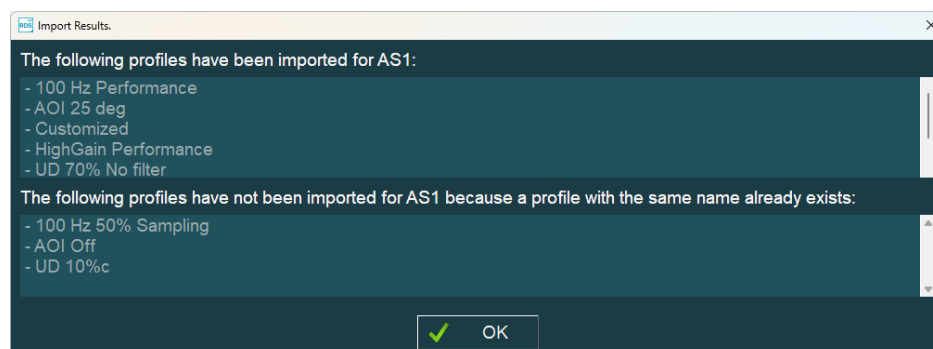
To export all the profiles for a type of scanner, connect the scanner and open the RDS Control Panel, scanner tab. Then press the “Export” button and select the folder where the package must be saved. All the custom profiles are then saved in a “*.scanprofiles” file.



- *Export is possible only when customized profiles are available.*
- *It is not possible to export only some of the profiles.*
- *Non-ASCII characters are not supported. Thus, it is no more possible to save profiles with such characters.*
- *The exported file must not be renamed.*

Importing profiles

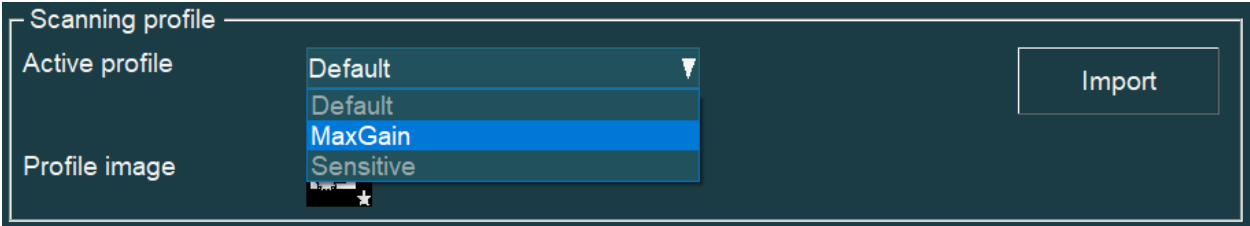
To import a package of profiles, open the RDS Control Panel, scanner tab and press the “Import” button. Then simply browse and select the file to import. RDS then shows a summary of the imported profiles.



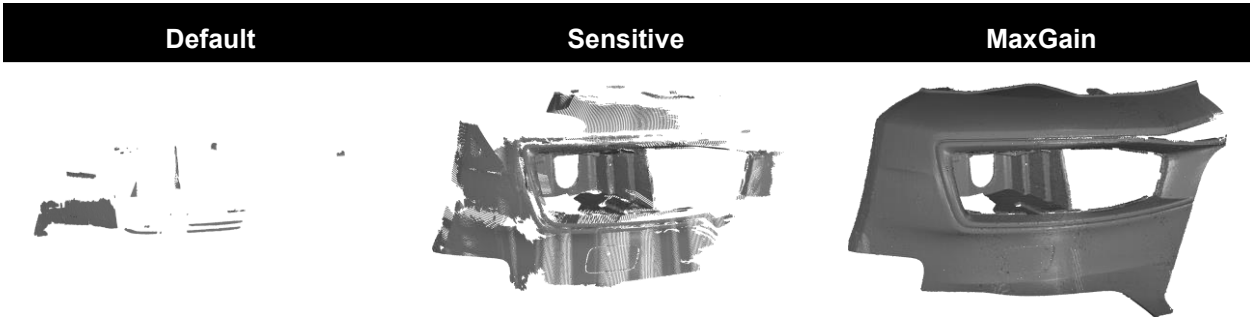
1.5.2

New Built-in Profile for the AS1-XL

In addition to the current “Default” and “Sensitive” built-in profiles, a new one has been added for very harsh surfaces. This easy-to-use profile activates the “SHINE HighSense” mode (at 100 Hz) and the High gain option, to be able to collect data on extreme digitizing needs.



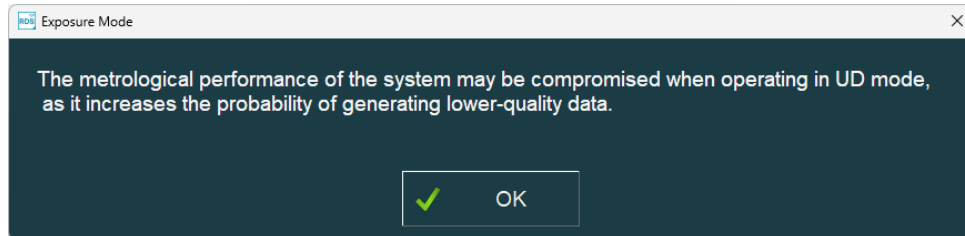
Typically, shiny black surfaces are often challenging. The “MaxGain” profile permits a good coverage.



1.5.3 Warning when Using User Defined Mode with AS1-XL

When switching to the “User Defined” mode with the AS1-XL, the exposure is manually set by the operator and no longer intelligently controlled by RDS. This can result on more noise and “poor quality” data.

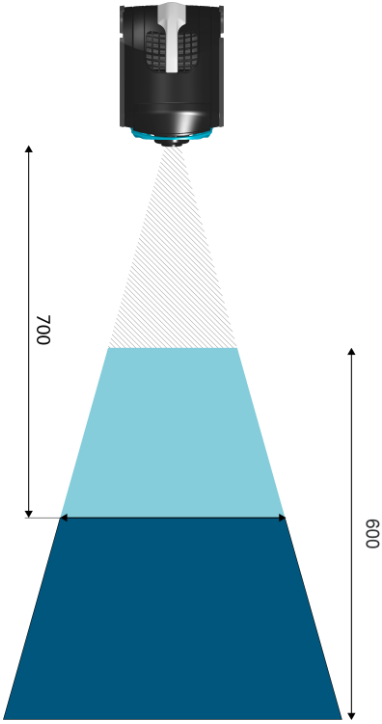
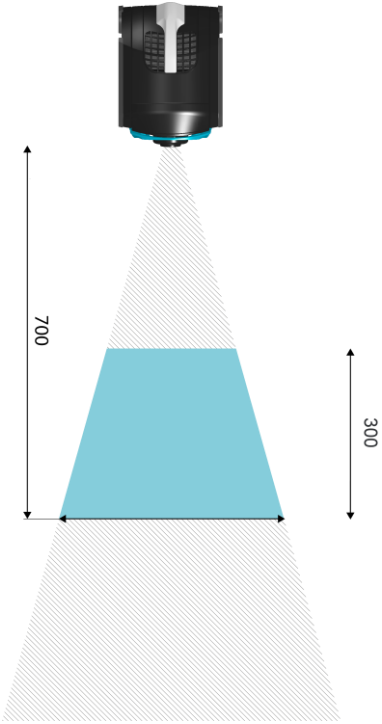
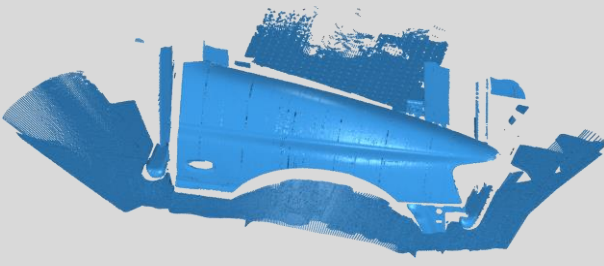
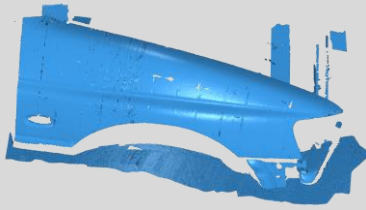
When switching to the UD mode in the RDS Control Panel, a warning is displayed to remind the risk of compromising metrological performance.



1.5.4 New Option to Switch On/Off the Far Range of the AS1-XL

The AS1-XL scanner provides a very large field of view and width of scanning line. When digitizing medium parts, it becomes useful to reduce the field of view and then avoid collecting useless data beside and behind the part to be scanned.

RDS now offers an option to deactivate the far range of the scanner and then benefits from the highest quality data on the useful scanning range.

Far Enabled	Far Disabled
	
	
 Distance helpers - The work distance indicator (colour guide at the top of the scanner) is adjusted and show colour according to the reduced range. - The red laser guide is fixed and cannot reflect the reduced range.	

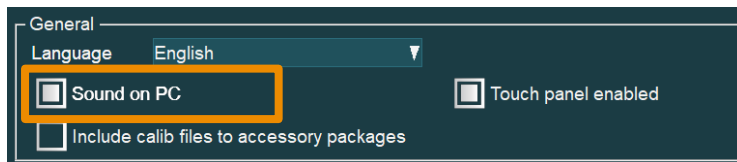
Reduced Range and Scanning Profiles

The new option can be memorized in a scanning profile as well as the other settings.

1.6 Other Improvements

1.6.1 RDS Sounds on the PC (RA8)

In addition to the speakers on the Absolute Arm (RA8), the PC can now emit the sounds coming from RDS. Open the RDS Control Panel > General Parameters and check the option “Sound on PC”.



Mechanical stops, GridLOK, RDS Data Collector... will be played by the PC in addition to the arm.



A small delay can be observed between the arm and the PC.

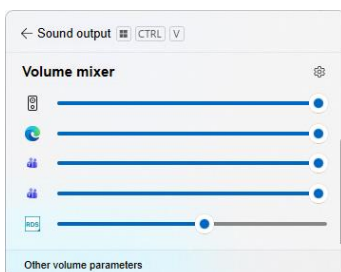
Control the volume on the PC

While the RDS Agent can control the sound volume of the arm, the volume on the PC can be simply controlled by Windows.

- Global Volume



- RDS-specific volume: open the Volume mixer



Send the sounds to an external device

As soon as the sound is managed by Windows, an external speaker or headset can be connected to the PC to provide audible sound in a noisy environment.

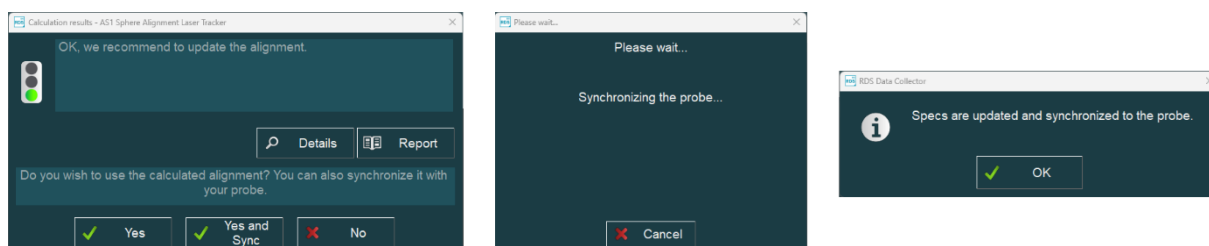


1.6.2 “Save to Probe” (trackers)

With the new Save to Probe feature, it is now possible to store the current alignment directly on the connected probe. This simplifies the synchronization of alignment data between the tracker and the probe without requiring additional software or manual steps.

After completing the alignment process, an additional button **“Yes and Sync”** appears in the dialog window:

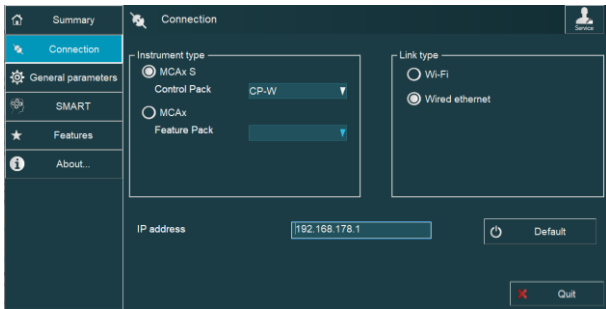
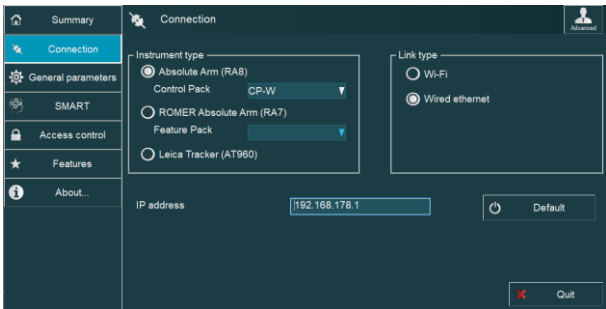
“Yes”	Simply accepts the new alignment as before.
“Yes, and Sync”	Accepts the alignment and additionally saves the values to the probe.



1.6.3 Phase out of Nikon Installer - Standard Installer open to MCA arms

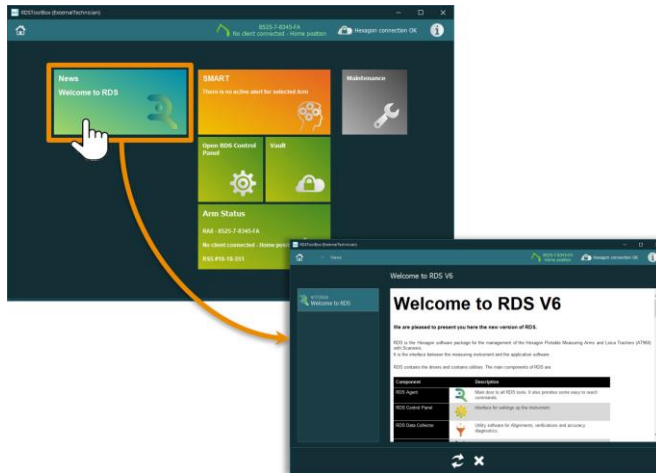
The Nikon specific RDS installer has been merged with the standard RDS installer. All the locks that prevented from using the standard RDS with MCAx and MCAx S arms have been removed, simplifying the management of providing RDS versions.

MCAx S and MCAx are now managed as RA8 and RA7 arms.

RDS 6.5 → Nikon installer	RDS 6.6 → Standard installer
	
MCAx S → Absolute Arm (RA8) MCAx → Romer Absolute Arm (RA7)	

1.6.4 RDS Toolbox publications synchronization issue (arms)

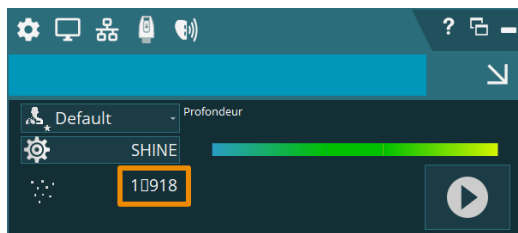
The synchronization of publications in RDS 6.5 could not succeed. They now are correctly synchronized.



1.6.5 RDS Agent

Because of a Windows11 reported bug, on the scanning window of the RDS Agent, with a scanner, the number of points was displayed with a "□" character instead of the space grouping symbol.

(Depends on the language settings)



1.6.6 RDS Data Collector

Missing CSV data after a sphere check in some languages (tracker)

Since RDS 6.4, in some languages*, the csv file generated at the end of the sphere checks could have missing data.

[illegible]

*: Chinese, Japanese, Russian and Korean

Unaligned sensors are notified only the first time (arm)

When a new sensor is mounted on the arm, RDS asks for its alignment. During the alignment process (including measurement with reference probe), the new sensor is dismounted (or unselected) and mounted back (selected). When mounted back, the “New sensor” message was displayed uselessly another time. Now only the first time is notified.

Sensors alignments on arms

On touch probes and scanners, if the calculation was run after a final checking, the calculation could use erroneously the checking file as an entry data. Now only the files designed for the calculation are considered.

Default CTE on Step bar artefact (arm)

When performing ISO 10360-12 and 10360-2 calibrations, the CTE proposed on the default step bar artefact was set to zero, causing a calculation error. The default CTE is now set to 11.5 (steel).

1.6.7 Improvement on Trackers Automation

Improved RDS Measurement Status handling

- The RDS Measurement Status now correctly transitions to “**NotReady**” during execution of specific commands, ensuring proper state readiness before execution and preventing conflicts or inconsistent behaviour.
- Commands affected:

Set Scanning Profile	Status transitions to <i>NotReady</i> with precondition notes indicating the scanning profile command is ongoing.
Prism Position	Status transitions to <i>NotReady</i> with precondition notes for prism position measurement.
Positioning	Status transitions to <i>NotReady</i> during positioning operations.
LMF Specs Update (before or after alignment)	Status transitions to <i>NotReady</i> to reflect alignment operations

Lock on improved

- Fixed an issue where the tracker skipped lock-on when RDS Measurement Status was *NotReady* for reasons other than tilted/6DoF invalid.
- Now lock on only skips when status is *Ready* or *NotReady* due to Tilted/6DoF invalid, matching expected behaviour.

Better Handling of Multiple GoAndMeasure commands

- Fixed “Instrument busy with another operation” errors caused by sending multiple GoAndMeasure commands in quick succession.

StartMeasurement handling

- Fixed Preview Mode failures after Scan Profile changes by ensuring proper initialization before executing GetPrismPosition.

Added measurement preconditions for the Idle-Reasons

- Scanning Profile Selection
- Prism Position Command
- Positioning Command
- LMF Specs Update

TrackerPositionToTarget improvements

(PSW-2470)

Several improvements have been set to prevent from issues linked to the TRACKERPOSITIONTOTARGET Command.

- Tracker_Position_To_Target gets skipped because we are already locked on but RDS Measurement Status is "Not ready"
- Endurance Test: TrackerPositionToTarget on TBRO.5in reflector failed with "No_Answer_From_Hardware"
- RDSCI_TRACKER_POSITION_TO_TARGET fails following RDSCI_STOP_MEASUREMENT
- No_Answer_From_Hardware when executing TrackerPositionToTarget directly after a beam break from the AP21
- Customer Gestamp: Position_To_Target returns RDSRC_NO_ANSWER_FROM_HARDWARE
- Issues with lock on ASI (tracker position to target)

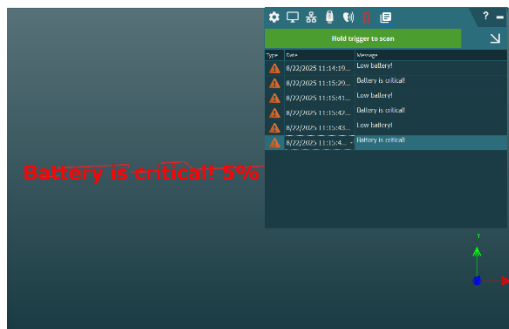
1.6.8 Various Improvements and Correction on Trackers

OVC was disabled when RDS goes to preview mode

A regression had been introduced in RDS 6.5, resulting on a disablement of the Overview Camera in preview mode. This has been restored.

Battery status events for Trackers listed in the Logbook

The Logbook now records battery status events for AT960 trackers, including warnings when battery level drops below 25% and critical alerts below 5% ensuring unexpected shutdowns during operations



2 RDS 6.5.2

2.1 RDS 6.5.2 Summary

RDS 6.5.2 is a specific maintenance version for the needs of the EU Radio Equipped Directive on cybersecurity.

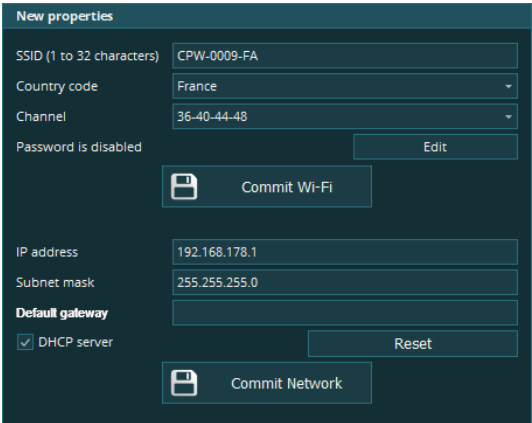
The changes on RDS only consist by the deletion of the default gateway configuration on the latest Absolute Arm (RA8 v3). All other functionalities remain unchanged.

2.2 Removal of the Gateway Configuration (RA8)

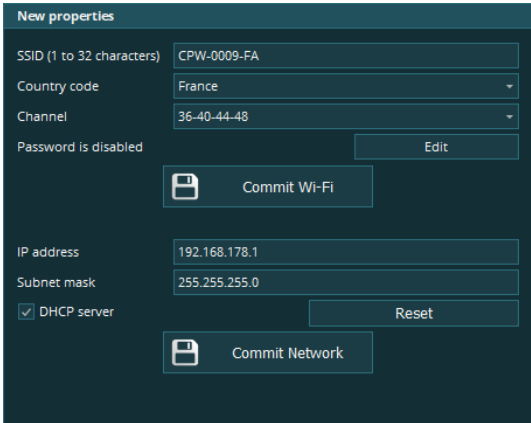
To respect the extension of the Radio Equipped Directive (RED 2014/53/EU), the possibility to configure the default gateway of the Control Pack (v2) has been removed.

In RDS Toolbox > Configure Connectivity, the parameter to define a default gateway has been suppressed, preventing its activation.

RDS 6.5.0



RDS 6.5.2



NOTICE

If the gateway on the Control Pack had been configured with an older version of RDS, it will be automatically disabled.



The connected arm's gateway is enabled (192.168.178.10).
Due to legal restriction, it will be disabled when applying changes.

OK

3 RDS 6.5

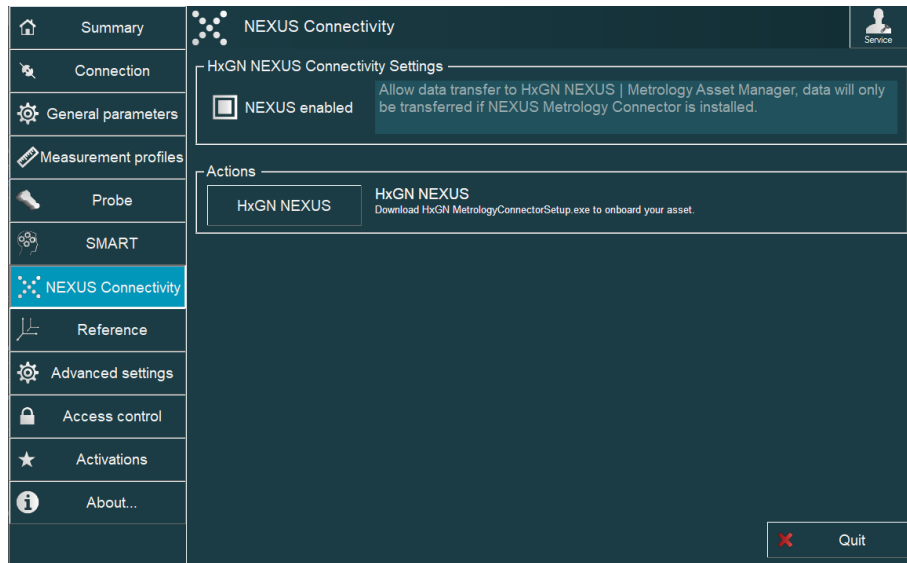
3.1 RDS 6.5 Summary

RDS 6.5 addresses the following new developments and changes:

- [Nexus Metrology Asset Manager ready](#)
- [New option for GridLOK to prevent from disengaging](#)
- [Clearer presentation of environmental warnings for RA8 v3](#)
- [Pass/failed feedback for probe alignments extended to all configurations](#)
- [New warning for low PC's memory](#)
- [Improved user feedback if sphere check fails \(LAS and AS1 scanners with tracker\)](#)
- [Enhanced System Check](#)
- [Improved graphics in SMART Analysis](#)
- [Clearer and condensed Logbook content](#)
- [Improved screen saver on the wrist display](#)
- ...and several other improvements and corrections

3.2 Nexus Metrology Asset Manager Ready (RA8)

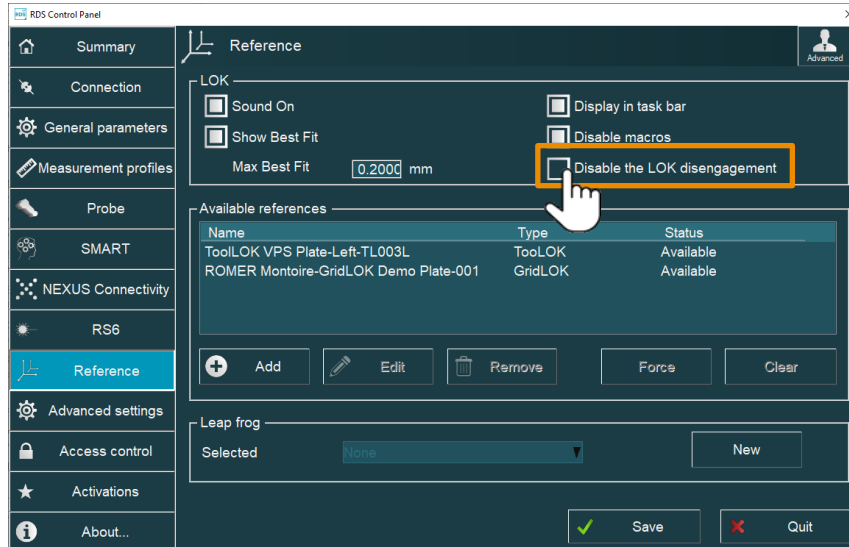
Following the migration of SFX to Nexus Asset Manager, RDS has been updated to reflect this change. All SFX mentions have been moved to Nexus.



3.3 Extension of Measurement Volume (arms)

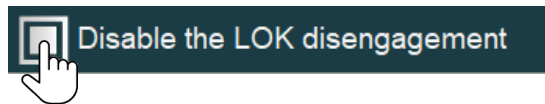
3.3.1 New option to disable LOK disengagements

A new option has been added in the RDS Control Panel to the LOK functionalities, to prevent from disengaging the position.



When checked, the new option “Disable the LOK disengagement” prevents the system from any accidental disengagement (unlock) of the current LOK position.

Simply open the RDS Control Panel > Reference tab and check the option (don’t forget to save). Then even taking 3 times the same point won’t disengage any LOK.



The option doesn’t prevent from engaging a new LOK position.

3.3.2 Corrections

Recovered Leapfrog

A lack was remaining in the reference recovering mechanism introduced with RDS 6.2.3. After a disconnection of the arm, if a leapfrog was used, the recovered Leapfrog reference was incorrect.

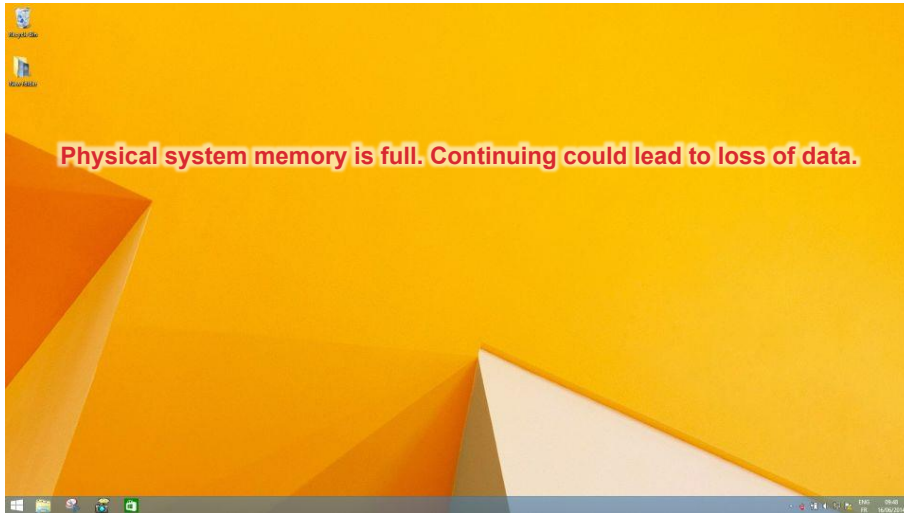
3.4 AS1 & AS1-XL

New Warning If PC's Memory becomes full

Using a scanner in harsh conditions (heavy cloud, high density...) often needs a lot of the physical memory of the PC. In some extreme conditions, the PC's memory may reach a status where the memory becomes too low.

In such case, RDS now warns the user to avoid any loss of data or crash:

- When the memory becomes low (80%)
- When it becomes critical (90%)



Application Software failed to set the Start-Stop mode (RA8)

With the AS1-XL, some applications software failed to set the start-stop mode of the scanner.

Wavy data

In some rare cases, irregular wavy data could occur. This has been fixed.



More improvements about the AS1 family in [3.7.1 Scanner Alignment & Check](#) and [3.8.2 Program Probe \(arms\)](#).

3.5 Environment Monitoring (RA8 v3)

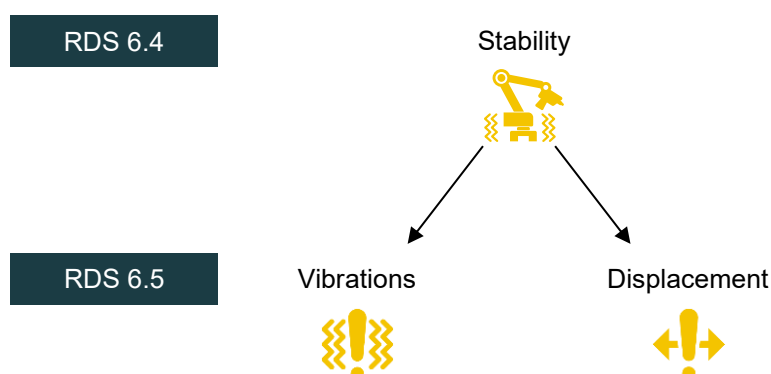
The Absolute Arm v3 introduced the monitoring of environmental conditions. Particularly, the arm warns about any vibration or displacement of the base. With RDS 6.4, any movement was notified as an “instability”.

Vibration and Displacement

To provide a better information, now the instability warnings have been split into “vibrations” and “displacement”.

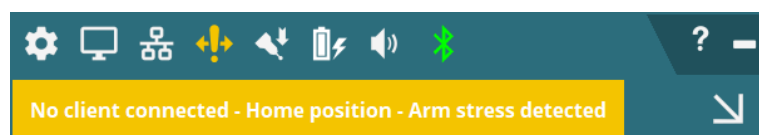
More Visible Icons

The icons for vibration and displacement have then been reworked for a clearer view, displayed on the RDS Agent and on the wrist display.



Instrument Status Icon

When a warning is triggered (vibration, displacement or tilt), now the icon is shown on the RDS Agent status bar at the place of the arm icon, until the notification is acknowledged.



3.6 RDS Agent

Logbook – Clearer and Condensed Presentation

Some entries of the Logbook have been reworked to provide a better readability.

RDS 6.4			RDS 6.5		
Type	Date	Message	Type	Date	Message
	28.02.2023 09:09:59	Error# 38 No Tracker connected Tracker not recognized (cable connection problem?)		28.02.2023 09:09:59	Error# 38: No Tracker connected

3.7 RDS Data Collector

3.7.1 Scanner Alignment & Check

Wrong Tolerance Percentage in Sphere Check Result (tracker)

An error has been introduced with RDS 6.4 on the percentage of the diameter deviation: the displayed value was 1.5 times too high, showing 100% instead of 150%. The correct value is back.

LAS / LAS XL Sphere Check Wrong Pass/Failed test (tracker)

The tolerance used in the Sphere Check with LAS and LAS XL was incorrect, resulting in not highlighted values while they should have been. Now the Pass/Failed tolerance has been set back to the correct value and out of specs values are correctly highlighted.

Spheres per face						
Face	RadDev [mm]	2σ-STD [mm]	X [mm]	Y [mm]	Z [mm]	Coverage [%]
Left Face (1)	-0.6528	1.1904	-196.4030	-2350.8212	-546.5118	75
All Faces	-0.6528	1.1904	-196.4030	-2350.8212	-546.5118	75

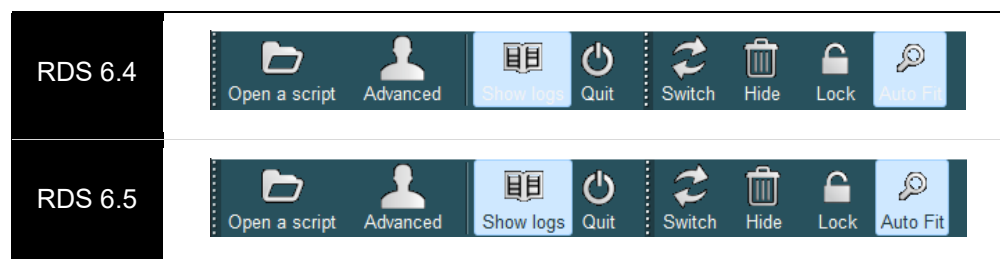
Tolerance 2.0000, Used 33%

✓ Finished

3.7.2 Better Visibility of the Pressed Buttons with W11 default interface

On Windows 11, the text displayed on pressed buttons was difficult to read because of low contrast.

Now such text is displayed in black instead of white, making it readable.



3.7.3 Artefact Temperature for Thermal Compensation (arms)

When entering the current temperature for the thermal compensation of the artefact, now RDS only accept temperatures that are within the Absolute Arm operating temperatures.

Current Temperature ?

Accepted value from 5°C to 45°C

20.000 °C

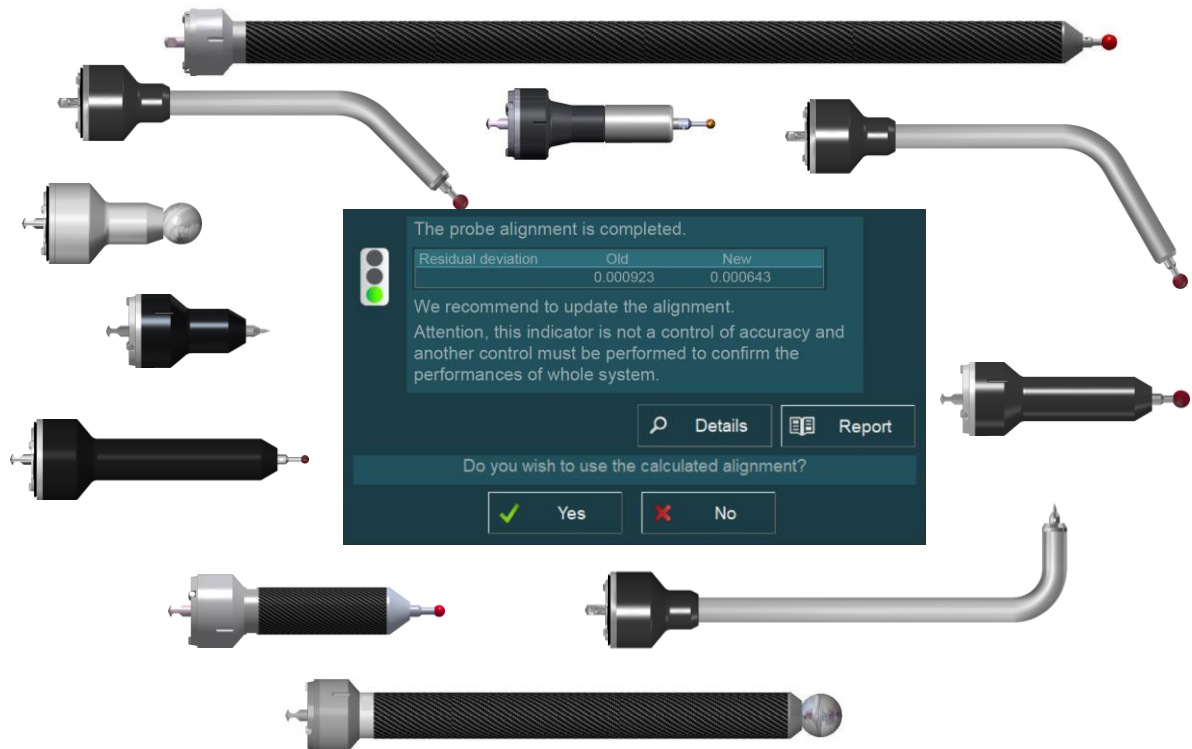
✓ OK ✗ Cancel



By typing values out of this range, the closest acceptable value will be taken into account.
 E.g.: typing 2°C, 5°C will be considered.

3.7.4 Pass / Failed for Probes Alignment (RA8)

Until now, the traffic light functionality when aligning a probe was applied on only some type of probes and sizes of arms. Now it has been extended to all sizes of Absolute Arms (RA8) with all types of touch probes.



3.7.5 Missing units in the alignment report details

When performing an alignment, the report details at the calculation step always showed values in millimetres. Now the results take into account the selected units (in the RDS Control Panel).

millimetres

	Current	New
Center deviation [mm]	-	0.000599
Diameter deviation [mm]	-	0.005012
Maximum deviation [mm]	-	0.010956
Residual deviation [mm]	-	0.005523

Details

Report

Do you wish to use the calculated alignment?

Yes

No

inches

	Current	New
Center deviation [in]	-	0.000024
Diameter deviation [in]	-	0.000197
Maximum deviation [in]	-	0.000431
Residual deviation [in]	-	0.000217

Details

Report

Do you wish to use the calculated alignment?

Yes

No

3.8 RDS Toolbox

3.8.1 System Check

The System Check continues to be improved, bringing more checks for a better coverage, but some inconsistencies have resulted.

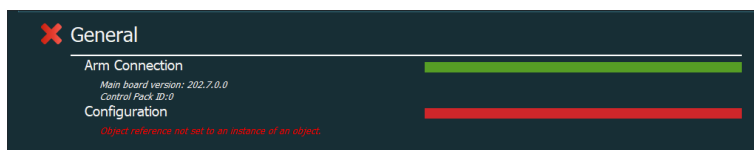
Incorrect “Passed” Status for encoder in certain cases (arms)

In case of missing encoder or encoder status bit error, the System Check was not reporting any error. Now these cases are clearly marked as failed.

Wrong Issues reported (arms)

While more and more tests are implemented in the system Check, some steps may report errors while they should not:

- HA30 / HA50 encoders reported zero volt while by design no voltage can be retrieved by RDS.
- RA7 Motherboard temperature reported 255.938 while by design the temperature cannot be retrieved.
- The haptic was not detected on a RA7 V6 (RA7 with a RA8 V2 wrist) while it was properly working.
- When used on RA8 v1 the “Encoder Thresholds” step erroneously always failed.
- The configuration test returned an error with RA7 Arms while it should not.



All these faulty errors have been fixed.

More Logs Added at the end of the System Check

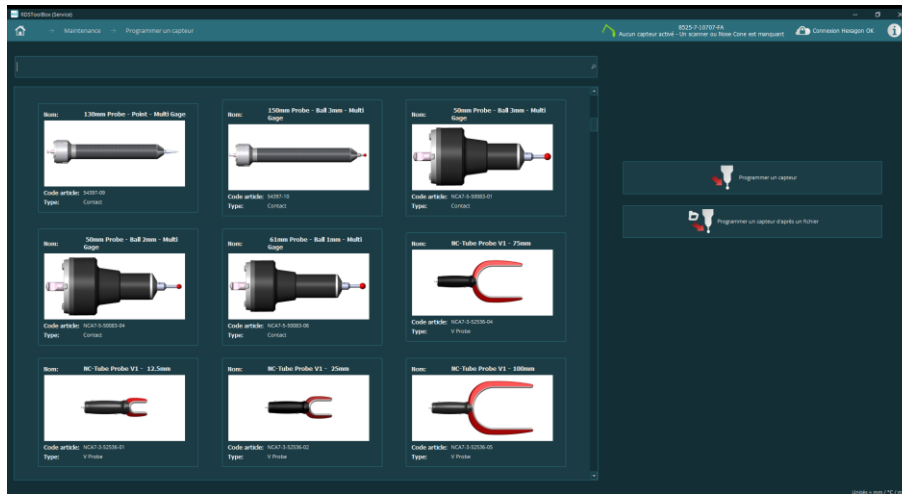
At the end of the System Check a package of log files is created. Until now, only vital logs were added.

Now all the relevant log files are used.

3.8.2 Program Probe (arms)

Pictures were cropped

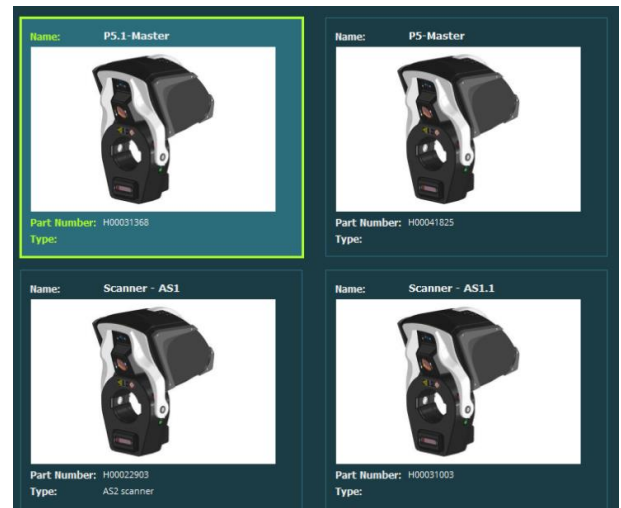
The pictures displayed in the probes tiles could be displayed partially. This is now fixed, and all pictures are correctly displayed.



AS1 and AS1-XL were not correctly displayed

In the list of available probes, some missing or incorrect names:

- the AS1.0-XL was missing
- P5-Master displayed instead of AS1-XL



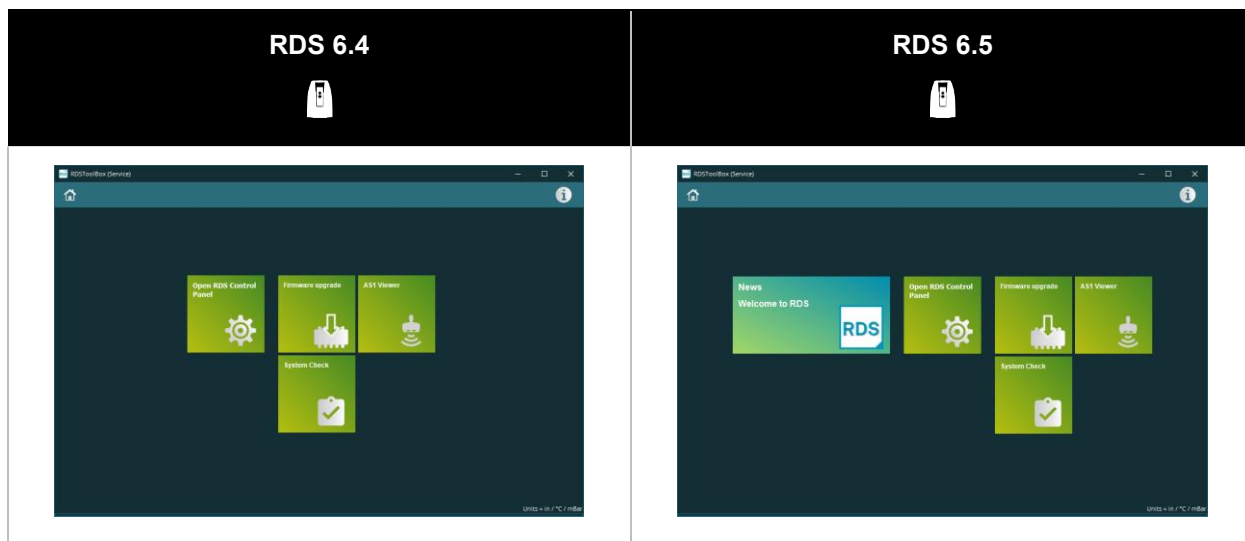
Probes could not be reprogrammed on RA7 v5

On the RA7 with a RA8 v1 wrist (RA7 v5), and an event board firmware v4.1.0.3369, the probes could not be reprogrammed, returning an error 0x25145E28. The latest even board firmware v4.3.0.3386 corrects this behaviour.

3.8.3 Publications

Publication Tile is now available to the trackers

The “Welcome to RDS” page previously displayed only for arms is now available for all the instruments, including the trackers.



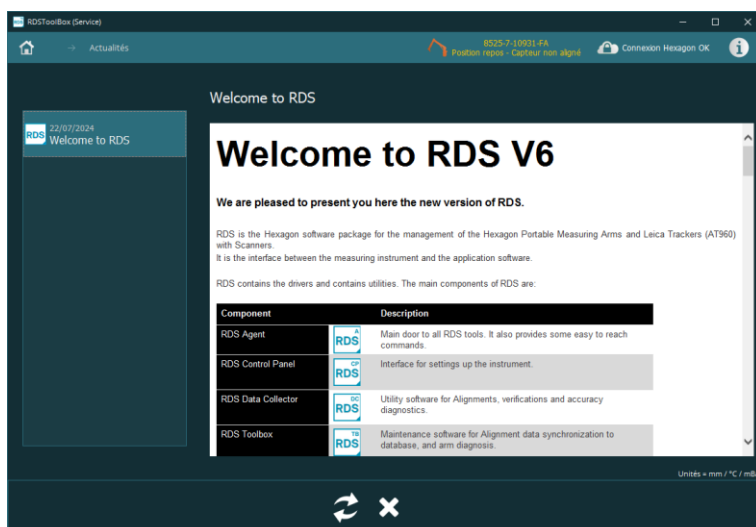
This tile opens the publication panel which provides the “Welcome to RDS”, a brief presentation of the RDS Software.



For more information, please read the RDS Software manual.

Welcome to RDS updated

The “Welcome to RDS” publication has been updated with the latest “what’s new” topics for RDS 6.3, 6.4 and 6.5.

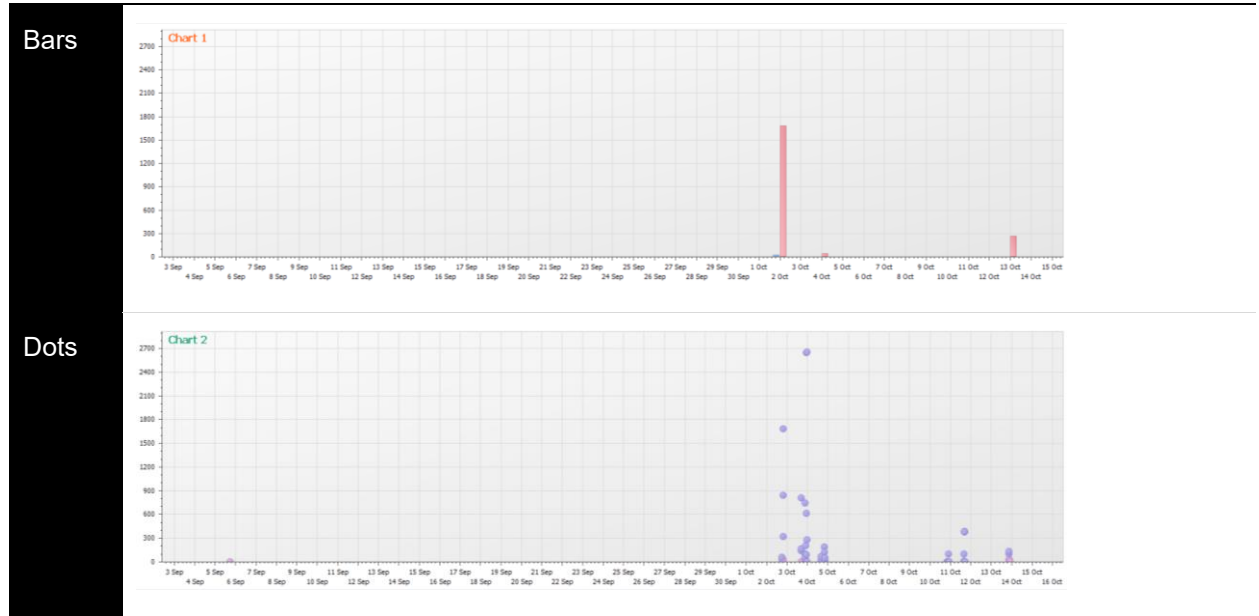


3.8.4 Other Improvements and Corrections

SMART Analysis (arms)

In RDS Toolbox, SMART Analysis, when displaying encoder errors, some events could not be displayed depending on the type of graphics.

The faulty “Period time” setting has been removed to provide a reliable display.



System Software Update > Bluetooth (RA8 v1-2)

Since RDS 6.4, the update of the Bluetooth configuration (in System Software update) could not succeed. This has now been fixed.

3.9 Absolute Arm Screen Saver

The Absolute Arm screen saver was inactive when the arm was not connected to RDS.

Now as soon as the arm is powered, the screen saver is active, even when not connected (Firmware correction).



4 RDS 6.4.3

RDS 6.4.3 addresses few fixes.

Compatibility with the latest encoder firmware (arms)

To keep the compatibility with the latest encoder firmware, modifications have been implemented.

- For the RA8: on the firmware itself (the new version of System Software onboarded with RDS 6.4.3 contains the needed firmware)
- For the RA7 (retrofitted arms with the latest encoder): the RDS service itself contains the modification.

Stress functionality on the RA8 v2

The new “Stress” functionality that appeared for the RA8 v3 with RDS 6.4.0 was incorrectly activated for the incompatible RA8 v2, showing erroneously stress notifications.

5 RDS 6.4

5.1 RDS 6.4 Summary

RDS v6.4 is the first version to support the new Absolute Arm (RA8 v3) and new long stand-off AS1-XL laser scanner. RDS v6.4 also has the following new developments and changes:

- [Supports the new Absolute Arm RA8 v3.](#)
- [Supports the AS1-XL scanner for use with the Absolute Arm RA8 and the Absolute Tracker AT960.](#)
- [Possibility to define the TCP / IP address of the Control Pack.](#)
- [Coefficient of thermal expansion \(CTE\) of a verification artefact can now be applied when making accuracy checks of the arm.](#)
- [Changes to terminology \(calibration, compensation, certification\) for consistency.](#)
- [Enhanced System Check.](#)
- [Extension of the Go-NoGo for the diagnostic and calibration scripts for the arms.](#)
- [Ability to change units \(°C / °F, mm / in and mbar / mmHg\).](#)
- [Configuration of Arm buttons.](#)

In addition, please note that the following are no longer supported by this version of RDS:

- HP-L20.8 and CMS 108 laser scanners
- RS-SQUARED scanner
- Multi Gage

5.2 Support of the AS1-XL Laser Scanner

RDS v6.4 is the first version to support the new large range laser scanner “AS1-XL”. Therefore, the AS1-XL cannot be used with an earlier RDS version.

It can be used with all Absolute Arms (RA8) and the Absolute Tracker AT960 (scanner mounted on the Absolute Positioner AP21).



Generally, using the AS1-XL in RDS is the same as for the AS1 scanner. Please find in next chapters the details of the AS1-XL settings and maintenance.

NOTICE

*The AP21 must be updated with firmware v1.2 to support the AS1-XL.
 The tracker must be updated with firmware v2.3 to support the AS1-XL.*

NOTICE

The AS1-XL laser scanner is NOT compatible with the legacy arm “Romer Absolute Arm” (RA7).

5.2.1 AS1-XL and the RDS Control Panel

Connection

AS1-XL on RA8	AS1-XL on AP21 (AT960)
The connection to the AS1-XL on the Absolute Arm remains the same as for the AS1 (connect the arm to the PC using either Wired Ethernet, Wireless or USB+Ethernet). (DHCP automatic address only)	The connection to the AS1-XL on the Absolute Tracker remains the same as for the AS1 (connect the tracker, connect the AP21 Positioner and mount the AS1-XL on it). Then Lock onto the AP21 with the tracker.



Wireless connection to the AS1-XL on the arm requires a CP-W.

AS1-XL Common Scanning Settings

Common settings (capture mode, profile creation and selection) remain the same for the AS1-XL as for any other scanner (AS1, RS5, LAS...).

Scanner type	AS1	IP address	192.168.178.1
Capture mode	Press to start and to stop ▼	Number of stripes	1
Sound guide	☐	 Check	 Align
Scanning profile			
Active profile	Customized ▼		
Profile image		Save as	Delete

AS1-XL Specific Scanning Settings

In addition to the existing AS1 settings, a new exposure mode is available to the AS1-XL: SHINE HighSense, designed for difficult material (new scan profile has been added to the AS1-XL, including this new mode).

Scan settings

Point sampling
 50 %

Scanning speed
 300 Hz

Exposure mode
 SHINE HighSense

Filter preference
 Quality

Angle of incidence
 ☐ 70.0 °

High gain
 ☐

A new [Filter preference](#) setting is added to give the user a choice to switch between data "Quality" or hardware "Performance" settings.

Setting	Description	Options
Exposure mode	Choice of fully automatic exposure based on the Hexagon "SHINE" technology or manual setup.	<u>SHINE</u> / SHINE HighSense / User defined
AOI	Angle of Incidence – quality filter removing points presenting a high incidence value with the surface.	<u>on</u> / off
High gain	High sensitivity mode for very difficult to measure surfaces.	on / <u>off</u>
Scanning speed	Choice of scanning frequency (lines per second), allowing adjustment to the speed of data capture.	100Hz – 200Hz – <u>300Hz</u>
Point sampling	Sampling to reduce the number of points per line and adapt the density to the needs.	<u>50%</u> / 100%
Filter preference	Scan data filter to prioritize either Data Quality or Hardware Performance.	<u>Quality</u> - Performance
Profile	Set of parameters for an easy selection. Users can save their own customized profiles.	<u>Default</u> / Sensitive (SHINE HighSense) + user profiles

Underline = default value

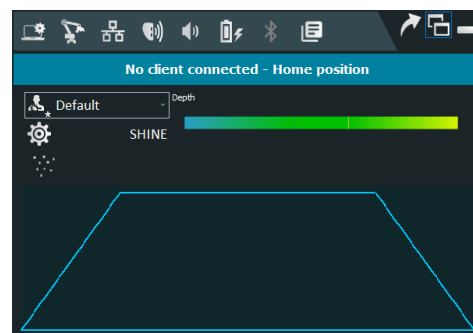


100Hz only can be used with the SHINE HighSense mode.

5.2.2 AS1-XL with the RDS Agent and Quick Access Menu

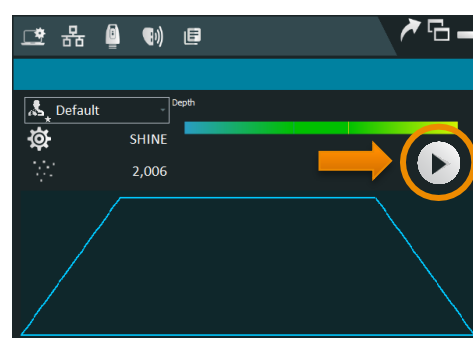
Scan View

As any other laser scanner, the AS1-XL automatically displays the scan view on the RDS Agent once connected. This view remains the same, with the same information and tools.



Start-Stop Scan from the RDS Agent (Tracker)

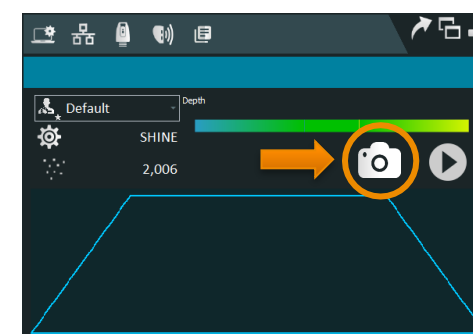
When used with a tracker, the RDS Agent provides new buttons in the AS1-XL scanning view to start and stop scanning manually from the PC when the Trigger button is not available (AP21 positioner used in an automated set-up).



Capture the Exposure (Tracker)

When used with a tracker and the exposure is set to "User Defined", a button appears to give to the operator the possibility to run the exposure capture from the PC.

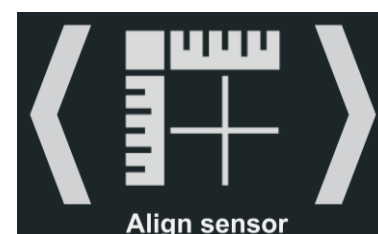
(see [next chapter](#) for more details).



Quick Access Menu (Q.A.M. – arms)

The Quick Access Menu provides the following actions for the AS1-XL.

- Switch to Manual mode (Advanced user profile only)
- Switch to SHINE mode (Advanced user profile only)
- Capture the exposure
- Select a scan profile
- Align the sensor.
- Check the sensor

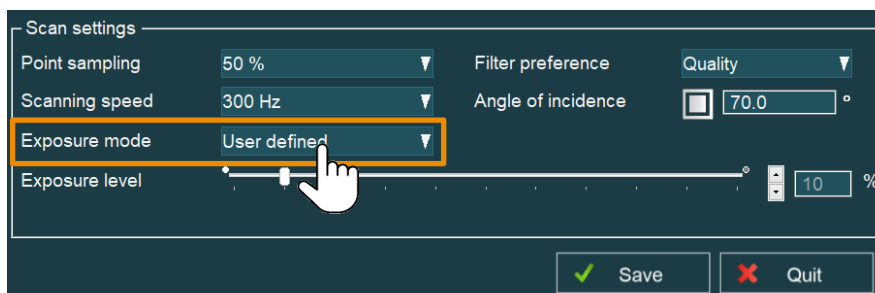


5.2.3 Exposure Management of the AS1-XL

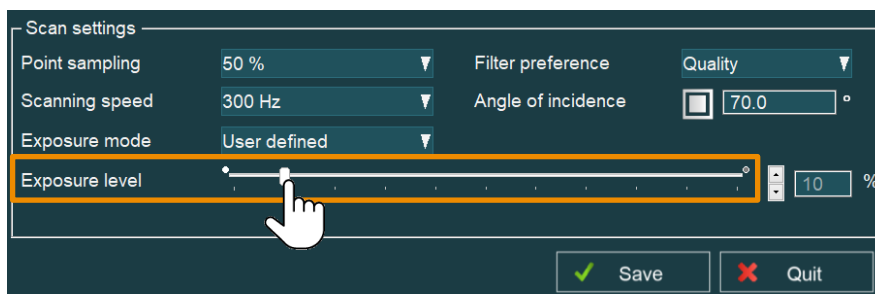
By default, the SHINE mode is used, applying an automatic dynamic exposure. A specific “SHINE HighSense” mode is also available for more demanding surfaces. However, the exposure can be set to “User defined”, and then the exposure can be set either with a fixed value, or by capturing the exposure as with the AS1.

Set the Exposure Manually

1. Open RDS Control Panel > Scanner settings.
2. Set the exposure mode to “User Defined”.



3. Adjust the exposure with the horizontal scroll bar.



Capture the Exposure

This process automatically sets the exposure according to the surface to be digitized.

Position the laser line on the surface to be scanned within the field of view and press the "capture exposure" button as shown below. Then wait for the scanner to adjust itself to the correct settings for that particular surface.

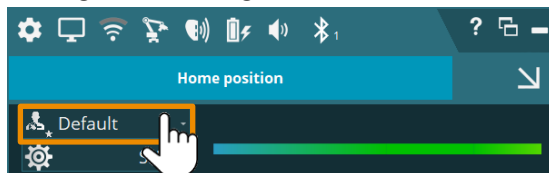


5.2.4 Scan Profile Management

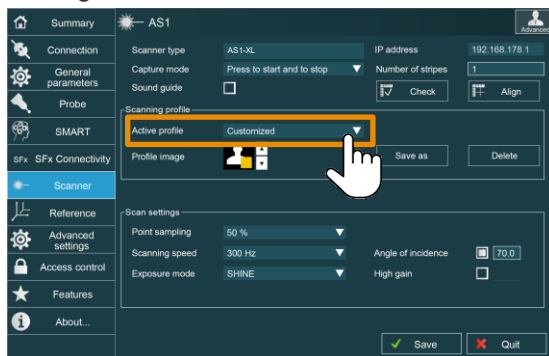
As with any other scanner, the current scan settings can be saved into a “Scan Profile”.

To select a profile:

- Through the RDS Agent > Scan view



- Through the RDS Control Panel > Scanner settings



- From the buttons of the instrument

 Press the 3-State button to activate the Quick Access Menu. Select “Scan Profile”. Choose the desired profile and validate. 	 Press the button “E” on the AP21 positioner. 
--	---



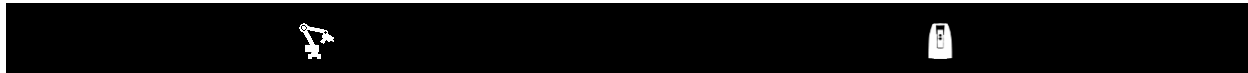
The AS1-XL provides two default scan profiles:

- Default – using the SHINE exposure mode, suitable for most applications.
- Sensitive – using the SHINE HighSense exposure mode, for more demanding surfaces.

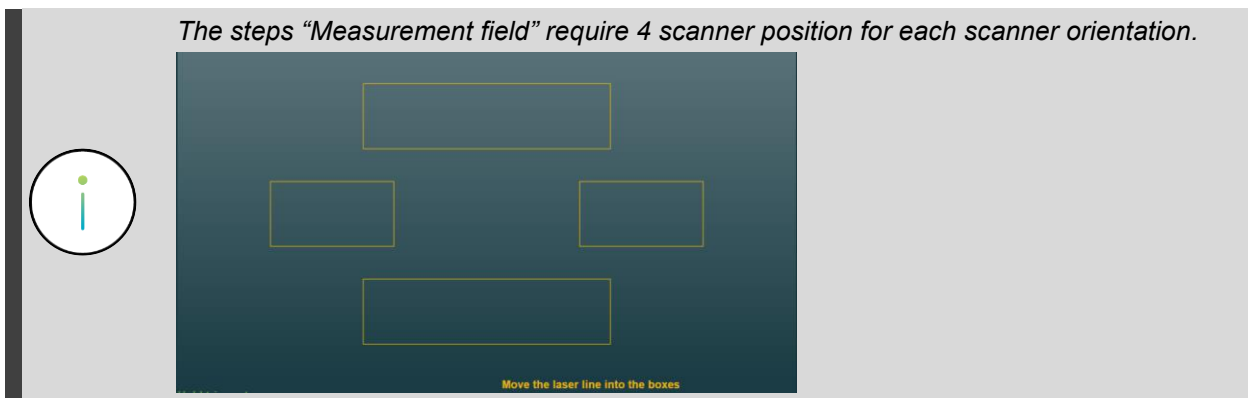
5.2.5 AS1-XL and RDS Data Collector

Scanner Alignment

The AS1-XL has its own specific scripts for aligning the scanner to the arm or tracker. Below is a list of available scripts to align the AS1-XL.



- Sphere with reference
- Measurement range
- Sphere alignment



Other Scripts

Due to its specific field of view, the AS1-XL has its own scripts. Most generic scripts cannot be used for the AS1-XL.

			
Specific to AS1-XL	•	Alignment (see above)	• Alignments (see above)
	•	Calibration: ISO10360-8 Annex D	• Diagnostics: Sphere check, 3 Planes distance
Common with other scanners	•	Scanning quick check	
	•	3 planes distance	
	•	Digitize	

5.2.6 AS1-XL and RDS Toolbox

AS1-XL SMART Indicators

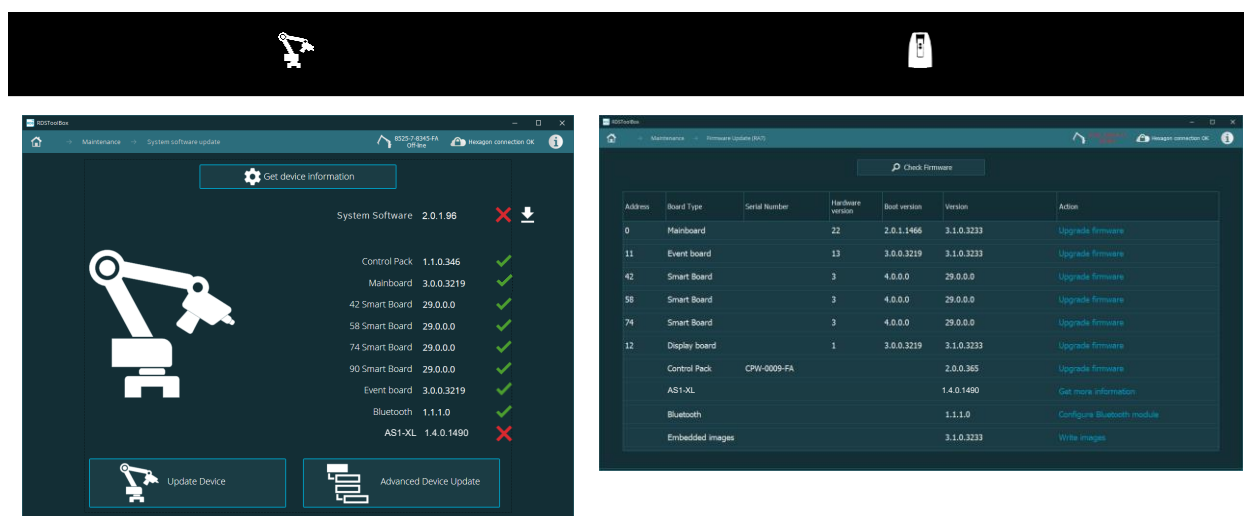
The AS1-XL laser scanner embeds the same SMART indicators as the AS1.



The SMART indicators cannot be retrieved when the AS1-XL is mounted on the AP21.

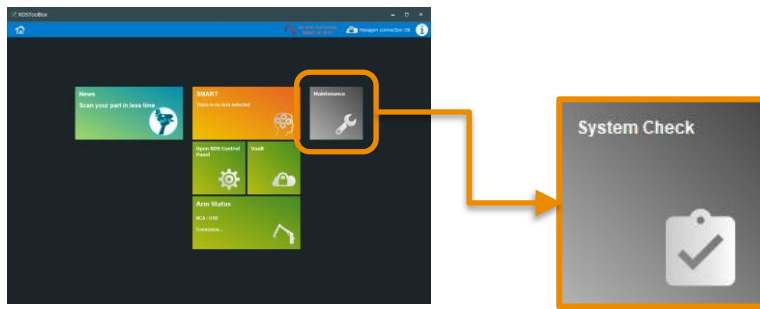
AS1-XL Firmware Upgrade

The firmware of the AS1-XL can be upgraded using the RDS Toolbox “System Software Update” (RA8) or “Firmware upgrade” (AT960) function (Advanced user profile).

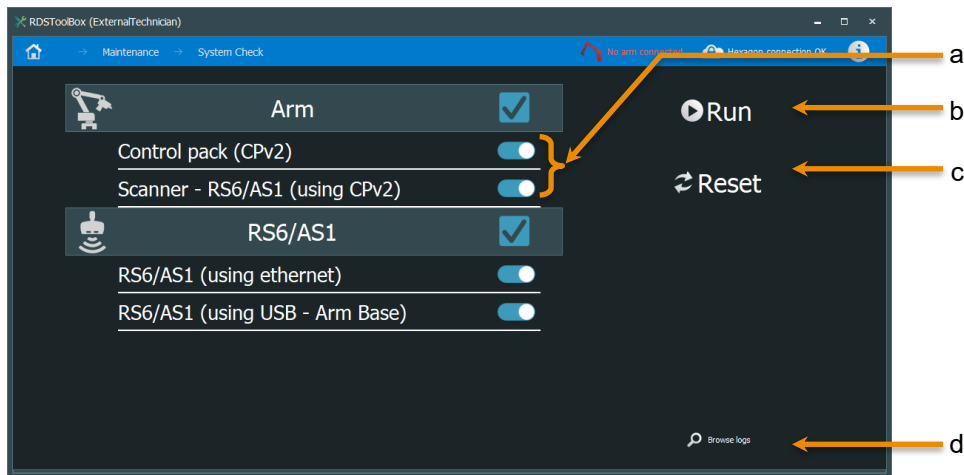


5.2.7 System Check

The “System Check” diagnostic tool includes the AS1-XL scanner.

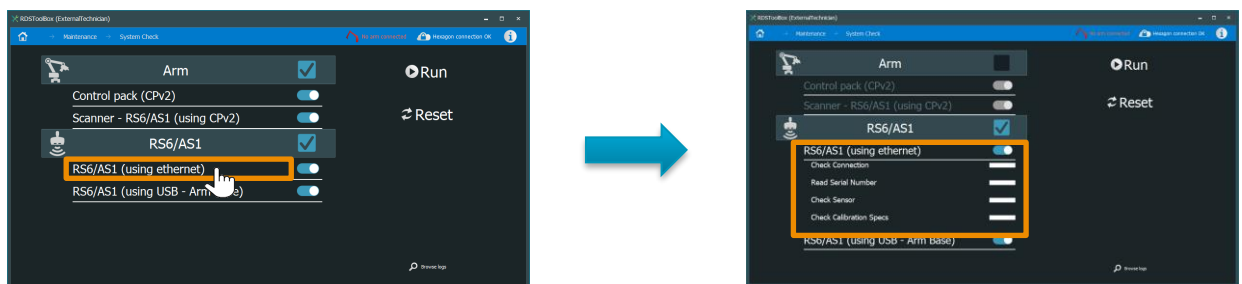


The system check enables a scanner check-up to be carried out to detect any failure.



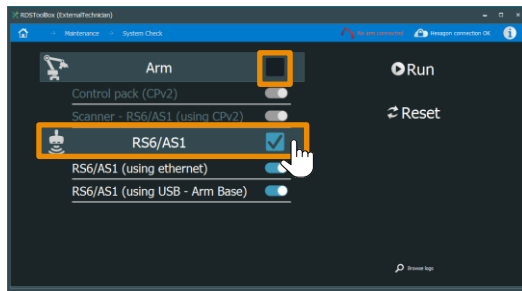
- a. Sub-categories test
- a. Run / stop the auto-diagnostic
- b. Reset the system check settings
- c. Display the logs

For each component to test, one or several sub-categories of tests can be done. Click on the sub-category to view the details of the test.

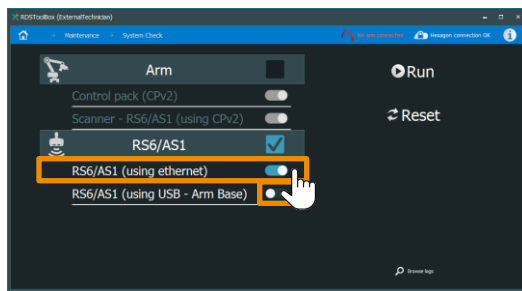


AS1-XL Check Process

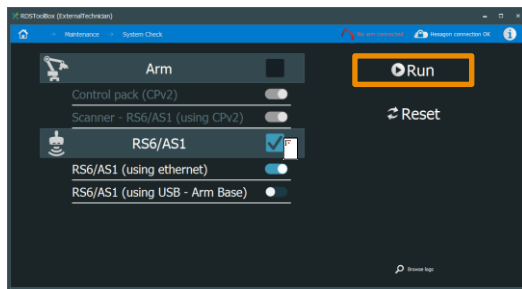
1. Check / uncheck the main component to test.



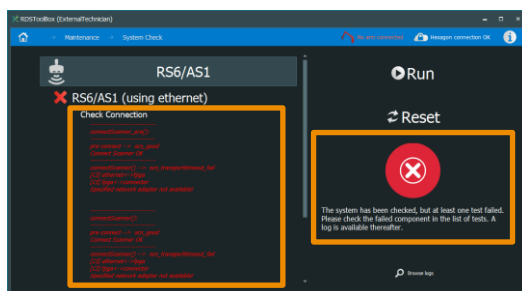
2. Select the tests to perform on the component.



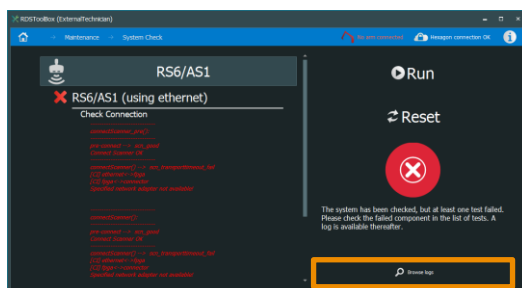
3. Run the Auto-diagnostic.



4. When finished, the test result is shown on the right side. If a failure occurs, the details of the test are displayed.



5. A set of logs becomes available: press "Browse Log". The corresponding files are grouped in a zip file (current date and time). Send the log file to your local service centre.



5.3 Support of the Absolute Arm RA8 v3

5.3.1 Absolute Arm v3 compatibility

RDS v6.4 is the first version to support the Absolute Arm (RA8) v3. Therefore, the RA8 v3 cannot be used with an earlier RDS version.

The RA8 v3 is compatible with all existing probes, scanners, Control Packs (v1 and v2) as well as all RDS functions and tools.



The RS-SQUARED, CMS 108 and HP-L-20.8 cannot be used with the RA8 v3.

In addition to the standard functions, the RA8 v3 brings new functionality for environmental stress monitoring (see [next chapter](#)).

5.3.2 Environmental monitoring (Absolute Arm v3)

When using the arm, it is vital that both the arm and the part remain as stable as possible throughout the measurement process. Knowing the environmental challenges within the working environment gives the user a better understanding of what may affect the results and guides them toward a corrective action.

RDS v6.4 includes environmental stress monitoring combined with new stress sensors on the Absolute Arm v3.



Environmental monitoring is only available on the Absolute Arm v3.

5.3.2.1 Enable Environmental Monitoring

RDS can monitor all the stress indicators and then will warn the operator if one exceeds its limits.

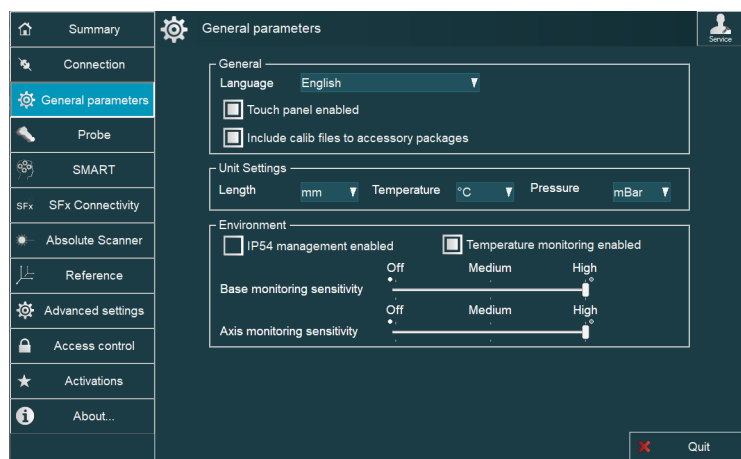
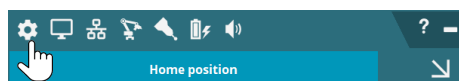
Alerts are displayed on the RDS Agent and on the Absolute Arm 7-axis wrist display. SMART Alerts are also then triggered.

Environmental Monitoring checks for several types of stress:

- Stability of the base (inclination, vibration, displacement)
- Stress of the Arm's axes
- Temperature gradient

Activation

Open the RDS Control Panel > General parameters.

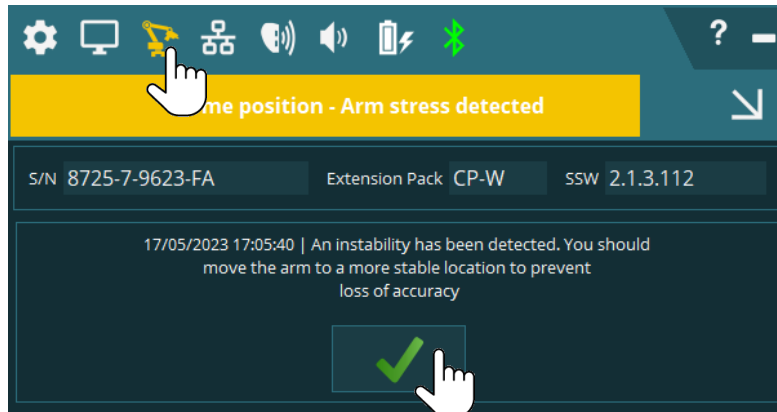


Set the appropriate monitoring to the required sensitivity.

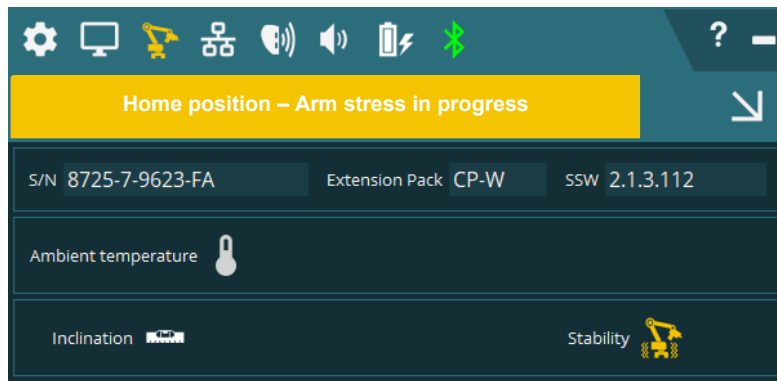
Off	The monitoring is disabled, no alert will be triggered.
Medium	Medium sensitivity applied to the sensors. Suitable for most situations.
High	The system is defined as very sensitive. Suitable to ensure careful handling when a very accurate measurement is expected.

Environmental Alerts

When environmental change or stress is detected, an alert is displayed on the RDS Agent. Open the Instrument tab to read the message and acknowledge the alert after taking the necessary corrective action.



If the cause of the alert is still present, the alert will remain visible until the corrective action is taken.



NOTICE

The environment monitoring by RDS is security for your instrument. By ignoring the notifications displayed by RDS or de-activating the monitoring, you may be exposed to incorrect measurements.



*The monitoring of the stress can be de-activated:
Open the RDS Control Panel > General parameters and uncheck the wanted option.
Read more in the appendix B. [RDS Control Panel](#).*



New self-test actions are available on RDS Toolbox > [System Check](#) for the vibration and tilt sensors.

5.3.2.2 Base Stability Monitoring

The arm contains sensors to check the relative tilt, vibrations and displacement of the arm base, and will alert the operator of any instability.

	Origin	Solution
	The inclination of the arm has changed.	• Verify the stability of the arm set-up. • Ensure that the mounting ring is correctly tightened with the supplied hook wrench. • Check that the mounting surface is clear. • Check that the tripod is correctly tightened.
	Vibrations have been detected.	• Check the stability of the floor or work station. • Check for anything that could be causing a vibration through the arm base (e.g. crane or forklift truck activity).
	A potential displacement of the base has been detected.	• Ensure the solidity of the platform to mount the arm (e.g. magnets are ON, base plate is securely fastened). • When using a tripod, alert others to your measurement activity by using barriers and/or signage. (Limit the risk of anyone accidentally kicking the tripod).

5.3.2.3 Inclination

The counterbalance of the arm is designed for horizontal mounting ($\pm 5^\circ$). If the arm is not level, it may affect the zero-G counterbalance.

	The workplane of the arm base is too inclined.	• Install the arm on a level work plane and reset the inclination.
---	--	--



The verification of the absolute inclination is done when powering the arm.

Inclination Sensor Reset

Following the detection of an inclination alert, a reset of the sensor is required once the corrective action has been performed. This will reset the current level as a reference to continue monitoring from.



A sensor reset is required when a station move is performed, and base monitoring is active. (Leapfrog, GridLOK...).

5.3.2.4 Axes Stress

When handling the arm, no stress must be applied to the axes at the risk of disrupting the measurement. The system will detect any such kind of stress and warns the user.

	A stress is applied to one or several axes. • Ensure that the whole arm is free to move on all the axes. • Do not ‘pull’ on the wrist during measurement.
---	---

5.3.2.5 Ambient Temperature

The Absolute Arm can be used between 5°C and 45°C in conditions of stable temperature. If the temperature is outside these limits, a deviation of the precision of measurement may occur. Also, if the variation of temperature evolves too quickly, it can affect part to be measured.

	The operating temperature is optimal
	Temperature variations were detected, evolving up or down. Wait until the temperature has stabilized before starting the measurement.
	The Arm is not working in the optimal temperature range. To achieve best accuracy, move to an environment with a stabilized temperature between 10°C and 30°C.
	The temperature exceeds the range. The measurement is forbidden. Move the measurement to where the temperature is within the operating range of the arm.
	Hardware issue



The temperature sensor is located at the base of the arm. Do not place any source of heat nearby the base to avoid any false alert.

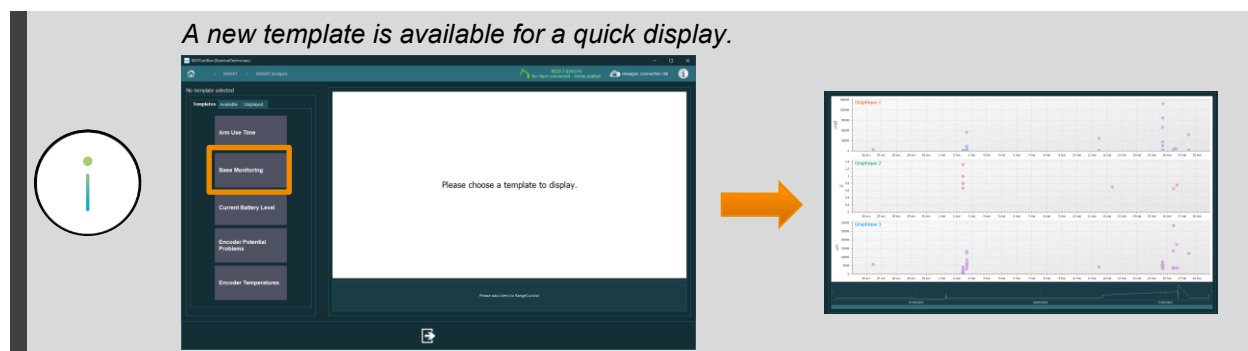
5.3.2.6 SMART Indicators and Asset Management

To monitor the environmental stress events, SMART (RDS Toolbox) and Metrology Asset Management tools receive new data.

SMART

Indicators have been implemented in SMART to monitor the new environmental stress.

Indicator		Components	Description
CompensatedBaseTemp Level (General)			Level of the ambient temperature compared to the recommended range 0 – optimal (10°C → 30°C) 1 – in range high (30°C→45°C) 2 – in range low (5°C→10°C) 3 – in range increasing too fast 4 – in range decreasing too fast 5 – out of range high (>45°C) 6 – out of range low (<5°C) 7 – monitoring de-activated 8 – initializing 9 – hardware issue
DiscDistStressDetected (Encoder)		A / B / C / D / E / F / G	Stress event on encoder
RelativeInclinationStress Detected (µrad) (Environment)			Tilt event when the inclination of the arm base changes.
ShockStress Detected (g) (Environment)			Shock event detected by the sensor within the arm base (It may result on a displacement).
DisplacementStress Detected (µm) (Environment)			Movement event of the base.



Asset Management

When activated, each environment warning is reported in the Metrology Asset Management.

 Warning Stability A stability issue has been detected on the base	The base of the arm has moved or was subjected to vibrations.
 Warning Encoder Stress A Stress has been detected on an axis	One or more axes are under stress.
 Ambient Temperature Info Ambient temperature range - Optimal	Current ambient temperature status
 Ambient Temperature Warning Ambient temperature range – Warm range	
 Ambient Temperature Warning Ambient temperature range – Out of range (too warm)	
 Ambient Temperature Warning Ambient temperature range – Fast increase	
 Temperature Monitoring Disable Ambient temperature monitoring is de-activated	The monitoring of ambient temperature has been disabled.
 Ambient Temperature Warning Ambient temperature range – Hardware issue	The temperature sensor is defective.



The Internal Temperature graph displayed by the Metrology Asset Management does not reflect the ambient temperature but the arm internal temperature (CPU).

5.4 Connectivity Configuration (RA8)

5.4.1 Overview

The available settings of the Control Packs v2 (CP-W) for the wireless connection (SSID, network key...) have been enhanced with additional settings:

- CP-C, CP-B and CP-W benefit from the extended configuration
- Common network configuration for wired and wireless connection can be modified
- Wi-Fi chipset tool has been renamed as “Configure connectivity”.



- The network configuration requires an update of the System Software v2.1 or higher.
- Legacy CP0, CP2, CP2 and CP3 don't benefit from this improvement.



The following network parameters can be set.

	Default value	Restrictions
IP Address	192.168.178.1	In case of DHCP, limited from X.X.X.1 to X.X.X.9 with a 24 bits mask (255.255.255.0).
Subnet mask	255.255.255.0	Last byte = 0 (X.X.X.0).
Gateway	-	The gateway must be in the range of the subnet mask and IP address.
DHCP Server	☒	DHCP Client not supported

NOTICE

To avoid any issue with the connection to the scanners, it is recommended to

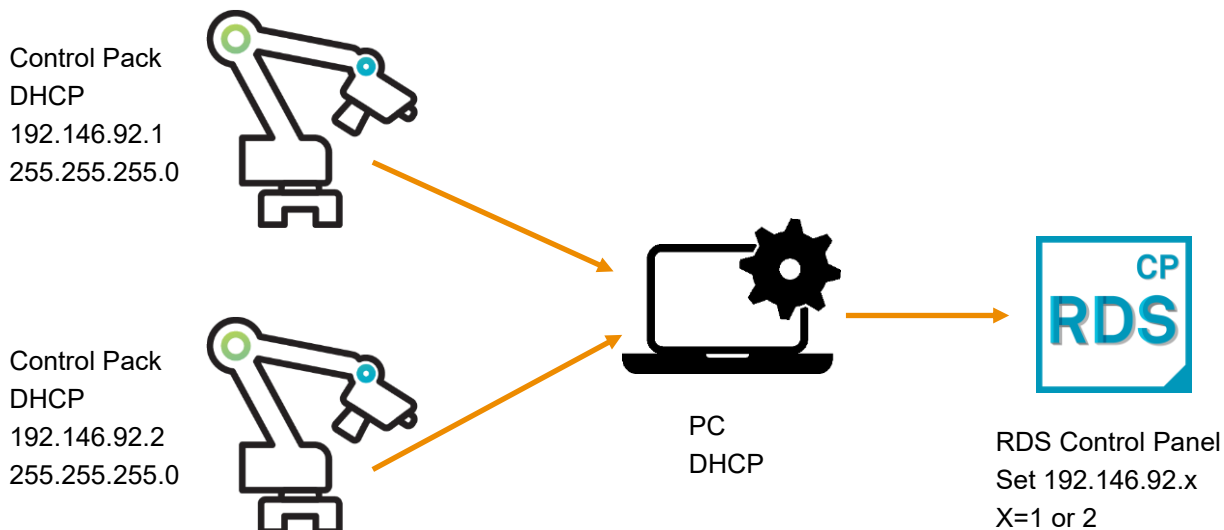
- Use an IP address in the range of 192.168.178.x
- X≠200; 201
- Mask 255.255.X.0

5.4.2 Advantages and Conditions

The network configuration offers new possibilities of connection.

Connection of Multiple Arms

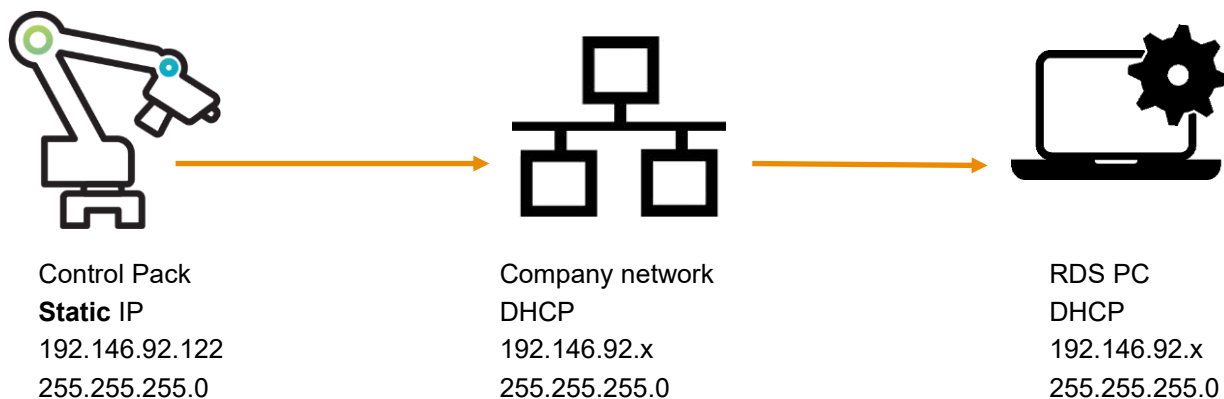
By setting several arms with different network configurations (for example simply different IP addresses), it is now possible to keep several arms connected and powered at the same time on a single PC. To switch from one arm to another, you just need to indicate the new network configuration to RDS.



Connection through a company network

Until RDS 6.3, the arm was required to be connected directly to the computer. With RDS 6.4 (and the appropriate firmware), it is now possible to connect it via the company network.

The network configuration of the Control Pack must use a static IP address, matching with the company network.



NOTICE

Using DHCP, the arm cannot be connected to the PC via the company network. However, using a static configuration ("DHCP Server" unchecked), this type of indirect connection can be used.

NOTICE

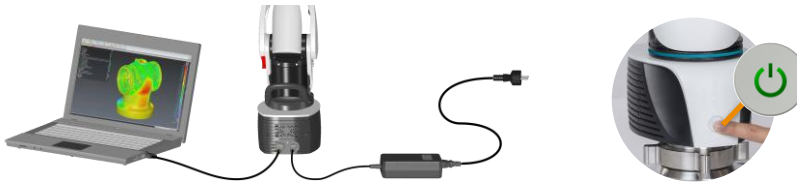
Scanning is a network intense case. Over a company network, performance issues can be encountered when using the system with its maximum performance settings.

NOTICE

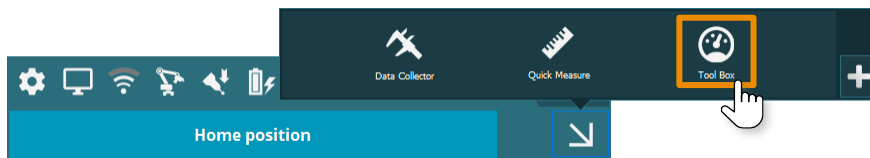
Prior to setting manually the IP address in the RDS Control Panel, the appropriate Control Pack and connection type must be first selected.

5.4.3 How to Change the Network Configuration

1. Establish a connection to the arm.



2. Open RDS Toolbox.



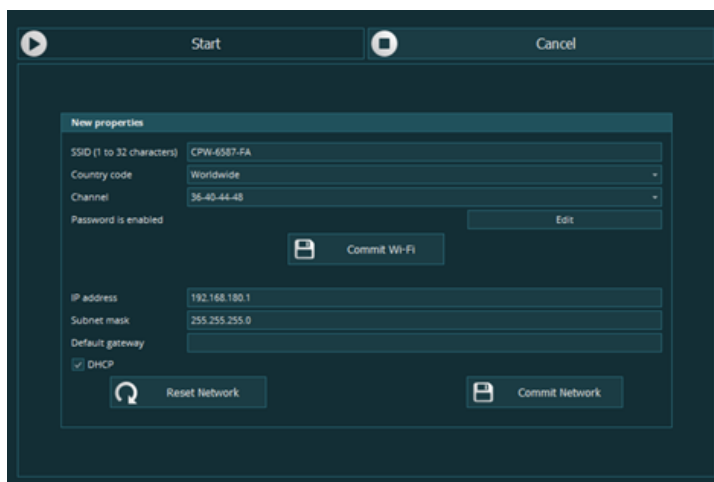
3. Select Maintenance > Connectivity configuration.



4. Click on "Start".



5. Enter the values for each feature and press "Commit Network".



6. Wait for the arm to be ready with the new settings.



When the network address has been customized, the Ethernet and Wi-Fi pictograms appear briefly orange during the initialization.



The Arm IP address in the RDS Control Panel is automatically set by RDS Toolbox.

Connection

Advanced

Instrument type

☒ Absolute Arm (RA8)
 Control Pack CP-W ▾

☐ ROMER Absolute Arm (RA7)
 Feature Pack ▾

☐ Leica Tracker (AT960)

Link type

☐ Wi-Fi
☒ Wired ethernet

IP address

192.168.178.1

Default

5.4.4 Reset of the network configuration

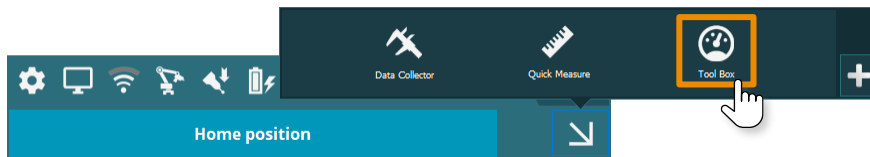
Through RDS Toolbox

On the Connectivity configuration tool in RDS Toolbox, a button permits to set back the default configuration.

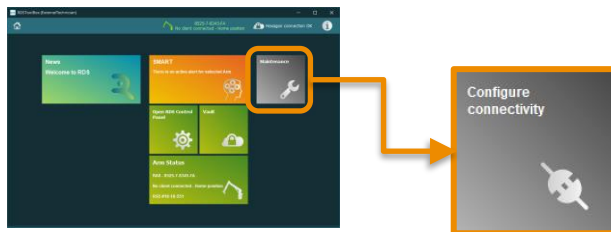
1. Establish a connection to the arm.



2. Open RDS Toolbox.



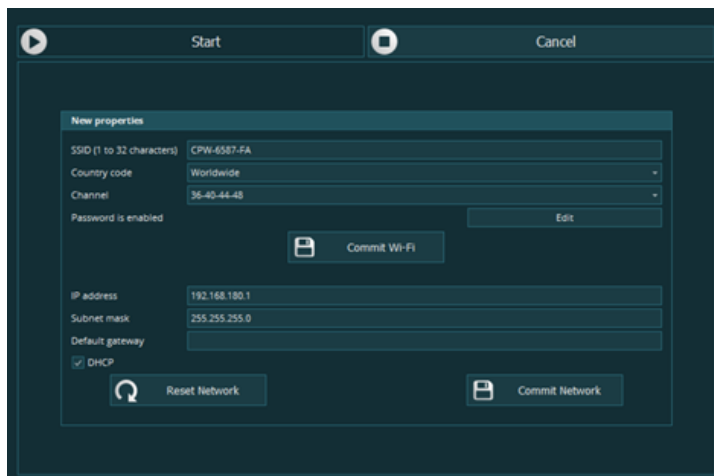
3. Select Maintenance > Connectivity configuration.



4. Click on "Start".



5. Press "Reset default" and "Commit Network".



6. Wait for the arm to be ready with the new settings.

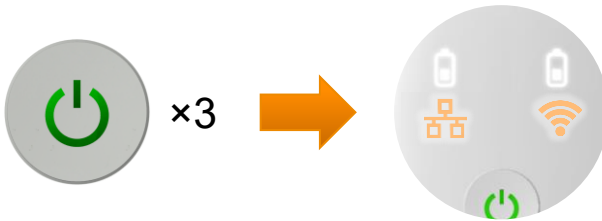
On the Arm

If the network configuration of the Control Pack has been modified and forgotten (i.e., the arm cannot be connected anymore), an interactive process on the arm will reset the network configuration.

1. Power on the arm.



2. Once initialized, press 3 times on the power button (the Ethernet and Wi-Fi pictograms turn to orange).



3. Again, press 3 times on the power button to reset the network configuration (if no action has been done before 10 seconds, the process is aborted).



The arm then will restart with the default configuration.

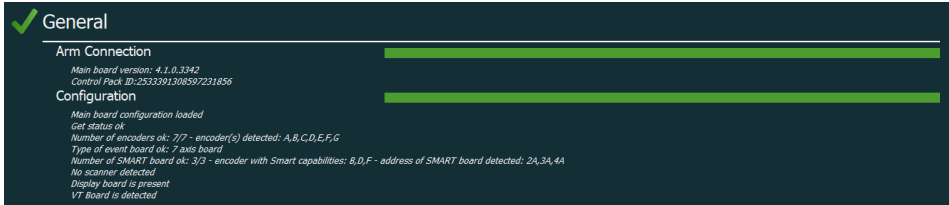
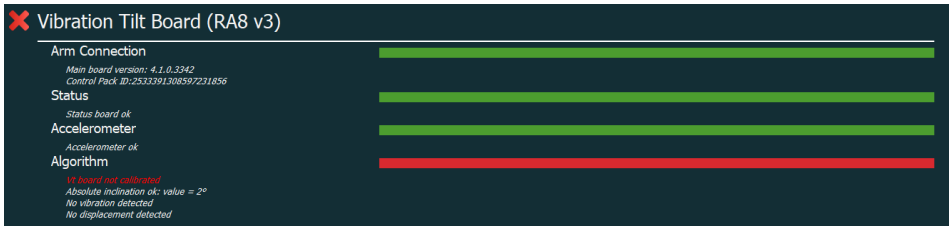
Special Cases for which the Configuration returns to the default

In some special cases, the Control Pack will automatically retrieve the default network configuration:

- The Control Pack is Mounted on an arm programmed with a legacy firmware (≤ 4.1)
- The Control Pack is reprogrammed with a legacy firmware (≤ 2.1)

5.5 Enhanced System Check (arms)

The system check tool in RDS Toolbox has been enhanced with new tests on the Absolute Arm

General 	A new component verifies the configuration of the arm (number of axes, presence of SMART, scanner, display and VT boards). 
Encoders	The test on the encoders now checks all parameters related to stress.
Vibration Tilt board 	(RA8 v3 only) A new component verifies the status of the VT board embedded at the base of the arm. 

AS1-XL

All the checks of the AS1 scanner have been extended to the new AS1-XL scanner.

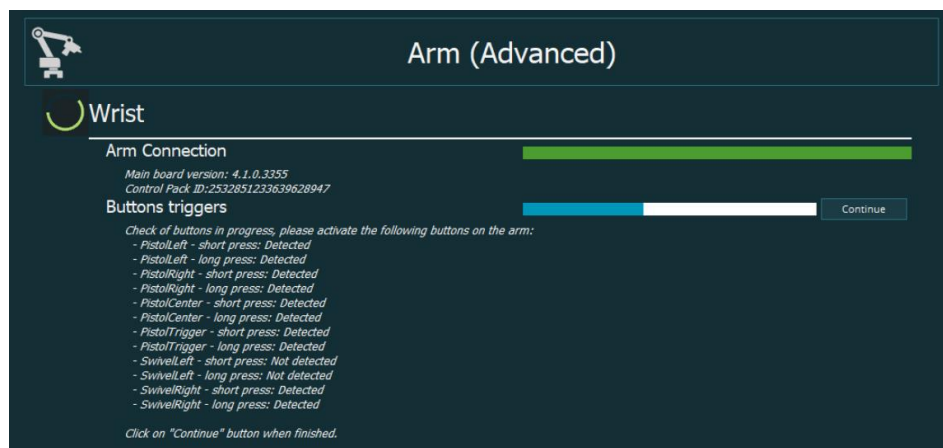
Arm Advanced check

Wrist Buttons

The existing check of the buttons on the wrist was considering only the three main buttons. It now considers all buttons on the wrist, for any kind of arm.

Also, now both short and long presses are checked.

Depending on the detected type of arm and removable components (Nose Cone, pistol grip), the short and long press are requested on the appropriate list of buttons.



Encoders

The process remains the same as before (as requested, all axes shall be manipulated, and then "Continue" must be pressed), but now, more indicators are checked.

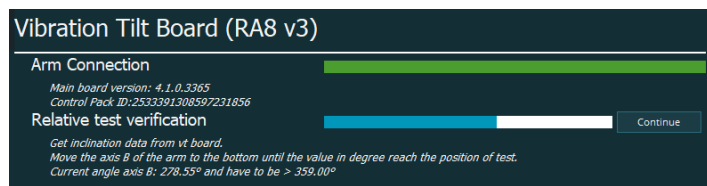
Vibration Tilt board



In addition to the standard static check, an advanced check will ask the user to perform some manipulations of the base to check the correct operation of the VT board:

- Move the B axis down until the requested angle (horizontal position).

RDS will check the correct function of the tilt board.



5.6 Artefact Temperature Compensation (arms)

A temperature compensation of the calibrated artefact can now be applied when performing probing or scanning quick checks or ISO calibrations in RDS Data Collector, on

- Length Checks
- Sphere checks

5.6.1 Using the Thermal Expansion

When executing a quick check or calibration script in RDS Data Collector, inputs are now proposed to enable the compensation of the temperature.

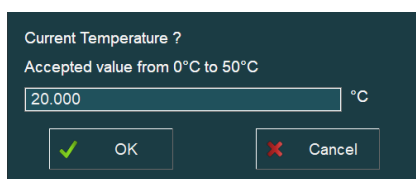
- Coefficient of thermal expansion (CTE) of the material.
- Temperature of the artefact

If the temperature or the coefficient are unknown, then the calculation will be done without the compensation of the thermal expansion.

Current temperature

- Manual input: enter the real temperature of the artefact to be used.

The acceptable values must be between 0°C and 50°C.




*By typing values out of this range, the closest acceptable value will be taken into account.
E.g.: typing -3°C, 0°C will be considered.*

NOTICE

The temperature entered manually is used for the entire calibration, thus, it belongs to the user to ensure a stable temperature of the artefact all along the measurements.

CTE Value

The Coefficient of Thermal Expansion depends on the material of the artefact used.

- On Quick checks, the CTE must be entered manually when prompted.
- On ISO 10360-12, several artefact files can be saved to automatically recall the appropriate properties (dimensions and CTE).



Refer to the user manual for a list of CTE values for our standard artefacts.

5.6.2 Result Using Thermal Compensation



No thermal compensation will be used in the following cases:

- Temperature = 20° (nominal temperature of calibration for artefacts)
- The CTE is null.

When displaying the results, new information is provided.

Calibrated [mm]	Nominal [mm]	Measured [mm]	Deviation [mm]
25.4000	25.4005	25.3901	-0.0104

CTE [$\mu\text{m}/^\circ\text{C}/\text{m}$]	Temperature [$^\circ\text{C}$]
5.500	23.626

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Calibrated value	Dimension given with the artefact (calibrated value at 20°C).
Nominal value	Compensated dimension of the artefact (calibrated value with the thermal compensation).
Measured	Dimension measured with the instrument.
Deviation	The error is now calculated between the current measurement and the compensated value.
CTE	Reminder of the entered coefficient of thermal expansion.
Temperature	Temperature used for the thermal compensation.

5.7

Go-NoGo For Diagnostic and Calibration Scripts (arms)

The Pass/Fail functionality in RDS Data Collector, introduced on the results of the probe and scanner alignments has been extended to the Quick Checks and ISO scripts.

Also, the results screens for the ISO 10360 calibrations have been improved to make it easier to understand the results.

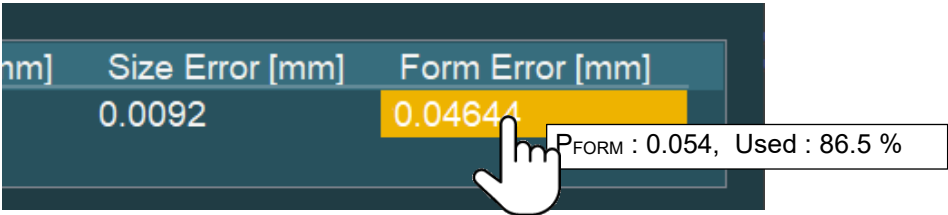
5.7.1

Go-NoGo

In the result screen, a traffic light shows if the arm is in or out of tolerances.



If out of tolerance, then the faulty value will be highlighted. Passing the mouse over the value will show a pop-up with details.



P _{FORM}	ISO Designation and specification value	E _{UNI}	P _{FORM}
		P _{SIZE}	L _{DIA}
Used	Percentage of the specification covered by the current measurement	$\leq 100\%$: within specifications* $> 100\%$: out of specifications	



The Go-NoGo is only applied to the RA8.

5.7.2 New Result Screens

The results screens have been redesigned for all quick checks and calibrations to make them easier to understand.

Probing Quick Check



ISO 10360-12

RDS 6.3

RDS 6.4

Length

	TheoDistance	AppDistance	AppDeviation	DevRound1	DevRound2	DevRound3
L_01_02	18.6420	18.6165	-0.0255	-0.0242	-0.0210	-0.0311
L_01_03	399.9970	399.9543	-0.0427	-0.0187	-0.0477	-0.0648
L_01_04	850.6650	850.6472	-0.0178	-0.0209	0.0035	-0.0361
L_01_05	1300.4190	1300.4512	0.0322	0.0468	0.0104	0.0396
L_01_06	1701.8290	1701.5223	-0.1027	-0.1009	-0.1266	-0.0806

Length deviations

	Calibrated [mm]	Nominal [mm]	AppDistance [mm]	AppDeviation [mm]	DevRound1	DevRound2	DevRound3
L_01_02	25.1700	25.1709	25.2258	0.0549	0.0525	0.0606	0.0513
L_01_03	75.0800	75.0828	75.1399	0.0571	0.0506	0.0511	0.0598
L_01_04	125.1600	125.1647	125.2335	0.0688	0.0678	0.0699	0.0687
L_01_05	200.0000	200.0075	200.0307	0.0232	0.0235	0.0218	0.0244
L_01_06	250.0700	250.0794	250.1012	0.0218	0.0251	0.0167	0.0238

Length deviations

Spheres 1 - 2

Theo diameter	Diameter	Min dev	Max dev	Average dev
25.4000	25.3868	-0.0254	0.0279	0.0103

Calibrated [mm]	Nominal [mm]	Measured [mm]	Size Error [mm]	Form Error [mm]
25.4000	25.4009	25.3964	-0.0046	0.0108

Spheres 1 - 3

Theo diameter	Diameter	Min dev	Max dev	Average dev
25.4000	25.3868	-0.0254	0.0279	0.0103

Articulated Location Error [mm]	
0.0055	

3D distances	
Name	3D distance [mm]
1 - 2	0.0033
1 - 3	0.0055
1 - 4	0.0029
1 - 5	0.0044
2 - 3	0.0041
2 - 4	0.0036
2 - 5	0.0021
3 - 4	0.0031
3 - 5	0.0027
4 - 5	0.0033

Cones

Min deviation	Max deviation	Average deviation
0.0017	0.0123	0.0045

Range over 2

Range over 2 - X	Range over 2 - Y	Range over 2 - Z
0.0080	0.0041	0.0037

Min deviation [mm]	Max deviation [mm]	Average deviation [mm]
0.0049	0.0334	0.0157

Scanning

RDS 6.3

RDS 6.4

QC - Sphere

Global sphere

X	Y	Z	Max	stddev	Theo Diameter	Diameter	Deviation
675.5533	-72.2824	208.3068	0.0711	0.0208	25.4014	25.4984	0.0970

Sub-spheres quality

Max	stddev	Theo Diameter	Diameter	Deviation	Rejected %
0.0711	0.0208	25.4014	25.4984	0.0970	0.0000

Calibrated [mm]	Nominal [mm]	Measured [mm]	Deviation [mm]
25.4000	25.4005	25.3901	-0.0104

ISO 10360-8

3D distances

Name	3D distance
1 - 2	0.0310
1 - 3	0.0180
1 - 4	0.0231
1 - 5	0.0320
2 - 3	0.0193
2 - 4	0.0220
2 - 5	0.0356
3 - 4	0.0063
3 - 5	0.0199
4 - 5	0.0143
Max	0.0382

Global sphere

X	Y	Z	Max	stddev	Theo Diameter	Diameter	Deviation
640.8573	-39.1482	208.0857	0.0901	0.0106	25.4000	25.4049	0.0049

Sub-spheres quality

Max	stddev	Theo Diameter	Diameter	Deviation	Rejected %
0.0730	0.0052	25.4000	25.3998	-0.0002	0.0000
0.0645	0.0051	25.4000	25.3964	-0.0036	0.0000
0.0747	0.0049	25.4000	25.4063	0.0063	0.0000
0.0699	0.0049	25.4000	25.4007	0.0007	0.0000
0.0878	0.0053	25.4000	25.3937	-0.0063	0.0000

LDia [mm]

0.0160

5.8 New Terminology

In an effort to align metrology terminology across all of Hexagon's product lines, RDS v6.4 contains some changes to the terminology used in previous versions.

Therefore, all messages, manuals and other documents have been updated to reflect these changes.

What is a Verification?

A verification is a check of the device's accuracy, comparing to a known reference artefact. It does not have to respect a specific published accuracy method or process.

The device's compensation model is not adjusted during verification.

A verification can be performed by the customer, a laboratory or a Hexagon Service Centre.

What is a Calibration?

The calibration is the process that establishes the relationship between the measured data and the nominal values of the reference artefact.

The calibration process is based on our published accuracy standards (for example ISO 10360-12 for an arm's probing accuracy or ISO 10360-10 for a laser tracker). This means that a specific process must be followed to arrive at the final result.

The device's compensation model is not adjusted during this process.

The result of the calibration is the printed 'Certification'.

What is a Certification?

A 'certification' is the document that results from the 'Calibration', statement of the device's accuracy performance, relative to its quoted accuracy standard (ISO 10360-XX).

What is a Compensation?

A compensation is an adjustment of the device's offsets, to improve the accuracy.

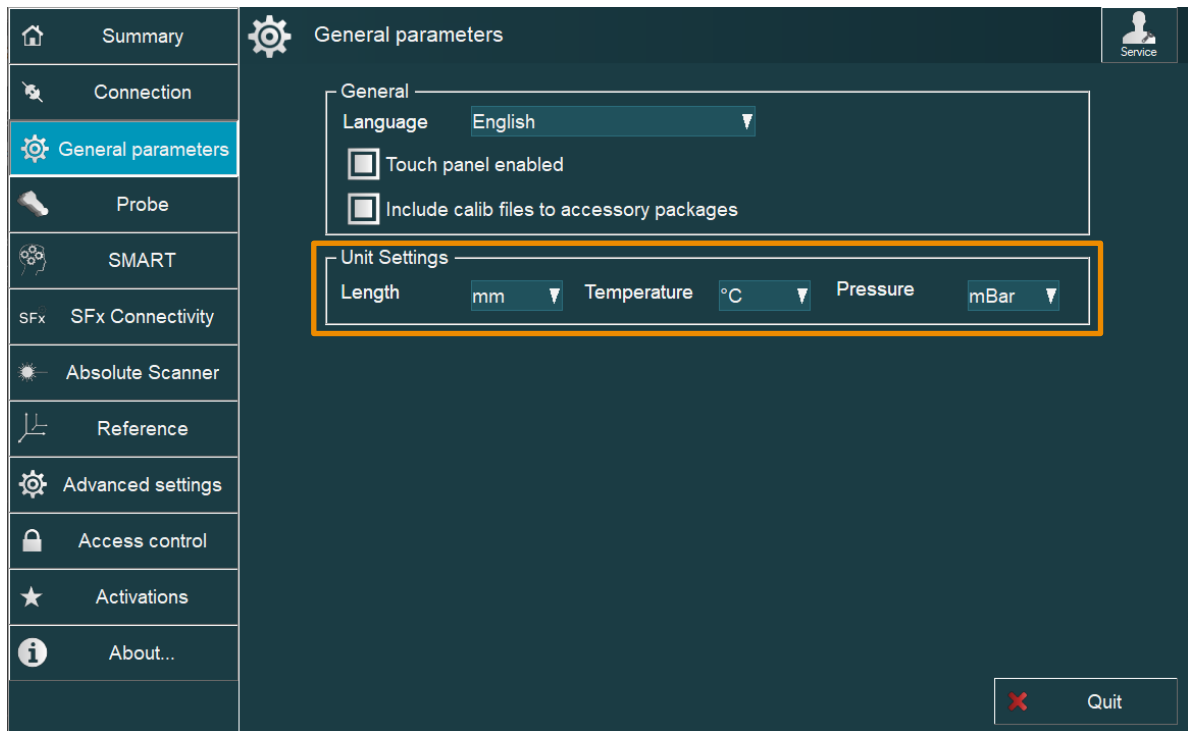
Summary

Description	Old wording	New wording
Adjustment of the device's offsets, to improve the accuracy.	✗ Calibration	✓ Compensation
Process that establishes the relationship between the measured data and the nominal values of the reference artefact.	✗ Certification	✓ Calibration
Document that results from the 'Calibration'	✗ Certification report	✓ Certification
Check of the device's accuracy, comparing to a known reference artefact.		✓ Verification

5.9 Units Settings

Length, temperature and pressure units can now be defined by the user in RDS v6.4.

The settings can be found in the RDS Control Panel, tab General settings.



All screens in the RDS Agent, RDS Control Panel, RDS Data Collector and RDS Quick Measure are then displayed with the selected units.

Calibrated [mm]	Nominal [mm]	Measured [mm]	Deviation [mm]
25.4000	25.4005	25.3901	-0.0104

CTE [$\mu\text{m}/^\circ\text{C}/\text{m}$]	Temperature [$^\circ\text{C}$]
5.500	23.626

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Example of RDS Data Collector result screen with the units.



The units set in RDS do not affect the data sent to the application software.

5.10 Other improvements

5.10.1 CMS108 / HP-L-20.8 phase out (arms)

The above-mentioned scanners are now phased out. All functionality related to these sensors will no longer be developed or maintained in RDS.

5.10.2 AS1 Scanner

New Option for Filter Preference

A new option is available in the RDS Control Panel for the AS1 and the AS1-XL, to use a light filter instead of the latest quality filter. This can be useful in the case of a low performance computer or some specific use cases for which the new filter would require very high resources.

Scan settings

Point sampling

50 %

Scanning speed

300 Hz

Exposure mode

SHINE

Filter preference

Quality

Angle of incidence

☒

70.0

High gain

☐

The “Filter preference” proposes two options.

Quality <i>(default)</i>	This is the advanced filter which provides the best quality, particularly for geometric feature extraction and boundaries, by analysing the complete 3D neighbourhood for each point. Note: the calculation is intense and cannot be guaranteed by computers below the recommended specifications.
Performance	This filter provides the best throughput by limiting the analysis to the neighbourhood along a single scanline only for each point. Note: It is less demanding in terms of resources and leaves the system reactive even on weaker computers or when working with very big point clouds.



This option is not available for the RS6, which only uses the “Performance” filter.



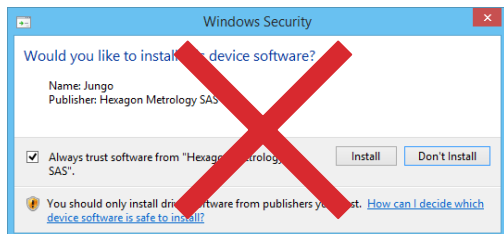
The filter preference is not applied to the scanner alignment nor the ISO 10360-8 calibration process in RDS Data Collector which automatically uses the “Quality” filter.

Empty lines in Preview Mode

In RDS 6.3.0, the preview mode was giving intermittently empty lines. This behaviour has been solved.

5.10.3 USB drivers (arms)

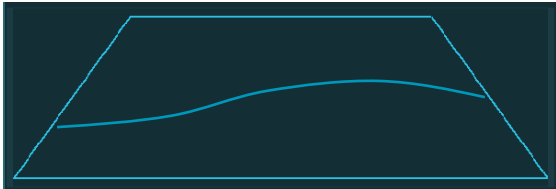
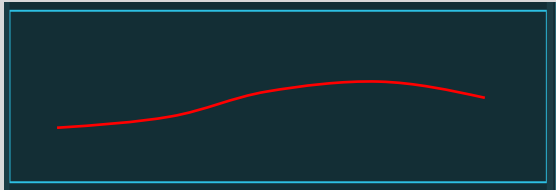
The Jungo USB drivers are no longer supported and have been replaced by the standard Windows driver (WinUSB). All the arms (RA7 and RA8) can now connect through USB (depending on the extension pack) without the need of any additional driver during the installation of RDS.



5.10.4 RDS Agent

RDS Agent Laser view

The laser view on the RDS Agent now reflects the connected scanner:

RS6, AS1, AS1-XL	Blue line	
RS2, RS3, RS4 RS5 HP-L-8.9 LAS, LAS-XL	Red line	

5.10.5 RDS Service (arms)

Serial Number of RA7 in the logs

RDS 6.3 introduced a regression for which the serial number of the RA7 was not shown in the rds.log file. This bug has been fixed.

RA8 Firmware v2.0.0 incompatibility

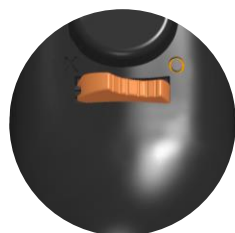
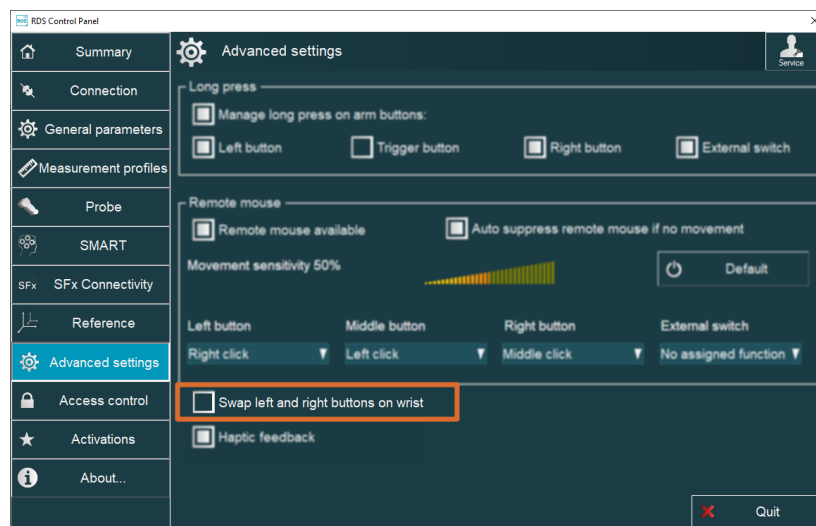
Since RDS 6.3.0, some RA8 arms with a specific configuration and v2.0.0 firmware failed to connect, and then the firmware update could not be performed. The connection issue has been resolved and the system software update can be performed normally.

5.10.6 RDS Control Panel

Swap left and right buttons (arms)

It is now possible to swap the use of the left and right buttons for validation and cancellation purposes. The option is available in the RDS Control Panel ► Advanced settings.

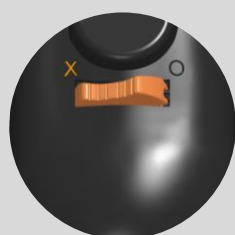
The swap is applied on any kind of arm (RA7 or RA8, 6-axis or 7-axis), even on the 3-State button located on the wrist display of the RA8 v1.



Right

Validation
purposes

Cancellation
purposes



Left

Cancellation
purposes

Validation
purposes



The Quick Access Menu and any test functionality are not affected by the swap.

More functional scanning settings

To provide a better scanning settings interface, the exposure slider is now visible only when needed.

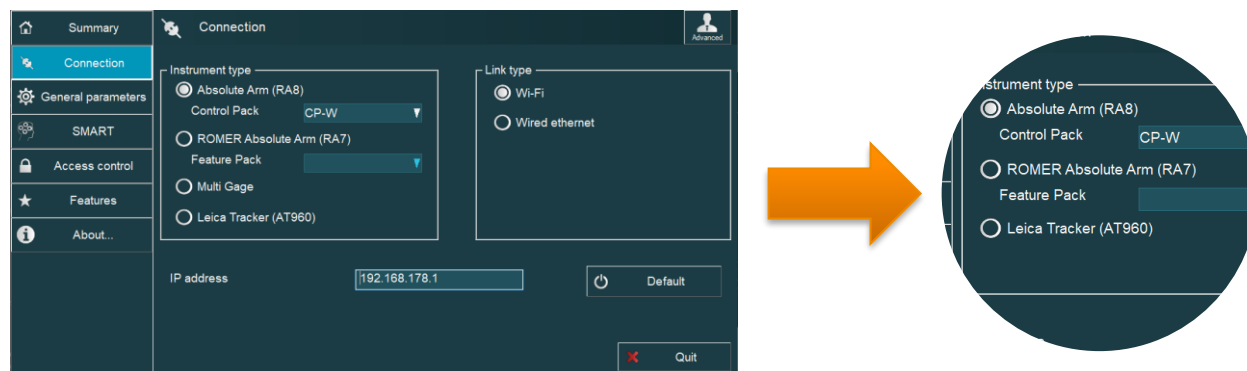


Available Languages

Traditional Chinese has been removed from the list of available languages for the benefit of simplified Chinese.

Multi Gage Connection Removed

After its phase out, the Multi Gage is no longer supported by RDS 6.4. Therefore, the selection of connection in the RDS Control Panel has been removed.



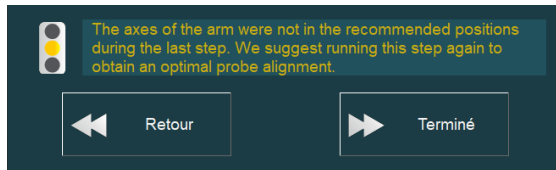
5.10.7 RDS Data Collector

Plane Test Removed from the Probing Quick Check

To provide a quick check that fits better to the calibration process of the arm, the plane test has been removed from the probing quick check.

Simplified Contact Probe Alignments

At the end of the probe alignment process, the final calculation is now performed without showing "before calculation" values. It is still a requirement to respect the nominal positions of the arm and probed point locations (around the sphere) to achieve a green light status.



Unused Scripts Removed

Some scripts have been removed from the installation. It mainly concerns the calibration scripts for the Service installer and the VDEVDI calibration.

Autosave.txt File with Probing Quick Check

When performing a probing quick check, the last results are normally added at the end of the "autosave.txt" file, but since RDS 6.2, the existing content of the file was totally removed and only the last result was kept. The correct function has been re-established and all the history of results is kept.

5.10.8 RDS Toolbox

SMART Data Upload (arms)

Since RDS 6.0, incorrect registry entries could result in a lack of SMART data upload to the server. When installed on a virgin computer, RDS 6.0 to 6.3 did not send any data automatically to the server. The RDS 6.4 installation now correctly reset the faulty registry.

Errors with System Check (arms)

Performing a system check with legacy arms (RA7, RA8 v1) could bring errors on absent components (e.g.: SMART components) while there is in fact no issue.

System Check now displays errors only for abnormally missing components.

System Check Logs

At the end of the System Check, RDS Toolbox dump the report in a zip file. This file is now populated with useful log files.

5.10.9 RA7 Firmware

Support for TKJ Probes

The firmware update applied on the RA8 and the RA7 (v1 to v4) for the compatibility with the new technology of the contact probes has now been also applied on the RA7 v5 and v6 (with RA8 wrist).

The firmware of the event board on the RA7 v5 and v6 must be updated to v4.1.0.3369.

6 RDS 6.3

6.1 Windows11 compatibility

RDS 6.3 addresses the compatibility with Windows11. All RDS functions can be now used safely with Windows10 or Windows11 x64 Pro or Enterprise.



The requirements for the application software must be checked to ensure its compatibility with Windows11.

6.2 New Scanning Filters for the AS1



The changes only concern the AS1. The RS6 scanner is not affected by the improvements nor the new requirements.

New requirements for the AS1

The quality filters of the AS1 have been reworked. This results on a higher consumption of the processor of the PC, thus the requirements have been reassessed to higher specifications.

	Minimum specs	Recommended specs for higher performance
Processor	2.1 GHz 6 Core (ex: I7-10 th generation)	2.1 GHz 16 Core (ex: I9-12 th generation)
RAM	64 Gb	64 Gb
Graphic card	RTX A4000	RTX A4500

The other specifications have not changed.



*Due to this higher specifications, older PCs may now not be sufficient and shows “Insufficient system resources” message.
If so, it is recommended to lower the frequency to 200 Hz.*

Geometric features quality

Scanning geometric features with the AS1 provides now a better quality on the boundaries, permitting an even more accurate calculation of the feature.

Missing scan lines

With previous versions of RDS, it could occur to the digitization to show gaps due to missing scan lines. The performances of scanning have been improved to avoid such gaps.

Tiny holes

Very small holes (less than 2mm diameter) were very challenging to be correctly digitized, most of the times providing a global empty space between several such holes. It becomes now possible to measure tiny holes even when they are close to each other.

6.3 AS1 Scanner Various Improvements

Support of the AS1 probe extension (trackers)

The new extension for the AS1 scanner on the trackers is supported by RDS. The use, and alignment are similar as the current use of the AS1.

Not-Aligned Face Information (trackers)

The information about a missing alignment of the scanner has been added in the RDS Control Panel and the RDS Agent.

Exposure Capture in the RDS Control Panel (tracker)

When the Used Defined mode is selected, the exposure can now be captured even if the RDS Control Panel is opened.

Scanning Profile Pre-set while not locked on AP21 (trackers)

With previous versions, the selection of the scanning profile through the API was possible only when the AP21 was locked on. It means that pre-selection by the application software through the API was not possible. This has been made possible, to offer the possibility to the application software to pre-select a scanning profile even if the positioner is not locked on.

Colour Guide

The AS1 and RS6 laser scanners now provide an additional information about the field of view. When the scanner is out of range, the red visual guide enters in a blinking mode. It returns to a static mode when reaching the field of view.



The RS6 scanner also benefits from the blinking mode of the colour guide.

Eeprom Handling Improvement

In some cases, the eeprom of the scanner could get corrupted. Its management has been improved to avoid this situation.

Scanner Connection Failure with AP21 (trackers)

A connection issue after a sphere alignment resulted on an unclear message. The message displayed on the RDS Agent (Logbook tab) has been changed to a clearer “Hardware connection issue detected. Please reattach the scanner”.

Wireless Scanning Performance Improvement (trackers)

Several issues have been corrected regarding scanning with the AS1 in wireless mode.

AS1.1 on Retrofitted Absolute Arm

A bug prevented users to scan with an IP54 scanner AS1.1 on an Absolute Arm retrofitted with a wrist v2 (with touch screen). Now such hybrid arm is compatible with the AS1.1.

6.4 RDS Toolbox

6.4.1 New System Software Update (RA8 arms)

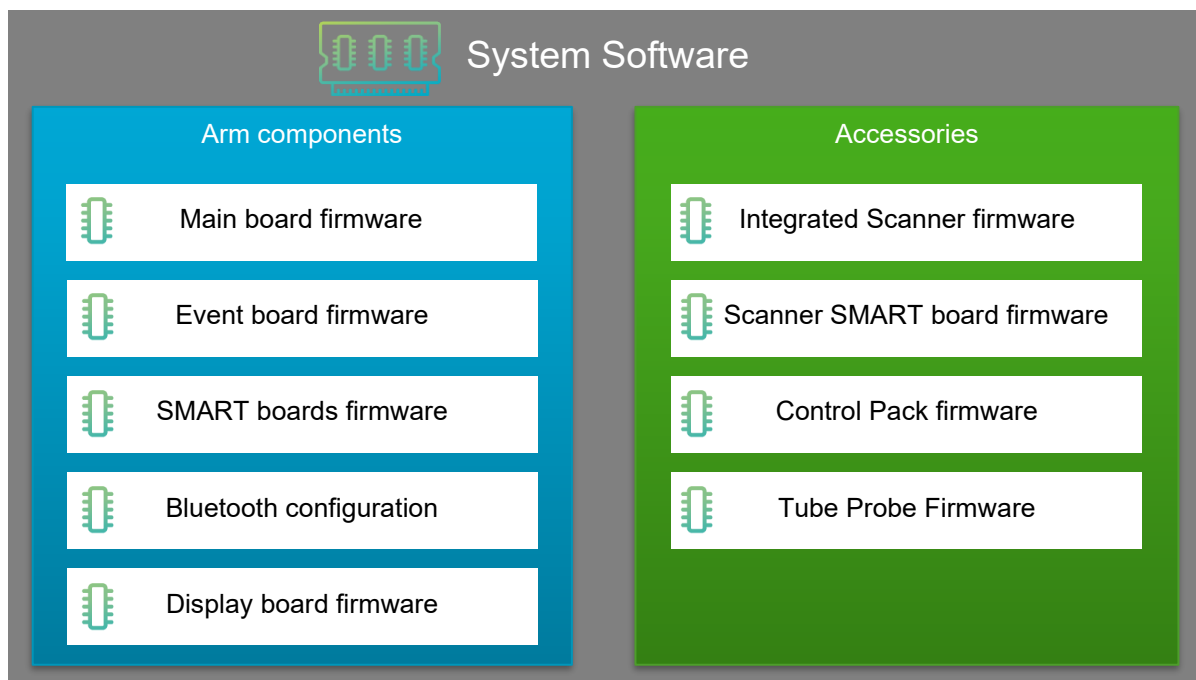
A new tool, introduced with RDS 6.2, was available until now only to Service profiles or upper. This has now been extended to Advanced profile (end user) or upper.

This tool has been implemented to simplify the update of the set of firmware on the arm, and to ensure the compatibility of all the firmware.

Definition of the System Software

The RA8 system software is the set of all firmware on its electronic boards. RDS provides a system software file, which contains tested and compatible firmware.

Even if each board can be updated individually, the entire system software can be updated in once. It is highly advised to update a complete system software as it provides a set of compatible firmware.



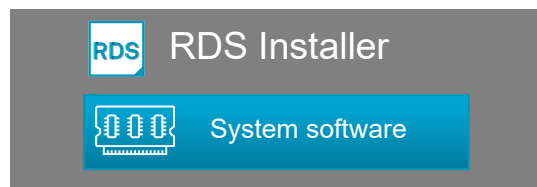
The System Software can be checked and updated through “System Software Update” tool in RDS Toolbox.

6.4.1.1 How to get a System Software file

From version 6.2, RDS software package embeds the fitting system software in its installation.

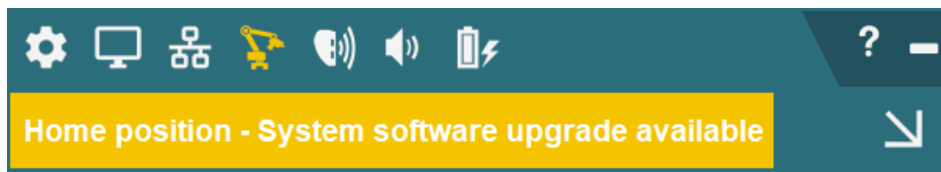
Once RDS is installed, the appropriate system software is also automatically available, no need to worry about it.

In case a new system software becomes available between two RDS versions, then service technicians can upload it manually as for any usual firmware.



Complete system software and individual firmware must be copied onto C:\Users\Public\Documents\Romer\RDS\Firmwares.

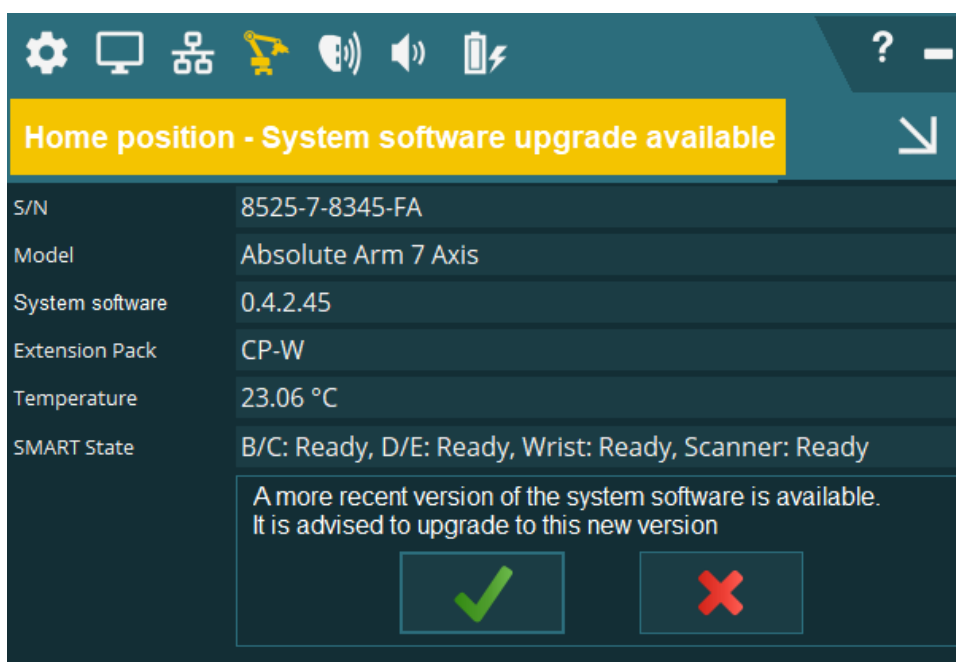
6.4.1.2 System Software Notifications

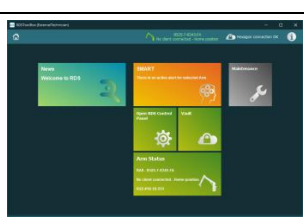


When connecting to the arm, RDS checks the current system software for any mismatch and if it is up to date. RDS will warn by a notification on the Agent if:

- The version of system software is up to date, but one component does not match.
- All components match with the system software, but an updated version of system software is available.

Then by opening the Instrument tab on the RDS Agent, the user (advanced user or upper) can choose between opening RDS Toolbox to update the system software or postpone the notification (1 week).



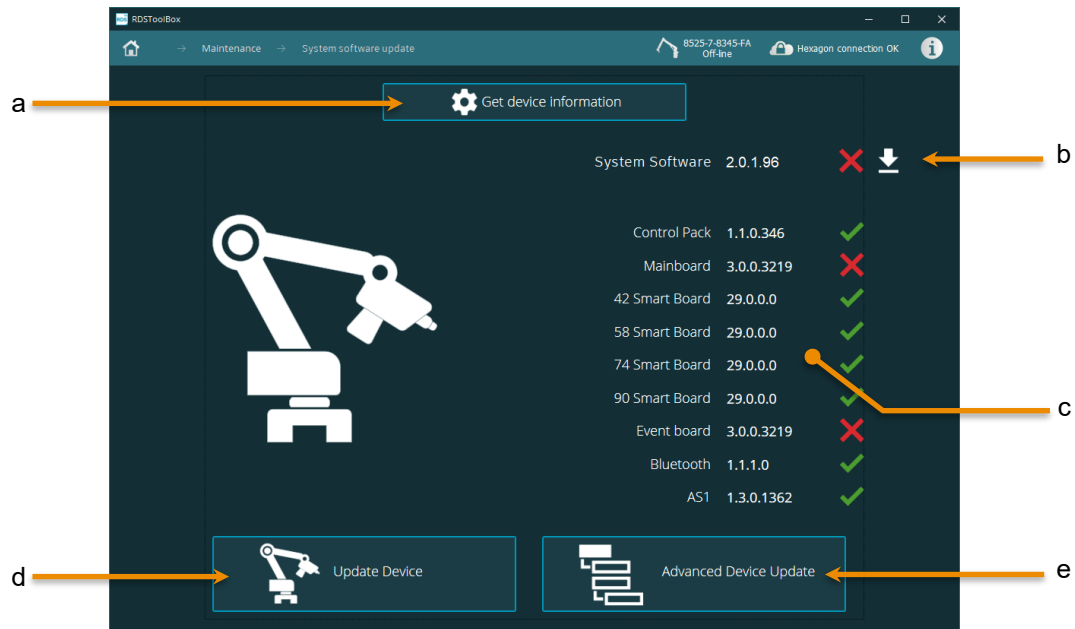
	Open RDS Toolbox to update the system software.	
	Postpone the notification one week.	

6.4.1.3 System Software Update



Advanced user profile or upper only can reach the System Software update.

To update securely the system software, open RDS Toolbox > Maintenance > System Software Update. RDS then checks the current system software and each component.

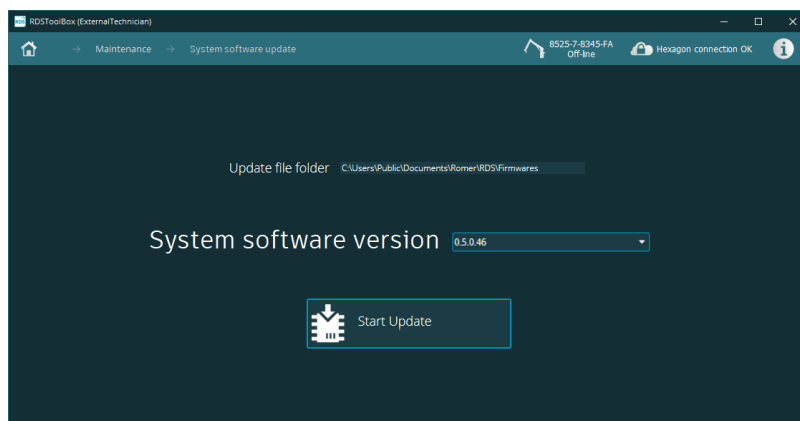


- Rerun the detection of components
- System software status
- Detailed components of the system
- Fast system software update
- Advanced software update (Service profile only)

System software		Components
✓	The current system software is compatible	The component match with the current system software
✗	The current system software contains non compatible components	The component does not match with the current system software
↓	The current system software is not up to date, a new one is available	

Fast Update of the Device

The standard update is the easiest way to update the system software: simply select the version of system software to upload on the arm and start.



The update may automatically restart the arm several times. Do not stop it.

6.4.2 Revised availability of the maintenance tools

Up to RDS 6.2.3, no profile restriction was applied on the availability of the end-user maintenance tools. The list has been revised, to hide sensitive tools to standard user profiles.

			RDS 6.2	RDS 6.3
Program a probe			Standard	Advanced
Arm dashboard			Service	Service
System Check		 	Standard	Standard
RS-SQUARED			Standard	Advanced
Wi-Fi Chipset			Standard	Advanced
System Software update			Standard	Advanced
Firmware upgrade		 	Standard	Advanced
View logs			Standard	Standard
View events			Service	Service
AS1/RS6 viewer		 	Service	Service

6.4.3 Firmware Update (arms)

RDS Toolbox > System Software with RS5

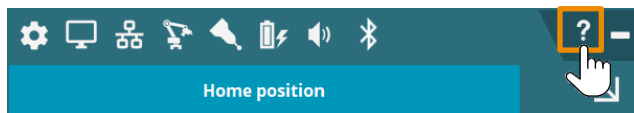
When opening the System Software update with a RS5 mounted on a RA8 7-axis, “**R55**” was listed instead of “**RS5**”.

6.5 User Documentation

Access to the User Manuals

To provide an easier access to the user manuals, when used from the arm installation USB stick, now the RDS installer installs the complete documentation folder on the computer.

Then, a direct access is possible from the RDS Agent.



List of Redistributable and libraries

The list of libraries, redistributable, or other tools, used by RDS has been updated in the RDS Software manual (appendix).

6.6 SMART (arms)

SMART Alerts Automatically Acknowledged

Some SMART alerts are now automatically acknowledged when conditions are not met anymore.

SMART Alert Popup was not Displayed

When an alert (for example shock alert) was triggered, the user was not notified but could see only looking at the list of alerts in RDS Toolbox. Now a small popup is automatically displayed at the right bottom corner of the screen.



Alert Short Description

In RDS Toolbox → SMART Overview or List of Alerts, the short description of the alerts was always displaying "an Internal Problem has been detected" instead of the appropriate description.

SMART Tile with no Alert

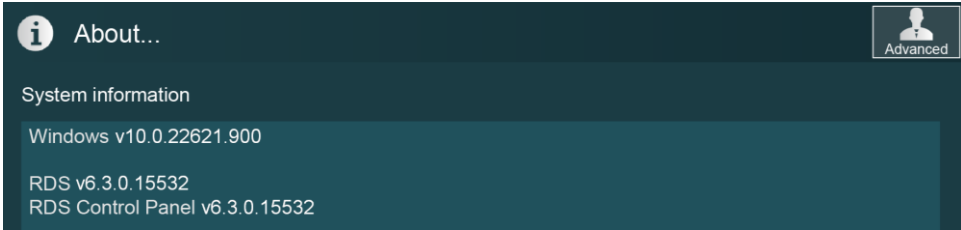
In RDS Toolbox, the SMART tile could show "No active alert" even when there were one.

6.7

RDS Control Panel

“About” date

In the RDS Control Panel > tab “About”, the RDS version date was always “2021-04-01” instead of the real build date. The useless date has been removed.



Tracker Compensation Time

The Tracker compensation time stamp was adjusted twice for the time zone. Once by LMF and then again in RDS.

LMF	RDS 6.2	RDS 6.3
Compensations 2022-08-11 10:58-03 Name: 2022-08-11 10:58-03 Comment: Time: 11/08/2022 10:58:03 Time zone = GMT + 1h	Instrument Tracker type: Tracker Product name: AT960-XR Serial number: 751054 Firmware version: 2.2.4.63 Compensation: 2022-08-11 11:58 ✖ Time displayed = GMT + 2h	Instrument Tracker type: Tracker Product name: AT960-XR Serial number: 751054 Firmware version: 2.2.4.63 Compensation: 2022-08-11 10:58 ✔ Time displayed = GMT + 1h

Only Compatible Trackers are Proposed

The Discover button in the RDS Control Panel could show all Trackers including not-supported ones. Now only compatible ones (AT960) are listed.

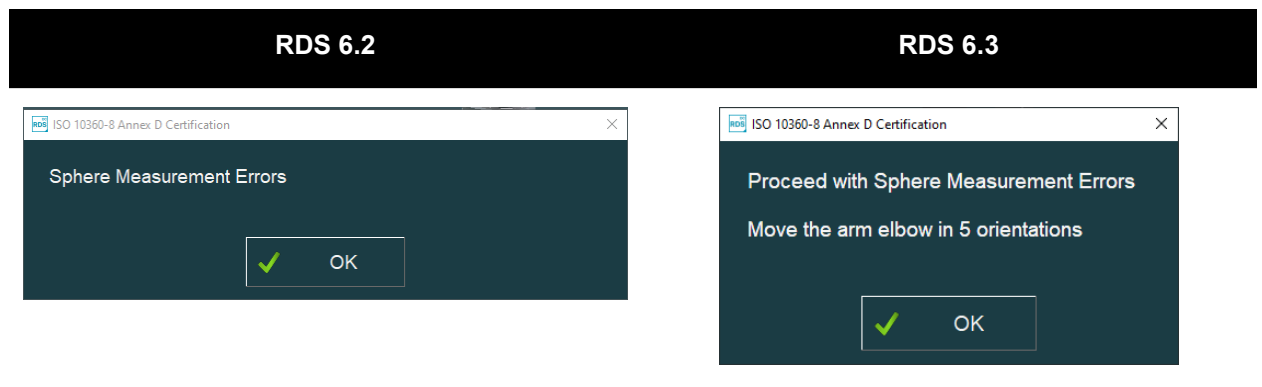
6.8 RDS Data Collector

Calibdata Folder Cleaning (trackers)

To keep a clean Calibdata folder and avoid multitude of subfolders, only 20 subfolders are kept. At the end of the operation, when pressing the “Finished / Next” button, the oldest extra-subfolders are now automatically removed.

ISO10360-8 Annex D – Message Update (arms)

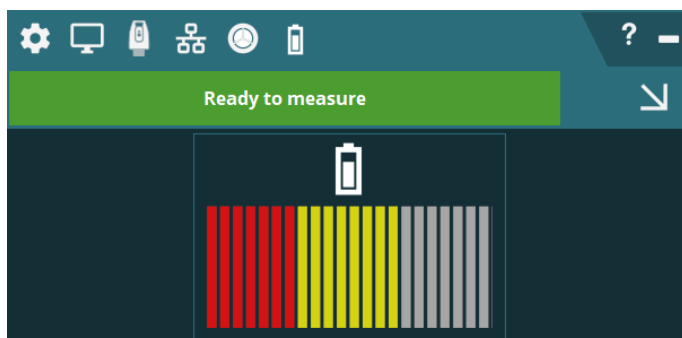
When performing an ISO10360-8 Annex D with an arm, a message was displayed “Sphere Measurement Errors”, according to the standard definition. This message could make confusion and has been modified to “Proceed with Sphere Measurement Errors”.



6.9 RDS Agent

Battery Status Icon (trackers)

The battery status icon was showing incorrect colour (yellow) with a charge 50%-79%. The status icon is now white for this level range.

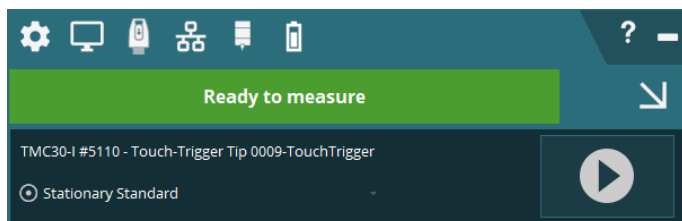


	RDS 6.2	RDS 6.3
50%-79%		

Tip Name Duplicated (trackers)

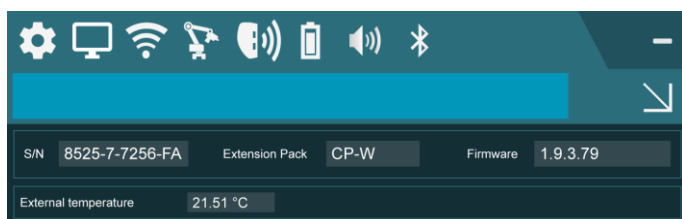
In the RDS Agent, the tip name of T-Mac and T-Probe was incorrectly displayed on the measurement panel.

TMC 30-I #5110 - Fixed Tip #000634 (6.0 mm) / #000634 (6...



Instrument

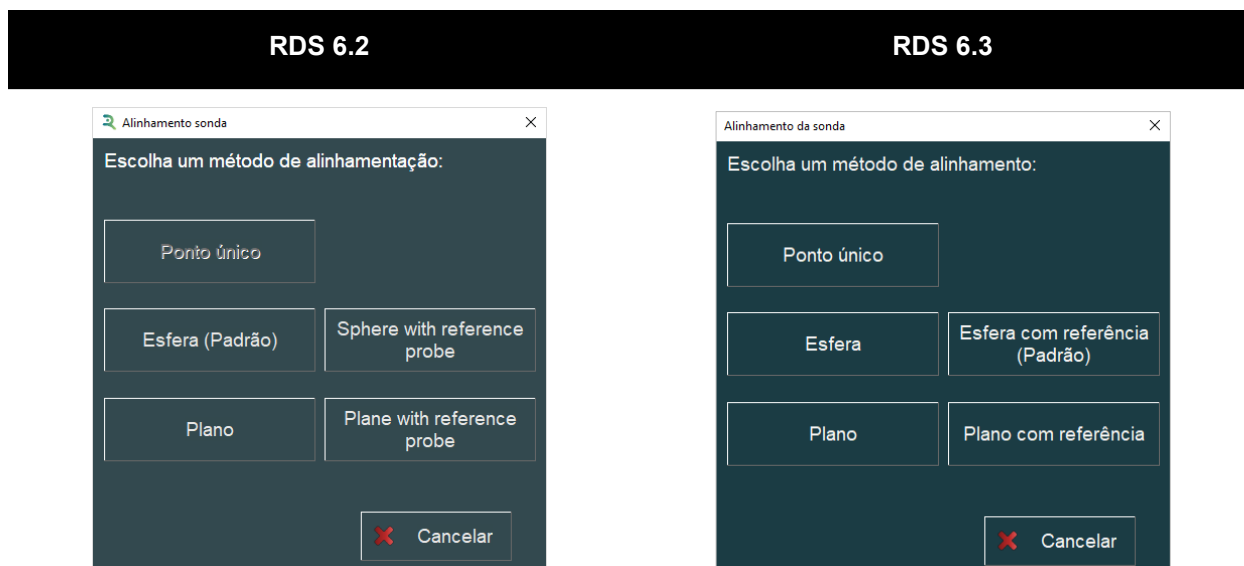
The information on the Instrument panel has been reorganized for a better readability.



6.10 Other improvements

The Choice of Alignment Method is Fully Translated (arms)

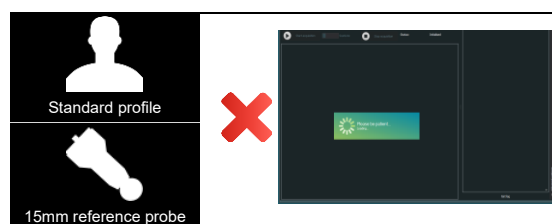
When pressing the “Align probe” button, a window appears, allowing to choose which method to use. On this window, some methods were not translated.



Align Probe Choice in the Quick Access Menu (arms)

The “Align sensor” access was available in the Quick Access Menu even if the current configuration (user profile, type of sensor) was preventing from performing it.

Now the access is now prevented from the Standard profile and for the 15mm reference probe.



Messages update

Corrections or improvements have been done on various prompts or messages.

RDS Service stops (arms)

In some conditions, especially when the PC woke from sleep mode, the RDS Service could crash. This has been fixed.

TKJ Probes (arms)

A technology update has been applied on the contact probes chipset for the Absolute Arm.

All the new IP contact probes now include this component.



On the Absolute Arm (RA8), a System Software 2.0.0 (event board firmware v4.0.0) is mandatory.

On the Romer Absolute Arm (RA7), the event board must be updated to v228

7 RDS 6.2.3

7.1 GridLOK / ToolLOK

Subsequent Points Tolerance for Disengagement

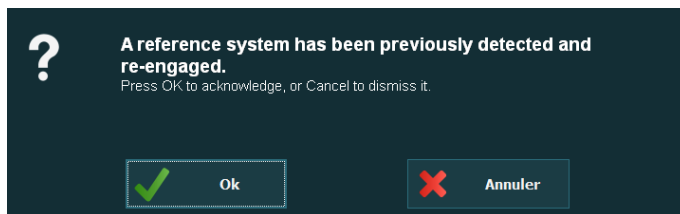
A regression on the tolerance to detect the same point for the LOK disengagement resulted in the fact that RDS could consider three subsequent points even if they were not exactly the same. This has been resolved.

ToolLOK Disengage Method

To disengage a ToolLOK, it was necessary to use a seat that belonged to the ToolLOK. As for the GridLOK, now any point measured three times disengage the ToolLOK.

LOK Persistence in Case of Disconnections

In case of short disconnection of the arm, the LOK (GridLOK or ToolLOK) now remains engaged when the arm becomes reconnected. No need to re-engage the LOK or any other action, just go on measuring.



Multiple ToolLOK Engagement

Engaging a ToolLOK when another one was already engaged was showing both engaged, despite only the last one was really engaged. Now engaging a ToolLOK when another one is already engaged, automatically disengage the first one.

Disengagement when no LOK is Engaged

Even if no GridLOK or ToolLOK was engaged, taking three times the same point was disengaging all available LOKs.

Now taking three times the same point only disengages the current LOK or has no effect on the LOK management if none is engaged.

Message when best-fit is out of tolerance

As for the GridLOK, a message is now displayed on screen for the ToolLOK when the best fit exceeds the maximum value specified in the RDS Control Panel.

7.2 Leapfrog

Leapfrog issue with latest Windows update

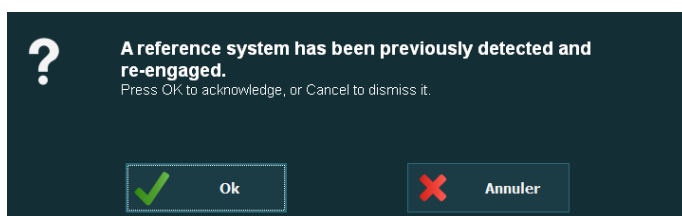
In some cases, a recent Windows update introduced a failure on the RDS Leapfrog process. This has been solved in RDS 6.2.3.

Leapfrog effectivity only when re-opening the RDS Control Panel

A regression has been introduced in earlier versions of RDS, making a leapfrog not yet effective at the end of the process in RDS Data Collector. It was necessary to re-open the RDS Control Panel to make the reference effective. Now the leapfrog is effective as soon as the script in RDS Data Collector is finished.

Leapfrog persistence in case of disconnections

As for the GridLOK and ToolLOK, in case of short disconnection of the arm, a Leapfrog (permanent or temporary) now remains engaged when the arm becomes reconnected. The displacement is no more lost, no need to re-engage the permanent Leapfrog or any other action, just go on measuring.



7.3 Others

RS6 Firmware upgrade (RDS Toolbox)

When mounted on a RA7 v5 or v6, the RS6 was not listed on the firmware upgrade function. Now the RS6 and AS1 can be upgraded even when mounted on a RA7 (v5 or v6).

8 RDS 6.2.1

LMF

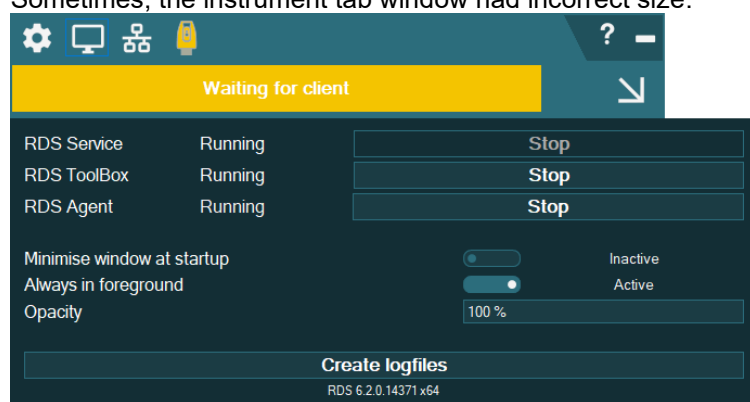
The LMF has been updated with LMF v1.9.

Memory leak in RDS Agent

When used in automation, the RDS Agent could get stuck, using a large amount of RAM.

RDS Agent – instrument tab

Sometimes, the instrument tab window had incorrect size.



Compatibility of the AS1 IP54 with the RA7

A filter prevented the AS1 scanner (IP54 compatible model) from being used with the Romer Absolute Arm retrofitted to the RA8 wrist (RA7 v5 and v6).

9 RDS 6.2

9.1 Support of the Absolute Arm v2

9.1.1 Standard functions

All standard functions related to the Absolute Arm remain the same as legacy arms:

- Connection
- Bluetooth
- Sound
- Power Supply
- Alignments, checks, diagnostics...
- Measurement
- ...

9.1.2 IP54 Management

The new Absolute Arm (RA8) v2 is protected against dust and moisture to IP54 standard.

- The '5' means the arm is protected from dust in a way that will not interfere with operation of the equipment. (However, some limited ingress of dust is permitted according to this standard).
- The '4' means the arm is protected from water, splashing from any direction. (Though some water ingress is permitted according to this standard).

However, due to removable components (probes, scanners, cables...), some precautions are necessary.

The RDS Agent provides a monitoring tool to detect any lack of protection to the system.

- When the arm is connected to the computer, RDS will verify if IP54 conditions are respected.
- If RDS detects that IP54 protection is missing (for example the Nose Cone is not installed on the 7-axis wrist), RDS will invite the user to intervene, to ensure that protection is maintained at all times.



The IP54 monitoring can be de-activated: open the RDS Control Panel > General settings and uncheck the IP54 option.

IP54 Alerts

1. If the arm is not fully IP54 protected, the icon will show in the RDS Agent.



2. To find out where the arm is not protected, click on the IP54 icon. A diagram will be shown to indicate what part of the arm requires attention. If there are several locations, scroll through them, by clicking on the right and left arrows.



3. Depending on the action, mount an accessory, or a cap (and then acknowledge), or reject if there is no possibility to respect the protection (IP54 alert remains).

NOTICE

Rejection:

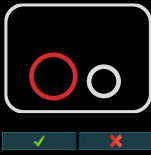
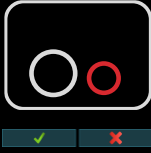
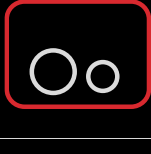
If no protection on the specified component can be applied, the user then shall press the red cross to reject IP54 protection. In case of rejection, the user undertakes to use the instrument in IP54 conditions.




NOTICE

Any IP54 notification, acknowledgement or rejection is logged.

List of potential situations

Status	Required action
	Mount a scanner or a Nose Cone.
	Mount a scanner compliant with IP54. If not possible, reject (the arm then is not protected).
	Mount a probe compliant with IP54 or Mount the TKJ cap and acknowledge.
	Mount a probe compliant with IP54.
	Ensure that the LAN connector is protected by the cap and acknowledge.
	Ensure that the power connector is protected by the cap.
	Change to a Control Pack v2 (CP-C / CP-B / CP-W).
	Place the Swivel Panel and acknowledge.

Compatibility of the AS1 scanner with IP54

The AS1 laser scanner is now compliant with IP54. RDS differentiates earliest AS1's (non-IP compliant) from new ones to be able to manage correctly the IP54 warnings.



The new AS1 (IP-compliant) are notified "AS1.1". They are not compatible with the legacy Absolute Arms RA8 v1.

9.1.3 Support of the New Wrist Display

The new Absolute Arm v2 is equipped with a new touch screen. The legacy 3-State button located on the wrist is now replaced by tactile actions.

Moreover, this new display permits the use of higher quality pictures.



Activation and control of the Quick Action Menu with the touch screen

Activate the Q.A.M.	Navigate the menu	Validate the choice	Exit the Q.A.M.
			
Swipe down	Swipe left or right	Tap the screen	Swipe up

Display of Alerts

When alerts are displayed on the RDS Agent, they are remotely displayed on the wrist display of the new Absolute Arm v2.



	No sensor detected		When the RDS Agent shows a red menu
	The sensor is not aligned		Temperature is too high
	Too close or too far from the surface to scan		SMART alert
	An axis is over limit		Battery alert
	Scanner is connecting or warming up.		

Use of the Wrist Display with Application Software

The new wrist display provides enhanced functionalities to the application software, to display instructions, results, or prompt questions, request validation...

The touch screen can then be used to control such dialogs, by swiping left or right, tapping...

9.2 SFX Asset Management for Arms

HxGN SFX is a secure asset management platform for monitoring Hexagon devices remotely. Based on cloud-native principles, it is designed for Supervisors and Quality Managers, so that they can check on the status of their Hexagon assets from a mobile device (smartphone, tablet or PC) in real time.

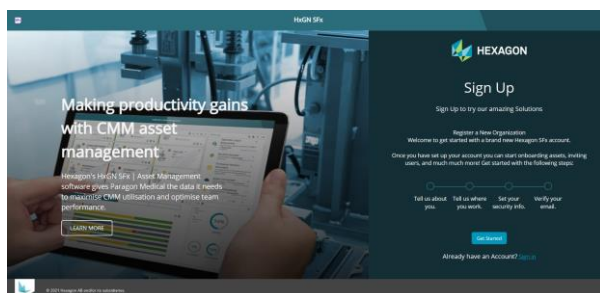
The Absolute Arm is delivered with a SFX licence.

To benefit from HxGN SFX | Asset Management, each arm (the “Asset”) must be onboarded with a utility called SFX Desktop, running on a Windows PC. Once the onboarding process has been finished, the arm can be connected in various ways to the HxGN SFX | Asset Management cloud solution. Only administrators in your organization’s SFX account can proceed. Click [here](#) to create a free SFX account for your organization in case it does not exist yet.

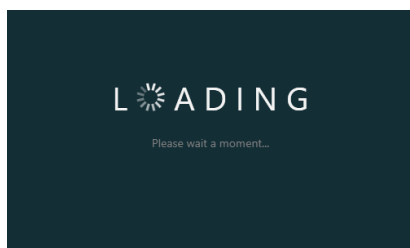
9.2.1 SFX Monitoring Setup

Install SFX Desktop

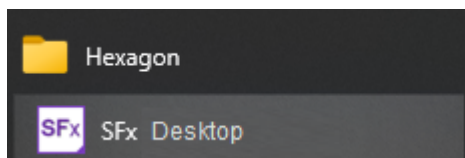
1. Sign into your SFX account on <https://login.hexagonsfx.com/Register> and go to Downloads in the user menu.



2. Download the latest version of [SFX Desktop](#).
3. Double-click the “SFXDesktopSetup.exe” installer and let it run the installation.

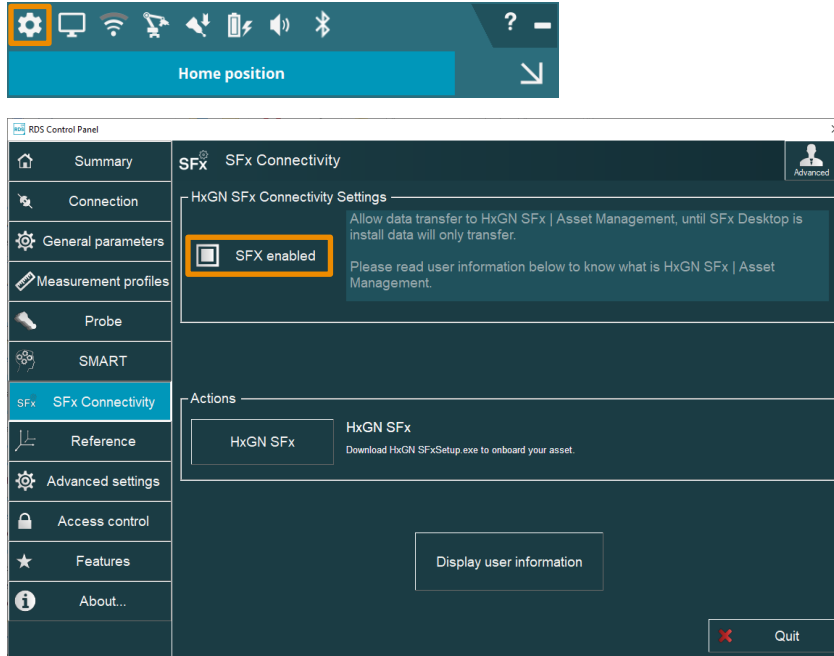


4. Then launch SFX Desktop from the Windows Start menu.



Enable Data Transmission to SFX

1. Connect RDS to the Absolute Arm you are about to onboard. Log in as Advanced user (see [Appendix B > RDS User Profile](#)).
2. Then open the RDS Control Panel, SFX Connectivity tab and switch on “SFX enabled”.



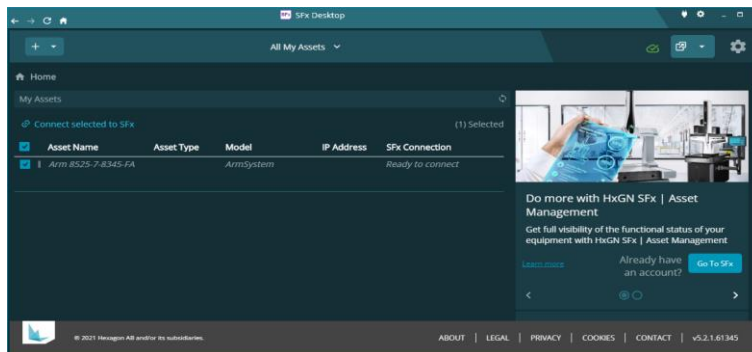
Connect the Arm to Sfx

1. Connect the arm to RDS.

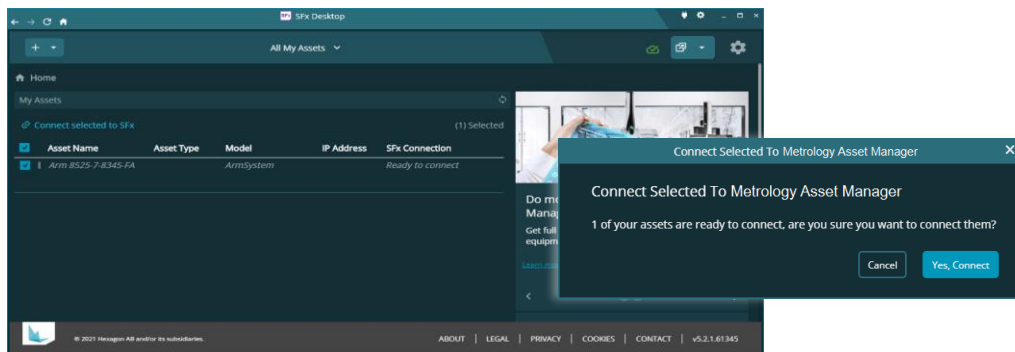


2. Launch Sfx Desktop.

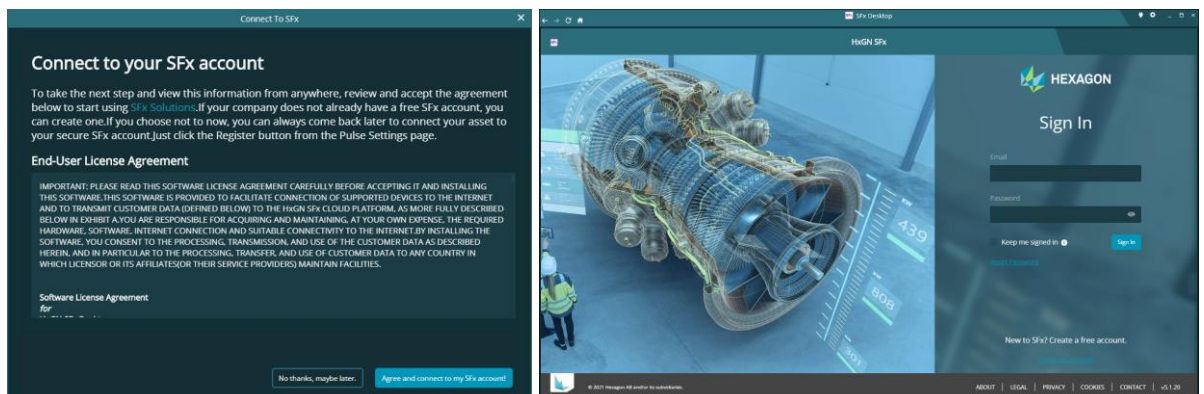
3. On the Home page, the list of available arms is displayed: select the one to connect to Sfx.



4. Press “Connect selected to Sfx” (validate next window).



5. If not yet logged-in, sign-in to or create your Sfx account.

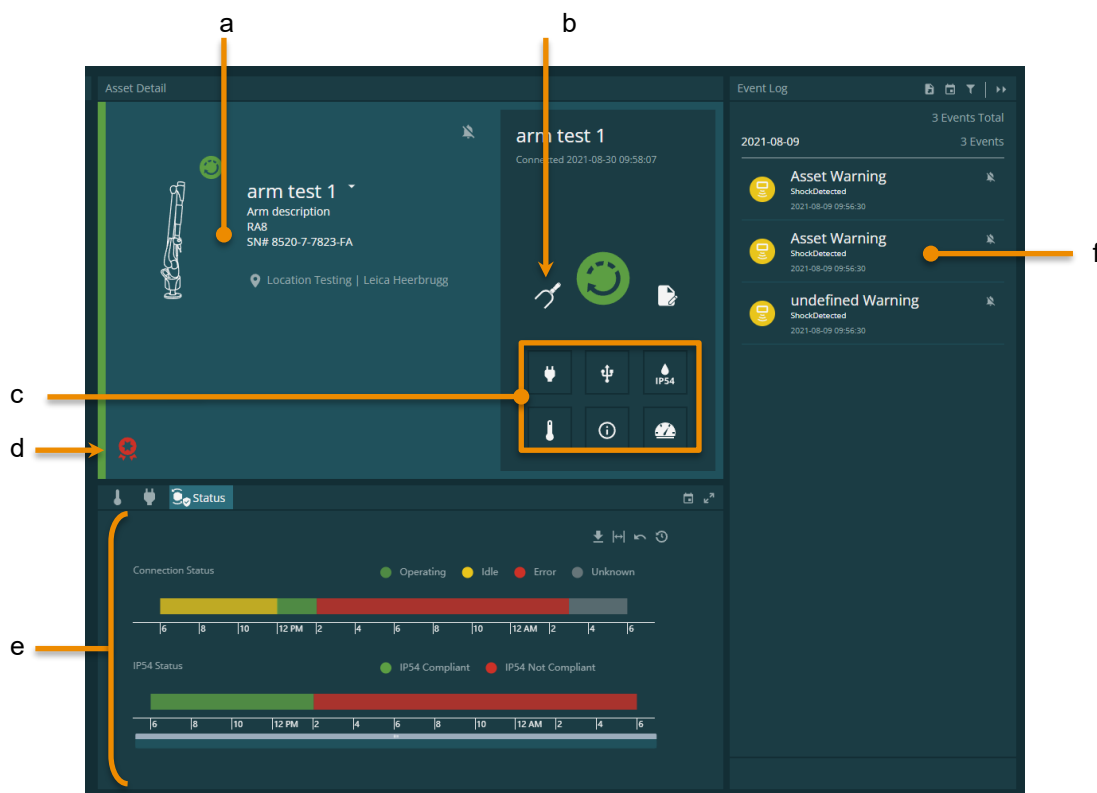


9.2.2 SFX Overview

Once the Absolute Arm is connected to SFX, the asset management provides information about it.

Access [SFX Asset Management](#): the Assets dashboard shows all the assets connected to the SFX account.

Use the filter to find the Absolute Arm and click on the tile.



a	Asset main identification	Name, Type, S/N, Location (or GPS location)
b	Sensors	Opens the probes window (Available probes and scanners)
c	Components	Shows the power source, batteries level, current and history over time.
		Opens the connection configuration (LAN settings...)
		Shows the history over time of IP54 compliancy
		Shows the internal temperature of the asset
		Opens the asset information window (Model, S/N, RDS software and system software...).
		Shows the history over time of the connection status
d	Certification	Indicates the certification status (opens the information window).
e	Histograms	History over the time of the selected components.
f	Alerts	Various alerts on the asset

9.2.3 Getting Started with GPS Location Add-on

ZT-2x is a rechargeable battery powered GPS location device that can be paired with Assets such as the Absolute Arm in HxGN SFx | Asset Management to visualize location on dashboards and send helpful geolocation change events and email notifications. The GPS Location add-on can be installed in shipment container or attached to measurement system depending on the required use case. If you have your GPS location add-on device at hand, the following steps are required to get started. Note: This article can be ordered through the Hexagon MI web shop.



Asset administrators only can link a GPS to his Asset.

Preparation

1. Remove the orange label from the back of the device to turn it on.

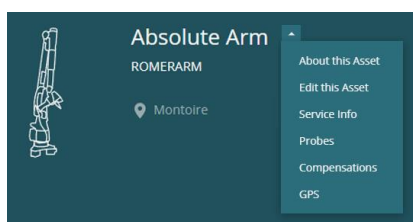


2. Observe that the LED starts to light up for activation and then turns off and remains off after a while depending on the connectivity.

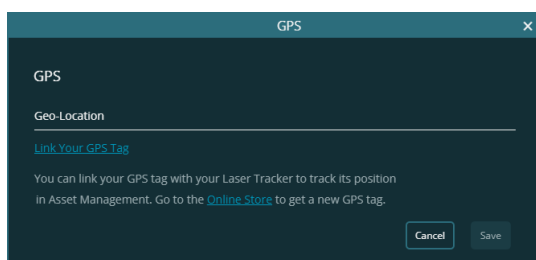


Link/Unlink your Asset

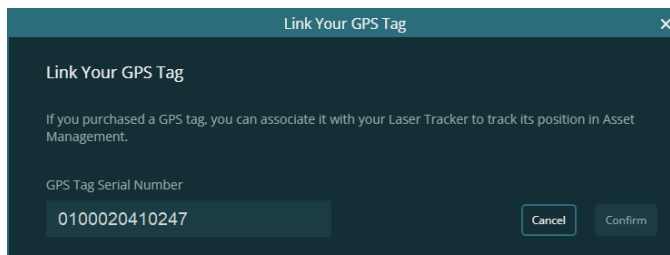
3. Log into the HxGN SFx | Asset Management Portal, Assets dashboard and select the Absolute Arm you want to link to. On the drop-down menu next to the Absolute Arm name, select "GPS".



4. Click on "Link Your GPS Tag" under Geo-location.



5. Type the 13 digits-serial number (SN) printed in the GPS tag (3) into the input box (6) and press “Confirm”.



6. If the GPS Tag has already been linked to another asset, an error message says, “This tag is linked to another asset”. To unlink a GPS tag, click “Unlink” next to the entered serial number, then click “Yes, Unlink”. An unlinked GPS tag can be used to link to another asset for Geo-location tracking.

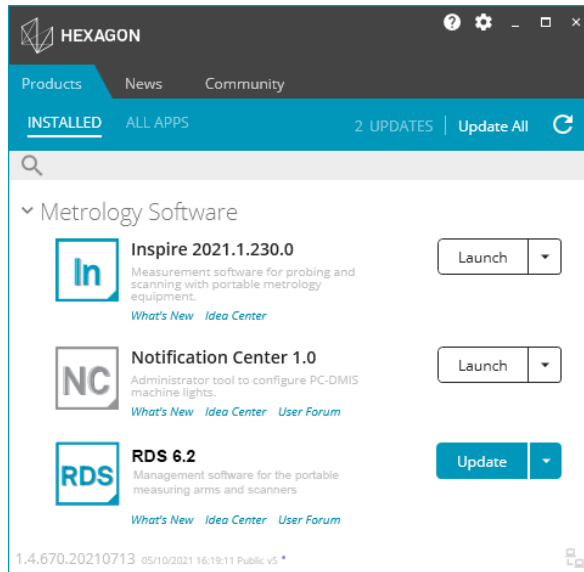
9.3 Universal Updater

RDS software now embeds the Hexagon Universal Updater.

As soon as a new RDS version becomes available, the Universal Updater icon in the notification bar will increment the number of available updates. Click on the Universal Updater icon to open the tool.



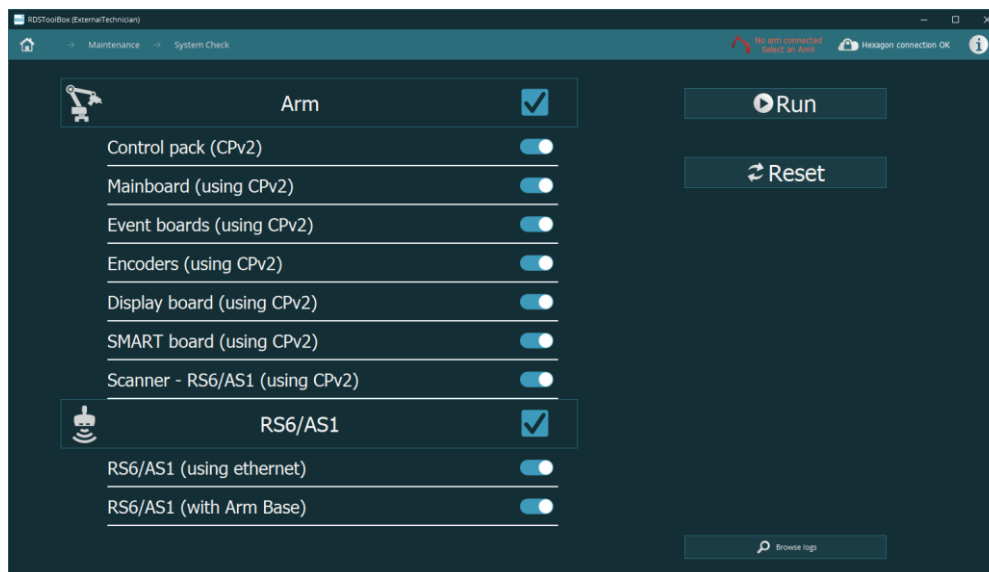
Then simply press on “Update” to download and install the updated version.



Downgrade is not possible with the Universal Updater.

9.4 Enhanced System Check (arms)

The System Check diagnostic tool in RDS Toolbox has been significantly enhanced with the addition of several new components.



Arm

Tests for RA7 and RA8.

Control Pack	Arm connection / Check connection / Memory / Internal peripherals / Self-test / IO expander
Mainboard 	Arm connection / Configuration / Sounds / Bluetooth / LEDs / SD Card Memory / FRAM Memory / ASID / Log File / Temperature
Event board 	Status (versions, statuses, components, probe file)
Display board 	(RA_ v2 only) Status
Encoders 	For each axis: SMART status (shocks) / Firmware and hardware versions / voltage, temperature
SMART boards 	For each board (CP, BC, DE and Wrist) Voltage, temperature and accelerometer
RS6 / AS1 on arm	Arm connection / Check connection / IO expander

RS6 / AS1

Tests on the scanner for the arm and the tracker

RS6/AS1 (using ethernet)	Checks connection (TCP/IP, firmware) / Reads serial number / Checks sensor (components temperature, fan speed, laser brightness) / Checks sensor calibration specs
RS6/AS1 with arm base	Scanner SMART board (voltage, temperature, accelerometer)

Advanced Checks (arms)

Tests that require manual intervention from the user (press buttons...).

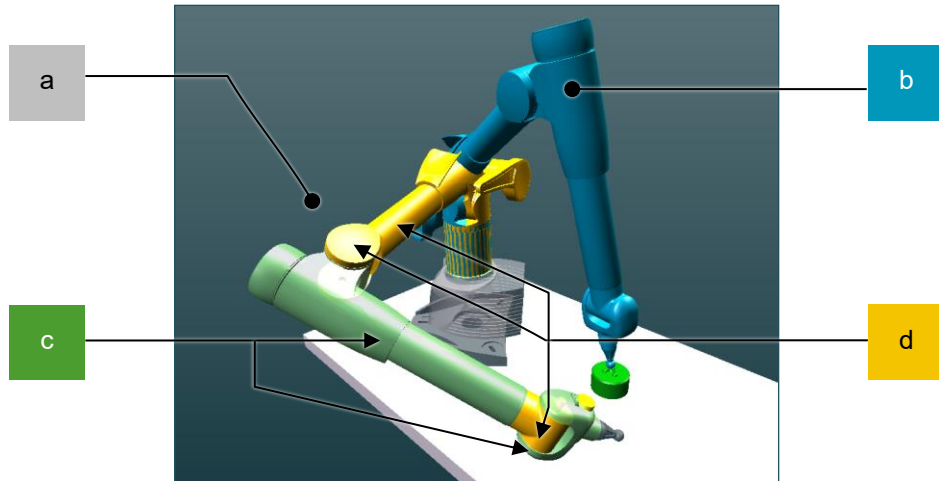
Wrist 	Buttons triggers	Press on each button as required.
Encoders 	Rotate the requested axis	

9.5 Sensors Alignment (arms)

To optimize the efficiency of the alignment of sensors, some securities and indications have been inserted during the execution of the scripts in RDS Data Collector.

Colours of the axes

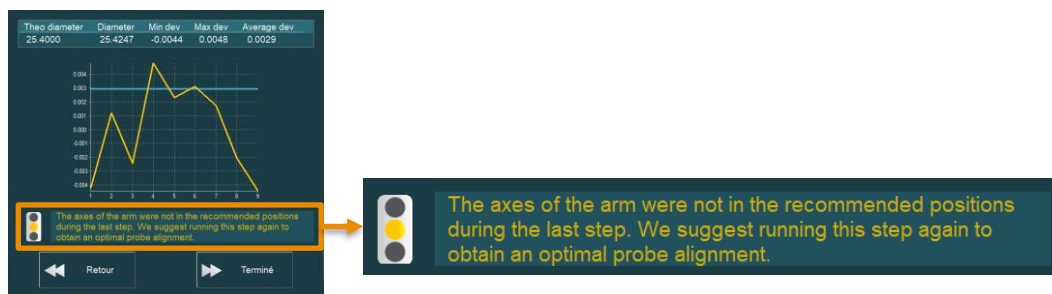
The Colours of the axes are more visible, to help the operator to respect the reference positions.



- a. Phantom real-time arm
- b. Position arm to reach
- c. Axes have a correct angle
- d. Axes have an incorrect angle

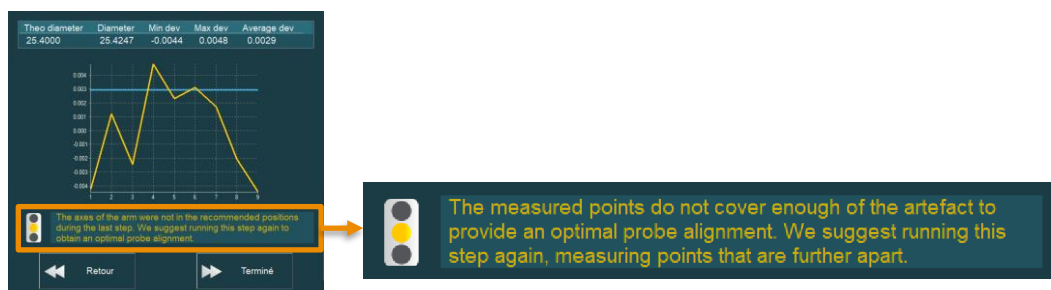
Respect of the reference positions

Once the measurements are completed, RDS checks if the reference positions have been respected during the measurement. If the angles of encoders cannot guarantee a correct alignment, then a traffic light warns the user.



Respect of the Points Repartition on the Artefact

As well as the reference positions of the axes, the repartition of the probe points on the artefact is checked. If the coverage of the artefact is not sufficient (ex if the points cover only 25% of the sphere), a traffic light is also displayed.



Go/No Go Indication on the Result

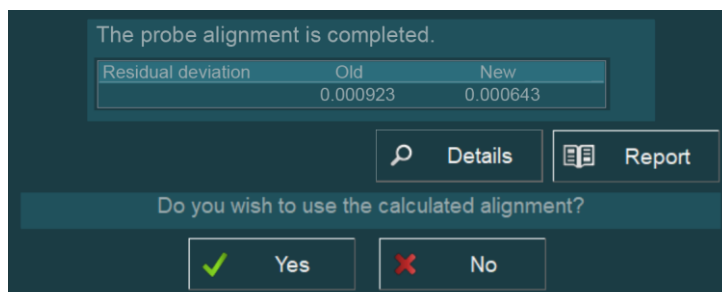
At the end of the calculation, according to the result value, a traffic light indicates to the user if the alignment can be used or not:

	The alignment result is correct, updating the alignment is allowed: click on Yes to memorise the new alignment or No to cancel this calculation.
	The alignment result is insufficient, updating is not possible and performing a new alignment is required.

 Old or custom probes may not show the traffic light. The choice to validate or not the alignment can then be made based on the alignment value.

Comparison between previous and new alignment value

At the end of the calculation, the previous and new alignment results are now displayed, to let the operator compare his new alignment with the previous one, especially if the traffic light is not available.



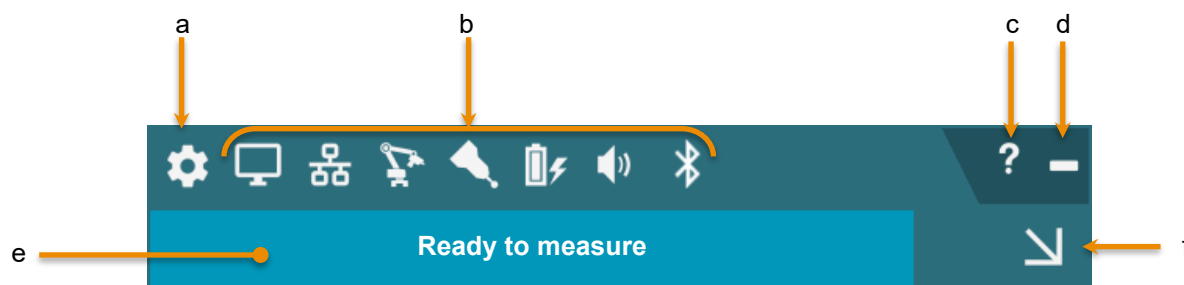
The screenshot shows a software interface with a message: "The probe alignment is completed." Below this message is a table with the following data:

Residual deviation	Old	New
	0.000923	0.000643

Below the table, there are two buttons: "Details" and "Report". Below these buttons is a question: "Do you wish to use the calculated alignment?" Below the question are two buttons: "Yes" (with a green checkmark) and "No" (with a red X).

9.6 RDS Agent

The RDS Agent has been redesigned, to follow the Hexagon software guidelines, and provide a better ergonomics.



- a. Control Panel quick access
- b. Status icons overview
- c. Access to help manuals on the download site
- d. Window control (see below).
- e. Global status
- f. Shortcuts to RDS tools

RDS Settings

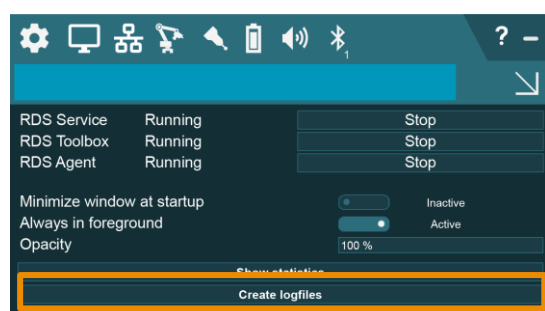
The access to the RDS Control Panel has been centralised at the top left of the RDS Agent (a) for an easier access (the “Settings” buttons on each tab have then been removed).

Help

The shortcut to the Portable-MI.Hexagon web site has been separated as a “Help” button (c) for a more friendly visibility.

Create Logfiles

On the “System” tab, the “Create logfiles” button, previously reserved to Service profile is now available to all users:



This tool is especially useful to gather all the necessary files for support and service expertise needs.

By pressing “Create logfiles” button, RDS collects all needed information and embeds them into a zip file.

Once the zip file created, RDS automatically opens the Windows Explorer to the appropriate folder (C:\Users\Public\Documents\Romer\RDS\Temp) and highlights the created file.

9.7 RDS Redesign

New Logo

RDS and tis components have a new Hexagon-corporate logo.



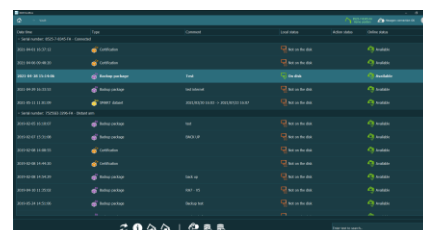
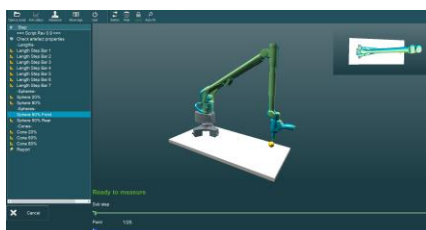
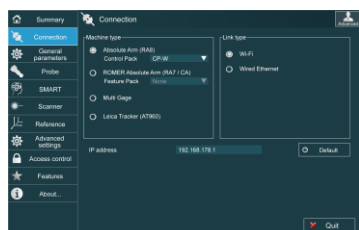
RDS Status Colours

The colours used to highlight RDS instrument, or accessories statuses now follow the Hexagon software guidelines.

Colour	Signification	Status example	
Blue	Operational mode	Ready	The instrument is operational (home position)
Green	Ready to measure	Press trigger...	The system is ready to measure
Yellow	Scanning	Scanning	The system is currently digitizing with a Laser scanner
Orange	Non-critical issue	Axis over limit	The instrument is connected, but an event prevents from measuring: Encoder on its limit No probe mounted ...
Red	Critical issue	Not connected	No instrument is connected, or issue of connection

RDS Components User Interface

As for the RDS Agent, the RDS Control Panel, RDS Data Collector and RDS Toolbox interface colours use the Hexagon software guidelines.



9.8 Other Improvements

Enhanced Haptic Feedback (RA8 arm)

In addition to the mechanical stops, the haptic feedback is now used for the following events:

	The connection to the arm has been lost (long ramp down vibrations)
	The capture of exposure (for scanners) is completed
	The Quick Access Menu has been activated or closed
	An unaligned sensor has been mounted
	The battery level becomes critical

Most of these events are followed by a warning on the RDS Agent and the wrist display.

Absolute Arm Start-up Melody

The music played when the arm starts has been updated. This update occurs on any Absolute Arm (RA8) on its first connection to RDS 6.2.

End of support for Ad Hoc Wi-Fi connections

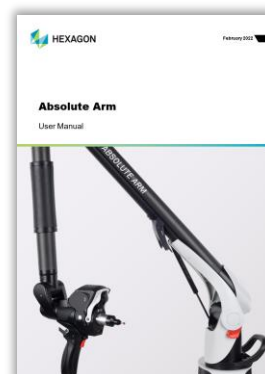
Since the support of Ad Hoc Wi-Fi networks ended with Windows 10, the Wireless connection with Multi Gage, FP2 and FP3 (RA7) has been removed from the possibilities in the RDS Control Panel.

Absolute Arm User Manual

The Absolute Arm user manual has been totally rebuilt, to provide all the information concerning the arm, easily and clearly.

It provides:

- Main body – All the essential information for installation, use, alignment, verification, care...
- Appendix A – All the details about the arm, accessories, legal information, specifications...
- Appendix B – Any other RDS information not mentioned in the main body.



All along the manual, hyperlinks provide an easy way to jump to the interesting chapters.



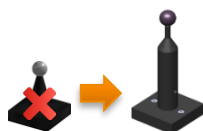
The independent RDS manual remains available for the current and legacy arms and for the trackers.

RSx firmware upgrade

The protection preventing from updating the firmware of the RSx scanners (RS1, RS2, RS3, RS4, RS5) has been removed, now allowing to update such scanners without the need of activation code (in the RDS Control Panel).

RDS Data Collector

When running scripts for scanners, the artefact sphere was represented as the probing sphere. Now the scanning sphere is represented.



10 RDS 6.1

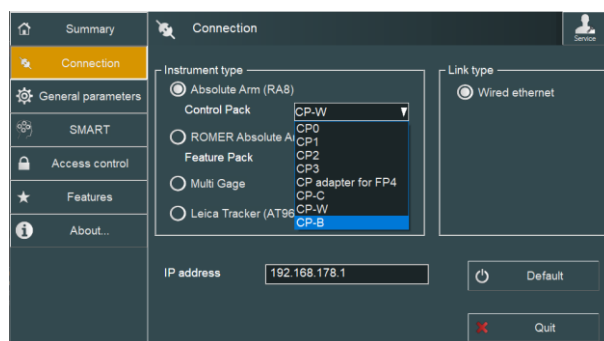
10.1 Support of the CP-B (RA8 arm)

A new Control Pack will be soon available for the Absolute Arm (RA8): the “CP-B”, providing a wired ethernet connection (as the CP-C), plus a stand-alone power with 2 batteries.

This Control Pack has been implemented in RDS 6.1.

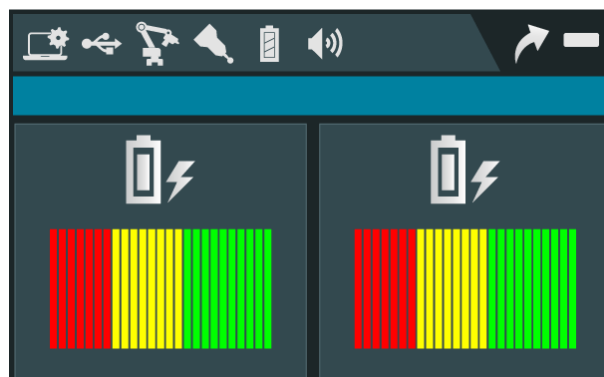
RDS Control Panel

As the CP-C, the CP-B can be selected in the Connection tab of the RDS Control Panel, providing the wired ethernet connection.



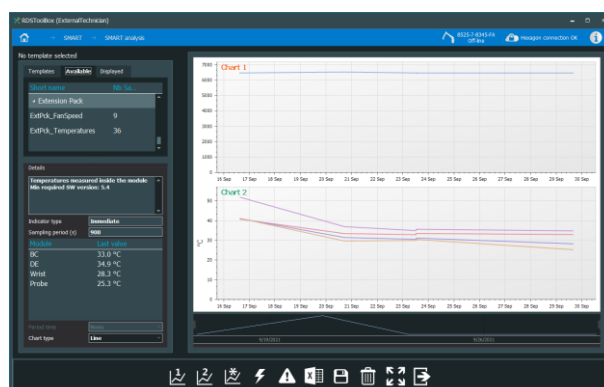
RDS Agent

As the CP-W, the CP-B contains 2 batteries, and the level of charge can be checked on the RDS Agent.



RDS Toolbox

The CP-B contains SMART sensors: fan speed and temperature can be checked in RDS Toolbox > SMART (Analysis).



10.2 GridLOK management (arms)

A set of improvements and correction has been brought to the [GridLOK](#) management and use.

Probe XYZ Data Lost

In certain circumstances when using GridLOK or Leapfrog, the probe centre coordinates could be lost, replaced by the TKJ coordinates. This issue has been solved.

Multi GridLOK Management

When several GridLOK were loaded in the arm memory, and used one after the other, GridLOKs matrixes could be mixed, resulting on an erroneous GridLOK reference.

Now several GridLOKs can be engaged one after the other, without any contraindication.

GridLOK Disengage Method

With previous versions, to disengage a GridLOK 3 points had to be taken **that belonged to the currently engaged GridLOK**, making the disengagement impossible once the arm moved. Now any point (on a seat or cone) can be used to disengage a GridLOK, on the Grid or not. The method (taking 3 times the same point) remains the same.

Issue to Remove from Memory

Some rare GridLOK files could not be removed from the memory of the arm. This was due to a certain format of the file. Now even those particular files can be removed.

Max Best Fit

In the RDS Control Panel, a “Max best-fit” was already present, but its behaviour was not applied as it should (even a higher value could engage successfully the GridLOK).

Now if the Best Fit value exceeds the “Max Best Fit” set in the RDS Control Panel > Reference tab, a message is shown, and the GridLOK engagement is rejected.

Unforce Method

In case of multiple available GridLOKs, it is possible to force the wanted one, in order to ensure the engagement of the correct area. However, the way to unforce was not clear enough. Now as soon as one reference is forced, the “Clear” button becomes available to unforce it.

10.3 Other improvements

Probing rate (RA8 arm)

The probing speed was previously limited to 20 Pts/s. It has been enhanced to 50 Hz.

Haptic feedback (RA8 arm)

When a disconnection occurs, the arm emits a long vibration to warn the user.

Scanner Fan Speed error

For few units of AS1, the fan speed can exceed a certain threshold. With the previous versions of RDS, the scanner was then stopped, preventing the user from continuing his operations.

An intermediate fix has been implemented in RDS 6.1. In such situation, events are still logged (stating that the fan speed is too high), but with no effect in the operator's job.

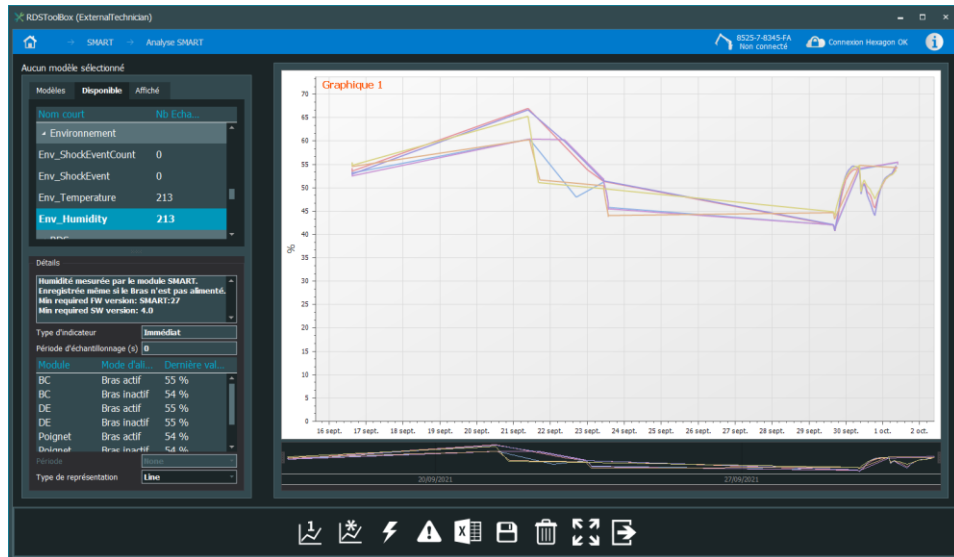
Visual C++ 2013

On certain PCs, due to the absence of Microsoft Visual C++ v2013, RDS Service was stopped at the connection of scanners (RS2-3-4-5, HP-L-8.9). The redistributable is now installed by RDS.

Humidity sensor enabled (Arms)

In addition to the accelerations and temperatures, once upgrade with v29 the SMART sensors on both RA8 and RA7 now also provide humidity.

The humidity reading can be checked on RDS Toolbox > SMART Analysis ("Environment").



11 RDS 6.0

11.1 Support of the AS1 Laser Scanner

The new AS1 laser scanner for the Absolute Arm 7-axis and the Absolute Tracker AT960 is supported by RDS 6.0 for its connection, alignment and check processes and all settings.



The AS1 replaces the RS6 laser scanner for Absolute Arm 7-axis (RA8) and also works on the new Absolute Positioner AP21 with the Absolute Tracker (AT960).

All the RS6 settings and tools remain identical for the AS1 (in the RDS Agent, RDS Control Panel and RDS Toolbox).

The alignment on the arm remains the same as any other scanner on the Absolute Arm in RDS Data Collector.

The alignment on the tracker remains the same as the LAS on the Absolute Tracker in RDS Data Collector.

NOTICE

The RS6 laser scanner is NOT compatible with the AP21 positioner.

11.1.1 RDS Control Panel

Connection

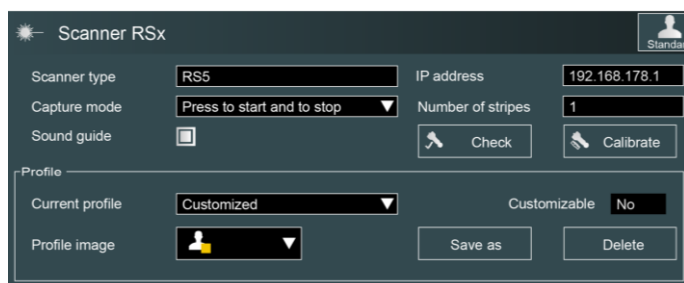
AS1 on RA8	AS1 on AT960
The connection to the AS1 on the Absolute Arm remains the same as for the RS6: connect the arm (full Wired Ethernet, Wireless or USB+Ethernet) to the PC. (DHCP automatic address only)	Connect the tracker as usual, connect the new AP21 Positioner and mount the AS1 on the AP21. Then Lock on the tracker to the AP21.



Wireless connection to the AS1 on the arm requires a CP-W.

AS1 Common Scanning Settings

Common settings (capture mode, profile creation and selection) remain the same for the AS1 as for any other scanner (RS6, RS5, LAS...).



Scanner RSx

Scanner type: RS5 IP address: 192.168.178.1

Capture mode: Press to start and to stop Number of stripes: 1

Sound guide: ☐ Check Calibrate

Profile

Current profile: Customized Customizable: No

Profile image: Save as Delete

AS1 Specific Scanning Settings

The AS1 provides exactly the same settings as the RS6 laser scanner.



Scan settings

Point sampling: 50 %

Exposure level: 10 %

Exposure mode: SHINE Angle of incidence: ☐ 70.0

Scanning speed: 300 Hz High gain: ☐

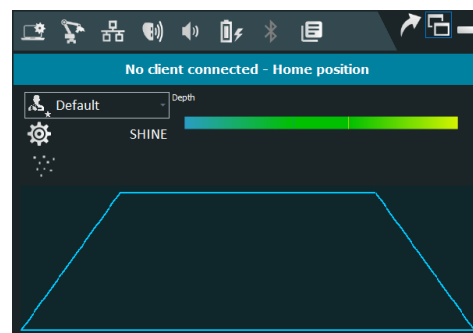
Setting	Description	
Exposure mode	Choice of fully automatic exposure based on the Hexagon “SHINE” technology or manual setup.	<u>SHINE</u> / User defined
AOI	Angle of Incidence – quality filter removing points presenting a high value of incidence with the surface.	<u>on</u> / off
High gain	High sensitivity mode for very dark and bright surfaces.	on / <u>off</u>
Scanning speed	Choice of scanning frequency (lines per second), allowing to adjust the scanning rate to the part to digitize.	100Hz – 200Hz – <u>300Hz</u>
Point sampling	Sampling to reduce the number of points per line and adapt the global scanning rate to the part to digitize.	<u>50%</u> / 100%

Underline = default value

11.1.2 RDS Agent - QAM

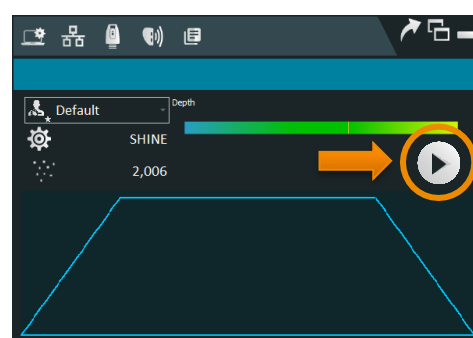
Scan View

As any other laser scanner, the AS1 automatically displays the scan view on the RDS Agent once connected. This view remains the same, with same information and tools.



Start-Stop Scan from the RDS Agent (Tracker)

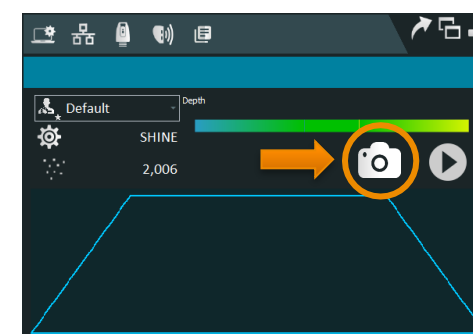
When used with a tracker, the RDS Agent provides new buttons in the AS1 scanning view to start and stop scanning manually from the PC when the Trigger button is not available (AP21 positioner without the MAP102 grip).



Capture the Exposure (Tracker)

When used with a tracker and the exposure is set to “User Defined”, a button appears to give to the operator the possibility to run the exposure capture from the PC.

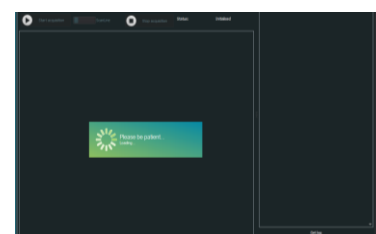
(see next chapter for more details).



QAM (arms)

The Quick Access Menu provides with the arm the following actions for the AS1/RS6:

- Switch to Manual mode (Advanced user profile)
- Switch to SHINE mode (Advanced user profile)
- Capture the exposure
- Select a scan profile
- Align the sensor



11.1.3 Exposure management

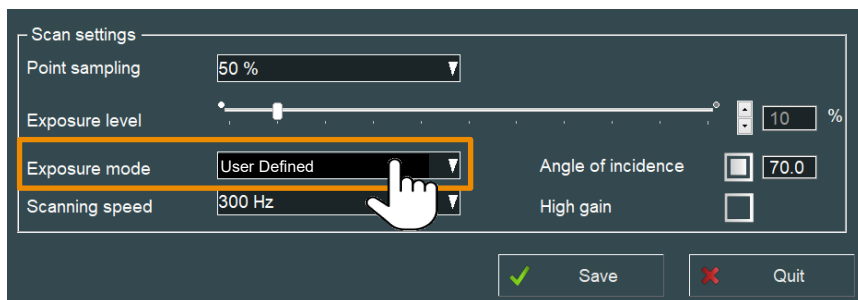
The management of the AS1 is the same as for the RS6 on the arms.

By default, the SHINE mode is used, applying an automatic dynamic exposure.

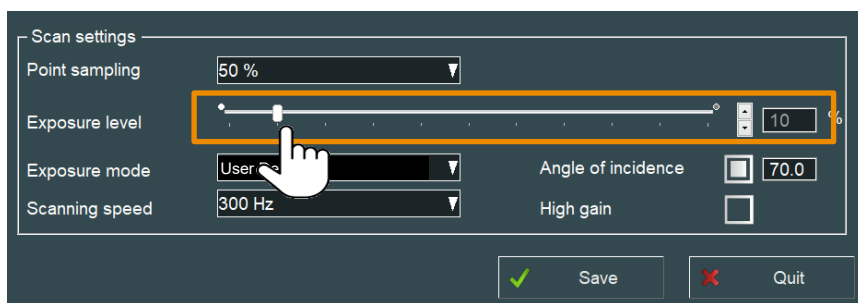
However, the exposure can be set to “Manual”, and then the exposure can be set either with a fixed value, or by capturing the exposure.

Set the Exposure Manually

1. Open RDS Control Panel > Scanner settings
2. Set the exposure mode to “User Defined”



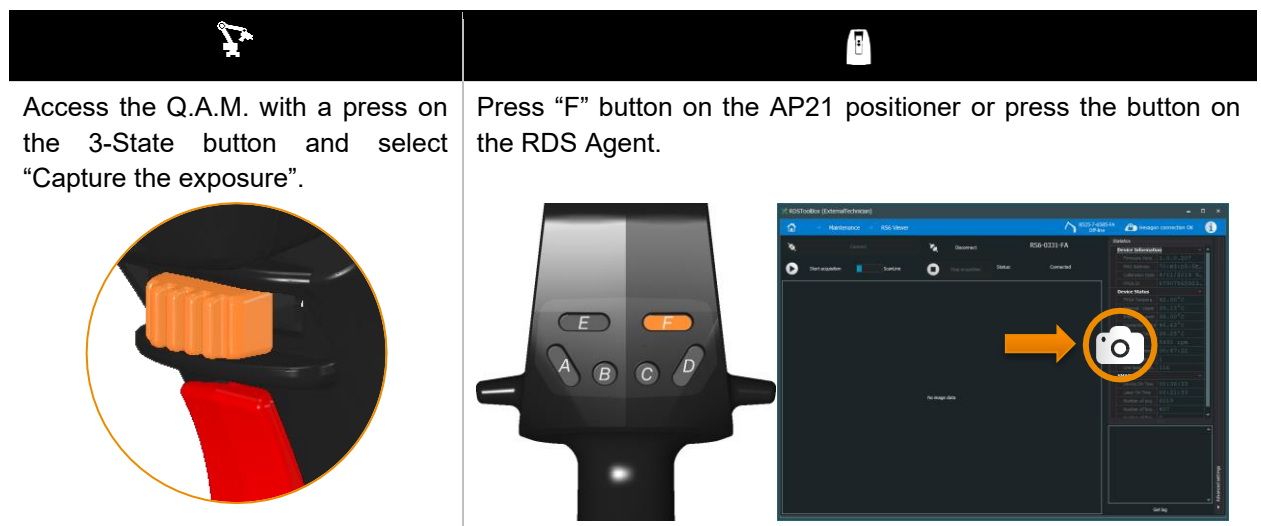
3. Adjust the exposure with the horizontal scroll bar.



Capture the Exposure

This process automatically set the exposure according to the surface to scan.

Position the scanner over the surface and Press the appropriate button, and then wait for the end of capture.



11.1.4 Scan profile management

As for any other scanner, the current scan settings can be saved into a “Scan Profile”.

To select a profile:

- Through the RDS Agent > Scan view
- Through the RDS Control Panel > Scanner settings
- From the buttons of the instrument

	
Press the 3-State button to activate the Quick Access Menu. Select “Scan Profile”. Choose the wanted profile and validate. 	Press the button “E” on the AP21 positioner. 

11.1.5 RDS Data Collector

Scanner Alignment

The process to align the AS1 scanner is the same as the other types of scanners, using the same scripts.

	
• Sphere • Sphere with reference (default) • Plane • Plane with reference	• Measurement range • Sphere

Other Scripts

All scanning scripts are compatible with the AS1.

	
• Alignments (see above) • Certifications (ISO10360-8 Annex D) • Diagnostics (Scanning quick check, 3 planes distance,)	• Alignments (see above) • Diagnostics (Sphere check)

11.1.6 RDS Toolbox

AS1 SMART Indicators (arms)

As well as the RS6, the AS1 laser scanner embeds SMART indicators.

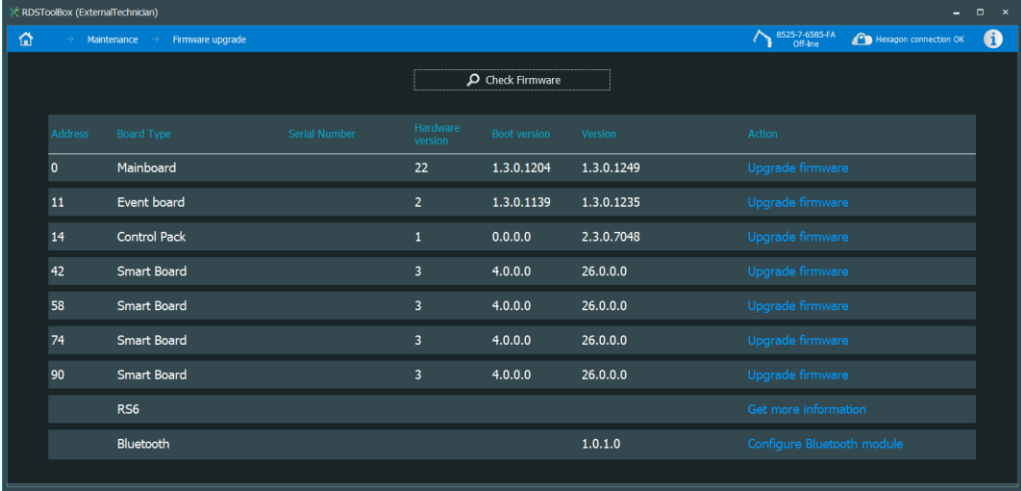
Indicator Id	units
Scan_LineLaserOnTime	sec
Scan_PowerCycleCount	N/A
Scan_PowerOnTime	sec
Scan_UpTime	sec
Scan_ScanTime & Scan_PreviewTime	sec
Scan_ScanStartCount	N/A
Scan_FanSpeed	rpm
Scan_FpgaTemp	°C
Scan_ConnectorBoardTemp	°C
Scan_LineLaserTemp	°C
Scan_SmartShockEventCount	
Scan_SmartShockEvent	g
Scan_SmartTemperature	°C



The SMART indicators cannot be retrieved when the AS1 is mounted on the AP21.

AS1 Firmware Upgrade

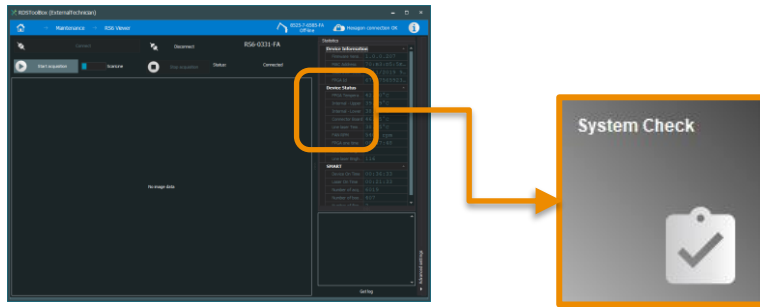
As for the other scanners, the firmware of the AS1 can be upgraded by the RDS Toolbox “Firmware upgrade” function. This tool is now also available when the AS1 is mounted on the AP21 positioner for the tracker.



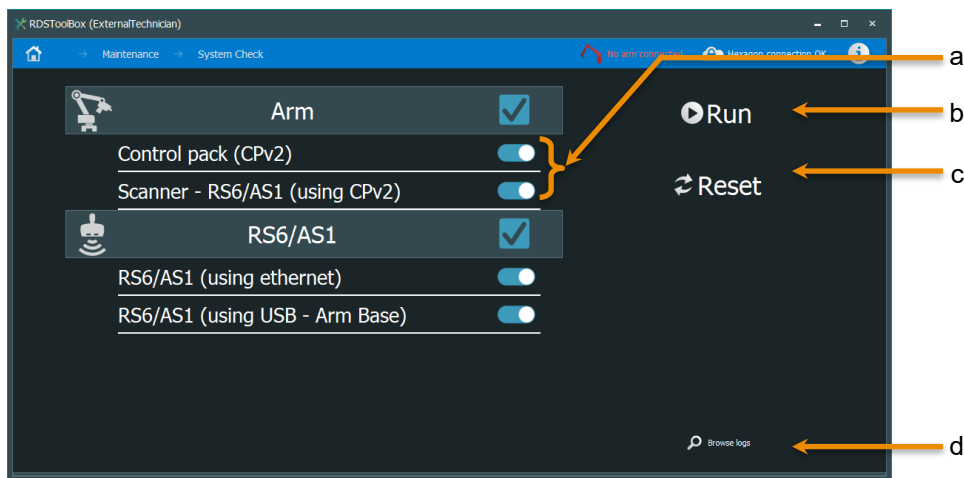
Address	Board Type	Serial Number	Hardware version	Boot version	Version	Action
0	Mainboard	22	1.3.0.1204	1.3.0.1249		Upgrade firmware
11	Event board	2	1.3.0.1139	1.3.0.1235		Upgrade firmware
14	Control Pack	1	0.0.0.0	2.3.0.7048		Upgrade firmware
42	Smart Board	3	4.0.0.0	26.0.0.0		Upgrade firmware
58	Smart Board	3	4.0.0.0	26.0.0.0		Upgrade firmware
74	Smart Board	3	4.0.0.0	26.0.0.0		Upgrade firmware
90	Smart Board	3	4.0.0.0	26.0.0.0		Upgrade firmware
	RS6					Get more information
	Bluetooth			1.0.1.0		Configure Bluetooth module

11.1.7 System Check

The “System Check” diagnostic tool is extended to the AS1 scanner, including when used with the tracker.

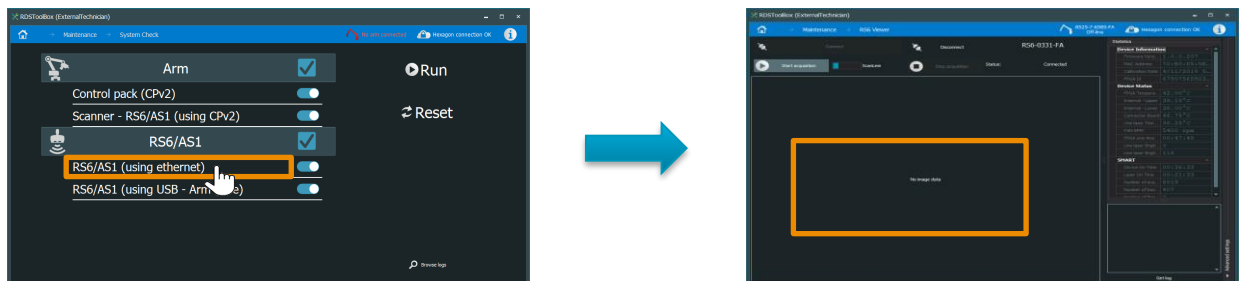


The RS6/AS1 Check operates a check-up of the scanner, to detect any failure.



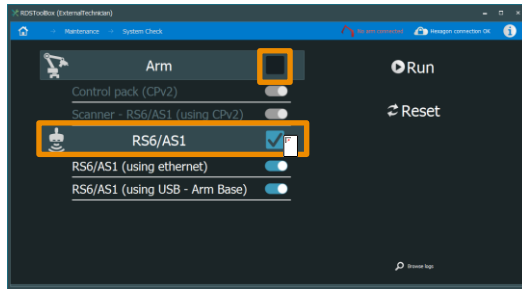
- a. Sub-categories test
- b. Run / stop the auto-diagnostic
- c. Reset the settings
- d. Display the logs

For each component to test, one or several sub-categories of test can be done. Click on the sub-category to view the details of the test.

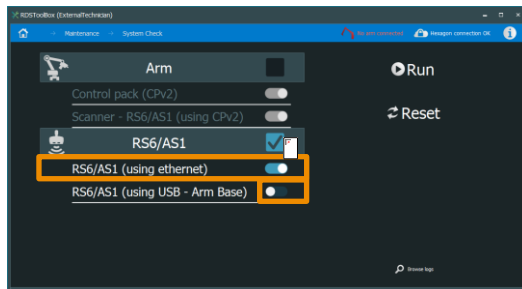


AS1 Check Process

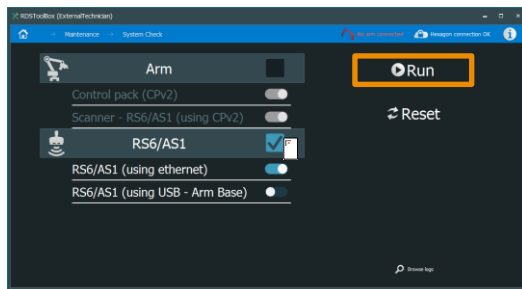
1. Check / uncheck the main component to test.



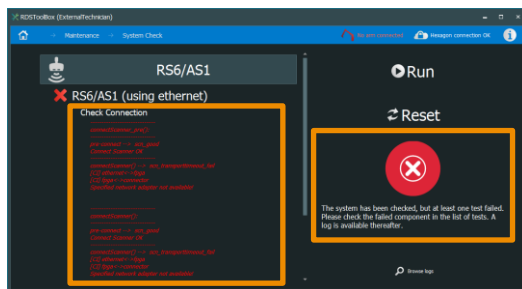
2. Select the tests to operate on the component.



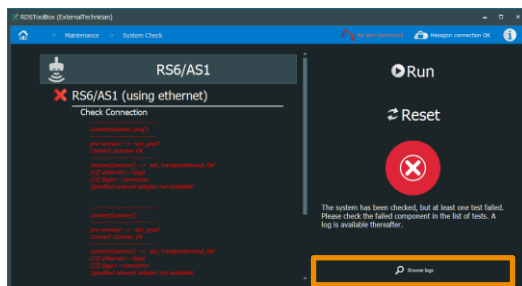
3. Run the auto-diagnostic.



4. When finished, the test result is shown on the right side. If a failure occurs, the details of the test are displayed.



5. A set of logs becomes available: press “Browse Log”. The corresponding files are grouped in a zip file (current date and time). Transmit the log file to the local service centre.



11.2 64 bits installer

RDS v6.0 switches from a 32 bits version (64bits-compatible) to a full 64 bits version.

Installation folder

Following the 64 bits installation, RDS installation folder changes:

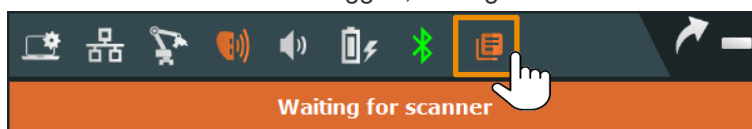
	Legacy versions ($\leq 5.4.1$)	RDS V6
Installation folder	C:\Program Files (x86)\RDS	C:\Program Files\Hexagon\RDS
Data files	Unchanged: C:\Users\Public\Documents\Romer\RDS	

11.3 Logbook

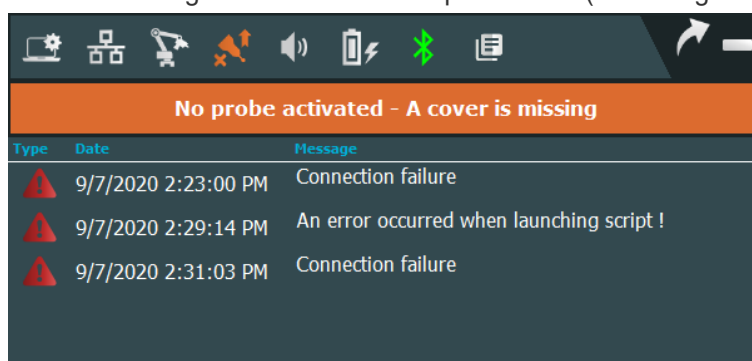
The new Logbook tab warns the operator about events such as a connection failure or other specific information.



- As soon as a new event is logged, the logbook status icon is flagged to the user by turning to red.



- Press on the logbook status icon to open the tab (the icon goes back to default-white)



Type	
	Critical error
	Non-critical error
	information

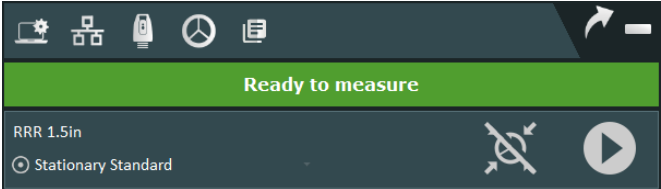
11.4 Miscellaneous

11.4.1 RDS Agent

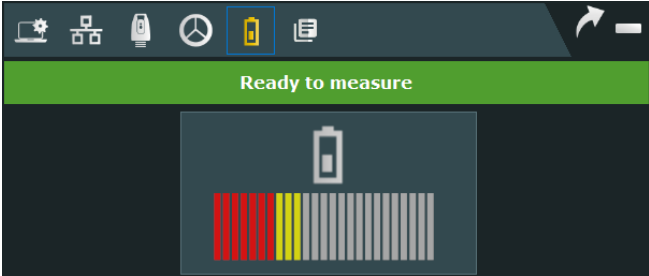
Trackers: the Battery Status is now Available

As well as for the arms, the battery status information is now displayed.

- When used on Power Supply, no battery status icon is shown.

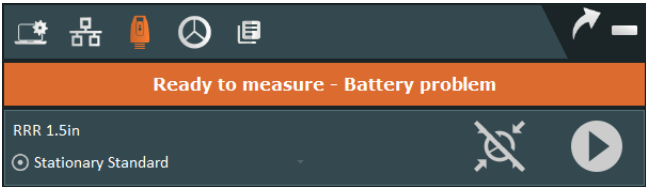


- When used on Battery, Battery status icon and tab become available.



	75 – 100 %	Battery OK
	47 – 74 %	Battery OK
	20 – 47 %	Battery Low
	5 – 20 %	Battery Very Low
	0 – 5 %	Battery Critical

- If a problem occurs on the battery, the global status becomes orange.



11.4.2 RDS Control Panel

Probes tab > diameter value

The diameter value has been removed from the list for Non-Contact Tube Probes and Scanners.

11.4.3 RDS Data Collector

Diagnostics > “Scanner – Digitize” script memory (arms)

With previous versions of RDS, and due to the 32 bits limitations regarding the memory, digitizing with RDS Data Collector could not be performed for large number of points.

With the introduction of the 64 bits installation, this limitation is over, RDS Data Collector can be used to collect any size of point cloud, to be exported to standard formats of files (*.psl, *.swl, *.asc, *.csv, *.xyz).

Diagnostic > “Non-Contact Probe - Quick Check” (arms)

Correction: the sign of the result was opposite.

Laser Scanner Alignment (arms)

The scripts for the laser scanners (RS2-4, RS5, RS6, AS1, HP-L-8.9, HP-L-20.8) have been renamed.

Legacy versions ($\leq 5.4.1$)	RDS V6
Scanner alignment – sphere	Laser scanner alignment – sphere
Scanner alignment – sphere with reference	Laser scanner alignment – sphere with reference
Scanner alignment – plane	Laser scanner alignment – plane
Scanner alignment – plane with reference	Laser scanner alignment – plane with reference

RDS Data Collector launch issue

Correction: due to a missing Windows® component on some new PCs (vcomp140.dll), RDS Data Collector could not run.

11.4.4 Others

HP-L-8.9 exposure (arms)

Correction: the exposure capture with the HP-L-8.9 scanner was not considered.

RS3 Frequency (arms)

Correction: the frequency was limited to 40 Hz instead of 100 Hz when used in wired mode.

Messages

The messages translations to French, German, Italian, Spanish, Chinese, Czech, Swedish, Portuguese, Korean, Japanese, Russian, Finish, Polish, have been updated.

Correction: Some texts were hard coded in English not translated into other languages.

Safenet sentinel driver

The Safenet Sentinel drivers have been updated from 7.5.9 to 7.6.0 (x64).

Probing Improvement (tracker)

The probing functionality with the tracker has been improved and now all targets are supported (requires a compatible application software).

Tracker switch from scanner to T-Probe (tracker)

Correction: in specific conditions, when switching the target probe from the LAS to the T-Probe, no measurement could be collected without changing the measurement profile.

Meteo data from tracker (tracker)

The humidity value coming from the tracker is now correctly rounded with 1 decimal.

User Manuals

The RDS User manual and RDS Data Collector manual have been merged into a single "RDS Software manual".

This RDS Software manual embeds more scanning tips and tricks.

Applications on background

Correction: when launched indirectly by an application software through the API, several RDS components (RDS Control Panel, Alignment choice window) could appear not on foreground.



Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter. For more information, visit hexagonmi.com.

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H00024298-EN
Rev 29 / V 6.6
RDS What's New