Operator and Maintenance Technical Manual
Chapter 1 – System Maintenance

1.1 TECHNICIAN'S COMPUTER

1.1.1 TECHNICIAN'S COMPUTER OVERVIEW

The technician's computer is a ruggedized laptop used as external test equipment for controlling operational, maintenance, and test activities that provides in-depth access for testing, analysis, debriefing, and maintenance.

The technician's computer functions as a browser (client) of the maintenance software (server) running in the MCU.

Selection tabs allow for display mode switching (Operational, Data, Scenarios, Debriefing and Maintenance)

1.1.2 LOGIN PROCEDURE

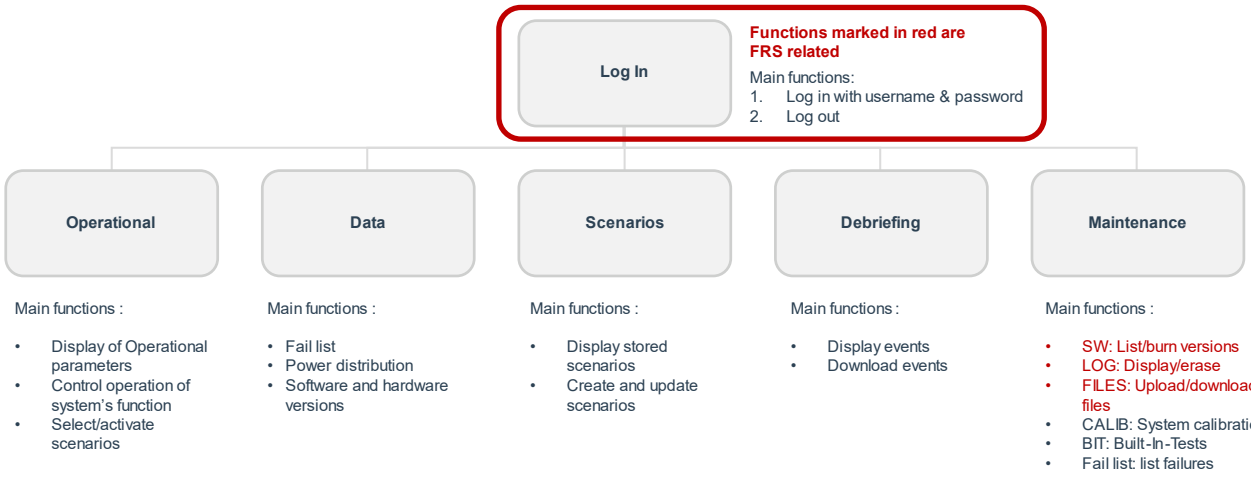
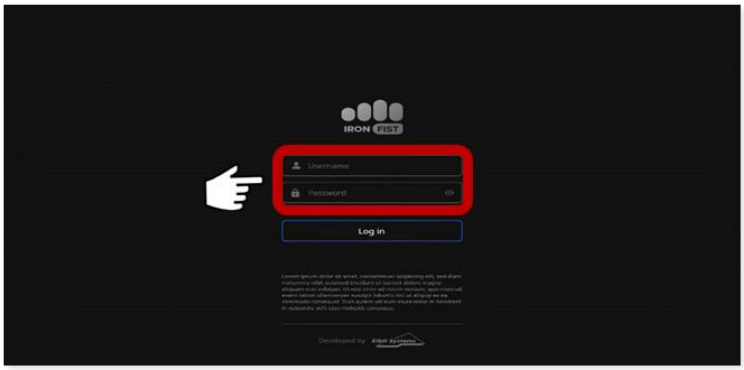
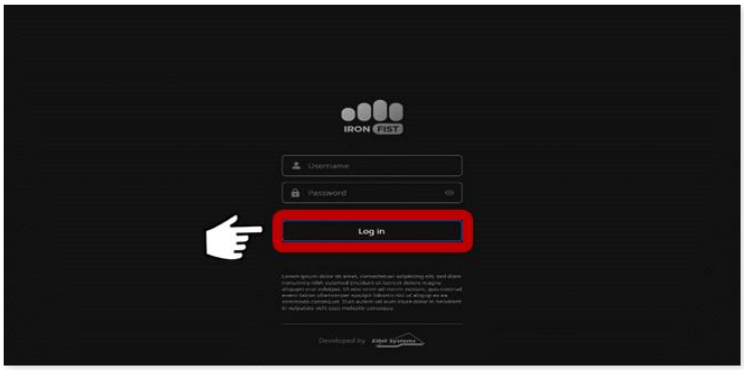


Figure 1-1 : Login Procedure

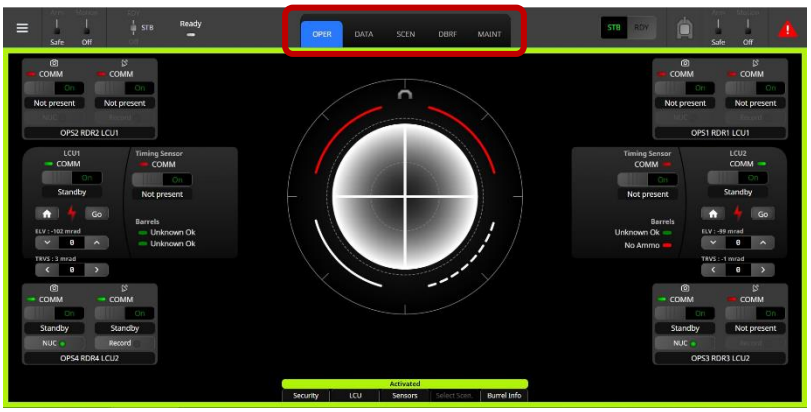
When powering up the technician's computer, the login screen is displayed.

Table 1-1 : Login Procedure

Action	Additional Information	Figure
Enter your username and password	Usernames and passwords will be provided for USG testing	
Click on “Log In”		

1.2 SYSTEM MODES

Table 1-2 : System Modes Indicators

Additional Information	Figure
The technician's computer contains 5 screens: • OPER – Operational • DATA - Data • SCEN - Scenario • DBRF - Debrief • MAINT - Maintenance	

1.2.1 DATA MODE - SYSTEM INFORMATION

1.2.1.1 DATA MODE MAIN FUNCTIONS

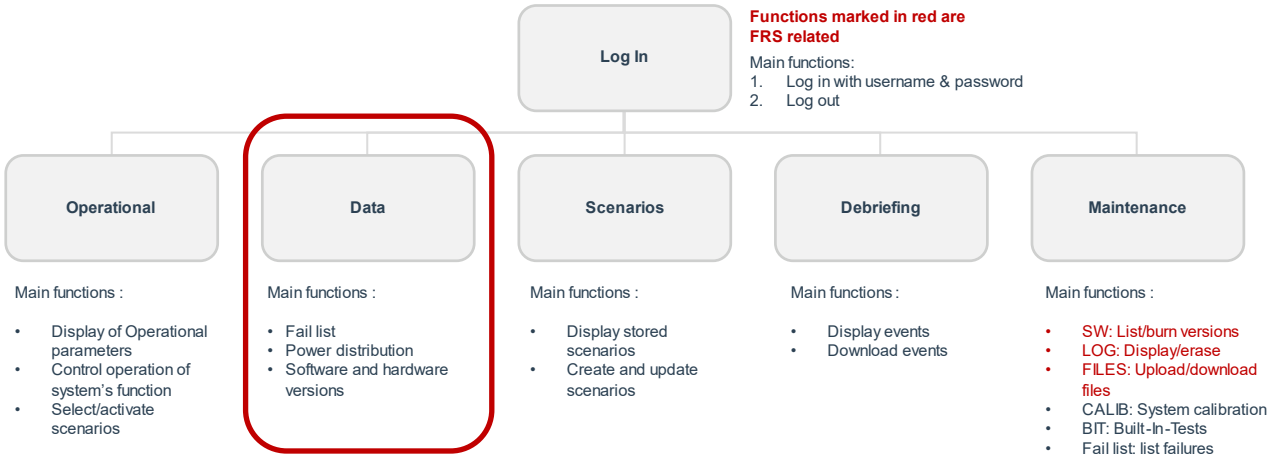


Figure 1-2 : Data Mode Main Functions

1.2.1.2 FUNCTIONALITIES OF THE DATA SCREEN

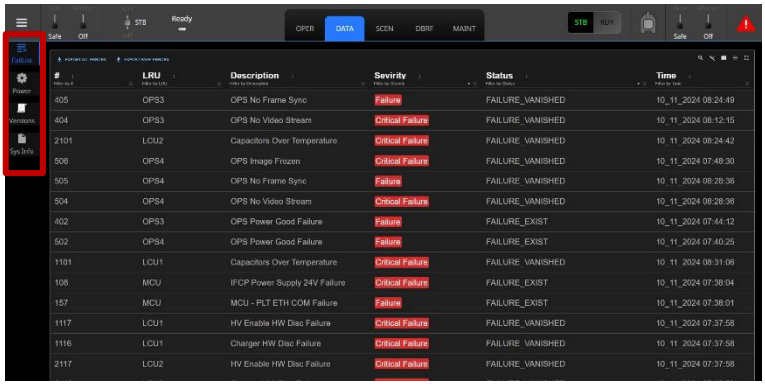
The Data Screen presents a detailed view of system information, including:

- A comprehensive faults list with explanations, timestamps, severity levels, and status indicators

- Power distribution details
- Software and hardware information for system LRUs

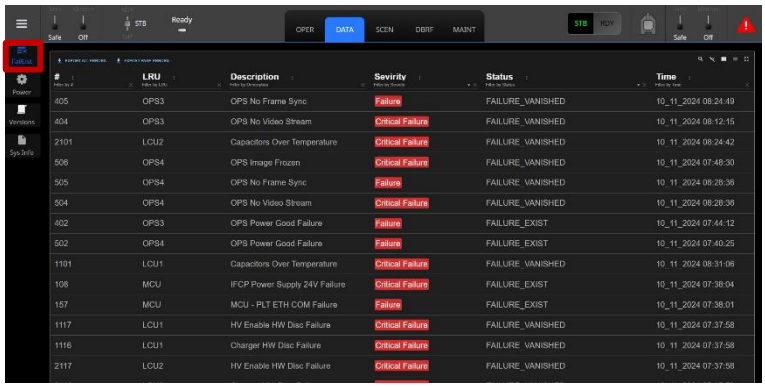
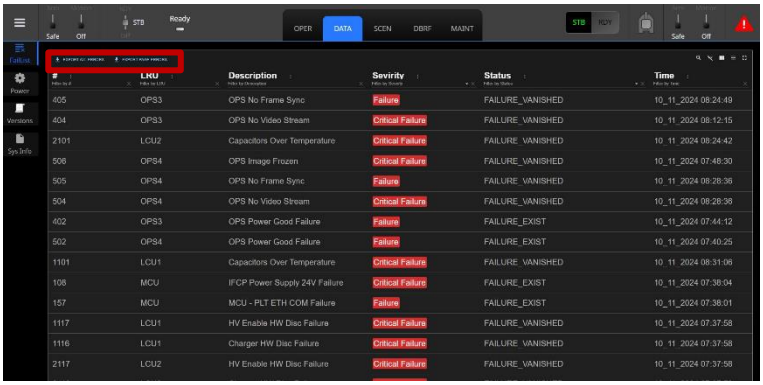
1.2.1.3 DATA MODE STRUCTURE

Table 1-3 : Data Mode – Data Screen Controls and Menus

Additional Information	Figure
Data Mode (DATA) provides the operator with comprehensive information on system failures, power consumption and distribution, as well as software and hardware versions.	
The Data Mode menu provides access to the following screens: • Fail list • Power • Versions • System information	

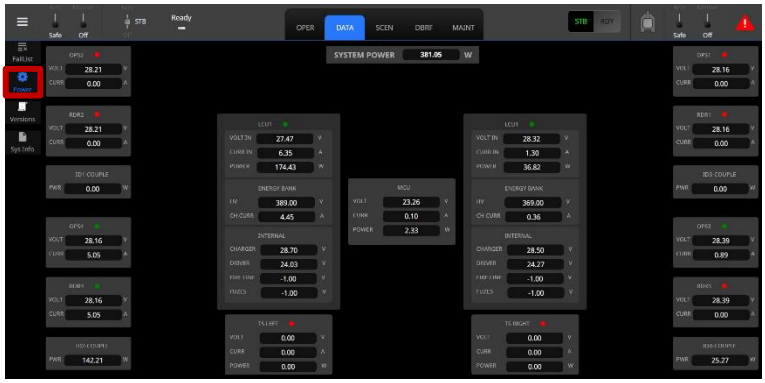
1.2.1.4 DATA MODE – FAIL LIST

Table 1-4 : Data Mode – Fail List

Additional Information	Figure
Fail list screen – is the default screen in DATA Mode, displaying all system faults with the following details: • LRU at fault • Fault description • Severity level • Fault status • Fault time and date	
Exporting options: • Export all errors • Export page errors	

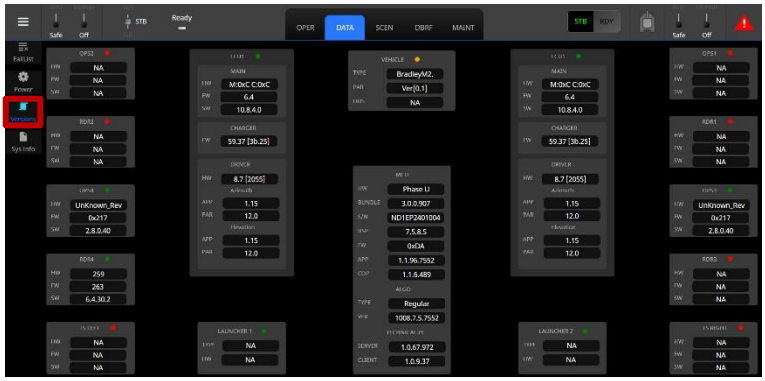
1.2.1.5 DATA MODE – POWER

Table 1-5 : Data Mode – Power

Additional Information	Figure
Power screen – this screen displays information on power consumption and distribution across the system's LRUs.	

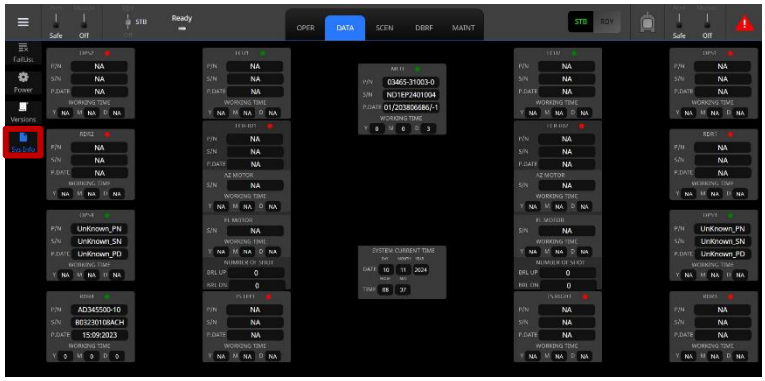
1.2.1.6 DATA MODE – VERSIONS

Table 1-6 : Data Mode – Versions

Additional Information	Figure
Versions screen – Shows software version information for each system LRU.	

1.2.1.7 DATA MODE – SYSTEM INFORMATION

Table 1-7 : Data Mode – System Information

Additional Information	Figure
System information screen – provides details on the hardware specifications of each system LRU.	

1.2.2 SCEN. MODE – CREATING AND INITIATING SCENARIOS

1.2.2.1 SCENARIO MODE MAIN FUNCTIONS

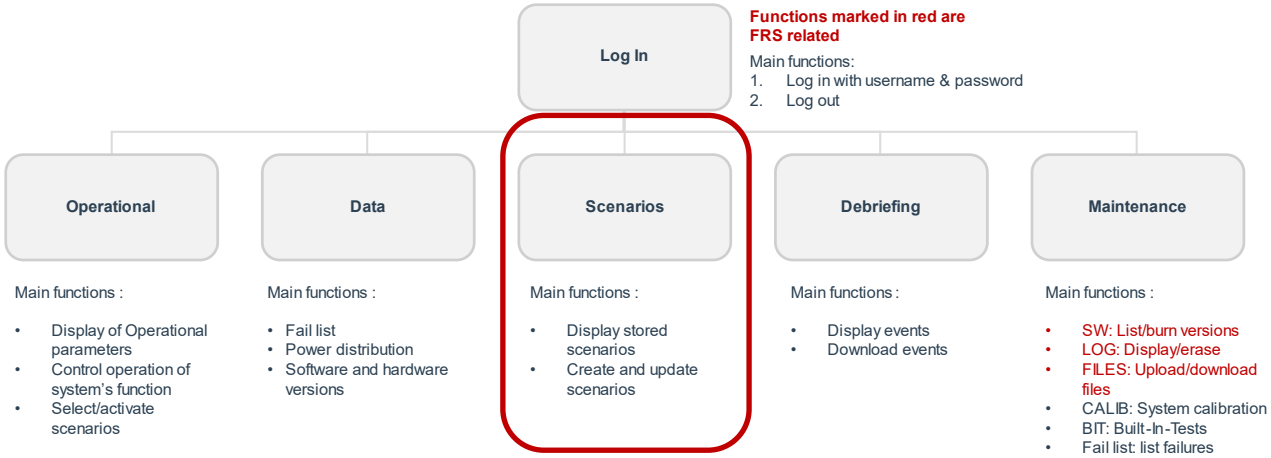


Figure 1-3 : Scenario Mode Main Functions

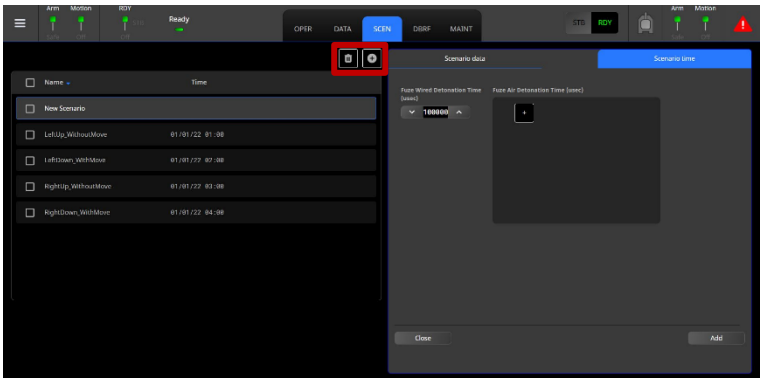
1.2.2.2 FUNCTIONALITIES OF THE SCENARIO SCREEN

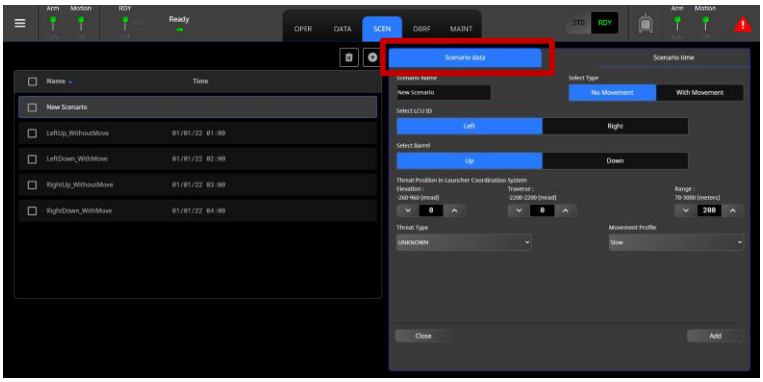
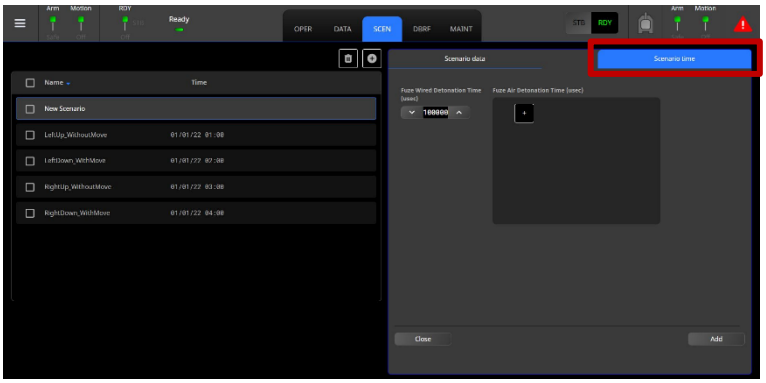
The Scenario Screen enables scenario management functions, such as:

- Creating, deleting and initiating scenarios for testing purposes
- Viewing scenario-specific data

1.2.2.3 SCENARIO MODE STRUCTURE

Table 1-8 : Scenario Mode – Scenario Screen Controls and Menus

Additional Information	Figure
Scenario Mode (SCEN) enables the operator to create, select, and manage scenarios for maintenance checks. **NOTE** To access scenarios, the system must be in Reduced Mode, activated via the Security tab on the lower ribbon.	
Creating and deleting scenarios: • Press the Plus (+) button to create a new scenario. • Press the Delete button to remove an existing scenario. The scenario list is located on the left side. Selecting a scenario from the list displays its details on the right. **NOTE** Scenarios can also be selected and initiated through the "Select Scen." tab on the lower ribbon.	

Additional Information	Figure
The Scenario Data tab allows the operator to view and configure the following scenario parameters: • Status and activity of related LRUs and barrels • Elevation and traverse • Target range • Movement speed • Threat type	
The Scenario Time tab allows the operator to view and set both fuze wire and air detonation time for the scenario.	

1.2.3 DBRF MODE – SCENARIOS SUMMARY

1.2.3.1 DEBRIEF MODE MAIN FUNCTIONS

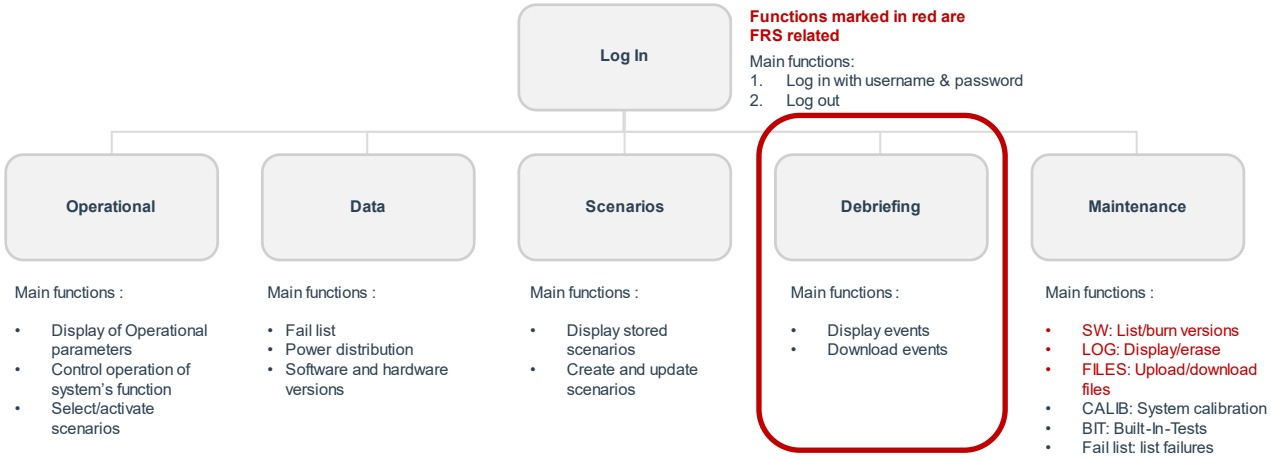


Figure 1-4 : Debrief Mode Main Functions

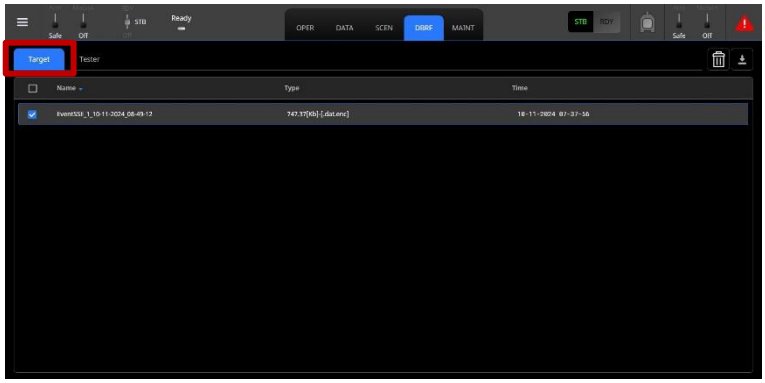
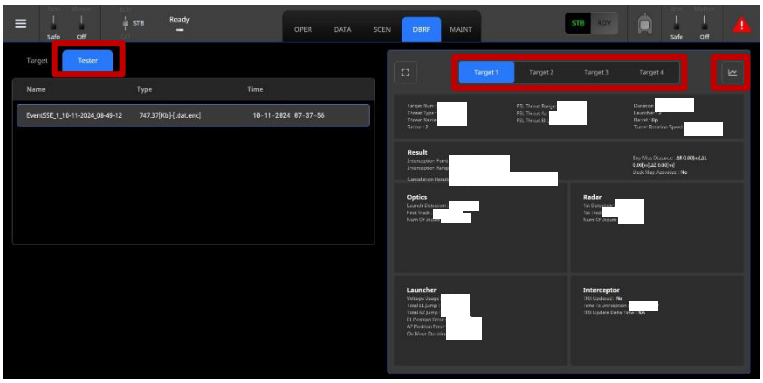
1.2.3.2 FUNCTIONALITIES OF THE DEBRIEF SCREEN

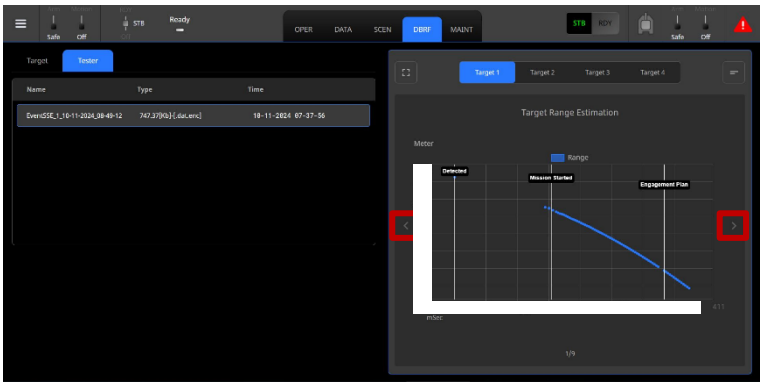
The Debrief Screen summarizes events with the following features:

- Provides an in-depth summary of selected events from a list of four "Targets"
- Presents event information in a graphical format

1.2.3.3 DEBRIEF MODE STRUCTURE

Table 1-9 : Debrief Mode – Debrief Screen Controls and Menus

Additional Information	Figure
Debriefing mode (DBRF) provides the operator with a summary of completed scenarios.	
The Target screen displays a list of scenarios, including their names, types, and the time and date of execution.	
The Tester screen offers more detailed information about the scenario, including: • Threat details • Sectors involved • Scenario results • Optics, Radar, launcher, and interceptor data	

Additional Information	Figure
The operator can select a scenario to view by choosing one of the four Targets. Pressing the Graph button displays scenario data in graphical form.	
The Graph screen displays information about the selected scenario in graph mode. Multiple graphs are available for each scenario. • Navigation arrows – switch between the different graphs for the selected scenario	

1.2.4 MAINT MODE – SYSTEM MAINTENANCE

1.2.4.1 MAINTENANCE MODE STRUCTURE

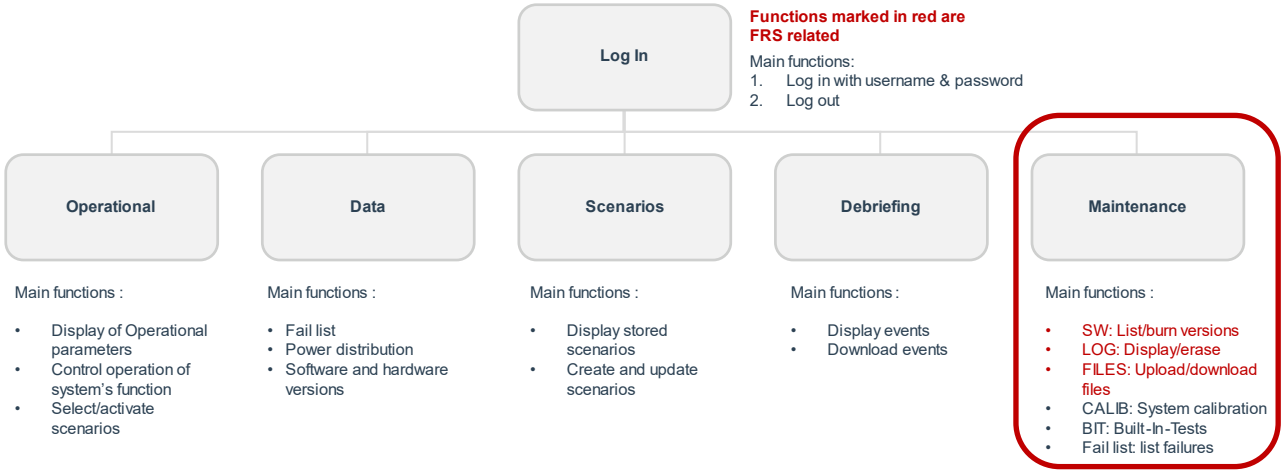


Figure 1-5 : Maintenance Mode Structure

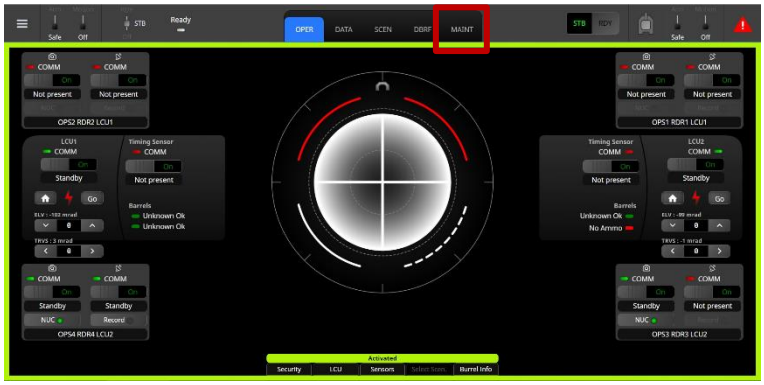
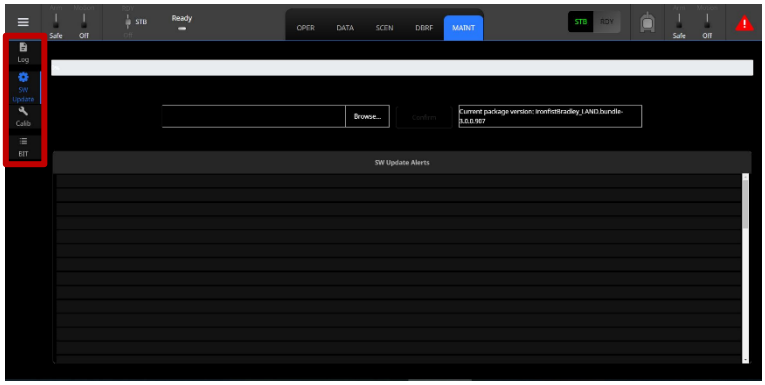
1.2.4.2 FUNCTIONALITIES OF THE MAINTENANCE SCREEN

The Maintenance Screen gives access to system information and allows initiation of maintenance procedures and tests, including:

- Viewing and exporting logs of all system events
- Performing software updates
- Running calibration procedures
- Initiating BIT

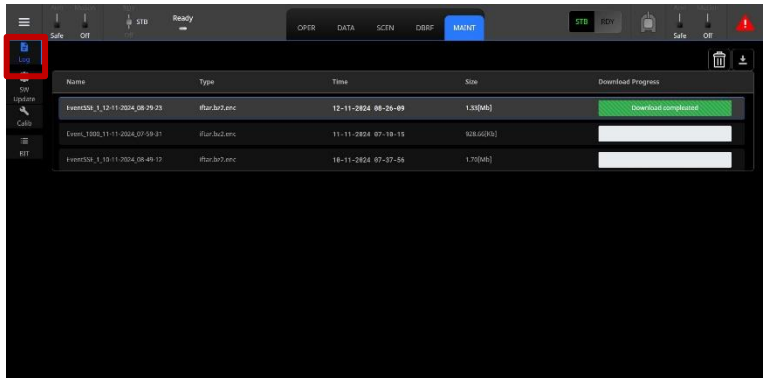
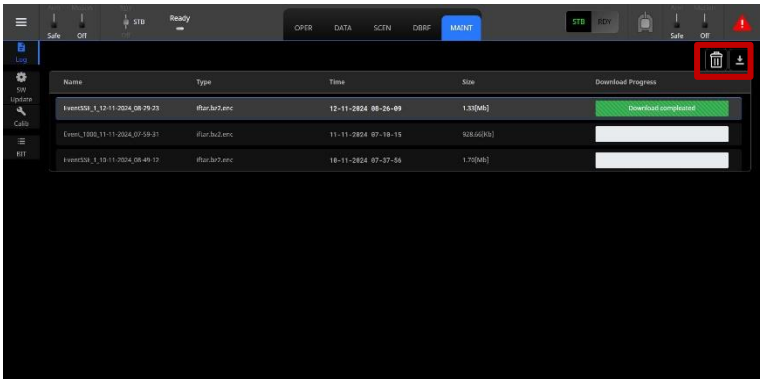
1.2.4.3 MAINTENANCE MODE STRUCTURE

Table 1-10 : Maintenance Mode – Maintenance Screen Controls and Menus

Additional Information	Figure
Maintenance mode (MAINT) allows the operator to view system information and perform maintenance activities, including calibration and initiating BIT.	
The Maintenance Mode menu provides access to the following screens: • Logs • Software updates • Calibration • BIT	

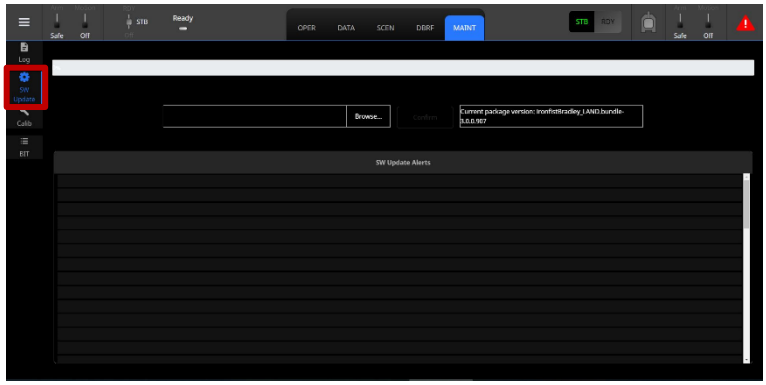
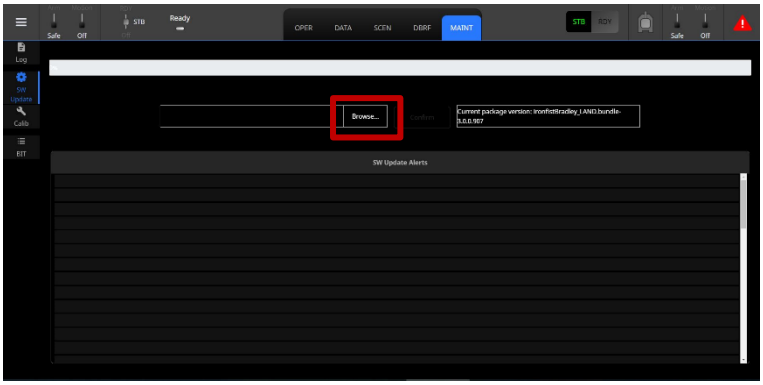
1.2.4.4 DATA MODE – LOGS

Table 1-11 : Data Mode – Logs

Additional Information	Figure
The Logs screen allows users to view and download system logs, providing detailed information about events, including: • Name of event • Type of event • Time and date • File size • Download progress	
Logs management options: • Delete event • Download event	

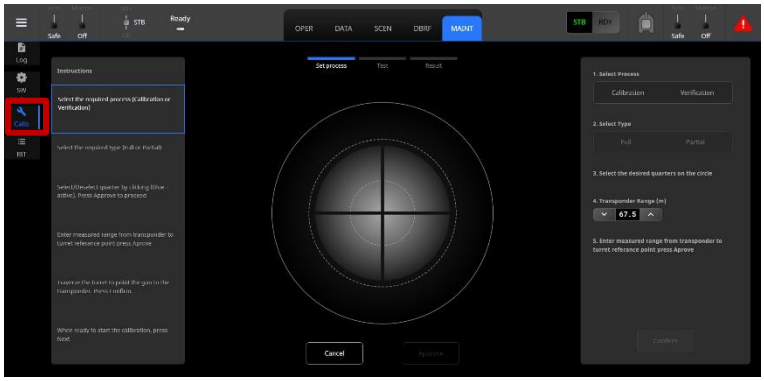
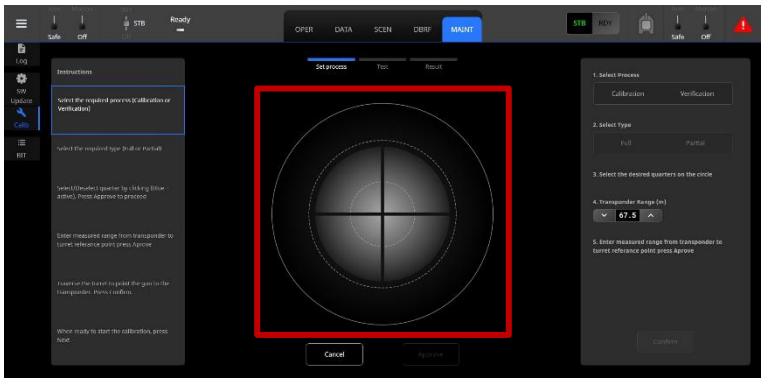
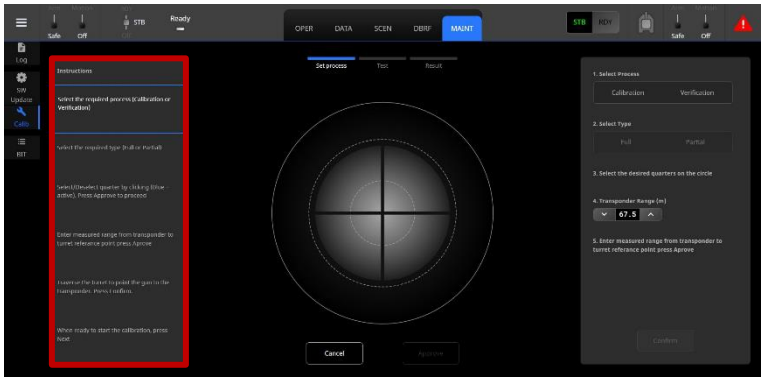
1.2.4.5 DATA MODE – SOFTWARE UPDATE

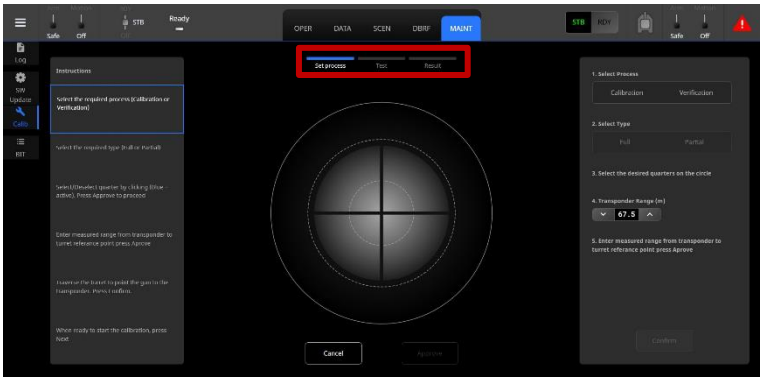
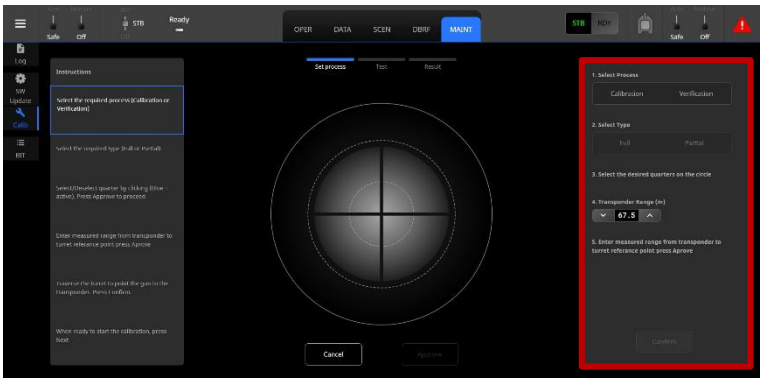
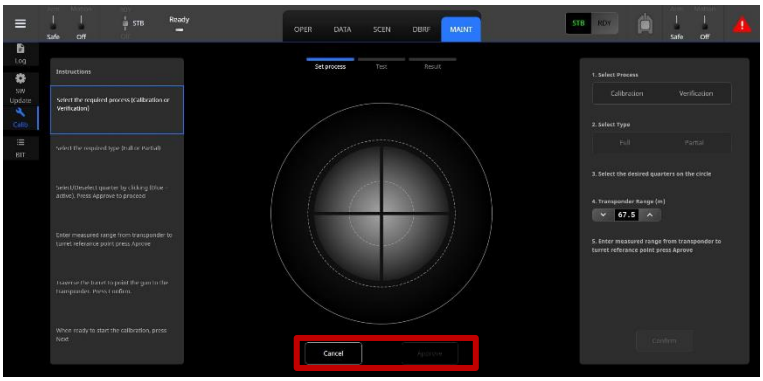
Table 1-12 : Data Mode – Software Update

Additional Information	Figure
SW Update screen displays the current software version and allows the operator to update the software (refer to section 0 for the procedure).	
The Browse button allows the operator to choose the required software file.	

1.2.4.6 DATA MODE – CALIBRATION

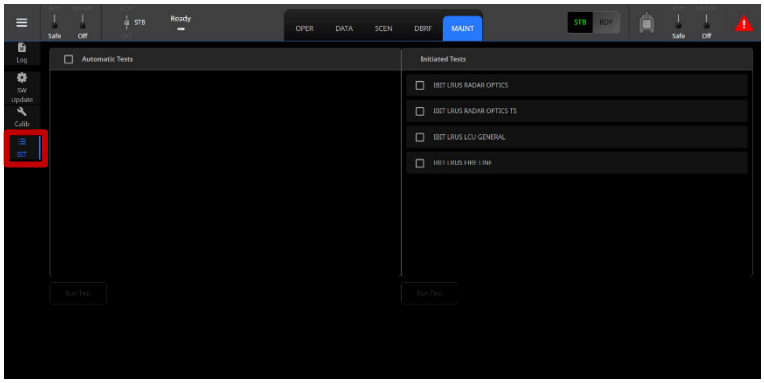
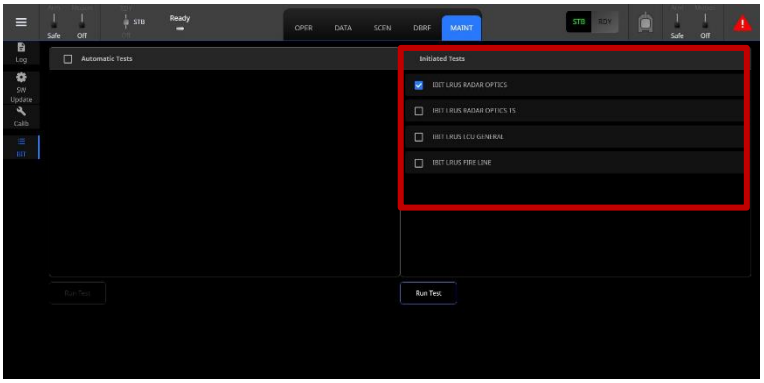
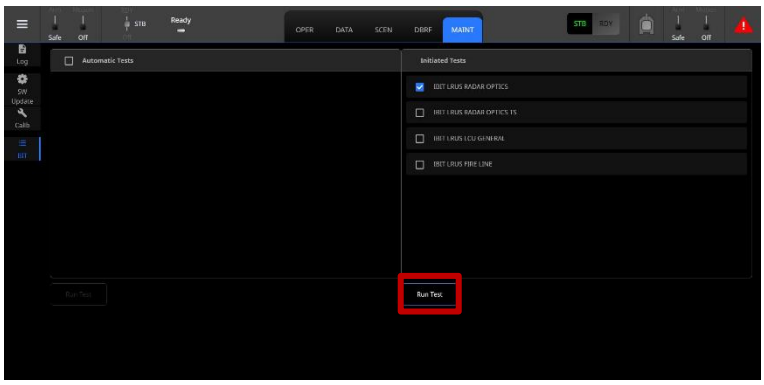
Table 1-13 : Data Mode – Calibration

Additional Information	Figure
The Calibration screen Facilitates the calibration and verification procedures (refer to section 1.4).	
The Quarters section enables the selection of specific quarters for the calibration or verification procedure.	
Instructions section: • Step-by-step instructions • Updates automatically upon completing the current step and pressing "Next"	

Additional Information	Figure
Progress section: • Set Process – selection of the desired process • Test • Result	
Calibration process selection: • Calibration or Verification process selection • Process Type, either a full or partial process according to the number of sectors • Selection of the specific quarters to be calibrated • Transponder range • Measured distance from the transponder to the turret reference point	
Progress buttons: • Cancel - cancels the current step • Approve - confirms completion of the current step and advances to the next step	

1.2.4.7 DATA MODE – BIT

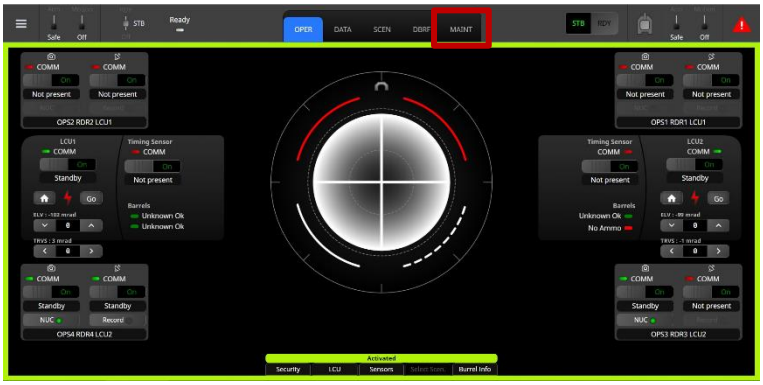
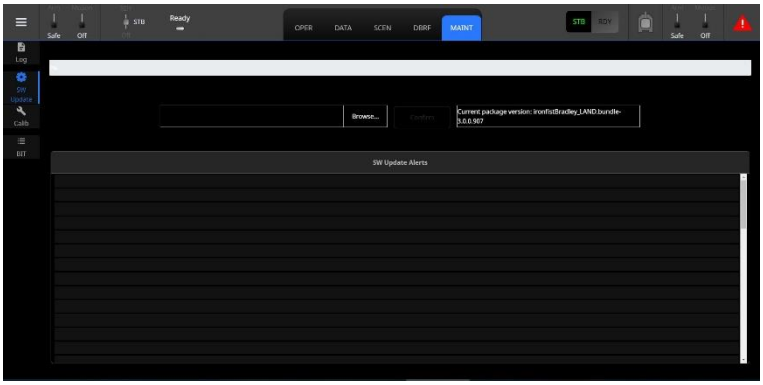
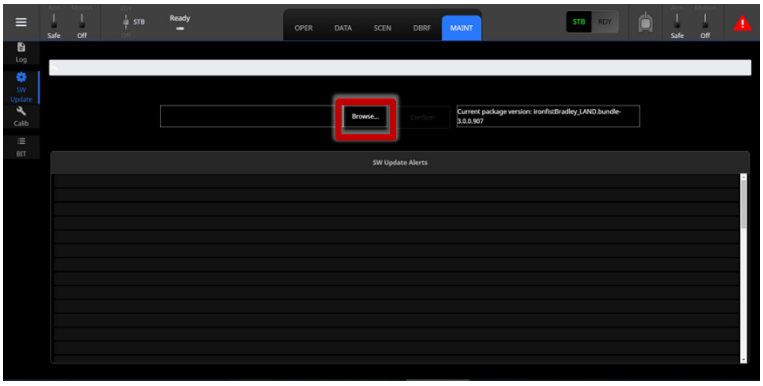
Table 1-14 : Data Mode – BIT

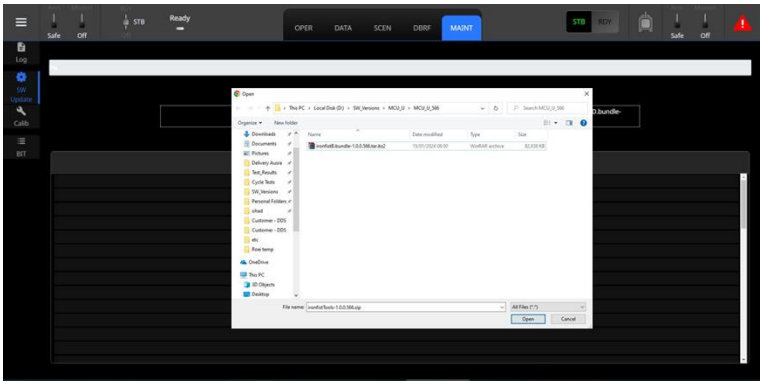
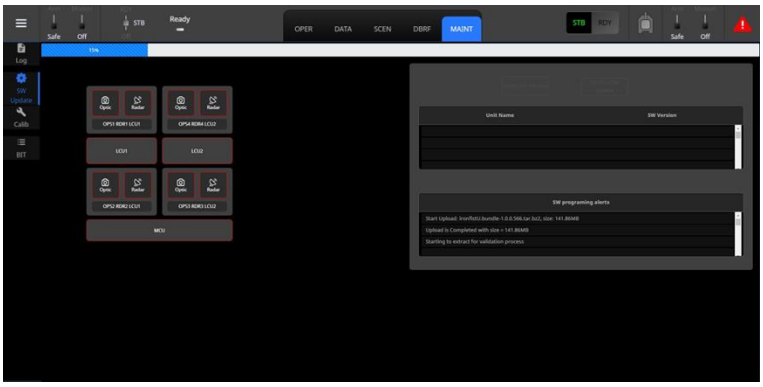
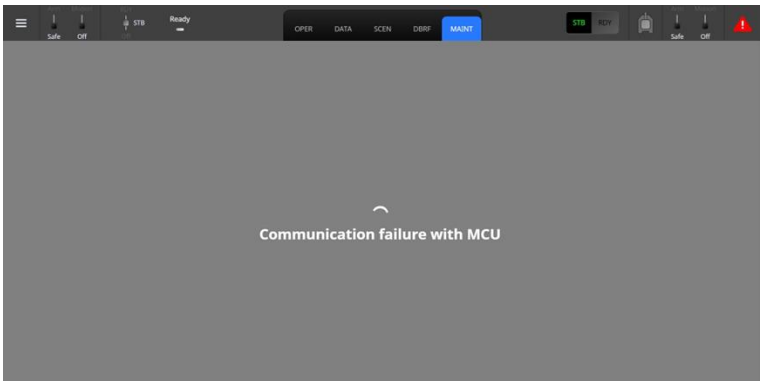
Additional Information	Figure
The BIT screen provides the operator with a list of tests to initiate (refer to section 1.5.1).	
The Initiated Tests section allows the initiation of a desired test by selecting from a list of available tests.	
The Run Test button initiates the selected test.	

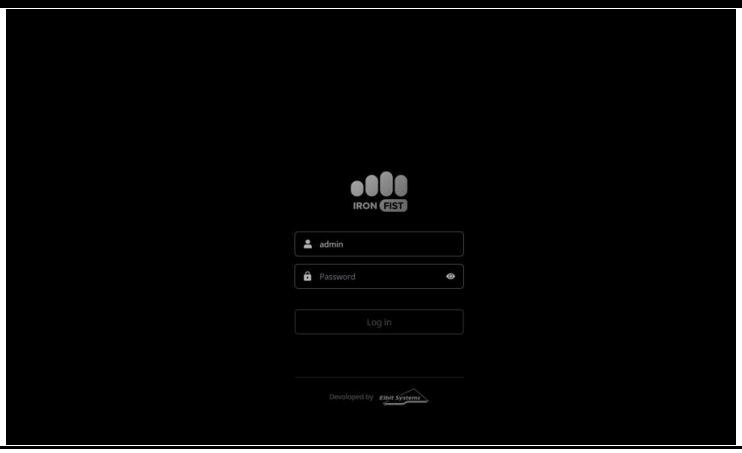
1.3 SOFTWARE UPDATE

The following table describes the software update procedure:

Table 1-15: Software Update

Additional Information	Figure
Change the technician's computer mode to "MAINT".	
On the left menu, click on "SW Update".	
Click "Browse" to open your file library.	

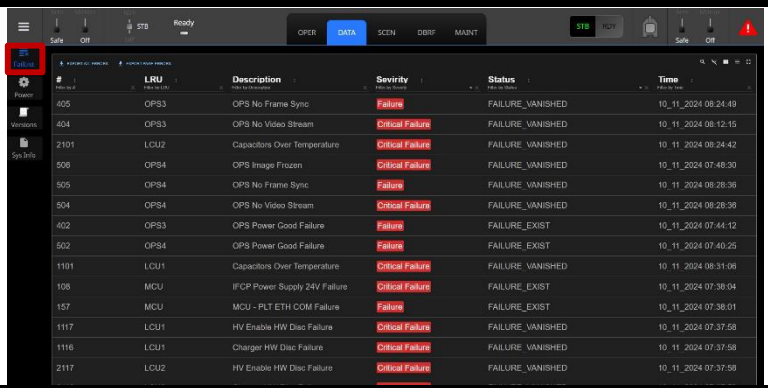
Additional Information	Figure
Select the relevant software version and click “Open”.	
The new version will now synchronize with the MCU. Do not interact with the computer during this process.	
The MCU will restart automatically after the update.	

Additional Information	Figure
After the restart, enter your username and password to re-enter the system.	

1.4 SYSTEM CALIBRATION

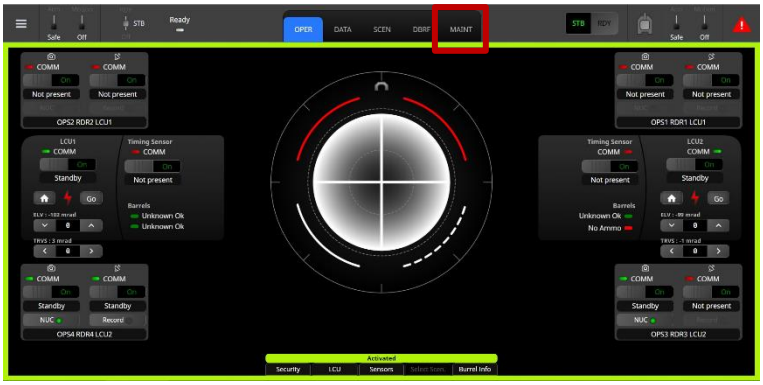
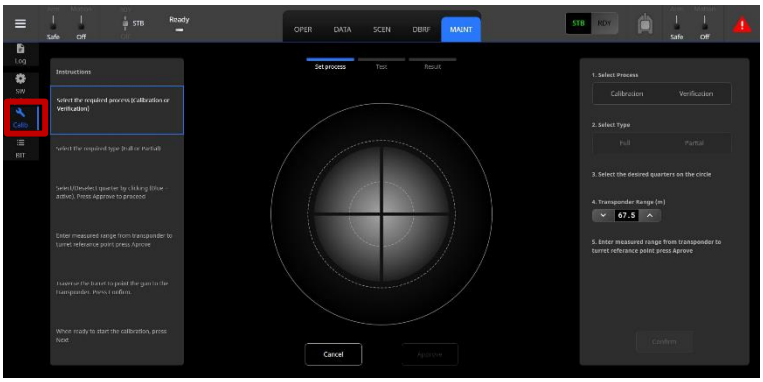
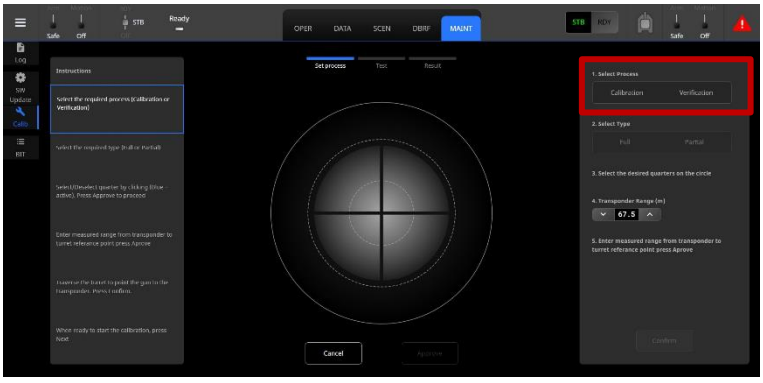
1.4.1 SET CALIBRATION PROCESS

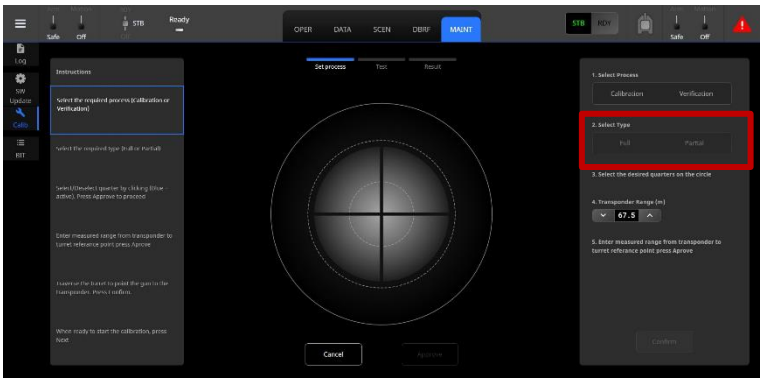
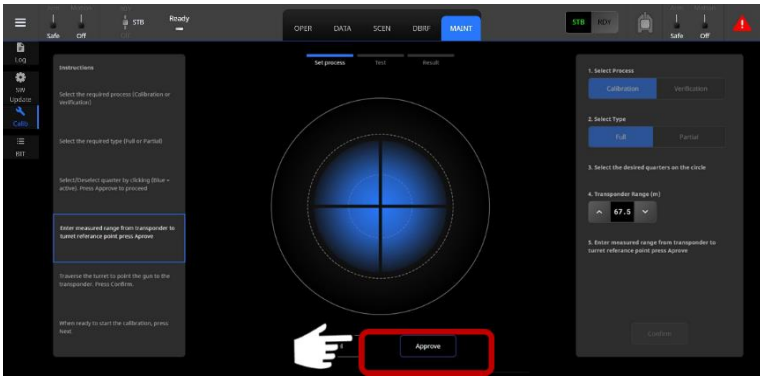
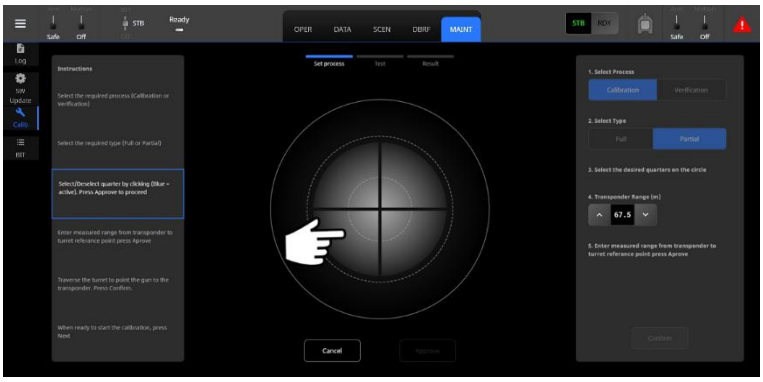
Table 1-16 : Set Calibration Process

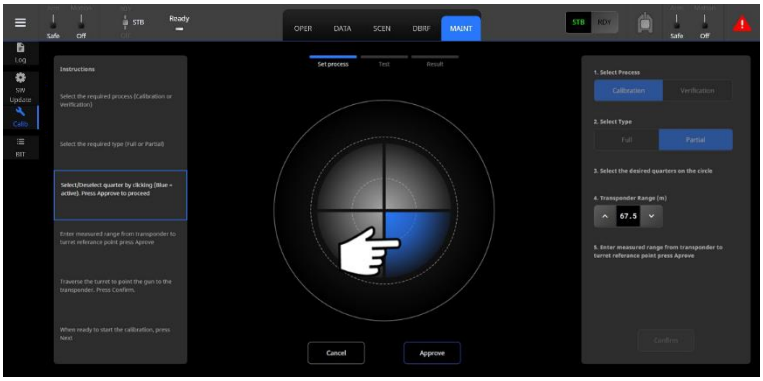
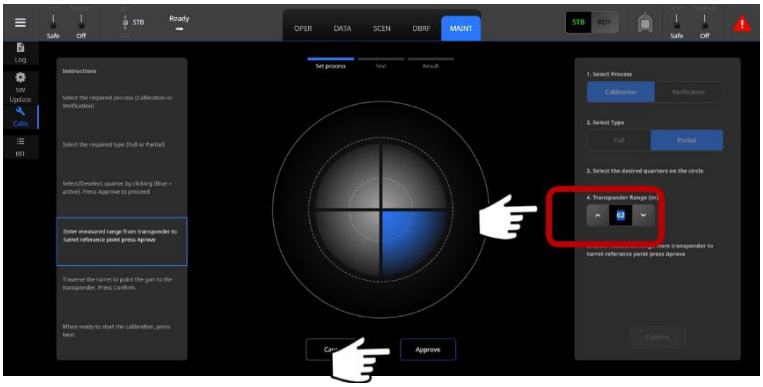
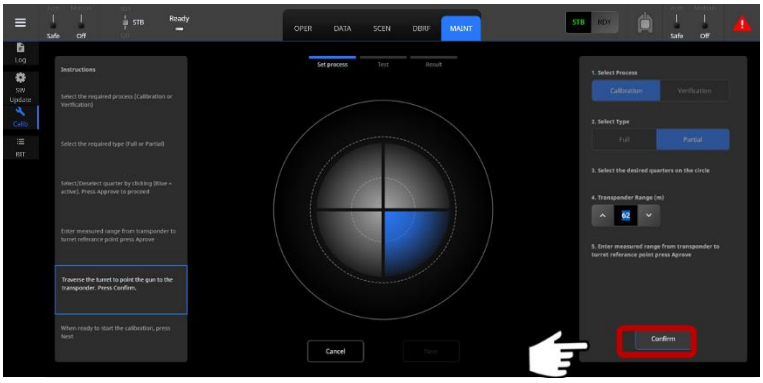
Action	Additional Information	Figure
Change the technician's computer mode to "DATA".		
	System health status will be displayed.	

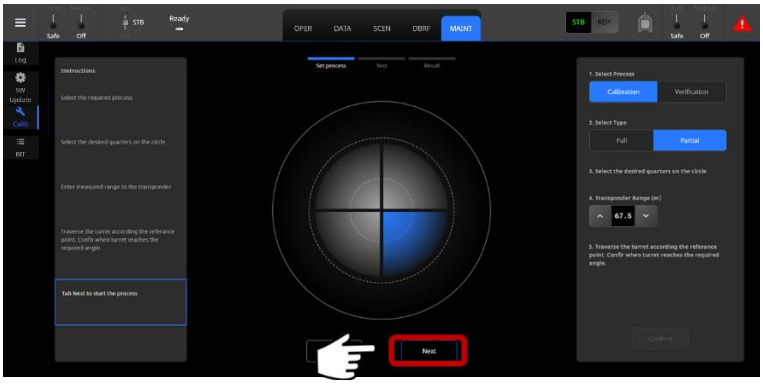
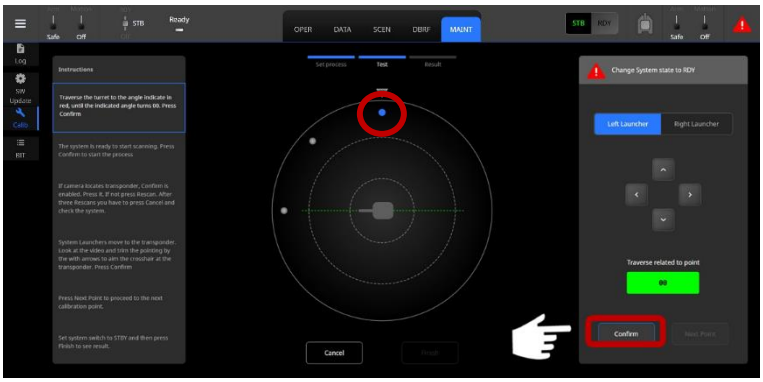
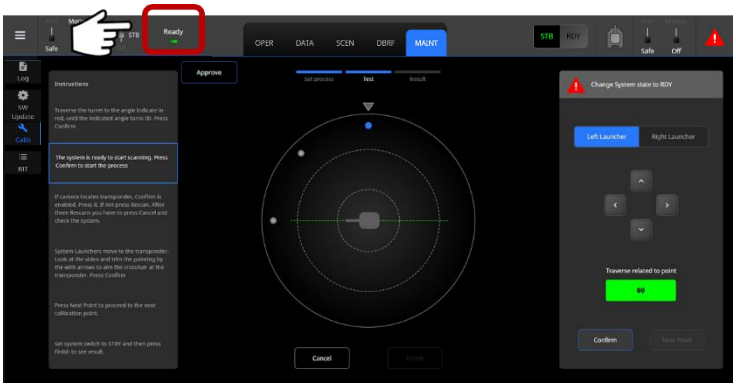
1.4.2 PERFORM CALIBRATION

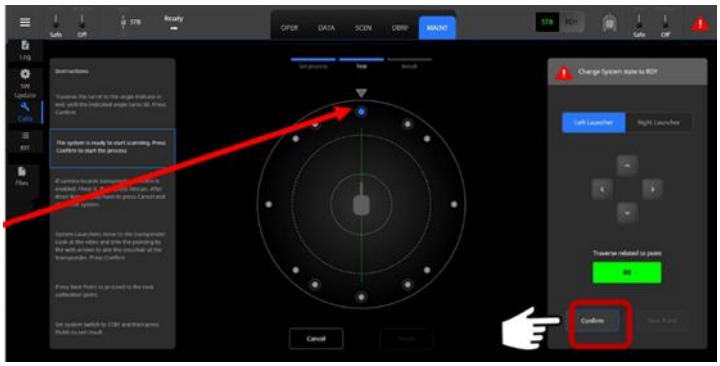
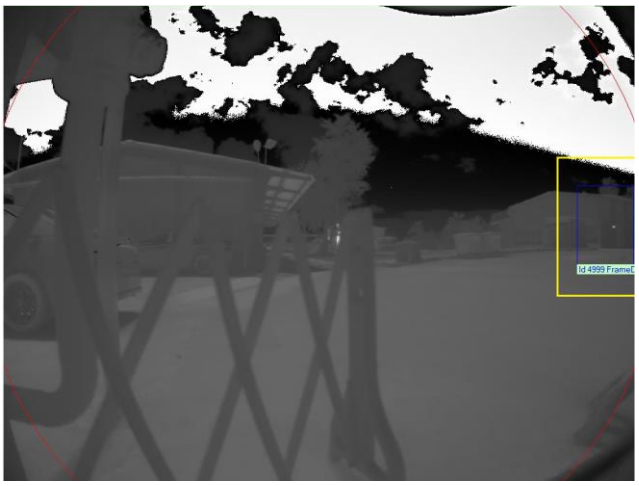
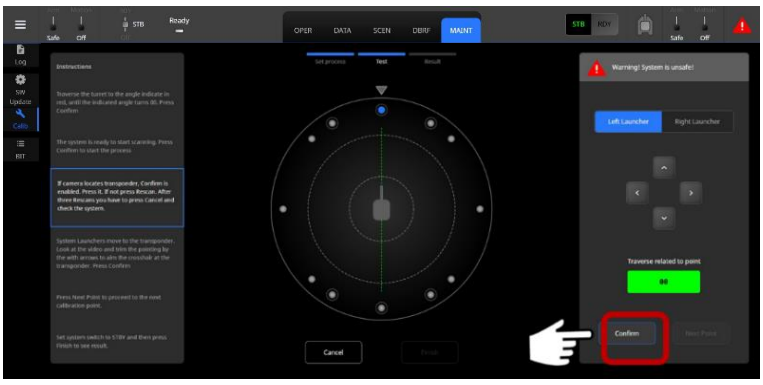
Table 1-17 : Perform Calibration

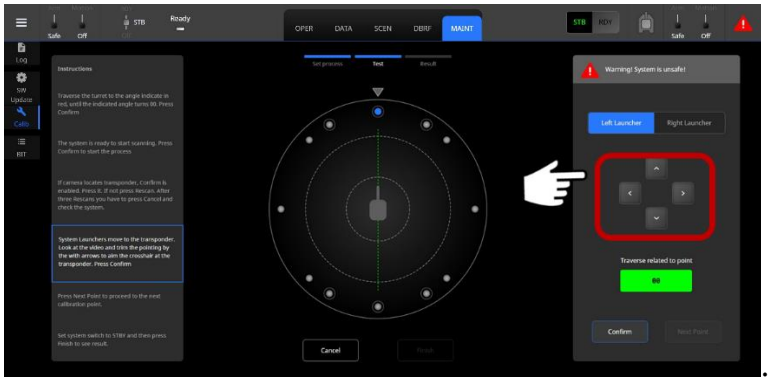
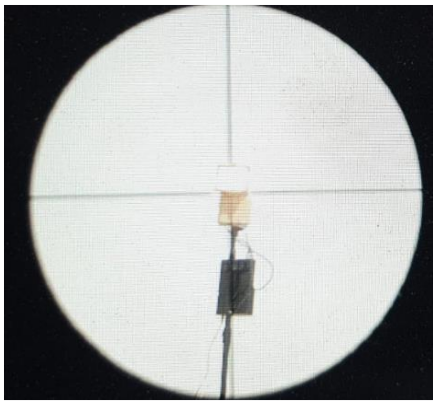
Action	Additional Information	Figure
Change the technician's computer mode to "MAINT".		
On the left menu, click on "CALIB".		
Select calibration process – (Calibration or Verification)	Calibration verification will be explained separately	

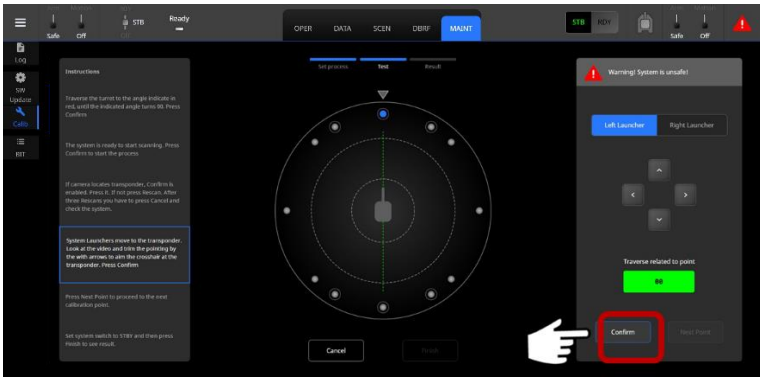
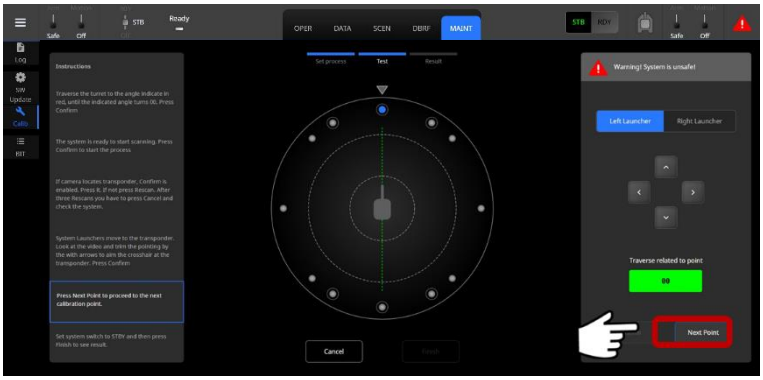
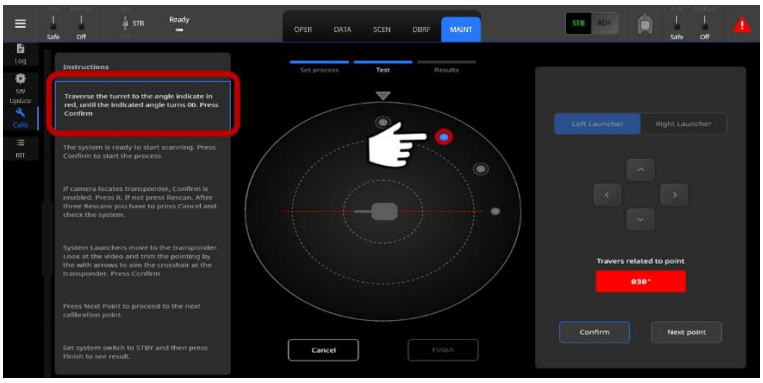
Action	Additional Information	Figure
Select calibration type (Full or Partial).	Full calibration – calibrating through 12 calibration points (360° azimuth). Partial calibration – selecting system quarters for calibration (4 points spaced around 90° azimuth).	
Press “Approve” to proceed.	If Full Calibration is selected, all quarters will be highlighted in blue (active).	
For Partial Calibration, select/deselect specific quarters by clicking.		

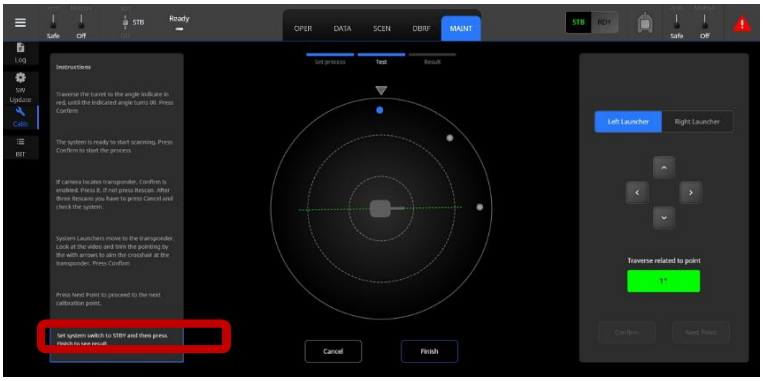
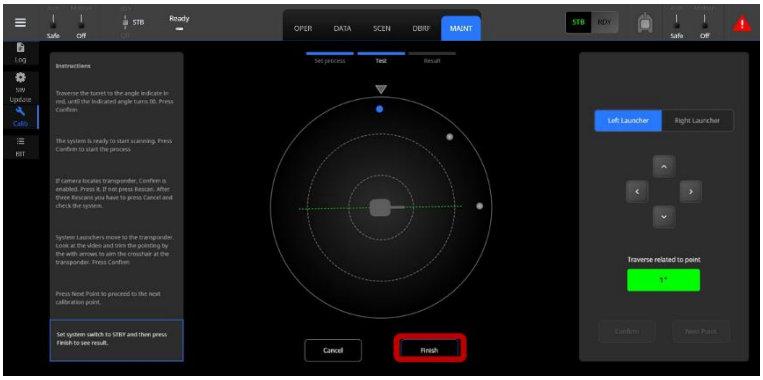
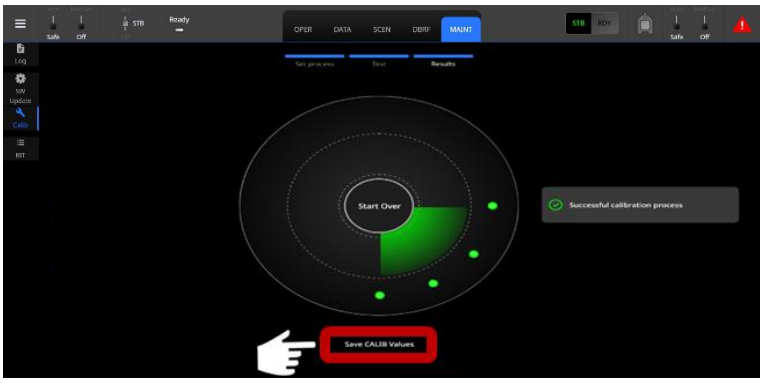
Action	Additional Information	Figure
	Active quarters appear in blue.	
Enter the measured range from the transponder to the turret reference point. Press “Approve”.	This step is applicable for both Full and Partial calibration.	
Traverse the turret to aim at the transponder. Click “Confirm” to start calibration.		

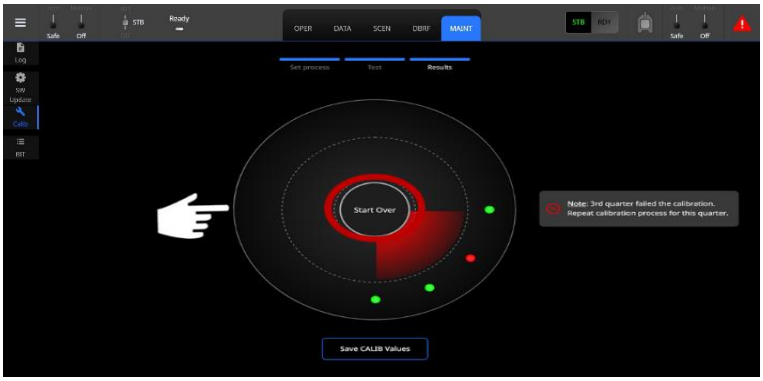
Action	Additional Information	Figure
When ready to start the calibration process, press “Next”.		
Traverse the turret to the angle indicated in red, until the indicated angle turns green and shows “00”. Click “Confirm” when the turret reaches the required angle.		
On the IFCP, set the system switch to RDY.	The system switch indicator in the technician’s computer will switch to “RDY”.	

Action	Additional Information	Figure
The system is ready to start scanning. Press “Confirm” to start the process.	Note: a circle around the calibration point indicates that this point is common for both launchers.	
The IR camera will scan the area and identify the IR radiating source. If the camera locates the transponder, the system will send the launcher to the identified location, and “Confirm” will become enabled (next slide).	The camera video can be observed on the computer connected to the CSB.	
If the camera locates the transponder, “Confirm” will become enabled—press it to proceed. If not, “Confirm” will be greyed out, and Rescan will appear.		

Action	Additional Information	Figure
Press Rescan. Press Rescan. After three unsuccessful rescans, select “Cancel” to check the system.		
The system launcher moves to the transponder. Use the up/down and left/right arrows to adjust the crosshair alignment until it is centered on the transponder while observing the video feed.		
Verify that the launcher is correctly aligned on the CSB-connected computer.		

Action	Additional Information	Figure
If the launcher is correctly aligned, press “Confirm”.		
Click “Next” to advance to the next calibration point.		
The next calibration point is marked in blue.	Repeat the above steps for each calibration point.	

Action	Additional Information	Figure
After proceeding through all calibration points, set the system switch to “STBY” on the IFCP.		
Click “Finish” to view the calibration results.		
If the calibration process is successful, click on “Save CALIB Values”.	The green calibration points indicate successful calibration.	

Action	Additional Information	Figure
If the calibration process fails, click on “Start Over” and repeat the calibration process for that quarter.	Red calibration points indicate a failed calibration, which may result from issues such as CSB and sensor misalignment or an LRU failure. The calibration process will be considered unsuccessful if any single calibration point fails.	

1.4.3 CONFIRM CALIBRATION RESULTS

Table 1-18 : Confirm Calibration Results

Step	Action
1.	Restart the system, and reboot to Ready mode .
1.	Via SeeU connect to one of the OPS and choose an object that can be seen clearly as a target.
2.	Get the target’s parameters (Az and El) from the SeeU.
3.	Open the technician’s computer.
4.	Change the technician's computer’s mode to“ MAINT.”
5.	On the left menu, click on “CALIB”.
6.	Select the calibration process – calibration verification.
7.	Select the calibration type – Full or partial.

Step	Action
8.	Set RADARs – off and enter the measured range of the transponder.
9.	Click confirm.
10.	Follow the on-screen instructions.

1.5 OPERABILITY CHECKS

1.5.1 BUILT-IN TEST

The IFLD has several Built-In-Test (BIT) modes designed to allow the system operator to detect and isolate system or subsystem faults.

The system's BIT monitors the system continuously while the system is in operation and detects and isolates failures that may lead to loss of system functions.

Exceptions are made for failure modes and damages that are obvious and easily localized by visual inspection.

BIT examines the system to the LRU level.

Power-Up Bit (PBIT):

- This test is performed automatically after system power-up and before entering normal operation (READY SAFE).
- Every detectable part of the system will be tested to indicate the readiness of the system.
- A system failure is indicated by the Critical Failure LED on the IFCP blinking red.
- If the system is OK – the critical failure LED is steady green.
- The main purpose is to alert the operator if a fault is detected.

Continuous BIT (CBIT):

- This test runs automatically as a background monitoring test during system operation, without affecting the system's functions and operations.
- The main purpose is to alert the operator if a fault is detected.
- During the process, the BIT updates the status on the BIT page of the technician's computer display.
- The BIT is informative, to assist the operator to perform off-line BIT effectively.
- The BIT tests the system up to LRU level.

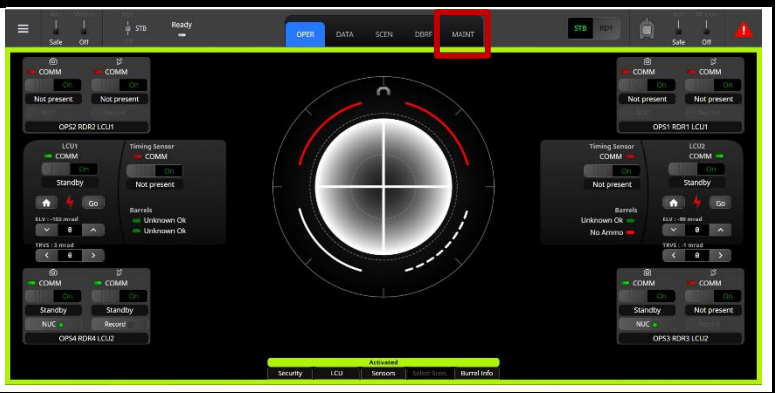
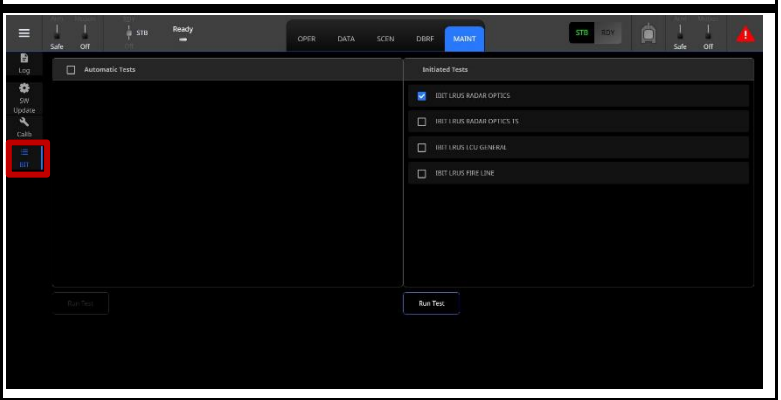
Initiated BIT (IBIT):

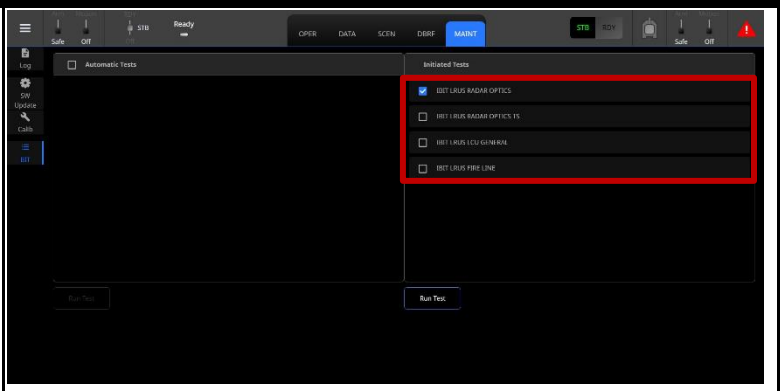
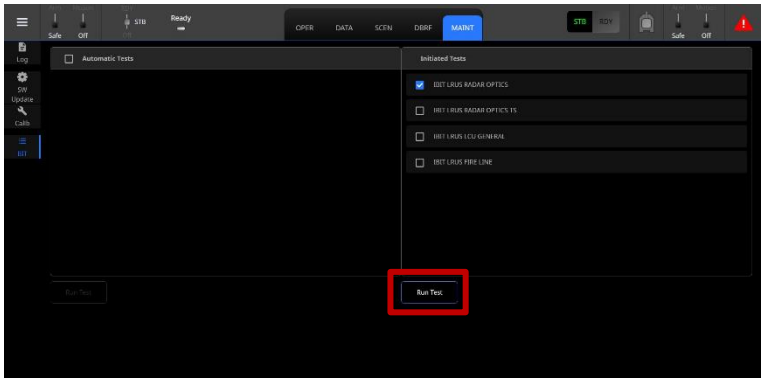
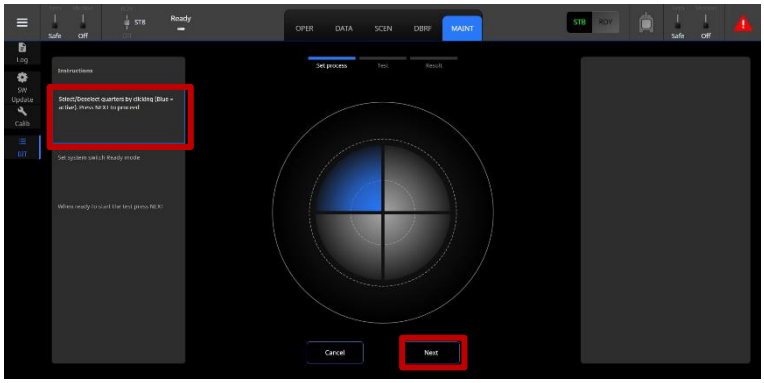
- This test must be performed manually once a week. For IBIT instructions refer to 1.5.2.
- The IBIT performs a quick system performance check. Every detectable part of the system is tested to indicate the readiness of the system.

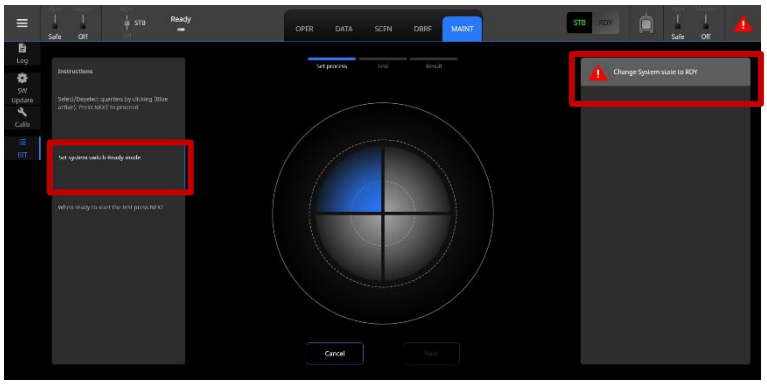
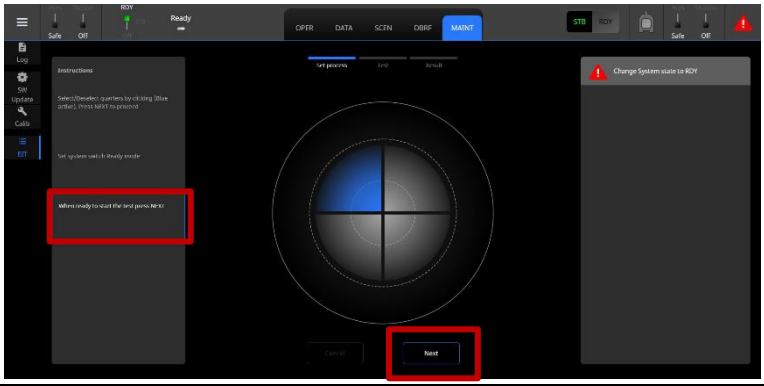
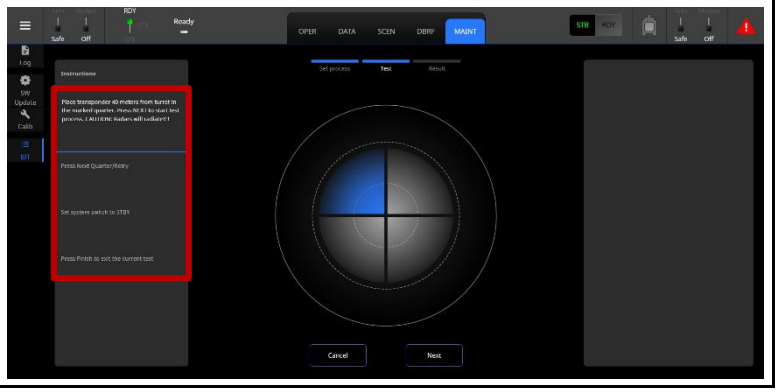
- This is evoked by an external system request initiated by the operator or maintenance crew when the Technician's Computer is connected to the system. This test is more extensive than the start-up BIT.
- To initiate IBIT the system must be switched to Maintenance mode and IBIT selected.
- Maintenance mode is accessible only in STANDBY mode. If the system is armed, the operator will be prompted to switch to STANDBY.
- In case of failure, the Master Alert (triangle on the right top of the technician's computer operational screen) turns blue.
- Clicking on the triangle will display a list of failures (indicated by a failure number).

1.5.2 INITIATED BIT

Table 1-19 : Initiated BIT

Action	Additional Information	Figure
Change the technician's computer's mode to "MAINT".		
On the left menu, click on "BIT".		

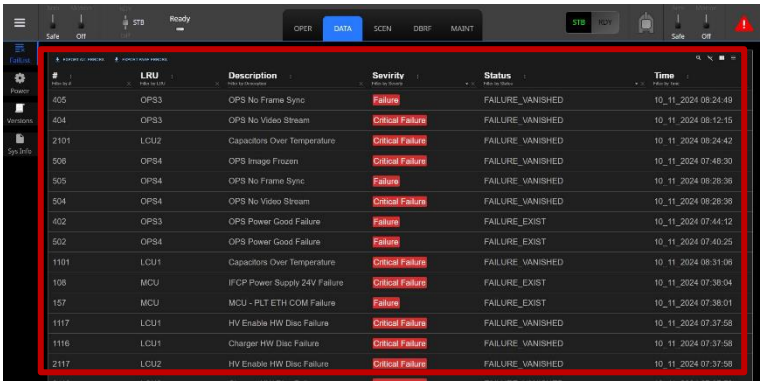
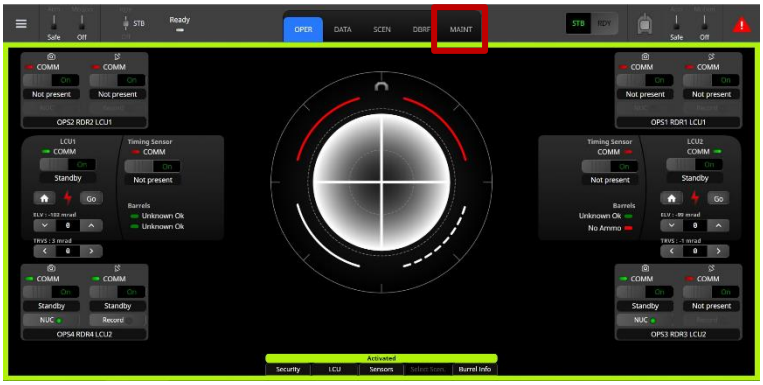
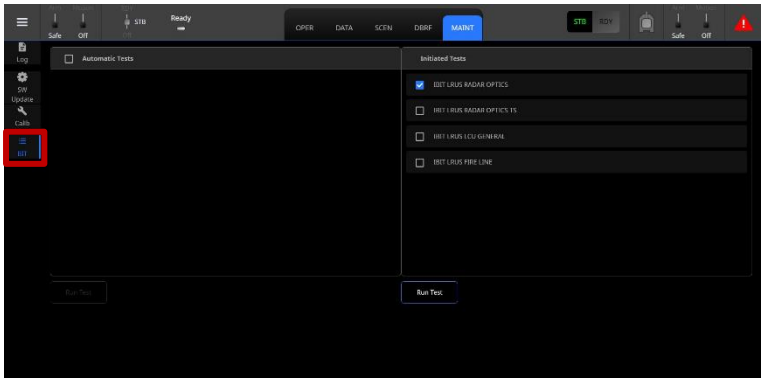
Action	Additional Information	Figure
Check the check box of the desired BIT to add it to the selected test queue.		
Click on “Start Test” to initiate the selected BIT.		
Select the desired quarters to test by clicking on the on-screen quarters. Press “Next”.	Blue – quarter is selected for testing Grey – quarter is not selected for testing	

Action	Additional Information	Figure
Set system State to RDY.		
Press “Next” to start the test.		
Follow the on-screen instructions. Press “Next” to proceed to the next step.		

1.5.3 FAILURE INVESTIGATION

Table 1-20 : Failure Investigation

Action	Additional Information	Figure
When the system discovers an error, the alert icon will turn red. Click on the icon to reveal more details.		
LRU that has errors will turn red.	Further information can be found under the fail list in the DATA screen.	
Change the technician's computer mode to "DATA".		

Action	Additional Information	Figure
On this screen, the failure description, severity, status and time will be shown.		
Change the technician's computer mode to "MAINT".		
On the left menu, click on "BIT". Follow the procedure detailed in section 1.5.2.		

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