Floormap®X

MFL Array Tank Floor Inspection Solution

Eddyfi Technologies

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1. General

Welcome! To ensure you remain safe during operation please refer to the precautions set out below, which must always be adhered to:

General Precautions

The following precautions **must always** be observed when using the FloormapX system. Please make sure that you review them **before** turning on the system.

- Keep this document in a safe place for future reference.
- Carefully follow the installation and operation procedures detailed herein.
- Respect all the safety warnings in this document.
- FloormapX system should only be used by trained operators.
- When transporting FloormapX, it is your responsibility to follow all safety precautions as dictated by the relevant local governing bodies.
- The equipment must not be used for purposes other than those intended. Eddyfi assumes no responsibility for any damage resulting from such improper usage.
- If you use the system in any manner that deviates from the ones specified by Eddyfi, the protection provided on the equipment may be rendered null and void.
- Do not use substitute parts or perform unauthorized modifications to the system.
- Service instructions, when applicable, are intended for trained service personnel only.
- Ensure by regular checks that the working site, equipment, and environments are kept in a clean and clearly arranged state.
- Rules and regulations regarding the prevention of accidents that apply to the working site should be observed.
- If the system does not operate normally please contact Eddyfi for assistance.
- Do not leave any FloormapX system unattended when not in use.

Safety Precautions

Observe the following safety precautions rigorously when using FloormapX.

WARNING

Pinch Hazards & Powerful Magnets

The FloormapX system utilizes powerful magnets and as such presents an inherent pinch/crush hazard. Care must always be taken when handling and using the FloormapX system. It is important to identify which states the FloormapX magnets are in.

- FloormapX magnets '**on (non-zero magnet indicator position)**': here the FloormapX **does** impart magnetism into the inspection surface and so is powerfully attracted to the inspection surface or any other ferrous surface or object.
- FloormapX magnets '**off (magnet indicator position at zero)**': here the FloormapX **does not** impart magnetism into the inspection surface and so is **not** attracted to the inspection surface. Note that there

will still be some low-level residual magnetism around the system in places that may attract small ferromagnetic items.

Removal / Deployment

Due to the powerful magnets involved, care must be taken when using the FloormapX tank floor scanner as the system may exhibit a strong force and present a finger trap hazard. Care must always be taken when handling and using the FloormapX system including when operating the adjustable bridge. Ensure the magnets are switched off investigating the scanning head of the FloormapX system.

Handling / Carrying / Tank entry

When required to carry the FloormapX system, ensure the magnets situated in scanning head are set to the 'off' position. If moving the FloormapX over a long distance it is recommended to use the dedicated transport cases. Regarding tank entry it is recommended that during tank ingress and egress the FloormapX is broken down into its component modules. When entering and exiting the tank it is recommended that the FloormapX is contained within the transit cases.

Magnetic Attraction

Due to the strong magnetism involved, ferrous material near the FloormapX system will be attracted to the system. Loose tools and other small objects containing iron (or other ferromagnetic material) will be strongly attracted by the system and may cause injury as they move towards the poles. Always ensure to work in a clean area, carefully follow handling instructions and be vigilant.

Pacemakers or other medical devices

Powerful magnets may interfere with medical electronics such as pacemakers, defibrillators, or other internal and external medical devices. The interference can be severe and cause malfunctions. Individuals wearing such devices should not handle strong magnets. If any user has any type of electronic, mechanical, implanted, or external medical device, they should consult a physician and the manufacturer of the medical device to determine its susceptibility to static magnetic fields prior to using the FloormapX. All magnetic products should be kept at a safe distance from individuals with such devices.

Damage to magnetic media, electronics, and mechanical devices

Any form of credit card, security pass, computer or programmed equipment may be permanently affected if exposed to the powerful magnetic field of the unit.
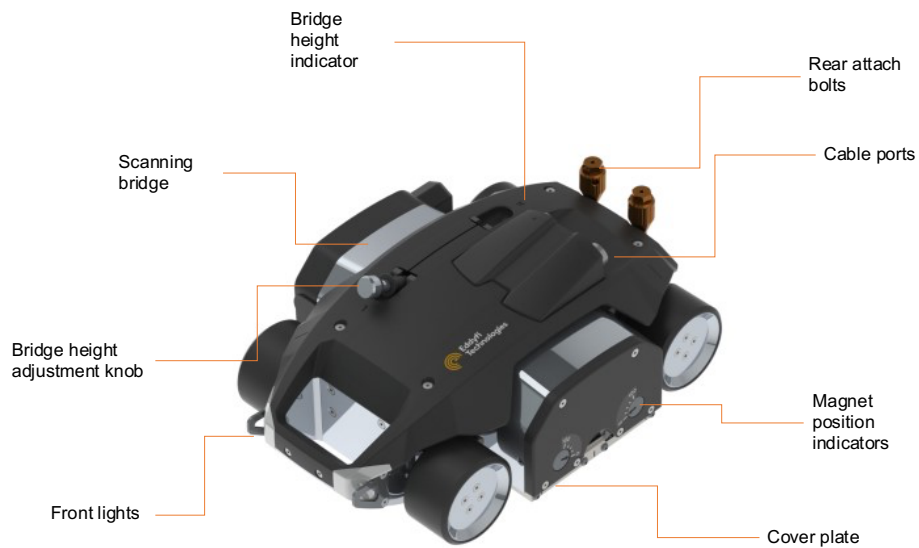
2. What's is in the Box

Scanning Head Box

- FloormapX scanning head.
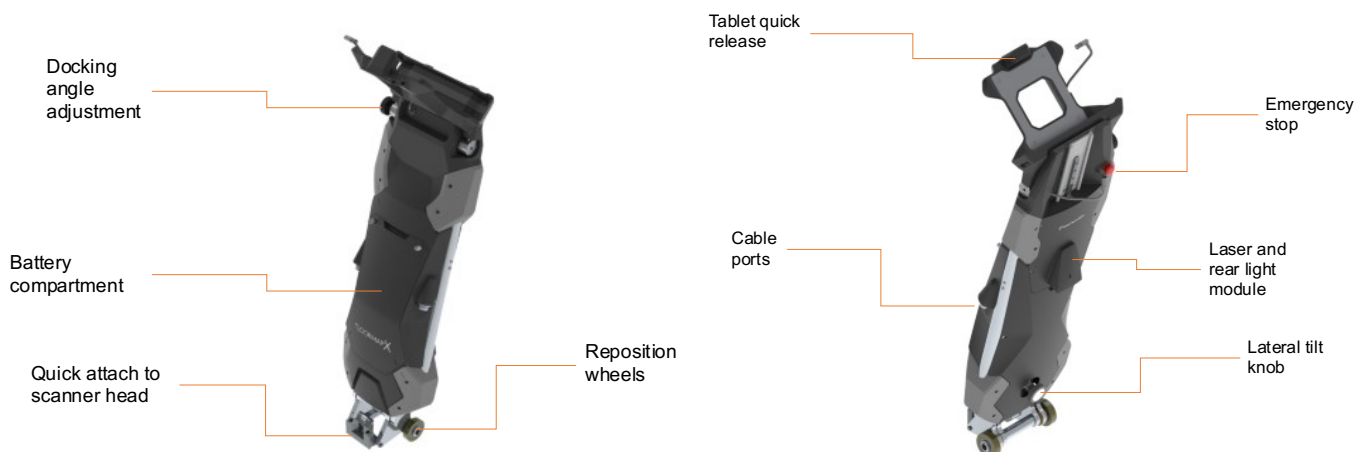- Documentation.

Main Chassis Box

- FloormapX Main Frame.
- FloormapX User Control.
- Cables – motorization and sensor probe cables.
- FloormapX Tablet with stylus and embedded SIMS GO acquisition software.
- FloormapX Tablet charger.
- 3 x NiMH Batteries and 2 x chargers.
- Documentation.
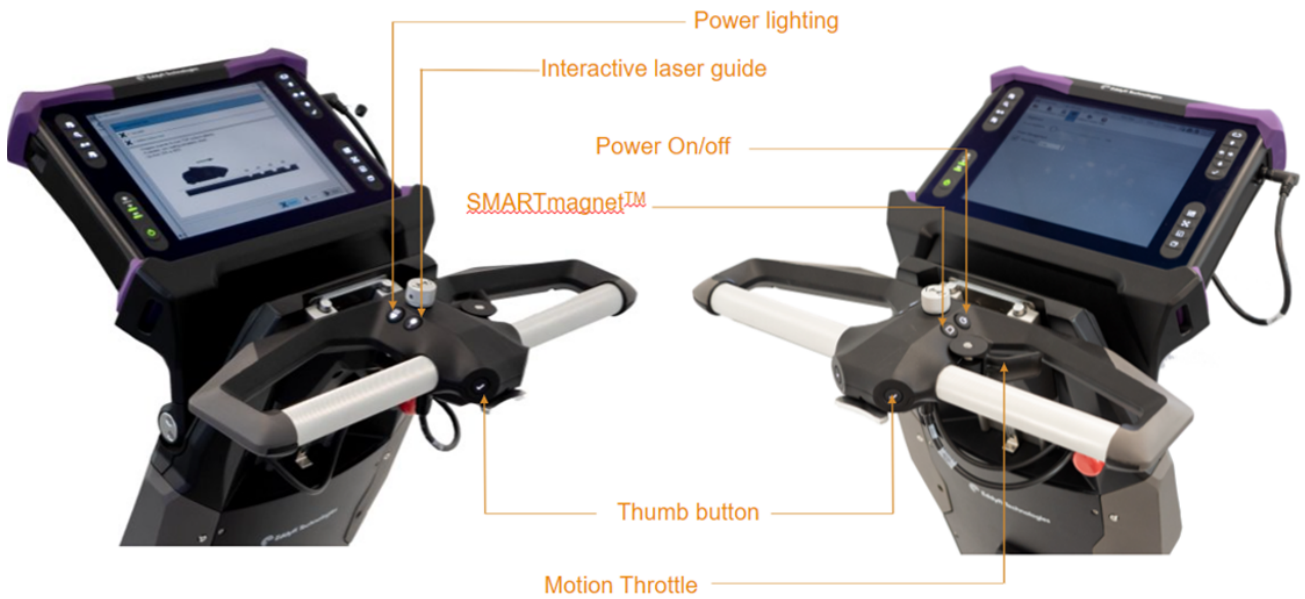
3. Component Overview

Scanning Head Overview

Bridge height indicator
Rear attach bolts
Scanning bridge
Cable ports
Bridge height adjustment knob
Front lights
Magnet position indicators
Cover plate

Main Frame Overview

Docking angle adjustment
Battery compartment
Quick attach to scanner head
Reposition wheels

Tablet quick release
Cable ports
Emergency stop
Laser and rear light module
Lateral tilt knob

User Control Overview

Below a close-up of the User Control is provided.

Power lighting
Interactive laser guide
Power On/off
SMARTmagnet™
Thumb button
Motion Throttle

Tablet Overview

The FloormapX tablet hard buttons can be used to simplify operation and increase efficiency.

Buttons Described Below
Change Keyboard Mode
Fine Tunning
Accept

Alarm Indicator
WiFi Indicator
Battery Indicator
Power

Buttons Described Below

In the table below see the button actions.

	Short press = open indication list Long press = open full indication list		Select active view
	Zoom and move to selected indication		Full extent
	Short press = reject selected indication Long press = accept selected indication		Empty – no function
	Add Indication		Change active view and cycle through STARS, MFLA and Sizing views

# Scanner Battery and Compartment

The scanner is battery powered and the SIMS GO software displays the icon for the battery level.

Battery Icon	Battery Status	Total Battery Charge
Flashing red battery	Empty	20% and lower
1 Red bar	Very Low	20% to 35%
2 Yellow bars	Low	36% to 51%
3 Green bars	Medium	52% to 67%
4 Green bars	High	68% to 84%
5 Green bars	Full	84% and higher
Charging icon	Charging	Charging

Battery locking cam

Battery (in active slot)

Idle battery slot

4. Assembling and Powering ON FloormapX

1. Remove the scanning head from the transit case and place on the ground.
2. Loosen the rear attach bolts on the rear of the scanner head and unscrew all the way, remove, and then replace so that they are supported by the spring-loaded bearing.
3. Attach the user control to the Main Frame and attach cable.
4. Remove the Main Frame from the transit case and place the wheels on the ground.
5. Engage the Main Frame rear attach mechanism into the scanner head rear attach mechanism. Press down on the rear attach bolts to engage them then screw down fully.
6. Attach the blue sensor cable and orange motorization cable.
7. Loosen the docking tilt adjustment knob then set the angle of the tablet to the desired position then dock the tablet and attach the connector.
8. Remove the battery front panel and install a battery into the right-hand active slot.
9. Power system on by pressing the tablet on button or the on button on the user control.
10. System is ready to use once the software has loaded and the system has completed its powering on sequence of flashing headlights.
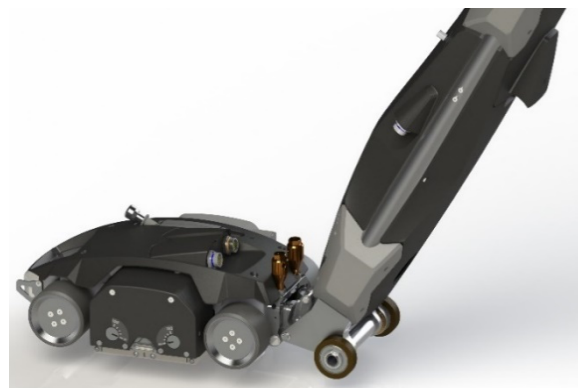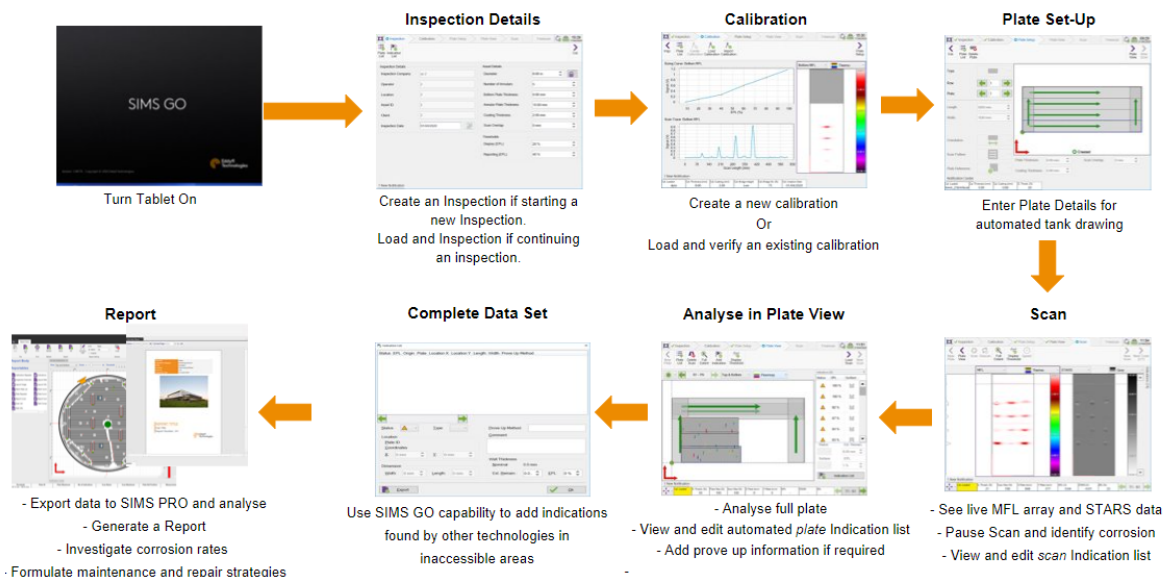
5. Typical Inspection Workflows

Depending upon the inspection workflow adopted and the inspection requirements the SIMS GO software can be adapted to meet your inspection needs. Below are suggested SIMS GO screening or mapping workflows.

Screening Inspection Workflow


Turn Tablet On

Inspection Details
Create an Inspection if starting a new Inspection.
Load and Inspection if continuing an inspection.

Calibration
Create a new calibration
Or
Load and verify an existing calibration

Freescan
- See live MFL array
- Pause Scan and identify corrosion

Report and Complete Data Set
Use SIMS GO Add Defect feature to create Indication List and Report.

Mapping Inspection Workflow

Turn Tablet On

Inspection Details
Create an Inspection if starting a new Inspection.
Load and Inspection if continuing an inspection.

Calibration
Create a new calibration
Or
Load and verify an existing calibration

Plate Set-Up
Enter Plate Details for automated tank drawing

Scan
- See live MFL array and STARS data
- Pause Scan and identify corrosion
- View and edit *scan* Indication list

Analyse in Plate View
- Analyse full plate
- View and edit automated *plate* Indication list
- Add prove up information if required
-

Complete Data Set
Use SIMS GO capability to add indications found by other technologies in inaccessible areas

Report
- Export data to SIMS PRO and analyse
- Generate a Report
- Investigate corrosion rates
- Formulate maintenance and repair strategies

6. SIMS GO Software Overview

Below we identify each of the major software screens encountered in the SIMS GO software

Inspection

Here the inspection and asset details are entered.
The asset details *Tank Diameter, Bottom Plate Thickness* and *Annular Plate thickness* are required as they aid you during the inspection.
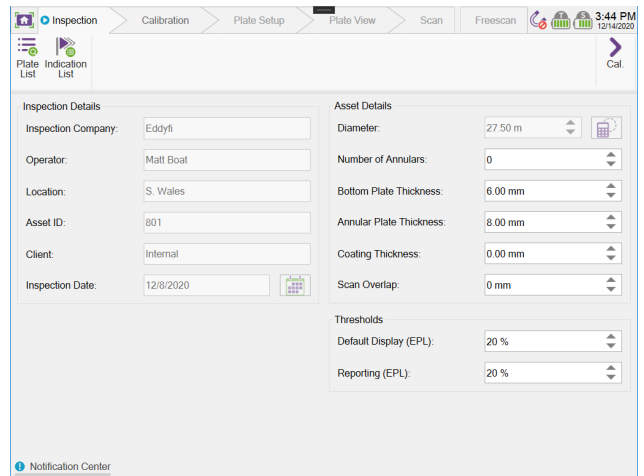

Calibration

Here calibrations can be *Create, Load,* or *Import* and the sizing curves and traces for a calibration can be viewed. When creating a new calibration, the software guides you through the process to ensure it is suitable for the inspection.

During an inspection it is recommended to verify all calibrations at regular intervals to ensure their validity. To verify a calibration, perform a *Freescan* across the reference plate and confirm the results.
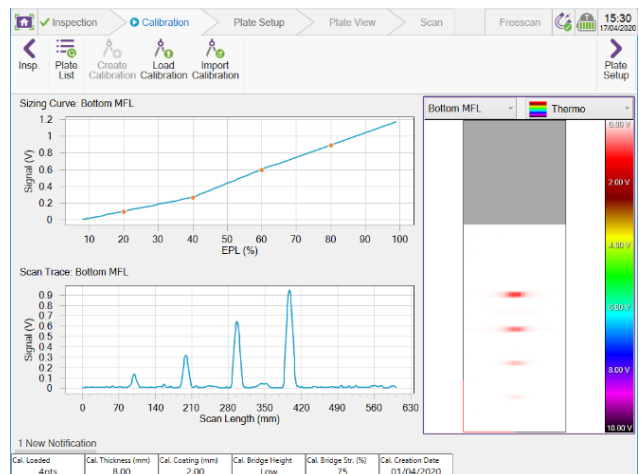
Plate Setup

Here you enter the information relating to the tank floor plate to be inspected. The information required includes:

- Plate Type
- Plate Number
- Plate Size and orientation
- Scan Pattern
- Plate Reference

Care must be taken when selecting the *plate reference* as this is the reference point for all data.
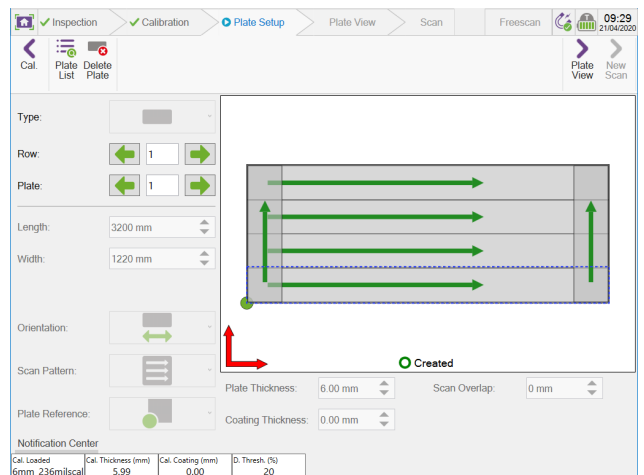
Plate View

Here you can analyse, edit, and verify the captured inspection data on the plate.

The indication list can be viewed and used to validate and edit any acquired data.

Any additional indications, found during the inspection, can also be included on the plate.

It is also possible to select tracks to view in the scan window.

Selected track and scan number
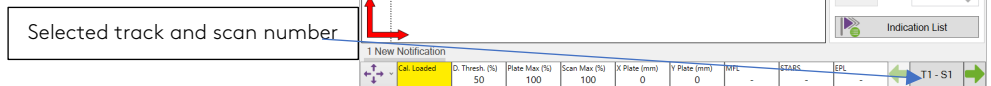
Scan

This represents the view of a scan seen during data acquisition. Whilst scanning, you see the raw MFL array data in the left-hand C-Scan and the raw STARS (top surface) data in the right-hand C-Scan. Also available on the far left-hand side is the *Endscan*. The *Endscan* provides a graphical response from the entire sensor head as the scan is performed.
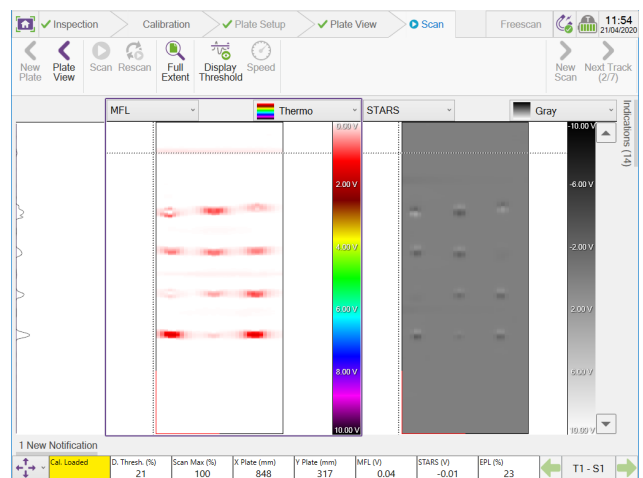
Freescan

Freescan represents a scan that can be performed in any direction and has no positional information on the tank floor. Free scans are perfect for:
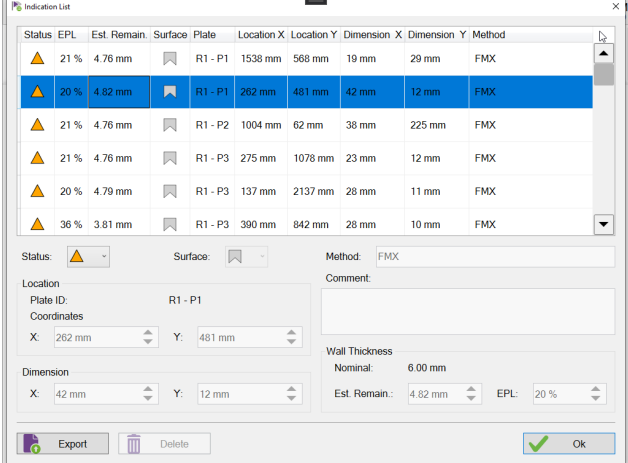
- Calibration verification.
- Investigating areas of interest during a mapping mode inspection, such as around an obstacle.
- Investigating areas at different bridge heights during a mapping mode inspection. Note the correct calibration for the bridge height must be loaded.

Any indications found using *Freescan* can be included in Plate View using the *Add Indication* feature.
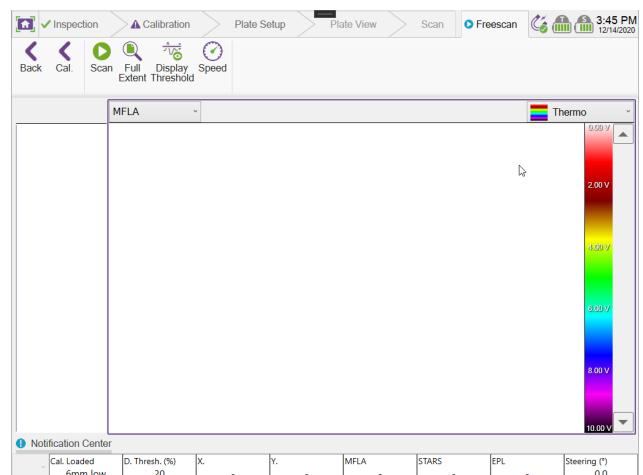
Indication List

The software automatically generates a full indication list of everything found in the inspection, identified per plate. This list can be exported from the software as a csv file. Any defect added via the *Add Indication* software feature are also included in this list. The list is editable, but no data is permanently deleted via the editing process.

Inspection Transfer

The inspection transfer window allows inspections to be export from the FloormapX system using an external USB drive.

The transfer window can be accessed from the SIMSGO backstage of the SIMSGO software and only accessible once the external USB drive is inserted into the FloormapX tablet.

Ensure there is sufficient space available on the external USB drive before data transfer.

The transferred inspection can be imported into the SIMSPRO software for report generation.

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