Eddyfi Magnifi® 5.0R4 Release Notes

Release date: August 5, 2022

*****Cloud-based licensing system*****

Magnifi 5.0 is now activated through a cloud-based licensing system.

For clients under a valid maintenance plan, access to version 5.0 is included. Simply type your current Magnifi key code in the *Manage License-> License code* field.

If you are not under a valid maintenance plan, please contact your Eddyfi Technologies sales representative.

This release note highlights the functionalities, improvements and fixes brought with Magnifi 5.0 (R3).

The 5.0R4 service release only fixes the following issue:

- License codes with less than nine characters could not be activated in desktop environment.

New Features and Improvements

Tubing Applications

- Artificial Intelligence (AI) package for ECT bobbin probes (BBST) version 1.0 with AI-based detection capabilities for tubesheet, support plates, and indications.
- *AI Wizard* guides the user to select the adequate AI detection package and the landmark detection settings based on the type of inspection and indication detection parameters. Upon completion, only the calibration of the signal in the Through-Wall Hole (THW) is required.
- *Grouping* tool allows grouping indications based on the channel, amplitude range, phase range, and location in the tube, based on user-defined settings. Results from conventional rule-based tools and AI automatic detection module can be used.
- *Acquisition* license restricted to setup and calibration for ECT, RFT, NFT, MFL, and IRIS probes. Includes full tube-length validation with DQV test using AI-ECT module 1.0. Reporting capabilities not included.

Generic

- Cloud-based licensing system.
- *Report entry keyboard shortcuts* speed up analysis by assigning desired shortcut to a specific defect type for a given channel, measuring method and sizing curve.

- *Logbook* feature allows locally storing data screening results, eliminating the need to reprocess screening on every data load, and enabling the use of the new data list sorting and filtering capabilities.
- *Sorting* data files in data list by name, date created, or by the number of potential indications detected with automatic detection.
- *Filtering* data files in data list by *Logbook* or *Report* entry:
    - File status: Planned or tagged
    - DQV result (if activated): No results, failed or passed
    - Journal (if activated): Not processed, no indication detected, with indications or for review
    - Report entries: Not analyzed, no defect, or with indications/features.
- *Logbook* and *Report* columns in the data list for users to review the associated information more easily.
- Dedicated Magnifi Help page via the user interface.
- Total number of data files displayed in inspection folder. Related number of data files displayed when a data file filter is applied.
- Ability to select behaviour for *Next / Previous Indication* button:
    - Detected (by automatic detection)
    - Reported
    - All indications.
- New indication visualization button in current view ribbon to select which indications display in the C-scans: detected, reported, or all.

Modifications to Existing Features

Tubing Applications

- Major overhaul of the *code view*: revisited UI, dedicated columns for types of indications, improved manual interactions, etc.
    - In the conventional Landmarks menu, *Suggest* button with common configuration parameters and option to activate/deactivate the detection now available.
- Large Acquisition Window can be resized smaller to take less space on the frontstage.

Surface Applications

- Updated Spyne setups:
    - Auto Next on Stop preference enabled
    - C-scan grid removed.
- Updated documentation for Sharck-HR and Spyne.

Generic

- The desktop Reddy data reader is now Magnifi CPN (Companion):
    - Replaces Magnifi R. Requires an active MAGNIFI-CPN license to run.
    - Magnifi CPN can read any data acquired with a Reddy. Previously, Magnifi R could only read Reddy data acquired under a valid maintenance plan (non-expired). This restriction has been removed with Magnifi CPN.
- Acquisition automatically stops when reaching the defined scan size in the Wizard or maximum size, preventing acquisition of too large of data files and overwriting the start of the scan.
- Rotation button of the Lissajous always displays the manual rotation.
- The DQV results are now refreshed automatically on all events: stop acquisition, load file, batch screening of files, or modification to the DQV parameters.
- All analysis content of the logbook and report are cleared from a data file when it is re-scanned or renamed.
- Selecting an indication only resizes the mini cursors (when enabled).
- Completely revamped notification centre is now located in top-right corner with new messages.
- Several modifications to the ribbons, including the following:
    - New *SMART Setup* ribbon regrouping configuration menus for both conventional and AI-based tools such as *Landmarks*, *Regions*, *Indications*, *DQV*, etc. All tools included in this ribbon are compatible with setups made with both the *Wizard* and the *Advanced* menus.
    - *Auto-Calibration* button renamed *Calibration Shortcuts.*
    - *Process Files* buttons that were available for Assisted Analysis are changed to *Screening Files* and moved to the *Analysis* ribbon.
    - *Add Note* button renamed *Add Message* to distinguish from the *Note* tab feature.
- Major modifications to the *Data List* tab, including the following:
    - Refreshed user interface to make it clearer and easier to use.
    - Improved behaviours and data selection when navigating through the data using the *Next* / *Previous* and *Auto Next on Stop* actions.
    - File delete button gives option to delete data file or clear: Logbook DQV, Logbook Detection, Notes, Report entries, or All.
    - Acquisition Preferences button has been removed from the frontstage and is now located in the backstage.
    - *Large Acquisition Window* button moved from *Data list* to the *Layout* ribbon
- Information shown in the DQV, Indications, and Notes tabs come from the loaded data instead of the selected data in the Data List tab.
- Screening tab renamed Indications tab with minor modifications to the UI.
- Specific indication code used displayed in the Lissajous when an indication is added to the report.
- Visibility improved in the Magnifi title bar.
- Detected and reported indications in the C-scans now have different colours and can be customized.

- Show C-scan Palette button moved from the header of the view to the current view ribbon.

Dropped Features

Tubing Applications

- RFT auto-normalization.

Generic

- Preference set to keep re-scanned files by default. To delete re-scanned files, the filter and delete options from the Data List tab can be used.
- Information and Documentation tabs removed from frontstage.
- Next / Previous Segments buttons.
- Specific buttons in the Analysis ribbon: Completion, Insert, Export, Display Profile.

Resolved Issues

Tubing Applications

- Resolved an issue preventing MFL tubing probes from nulling.
- Fixed glitches and problems with resizing the 2D C-scan cursor when fully open on the circumferential axis.
- Acquisition (ACQ) license resolves license issue with the Ectane 2 I (Iris only) model.
- Magnifi no longer crashes when Iris scan size is set too large.
- Iris A-scan updated after changing the turbine size in the Probe step of the Wizard.
- "Load File" and "Acquire" buttons no longer glitch and slow down the software when navigating between data files if TubePro Integration option is enabled.
- Corrected issues with the next data selection when using the Manual Sequence.
- Large Acquisition Window now always shows the right file name.
- Code view scrolling and scaling coherent with other views.
- With an RFT setup, the Calibration step of the Wizard no longer loses values.

Surface Applications

- Fixed several issues with Surface MFL (PipescanHD probes) setups:
    - C-scan Palette controls stay enabled after each data load or acquisition.
    - Green background of the strip chart view now displayed accurately.
- Custom Calculated Infofields no longer transmitted to the next setup loaded.

Generic

- Memory leak issues resolved.
- Report tab no longer collapses too quickly.
- 3D C-scan view:
    - Fixed memory leaks and crashes with large data files.
    - Effects of the 2D C-scan subtraction cursor now visible on the 3D C-scan views.
- Smooth resizing of the cursor in strip chart even when zoomed in.
- Smooth data scrolling with the mini strip charts under the Lissajous even when zoomed in.
- Automatic comments associated with indication codes now added to the report.
- Several display issues with the Data List tab now fixed:
    - Items always appended and located correctly under the parent item.
    - Setup Mode watermark position and size.
    - Adding files using the Free Format naming format now increments correctly.
- Tag for Review button now works for all the data files that have the same naming format as the one used for the current inspection sub-folder.
- Re-scan button now always functional.
- Resolved some crashes or freezes that could happen with the following operations:
    - Disabling the real-time processing with the median filter.
    - Cancelling modifications in the Data Processing window.
    - Manual edition of the alarm zones in the Lissajous views.
- Detected indication boxes in 2D C-scan remain displayed after accessing the Wizard without applying modification.
- Recording can be stopped when DQV is enabled.
- Previous / Next Indication buttons can be clicked faster.
- Swap orientation option supported when loading legacy data files (.dat).
- Fixed errors happening when closing Magnifi R.

Known Issues, Limitations, and Restrictions

Tubing Applications

- Some types of manual operations to the AI landmarks are not fully supported.
- Logbook can't be enabled when setup is configured with the legacy landmark detection engine.
- Logbook column indicates that 0 indication was detected when the AI landmark detection engine has not been calibrated.

Generic

- Data List naming format always returns to Free Format when loading an inspection sub-folder.
- Some files from the Documentation section of the backstage have not been updated.
- The unit of some fields has changed from samples (smpl) to counts (cnt).

- Magnifi can take a few seconds to close.
- Buttons in the Manage License window can take a few seconds before being available.
- Some minor visual issues when opening Magnifi by double-clicking on .magsetup or .magdata files directly from Windows.

AI-ECT module 1.0 for ECT Bobbin Release Notes

Data Requirements

Setup configuration and parameters:

- Technique: ECT.
- Probe model: bobbin.
  - Eddyfi ECT-BBST probes
  - 3rd party manufacturer not validated.
- Channels: both Absolute and Differential channel must be used.
- Four (4) frequencies, with the following specific ratios:
  - F1 = F2 x 2
  - F2 = F_{90}, the frequency which provides 90° separation between near side and far side
  - F3 = F2 / 2
  - F4 between F2 / 4 and F2 / 16.
- Instrument channel names must be similar to the default configuration (ex: R_ABS-F1, …).
- Magnifi 3.X and 4.X data files are compatible if above requirements are fulfilled.

Current development database content

- Eddyfi ECT-BBST bobbin probes.
- Type of heat exchanger inspected:
  - Straight through bundles with open end
  - Straight bundles with partial restriction on opposite tubesheet
  - U-bend bundles, *one-leg* (inspection with a rigid probe).
- Types of tubes:
  - Plain tubes.
- Non-ferromagnetic tube materials: Admiralty Brass, Aluminum Brass, CuNi 70-30, CuNi 90-10, Inconel 825, SA-213-316L, SA-249-304L, SA-249-316L, SA-249-317L, SA-359-443, SS304, SS304L, SS309, SS316, SS321, SMO254, SB163, SB167, and Titanium.
- Tube OD:
  - Most common diameters: 19.05 mm (0.75 in); 25.4 mm (1.0 in)
  - All: 9.53 mm (0.4 in) to 50.8 mm (2 in);

- Tube wall thickness:
  - Most common: 1.25 mm (0.050 in) and 1.65 mm (0.065 in)
  - All: 0.5 mm (0.020 in) to 3.22 mm (0.127 in)
- Tube lengths: 2 m (6.6 ft) to 18 m (59 ft).
- Sampling density: 2 samples/mm to 4 samples/mm.
- Total number of individually tagged indications: 13,502.
  - Tagged indications are determined to be a relevant indication based on the ASME code definition, but are not all significant enough to be reported.

Detection capabilities and improvements

Landmarks

- Detection of Tubesheet In & Out (TSI & TSO).
- Detection of Support Plates (SP)
  - Not required to know exact or approximate quantity of support plates in bundle.
- In calibration tube, detection of air before (AIRI) and after (AIRO) the tube is supported.
- For data files that include data while the probe is pushed down the tube, landmarks are automatically removed in that region and kept when the probe is pulled back.

Indications

- Generic detection of potential indication, not specific to a certain type.
- Detection is performed in the free span region only, no overcalls on noise outside the tube.

Limitations and Restrictions

- ECT-BBFS saturation, ECT-BBST flexible, DefHi, and ECT-BBAC air conditioning probes are not supported.
- Tubes with external fins, ID and/ OD mechanically enhanced tubes.
- Indications under support plates and tubesheets are not detected.
- Indications with length greater than 1,000 pixels are not detected. For a typical sampling rate of 2 samples/mm, this represents a length of approximately 50 cm (19.7 in)

Minimum System Requirements for Magnifi 5.0R3 and AI-ECT 1.0

- Processor: Core i5 (or equivalent).
- Operating systems:
  - Edition: Windows® 8.1 and Windows 10 version 1607 (Anniversary Update)
  - System type: 64-bit operating system
  - Note: The software is tested and optimized for most major language packs available on the Windows suite.
- Memory: 8 GB.
- Graphics card: GPU with DirectX 11 support.
- Disk space: 20 GB.
- Network: Built-in network card.
- Display:
  - Screen size: 13 in
  - Resolution: 1366 × 768 pixels
  - Display scale: 100% (Windows preferences setting).
- Administrator rights: User must have local administrator permissions on the computer to install and use Magnifi.

Recommended System Requirements

- Processor: Core i7 (or equivalent).
- Operating systems:
  - Edition: Windows 10 (latest version)
  - System type: 64-bit operating system
  - Note: The software is tested and optimized for most major language packs available on the Windows suite.
- Memory: 16 GB.
- Graphics card: Dedicated GPU with DirectX 11 support.
- Disk space: 100 GB.
- Network: Built-in network card.
- Display:
  - Screen size: 15 in
  - Resolution: 1920 x 1080 pixels
  - External monitor: 22 in or larger, with a minimum resolution of 1920 × 1080 pixels (for extensive analysis purposes)
  - Display scale: 100% (Windows preferences setting).

- Administrator rights: User must have Administrator permissions on the computer to install and use Magnifi.

Firmware

Included in this release of Magnifi is the following package:

Eddyfi Ectane® 2

- Version: 2.1R7 (update the firmware on first connection to the Ectane 2).

Ectane

- Version: 1.8R5.1 (same version as for Magnifi 3.5R15).