MES 7.2 (06/07/2020)

New features

- Advanced PhotoStim GUI
  - Several channels can be handled simultaneously
  - Photostimulation and scanning can be performed alternately with the frequency of a fixed pattern
  - Total time can be set (it adjusts Frequency and last value of Time automatically)
  - Settings are saved to Protocol and are loaded when opening GUI
  - Stimulation can be synchronized to the beginning of a frame
  - the value of laser amplitude and time difference in protocol will be automatically adjusted when changing their values (without regereration of protocol)
- Reset button for protocol channels
- Pattern Copy/Paste buttons in Special scan mode
- Automatic adjustment of PMT gating signal (length of automatic restart can be set in configuration)

Bugfixes

- Image background pool bugfix
- Correction of limits of LUT in case of Capture
- Scan sync signal bugfixes

Known issues

- Measurements made with MES 7.2 cannot be opened on previous versions (but all older measurements can be opened in 7.2)
- electrophysiology module is not working
- FixWithStage is not working for rotated viewports (warns about it)
- Maximal field of view in the Hi-speed raster scan mode can be achieved with a nontrivial combination of Rotation XY and FastZ values.
- Matlab R2019a-R2020a is only partially tested

MES 7.1

New features

- Warning signal when PMT signal level is too high
- Direction of gamma Euler angle is reversed to match the convention used for alpha and beta
- Suggested optimal alpha and FastZ values are displayed in the Info panel
- Special/Line scan patterns can be dragged with Shift + Click

- High-speed AO recording can be used in the MetaProtocol
- Warning when PMT signal is too high
- SocketModule support
- UncageMapping support
- Loading settings of saved measurements improved - Load/Load multiple settings window
- Maximum length of LineMagic line is set to 300 µm

User experience

- Global cursor is displayed on FOV Visualization window as well
- SampleStage button on Focusing panel
- Improved position loading functionality
- Improved TIFF export with metadata.txt
- During measurements GUI elements that have no effect are disabled
- Limits of AO Z is a function of the objective calibration

Stability

- improved stability with main electric and peripheral electric system (increased stability during HW state setting and MetaProtocol runs)
- improved stability of camera

Bugfixes

- Direction of gamma Euler angle is reversed to match the convention used for alpha and beta
- TIFF export bugfixes and significant speedup, export process can be cancelled
- FoldedFrame Export movie bugfix
- Kombiplexer-related timer handling bugfixes - increased stability during HW state setting and MetaProtocol runs
- Background pool bugfixes
- Protocol saving issue with 'image' type channel
- Line scan Rectangle selection bugfix
- SampleStage also prompts for confirmation of large movements
- Z-stack viewer Stack movie bugfix
- Image statistics and histogram bugfixes
- Cell3DFinder subselect feature bugfix
- Special/Line scan pattern selection works only on image area
- Raster scan Record mode bugfixes (record time)
- Opening the PDF manual is not blocking the GUI
- Blinking issue of live window
- LUT is available at the first start of Live imaging in Live window

Known issues

- Measurements made with MES 7.1 cannot be opened on previous versions (but all older measurements can be opened in 7.1)

- electrophysiology module is not working
- FixWithStage is not working for rotated viewports (warns about it)
- Maximal field of view in the Hi-speed raster scan mode can be achieved with a nontrivial combination of Rotation XY and FastZ values.
- Matlab R2019a-R2020a is only partially tested

MES 7.0

New features

- High-speed scanning at 40Hz at a resolution of 510×510 pixels on a FOV of 500×500 µm
- Imaging plane can be rotated with AO technique without any physical constraint according to all three Euler angles
- Scanning plane can be extended to a volume as an alternative of Bessel beam technology
- With special scanning modes the activity of a cell and its dendrites can be followed in 3D (multiline, ribbon, snake, chessboard and cube scanning) fitting the drifting direction according to the actual viewport axes
- Acousto-optical drift scanning with special surface and volume elements can be used for reducing motion artefacts (3D Anti-Motion technology)
- Photostimulation enhancements
- Automatic cell detection
- A set of measurement parameters (e.g. rotation and translation of imaging plane) can be changed during measurement

User experience

- Improved visualization for Z-stacks and rotated planes in Raster Scan mode
- Display average on High Speed Frame Scan, Volume Scan and Special Scan modes
- Simplified GUI for Z-stacks

Stability

- Femtonics Log Collection System for preventing and diagnosing issues

Compatibility

- This software branch supports Femtonics galvo systems no longer

(MES 6.4 and 6.3 releases support only galvo systems)

MES 6.2

New features:

- Controlling motorized tilting objective

    - Redesigned Focusing GUI with controls for Femtonics X/Y stage and motorized tilting objective unit
    - A visual guide can be opened from the Focusing panel to help better understand the available handwheel modes
    - New Virtual mode for focusing and navigating with a tilted objective
    - More detailed movement range limiting allowing for a wider tilting range
- Photostimulation
    - Usage of several patterns at AO special scanning modes to perform photostimulation
- The Behaviour importer module now handles velocity data (.vlg files) recorded with Femtonics Gramophone devices
- CurveGenerator window to insert user specified curves to selected channels in protocol window
- Electrophysiology measurement can be performed in camera mode without scanning

New analysis features:

- Improved and faster motion correction algorithm for Femto3D AcoustoOptic microscopes' chessboard scanned measurement units
    - With more intuitive parameter set
    - Units can be transformed to the same reference image
    - Motion correction batch process can be called from command line as well
    - Offset curves in X and Y direction are saved into .mat files
    - See also Translational Motion correction batch

User experience:

- 3D visualization and navigation
    - Simplified GUI and new visualization mode for Femto3D AcoustoOptic (AO), and Piezo objective positioner specific 3D scanning features in the cases of Femto2D and FemtoSmart systems
    - Navigation commands (step left/right/up/down/Z-up/Z-down, zoom in, zoom out, fixed and free zoom) work in reference of the actual viewport, even in rotated cases
    - Protocol editor shortcuts for setting the most relevant parameters
    - Rotation controls moved to Navigation panel
    - In case of rotated planes, the (0,0) coordinates are shown at the center of FOV
    - Fast Z-stack gives a warning if the selected values are not reachable with the AO focus or piezo
- Improved features in Folded Frame viewer
    - The borders of Folded Frame fields can be made visible in the viewer window of the measurement unit
    - The borders of user selected ROIs (i.e. which pixels belong to the selection) can now be visualized
    - The recalculation of curves from user selected ROIs can now be turned off with the checkbox above the graph
    - Advanced ROI selection and adjustment in FF viewer (ROIs can now be adjusted on a one-by-one basis)

- Z-stack mode chooser in synchrony with handwheel modes
- Warning 1 week before license expiry
- Line scan: warns when less than 4 pixels are selected (to avoid kpm2 error)
- Redesigned InfoView window
- The 4D scan settings panel cannot be closed when 4D scanning is enabled
- Settings menu items
    - the different settings will no longer be saved with a separate menu item
    - the windows that are closed with Save button will save the settings immediately (or close the application)

Stability:

- Improved stability for camera handling
- KGOLE object ungrouping image quality loss fixed

MES 6.1

New features:

- Sine pattern generator for the protocol editor window (open source)

User experience:

- Resolved flickering bug during Live scan

Stability:

- Reduced distortions in full field scanning
- Bugfix at protocol input synchrony field
- Support for recent PES firmware version

MES 6.0

New features:

- Improved translational motion correction
- Batch process for translational & non-rigid motion correction module
- Binning option in camera control
- Configurable PMT warm-up time
- Improved 4D scan window in rollercoaster module
- Simplified control for 3D anti-motion scanning modes
- Speed mode button for AO raster scan and Z-stack
- Application for automatic sender of log and setting files (troubleshooting)
- Improved Look Up Table GUI with support of full numeric pad shortcuts and display names of colormap
- The last edited LUT channel is saved and next time it is automatically selected
- Auto button also sets the middle slider on LUT window

- GUI: separate views for simplified and full functionality
- Orthoslicer module functionality is integrated into the standard MES release

User experience:

- New 'Simplified view' switch affecting raster scan, Z-stack, Line scan and AO line scan
- Vertical PMT voltage sliders, PMT voltage sliders of unused PMTs are hidden
- Arbitrary names for Laser and PMT voltage sliders can be set in Service Tools
- Progress bar for longer calculations at curve analysis
- Optimized handwheel smoothness
- Save image (a.k.a. „Photo") button now moved to the Immediate window top left corner

Stability:

- Curve analysis window at partial filter
- Curve analysis window FWHM for negative peaks and spectrogram
- Importing .abf files
- Various bugfixes
- Support for MATLAB 2017b

MES 5.0

New features:

- Electrophysiology importer supports Intan RHD format
- Electrophysiology importer supports CNT format

User experience:

- Auto LUT for camera
- Improved protocol structure and GUI
- Multi ROI broken view for FoldedFrame measurements

Stability:

- New camera driver and interface
- Automatic packaging and sending debug data to Femtonics if requested
- Support for MATLAB 2015b

MES 4.6

New features:

- 4D scanning with rollercoaster
- DoCallback module: endless possibilities

- dGpR module: new R compensated dG/G calculation mode
- AO scanning: support for v5 AO driver cards
- Improvements to Cell3DFinder module: finding cells with nuclear exclusion
- Load arbitrary curves into protocol and use them for output generation during line scans
- Metaprotocol handles devices and can capture images and z-stacks at multiple positions
- Support to Sutter MP285 stages
- New module: bpodimporter imports signals from the BPOD behavioral control device.
- Support for tilting objective
- Intrinsic imaging and VisStim (visual stimulation) support
- Support for holographic stimulation
- Support for PClamp 10.6., ABF 2.03 and Windows 10 for Electrophysiology importer
- New module MCTeleClient performing MultiClamp700B telegraphing.

User experience:

- Global cursor helps identifying same locations on different images.
- FoldedFrame can draw more flexible regions: transverse direction is calculated per ROI.
- Improvement for software-controlled beam coupling adjustment (uncage upgrade - laserintapt module)
- AutoROI function on FoldedFrame (XYT) viewer window
- Point to line setting dialog: it is possible to configure multiple patterns to replicate
- Multiple Immediate windows supported: real time parallel display of multiple channels

Stability:

- Bidirectional scanning correction on the main GUI
- New device drivers for PES, LuigsNeumann and APT- increased stability

MES 4.5

New features:

- Support to export data to large HDF5 files
- Spectrogram calculation in curve analysis
- Form XYT measurement unit from time lapse images captured by metaprotocol
- Motion artefact correction function for galvo XY or XYZ images.
- Improved point management GUI: multiple separate point groups
- Improvements to PipetteManipulation module: supports hardware other than LuigsNeumann

User experience

- Curve analysis display preferences
- Bulk XYZ and XYT export to multiTIFF

- Adjuster GUI helps fine positioning selections in 3D
- Image statistics calculates histogram
- Convenient PMT enable button