

Release Notes 2022



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Introduction

Welcome to MIKE+ 2022.

In this Release Note, you will find information about new features of MIKE+, and what you need to know in order to install and get started with MIKE+ 2022.

MIKE+ is our new, flexible system for modelling and designing water distribution networks and collection systems for wastewater and storm water, as well as for modelling river networks and 2D surface flooding.

MIKE+ is offered in two versions:

- **MIKE+**
- **MIKE+ ArcGIS**

With MIKE+ you get:

- GIS-based model building and data management
- Powerful hydraulic simulation engine that supports parallel processing
- Integrated water quality, fire flow, real time control, flushing, multi-source tracing and hydraulic simulation (water distribution)
- Integrated water quality, control rules, LID and Soakway, rain dependent inflow and infiltration (collection system and river network)
- Long-term statistics (collection system)
- Integrated 2D hydraulic and water quality, dynamic interactions with collection system and river networks, surface flows visualisation (2D overland)
- Full undo and redo capability in all editors
- Thematic mapping and integrated result visualisation
- Open data models - easy integration with other applications
- Instant data checking and validation

With MIKE+ ArcGIS you get:

- Sophisticated GIS capabilities and smooth integration with ArcGIS Pro. MIKE+ embeds ArcGIS/ArcGIS Pro software for GIS-based model building, data management and result presentation.

System requirements

Operating systems

Fully supported Windows operating systems *	Windows 10 Pro, version 21H1 (64 bit) Windows Server 2016 Standard, version 1607 Windows Server 2019 Standard, version 1809
Non-supported but partially tested operating systems **	Windows 11 Pro, version 21H2 (64 bit) Windows Server 2022, version 21H2

* Fully supported operating systems are systems that have been tested in accordance with MIKE's Quality Assurance procedures and where warranty and software maintenance agreement conditions apply.

** Non-supported but partially tested operating systems are systems, which are not officially supported by the MIKE software products. These operating systems have only undergone very limited testing for the purpose of MIKE software, but the software and key features are likely to work. Installation of MIKE software on a non-supported operating system is done so at the user's own risk. The MIKE software warranty and software maintenance agreement conditions do not apply for unsupported operating systems and DHI is under no obligation to provide assistance or troubleshooting for cases where the software is being used on a non-supported operating system.

Please note that single user installations are not allowed on server operating systems. Also, when running a fully supported operating system as a 'guest operating system' on a virtualization platform, it is automatically downgraded to a non-supported operating system under the conditions provided above.

Minimum hardware/software requirements

Processor	compatible with x64 instruction set, 2.2 GHz or higher
Memory (RAM)	4 GB or higher *
Storage	64 GB or higher *
Display	resolution 1024 x 720 (High-Definition) or higher, 24-bit color (true color)
Graphics adapter	64 MB RAM (256 MB RAM or higher recommended), 32-bit true color **
Software requirements	Microsoft .NET Framework 4.7.2 or higher

* The actual required amount of memory and disk space depend on the usage (application, model setup, size of data files etc.)

** MIKE+ utilizing GPU for 2D overland simulations requires a Nvidia graphics card with compute capability 5.2 or higher. Please note that some of these graphics' cards have varying performance in single compared to double precision calculations. The GPU functionality is based on version 11.1.1 of the Nvidia® CUDA® Toolkit.

Installation

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To install MIKE+:

To install MIKE+, please go to the MIKE+ product folder and execute the setup.exe file either on the MIKE 2022 USB or from the downloaded, un-zipped installation files. Press the 'Install' button to begin installation.

The setup program will automatically install all necessary files and folders on your computer. Additionally, an entry is created in the Start Menu for MIKE+.

To install MIKE+ ArcGIS:

To install MIKE+, please go to the MIKE+ product folder and execute the setup.exe file either on the MIKE 2022 USB or from the downloaded, un-zipped installation files. Press the 'Install' button to begin installation.

The setup program will automatically install all necessary files and folders on your computer. Additionally, an entry is created in the Start Menu for MIKE+.

Please choose ArcGIS Pro's "ArcGISPro.msi" to install ArcGIS Pro separately. This version of MIKE+ comes with ArcGIS Pro 2.7. You find the installation of ArcGIS Pro in the folder "Prerequisites\ArcGIS Pro 2.7". Other versions of ArcGIS Pro might also work with MIKE+ but are not covered by warranty and software maintenance agreement conditions.

Optional installation of PostgreSQL/PostGIS:

Both MIKE+ and MIKE+ ArcGIS are installed with SQLite/Spatialite. If you wish to use the alternative database option, PostgreSQL/PostGIS then please install the two products found in the "Prerequisites\PostgreSQL 11.2" and "Prerequisites\PostGIS 2.5.1" folders. Before you install the two products, we recommend that you read the note describing how to install PostgreSQL/PostGIS - this is available [here](#).

License file and dongle

Please Note that when using the local or network license option, which require a license file and a dongle, then

- the DHI License Manager must be installed separately.
- all licensed applications included in MIKE 2022 require a 2022 version of the DHI License Manager.
- a new license file format (file extension dhilic2) has been introduced with MIKE 2022 and these license files can only be used together with a DHI License Manager 2022.

To use MIKE software in licensed mode, please refer to the DHI License Manager Release Notes ([License Manager Release Notes](#)).

Product invocation

Launch MIKE+ from the Windows Start menu.

Support

For general support, please refer to our [FAQ](#).

If you experience any difficulties, or if you have questions, please contact our Customer Care team by e-mail or phone:

Customer Care

DHI A/S
Agern Allé 5
DK-2970 Hørsholm
Denmark

mike@dhigroup.com

Tel: +45 4516 9333

You can also contact your local Customer Care team for support in your local language. You can find the list [here](#).

New features and fixed issues

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Release 2022

Every new release of MIKE+ consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find below short descriptions of the most significant news.

New features

Module/type	New feature
General	SWMM model networks can now be coupled to a 2D overland model. This is enabled by activating the 2D overland module in the 'Model type' editor in SWMM model setups. This will enable the definition of the 2D overland model as well as 1D-2D couplings. In this version, couplings to the 2D model are only available with nodes (no lateral coupling along banks for open channels), and coupling of water quality components is not supported.
General	Map data from MIKE+ can now be exported to CAD files (.dwg and .dxf formats), using the 'Import and export' tool. Check the documentation to get the available list of assignments for CAD files.
General	Longitudinal profile plots can now be exported to CAD files (.dwg format). This new option is accessed from the context menu of the profile plot.
General	From the 'Import and export' tool, it is now possible to import data from an Oracle spatial database.
General	Connecting to a WMS server to display background layers now allow connecting through a proxy server.
General	A new 'Measure' tool is available in the ribbon bar, in the Map tab. It allows measuring distances on the map along segments or polylines, as well as polygons' areas.
General	A new 'Export map' button has been added to the ribbon, in the 'Map' tab. It can be used to save the map layout to an image file.
General	The 'Import and export' tool can be executed from a command line, reading the import/export configuration from a configuration file. Please refer to the documentation to get more details about the command line's syntax.
General	A new 'Automap sections' button has been added to the 'Import and export' tool. When importing data from a MIKE+ project to another MIKE+ project, this button will create all sections corresponding to all relevant tables in the MIKE+ database for the active working mode (e.g. Water Distribution), and will populate them with the proper assignments. This button should therefore be used to merge two MIKE+ projects together. Note that if some duplicate names are found in the two projects, the imported record will be renamed, and other features referencing this name may have to be updated accordingly after the import. This may e.g. be the case for tables of materials, which may be used in the pipes definition to assign the roughness value.
General	In the 'Import and export' tool, a new job property called 'Source text format' has been added. This option applies when converting input strings (texts) to numbers, and controls how the decimal separator is identified.
General	A new function called DoubleFromString has been added to the Expression editor, to convert input string (text) data to numerical values and controlling the format of the decimal separator in the input text. It can e.g. be used in the 'Field calculator' or in the 'Import and export' tool.

General	The date and time of results shown in the 'Property and result explorer' view is now synchronised with the date and time of results shown on the map.
General	It is now possible to export simulation files and run simulations from a command line (without opening the user interface) also for Water Distribution and SWMM model types. All model types therefore support the command line execution.
General	The tool 'Clone and repair database', available in the File menu, may be used with damaged / corrupt databases. It will create a new database but without the damaged tables, which can then be populated again manually.
General	A default unit system can now be selected from the 'User preferences' dialog, to choose between SI and US unit systems. It will especially control in which unit system the results are shown, when no model database is opened.
General	In the 'Model and result report' tool, 'Joins' can now merge data from model tables and results in a common table of the report. A new 'Time step' option also allows adding a column to the join table, with results from a selected time step.
General	In 'Rivers, collection system and overland flows' mode, closing MIKE+ while a simulation is running will offer an option to continue the simulation outside of the MIKE+ application. This option can be used to release the license module of the user interface while running a simulation.
Collection System and Rivers	Raster layers with type 'GeoTIFF' and 'Arc/Info Binary Grid' can now be used as input DEM for use in the 'Catchment delineation' tool.
Collection System and Rivers	A new 'Statistics' content type can be selected for catchments and network result files. This type of result file stores maximum / minimum / average values and time of maximum / minimum value, as well as accumulated values for the relevant result items, computed throughout the simulation. These statistics are computed during the simulation and therefore don't depend on a storing frequency of the results.
Collection System	A new 'Results differences' tool is available in the 'Results' tab in the ribbon. This tool is designed for comparing results from different variants of hydraulic network simulations, and report any significant difference of result. This may e.g. be used when comparing results from a former version of a model and results from a new version updated with the latest information from an asset management system. The tool allows you to quickly identify locations where results differences are observed, and visualise and compare results at these locations. It is not necessary to have a model database opened for using the tool.
Collection System	An 'Initial level' can now be specified in the weirs' and orifices' properties, to control the elevation of structures controlled by control rules at the start of the simulation.
Rivers	Several new types of structures are now available for river networks: Pumps, Bridge structures, Dambreaks, Tabulated structures, and user-defined Energy losses.
Rivers	River models previously created with MIKE HYDRO River or MIKE 11 can now be imported automatically into MIKE+, from the File \ Import menu. Please note that the import is limited to the river functionalities currently supported in MIKE+ (mainly the rivers and catchments definitions as well as structures and boundary conditions), whereas some functionalities remain unsupported for now in MIKE+ and are ignored during the import (e.g. storages, multiple zones resistance and time-varying resistance factors, variables, side structures, etc.). Before importing a river model, make sure that all expected river functionalities are available in MIKE+, and check for possible warnings in the Log view after the import.
2D overland	Improved performance for 2D overland applications using GPU acceleration: <ul style="list-style-type: none"> • Tuning of timings and numerous small tweaks. • OpenMP parallelisation for pre-processing of infrastructure.

	<ul style="list-style-type: none"> • Pre-processing of boundary conditions (initialisation). • Optimised data transfer on 2D flood statistics results. <p>In addition, a new dynamic list approach is used together with optimised gradient calculation for forcing calculations.</p>
2D overland	A new check box called 'Allow for recalculation' has been added to the '1D-2D couplings' editor. The default behavior of couplings remains unchanged, i.e. the location of the coupling in the 2D domain is updated / recalculated whenever the coupled 1D element is changed (new node ID, modified river chainages, etc.). However, when this check box is unselected, the location in 2D domain will always remain unchanged, which is especially useful when this location has been customized.
2D overland	Coupling of Advection-Dispersion components is now possible also when coupling the 1D network to a MIKE 21 FM or MIKE 3 FM file.
SWMM	The 'Topology repair' tool is now also available for SWMM model networks.
Water Distribution	A new 'Optimization' special analysis has been added. It is used to optimize pumps and valves' behavior to meet e.g. a target water depth, pressure or flow in the network.
Water Distribution	A new 'Online analysis' special analysis has been added. It is used to map the model data from MIKE+ to a SCADA system's data, especially for use in Water Distribution Online.
Water Distribution	The 'Pipe criticality' special analysis has been renamed 'Network vulnerability', and now also reports criteria related to nodes.
Water Distribution	In interactive fire flow analyses, a new 'Free discharge hydrant' method has been added, which computes both hydrant discharge and residual pressure for a free discharge hydrant.
Water Distribution	Extra result items 'Tap pressure' and 'Demand allocations pressure' are now saved during simulations.
Water Distribution	Extra result items related to pumps are saved during simulations: efficiency, energy costs, and energy. These items are saved only when the simulation is performed using the EPANET 2.2 engine version.
MIKE 1D engine	Added static volume output to Pump Emergency Storage calculations (TT59012).

Fixed issues

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Module/type	Error/Inconvenience
General	User-defined columns were not exported, when a feature layer was exported to a shape file.
General	An unexpected error "Unable to open database file. x64 is True" was obtained when running a simulation from a MIKE+ project saved on a network location (other than the local machine).
General	Colors on extra result maps could be inconsistent with the defined color palette, when multiple result layers (from multiple result files) were added to the same map.
General	In the Profile plot properties, it was not allowed to apply negative values to control the minimum and maximum values along the right Y-axis.

General	An unexpected error sometimes occurred when loading the symbology for a shape file from a file.
General	RDI additional result items were not saved to result files.
General	An unexpected error about a non-existing source was provided in the 'Import and export' tool when trying to export a result layer to e.g. shape file.
General	When loading a .dfs0 time series in the list of result files, the "Time period to load" was ignored and the entire time series was always loaded.
General	Values imported from the 'Import and export' tool were wrongly altered in some cases, when the decimal separator in the source file was a comma.
General	Shape files exported from a model with a coordinate system with length unit in feet were defined with inconsistent coordinates and units.
General	Various errors preventing from showing background maps from some WMS servers have been corrected.
General	An error preventing from displaying a Google Map or Open Street Map background layer for some map projections, when the projection's false origin is defined exactly at the border of the valid region, has been fixed.
General	When exporting a feature layer to a shape file, the feature name was always appended as a suffix. It is now appended only when multiple shape files are exported for the same feature layer.
General	Flow tracing from results was wrong when the flow in the first pipe was smaller than the threshold value.
General	When activating the option 'Show columns in active tab' from the context menu of overview grids, several columns from the active tab were not shown.
General	An unexpected error occurred when using time series with a non-equidistant time axis, in the 'Plots and statistics' editor.
Collection System	In the Initial conditions editor, data in the table of local values were deleted when the set of initial conditions was renamed.
Collection System	Various improvements and corrections to the validation of data from the CS network and catchments have been made.
Collection System	Attributes 'Description' and 'AssetName' failed to import from MIKE URBAN classic, for the catchments table.
Collection System	The catchment's geometry on the map was incorrectly imported from MIKE URBAN classic when the catchment was defined with multiple polygons (e.g. when containing holes). Holes can now be imported. The biggest polygon is imported to define the catchment geometry in other (unsupported) cases.
Collection System	An unexpected error was sometimes obtained when computing the Distributed weights for grid distributed rainfall boundary conditions.
Collection System	Attributes 'NetTypeNo' and 'Element_S' were missing in the list of domains when applying the Field calculator in the 'Pipes and canals' editor.
Collection System	MIKE+ did not allow defining a boundary condition in a soakaway node.

Collection System	An unexpected error "Found non-noded intersection" was sometimes obtained when trying to merge catchments with the Network simplification tool.
Collection System	Wrong validation errors were reported in the Expression editor when using a sensor with type 'Action Active Time', because it was wrongly considering it as a double value.
Rivers	Rivers imported from shape files were always given a chainage length of 100 m, regardless of the actual length of the imported lines.
Rivers	An unexpected error occurred when exporting cross sections to shape file.
Rivers	From the 'Measurement stations' editor, using the arrow button to pick a river location from the map did not pick the chainage location along the river from the clicked location.
2D overland	MIKE+ did not provide the expected warning message when the generation of the mesh failed.
2D overland	The 'Apply' option for 2D boundary conditions was ignored, making the boundary conditions always active.
2D overland	Various errors occurring when importing a MIKE 21 and/or MIKE FLOOD file into MIKE+ have been fixed.
2D overland	Coordinates of the 2D domain's extent were wrongly converted between feet and meters during import from MIKE URBAN classic.
2D overland	Attributes from 2D overland editors could not be selected as target in the 'Interpolation and assignment' tool.
2D overland	The coupling tools 'Create couplings' and 'Edit location' were wrongly disabled when coupling the 2D overland module to a MIKE HYDRO River file.
2D overland	MIKE+ failed saving the 'Roughness value' and 'Infiltrated volume' result items in 2D result files when selected.
2D overland	It is now possible to filter the list in the '1D-2D couplings' editor by coupling type.
2D overland	When several 2D boundary conditions had the same code value (i.e. defining a discontinuous boundary condition), only the first part was displayed on the map.
2D overland	Simulations failed when including a 1D-2D coupling to a soakaway node, due to an unexpected error claiming the node type was incorrect.
2D overland	The list 'Couple to' was missing in the '1D-2D couplings' editor, when coupling to an existing MIKE 21 file instead of the 2D overland module.
SWMM	"Asset ID" could not be added as extra X-Axis below profile plots, for some SWMM network features.
SWMM	Date and times from time series with relative time, were wrongly interpreted in the simulation if they were typed in with values higher than 1 day.
SWMM	The 'Default time step for new rows' in the 'Time series' editor did not work properly.
SWMM	The layer type 'Catchments' was missing from the list of target layers, in the map's toolbar.
Water Distribution	An unexpected error was sometimes obtained when loading some .dat files in the 'Measurement stations' editor, due to a non-recognized format.

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Water Distribution	The import of EPANET .inp files sometimes failed with missing error descriptions.
Water Distribution	Start date and End date could not be specified for special days in patterns.
Water Distribution	The relative viscosity was wrongly given a unit of m ² /s.
Water Distribution	Sustainability Analysis sometimes failed to report empty or full tanks.
Water Distribution	Option 'Report raw results' did not work.
Water Distribution	With EPANET 2.2 engine, a wrong demand value was considered in the fire flow analysis with the method 'Pressure for flow' and in the flushing analysis.
Water Distribution	An unexpected validation error about the input string's length was returned when selecting 'Link Flow (absolute)' as result item in the 'Plots and statistics' editor.
Water Distribution	Demand statistics was not taking into account the value of a demand multiplier if entered in the Multiple demands editor.
MIKE 1D engine	Added support for decimal entry of UHM curve number values (TT56536).
MIKE 1D engine	Fixed error causing failure of LTS job list (TT56780).
MIKE 1D engine	Fixed scripting error in which res1D file not released by MIKE 1D controller (TT58619).
MIKE 1D engine	Fixed error in display of collection system slope in html summary (TT58908).
MIKE 1D engine	Corrected data type expected for sensor type "ActionActiveTime" (TT59020).
MIKE 1D engine	Added more informative error message to users attempting to obtain LTS results for 'weirs out of system' for setups with internal weirs only (TT59036).
MIKE 1D engine	Added support for "Close" and "Open" actions for valves in RTC setups (TT59072).
MIKE 1D engine	Added informative error message for setups with duplicate branch definitions (TT59151).
MIKE 1D engine	Added informative error message for setups with time series missing continuously increasing time series values (TT59165).
MIKE 1D engine	Corrected errors in the application of catchment water quality boundary conditions (TT59196).
MIKE 1D engine	Corrected unhandled exception occurring when importing setup from MIKE HYDRO River (TT5930).
MIKE 1D engine	Corrected saving error occurring when results saving period is user-defined (TT59431).
MIKE 1D engine	Disabled unit conversion to standard units before input to control module (TT59445).
Couplings engine	Fixed error in which couplings engine did not close properly after an error during initialization (TT59563, TT59808).
MIKE 1D engine	Made change to order of calculations to enable 'SaveFullRunningDischarge' feature (TT5951).
Couplings engine	Fixed formatting error in html summary for coupled simulations (TT5951).

Couplings engine	Added informative error message when node coupled to 2D model located outside 2D domain (TT5923).
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