

Release Notes 2021

MIKE 3

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Introduction

Welcome to MIKE 3 2021 Update 1

In this Release Note, you will find information about new features of MIKE 3, and what you need to know in order to install and get started with Release 2021.

MIKE 3 is a complete 3D modelling package for estuaries, coastal areas, and seas. It covers a wide range of hydrodynamic, environmental and sediment transport processes.

System requirements

The recommended minimum system requirements are:

Fully supported Windows operating systems *	Windows 10 Pro, version 20H2/2009 (64 bit) Windows Server 2016 Standard (64 bit) Windows Server 2019 Standard (64 bit)
Processor	x64, 2.2 GHz (or higher)
Memory (RAM)	2 GB (or higher)
Hard disk	40 GB (or higher)
Monitor	SVGA, resolution 1024x768 in 16-bit color
Graphics adapter	64 MB RAM (256 MB RAM or higher recommended), 32-bit true color **
File system	NTFS
Software requirements	Microsoft .NET Framework 4.7.2 or later

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- * 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.
- ** MIKE 3 Flow Model FM utilizing GPU 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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DHI License Management - If you are installing on a computer or server where you will also install the license file, please also install the DHI License Manager. It must be downloaded separately.

To install MIKE 3, please go to the MIKE Zero product folder and execute the setup.exe file either on the MIKE 2021 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 Zero.

Important information: Please be aware that all MIKE software on the same computer must be installed with the same service pack. This is due to the dependencies between MIKE software products and the ability for the software to use the latest feature and systems updates.

License file and dongle

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

Product invocation

Launch 'MIKE Zero' from the Windows Start menu. Then you can select MIKE 3 from within the MIKE Zero Shell.

Starting any MIKE Zero application without a DHI configured hardware key and valid license files will cause the program to run in demo mode. If this happens, a message box will inform you during program initialization. When running in demo mode, the MIKE Zero installation supplies full access to all editors, computational engines and editing facilities. However, restrictions apply to the setups that can be executed as a model simulation.

Support

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

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

Customer Success

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

mike@dhigroup.com

Tel: +45 4516 9333

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

New features and fixed issues

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Release 2021 Update 1

Every new release of MIKE 3 consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find short descriptions of the most significant news in Release 2021 Update 1 below.

New features

Module/type	New feature
MIKE 3 Flow Model FM – Mud Transport module	New approach for modelling a sand fraction in the Mud Transport module in the FM Modelling system. The 'Near-bed and suspended load sand transport' model is an entirely new scientific concept that uses a combination of DHI's Sand Transport Program (STP), to calculate the transport of sand for combined waves and currents near the bed, and our advection-diffusion solver, to consider suspended load for pure currents in the remainder of the water column. The implementation can also handle sand spilling into the water column from dredging operations.
MIKE 3 Flow Model FM	New option for applying jet sources in MIKE 3 Flow Model FM. The jet calculations can now be performed only at the overall time step, which can significantly reduce the computation cost.
MIKE 3 Flow Model FM	Improved performance using jet sources in combination with MPI parallelisation in MIKE 3 Flow Model FM. The MPI overhead is reduced, approximatively, by a factor 2.
MIKE Zero	Significantly improved performance of key MIKE Zero editors and viewers relating to: <ul style="list-style-type: none"> • Display of unstructured grids • Display of curvilinear grids • Display of structured orthogonal grids • Search of elements of unstructured grids • Allocated memory for unstructured grids • Handling of large datasets In real terms, the MIKE 21/3 FM editor now performs well with meshes of more than 10M elements and certain editors (notably the MIKE Zero Grid Editor) can handle datasets far in excess of 100M grid cells.
MIKE Zero	Item values in dfs0 files can now be specified in single precision or double precision. All items in the file can now be converted to either single precision or double precision with one click. Please note: the engines and tools in MIKE Zero are in general only validated for use with input items in single precision. Using double precision may lead to unexpected results. In some instances, for example, when using the Passing Vessel tool for Mooring Analysis, double precision items are expected.
MIKE Zero	MIKE Zero Engineering Unit Management (EUM) System has been extended with new unit types.
MIKE ECO Lab – ABM Lab	Improved accuracy of numerical integration scheme.

Fixed issues

Module/type	Error/Inconvenience
Various	Numerous corrections, stability and performance fixes.
MIKE ECO Lab	Buoyancy equation has been updated for the Extended Oilspill template.
MIKE 3 Flow Model FM & MIKE 3 Wave Model FM	Improved implementation for spherical coordinates in the HLLC solver using the Navier-Stokes equations.
MIKE 3 Flow Model FM & MIKE 3 Wave Model FM	Improved implementation in z-level domain for the HLLC solver using the Navier-Stokes equations.
MIKE 3 Flow Model FM	The calculation of the mean surface elevation used for a standard link (coupling with the river model) has been changed. The mean value is now only calculated using the surface elevation in real wet elements.
MIKE 3 Flow Model FM	Extension of the gate implementation to handle the case where a gate is located in a dry area, and water is starting to pass the gate.
MIKE 3 Flow Model FM	Consistent treatment of land boundary conditions in connection with structures.
MIKE 3 Flow Model FM	Improvements to long culverts where the outflow is to a fully dry area.
MIKE 3 Flow Model FM	Improvements when using the Mud Transport module in z-level layers in MIKE 3 Flow Model FM.
MIKE 3 Flow Model FM – Mud Transport module	Improved mass budget calculations in disposal calculations, in the Mud Transport module, which occurred for very shallow waters.
MIKE 3 Flow Model FM – Mud Transport module	Improved calculation of disposal/erosion in the mud transport module using a sand fraction.
MIKE 3 Wave Model FM	Improvements to the TMA spectrum calculation in MIKE 3 Wave Model FM.

Release 2021

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New features

Module/type	New feature
MIKE Zero	Improved handling of Map Projections.
MIKE Zero	MIKE Zero extended tile support.

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MIKE 3 Flow Model FM	Improved numerical scheme for hydrodynamic (HD) calculations and advection-dispersion (AD) calculations: <ul style="list-style-type: none"> • New algorithm for gradient calculation for higher order scheme in space - both HD and AD calculations. • New gradient limiter for higher order scheme in space – only AD calculations. • Time-centering for the calculation of vertical velocity in the sigma coordinate system using Sigma for the vertical discretisation.
MIKE 3 Flow Model FM	Output of detailed information for culverts, weirs and gates.
MIKE 3 Flow Model FM	Possibility to specify the light extinction coefficient for short wave radiation as 2D map.
MIKE 3 Flow Model FM	New normalised approach for absorption of short-wave radiation in the water column.
MIKE 3 Flow Model FM	Additional inundation output: <ul style="list-style-type: none"> • Velocity components at maximum current speed. • Time at first depth above threshold.
MIKE 3 Flow Model FM	Improved level and flux boundary in connection with dry areas for the hydrodynamic module.
MIKE 3 Flow Model FM	Improved GPU calculations utilising the latest NVIDIA CUDA technology.
MIKE 3 Flow Model FM – Mud Transport module	Disposal of sediment: A nearfield/farfield coupled approach is used for modelling sediment disposal from a split barge. The nearfield solution is based on an integrated approach independent from the MIKE computational mesh.
MIKE 3 Flow model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	New hotstart option for particles.
MIKE ECO Lab	Optimised MIKE ECO Lab calculations: <ul style="list-style-type: none"> • Faster initialization routines. • Improved memory handling.

Fixed issues

Module/type	Error/Inconvenience
Various	Numerous corrections, stability and performance fixes.
General	Improved validation messaging.
MIKE 3 Flow Model FM	Improved calculations and output in respect of turbine structures.
MIKE 3 Flow Model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	Extended evaporation parameterisation for oil spill calculations.
MIKE 3 Flow Model FM	Improved handling of evaporation and precipitation in the GPU version.

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MIKE 3 Flow Model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	Improved naming conventions for elements in particle class.
MIKE 3 Flow Model FM	Improved handling of meshes in the GCS_WGS1984 projection for hydrodynamic calculations.
MIKE Zero	Improved manipulation of mixed quadrangular and triangular meshes in Data Manager.
MIKE 3 Flow Model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	Improved handling of gridded particle track sources.