Release Notes 2021

MIKE 21

Contents:

Introduction

Welcome to MIKE 21 2021 Update 1

In this Release Note you will find information about new features of MIKE 21, and what you need to know in order to install and get started with Release 2021.

MIKE 21 is the world's leading modelling package for 2D free surface flow, waves, sediment transport and environmental processes. It is the true work horse of estuarine and coastal modelling with a wider range of facilities and modules than any similar package

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

* 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 21 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

top

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 21, 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 21 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

top

Release 2021 Update 1

Every new release of MIKE 21 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 21 Flow Model FM – Mud Transport module	New option for specifying fluid properties (density of the fluid, Bingham fluid viscosity and the yield stress) for simulation of non-Newtonian fluids in the MIKE 21 Flow Model FM. If the Mud Transport module is included in the simulation, the fluid properties can now vary in time and space. The fluid properties are then calculated as function of the volumetric concentration of the suspended sediment in the mud transport calculation. This feature has been designed to consider mixing of non-Newtonian fluids with clean water (a minimum Cv parameter sets the threshold at which the fluid properties start to transition linearly to pure Newtonian).
MIKE 21 Curvilinear Flow Model	Improved river morphology features (starting conditions, helical flow and sediment transport parameters) and significantly extended output options.
MIKE 21 Mooring Analysis	Improved performance of the Frequency Response Calculator (for use in MIKE 21 Mooring Analysis) for cases with a large number of panels. Up to a factor of 2 can be achieved.
MIKE 21 Mooring Analysis	New option for specifying current and wind in MIKE 21 Mooring Analysis. Constant current and wind condition can now be specified directly in the GUI and engine without the need to use a input dfs0 file.
MIKE Zero	Significantly improved performance of key MIKE Zero editors and viewers relating to: • 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

top

Module/type	Error/Inconvenience
Various	Numerous corrections, stability and performance fixes.
MIKE 21 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 21 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 21 Mooring Analysis	The damping coefficient for chains is now applied in the calculations.
MIKE 21 Flow Model FM	Consistent treatment of land boundary conditions in connection with structures.
MIKE 21 Flow Model FM	Improvements to long culverts where the outflow is to a fully dry area.
MIKE 21 Flow Model FM – Mud Transport module	Improved calculation of disposal/erosion in the mud transport module using a sand fraction.
MIKE 21 Mooring Analysis	Improved handling of time series files for waves of type ‘varying in time, constant in domain’.

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.
MIKE 21 Flow Model FM	Improved numerical scheme for advection-dispersion (AD) calculations: • New algorithm for gradient calculation for higher order scheme in space. • New gradient limiter for higher order scheme in space.
MIKE 21 Flow Model FM	Output of detailed information for culverts, weirs and gates.
MIKE 21 Flow Model FM	Possibility to specify the light extinction coefficient for short wave radiation as 2D map.
MIKE 21 Flow Model FM	Additional inundation output: • Velocity components at maximum current speed. • Time at first depth above threshold.

MIKE 21 Flow Model FM	Improved level and flux boundary in connection with dry areas for the hydrodynamic module.
MIKE 21 Flow Model FM	Improved GPU calculations utilising the latest NVIDIA CUDA technology.
MIKE 21 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: • Faster initialization routines. • Improved memory handling.
MIKE 21 Spectral Waves Model	Cyclic boundary conditions. Particularly valuable for large-scale Global Models.
MIKE 21 Spectral Waves Model	Cap value to limit the wind drag (fully spectral formulation): For extreme wind conditions (for example, hurricanes and tropical cyclones) the wind drag becomes very high resulting in unrealistic high wave growth rates. Therefore, a simple limit (cap) on the ratio between the friction velocity, U*, and wind speed, U10, at 10m level can be applied.
MIKE 21 Mooring Analysis	Support for Trelleborg's DynaMoor system: DynaMoor, combines Trelleborg's class leading Quick Release Hooks with an innovative constant tensioning system. This balances loads on the ship's mooring lines leading to a safer, more secure mooring. Now fully supported and parameterized in MIKE 21 MA.

Fixed issues

top

Module/type	Error/Inconvenience
Various	Numerous corrections, stability and performance fixes.
General	Improved validation messaging.
MIKE 21 Flow Model FM	Improved treatment of flood and dry in the calculation of dispersion in Transport (Advection-dispersion) module.
MIKE 21 Flow Model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	Extended evaporation parameterisation for oil spill calculations.
MIKE 21 Flow Model FM	Improved handling of evaporation and precipitation in the GPU version.
MIKE 21 Flow Model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	Improved naming conventions for elements in particle class.
MIKE 21 Mooring Analysis	Improved visualisation of vessel hulls.
MIKE 21 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 21 Flow Model FM – MIKE ECO lab/Oilspill module and Particle Tracking Transport module	Improved handling of gridded particle track sources.