

# Release Notes 2024



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## Introduction

Welcome to WEST 2024

In this Release Note you will find information about new features of WEST, and what you need to know in order to install and get started with WEST 2024.

WEST 2024 is the a powerful and user-friendly tool for dynamic modelling and simulation of municipal Water Resource Recovery Facility (WRRF) and Integrated Urban Water System (IUWS). The extensive state-of-the art model library of WEST enables one to model and evaluate almost any kind of modern WRRF and a variety of IUWS systems.

WEST 2024 comes in five different flavors:

- **WEST Basic:** Entry-level product: allows for the construction of a plant layout (limited in size) and for the execution simulations, using a reduced block library
- **WEST:** Construction of plant models using standard blocks, simulation, output visualization, and computation of user-specified objective functions, and execution of advanced experiments (formerly: WESTforDESIGN)
- **WEST +:** Construction of plant models using standard and custom blocks, simulation, output visualization, computation of user-specified objective functions, and execution of advanced experiments (formerly: WESTforOPTIMIZATION)
- **WEST Player:** Simulation, output visualization, and computation of user-specified objective functions on the basis of a fixed executable plant model, previously prepared by WEST or WEST + (formerly: WESTforOPERATORS)
- **WEST SDK:** Software Development Kit for the integration of the WEST engine (i.e. Tornado) in custom applications (formerly: WESTforAUTOMATION)

WEST 2024 comes with 2 separate model libraries: the **MSL** library (that uses MSL as modelling language), now obsolete, and the **Modelica** library (that uses Modelica as modelling language).

**Important:** issues that should surface in the MSL library will be solved, but the library will no longer be actively developed and will eventually be discontinued. As of Release 2020, all new (model) development is taking place in Modelica.

## System requirements

### Operating systems

Fully supported Windows operating systems *	Windows 11 Pro, version 23H2 (64 bit) Windows 10 Pro, version 22H2 (64 bit) Windows Server 2022, version 21H2 Windows Server 2019 Standard, version 1809
Non-supported but partially tested operating systems **	Windows Server 2016 Standard, version 1607

\* 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 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.)

## Installation

**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 WEST, please choose WEST in the 'Product Overview' dialogue box that appears when inserting the MIKE software 2022 USB and clicking the Setup.exe or executing the Setup.exe file from the downloaded 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 WEST.

## 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 2024 require a 2024 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 or newer.

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

## Product invocation

Launch WEST from the Windows Start menu.

## Support

For general support, please refer to our [Customer Care Portal](#).

If you experience any difficulties, or if you have questions, please contact our Customer Care team at [mike@dhigroup.com](mailto:mike@dhigroup.com).

You can also contact your local Customer Care team for support in your local language. A list can be accessed from [here](#).

## New features and fixed issues

Every new release of WEST consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Below is an overview of the most significant news.

### Release 2024

#### New features

Module/type	New feature
Modelica Library	Models Guide (available upon request)
Modelica Library	Special.LoadSeparator conversion model. Generic black-box tank model, with option to input a removal efficiency for each component.
Modelica Library	Biogas.Mix02 conversion model. Mixer for 2 incoming fluxes of biogas.
Modelica Library	Anammox.Multiprobe conversion model.

Module/type	New feature
Modelica Library	Tanks_AS.VolumeConstant_OnOff conversion model. Activated sludge tank that can operate as a regular tank, i.e. with constant volume ( $Q_{out} = Q_{in}$ ) at regime, and that can be emptied and refilled during transient (i.e., pump-regulated inflow and outflow). It can be used isolated or in series.
Modelica Library	Cost.Cost_Generic conversion model. Generic cost calculator for 1 quantity, expressed as mass or volume.
Modelica Library	Set of 'operational' control models (ControllersOp category): Ratio, OnOff11, PI11, PID11. The models can be turned on/off (mode interface variable): when off, the fall-back action is activated.
Modelica Library	MixSplit.Abs10 model. Connector with up to 10 influent and effluent fluxes: effluent fluxes are set as flow rates. 'Absolute' split, i.e., pump (prioritized 1-10).
Modelica Library	Tanks_Dewater.ThickenerEfficiency2. Simple thickening model based on target solids and percent water separation.
Modelica Library	IUWS_Generators.PenmanMonteith evaporation generator. It uses Penman-Monteith equation.
Modelica Library	Plosz model for secondary clarifiers. One-dimensional (1-D) convection-dispersion model, by. B. Gy. Plosz.
Modelica Library	IUWS4 instance. It uses KOSIM4 as sewer category, which includes a generic micropollutant element in 3 individual components: soluble (SMP), soluble conjugate (SMPconj) and particulate (XMP). The river model has been modified to accommodate the extra components too.
Modelica Library	Granular Activated Carbon model (GAC_01bed). It is available in the scope of IUWS4.
Modelica Library	Granular Activated Carbon model with 10 beds in series (GAC_10beds). It is available in the scope of IUWS4.
Modelica Library	Extension of ASM2dMod to include several micropollutants (ASM2dModMP2). In the scope of the new instance, ozonation treatment can be modelled.
Modelica Library	Added missing flow splitting and combining models to handle pH as component in RWQM1.

Module/type	New feature
Modelica Library	New set of standard biochemistry functions, e.g., Arrhenius temperature-correction (Arrh), Monod type growth (Monod) and inhibition functions (InhMonod), Haldane inhibition function (InhHaldane), etc.
Sample Projects	New sample for line out of operation. It illustrates the use of the new Tanks_AS.VolumeConstant_OnOff conversion model.
Sample Projects	mTestCase_Blowers: upgraded to include multi-blower control models.
Sample Projects	mDemo_PWMSA_PointSettler. It illustrates the use of a point settler in the scope of PWM_SA
Sample Projects	mDemo_PWMSA_THP. It illustrates the use of thermo-hydrolysis in the scope of PWM_SA.
Sample Projects	mDemo_PWMSA_Fractionator. It illustrates the use of the probabilistic fractionator in the scope of PWM_SA.
Sample Projects	mDemo_PWMSA_WholePlant. It illustrates the use of the PWM_SA whole plant modelling approach.
GUI	Option to select a folder when saving/loading snapshots

### Fixed issues/inconveniences

Module/type	Error/Inconvenience
Modelica Library	Effect of chem dosing on X_TSS component was added to DoseBaseChemP and DoseFeCl3 conversion models (instance: ASM2dMod)
Modelica Library	Error in Outflow calculation: removed division by 1E06
Modelica Library	Various fixes to the Anammox model
Modelica Library	Nd definition missing in FineBubble2 conversion model.
Modelica Library	Error in calculation of M_CO2 in Aeration.BaseBottom conversion model
Modelica Library	Added pumping for chemical dosing (Chem_COD_Q0i and Chem_MEOH_Q0i to P_Pump_Tot) to Operation_Simple cost calculator.
Modelica Library	Fixed error in units of cost of chemical dosing

Module/type	Error/Inconvenience
Modelica Library	Added new interface (i.e., Cost_Extra) to operational cost calculator for the calculation of total costs.
Modelica Library	Added missing Gujer matrix implementation for ASM1.Default_AerDig conversion model.
Modelica Library	Fixed error in calculation of influent TSS (Help_In) for dewatering units.
Modelica Library	Removed IsOnBCx and IsOn_BUx in multi-blower controllers, i.e., Blowers.Common10_CFHQVFD and Common10_PDHQVFD conversion models.
Modelica Library	Added definition of mode_TSS parameter in ASM2dMod.Separation_Ideal and ASM2dModPFAS.Separation_Ideal conversion models.
Modelica Library	Fixed missing link between A_Tot parameter from catchment model (coupled model) to DWF sub-model.
Modelica Library	Enabled TanksAD category in the scope of the ASM2dISS instance.
Modelica Library	UASB conversion model moved to TanksAD category.
Modelica Library	Test.mo can fail due to duplicate Types names. Added category name as prefix.
Modelica Library	Cleaned up duplicates of sewer-related splitters and combiners, from KOSIM(2 and3) categories. All sewer-related splitters and combiners now in Splitters and Mixers categories respectively, with suffix 's'
Modelica Library	Added missing V_c_real initial equation to Tanks_Filters.Filter1D conversion model.
Modelica Library	Influent blocks other than Municipality result in error when used with a IUWS instance.
Modelica Library	Gasflow in middle layer accounted for twice in UASB model
Modelica Library	Incorrect derivation of partial pressures of biogas components in UASB model
Modelica Library	Incorrect calculation of total biogas production in UASB model
Modelica Library	Several fixes in the implementation of the Burger-Diehl model for secondary clarifiers. Removed batch mode option
Modelica Library	Incorrect code generated for the instance-dependent Test.mo files, in case of category-dependent Types resulted in 'Duplicate names found' error. Category name is now prepended to the Type name.
Modelica Library	Removed Qsp from BaseBottom, as it is a mere calculation and not used anywhere else
Modelica Library	Controllers/Ratio2 renamed Controllers/RatioB
Modelica Library	Update of PWM_SA description in Modelica Models Guide
Modelica Library	Nitrification does not happen in river model (RWQM1). Added missing implementation of K_N_T variable.

## Known defects and workarounds

Module/type	Error/Inconvenience	Work-around
WEST GUI	Projects saved in WEST 2024 can be used in WEST 2023, but the plots will have to be re-created – as the underlying third-party component has been upgraded.	---
WEST GUI	The definition of Calculator Variables involving vectors or matrices in Modelica results in an error	Manually edit the TornadoMain.xml in the WEST\2021\etc\ folder and set to “ <b>false</b> ” the <b>EnableMSLCalcVarCompatibility</b> property
WEST GUI	Unit conversion does not work in Influent Tool	Use standard (SI) units rather than US or Imperial
Samples	Python Extensions sample only works after executing steady-state and dynamic simulation	Follow instructions provided in the Notes to the sample