Release Notes 2021

WEST

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Introduction

Welcome to WEST 2021

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 2021.

WEST 2021 is the 6th release of the re-designed and re-engineered version of WEST, the 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 2021 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 2021 comes with 2 separate model libraries: the conventional **MSL** library (that uses MSL as modelling language) and a new **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

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.

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 WEST, please choose WEST in the 'Product Overview' dialogue box that appears when inserting the MIKE software 2021 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

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 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

Every new release of WEST 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 below.

New features

Module/type	New feature
WEST	Ability to execute advanced experiments
GUI	Ability to duplicate a plot: format is preserved
Modelica Library	Continuity factors added to the Gujer matrices of the main Categories
Modelica Library	New models: • Pre-treatments: screening and grit chamber • Equalization tank • Primary Settling: Otterpohl-Freund, BSM2, Takacs, with lamellae • Reactive Settler • Zero-dimensional (Rauch) biofilter model • One-dimensional biofilm model: MBBR • MBR • Efficiency-based Thickener • UASB • Aerobic Digestion • Heat exchanger • Gas turbine • PID controller with anti-windup

	• Stripper for ammonia recovery

Modelica Library	Improvements:
	
	• ASM2dISS extended to include
	  ○ 2-step nitrification
	  ○ 4-step denitrification
	  ○ Anammox
	  ○ Sulfate reduction
	
	• ADM1 extended to include sulfur, with option to carry sulfur over from the upstream water line (ASM2dISS), or to input it at the level of the anaerobic digestion model:
	  ○ 4 biomass components
	  ○ 3 soluble components
	  ○ 1 gas component
	  ○ 4 decay-, 5 uptake/growth- and 1 gas transfer processes
	
	• Separate definition of biokinetics for biofilm and bulk liquid
	• Interfacing with ADM1 possible for all model instances (ASM1, ASM2d, ASM2dISS)
	• Heat losses calculation in Anaerobic Digester
	• Cost calculator extended to include energy recovery from biogas and heat losses in energy balance

Modelica Library	New samples: • Python Extension • Oxidation Ditch • MBBR • BSM2

Fixed issues/inconveniences

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Module/type	Error/Inconvenience
MSL Library	Sand filter: missing Q's calculations
MSL Library	Incorrect calculation of aeration energy (factor 1E03)
MSL Library	Use of "mode" and "pHss" in the scope of anaerobic digester not correctly reflected in the compiled library, resulting in runtime error upon launching a simulation
GUI	Initialization (e.g. end state of steady-state simulation to initial values of dynamic simulations) works correctly, i.e. does not re-initialize the steady-state simulation too
GUI	Incorrect default loop-breaker (Modelica language)
GUI	Switching model instance (Modelica language) causes error
GUI	In advanced experiments, step size is not compared against lower bound
GUI / Model Editor	Missing icon in Gujer Matrix editor (Modelica language)
Modelica Library	Incorrect default value of energy per molar unit of methane (kJ/mol CH4)

Modelica Library	Incorrect default value of mixing energy requirement per unit volume (kWh/m3/d)
Modelica Library	Incorrect calculation of aeration energy (factor 1E03)
Modelica Library	Missing implementation of “dm” variable in WATS model for circular pipe
Modelica Library	Use of “mode” and “pHss” in the scope of anaerobic digester not correctly reflected in the compiled library, resulting in runtime error upon launching a simulation

Known defects and workarounds

Module/type	Error/Inconvenience	Work-around
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