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OpenFlows™ Water

Water Distribution System Modeling and Management

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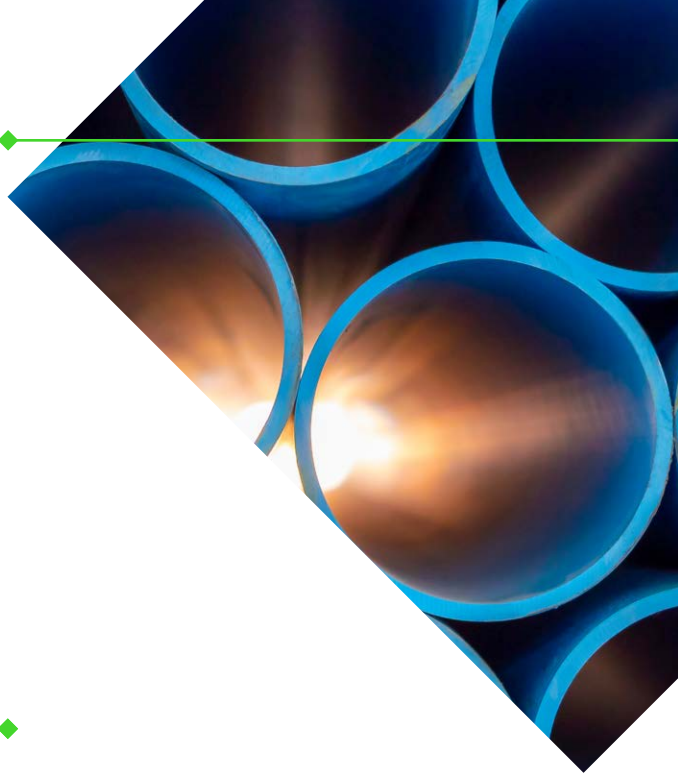
Advancing Infrastructure

PRODUCT DATA SHEET



OpenFlows™ Water

Water Distribution System Modeling and Management

PLAN, DESIGN, AND OPTIMIZE WATER DISTRIBUTION SYSTEMS QUICKLY AND EASILY

OpenFlows Water is a user-friendly hydraulic modeling application trusted by thousands of engineers to understand their water distribution systems and make better decisions. The application helps with planning, designing, and building sustainable water systems, as well as solving everyday challenges in their operations and maintenance. OpenFlows offers reliable, versatile, and easy-to-deploy hydraulic analysis solutions, including AI-enabled optimization capabilities for you to efficiently design or rehabilitate piping, calibrate networks, locate leaks, and optimize pump energy use. OpenFlows users benefit from our superior support, learning resources, and value-added services.

SCENARIO MANAGEMENT

Perform multiple hydraulic modeling scenarios using alternative data sets to simulate the system under a variety of "what-if" conditions, including different demands, master planning horizons, operational strategies, or possible designs. In master planning, you can easily configure model runs to include only assets that will be in service in a selected year.

TRANSIENT SIMULATION AND ANALYSIS

Transient pressures can cause catastrophic damage to pipes and equipment, endanger operators, introduce dangerous contaminants into the system, and interrupt service to customers.

INTEROPERABLE HYDRAULIC MODELING

Compatible with various data formats and sources, OpenFlows allows you to efficiently build your hydraulic model by quickly synchronizing network data from standard formats, such as GIS and CAD files, databases, and spreadsheets. Import and export model files using the EPANET file format. Minimize system disruptions by realistically modeling the expected current system conditions using real-time data from SCADA or other data sources.

MODEL CALIBRATION

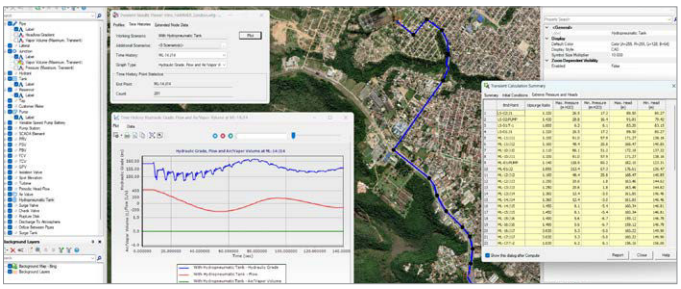
Ensure your model is calibrated and accurate in any condition – including peak days, component failures, fire flows, or future demands – by eliminating discrepancies between the model and field data. Apply AI-powered automated calibration using Darwin® Calibrator to quickly identify reasonable calibration or leakage hypotheses that provide best matches to measured flows and pressures.

DESIGN OPTIMIZATION

Darwin Designer can automatically find maximum pressure benefit or minimum cost designs and rehabilitation strategies based on the available budget, construction costs, and pressure and velocity constraints. A multiobjective design can simultaneously consider both benefit and cost.

ENERGY ANALYSIS AND OPTIMIZATION

With Darwin Scheduler, you can automatically identify the most energy-efficient pump scheduling strategies for fixed- and variable-speed pumps to minimize energy usage or energy cost based on pressure, velocity, pump start frequency, and tank level constraints. Add energy cost information and/or carbon emission factors to compute energy costs and carbon emissions for a scenario. Evaluate multiple scenarios to capture seasonal or other operational changes, incorporate complex energy cost structures, and include other types of energy costs, such as pump station lighting and HVAC.



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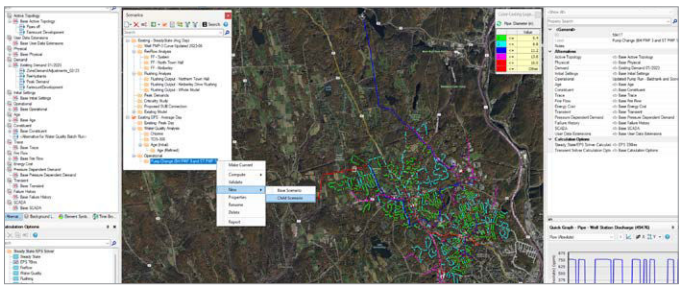

Identify, manage, and mitigate the risks associated with transients to prevent catastrophic water failures.

SYSTEM REQUIREMENTS

MINIMUM: Windows 10, 11, and Server, 8GB RAM. OpenFlows Water runs without platform restrictions as a stand-alone application. It also runs within ArcGIS, ArcGIS Pro, Microstation®, and AutoCAD.

RECOMMENDED: 16GB RAM

OpenFlows Water At-A-Glance

OpenFlows Water includes the capabilities of WaterGEMS®, WaterCAD®, and HAMMER. The software is licensed in four convenient tiers. See the Comparison Checklist to decide the tier that best suits your project and analysis needs.

INTEROPERABILITY AND GRAPHICAL EDITING

- Run standalone and within:
  - ArcGIS, ArcGIS Pro (Esri license required)
  - AutoCAD (AutoCAD license required)
  - MicroStation
- Streamlined Controls Editor in table format
- Element morphing, splitting, and reconnection
- Scaled, schematic, and hybrid environments
- Multiple background-layer and Bing map support

MODEL BUILDING AND DATA CONNECTION

- DGN, DXF, spreadsheet, database, Oracle Spatial, and ODBC connections
- ArcGIS Online*, shapefile, geodatabase,* Geometric Network,* and SDE* connections (*when running within ArcGIS Pro)
- GIS-ID property to associate records in data source/GIS and elements in the model
- SCADAConnect® unlimited signal pack for live connections, customer meter, and lateral link elements (no need to split pipes)
- Automatic demand allocation from GIS data (e.g., point or polygon loads, population, land use, customer meters)
- Daily, weekly, monthly, and superimposed demand patterns
- Unaccounted-for water and leakage estimation
- Area, count, discharge, and population-based unit demands
- Elevation extraction from DEM, TIN, shapefiles, and CAD drawings and surfaces
- Series, parallel, branch-trimming, and multicriteria automated skeletonization of pipes
- Automated model skeletonization and support for isolation valves
- User data extensions, including formula-based
- Sync in to update a model, or sync out to an external file

SCENARIO AND MODEL MANAGEMENT

- Comprehensive unlimited scenario management
- Custom engineering libraries
- Statistical analysis
- Dynamic and static selection sets
- Local and global engineering units management
- Sub-model management
- Drawing review capabilities for connectivity consistency
- Automatic topology review
- Orphaned nodes and dead-end pipe queries
- Change tracking

HYDRAULICS, OPERATIONS, AND WATER QUALITY

- Steady-state and extended-period simulations
- Constituent concentration and multispecies water quality analysis
- Tank mixing analysis
- Water age analysis
- Water loss analysis
- Water quality batch run
- Source tracing
- Fire flow analysis
- Rule-based or logical controls
- Variable-speed pumping
- System head curves and combination pump curves
- NPSH analysis
- Pump and turbine energy and energy cost analysis
- Carbon emission calculation
- Capital cost calculation
- Override of pump and valve controls using historical SCADA data
- Real-time modeling
- Emergency response simulations for pipe breaks, power outages, fires, and pipe shutdowns
- Criticality analysis for pipes and valves
- Leakage and sprinkler modeling
- Pressure-dependent demands
- Conventional and unidirectional flushing simulations
- Control valves and air release valve elements
- Top-fill tank element
- Pressure zone automated identification and management
- Support for DMA design

OPTIMIZATION

- Pipe vulnerability rating (Pipe Renewal Planner)
- AI-powered model calibration and leak detection using genetic algorithms (Darwin Calibrator)
- AI-powered pipe sizing, design and rehabilitation using genetic algorithms (Darwin Designer)
- AI-powered Pump schedule optimization using genetic algorithms (Darwin Scheduler)

TRANSIENT SIMULATION AND ANALYSIS

- Hydraulic transient force computation
- Support for multiple what-if scenarios. Detailed results along entire pipe length using a Method of Characteristics algorithm
- Synchronized maps, profiles, and point history visualizations
- Supports all hydraulic elements and multiple simultaneous transient sources
- Analysis of impacts of rapid demand and/or pressure changes. Modeling of surge protection equipment. Multiple supported transient friction methods: steady, quasi-steady, unsteady, or unsteady (Vitkovsky).
- Automated element validation
- Wave speed calculator

RESULTS PRESENTATION

- Thematic mapping with property-based color coding, symbology, and annotations
- Dynamic, multiparameter, and multiscenario graphing
- Scenario and element comparison
- Contour mapping
- Advanced tabular reporting with FlexTables
- Creation of Google Earth (KML) files
- Video recording of results animation
- Customizable reports

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