AVEVA **Instrumentation**
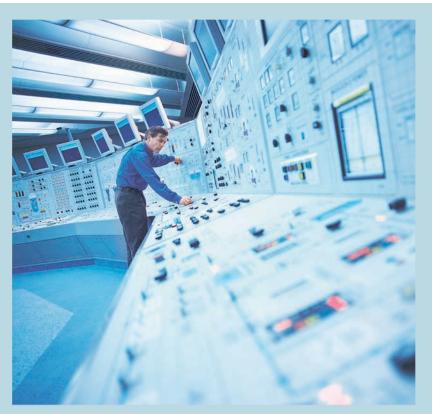
Instrumentation and Systems engineering, design, documentation and management for the entire asset life cycle

AVEVA Instrumentation™ is proven, feature-rich software for instrumentation and systems engineering enabling instrumentation teams within multi-discipline organisations to design complete installations. Its intuitive graphical user interfaces, extensive use of design rules and catalogues, automatic generation of high-quality drawings and reports for installation and commissioning, and maximum workflow flexibility make AVEVA Instrumentation the preferred choice for projects of all sizes both for the EPC or shipbuilder in design and for the asset operator in everyday operations and maintenance.

Stand-alone or fully integrated, AVEVA Instrumentation enables instrument engineers to quickly execute new and legacy instrumentation engineering projects and share data while maintaining control through an out-of-the-box product. When used as part of an integrated AVEVA software deployment, it adds instrumentation data into the complete project information model, exposing it to the full range of AVEVA's design, engineering, collaboration and life cycle management technologies.

An estimated 70% of all data items in Plant and Marine environments are typically connected to instrumentation and control processes

Business Benefits

■ **Increased productivity**
A uniquely graphical 'visual engineering' approach boosts productivity on both large and small projects. Catalogue- and rules-based automation saves time and reduces errors and design revisions.

■ **Automatically generated high-quality deliverables**
An extensive range of customisable deliverables using reports or templates may be created, including:
- Instrument index
- Datasheets
- Cable schedules
- Cable block diagrams
- Fieldbus diagrams
- Loop diagrams
- Termination diagrams
- Hook-up diagrams
- Bill of Materials

■ **Increased design quality**
Use of catalogues and rules enables the efficient creation of compliant design. Seamless integration with 3D model data extends this, for example, to enable efficient cable routing. High-quality documentation tools, with revisioning and highlighting features, maximise productivity in asset operations.

■ **Rapid payback**
Easy, rapid deployment, with minimal user training needs, immediately increases productivity on new or existing projects.

■ **Collaborative workflow**
A database shared with AVEVA Electrical™, improved data access control, integration with other AVEVA solutions and interoperability with third-party software enable efficient cross-discipline collaboration, ensuring design integrity.

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AVEVA™

Datasheets and Instrument Indexes can be efficiently created with the Instrument Engineer module

User defined reports can be easily created, including export to various formats such as Excel and PDF, with revisions highlighted

Key Features

AVEVA Instrumentation comprises four integrated modules which share a common, Microsoft SQL multi-user database for design and as-built data. Multiple languages are supported for ease of deployment and use worldwide. Data integrity is ensured by extensive validation processes, automatic cross-referencing and rigorous change control. The product can be readily customised by User Administration without the need for programming skills. Other important features include:

❚ Full integration with AVEVA's P&ID, engineering, 3D design and Information Management software
❚ Interfaces to industry-standard document management systems
❚ Revisioning and highlighting management of reports, datasheets and drawings
❚ Work sharing, with rigorous data access control and CITRIX Ready certification

Integrated Modules

The separation of these modules provides a contextual experience, without overwhelming the user with available commands; activity is simplified by splitting into modules, built using Microsoft's latest .NET technology and Microsoft® Fluent™ user interface.

Instrument Engineer module

This module enables instruments and loops index data entry, change tracking, generation of datasheets and the creation and management of reports and documentation. Its best-in-class features include a straightforward and flexible spreadsheet-style interface, as well as the capabilities below.

❚ **Datasheets**
- Multiple instruments assignable by tag reference to a classification datasheet
- Easy management of process data across multiple datasheets
- Document management functions, including searching and change highlighting
- Familiar spreadsheet functions such as import/export, format copying, datasheet reuse, configurable printing, PDF creation
- Audit logging, revision control and change reporting

❚ **Instrument List**
- Data import from Excel, P&IDs or engineering software
- Add, edit and maintain list data, including DCS, PLC and I/O information
- Flexible, user-definable tag formats and list layout
- Change reporting and management
- Data association with datasheets and process equipment
- Data association with the Instrument Designer and Wiring Manager modules
- Automatic update of loop drawing and hook-up document numbers
- Assign wiring rules and generate Wiring Manager module data automatically

❚ **Loop List**
- Advanced user interface for the easy creation, editing and copying of loops
- Generate Loop Wiring Check reports in pdf format
- Data association with the Instrument Designer and Wiring Manager modules

❚ **Reports**
Extensive, user-definable report generation, including:
- Instrument and Loop Lists, I/O allocations
- Datasheet List, Process Data List
- Report by datasheet type, by tag, by assignment status, etc.
- Database changes between revisions, audit log
- Flexible print layout and export options

Instrument Designer module

This module enables the automatic generation and revision of CAD drawings from the project/plant database, with or without the use of templates. It handles the parametric creation of termination drawings and may be used on existing AutoCAD drawings. Its features include:

▌ Drawing List management
- Manually add, edit, update, delete or open drawings from the Drawing List
- Add Loop Drawings automatically from Instrument Engineer's Loop List
- Add Termination Drawings automatically from Wiring Manager's Equipment List
- Add Cable Block Diagram drawings automatically from Wiring Manager's Cable Block Diagram List
- Create and manage drawing revisions with automatic clouding option
- Link drawing text fields to any database fields
- Batch mode operation for efficient drawing creation, updating and printing

▌ Loop Diagram generation
- Fully user-definable drawing templates
- Edit and update existing drawings
- Data association with Wiring Manager and Instrument Engineer modules for automatic updating
- Full revision history

▌ Termination Diagram generation
- Fully automated creation of template-based and parametric drawings
- Cable and termination data automatically updated from Wiring Manager
- Automatic continuation over many multi-sheet drawings
- Automatic reference drawing numbering

▌ Hook-up Drawing generation
- User-definable drawing templates
- Assign tags to hook-up type, and hook-up items from a user-definable catalogue (catalogue is supplied with over 3,000 items)
- Automatically create drawings with BoM and Tag List
- Create BoM reports by plant area or for the total project
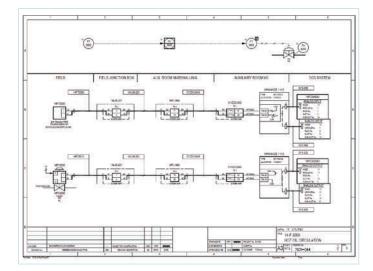
▌ Change management
- Report all drawing changes, additions, deletions, renaming, etc.
- Report changes by field
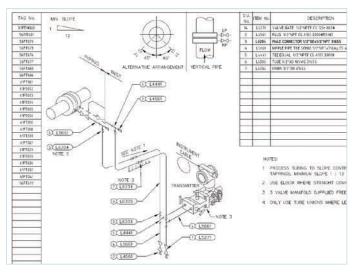- Log changes for reporting

Process Engineer module

The Process Engineer module enables the creation and management of process data for instruments, process equipment or process lines in a grid format. It enables users to enter their own data and makes process data available for inclusion alongside instrumentation data on documents such as instrument lists, datasheets, instrument calculations, and so on.
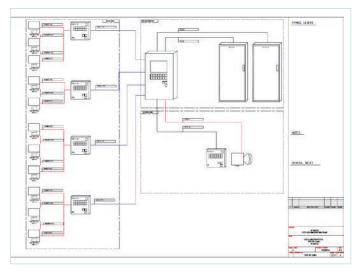
Features include:

▌ Ability to view instruments by type, with Import/Export facilities
▌ Flexible tagging format for process equipment and lines
▌ Immediate identification of gaps and inconsistencies in data
▌ Intuitive reporting capability, fully integrated with the rest of the AVEVA Instrumentation modules

AutoCAD Loop Diagram, automatically generated using the Instrument Designer module

AutoCAD Hookup Drawing, generated using the Instrument Designer module

Interconnection diagram deliverables can be customised and delivered using AVEVA Instrumentation

Key Features (continued)

Wiring Manager module

This powerful module handles all detailed cable, wiring, and termination design, creating data which is used by the Instrument Designer module for drawing generation. It features an advanced user interface and three integrated functions for handling equipment, cable and interconnection data.

▌ **Advanced user interface**
- Intuitive and easy to learn for immediate productivity
- Drag-and-drop wire termination and diagram layout functions
- Catalogue-driven component selection

▌ **Equipment functions**
- Graphical definition and easy reuse of equipment terminal arrangements and terminal strips/rails
- Graphical representation of equipment hierarchy
- Supports DIN rails with multiple devices
- Assign tags to junction boxes
- Rule-based creation of terminations

▌ **Cable functions**
- Cable creation by catalogue, by copying, or by importing existing data
- Catalogue-driven gland and gland adapter assignment with BoM reports
- Automatic core marking updates from Catalogue Number changes
- Automatic cables and drums schedule reports for minimum wastage
- Cables and drums freeze management
- Bidirectional exchange of cables and equipment management information, such as length, cable status or cable node path, with AVEVA Everything3D™ (AVEVA E3D™)
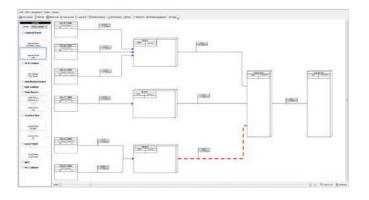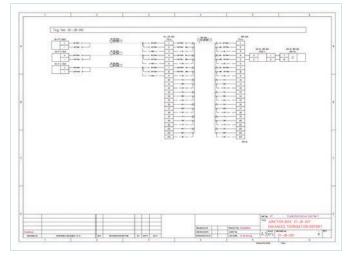
▌ **Cable/wire terminations**
- Drag-and-drop wire termination and I/O allocation
- Automatic creation of editable and fully customisable Cable Block Diagrams
- Automatic rule-based numbering and wiring
- Automatic cross-patch wiring within equipment and within rooms
- Graphical termination reports in PDF or CAD formats

▌ **Reporting**
- Cable schedules, pulling report, drum list
- Cable BoM, cable gland and adapter BoM
- Wire/ferrule number schedules
- I/O allocations

AVEVA Instrumentation's rich functionality enables efficient, accurate and productive system design and installation, while also providing rapid access to up-to-date information during operation. It is a complete life cycle solution.

The Wiring Manager module generates high-quality Cable Block Diagrams, Termination Diagrams and Cable Schedules, as shown in the sequence above

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