

AVEVA Instrumentation

Instrument and Systems engineering, design, documentation and management for the entire asset lifecycle

AVEVA Instrumentation is a proven, feature-rich software suite for Instrumentation and Control engineering. Its advanced graphical user interfaces, extensive use of design rules and catalogues for data creation, and maximum workflow flexibility make AVEVA Instrumentation the preferred choice for projects of all sizes.

Stand-alone or fully integrated, AVEVA Instrumentation is functionality rich and supports the complete asset life-cycle.

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 lifecycle 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

Catalogue and rules-based automation makes system design efficient and effective. Highly graphical 'visual engineering' approach boosts productivity on both large and small projects.

■ Automatically generated deliverables

An extensive range of customisable deliverables may be created, including:

- Cable Block Diagrams
- Loop Diagrams
- Instrument Index
- Datasheets
- Hookup Diagrams
- Termination Diagrams
- Cable Schedules
- Bill of Materials
- Fieldbus Diagrams

■ Increased design quality

Use of catalogues and rules enables 'right first time' design. Accurate design information is further supported by seamless integration with 3D model data, e.g. for cable routing. High-quality documentation maximises productivity in operations.

■ Rapid payback

Easily and rapidly deployed on new or existing projects. Intuitive use minimises training needs and makes users immediately productive.

■ Collaborative workflow

A database shared with AVEVA Electrical provides significant interconnection ensuring the integrity of the design.



Key Features

AVEVA Instrumentation comprises four integrated modules which share a common, multi-user database for design and as-built data. It can be used with MS SQL server (recommended), or other database packages for smaller projects.

AVEVA Instrumentation supports multiple languages throughout for ease of deployment and use worldwide. Data integrity is ensured by extensive validation processes, automatic cross-referencing and rigorous change control. Straightforward customisation enables configuration by users without the need for programming skills. Other important features include:

- Full integration with the AVEVA Enterprise information and resource management portfolio
- Interface to all industry-standard document management systems
- Report comparison and highlighting
- E&I Extracts feature enables data to be divided up between project teams and then merged back into the main database

Integrated Modules

AVEVA Instrumentation operates a collaborative set of modules which share a common multi-user database for design and as-built data.

Instrument Engineer module

This module enables instrument index data entry, change tracking, generation of datasheets and the creation and management of reports and documentation. Its features include a straightforward and flexible spreadsheet-style interface, plus:

■ 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 and P&IDs
- Add, edit and maintain list data, including DCS/PLC I/O information
- User-definable tag formats and list layout
- Change reporting and management
- Data association with Datasheets
- Data association with the Instrument Designer module
- Automatic update of loop drawing and hook-up document numbers

■ Loop List

- Advanced user interface for easy creation, editing and copying of loops
- Assign 'wiring rules' and generate Wiring Manager module data automatically
- 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

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Instrument Datasheet

CONTROL VALVE

1	Tag No.	80-PV-1305				P&ID No.	AT-10089							
2	Service	FUEL GAS TO REBOILER B447N				Line Number	150-HC-1265							
PROCESS CONDITIONS														
3	Fluid Name	FUEL GAS				Design Temp.	Min	Max	0°C					
4	Fluid State					Design Press.	Min	Max	0 kPa					
5	Operating Conditions	Min Flow	Normal Flow	Max Flow	Design Temp.	Min	Max	0°C						
6	Liquid Flow Rate	-	-	-	Critical Temp	Critical Press.		-						
7	Vapour Flow Rate	5481 Sm/hr	-	17025 Sm/hr	Critical Temp	Critical Press.		-						
8	Inter Pressure	2450 kPa	-	2440 kPa	Pressure Control	Pressure Control		-						
9	Pressure Drop	85 kPa	-	45 kPa	Delta P @ Shut Off	2500 kPa		-						
10	Inter Temperature	85 °C	-	85 °C	Alarm P @ Shut Off	-		-						
11	Liquid Vapour Pressure	-	-	-	Alarm P @ Shut Off	-		-						
12	Liquid Density	-	-	-	Alarm P @ Shut Off	-		-						
13	Liquid Viscosity	-	-	-	Alarm P @ Shut Off	-		-						
14	Vapour Molecular Weight	8.22	-	8.22	Alarm P @ Shut Off	-		-						
15	Vapour Compress. Factor, Z	1	-	1	Alarm P @ Shut Off	-		-						
16	Vapour Ratio of Specific Heats	1.29	-	1.29	Alarm P @ Shut Off	-		-						
17	C _p Calculated	34.472	-	126.153	Alarm P @ Shut Off	-		-						
18	Value Opening	20 %	-	75 %	Alarm P @ Shut Off	-		-						
19	None Calculated SPL	60.2 dBA	-	64.8 dBA	Alarm P @ Shut Off	-		-						
VALVE BODY														
20	Line Size & Sch.	Insert	Outer	DN 150 (Sch 40)	Body Type	Flare		-						
21	Insulation Jacket	None				Body Material	CS to ASTM A216							
22	Valve Type	Globe				Body Material	Same as Body							
23	Selected Body Size	Rated Or	DN 80	140	Body Type & Material	ENVRD PTFE		-						
24	End Connections Type & Rating	ASME C 300 RF				Body Bolting	Body Nuts	ASTM A193 Gr B7	ASTM A193 Gr B7					
25	Flange Finish	3.2 to 6.3 µmRa				Leak & Test Valve	Leak							
26	Flow Direction													
27	Flow Direction													
28	Flow Direction													
TRIM														
29	Type	Size	Material	3/16 inch	Plug/Ball/Seat Material	416SS HCl		-						
30	Characteristic	Fixed Travel	Linear	1-1/2 inch	Seat Material	416SS HCl		-						
31	Trim (Balanced / Unbalanced)	Balanced				Material Change/Date	18 APR 11							
32	FL	KT	0.819	0.649	Material Change/Date	318 DS		-						
33	No. of Seals	1				Leakage Class	ANSI Class 1							
ACTUATOR														
34	Type	Spring Diaphragm				Actuator Orientation	Standard							
35	Actuator	Size	Area	45	Handwheel	Not Required		-						
36	Valve Action on Air Supply Failure	Value Closes on Air Failure				Volume Tank	Not Required							
37	Block Flange	14-3/4" gwg				Other	-							
ACCESSORIES														
38	Positioner Type	Smart Signal 4-20mA with HART				Model	Seals	Flange	Flange					
39	Positioner	Action	Channel	Direct	Lock Up/Quick Exhaust	Not Required		-						
40	Positioner	Output	Supply	Output	Isolated Valve	Type	Voltage	Not Required						
41	Cable Entry	N2 for all Electronic Enclosures				Limit Switches	Not Required							
42	SP Transducer	Signal Input	4-20mA from Control System				Open	Close	NA					
43	Air Supply	Range	Conn	230 to 275 kPa gwg	Limit Switches	Not Required		-						
MANUFACTURER & MODEL														
44	Item	Tag	Manufacturer	Model	Ex Cert.	Ex Authority	Certificate No.	Cert Expiry						
45	Value	80PV1305	Fluor	3" ET	-	-	-	-						
46	Actuator	-	Fluor	60P	-	-	-	-						
47	Positioner	-	Fluor	DV5010AD	ExHA, HC, TA	SAA	Aus Ex 3725A	09/09/2011						
48	Reference Value	None												

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

Instrument Index				
Tag No	Description	P&ID	Plant Connection	Manual
Loop No: L-1023 Service: T-1020 SLUG CATCHER				
LIC-1023A	PCS CONTROLLER	DWG-01-BP-1003	*	*
LIC-1023B	PCS CONTROLLER	DWG-01-BP-1003	*	*
LV-1023	DP FB LVL TRANS. HP&LP SEALS	DWG-01-BP-1003	T-1020	YOKOGAWA
LY-1023A	CONTROL VALVE	DWG-01-BP-1003	150-PL-1020-EA3N	FLOW VALTEC
LV-1023B	CONTROL VALVE	DWG-01-BP-1002	100-PF-1014-EA3X	FLOW VALTEC
LY-1023A	I/P CONVERTER	DWG-01-BP-1003	150-PL-1020-EA3N	*
LY-1023B	I/P CONVERTER	DWG-01-BP-1002	100-PF-1014-EA3X	*
Loop No: L-1024 Service: T-1020 SLUG CATCHER				
LAHH-1024	SIS ALARM	DWG-01-BP-1003	*	*
LALL-1024	SIS ALARM	DWG-01-BP-1003	*	*
LG-1024	MAG FOLLOWER LEVEL GAUGE	DWG-01-BP-1003	T-1020	VTA
LZT-1024	MAG ANA LVL TRANS.	DWG-01-BP-1003	T-1020	K-TEK
Loop No: L-1045 Service: C-1030 INLET SEPARATOR				
LAHH-1045	SIS ALARM	DWG-01-BP-1004	*	*
LALL-1045	SIS ALARM	DWG-01-BP-1004	*	*
LG-1045	MAG FOLLOWER LEVEL GAUGE	DWG-01-BP-1004	C-1030	VTA
LZT-1045	MAG ANA LVL TRANS.	DWG-01-BP-1004	C-1030	K-TEK
Loop No: L-1046 Service: C-1030 INLET SEPARATOR				
LIC-1046	PCS CONTROLLER	DWG-01-BP-1004	*	*
LV-1046	DP FB LVL TRANS. HP&LP SEALS	DWG-01-BP-1004	C-1030	YOKOGAWA
LY-1046	CONTROL VALVE	DWG-01-BP-1004	150-PL-1029-DA3N	FLOW VALTEC
LV-1046	I/P CONVERTER	DWG-01-BP-1004	150-PL-1029-DA3N	*
Loop No: L-1061 Service: C-1040 STABILISER FEED SURGE DRUM				
LG-1061	MAG FOLLOWER LEVEL GAUGE	DWG-01-BP-1005	C-1040	VTA
LIC-1061	PCS CONTROLLER	DWG-01-BP-1005	*	*

User defined reports may be easily created, including export to Excel and PDF

Instrument Designer module

This module enables 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. 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
- Create and manage drawing revisions
- 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 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 multiple drawings
- Automatic reference drawing numbering

Hookup / Installation Drawing Generation

- User-definable AutoCAD drawings
- Assign tags to hookup type, and hookup items from a user-definable catalogue. (Catalogue supplied with over 3000 items.)
- Automatically create drawings with BoM and Tag List
- Create BoM reports by plant area or for the total project

Change Management

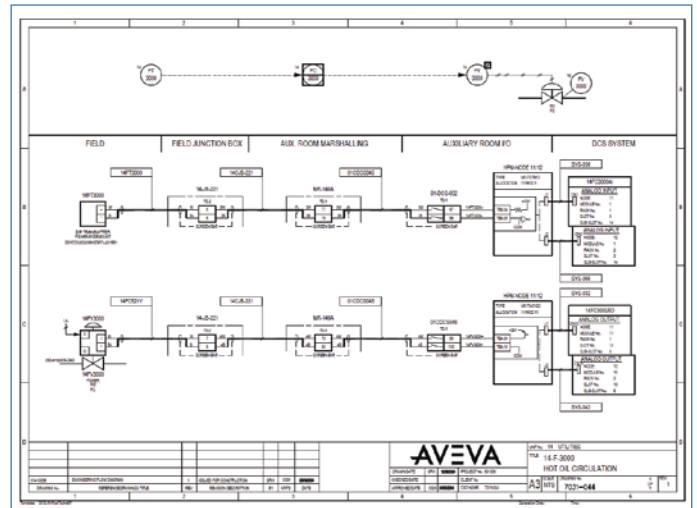
- Report all drawing changes, additions, deletions, renaming etc
- Report changes by field
- Log changes for reporting

Process Engineer Module

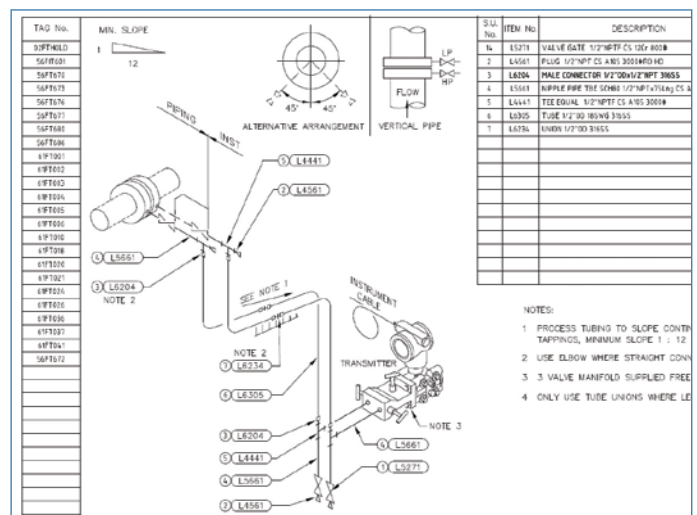
The Process Engineer module enables the viewing and editing of process data for multiple instruments, in a grid format. It gives users the ability to enter their own data and makes process data available for inclusion alongside instrumentation data on all documentation, e.g. datasheets.

Features include:

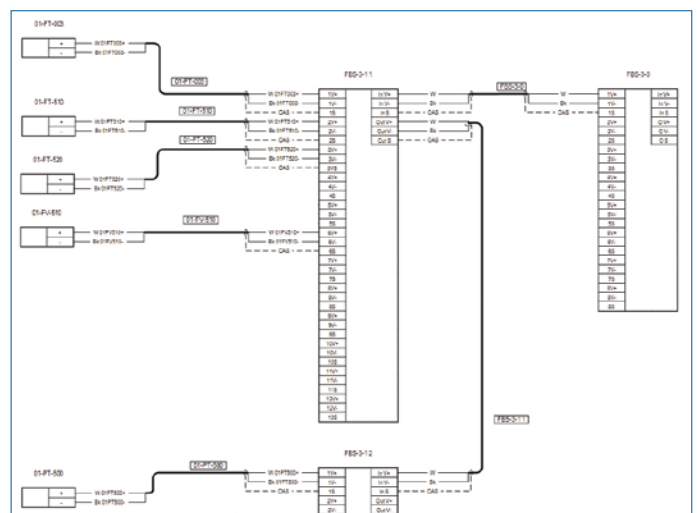
- Ability to view like instruments
- Immediate identification of gaps in data
- Immediate identification of inconsistencies in data
- Intuitive reporting capability, fully aligned with the rest of the AVEVA Instrumentation modules



AutoCAD Loop Diagram, generated using the Instrument Designer module



AutoCAD Hookup Drawing, generated using the Instrument Designer module



Fieldbus segment diagrams can be customised and delivered using AVEVA Instrumentation

