

9/10/2020

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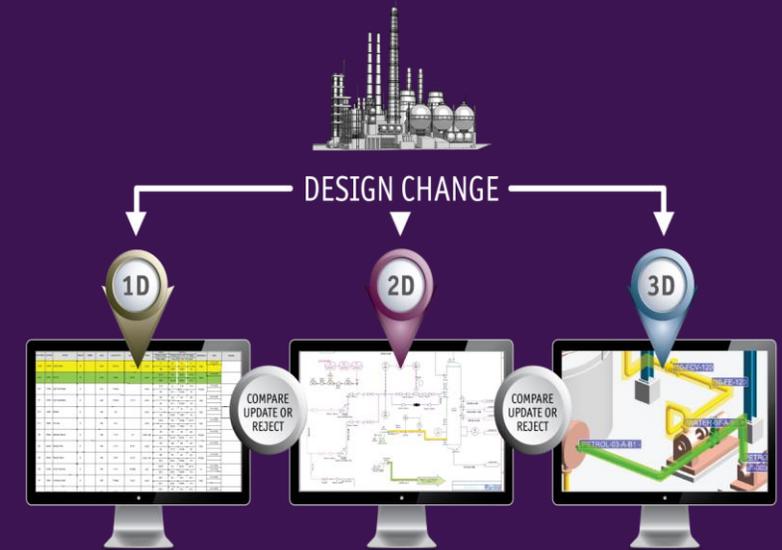
# Electrical & Instrumentation

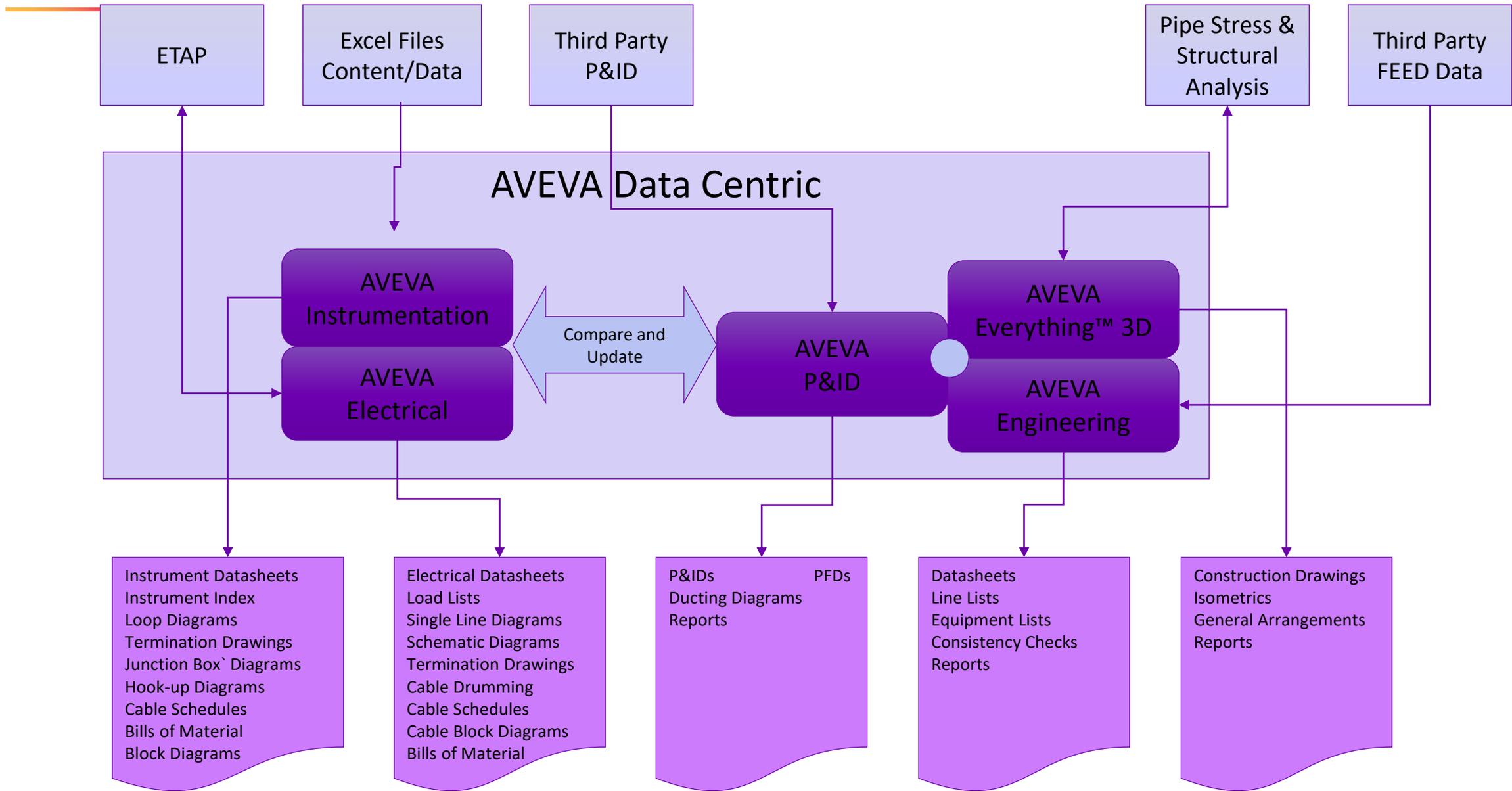
Joshua Herbert - Technical Sales Consultant

**AVEVA**

# Objectives

- ✓ Remove barriers between sources of information
- ✓ Improve the flow of information
- ✓ Keep personnel working with latest information
- ✓ Automate common tasks and work processes
- ✓ Lower cost through reuse and standardization
- ✓ Support global work sharing
- ✓ Improve consistency of data and deliverables
- ✓ Enter data once and use many times error-free







AVEVA Instrumentation



AVEVA Electrical

AVEVA

# AVEVA ELECTRICAL

# Designer

# Wiring Manager

# Engineer

The image displays a complex software interface for electrical design, featuring several overlapping windows and data tables.

**Equipment List (Top Left):**

AREA	DWGNO	sheet	DrawingType	EquipmentNo
Default	Garry-Do Not Delete	1	SchematicDiagram	Garry-Do Not Delete
Default	M-101	1	SchematicDiagram	M-101

**Equipment List (Top Right):**

Area	EquipmentNo	Description	EquipmentType	Status	VendorSuppli	DwgRequired	DesignStatus	SketchDwgNo	Rev
Default	B-101	Battery Bank 1	Battery Charger						
Default	CP-101	Remote Control Panel	Cabinet/Panel						
Default	EH-101	Vessel 1 heater	Heater						

**Supply Details (Middle Left):**

Equipment No: MCC-1-415V  
Description: Motor Control Centre process 1  
Supply Type: MCC  
Supply Class: Normal  
Rated Data: Voltage: 415 V, Load: 1000.00 kVA, No. of Phases: 3, Current: 2410.00 A, Frequency: 50 Hz

**Load Summary:**

Load	Maximum Demand	Active Power	Reactive Power	Current	Power Factor
Load:	302.18 kVA	292.37 kW	76.36 kVAr	420.39 A	0.968
Load:	197.71 kVA	182.37 kW	76.36 kVAr	275.06 A	0.922

**Cable Schedule (Bottom Right):**

Cable No	From	To	Cores	Size	OAS	GS	Length	Manufacturer	CatalogNo	V
M-300	MCC 1	M-300	3C+E	95mm <sup>2</sup>			100	Olex	FNHC22	0.6/1kV
M-301	MCC 1	M-301	3C+E	70mm <sup>2</sup>			150	Olex	FNHC20	0.6/1kV
M-302	MCC 1	M-302	3C+E	10mm <sup>2</sup>			200	Olex	FNHP13	0.6/1kV
M-303	MCC 1	M-303	3C+E	50mm <sup>2</sup>			250	Olex	FNHC19	0.6/1kV

**Diagram (Center):** A detailed electrical schematic showing a Generator 1 connected to a Transformer 1 (308.10 kVA). The transformer feeds into a MCC-1-415V busbar system, which includes MCC-1-415V Busbar 1 (415 V 50 Hz 3 ph 0.00 kVA) and MCC-2-415V Busbar 1 (415 V 50 Hz 3 ph 0.00 kVA). Various equipment units (M-100, M-300, M-301, M-302, M-303) are connected to these busbars. The diagram also shows a MCC 1 unit at the top.

# Engineer Module

Graphical Engineering

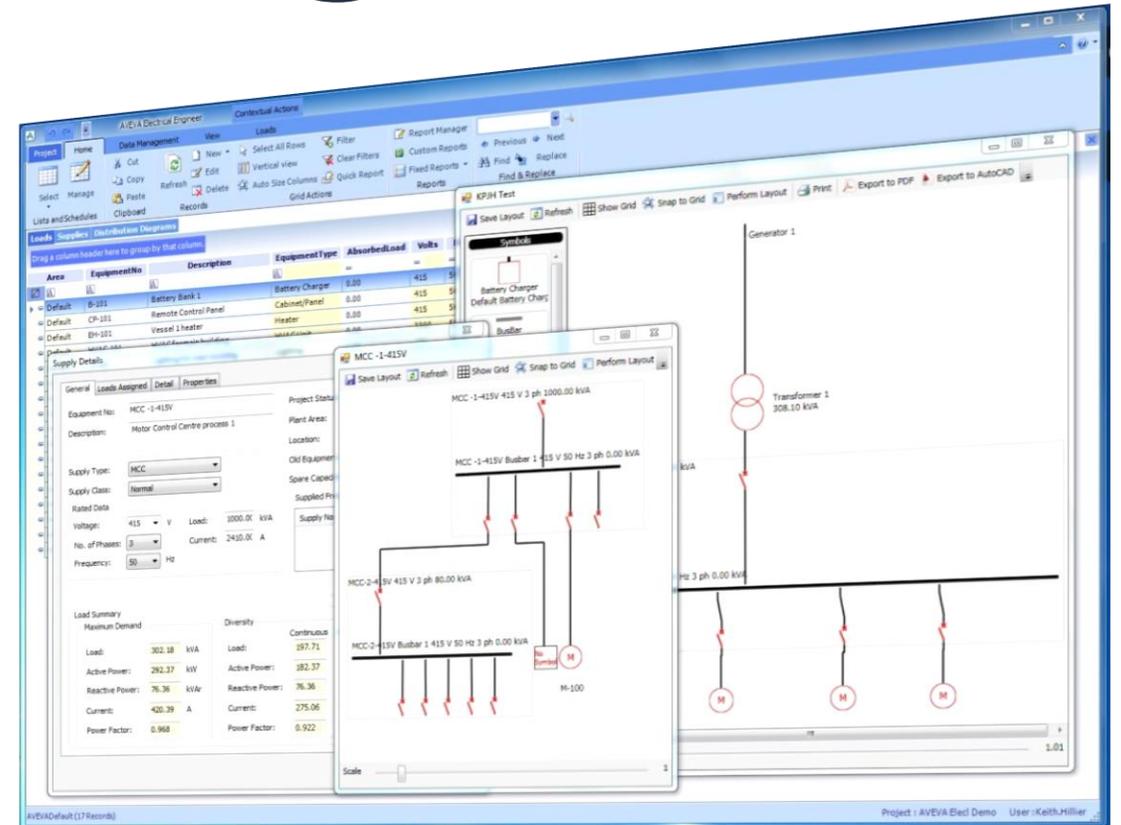
Load lists

Supplies

Calculations

Datasheets

# Engineer



# Wiring Manager Module

Cable schedules

Terminations

Cable block diagrams

# Wiring Manager

The screenshot displays the AVEVA E3D Electrical Manager software interface. The main window shows a cable block diagram with a central MCC 1 connected to three motors: M-301, M-302, and M-303. The diagram is titled 'Cable Block Diagrams - Unified Diagram'. Below the diagram, a 'Cable Schedule' table is visible, listing cable details for connections from MCC 1 to the motors.

Cable No.	From	To	Cores	Size	DAS	GS	Length	Manufacturer	CatalogNo	V
M-300	MCC 1	M-300	3C+E	50mm <sup>2</sup>			100	Olex	FNHC22	S.A/1KV
M-301	MCC 1	M-301	3C+E	70mm <sup>2</sup>			150	Olex	FNHC20	S.A/1KV
M-302	MCC 1	M-302	3C+E	10mm <sup>2</sup>			200	Olex	FNHP13	S.A/1KV
M-303	MCC 1	M-303	3C+E	50mm <sup>2</sup>			250	Olex	FNHC19	S.A/1KV

## Designer Module

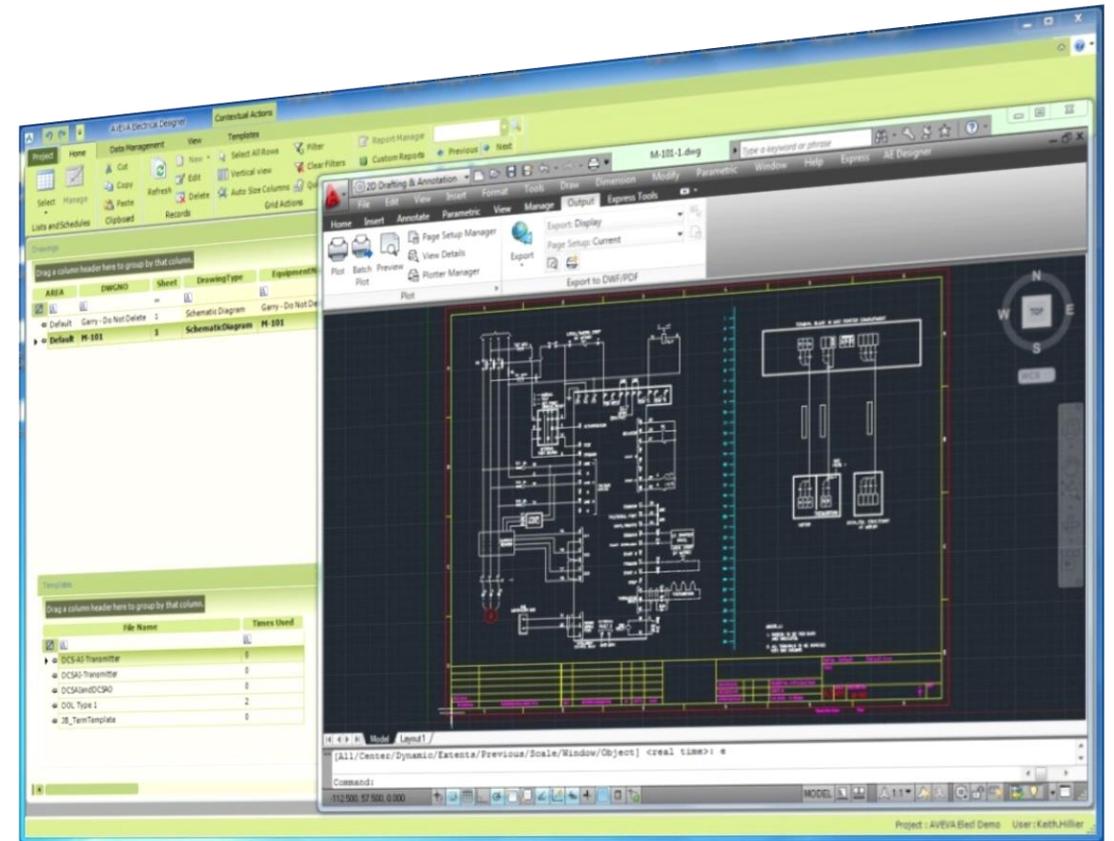
Auto Creation of Single Line Diagram In AutoCAD

Auto Creation of Schematic Diagrams in AutoCAD

Wiring/Termination Diagrams

Installation Details

# Designer



# Automatic Deliverables & Reports

The screenshot displays the AVEVA Instrumentation Engineer software interface. The top menu bar includes 'Project', 'Home', 'Manage', 'View', and 'Instruments'. The 'Instruments' menu is open, showing options like 'List Tools', 'Report Manager', 'Custom Reports', 'Fixed Reports', 'Find & Replace', and 'Find & Replace'. Below the menu is a toolbar with icons for 'Select', 'Manage', 'Clipboard', 'Records', 'Grid Actions', and 'Reports'. The main workspace is divided into several overlapping windows:

- Cable Schedule:** A table listing cable specifications.
 

Cable No	From	To	Length	Cores	Size	DWG	GS	Description	Status
16-98-024	16-98-024	16-98-027	100	20P	0.5mm <sup>2</sup>	✓	✓	PERGASCON/LAS/SHAW/PC-BLA	New
16-98-021	16-98-021	16-98-026	100	20P	0.5mm <sup>2</sup>	✓	✓	PERGASCON/LAS/SHAW/PC-BLA	New
16-98-022	16-98-021	16-98-026	100	20P	0.5mm <sup>2</sup>	✓	✓	PERGASCON/LAS/SHAW/PC-BLA	New
16-98-023	16-98-021	16-98-027	100	20P	0.5mm <sup>2</sup>	✓	✓	PERGASCON/LAS/SHAW/PC-BLA	New
16-98-025	16-98-021	16-98-027	100	20P	0.5mm <sup>2</sup>	✓	✓	PERGASCON/LAS/SHAW/PC-BLA	New
- Temperature Junction Box (1501-2):** A schematic diagram of a junction box with various terminals and connections.
- Block wiring diagram:** A complex schematic showing the interconnection of various instruments and components.
- Instrument Datasheet:** A table providing detailed specifications for a Differential Pressure Instrument.
 

Instrument Datasheet		
Tag No.	15-PT-110	15-PT-210
<b>Electrical Datasheet</b>		
1 Tag No	M-102A	Client
2 Service	P-102A HO Recycle Pump FEED	Project No
3 Reference SLD No	DD-X-4506-1	Location
4 Reference PID No	a1-51-2009-4	Specification Number
5 Equipment Type	Recycle Pump Feed Motor	Issue Purpose
<b>SITE CONDITION DATA</b>		
8 Ambient Temperature	HOLD	Installation Type
9 Design Temperature	270	Hazardous Area
10 Temperature Rise	340	Gas Group
11 Altitude	300	
12 Relative Humidity	405	
<b>ELECTRICAL DATA</b>		
16 Motor Voltage Class		Normal Speed
17 Motor Type		No of Poles
18 No Of Phases	3	Starting Method
19 Rated Voltage	415	Starting Current
20 Rated Power Factor	0.91	Start Up Time
21 Rated Frequency	50	Winding Connection
22 Rated Power	55	Winding Temperature Detector
23 Motor Duty Type		Bearing Temperature Detector

- Load Schedule
- Cable Schedules
- Cable Pulling Schedules
- Termination Reports
- JB arrangement & Equipment layout
- Datasheets
- Block wiring
- Installation details

TagNo	Area	Loop No	Description	Function	Number	MaxFlowRate	NormFlowRate	MinFlowRate
20-RV-105	20		RELIEF VALVE	RV	105			
20-QS-110	20		QUANTITY SENSOR ELEMENT	QE	110			
20-QT-110	20		QUANTITY TRANSMITTER	QT	110			
20-QA-110	20		QUANTITY ANALOG	QA	110			
20-PC-201	20		PRESSURE CONTROLLER	PC	201			
20-PT-201	20		Pressure Transmitter	PT	201			
20-TE-201	20		TEMPERATURE ELEMENT	TE	201			
20-FV-201	20		FLOW CONTROL VALVE	FCV	201			
20-LT-203	20		LEVEL TRANSMITTER	LT	203			
20-FV-2307	20		ORIFICE PLATE	FE	2307	0.0125m <sup>3</sup> /s	0.0083m <sup>3</sup> /s	0.005m <sup>3</sup> /s
20-FIC-2307	20		INDICATING CONTROLLER	FIC	2307			
20-FT-2307	20		TRANSMITTER	FT	2307			
20-PT-301	20		PRESSURE TRANSMITTER	PT	301			
20-XV-301	20		VALVE	XV	301			
20-PT-302	20		PRESSURE TRANSMITTER	PT	302			
20-PT-303	20		PRESSURE TRANSMITTER	PT	303			
20-LG-601	20		LEVEL GAUGE	LG	601			
20-TG-601	20		TEMPERATURE GAUGE	TG	601			
20-TG-602	20		TEMPERATURE GAUGE	TG	602			
20-PG-602	20		PRESSURE GAUGE	PG	602			
20-PG-603	20		PRESSURE GAUGE	PG	603			
20-PG-604	20		PRESSURE GAUGE	PG	604			
20-TG-604	20		TEMPERATURE GAUGE	TG	604			
20-TG-631	20		TEMPERATURE FEED TO REFLUX D	TG	631			

# Document Modification Management

Highlight in datasheets

Highlight in reports

Clouding in CAD drawings

The image displays a complex software interface for document modification management, featuring several overlapping windows:

- Instrument Datasheet (CONTROL VALVE):** A table with fields for Tag No. (01-FV-510), Service (Reactor 01-R-510A Feed), P&ID No., Line Number, Fluid Name (Diesel / HO), Fluid State (Liquid), Design Temp, and Design Conditions.
- Electrical Datasheet (INDUCTION MOTOR):** A table with fields for Tag No. (21-P-1505-B), Client (AVEVA), Project No. (SAMSP5), Reference SLD No. (21-P-1505-B), Location (SAMSP5), Reference PID No. (41-51-2009-4), Specification Number (SP-12-3X), Equipment Type (ROTARY), and Issue Purpose.
- Manufacturer / Vendor Data:** A table listing technical specifications such as Shaft Rotation Facing Motor Drive, Transmission Ratio, Thrust Transmitted to Motor, Bearing Type (DOUBLE SHIELDED), Cooling Method, Lubrication Type (POLYUREA), Lube Oil Supply Temperature, Space Heater Rating, Temperature Rise (CLASS B @ 10SF), Thermal Time Constant, Efficiency (94.00), Terminal Boxes Provided, Cable Gland Size, and Ground Lug Size.
- Report Instrument Index:** A window showing a list of instrument loops and services, with some entries highlighted in yellow.
- CAD Drawings:** Two AutoCAD windows showing piping and instrumentation diagrams. The drawings include labels like "PIPING INSTR." and "SLUFF BR." and feature clouded areas for modification.

# Cable Routing Integration With The Digital Model

**Fill Level Check**

Load From:  Site  Zone  Cableway  Cableway Branch

Select Cableway Branch

Cableway Branch	Max Fill Level
/CWAY-AREA03-POWER_B1	60

Total Items = 1

Connections  
 Connection 1: No Connections  
 Connection 2: No Connections

**Current Branch**  
 /CWAY-AREA03-POWER\_B1

Branch Points

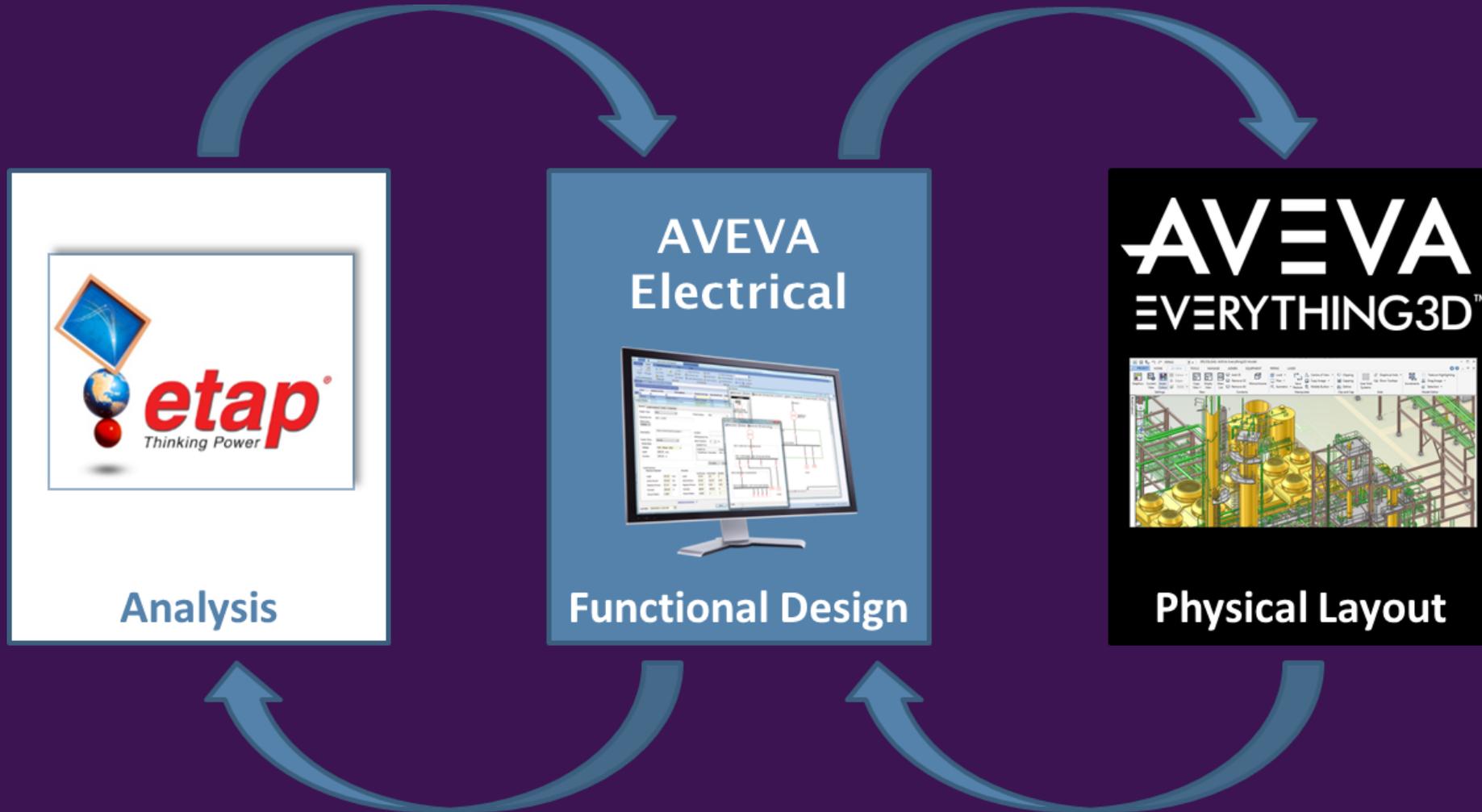
NAME	FLEVEL	FLEVEL 1	FLEVEL 2	FLEVEL 3	FLEVEL
HEAD	0.00	-	-	0.00	-
RN001	0.00	0.00	0.00	0.00	-
RATTA 2	0.00	0.00	1.73	1.73	-
RN100	1.73	1.73	1.73	0.00	-
RN101	1.73	1.73	1.73	0.00	-
RATTA 1	1.73	1.73	3.00	1.27	-
RN102	3.00	3.00	3.00	0.00	-
RATTA 3	3.00	3.00	3.00	3.00	-

Section No 8989      Section Width 800mm  
 Percentage Fill 75%

Cable No	From	To
001-1-A-P201	MCC001	P201
002-1-A-P401	MCC002	P401
002-1-A-P601	MCC002	P601
001-1-B-P201	MCC001	P201
002-1-B-P401	MCC002	P401
002-1-B-P601	MCC002	P601



# Integrated projects with AVEVA Electrical <sup>TM</sup>



# AVEVA INSTRUMENTATION

# Designer

# Wiring Manager

The screenshot shows the AVEVA Instrumentation Designer interface. On the left, there's a 'Drawings' list with columns for AREA, DWGNO, and SH. The main workspace displays a 2D drawing of a process area with various instrumentation symbols like flow transmitters and controllers. On the right, there's an 'Instruments' list with columns for AreaNo and TagNo. The interface includes standard CAD tools like 'Line', 'Move', and 'Draw'.

The screenshot shows the AVEVA Instrumentation Wiring Manager interface. At the top, there's a ribbon with tabs like 'Project', 'Home', 'Data Management', 'View', and 'Equipment List'. Below the ribbon is a table of equipment with columns: Area, EquipmentNo, Description, EquipmentType, Status, VendorSuppl, DwgRequired, DesignStatus, SketchDwgNo, Rev, and Parent. Below the table, there's a 'Cable Block Diagrams - 10-JB-001' window showing a schematic diagram with components like 10-FCV-120, 10-JB-001, 10-DCS-001, and 10-FT-120 connected by lines.

# Engineer

Instrument Datasheet		DIFFERENTIAL PRESSURE INSTRUMENT			
1	Tag No.	10-FT-120			
2	Service	Flow to G1306A			
3	P&ID No.	Line or Equipment: Flow to G1306A			
4	Area Classification				
5	Ingress Protection	IP 65			
PROCESS CONDITIONS					
7	Fluid Name	Fluid State	WASTE WATER		
8	Diff Pressure	Normal	Max	2.5 bar	Design Pressure
9	Temperature	Normal	Max	113 °F	Design Temperature
TRANSMITTER					
11	Instrument Range	LRV / URV / Units	0	10000	KG/H
12	Calibration Range	LRV / URV / Units	0	8900	KG/H
13	Accuracy	Sq. Root Extract			
14	Elevation	Suppression			
15	LP Proc. Conn.	HP Proc. Conn.			
16	Conduit Connector	Power Supply			
17	Housing	Paint	Tag Plate		
ELEMENT/ BODY					
20	Element Type	Element Material	Temperature Limits		
21	Measurement (Flow / DP etc)		Pressure Limits		
22	Body Material				
23	Bolts	Seals			
24	Other wetted materials				
25	Fill Fluid				
26	NACE Certification				
DIAPHRAGM SEAL					
28	Seal Type LP	Seal Type HP			
29	LP Proc. Conn.	HP Proc. Conn.			

# Engineer Module

Instrument Tags

Loop List

Integration

Data Deliverables

The screenshot displays the AVEVA Instrumentation Engineer software interface. The main window shows an 'Instrument Datasheet' for a 'DIFFERENTIAL PRESSURE INSTRUMENT' with tag number '10-FT-120'. The interface includes a menu bar, a toolbar, and a list of instrument tags on the left. The datasheet is divided into several sections:

- Instrument Datasheet:** Contains fields for Tag No. (10-FT-120), Service (Flow to G1306A), PSID No., Area Classification, and Ingress Protection (IP 65).
- PROCESS CONDITIONS:** Includes Fluid Name (WASTE WATER), Fluid State (Liquid), Design Pressure (2.5 bar), and Design Temperature (113 °C).
- ELEMENT/ BODY:** Lists Element Type, Element Material, Measurement (Flow / DP etc), Body Material, Bolts, Seals, Other wetted materials, Fill Fluid, NACE Certification, and Temperature/Pressure Limits.
- DIAPHRAGM SEAL:** Specifies Seal Type LP and Seal Type HP.

The software interface also shows a 'Contextual Actions' menu and a 'Data Management' toolbar. The status bar at the bottom indicates 'ENG ROADSHOW-Default (25 Records)'.

# Wiring Manager Module

Graphical Engineering

Block Wiring

Cable & Termination Management

Definition of Equipment, device  
terminal layout

Cables & Interconnections



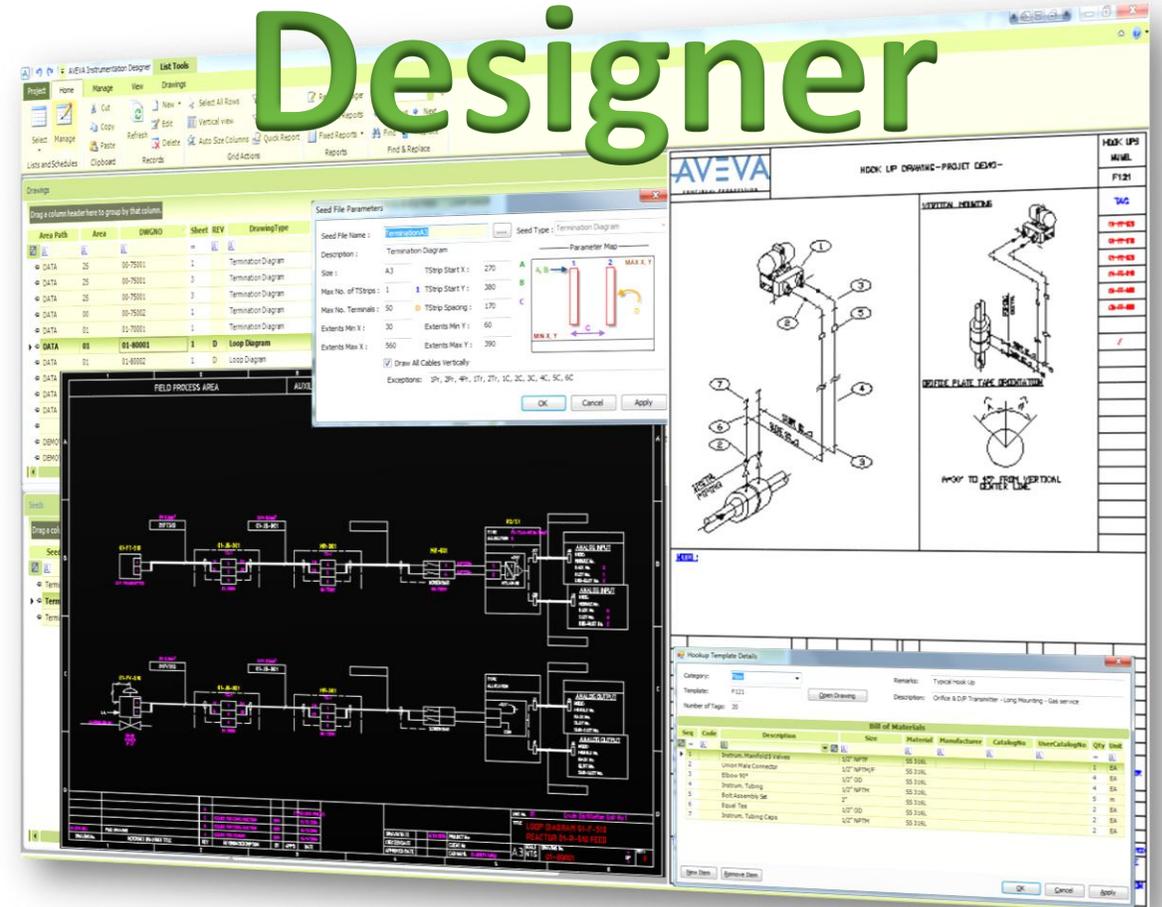
# Designer Module

Automated Diagrams

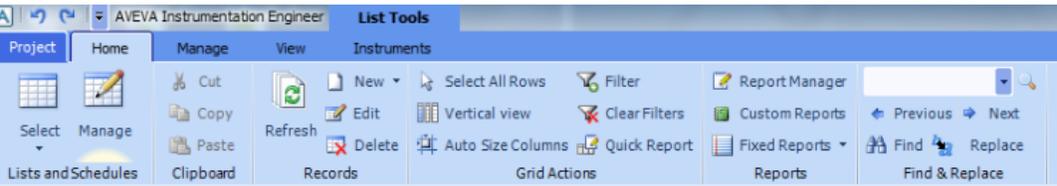
Hookup & Installation diagrams

Bill of Materials

Drawing Management



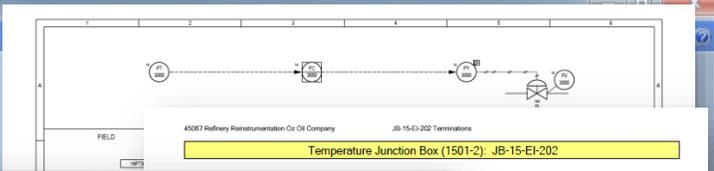
# Automatic Deliverables & Reports



Drag a column header here to group by that column.

TagNo	Area	Loop No	Description	Function	Number	MaxFlowRate	NormFlowRate	MinFlowRate
20-RV-105	20		RELIEF VALVE	RV	105			
20-QE-110	20		QUANTITY SENSOR ELEMENT	QE	110			
20-QI-110	20		QUANTITY INDICATOR	QI	110			
20-QT-110	20		QUANTITY TRANSMITTER	QT	110			
20-QI-111	20		QUANTITY INDICATOR	QI	111			
20-QI-112	20		QUANTITY INDICATOR	QI	112			
20-FCV-201	20		CONTROL VALVE	FCV	201			
20-FE-201	20		ORIFICE PLATE	FE	201			
20-PT-201	20		CONTROL VALVE	PT	201			
20-PV-201	20		CONTROL VALVE	PV	201			
20-TE-201	20		TEMPERATURE ELEMENT	TE	201			
20-FCV-203	20		CONTROL VALVE	FCV	203			
20-LIC-203	20		LEVEL INDICATING CONTROLLER	LIC	203			
20-LT-203	20		LEVEL TRANSMITTER	LT	203			
20-FCV-2307	20		FLOW CONTROL VALVE	FCV	2307	0.0125m3/s	0.0083m3/s	0.0056m3/s
20-FE-2307	20		ORIFICE PLATE	FE	2307			
20-FIC-2307	20		CONTROL VALVE	FIC	2307			
20-FT-2307	20		FLOW TRANSMITTER	FT	2307			
20-PT-301	20		CONTROL VALVE	PT	301			
20-XV-301	20		SHUTDOWN VALVE	XV	301			
20-PT-302	20		CONTROL VALVE	PT	302			
20-PT-303	20		CONTROL VALVE	PT	303			
20-LG-601	20		TEMPERATURE GAUGE	LG	601			
20-RO-601	20		ORIFICE PLATE	RO	601			
20-TG-601	20		TEMPERATURE FEED TO REFLUX D	TG	601			
20-PG-602	20		PRESSURE GAUGE	PG	602			
20-PG-603	20		PRESSURE GAUGE	PG	603			
20-PG-604	20		PRESSURE GAUGE	PG	604			
20-TG-604	20		TEMPERATURE GAUGE	TG	604			
20-TG-631	20		TEMPERATURE FEED TO REFLUX D	TG	631			

- Loops
- Termination reports
- Cable schedules
- Instrument indexes
- JB arrangement & Equipment layout
- Datasheets
- Block wiring
- Field buss segment diagrams
- Hook-ups



TAG No.	MIN. SLOPE	DESCRIPTION	MFR	CAT No.	QTY
SPT060	1	VALVE GATE 1/2"NPT CS 100-800W			1EA
SPT061	12	PLUS 1/2"NPT CS 300080 HD			1EA
SPT062		MALE CONNECTOR 1/2"ODx1/2"NPT 316SS	BILOK	DCT-8-8-55	4EA
SPT063		NPTFE PIPE THE SCH50 1/2"NPTx75Lg CS A10-B			4EA
SPT064		TIE EQUAL 1/2"NPT CS A105 300W			1EA
SPT065		TUBE 1/2"OD 316SS			8EA
SPT066		UNION 1/2"OD 316SS	B-LOK	01A-8-85	2EA

ITEM No.	DESCRIPTION	MFR	CAT No.	QTY			
16	Calibration Range	Min	Max	0 Bar	2.5 Bar	0 Bar	2.5 Bar
17	Elevation	Suppression	N/A	N/A	N/A	N/A	N/A
18	Element Type	Same as Body	Diaphragm	Diaphragm	316 SS	316 SS	316 SS
19	Element Material						
20	Body Material	Body Rating	316 SS	210 bar	316 SS	210 bar	316 SS
21	Process Flanges Material						
22	Wetted O-Rings Material		Glass Filled PTFE	Glass Filled PTFE			
23	Fill Fluid		Silicone DC 200 G1	Silicone DC 200 G1			
24	Boots	Housing	A286 SS	Low Cu Alum	A286 SS	Low Cu Alum	
25	Paint		Epoxy or similar(Note 4)	Epoxy or similar(Note 4)			
26	Connection	Process	1/4" NPTF	1/2" NPTF	1/4" NPTF	1/2" NPTF	
27	Ingress Protection	Accuracy	IP 68	0.1% of span	IP 68	0.1% of span	
28	Process Connection		N/A	DIAPHRAGM SEAL	N/A		
29	Rating						
30	Diaphragm Material						
31	Housing Material	Upper	Lower				
32	Fill Fluid						
33	Capillary Material						
34	Capillary Type	Capillary Length					
35	Flushing Connection						
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# Document Modification Management

Highlight in datasheets

Highlight in reports

Clouding in CAD drawings

The image displays three overlapping software windows from the AVEVA suite, demonstrating document modification management features:

- Top Window (Instrument Datasheet):** Shows a table for 'CONTROL VALVE' with tag '01-FV-510'. The 'Operating Conditions' section is highlighted in yellow.
- Middle Window (AVEVA Instrumentation Report Manager):** Displays a report titled 'Instrument Index' with a table of instrument details. The 'Loop No: 01-F-510' section is highlighted in yellow.
- Bottom Window (AutoCAD):** Shows a CAD drawing of a piping system. Several instrument symbols are highlighted in red, including '01-FV-510', '01-FV-520', '00-FV-600', '01-FV-003', '01-FE-510', and '01-FE-520'.

# Instrumentation VIDEO

# Value of AVEVA Electrical / Instrumentation solution

- Easy To Use
- Complete Change Management.
- Standardization of Catalogs.
- Visualization and Reporting Clarity.
- Project Scalability.
- Vendor Data Support.
- Viewing Electrical Data in a 3D Context.



# Q&A

This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

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#### ABOUT AVEVA

AVEVA is a global leader in engineering and industrial software driving digital transformation across the entire asset and operational life cycle of capital-intensive industries.

The company's engineering, planning and operations, asset performance, and monitoring and control solutions deliver proven results to over 16,000 customers across the globe. Its customers are supported by the largest industrial software ecosystem, including 4,200 partners and 5,700 certified developers. AVEVA is headquartered in Cambridge, UK, with over 4,400 employees at 80 locations in over 40 countries.

[aveva.com](https://www.aveva.com)