


CADWorx Instrumentation page

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What is CADWorx Instrumentation?

CADWorx Instrumentation is a "data-centric" Instrument design and documentation system. The software is used by instrumentation or control system design engineers for the automated production of instrumentation documents such as, Instrument Data Sheets, Loop Diagrams, Hook up Diagrams, Wiring /Terminal Strip diagrams, Instrument Index reports, Bills of material reports, Cables Schedule reports, Interconnection reports and many other documents. This automated production of deliverables increases efficiency and accuracy and reduces project costs.

CADWorx Instrumentation uses a familiar drag and drop method to link components and electrical connections and includes copy and paste, search, replace, and many other "spreadsheet style" tools.

CADWorx Instrumentation database options include MS-Access and SQL Server, and additional processing of the instrumentation data can be easily accessed by IT administrators "behind the scenes".

Exports and imports are available to most common formats to easily incorporate vendor and customer data. External "component" databases such as a P&ID database can be live linked with a minimum of effort allowing CADWorx Instrumentation to optionally absorb and modify data from your P&ID or external system.

The software can be fully integrated with CADWorx Electrical and CADWorx Raceway 3D modelling and cable routing. Linking to other SQL based applications is limitless and under user control. This automated transferal of data increases efficiency and accuracy which can provide significant project cost reduction.

CADWorx Instrumentation can be integrated with Cable Scheduler allowing users the benefit of a single database for their I&E project, which again, increases accuracy, lowers re-work, and reduces project costs.

Output drawings are created in DWG format. Datasheets are created in Excel format. Reports generated including Instrument Index, I/O lists, Cable Schedules etc. are available in Excel , Access or SSRS.

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Overview	Benefits	Capabilities	Key Features	Customer Success	System Requirements	Related Products
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Overview

Why Use CADWorx Instrumentation?

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Repetitive diagrams such as loops and hook-ups, and documents such as data sheets and instrument indexes, are ideally suited to tabular work procedures. Using CAD and text formats alone is slow and error prone for these large drawing sets having arrays of repetitive data.
Who Uses CADWorx Instrumentation?
Instrumentation or Control System design engineers will typically be working with PLC or DCS based control systems for continuous processes. The instrumentation, I/O and connectivity for these systems requires a significant level of documentation (e.g., datasheets and loop diagrams) all of which can be efficiently produced with CADWorx Instrumentation.
Industries Served
<ul style="list-style-type: none">• Oil & gas• Petrochemicals• Chemicals• Pharmaceuticals• Food & beverage• Water• Power - Nuclear/non-Nuclear• Semiconductor• Mining• Marine• Utilities• Infrastructure/AEC/BIM

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Benefits of CADWorx Instrumentation
Centralized Data Management: <ul style="list-style-type: none">• Unified Database: Provides a centralized database for all instrumentation data, ensuring that all information is stored in one location, which improves data accessibility and management.• Single Source of Truth: Acts as a single source of truth for instrumentation data, reducing data duplication and inconsistency.
User-Friendly Interface: <ul style="list-style-type: none">• Intuitive Design: Features a user-friendly interface that simplifies navigation and makes it easier for users to access and manage instrumentation data.
Streamlined Instrumentation Lifecycle Management: <ul style="list-style-type: none">• Full Lifecycle Support: Manages the entire lifecycle of instruments from procurement through installation, maintenance, and decommissioning, helping to ensure that instruments are properly tracked and managed throughout their useful life.

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- **Maintenance Tracking:** Includes features for tracking maintenance schedules, service records, and calibration history, which helps ensure instruments are maintained in optimal condition.

Enhanced Data Accuracy and Integrity:

- **Automated Data Entry:** Automates data entry and updates, reducing the risk of manual errors and improving the accuracy of instrumentation data.
- **Validation and Verification:** Provides tools for data validation and verification, ensuring that all information is accurate and meets necessary standards.

Integration with Other Systems:

- **Seamless Integration:** Integrates with other CADWorx design tools – [CADWorx P&ID Professional](#) and [CADWorx Raceway](#) - and third-party systems, enabling smooth data flow and interoperability between solutions.
- **Data Import/Export:** Supports data import and export features, facilitating the exchange of information between different systems and software.

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Improved Collaboration and Communication:

- **Shared Access:** Allows multiple users to access and work with instrumentation data simultaneously, improving collaboration among team members.
- **Access Control:** Provides role-based access control to ensure that users only have access to the data and functionalities relevant to their responsibilities.
- **Customizable Reports:** Generates customizable reports that can be tailored to meet specific project or regulatory requirements, providing detailed insights into instrumentation data.

Regulatory Compliance and Standards:

- **Compliance Tracking:** Helps ensure compliance with industry regulations and standards by tracking and documenting all necessary instrumentation data and maintenance activities.
- **Audit Trails:** Maintains comprehensive audit trails for all data changes and activities, supporting transparency and accountability.

Cost and Time Efficiency:

- **Reduced Administrative Effort:** Automates many aspects of instrumentation management, reducing the administrative effort required and freeing up resources for other tasks.
- **Optimized Instrument Utilization:** Improves the utilization and management of instrumentation resources, which can lead to cost savings and increased operational efficiency.

Scalability and Flexibility:

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- **Adaptable to Various Needs:** Scalable and flexible to accommodate different sizes and types of instrumentation projects, from small installations to large industrial systems.
- **Customizable Solution:** Offers customizable features to fit specific project requirements or organizational needs.

Training and Support:

- **Technical Support:** Hexagon provides comprehensive technical support to assist users with troubleshooting, software updates, and best practices, ensuring that teams can fully leverage the software's capabilities.
- **Training Resources:** Users have access to a variety of training resources, including webinars, tutorials, and documentation, to help them maximize the benefits of CADWorx Instrumentation. Free eLearning available via [Hexagon University](#).

CADWorx Instrumentation provides a robust and efficient solution for managing instrumentation systems, with strong capabilities in data management, lifecycle support, reporting, integration, and user accessibility. Its features are designed to enhance data accuracy, streamline operations, and support effective collaboration, making it a valuable tool for organizations dealing with complex instrumentation needs.

Capabilities

- Works on AutoCAD and BricsCAD
- Supports commercially available databases: Access, SQL
- Automated mass production of deliverables
- Automated reports
- Ability to access cloud-based projects
- Live link to CADWorx P&ID database (also AutoCAD P&ID)
- Cable Block Diagrams
- Flexible import from XLS, MDB, SQL, DBF
- Import forms from vendors
- Drag and drop "smart" interconnection
- Smart bulk editing tools
- CAD DWG for diagrams and XLS for datasheets
- eLearning content available

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Diagram Production:

- Automated production of Loop diagrams (in DWG format.)
- Automated production of Hook up diagrams (in DWG format.)
- Automated production of Wiring /Terminal Strip diagrams (in DWG format.)

Document Production:

- Automated production of Instrument Data Sheets (in Excel format.)
- Automated production of Instrument Index report.
- Automated production of Bill of materials report.
- Automated production of Cables Schedule report.

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- Automated production of wire interconnection lists.
- Automated production of conductor/core interconnection lists.
- Automated production of User-defined reports.
- Project Management and Revision tracking.
- Automated project drawing index list.
- Automated materials quantity summary report.
- Automated wire label / ferrule lists.
- Tag name duplication cross referencing report.
- Automated warnings summary.
- Revision comparison reports for all parts and connections.
- Importing, Exporting, and Linking to [CADWorx P&ID Professional](#).
- A CADWorx P&ID database (or other user "component" databases) can be live linked with a minimum of effort allowing CADWorx Instrumentation to optionally access and modify data from the P&ID system.
- Exports and Imports are available to most common formats for ease of incorporation of vendor data and supply of customer data. Flat file and relational imports and exports are possible.
- Import and export directly from client instrument datasheets.

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Database:

- Database choices of Access and SQL Server.
- Tables and the structure of the tables is user definable.
- Multi-user system designed for concurrent engineering.
- Preliminary component, cable, and enclosure information from CADWorx Electrical single line and cable block diagrams is instantly available for inclusion within your CADWorx Instrumentation database.
- Cable lists, components, and enclosures within CADWorx Instrumentation can be instantly made available to CADWorx Raceway for modelling, interference analysis and cable and raceway routing and filling.

User Interface:

- Users can work in a familiar drag and drop "explorer style" environment or in a tabular "spreadsheet style" environment with row and column copy/paste, search and replace, filter, sort and increment and many other "spreadsheet style" tools.
- Folders represent "containers" for instruments and other components.
- Use client datasheets as a form for your data entry.

User Management:

- Users may be set up to be Administrators, Users, or Viewers. Administrators may be normal users that can manage other users and have advanced set-up options. Users manage the data and networking inside the databases, with the aim of producing output documents. Viewers can access the database as "read only".

Data Specifications:

- Instrument data ratings and specifications are maintained in "per instrument type" tables and the contents of these tables are user definable.

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- All components are "specification capable" and can have an instrument data sheet.
- User definable "WYSIWYG" instrument data sheets.

Template System:

- Most output documents and diagrams are "template based" and as such, their appearance and data content are under user control. The templates are typically in DWG format for diagrams, Excel for instrument data sheets and Access for Reports.

Electrical Terminations and Links:

- Association of components with their related areas, enclosures or similar can be done via drag and drop mechanisms which establish the link between the items. Electrical connections can also be done in this way. By dragging one or many conductors OR dragging whole cables on to a terminal strip (or an instrument) bulk terminations can be made.
- Loops and terminal strips are graphically displayed "WYSIWYG" as connections are made for those loops/ strips.
- Instruments and other catalogue based devices can be pre-allocated cable types, automated cable naming, and terminations removing the need to create terminations manually.
- Imported components with valid catalogue numbers can "adopt" cables and terminations as specified in their respective catalogues.

Event Log:

- The Event Log records user nominated activities from user login/logout to a component modification/deletion, to document printing or exporting. Events are logged with the activity, user, and time data, in daily tables.

Key Features		
Adding Components	Importing Data	Adding Wires
		
<p>Instrument definition and control system design is made easy through an intuitive user-interface and focused industry workflows. Components having the correct specification are selected from in-built vendor or custom-defined catalogs. Add a data sheet or loop, globally edit components to ensure consistency in tagging, numbering and design information.</p>	<p>Import and export data from and to many other sources, including static spreadsheets and other databases. Live linking to an existing P&ID database enables data for instruments as well as associated components such as tanks, lines, valves and other equipment to be shared so that it becomes part of the overall control system design.</p>	<p>Quickly add wires and multi-core cables as batches with the correct specifications. Connect via marshalling terminal strips and junction boxes. Cables are smart, having all the data required for termination, and later, automated cable routing and tray filling.</p>
Connecting Wires and Cables	Data Sheets	Hook-up Diagrams
		
<p>Connect cables and wires to instrument devices and junction box terminals quickly and easily by dragging and dropping conductors to make electrical connections.</p>	<p>Data sheets can be easily customized, letting you produce exactly what you need. Excel-based working supports the efficient creation and update of instrument data sheets as your project progresses.</p>	<p>Hook up diagrams, otherwise known as installation detail drawings, are generated from templates, fully customizable in terms of appearance and content. The background CAD diagram is 100% your choice!</p>
Loop Diagrams	Terminal Strip Diagrams	Reports
		
<p>Three different types of loop diagram - Auto loops, Custom loops, and Field-bus loops are possible. Loops are built 'Lego building block style' with many small template blocks arranged parametrically to form the loop. The Loop preview displays the</p>	<p>Terminal strip diagrams, otherwise known as wiring diagrams, are generated by the wiring diagram generator using customisable templates. Each instrument can have its own wiring diagram based on your choice of graphic. Cables are drawn between any connected</p>	<p>All report options you need to support accurate procurement of materials, and to help manage your projects, are available. Reports use templates which you can customise to your needs. The format and content included in all report types is completely</p>

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default loop that will be drawn for an instrument.	components and all base template formulae including the title block formulae, are based on data within the database.	customizable without programming.
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Customer Success	
Downer Engineering (Australia)	Roche Energy (Australia)
	
<p><i>"Automatic generation of drawings from database information resulted in significant improvements in terms of drawing accuracy, quality control, and change management over more conventional drawing production methods."</i></p> <p align="center"><i>Engineering Manager</i></p>	<p><i>"Using Protogen, I have produced over 200 loop drawings from 16 different prototypes, and I did it in less than 2 weeks. The others, 4 of them, produced 500 loop drawings manually, and it has taken them 3 months."</i></p> <p align="center"><i>Engineer</i></p>

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Related Products
CADWorx Electrical CADWorx Raceway CADWorx P&ID Professional BricsCAD

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