system 302

Open Digital Ecosystem

Software Portfolio

System302 Open Digital Ecosystem, ready for Industry 4.0
A scalable portfolio of software, hardware and services, ready to transform your industry's performance.

smar
Technology Company

In this Catalog

As a result of more than four decades of experience in the development and supply of industrial instrumentation and automation solutions on all continents, Nova Smar S/A today owns and maintains an Open Digital Ecosystem called System302, which consists of a scalable hardware, software, and services portfolio based on industry open standards and best practices, which allows its users to implement applications capable of **transforming the performance of their industrial plants.**

In addition to providing communications and logic execution for continuous and discrete controls, System302 Software modules were designed to increase the efficiency of industrial operations.

Solutions for visualization, operation, maintenance, historical record, data analysis, cloud integration, access from anywhere and from any device, connectivity and technological standardization are part of this suite.

Such solutions can be applied to any type of industry for contributing to the improvement of its operations and to the automation and digitization of its information usage, as a way to solve typical situations and challenges of an industrial production environment, with its highly varied processes and equipment.
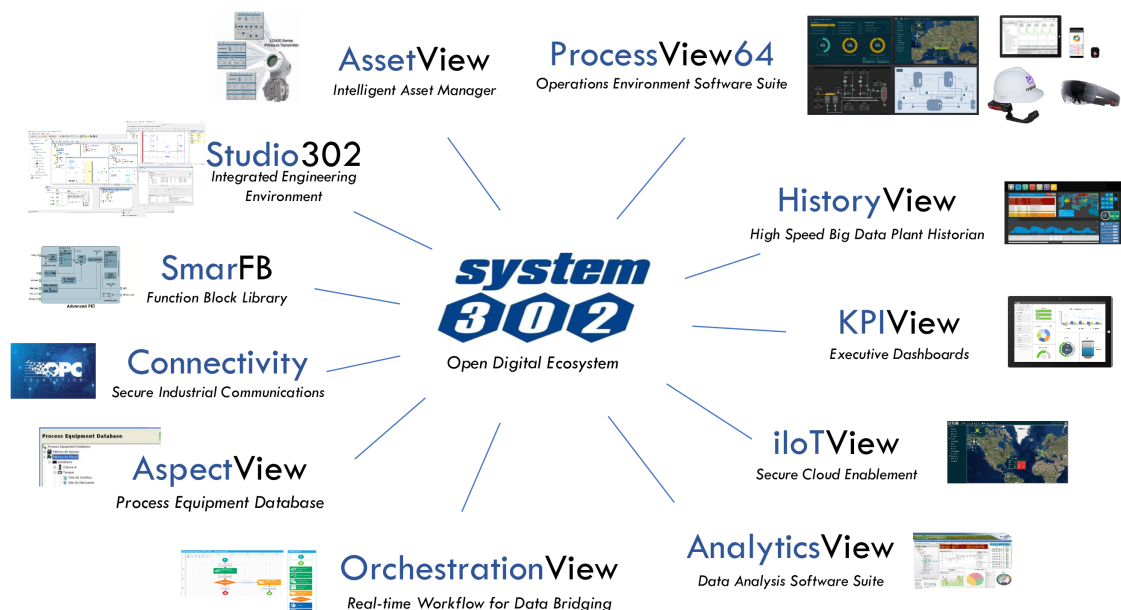
Smar´s System302 Software Portfolio

The following figure illustrates a typical physical architecture, which can be implemented from System302 solutions. It joins devices, field signals, controllers, server computers and clients workstations, among other components in order to deploy automation and control systems for solving the most diverse challenges of any type of industrial processes and plants.
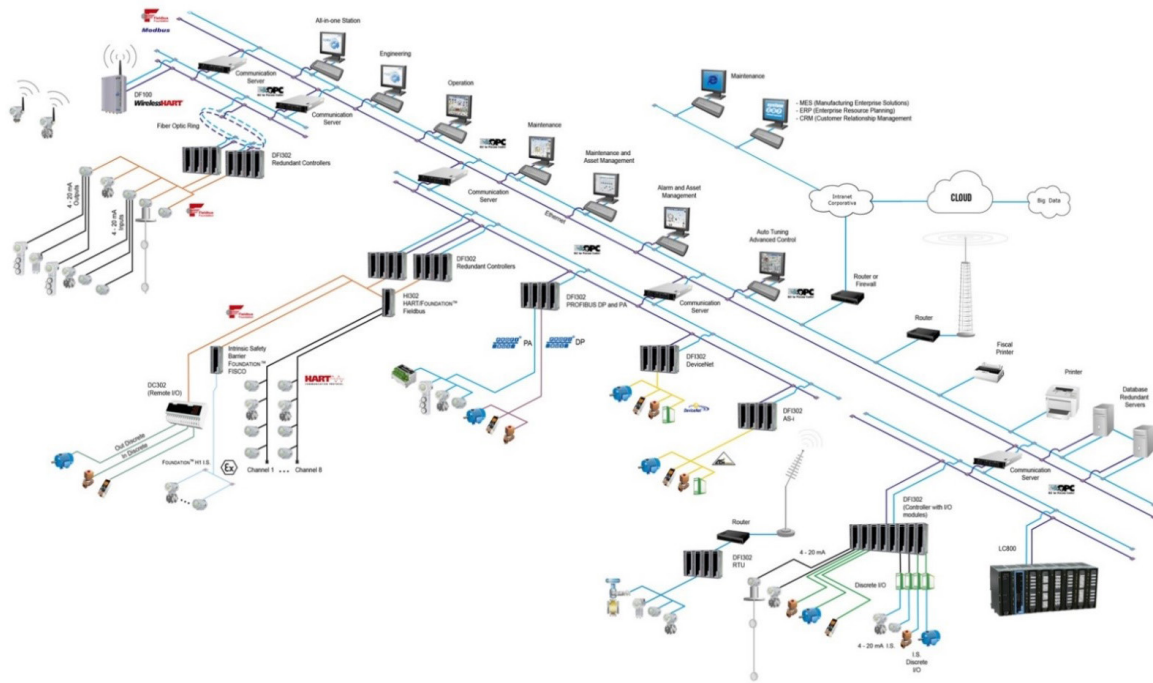
The subject of this catalog corresponds to the suite of software applications which can run on server computers, workstations and many other devices such as Thin clients, Tablets, Smart Phones and even Smart Watches, which function as user interfaces. It is a set of software modules designed to make the work processes of its users more efficient.

The following diagram illustrates the main System302 software solutions.

AssetView
Intelligent Asset Manager

ProcessView64
Operations Environment Software Suite

Studio302
Integrated Engineering Environment

HistoryView
High Speed Big Data Plant Historian

SmarFB
Function Block Library

KPIView
Executive Dashboards

Connectivity
Secure Industrial Communications

system 302
Open Digital Ecosystem

iIoTView
Secure Cloud Enablement

AspectView
Process Equipment Database

AnalyticsView
Data Analysis Software Suite

OrchestrationView
Real-time Workflow for Data Bridging

Studio302
Integrated Engineering Environment

Everything you need to set up networks, devices, and controls in a single easy-to-use environment

Studio302 is an user-friendly integrated engineering environment which includes all software tools necessary for the configuration, management and maintenance of networks, devices and controls of a control and automation system.

### Flexible Architecture Supporting Multiple Workstations

Studio302's Client/Server architecture allows the creation of an Engineering and Maintenance environment for the system consisting of numerous workstations, with controlled access to system configuration and diagnostics.

Single and Integrated Database

The complete system configuration is stored in a single database, ensuring the consistency of the entire application and making its management much easier. This way, once edited at one of the stations, the configuration is automatically updated throughout the system, eliminating the need for repetitive configurations on different machines. Studio302 is also equipped with modification management features which ensure that specific areas of the application are not edited at the same time by more than one user, thus eliminating inconsistencies. Thus, it reduces significantly the complexity of users work processes.
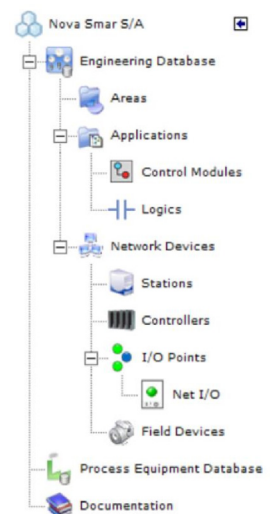
*Quick access to physical nodes and logical settings*
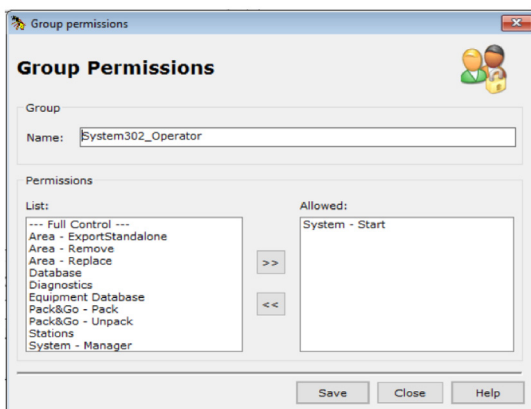
Access Management

Users Integrated to the Operating System

User groups created on Windows operating system can be automatically incorporated into Studio302´s login. And access priviledges defined for each professional ensure that each user profile only has access to a certain set of functionality.

Backup and Restore

Studio302 also has resources for creating backup copies of the entire configuration through a simple command.
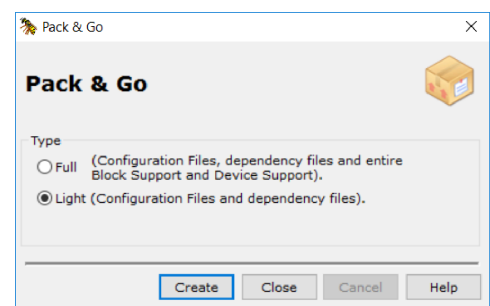

Pack / Unpack for backup and restore functionality

Graphical visualization of the execution of control strategies and logics

Configuration is simplified by being based on the hierarchy and terminology of the ISA S88 standard. And all configuration of devices, function blocks and their parameters is based on tags rather than meaningless addresses.

And the mesh settings or discrete logic and control strategies are implemented through easy-to-use graphical tools such as **Syscon** and **LogicView**.
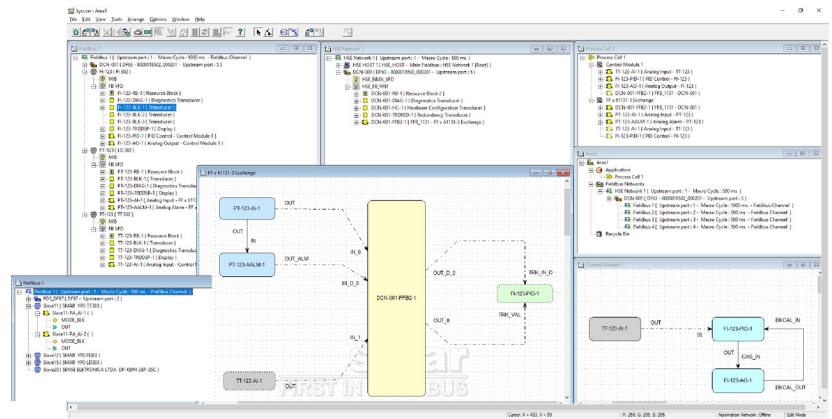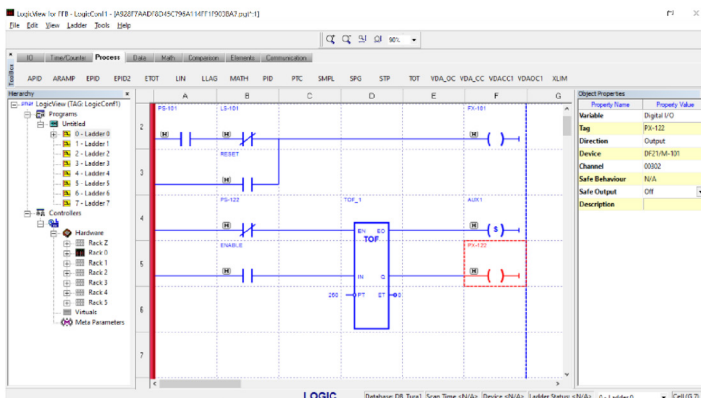

Syscon - Control Strategies with Function Blocks

LogicView – IEC 61131-3 logics

Quick and Easy Access to Online Information

Online information of variables, diagnostics and other types of device parameters, as well as logics and controls execution status are always available, making tests, adjustments, troubleshooting, etc.

## Advanced Diagnostic Features for Local and Remote Troubleshooting

In addition to device diagnostics, Studio302 also has advanced features including reports, logs, network analyzers.

System Simulation

Studio also includes a system controllers simulation tool called **SimulationView**. This way, users are able to simulate the operation of controllers for testing or for implementing environments for operation training (OTS - Operator Training Simulator).
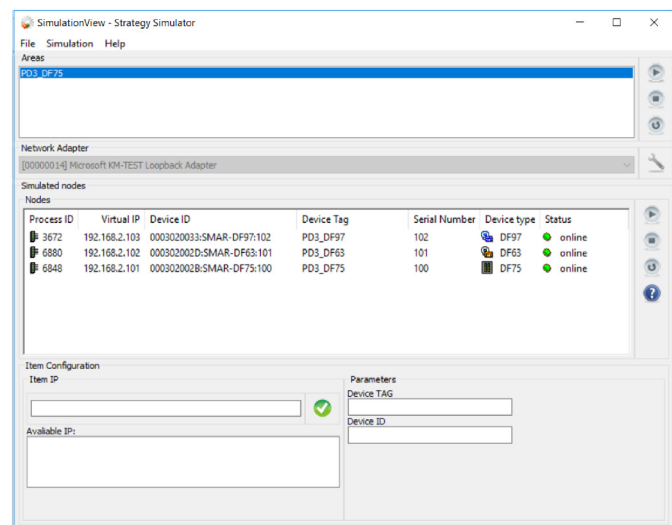

SimulationView - System Simulation

Special Applications

Studio302 also incorporates software tools dedicated to special applications such as **HFCView**, which is a software for supervision, management and reporting of flow measurement systems (AuditFlow) based on the HFC302 flow computer from Nova Smar S/A. Similar to this one, this environment also includes **TMCView** software for managing and reporting tank gauging systems.

HFCView - Management and Reporting of Flow Measurement Systems

In addition to all these benefits and other facilities, **Studio302** also includes several other features to meet your systems management needs, including **LicenseView**, called software license manager, **ServerManager** to manage OPC communication servers, **FBTools** for carrying out device firmware updates, a configuration database manager, tools for parameterizing certain types of devices such as **ProfibusView** for ProfibusPA instruments and the **FDT HART Configurator** for HART devices, among others.
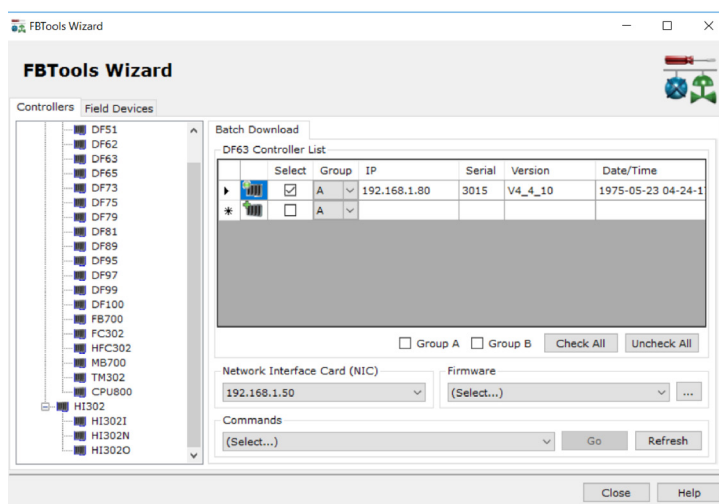
FBTools - Updating firmware tool for Controllers and Field Instruments

Regarding OPC communication, SMAR offers a complete set of Classic and UA (Unified Architecture) OPC servers and clients. The so-called Classic OPC includes OPC DA (Data Access), OPC AE (Alarms and Events) and OPC HDA (Historical Data Access). OPC servers are available for the full range of SMAR controllers and other of its Ethernet-connected devices.

In short, **Studio302** constitutes a complete set of software tools for the configuration, operation and management of devices, networks, controls, logics and communications of an industrial process automation system.

AssetView
Intelligent Asset Manager

Transform the power of your intelligent devices into Reliability and Performance

AssetView is an asset management tool for virtually any intelligent device or equipment, such as field instruments, valve positioners and controllers.

Higher EFFICIENCY:
- Productivity
- Quality
- Availability

Lower COSTS related to:
- Operation and maintenance
- Health, Safety and Environmental Risks
- Waste and Rework

This powerful tool allows users to obtain significant reliability and performance improvements through the use of the **diagnostic** information availabe on **intelligent devices.** Online Monitoring and data Storage and Analysis are the basis of its application, which leverages open communication technologies such as **Fieldbus FOUNDATIONTM, Profibus, HART** and **WirelessHART.**

The software also includes a set of functionalities to support maintenance activities, aiming to facilitate the execution of reactive maintenance activities, at the same time that it provides resources for the greater use of planned maintenance practices (preventive, predictive and proactive).

Benefits and Features:
- Flexibility through the use of Web browsers as user interface;
- Increase in coverage through the use of open technologies and the consequent possibility of incorporating devices from any manufacturer;
- Higher productive maintenance resulting from the use of AssetView´s powerful resources which facilitate and make the Maintenance Teams work processes much more efficient;
- Results improvements, such as:
  - √ Improvement of operational reliability and efficiency (productivity, quality and availability);
  - √ Reduction of unscheduled downtime and maintenance costs;
  - √ Faster troubleshooting and issue resolution;
  - √ Faster device configuration and commissioning;
 - √ Reduction of accident risks due to equipment failures.

LD400 Series Pressure Transmitter

ProcessView64
Operations Environment Software Suite

State of the Art Technology for Operations

Designed to leverage 64-bit platforms and OPC UA technologies, PROCESSVIEW64 allows operators, executives and IT professionals to integrate information in real time in a secure and unified viewing environment, fully Web enabled.

Among the most important points in this set of scalable solutions from SMAR for operations, we must mention its visualization technology that allows access from any desktop or mobile device; its high availability; centralized configuration; and the ability to connect to a wide variety of industry standard communication protocols.
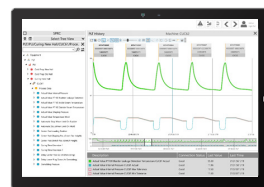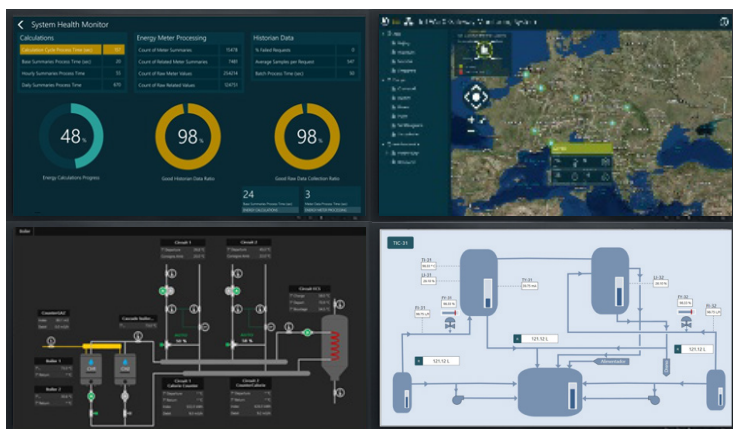
ProcessView64 is a powerful suite of software applications for performing and managing Industrial Plant Operations, including:

- AnyGlass visualization
- Mission-critical redundancy (real-time, historical and alarm information data is always available)
- Powerful Centralized Configuration
- Universal Connectivity
- Minimized Design Time
- Object Oriented Distributed Alarm Management

- Asset organization according ISA-95
- Robust Real-Time and Historical Trends
- Native Geo-SCADA
- Asset visualization in 2D and 3D graphics
- Creation of powerful reusable smart symbols
- Reports
- Configure once and deploy anywhere

AnyGlass Visualization

Bring the visualization of SMAR to any device. Create displays on the desktop that can responsively scale to run on any mobile client. Leverage native apps to provide a consistent user experience on any smartphone or tablet. Access HMI/SCADA applications on any HTML5 compliant web browser. SMAR´s responsive UI technology flawlessly transitions between clients to provide a consistent user experience.
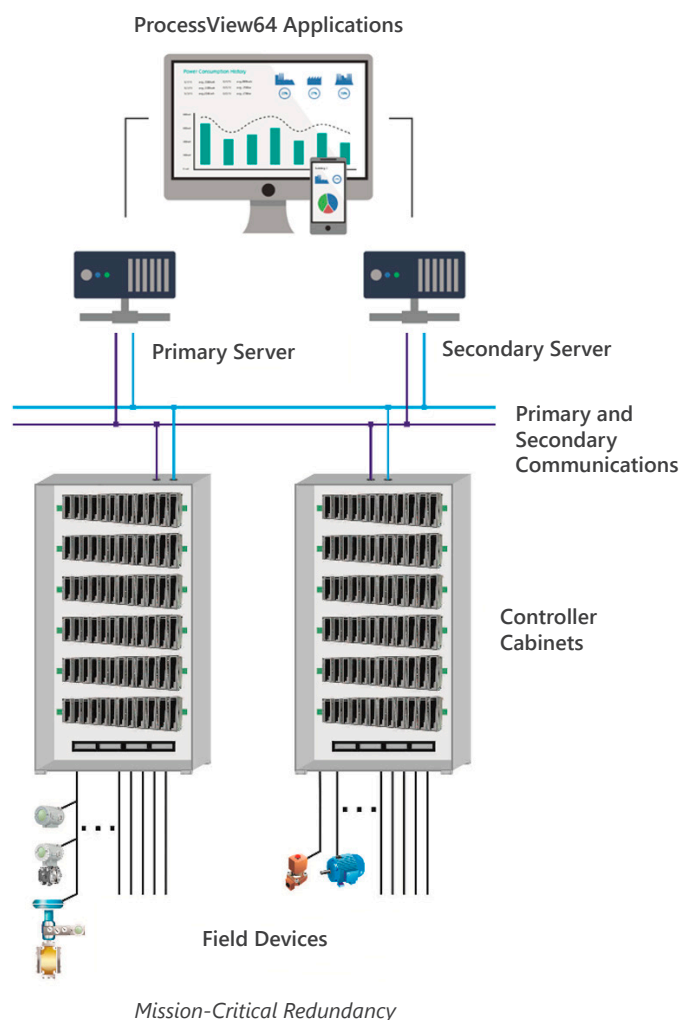
Mission-Critical Redundancy

SMAR ensures the safety of any critical data by offering high availability redundancy for communication reliability. Redundant collectors and loggers serve as a backup in case of a system failure. With automatic fault detection and store-and-forward technology, SMAR users can be assured that mission-critical real-time data, historical data, and alarm information are always available. SMAR redundancy solutions are simple to configure, install, and deploy.

Powerful Centralized Configuration

The Workbench is the multi-functional, centralized configuration environment for all back-end applications, making development more efficient and minimizing design time for any application. Configure assets and historical logging from the same screen. Users can configure and manage their entire **ProcessView64** application from any workstation.

Front-end user interfaces and dashboards are configured using the GraphWorX64 visualization module. Design HMI and SCADA displays leveraging 2D and 3D graphics, integrated parallel projection, preconfigured symbols, dynamic properties, animation, and flexible aliasing.

ProcessView64 Applications

Primary Server   **Secondary Server**

Primary and Secondary Communications

Controller Cabinets

Field Devices

*Mission-Critical Redundancy*

9

Universal Connectivity

SMAR supports industry standard communications such as OPC, OPC UA, Modbus, MQTT, web services, and databases. The solution has been certified for OPC UA compliance by the OPC Foundation as both client and server. Simple device discovery on the network makes integration seamless and efficient.

Minimized Design Time

The largest cost of any automation project is in engineering the application. For an average project, this can be well over 60 percent of the total investment. ProcessView64 greatly reduces configuration effort and minimizes design time, resulting in enormous cost savings and drastically reduced deployment time. SMAR is able to consistently deliver software solutions that run on the latest 64-bit Microsoft operating systems, affordable IoT devices, and Microsoft Azure. Leverage key features of Windows within ProcessView64 and provide users with the greatest application performance, reliability, and flexibility.

Object Oriented Distributed Alarm Management

Enterprise-wide distributed alarm management is provided through AlarmWorX64, SMAR´s native alarming module. Notify your personnel of abnormal conditions and events in real time with ISA 18.2 compliant features. Integrate the AlarmWorX64 Viewer into any SCADA or HMI display to bring to light real-time and historical alarms when and where operators need to see them.
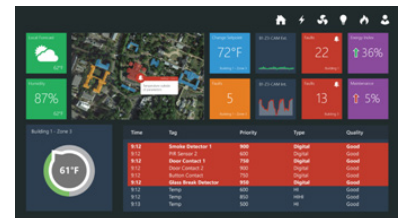

Asset Organization

ProcessView64 includes an ISA-95 compliant asset organization module called AssetWorX. Assets can be organized and configured in the Workbench with a runtime component critical for scaling large projects while providing intuitive navigation. These hierarchies can optionally include alarms, customizable colors, icons, names, and drag-anddrop functionalitie


Real-Time and Historical Trends

Visualize enterprise-wide data in trends, logs, charts, and reports with ProcessView64´s trending module, TrendWorX64. Chart real-time and historical data from any relational database to provide users with actionable data. Customize trends with varying data replay rates, colors, multiple data sources, and multiple cursors. Interact with trends in runtime with multiple playback and filtering functions.
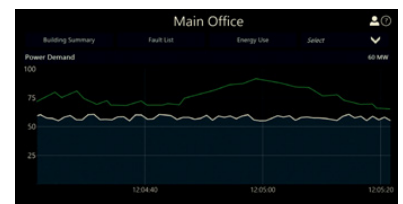
Native Geo-SCADA

SMAR' geographic information system (GIS) mapping module, EarthWorX, provides visualization for widely dispersed assets. Create a geographical overview to monitor multiple locations while maintaining the ability to locate and drill into specific assets. Users can integrate with Google Maps, Bing Maps, and Esri to include additional GIS mapping features and data layers.
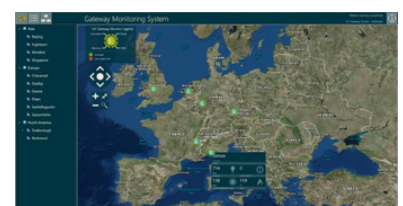
History View

High Speed Big Data Plant Historian

The importance of your Data demands a High Speed, Reliable and Robust Plant Historian

SMAR´s HistoryView is an advanced 64-bit high-speed, reliable, and robust historian. Designed for the most mission-critical applications, HistoryView's advanced high compression algorithm delivers unparalleled performance with very efficient use of resources. HistoryView integrates with the latest big data technologies, including Azure SQL, Microsoft Data Lakes, Kafka, and Hadoop. This makes HistoryView the most efficient and secure real-time plant historian for any Microsoft operating system.

Key Benefits and Features:

- High variety of remote data collectors / Collect data from any device, anywhere, following industry standards
- Uses trends and customizable graphics for decision making
- Real-time, historical and archived data replay
- Store and forward critical data
- Integrated performance calculations
- Native report add-in for Microsoft Excel®
- Web-enabled configuration and administration
- Automatic data backup and archiving
- SQL query engine
- Tracing diagnostic data with event logs
- Integrated redundancy
- Seamless integration with other SMAR software
- Fast data collection for enterprise-wide data storage
- Export data to Azure Data Lakes and other cloud storages

Charts, Data Analysis, and Reporting

Choose from a multitude of chart and trend styles to best represent and accentuate real-time and historical data. Use configuration options to customize trends to make data analysis concise and intuitive. Drag and drop data sources during runtime and view multiple trends simultaneously. Enter operator comments as well as manage lab data and audit trails.

HistoryView includes an industry standard SQL Query Engine for reporting and bulk data editing, enabling tight integration with any SQL compatible database such as Microsoft SQL Server, Oracle, and any open database.

Data Merging

HistoryView includes a module for automatic or manual insertion of data, empowering users to import historical or log data from databases, other historians, or intermittently connected field devices and equipment. This also provides for greatly increased reliability in capturing all data, even when network disruptions occur.

Performance Calculations

Customize calculations that can be triggered periodically or on any event, using flexible date/time, mathematical, string, and historical data retrieval functions within the expression editor.

HistoryView-to-HistoryView Connectivity

Merge data collected by distributed servers, while maintaining full system interconnectivity for metrics and analytics. HistoryView-to-HistoryView connectivity can also automatically detect changes in the source data and propagate those to the central HistoryView server, maintaining a unified historical database.
Remote Collectors
Architected as a distributed, enterprise-wide historian, HistoryView remote collectors allow for historical data collection from dispersed locations. Remote collectors ascribe by SMAR' universal connectivity capability including OPC UA, BACnet, and SNMP protocols.
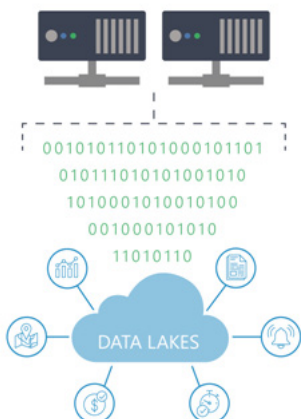
Big Data and Long Term Storage with Data Lakes

HistoryView is designed to handle "hot," "warm," and "cold" data. Hot data is acessible immediately for daily use, warm data is archived but easy to get to for reports and analytics, and cold data has been archived for long term storage or advanced analysis. The HistoryView Data Exporter moves cold data to a variety of external storage systems, such as Azure SQL, Microsoft Data Lake, Hadoop, and Kafka. Securely keep your data for long term storage or use powerful analytics and machine learning to elevate your HistoryView data to new levels and bring even more insight into your processes and systems. Collect your data in one place and turn it into knowledge.

KPIView
Executive Dashboards

Keep Up With Your Operations From Any of Your Devices, Accessing Your Most Important Indicators in Real Time

KPIView is a powerful visualization and analysis tool for executives, managers and other industry leaders.

- *Connect all your devices, manage and browse through your assets with real-time data.*
- *Build dashboards according your specific industry needs.*
- *View the most important performance indicators of your company or of your systems, from any client station or mobile device, and download dashboards seamlessly.*

Advanced KPIView user experience features automatically adjust views (responsive user interface), in addition to providing a vast library of preconfigured symbols.

Key features:

- Self-service Real-time Dashboards for Any Glass
- KPIs on tablets, phones, Apple Watch, etc.
- Wide variety of industry-specific symbol libraries from which to choose
- Reports creation and distribution
- Drag and drop interactions for easy setup
- Device independence with HTML5 technology
- Leverage powerful analytical tools with business intelligence
- Graphs, Alarms, KPIs and Dashboards, Analytics and Trends, etc.
- IoT and Cloud Ready

iloTView
Secure Cloud Enablement

*Leverage Your Industry 4.0 Applications with Secure, Real-Time Communications to the Cloud*

iloTView combines SMAR's micro SCADA software technology with its HMI/SCADA, analytical and mobile solutions running in the cloud

SMAR offers several important IoT technologies, including asset connectivity, secure communications to the cloud , integrated real-time visualization and analysis.

Connection to virtually any automation equipment through industry-supported protocols such as OPC UA, Modbus, SNMP, Web Services and classic OPC tunneling.

- Secure publication of data to the Cloud
- Compatibility with any public or private Cloud
- Vizualization on Any Device, Anywhere
- Remote Asset Monitoring and Control
- Analysis execution
- Integration of Existing Equipment
- Historical Data Storage and Forwarding
- Optional use of cloud services, such as Power BI and Machine Learning, for greater depth of analysis
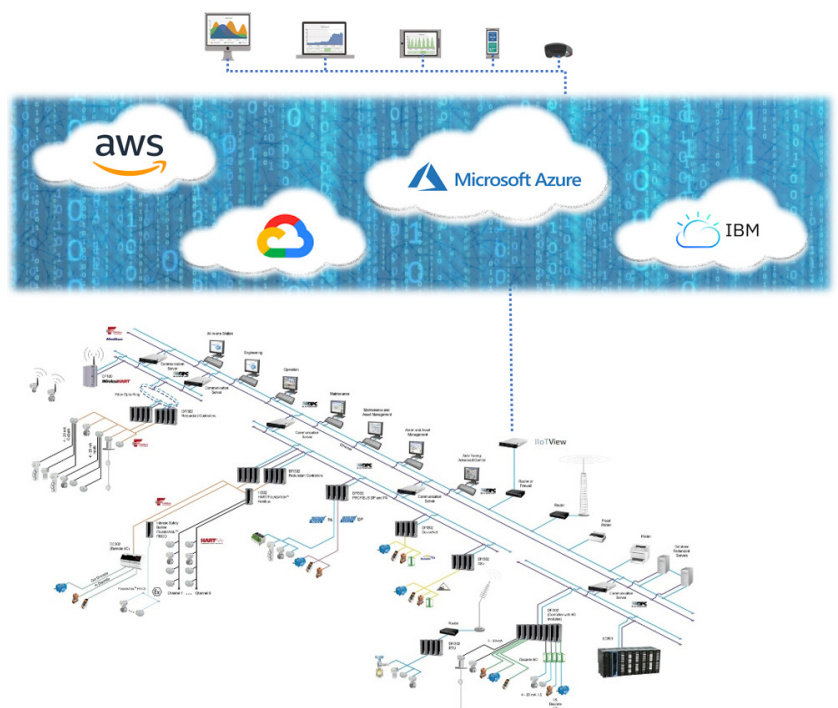
AnalyticsView
Data Analysis Software Suite

Transform large amounts of Plant Data into Actionable Intelligence, in Real Time

SMAR AnalyticsView solutions drive improvement in productivity, efficiency, quality, and sustainability.

The solutions can be applied to solve common business intelligence (BI) challenges, enabling users to move rapidly and easily from data to information, without help from IT or from data scientists.

The solutions can leverage technologies such as expert systems and machine learning in Big Data applications, leading to visualization and reporting solutions to address, for instance, quality, efficiency and maintenance issues.

Critical operational information are organized in a user-defined asset catalog and compatible with ISA S95, for analysis, visualization and operation. And Users can expand analysis with their own calculations

The solution includes two importante tools, AnalytiX-BI and Fault Detection and Diagnostics (FDD).

AnalytiX-BI is a Business Intelligence tool which was created to address the scattering of information and other situations that make it difficult to provide a cohesive view of a system.

It opens up new possibilities for analyzing business intelligence (BI) information within an operational context to reduce costs and maximize efficiency. It improves data accessibility, enables analytical processing, and provides data modeling/context with incredible performance and intuitive visualization. It offers intuitive point-and-click data models and powerful query technologies that bridge IT, management, and business systems.
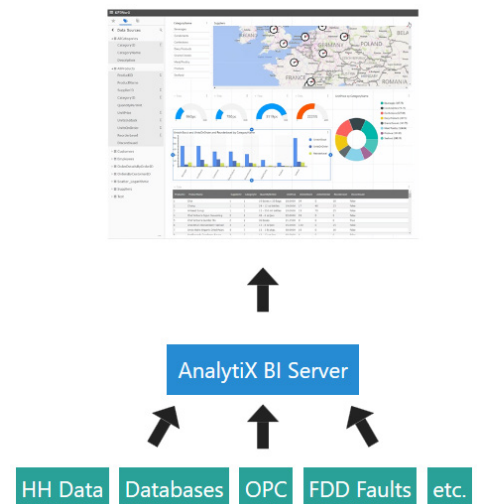
Fault Detection and Diagnostics (FDD) technology significantly reduces costs and improves operational efficiency. Fault rules can be customized to predict equipment failures and advise personnel of preventive actions. Before the emergence of FDD software solutions, many organizations relied on institutional knowledge in order to fix or maintain their wide variety of equipment. After the development of FDD tech, this type of info (the numerous symptoms, causes and recommended actions) that may have only existed in the heads of senior personnel or, if lucky, in print or electronic archives, could now be used in algorithms to help organizations move from reactionary "break/fix" maintenance to more modern, more cost-effective predictive maintenance.

OrchestrationView

Real-time Workflow for Data Bridging

Gain Efficiency by Orchestrating Data Exchange Between Different Systems and Automating Workflows

The OrchestrationView solution enables users to rapidly implement data orchestration and integration tasks that adhere to business logic, without requiring programming.

The solution can access **Microsoft SQL Server, Oracle, Microsoft Access, SAP**, and virtually any real-time or archived manufacturing or business data source.
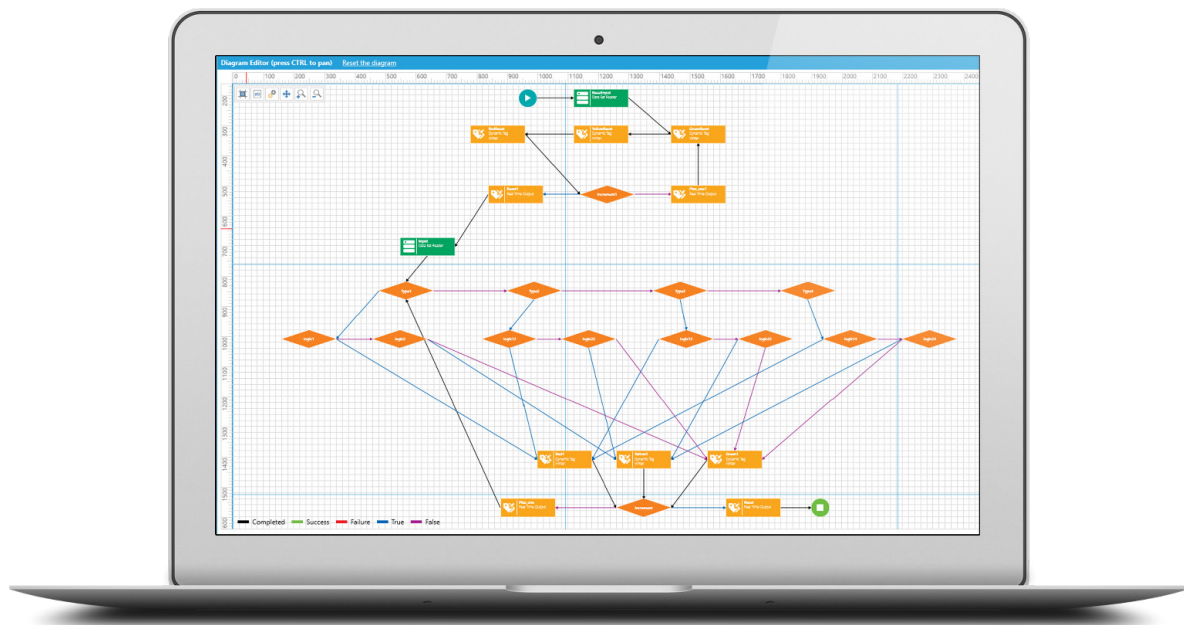
Key features:

- Highly intuitive graphical tool for developing custom flow logic
- Connectivity to heterogenous data sources
- Defines, calculates and implements work and business rules
- Transaction triggering provide the following trigger types: manual, based on periodic dates and times, on OPC Data Value Change, on alarm, on database value change, On File/Directory Change, etc.
- Redundancy and Load Balancing: Multiple servers can work together to execute transactions, share the load and provide redundancy in events where a server goes offline.

Aspect**View**

Fast Link to Any Equipment Aspect

Quickly Access all Relevant Content about your Plant´s Equipment

AspectView is a software tool that quickly connects the user to any information and content related to their field instruments, motors, controllers, heat exchangers, boilers, and virtually any equipment in their industry.

Flexibility to include the most varied aspects or content types related to your equipment, such as:

- Instruction Manuals
- Drawings (dimensional, mounting, installation
- Diagrams (wiring, network, loop)
- Photos, Videos, Audios
- Operational Displays
- Web Pages
- Brochures
- Datasheet
- Spreadsheets
- OPC Tags
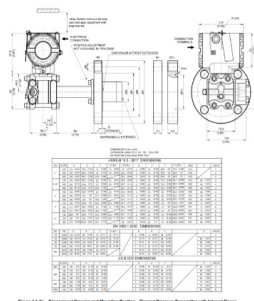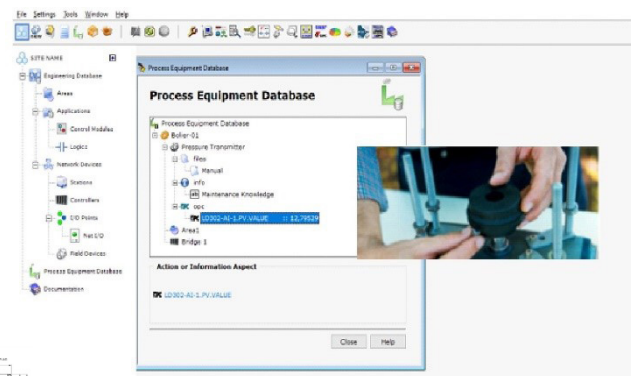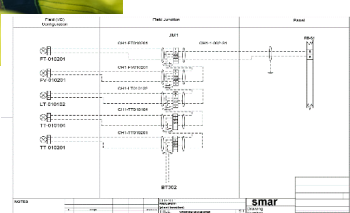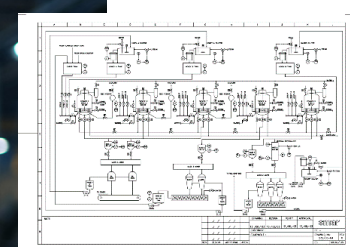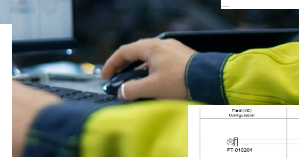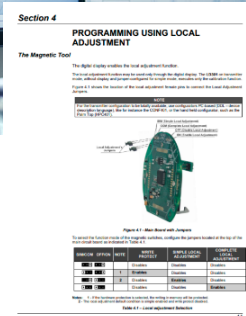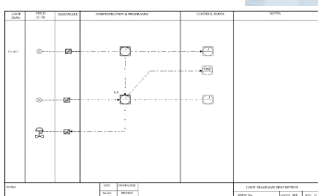
Connectivity
Secure Industrial Communications

Flexibility to Overcome Any Data Connectivity Challenge.
Ready for Industry 4.0

System302 includes powerful data connectivity resources involving Automation, Information, Databases, and Internet of Things (IoT) technologies.

Additionaly to the possibility of using several industrial buses and their standardized and non-proprietary communication protocols, such as HSE - High Speed Ethernet, FOUNDATION fieldbus, HART, AS-Interface (AS-i), DeviceNet, PROFIBUS-DP and PROFIBUS- PA, System302 also offers a wide range of options for connecting and exchanging data over Ethernet.

INDÚSTRIA 4.0

| CONTROLE E AUTOMAÇÃO | COMPUTAÇÃO EM NUVEM | IoT | BIG DATA | INTEGRAÇÃO DE SYSTEMAS |
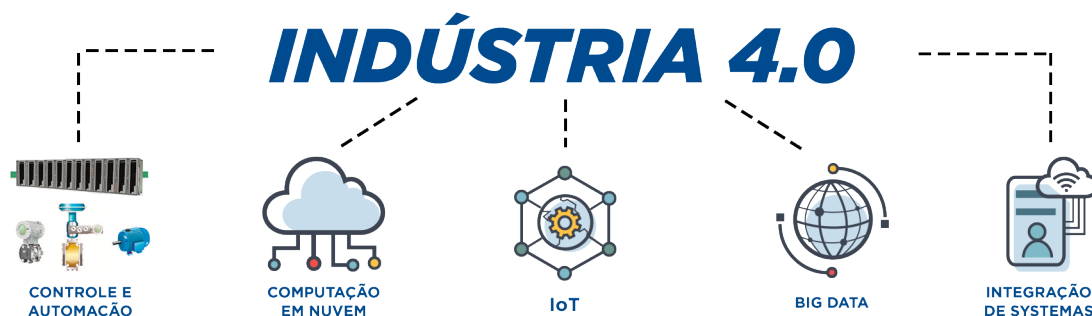
OPC Connectivity - Servers and Clients:
- OPC Unified Architecture (UA)
- OPC Data Access (DA)
- OPC Historical Data Access (HDA)
- OPC Alarms and Events (AE)

Direct Connectivity via Communication Protocols and Drivers
- Modbus,
- DNP3,
- IEC 61580 / IEC 60870,
- SNMP,
- Drivers for third-party devices, such as Allen-Bradley,
- Siemens, Omron, Schneider, Mitsubishi, GE, etc.

Connectivity to Databases
- Microsoft SQL Server, Microsoft Access,
- Oracle,
- SAP
- Virtually any industrial or business data
- source, real-time or archived,

Cloud Connectivity via IT Standards
- Message Queuing Telemetry Transport (MQTT)
- Advanced Message Queuing Protocol (AMQP)
- Representational State Transfer (REST)
- Websockets

Smar**FB**
Function Block Library

Standardized Function Blocks, ready to be incorporated into Third Party Controllers and Devices, in a Practical and Sustainable way

Open technologies bring countless benefits, one of which is to foster a culture of collaboration and innovation.

It is in Smar's DNA, who has a wide library of function blocks developed to solve the diverse demands of automation and control. Such blocks have been used for decades in System302 implementations in all continents. And the great news is that this technology can also be used in compatible devices from other manufacturers.

This possibility is due to the open technologies used, including O-PAS, OPC, FOUNDATION FieldbusTM and FDI, Field Device Integration. In this way, function blocks can be executed on compatible hardware devices from other manufacturers, such as controllers and field instruments, allowing greater usage possibilities and flexibility of choice for users.
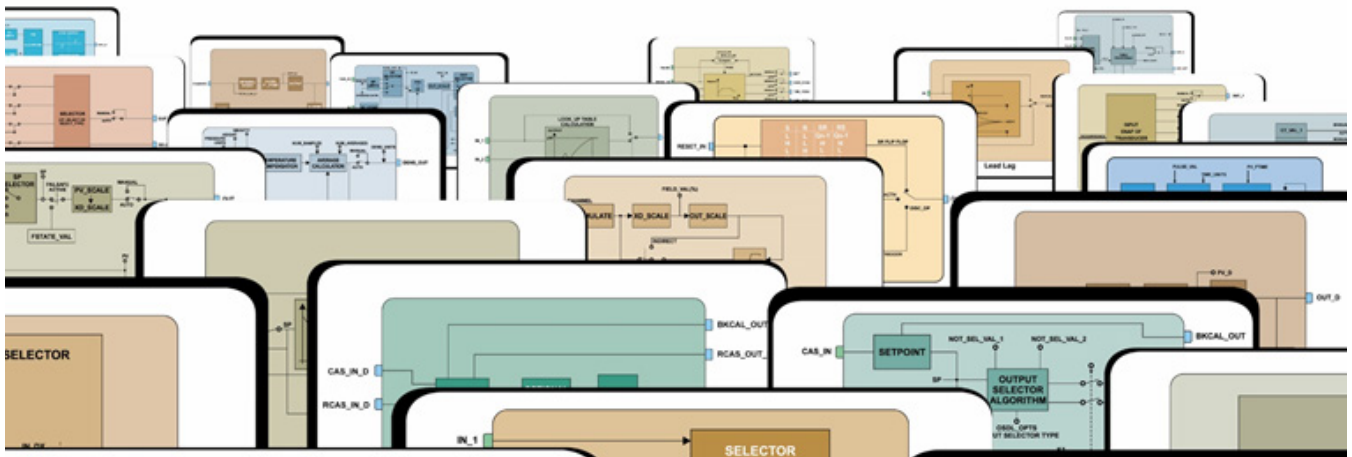
Open technologies make it possible for hardware and software components from different manufacturers to be used together in the same application or subsystem.

Data structures and communications used by the function blocks are standardized to guarantee interoperability. And the complete description of features allows different configuration tools from different manufacturers to handle the configuration, in a standardized way.

The list of available function blocks includes:

Input blocks:
- Analog Input, AI
- Discrete Input, DI
- Pulse Input, PI
- Analog Input, MAI
- Multiple Discrete Input, DI

Analog Input
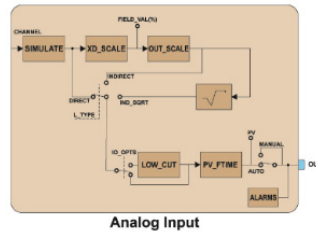
Control and calculation blocks:
- PID Control, PID
- Enhanced PID Control, EPID
- Advanced PID Control, APID
- Splitter, SPLT
- Set Point Ramp Generator, SPG
- Output Selector, Dynamic Limiter, OSDL
- Step Output PID, STEP
- Arithmetic, ARTH
- Signal Characterizer, CHAR
- Integrator, INTG
- Analog Alarm, AALM
- Input Selector, ISEL
- Timer, TIME
- Lead-Lag, LLAG
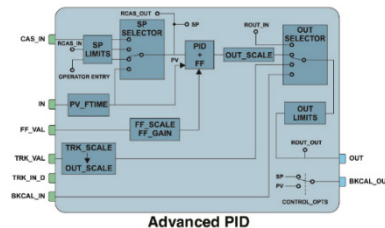
- Density, DENS
- Constant, CT
- Flip-Flop and Edge Trigger, FFET

Output blocks:
- Analog Output, AO
- Discrete Output, DO
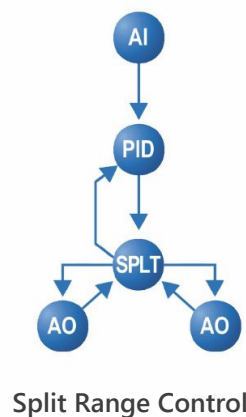- Multiple Analog Output, MAO
- Multiple Discrete Output, MDO

Transducer/resource blocks
- Resource, RS
- Transduce, TRD
- Diagnostic Transducer, DIAG
- Display Transduce, DSP

Advanced PID

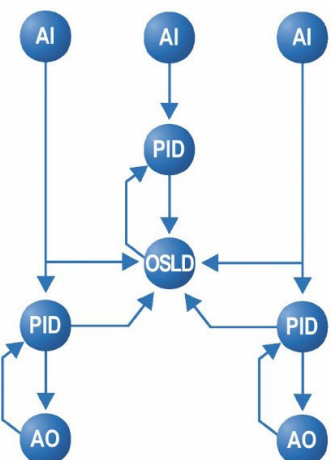Output Selector
and Dynamic Limiter
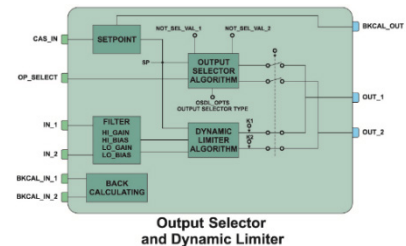
These function blocks can then be used to compose a multitude of continuous and discrete control strategies, as shown in the illustrative examples below.

This way, SMAR seeks to strengthen the entire automation market, providing to other companies and suppliers greater agility in developing solutions through the incorporation of proven technology to their products, while allowing greater freedom for users to select hardware and software components best suited to their objectives.

Split Range Control

Cross Limited Combustion Control

Control Module Examples

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