.0 Adroit Technologies

MAPS 4

Product Description

MAPS

MITSUBISHI ADROIT PROCESS SUITE

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1. MAPS SCADA/HMI - The Future of Process Visualisation and Productivity

Create advanced, secure and integrated solutions that deliver value to your business. The MAPS SCADA and related software products provide the latest automation software for general industrial users including utilities, telecommunications, food and beverage, manufacturing, life sciences, mining and mineral processing, IoT, Smart Cities or building and facilities management industries.

The MAPS SCADA takes raw data from front end devices like a Programmable Logic Controller (PLC's) or Remote Telemetry Units (RTU's) in the process field and transforms it into an easy to understand graphical representation, whilst adding the ability to log history, do alarming and eventing.

MAPS SCADA helps identify and manage key factors such as quality, production and energy efficiency which ultimately lead to greater business profits.

When used with the Mitsubishi PLC range; the Mitsubishi Adroit Process Suite (MAPS) delivers a tightly integrated SCADA and PLC solution built around preconfigured and tested engineering PLC function block libraries, with a built-in full suite of diagnostics, maintenance tools and integrated document management capabilities. Giving the users a life-cycle management tool focused on reducing costs.

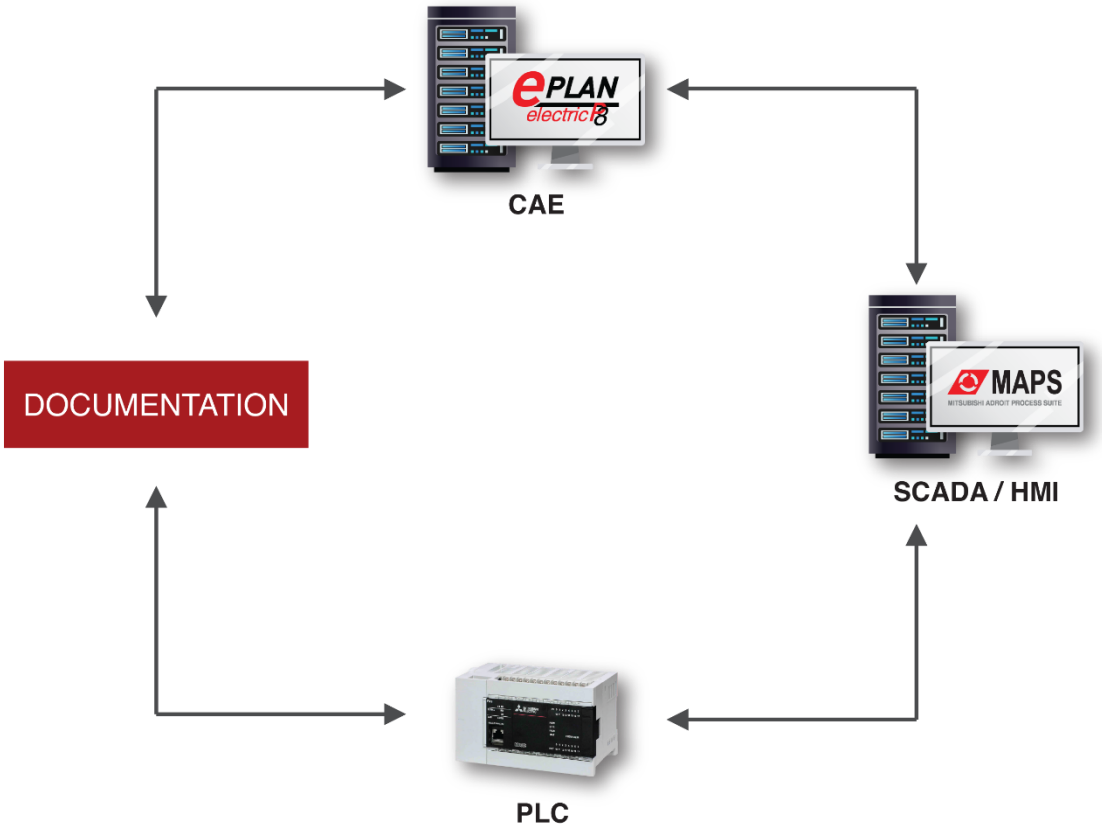


Figure 1 Combination of best breed software

Any modern SCADA/HMI solution requires integration with many sources of data. One of the big differentiators with MAPS is that it offers secure connectivity many datasources, including real-time, transactional and web services

2. Features and Benefits

Rich User Interfaces Compatible with Real-time, Database and Web Technologies

2.1. Smart User Interface for Enhanced Operational Efficiency

Build the most powerful user interfaces.

The Smart UI (User Interface) combines all the components necessary to build custom-made user interfaces to manage quality and performance of client's operations.

Built on the Microsoft .NET platform, the design environment has a full set of 2D and 3D graphics libraries and components available. These allow you to build the user experience most suited to your own needs. From classical 2D to enhanced Situational Awareness screens it caters for every user experience requirement.

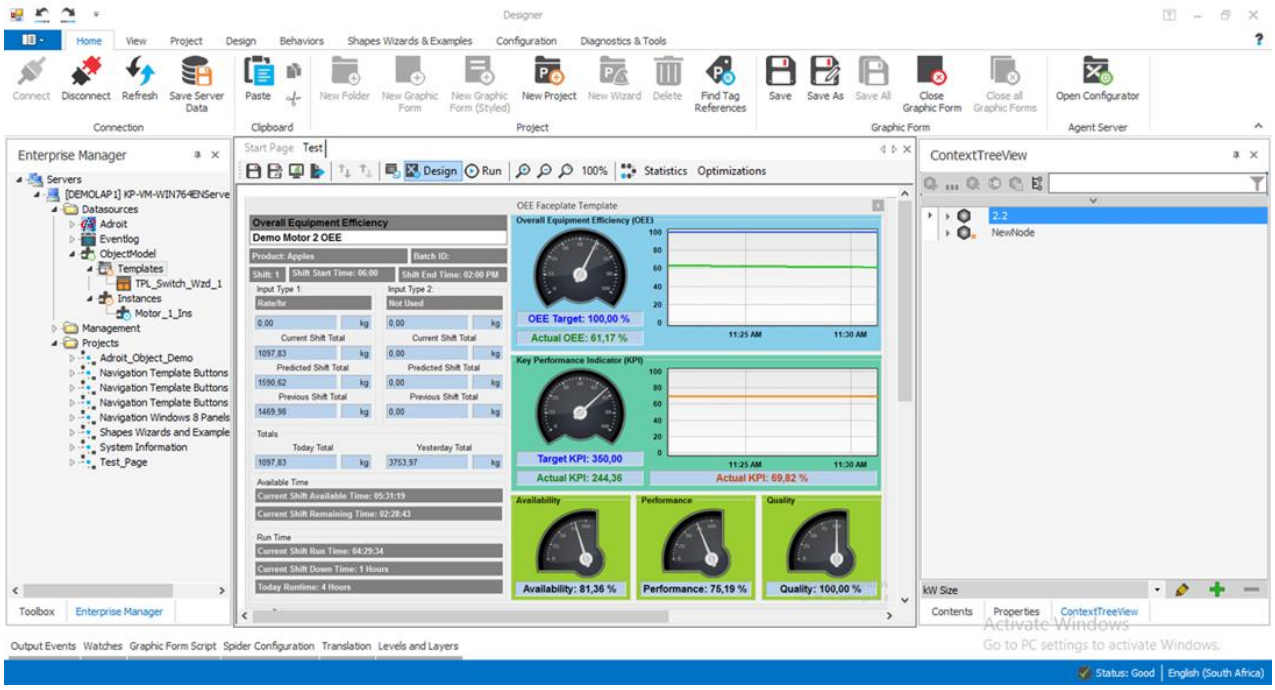


Figure 2 Designer

2.2. Secure, Reliable and Scalable

MAPS SCADA is designed with security and reliability at its core.

The client-server and distributed architecture when combined with the Active Clustering technology allows secure and highly distributed systems to work seamlessly in even the most complex and challenging industrial environments.

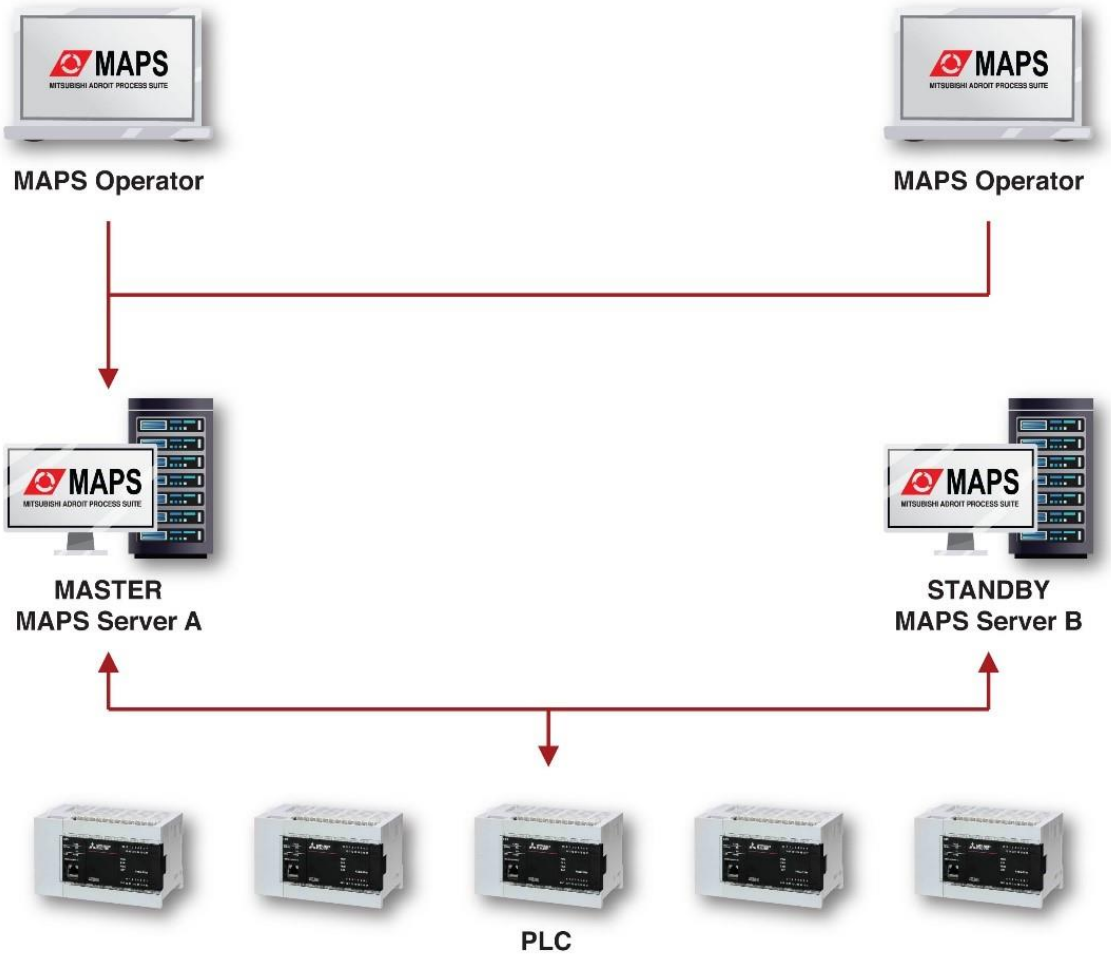


Figure 3 Active Clustering

2.3. Connect to any Source of Data from the MAPS SCADA

MAPS SCADA is designed with openness and today's plant architectures in mind.

The control system is not only made up of data from PLCs but sometimes needs to integrate to MIS/MES (Manufacturing Information Systems/Manufacturing Execution Systems) and even ERP (Enterprise Resource Planning) systems in the manufacturing process.

By allowing secure connections to both real-time and database sources, MAPS SCADA exposes the data in an uncomplicated self-explanatory way. MAPS SCADA can, however, be as complicated as is required to achieve the system's design goals.

OLEDB Databases; allows execution and use of data returned from queries, views that can be parameterised using real-time tags from the SCADA. This flexibility allows users to build the most integrated operator interfaces to drive even more efficiencies.

WebServices; develop and integrate data from any web service into your SCADA/HMI application.

2.4. Reducing Engineering Time & Costs

Making efficient use of the MAPS Object Model, Wizards, Templates and bulk EXCEL engineering tools.

Engineering, commissioning and maintenance costs can be considerably reduced with the preassembled modules, wizards and templates available in the library. There is a single point of configuration, deployment and management which allows for bulk engineering. The wizard and template approach to projects reduces the time spent on design and configuration utilising the bulk import/export functionality. Use EXCEL tools to construct the SCADA database.

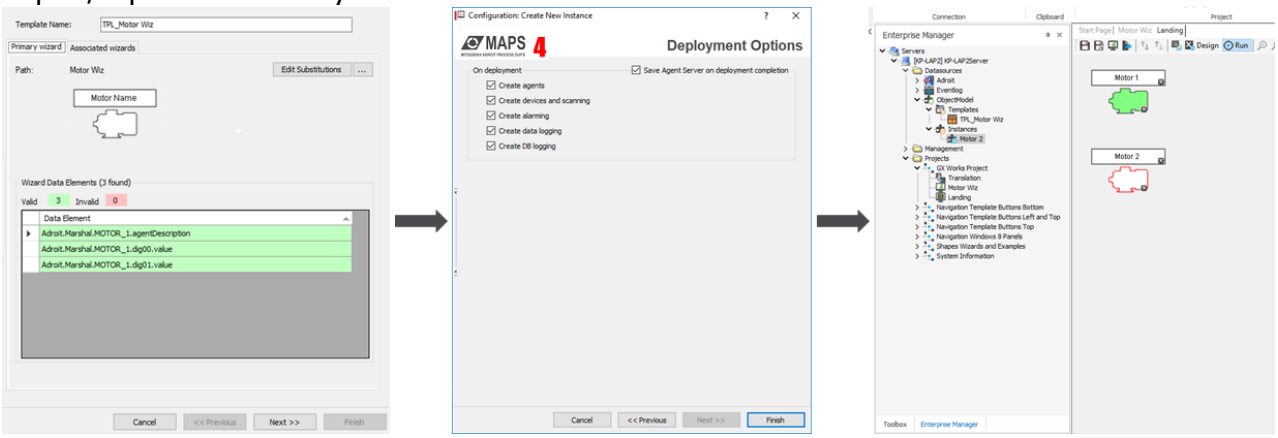


Figure 4 Object Model

Higher quality, easier and better management of SCADA projects – standardise equipment design.

Create re-usable standardised, designed object templates in the Designer to represent items such as pumps, valves, conveyors, blowers. Duplicate these standard objects as instances when creating projects using the Object Model. Each instance inherits all the standardised object template configuration including scanning, logging, alarming and any context built into the original object template, so the entire tag database, logging, scanning and alarming can be generated whilst configuring the graphics.

2.5. Advanced Displays for the Operators

Multi-monitoring and multi-view screen display

Being a true client-server architecture allows for deployment of as many MAPS SCADA screens as supported by the video display system. This allows alarms, graphics, alarms, trends, camera views, production screens over several monitors. The display is determined by the configuration of the system. The limit is defined by the number of screens attached to a single PC. A single operator can be shared across all screens, or multiple Operators can be run across multiple screens. *The only limit is the hardware.*

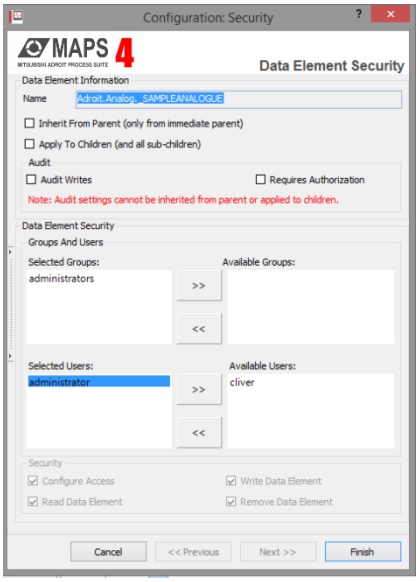
2.6. Productivity comes standard in MAPS SCADA

Improve Performance, Save Energy and Reduce Costs across the entire plant.

Using the built-in MAPS SCADA MIS/MES capability to manage savings and performance. Whether the key objective is Productivity using Overall Equipment Efficiency (OEE), Energy using Maximum Demand or Alarm Management to enhance Asset Performance, MAPS SCADA offers easy-to-use objects that deliver this enhancement through easy configuration.

The Simple Network Management Protocol (SNMP) and Network Monitoring (ICMP) capability can be used to optimise your IT assets. Locating and identifying potential problems in advance ensures that the most efficient automation installation including PLC's and, IT Networks are all optimised.

2.7. Security (Role based Access)



Access for authorised users only (up to 5 Levels)

The product is built on Microsoft Security, respecting and integrating Users and Groups locally or on Domain Controllers.

Projects can be secured down to the smallest data element or client side control.

The MAPS Security Manager provides a single utility that contains all the Windows and MAPS Security settings to allow an Administrator to fully secure the MAPS installation. This utility also allows the configured security settings to be saved, so that they can be applied to the other MAPS computers, as needed.

2.8. Industry 4.0 and IIoT Ready

MAPS SCADA is ready for the 4th Industrial Revolution.

Telemetry, remote data acquisition and being internet-aware makes MAPS SCADA an excellent choice to take advantage of the new Industry 4.0 and IIoT revolution.

Hosting MAPS SCADA in the cloud or privately and using the Internet of Things (IoT) Agent allows MAPS SCADA to seamlessly talk to third-party IoT cloud hosted environments.

Independent of the chosen environment (Amazon, Azure, Huawei, Sigfox or NBIoT), MAPS SCADA is an ideal IoT application builder and Enterprise framework.

Additionally, the built-in OPC UA, Sigfox and MQTT driver allows secure communications to devices deployed anywhere on the cloud.

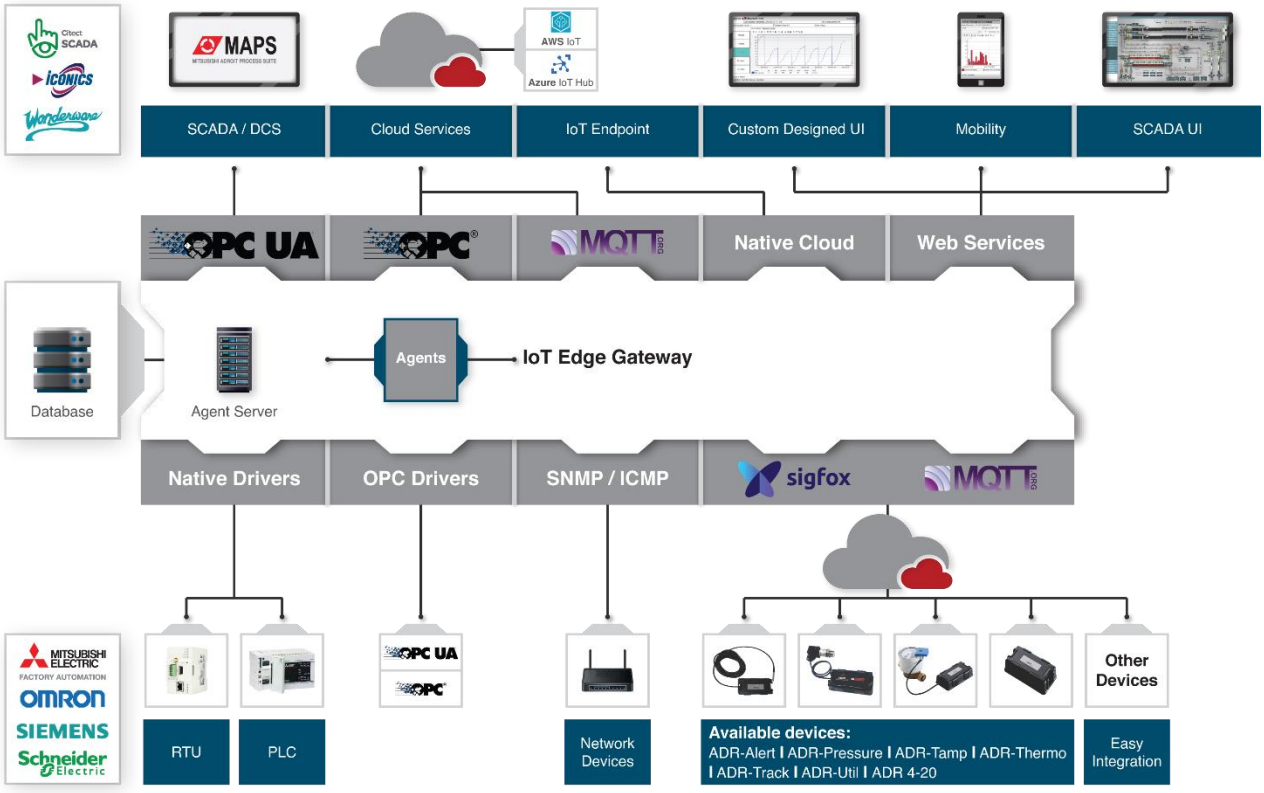


Figure 5 IIoT Ready

3. Building a MAPS SCADA Solution

3.1. Define the End Goal of the Automation Solution

Choose the Value Added Features of MAPS SCADA to complete the task

Consider the following criteria when licensing MAPS :

- The low-cost alternative to MAPS SCADA, the MAPS HMI or the more powerful solution, the Mitsubishi Adroit Process Suite (MAPS).
- The number of scan points that are communicating from the PLC network to the Agent Server (I/O Server).
- The protocol drivers required for the existing and new hardware.
- Whether or not a redundant Active Cluster Server is required.
- The number of concurrent connections the system will have - Operators and or 3rd party applications.
- The number of mobile Performance Anywhere Clients or Adroit Air Mobile App connections required.
- Alarm Management and Analysis Software.
- SCADA Intelligence software for Reporting and Big Data Analysis.

Once all criteria have been taken into account, all the standard tools and features of MAPS SCADA can be used to build the solution.

3.2. Sizing and Licensing

Server and Client

MAPS SCADA is licensed in two dimensions. The first dimension is the size of the Agent Server scan points. This relates to how many registers are being scanned to and from the PLCs or RTUs. In order to use Active Clustering technology, a license for a second server is required. The second dimension is how many concurrent Operators (View Clients) will be connected to the Server.
NOTE: Any external application creating and using a connection is regarded as a remote connection and would require a license.

3.2.1. How is it Packaged?

MAPS SCADA is sold/licensed based on two criteria i.e. the number of scan points and remote clients. The total number of digital and analogue points to be communicated between the PC and the PLC is the number of "Scan Points", some of you will know these as external I/O, or "tags". Remote clients refer to the number of additional PCs that will be running MAPS SCADA Operators (user interfaces or view clients) so that multiple users can view the process simultaneously.

Typically, MAPS is licensed via a USB dongle - HASP software protection key, which is inserted into the USB port of the computer on which the Agent Server is running. This HASP is then programmed in accordance with your specific license agreement. In situations where it is not possible to use a physical HASP, it is also possible to license MAPS via a software license, which is only available on request. For further details, contact Adroit Technologies support.

MAPS SCADA is packaged in different scan point sizes; these are 30, 75, 150, 300, 750, 1500, 2500, 5000, 15000, 25000 and in bundles of 5000 points thereafter(the only limitation is the system

capability). This allows the user to purchase the size that best fits the application. Functionality of all packages is uniform, irrespective of the number of scan points and remote clients.

On purchasing MAPS SCADA the customer receives the following:

- Media containing all of the MAPS SCADA tools to configure and run the system. The media also contains a multimedia presentation, training materials, all available PLC drivers/interfaces, over 300 pre-configured graphic objects such as meters, lights, conveyors, pumps etc., sample applications, and a comprehensive help system.
- It is also available as a download on the Internet website https://www.mapsscada.com/downloadsacc/
- License Key (HASP), which fits the USB port.

3.2.2. Licensing Definitions

MAPS SCADA is licensed based on the following:-

- Scan points: When a memory address is scanned/attached in the PLC and every DBAccess; script; and SNMP agent a scan points is consumed.
- Remote Nodes: A remote node licence is required for every client connection.
- Version: HASPs are licensed against versions of MAPS.
- OEM: Additional components are licensed against the OEM code of the HASP. E.g. Alarm management; Max Demand; Siemens Ethernet driver; DNP 3.0 driver.

A time limit is set on development HASPs. Production HASPs have no time limit.

3.3. Designer and Operator

Designing and Operating

MAPS SCADA has two types of clients; the Designer for configuring and engineering and the Operator for viewing the MAPS SCADA projects. Both of these applications can run over the internet and are secure, requiring user authentication at the time of log-on.

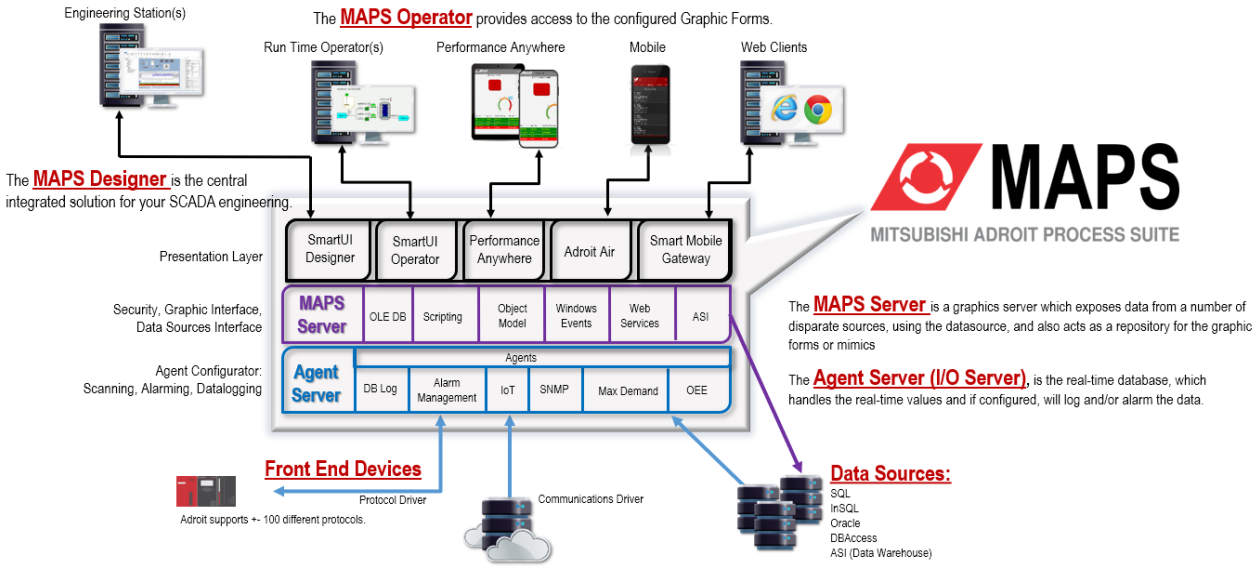


Figure 6 MAPS - Definition of Components

The MAPS SCADA has a flexible, object-oriented, client server architecture that supports any system from a stand-alone implementation to an installation spanning multiple distributed sites.

3.4. Datasource Connectivity

3.4.1. Database

MAPS SCADA is compatible with OLE DB compatible databases, including MS Access, MS SQL, and ORACLE. MAPS SCADA standard installation includes SQL Server 2014 Express (English Version).

3.4.2. Connection to PLCs and other Equipment | Protocols

Seamless integration into all popular PLCs and RTUs on the market

MAPS SCADA supports a large library of protocols for communication to front-end devices.
Some of the protocols that are supported are Mitsubishi, Siemens, Modbus, Omron, Allen Bradley, BACNet, MQTT compatible devices and SNMP. MAPS SCADA also supports Mitsubishi MX components communications which allow communication to the E-Factory suite.

- Mitsubishi MX components
- Mitsubishi Q / L / FX Series
- OPC (Client and Server) and OPC UA Client and Server

Other drivers include Allen Bradley, Siemens, Schneider (Modbus), Omron, Beckhoff (Ethercat), DNP 3.0, MQTT, BACNet and SNMP and are all supported as native drivers.

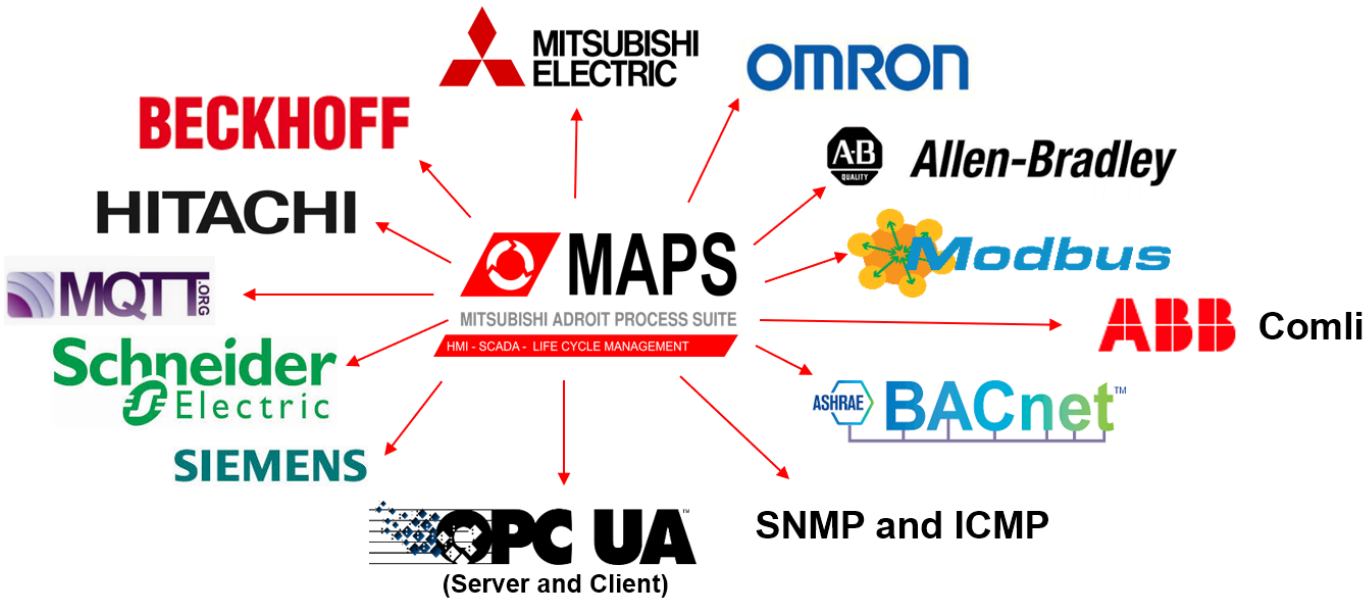


Figure 7 Devices

A full list is available here: https://adroittech.co.za/adroit-maps-protocol-drivers/

3.5. Reliability and Redundancy

3.5.1. Server and Client

MAPS SCADA supports server and client redundancy. Use two servers to configure a primary server and a standby server, enhancing the reliability of a system and reducing the communication load on a network. MAPS SCADA can be configured to suitably match the needs of the system; be it standalone or large scale distributed system.

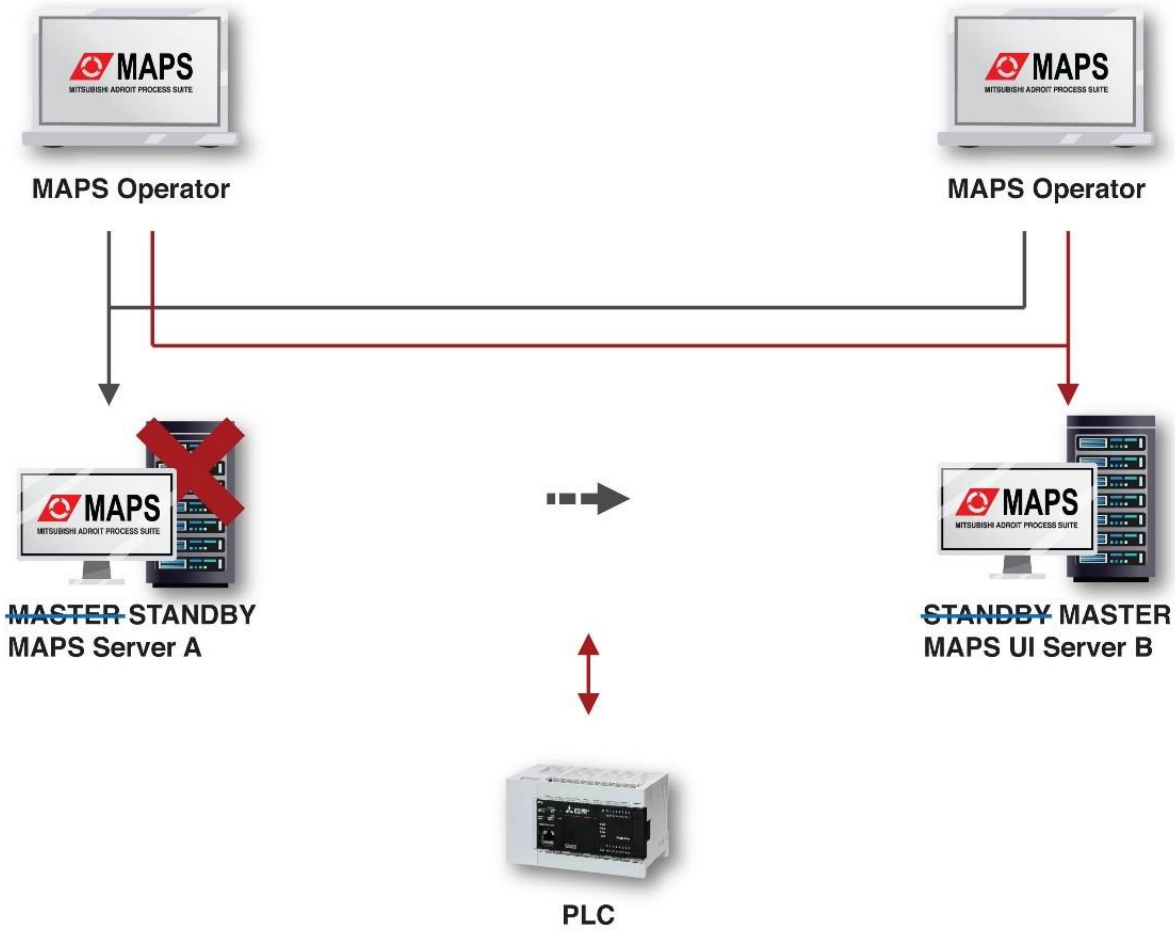
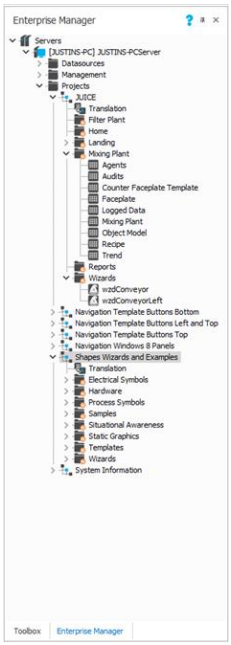


Figure 8 MAPS in a stand-alone or distributed system

4. Overview of MAPS SCADA

4.1. Intuitive Project Development and Management

4.1.1. Enterprise Manager



The Enterprise Manager view in the design application allows a user to organise all of the related projects from a single location. These include a variety of applications.

MAPS SCADA can be fully or selectively backed up and restored easily using the MAPS Config Editor application.

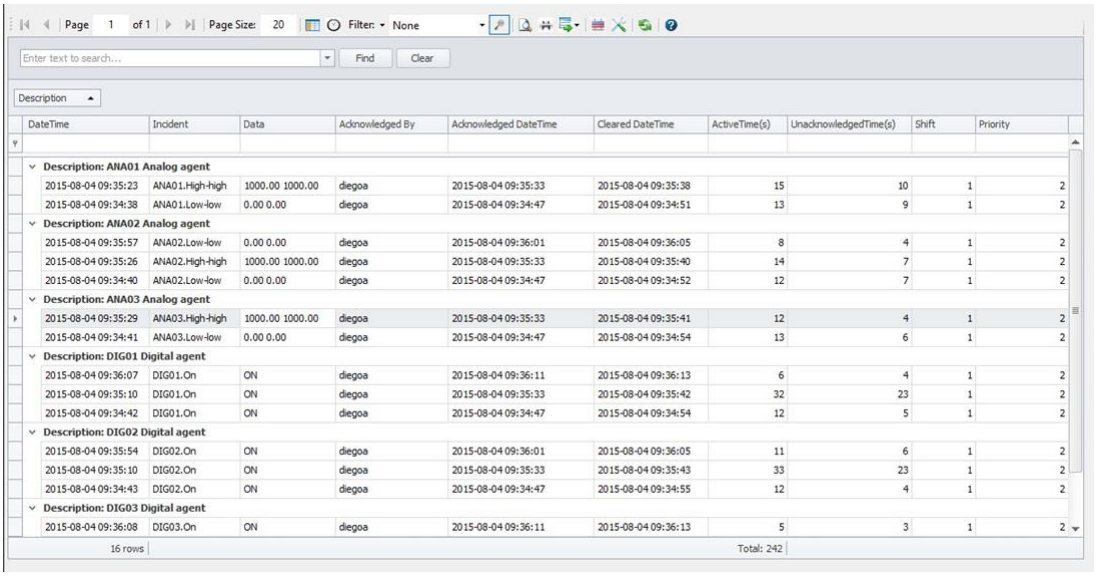
There is also auto-backup function to backup changes to graphic forms and the Agent Server database and Config files, this allows for manual roll-back.

Graphic forms can be locked, and password encrypted to ensure integrity.

4.2. Alarming and Events

Quickly attend to any situation by monitoring alarm tag data and issuing alarm notices.

Any graphic form may be launched by clicking an alarm entry. Alarming and Eventing is handled by the Agent Server. The software also collects alarm information from the Agent Server and can store it in a database; logging the alarm history.



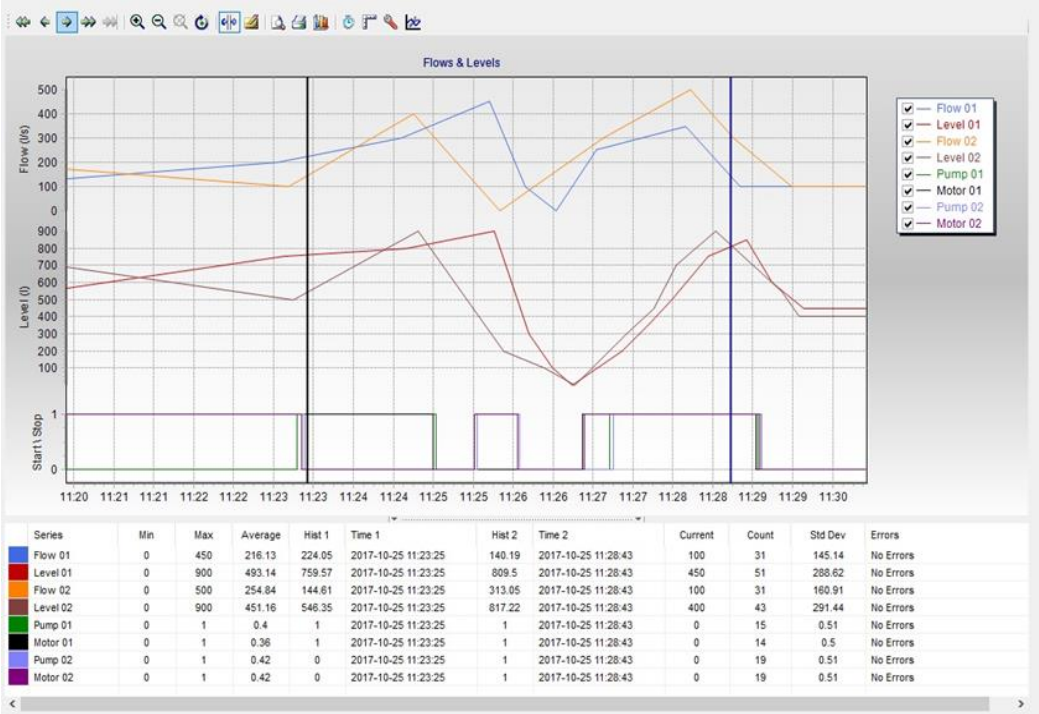
Alarm controls can be used to display data in real-time and historical alarm information on the graphics. An operator can filter alarm information during operation to view only necessary data. By altering the conditions to match the user's needs (e.g. sort and combine alarm charts) alarms can be analysed efficiently. Alarm agents are used to define the course of action to take when an alarm occurs. For example, sending an SMS or email and logging the information to a database for history.

4.3. Built-in Process Historian

4.3.1. Trending

It is possible to view real-time and historical trend data in single trends. On the other hand, historical data is stored in the MAPS SCADA historical trend files or to an external OLE DB and logged as a trend history. The logged data will be shown as a historical trend alongside the real-time data.

Logging can be done using time triggers, event triggers and advanced features such as changing the logging frequency of logging based on a process value allows user's complete flexibility. In addition, automatic backups to CSV at user-defined intervals allows users to access and use these for further value and analysis and reporting.



Series	Min	Max	Average	Hist 1	Time 1	Hist 2	Time 2	Current	Count	Std Dev	Errors
Flow 01	0	450	216.13	224.05	2017-10-25 11:23:25	140.19	2017-10-25 11:28:43	100	31	145.14	No Errors
Level 01	0	900	493.14	759.57	2017-10-25 11:23:25	809.5	2017-10-25 11:28:43	450	51	288.62	No Errors
Flow 02	0	500	254.84	144.61	2017-10-25 11:23:25	313.05	2017-10-25 11:28:43	100	31	160.91	No Errors
Level 02	0	900	451.16	546.35	2017-10-25 11:23:25	817.22	2017-10-25 11:28:43	400	43	291.44	No Errors
Pump 01	0	1	0.4	1	2017-10-25 11:23:25	1	2017-10-25 11:28:43	0	15	0.51	No Errors
Motor 01	0	1	0.36	1	2017-10-25 11:23:25	1	2017-10-25 11:28:43	0	14	0.5	No Errors
Pump 02	0	1	0.42	0	2017-10-25 11:23:25	1	2017-10-25 11:28:43	0	19	0.51	No Errors
Motor 02	0	1	0.42	0	2017-10-25 11:23:25	1	2017-10-25 11:28:43	0	19	0.51	No Errors

View multiple data items in one trend display, split or overlap view/s as well as pause a trend display, add display data and change a display scale. Exporting trend views can be done from the trend control, into PDF, EXCEL, JPG formats. MAPS SCADA offers as standard a user-defined trend control that allows operators to define and view their own trend screen definitions.

This sample has 8 pens driven by 4 analogues and 4 digitals. Two flow analogues (Flow 01 & Flow 02) show flows, which are grouped together in separate (Flow) left axis; the other two level analogues (Level 01 & Level 02) show levels and are also grouped in a separate (Level) left axis. Lastly, all digitals (Pump 01, Pump 02, Motor 01 and Motor 02) are grouped in a separate (Start/Stop) left axis and are in step line (stairs) mode, to show start/stop (0 or 1) properly on the trend.

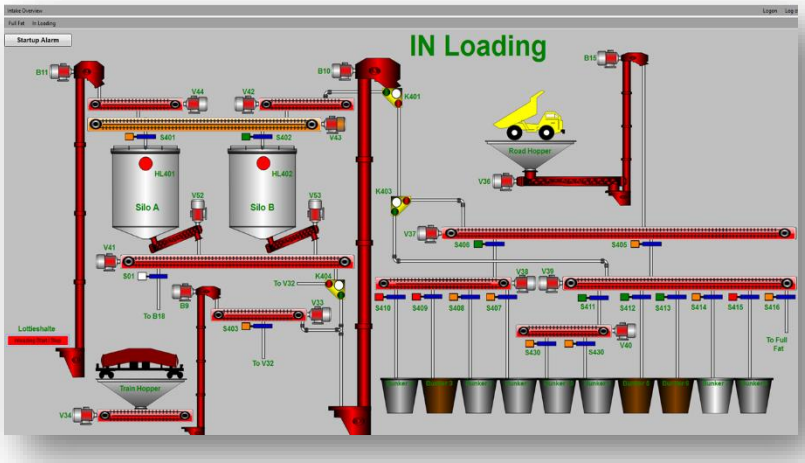
4.4. Enhancing the Monitoring Function

Video monitoring – Internet Browser Control

View video images from CCTV at the same time as monitoring graphics. The system operation will be secure and safe. MAPS SCADA has an internet browser control which allows any web URL to be hosted. If the web URL points to a CCTV feed, then it can be hosted.

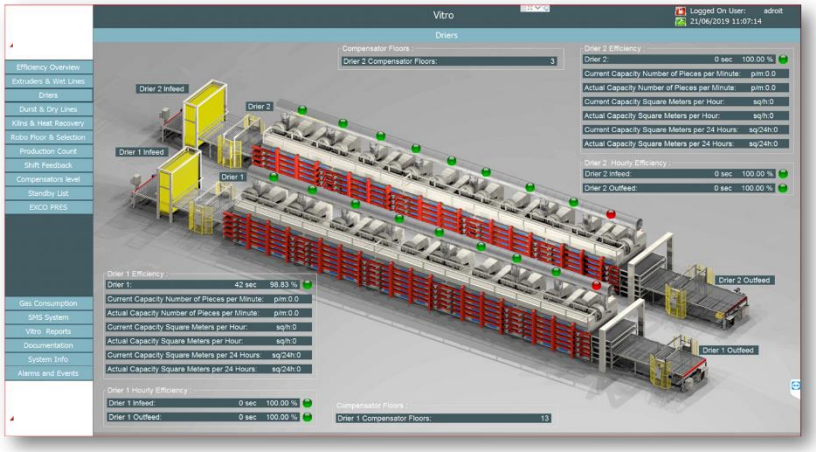
4.5. Enhancing Visibility

2D and 3D Graphics



Create high definition 2D graphics using MAPS SCADA Client. Equipment monitoring can be effectively represented using only 2D graphics. Control enlargement, reduction, rotation, and parallel movement to monitor anything.

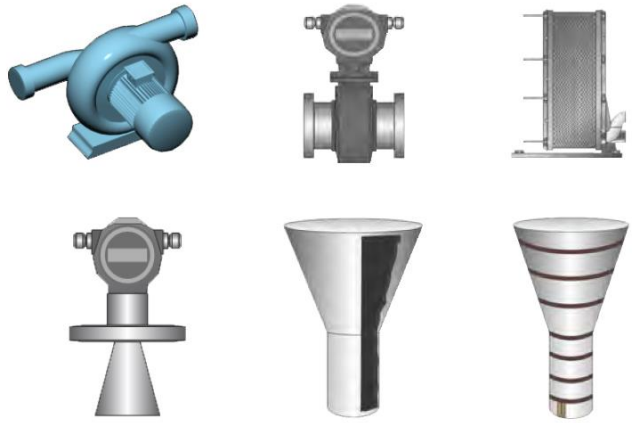
There are 3D graphic forms available for 3D perception, these can be built in any third-party development environment and simply imported into the MAPS SCADA graphic system as static backgrounds and even XML files. Live data can then by placed over the graphic to create a truly amazing UI.



When an alarm occurs, click on it and the information displayed will assist with fault finding. The information can also be viewed as a trend. Any graphic form can be launched from an alarm entry. Importing of CAD drawing files is supported in the MAPS SCADA using the XAML import functionality.

4.6. Built-in Symbols or Design your Own

Static Symbol, Template and Wizard Library



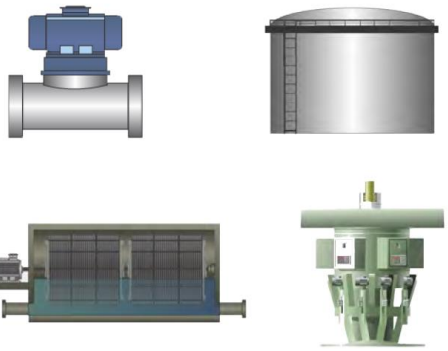
A set of pre-made symbols are available in the equipment library, which can reduce engineering time spent on creating graphics. Custom symbols can be created and saved to the equipment library. The equipment library has more than 300 symbols which cover a variety of industries including water treatment, building management, food, chemicals and more. The same design environment is used to build your own libraries including statics, wizards and templates that can be used time and again to save you engineering time and money.

Animation of graphics is made possible by applying easy to use "behaviours" onto the properties of a graphic. These include but aren't limited to; display value, execute command, colour, etc. The purpose of animating a graphic form, causes it to display data and information and allow the end-users to interact with it. This reduces the labour for creating scripts to perform the complex animation.

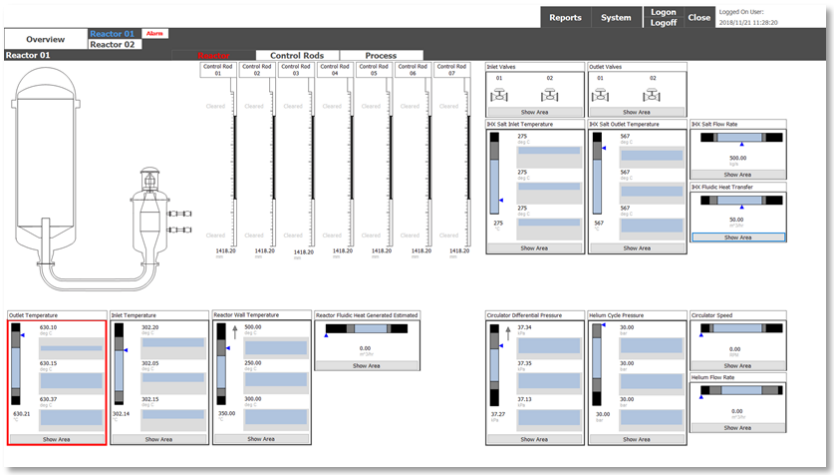
4.6.1. Graphical Libraries

MAPS SCADA provides a comprehensive library of static and dynamic objects that allows for rapid development of a solution. The library is separated into four main areas:

- Process
- Building
- Electrical
- Situational Awareness



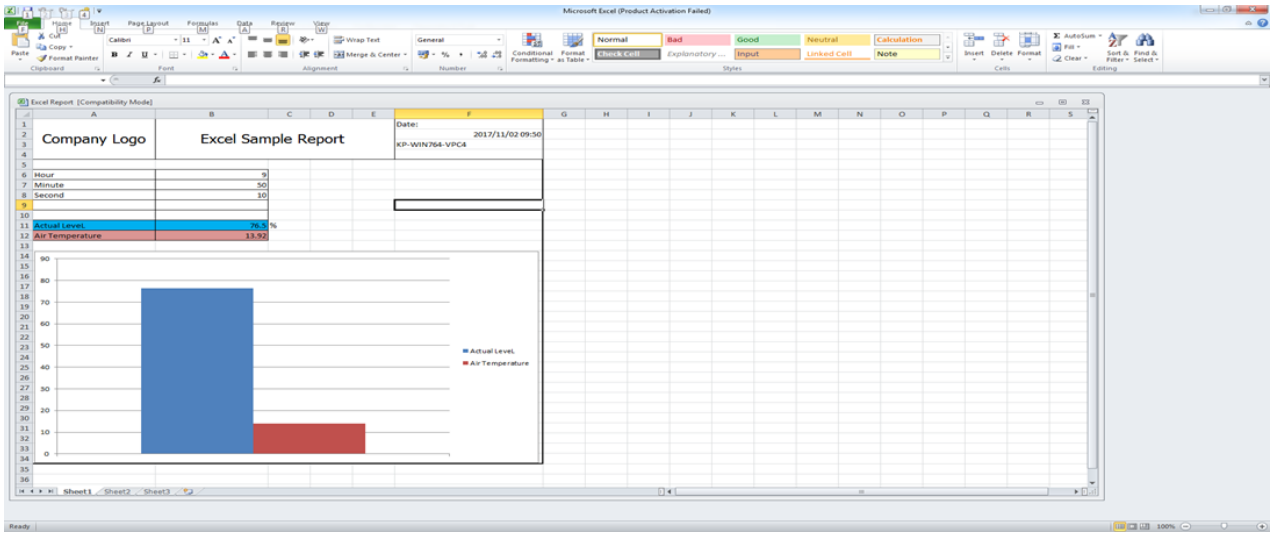
Based on the ISA 101.10 the Situational Awareness library contains objects that will allow the operator to have a more intuitive experience.



4.7. Easy Reporting in EXCEL

4.7.1. Link Data into Excel to produce simple and effective reports

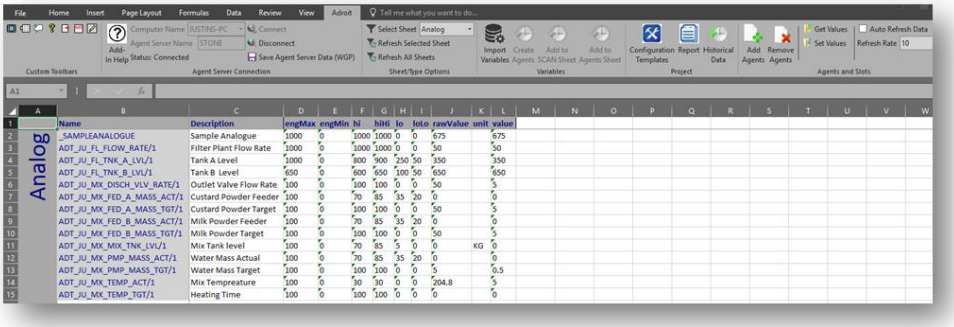
Data from the Agent Server can be linked to create real-time reports in Microsoft EXCEL. For enterprise reports use the MAPS SCADA Intelligence product that brings the power of Business Intelligence and Analytics to your business.



4.7.2. Bulk Config Using EXCEL

Generate your tag configuration using the power of Excel, including scanning, logging and alarming.

Configuration data can be converted from Agent Server load files (*.WGP) into comma separated variable files (*.CSV) by using the Export command from the File menu or from the configurator's Edit dialog.



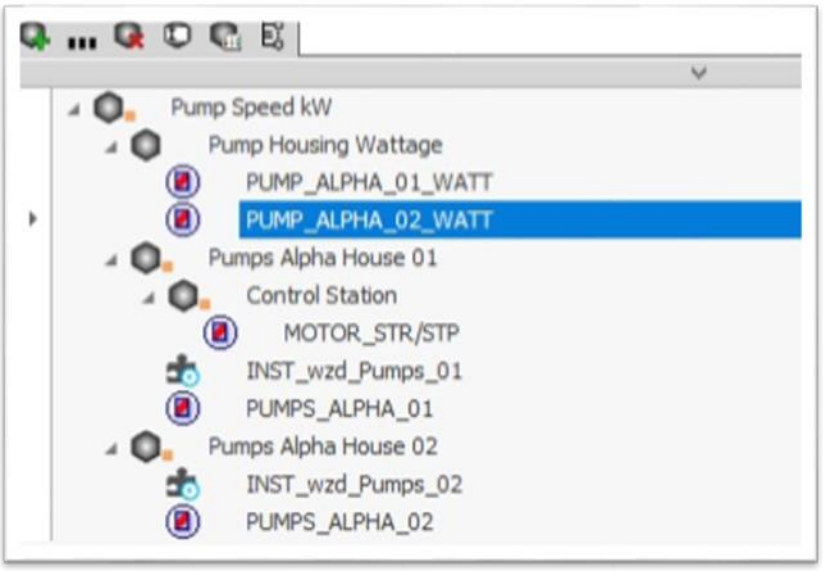
Third party applications can then be used for off-line editing and modification prior to re-Import into an Agent Server load file.
However, MAPS offers an Excel Add-in Tool that assists with the bulk configuration of tags. The MAPS Add-in for MS Excel is a bulk offline configuration tool for your MAPS agent database file, which is primarily intended for advanced users.

In addition to being a bulk SCADA configuration tool, this tool allows you to:

- Configure the security and auditing properties of the required agents and their slots
- Create report/s that display MAPS Agent Values
- View historical data of a logged tag.

4.8. Objects and Context | Easy Access to Equipment

Allows for easier sorting, filtering and management of SCADA projects.



Add context to each object template and view in the designer or operator. Group equipment by Equipment Type, Manufacturer, Energy Rating, Voltage and any other detail important for being able to monitor and manage.

The context view is a means of creating keywords to classify your existing objects, so that they can be searched for or grouped together.

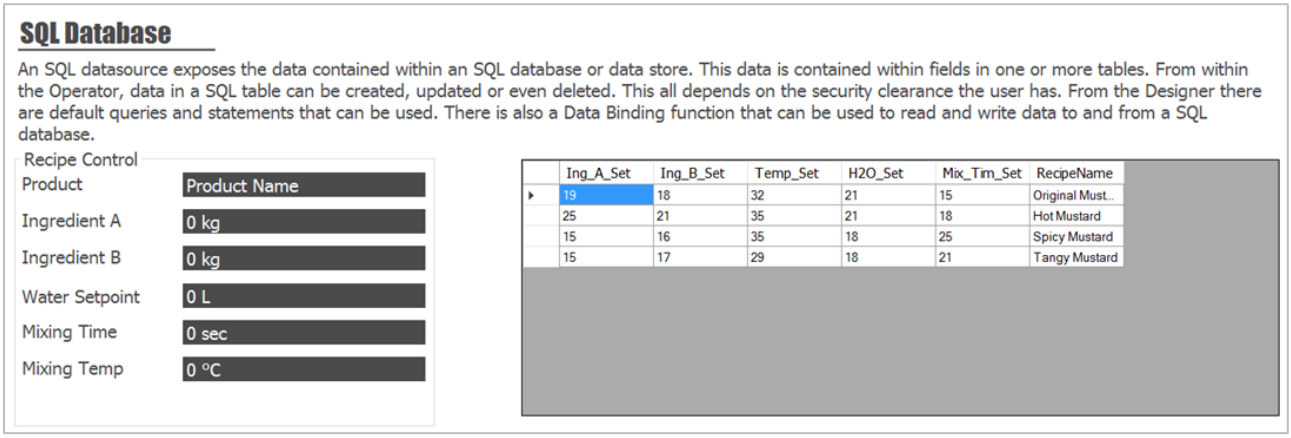
4.9. Enhancing Visualisation

4.9.1. CAD Compatible

Use 2D pre-set objects to quickly display and reduce engineering time. The pre-made wizards for text display as part of the standard library. It is also possible to import XAML graphics files to construct a screen display.

4.9.2. Database Grids and Views

MAPS SCADA offers standard Windows datagrid and dataview controls to use in an MAPS SCADA solution to support complex queries, sorting and filtering on the data. The queries can be triggered



from MAPS SCADA data elements so dynamic queries can be executed to deliver the most up to date information to the Operators. The OLE DB datasource allows views from tables, views and queries to be executed and delivered into the required views.

4.9.3. Windows .Net Controls

Extending MAPS to suit your visualisation needs

A complete catalogue of the standard Windows controls is available within the Designer. If you need additional functionality it is possible to develop your own or purchase a control and simply bring it into your MAPS SCADA system for you to use. You can drive any exposed property from any data element within the Server or Script.

4.10. Adding further value using Scripting

4.10.1.1. Scripting the User Interface

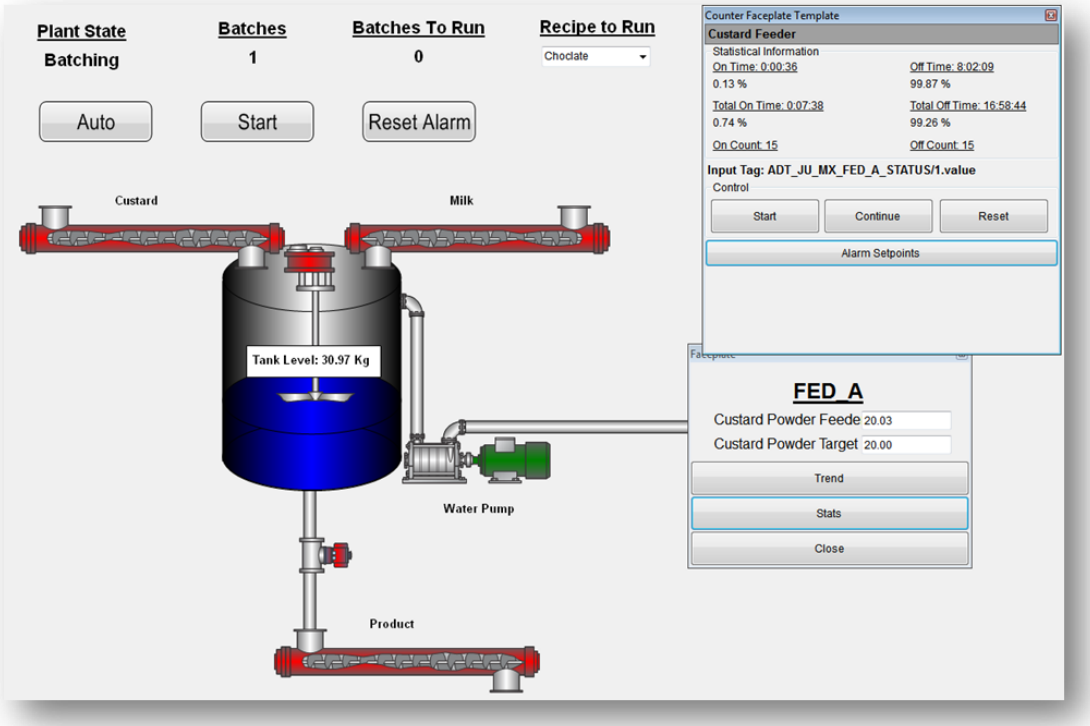
MAPS SCADA has its own script editor and engine. It is also integrated into Microsoft Visual Studio so advanced users can further enhance the MAPS SCADA user interfaces they are building through more complex and user-driven scripts from within this common development environment. MAPS SCADA has superior database handling. These enable easy implementation of complicated periodical processes and event-dependent processes.

4.10.2. Scripting the I/O Server

Server Side Scripts may be executed in in the I/O Server, also known as the Agent Server. A choice of VBScript or JavaScript gives you flexibility. Time triggers, data triggers, and other various conditions can be set to execute scripts.

4.11. Recipe Management

MAPS SCADA offers a Recipe Management tool which can be used for batch processes. It makes use of the Microsoft SQL Compact database. The Recipe Manager allows for the easy control and management of ingredients for a given product. Selecting a recipe, selects the correct setpoints,



parameters and automatically assign a batch number to the batch. The recipe manager can also be used to autorun recipe schedules. An example is a mixing plant that has numerous variety of products each requiring varying amounts of powder, water, and milk.

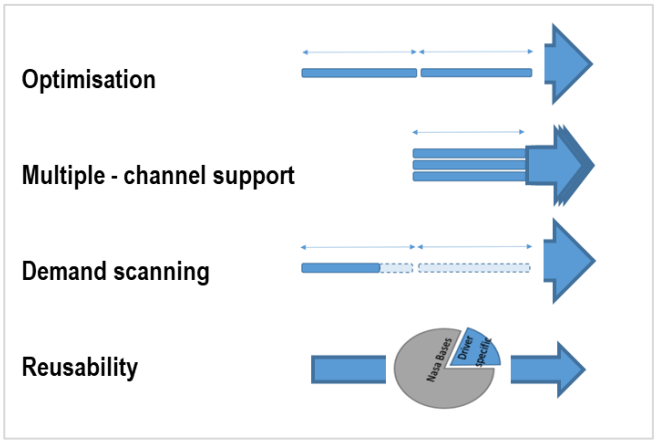
4.12. Demand Scanning

Optimised PLC network communication - reduction of scanning network traffic

The introduction of NASA (New Adroit Scanning Architecture) into MAPS 4.05 determines what needs to be scanned and when.

Demand scanning of tags reduces the PLC network communications load significantly.

Tags are only communicated when subscribed to and needed in the SCADA. NASA architecture has been retrofitted onto certain popular PLC drivers and please check with us prior to ordering.



4.13. Open System to suit all Business Needs

Data Sharing

MAPS SCADA is a completely open architecture and allows for sharing of information to external applications. Offering many different technologies from OLE for Process control (OPC and OPCUA), Web Services, C++, and ActiveX interfaces offers difference functionality to suit external interfacing requirements. Only your imagination limits the system capabilities.

4.14. Building a multi-language application

Multi-language display

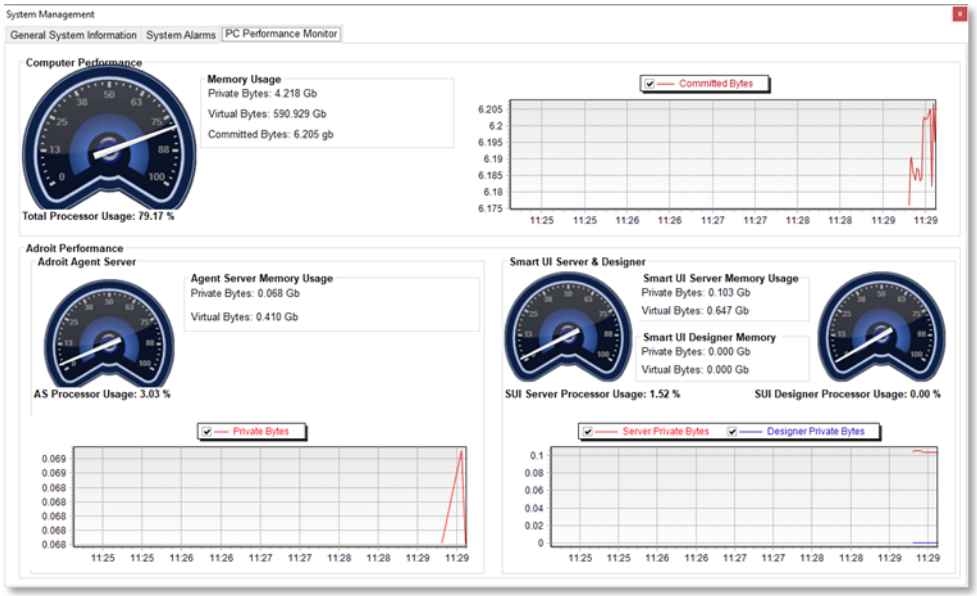
It is possible to translate the user interface into other languages offline. This is setup in the Config editor. A simple script run from a button on the project will change the language.

4.15. Situational Awareness

Situational awareness or situation awareness (SA) is the perception of environmental elements and events with respect to time or space, the comprehension of their meaning, and the projection of their future status

4.16. System Management

MAPS ships with standard graphic forms that can easily be included in any project that can be used to monitor the system health of the project.



5. Mobility

Monitor your plant, building or assets on the move

5.1. Performance Anywhere

Performance Anywhere is the HTML 5 mobile front-end software that monitors important applications of a building or a plant. It is simple to set up and use Performance Anywhere client efficiently. The user can have access to, and monitor, important data anytime, anywhere and from any terminal. The manager, engineer, the maintenance worker and the operator can: access and monitor data in real-time, view data on alarms, trends, energy, quality, production information etc.

MAPS SCADA has a single free Performance Anywhere Client licensed with a standard installation. Thereafter bundles of five clients may be purchased.

5.2. Adroit Air

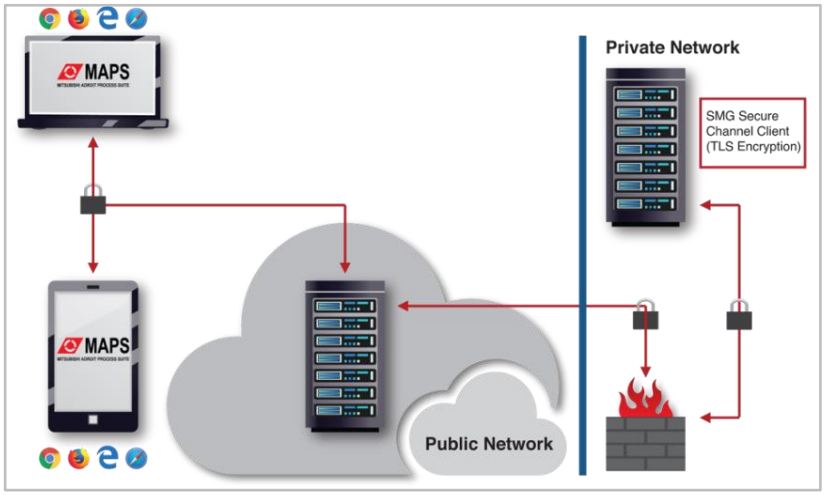
Always be in contact with your plant via push notifications on your mobile phone, by receiving alarms, operator messages and production data. A Web Push Message platform that enables the SCADA to notify specified users of certain alarms on site and selected process data via their mobile device. The platform consists of a SmartUI data source, a mobile app (for Android and IOS) and some cloud fabric to support communication.

5.3. Secure Mobile Gateway

Ever wanted to be able to securely log-on from any device to monitor your MAPS SCADA system remotely. Well this is all possible with our Secure Mobile Gateway offering.

Zero footprint deployment makes this extremely attractive to IT and Enterprises wishing to deliver the value of your system even wider.

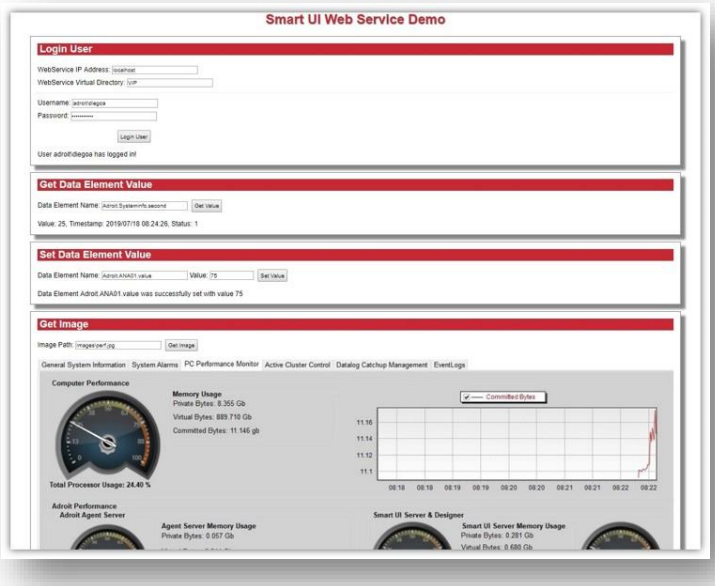
Additional software component providing encrypted Web Access to



existing Smart UI and Classic UI SCADA mimics using a HTML 5.0 compliant web browser including Apple, Android, Linux, Windows.

Requires no open firewall ports, secure channel is initiated from client side – Prevents any direct exposure to sniffing, DDOS attacks and hack attempts.

5.4. Custom Web Pages



Create a Customise HTML5 Web Page to securely call the SmartUI Webservice API.

The SmartUI Webservice API provides calls to the following SmartUI Server functions (i.e. Login, logoff, get and set tag values, acknowledge alarms etc.

Tag values and historical data can be pulled from the SmartUI server.

Set Tag values and acknowledge alarms in the SmartUI server.

6. Building a Geographic Oriented Solution

GIS System (a plugin in MAPS version 4)

Using the GIS (Geographic Information System) Datasource, add intelligence to a map overview by providing icons that represent the actual position and status of assets or sites. The icons can also be linked to a graphic representation of the assets or sites.

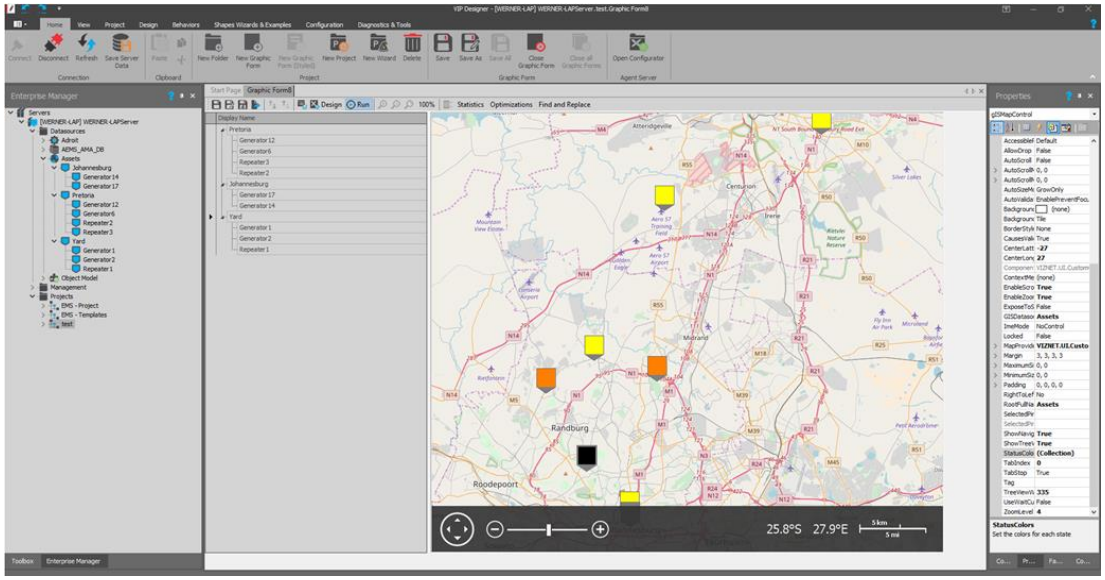


Figure 9 GIS in the Designer

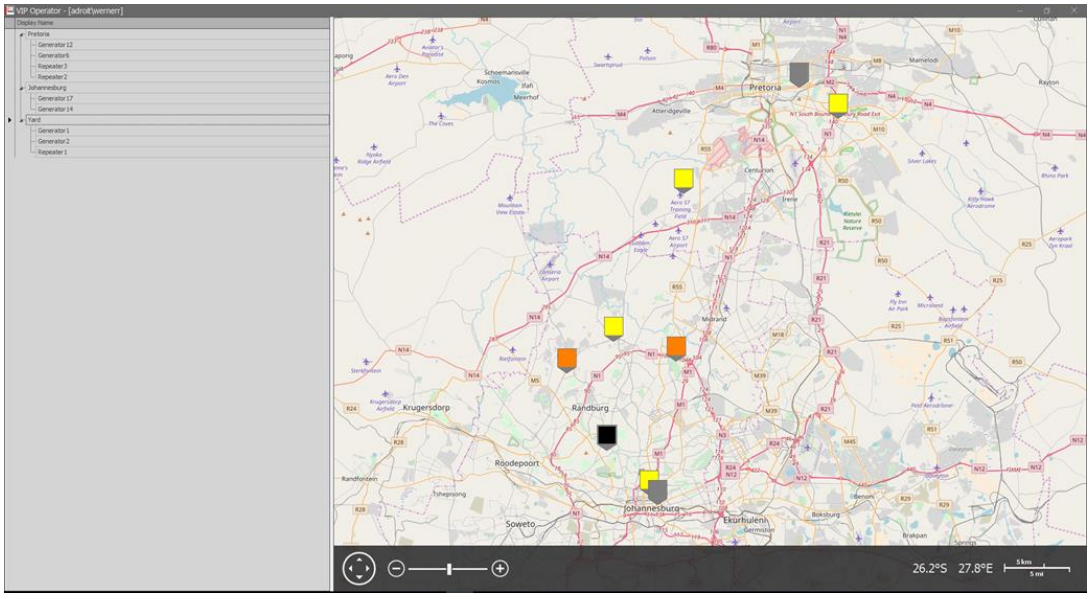


Figure 10 GIS in the Operator

7. MAPS SCADA Solutions

Adroit Technologies Technical Services consults in and develops customised industrial IT, MIS and MES solutions for Customers. By adopting a more holistic approach to operations management, significant savings and operational efficiencies can be realized. In each industry, MAPS SCADA is uniquely placed to ensure a superior quality of supply in all aspects of the operations and management of these facilities including historical data logging and trending, quality management, reporting and analysis, event and alarm management.

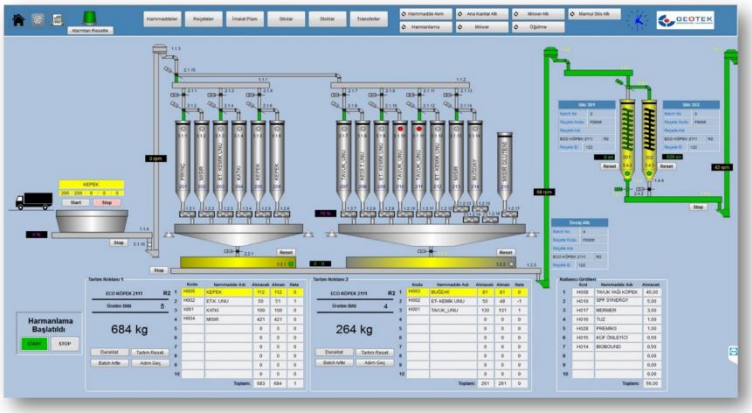
MAPS SCADA provides secure remote access using Windows security to ensure that only authorised users are able to access the system by managing users and groups.

The Alarm Management allows you to measure and report against world-class alarming standards and guidelines such as ISA 18.2 and EEMUA 191, leading to higher efficiency, quality and safety.

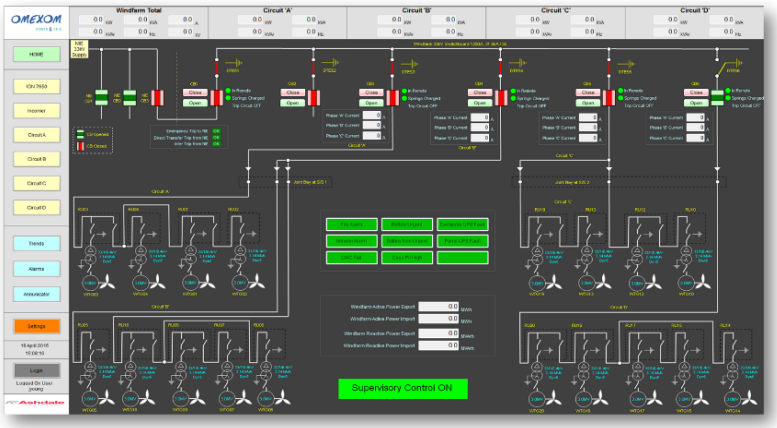
The SCADA Intelligence software product brings the latest thinking in Reporting, Big Data and Analysis to the industrial control industry. Dashboards and analysis of production, quality or energy data can now be used to add even more value to your organisation.

7.1. Food and Beverage Industry

MAPS SCADA is ideally suited to assist in the efficient monitoring and control of even the most complicated production processes of Food and Beverage plant. A time-tested and reliable solution used by large Food and Beverage producers to safely run their valuable and strategic assets. MAPS SCADA has an open system architecture that has not only traditional SCADA/HMI functionality but the ability to integrate all aspects of the Food and Beverage industry operations.

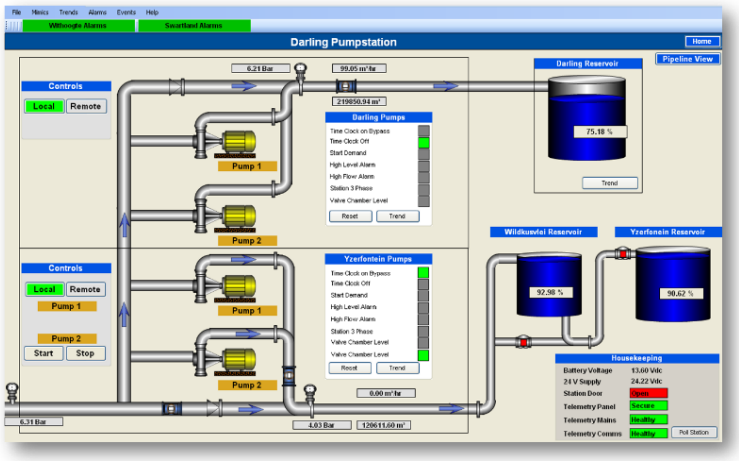


7.2. Power Generation



MAPS SCADA is suited for even the most complex power and nuclear infrastructures for monitoring and controlling. MAPS SCADA is not bound to any specific hardware type and has a library of free drivers to connect to any PLC together with high availability hot-standby solutions. It makes it an ideal choice in an industry where robustness and reliability are key factors. MAPS SCADA offers great flexibility to customers. Redundant CPUs, a CC-Link IE Control network and MAPS SCADA servers can construct a high reliability system. Whether the application is solar, wind, coal, nuclear or gas generated, MAPS SCADA is the ideal platform for this industry.

7.3. Water and Wastewater

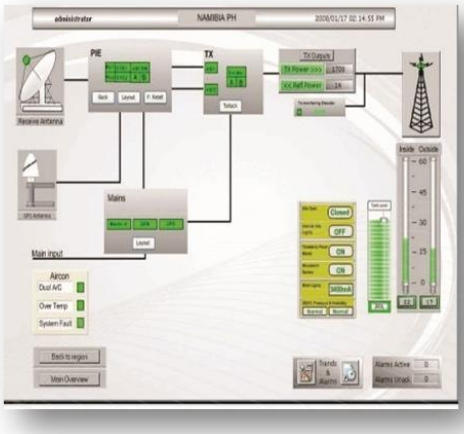


Whether the application is a purification, distribution or wastewater treatment, MAPS SCADA is the ideal platform within this industry. Water management is becoming increasingly complex and demands an urgent review to ensure sustainable service delivery and contribution to economic growth to meet present and future needs. MAPS SCADA is ideally suited to the Water and Wastewater Industries and is trusted by many utilities, mines and municipalities (local authorities) to safely run these valuable and strategic assets. The MAPS SCADA architecture and openness offers water and wastewater customers a unique capability of not only traditional SCADA/HMI functionality but the ability to integrate all aspects of their operations.

7.4. Mining and Mineral Processing

MAPS SCADA is ideally suited to provide a total solution in assisting in the efficient and productive extraction, concentration and processing of any mineral mining operation. MAPS SCADA can be found in Coal, Gold, Diamond, Chrome, Vanadium mines and processing plants across the world and is trusted by many companies to safely run these valuable and strategic assets. Whether the application is Mining, Concentrating, Smelting, Refining or final product manufacturing MAPS SCADA is the ideal platform for this industry.

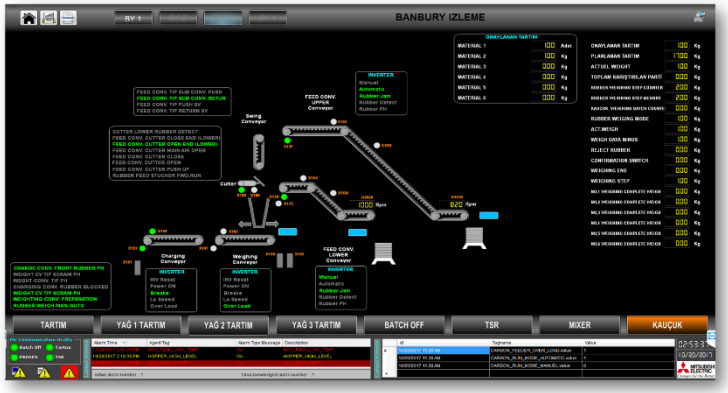
7.5. Telecommunications



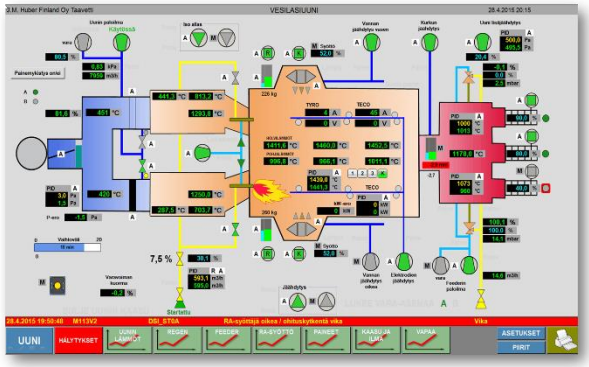
MAPS SCADA is recommended to assist in the efficient monitoring and control of even the most complicated telecommunications infrastructure. MAPS SCADA is being used by large Companies to safely run these valuable and strategic assets and has the ability to integrate all aspects of their communications operations.

7.6. Automotive Industry

MAPS SCADA can be applied at every process in an automotive plant to create a complete monitoring control system. For manufacturing, production and operations management, quality management, testing or any other part of the automotive value chain MAPS SCADA can be the portal to the multitude of sub-systems making up this complex business.



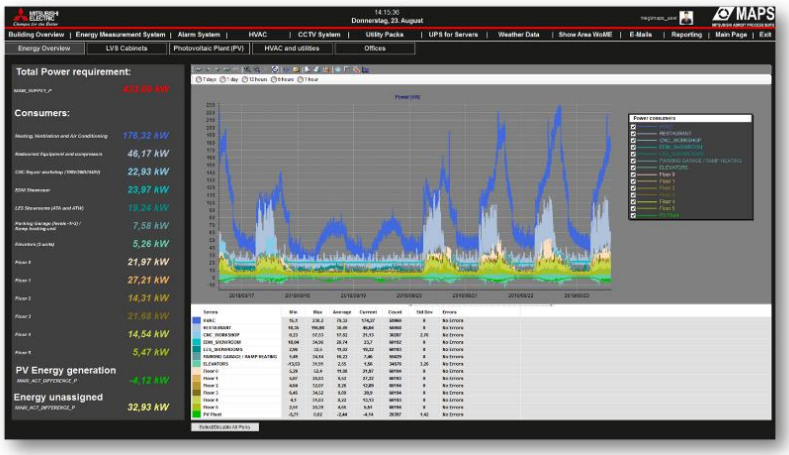
7.7. Electrical/Electronics Industry



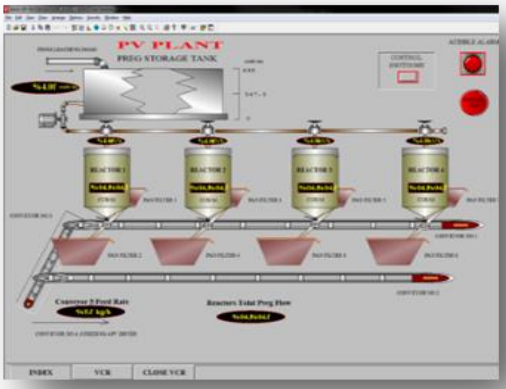
MAPS SCADA can be applied for the monitoring control of an assembly plant of electrical machinery and electronics.

7.8. Building and Facilities Management

We recommend MAPS SCADA for the monitoring control of even the largest and most complex facilities management solutions. This provides a variety of solutions: monitoring control linked to an air-conditioning controller, the visualisation of energy and energy measurement equipment, security and alarm systems.



7.9. Steel Industry

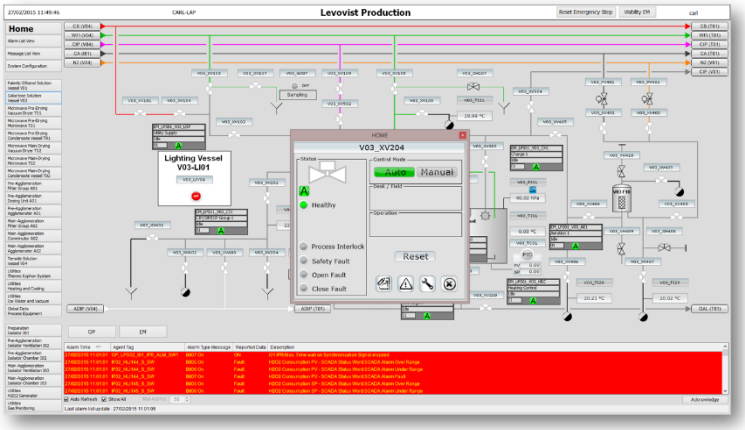


We process MAPS SCADA for the monitoring control of each process and utility at a steel plant. Redundant CPUs enable you to construct a highly reliable system.

7.10. Chemical and Pharmaceutical Industry

The use of MAPS SCADA can provide a total solution. This includes process and utility monitoring control and production control for a plant producing industrial chemicals, high-functional materials and medical products.

The standard MAPS SCADA security functionality allows companies to build CFR21 11 Certified Process that require retention of certain process changes. Double verification using digital signature technology when combined with other configuration delivers a certifiable manufacturing process.



8. MAPS Product Suite

8.1. MAPS HMI

Following market demands Adroit Technologies has introduced a reduced functionality, low cost version of the highly successful Mitsubishi Adroit Process Suite (MAPS SCADA) to the market. The focus is the machine builder and more simple HMI requirements that do not require the capabilities of the full MAPS software.

However, unlike most competitive stand-alone solutions the MAPS HMI software allows users to license up to 2 remote operators/view clients.

This allows the user to have more visibility into the plant or machine being controlled. This feature also allows the user to change the HMI project remotely.

In addition MAPS HMI supports simultaneous connections to over 100 different controllers.

Being based on the MAPS SCADA architecture means that users have access to various Agents when configuring the I/O, allowing a more object-oriented approach to configuration.

Users are therefore not limited to simple tag based configuration but have access to all the power of a SCADA, including unlimited alarming, logging, scripting and interaction to the database that allows for a far more flexible and powerful solution.

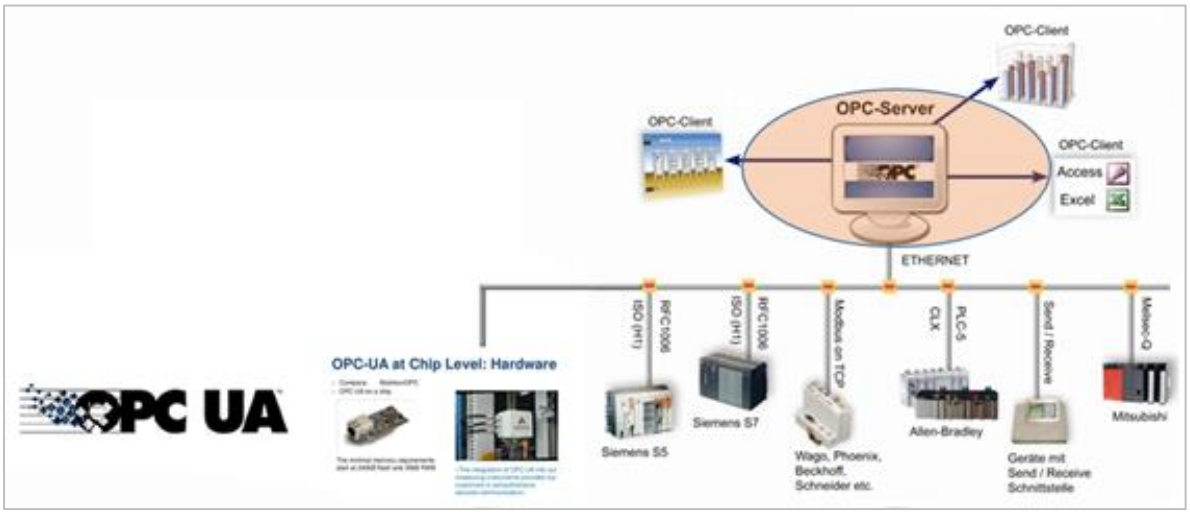
8.2. OPC/Edge Gateway

Using the tried and tested Adroit Agent Server Technology and Drivers we have developed, a product similar to Kepware, Matrikon.

OPCUA Server – but much smarter
Access data using our Drivers and Datasources
PLC's, MQTT, Sigfox, OPC, OPCUA, Databases

Manipulate and Process Data using the Agent Technology
Process Data, Alarms

Expose the data to other SCADA/Historians/Business applications using OPCUA from the Adroit OPC Server.



8.3. Historian

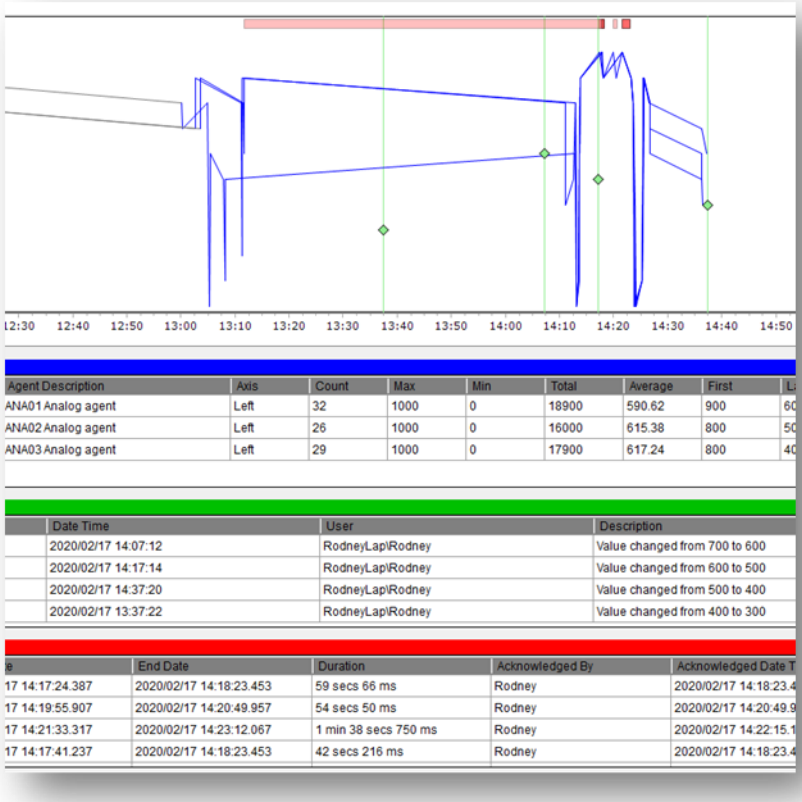
8.3.1. Historian

Uses our new Smart Data Services built on Windows Communications Foundation / Windows SDS technology:

- Centralised data storage and access from many and remote Agent Servers.
- Easy to set up.
- Centralised Storage of Datalog Data, Remote Access to Alarm Managements, Events using TCP/IP.
- Process Analysis Control .
- Enhanced Trend Control.

8.3.2. Process Analyser

The Process Analyser is a tool used in the SmartUI to view the historical data of datalogs, while also displaying the relevant and associated Audit events and Alarm data (Historical Incidents) over the same period of time.



This tool is used to help users to determine what event or series of events lead to a failure in their plant, factory or production process, by allowing users to compare three different sets of data (datalogs, audits and incidents) against each other.

Centralised View:

- Datalogs
- Alarms
- Events
- Audit Data

Driven by:

- Tag
- Object Model

8.4. Product Comparison

	MAPS	Adroit	Adroit Lite	Adroit Lite & IPC Bundle	Adroit Ignite	OPC/Edge Gateway
Scanned Point Sizes	30, 75, 150, 300, 750, 1 500, 2 500, 5 000, 10 000, 15 000, 20 000, 25 000 & 50 000 (also available 5 000 Bundles)	30, 75, 150, 300, 750, 1 500, 2 500, 5 000, 10 000, 15 000, 20 000, 25 000 & 50 000 (also available 5 000 Bundles)	30, 75, 150, 300, 750 & 1 500	300	Agents 8, 30, 75, 150, >150	8, 30, 300, 1500, 5000, >5 000
Local Design Client	Included as standard on local AS	Included as standard on local AS	Included as standard on local AS	Included as standard on local AS	Included as standard on local AS	Included as standard on local AS
Client Type	Single or 5 x View Client Bundles	Single or 5 x View Client Bundles	No. of Client connections available:	No. of Client connections available:	No. of Client connections available:	OPC Client Connection Licensed
Ø Designer	✔	✔	✔	✔	✔	–
Ø Operator	✔	✔	✔ Max no. = 2	✔ Max no. = 2	✔ Max no. = 2	–
Ø Performance Anywhere	✔	✔	✔ Max no. = 5	✔ Max no. = 5	✔ Max no. = 5	–
Ø Adroit Air	✔	✔	✔ Max no. = 5	✔ Max no. = 5	✔ Max no. = 5	–
Redundancy (Hot Standby)	Supported (75% of Agent Server prices)	Supported (75% of Agent Server prices)	✘	✘	✘	✘
Distributed/Proxy Architecture	✔	✔	✘	✘	✔	✔
Group Wide License	✔	✔	✔	✔	✔	✔
Technology Agreement	Based on Scanned Points	Based on Scanned Points	Based on Scanned Points	Based on Spanned Points	Based on Agents used	Based on Spanned Points
Agent Types	All Available	All Available	All Available*, **EXCEPT** for: -	All Available*, **EXCEPT** for: -	All Available*, **EXCEPT** for: -	All Available*, **EXCEPT** for: -
Ø Primitive	✔	✔	Frame; Integer; Real	Frame; Integer; Real	Frame; Integer; Real	Frame; Integer; Real
Ø Basic	✔	✔	MultiState	MultiState	Marshall; MultiState	MultiState
Ø Advanced	✔	✔	Alarm Management; ARec; Recipe; Scheduler; ShifAdv	Alarm Management; ARec; Recipe; Scheduler; ShifAdv	Alarm Management; ARec; Recipe; Scheduler; ShifAdv	Alarm Management; ARec; Recipe; Scheduler; ShifAdv
Ø MIS/MES	✔	✔	MaxDemand; OEE_adv; OEE; PID	MaxDemand; OEE_adv; OEE; PID	MaxDemand; OEE_adv; OEE; PID	MaxDemand; OEE_adv; OEE; PID
Ø IT	✔	✔	Audit; DumpConfig; ICMP; SNMPMngr	Audit; DumpConfig; ICMP; SNMPMngr	Audit; DumpConfig; ICMP; SNMPMngr	Audit; DumpConfig; ICMP
Ø System	✔	✔	✔	✔	✔	✔
Ø Other	✔	✔	Custom; UDT	Custom; UDT	Custom; UDT	Custom; UDT
Datasources	Adroit; Adroit Air; OLEDB; EventLog; GIS; ObjectModel; ServerScripts; MAPS; Simulation	Adroit; Adroit Air; OLEDB; EventLog; GIS; ObjectModel; ServerScripts; MAPS; Simulation	Adroit; Adroit Air; OLEDB; EventLog; GIS; ObjectModel; ServerScripts; MAPS; Simulation	Adroit; Adroit Air; OLEDB; EventLog; GIS; ObjectModel; ServerScripts; MAPS; Simulation	Adroit; EventLog; ServerScripts; Simulation	–
Interfaces	C API; Web Services; OLE; Active X	C API; Web Services; OLE; Active X	C API; Web Services; OLE; Active X	C API; Web Services; OLE; Active X	C API; Web Services; OLE	C API; Web Services; OLE
Operating Software - OS	Windows 10 Enterprise	Windows 10 Enterprise	Windows 10 Enterprise	Windows 10 Enterprise	Windows 10 Enterprise	Windows 10 Enterprise
Operating Software - Other	.Net framework 4.6.2	.Net framework 4.6.2	.Net framework 4.6.2	.Net framework 4.6.2	.Net framework 4.6.2	.Net framework 4.6.2
FED Drivers	Over 100 available	Over 100 available	Over 100 available	Over 100 available	Over 100 available	Over 100 available
Licensed Drives	Allen Bradley; Siemens EtherNet and DNP3.0	Allen Bradley; Siemens EtherNet and DNP3.0	Allen Bradley; Siemens EtherNet and DNP3.0	Allen Bradley; Siemens EtherNet and DNP3.0	Allen Bradley; Siemens EtherNet	Allen Bradley; Siemens EtherNet and DNP3.0
			*Marshall Agent requires 16 Scanpoints	*Marshall Agent requires 16 Scanpoints		

9. MAPS Product Suite Documentation

The following related documentation is also available on the Adroit website:-

https://www.mapsscada.com/downloadsacc/