

## Safety System Software (S<sup>3</sup>)

### APPLICATION

Safety System Software (S<sup>3</sup>) is a robust, full featured configuration, diagnostic, programming and real-time monitoring package for integrators and end users.

In addition, by utilizing its integral OPC (OLE for Process Control) server option, a wide variety of status and diagnostic information can be shared with DCS, PLC, and many other compatible systems.

This data sheet covers the specific use of this robust software tool with Det-Tronics Eagle Quantum Premier® (EQP) systems.



### FEATURE

- Supports multiple simultaneous connections.
- Automatic serial port configuration: baud rate, data bits, stop bits, parity.
- Support for previous generations of Det-Tronics hardware, consult factory for details.
- Available OPC 2.03 Data Access Server.
- Complete logic programming and simulation environment for Eagle Quantum / Premier fire & gas systems.
- Complete field device programming environment for Eagle Quantum / Premier systems.
- Monitors up to 120,000 unique events / alarms.
- Event logging to screen, disk and printer.
- Single window view of data from a variety of sources.
- Multi-level security for up to 64 unique accounts.

- Project based development environment for managing multiple projects.
- Printing of comprehensive project documentation.
- Integral project backup / restore utility.
- Logging of changes to device configurations, alarm setpoints, downloads, etc.

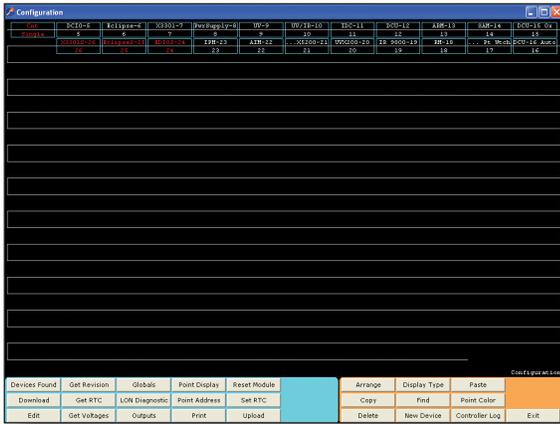
### DESCRIPTION

S<sup>3</sup> provides a full featured data acquisition, display and configuration package.

With specific support for the EQP system, it provides all of the tools needed to ensure accurate system configuration and to enable quick and easy access to relevant information.

# SYSTEM CONFIGURATION

The S<sup>3</sup> database contains all of the information needed for easy and accurate configuration of any Det-Tronics or third party device that can be used on the EQP system.



LON Overview Window

System and device configuration is graphically presented with all pertinent information and user selectable options readily available from the point configuration screen.

# LOGIC EDITOR

S<sup>3</sup> provides an object-based graphic development environment for the creation of gas detection, fire detection, fire suppression and annunciation logic when used with the EQP system.

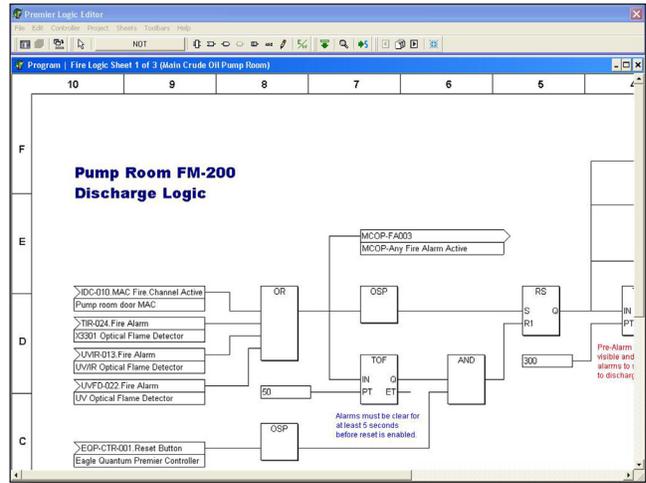
Logic is created with an IEC-61131-3 style editor utilizing a library of logic functions that match the capabilities of the EQP controller.

These logic “drawings” become both the documentation and the program.

With this user friendly and powerful tool, virtually any conceivable logic can be quickly and easily created, tested and deployed.

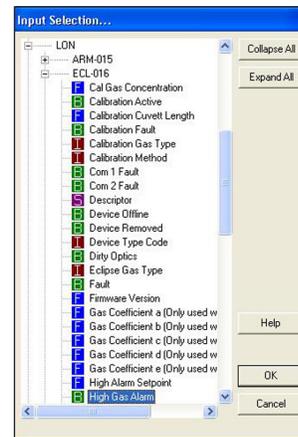
One key feature is that “linking” logic connections to field device inputs and outputs doesn’t require any knowledge of the controller’s internal addressing.

Simply “double-click” on an input or output block on the drawing and a “browser” style selection dialog box is provided.



Logic Editor Window

As shown in the example below, an “input” is being selected. Clicking on the tag name for any device on the EQP LON (Local Operating Network) expands the tag name to display any available data that can be linked to the logic.



Input Selection Window

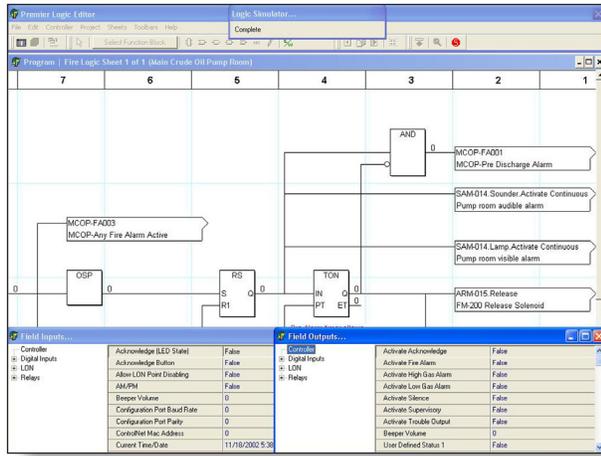
Color coded blocks to the left of the data indicate the data-type; B for Boolean, F for Floating Point etc. In this example, the boolean value “High Gas Alarm” is selected from the device named ECL-016.

Simply make the appropriate selection, click on the “OK” button and the connection is complete.

An extensive online help library is only as far away as the F1 key or “Help button” to answer any questions on using the features of the logic editor, or to determine the syntax or use of any of its logic elements.

## LOGIC SIMULATOR

Below is a sample screen showing the logic simulator in use. Using the same logic drawings created in the logic editor, S<sup>3</sup> allows logic to be simulated without being attached to the control system. Simply point and click on inputs to toggle their state and watch the logic flow.



Logic Editor Window

Latches are set, timers and counters function, and logic flows from page to page until outputs are generated. This powerful feature can be a tremendous time saver, since it allows for complete logic de-debugging from the computer prior to connection to the system.

## ONLINE MONITOR

When connected to the system Controller, the logic diagrams can be viewed in an “online monitoring” mode where the current state of all logic is dynamically shown. Using the same format as the simulator shown above, the monitor displays the “real-time” logical and calculated values at the output pins of all input and logic gates.

## PRE-BUILT POINT DISPLAYS

S<sup>3</sup> provides “Point Displays” for all EQP intelligent field devices. These point graphic screens organize and display information in an easy to read format. The example below shows the information for an intelligent infrared hydrocarbon gas detector.



Point Display

In this display, a mix of discrete and analog data is shown with the process related Alarm History and Analog Input Track in the top section, discrete diagnostic information about the field device in the center section, and calibration history in the bottom section.

S<sup>3</sup> provides a variety of point displays that are tailored to the unique requirements of each instrument type —instruments such as gas detectors, optical flame detectors, supervised input and supervised output devices.

On devices with an analog process variable, like gas detectors, a one minute running trend is provided superimposed over the low and high alarm setpoints. On certain devices calibration history is also available and is shown both in a “numeric table” and “XY Plot” graphic form.

## CONNECTIVITY

Full and easy communication between systems is a cornerstone of today’s modern automation, control and safety system strategies. It’s no longer acceptable for the safety systems to be isolated from the larger plant-wide systems and seamless integration into these systems is fast becoming a requirement. To accomplish this, S<sup>3</sup> is available with an OPC server which enables connectivity to a variety of modern platforms.



OPC is an industry standard created with the collaboration of a number of leading worldwide automation and hardware/software suppliers working in cooperation with Microsoft®. The organization that manages this standard is the OPC Foundation. The Foundation has over 220 members around the world, including nearly all of the world's major providers of instrumentation and control systems.

The OPC option for S<sup>3</sup> simplifies the transfer of safety system data from many sources to distributed control systems or other OPC compliant systems. S<sup>3</sup> is an "OPC Version 2.03 Data Access Server" and can make available, with user configuration, any information that is tracked by the S<sup>3</sup> event handling database.

Tagname	Type	Port	Point	I/O	Channel	State
Controller	EQP Controller	1	1	I	255	Inactive
Ctr-Inp-1	EQP Controller Input	1	1	I	1	Inactive
Ctr-Inp-2	EQP Controller Input	1	1	I	2	Inactive
Ctr-Inp-3	EQP Controller Input	1	1	I	3	Inactive
Ctr-Inp-4	EQP Controller Input	1	1	I	4	Inactive
Ctr-Inp-5	EQP Controller Input	1	1	I	5	Inactive
Ctr-Inp-6	EQP Controller Input	1	1	I	6	Inactive
Ctr-Inp-7	EQP Controller Input	1	1	I	7	Inactive
Ctr-Inp-8	EQP Controller Input	1	1	I	8	Inactive
ECL-S-25	Point IR Gas Detector(PIRECL)SIL	1	25	I	255	Inactive
EDIO-S-24	8 Channel EDIO SIL	1	24	I	255	Inactive
EDIO-S-27	8 Channel EDIO SIL	1	27	I	255	Inactive
EDIO-S-28	8 Channel EDIO SIL	1	28	I	255	Inactive
EDIO-S-29	8 Channel EDIO SIL	1	29	I	255	Inactive
I-ClassA-Open	EDIO Input A-A	1	24	I	1	Inactive
I-ClassA-Open-S	EDIO Input A-A	1	24	I	3	Inactive
I-ClassA-UnMon	EDIO Input A-A	1	24	I	7	Inactive
I-ClassB-Open	EDIO Input	1	24	I	5	Inactive
I-ClassB-Open-S	EDIO Input	1	24	I	6	Inactive

OPC Server Configuration Window

The S<sup>3</sup> OPC Server implementation is simple to configure. As devices are added to the EQP configuration database, the device tagnames along with all of the alarm and event tracking for these devices are automatically transferred into the OPC Server database, where it is stored under the device's tagname.

Any or all tags can easily be "Activated" for access by any OPC compliant client by selecting the tag and then choosing the "Activate" button in the "OPC Server Configuration" dialog box.

EQP devices contain more than a single data value and detailed information on the OPC data available for any Tag can be viewed by selecting the Tag and then choosing the "Properties" button which opens a "Property Viewer" showing this data.

Although the EQP does have "legacy" connectivity via an onboard Modbus-RTU communication port, using S<sup>3</sup> with its optional OPC Server eliminates the need for the Host system programmer to know anything about the controller's internal memory structures (i.e. Modbus memory maps). Integration becomes a simple matter of knowing what "Tagname" is needed and then browsing the OPC database for the required data to "link" into the host system.

Extension	Description	Variant Type	Item ID
DECS	DEC Device State	VT_I4	6501
ITD	Item Description	VT_BSTR	101
TIMEDATE	Current Date/Time	VT_DATE	6536
FA	Fire Alarm	VT_BOOL	5068
QLIT	Trouble	VT_BOOL	5076
FIRSTSCAN	First Scan	VT_BOOL	6537
HGASALA	High Gas Alarm	VT_BOOL	6503
LGASALA	Low Gas Alarm	VT_BOOL	6504
QLIA	Acknowledge	VT_BOOL	5078
QLISIL	Silence	VT_BOOL	5079
QL2PMA	Program Mode Active	VT_BOOL	5085
QLIS	Supervisory	VT_BOOL	5077
EXTRADEVICE	Extra LON Device	VT_BOOL	6539
LERRNUM	Logic Error Reference Number	VT_I4	6540
WRGDEVTYPE	Wrong Device Type	VT_BOOL	6538
LERRCODE	Logic Error Code	VT_I4	6541
MEMFAULT	Memory Fault	VT_BOOL	6515
RTCFAULT	Real Time Clock Fault	VT_BOOL	6542
LONGFAULT	LON Ground Fault	VT_BOOL	6543

OPC Property Viewer Window

## HARDWARE REQUIREMENTS

Windows 10 operating system and computers operating on a 64 bit platform are fully supported. As with many modern programs, the faster the machine, the better the performance.

Minimum requirements:

- 256 MB of physical memory. Det-Tronics typically provides a minimum of 512MB of physical RAM in its OIS installations.
- Thousands of colors (16 bit) with a minimum display resolution of 1024 pixels wide by 768 pixels (XGA). Software support for touchscreens is included.
- CD-ROM drive required.
- 50 MB free hard disk space required.
- Communication is possible with some systems via a single or redundant Ethernet connection. Each network card must have a separate, fixed, TCP/IP address.
- S<sup>3</sup> is designed to work with a serial version of the Okidata ML490 four color, tractor feed, dot matrix printer.

## ORDERING INFORMATION

Det-Tronics has the engineering and project management expertise to configure and manage a custom system designed to meet your needs.

For additional information about the use of S<sup>3</sup> for Eagle Quantum Premier, Modbus RTU, Triconex V9, or for assistance in ordering a system to meet the needs of a specific application, please contact us through our Corporate Offices or a Regional System Solution Center.

Specifications subject to change without notice.

All trademarks are the property of their respective owners.  
© 2019 Detector Electronics Corporation. All rights reserved.



**Corporate Office**

6901 West 110<sup>th</sup> Street | Minneapolis, MN 55438 USA

Operator: 952.941.5665 or 800.468.3244

Customer Service: 952.946.6491 or 800.765.3473

[www.det-tronics.com](http://www.det-tronics.com) | Email: [det-tronics@det-tronics.com](mailto:det-tronics@det-tronics.com)