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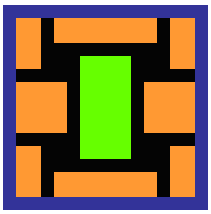
RsS SCADA System



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Solutions for SCADA communications and protocol translation

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Introduction

RsS SCADA Systems (RsS) provides a robust supervisory monitoring and control platform that allows you to build a solution to meet current and future Supervisory Control & Monitoring needs. RsS provides real-time functionality for local or remote supervision, including events and alarms handling, reporting, trending as well as parameter setting.
Features include:

- Reliable data acquisition and supervisory control
- Compliance with Industry Standard/Proprietary Protocols and simultaneous multiprotocol support
- Full graphics user interface support for all SCADA functions
- Highly Flexible and performing system capable of handling thousands of alarms and SCADA information per second
- Integrated multidimensional tagging capability
- History Logging with any MS SQL Server or ODBC Compliant Database
- State-of-the-art reporting capabilities with reports can be exported into MS Excel for better viewing and analysis
- RsS with more than 15 installations over last 2 years has proven to be reliable, stable and cost –effective solution.

Key Components

RsS Server (RS)

- Its main function is to handle all the Acquisition & Control and manage Database Management System.
- For control sequence, the RS manages the correct execution of control sequence together with the PLC/RTU.
- RS manages the supervision between all the devices and information is logged in Database System used by HMIs to animate the system supervision, indicating the place where (and when) a failure occurs.

Human-Machine Interface (HMI)

- RsS HMI is an innovative set of applications that displays the acquired data to operators as useful information. Operators can monitor, analyse and control using HMI.
- All controls are initiated using more familiar interfaces that allows to make more informed decisions. All graphics are high-resolution. The pictures are configured for each process to help the operator with clear indication, in format, colour and video attributes. Online help functions are included.

Database

- RsS has inbuilt DB Manager that stores the system information in any ODBC Compliant Database. Also RsS has powerful Historian application used for real-time and history information.

Engineering Works Station (EWS)

- Data Configurator provides with the set of tools that allows to design and maintenance of the Plant Database. It consists of 4 types of information:
  - Plant Information: Holds all Substation Tags Information.
  - RTU/PLC Information: Hold information of associated RTUs / PLCs and IEDs
  - System Devices: Holds information for remote devices like remote SCADAs and Servers / HMIs
  - Communication Information: Holds the communication information between Plant and RTUs/PLCs/IEDs/ Remote Substations

Design Specification

Operating System

- 32 Bit

Processor

- Single Processor
- Multithreaded Application
- Multiprocessor Supported (symmetric multiprocessor design not implemented)

Architecture: 3 Tiers

- Server Layer
- HMI Layer
- Database Layer
- Each Layer can be installed at one PC and can be distributed over network over different machines

Server Layer

- Interfacing with Field Devices/ HMI/ Database Server
- Logging Data in DB Server
- Manage Redundancy

Database Layer

- All Data Logging only by Server Layer
- HMI other only read data from Database for Display / Read-only purpose
- Redundant Database Layer supported

HMI Layer

- Interface with Server Layer and Database Layer
- HMI Layer includes HMI application, TRENDS application
- Data is displayed from Database layer
- Control data is directly exchanged with Server Layer

Server - Field Device Interfacing

- Industry Standard Protocols

Server – HMI Layer Interfacing

- Proprietary Protocol: RSP
- OPC Interface can also be provided

Database HMI Layer

- 10ms Database synchronization by HMI for Status and Analog values

Server – DB Layer Interfacing

- Database updated in Real-time, without any delays

Security

- All password saved on Hard disk are with RSA Encryption
- All authentication messages over the network are encrypted with RSA 128 Bit Encryption
- All data exchange for Server - HMI Layer over network is using proprietary protocol
- All data exchange with Database layer is using OLEDB. Data is not encrypted, standard OLEDB connection is used

Functional Specifications Specification

RsS Server

- Maximum 2 Servers in redundant configuration

DB Server

- Maximum 2 Servers in redundant configuration

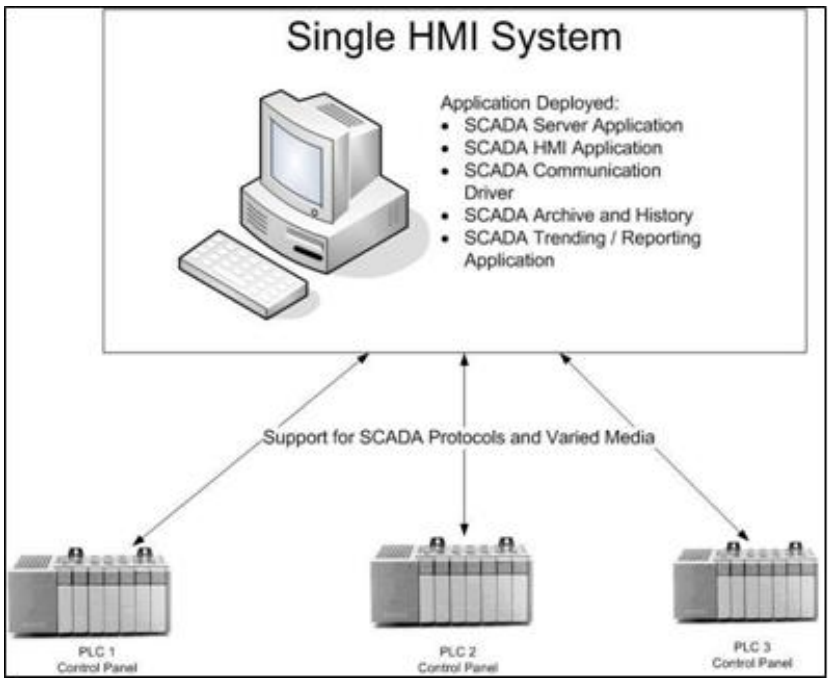
HMI

- 16 HMIs per system
- Password stored locally in encrypted format. Authentication messages are encrypted before transmitting on network (RSA 128 Bit)

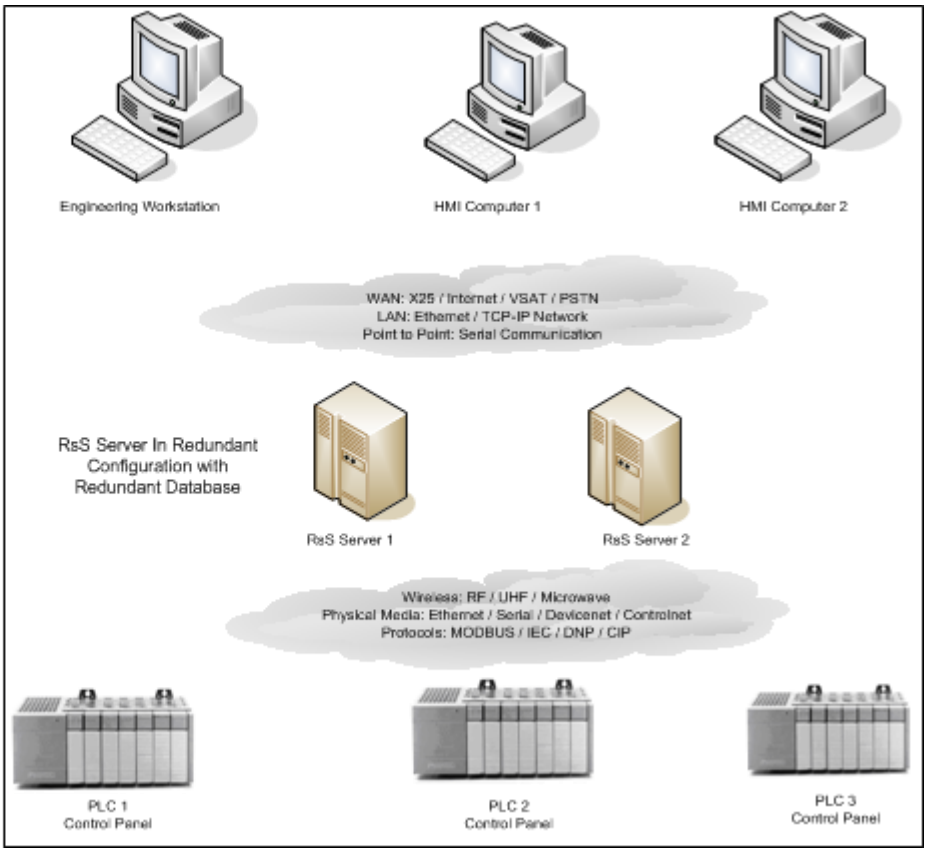
Engineering Limitations

- Virtually Unlimited Tags: Presently 128000 Tags
- Supports: 1 Station, 256 Voltage Levels (Partitions), 256 Bays per Partition
- 65000 interlocks
- 65000 Control Popup
- 1024 Arithmetic and Logic Functions
- Printer: 1 Log Printer, Report Printing, Screen Printing
- Trends: 20 trends per screen
- Single Acquisition Protocol (Multi-protocol support is an Add-on Features)

Architecture Details

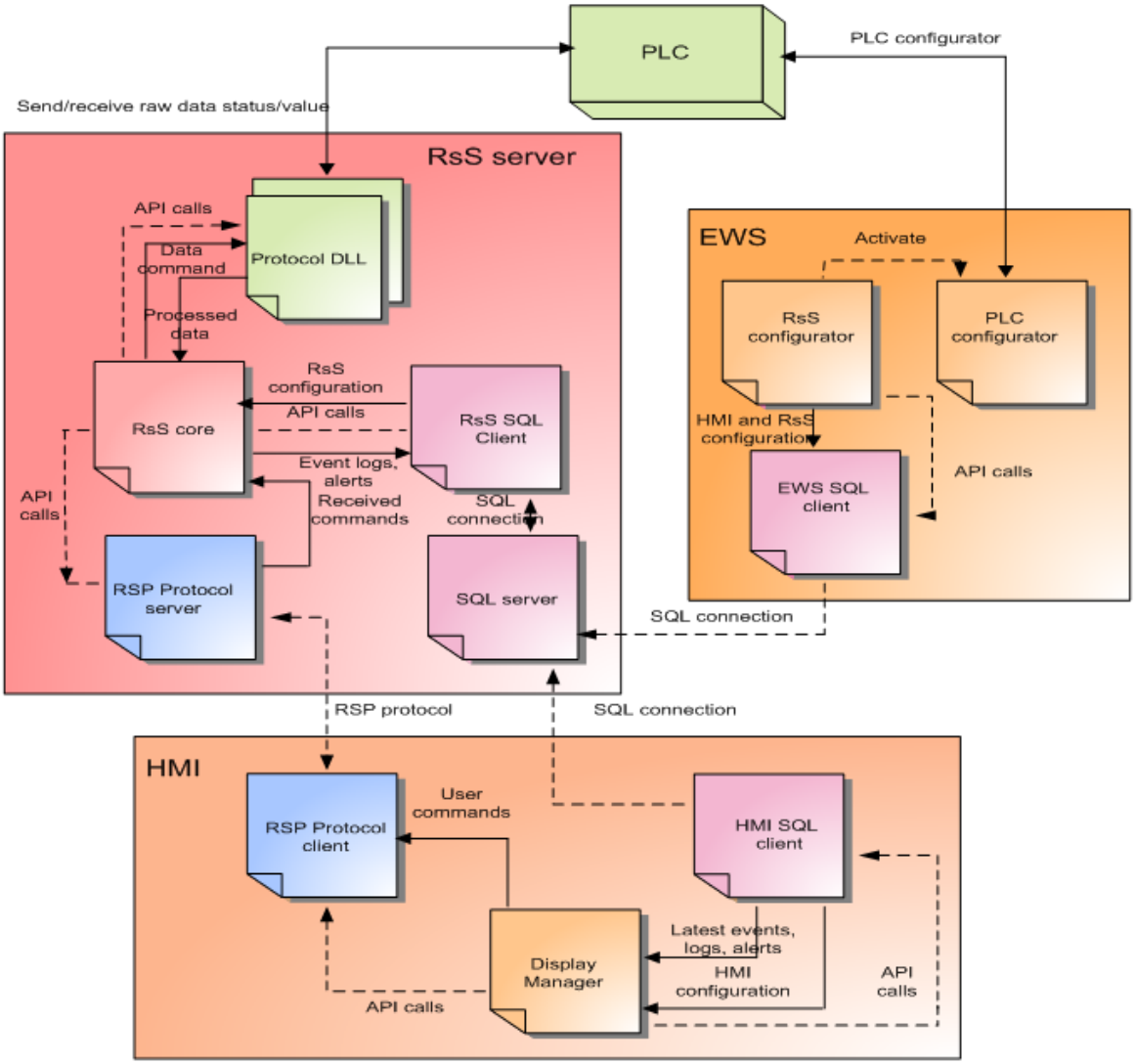


Single PC

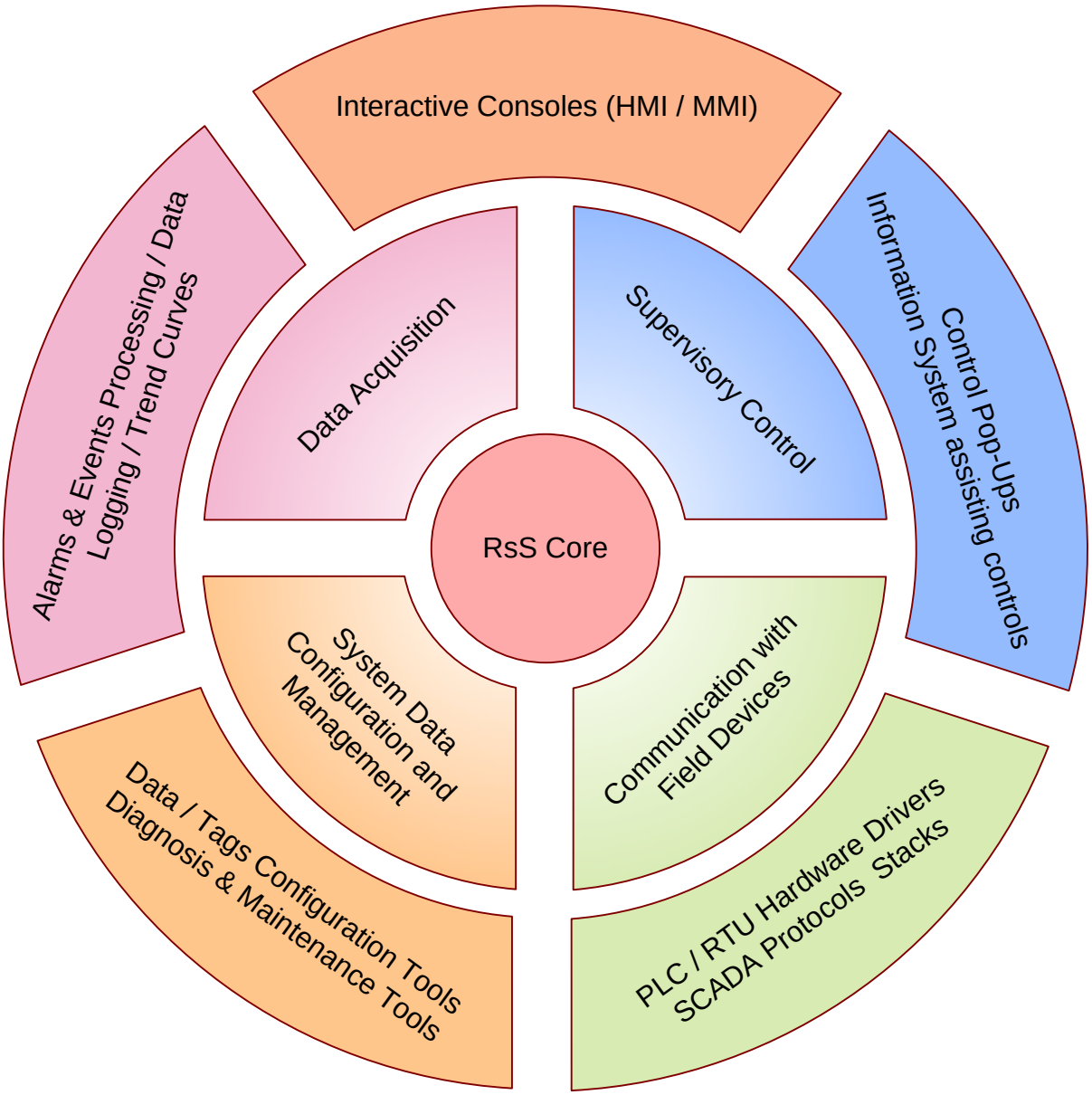


Distributed Architecture

System Management and Inter Process Architecture



System Modules



Key Applications

Alarms

Alarm subsystem notifies operators to problems on SCADA System, with capability of processing all events and alarms in real-time with millisecond time stamping. Alarms can be defined as Events and Logs, in Group associated with levels, printable state and Annunciation states, etc. User defined associated logs for History or Event information.

User Access

User Access Rights are managed by Login Password and allows control up to individual device level.

Communication with Field Devices RTU / PLC and RsS Gateway

The Telecontrol Module (TM) is a heart of system, allowing the Operator to remote control the Devices. It handles the Telecontrol protocol and supplied device data according to the configuration. The system is delivered basically with one Main and one Alternate communication channel, single/multiple port, and can be extended. Telecontrol module makes the data conversion between its system format and the Telecontrol Protocols format. This is achieved through a database defined by configuration, from the site data and the other site requirements supplied by the Utility. This module provides support for wide array of PLC Platforms like Allen-Bradley, GE, Siemens, ALSTOM, ABB, Mitsubishi, etc. Supported Protocols are:

- DNP 3
- IEC 61850
- IEC60870-5-101 / 104 / 103
- MODBUS
- OPC DA / A&E
- Ethernet I/P
- Profibus
- ICCP

Logging and Data Export

RsS dynamically store information in any ODBC compliant databases. Also data from HMIs can be directly exported to MS Excel allowing better viewing and presentation for System Data.

Trend / Reports

Provides real time & historical graphical Trends / Reports for the defined Analog and Digital Information.

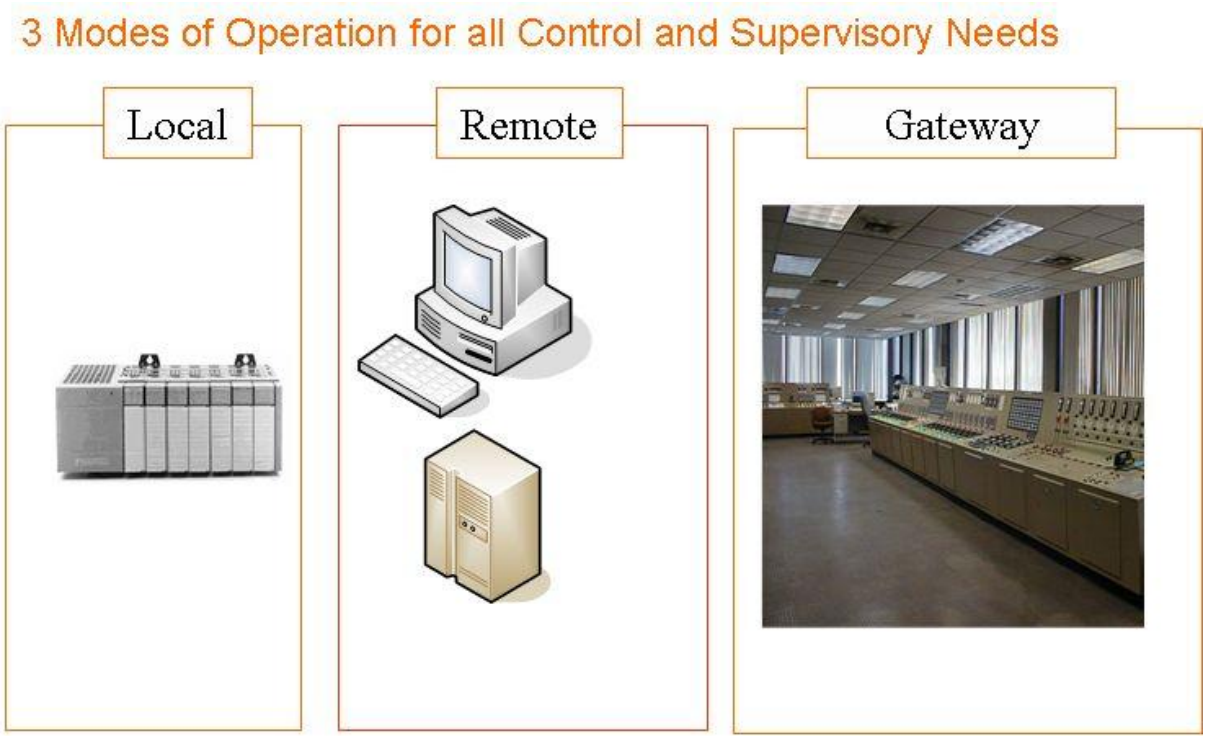
- For Real time trending Trend Application acquires data every 800ms (to give resolution of 1s)
- Historical Trends can be drawn for Values between two defined time periods.
- Trend data is available for viewing at as Graph as well as Tabular form.

- Graphs can be saved in Bitmap form and Tabular data can be exported to Excel sheet

Redundancy

- RsS Server: Two RsS Servers (RS) can be configured in hot-standby mode.
- Operator Work Station (HMI):RSS can support multiple HMIs for device level redundancy
- Database Redundancy: Two DB Servers can be installed and managed by RsS in redundant configuration.

Modes of Operation



- Local Mode: Allows plant to be operated locally from Device or Device Panel. In this mode control from RsS HMI and RsS Gateway is blocked.
- Remote Mode: Allows plant to be operated from RsS HMI, control from RsS Gateway is Blocked.
- Gateway Mode: Allows plant to be operated from Remote Control Application, control from RsS HMI is Blocked.

Modular Offering

Minimum Configuration

- RsS Server: One RsS Servers (RS).
- Operator Work Station (HMI):One HMI
- Database Redundancy: One DB Servers is must in minimum configuration.

Add-on Modules

- Development Module
- RsS Redundancy
- Operator Work Station (HMI) Multiple Clients (upto 16 Per system)
- Database Redundancy
- Reports and Trending Application
- RsS Gateway for Remote Control Center interfacing
- Multi Protocol Support
- Statistical Process Control (SPC) Charts

Engineering Price Estimation

System based on RsS SCADA Application with all the modules for following requirements can be configured in 15 Days:

- More than 2000 Tags
- More than 30 HMI Views
- 25 Reports
- Dual Database, Dual Server, 3 HMIs
- Single Protocol without Gateway