

# General Specifications

## FAST/TOOLS



### GS 50A01A10-01EN

#### ■ GENERAL

FAST/TOOLS has been developed with over 25 years of experience by combining our expertise in Supervisory Control And Data Acquisition (SCADA) with requirements from users and industry leaders. The FAST/TOOLS package is a powerful, modern, flexible, distributed operations information and control software package. It implements a Web-based supervisory control human machine interface, OPC server/client functions, data acquisition from a variety of controllers and devices, alarm management and historical data management. Furthermore it is a leading system package for operations control and information integration with business systems and is available on a wide range of industry standard operating platforms. Many industries and utility companies with a need for data integration and data integrity use FAST/TOOLS from Yokogawa in their applications. FAST/TOOLS is also successful in critical applications due to its very reliable design, support of redundant and nonstop systems and its on-line configuration capabilities. These properties contribute to high efficiency and high quality production processes. FAST/TOOLS has been developed with a number of key issues in mind, one of which is to provide a system that can start small and which can easily grow with client needs, both in the short and long term. This philosophy protects against premature obsolescence. The consequence of being a hardware independent supplier means support of standard operating systems, standard network protocols, standard user interfaces and standard software development tools. FAST/TOOLS provides solution possibilities in a wide range of control execution applications with the following characteristics:

- Multiple Process Site environments
- PLC/RTU based control systems
- Wide area communication
- Intensive (mission critical) control performed by subsystems
- Relatively high content sequential (logic) control

These characteristics are often seen in for example Oil & Gas production and transport, infrastructure, utilities monitoring and control and high performance manufacturing applications. It also allows the flexibility of combining different types of systems to provide hybrid solutions, both on new and existing sites (green and brown field development).



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● **Web based HMI**

FAST/TOOLS has a truly Web-based HMI to be deployed on the web. All the workflow processes, business logic, and database links were designed after careful studies both technical and ergonomically. It's built to work autonomously on the web and can be extended with new applications. Web-based applications can easily access legacy data on other platforms. Typically interactive, the application accepts input from the web user, processes the input, and displays the results. Information is stored on BuildLinks' servers and the access is obtained via secure logins.

Applications and process information can be rapidly deployed and is easily maintained centrally on the server. This so called "zero deployment" means that client applications can be run from any web-browser and the users always get the most recent version of an application. There is no need to manage licenses and software installations on the client side and no application files need to be copied over and no communication configurations need to be setup. Benefits include faster application delivery and increased IT productivity, broadly accepted technology.

Other benefits of a web-based application are:

Information can be accessed anywhere an Internet connection is available.

The information is 'real-time' (no waiting time for critical information).

The information is more secure than it would be on a personal computer.

Upgrades containing new functions and enhancements are free and automatically deployed there is no need to manually install software or license keys.

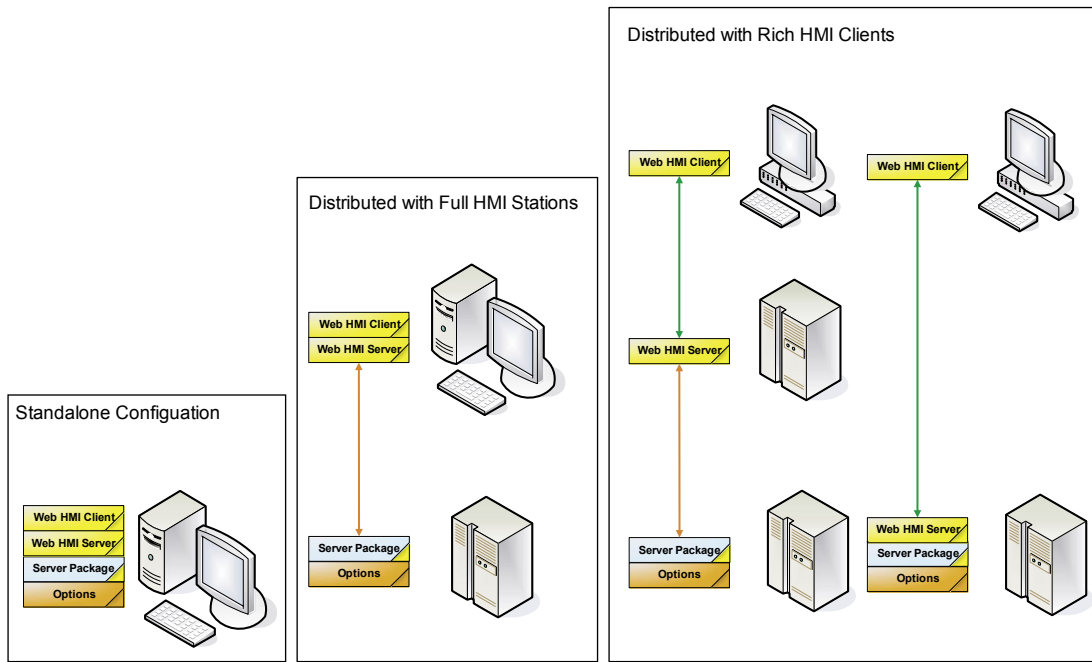
Today Web-technologies are used more and more. Instead of specific client programs, Web browser environments become a user interface, a HMI, to an application (see figure below).



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**Figure Web Based Visualization**

The FAST/TOOLS Web HMI consists of a Web HMI Server and a Web HMI Client that can either run separate from the FAST/TOOLS Server or be installed altogether with the FAST/TOOLS Server environment on a standalone node. Installing the Web HMI Server on a separate node has the advantage that load can be shared between the FAST/TOOLS Server and Web HMI Server.



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Figure System Software Distributions

For Web HMI Operator Stations both Web HMI sever and client are advised to be installed and maintained on the same machine as represented above.

In a configuration with Remote Web HMI Clients each Web HMI Client connect to the Web HMI server over the office LAN and get automatically loaded and updated with their specific HMI environment (called a zero deployment see figure 2.11) which is maintained at the Web HMI server.

### Zero Deployment (Push Application)

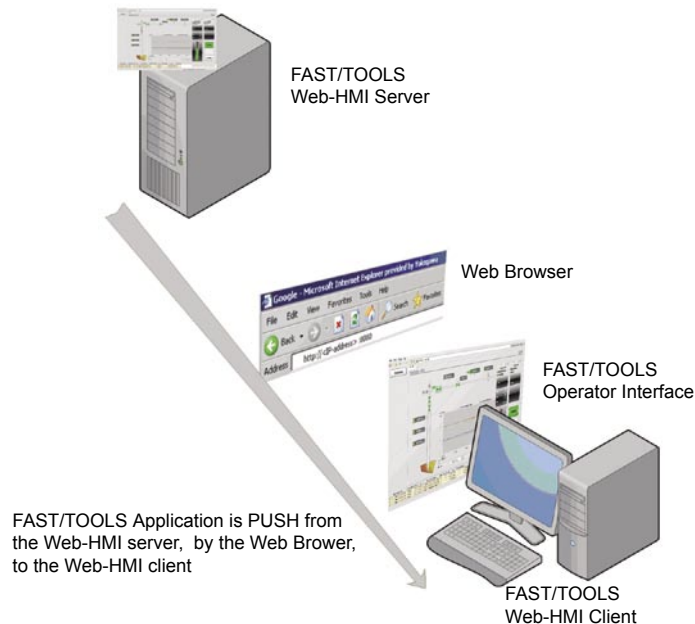


Figure Zero Deployment Application Delivery

This allows for maximal scalability and flexibility with respect to remote operations and load sharing. FAST/TOOLS Web HMI can run either as a Java Application (Web Start) or as a Java applet in a Web browser. Benefits are:

- Client Applications can be run from any web-browser.
- Users always automatically get the most recent version of an application.
- No need to manage licenses and software installations on the client side.
- No need to copy application files and setup of communications.

Benefits include faster application delivery and increased IT productivity through a broadly accepted technology which is positioned to leverage standard and proven web security techniques as administered by IT departments.

Both hardware and software security standards and solutions can be deployed such as bio metric scans, ID cards, Network Centric Computing (for example Citrix XenApp), VPN Tunneling Token & Username/Password (level 2 security). Built-in endpoint scans and policy controls take into account each user's role, device characteristics and network conditions to determine which applications and data they are authorized to access.

For guidelines on defining a secure SCADA system architecture across network domains please refer to the Yokogawa PNS (Plant Network Security) group's SCADA security implementation V3 document.

## ■ SYSTEM SPECIFICATION

### ● FAST/TOOLS Software Modules

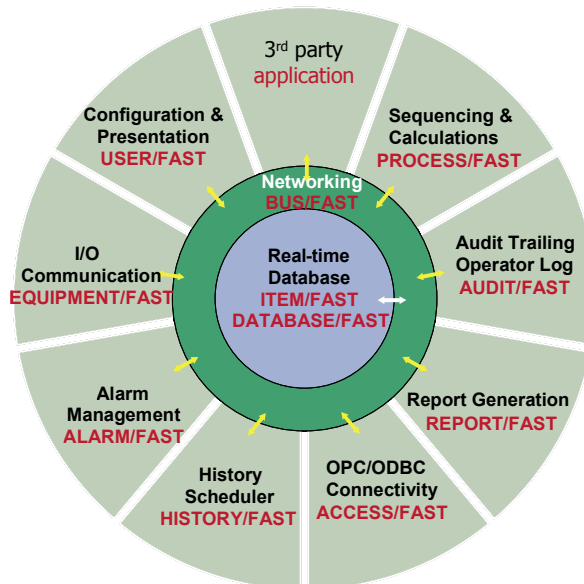
FAST/TOOLS is comprised of function specific software modules (specified in the table below) that connect to the communication data bus BUS/FAST. All FAST/TOOLS modules are event based and submit their events to BUS/FAST. BUS/FAST passes these events in a highly secure and reliable manner to modules that are subscribed to these events. The result is a very low CPU-load on any system during normal operations.

Tool name	Description
BUS/FAST	Basic networking support and secure communications
DATABASE/FAST	Real-time database with ISAM based file support and distributed Data Set Services
HISTORY/FAST	History scheduler
AUDIT/FAST	Audit trailing and Operator Log
ITEM/FAST	Real time item data handling
EQUIPMENT/FAST	I/O communication
ALARM/FAST	Alarm management and handling
PROCESS/FAST	Sequencing and Calculations
REPORT/FAST	Report generation
ACCESS/FAST	Open DataBase Connectivity (ODBC) interface, OPC (DA&AE) server and client functionality
USER/FAST	Configuration & Presentation
INTEGRATION	Various utilities and application integration options.

The full FAST/TOOLS functionality can be installed on one system (stand-alone configuration) or distributed over many (dispersed) systems (distributed configuration). The minimal configuration of any FAST/TOOLS system is a standalone system with the following modules installed:

- BUS/FAST
- ITEM/FAST
- DATABASE/FAST
- EQUIPMENT/FAST
- ALARM/FAST
- PROCESS/FAST
- USER/FAST

Additionally any of the other modules can connect to the bus in order to enhance the functionality of FAST/TOOLS.



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Figure FAST/TOOLS Modular Structure

● **FAST/TOOLS Functional Components**

In addition to the software modules FAST/TOOLS defines four functional components within its software & system architecture which may be distributed across geographical dispersed locations to adapt to any specific application requirements:

Function	Description
SCADA Server	The SCADA Server is the core processing unit of the system. Within a distributed configuration it manages sets of data such as control objects (tags) and takes care of gathering data from the attached equipment and front-end servers in any distributed or stand-alone configuration.
Front-End Server	A Front-End Server takes care of intensive pre-processing of large data quantities from the attached equipment and passing it on to the SCADA server. In addition also some local control and operations functionality can be implemented.
Web HMI Server	A Web HMI Server delivers an operation and monitoring window (HMI) of data & information gathered and processed by SCADA servers to Web HMI Clients.
Web HMI Client	A Web HMI Client accesses a Web HMI Server to display process mimics, trends, alarm & events and other operating data. Furthermore each Web HMI client accommodates a full functional application engineering environment for both database and display configuration. A Web HMI Clients can run on the same computer as its Web HMI Server or on a different computer across LAN/WAN networks.

Each FAST/TOOLS system comprises at least of one SCADA Server, one Web HMI Server and one Web HMI Client component. These may be configured as a stand-alone or distributed system. The following table provides an overview of which of the specific FAST/TOOLS software modules are installed on each functional system component:

Module name	Component			
	SCADA Server	Front-End Server	Web HMI Server	Web HMI Client (Note)
BUS/FAST	*	*	*	
DATABASE/FAST	*	*	*	
HISTORY/FAST	*	*		
AUDIT/FAST	*			
ITEM/FAST	*	*		
EQUIPMENT/FAST	*	*		
ALARM/FAST	*	*		
PROCESS/FAST	*	*		
REPORT/FAST	*			
ACCESS/FAST	*	*(OPC only)		
USER/FAST			*	
INTEGRATION	*	*	*	

Note: The Web HMI Client only requires a standard supported OS (Windows XP or Windows 7) and a Web browser (Internet Explorer or Firefox). There is no need to install and maintain any FAST/TOOLS components (zero deployment) on a Web HMI Client.

● **FAST/TOOLS System Dimensions**

The table below shows the scalability and specifies the dimensional limits of FAST/TOOLS based systems.

Function	Specification	Remarks
SCADA Server	Up to 255 Servers per control LAN (Note)	Consult Yokogawa when more SCADA servers are needed. (Note)
Front-End Server	Up to 255 Front-End Servers per SCADA Server (Note)	Maximum number of Front-End Servers one SCADA server can host. (Note)
Web HMI Server	Up to 255 Web HMI Servers per SCADA Server (Note)	Maximum number of Web HMI Servers that can access to one SCADA Server. (Note)
Web HMI Clients	Up to 100 Web HMI Clients per Web HMI Server	Maximum number of Web HMI Clients that may connect at the same time to one Web HMI Server, including the Web HMI client on the same computer
Domain	Up to 255 nodes per domain	A domain is defined as a SCADA Server and its associated Front-End Servers, Web HMI Servers and Web HMI Clients. Only the SCADA Server, Front-End Servers and Web HMI Servers are counted as a node
I/O devices and controllers	Up to 255 per Server / Front-End	
Item tags	Up to 16 million per domain	

Note: The total number of nodes (= computer stations) in one domain may not exceed 255 (computer stations with only a Web HMI Client installed are not counted as a Node). One should always consider the physical boundaries (network bandwidth, disk speed and storage capacity) that can affect these numbers.

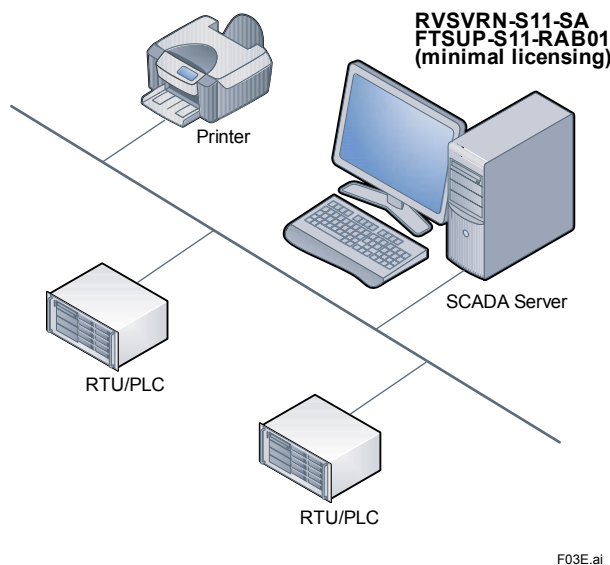
### ■ SYSTEM CONFIGURATIONS AND ARCHITECTURES

FAST/TOOLS has a true client/server architecture, which is not limited to stand-alone stations, and allows for distributed functionality. Front-end Servers give the possibility to reduce the load on the SCADA Server by pre-processing data on remote locations and passing through only relevant data. Configuration of these stations is stored on the SCADA Server and is automatically deployed to the Front-end Servers. There is no need for the engineer to visit the remote locations. SCADA and Front-end Servers can run one or more I/O-drivers per node, e.g. a configuration could be an application running up to 70 I/O-drivers at the same time on one node, using for example only three network connections available to connect to the 70 remote PLC/RTU devices.

Where system availability is a prime issue FAST/TOOLS can be configured to run in a redundant configuration. Several redundancy concepts are available as a standard, illustrating the flexibility of FAST/TOOLS. Examples are dual or triple server configurations, redundant networks between the SCADA system servers and clients and/or between SCADA system servers and PLC's, RTU's, etc. With the exception that Front-end servers can only be configured as a single server entry.

FAST/TOOLS supports at least any combination of the following architectures within the specified system dimension limits (see the SYSTEM SPECIFICATION section above).

#### ● Stand-alone Concept

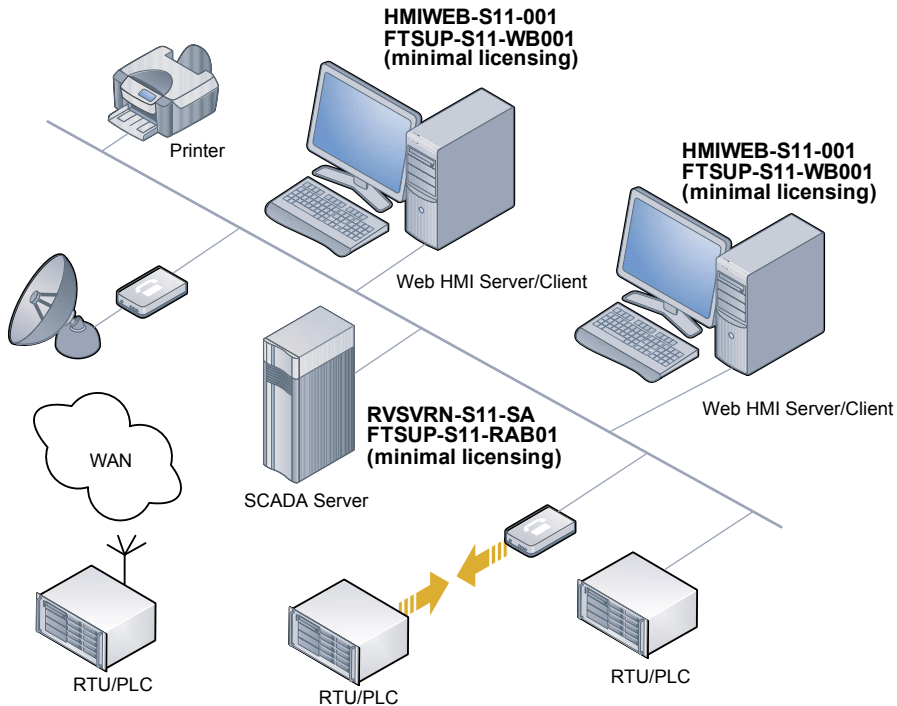


The 'Stand-alone' concept is based on running the complete SCADA data acquisition, supervisory control, engineering and operations environment on one computer. In terms of licensing this requires only one Windows based SCADA Server package (sized to the required number of items for its application). With reference to the 'Models and Suffix codes' section in this GS document the minimal license requirement for this architecture – assuming only the standard driver package for field I/O communications is required – is:

Item	Model	Quantity
SCADA Server	RVSVRN-S11-SA	1
Product support	FTSUP-S11-RAB01	1

This type of configuration may be used for relatively small applications where it is acceptable to have only one combined Server/HMI station for both operator supervision and engineering.

● Remote Web HMI Server/Client Concept



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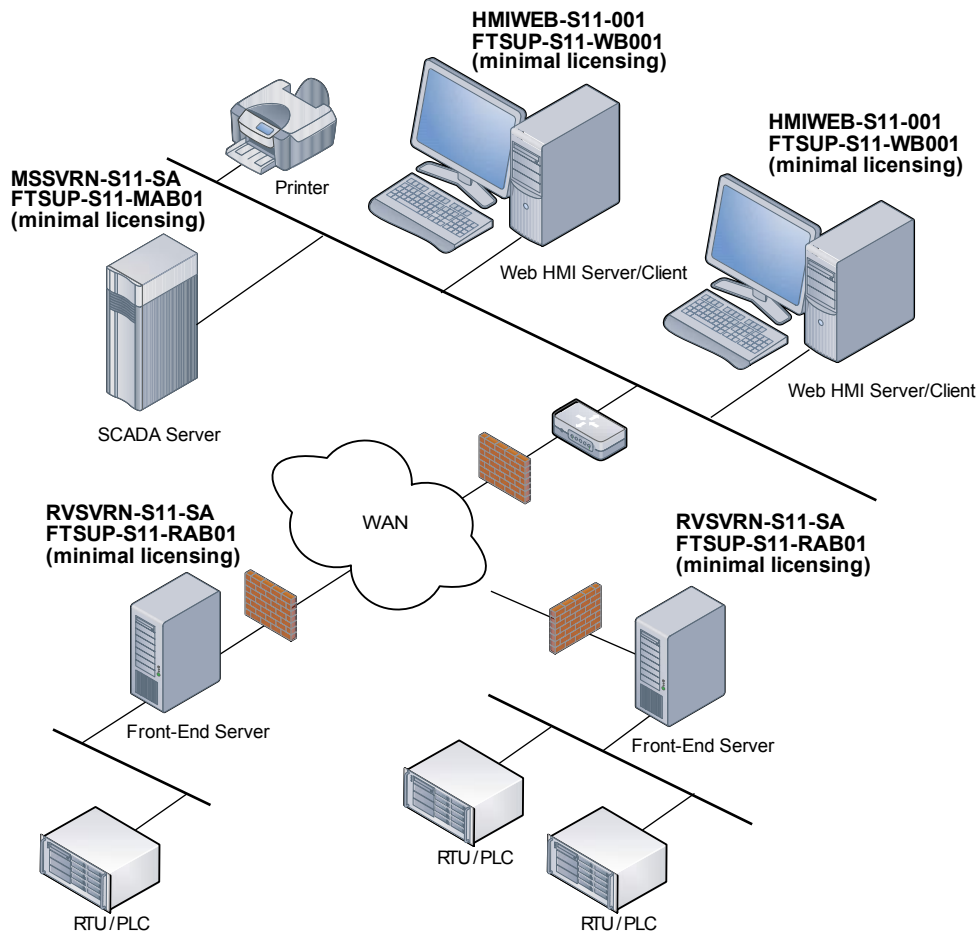
The 'Remote Web HMI Server/Client' concept allows for more scalability. It is based on running the SCADA data acquisition, applications and real-time database environment on a dedicated heavy duty SCADA server while running the engineering and operations environment on one or more dedicated operator/engineering computers. In terms of licensing the configuration as visualized above requires one Windows, Unix or Linux based SCADA Server package (sized to the required number of items for its application) and two Web HMI Server packages (including one client). With reference to the 'Models and Suffix codes' section in this GS document the minimal license requirement for this architecture – assuming only the standard driver package for field I/O communications is required – is:

Item	Model	Quantity
SCADA Server	RVSVRN-S11-SA or UNSVRN-S11-SA	1
Web HMI Server/Client	HMIWEB-S11-001	2
Product support	FTSUP-S11-RAB01 or FTSUP-S11-MAB01	1
Product support	FTSUP-S11-WB001	2

This type of configuration may be used for fairly large applications with many RTU/PLC stations randomly located (possibly at long distances) around one central location.



● Distributed System Concept



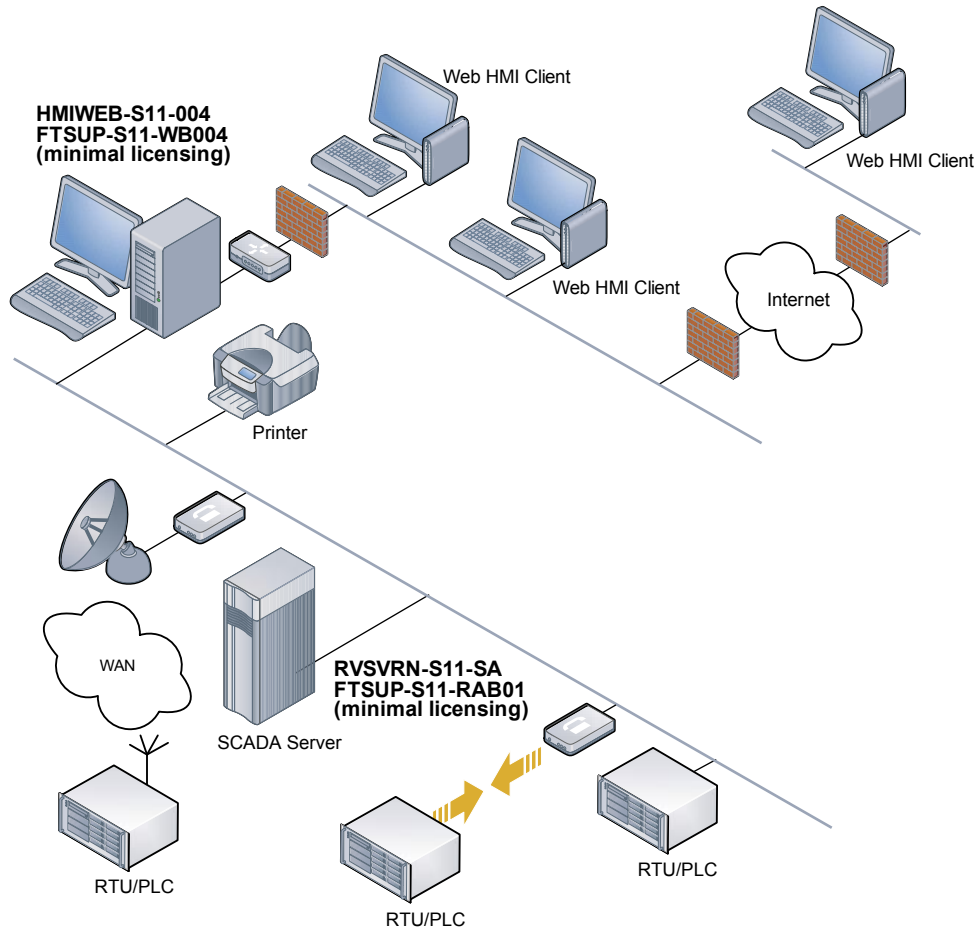
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The 'Distributed system' concept allows for enhanced distributed environments. It is based on distributing the real-time database by running the primary SCADA data acquisition and pre-processing services on one or more Front-end servers hosted by a SCADA server while running the engineering and operations environment on one or more operator/engineering computers. In terms of licensing the configuration as visualized above requires one Distributed Windows, Unix or Linux based SCADA Server package (sized to the required number of items for its application) and two Web HMI Server packages (including one client). With reference to the 'Models and Suffix codes' section in this GS document the minimal license requirement for this architecture – assuming only the standard driver package for field I/O communications is required – is:

Item	Model	Quantity
SCADA Server	MSSVRN-S11-SA or UNSVRN-S11-SA	1
Web HMI Server/Client	HMIWEB-S11-001	2
Product support	FTSUP-S11-MAB01	1
Product support	FTSUP-S11-WB001	2
Front-end Server	RVSVRN-S11-SA	2
Product support	FTSUP-S11-RAB01	2

This type of configuration may be used in general for very large applications with very high concentration of data acquisition at several remote locations possibly with many RTU/PLC stations at each location.

● Remote Web HMI Client Concept



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Figure Remote Web HMI Client

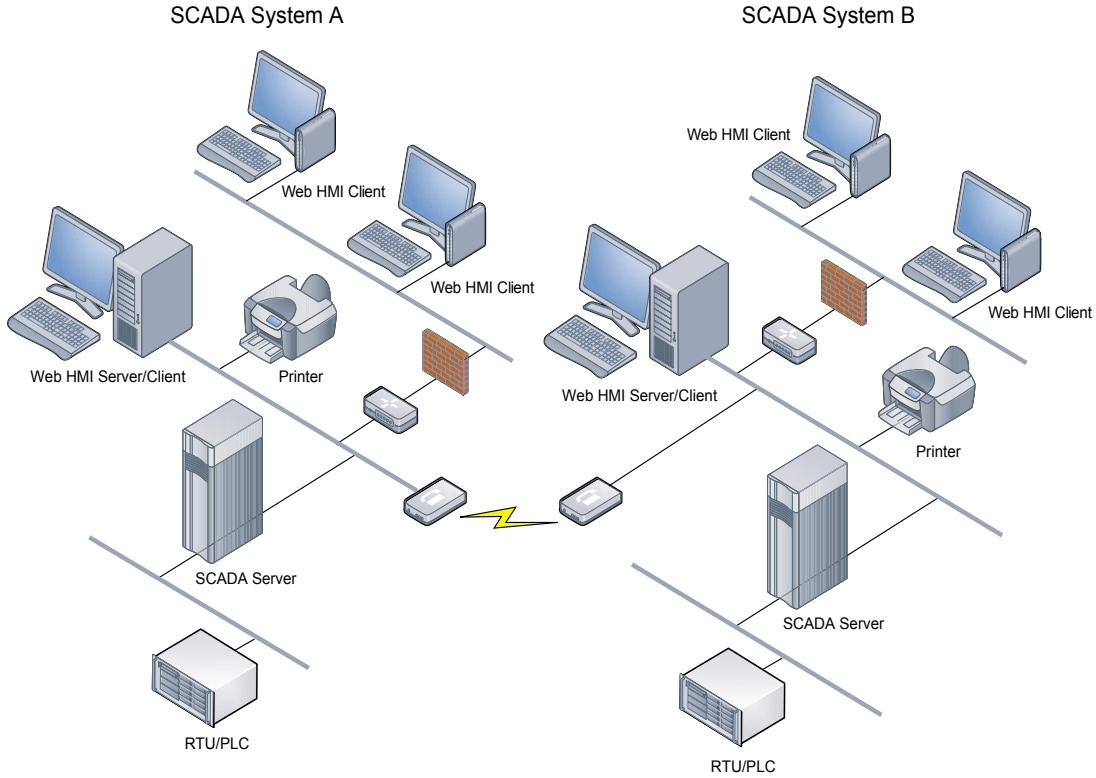
The 'Remote Web HMI Client' concept allows for enhanced HMI flexibility and negligible cost for maintaining remote clients across geographically dispersed locations. It is based on running the Web HMI Server on a dedicated computer serving its associated remote Web HMI Clients. These Web HMI Clients can be easily deployed on any computer device at any location over LAN, WAN and VPN networks. Local software installation and license registration is not required (zero deployment), and is initiated through a standard supported Web browser (Internet Explorer 8 or Firefox 3). In terms of licensing the configuration as visualized above requires one Windows, Unix or Linux based SCADA Server package (sized to the required number of items for its application) and one Web HMI Server package (including three client). With reference to the 'Models and Suffix codes' section in this GS document the minimal license requirement for this architecture – assuming only the standard driver package for field I/O communications is required – is:

Item	Model	Quantity
SCADA Server	RVSVRN-S11-SA or MSSVRN-S11-SA or UNSVRN-S11-SA	1
Web HMI Server/Client	HMIWEB-S11-004	1
Product support	FTSUP-S11-RAB0 or FTSUP-S11-MAB01	1
Product support	FTSUP-S11-WB004	1

This type of configuration may be used for applications when many 'light' and/or remote users need a real-time window into the process and its SCADA environment.

● **Host- to Host Architecture**

The FAST/TOOLS Web HMI consists of a Web HMI Server and a Web HMI Client that can either run separate from the FAST/TOOLS Server or be installed altogether with the FAST/TOOLS Server environment on a standalone node. Installing the Web HMI Server on a separate node has the advantage that load can be shared between the FAST/TOOLS Server and Web HMI Server.



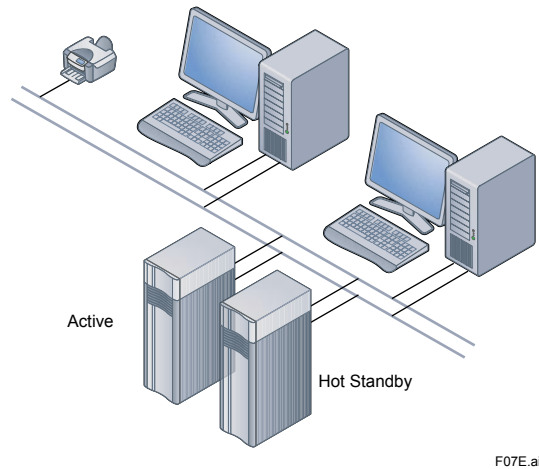
**Figure Host to Host coupling**

The 'Host to Host' concept (see figure above) allows for loosely coupling two or more autonomous FAST/TOOLS systems to exchange or synchronize 'real-time' data across independent system domains.

This type of configuration may be used for applications where several systems at a central or across dispersed process locations need to be fully independent in terms of maintainability and operations, while at the same time exchange key data with other (high level master) FAST/TOOLS SCADA Servers.

● **Media independent (Redundant) Communications & High Availability Computing (HAC)**

FAST/TOOLS supports full communication and application redundancy, independent of applied communications media and system server hardware. There are several features available in FAST/TOOLS for building high availability system configurations combined with advanced guidance tools for some typical set-ups.



**Figure High Availability Computing (HAC)**

The high availability features of FAST/TOOLS are abbreviated to HAC (High Availability Computing). The HAC features are divided into dedicated functional parts, each fulfilling a specific role.

**Watchdog**

This feature is only applicable for redundant server configurations. In this scenario one Watchdog process runs on each of the redundant servers. A Watchdog takes a number of inputs relating to the health the 'active' system as well as the current health of the 'hot standby' system. It decides whether the system is sufficiently healthy to carry on, or whether the redundant server should be brought online.

The Watchdog takes the following inputs as a basis for determining the health of the system:

- Current FAST/TOOLS health
- Current state of the network connection to the partner server
- Availability of network devices
- Results of custom scripts

The watchdog can support the following configurations:

- Up to 4 network interfaces
- Up to 20 IP device checks
- Provision for periodic checks using custom scripts as input to the health check

**Active and Hot Standby**

Once a redundant server combination is up and running, one server will be running FAST/TOOLS in its entirety, whilst the other server will be running a minimum set of FAST/TOOLS functions sufficient to monitor its own system and its associated redundant counterpart. The server that is running the full real-time FAST/TOOLS environment is said to be the ACTIVE server and all SCADA functions will be handled by this machine. The other server that is running the minimum set is said to be the HOT STANDBY server and does not provide any SCADA functions (Note that only one server is allowed to be ACTIVE at any time).

**Island situation**

The 'active' server does not shut itself down in a bad health situation, but will be shut down by the 'hot standby' server. The only exception to this is when the server is in an island state. This means that the server detects that it has no connection to the partner, no connection to any other network devices and so is isolated from the rest of the world. In this case it has no connection to the field and no-one to shut it down, so the server will shut itself down in this case after a predefined timeout.

**Initial status**

When the redundant servers are initially started they will always start up as a HOT STANDBY server. The servers in a redundant configuration are of equal value, when the system starts initially and both servers are STANDBY the server that has been assigned as the PRIMARY server will become ACTIVE and the other (SECONDARY) server will remain in STANDBY mode.

**Data synchronization**

This mechanism secures - when one or the other server becomes active at any time - that the configuration and information on both servers is constantly synchronized, so that when the HOT STANDBY server takes over it does so with the latest configuration and information (mirror function).

## ■ MAIN SYSTEM FUNCTIONS

### ● Process Visualization and Supervision

#### Human Machine Interface

The FAST/TOOLS HMI is fully Web based and allows the operator to easily and intuitively navigate through the operator displays in a browser-like environment. The HMI is designed for intranet deployment and delivers the benefits of incorporating web technology.

Some of the main benefits are:

- Minimum specification of PC hardware
- Centralized administration of software installation and management
- Load sharing through remotely deployed displays and distributed client/server architecture



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The benefits for the operator are ease of use provided by the intuitive browser-like HMI standard that allows the grouping of FAST/TOOLS data into logical categories such as process mimics, alarm and event views, historical and real-time trending, faceplates and reports (which can be step less zoomed and panned in real-time). Furthermore the process mimics can contain multiple dynamic layers and visibility groups which become active and visible depending on user privileges, process conditions, zoom level, etc.

Although the FAST/TOOLS HMI is freely configurable to meet specific application needs the basic elements that can be enabled as part of the operator environment for supervision and control are:

- Layout
- Menu
- Toolbar
- Status line

The FAST/TOOLS HMI menu and toolbar accommodates for advanced display navigation through browser history, menu's and direct display call-ups.

**Alarm and Events**

ALARM/FAST allows alarms to be presented on a number of different devices, like:

- Web HMI Servers & Clients
- Printers
- Paging systems (paggers, SMS, telephone)
- Acoustic devices (horns)

On Web HMI Servers & Clients the alarm presentation will, in most cases, be a real-time alarm table in a frame with scroll bars containing significant information for the operator. Additionally, graphical objects to which the alarms apply can be configured to change color, shape, position etc.

Alarm Time	Installation	Unit	Tag	Item description	Alarm Text	Priority	Alarm Type	Acknowledged	Value	Eng Units
May 19, 2010 5:18:50 PM	DEMO	TANK	LT001	TANK LEVEL	NR	15	NORMAL	<input type="checkbox"/>	1636.57338175604	mm
May 19, 2010 5:17:55 PM	DEMO	WELL-001	PT130	OUTER CASING PRESSURE	NR	15	NORMAL	<input type="checkbox"/>	2.05782616657002	bar
May 19, 2010 11:53:39 AM	DEMO	REACTOR	PCV-001	STEAM VALVE	LL	1	ALARM	<input type="checkbox"/>	0	%
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV030	MOV030	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV010	MOV010	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV011	MOV011	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV015	MOV015	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV016	MOV016	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV017	MOV017	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV018	MOV018	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV023	MOV023	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV024	MOV024	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV028	MOV028	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV002	MOV002	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV009	MOV009	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV007	MOV007	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV008	MOV008	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV005	MOV005	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV006	MOV006	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 11:00:23 AM	DEMO	TANK	MOV003	MOV003	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	
May 19, 2010 10:59:33 AM	DEMO	WELL-001	SSV002	SSV	CLOSED	2	ALARM	<input checked="" type="checkbox"/>	0	

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In ALARM/FAST the alarm information can be customized for each device. Generally speaking the alarm text line will contain information regarding:

- Alarm priority (0-15)
- Alarm status (Alarm, Event, Acknowledged, reset, normal, etc)
- Date and time of the alarm (generated by FAST/TOOLS or via the timestamp received from the PLC or RTU, down to milliseconds)
- Item name, value, description and alarm description
- Alarm status text (Low, Low-Low, High, High-High, normal, underrange, overrange, offline, blocked, etc.)

Alarms are presented in two ways:

- Dynamically on display and/or printer (current alarms)
- Historical (chronological in time) on display and/or printer Historical alarms can be archived on disk or external storage.

Current alarms can be presented in a scalable frame with scrollbar controls that for example can be defined as a separate current alarm display or a three line banner at the bottom of the page. This overview is dynamic by nature; if an alarm no longer exists and is acknowledged (manually or automatically) then the alarm disappears from the screen. If there are no alarms active, this display or banner is empty. Every column of the alarm text line can be used to sort the alarm list so that current alarms can be sorted in:

- Priority base order
- Time base order
- Alarm status order
- Etc.

Every alarm status (Alarm, acknowledged alarm, repeated alarm, delayed alarm, normal, etc) can have its own distinct fore and background color or no background color. Furthermore definition of alarm line columns can be freely organized and represented.

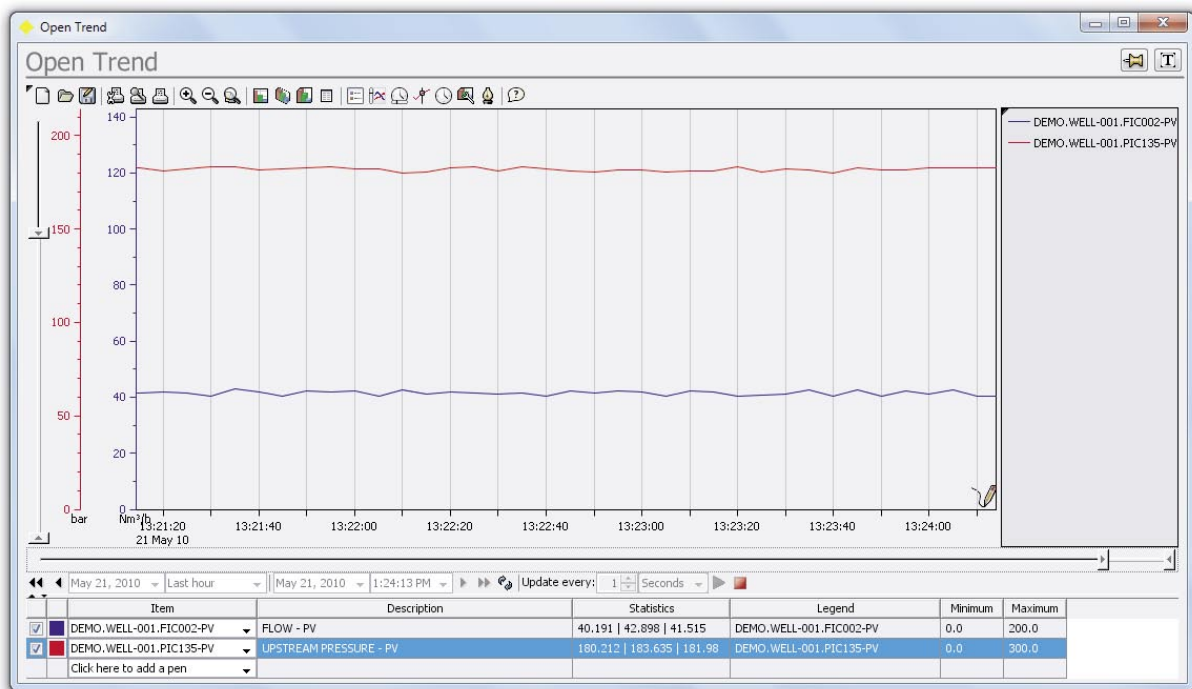
The historical alarm overview has the same functionality as described above for the current alarm overview. All status changes of alarms are represented in a fully scrollable historical alarm overview table with scroll bars and fast keys (page-up/down, etc.).

**History and Trending**

The FAST/TOOLS trend module provides trend visualization capabilities for all real-time and historical FAST/TOOLS data. The user interface is very intuitive and allows for fast open trend configuration.

Some of the main features are:

- 2D & 3D Rendering
- Full zoom capabilities and animation
- Historical & Real-Time trending
- Power full sliders for various axis like value and time
- Easy time-range selection
- Max 20 pens
- Automatic selection of history groups
- Supports relative and shift related time intervals
- Free to configure legend (location, description & transparency)
- Export trending data in bitmap and CSV data files
- Reversing of time and value axis
- Complete flexibility of window decoration and layout



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The two types of trends in FAST/TOOLS are:

- Real-time trends
- Historical trends

The FAST/TOOLS trend module has an extensive library of ready-to-use trend templates. You only have to couple the item to the pen and the trend is ready to run. Besides using the trend templates it is possible to customize or adjust the trends from the library

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Some parameters you can set for a trend:

- The pen appearance (continuous line, dashed line, points)
- Start-time and stop-time (can be changed on-the-fly)
- Min and Max scaling value of the process variable that is trended
- The process variable to connect to a pen
- Starting and stopping the trending process
- The number of samples to show on the display
- A hairline can be activated to read value and time at a sampled point
- The sampling rate with which the trend screen is updated
- Different time scales by varying start- and end-time (can be changed on-the-fly)

Up to 20 pens can be assigned to values that can be plotted in time.

One of the more advanced features of the FAST/TOOLS Trend module is a build in option to synchronize the representation of trend data with the historical alarm statuses based on time/date. When moving the trend hairline across the historical or real-time trend time-line the associated alarms and their status at that specific point in time are displayed. Furthermore FAST/TOOLS trend module supports on-the-fly zooming and panning by the operator on any specific trend when this privilege is enabled.



● **Process Field I/O Communications**

FAST/TOOLS supports many native PLC/RTU driver protocols developed for data acquisition, to enhance communication performance and reliability. FAST/TOOLS can provide direct communication links to various brands of DCS/PLC/RTU on the same SCADA server. It also has many field proven communication interfaces through Fibre Optics, serial lines, radio, satellite, PSTN, etc.

The part of FAST/TOOLS that takes care of communication with I/O devices, like RTU's, distributed I/O, and PLC's, is called EQUIPMENT/FAST. It uses device specific I/O-drivers, polls the equipment and updates the real-time database. FAST/TOOLS supports as standard the equipment types listed below:

EQUIPMENT/FAST Driver		TCP/IP	Terminal server (*4)	Serial
Yokogawa STARDOM	(*1)	yes		
Yokogawa DAQStation	(*1)	yes		
Yokogawa DAQMaster	(*1)	yes		
Yokogawa FA-M3	(*1)	yes		
Yokogawa ProSafe-COM	(*1)	yes	yes	yes
Yokogawa Host-Host (*9)	(*1)			
Modbus Slave	(*1)	yes	yes	yes
Modbus Master	(*1)	yes	yes	yes
Beckhoff BK8100	(*1)		yes	
Rockwell CIP	EQP-S11-ROC	yes		
Rockwell DF1	EQP-S11-ROC		yes	yes
Rockwell DH+	EQP-S11-ROC	yes		
Siemens 3964R	EQP-S11-SIE			yes
Siemens SAPI-S7 (*2)	EQP-S11-SIE	yes		
Emerson BSAP	EQP-S11-EME		yes	yes
Emerson Fisher ROC	EQP-S11-EME		yes	yes
WITS level 0 slave (*3) (*5)	EQP-S11-RTU		yes	yes
WITS level 0 master (*3) (*5)	EQP-S11-RTU		yes	yes
DNP3 Master	EQP-S11-RTU	yes	yes	yes
HEX repeater	EQP-S11-RTU		yes	
TIE (*6)	EQP-S11-GEN			yes
HART router	EQP-S11-GEN		yes	
Yokogawa ProSafe-RS (*7)	EQP-S11-SCS			
Melsec Mitsubishi driver(*8)	EQP-S11-MEL	yes		yes
IEC 60870-5-101	EQP-S11-IEC		yes	yes
IEC 60870-5-102	EQP-S11-IEC		yes	yes
IEC 60870-5-103	EQP-S11-IEC		yes	yes
IEC 60870-5-104	EQP-S11-IEC	yes		

- \*1: Standard in server package RVSVR, MSSVR & UNSVR.
- \*2: Software needed from Siemens; SIMATIC.NET SAPI-7 software package. Only for Windows XP platform
- \*3: Only on Windows platform.
- \*4: FAST/TOOLS system is communicated by TCP/IP to the Terminal Server. Terminals Server is communicated serial to device.
- \*5: Wellsite Information Transfer Specification (WITP).
- \*6: Telemetry Integration Environment (TIE) .
- \*7: Used Vnet/IP network. Software needed (CHS5700) and VnetIP card VI702 in FAST/TOOLS server. Only for Windows XP platform.
- \*8: Software needed from Mitsubishi: EZ-Socket. Only for Windows XP platform. Software on FAST/TOOLS DVD.
- \*9: Used FAST/TOOLS DURM networks.

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## ● System Support Functions

FAST/TOOLS is delivered with a complete set of diagnostic tools for every module which allows online monitoring of:

- Configuration settings
- Real-time values of items, communication statistics, process-load
- Time related issues
- Status values
- And other module specific parameters

These diagnostic tools are used to locate suspicious faulty situations in the SCADA system and to optimize the performance of the SCADA system. Performance optimization can be done by:

- Balancing network traffic between e.g. a server and workstation in a redundant network
- Preventing queue overflows by adapting queue sizes of FAST/TOOLS processes
- Optimizing scan times of external process variables

In addition some diagnostic tools allow logging diagnostic data to a file on disk, which can be used for analyses later on.

## ■ FUNCTIONAL SPECIFICATION

Please find below the functional limits of the FAST/TOOLS software package.

Functional Element	Details	Limits	Remarks
Item tags	Name Length	45 Characters	divided in 3 x 15 characters according to the format unit.installation.tag
	Description Field	80 Characters	
	Value clamping		Can be applied to alarm limits and process value scale
	Sub-items	16 per Item	
	Integrator	1 sec. resolution	
	Pulse counter	long integer	
	Min/max indicator		
	Rate of change	1 sec. resolution	
	Limit and dead band	HH, H, L, LL, Dead band	
	Blocks of items, unit & installation		Preserve current values
	Data compression	30% on average	
Displays / Symbols	Name Length	31 Characters	
	Number of displays and symbols	Unlimited	
	Symbol Library		Standard library contains more than 3000 symbols
	Multi Monitor Support	Dual or Quad	Conforms to available desktop resolution and video hardware performance.
Connectivity	OPC server and OPC client		DA (v2.0) and A&E (v1.02) (tested with compliance tool v2.05a)
	ODBC Server		For both process and configuration data. ODBC API conformance level 1, SQL conformance level minimum.
	API for easy connection of third party software		Available for C, Java and VB .NET
Alarm Management	Number of Alarms	Unlimited	
	Alarm Acknowledgement		Freely definable alarm states & acknowledgement methods.
	Delayed Alarms	Up to 18 hours	
	Repeated Alarms	Up to 18 hours	
	Alarm Collections	32,767 Max.	
	First out and first up annunciation	Unlimited	
	Area of Interest	Up to 16	
	Alarm Priority groups	Up to 16	
Alarm rerouting		Free rerouting of alarms to e-mail, SMS, pagers, etc.	
Operator log/audit trail			Store actions of users and SCADA system; who, where, when and why.
Trends	Number of pens	Up to 20 per trend	
	Zooming and Panning		
	Sample period	Up to 1 msec.	
	Update period	Up to 1 sec.	
	Hairline cursor		
	Synchronization with alarm overview		
	Scalable timeline and resolution		
Reports	Report generation		
	Report browser / manager		Ad-hoc, Scheduled and event-based
	Printer Management		
Data Archiving	Averaging of history values		On scan and event based
	Managing historical files		
	Automatic archiving		External storage of all new historical data
Security	User name & password	Unlimited	
	Authorization groups	Unlimited	
	Process areas	0-999	Operator access level per area
	Automatic login		After system login
	Areas of interest	Up to 32 entries per item	Labels describing the functional area of a process tag

**■ SOFTWARE PERFORMANCE**

FAST/TOOLS has been extensively tested on its software performance. These tests were conducted on a system with the SCADA server hardware configuration and specification as stated below:

Dell PowerEdge 2900: Tower Chassis
Quad core Intel Xeon E5410 2x6MB Cache, 2.33GHz 1333MHZ FSB
4GB FB 677MHz Memory (2x2GB dual rank DIMMs) (win2003 uses a maximum of 2,99GB)
2 * 146GB, SAS, 3.5-inch, 15.000 rpm Hard Drive
3 * Broadcom NextXtreme II 5708 1-Port Gb Ethernet NIC w/TOE, Cu, PCIe
48x SATA CDRW/DVD Combo Drive, IDE, Half Height
Windows 2003 operating system

System load on which test results are based is up to 100.000 item updates per second over a network. Please note that because FAST/TOOLS is event driven an update rate of 100.000 items is only applicable to very large system configurations. The results of the performance tests are presented in the tables below:

**SCADA Server CPU load:**

Items in database	Items updated per second	Server CPU load in %
10.000	10.000	4%
20.000	20.000	4%
50.000	50.000	4%
100.000	100.000	5%
150.000	100.000	5%
200.000	100.000	5%
500.000	100.000	5%

**SCADA System Network load:**

Items in database:	100.000
Updates per second	Network load in Kb/s
0	25
500	35
1000	45
1500	55
2000	65
2500	75
3000	85
3500	95
7500	165
10000	215
12500	260
17500	350
22500	445
27500	535
30000	590
32500	630
37000	715
42500	815
47500	910
49500	945
50000	955
60000	1140
70000	1325
80000	1515
90000	1700
100000	1845

Note: Small deviations from the above results may occur in practice due to the open nature of the system and the freedom to use any qualified customer of the shelf system and network hardware.

## ■ OPERATING ENVIRONMENT

FAST/TOOLS is supported on the server platforms as defined below. For each platform, the required operating system is specified.

Platform	Operating System
PC	Microsoft Windows Server 2008 R2 + SP1 Microsoft Windows XP + SP3 Microsoft Windows 7 Professional 64 bit + SP1 Redhat Enterprise Linux 6
IBM	AIX 6.1
SUN	Solaris 10

## ■ SYSTEM REQUIREMENTS

The specified hardware is a minimum recommendation for optimal software performance. Furthermore it should be taken into account that additional non FAST/TOOLS applications may require additional resources

### ● SCADA Server

Items	Specifications	
CPU	Windows 7	Intel © Core™ 2 Processor, 2.50 GHz or better.
	Windows XP	
	Windows Server 2008	
	Redhat Linux 6	Intel Pentium Dual Core, 1.8 GHz or better
	AIX 6.1	IBM Power® 710 Express server, 3.8 GHz or better
	Solaris 10	SUN SPARC Enterprise M3000 server 2.75GHz
RAM	At least 4 GB	
Hard Disk	250 GB (7200 rpm) At least 200 Mbytes of free space is required for the software. Additional disk space is required to store configuration and historical data: add on average 2150 byte per item definition, 100 byte per history sample , 550 byte per event sample, 18 Kb per class, 2 Kb per object, 2 Kb per report and 30 Kb per display symbol.	
Ethernet adapter	An Ethernet adapter that is supported by the operating system is required at installation. Please note that for HAC (High Availability Computing) a dedicated network adapter is preferred.	
DVD-ROM Drive	A DVD-ROM drive that is supported by the operating system is required.	

### ● Front-End Server

Items	Specifications	
CPU	Windows 7	Intel © Core™ 2 Processor, 2.50 GHz or better.
	Windows XP	
	Windows Server 2008	
	Redhat Linux 6	Intel Pentium Dual Core, 1.8 GHz or better
	AIX 6.1	IBM Power® 710 Express server, 3.8 GHz or better
	Solaris 10	SUN SPARC Enterprise M3000 server 2.75GHz
RAM	At least 4 GB	
Hard Disk	250 GB (7200 rpm) At least 200 Mbytes of free space is required for the software. Additional disk space is required to store configuration data: add on average 2150 byte per item definition, 18 Kb per class, 2 Kb per object, 2 Kb per report and 30 Kb per display symbol.	
Ethernet adapter	An Ethernet adapter that is supported by the operating system is required at installation.	
DVD-ROM Drive	A DVD-ROM drive that is supported by the operating system is required.	

● **Web HMI Server**

Items	Specifications	
CPU	Windows 7	Intel © Core™ 2 Processor, 2.50 GHz or better.
	Windows XP	
	Windows Server 2008	
RAM	At least 4 GB	
Hard Disk	250 GB (7200 rpm) At least 200 Mbytes of free space is required. Additional space is required for display and symbols.	
Ethernet adapter	An Ethernet adapter that is supported by the operating system specified is required at installation.	
DVD-ROM Drive	A DVD-ROM drive that is supported by the operating system is required.	
Peripherals	Sound card and speaker are required for audible messages	
Web browser	Internet Explorer 8 or Mozilla Firefox 3	

● **Web HMI Client**

Items	Specifications	
CPU	Windows 7	Intel© Core™ i3 Processor
	Windows XP	
RAM	At least 2 GB	
Hard Disk	250 GB (7200 rpm) At least 200 Mbytes of free space is required.	
Ethernet adapter	An Ethernet adapter that is supported by the operating system specified below is required at installation.	
DVD-ROM Drive	A DVD-ROM drive that is supported by the operating system is required.	
Peripherals	Sound card and speaker are required for audible messages	
Web browser	Windows 7	Internet Explorer 8 or Mozilla Firefox 3
	Windows XP	

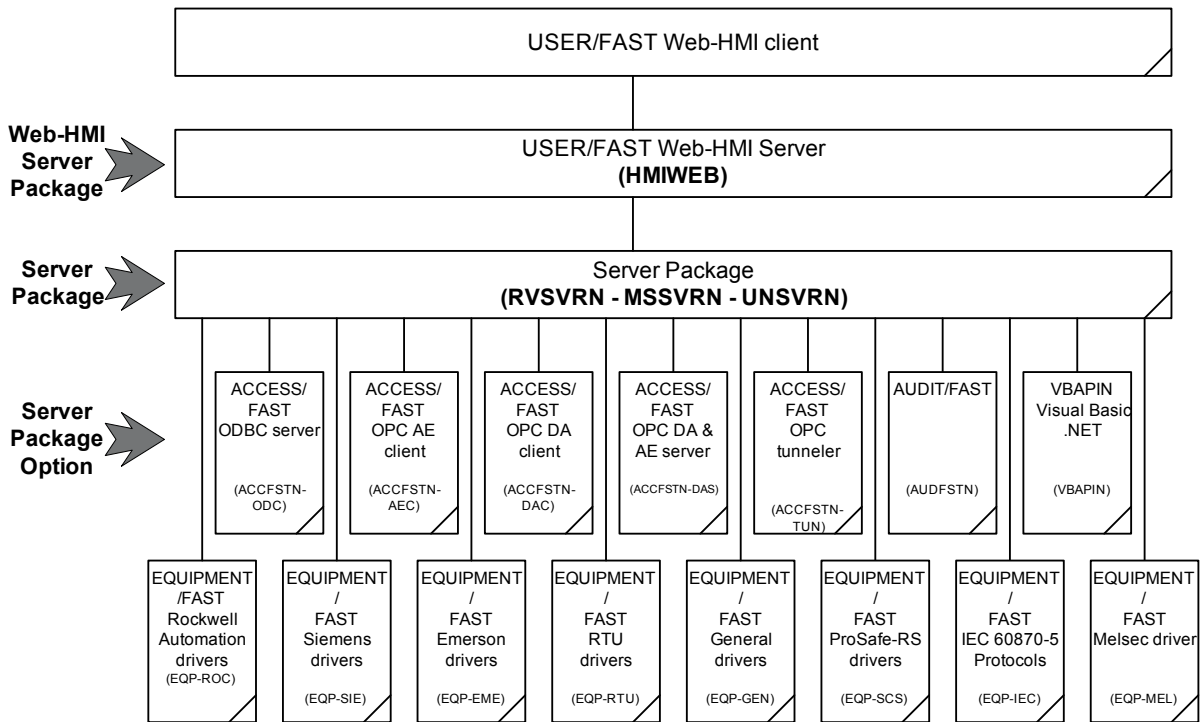
■ **NOTICE FOR THIRD-PARTY PRODUCTS**

FAST/TOOLS is software that makes the most of commercial off-the-shelf (COTS) software, so third-party products meeting the specifications required by FAST/TOOLS are myriad. The pieces of software described in the General Specifications and User’s Manuals of FAST/TOOLS, will operate correctly to the extent of the specifications. Yokogawa has conducted combination tests on third party products that many want to use with FAST/TOOLS. These tests may also be performed on new third-party products as required. Nevertheless, these tests simply check the basic operations in combination with FAST/TOOLS and are not intended to assure correct operations. The most recent results of these tests will be available to those who have concluded a support contract.

## MODELS AND SUFFIX CODES

### FAST/TOOLS Package Structure

The following figure shows the package structure of FAST/TOOLS.



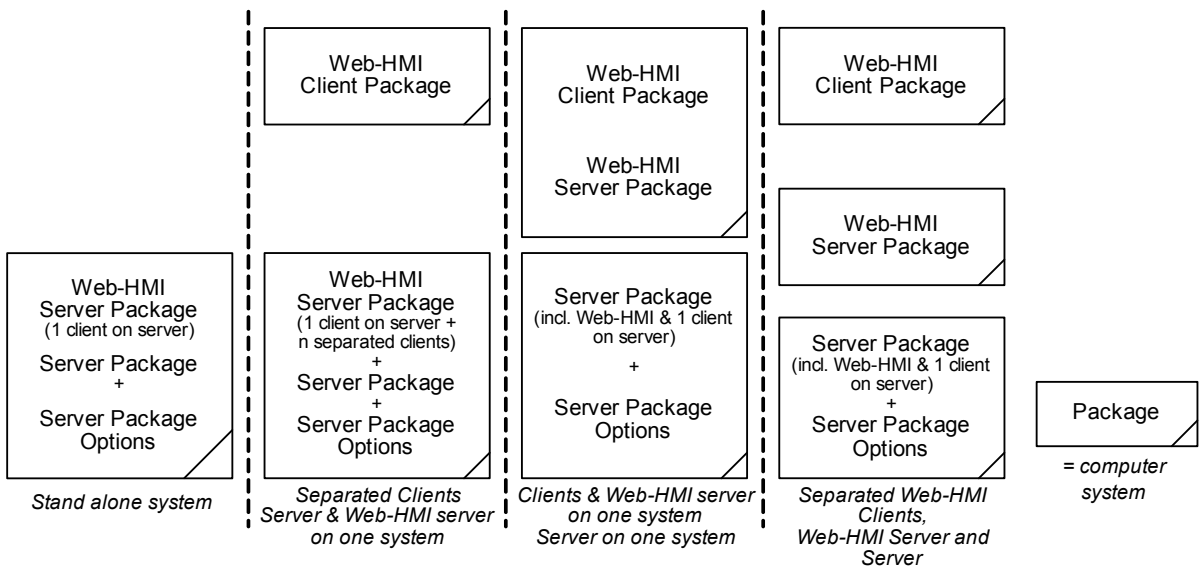
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Note: Bold items are Model numbers.

Note: For all Server Package option a Server package is required except VBAPIN.

### FAST/TOOLS Computer Segregation

The following figure shows the computer segregation of FAST/TOOLS. It shows which package can be combined on the same computer system.



F12E.ai

The Web-HMI client can run both the operator interface and the application database configuration interface.

● Windows Server Package

		Description
<b>Model</b>	RVSVRN	FAST/TOOLS Microsoft Windows Server Package
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1
	-SA	Max. item numbers: 250
	-SB	Max. item numbers: 500
	-SC	Max. item numbers: 1,000
	-SD	Max. item numbers: 2,000
	-SE	Max. item numbers: 4,000
	-SF	Max. item numbers: 8,000
	-SG	Max. item numbers: 16,000
	-SH	Max. item numbers: 32,000
	-SJ	Max. item numbers: 64,000
	-SK	Max. item numbers: 128,000
-SL	Max. item numbers: 256,000	

Note: Standard drivers are: STARDOM, DAQStation, DAQMaster, FA-M3, Host-Host, Modbus slave, Modbus master & Beckhoff BK8100.

Note: FAST/TOOLS Server - Client configuration only

Note: Configuration only for Windows platform

Note: Audit trail module (Model AUDIT/FASTN) not included

Note: For server extensions, see Price Sheet 50A05D00-00E.

● Windows Server Package – Distributed

		Description
<b>Model</b>	MSSVRN	FAST/TOOLS Microsoft Windows Server Package – Distributed
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1
	-SA	Max. item numbers: 250
	-SB	Max. item numbers: 500
	-SC	Max. item numbers: 1,000
	-SD	Max. item numbers: 2,000
	-SE	Max. item numbers: 4,000
	-SF	Max. item numbers: 8,000
	-SG	Max. item numbers: 16,000
	-SH	Max. item numbers: 32,000
	-SJ	Max. item numbers: 64,000
	-SK	Max. item numbers: 128,000
-SL	Max. item numbers: 256,000	
-SU	Max. item numbers: unlimited	

Note: Standard drivers are: STARDOM, DAQStation, DAQMaster, FA-M3, Host-Host, Modbus slave, Modbus master & Beckhoff BK8100.

Note: For server extensions, see Price Sheet 50A05D00-00E.



● **LINUX & UNIX Server Package**

		Description
<b>Model</b>	UNSVRN	FAST/TOOLS LINUX & UNIX Server Package
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1
	-SA	Max. item numbers: 250
	-SB	Max. item numbers: 500
	-SC	Max. item numbers: 1,000
	-SD	Max. item numbers: 2,000
	-SE	Max. item numbers: 4,000
	-SF	Max. item numbers: 8,000
	-SG	Max. item numbers: 16,000
	-SH	Max. item numbers: 32,000
	-SJ	Max. item numbers: 64,000
	-SK	Max. item numbers: 128,000
	-SL	Max. item numbers: 256,000
-SU	Max. item numbers: unlimited	

Note: Standard drivers are: STARDOM, DAQStation, DAQMaster, FA-M3, Host-Host, Modbus slave, Modbus master & Beckhoff BK8100.

Note: For server extensions, see Price Sheet 50A05D00-00E.

● **EQUIPMENT/FAST**

		Description
<b>Model</b>	EQP	FAST/TOOLS EQUIPMENT/FAST (drivers)
<b>Suffix Codes</b>	-S	Software license
	1	Always 1
	1	Always 1
	-SCS	ProSafe-RS drivers
	-ROC	Rockwell Automation drivers (*1)
	-SIE	Siemens drivers (*2)
	-EME	Emerson drivers (*3)
	-RTU	RTU protocol drivers (*4)
	-GEN	General drivers (*5)
	-IEC	IEC 60870-5 Protocols (*6)
	-MEL	Melsec driver

\*1: includes CIP, DH+ & DF1 protocol, for e.g. ControlLogix or PLC5

\*2: includes 3964R & SAPI-S7 driver, for e.g. Siemens S5 & S7 PLCs

\*3: includes BSAP & Fisher ROC driver, for e.g. Bristol Babcock RTUs

\*4: includes WITS level 0 slave, WITS level 0 master, DNP3 & HEX Repeater driver

\*5: includes TIE & HART Router driver

\*6: includes IEC 60870-5-101, IEC 60870-5-102, IEC 60870-5-103 & IEC 60870-5-104

Note: Not all the drivers are supported on all platforms. Some drivers will need third part software. Some drivers will support only TCP/IP and/or Serial.

Note: For drivers not listed above, please see the General Specification of FAST/TOOLS.

● ACCESS/FAST

		Description
<b>Model</b>	ACCFSTN	ACCESS/FAST
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1
	-ODC	ODBC sever
	-AEC	OPC AE client (only on Windows version)
	-DAS	OPC DA & AE Server (only on Windows version)
	-DAC	OPC DA client (only on Windows version)
	-TUN	OPC Tunneller client / server (only on Windows version)

Note: For ACCFSTN-AEC & ACCFSTN-DAC; in order to obtain these licenses, please place a P.O.

● AUDIT/FAST

		Description
<b>Model</b>	AUDFSTN	AUDIT/FAST Audit Trail
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1

● Web-HMI Server Package

		Description
<b>Model</b>	HMIWEB	Web-HMI Server Package For Engineering and Operator Interface
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1
	-001	Including 1 (Rich) concurrent client
	-002	Including 2 (Rich) concurrent clients
	-003	Including 3 (Rich) concurrent clients
	-004	Including 4 (Rich) concurrent clients
	-005	Including 5 (Rich) concurrent clients
	-006	Including 6 (Rich) concurrent clients
	-007	Including 7 (Rich) concurrent clients
	-008	Including 8 (Rich) concurrent clients
	-009	Including 9 (Rich) concurrent clients
	-010	Including 10 (Rich) concurrent clients
	-015	Including 15 (Rich) concurrent clients
	-020	Including 20 (Rich) concurrent clients
	-025	Including 25 (Rich) concurrent clients
	-050	Including 50 (Rich) concurrent clients
	-100	Including 100 (Rich) concurrent clients
	-250	Including 250 (Rich) concurrent clients
	-500	Including 500 (Rich) concurrent clients

Note: A full client runs on each Web-HMI Server (Engineering & Operator environment).

Note: A Web-HMI Server will only run on a Windows platform.

Note: For Web-HMI client extensions, see model codes for upgrades further down this section.

● Visual Basic .NET API

		Description
<b>Model</b>	VBAPIN	Visual Basic .NET API
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1

Note: This is a project licences.

● FAST/TOOLS User's Manual on CD-ROM

		Description
<b>Model</b>	FTMANCD	Support contract for FAST/TOOLS licence (RVSVRN, MSSVRN & UNSVRN) Annual fee
<b>Suffix Codes</b>	-1	Always 1
	CCD	on CD-ROM

● FAST/TOOLS Users Manual

		Description
<b>Model</b>	FTMAN	FAST/TOOLS User Manual
<b>Suffix Codes</b>	-1	Always 1
<b>Option Codes</b>	/C4C02	AUDIT /FAST System Integrator's Manual
	/C3C00	BUS/FAST User Manual FSU-editor
	/C3C01	BUS/FAST DUR Programmer's Guide
	/R7R00	ACCESS/FAST System Integrator's Manual
	/M2M00	ALARM/FAST Programmer's Guide
	/M7M01	ALARM /FAST System Integrator Manual
	/H2H00	AUDIT/FAST Programmer's Guide
	/H7H01	AUDIT /FAST System Integrator's Manual
	/E5E01	BUS/FAST User Manual FSU-editor
	/E2E00	BUS/FAST DUR Programmer's Guide
	/B2B00	BUS/FAST GIN Programmer's Guide
	/B2B01	BUS/FAST UMH Programmer's Guide
	/E2E02	BUS/FAST FSL Programmer's Guide
	/E7E03	BUS/FAST System Integrator's Manual DUR
	/E7E04	BUS/FAST System Integrator's Manual DURSIM
	/E7E05	BUS/FAST System Integrator's Manual
	/S2S00	COLOUR/FAST Controlling the Display
	/S2S01	COLOUR/FAST Convert Utility User Manual
	/S2S02	COLOUR/FAST Extending Display Dynamics
	/S7S02	COLOUR/FAST System Integrator's Manual Maintenance
	/S7S03	COLOUR/FAST System Integrator's Manual
	/F6F00	DATABASE/FAST DLL Language Manual
	/F6F01	DATABASE/FAST DSS Language Manual
	/F2F01	DATABASE/FAST Programmer's Guide DSS
	/F2F02	DATABASE/FAST Programmer's Guide ISF
	/F7F02	DATABASE/FAST System Integrator's Manual DSS
	/F7F01	DATABASE/FAST System Integrator's Manual ISAM
	/A3E00	DATABASE/FAST High Availability Computing User Manual
	/L2L00	EQUIPMENT/FAST Programmer's Guide
	/L7L01	EQUIPMENT/FAST System Integrator's Manual Maintenance
	/L7L02	EQUIPMENT/FAST System Integrator's Manual
	/A1A00	FAST/Conventions Volume 1
	/G2G00	HISTORY/FAST Programmer's Guide
	/G7G01	HISTORY/FAST System Integrator's Manual
	/T7T00	Integration System Integrator's Manual Maintenance
	/T7T01	Integration System Integrator's Manual
	/J2J00	ITEM/FAST ITH Programmer's Guide
	/J2J01	ITEM/FAST ITM Programmer's Guide
	/J7J01	ITEM/FAST ITH System Integrator's Manual
	/J7J02	ITEM/FAST ITM System Integrator's Manual
/N6N00	PROCESS/FAST Language Manual	
/P2P00	PROCESS/FAST Programmer's Guide	
/P7P01	PROCESS/FAST System Integrator's Manual	
/Q6Q00	REPORT/FAST Language Manual	
/Q2Q01	REPORT/FAST Programmer's Guide	
/Q7Q02	REPORT/FAST System Integrator's Manual Maintenance	
/Q7Q03	REPORT/FAST System Integrator's Manual	

● **FAST/TOOLS Consultancy**

		Description
<b>Model</b>	CONFSTN	FAST/TOOLS Consultancy
<b>Suffix Codes</b>	-C	Mo-Fr: 8 hours/day (08h - 17h) per hour
<b>Option Codes</b>	/E1	Uplift for overtime: between 17h 22h
	/E2	Uplift for overtime: between 22h - 08h
	/E3	Uplift for overtime: in weekends / holidays

Note: Prices excluded embilisation/demobilisation. All traveling hours and related costs to requested site-visits will be invoiced to the Customer.

● **FAST/TOOLS Support contract**

		Description
<b>Model</b>	FTSUP	Support contract for FAST/TOOLS licence (RVSVRN, MSSVRN & UNSVRN) Annual fee
<b>Suffix Codes</b>	-S	Software licence
	1	Always 1
	1	Always 1
	-RAB□□	Number of RVSVRN server licence -SA and/or -SB
	-RCD□□	Number of RVSVRN server licence -SC and/or -SD
	-REF□□	Number of RVSVRN server licence -SE and/or -SF
	-RGH□□	Number of RVSVRN server licence -SG and/or -SH
	-RJK□□	Number of RVSVRN server licence -SJ and/or -SK
	-RL0□□	Number of RVSVRN server licence -SL
	-MAB□□	Number of MSSVRN/UNSVRN server licence -SA and/or -SB
	-MCD□□	Number of MSSVRN/UNSVRN server licence -SC and/or -SD
	-MEF□□	Number of MSSVRN/UNSVRN server licence -SE and/or -SF
	-MGH□□	Number of MSSVRN/UNSVRN server licence -SG and/or -SH
	-MJK□□	Number of MSSVRN/UNSVRN server licence -SJ and/or -SK
	-MLU□□	Number of MSSVRN/UNSVRN server licence -SL and/or -SU
	-WB□□□	Enter clients licences (model HMIWEB)

Note: The annual support contract provides product support on the standard FAST/TOOLS product for faults/bug fixes. The support contract includes office hour telephone and e-mail support. Application support and remote support will be provided on request.

Note: All software licenses will be sold with a support contract to the end-user. This support contract will become effective as soon as the license is purchased. This also applies to upgrade licenses.

Note: Valid for FAST/TOOLS Software license only.

● **Windows Server Package for Upgrade**

		Description
<b>Model</b>	RVSVRN	FAST/TOOLS Microsoft Windows Server Package
<b>Suffix Codes</b>	-S	Software licence
	2	For upgrade
	1	English version
	-AB	Upgrade licence from 250 to 500 item numbers
	-BC	Upgrade licence from 500 to 1,000 item numbers
	-CD	Upgrade licence from 1,000 to 2,000 item numbers
	-DE	Upgrade licence from 2,000 to 4,000 item numbers
	-EF	Upgrade licence from 4,000 to 8,000 item numbers
	-FG	Upgrade licence from 8,000 to 16,000 item numbers
	-GH	Upgrade licence from 16,000 to 32,000 item numbers
	-HJ	Upgrade licence from 32,000 to 64,000 item numbers
	-JK	Upgrade licence from 64,000 to 128,000 item numbers
	-KL	Upgrade licence from 128,000 to 256,000 item numbers

● **Windows Server Package - Distributed for Upgrade**

		Description
<b>Model</b>	MSSVRN	FAST/TOOLS Microsoft Windows Server Package - Distributed
<b>Suffix Codes</b>	-S	Software licence
	2	For upgrade
	1	English version
	-AB	Upgrade licence from 250 to 500 item numbers
	-BC	Upgrade licence from 500 to 1,000 item numbers
	-CD	Upgrade licence from 1,000 to 2,000 item numbers
	-DE	Upgrade licence from 2,000 to 4,000 item numbers
	-EF	Upgrade licence from 4,000 to 8,000 item numbers
	-FG	Upgrade licence from 8,000 to 16,000 item numbers
	-GH	Upgrade licence from 16,000 to 32,000 item numbers
	-HJ	Upgrade licence from 32,000 to 64,000 item numbers
	-JK	Upgrade licence from 64,000 to 128,000 item numbers
	-KL	Upgrade licence from 128,000 to 256,000 item numbers
-LU	Upgrade licence form 256,000 to unlimited item numbers	

● **FAST/TOOLS LINUX & UNIX Server Package for Upgrade**

		Description
<b>Model</b>	UNSVRN	FAST/TOOLS LINUX & UNIX Server Package
<b>Suffix Codes</b>	-S	Software licence
	2	For upgrade
	1	English version
	-AB	Upgrade licence from 250 to 500 item numbers
	-BC	Upgrade licence from 500 to 1,000 item numbers
	-CD	Upgrade licence from 1,000 to 2,000 item numbers
	-DE	Upgrade licence from 2,000 to 4,000 item numbers
	-EF	Upgrade licence from 4,000 to 8,000 item numbers
	-FG	Upgrade licence from 8,000 to 16,000 item numbers
	-GH	Upgrade licence from 16,000 to 32,000 item numbers
	-HJ	Upgrade licence from 32,000 to 64,000 item numbers
	-JK	Upgrade licence from 64,000 to 128,000 item numbers
	-KL	Upgrade licence from 128,000 to 256,000 item numbers
-LU	Upgrade licence from 256,000 to unlimited item numbers	

● **USER/FAST Web-HMI Server Package for Upgrade**

		Description
<b>Model</b>	HMIWEB	USER/FAST Web-HMI Server Package
<b>Suffix Codes</b>	-S	Software licence
	2	For upgrade
	1	English version
	-UP1	Upgrade licence for 1 (Rich) concurrent client
	-UP5	Upgrade licence for 5 (Rich) concurrent client

Note: Web-HMI Licence are only available in the follow range; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 and 25.

■ **ORDERING INFORMATION**

Specify the model and suffix codes.

■ **TRADEMARKS**

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