



FAST/TOOLS SCADA Solutions

for Pipeline and Local Distribution Companies

Bulletin 50A01A00-01EN

www.yokogawa.com/us

YOKOGAWA 



About Yokogawa

Yokogawa is a world leader in instrumentation, automation and information systems with offices in 55 countries and more than 20,000 employees worldwide. Our technology expertise and unyielding focus on the customer have made us a trusted industry partner since 1915.

Yokogawa's commitment to innovation is reflected in our extraordinary ongoing investments in R&D. We have secured more than 5,000 patents and registrations representing a number of important advancements including the world's first distributed control system and the first digital sensors for flow and pressure measurement.

In oil and gas, our proven project execution capabilities contribute to Yokogawa's repeated selection for projects that demand superior results during the full life cycle investment. As an example, Yokogawa is the preferred automation partner for two of the largest international oil companies for all their projects worldwide. Management at both of these companies specifically highlight our strengths in project execution and ongoing service/support as reasons for selecting Yokogawa.

Yokogawa Corporation of America (YCA) was established in 1957 and is responsible for Yokogawa's business in North America and the Caribbean. YCA is headquartered in Houston with regional offices in Calgary, Mexico City and Atlanta. All offices have system engineering and integration centers; the Houston Systems Center is the largest with more than 350 employees that execute SCADA, DCS and other control system projects.

Yokogawa's Global SCADA Center (GSC) is responsible for the FAST/TOOLS platform and is co-located in Japan and the Netherlands. The GSC utilizes a global team with employee resources from Romania and India in addition to Japan and The Netherlands.

SCADA Solutions from a World Leader in Automation and Information Technology

FAST: Flexible Advanced System Techniques

FAST/TOOLS SCADA software was initially developed in 1978 for NAM, Shell's operating company in the Netherlands, and has been continuously enhanced and improved over the ensuing years. Originally developed when computers had limited CPU power and very little memory, the FAST/TOOLS software kernel to this day has a very compact footprint for ultra-efficient CPU and memory utilization. A key differentiator is the highly reliable, service-oriented architecture (SOA) design.

FAST/TOOLS is operating system independent, running on Unix, Linux and Microsoft platforms. FAST/TOOLS does not use the Microsoft system compilers, schedulers, executors, and other networking/web services often used by other SCADA platforms. It's exactly those services and executors that cybercriminals are using to get access to systems. We eliminate all those vulnerabilities, and instead, we built these functions natively within FAST/TOOLS for a very robust and reliable system from a security point of view.

With over 20,000 servers installed worldwide, the majority for oil and gas applications, FAST/TOOLS is firmly established as one of the world's leading SCADA platforms.

Proven Reliability

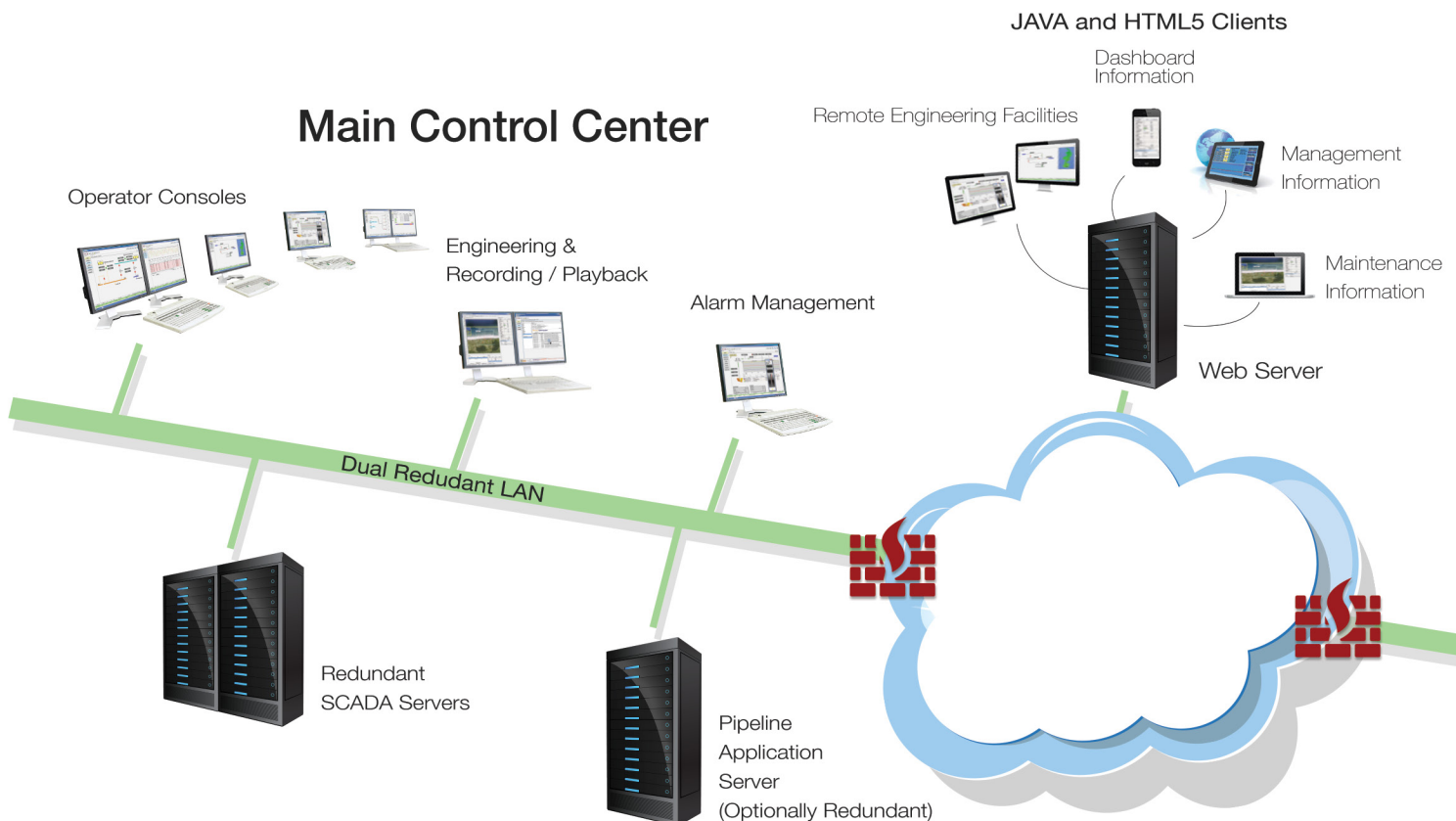
Dual, triple and quadruple redundancy options? Check. More than one million tags on a single server with 180,000 updates per second? Check. On-line configuration changes? Check. Platform independent, open architecture design? Check. Integrated driver set for most commonly-used oil and gas RTUs, PLCs and flow computers? Check. Multiple communication paths to remote devices? Check.

Scalable and Cost Effective

FAST/TOOLS is a true SCADA system, capable of supporting large-scale implementations, but also scalable to smaller installations. The FAST/TOOLS licensing structure is equally competitive in applications ranging from large SCADA installations to single HMI platforms.

Flexible Architecture

In addition to redundancy, FAST/TOOLS provides replication between servers. From hierarchical architectures, to casual user servers, to centralized decision support centers and alarm management centers...the possibilities are endless.



Typical Pipeline Architecture

Applications from Experience

Gas Applications

Yokogawa has extensive experience in deploying FAST/TOOLS for gas pipelines and local distribution companies. Our library includes these commonly used applications:

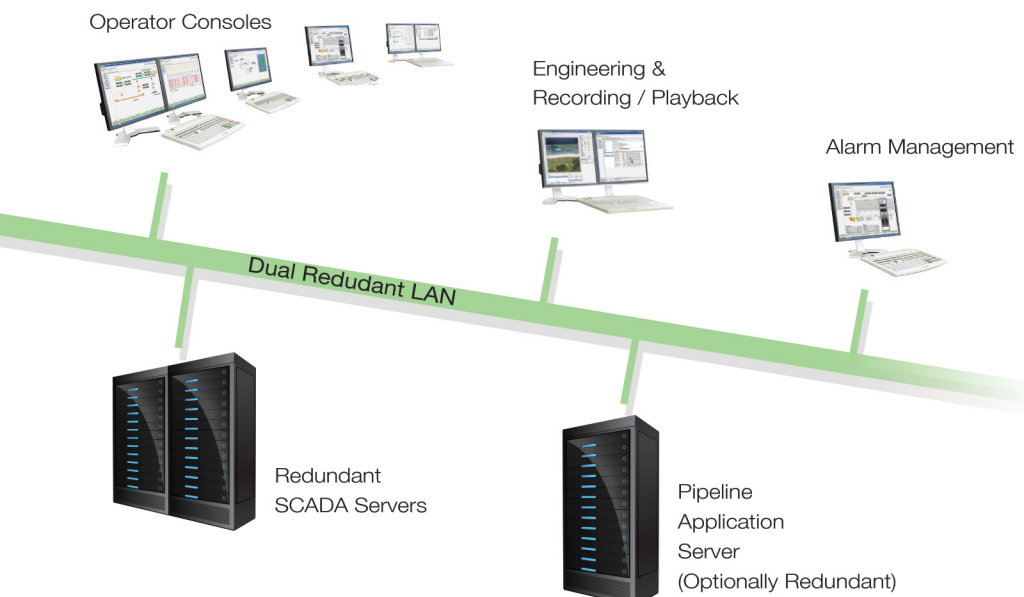
- Line Pack and Draft
- Nomination Tracking and Delivery Scheduling
- Gas Quality Source and Destination Management
- EFM Configuration and History Processing
- Host AGA Calculations
- Flow Totals
- Compressor Efficiency and Wheel Maps
- Storage Facility Management

Liquid Applications

FAST/TOOLS has an equally impressive track record for crude oil and refined product pipelines and terminals. Applications include the following:

- Metering/Tanking/Ticketing
- Meter Proving
- Pig Launching, Tracking and Receiving
- Flow Path Verification/Valve Alignment
- Pump Statistics/Control Validation
- Volumetric Batch Tracking
- Volumetric and Rate-of-Change Leak Detection

Backup Control Center



Comprehensive Functions

Security and User Profiles

Security is a major concern when it comes to SCADA systems. FAST/TOOLS can be integrated easily with any security measures a user has in place such as Active Directory and other industry standard tools. FAST/TOOLS also provides its own security model, and allows administrators to create user profiles that define both privileges (view only, for example) and areas of responsibility (compressor stations only, for example).

Trending

The FAST/TOOLS trend module provides outstanding trend visualization of all real-time and historical points. Common trending functions such as adding new pens, scaling, changing colors, panning/zooming, exporting in csv, Excel or XML formats, and other functions can be accessed in a single click. In addition to time-based trends, FAST/TOOLS can also generate X-Y plots.

Alarm and Event Management

FAST/TOOLS offers an alarm and event management environment with extensive sorting and filter options based on priority, time, tag, etc.; as well as adjustable acknowledgement/reset options such as rerouting of alarms, shelving, delaying, repeating and more. With one click, operators can jump from the overall alarm view to the particular graphic display that contains the point in alarm.

Alarm System Performance Analysis (ASPA)

To comply with the PHMSA CRM rules, EEMUA 191 directives and ANSI/ISA 18.2 standards, Yokogawa has developed ASPA to provide performance measurements, design benchmarks and usability metrics. ASPA supports alarm system performance improvement processes that help avoid operator overload and reduce the risk of critical alarms being overlooked.

Connectivity and Integration

FAST/TOOLS easily integrates with other applications using common tools such as XML, ODBC, SOAP, HTML and OPC. Interfaces have already been built and certified for many common pipeline and local distribution company applications such as the following:

- Leak detection and modeling systems such as those offered by Atmos, ESI and others
- Measurement systems such as those offered by Flow-Cal, Spirit and others
- Historians – OSI PI, Exaquantum and others
- ERP Systems – SAP, Oracle and others

Recording and Playback

User-centric recording and playback makes the system more effective by allowing others to observe what operators actually see when on the job, either in real-time or after the fact. This feature provides real-world insights that can be used for system optimization, and to better instruct and prepare operators to perform their tasks.





Web-based HMI requires Zero Deployment

As a web-based SCADA solution, FAST/TOOLS reduces total cost of ownership while significantly decreasing application delivery time. Our Web HMI is a push application that offers zero client deployment effort, meaning that once it's deployed on a server, there's no need to install any additional software on the client machines, as access simply requires launching a web browser, typing in the URL, and entering password information. In addition to all standard web browsers, FAST/TOOLS supports mobile devices with HTML5.

Information can be accessed anywhere an Internet connection is available, either wired or wireless. Benefits include:

- The information is 'real-time' (no waiting time for critical information).
- The information is more secure than if it were stored locally on the client device.

FAST/TOOLS not only eliminates the expense incurred with purchasing, installing and maintaining client licenses on each user's machine, zero client deployment also means users get updates automatically and immediately whenever they log on. This ability to implement upgrades and patches instantaneously across the system also helps protect sensitive data, since critical updates are immediately available to all HMI's system wide.

Because it's web-based, FAST/TOOLS HMI allows your operators to easily and intuitively navigate through the displays with a browser. The HMI delivers the benefits of incorporating the latest web technology and centralized administration of software installation and management.

The FAST/TOOLS HMI editor allows displays to be built up with dynamic layers and visibility groups that can independently be made visible and/or transparent in the web-based operator environment. As a result, multi-level pipeline supervision and KPI monitoring can be carried out in one view.

Google Earth Style Panning and Zooming

FAST/TOOLS provides up to 99 layers for graphics that display details depending on the zoom level, much like how Google Earth shows streets and houses as the user zooms in. These dynamic layers eliminate the need to open various windows.



Efficient Engineering Environment

FAST/TOOLS software includes a number of tools to speed development time and increase functionality. The engineering module provides access to the system's full intuitive configuration environment. This multi-user environment speeds application development as team members can work together on a single project without geographical limitations.

Furthermore, the system has been designed so that investments made in applications can be preserved when upgrading to new operating system platforms or updated FAST/TOOLS versions. This platform independence is achieved by using Web-based clients that can be quickly and easily redeployed. This significantly reduces the overall cost of ownership, and positively contributes to minimizing any negative effects on the pipeline and processes that are being monitored and controlled by the FAST/TOOLS SCADA system.

FAST/TOOLS application database is scalable to virtually unlimited I/O counts with a minimal impact on overall system performance. Full support of on-line editing (adding/removing) of graphics, item (tag) definitions, reports and I/O drivers guarantees maximum availability. Furthermore, the system supports automatic data archiving of historical data to all commonly-used media, and data clean-up technologies to ensure quick recovery and maximize performance.

Productivity is maximized through object-oriented graphics with rich animation capabilities. There's no need to update symbols separately, as a single change in a parent symbol will update all child symbols system wide. This feature not only speeds the propagation of changes, but also ensures consistency across a single application, and among multiple applications.

Pipeline equipment and associated tags can be organized as objects with defined properties and characteristics that can be reused throughout the system. The defined objects can be easily propagated to the entire plant by assigning unique tag numbers for each object.

A control symbol can be defined once and used as many times throughout the system as required. For example, a block valve object may include multiple measurements, such as upstream and downstream pressure, which are combined into one object. These properties can then be propagated to another object, such as BlockValve2.

A quick load configuration tool is available to build the SCADA database, and configuration changes can be done online with no rebooting required.



Project Execution & Ongoing Support

If there is one thing that Yokogawa has learned after executing 22,000 DCS and SCADA projects, it's that no two projects are alike.

FAST/TOOLS projects can be executed under a number of different implementation models among the end users, Yokogawa, contractors and system integrators.

Many of our customers have hired Yokogawa as their Prime SCADA Contractor (PSC) to handle most if not all of the project implementation tasks. As a PSC, Yokogawa has developed a proven methodology to execute projects on-time and under budget.

Other customers—using various combinations of in-house staff, contractors or integrators—have implemented FAST/TOOLS systems with little involvement from Yokogawa beyond initial training. FAST/TOOLS provides an incredibly rich and easy-to-use development environment that includes wizards, templates and other tools for rapid deployment, making it easy for new users to come up to speed quickly.

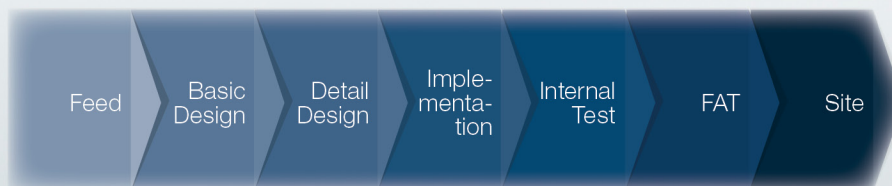
A co-engineered solution model is increasingly popular, whereby a joint team of Yokogawa engineers, customer staff, and/or contractors execute the various tasks for a project. There are many benefits to this model including

less demand on in-house resources versus the “customer-executed” approach, faster overall project execution and lower total application development costs. As there is more detailed involvement by the customer than with the traditional PSC model, this approach makes the customer more prepared for the operation, maintenance and ongoing support of the new system.

Once your project is up and running, Yokogawa offers a variety of support options including:

1. Cost-effective software maintenance contracts to keep your system current
2. 24/7 support agreements
3. Web-based information portals
4. Remote system monitoring and preventative maintenance
5. On-site engineers to work as part of your team (embedded engineering)

All of these options are supported by onsite and offsite training as required, and Yokogawa can tailor a support package that keeps your system running, healthy and up-to-date.





Dramatically Lower Costs over the Life Cycle of your SCADA investment

Why have hundreds of pipeline and local distribution companies chosen FAST/TOOLS? In addition to proven technology, Yokogawa delivers lower costs throughout the system life cycle, from initial installation and start-up and through many years of operation, by providing the following benefits:

- Cost-effective and flexible server and client licensing structure – Buy only what you need today with trouble-free, online expansion in the future
- Zero deployment clients – Eliminate the headaches and costs of bringing new users onto the system
- Quality system delivery – Flawless project execution and professional lifecycle services are the hallmark of

Yokogawa Industrial Automation. It is not just about methodologies and expertise, but includes the mindset to work together as a team to accomplish a shared goal.

- Migration path – At Yokogawa, long-term partnerships with our clients are the norm. Through our cost-effective software subscription service, customers are assured that their FAST/TOOLS systems never become obsolete.

Say goodbye to expensive SCADA upgrade projects. Choose FAST/TOOLS and be assured of a low-cost future migration path.



Migrating a Legacy System to FAST/TOOLS

Yokogawa recognizes and understands the challenges in planning and implementing a SCADA migration project. The knowledge gained through executing dozens of migration projects has permitted us to develop an extensive set of tools, procedures and engineering design standards to ensure the successful migration of your SCADA system.

The cutover from the legacy system to FAST/TOOLS is one of the most critical phases in the project because the operation of the pipeline has to continue during the cutover. Cutover planning is discussed in detail during the Functional Design phase. Often, FAST/TOOLS will be configured initially to operate in parallel to the existing system without being in control (listen mode). After successful testing of data acquisition functions, FAST/TOOLS is then configured for control as well with the legacy system in listen only mode. After successfully passing all tests, and a reasonable “burn-in” period of operation, the legacy system can be decommissioned.

Extensibility Beyond the Core

FAST/TOOLS offers numerous ways to build extensions and/or support existing applications. It provides an open Service Oriented Architecture (SOA) platform not only to Yokogawa’s own data sources but also to 3rd party sources which can be anything from a database to a complete application data model. As well, a number of well-documented APIs are available including .NET, C++, C#, Java, Python, ODBC and Web Services.

Applications and enhanced functions can also be developed within the FAST/TOOLS environment using the PROCESS/FAST scripting engine. With Release 10, the PROCESS/FAST scripting language is Java (not a “Java-like” language). The advantage of building applications in PROCESS/FAST is that they are native to the FAST/TOOLS environment, therefore streamlining integration, maintenance and upgrade tasks.



A Complete Pipeline Automation Portfolio

Stardom RTU

Proven solutions for meter stations, block valve stations, pump/compressor stations and other facilities.



World-class Instrumentation

Pressure, Temperature, Flow and more.



Centum VP Distributed Control Systems

From gas plants to terminals to LNG plants and more, Centum VP has been proven in over 15,000 installations worldwide.



ProSafe-RS

SIL 3 certified solutions for safety and critical control functions.



Dawn Wireless

The next generation of industrial wireless I/O providing true mesh networking with over-the-air configuration and firmware upgradability.



Metering Systems and Solutions

Complete meter and prover skids.



vigilantplant.®

The clear path to operational excellence

SEE
CLEARLY

KNOW
IN ADVANCE

ACT
WITH AGILITY

VigilantPlant is Yokogawa's automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

Yokogawa Corporation of America

12530 W. Airport Blvd., Sugar Land, TX 77478
Phone: 281-340-3800 Fax: 281-340-3838

2 Dart Road, Newnan, GA 30265-0928
Phone: 770-254-0400 Fax: 770-254-0928

<http://www.yokogawa.com/us>

Yokogawa de Mexico, SA de CV

Av. Urbina No. 18
Fracc. Parque Industrial Naucalpan
Naucalpan de Juarez
Estado de México, C.P. 53489
Phone: (55) 5955-7400 Fax: (55) 5955-7417
<http://www.yokogawa.com/mx>

Yokogawa Canada, Inc.

Bay 4, 11133 40th Street SE, Calgary, AB T2C 2Z4
Phone: 403-258-2681 Fax: 403-258-0182
<http://www.yokogawa.com/ca>

Trademarks

FAST/TOOLS is a trademark of Yokogawa Electric Corporation.
Other company and product names in this bulletin are trademarks or registered trademarks of the respective companies.

Represented by:

Printed in USA, [Ed: 04/b]