Scalable, Secure Remote Monitoring Solutions
Stay a step ahead by remotely monitoring your critical assets
Why Is This Important?

What’s Driving This Need?
Customer Impact

It’s likely you are dealing with leaner budgets and staffs, an aging work force, remote locations and employees trying to keep pace with ever-changing technology.

Wouldn’t it be great to enable the best qualified engineer to have visibility and access to every site?

Rockwell Automation Remote Monitoring Services provides you secure remote access to your sites and valuable information on the health of your assets and systems. If you would rather rely on our expertise to provide the support for you, Remote Monitoring Services connect knowledgeable resources to prevent or optimize your production, and offer support during unexpected failures. All while giving you total visibility and control over who has access, what they have access to and what information they can see.

Remote Monitoring Services can help optimize your operations, improve employee efficiency and increase productivity
The Modern Enterprise

Global Locations, Partners and Suppliers

Connected Enterprise

- Faster Time to Market
- Lower Total Cost of Ownership
- Improved Asset Utilization
- Enterprise Risk Management
The Modern Issues

Workforce Availability
System Complexity
Connectivity
Security

Continue to Increase Productivity
Workforce Readiness Challenges

Knowledge Gaps on Technology
- The days of having a “technology” person have passed

Experience Gaps
- Every 10 retiring maintenance workers are replaced with 3–7 workers
- 10 million workers are required by 2020 to support the manufacturing industry

Talent Availability
- Fewer skilled workers available, greater global competition for those workers
- An estimated 10 million jobs with manufacturing organizations cannot be filled today due to a growing skills gap

“The difficult economy can drive broad cuts in maintenance. This causes expensive reactive activities to displace preventive tasks at an increasing rate, leading to a downward spiral in capability. Instead, [manufacturers should] optimize without compromising capability.” - 2010 Mobility for Asset Management Worldwide Outlook report, Ralph Rio, ARC Advisory Group
What Is Driving the Need for Remote Services?

All customers are developing strategies to **Drive Costs Down** through remote support, **Revenue Up** from post-sale support and **Increase Asset Uptime** with the use of better, faster information and preventative technology.

**Figure 1: Current Market Pressures for Remote Service**

- Need to reduce service-related costs: 44% in 2008, 50% in 2009
- Customer demand for faster service: 47% in 2008, 54% in 2009
- Customer demand for improved asset availability: 45% in 2008, 46% in 2009
- Customer demand for improved asset performance (output): 35% in 2008, 36% in 2009
- Competitive pressures/differentiation: 31% in 2008, 28% in 2009
- Need to curb increases in service costs: 31% in 2008, 26% in 2009
- Mandate to drive new revenue opportunities: 21% in 2008, 27% in 2009

Source: Aberdeen Group, March 2009
How Does This Affect Your Bottom Line?

65% Hourly increase in cost of downtime from 2010 through 2012

(“The Cost of Downtime is Rising”, Dick Csaplar - Aberdeen Group)
How Does This Affect Your Bottom Line?

$20B Cost Of Unscheduled downtime

8% Is spent figuring out if there is a real problem
21% Is spent diagnosing the problem
47% Is finding the resources to fix the problem

76% of the time before the fixing even starts

REMOTE MONITORING & DIAGNOSTIC solutions can help resolve issues faster, eliminate unneeded maintenance activity, and get you back up and running faster!
Remote Monitoring Solutions
Scalable Solutions that Maximize Collaboration

COLLABORATION

Anticipate activities throughout the ENTERPRISE and through the SUPPLY & DEMAND chain

LOWER Customer Rejects & Returns
INCREASE Supplier Incoming Quality (& Higher first Pass Yields)

KNOWLEDGE & EXPERIENCE will shrink significantly over the next 5 years

Leverage centrally located DOMAIN expertise across operations, sharing best practices and enlisting the knowledge base of an entire supply chain

Transforming KNOWLEDGE into POWER
Our Goal with Remote Monitoring Solutions

<table>
<thead>
<tr>
<th>Without Remote Monitoring</th>
<th>With Remote Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Initiated Call</td>
<td>Automatic Incident Detection</td>
</tr>
<tr>
<td>Diagnosis with Customer</td>
<td>Detailed Information</td>
</tr>
<tr>
<td>Additional Investigation</td>
<td>Directly Available</td>
</tr>
<tr>
<td>Direct Intervention</td>
<td>Direct Access to System</td>
</tr>
<tr>
<td>Multiple Interventions</td>
<td>Preparation for Intervention</td>
</tr>
<tr>
<td></td>
<td>Scheduled Intervention</td>
</tr>
</tbody>
</table>

Source: Gartner DataQuest
What Does Remote Access Offer?

- Alerting
- Collecting
- Detecting
- Distributing
- Fixing
- Monitoring
- Preventing
- Reporting

Providing automated collection of data for reporting and

**Premium Services Sales**

your customer to **prevent** them

decreasing **Mean Time To Repair**

**before** the customer does

*Having Remote Access is the equivalent of staffing your best support engineer at every site on a 24x7x365 basis***
Remote Monitoring Architecture
Secure Remote Access and Monitoring
Secure Remote Access
Defining “Good – Better – Best”

**Good** – Standard
- Outbound Only Communication (443 & 80)
- Secure Socket Layer
- User Authentication
- Remote Access Audit Trail
- End-User Control (On/Off)

**Better** – Enhanced
- Outbound Only Communication (443)
- Secure Socket Layer
- Certification
- Fingerprint
- Limit access by User and/or IP address
- User Authentication
- Remote Access Audit Trail
- Remote Access Notification
- Remote Access Surveillance / Recording
- Complete End-User control

**Best** – Enhanced +CPwE
- VSE Enhanced Features
- Rockwell Automation / Cisco Reference Architecture Compliant
Secure Remote Access - Standard

Good Security

- User Authentication
- Access to entire network
- End-User Control (Grant / Deny)
- Access Limits (User to VSE)
- Does Not Limit Device Access
- Not compatible with VSE monitoring Services
Secure Remote Access - Standard Audit

- Authentication through VSE Standard
- No Network Isolation
- Access log in VSE Service Center
  - No Audit Log
  - No Surveillance
  - Remote access limits set by network architecture.
Secure Remote Access - Enhanced
Better Security

- Multiple Security Levels
- Limits Remote Access
- Limits Data Flow
- Complete End-User Control
- Compatible with RA Remote Monitoring Services

Level 0

Industry Security Zone

Common Collaboration Platform for all Remote Workers
Secure Remote Access - Enhanced Multiple Security Levels

Virtual Support Engineer™:
Continuously polling the Comm Server from inside firewall using HTTPS on Port 443 to 2-3 specific IP addresses.

- Data is compressed, encapsulated, encrypted
- No possibility of VPN bleed or fake connections
- A secure multi-purpose tunnel to customer sites
Every action can be approved or denied by the Site Administrator.

Customer Site

- Application
- Database
- Server
- Network Device
- Other

Site Server

Audit Trail

Only rules approved by site are installed. Each system's passwords can be set and managed locally by the Site Administrator.

Site Administrator can control the data flow

Firewall remains intact. Only Port 443 used

username / password authentication for access by Site Administrator

Site Administrator can control the data collection

Internet

Customer Site

Prepaid Application DAC Database Telepath Server SMSC Network Device Other

Only Port 443 used

Audit Trail

Every action can be approved or denied by the Site Administrator.
Secure Remote Access - Enhanced
End-User Control

- Authentication
- End user manages access requests
  - Grand / Deny
  - Device Access Control
  - Data Flow
  - Remote Access
  - Remote Access Notification and Control
  - **Remote Access Surveillance**
- Network Isolation through VSE configuration
- Audit log in VSE Service Center
  - Access
  - **Surveillance Video**
FactoryTalk® Asset Centre
Rockwell Automation VSE + FactoryTalk AssetCentre

Level 3
- FactoryTalk Application Server
- FactoryTalk Directory
- FactoryTalk Asset Centre

Level 2
- FactoryTalk Client
- Operator Interface
- Engineering Workstation

Level 1
- Batch Control
- Discrete Control
- Drive Control
- Continuous Process Control
- Safety Control

Level 0
- Sensors
- Drives
- Actuators
- Robots

Industrial Security Zone

Cell/Area Zone

Firewall

Internet

DMZ

Communication Server

Database Server

Collection Data

Application Server

Management Alerts, Notifications and Reports

Service Center
### FactoryTalk Asset Centre

**Rockwell Automation VSE + FactoryTalk Asset Centre**

- Authentication through VSE and FTAC
- Network Isolation through FTAC configuration
- Audit log in FTAC
  - Access
  - Changes
  - Compare
- Audit Log in VSE Service Center
  - Surveillance Video

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Here's a complete audit log of OEM activity:

<table>
<thead>
<tr>
<th>Status</th>
<th>Submit Date</th>
<th>Submitted By</th>
<th>Activity Type</th>
<th>Destination</th>
<th>Completed</th>
</tr>
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<tbody>
<tr>
<td>✔️</td>
<td>1-NOV-2013 19:32:29</td>
<td>Shawn Boike</td>
<td>Remote Access</td>
<td>Site (id:22050)</td>
<td>1 of 1</td>
</tr>
<tr>
<td>✔️</td>
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<td>Sal Conti</td>
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<td>Remote Access</td>
<td>Site (id:22050)</td>
<td>1 of 1</td>
</tr>
</tbody>
</table>
Remote Access that meets CPwE Referenced Architecture

Enterprise Security Zone

- Secure Remote Access through the Enterprise Zone
- Authenticated access to the VSE in the IDMZ
- Tight VNC access to the VSE terminal
- All alarm management and access is maintained within the manufacturing zone

Manufacturing Security Zone


Firewall Rules

Access Control Lists (ACLs)
Secure Remote Access + CPwE
BEST Security

Logical Model – Industrial Automation and Control System (IACS)
Converged Multi-discipline Industrial Network
No Direct Traffic Flow between Enterprise and Industrial Zone

Remote Monitoring Service
- Remote Access
- Monitor and Alarm Mgmt.
- Maintenance Tools
Overview of the Architecture

Benefits

Aggregate Machine Data
- Performance Dashboards
- Alarm Diagnostics
- Alarm Notification
- Current Machine Status
- Historical Trends

Data Accessibility
- Secure Internet Access
- Mobile Devices

Remote Services and Support
- Application Support
- Remote Monitoring Services

Only sends information out
Does not allow remote access
Remote Monitoring Services

System Intelligence
Contextualized Information

- Right Information – Right Time – Right Person

**ENTERPRISE**
- EXECUTIVE

**SITE**
- PRODUCTION MANAGEMENT

**EQUIPMENT/LINE**
- OPERATOR

Empowering PEOPLE to make SMARTER, more INFORMED decisions
Notifications and Reporting – Anywhere, Anytime

Summary Reports for Real-time Process Intelligence

Downtime Reports and Notifications

Compare Performance Across Plants

Enable mobile collaboration - Know WHEN and WHAT needs attention
Remote Monitoring Services

Remote Asset and System Monitoring
Remote Monitoring & Support

Secure Remote Access

- Asset Health
- System Health
- Infrastructure
- Environment
- Consumables
- Data

Data Aggregation
Rockwell Automation Differentiation

Our People

- **Understanding IT / OT** Convergence with customer-specific knowledge
- **Global infrastructure**
  - Multiple Certified Remote Support Centers Staffed by Rockwell Automation Engineers
    - Providing Follow-the-Sun, 24x7 Support with over 350 Engineers in over 20 Languages
  - 24x7x365 Remote Monitoring and Support
  - IT / OT engineers in field that can be leveraged for on-site needs
  - Multi-language remote support capabilities

Technologies

- **Virtual Support Engineer** - Secure Remote Access and Monitoring
- **RA Cloud** - Data Collection, Aggregation, Visualization, Notification, Trending and Reporting
- Virtualization – **Industrial Data Center** for a complete turnkey solution for the plant floor

Our Partners

- Cisco, Microsoft, VMWare, EMC, ATT, Smart Cloud, Encompass
### CHALLENGES
- Installed Rockwell Automation PowerFlex® 7000 Medium Voltage Drives on Oil Rig off the coast of Alaska
- Cost of downtime reaches $300,000 / day
- Support staff not completely comfortable with new technology
- Critical asset that would stop production if it fails

### DELIVERED SOLUTION
- Rockwell Automation Remote Support delivered Virtual Support Engineers to monitor 16 PowerFlex 7000 drives
- Respond to any warning or fault within 10 minutes
- Monitor key performance indicators such as
  - Speed
  - Current
  - Power
  - Voltage

### RESULTS
- Fast ROI:
  - Automated detection and notification of four incidents – In the first 2 weeks!
  - Issues addressed within minutes
  - Savings have already paid for the contract for several years
# Customer Example

**State Owned and Operated Draw bridges**

## Challenges

- Mission Critical Asset
  - Draw bridges
- Limited Support Staff with aging skill set
- New technology
- Unacceptable unplanned downtime

## Delivered Solution

- Rockwell Automation Services delivered a 10-year Remote Monitoring Agreement:
  - ControlLogix® with Entec Modules monitoring motor currents, drive faults and vibration system faults
  - Cabinet door switches with time stamp
  - Main drive motors, diesel oil tank level, safety gates with bridge status (up, down, etc)
  - A Skew measurement that compares 2-4 encoders against limit switches (full up or full down) to see if the lift motors / cables, drums, etc are "cocking" the bridge
  - Assurance™ Integrated Support Agreement
  - Seamless Integration of Support Customer Experience

## Results

- No unplanned downtime to date
- Lower total cost of ownership
- Cost avoidance: training, on-site parts, incremental staff
- Proactive downtime avoidance and seamless incident response that is managed by Rockwell Automation
**Cloud Monitoring** was our logical step to handle torrential machine data from this plant.

<table>
<thead>
<tr>
<th>CUSTOMER CHALLENGES</th>
<th>DELIVERED SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Business challenge</td>
<td>• Solution delivery/execution</td>
</tr>
<tr>
<td>• Remotely monitor plant and machine performance and back up data</td>
<td>• Installed in 2 hours with zero downtime, running since Oct 2012</td>
</tr>
<tr>
<td>• Current Status Quo</td>
<td>• Technology solution</td>
</tr>
<tr>
<td>• Expensive on-premise solutions</td>
<td>• Cloud Agent technology was integrated to existing FTHSE data collection, BI/analytics tools on top of Big data</td>
</tr>
<tr>
<td>• Environmental / Economic Challenges</td>
<td>• Support plan</td>
</tr>
<tr>
<td>• Strict Canadian regulations</td>
<td>• Resilient and scalable cloud infrastructure</td>
</tr>
<tr>
<td>• Proactively react to abnormal situations that would affect performance</td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS**

- Achieved scalable, cost-effective real-time plant and equipment performance monitoring to prove SLA compliance
- Collected machine data is backed up in cloud storage for compliance and R&D
- Cloud analytics encapsulated ACMTC’s knowledge for use in future sales and machine design
**Customer Example**
Large Food Manufacturer

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>DELIVERED SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Moved to Managed Switches and EtherNet on the Plant Floor</td>
<td>• Rockwell Automation Remote Support delivered Virtual Support Engineers to 52 plants in North America</td>
</tr>
<tr>
<td>• IT brought along their traditional IT support provider – who supported the office space - to support the plant floor side</td>
<td>• Set up monitoring of over 400 switches</td>
</tr>
<tr>
<td>• Support provided did not respond with the speed that the production side of the business required</td>
<td>• Developed alarm profiles to monitor eight key parameters in every switch</td>
</tr>
<tr>
<td></td>
<td>• Respond with a 10-minute SLA to any alarm received</td>
</tr>
<tr>
<td></td>
<td>• Customer proactively contacts Rockwell Automation to assign IP addresses and open/close ports</td>
</tr>
<tr>
<td></td>
<td>• Coupled service with Cisco SmartNet agreement to supply parts and replacements</td>
</tr>
</tbody>
</table>

**RESULTS**

• Customer saw significant improvement in uptime and decrease in downtime events
• Better management of network
• Expanded service to cover additional control system components and equipment from other providers
# CENTRIA Coating Services
Pre-painted Metal Industry Leader

## CHALLENGES
- Upgraded facility with new, advanced automation technology
- Lack of engineering talent to support and maintain latest automation technology
- Lacked the 24/7 reporting and alarming that is critical to support their 24/7 continuous operation

## DELIVERED SOLUTION
- Rockwell Automation Remote Support delivered TechConnect℠ Application Support Solution
- Rockwell Automation team installed a kiosk with a high-speed data logger at customer site – allowing off-site surveillance and alarming by a team of trained Rockwell engineers.
- Real-time tracking of 2,500 data points – controllers, drives, HMI, regulatory compliance
- Secure access to historical data for troubleshooting

“Shortly after the Application Support agreement was established, I began receiving notifications about lifecycle changes that I wouldn’t have anticipated otherwise.”

## RESULTS
- Centria reduced maintenance downtime by 50 percent
- Lowered total cost of ownership for fully staffed maintenance operations to support advanced new automation technologies
- Added predictive maintenance capabilities
Challenges

- Operational challenges including instability and sheet breaks when switching between products, resulting in downtime at a cost of $7,000 per hour
- Lack of technical expertise required to manage and support the newly installed PowerFlex® drives system

Delivered Solution

- Rockwell Automation Remote Support delivered TechConnect™ Application Support Solution which provided consistent and highly knowledgeable technical expertise, who understood customer’s new drives system and could support it, to address skill gap
- Application engineers visited the site to gather documentation and data on the equipment, operations and staff to become more familiar with drive systems

Results

- Due to proactive troubleshooting of the issues, downtime reduced significantly and resulted in increased revenue of $630,000 per year
- Improvement in overall efficiency in the performance of the equipment and minimizing staffing efforts resulted in the reduction of costs by $28,834 in operations. In training and alternative support efforts, $378,675 was saved
- The paper mill was able to achieve their longest 24x7 uptime stretch in the 2nd quarter of 2012
Customer Example
Specialty Paper Company

CHALLENGES

• Company experienced a high frequency of downtime events. Due to the nature of their process line system, company lost $9,000 per hour in revenue from downtime

• In one year, company recorded 147 hours of unplanned downtime that resulted in a loss of $1.3 million in revenue

• Company required diagnostics and calibration on the newly installed equipment

DELIVERED SOLUTION

• Rockwell Automation Remote Support delivered TechConnect\textsuperscript{SM} Application Support Solution which provided consistent and highly knowledgeable technical expertise, who understood customer’s process line system

• Application engineers monitored and addressed alarms efficiently by offering corrective actions which improved overall process and averted downtime

RESULTS

• Customer was able to save $805,000 in overall equipment efficiency in the first year

• The quick response time to process line faults by Rockwell Automation engineers yielded a reduction of 57 percent in inadvertent downtime hours
Scalable Secure Remote Monitoring Solutions
Stay a step ahead by remotely monitoring your critical assets