SCADA Features and Benefits for Small to Medium Sized Communities

Presented by: Rick Alvarez
What will we be talking about?

- What is SCADA?
- Why do you need it?
- What types of SCADA are available?
- What communication options are available?
- SCADA Capabilities
- What Value Does SCADA Offer?
- How much does it cost?
S.C.A.D.A.—WHAT IS IT?

- **SUPERVISORY**—THE ABILITY TO MONITOR REMOTE LOCATIONS FROM A COMPUTER.
- **CONTROL**—THE ABILITY TO CONTROL REMOTE LOCATIONS FROM A COMPUTER.
- **DATA ACQUISITION**—THE ABILITY TO BRING STORED DATA BACK FROM A REMOTE LOCATION FOR STORAGE, TRENDING AND REPORTING.

  - In simple terms: monitoring, controlling and collecting data from remote sites
Why Do You Need It?

- Shrinking Budgets
- Less Manpower
- More responsibilities
- Stricter Regulations

SCADA offers immediate access to all aspects of your collection and treatment systems
What Types of Monitoring and SCADA Are Available?

Monitoring
- Autodialers
- Cellular RTU (Remote Terminal Unit)

SCADA
- Traditional
- Hosted
- Hybrid
Good low-cost solution for basic alarms
Phone-line communications
Limited Inputs (typically 8 or 16)
  ◦ Pump alarms
  ◦ Level alarms
  ◦ Intrusion alarms
  ◦ Power fail
Cellular RTU

- Reliable communications
- Regular heartbeat check
- Limited Inputs (typically 8 or 16)
  - Pump alarms
  - Level alarms
  - Intrusion alarms
- Inexpensive
- Ease and flexibility of installation
- Scalable from 1 unit to X units
- Meets or exceeds homeland security and AWWA standards
Basic Components of Cellular RTU

1. Field RTU...The Box
2. National Wireless Data Networks
3. Centralized Web Software
4. Alarms To Virtually Anything
5. Secure Customer Web Site

1. RTU
2. Network Carriers
3. Centralized Web Based Software
4. Alarms & Data
   - Pagers
   - Fax
   - Email
   - Phones
   - Your HMI
5. Customer Website

Internet
Traditional SCADA

- Also called ‘resident’ or ‘local’ installation
- Municipality owns all hardware and software
- Software updates and licensing are owner’s responsibility
  - Most software packages require annual license renewal
- Computer hardware is owner’s responsibility
  - Typically not installed in secure or clean location
Hosted

- System supplier owns all software and servers
  - Responsible for software updates, license renewals, server maintenance
  - 24/7 monitoring of system performance
Hosted

- Secure Location
- Redundant Servers
- Continuous Power
  - Instant UPS power backup
  - Long-term generator power backup
- Continuous Internet
  - Multiple internet connections with multiple carriers
- Continuous Server Monitoring
Hybrid

Combination of Traditional and Hosted
- All the benefits of hosted SCADA
- Local installation serves as ‘backup’
- ‘Belt and Suspenders’ approach
What Communication Types are Available

- Cellular
- Wi-Fi
- Fiber optic
- DSL
- Cable modem
- Radio
- Satellite

Consult with your engineer or system supplier to determine the most cost-effective and reliable option in your application.
**SCADA Capabilities – Alarming**

- Able to annunciate alarms by:
  - Voice Callout
  - Email Message
  - Text Message
  - Pager Notification

- Able to acknowledge alarms by:
  - Voice Callout
  - Reply to Email
  - Reply by Text Message
  - Alarm Summary page

- Alarm lists can be sorted by type, site, etc.
Multi-Point Trending

Create custom multi-point trends:
- “One-Click” 1st tag
- Keep Trend View Open
- “One-Click” 2nd tag
- “One-Click” 3rd tag
- Keep going as needed

Option to Save, Print, and Export to Excel.
Report template designed to customer specifications

Able to receive daily or monthly reports automatically to your email and/or FTP Site

Daily Alarm Summary page is also included.
SCADA Capabilities – Control

- Popup control screens:
  - Pump Control
    - Manual / Off / Auto
  - Well Level Setpoints
    - Lead / Lag / Lag2 / Lag3
  - Well Alarm Setpoints
    - HiHi / Hi / Lo / LoLo.
What Value Does SCADA Offer?

- Immediate notification
- Predictive Maintenance
- Warranty Validation
- Historical Data
- Lower Insurance Premiums or Grants
Immediate Notification

- Real time (Live) Monitoring of Pumps / other equipment
- Advanced Pump Protection & Station Management
- Alarm Notification
Predictive Maintenance

Sources of Maintenance Data

• Pump efficiency (gals/kWh)
• Pump flow rates
• Pump run times
• Pump starts
• Insulation Resistance Testing of motor windings

• Flagging of problems before they occur!
Historical Data

- All logged data is stored for future use
  - Engineering design
  - Long term performance
Warranty Validation

- Support for warranty claims
  - Comprehensive monitoring
  - Maintenance records

- Many manufacturers require proof of maintenance in order to honor warranty claims!!

Insurance Premium Reductions/Grants

- Many insurance companies have programs that can offset the cost of SCADA
- Check with your insurance agent
  - Do they offer discounts or grants?
  - Does your community qualify?
How Much Does It Cost

- Traditional SCADA
  - Initial Costs:
    - SCADA Hardware
    - SCADA Software
    - Software Development
    - IT Configuration
  - Yearly Costs:
    - Hardware Maintenance
    - Software License Renewal
    - IT Maintenance

- Hosted SCADA
  - Initial Costs:
    - Software Development
  - Yearly Costs:
    - Service Fee

- Autodialer or Cellular RTU
  - Initial Costs:
    - Hardware
    - Installation
  - Yearly Costs:
    - Phone or cellular costs
How Much Does It Cost

Relative Cost

1 2 3 4 5 6 7 8 9 10 11

- Autodialer
- Cellular RTU
- Hosted SCADA
- Traditional SCADA
## Features Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>Autodialer</th>
<th>Cellular RTU</th>
<th>Traditional SCADA</th>
<th>Hosted SCADA</th>
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<tbody>
<tr>
<td>Web–hosted platform</td>
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<td>Convertible to hybrid installation</td>
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<td>Realtime monitoring</td>
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<td>Alarm notification/acknowledgement</td>
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<td>Control (H–O–A and setpoint)</td>
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<td>Historian</td>
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<td>Phased implementation</td>
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<td>I/O limit</td>
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<td>Multiple communication protocols</td>
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<td>Ethernet connectivity (connect to existing PLC–based controllers)</td>
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<td>Secure (256 Bit) communications</td>
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<td>Proprietary hardware required</td>
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<td>Customizable reports</td>
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<td>Alarm summary</td>
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<td>Customizable security settings</td>
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<td>Customizable user interface</td>
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<td>Mobile device compatible</td>
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Questions?

Thank YOU!