Access and Visualization of Process Data

Why record data?

– Someone else needs it or said it was a requirement;
  • FDA, EPA, Boeing Spec, Outside Agency
  • Customer demands a record of the process
  • Internal approval group requires it

– The Operator needs to know what happened – obtain information to make a decision

– Historical record - just in case

– Record of process (proof of process)

– Process improvement

– Certification Purposes - check to ensure equipment is performing to specification
Access and Visualization of Process Data

**Operations**
- Real time data
- Alarms, events
- Replay, review last run
- Print screen at process
- Archive data

**Maintenance**
- Diagnostics for troubleshooting
- Monitor Alarms
- E-mail alerts
- Remote viewing
- Real-time data monitoring
- Process history

**Main Office**
- See process status
- Remote viewing
- Monitoring and compliance checks
- FTP data upload on demand for analysis
- Report generation

Guard House
- Alarm notifications by email

Honeywell Paperless Recorder

Engineer

Who needs the data?

Ethernet
Recorder Process Applications

• Wastewater plants
  - Flow monitoring
  - Flow totalization
  - Waste Water treatment
  - Water quality recording

• Utilities
  - Reactor & Process temps
  - Generator Bearing temps
  - Flows & Pressures to boilers
  - Scrubbers air flows & emissions
  - Totalized flows
  - Cooling water flows & pressures

• Thermal industry
  - Process recording (temp)
  - Heat treatment
  - Temp Uniformity Surveys
  - Energy usage monitoring
  - Molten Metal recording

• Pharmaceuticals
  - Environmental rooms
  - Storage rooms
  - Boiler & steam generation
  - Reactor vessel activity

• Food and beverage industry
  - Pasteurization process (temp & flow)
  - Cooking / Canning / Retorts
  - Food processing
  - Freeze drying
  - Smokehouses
  - Fermentation processes

• Laboratory / Testing
  - Environmental chambers
  - Oven monitoring
  - Sterilizers
  - Pilot batch processing
# Water Pumping Station Application

<table>
<thead>
<tr>
<th>Problem</th>
<th>Monitor the water pumping station performance and ensure all outputs are at the proper levels</th>
</tr>
</thead>
</table>
| Solution | **Multi-input, display and communications capability**  
• Direct connection of input signals from pressure & flow transmitters for monitoring of process  
• Pulse inputs can be used directly by the recorder, no special signal conditioner  
• Perform totalization flow internally eliminating the need for other equipment  
• Ethernet connectivity allows for remote monitoring and alarm notification  
• Transmitter power supply eliminates need for separate supply to power transmitters |
| Benefit | **Clear displays, direct input connections provide better decision making and low cost of monitoring** |
Honeywell Electronic Paperless Recorders

- Portfolio of 4 different capability instruments
- Acquires, stores, displays and transmits data and messages
- Analog input measurements for up to 48 channels
- Data replay feature at recorder display (with zoom in/out)
- Color display configurable for bar graphs, trend, panel meters or combination viewing
- Remote viewing of data and control of recorder via Ethernet connectivity
- Secure data recording – data encrypted and password system
- Large electronic buffer size for maximum data storage
Honeywell Electronic Paperless Recorders

<table>
<thead>
<tr>
<th>Model</th>
<th>Display Type</th>
<th>Inputs</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>eZtrend GR</td>
<td>5.7” TFT QVGA</td>
<td>3 to 12</td>
<td>320 x 240</td>
</tr>
<tr>
<td>Minitrend GR</td>
<td>5.7” TFT VGA</td>
<td>4 to 16</td>
<td>640 x 480</td>
</tr>
<tr>
<td>Multitrend GR</td>
<td>12.1” TFT XGA</td>
<td>4 to 48</td>
<td>1024 x 768</td>
</tr>
<tr>
<td>DR Graphic</td>
<td>12.1” TFT XGA</td>
<td>4 to 16</td>
<td>Slim depth, enclosed case</td>
</tr>
</tbody>
</table>

**Unique Features**

- Remote view & control
- Fuzzy logging
- High capacity storage
- 20 msec input scan
- Custom screens
- Math scripting
- Secure communications
- Modbus Master
- Concurrent Batch
- Flexible input to pen assignment
- Independent display chart speed and pen logging rate selections
- Events
- Diagnostics & HealthWatch
- Firmware credit flexibility
- Reports from recorder
- Password synchronization
- 50 User Password support
Honeywell Product Value

- Accurate & reliable data to improve process performance
- Visualization of the process
- Fast, easy retrieval for review & reporting
- Documentation for regulatory compliance
- Secure data with secure access to prevent tampering
Easy to Read Display Screens

High Resolution Displays

- **eZtrend** - 5.7” TFT QVGA (320x240)
- **Minitrend** - 5.7” TFT VGA (640x480)
- **Multitrend** - 12.1” TFT XGA (1024x768)
- **DR Graphic** - 12.1” TFT XGA (1024x768)

Intuitive Screen Selections

- Trend, Bargraph, Digital, Circular (*Multi and DR Graphic*)
- Non-process screen displays; Alarm, Min-Max, Totals, Counters, User Variables, Script Timers, Messages
- Actionable screen selections through Events for improved process viewing (*automatically jump to important screen*)
Display Screens for Operator and Engineer Access

- Clear visual icons and menu driven prompts for ease of use
- Touch Screen for easy navigation, and “bread crumbs” to show where you are
- Set-up and operate recorder in users local language (20 supported)
- Full function “HELP” built into recorder to answer user questions
- Password access segments available screens by pre-set authorization settings
- “Credit” System for flexible selection of firmware options
Data Format Flexibility for Display Viewing

Example: Input displayed with different scaling

- Analog input (a4) can be assigned to two independent pens (Pen 1 and Pen 3)
- Each pen can be scaled to desired ZERO and SPAN ranges
- Pens can be displayed together with their individual scales in their own display
Report Generation and Display

- Manual or periodic report generation at recorder of pen values

- Display daily/weekly/monthly totals, max./mins., averages, etc.

- Report output can be viewed on screen, printed, e-mailed or exported to the removable media
Custom Display Screens - Screen Designer Application

- Custom recorder screens can be created with the PC based application; Screen Designer

- Custom screens are developed with Screen Designer templates on the PC and then loaded into the recorder via removable media

- Bitmaps may be inserted into the Screen Designer application and then loaded into the recorder
Recorder Remote Viewing on a PC

- Web browser option in the recorder extends the user interface and display view onto a remote PC
- View the recorder display remotely via Ethernet connection and a web browser (supporting Explorer 6 to IE10)
- Capability is password protected to prevent unauthorized access
- Supports full remote control of the recorder
- A remote viewing PC application is also available for recorder view and control (in place of Internet Explorer) via direct Ethernet connection
Recorder Connectivity for Data Access

- **Multiple ways to connect with recorders**
  - Standard Ethernet connectivity
  - RS485 Modbus connectivity
  - OPC Server capability (*thru PC*)

- **Remote Viewer & Control**
  - Remote access via Internet or Remote Display Tool
    PC app for easy viewing

- **Modbus Master**
  - Recorder runs communications, collecting data for other Modbus devices without an extra PC

- **Real Time & scheduled FTP data collection**
  - Secure communications with Authentication between TrendServer and recorders
Recorder Data Availability

IT IS ALL ABOUT THE DATA . . .

• Secure data storage, encrypted to prevent undetected tampering of data
• Data storage frequency set on a Pen by Pen basis
• Expandable internal data storage capacity (up to 4GB – Mini/Multi/DR Graphic, 2GB eZtrend)
• Removable data storage to USB memory key, SD card, or FTP upload
• Secure FTP data transfers
• Recorder Events to Start and Stop logging
• Data can be exported in Excel or CSV formats from TrendManager software
TrendManager Pro - PC Software Suite

**TrendViewer**
- Imports data, opens graph, prints
- Data is retained until the next import

**TrendManager / TrendServer**
- Imports data, opens graph, prints
- Data saved to a secure database
- Analyze data, create specific graphs, export data (CSV, Excel)
TrendManager Pro - PC Software Suite

- Graphing
  - drop and drag pens/graphs
  - no folders or files

- Recorder configuration

- Real-time communications
  - supports Modbus
  - supports Ethernet/RS485

- Import data and setups

- Batch data analysis

- System setup
  - password, status, e-mail, real time buffer
TrendManager Pro - PC Software Suite

View and Arrange Data
- Recorder data associated to recorder name for easy selection
- Drag and drop of pens or entire recorder into viewing pane
- Arrange pens, view events, adjust scaling, view data values
TrendManager Pro - PC Software Suite

Real Time Data
- TrendServer is set up to gather real time data
- Runs as a service to prevent loss of data
TrendManager Pro - PC Software Suite

Concurrent Batch
- Record data based on batch identifiers from up to 6 processes
- Batches recorded concurrently
- Independent control of actions
  - Start / Stop / Pause / Resume / Abort
- Pens grouped for easy Batch analysis
  - Pens are unique for each Group
- Indicators to show status of batch

Batch Identification for faster analysis
- Batch Start screen for quick starts
- Batch data identification - ID, Lot#, Description Comments
- Audit trail of Batch messages
Access and Visualization of Process Data - Summary

1. Flexibility of acquired data displayed on multiple screen views on recorder
2. Data scaling views for enhanced resolution
3. Remote recorder view and control on PC
4. Report generation at recorder
5. Custom display screen development
6. Data transfer via network or storage media
7. PC data review, analysis, export