



Setting the Standard for Automation™

EDDL Enables Wireless Device Diagnostics

ISA EXPO 2008 Bus Station Theater

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

Topics Covered

- Wireless technology (transmitting data)
- Device integration technology (displaying data)
- EDDL wireless device integration
- EDDL wireless device commissioning
- EDDL unleashing wireless device diagnostics
- Others (time permitting)



Setting the Standard for Automation™

Wireless Technology

WirelessHART: IEC/PAS 62591

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

Wireless Field Device

Integral and adjustable
Omni-directional antenna

Built-in ultra-low
power radio



Internal power module



- No wires at all
 - No auxiliary DC power supply
 - No external radio
 - No power cable
 - No signal wires
- Pure digital communication
 - No 4-20 mA, no range to set
- Self-contained
 - Sensor
 - Transmitter
 - Radio
 - Antenna
 - Power module
 - Rugged long-life battery: 5-7 years

Wired HART
devices can
use a wireless
adapter

Wireless Field Network Applications

Is not a replacement for:

- 4-20 mA/HART
- Fieldbus

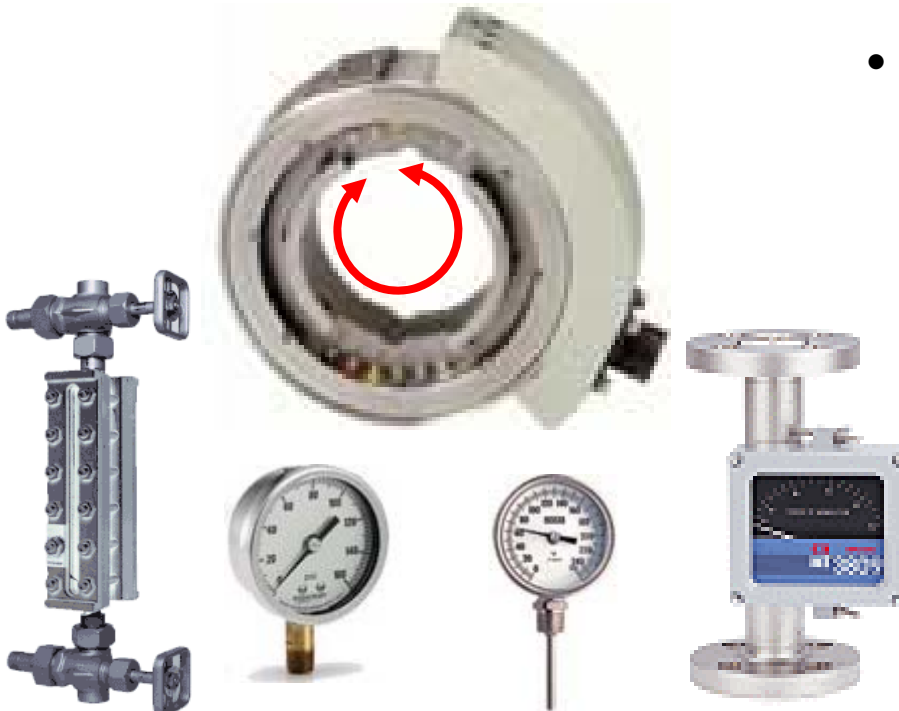
Is a solution for:

- Take the place of mechanical gauges
- Eliminating slip-rings
 - Rotating kilns
- Monitoring where no spare wires exist:
 - Relief valves status
 - Control valve position
 - On/off valve position
 - Safety shower status

Temporary trials

Integrating stranded diagnostics

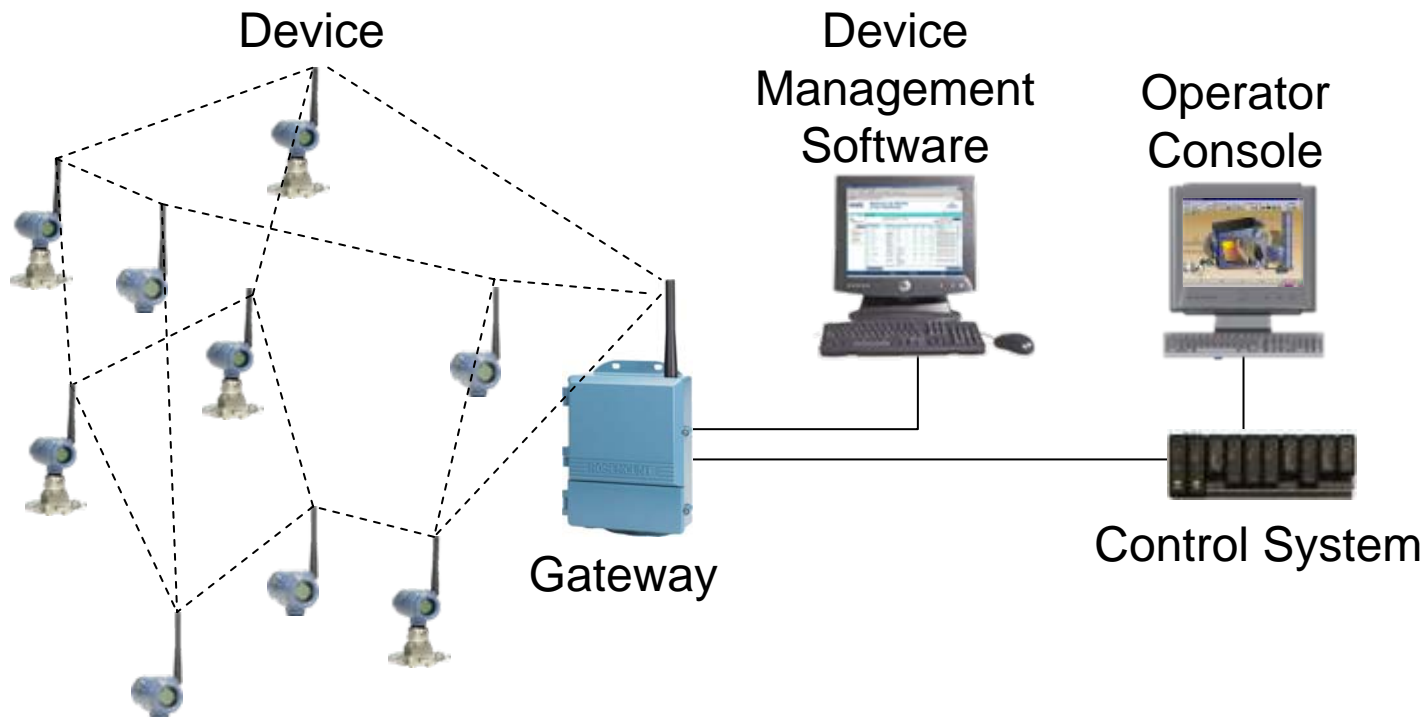
Inaccessible points



Level Pressure Temperature Flow

Full-Mesh Topology

- All devices capable of routing messages
 - Redundant communication paths down to field level
- 200 m between any two devices
- Many hops means longer distance
- Interoperable
 - WirelessHART IEC/PAS 62591





Setting the Standard for Automation™

Device Integration Technology

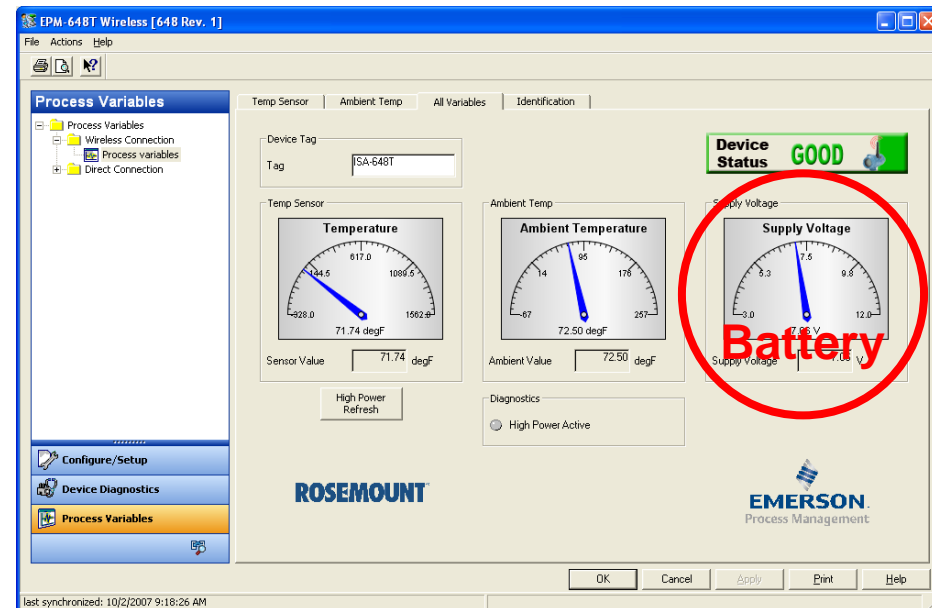
EDDL: IEC 61804-3

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

Device Management Software

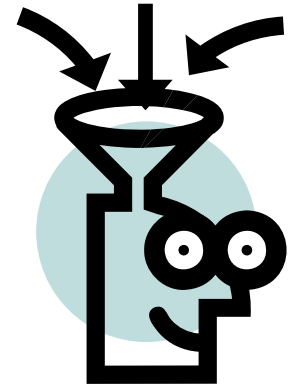
EDDL™

- Monitoring
 - Process variables
- Configuration/Setup
 - Basic setup
 - Device configuration
 - Identification
 - Materials of construction
 - Variable configuration
 - Calibration Trim
- Diagnostics
 - Status
 - Failed
 - Maintenance
 - Advisory
 - Battery



Device Integration & Plant Life Cycle

- Problem:
 - Software is used to decode and display device information
 - New versions and types of devices come to the plant every few months
 - Software must be kept up to date with new devices
- Solution:
 - Copy new device description (EDDL)
 - No change to the software



Device Integration Technologies

EDDL

- Similar to HTML web page concept
- EDDL text file is a description of the data in device in each device type, how to communicate it, and how to display it
- Interpreter is the "browser" such as handheld or device management software that displays the data to the user

The logo consists of the text "EDDL" in a white, sans-serif font, followed by a smaller "TM" trademark symbol, all contained within a dark gray rectangular box.

EDDL™

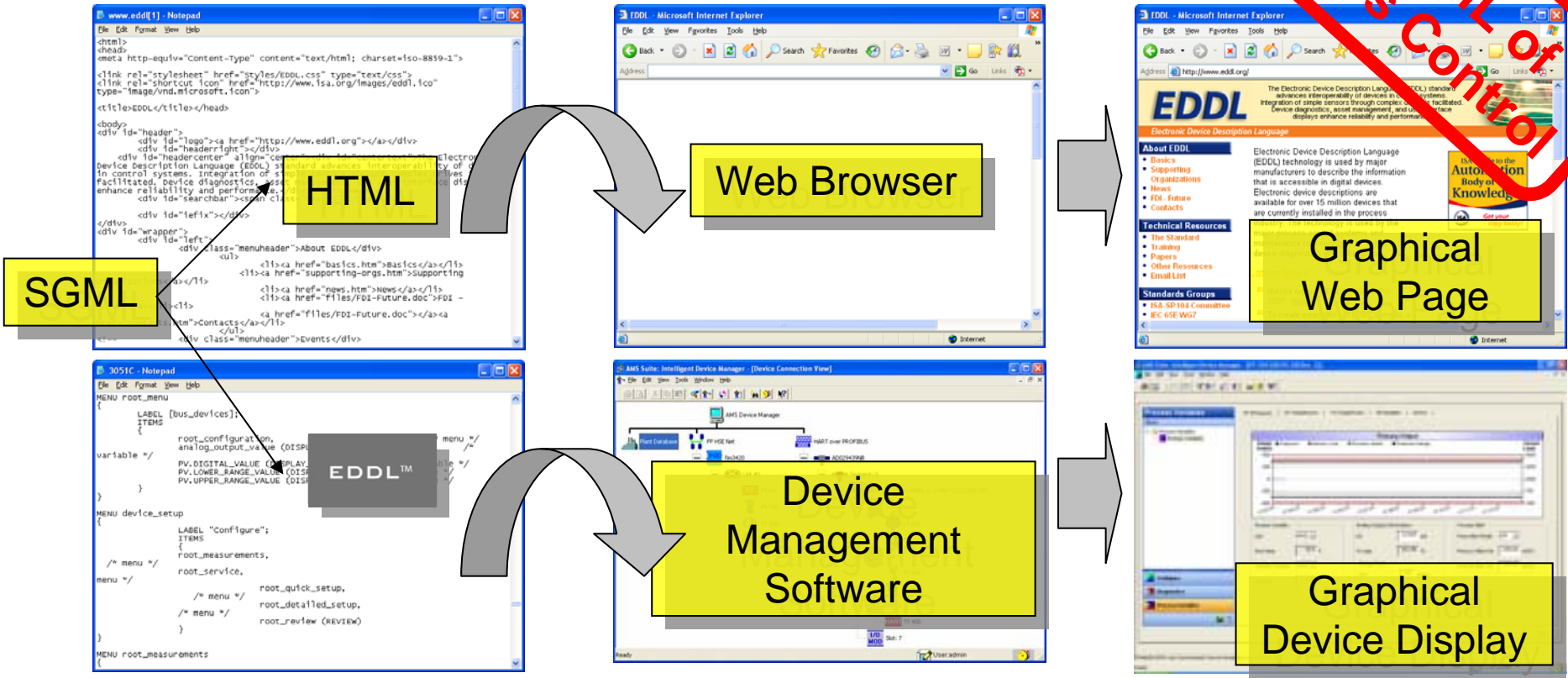
EDDL file is loaded on the computer, it is not in the device.

There is no such thing as an
“EDDL device”



The HTML of Process Control

EDDL Technology - Works Like The World Wide Web



- Just like HTML made the Internet easy to use, EDDL with enhancements makes wireless devices easy to use.

EDDL Decodes Communication

- Protocols transmit ones (1) and zeros (0)
- The EDDL files enable software to translate ones and zeros from the device into values, text, and graphics etc. to the user
- The EDDL files enable software to translate user input to ones and zeros sent to the device

WirelessHART
Expanding the Possibilities

0010 0110 1101 0000 1001 1101 0010

HART

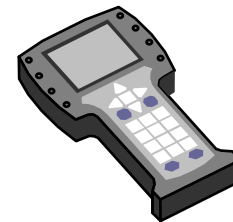
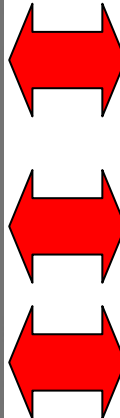
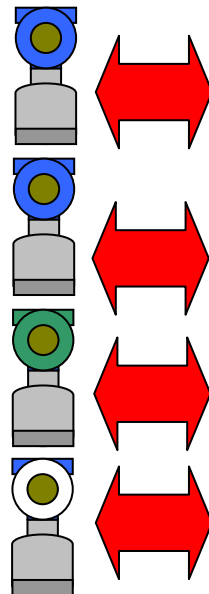
COMMUNICATION PROTOCOL
0010 0110 1101 0000 1001 1101 0010

Fieldbus
Foundation

0010 0110 1101 0000 1001

PROFIBUS
PROCESS FIELD BUS

0010 0110 1101 0000 1001 1101 0010



One software, many:

- Manufacturers
- Device types
- Protocols
- Versions
- Tasks



Setting the Standard for Automation™

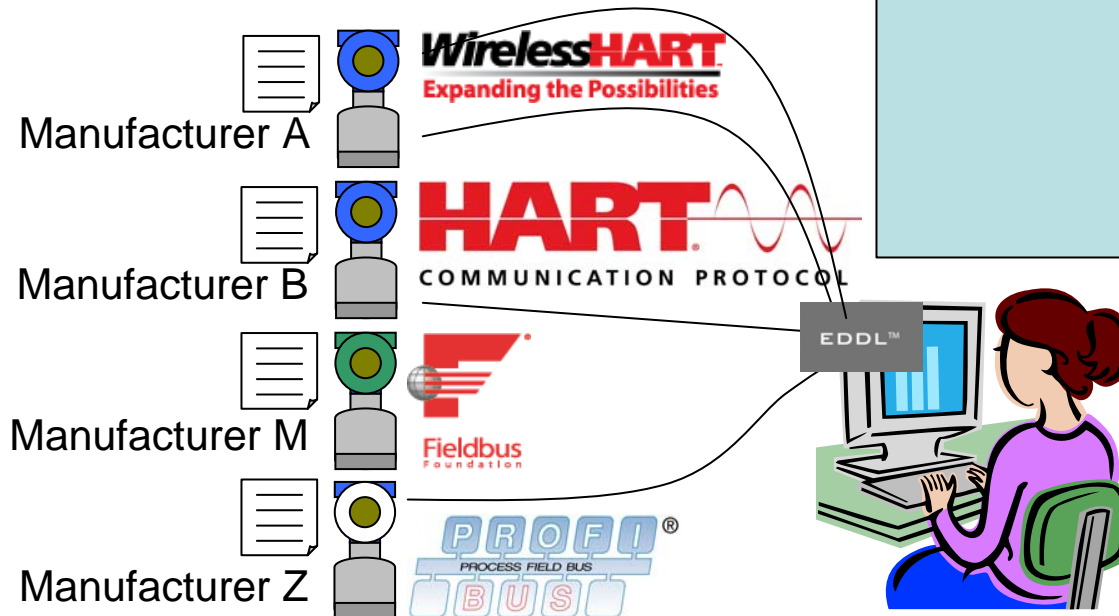
EDDL Device Integration

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

EDDL is Easy to Integrate and Update

- EDDL is easy
 - Files pre-loaded on new systems
 - Download files for new device from the Internet
 - Email (small file)
 - Copy and paste EDDL file
 - Device automatically bind to file

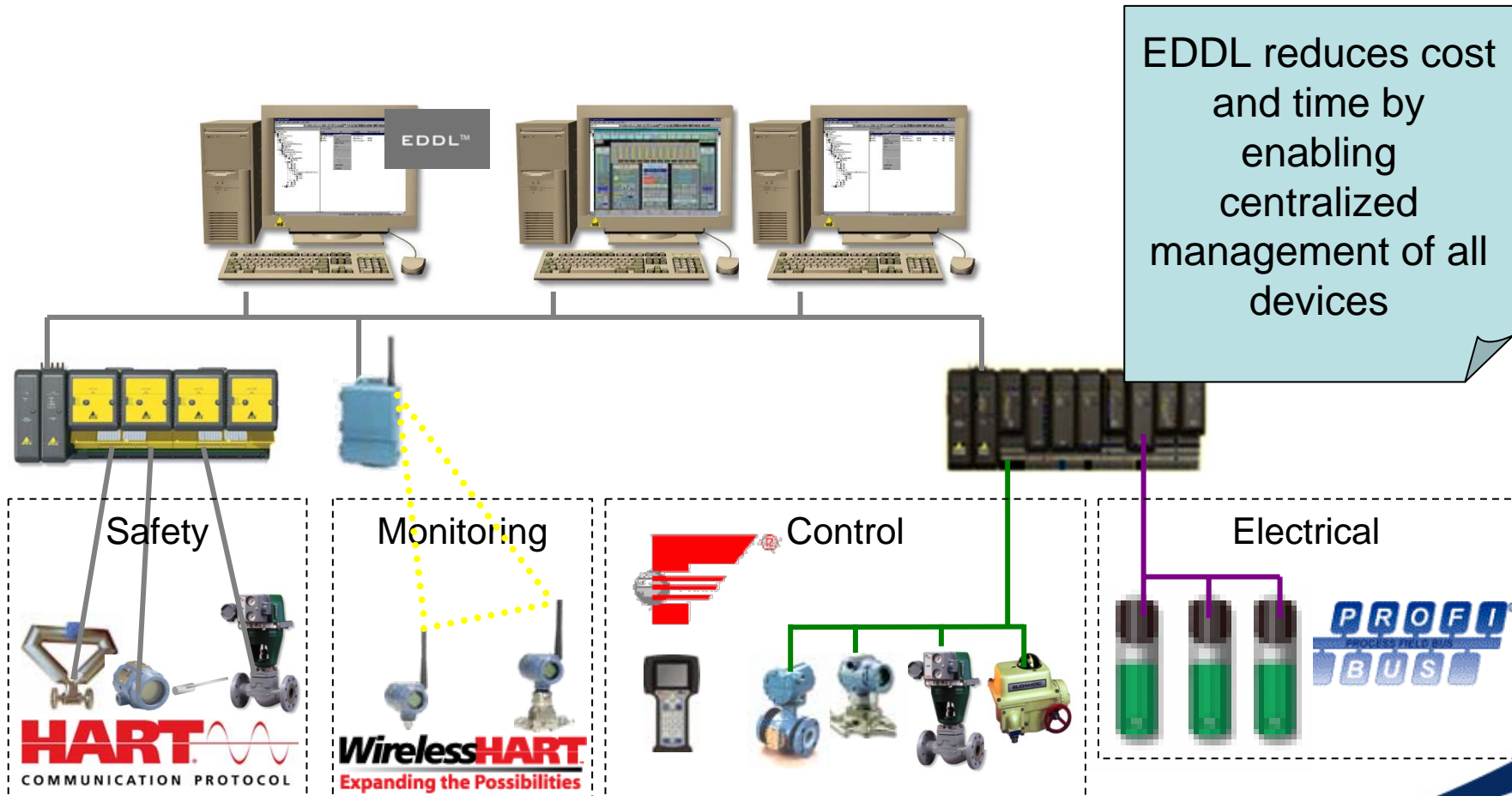
EDDL reduces cost and time by simplifying and speeding integration of device files



EDDL Ease of Use

- Single Software

- EDDL is an integral part of leading bus protocols
 - HART, FOUNDATION fieldbus, PROFIBUS, and WirelessHART
- A single software supports multiple protocols





Setting the Standard for Automation™

EDDL Device Commissioning

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

Deploying and Commissioning WirelessHART Devices

- Wireless System
 - Set network ID
 - Set network password
 - Set security level
- Wireless Device
 - Enter Network ID
 - Enter Join key (password)
 - Update rate
 - Configure as needed

Device
Management
Software



Control
System



Gateway



Wired HART
used for
commissioning



Wireless Gateway Setup

Wireless Gateway [1420 Rev. 1]

File Actions Help

Configure/Setup

- Configure/Setup
 - Basic Setup
 - Device

Identification | Master Configuration | **Wireless Interface Configuration**

Wireless Network Setup

| | |
|--------------------|----------|
| Network Tag | network |
| Network ID | 1234 |
| Network Join Ke... | 19578210 |
| Network Join Ke... | 00000000 |
| Network Join Ke... | 00000000 |
| Network Join Ke... | 00000000 |
| Network Key Ch... | 604800 |

Network ID

Join Key

Engineering unit next to values

Content defined by device manufacturer. All information appears in all EDDL systems.

Time: Current

OK Cancel Apply Print Help

Last Synchronized: Device Parameters not Synchronized.

Functions neatly organized in menu

'Frames' group different configuration aspects

Wireless Device Setup Network ID and Join Key

The screenshot shows the configuration window for a device named PRESS11. The interface includes a menu bar (File, Actions, Help), a toolbar, and a main configuration area with several tabs: Identification, Network, Materials of Construction, and Smart Power (TM). The 'Identification' tab is active, showing fields for 'Device Tag' (set to PRESS11) and 'Self-Organizing Network Parameters' (Network ID set to 9211). A 'Set Join Key' button is located below the Network ID field. To the right, the 'Self-Organizing Network Identification' section shows 'Radio Model Number' as 300120 and a list of radio status indicators with their corresponding colors and descriptions. A 'Get Unique Identification' button is at the bottom of this section. A blue 'ADVISORY' banner is also present. The bottom of the window features a 'Time' dropdown set to 'Current', and buttons for 'OK', 'Cancel', 'Apply', 'Print', and 'Help'. The Rosemount and Emerson logos are visible at the bottom.

Network ID

Security is configured with a wired connection

Join Key Wizard

| Radio Model Number | Radio Type | Wireless Device Type | Radio Hardware Revision | Radio Software Revision | Radio Software Revision | Radio Software Revision |
|--------------------|------------|----------------------|-------------------------|------------------------------|-------------------------|-------------------------|
| 300120 | | | | | | |
| | Read-Write | Read-Only | Changed (must download) | Mis-compare (must reconcile) | No communication | Failure |

Wireless Device Setup Join Key EDDL Wizard

EDDL™



Set Join Key - PRESS11

Enter join key (part 1 of 4)

Set Join Key - PRESS11

Enter join key (part 2 of 4)

Set Join Key - PRESS11

Enter join key (part 3 of 4)

Set Join Key - PRESS11

Enter join key (part 4 of 4)

00000000

Content defined by device manufacturer.
All information appears in all EDDL systems.

EMERSON
Process Management

ADVISORY

Model 300120
2.4 Ghz
Unknown
3001
1
61
89

Next > Cancel

OK Cancel Apply Print Help

last synchronized: Device Parameters not Synchronized.

Wireless Device Setup

PRESS11 [3051S Rev. 1]

File Actions Help

Configure/Setup

- Configure/Setup
 - Wireless Connection
 - Basic Setup
 - Device
 - Variables
 - Calibration
 - Alerts
 - Direct Connection
 - Basic Setup
 - Device
 - Variables
 - Calibration
 - Alerts

Identification | Network | Materials of Construction | Smart Power (TM)

Device Tag

Tag:

LCD Mode:

Power Mode:

Transmit Rate:

Database Mode:

ADVISORY

Transmit Rate

ROSEMOUNT

EMERSON
Process Management

Time:

OK Cancel Apply Print Help



Setting the Standard for Automation™

EDDL Unleashing Diagnostics

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

Diagnostics

TT-123 [648 Rev. 1]

File Actions Help

Organized by tabs

Device Diagnostics

- Device Diagnostics
 - Wireless Connection
 - Status
 - Direct Connection

Failed Maintenance Advisory Logging

Device Failure

- Field device malfunction
- Configuration Error
- Ambient Beyond Failure Limit
- Temp Sensor Open/Short
- Terminal Temp Sensor Failed
- Supply Voltage Failure

Consistent problem indication (look & feel) for any device

Details

Consistent problem indication (look & feel) for any device

Details hidden to not clutter - Click to reveal...

ROSEMOUNT

EMERSON Process Management

OK Cancel Apply Print Help

last synchronized: 2008-06-30 13:31:54

Pop-Up Window Diagnostics Details

Details

Diagnostic Details

- Memory Failures**
 - NV Non-Corr Error
 - NV Corr Error
 - NV Write Error
 - RAM Error
 - RDM Error
- Feature Board Failures**
 - Radio Internal Comm Failure
 - Radio Malfunction
 - Ambient Beyond Failure Limit
 - Supply Voltage Failure
- Configuration Errors**
 - URV/LRV Beyond Sensor Limits
 - HI-HI Alert Configuration Error
 - HI Alert Configuration Error
 - LO Alert Configuration Error
 - LO-LO Alert Configuration Error
- Sensor Failures**
 - Temp Sensor Open/Short**
 - No Temp Sensor Updates
 - Temp Sensor Saturated
 - Terminal Temp Sensor Failed
 - No Terminal Temp Updates
 - Terminal Temp Saturated
 - Sensor Mismatch

ROSEMOUNT™

EMERSON
Process Management

Print Close

'Frames' group
different
diagnostics
aspects

Device Manufacturer Know-How - EDDL Help

TT-123 [648 Rev. 1]

File Actions Help

Device Diagnostics

- Device Diagnostics
 - Wireless Connection
 - Status
 - Direct Connection

Failed Maintenance Advisory Logging

Device Failure

- Field device malfunction**
- Configuration Error
- Ambient Beyond Failure Limit
- Temp Sensor Open/Short**

Temp Sensor Open/Short - The process temperature sensor can not be measured.
 1.) Check the sensor wiring and connections.
 2.) Replace the temperature sensor.
 3.) If the condition persists, please contact a service center.

Details

Configure/Setup

Device Diagnostics

Process Variables

Device Manual

Content defined by device manufacturer. All information appears in all EDDL systems.

EMERSON Process Management

OK Cancel Apply Print Help

last synchronized: 2008-06-30 13:31:54

Context sensitive help from factory expert at the click of a button

Temp Sensor Open/Short - The process temperature sensor can not be measured.
 1.) Check the sensor wiring and connections.
 2.) Replace the temperature sensor.
 3.) If the condition persists, please contact a service center.

Device Manual

Content defined by device manufacturer. All information appears in all EDDL systems.

Device Manufacturer Know-How - EDDL Illustrations

TT-123 [648 Rev. 1]

File Actions Help

Configure/Setup

- Configure/Setup
 - Wireless Connection
 - Basic Setup
 - Device
 - Variables
 - Calibration
 - Alerts
 - Direct Connection

HI-HI Alert | HI Alert | LO Alert | LO-LO Alert

Configuration for HI-HI Alert

Mode: Off Units: degC

Set Point: 100.000 degC

Assigned Variable: Temperature Dead Band: 10.000 degC

Device Status GOOD

Alert Variable - Choose which device variable for the alert to track.

Image illustrating concepts

Rising Alert Example

Units of measurement

Time

Alert "OFF" Alert "ON" Alert "OFF"

Dead band

Assigned Variable

Alert Set Point

ROSEMOUNT

EMERSON Process Management

Time: Current

OK Cancel Apply Print Help

last synchronized: 2008-06-30 13:31:54

Easy Monitoring with EDDL

EPM-648T Wireless [648 Rev. 1]

File Actions Help

Process Variables

- Process Variables
 - Wireless Connection
 - Process variables
 - Direct Connection
 - Process variables

Temp Sensor | Ambient Temp | All Variables | Identification

Device Tag: ISA-648T

Tag: ISA-648T

Temperature Value | Sensor

Sensor Limit: 1562.0, 1089.5, 617.0, 144.5, -328.0

18:24:04 18:25:04 18:26:04 18:27:04 18:28:04 18:29:04 18:30:04 18:31:04 18:32:04 18:33:04 18:34:04

Process Variable Information

Sensor Value: 72.04 degF

High Power Refresh

ROSEMOUNT

EMERSON Process Management

Sensor Diagnostics

- Temp Sensor Open/Short
- Temp Sensor Saturated
- Temp Sensor Out of Limits
- No Temp Sensor Updates
- High Power Active

GOOD

OK Cancel Apply Print Help

last synchronized: 10/2/2007 9:18:26 AM

Not only do you see what the value is now, but also what it was a few minutes ago

Charts and Graphs for all device types from all manufacturers using all protocols work the same way