Frontline Software Features

- Common core software for all Frontline products
- Same user interface for all products, allowing users to easily move between analyzer products
- Dashboard and/or Network View for Ethernet protocol decoders
- Real-time capture and communications analysis
- Bit-level decoding along with control signal capture
- Rapid development of decoders for proprietary protocols
NetDecoder

NetDecoder is a protocol analyzer and network monitoring tool for industrial control and SCADA networks.

Uses
- Find network problems before they cause losses
- Fix network problems quickly
- Optimize bandwidth utilization & reduce latencies
- Monitor your network for alarms and intruders
- Debugging tool for network product developers

Benefits
- Reduce downtime and increase uptime
- Improve network performance
- Improve network security
- Perform faster and more efficient network installations
- Rapidly develop industrial control and SCADA network products
- Perform better in Conformance testing of network products
# Supported Industrial Network Technologies

## Serial Networks
- Modbus RTU
- Modbus ASCII
- DNP3 over Serial
- DF1/PCCC
- IEC 60870-5-101
- IEC 60870-5-103
- BSAP Bristol Babcock
- ABB COMLI
- Emerson ROC
- BACNet

## Ethernet Networks
- Modbus/TCP
- EtherNet/IP (CIP and PCCC)
- Allen-Bradley’s CSP/PCCC
- DNP3 over Ethernet
- IEC 60870-5-104
- PROFINET
- CC-Link over Ethernet
- BACNet over Ethernet

## Industrial Bus Networks
- Allen-Bradley’s Data Highway Plus (DH+)
- DeviceNet
- ControlNet
- Allen-Bradley DH-485
- CAN 2.0 A
NetDecoder software works with USB-based Interface devices

- RS-232 ComProbe II
- RS-422/485 ComProbe
- Ethernet ComProbe
- Rockwell’s USB interface devices
  - ControlNet-to-USB Interface (1784-U2CN)
  - Data Highway Plus-to-USB Interface (1784-U2DHP)
  - DeviceNet-to-USB Interface (1784-U2DN)
- “CC-Link Interface Device” – Planned release in Q4 2010
  - USB interface to analysis PC
  - Form factor will be similar to our RS-422/485 ComProbe
RS-232 ComProbe II with USB Interface

- Optional interface for NetDecoder Analyzer
- Async speeds to 921.6K and supports 0.1 microsecond timing

Package Includes:
- 6-foot USB Cable; RS-232 Y-Cable; 6-foot RS-232 Extension Cable
- Two 25-Pin to 9-Pin Adapters
- Frontline Cable bag to keep everything in
RS-422/485 ComProbe
Key Ethernet ComProbe Features:

- Enables you to tap into Ethernet traffic downstream of an Unmanaged Switch
- Enables you to invisibly tap into the Ethernet network –
  - No new IP address put on the Network
- Capturing through the USB connection enables you to capture more Ethernet communications issues than what is allowed to come through the NIC card in the PC
- Powered via the USB connection to your PC

Rockwell Automation’s USB Interfaces

- ControlNet-to-USB Interface (1784-U2CN)
- DeviceNet-to-USB Interface (1784-U2DN)
- Data Highway Plus-to-USB Interface (1784-U2DHP)
NetDecoder Software

- SELECT the appropriate protocol decoder.
  - NetDecoder comes with a library of protocol decoders and monitoring tools.
- Run both a serial and Ethernet decoders at the same time.
  - Great for those times you need to monitor a serial to Ethernet protocol bridge.
- Create Shortcuts for frequently used protocols.
  - Time Saver
NetDecoder Software Security

- Activate over the Internet
- Activate by Email
- Activate by Phone
- Move License from one PC to another

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NetDecoder Control Window

Start Data Capture

Stop Data Capture

Erase Data Capture

Save As

Frame Display

Ethernet Dashboard

Statistics

Network View

Event Display
Capturing Data

- To start capturing data, select the red circle, it will automatically start capturing data to a file.
  - ‘Pause’ capture
  - ‘Save’ capture
  - ‘Erase’ capture

Graphical Network Analysis Features
- Ethernet Network View
- Ethernet Dashboard View

- Proposed CC-Link Dashboard View will have another icon here
Data Capture Options

- **Capture to a single file** and choose to wrap or close file when full.
- For 24/7 data capture, **capture to a series of files** and optionally wrap files.
- **Capture file size** is mostly dependent on PC’s hard drive size.
Ethernet Dashboard View

Dynamic Graphical overview of the Ethernet network with Alarms and Notifications

- 10 and 60 Minute **Histogram** of Network Utilization
- **Network Utilization Meter** with Color Background Alert
- **Bad Packets Meter** with Color Background Alert
- **Top Talker Meter** with Color Background Alert
- **Top 10 IP/MAC Address Contributing** to Network Traffic
- 10 and 60 Minute **Histogram of Top Six IP Addresses**
- **Distribution of TCP/or UDP Application Related Protocols**
- **Network Alarms** for Unauthorized IP Addresses and User Define Protocol Alarm Levels

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Ethernet Network View
Dynamic graphical view coupled with individual device statistics

- Packets Transmitted and Received
- Bytes Transmitted and Received
- DNS Names
- Nodes In and Out
- Utilization Information
- Broadcast Information
- IP Address and MAC Address
- Named MAC Address
- NetBios Name
- Assign User-Friendly Names for each Node
DH+ Network Statistics

Network Issues
- **Green**: Device present and OK
- **Yellow**: Device present with an Error
- **Red**: Device absent
- **Blue**: Device present, previously dropped off bus
- **Red Triangle**: Device is a non-responder

Network Statistics
- Token Rotation Timing
- Network Event Log
- Token Rotation Timing and History
- Network Throughput

Device Statistics
- Top Talkers
- Top Conversations
- Top Listeners
- Nodes Transaction Summary
ControlNet Network Statistics

- Network Update Time
- Scheduled and Unscheduled Maximum Node
- Slot Time
- Blanking Time
- Guard Band Information
- Interval Modulus
Network Statistics

- **Statistics Screen** useful for:
  - base lining,
  - troubleshooting and
  - to determine network health and status.

- Look for metrics or indicators that are **"out of range"**.
Protocol Analysis with Frame Display

Summary Pane

Binary Decode

Radix (Hex, Octal, Decimal) Decode

Decode to Text

ASCII Decode

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Example of NetDecoder DH+ Device Performance Analysis

Statistics on Device responsiveness

How responsive are the nodes on the bus to commands sent to them or do they sometimes not respond at all.

Statistics on Device Requests for Information

How responsive are other nodes on the bus to commands sent by these devices
Event Display Window - Detailed data display

Multiple events can be Highlighted in the Event Display Window

Display Includes:
- Event Number
- Frame
- Data Rate
- Delta Time
- CRC
- Errors
- Control Signal Status
- Hex, ASCII, Decimal, Octal, Binary
Protocol Analysis

The Event Display, Frame Display and Protocol Navigator are all synchronized, providing a powerful protocol analysis solution.

Highlight a Frame in any window and it will show in all three.
Data Analysis: Identify Events

- **Event Display** flags transitions and combined with the **Signals Display** you can identify timing problems.

- **Synchronized Displays**
  - Useful for fragmented messages
    - Ethernet
    - DeviceNet
    - Serial

- **Delta times between events**
Display Filters & Capture Filters

Filtering Enables You to View only the Relevant Information

- **Click on a Protocol Tab** to filter that particular protocol

- **Right Click Filter** on a value and select “Name = Value” from the list to filter on that Value.

- **Quick Filter** option to display only what you want to see. Includes preset filters and user defined filters.

- **Capture Filter** option to limit the amount of captured Ethernet data. Useful for long-term network monitoring or quick troubleshooting.
Frame Display Export Function

- Export part or all of a file for processing with third party software
- Export Summary Pane data to CSV file for further statistical analysis
- Select the frame in the Summary Pane, right click and choose "Export"
Frame Display Print Function

- Print all or selected frames in Summary Pane
- Print Summary Pane along with all or selected Decode Pane Levels
DecoderScript™

• Easy to use scripting language to write your own decoders

• Write decoders for proprietary protocols or add extensions to existing protocol decoders

• You don’t need to be a “C” programmer to write decoders!

• Write a decoder yourself or contract with Frontline’s engineering team to write the decoders for you.
NetDecoder PC Requirements

- Windows XP SP 2 or higher, Vista, 32-bit Win-7 (Win 7 64-bit with Frontline Devices that have USB interfaces.)
- Pentium 1GHz processor or higher; RAM: 1 GB (minimum), 2 GB recommended; 50 MB free Hard Disk space.
- One USB Port.
- Ethernet sniffers require standard Ethernet Network Interface Card (NIC) or the Frontline Ethernet ComProbe
- Data Highway Plus sniffer requires:
  - Rockwell Automation’s 1784-U2DHP
- DH-485 sniffer requires a 2 port RS-485 serial card.
- CAN2.0A sniffer requires SST's DeviceNet PCI or PCMCIA interfaces.
- DeviceNet sniffer requires one of the following
  - SST's DeviceNet PCI or PCMCIA interfaces
  - Rockwell Automation's 1784-U2DN.
- ControlNet sniffer requires Rockwell Automation's 1784-PCC card or 1784-U2CN device.
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