FieldServer – OEM ProtoNode
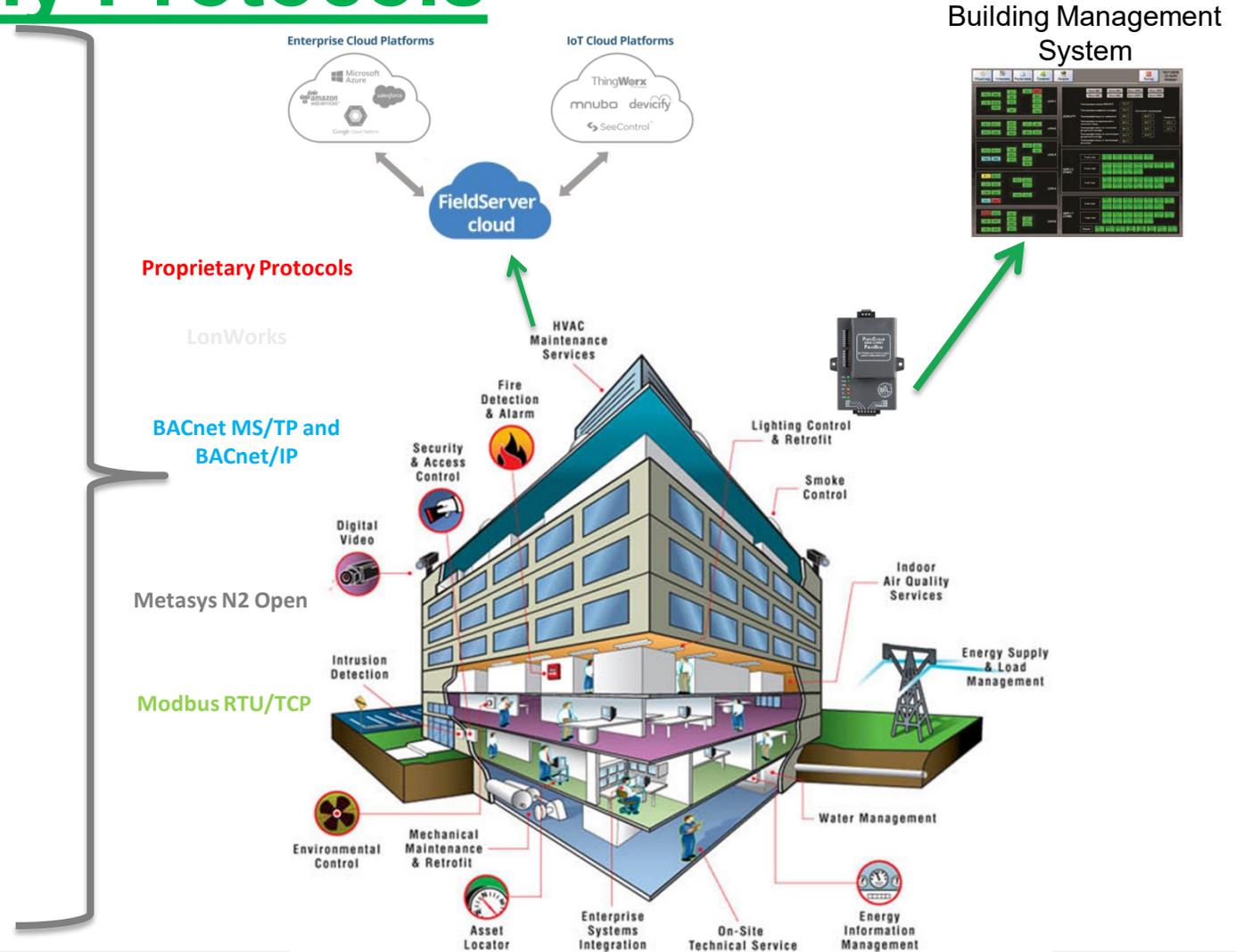
What MSA Can Do For the OEM

- ❏ **Help OEM Sell more products Commercial BMS Environments $$$$$$**
- ❏ 1 pre-programmed part numbers support OEM's to BMS.
  - ❏ 1st part number supports BACnet MSTP/IP, Modbus TCP, N2
  - ❏ Supports 2 RS-485, 1 Ethernet and 1 Wi-Fi
- ❏ Best of Breed:
  - ❏ BACnet BTL Rev 16
- ❏ Complete turnkey BMS/Cloud solutions
  - ❏ Easy to install and support
    - ❏ Locally or remotely (FieldPoP)
  - ❏ Dock to Stock to Field
  - ❏ No configuration files to manually build or load
  - ❏ We provide a customized installation manual, BMS and installation/diagnostic training
  - ❏ We are there when YOU need us.

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The World of Many Protocols

- Multiple Devices
- AC Controls – HVAC Roof Top units
- Boiler Controls – Steam – Hot Water
- Energy BTU Flow Meters
- Energy Electricity Demand Metering
- Energy Management Systems - Panels
- Commercial Dehumidifiers
- Chillers
- Lighting Control Systems
- Fire Alarm Panels
- Fume Hood Controllers
- Security Panels
- Air Handlers
- Motorize Window Shading
- Variable Frequency Drives
- Control Systems
- Distributed Control Systems
- Gas Panels
- Power Managers
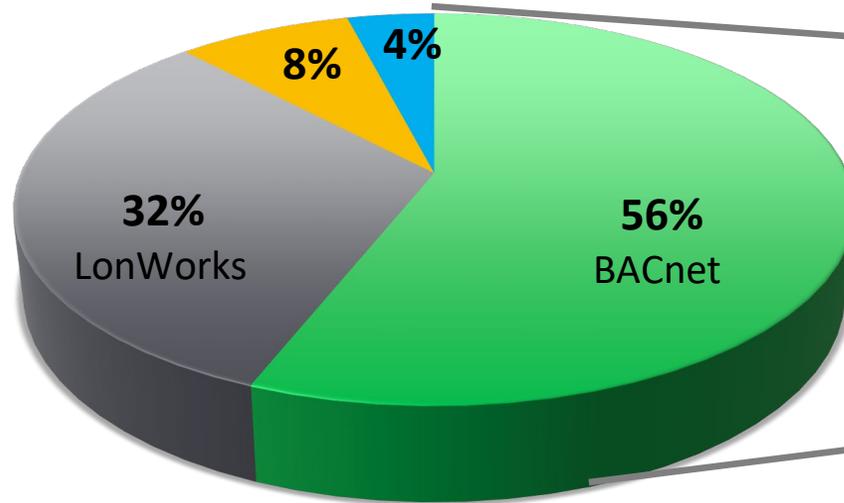- Programmable Logic Controllers
- Temperature Controllers

Building Management System

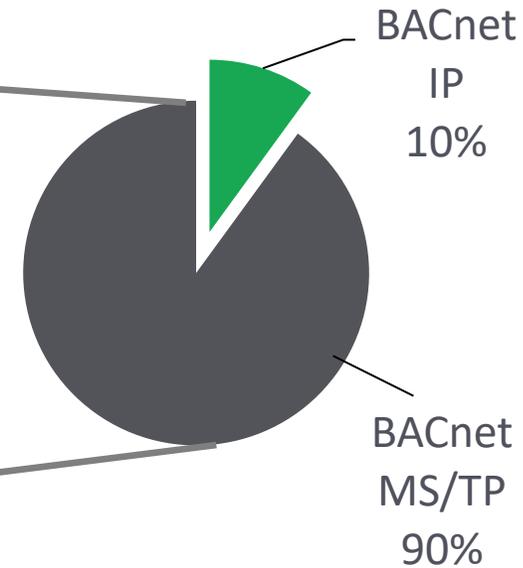Proprietary Protocols

LonWorks

BACnet MS/TP and BACnet/IP

Metasys N2 Open

Modbus RTU/TCP

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BMS: North American Market Share

North American Market Share

- BACnet
- LonWorks
- Metasys N2
- Modbus TCP/IP & Others

4%
8%
32% LonWorks
56% BACnet

BACnet MS/TP vs. BACnet/IP

BACnet IP 10%
BACnet MS/TP 90%

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Trusted Partner to 450 OEMs

Implications for OEMs

❑ LOST revenue opportunities

    ❑ Manufacturers that do not support automation protocols has a big competitive disadvantage

❑ Development COST of network protocols are high

    ❑ Often manufacturers core competence
        does not include networking

❑ Development TIME for each protocol is long

    ❑ 1-2 years from start to finish

❑ High RISK of initial failure

    ❑ Achieving product stability takes time

> FieldServer OEM approach provides rapid, cost-effective and reliable protocol implementation for new and legacy devices

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What MSA Provides

- ❑ MSA provides a **complete cost-effective turnkey solution**.
  - ❑ Pre-programmed
  - ❑ No configuration file build or download in the field
  - ❑ With only two-part numbers, we can support all of your BMS protocol needs
    - ❑ 1st part number supports BACnet MS/TP, BACnet/IP, Modbus RTU, Modbus TCP, and Metasys N2
    - ❑ 2nd part number supports 1 or multiple OEM's products to LonWorks
    - ❑ Our gateways carry the industry's highest certifications, BACnet BTL (Rev 12) and LonMark
  - ❑ We can co-brand the ProtoNode with the OEM's logo
- ❑ **Ease of installation**:
  - ❑ No proprietary or third-party software is required to install the gateway
  - ❑ Field installation of the ProtoNode takes under 20 minutes
  - ❑ BACnet ProtoNodes can ship with a complete BACnet Browser in box (webserver)
    - ❑ OEM's Reps/Installers have fast validation of the OEM's products on the BACnet network
    - ❑ No outside BMS integrator required to validate the installation
    - ❑ Your installers have control of test your products end to end

MSA Secure IIoT Gateways

← Wired		Wi-Fi	Wi-Fi/Cell Modem →
Embedded IIoT/BMS TTL to Ethernet Modules	IIoT/BMS Gateway 2 RS-485 and 1 Ethernet	IIoT/BMS Gateway 1 or 2 RS485/232, 1 Ethernet, 1 Wi-Fi	IIoT/BMS Gateway 1 RS485/232, 1 Ethernet, 1 GPRS Cell modem and 1 Wi-Fi

ProtoNode Gateways

- Preprogrammed OEM protocol gateways
- Cloud enabled
- Dynamically supports multiple RS-485 and Ethernet OEM Devices/Profiles
    - Auto-Discovery or Web Configurator
- Automatically builds configuration files for known Modbus RS-485 Devices/Profiles
- Product hardware options:
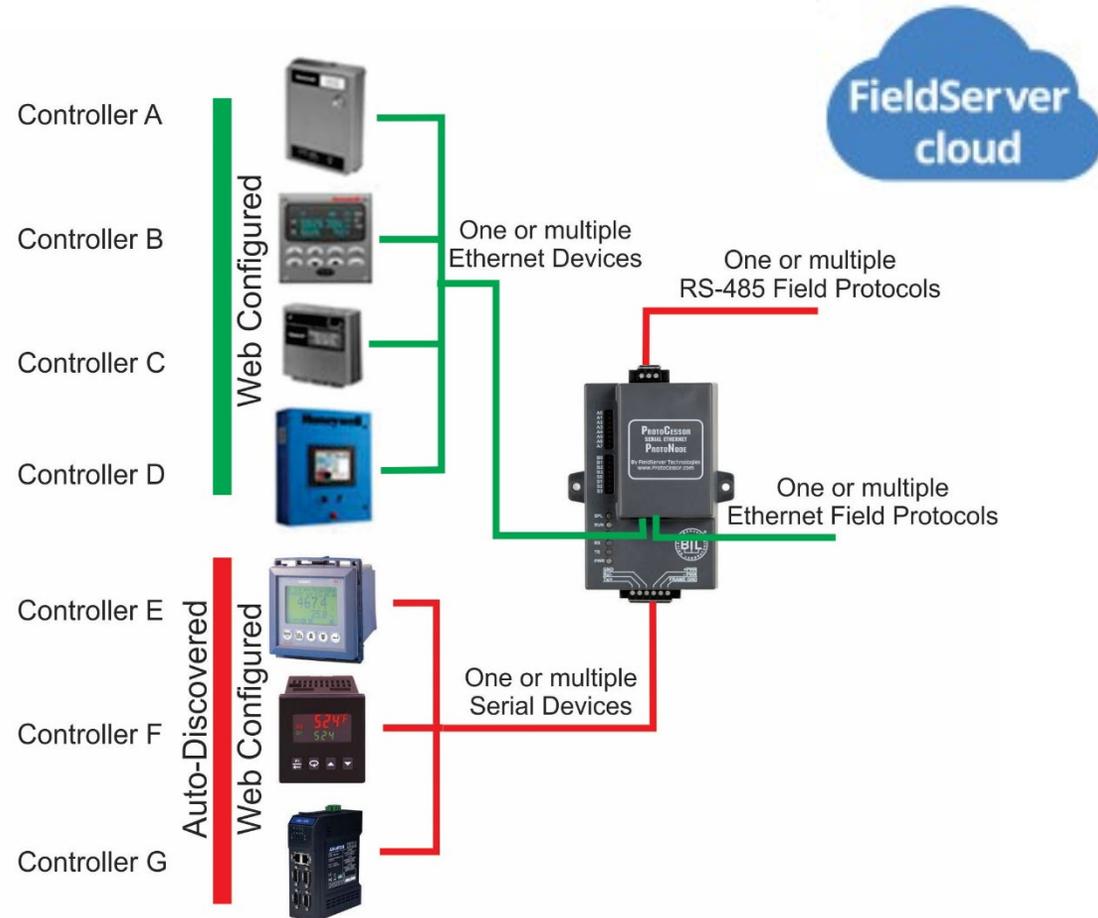- Power requirement: 9-30Vdc or 12- 24Vac
- Current draw @ 12V is 250 mA (max)

ProtoNode	Interface Connections							Point Count			Certifications	
	RS-232	RS-485	RS-422	Ethernet	LonWorks	KNX	M-Bus	Level I	Level II	Level III	BTL	LonMark
FPC-N34		2		1				1500	5000	10000	Yes	
FPC-N35		1		1	1			1500	4096	n/a	Yes	Yes
FPC-N36		1	1	1				1500	5000	10000	Yes	
FPC-N37			1	1	1			1500	4096	n/a	Yes	Yes
FPC-N38	1	1		1				1500	5000	10000	Yes	
FPC-N39	1			1	1			1500	4096	n/a	Yes	Yes
FPC-N40		1		1		1		1500	5000	10000	Yes	
FPC-N41				1	1	1		1500	4096	n/a	Yes	Yes
FPC-N42		1		1			1	1500	5000	10000	Yes	
FPC-N43				1	1		1	1500	4096	n/a	Yes	Yes
FPC-N54	1	2		1				1500	5000	10000	Yes	
FPC-N64	1	2		2				1500	5000	10000	Yes	

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Methods of Configuration

The Power of the ProtoNode

- **Cloud Enabled**
- Multi protocol support
- Multi device support
- Static and Dynamic configuration
- Fastest time to market
- Largest protocol library available
- Largest point count available 10,000+

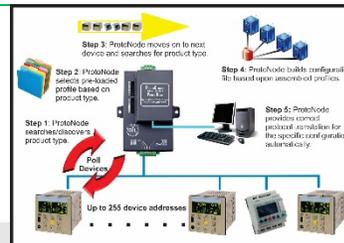# 3 Methods of On-Site Configuration Options

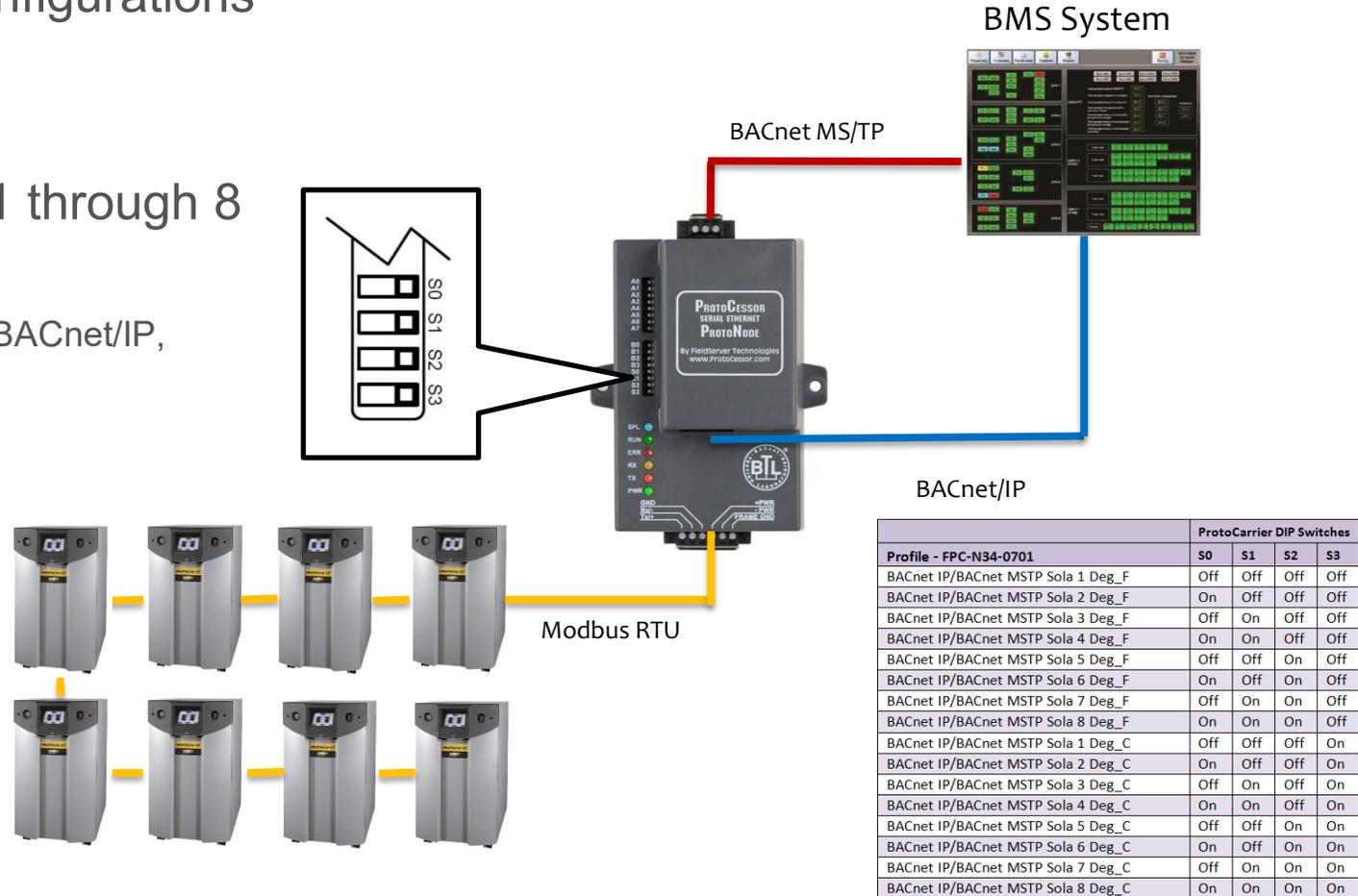| **Auto-Selector** STATIC	**Auto-Discovery** DYNAMIC	**Web-Configuration** DYNAMIC
• Pre-defined installations • Stored configuration Files • DIP switch selections • Multiple protocols • Multiple products • No mix of products	• Plug-n-Play installations • Automatically discovers devices and dynamically builds configuration • Multiple protocols • Multiple products • Mix of serial products	• Fully flexible installations • Selectable devices • Multiple protocols • Multiple products • Any mix of products

Auto-Selector Example: LAARS

- ❑ Supports many stored configurations
  - ❑ Mascot II Degrees C & F
  - ❑ NT 80 – 850
- ❑ DIP switch selectable for 1 through 8 boilers to:
  - ❑ 1 part number to BACnet MS/TP, BACnet/IP, Metasys N2 and Modbus TCP/IP
  - ❑ 2nd part number for LonWorks

BMS System

BACnet MS/TP

BACnet/IP

Modbus RTU

Profile - FPC-N34-0701	ProtoCarrier DIP Switches			
	S0	S1	S2	S3
BACnet IP/BACnet MSTP Sola 1 Deg_F	Off	Off	Off	Off
BACnet IP/BACnet MSTP Sola 2 Deg_F	On	Off	Off	Off
BACnet IP/BACnet MSTP Sola 3 Deg_F	Off	On	Off	Off
BACnet IP/BACnet MSTP Sola 4 Deg_F	On	On	Off	Off
BACnet IP/BACnet MSTP Sola 5 Deg_F	Off	Off	On	Off
BACnet IP/BACnet MSTP Sola 6 Deg_F	On	Off	On	Off
BACnet IP/BACnet MSTP Sola 7 Deg_F	Off	On	On	Off
BACnet IP/BACnet MSTP Sola 8 Deg_F	On	On	On	Off
BACnet IP/BACnet MSTP Sola 1 Deg_C	Off	Off	Off	On
BACnet IP/BACnet MSTP Sola 2 Deg_C	On	Off	Off	On
BACnet IP/BACnet MSTP Sola 3 Deg_C	Off	On	Off	On
BACnet IP/BACnet MSTP Sola 4 Deg_C	On	On	Off	On
BACnet IP/BACnet MSTP Sola 5 Deg_C	Off	Off	On	On
BACnet IP/BACnet MSTP Sola 6 Deg_C	On	Off	On	On
BACnet IP/BACnet MSTP Sola 7 Deg_C	Off	On	On	On
BACnet IP/BACnet MSTP Sola 8 Deg_C	On	On	On	On

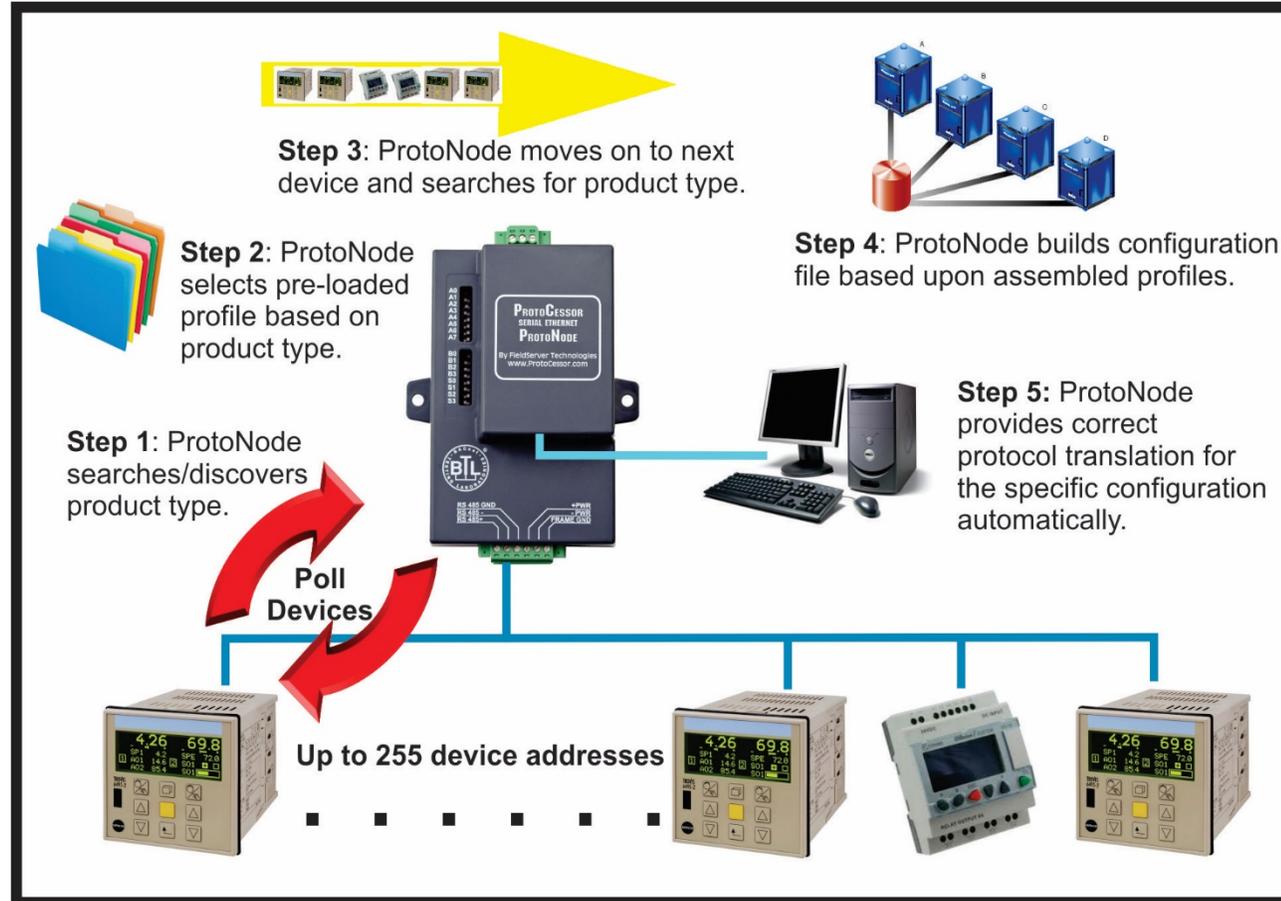MSA The Safety Company | fieldserver

Auto-Selector: Summary

- ❑ Auto-Sector = Pre-Defined Static Configurations
  - ❑ One part number supports:
    - ❑ Multiple FIELD protocol options
    - ❑ Multiple product lines
    - ❑ Multiples of the same types of products (LAARS Ex: 1 through 8)
    - ❑ Configurations are DIP switch selectable
  - ❑ Store up to 1000 pretested configurations
    - ❑ 1 or 8 devices to 1 protocol = 1 configuration
    - ❑ Only 1 configuration can run at a time
    - ❑ **1 product line (1 to 8 devices) to BACnet/IP, MS/TP, Metasys N2 Modbus TCP = 32 stored configs**
    - ❑ **2nd product line (1 to 8 devices) to BACnet/IP, MS/TP, Metasys N2 Modbus TCP = 64 stored configs**
- ❑ Auto Selector configurations are NOT dynamic.
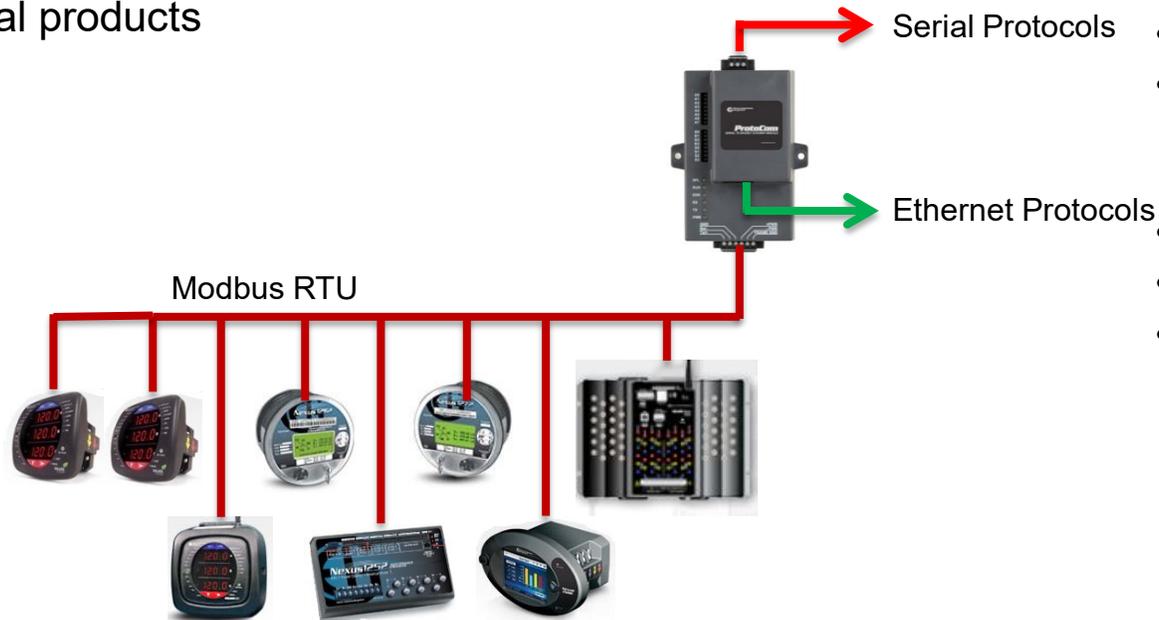 - ❑ Does NOT support mix of different products

Auto-Discovery Process

Auto-Discovery Example: Electro Industries

Auto-Discovery Configuration:

- On Power up Auto-Discover serial products

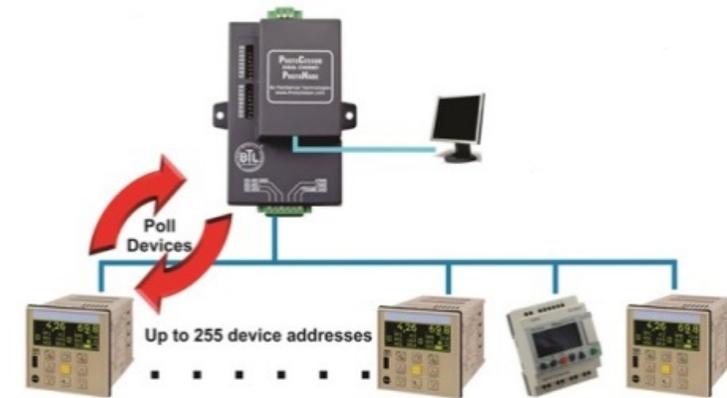Serial Protocols

- BACnet MS/TP
- Metasys N2
- AB DF1

Ethernet Protocols

- BACnet/IP
- EtherNet/IP
- Modbus TCP/IP

Modbus RTU

Supports any mix of RS-485 meters:

- Including multiples of any meters

Auto-Discovery: Summary
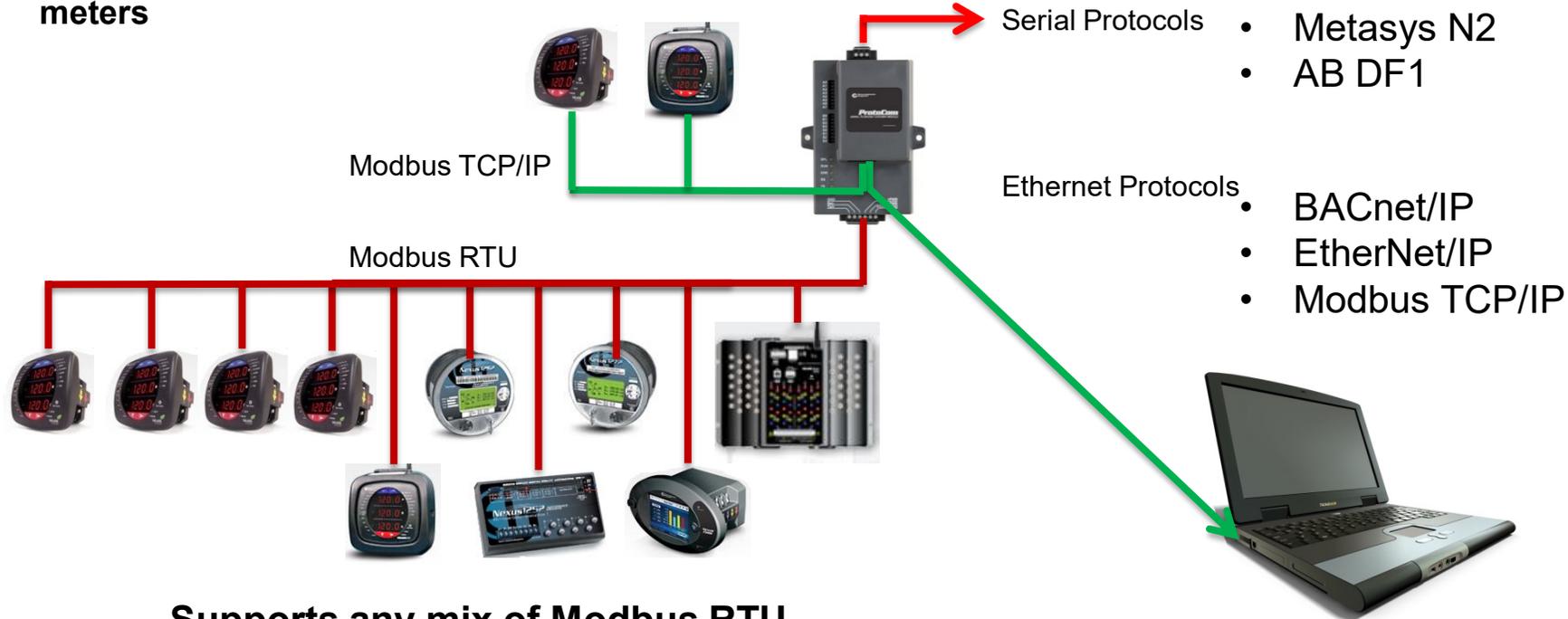
❑ Auto-Discovery = Multiples of Mixed Serial Products

  ❑ One part number supports:

    ❑ Multiple FIELD protocol options

    ❑ Multiple product lines

    ❑ Any mix of multiple serial products

  ❑ Dynamically builds configuration from Device Profiles

    ❑ 1 product = 1 Device Profile

    ❑ Store 1000 different profiles

❑ Auto-Discovery configurations are dynamic

  ❑ Provides support for ANY mix of different products

  ❑ Limitation: only supports serial products

Poll Devices

Up to 255 device addresses

Web-Configuration Example: Electro Industries

Two methods of configuration:
- Auto-Discover supported RS-485 meters
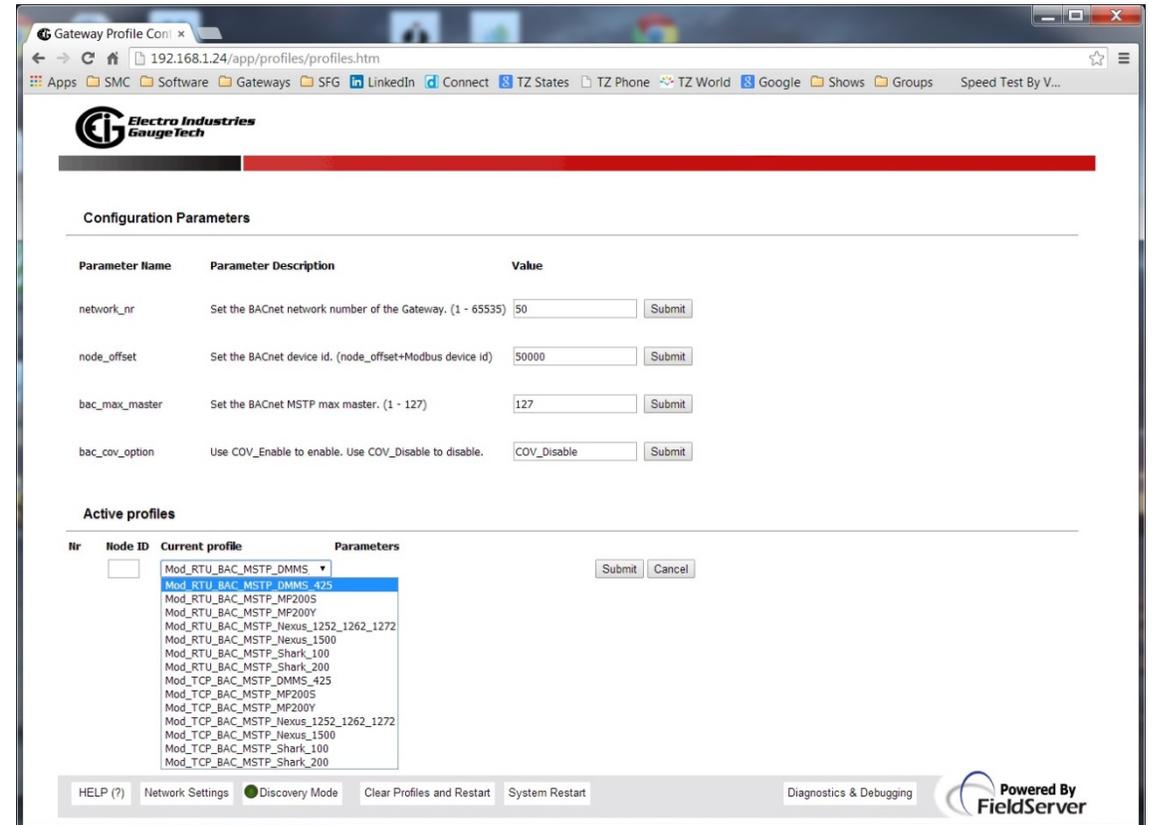- **Web-Configurator for adding Modbus TCP/IP and RS-485 meters**

Serial Protocols

- BACnet MS/TP
- Metasys N2
- AB DF1

Modbus TCP/IP

Ethernet Protocols

- BACnet/IP
- EtherNet/IP
- Modbus TCP/IP

Modbus RTU

Supports any mix of Modbus RTU and Modbus TCP/IP meters:
- Including multiples of any meters
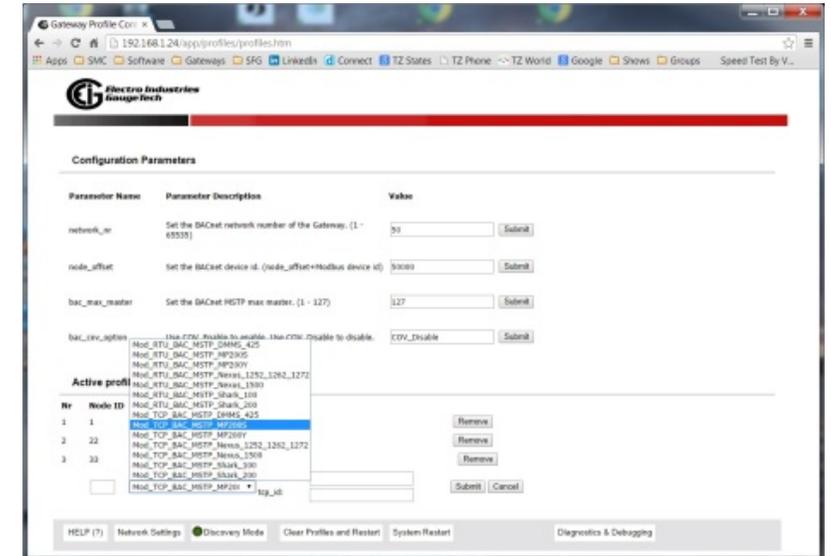
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Web-Configuration Example: Electro Industries

❑ Web-Configurator:

❑ Offers Modbus RTU / Modbus TCP/IP Profiles for all 9 EIG meters

❑ Used for Ethernet meters (Modbus TCP/IP meters cannot be Auto-Discovered)

❑ Can also be used for any RS-485 meters (with or without Modbus RTU Auto-Discovery)

❑ Dynamically builds the required Configuration file

Web-Configuration: Summary

- ❑ Web-Configuration = ANY mix of products
  - ❑ One part number supports:
    - ❑ Multiple FIELD protocol options
    - ❑ Multiple HOST protocol options, Serial + Ethernet
    - ❑ Multiple product lines
    - ❑ Any mix of multiple products
  - ❑ Dynamically builds configuration from Device Profiles
    - ❑ 1 product = 1 Device Profile
    - ❑ Store 1000 different profiles
    - ❑ Used when OEM products do not have unique identifiers
    - ❑ Supports a mix of different products profiles in 1 configuration
- ❑ Auto-Configuration configurations are dynamic
  - ❑ Provides support for ANY mix of different products
  - ❑ Easy additions to existing installations

FieldServer Gateway Summary

❑ Accelerated Time-to-market
  - ❑ Cut time-to-market by more than 50-90%
  - ❑ Very little protocol knowledge is required

❑ Reduced Cost
  - ❑ Development cost reduced by more than 70%
  - ❑ Little or no engineering is required – no new headcount
  - ❑ One SKU supports multiple controllers and multiple protocols

❑ Risk Reduction
  - ❑ Turn-key and pre-tested implementation minimize errors
  - ❑ Customized documentation reduces start-up problems – no trial and error
  - ❑ On-going support ensures products are up-to-date with latest standards
  - ❑ Strong driver library with over 140 different protocols implemented

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Thank You

At MSA, we know what's at stake.