FOUNDATION™ Fieldbus H1 Master for EtherNet/IP™ and Modbus® TCP
A-FFL/B

The FF Link module simplifies the implementation of FOUNDATION™ Fieldbus H1 by combining an EtherNet/IP™ and Modbus® TCP Linking device with an internal isolated power conditioner and bus terminator.

The FF Link supports module redundancy when in EtherNet/IP target mode, allowing two FF Link masters to be connected to the same H1 segment in a one-active-one-standby strategy.

Configuration is achieved using Aparian's free-downloadable Slate configuration environment. Slate generates H1 device specific UDTs and mapping code which can be imported into Studio 5000, allowing even complex systems to be configured in minutes.

Features

- ♦ Operates as a FOUNDATION™ Fieldbus H1 Master.
- ♦ Supports up to 32 FOUNDATION™ Fieldbus H1 field devices.
- ♦ Module has various configurable primary interfaces:
  - o EtherNet/IP Target
  - o Modbus TCP Server
  - o Modbus TCP Client
  - o EtherNet/IP Originator (Class 1- connections 10 and Explicit Messaging with up to 10 EtherNet/IP devices).
- ♦ Provides a built-in Isolated Power Conditioner that can supply up to 420mA.
- ♦ Allows the use of external Power Conditioners for Intrinsically Safe (IS) applications.
- ♦ Provides a built-in software enabled Fieldbus terminator.
- ♦ Dual Ethernet ports which support Device-Level-Ring (DLR).
- ♦ Built-in H1 and Modbus packet capture.
- ♦ Supports detailed H1 live list, H1 Alert (Alarm) extraction, and H1 Master Redundancy
- ♦ Device Specific UDT, tag and logic generation for import into a Studio5000 project.
- ♦ Network Time Protocol (NTP) supported for external time synchronization.
- ♦ Device Type Manager (DTM) supported.
- ♦ Online change configuration supported.
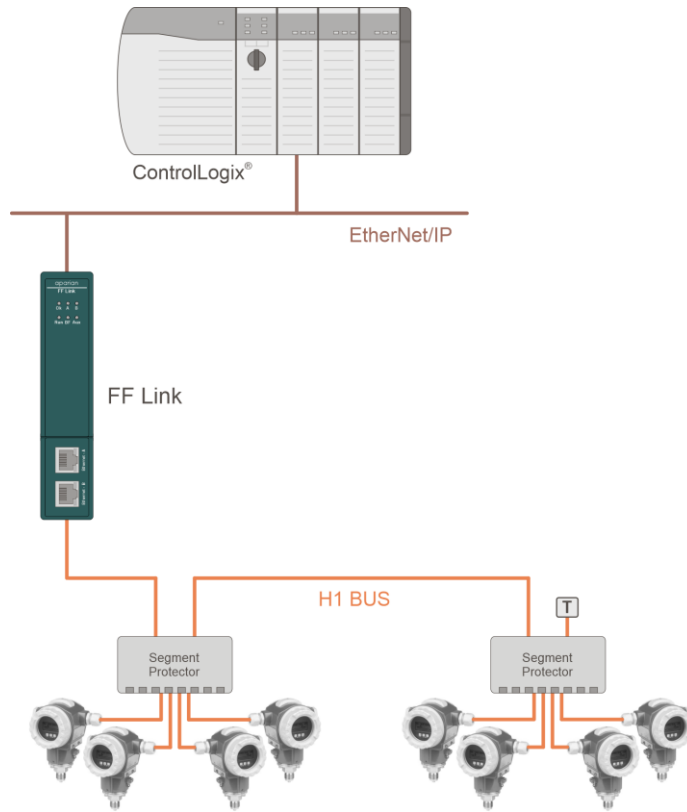- ♦ Optional Advanced H1 scheduling.

Figure 1 – FF Link H1 Master to Logix (EtherNet/IP target) architecture
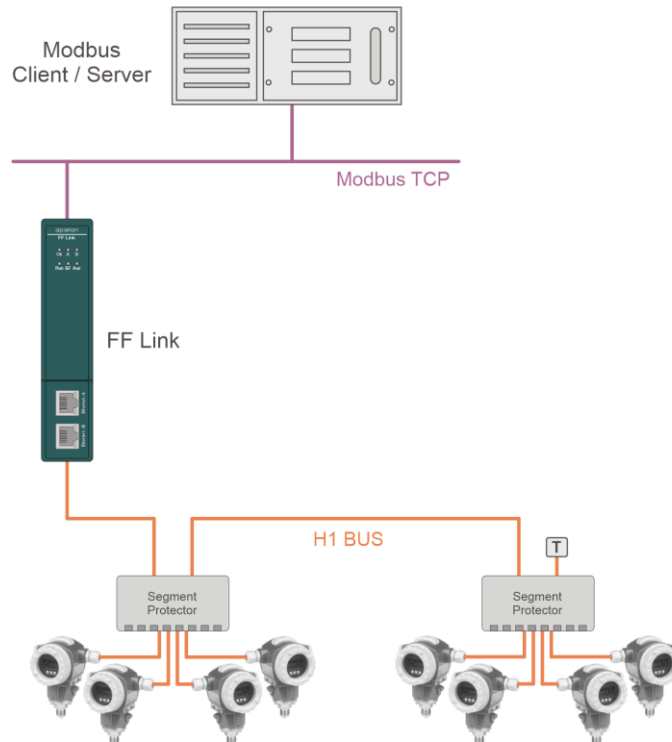

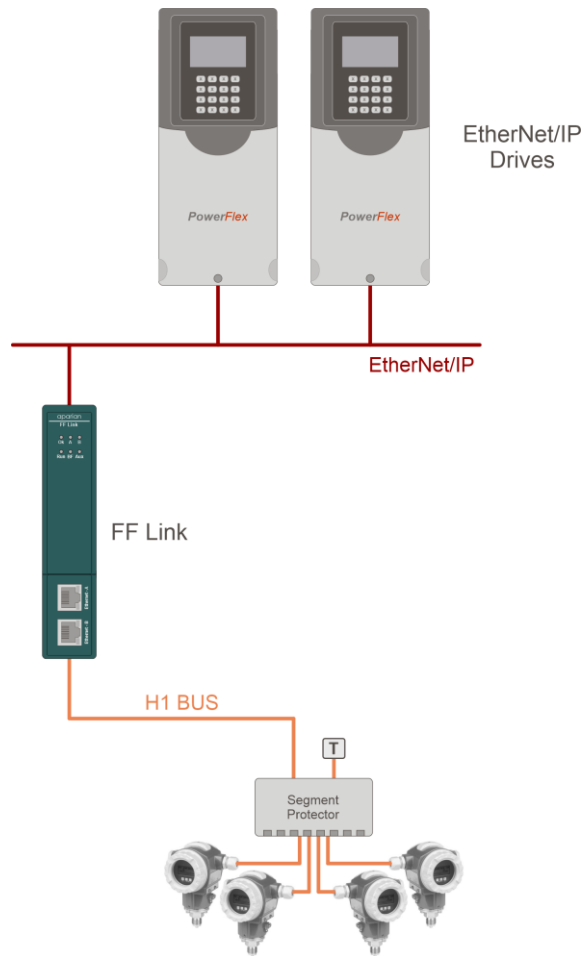**Figure 2 - FF Link H1 Master to Modbus TCP architecture**

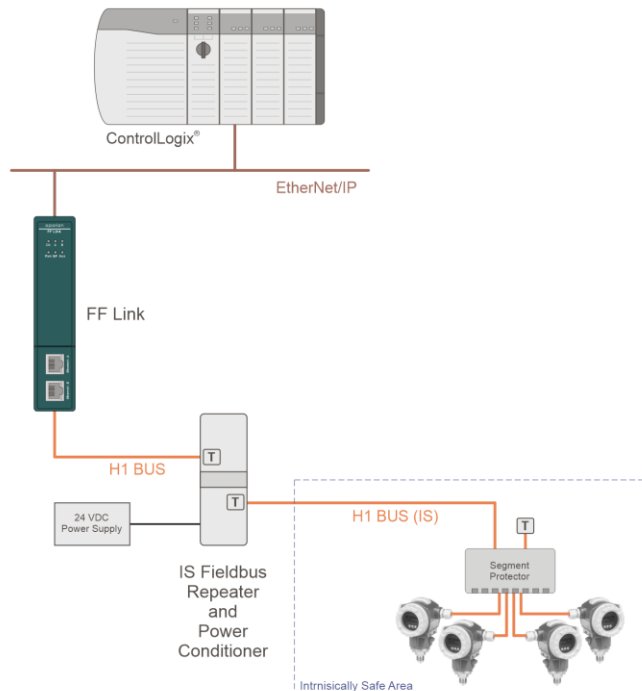**Figure 3 – FF Link H1 Master to EtherNet/IP Originator architecture**

Figure 4 – FF Link H1 Master with External Intrinsically Safe Repeater

Specifications

Ethernet

Specification	Description
Connector	RJ45
Conductors	CAT5 STP/UTP
ARP Connections	100 max.
TCP Connections	100 max.
CIP Connections	20 max.
Communication Rate	10/100 Mbps
Duplex Mode	Full / Half
Auto-MDIX	Supported
Embedded Switch	Yes, 2 x Ethernet ports
Device Level Ring (DLR)	Supported
Network Time Protocol (NTP)	Supported

Modbus TCP Client

Specification	Description
Modes Supported	Modbus TCP
Modbus Server Devices	20 max.
Modbus Mappings	100 max.
Mapping Ranges	Holding Register: 0 to 65535 Input Register: 0 to 65535 Input Status: 0 to 65535 Coil Status: 0 to 65535
Base Offset	Modbus (base 0), PLC (base 1)
Configurable Modbus TCP Port	Yes
Data Re-formatting Supported	BB AA BB AA DD CC CC DD AA BB DD CC BB AA

Modbus TCP Server

Specification	Rating
Modes Supported	Modbus TCP
Mapping Ranges	Holding Register: 0 to 65535 Input Register: 0 to 65535 Input Status: 0 to 65535 Coil Status: 0 to 65535
Base Offset	Modbus (base 0), PLC (base 1)

H1

Specification	Description
Connector	3-way terminal
Conductor	24 to 18 AWG
LAS	Supported
H1 Alarming	Supported
Intrinsically Safe (IS) Applications	Supported
Advanced H1 Scheduling	Supported
Maximum Slave Devices	32
Isolated	Yes
Internal Power Conditioner Voltage	Max: 23.0 VDC Min: 19.0 VDC
Internal Power Conditioner Current	Max: 420 mA – Max. Ambient Temperature <= 50 °C Max: 320 mA – Max. Ambient Temperature <= 60 °C Max: 220 mA – Max. Ambient Temperature <= 70 °C **Note:** Includes 20mA for internal MAU
Internal Termination	100 Ω - Software Enabled

EtherNet/IP Target

Specification	Description
Class 1 Connection Size	Max. Input Size: 500 bytes (492 bytes mapped data)
	Max. Output Size: 496 bytes (492 bytes mapped data)
Class 1 Connection Count	1 to 4
Class 3 Messaging Supported	Yes
UCMM Messaging Supported	Yes

EtherNet/IP Originator

Specification	Description
Class 1 Cyclic Connections Supported	Yes
Class 3 / UCMM Connections Supported	Yes
Class 1 Connection Count	10
Class 3 / UCMM Target Device Count	10
Class 3 / UCMM Mapping Count	50
Direct-To-Tag Logix Support	Yes

Hardware

Specification	Description
Dimensions (H x W x D)	149.0 x 34.0 x 116.0 mm 5.86 x 1.33 x 4.56 inches
Power Supply	Input: 22 to 26 VDC
Power Consumption	Maximum: 135 mA @ 24V => 3.3 W (No Bus Load) Maximum: 580 mA @ 24V => 14.0 W (Full Bus Load of 400 mA)
Connector	3-way terminal
Conductors	24 to 18 AWG
Enclosure Rating	IP20, NEMA/UL Open Type
Temperature	-20 to 70°C (Power Conditioner Load <= 220 mA, Full Bus Load <= 200 mA) -20 to 60°C (Power Conditioner Load <= 320 mA, Full Bus Load <= 300 mA) -20 to 50°C (Power Conditioner Load <= 420 mA Full Bus Load <= 400 mA)
Relative Humidity	5% to 90% - No condensation
Earth Connection	Yes, terminal based
Emissions	IEC 61000-6-4
ESD Immunity	EN 61000-4-2
Radiated RF Immunity	IEC 61000-4-3
EFT/B Immunity	EFT: IEC 61000-4-4
Surge Immunity	Surge: IEC 61000-4-5
Conducted RF Immunity	IEC 61000-4-6

Agency Approvals & Certifications

Please visit our website: www.prosoft-technology.com