

Case Study

FDI Communication Gateway Plugin



Project

Creation of a plugin for an FDI communication gateway



Technologies

FDI 1.4.1, FDI Communication Gateway Plugin (CGP), FDT Gateway DTM, EDD/EDDL, .NET / C#



Customer

Producers of remote I/O devices



Services

Software engineering, FDI/FDT incorporation, device integration



Industry

Automation technology / Mechanical and plant construction



Period

2025

Wetcon created an FDI Communication Gateway Plugin for a manufacturer of remote I/O components, effectively converting an existing Gateway-DTM into a contemporary FDI gateway package.

According to the FDI-1.4.1 specification, the entire communication framework of a remote I/O system is now represented solely through FDI packets, encompassing both gateway functionality and associated field devices.

This lays the foundation for transitioning from FDT-based gateway DTMs to a scalable, FDI-focused device management architecture.





Initial situation and challenges

The previous gateway functionality was solely implemented within an existing FDT Gateway DTM and could not be utilized directly as an FDI package.

Up to version 1.4, FDI provided standardized device packages; however, there was initially no method to map complex gateways (protocol converters, remote I/O heads) using solely EDDL.

Requirements including the parallelization of requests, management of timeouts, queuing, and intricate byte operations could not be achieved with EDDL alone.

The objective was to convert the current gateway logic into a solution that complies with FDI standards, without necessitating a complete redesign of the communication from the ground up – while also ensuring the efficient repetition of future gateway migrations.



Our approach

Wetcon has created an FDI Communication Gateway Plugin (CGP) in accordance with the FDI 1.4.1 specification and has incorporated it into a new FDI bundle package.

The current Gateway-DTM functioned as a technical framework for structure, operational concept, and communication logic.

For the headend of the remote I/O system and the related module types, appropriate FDI device packages containing catalog information, documentation, and EDD were developed and assembled into a bundle package that represents the entire gateway topology.



Architecture Platform

Implementation of an FDI Communication Gateway plugin in accordance with FDI 1.4.1 as a platform-agnostic .NET component. Use of the FDI bundle concept to consolidate various FDI packages (gateway, modules, field devices) into a single package.



Programming Languages

C# (.NET), utilizing chosen logic components from the current FDT implementation for protocol conversion and command packing/unpacking.



Communication

Implementation of gateway communication in accordance with the FDI-CGP interfaces, incorporating support for stringent timing requirements when managing the remote I/O (for instance, mapping a single HART command to several Profinet or Profibus commands within specified time intervals).

Utilization of the protocol-specific XML schemas established in FDI for the transmission of commands



Interfaces / Protocols

Migration of the current FDT gateway logic to the FDI-CGP interfaces, encompassing the management of different fieldbus technologies (e.g., HART over Profinet/Remote I/O).

Emphasize the utilization of the expertise gained from the Gateway DTM implementation whenever it is technically practical.



UX/UI focus areas

Redesign of the gateway user interface utilizing EDD (and optionally UIP in HTML/JavaScript) in accordance with FDI specifications, following the prior UI concept of the gateway DTM.

Delivering a uniform, FDI-standard user interface for the headend, modules, and associated field devices.

Technical Execution





Outcomes & Benefits



Comprehensive mapping of gateway and remote I/O communication within an FDI-based device management framework – independent of FDT gateway DTMs.



Support for stringent timing and performance standards when interacting with remote I/Os via the FDI-CGP interfaces.



Reusable approach: The established migration methodology enables the conversion of additional existing FDT Gateway DTMs into FDI bundle packages with the Communication Gateway Plugin, requiring a measurable effort.

Are you considering migrating current FDT gateway DTMs to a device management architecture based on FDI?

Discuss reusable migration concepts and FDI Communication Gateway Plugins with us.



www.wetcon.net/kontakt/



projects@wetcon.net



+49-7307-936-9180