

Reference Topology ME02

Mitsubishi Electric MELSEC System Q - Redundant PLC System
and HART over PROFIBUS for Power & Energy Industry

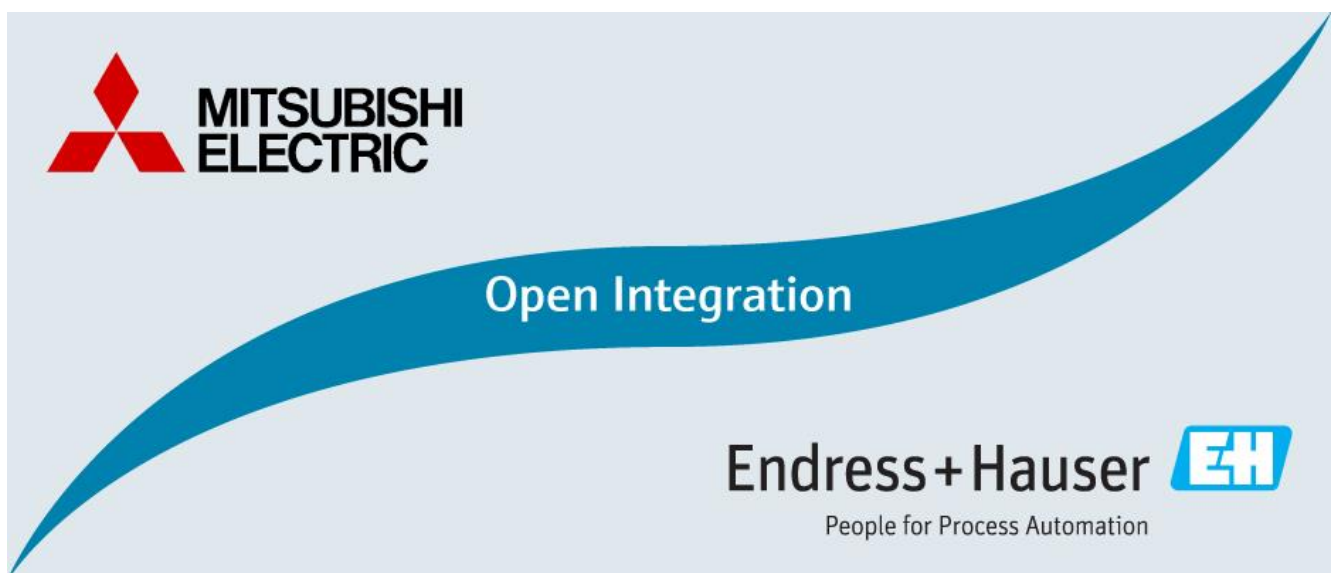


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1 Document Information

1.1 Purpose and Scope

This document specifies the Open Integration Reference Topology ME02. All content of this document is jointly developed, reviewed and approved by Mitsubishi Electric and Endress+Hauser as a common deliverable of Open Integration.

1.2 Document History

This is version 1.00.00 of this document. Version history:

Version	Released	Description
1.00.00	2016-12	Initial version

1.3 Related Documents

Please refer to related documents as listed below:

Document	Description
SD01766S/04/EN/01.16	Integration Tutorial ME02
SD01767S/04/EN/01.16	Integration Test Summary ME02
SD01768S/04/EN/01.16	List of Tested Devices and Versions ME02

2 Target Market

2.1 Industry Application

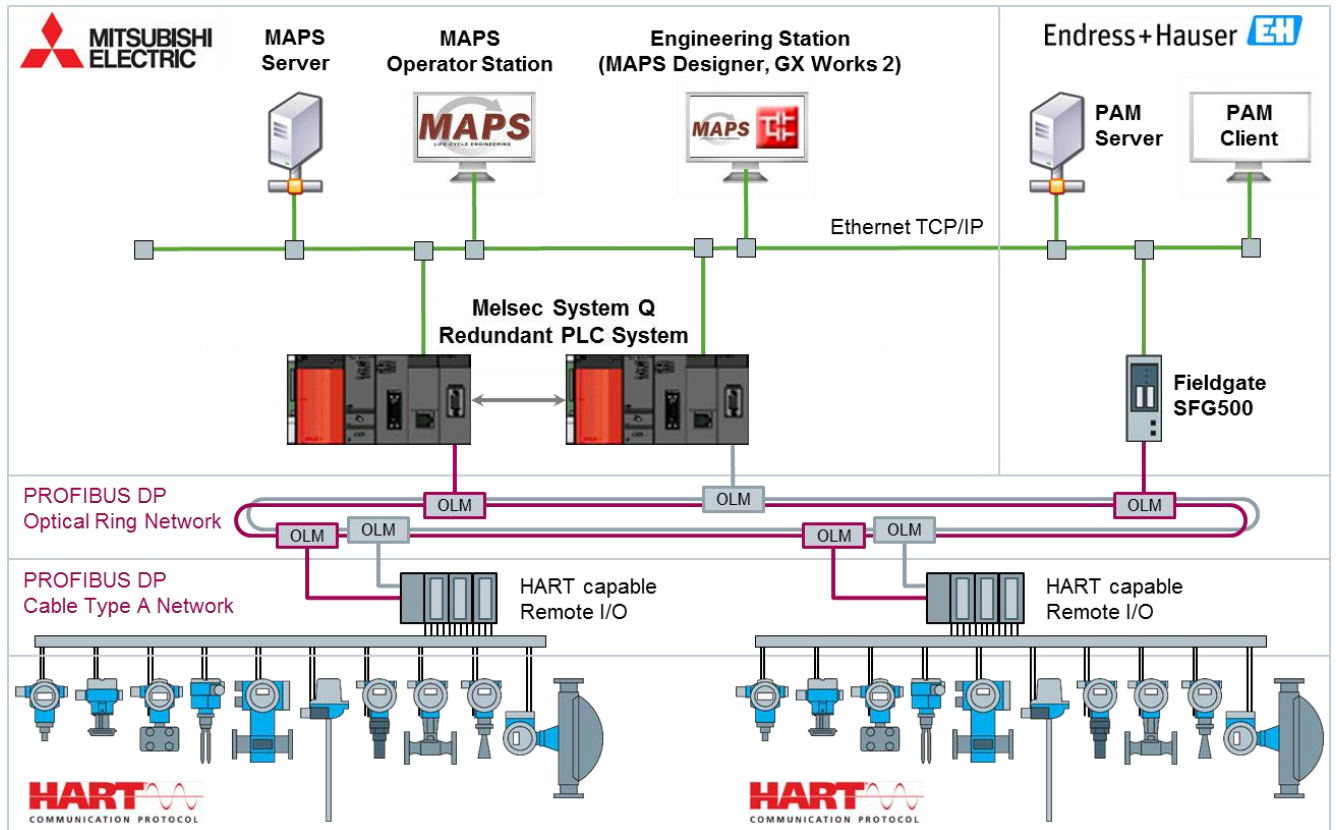
This reference topology is designed to serve high availability applications in Power / Energy industries.

2.2 Fieldbus Technology

This reference topology is designed for instrumentation with 4-20 mA / HART, connected to the control system via HART capable Remote I/O and PROFIBUS DP.

3 Reference Topology

3.1 Overview





3.2 Process Control System

The process control system part top left in the overview is provided by Mitsubishi Electric:

A MELSEC System Q Redundant PLC System is composed of two interconnected control units; each equipped with a backplane power supply, a controller module, an Ethernet module and at least one PROFIBUS DP master module. This provides controller and field network redundancy down to Remote I/O units, which connect via HART capable AI and AO modules to smart field devices.

Core element on top of the system backbone is an Engineering Station for control engineering with GX Works2, complemented with MAPS Designer to configure MAPS Server and Operator Station as runtime environment for process visualization.

Reference hardware:



 MITSUBISHI ELECTRIC	Article	Description
MELSEC redundant System Q 	2x Q33B	PLC Q Series Base unit power supply + CPU slot + 3 I/O slots
	2x Q63P	PLC Q Series Power supply 24 V DC input, 5V DC, 6A output
	2x Q25PRHCPU	Redundant CPU module, 4096 E/A; 250k steps program capacity
	2x QJ71E71-100	Ethernet module, 100 MBaud
	2x QJ71PB92V	PLC Q Series Profibus DP Master module, DP-V1 Protocol, 12MBaud, IEC61158/EN50170
	QCT10TR	Tracking cable (1m) for program synchronization

3.3 Asset Management System

The asset management system part top right in the overview is provided by Endress+Hauser:

FieldCare or PAM Suite Servers and Clients (PAM = plant asset management) can access all underlying HART devices via system backbone and hardware of the control system, or independently via Fieldgate SFG500, PROFIBUS DP and HART capable Remote I/O.

Reference hardware:



Endress+Hauser  <small>People for Process Automation</small>	Article	Description
Fieldgate SFG500 	SFG500	Ethernet / PROFIBUS DP gateway
	SFM500-A1	Asset Management Module for Fieldgate SFG500

3.4 Field Network Infrastructure

3.4.1 PROFIBUS DP Optical Ring Network

The PROFIBUS DP Optical Ring Network is optional for this reference topology, with limited impact to integration tests. If applied, Mitsubishi Electric and Endress+Hauser recommend using optical link modules from R.STAHL for this reference topology.

Reference hardware:

	Article	Description
Mediaconverter 	9186/15-12-11	Safe area/Zone 2 installation; RS485 / FO "op is"; ring

For optical network a multimode cable with ST-connectors (BFOC/2,5 plug) is required. An Optical ring installation is suitable for installation in a Zone 1 or Zone 2 environment.



3.4.2 PROFIBUS DP Cable Type A Network

The PROFIBUS DP Cable Type A Network is mandatory for this reference topology, with limited impact to integration tests. Specific reference hardware for this part is not yet defined; recommendable hardware may be listed here in future.

3.4.3 HART capable Remote IO

The HART capable Remote IO is mandatory for this reference topology, with decisive impact to integration tests. Mitsubishi Electric and Endress+Hauser recommend using the LB series from Pepperl+Fuchs for this reference topology.

Reference hardware:

 PEPPERL+FUCHS	Article	Description
Remote IO System 	LB9022S	Redundancy Base Backplane
	LB9006C	Power Supply 24V
	LB8109H0906	Unicom Com Unit for PROFIBUS DP/DP-V1
	LB3102A2	HART Transmitter Power Supply, Input Isolator, 1-Channel, 2 or 3-wire Transmitters
	LB3106A	HART Transmitter Power Supply, 4-Channel, 2-wire Transmitters
	LB4106A	HART Output Isolator, 4-Channel

LB remote I/O is certified for mounting in Zone 2, Class I, Div. 2 or in the non-hazardous area. This modular signal conditioning system allows interfacing signals from the field with a control system in the non-hazardous area via safe area (Non-Ex) field connections or intrinsically safe area (Ex i) field connections field connections. Both circuit types can be mixed in one system.







3.5 Field Devices








Open Integration reference topologies always have to be tested versus a selection of the most relevant field devices for the target market defined in chapter 2.1. This serves to verify that the system under test is capable to handle a necessary variety of certified field devices. All field devices are fully compliant to standards, but may be implemented versus different version of standards and each field device typically implements only a subset of relevant compliant means.



3.5.1 HART devices

This chapter defines only a basic set of mandatory field devices for verification of this reference topology, as agreed by Mitsubishi Electric and Endress+Hauser. For more details, please refer to latest list of tested devices and versions for this reference topology, referenced in chapter 1.3.

Reference hardware:

Endress+Hauser  People for Process Automation		Article	Description	HART ID
iTEMP 		TMT112	DIN rail Temperature Transmitter	0x00C9
Cerabar S 		PMP71	Absolute and Gauge Pressure Transmitter	0x0018
iTEMP 		TMT82	Temperature Transmitter	0x00CC
Cerabar M 		PMP51	Absolute and Gauge Pressure Transmitter	0x0019
Deltabar S 		PMD75	Differential Pressure Transmitter	0x0017

Endress+Hauser  People for Process Automation	Article	Description	HART ID
Promag 	10L	Electromagnetic Flow Transmitter	0x0045
Levelflex 	FMP51	Guided Radar Level Transmitter	0x0022
Micropilot 	FMR57	Radar Level Transmitter	0x0028
Prowirl 200 	7F2B	Vortex Flow Transmitter	0x0038
Deltabar M 	PMD55	Differential Pressure Transmitter	0x0021
Promag 	50P	Electromagnetic Flow Transmitter	0x0041

 auma [®] <i>Solutions for a world in motion</i>	Article	Description	HART ID
AUMATIC 	AC 01.2	Actuator control for SA/SAR .2 multi-turn actuators and SQ/SQR .2 part-turn actuators	0xE1FD

www.endress.com/open-integration
