Reference Topology SE02

Schneider Electric Modicon M580 and HART for
Water & Wastewater Industry

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1   Document Information

1.1   Purpose and Scope

This document specifies the Open Integration Reference Topology SE02. All content of this document is jointly developed, reviewed and approved by Schneider 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	2017-10	Initial version

1.3   Related Documents

Please refer to related documents as listed below:

| Document	Description
SD01937S/04/EN/01.17	Integration Tutorial SE02
SD01938S/04/EN/01.17	Integration Test Summary SE02
SD01939S/04/EN/01.17	List of Tested Devices and Versions SE02

2   Target Market

2.1   Industry Application

This reference topology is designed to serve applications in Water / Wastewater industries.

2.2   Fieldbus Technology

This reference topology is designed for instrumentation with HART.

3 Reference Topology

3.1 Overview
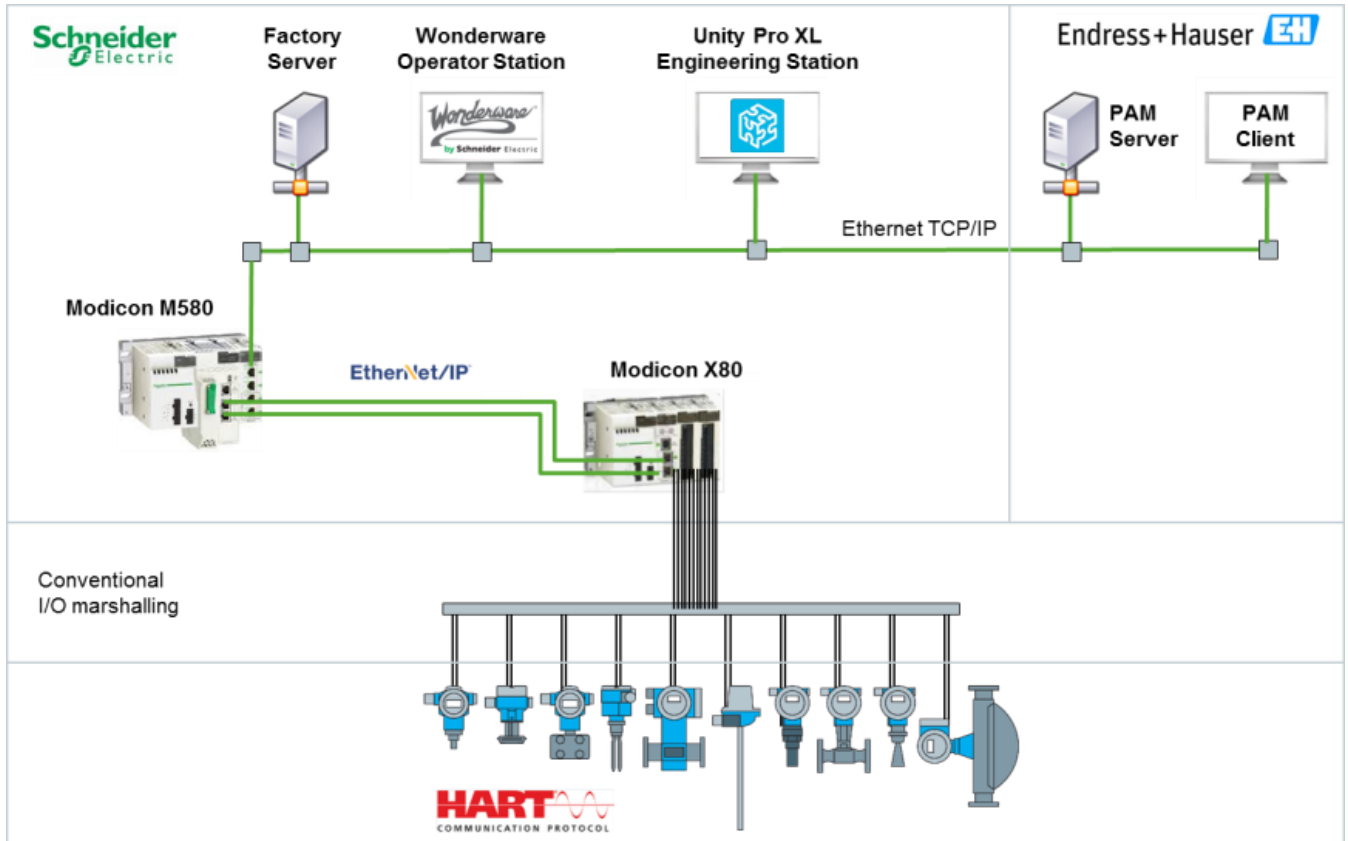
3.2 Process Control System

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

The Schneider Electric Modicon M580 control unit is connected into an EtherNet/IP single ring with X80 remote I/O units. X80 units are equipped with HART capable AI and AO modules to connect towards HART capable field devices. Core element on top of the system backbone is an Engineering Station for control engineering with Unity Pro XL, complemented with Wonderware software for process visualization.

Reference hardware:

Schneider Electric	Article	Description
Modicon M580	BME XBP 0400	Ethernet and X-bus backplane, 4 slots
	BMX CPS 2010	Power supply module 24 V DC, 16.8W
	BME P58 2040	Processor module M580
	BMX NOC 0402	Ethernet IP network module
X80 I/O Platform	BME XBP 0400	Ethernet and X-bus backplane, 4 slots
	BMX CPS 2010	Power supply module 24 V DC, 16.8W
	BME CRA 31210	Modicon X80 EIO drop adapter
	BMEAHI0812	HART module with 8 analog inputs
	BMEAHO0412	HART module with 4 analog outputs
	ABE-7CPA03	Connection sub-base for analog Input channels
	ABE-7CPA21	Connection sub-base for analog Output channels
	BMX FTA 1522 BMX FTA 3022	1.5m or 3m shielded cable for connecting one analog input card BMEAHI0812 to one sub-base ABE-7CPA03
	BMX FCA 150 BMX FCA 300 BMX FCA 500	1.5m, 3m or 5m shielded cable for connecting one analog output card BMEAHO0412 to one sub-base ABE-7CPA21

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 may access the underlying HART devices via system backbone and hardware of the control system. For details, please refer to the latest integration test summary for this topology, referenced in chapter 1.3.

3.4   Field Network Infrastructure

3.4.1   Conventional I/O marshalling

Conventional I/O marshalling is mandatory for this topology, with limited impact to integration tests. However, the applied electrical components and wiring must not harm HART communication between I/O modules and connected field devices. Specific hardware for this part is not yet defined; recommendable hardware may be listed here in future.

3.5 Field Devices

Open Integration reference topologies always have to be tested versus a selection of 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.

This chapter defines only a basic set of mandatory field devices for verification of this reference topology, as agreed by Schneider 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.

3.5.1 HART devices

Reference hardware:

Endress+Hauser	Article	Description	Device Type
Promag 10	10L	Electromagnetic Flow Transmitter	0x0045
Promag 50	50W	Electromagnetic Flow Transmitter	0x0041
Cerabar M	PMC51	Absolute and Gauge Pressure Transmitter	0x0019
Prosonic S	FMU90	Ultrasonic Level Transmitter	0x001B
	FDU91	Ultrasonic Level Sensor	
Liquiline	CM442	Liquid Analyzer Transmitter	0x119C
	CPS11D	Memosens Digital pH Sensor	
	CYK10	Memosens Digital Data Cable	

Endress+Hauser	Article	Description	Device Type
Waterpilot	FMX21	Absolute and Gauge Pressure Transmitter	0x0024
Promag 400	5L4	Electromagnetic Flow Transmitter	0x1167
iTEMP	TMT82	Temperature Transmitter	0x11CC
Cerabar S	PMC71	Absolute and Gauge Pressure Transmitter	0x1118
Prosonic M	FMU40	Ultrasonic Level Transmitter	0x0011
Micropilot	FMR50	Radar Level Transmitter	0x0028

auma	Article	Description	Device Type
AUMATIC	AC 01.2	Actuator control for SA/SAR .2 multi-turn actuators and SQ/SQR .2 part-turn actuators	0xE1FD

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