Member and Non-Member Components in the Project

Supplier	Hardware Name	Product ID	Amount	Description
Pepperl+Fuchs	Base Backplane	LB9023BP08110.1	2	This is a base backplane for several different IO cards as well as a gateway and power supply.
Pepperl+Fuchs	Power supply	LB9006C	2	This is the power supply that belongs to the backplane.
Pepperl+Fuchs	Universal Input/output card	LB7104A	6	This backplane I/O card can read several analog or digital input values. It fits on the backplane and enables to read and write HART commands.
Pepperl+Fuchs	Gateway for PROFINET	LB8122A.1.EL	2	This is a gateway that fits on the backplane. It enables Profinet communication as well as separate HART-IP port.
Pepperl+Fuchs	IO-Link master	ICE2-8IOL-K45S-RJ45	1	This I/O-Link master can connect to any I/O-Link device, communicating via OPC UA.
CodeWrights	IIoT Server	Not available	1	This specific software acts as a HART IP client and can publish the data on an OPC UA server. It automatically detects devices and reads all available data from them. The software is still in development and therefore not commercially available.
WAGO	Edge Controller	752-8303/8000-002	1	This is the edge controller on which all data streams are combined. It runs a docker instance on it, which has several containers.
WAGO	Controller PFC	750-8210	1	This is the controller PLC that is connected to different module cards. On it runs a PLC program which reads the different HART and IO-Link data.
WAGO	2 Channel Analog module	750-482	4	This module card is connected to the controller PLC. It can read a total of two different HART channels.
WAGO	IO-Link-Master module	750-657	2	This module card is connected to the controller PLC. It can read a total of two different IO-Link channels.
M&M Software	OPC UA & Cloud Connector	Not available	1	M&M provided software to connect the OPC UA server of the PLC to the Edge computer, and also a connector to the WAGO Cloud.
Krohne	Flow Meter	OPTIFLUX 4300	3	The electromagnetic flow meters are used in the experiment of this thesis. They consist of a Optiflux 4000 flow meter combined with a IFC 300 data converter. They are also HART devices that are subject of the OI4 demonstrator.
Krohne	Temperature transmitter	OPTITEMP TRA-S11	2	The temperature transmitters are used to monitor the hydro loop while in use. They are also HART devices t6hat are subject of the OI4 demonstrator.
Krohne	Pressure transmitter	OPTIBAR PC 5060 C	2	These pressure transmitters are used to monitor the hydro loop while in use. They are also HART devices that are subject of the OI4 demonstrator.
FOCUS-ON	Self Regulating Valve	Focus One	1	This modern combination of valve and flow meter is part of the OI4 demonstrator.

				Different communication paths are compared to analyse potential miss matches.
UReason	APM Studio	Not available	1	APM Studio is UReason's software for asset performance management and condition monitoring. In the OI4 demonstrator, it is used as a data synchronisation and acquisition tool, as well as for processing certain data streams.
Balluff	Condition Monitoring Sensor	BCM R15E-001-DI00-01	3	The condition monitoring sensors were used in the experiment of this thesis. They have been used to monitor the vibrations of the centrifugal pumps.
Endress+Hauser	Temperature transmitter	iTEMP TMT82	2	The temperature transmitters are used to monitor the hydro loop while in use. They are also HART devices that are subject to the OI4 demonstrator.
Endress+Hauser	Flow Meter	PROMASS 84	1	This mass corriolois flow meter is installed for the flow monitoring during the use of the flow loop. It is a HART device which is used in the OI4 demonstrator.
Schneider Electric	Frequency drive	Altivar 600	3	This frequency drives are used in the experiment of this thesis. They are connected to the DCS and control the three centrifugal pumps.
Schneider Electric	Software OPC UA-Server	EcoStruxure Process Expert	1	Schneider Electric is providing a DCS to control and monitor the hydro loop. This software combines analog and digital data from the field devices and provides an OPC UA server.