

Ethernet interface OPC UA (EUROMAP 82.1)

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2 Introduction

The information model used in the temperature control unit for communication via OPC UA corresponds to the officially released standard "EUROMAP 82.1, Version 1.00 = VDMA 40082-1:2019-11". This overview contains information about the structure of the data model OPC UA, which is implemented in Thermo-5 units with software version SW51-2_1916 and higher. The OPC UA server of the Thermo-5 temperature control units supports all mandatory and additional optional parameters which are listed below.

Note:

Information about the standardized protocol description Euromap 82.1 version 1.00 and Euromap 83 version 1.01 can be found at the following link:

- hb.click/euromap82-1
- hb.click/euromap83

Note:

The basic structure corresponds to the OPC Unified Architecture specification and can be taken from the following link:

- <https://opcfoundation.org/developer-tools/specifications-unified-architecture>

3 Server OPC UA

3.1 Supported OPC UA profiles

- EUROMAP 82.1 Basic
- EUROMAP 82.1 Alarms
- EUROMAP 82.1 Maintenance

3.2 Specifications

Operating limits	Limit	Comment
ActiveSessions	2	Number of clients that can be simultaneously connected to the server
MaxMonitoredItemsPerCall	200	
MaxNodesPerBrowse	1000	
MaxNodesPerMethodCall	200	
MaxNodesPerRead	200	
MaxNodesPerWrite	200	
MaxNodesPerRegisterNodes	200	
MaxNodesPerTranslateBrowsePathsToNodeIds	200	
MaxSubscription	40 resp. 20 per session	

4 Data model OPC UA

Explanation of terms	
BrowseName: Name of the parameter according to the standard "EUROMAP 82.1" for unique identification.	DisplayName: Name of the parameter which is displayed on the control panel of the Thermo-5 temperature control unit.

4.1 TCD_InterfaceType (DisplayName: TCD_HB_Therm_xxxx-xxx)

BrowseName	DisplayName	Comment
DisplayLanguage	Language	

4.2 Identification (DisplayName: Identification)

BrowseName	DisplayName	Comment
DeviceClass	Unit class	
Manufacturer	Manufacturer	
Model	Type of unit	
SerialNumber	Unit number	
SoftwareRevision	Software version	
YearOfConstruction	Year of manufacture	

4.3 TCDSpecification (DisplayName: Unit specifications)

BrowseName	DisplayName	Comment
MaxTemperature	Temperature	
PowerValue	Heating capacity	
ConnectedLoad	Connections	
NominalFlowRate	Flow rate max.	
CoolingCapacity	Cooling capacity	

4.4 MachineConfiguration (DisplayName: Setting)

BrowseName	DisplayName	Comment
UserMachineName	User-defined machine name	
LocationName	Site	
TimeZoneOffset	Time zone	
SetMachineTime	Set date and time	

4.5 Operation (DisplayName: Operation)

BrowseName	DisplayName	Comment
DeviceMappingNumber	Address	
HighestActiveAlarmSeverity	Highest active alarm severity	
ActiveErrors	Active Errors	
ResetAllErrors	Reset all errors	
ResetErrorById	Reset Error by ID	
OperatingMode	Operating mode	
HoursOfOperation	Operating hours	
IdentifyDevice	Identify device	
SwitchOn	Unit ON	
SwitchOff	Unit OFF	

BrowseName	DisplayName	Comment
ReduceToStandByOn	Cooling ON	
ReduceToStandByOff	Cooling OFF	
InputArguments	Input arguments	

4.6 DeviceZone (DisplayName: Zone)

BrowseName	DisplayName	Comment
InternalMeasuringPoint	Measuring point internal	
StandbyTemperature	Cooling temperature	
SwitchingOffTemperature	Safety cut-off temperature	
TemperatureLimitation	Temp. nom. value limitation	
TemperatureMainLine	Main line	
TemperatureReturnLine	Return line	
PressureMainLine	Main line pressure	only available with pump type 4S or 8R or with additional equipment ZU
PressureReturnLine	System pressure actual value	
ActualProcessPower	Process power	
ActualRegulationRatio	Regulation ratio	
DelayTimeAfterCooling	Wait after cooling	
ActualPumpSpeedRPM	Pump speed	only available for pump type 4S or 8R
ActualPumpPower	Power pump	only available for pump type 4S or 8R
PumpControlMode	Pump operating mode	only available for pump type 4S or 8R

4.6.1 Temperature (DisplayName: Temperature)

BrowseName	DisplayName	Comment
ActualValue	Main line	
SetValue	Nominal value 1	
SetRampUp	Ramp heating	
SetRampDown	Ramp cooling	
UpperTolerance	Upper dev. nominal/actual	
LowerTolerance	Lower dev. nominal/actual	
AutomaticMonitoring	Monitoring	
MonitoringSensitivity	Monitoring level	
AlarmSuppression	Startup-alarmsuppression	
ResetMonitoring	Reset monitoring	

4.6.1.1 ClosedLoopControl (DisplayName: Controller)

BrowseName	DisplayName	Comment
PIDParameters	PID parameter	
AutomaticControllerMode	Operating mode	
AutoTuningActive	Auto tuning active	
AutoTuningOn	Auto tuning ON	
AutoTuningOff	Auto tuning OFF	

4.6.2 TemperatureDifference (DisplayName: Temperature differential)

BrowseName	DisplayName	Comment
ActualValue	Deviation actual/nominal	
SetValue	Nominal temperature difference	only available for pump type 4S or 8R with "Eco-mode Temp"
MaxValue	Deviation temp. difference.	only available for pump type 4S or 8R with "Eco-mode Temp"
AutomaticMonitoring	Monitoring	
MonitoringSensitivity	Monitoring level	
AlarmSuppression	Startup-alarmsuppression	
ResetMonitoring	Reset monitoring	

4.6.3 FlowRate (DisplayName: Flow rate)

BrowseName	DisplayName	Comment
ActualValue	Flow rate	
SetValue	Nominal flow rate	only available for pump type 4S or 8R with "Eco-mode Flow"
MinValue	Flow rate internal min.	only available with operating mode ≠ "Eco-mode Flow"
MaxValue	Flow rate internal max.	only available with operating mode ≠ "Eco-mode Flow"
UpperTolerance	Average Dev. Target-Is Above	only available for pump type 4S or 8R with "Eco-mode Flow"
LowerTolerance	Average Dev. Target-Is Below	only available for pump type 4S or 8R with "Eco-mode Flow"
AutomaticMonitoring	Monitoring	
MonitoringSensitivity	Monitoring level	
AlarmSuppression	Startup-alarmsuppression	
ResetMonitoring	Reset monitoring	

4.6.4 PressureDifference (DisplayName: Pressure differential)

BrowseName	DisplayName	Comment
ActualValue	Pressure difference pump	
SetValue	Nominal pressure difference	only available for pump type 4S or 8R with "Eco-mode Pressure"
UpperTolerance	Pressure diff. pump above	only available for pump type 4S or 8R with "Eco-mode Pressure"
LowerTolerance	Pressure diff. pump below	only available for pump type 4S or 8R with "Eco-mode Pressure"
AutomaticMonitoring	Monitoring	
MonitoringSensitivity	Monitoring level	
AlarmSuppression	Startup-alarmsuppression	
ResetMonitoring	Reset monitoring	

4.6.5 PumpSpeed (DisplayName: Pump speed)

BrowseName	DisplayName	Comment
ActualValue	Output pump	only available for pump type 4S or 8R
SetValue	Nominal speed	only available for pump type 4S or 8R with "Eco-mode Speed"

4.6.6 ExternalSensor (DisplayName: External sensor)

BrowseName	DisplayName	Comment
ActualValue	External	
Used	Controller of external sensor active	
ExternalSensorModeOn	External sensor ON	
ExternalSensorModeOff	External sensor OFF	
ThermocoupleType	Sensor type external sensor	
CommunicationProtocolType	Protocol	
AutomaticModeSwitch	Switch over external sensor	

4.6.6.1 ClosedLoopControl (DisplayName: Controller)

BrowseName	DisplayName	Comment
PIDParameters	PID parameter	
AutomaticControllerMode	Operating mode	
AutoTuningActive	Auto tuning active	
AutoTuningOn	Auto tuning ON	
AutoTuningOff	Auto tuning OFF	

4.6.7 LeakStopper (DisplayName: Leak stopper)

BrowseName	DisplayName	Comment
On	Leak stopper ON	only available with additional equipment ZL (leakage stop operation)
Off	Leak stopper OFF	only available with additional equipment ZL (leakage stop operation)

4.6.8 MouldEvacuation (DisplayName: Mould evacuation)

BrowseName	DisplayName	Comment
On	Mould evacuation ON	only available for devices with mould evacuation
Off	Mould evacuation OFF	only available for devices with mould evacuation
TemperatureLimit	Mould evacuation limit temp.	only available for devices with mould evacuation
Time	Time mould evacuation	only available for devices with mould evacuation
Sink	Mould evac. with compr. air	only available with additional equipment ZG (mould evacuation with compressed air)

4.6.9 MaintenanceInformation (DisplayName: Support)

4.6.9.1 Cooling (DisplayName: Cooling)

BrowseName	DisplayName	Comment
Status	Status	
CloseCoolingValves (AdditionalInformation)	Close cooling valves	
OpenCoolingValves (AdditionalInformation)	Open cooling valves	
Interval	Maintenance interval cooler	
RemainingInterval	Duration until maintenance cooler	
Reset	Reset	
TotalOperation	Operating hours cooler	

4.6.9.2 Fluid (DisplayName: Heat transfer medium)

BrowseName	DisplayName	Comment
Status	Status	
Interval	Maintenance interval fluid	
RemainingInterval	Duration until maintenance fluid	
Reset	Reset	

4.6.9.3 Heating (DisplayName: Heating element)

BrowseName	DisplayName	Comment
Status	Status	
Interval	Maintenance interval heater	
RemainingInterval	Duration until maintenance heater	
Reset	Reset	
TotalOperation	Operating hours heater	

4.6.9.4 Pump (DisplayName: Pump)

BrowseName	DisplayName	Comment
Status	Status	
PumpCondition (AdditionalInformation)	Pump condition	
Interval	Maintenance interval pump	
RemainingInterval	Duration until maintenance pump	
Reset	Reset	
TotalOperation	Operating hours pump	

4.6.10 ExternalChannels (DisplayName: External flow meter)

A maximum of 8 external flow meters per zone are supported. Provided the operation is "Integrated" for the integration of the external flow meters (Parameter: DFM recognition = "integrated").

4.6.10.1 ExternalChannel_1..8 (DisplayName: Measuring circuit 1...8)

BrowseName	DisplayName	Comment
TemperatureMainLine	Main line	only available for units with Flow-5
TemperatureReturnLine	Return line external 1..8	only available for units with Flow-5

4.6.10.2 FlowRate (DisplayName: Flow rate 1..8)

BrowseName	DisplayName	Comment
ActualValue	Flow rate external 1..8	only available for units with Flow-5
MinValue	Flow rate external 1..8 min.	only available for units with Flow-5
MaxValue	Flow rate external 1..8 max.	only available for units with Flow-5

4.6.10.3 TemperatureDifference (DisplayName: Temperature differential 1..8)

BrowseName	DisplayName	Comment
ActualValue	Diff. return/main line ext. 1..8 (Actual value)	only available for units with Flow-5
MaxValue	Diff. return/main line ext. 1..8 (Limit value)	only available for units with Flow-5