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Endress+Hauser
People for Process Automation

Supplementary documentation

Data transmission via PROFINET

Liquiline CM44x
Liquiline CM44xR
Liquiline CM44P
Liquistation CSFxx

Valid as of version:
1.11.00 (Device firmware)

Document: Data transmission via PROFINET Guideline

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Table of contents

1 About this document

1.1 Document function

This supplementary document must only be used in conjunction with a Liquiline CM44x/CM44Rx/CM44P, Liquiline CA80xx or Liquistation CSFxx with PROFINET interface.

This supplementary document is an integral part of the Operating Instructions and provides information on how to use the device with PROFINET.

This supplementary documentation covers the aspects of system integration into a PROFINET network and provides detail information of the PROFINET related functionality of the device.

Additional information is contained in the following Operating Instructions:

Manual	Product	Function
BA00444C	Liquiline CM44x	Multichannel controller for Memosens sensors
BA01225C	Liquiline CM44xR	Multichannel controller for Memosens sensors (Rail mount)
BA01570C	Liquiline CM44P	Multichannel controller for process photometers
BA00478C	Liquistation CSF34	Automatic water sampler for North America
BA00443C	Liquistation CSF48	Automatic water sampler
BA01240C	Liquiline System CA80AM	Ammonium analyzer
BA01354C	Liquiline System CA80COD	COD analyzer
BA01416C	Liquiline System CA80PH	Colorimetric analyzer for orthophosphate (molybdenum blue method)
BA01435C	Liquiline System CA80PH	Colorimetric analyzer for orthophosphate (molybdate-vanadate method)
BA01574C	Liquiline System CA80NO	Nitrite analyzer
BA01575C	Liquiline System CA80CR	Chromate analyzer
BA01585C	Liquiline System CA80AL	Aluminum analyzer
BA01586C	Liquiline System CA80FE	Iron analyzer
BA01593C	Liquiline System CA80TP	Total phosphorus analyzer
BA01650C	Liquiline System CA80SI	Silica analyzer
BA01772C	Liquiline System CA80HA	Water hardness analyzer

Information about installation and electrical connection are part of the main documentation.

1.2 Definitions and Abbreviations

1.2.1 Definitions

GSD	General Station Description The device description of a PROFINET Device.
GSDML	GSD Markup Language The language in which PN-GSDs are written (XML, elements and attributes carry information).

1.2.2 Abbreviated terms

API	Application Process Identifier (also known as Profile ID)
AR	Application Relationship
CR	Communication Relationship
DAP	Device Access Point
DCP	Discovery and basic Configuration Protocol
DHCP	Dynamic Host Configuration Protocol (see RFC 2131)
FDT	Field Device Tool (see http://www.fdt-jig.org/)
GSD	General Station Description
GSDML	GSD Markup Language
HMI	Human Machine Interface
I&M	Identification & Maintenance
IO or I/O	Input / Output
IOCS	Input Output Object Consumer Status
IOPS	Input Output Object Producer Status
IOXS	IOCS and IOPS
LLDP	Link Layer Discovery Protocol (see IEEE 802.1AB-20)
NRT	Non-Real Time
PI	PROFIBUS & PROFINET International (http://www.profibus.com/)
RT	Real Time Protocol
SNMP	Simple Network Management Protocol (see RFC 1157)
UDP	User Datagram Protocol (see RFC 768)
XML	Extensible Markup Language

2 System integration

2.1 GSD file

In order to integrate field devices into a PROFINET system, the PROFINET system needs a description of the device parameters, such as output data, input data, data format and data volume.

These data are available in the General Station Description (GSD) file which is provided to the automation system when the communication system is commissioned. In addition, device bit maps, which appear as icons in the network structure, can also be integrated.

The General Station Description (GSD) file is in XML format, and the file is created in the GSDML description markup language.

The Generic Station Description (GSD) file can be obtained from the following sources:

- **Download from the Internet** from our web site www.endress.com
- **Download from the device web server** by opening the following URL with a web browser: http://<ip-address>/userfiles/GSD.zip

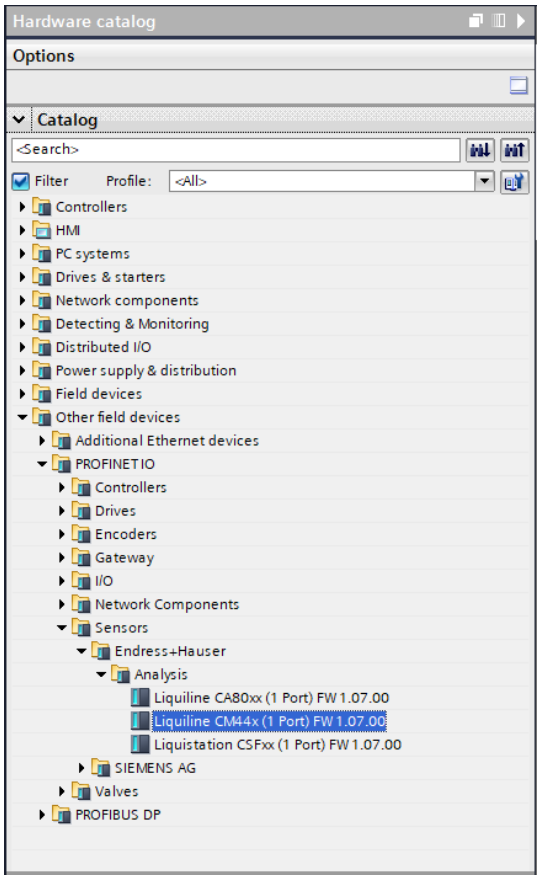
Different GSD files are used for transmitters, water samplers and analyzers.

GSD File Name	Product	Bitmap
GSDML-V2.34-Endress+Hauser-CM44x- yyyymmdd.xml	Liquiline CM44x Liquiline CM44xR Liquiline CM44P	
GSDML-V2.34-Endress+Hauser-CSFxx-yyyymmdd.xml	Liquistation CSF34 Liquistation CSF48	
GSDML-V2.34-EH-CA80xx- yyyymmdd.xml	Liquiline System CA80AM Liquiline System CA80COD Liquiline System CA80PH Liquiline System CA80NO Liquiline System CA80CR Liquiline System CA80AL Liquiline System CA80FE Liquiline System CA80TP Liquiline System CA80SI Liquiline System CA80HA Liquiline System CA80TP	

2.1.1 Installation of GSD file in TIA Portal

The method of installing the GSD file depends on your engineering tool. The following example applies to Simatic TIA Portal V15.

In TIA Portal open **Options > Manage general station description files (GSD)**, then open the source path of the GSD file you wish to install. Mark the GSD-file to be installed and confirm installation. The GSD-file is then automatically added to the Hardware-Catalog:



2.1.2 Functionality of the GSD file with Liquiline products

The number of parameters and plug & play functionality of the Liquiline products is not suitable to be described in a GSD file. For our Liquiline products the GSD file is intended solely for the use case of integration into a PROFINET system, not for device parameterization.

Application	Tooling
Integration into PROFINET system	Engineering Tool
Device name and IP-Address	Engineering Tool
Parameterization of device	Local display or device web server
Backup/Restore of device parameterization	SD-card to save and load parameter backup file

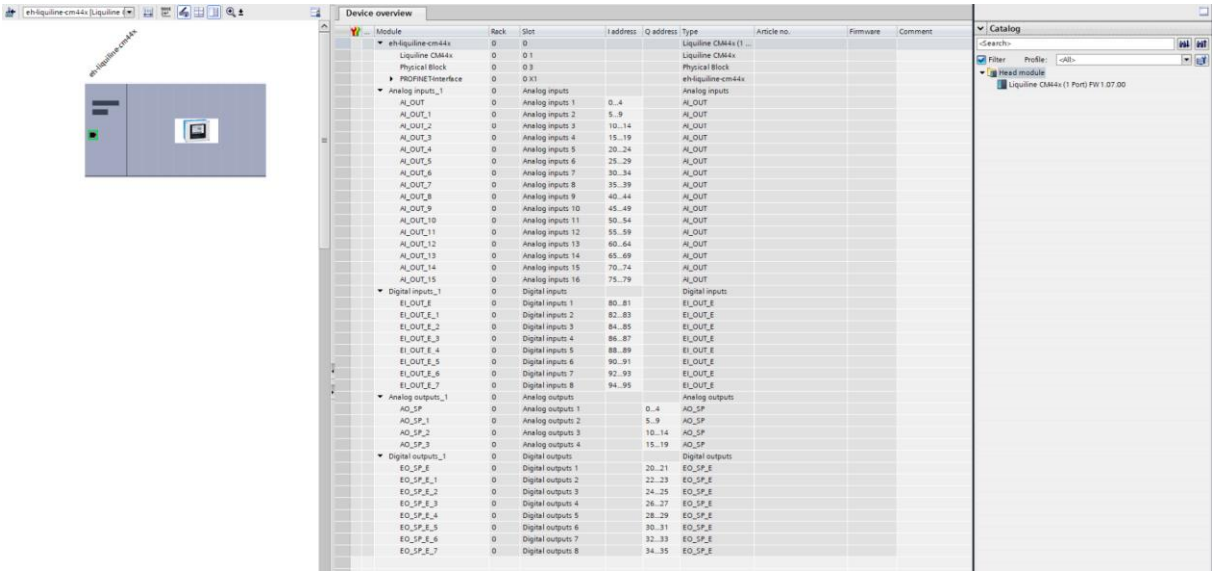
This version of the GSD-file does not contain parameters in any GSD-modules. This may change with future versions of the Liquiline GSD-files.

2.1.3 GSD-Modules and cyclic I/O-data

The GSD modules are placeholders for I/O values like measurement or set point values. The Liquiline GSD file contains the following types of GSD modules:

Name	Number	Data direction	Data	Data type
Analog inputs	16	Device → Controller	Float32 (4 Byte) + Status (1 Byte)	DS-101
Digital inputs	8	Device → Controller	Unsigned (1 Byte) + Status (1 Byte)	DS-102
Analog outputs	4	Controller → Device	Float32 (4 Byte) + Status (1 Byte)	DS-101
Digital outputs	8	Controller → Device	Unsigned (1 Byte) + Status (1 Byte)	DS-102

The GSD-modules in the GSD-file are in fixed positions and cannot be removed. This allows you to add additional process values to the cyclic data I/O-data from the device menu without having to adjust the PROFINET project with the engineering tool.



The total number of cyclic I/O data exchanged between a Liquiline device and the PLC is:

- 96-byte input data from device to plc
- 36-byte output data from plc to device

The procedure of selecting data sources for Analog/Digital input modules and connecting data sinks to Analog/Digital outputs modules is described in chapter 3.2.

2.2 Device replacement

The PROFINET station name and IP address are assigned by the control system to the newly added device using the neighborhood detection function.

Other device parameters are not automatically restored. Use the SD card to backup and restore the complete device parameterization.

2.3 Reset device

The *Factory default* reset function in the device menu does not reset the PROFINET network settings.

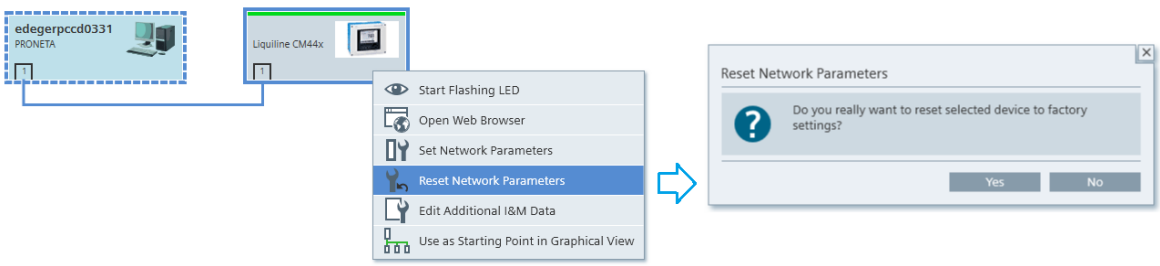
The following tables lists the supported Reset functions and relation to the reset functions in the menu.

Table 1 DCP service RESET_FACTORY_SETTINGS

RESET_...	Description	Liquiline device menu
APPLICATION_DATA	Reset parameters except network parameters to factory default values	Diagnostics/Factory defaults
COMMUNICATION_PARAMETER	Reset network parameters, e.g. Device name = '' IP address = ''	
ALL_STORED_DATA	Reset all parameters to factory defaults including network parameters	
DEVICE	Reset all parameters to factory defaults including network parameters	

TIA-Portal Online access > Functions > *Reset to factory settings* performs a RESET_ ALL_STORED_DATA.

Simatic PRONETA *Reset Network Parameters* actually performs a RESET_ ALL_STORED_DATA.



Backup the device parameterization after commissioning or after making changes on SD card and store the backup files safely: *Setup/Extended setup/Data management/Save setup*

3 PROFINET communication

3.1 Network settings

3.1.1 Device menu

The communication settings can be changed with the PROFINET DCP service only. The active communication settings are displayed in the Diagnostics menu.

- The communication settings are done with the Engineering Tool of your choice. Another option are free tools supporting the PROFINET DCP service.

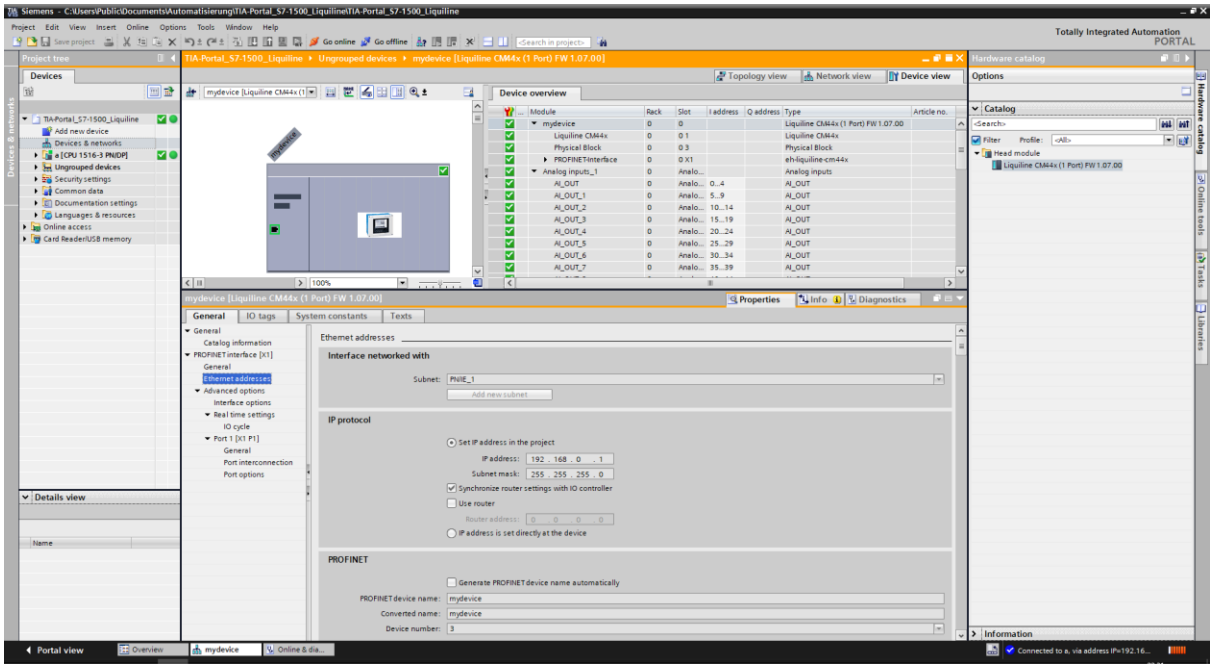
Parameter	Access	Options	Info
Device menu: Setup/General Settings/Extended setup/PROFINET:			
Name of Station	Read only	Max. 240 characters	PROFINET name of the device.
Device menu: Setup/General Settings/Extended setup/Ethernet:			
Enable	Read only	Off On (default)	The Ethernet interface is disabled The Ethernet interface is enabled
Device menu: Setup/General Settings/Extended setup/Ethernet/Settings:			
IP-Address mode	Read only	DCP	Network settings are obtained by the PROFINET DCP service.
Device menu: Diagnostics/System information/PROFINET:			
Name of Station	Read only	Max. 240 characters	PROFINET name of the device.
Device menu: Diagnostics/System information/Ethernet:			
Enable	Read only	Off On (default)	The Ethernet interface is disabled The Ethernet interface is enabled
Webserver	Read only	Off On (default)	The web server is disabled The web server is enabled
IP-Address	Read only	???.???.???.???	IP address, Default value 0.0.0.0
Subnet mask	Read only	???.???.???.???	Subnet mask, Default value 255.255.255.0
Gateway	Read only	???.???.???.???	IP address of default gateway, Default value 0.0.0.0
MAC address	Read only	??:??:??:??:??:??	The MAC address cannot be changed. The MAC address is printed on the nameplate of the module on which the Ethernet port is located. In addition, the MAC address is printed on the inside of the display unit.
Webserver TCP Port	Read only	80	Fixed value

3.1.2 Simatic TIA portal

PROFINET devices are identified through a unique device name on the network.

Assign a unique *Name of station* (Device name) to the Liquiline device. In the following example "mydevice" is used. In TIA portal Name of station is simply called Name and is in the device properties in the General section.

Check the automatically issued IP address in *PROFINET interface [X1] > Ethernet addresses* and modify if necessary. The PROFINET controller and the Liquiline device must be on the same subnet.



3.1.3 Assigning Device name to Liquiline device online

The Ethernet interface of the Liquiline products has a unique MAC address, which is printed on the side of the base module and on the label on the inside of the LCD display unit. The MAC address can be also obtained from the device menu: *> Setup > Extended setup > Ethernet > Settings > MAC address*

The following sub chapters describe how to set the device name and IP address with two common tools.

3.1.3.1 TIA-Portal

Connect the Liquiline device to the PROFINET network.

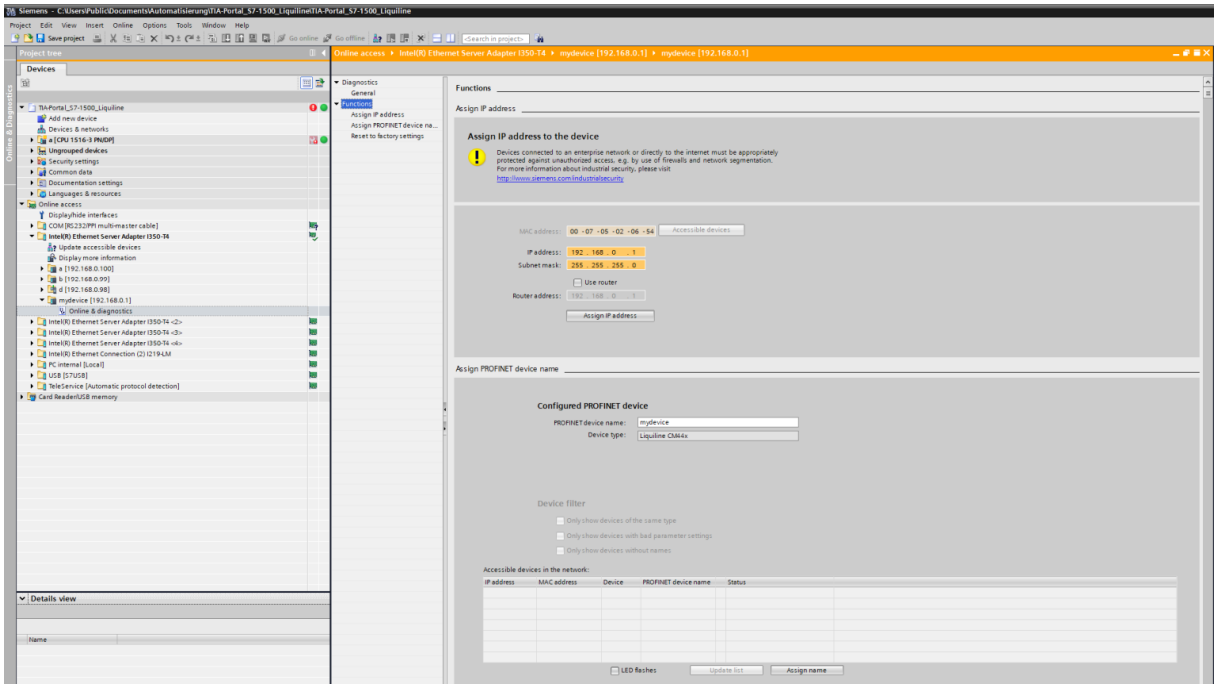
There are multiple ways to set the device name within TIA portal. In this manual we describe only one the possibilities. Please see the documentation of your engineering tool for more information.

Select *Online access > Network interface* to which the device is connected.
Double-click *Update accessible devices* to get a list of reachable devices

The Liquiline device will show up and can be identified by its unique MAC address.

Double-click *Online & diagnostics* to open the settings.

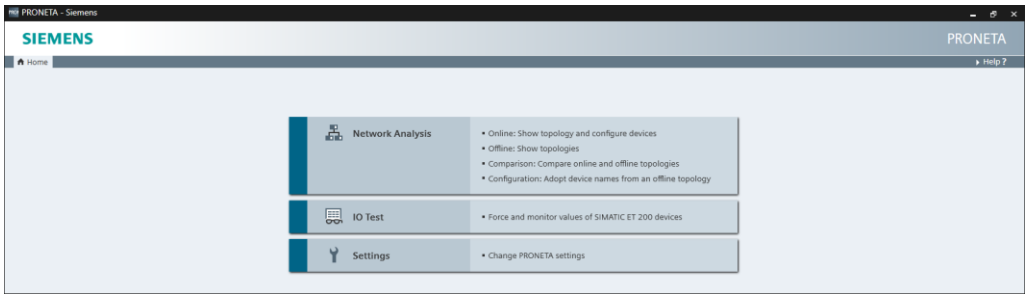
Open *Functions* to assign the Device name and IP address to the device which was earlier defined in the project.



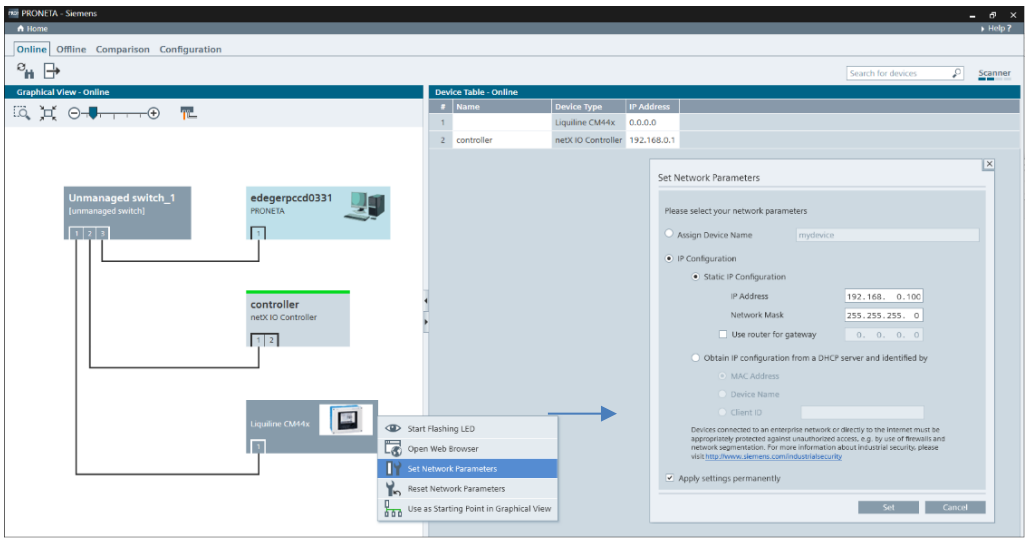
Download the project to the controller and verify that the communication is working.

3.1.3.2 SIEMENS PRONETA©

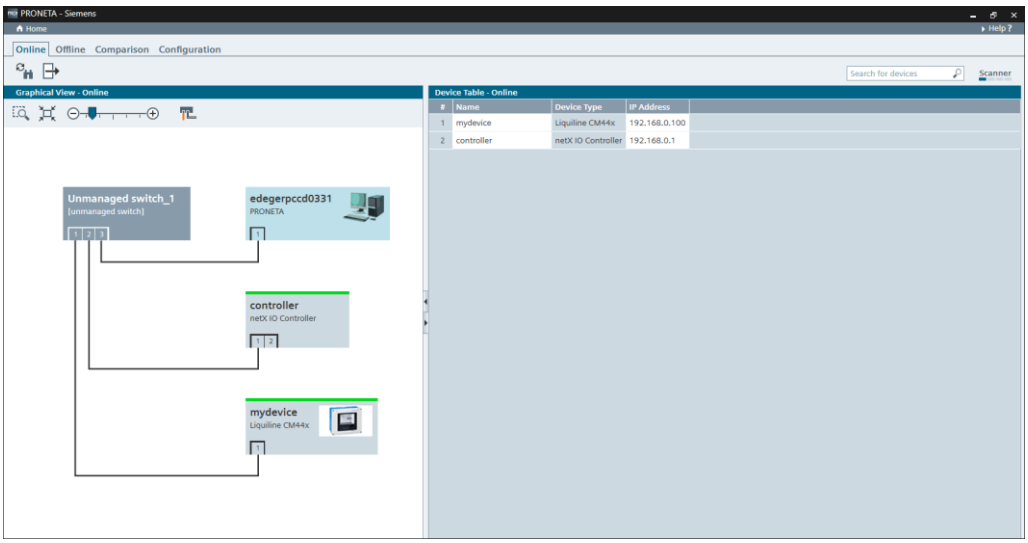
SIEMENS PRONETA© is a free PC-based software tool which helps regarding the commissioning of PROFINET plants before a CPU has been linked up with the network. It can be used without a plc is on the network.



Open *Network Analysis*.



Open *Set Network settings* and enter information for *Name of station* and/or *IP settings*. Send information. The updated information is displayed.



The device has now a valid IP address. If the device has a valid license for the integrated web server, you can access the web server directly from the context menu of SIMATIC PRONETA©.

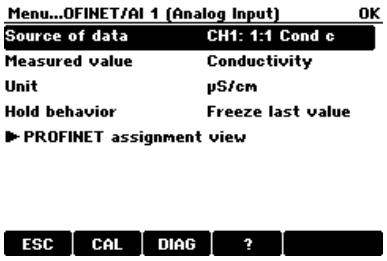
3.2 Configuration of data for PROFINET cyclic data transfer

In addition to integration of the device into the PROFINET system the data included in the cyclic data exchange are selected in the device menu either at the device or remotely using the device web server.

The Liquiline device platform is based on a modular multi-channel, plug & play sensor concept. Therefore, there is no general relationship between the sensor measured value and a device variable. A device variable acts as a kind of place holder for measured values or actuating values that can be transmitted via PROFINET communication. The following device variables are available:

Abbreviation	Name	Info	Example
AI1 to AI16	Analog Input	Device variable read from the device	Read measured value
DI1 to DI8	Digital Input	Device variable read from the device	Read relay status
AO1 to AO4	Analog Output	Device variable written to the device	External controlled variable
DO1 to DO8	Digital Output	Device variable written to the device	Start cleaning

3.2.1 Select data sources for device variables AI-x (Analog Inputs)



Step	Device menu	Action
1	/Setup/Outputs/PROFINET	Select the AI or DI device variable
2	.../AI-x/Source of data	Select a data source, for example a sensor
3	.../AI-x/Measured value	Select a measured value of the selected sensor
4	.../AI-x/Unit	Select unit for AI output value
5	.../AI-x/Hold behavior	Select the hold behavior, if data source is in Hold

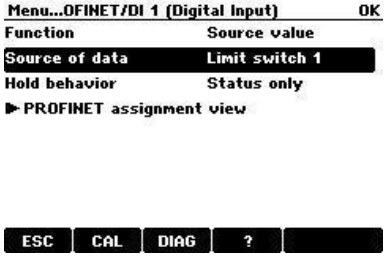
Function	Options	Info
Source of data	Options • None • Any data source Factory setting • None	The data sources presented for selection depend on your device version. You can choose from all the sensors connected to the inputs, controllers as well as mathematic functions and current inputs. For more information and an overview about the available options see main operation manual.
Measured value	Options • None • Depends on the data source Factory setting • None	The measured value that you can choose depends on the option selected under "Source of data". For more information and an overview about the available options see main operation manual.
Unit	Options	

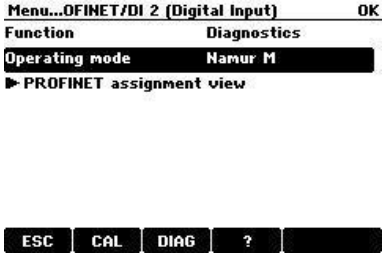
	• Any compatible unit	
Unit text	Textual unit	Visible only for user defined units
Hold behavior	Options • Freeze last value • Status only	Behavior in device or sensor hold state • The last value is hold • A hold does not affect the value

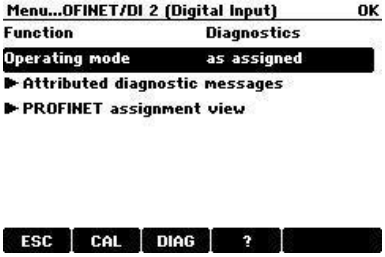
3.2.2 Select data sources for device variables DI (Digital Inputs)

Device variables DI can be used to send the following kinds of information to the PROFINET controller:

- Source value: Status, e.g. of a Limit Switch
- Diagnostics > Namur: Namur NE107 status signal (F/C/S/M)
- Diagnostics > as assigned: Status (True/False) of diagnostic codes





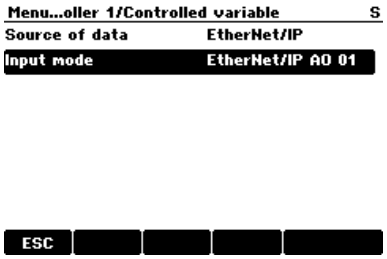


Step	Device menu	Action
1	/Setup/Outputs/PROFINET	Select the AI or DI device variable
2	.../DI-x/Source of data	Select a data source, for example a sensor
3	.../DI-x/Measured value	Select a measured value of the selected sensor
4	.../DI-x/Unit	Select unit for AI output value
5	.../DI-x/Hold behavior	Select the hold behavior, if data source is in Hold

Function	Options	Info
Function	Options • Off • Source value • Diagnostics Factory setting • Off	
If Function = Source value:		
Source of data	Options • None • Limit switches • Alarm relay • Relay • Binary inputs Factory setting • None	The data sources presented for selection depend on your device configuration. For more information see operating manual.
If Function = Diagnostics:		
Operating mode	Options • as assigned • Namur M • Namur S • Namur C • Namur F	For more information see operating manual.

Function	Options	Info
	Factory setting • as assigned	
Hold behavior	Options • Freeze • None Factory setting • None	For more information see operating manual.

3.2.3 Select data sinks for device variables AO (Analog Outputs)



The value mapped to a device variable AO must be configured in the menu of the component using the device variable as input. A device variable AO is used to transmit an analog value to the measuring device instead of using a 4...20 mA current input of the measuring device.

A device variable AO correspond to a current input and has the same connection possibilities.

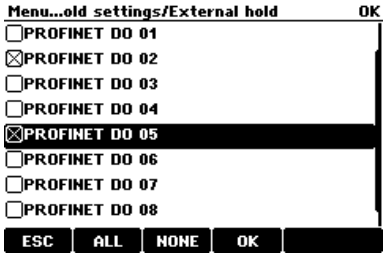
The value is transmitted along with a status via PROFINET. Therefore, set the status value to 128 (good). Otherwise the value will not be used as valid input by the function.

Table 2 List of data sinks for device variables AO (Analog Outputs)

CM44x	CM44P	CSFxx	CA80	Menu
x	x	x	x	Setup/Additional functions/Controllers/Controller x/Disturbance variable/Source of data
x	x	x	x	Setup/Additional functions/Limit switches/Limit switch x/Source of data
x	x	x	x	Setup/Additional functions/Mathematical functions/MF x/Formula
x	x	x	x	Setup/Inputs/Oxygen/Extended setup/Input pressure[1]
x	x	x	x	Setup/Outputs/Current output x/Input variable[2]

[1] Visible if parameter “Medium pressure” is set to “Measured value”
[2] Visible if parameter “Source of data” is set to “PROFINET”

3.2.4 Device functions accepting DO device variables as input value



The value mapped to a device variable DO must be configured in the menu of the component using the device variable as input. A device variable DO is used to transmit an analog value to the measuring device instead of using a binary input of the measuring device.

A device variable DO correspond to a binary input and has the same connection possibilities.

Table 3 List of data sinks for device variables DO (Digital Outputs)

CM44x	CM44P	CSFxx	CA80xx	Menu
x	x	x	x	Setup/General settings/Logbooks/Data logbooks/Source of data
x	x	x	x	Setup/Operation/User ... screens/Screen x/Line y/Source of data
x	x	x	x	Setup/Additional functions/Controllers/Controller x/Controller Enable
x	x	x	x	Setup/Additional functions/Mathematical functions/MF x/Formula
x	x	x	x	Setup/Inputs/Sensor x/Extended setup/External hold
x	x	x	x	Setup/Additional functions/Cleaning/Cleaning x/Start signal
x	x	x	x	Setup/Additional functions/Diagnostic modules/Diagnostic module x/Input variable[1]
x	x	x	x	Setup/General settings/Hold settings/External hold
x	x	x	x	Setup/Inputs/Sensor x/Extended setup/External hold
x	x			Setup/Additional functions/Measuring range switch/MRS set x/Binary input x
		x		Setup/Sampling programs/Advanced program/Start condition
		x		Setup/Sampling programs/Advanced program/Stop condition
		x		Setup/Sampling programs/Advanced program/Setup Subprogram/Enable subprogram
		x		Setup/Sampling programs/Advanced program/Setup Subprogram/Sampling signal[2]
		x		Setup/General settings/Sampling/Ext. Program Pause
		x		Setup/General settings/Sampling/Ext. Program Hold
		x		Setup/Sampling programs/Advanced program/Setup Subprogram/Subprogram/Setup subprogram/Subprogram x/Bottle change signal[3]
		x		Setup/Sampling programs/Advanced program/Setup Subprogram/Subprogram/Setup subprogram/Subprogram x/Activation signal[4]
			x	Setup/Analyzer/Extended setup/Signal for process access
	x			Setup/Inputs/Photometer/Input variable[5]

[1] visible, if parameter "Source of data" is set to "PROFINET"
[2] visible, if parameter "Sampling mode" is set to "PROFINET"
[3] visible, if parameter "Bottle change mode" is set to "PROFINET"
[4] visible, if parameter "Enable subprogram" is set to "PROFINET"
[5] visible, if parameter "Lamp control input" is set to "PROFINET"

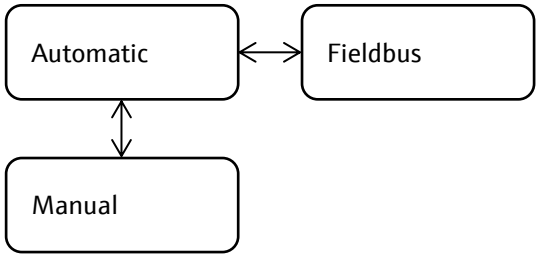
3.2.5 Communication loss behavior

If PROFINET communication fails, all AO/DO device variables assume the status BAD and are thereby marked as invalid for processing within the device.

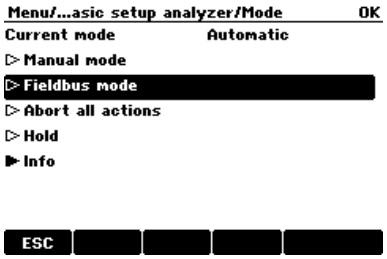
3.3 Liquiline CA80xx Analyzer Remote Control

This chapter applies only to the Liquiline CA80xx analyzer.

3.3.1 Operating modes



The operating modes menu can be accessed by the softkey “MODE”.



The *manual mode* of the analyzer is reserved for maintenance and repair work. This work must be done locally at the device, possibly by removing and replacing parts. Remotely requested activities cannot be allowed to interfere with this work and therefore are denied. Furthermore, it must not be possible to switch from manual mode to any other mode by remote command.

In *fieldbus mode*, all activities are started by explicit request from the remote operator. Before and after each activity, the analyzer is in an idle state and awaits the next command. When an activity is requested, it is immediately executed if the analyzer is idle, otherwise it is denied because the device is busy. Requests for unsupported activities are also denied.

In automatic mode, activities are normally triggered in regular intervals by the analyzer. Remotely requested activities shall be executed in addition to the regular scheduled activities. When an activity is requested, it is immediately executed if the analyzer is idle, otherwise it is placed in a queue for later execution -- the same queue that is used to serialize activities scheduled for the same time.
New activities are added to the queue in the order in which they are requested. To prevent unlimited growth of the queue, a remote request for an activity is denied (for reason "system is busy"), if another instance of the same type of activity is already present in the queue.
Only one measurement of any sample channel can be added to the queue: For example, a request to measure SP2 will be denied if a measurement of SP1 is already in the queue.
Different calibration types are treated as different types of activities, even if "Calibration" includes a "Zero calibration" and a "Slope calibration". It is therefore possible for a Calibration, a Zero calibration and a Slope calibration to be in the queue at the same time.

The operation mode can be changed at any time using the device menu. The setting of the device menu has priority over the setting by PROFINET. This is a safety measure to prevent the start of actions over PROFINET while the analyzer is in operation mode “Manual” during maintenance work.
A change from “Manual” directly to “Fieldbus” is now allowed by PROFINET. PROFINET can only change the operation mode from “Automatic” to “Fieldbus”.

3.3.2 Remote triggering of activities

The following activities can be remotely triggered if they are supported for the given device type and hardware configuration. The term "remotely requested activity" in this document stands for any activity from this list.

- Measurement of a given sample channel. Instead of a specific sample channel, a measurement can also be requested to use the next channel from the channel sequence list. "Grab sample" is not supported, as it must be connected locally to the analyzer.
- Calibration executes the same method of calibration used in automatic mode. Depending on the device type and setup, it may be either a 1-point or a 2-point calibration. The result is evaluated according to the same rules and stability limits as in the automatic mode. If a calibration step fails, it is repeated according to the rules used in automatic mode. (The max. number of repetitions is given by the Calibration trials parameter.)
- Zero Calibration: Executes a zero calibration, if an *automatic* zero calibration method is supported by the device (i.e. a zero standard solution is permanently connected). The result is evaluated according to the stability limits for the zero calibration. If the zero calibration fails, it is repeated according to the rules used in automatic mode. (The max. number of repetitions is given by the Calibration trials parameter.)
- Slope Calibration: Determines a new calibration factor. The result is evaluated according to the stability limits for the calibration factor. If the slope calibration fails, it is repeated according to the rules used in automatic mode. (The max. number of repetitions is given by the Calibration trials parameter.)
- Reference sample inspection: Executes a reference sample inspection, if supported by the device. The result is evaluated according to the acceptance limits. If the reference sample inspection fails, it is *not* repeated and does not trigger a calibration attempt.
- Cleaning: Executes the analyzer cleaning routine if supported by the device.

The following parameters can be used to remotely control these actions.

API	Slot	Subslot	Index	Parameter	Type	R/W	Description
0	1	9	9058	SP_FOR_FIELDBUS_ACTIVITIES	UINT8	R/W	Sample channel (SPx) for remotely triggered activities. 0: Next channel from channel sequence list 1: SP1 2: SP2 3: SP3 4: SP4 5: SP5 6: SP6 Factory default: 0
0	1	9	9402	ANALYZER_REQUEST	UINT8	R/W	This parameter is used to request an analyzer activity. 0: None 1: Start Measurement 2: Start Calibration 3: Start Cleaning 4: Start Reference sample inspection 5: Start Zero calibration 6: Start Slope calibration

API	Slot	Subslot	Index	Parameter	Type	R/W	Description
0	1	9	9901	ACTIVITY_REQUEST_STATUS	UINT8	R	This parameter reads the status of processing the requested function. 0: Ready to start action. This state is entered, if the analyzer enters fieldbus mode, while nothing is running that disturbs the start of any function via fieldbus. 1: Action request accepted, but not yet started (request was inserted into the queue in automatic mode) 2: No request allowed, because the analyzer is in manual mode. 32: Current action abort in progress 33: Measurement in progress 34: Calibration in progress 35: Cleaning in progress 36: Reference sample inspection in progress 37: Zero calibration in progress 38: Slope calibration in progress 64: Last activity was aborted 65: Measurement finished successfully 66: Calibration finished successfully 67: Cleaning finished successfully 68: Reference sample inspection finished successfully 69: Zero calibration finished successfully 70: Slope calibration finished successfully 96: Reference sample inspection failed 97: Measurement failed 98: Calibration failed 99: Cleaning failed 100: Zero calibration failed 101: Slope calibration failed
0	1	9	3505	CURRENT_ACTIVITY	UINT8	R	0: None (factory default) 1: Measurement 2: Calibration 3: Cleaning 4: --- 5: --- 6: Emptying SC 7: --- 8: --- 9: Empty hoses 10: Initializing 11: Cleaning up 12: Cleaning sample preparation 13: Dispenser replacement up 14: Dispenser replacement down 15: Testing liquid manager actuator 16: Bottle insertion 17: Bottle removal 18: Open valves 19: Close valves 20: Rinse reagents 21: Rinse with water 22: Commissioning 23: Empty reactor 24: Empty dosing unit 25: Empty dilution module 26: Rinse analyzer 27: Reactor heating test 28: Reactor pressure test 29: Custom 30: Rinsing 31: Rinsing 32: Rinsing 33: Rinsing

API	Slot	Subslot	Index	Parameter	Type	R/W	Description
							34: Preparing 35: Service function 1 36: Service function 2 37: Service function 3 38: Service function 4 39: Service function 5 40: Dispenser test 41: Dispenser test 42: Grab sample meas. 43: Reference sample inspection 44: Manual reference sample inspection

3.3.3 Aborting remotely requested activities

In *manual mode*, every abort request is denied, because remotely triggered activities are not allowed in the first place.

In *fieldbus mode*, the abort request acts on the currently running analyzer activity. If the analyzer is idle, the abort request is silently ignored.

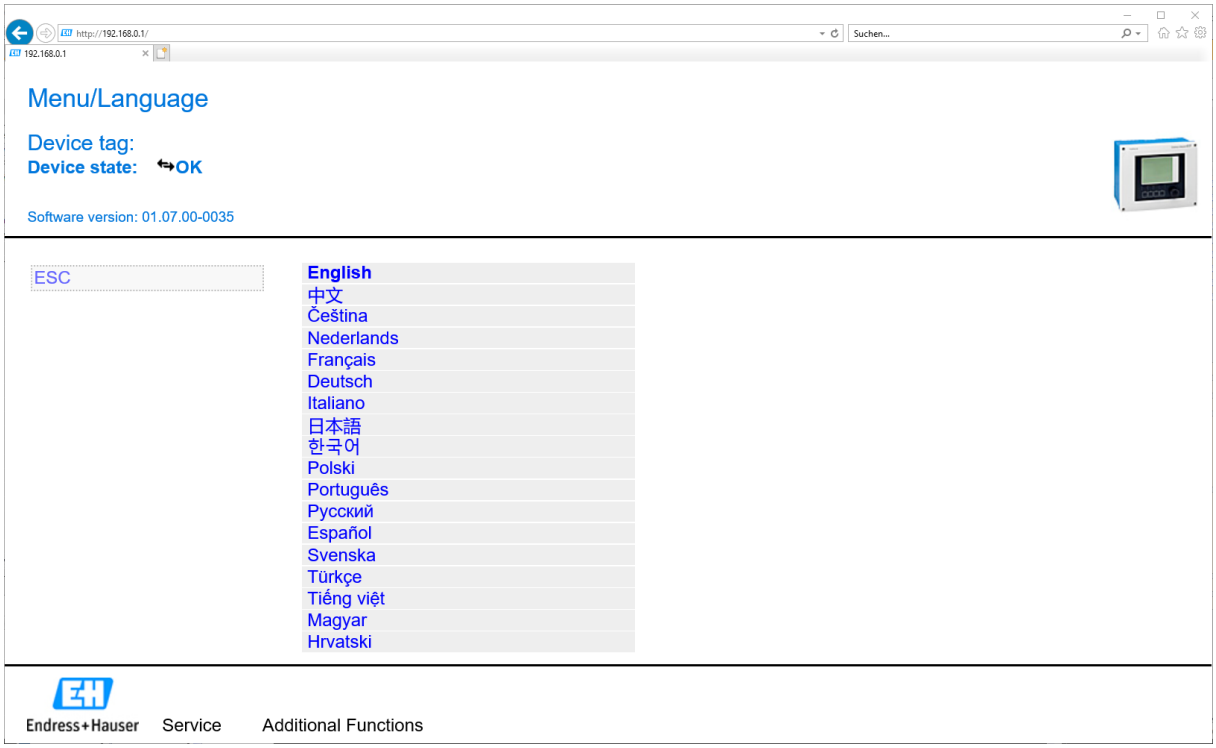
In *automatic mode*, the abort request acts on the currently running analyzer activity (no matter if this activity was remotely requested or triggered by timer), and it removes all remotely requested activities from the queue (but not the timer-triggered activities). This allows the remote operator to clear all previous requests from the queue, if necessary. If the analyzer is idle, the abort request is silently ignored.

API	Slot	Subslot	Index	Parameter	Type	R/W	Description
0	1	9	3537	COMMON_REQUEST	UINT8	R/W	Abort current activity 0: None 1: Abort current action

4 Web server

4.1 Function description

The local device operation can be accessed using the integrated device web server. All languages of the local operation system are supported.



4.2 Web server login

The following access data are pre-programmed into the device when the device is delivered:

Username:	admin
Password:	admin

Please note that communication via the HTTP protocol is not encrypted. The username and the password are transmitted as non-encrypted information.

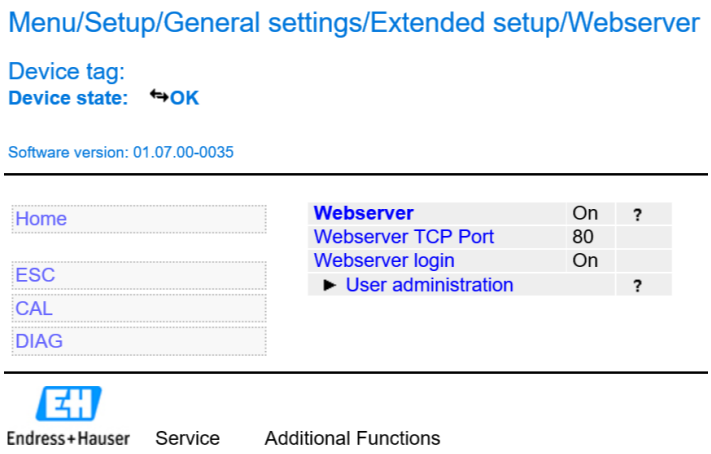
4.3 Security

Please note that HTTP communication including the login information is not encrypted on the network.

You can disable the Web server via the menu:

Setup > General settings > Extended setup > Webserver > Webserver (on/off)

4.4 Web server settings

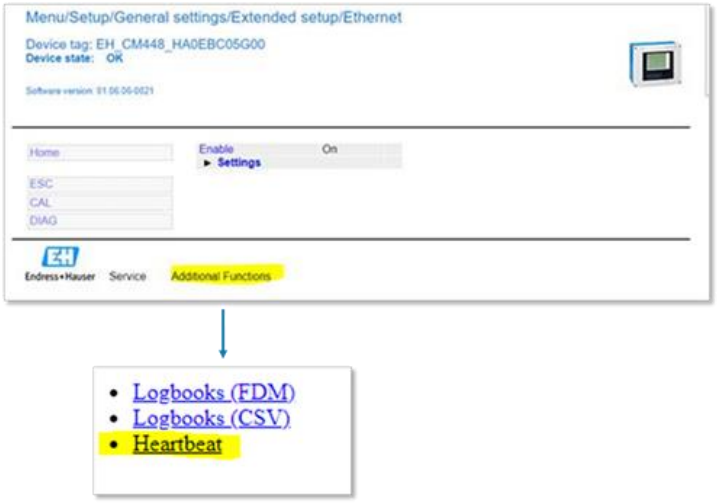


Parameter	Options	Info
Web server	On (default) Off	When the Web server is disabled it is not possible to access the Web server via any interface (Ethernet, CDI or DTM).
Web server TCP port	80	Fixed value
Web server login	On (default) Off	
User administration	Wizard	You can change the username and/or the user password. You require the access data that are currently valid to change the name/password.

4.5 Exporting Heartbeat Verification Report

The last Heartbeat Verification Report can be downloaded from:

http://<IP-Adresse>/heartbeat.fhtml



4.6 Exporting PROFINET GSD file

The GSD.zip file can be downloaded from the web server:

http://<ip-address>/userfiles/GSD.zip

4.7 Exporting device logbooks

The logbooks can be exported via the Web server and saved to a PC. Open a Web browser and enter one of the following URLs to get to an overview page.

http://<IP address>/logbooks_csv.fhtml	This file format can be read with any text editor or can be imported into Microsoft Excel, for instance. Separator: ";"
http://<IP address>/logbooks_fdm.fhtml	This data format can be imported into the Endress+Hauser Field Data Manager Software: http://www.endress.com/MS20

The user must be logged in to view the logbook overview. The individual logbooks can be downloaded directly without the need to log in beforehand.

The logbooks can be downloaded in two file formats:

- *.csv comma separated values
- *.dat Endress+Hauser Field Data Manager Software

Table 4 Logbook URLs for direct download

*.csv	*.dat
http://<IP address>/Calibration_logbook.csv	http://<IP address>/Calibration_logbook.dat
http://<IP address>/Diagnostic_logbook.csv	http://<IP address>/Diagnostic_logbook.dat
http://<IP address>/Configuration_logbook.csv	http://<IP address>/Configuration_logbook.dat
http://<IP address>/HW_version_logbook.csv	http://<IP address>/HW_version_logbook.dat
http://<IP address>/Version_logbook.csv	http://<IP address>/Version_logbook.dat
http://<IP address>/Data0_logbook.csv	http://<IP address>/Data0_logbook.dat
http://<IP address>/Data1_logbook.csv	http://<IP address>/Data1_logbook.dat
http://<IP address>/Data2_logbook.csv	http://<IP address>/Data2_logbook.dat
http://<IP address>/Data3_logbook.csv	http://<IP address>/Data3_logbook.dat
http://<IP address>/Data4_logbook.csv	http://<IP address>/Data4_logbook.dat
http://<IP address>/Data5_logbook.csv	http://<IP address>/Data5_logbook.dat
http://<IP address>/Data6_logbook.csv	http://<IP address>/Data6_logbook.dat
http://<IP address>/Data7_logbook.csv	http://<IP address>/Data7_logbook.dat

5 Diagnostics

5.1 Communication status

5.1.1 Communication Icon

The communication icon ⇆ in the status bar signals access via PROFINET. The communication icon is not triggered by other protocols like e.g. communication with the device web server.

5.1.2 Light Emitting Diodes - LEDs

LED	Name	Behavior	Meaning
RJ45	LNK/ACT	Green	Off = Connection is not active On = Connection is active Flashing = Data transmission
	10/100	Yellow	Off = Transmission rate 10 MBps On = Transmission rate 100 MBps
COM	IO-AR established	Green solid	
	Acyclic Read/Write	Green 0.5 s on/off	
	Error in Connection	Red 3 s	IO-Connection is not accepted
	Acyclic Read/Write Error	Red 0.5 s on/off	Acyclic access returned with error
	Flash Once	Green on/off 0.5 s for 1 s	
		Green on/off 0.5 s for 1 s	
Status	Failure	Red	
	Function check	Red, blinking, 1 Hz	
	Out of specification	Red, blinking, 1 Hz	
	Maintenance required	Green, blinking, 1 Hz	
	Ok	Green, on	

5.2 Diagnostic information via Web server

The device status is displayed in the header.

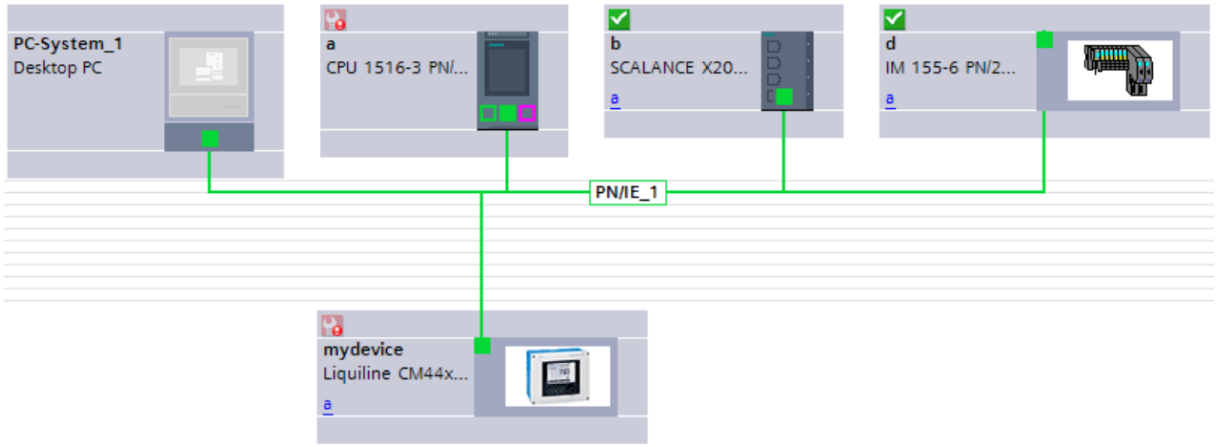
Figure 1 left: device status = ok, right: device status = failure (F)

A complete list of all the active diagnostic messages is provided in the Diagnostics menu.

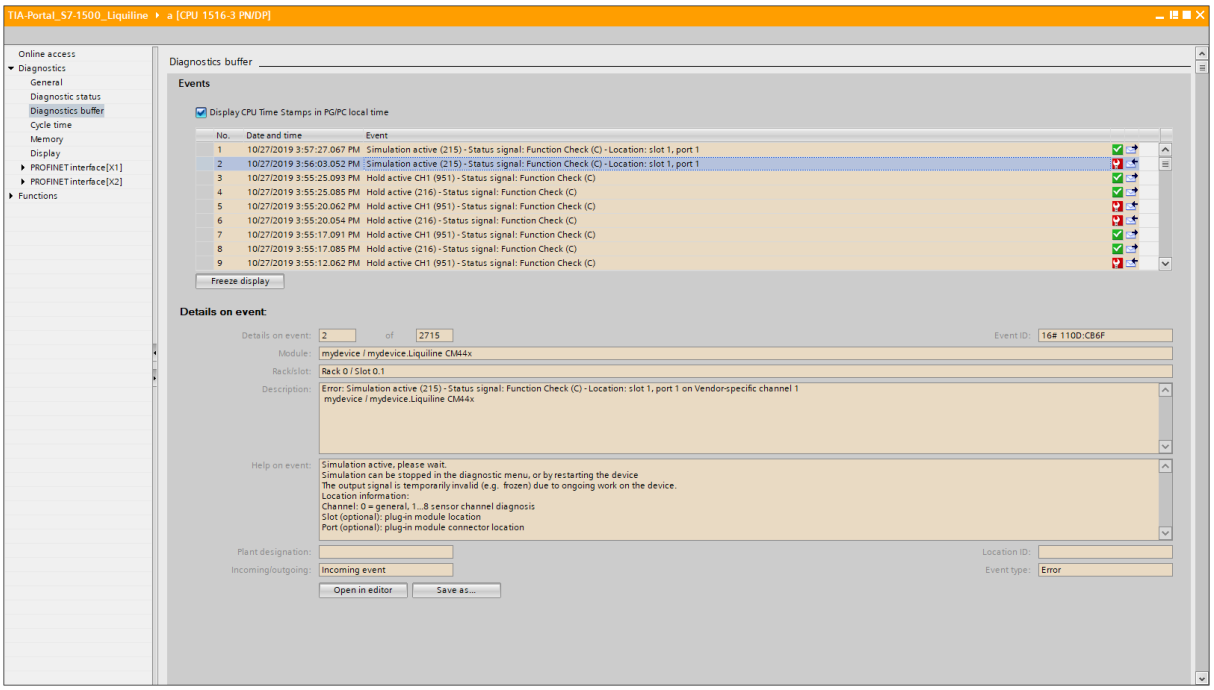
Previous diagnostic events can be displayed via the diagnostic logbook.

5.3 Diagnostic information via PROFINET

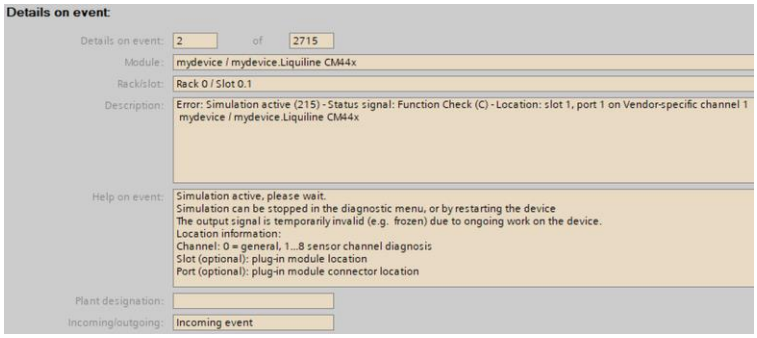
Diagnostic events are transmitted as Alarms to the PROFINET controller and displayed, e.g. in TIA-Portal:



Open the diagnostic buffer of the controller by double-clicking the red symbol next to the controller icon.



The GSD file of the Liquiline products contain the text and help text for each diagnostic code. The display of this information depends on your engineering tool.



Entry in device diagnostic list:

C215 CH1 1:1

"Function Check"
"Simulation active" at sensor channel 1 connected to Memosens port 1 of Memosens module located in Slot 1

5.4 SNMP (Simple Network Management Protocol)

Simple Network Management Protocol (SNMP) is an Internet Standard protocol for collecting and organizing information about managed devices on IP networks.

The password for read access is “public” and cannot be changed.

This device supports SNMP v1 and supports the following MIBs (management information base):

- MIB2
- LLDP MIB
- LLDP-EXT-DOT1-MIB
- LLDP-EXT-DOT3-MIB
- LLDP-EXT-PNIO-MIB

6 Appendix

6.1 Technical data

Protocol	**"Application layer protocol for decentral device periphery and distributed automation", PNIO Version 2.34**
Communication type	100 MBit/s
Conformity class	Conformance Class B
Netload Class	Netload Class III
Baud rates	Automatic 100 Mbit/s with full-duplex detection
Cycle times	From 32 ms
Polarity	Autopolarity for automatic correction of crossed TxD and RxD pairs
Device profile	Application interface identifier 0xF600 Generic device
PROFINET Interface	1 Port, Realtime Class 1 (RT_CLASS_1)
Manufacturer ID	0x11
Device type ID	0x859C / 0x859D / 0x859F
Device type	Liquiline CM44x / Liquistation CSFxx
Device description files (GSD)	Information and files under: ▪ www.endress.com On the product page for the device: Documents/Software → Device drivers ▪ www.profibus.com On the device product page under Products/Product Finder
Supported connections	▪ 1 x AR (IO Controller AR) ▪ 1 x AR (IO-Supervisor Device AR connection allowed) ▪ 1 x Input CR (Communication Relation) ▪ 1 x Output CR (Communication Relation) ▪ 1 x Alarm CR (Communication Relation)
Configuration options for measuring device	▪ Local display with keys and navigator ▪ Web Browser ▪ Manufacturer specific software (FieldCare, DeviceCare)
System integration options	General Station Description (GSD)
Configuration of device name	DCP protocol
Supported functions	▪ Identification & Maintenance Simple device identification via: – Control system – Nameplate ▪ Measured value status The process variables are communicated with a measured value status ▪ Blinking feature (DCP.service.flash) via the onsite display and device LEDs for simple device identification and assignment

6.2 Data types

6.2.1 Coding of DS-101: Value & Status (Floating Point structure)

This data structure consists of the values and the state of the Floating-Point parameters. These parameters can be inputs or outputs.

Byte	Element Name	Data Type	Size	Description
0…3	Value	Float32	4	Floating-Point number (IEEE 754)
4	Status	Unsigned8	1	Status byte (compliant with PA-Profile 4.0)

6.2.2 Coding of DS-105: Value & Status (Enumerated structure)

This data structure consists of the value and state of the discrete value parameters.

Byte	Element Name	Data Type	Size	Description
0	Value	Unsigned8	1	0…255 (>1: TRUE, =0: FALSE)
1	Status	Unsigned8	1	Status byte (compliant with PA-Profile 4.0)

6.2.3 Coding of DATE_AND_TIME

DATE_AND_TIME
Data length = 7 bytes

Byte	Bit								Description
	7	6	5	4	3	2	1	0	
0	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	0 … 59999 ms
1	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	
2	0	0	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	0 … 59 min
3	S	0	0	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	Bits 0 to 4: 0 … 23 h S=0: standard time, S=1: summertime
4	2^{2}	2^{1}	2^{0}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	Bits 6 to 8: 1…7 day of week (1=Monday, 7=Sunday) Bits 1 to 5: 1…31 day of month
5	0	0	0	0	2^{3}	2^{2}	2^{1}	2^{0}	Month (1…12)
6	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	Year (0…255) / 0 = 1900

6.2.4 Coding of PA_UNIT

Enumeration of data type Unsigned16 which contains a unit code defined in chapter 6.4.

6.2.5 Coding of VisibleString

Unused characters of VisibleString parameters shall be set to 0x20 (space). The string does contain only printable characters and is not null terminated.

6.2.6 Coding of OctetString

Unused characters of OctetString parameters shall be set to 0x00 (zero). The string does contain any values.

6.2.7 Coding of EDDL_DURATION

Byte	Bit								Description
	7	6	5	4	3	2	1	0	
0	2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}	Number of milliseconds (of one day)
1	2^{23}	2^{22}	2^{21}	2^{20}	2^{19}	2^{18}	2^{17}	2^{16}	
2	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	
3	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	
4	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	Number of days
5	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}	

6.2.8 Coding of the status byte (device ⚲ controller)

The quality is encoded in the two most significant bits. Bit 0 indicates mars a simulated value.
b10xxxxxS = Good
b01xxxxxS = Uncertain
b00xxxxxS = Bad

The status byte send to the PROFINET controller can assume the following values.

Status		Quality	Sub status	Meaning
hex	dec			
0x81	129	Good	Simulation active	The measured value is a simulated value.
0x80	128	Good		The measured value is valid and can be used.
0x78	120	Uncertain		The reliability of the measured value is limited. Check the diagnostic messages of the device.
0x23	35	Bad	Passivated	No data source is configured in device menu.
0x24	36	Bad	Maintenance alarm	The measured value cannot be used. More diagnostic information is available.
0x24	36	Bad	Configuration Error	No data source has been selected. Check the device configuration (Section 3.2).

6.2.9 Status byte (controller → device)

Status		Quality	Usage of value by the receiving data sink, e.g. PID controller
hex	dec		
>= 0x80	>= 128	Good	The received value is valid and can be used.
< 0x80 >= 0x40	< 128 >= 64	Uncertain	Treated as Good or Bad status depending on the consuming data sink.
< 0x40	< 64	Bad	The value is invalid, and the fail-safe behavior of the data sink is triggered.

6.3 Diagnostic codes

The PROFINET Channel error number is equal the Diagnostic code of the Liquiline products plus 256.

Channel error number	Diagnostic code	Short text
258	2	Sensor unknown
260	4	Sensor defective
261	5	Sensor data invalid
266	10	Sensor scanning
268	12	Writing data failed
269	13	Sensor type wrong
274	18	Sensor not ready
278	22	Temperature sensor
317	61	Sensor electronic
318	62	Sensor connection
337	81	Initialization
356	100	Sensor communication
357	101	Sensor incompatible
358	102	Calibration timer
359	103	Calibration timer
360	104	Calibration validity
361	105	Calibration validity
362	106	Sensor TAG
363	107	Calibration active
364	108	SIP, CIP, autoclaving
365	109	SIP, CIP, autoclav cap
366	110	Init. channel
367	111	Operating time cap
369	113	Incompatible filter
370	114	Temp.offset high
371	115	Temp. offset low
372	116	Temp. slope high
373	117	Temp. slope low
374	118	Sensor glass break.
375	119	Sensor check
376	120	Sensor reference
377	121	Sensor reference
378	122	Sensor glass
379	123	Sensor glass
380	124	Sensor glass
381	125	Sensor glass
382	126	Sensor check
383	127	Sensor check
384	128	Sensor leakage
385	129	Sensor leakage
386	130	Sensor supply
387	131	Sensor calibration
388	132	Sensor calibration
389	133	Sensor signal
390	134	Sensor signal
391	135	Sensor temp. low
392	136	Sensor temp. high

393	137	Sensor LED
394	138	Sensor LED
396	140	Sensor check
397	141	Polarization
398	142	Sensor signal
399	143	Sensor check
400	144	Conductivity range
402	146	Sensor temperature
403	147	Sensor check
404	148	Sensor check
405	149	Sensor LED
406	150	Sensor check
407	151	Sensor buildup
408	152	Sensor data invalid
409	153	Sensor defective
410	154	Sensor data invalid
411	155	Sensor defective
412	156	Organic pollution
413	157	Filter change
414	158	Sensor check
415	159	Sensor check
416	160	Sensor data invalid
417	161	Filter change
418	162	Install.factor
419	163	Install.factor
420	164	Sensor data invalid
424	168	Polarization
425	169	Operating time
426	170	Operating time
427	171	Lamp change
428	172	Echo lost
429	173	Sludge level
430	174	Turbid. failure
431	175	Wiper failure
432	176	Operating time
433	177	Operating time
434	178	Operating time
435	179	Operating time
436	180	Operating time
437	181	Operating time
438	182	Operating time
439	183	Operating time
440	184	Operating time
441	185	Operating time
442	186	Operating time
443	187	Operating time
444	188	Operating time
445	189	Operating time
446	190	Operating time
447	191	Operating time
448	192	Operating time
449	193	Operating time

450	194	Operating time
451	195	Operating time
452	196	Operating time
453	197	Operating time
454	198	Operating time
455	199	Operating time
458	202	Selftest active
471	215	Simulation active
472	216	Hold active
497	241	Firmware failure
498	242	Firmware incomp.
499	243	Firmware failure
517	261	Electronics module
518	262	Module connection
519	263	Incomp. detected
540	284	Firmware update
541	285	Update failure
558	302	Battery low
560	304	Module data
561	305	Power consumption
562	306	Software error
566	310	Temperature sensor
567	311	Temperature sensor
568	312	Temperature sensor
569	313	Safety sensor
570	314	No sample flow
571	315	Refrigeration
572	316	Heating
573	317	Liquidsensor
574	318	Liquidsensor
575	319	Safety sensor
576	320	Safety sensor
577	321	Liquid sensor
578	322	Read sub-program
579	323	Write sub-program
580	324	Delete sub-program
581	325	Read subprogram list
582	326	Membrane pump
583	327	Air-Manager
584	328	Distribution arm
585	329	Pump failure
586	330	Membrane pump
587	331	Peristaltic pump
588	332	Peristaltic pump
589	333	Pressure sensor
590	334	Climate mod. defect.
591	335	Fan defective
593	337	Pump hose warning
594	338	Pump hose alarm
595	339	Liquidsensor warning
596	340	Liquidsensor
599	343	Power supply

600	344	Program pause
601	345	Time changeover
602	346	Time changeover
603	347	No sample confirm.
604	348	Read program
605	349	Write program
606	350	UPS Battery
607	351	Delete program
608	352	Read Programlist
609	353	Overfill check
610	354	Bottle check
611	355	Start time over
612	356	Overfill check
613	357	Sampling faulted
614	358	Configuration
615	359	Emptying error
616	360	Cooling/Heating
617	361	Cooling/Heating
618	362	Photometer temp.
619	363	Photometer temp.
620	364	Timeout dosing
621	365	Photometer comm.
622	366	Dosing unit defect.
623	367	Module connect.
624	368	Reactor temp. low
625	369	Reactor temp. high
626	370	Internal voltage
628	372	Dosing failure
629	373	Electronictemp. high
630	374	Sensor check
631	375	No 4R module
632	376	Waste canister
633	377	Waste canister
634	378	Safety cover open
635	379	Safety cover defective
636	380	Temperature sensor
637	381	Valve malfunction
639	383	Unspecific failure
640	384	Unspecific failure
641	385	Heating temp. low
642	386	Heating temp. high
643	387	Function check active
657	401	Factory reset
659	403	Device verification active
661	405	Service IP active
662	406	Param. active
664	408	Calibration aborted
668	412	Writing backup
669	413	Reading backup
711	455	Mathemat. function
716	460	Output below limit
717	461	Output above limit

756	500	Sensor calibration
757	501	Sensor calibration
758	502	No text catalog
759	503	Language change
761	505	Sensor calibration
763	507	Sensor calibration
765	509	Sensor calibration
767	511	Sensor calibration
769	513	Zero warning
771	515	Sensor calibration
773	517	Sensor calibration
774	518	Sensor calibration
776	520	Sensor calibration
778	522	Sensor calibration
785	529	Diag. setup active
786	530	Logbook at 80%%
787	531	Logbook full
788	532	License error
790	534	Electrolyte warning
791	535	Sensor check
792	536	SD card filled 80%%
793	537	SD card filled 100%%
794	538	SD card missing
796	540	Parameter save fail
797	541	Parameter load ok
798	542	Parameter load fail
799	543	Parameter load abort
800	544	Parameter reset ok
801	545	Parameter reset fail
806	550	Process temperature
807	551	Process temperature
808	552	Conductivity low
809	553	Conductivity high
810	554	Concentration low
811	555	Concentration high
812	556	Temperature low
813	557	Temperature high
814	558	Conductivity low
815	559	Conductivity high
816	560	Conduc. compensation
817	561	Conduc. compensation
821	565	Configuration
822	566	Package incompatible
823	567	Factory calibration
824	568	Invalid debug log configuration
970	714	Filter mats change
971	715	Calibration expired
972	716	Calibration failed
973	717	Photometer defective
974	718	Cuvette covering
975	719	Cuvette covering
976	720	Membrane change

978	722	Sensor reference
979	723	Sensor reference
980	724	Sensor reference
981	725	Sensor reference
982	726	Liquids warning
983	727	Liquids alarm
984	728	Level cleaner C
985	729	Filter candle change
986	730	Cleaning solution
987	731	Leakage detected
988	732	Wear parts alarm
989	733	Wear parts warning
990	734	Calibration quality
991	735	Inspection failed
992	736	Final inspec. failed
996	740	Sensor defective
1026	770	Sensor deactivated
1027	771	Lamp change
1028	772	Lamp change
1029	773	Lamp change
1030	774	Lamp defective
1088	832	Temp. range exceeded
1097	841	Operating range
1098	842	Process value
1099	843	Process value
1100	844	Process value
1159	903	Minimum flow
1160	904	Process check alarm
1162	906	Cat.exchanger failure
1163	907	Cat.exchanger warning
1164	908	IEX capacity low
1165	909	IEX capacity exhausted
1166	910	Limit switch
1170	914	USP/ EP alarm
1171	915	USP / EP warning
1172	916	EasyCal certificate
1176	920	No sample
1177	921	Pump bracket open
1178	922	Armature cycle
1179	923	Armature cycle
1180	924	Inline armature
1181	925	Inline armature
1182	926	Inline armature
1183	927	Winter operation
1184	928	No sample
1185	929	Input signal
1186	930	Sample flow
1187	931	Sampling time
1188	932	Cleaning failure
1190	934	Process temp. high
1191	935	Process temp. low
1192	936	Temp. range exceeded

1193	937	Controlled variable
1194	938	Controller setpoint
1195	939	Control. disturbance
1196	940	Process value
1197	941	Process value
1198	942	Process value
1199	943	Process value
1200	944	Sensor range
1201	945	pH value high
1202	946	pH value low
1207	951	Hold active CH1
1208	952	Hold active CH2
1209	953	Hold active CH3
1210	954	Hold active CH4
1211	955	Hold active CH5
1212	956	Hold active CH6
1213	957	Hold active CH7
1214	958	Hold active CH8
1216	960	Aux. voltage low
1217	961	%0V
1218	962	%0V
1219	963	%0V
1220	964	%0V
1221	965	%0V
1222	966	%0V
1223	967	%0V
1224	968	%0V
1225	969	Modbus Watchdog
1226	970	Curr. input overload
1227	971	Current Input low
1228	972	Curr. input > 20 mA
1229	973	Current Input < 4 mA
1230	974	Diagnostics confirm.
1231	975	Device restart
1232	976	PFM/PWM value high
1233	977	PFM/PWM value low
1234	978	ChemoClean Failsafe
1239	983	Sensor ISE check
1240	984	Process temperature
1241	985	Sensor Interface
1243	987	Calibration required
1246	990	Deviation limit
1247	991	CO2 conc. range
1248	992	pH calculation range
1249	993	rH calculation range
1250	994	Difference conduct.

6.4 Unit codes

PROFINET	Symbol	Name	Standard unit
1000	K	Kelvin	℃
1001	℃	Celsius	℃
1002	℉	Fahrenheit	℃
1005	°	Degree	°
1010	m	Meter	m
1011	km	KiloMeter	m
1012	cm	CentiMeter	m
1013	mm	MilliMeter	m
1015	nm	NanoMeter	m
1018	ft	Feet	m
1019	inch	Inch	m
1020	yd	Yards	m
1021	mi	Miles	m
1034	m^3	CubicMeter	m^3
1038	L	Liter	m^3
1040	ml	MilliLiter	m^3
1043	Cf	CubicFeet	m^3
1048	gal	Gallons	m^3
1054	S	Seconds	s
1056	ms	MilliSeconds	s
1057	µs	MicroSeconds	s
1058	min	Minutes	s
1059	h	Hours	s
1060	d	Days	s
1061	m/s	MeterPerSecond	m/s
1062	mm/s	MilliMeterPerSecond	m/s
1063	m/h	MeterPerHour	m/s
1066	in/s	InchPerSecond	m/s
1067	ft/s	FeetPerSecond	m/s
1069	inch/min	InchPerMinute	m/s
1072	inch/h	InchPerHour	m/s
1077	Hz	Hertz	Hz
1083	1/min	OnePerMinute	Hz
1097	kg/m^3	KiloGramPerCubicMeter	kg/m^3
1103	kg/l	KiloGramPerLiter	kg/m^3
1104	g/ml	GramPerMilliLiter	kg/m^3
1105	g/l	GramPerLiter	kg/m^3
1130	Pa	Pascal	Pa
1136	hPa	HectoPascal	Pa
1137	bar	Bar	Pa
1138	mbar	MilliBar	Pa
1209	A	Ampere	A
1211	mA	MilliAmpere	A

PROFINET	Symbol	Name	Standard unit
1212	µA	MicroAmpere	A
1213	nA	NanoAmpere	A
1214	pA	PicoAmpere	A
1221	Ah	AmpereHours	As
1240	V	Volt	V
1243	mV	MilliVolt	V
1244	µV	MicroVolt	V
1281	Ω	Ohm	Ω
1282	GΩ	GigaOhm	Ω
1283	MΩ	MegaOhm	Ω
1284	kΩ	KiloOhm	Ω
1285	mΩ	MilliOhm	Ω
1287	S	Siemens	S
1289	mS	MilliSiemens	S
1290	µS	MicroSiemens	S
1291	Ωm	OhmMeter	Ωm
1292	GΩm	GigaOhmMeter	Ωm
1293	MΩm	MegaOhmMeter	Ωm
1294	kΩm	KiloOhmMeter	Ωm
1295	Ωcm	OhmCentiMeter	Ωm
1296	mΩm	MilliOhmMeter	Ωm
1297	µΩm	MicroOhmMeter	Ωm
1298	nΩm	NanoOhmMeter	Ωm
1299	S/m	SiemensPerMeter	S/m
1300	MS/m	MegaSiemensPerMeter	S/m
1301	kS/m	KiloSiemensPerMeter	S/m
1302	mS/cm	MilliSiemensPerCentiMeter	S/m
1303	µS/mm	MicroSiemensPerMilliMeter	S/m
1342	%	Percent	%
1347	m^3/s	CubicMeterPerSecond	m^3/s
1348	m^3/min	CubicMeterPerMinute	m^3/s
1349	m^3/h	CubicMeterPerHour	m^3/s
1350	m^3/d	CubicMeterPerDay	m^3/s
1351	l/s	LiterPerSecond	m^3/s
1352	l/min	LiterPerMinute	m^3/s
1353	l/h	LiterPerHour	m^3/s
1354	l/d	LiterPerDay	m^3/s
1356	cfs	CubicFeetPerSecond	m^3/s
1357	cfm	CubicFeetPerMinute	m^3/s
1358	cfh	CubicFeetPerHour	m^3/s
1359	cfd	CubicFeetPerDay	m^3/s
1362	gps	GallonPerSecond	m^3/s
1363	gpm	GallonPerMinute	m^3/s
1364	gph	GallonPerHour	m^3/s
1365	gpd	GallonPerDay	m^3/s

PROFINET	Symbol	Name	Standard unit
1366	mgd	MegaGallonPerDay	m^3/s
1388	kg/mol	KiloGramPerMol	kg/mol
1389	g/mol	GramPerMol	kg/mol
1397	mol/m^3	MolPerCubicMeter	mol/m^3
1399	mol/l	MolPerLiter	mol/m^3
1422	pH	PH	pH
1423	ppm	ppm	%
1424	ppb	ppb	%
1451	mgs	MegaGallonPerSecond	m^3/s
1455	mgm	MegaGallonPerMinute	m^3/s
1459	mgh	MegaGallonPerHour	m^3/s
1551	S/cm	SiemensPerCentiMeter	S/m
1552	µS/cm	MicroSiemensPerCentiMeter	S/m
1553	mS/m	MilliSiemensPerMeter	S/m
1554	µS/m	MicroSiemensPerMeter	S/m
1555	MΩcm	MegaOhmCentiMeter	Ωm
1556	kΩcm	KiloOhmCentiMeter	Ωm
1558	mg/l	MilliGramPerLiter	kg/m^3
1559	µg/l	MicroGramPerLiter	kg/m^3
1560	%SAT	PercentSaturation	%
1562	%Vol	PercentVol	%Vol
1563	ml/min	MilliLiterPerMinute	m^3/s
34000	K	DeltaKelvin	℃
34001	℃	DeltaCelsius	℃
34002	℉	DeltaFahrenheit	℃
34003	%/K	PercentPerKelvin	%/K
34004	1/K	LfTempCompensation	1/K
34005	1/m	PerMeter	1/m
34006	V/pH	VoltPerPH	V/pH
34007	%/V	PercentPerVolt	%/V
34008	V/%	VoltPerPercent	V/%
34009	Pa/A	PascalPerAmpere	Pa/A
34010	A/Pa	AmperePerPascal	A/Pa
34011	month(s)	Month	month(s)
34012	$A/(kg/m^3)$	AmperePerKilogramPerCubicMeter	$A/(kg/m^3)$
34013	FNU	Formazine_Nephelometric	FNU
34014	rH	rH	rH
34015	g/kg	GramPerKilogram	g/kg
34016	PSU	PSU	PSU
34017	KByte	Kilobytes	KByte
34018	å°¦	Dough	kg/m^3
34019	nA/(mg/l)	NanoAmperePerMilligramPerLiter	$A/(kg/m^3)$
34020	pA/(mg/l)	PicoAmperePerMilligramPerLiter	$A/(kg/m^3)$
34021	EBC	European_Brewing_Convention	FNU

PROFINET	Symbol	Name	Standard unit
34022	ASBC	American_Society_of_Brewing_Chemists	FNU
34023	TE/F	Turbidity_Formazine	FNU
34024	FTU	Formazine_Turbidity_Unit	FNU
34025	mg/l	MilliGramPerLiterPercent	%
34026	AU	AbsorbanceUnit	AU
34027	%T	PercentTransmission	%T
34028	OD	OpticalDensity	AU
34030	eq	Equivalent	eq
34031	eq/m³	EquivalentPerCubicMeter	eq/m³
34032	eq/l	EquivalentPerLiter	eq/m³
34033	eq/gal	EquivalentPerGallon	eq/m³
34034	ppm	ppm_density1	kg/m³
34035	ppb	ppb_density1	kg/m³
34036	1/Pa	PerPascal	1/Pa
34037	°C/s	CelsiusPerSecond	°C/s
34038	°C/min	CelsiusPerMinute	°C/s
34039	FAU	FormazineAttenuationUnit	FNU
34040	As	AmpereSeconds	As
34041	mV/pH	MilliVoltPerPH	V/pH
34042	NTU	Nephelometric_Turbidity	FNU
34043	1/cm	PerCentiMeter	1/m
34044	1/hPa	PerHectoPascal	1/Pa
34045	1/MPa	PerMegaPascal	1/Pa
34046	1/mm	PerMilliMeter	1/m
34047	pA/hPa	PicoAmperePerHektoPascal	A/Pa
34048	µAs	MicroAmpereSeconds	As
34049	week(s)	Weeks	s
34050	inch/d	InchPerDay	m/s
34051	mm/d	MilliMeterPerDay	m/s
34052	mm/h	MilliMeterPerHour	m/s
34053	mm/min	MilliMeterPerMinute	m/s
34054	mV/%	MilliVoltPerPercent	V/%
34055	nAs	NanoAmpereSeconds	As
34056	nS/cm	NanoSiemensPerCentiMeter	S/m
34057	1/d	OnePerDay	Hz
34058	1/h	OnePerHour	Hz
34059	%/µV	PercentPerMicroVolt	%/V
34060	%/mV	PercentPerMilliVolt	%/V
34061	%TS	PerCentTS	kg/m³
34062	ppmVol	ppmVol	%Vol
34063	MByte	Megabytes	KByte
34064	GByte	Gigabytes	KByte
34065	dm	DeciMeter	m
34066	Byte	Bytes	KByte
34067	A/hPa	AmperePerHektoPascal	A/Pa

6.5 Parameter tables

6.5.1 Common for all products

6.5.1.1 I&M (Identification and Maintenance): API 0, Slot 0, Subslot 1

The Liquiline devices support the following standardized I&M records. I&M records are structures of data elements, which provide information for information and maintenance use cases in a vendor independent format. I&M data can be ready acyclic to identify the devices on the PROFINET network.

6.5.1.1.1 I&M_0: Index 0xAFF0, Access: Read only

Element	Name	Data type	Description
1	VendorIDHigh	Unsigned8(1)	0
2	VendorIDLow	Unsigned8(1)	0x11 (17) = Endress+Hauser
3	OrderID	Unsigned8(1)	
4	IM_Serial_Number	VisibleString16(16)	Unique serial number of the device.
5	IM_Hardware_Revision	Unsigned16(2)	Not used
6	IM_Software_Revision	Struct of	
	SWRevisionPrefix	VisibleString(1)	"V" for an officially released version "R" for Revision "P" for Prototype "U" for Under Test (Field Test) "T" for Test Device
	XX	Unsigned8	Major-part of SW-Version (0 ... 99)
	YY	Unsigned8	Minor-part of SW-Version (0 ... 99)
	ZZ	Unsigned8	Bugfix-part of SW-Version (0 ... 99)
7	IM_RevisionCounter	Unsigned16(2)	
8	IM_Profile_ID	Unsigned16(2)	
9	IM_Profile_Specific_Type	Unsigned16(2)	
10	IM_Version	Unsigned8(1)	
11	IM_Supported	Bitfield(1)	Bit 0: fixed = 0 Bit 1:

6.5.1.1.2 I&M_1: Index 0xAFF1, Access: Read/Write

Element	Name	Data type	Description
1	IM_Tag_Function	VisibleString(32)	Function of the device, Default value = empty string
2	IM_Tag_Location	VisibleString(22)	Location of the device, Default value = empty string

6.5.1.1.3 I&M_2: Index 0xAFF2, Access: Read/Write

Element	Name	Data type	Description
1	IM_Date	VisibleString(16)	Installation date, Default value = empty string

6.5.1.1.4 I&M_3: Index 0xAFF3, Access: Read/Write

Element	Name	Data type	Description
1	IM_Descriptor	VisibleString (54)	Description, Default value = empty string

6.5.1.2 DEVICE - API: 0, Slot: 0, Subslot: 3

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1000	LOCAL_OP_ENA	R/W	UNSIGNED8	1			Default: false	If communication fails for a time greater 30 sec, local operation will be enabled automatically. Selection: 0: Disabled 1: Enabled
1001	CURRENT_ERROR	R	UNSIGNED16	2			Default: 0	This parameter contains the device specific three digit diagnostic code. When more than one error is active the error with the highest priority is available in this parameter.
1002	LAST_ERROR	R	UNSIGNED16	2			Default: 0	This parameter contains the error/warning code that disappeared last.
1003	CLEAR_LAST_ERROR	R/W	UNSIGNED8	1			Default: 0 Selection: 0: No 1: Yes	Writing the parameter clears the last diagnostic code in CURRENT_ERROR
1004	ENP_VERSION	R	VISIBLE_STRING_16	16				*ENP version* Version of the ENP (electronic name plate).
1005	EXTENTED_ORDER_CODE	R	VISIBLE_STRING_60	60	X			*Current order code ext.* Current extended ordercode of the device
1006	CURRENT_DIAG_SOURCETYPE	R	UNSIGNED8	1			Default: 0 Selection: 0: General 1: Temperature Input	Most important device-related diagnosis : diagnosis code

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							2: Binary Input 3: Binary Output 4: Current Input 5: Current Output 6: Relay 7: Memosens Sensor 8: PID Controller 9: Cleaning 10: Limit switch 11: Mathematical functions 12: Binary Input Module 13: Binary Output Module 14: Sample point	
1007	CURRENT_DIAG_MODUL	R	UNSIGNED8	1			Default: 0 Selection: 0: None 1: Slot 2 2: Slot 3 3: Slot 4 4: Slot 5 5: Slot 6 6: Slot 7 7: Slot 8 8: Sampler 9: Software 10: Analyzer	Most important device-related diagnosis : name of module
1008	CURRENT_DIAG_PORT	R	UNSIGNED8	1			Default: 0	Most important device-related diagnosis : connection ID
1009	CURRENT_DIAG_NE107_STATUS	R	UNSIGNED8	1			Default: 0	Most important device-related diagnosis : status according to NAMUR NE107
1010	CURRENT_DIAG_TIMESTAMP	R	EDDL_DATE_AND_TIME	7			Default: 0	Most important device-related diagnosis : time of diagnosis appearance

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1011	NUMBER_ADDITIONAL_DIAG	R	UNSIGNED8	1			Default: 0	Nummber of additional device-related diagnosis messages
1012	LAST_DIAG_SOURCETYPE	R	UNSIGNED8	1			Default: 0 Selection: 0: General 1: Temperature input 2: Binary input 3: Binary output 4: Current input 5: Current output 6: Relay 7: Memosens sensor 8: Controller 9: Cleaning 10: Limit switch 11: Mathematic function 12: Binary input module 13: Binary output module 14: Sample point	Past device-diagnosis : component
1013	LAST_DIAG_MODUL	R	UNSIGNED8	1			Default: 0 Selection: 0: none 1: Slot 2 2: Slot 3 3: Slot 4 4: Slot 5 5: Slot 6 6: Slot 7 7: Slot 8 8: Sampler 9: Software 10: Analyzer	Past device-diagnosis : name of module
1014	LAST_DIAG_PORT	R	UNSIGNED8	1			Default: 0	Past device-diagnosis: port
1015	LAST_DIAG_NE107_STATUS	R	UNSIGNED8	1			Default: 0	Past device-diagnosis : status according to NAMUR NE107

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1016	LAST_DIAG_TIMESTAMP	R	EDDL_DATE_AND_TIME	7			Default: 0	Past device-diagnosis : time of diagnosis apperance
1017	DISPLAY_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the device display
1018	POWER_SUPPLY_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of integrated power supply
1019	CPU_SER_NUM	R	VISIBLE_STRING_16	16				Serial of sub-rack
1020	BASE_MODUL_SER_NUM	R	VISIBLE_STRING_16	16				Serial of base module
1021	FMSY1_MODUL_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of 'FXAB1' module
1022	EXTENSION_MODUL_1_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1023	EXTENSION_MODUL_2_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1024	EXTENSION_MODUL_3_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1025	EXTENSION_MODUL_4_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1026	EXTENSION_MODUL_5_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1027	EXTENSION_MODUL_6_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1028	EXTENSION_MODUL_7_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1029	EXTENSION_MODUL_8_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of extension module
1030	SENSOR_1_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1031	SENSOR_2_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1032	SENSOR_3_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1033	SENSOR_4_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1034	SENSOR_5_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1035	SENSOR_6_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1036	SENSOR_7_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor
1037	SENSOR_8_SER_NUM	R	VISIBLE_STRING_16	16				Serial number of the sensor

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1038	SENSOR_1_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1039	SENSOR_2_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1040	SENSOR_3_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1041	SENSOR_4_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1042	SENSOR_5_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1043	SENSOR_6_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1044	SENSOR_7_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1045	SENSOR_8_SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of connected sensor
1046	UDL_STATUS	R	UNSIGNED16	2			Default: 33111	Internal use
1047	UTC_ZONE	R	UNSIGNED8	1	X		Default: 14 Selection: 0: Baker Island 1: Midway Island, Samoa 2: Hawaii 3: Alaska 4: Los Angeles, Vancouver 5: Denver, Phoenix 6: Chicago, Mexico City 7: New York, Toronto 8: Caracas, La Paz 9: Newfoundland 10: Buenos Aires, Brasilia 11: Mid Atlantic 12: Kap Verde 13: London, Lisbon 14: --- 15: Berlin, Rome, Paris 16: Athens, Cairo, Kiew 17: Kuwait, Moscow	*Time zone*

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							18: Abu Dhabi, Tiflis 19: Kabul 20: Islamabad, Karatsch 21: New Delhi 22: Kathmandu 23: Astana, Dhaka 24: Pyinmana, CoconutIsland 25: Bankok, Jakarta 26: Singapur, Peking 27: Seoul, Tokio 28: Adelaide, Darwin 29: Brisbane, Canberra 30: Magadan, Salomon Islands 31: Norfolk Island 32: Auckland, Wellington 33: Chatham Islands 34: Nuku Alofa 35: Christmas Island	
1048	DAYLIGHT_SAVING_ACTIVE	R	UNSIGNED8	1	X		Default: false	
1049	ORDER_CODE_AS_DELIVERED	R	VISIBLE_STRING_60	60				*Orig. order code ext.*
1050	RTC_DATETIME	R	EDDL_DATE_AND_TIME	7				*Date/Time* Real-Time Clock
1100	REMOTE_CAL_TARGET_CHANNEL	R/W	UNSIGNED16	2			Default: 0	Internal use
1101	REMOTE_CAL_CALIBRATION_CHANNEL	R/W	UNSIGNED16	2			Default: 0	Internal use
1102	REMOTE_CAL_CHANNEL_COMMAND	R/W	UNSIGNED16	2			Default: 0 Selection: 0: Idle 1: Reset 2: Next step 3: Reserved 4: Reserved 5: Reserved 6: Reserved 7: Reserved 8: Reserved 9: Reserved	Internal use

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							10: Start 1-point calibration 11: Start grab sample calibration 12: Start 2-point calibration 13: Start numeric input calibration 14: Start 1-point calibration (2nd variant) 15: Start 1-point calibration (3rd variant) 16: Start sensor cap change 17: Start sensor electrolyte change 18: Start numeric input calibration (2nd variant) 19: Reset to factory calibration	
1103	REMOTE_CAL_ARGUMENT1	R/W	FLOAT	4			Default: 0.0	Internal use
1104	REMOTE_CAL_ARGUMENT10	R/W	FLOAT	4			Default: 0.0	Internal use
1105	REMOTE_CAL_ARGUMENT2	R/W	FLOAT	4			Default: 0.0	Internal use
1106	REMOTE_CAL_ARGUMENT3	R/W	FLOAT	4			Default: 0.0	Internal use
1107	REMOTE_CAL_ARGUMENT4	R/W	FLOAT	4			Default: 0.0	Internal use
1108	REMOTE_CAL_ARGUMENT5	R/W	FLOAT	4			Default: 0.0	Internal use
1109	REMOTE_CAL_ARGUMENT6	R/W	FLOAT	4			Default: 0.0	Internal use
1110	REMOTE_CAL_ARGUMENT7	R/W	FLOAT	4			Default: 0.0	Internal use
1111	REMOTE_CAL_ARGUMENT8	R/W	FLOAT	4			Default: 0.0	Internal use
1112	REMOTE_CAL_ARGUMENT9	R/W	FLOAT	4			Default: 0.0	Internal use
1113	REMOTE_CAL_STATUS	R	UNSIGNED16	2			Default: 0 Selection: 0: Ready 1: Not ready 2: Busy 3: Error 4: Reserved 5: Reserved 6: Reserved 7: Reserved 8: Reserved	Internal use

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							9: Reserved 10: Step 1 11: Step 2 12: Step 3 13: Step 4 14: Step 5 15: Step 6 16: Step 7 17: Step 8 18: Step 9 19: Step 10 20: Step 11 21: Step 12 22: Step 13 23: Step 14 24: Step 15	
1114	REMOTE_CAL_RESULT	R	UNSIGNED16	2			Default: 0 Selection: 0: OK 1: Busy 2: Local calibration menu active 3: No sensor selected 4: Selected sensor is not supported 5: Invalid value 6: Calibration failed	Internal use
1115	REMOTE_CAL_INFORMATION1	R	FLOAT	4			Default: 0.0	Internal use
1116	REMOTE_CAL_INFORMATION10	R	FLOAT	4			Default: 0.0	Internal use
1117	REMOTE_CAL_INFORMATION2	R	FLOAT	4			Default: 0.0	Internal use
1118	REMOTE_CAL_INFORMATION3	R	FLOAT	4			Default: 0.0	Internal use
1119	REMOTE_CAL_INFORMATION4	R	FLOAT	4			Default: 0.0	Internal use
1120	REMOTE_CAL_INFORMATION5	R	FLOAT	4			Default: 0.0	Internal use
1121	REMOTE_CAL_INFORMATION6	R	FLOAT	4			Default: 0.0	Internal use
1122	REMOTE_CAL_INFORMATION7	R	FLOAT	4			Default: 0.0	Internal use
1123	REMOTE_CAL_INFORMATION8	R	FLOAT	4			Default: 0.0	Internal use
1124	REMOTE_CAL_INFORMATION9	R	FLOAT	4			Default: 0.0	Internal use
1125	KEY_PERF_INDICATOR_DEVICE_OPERATING_TIME_TOTAL	R	EDDL_DURATION	6	X			The total operating time since commissioning
1126	KEY_PERF_INDICATOR_DEVICE_AVAILABILITY	R	FLOAT	4		%	Default: 100.0	(Operating time - Time in failure) /

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
								Operating time * 100 %
1127	KEY_PERF_INDICATOR_DEVICE_OPERATING_TIME	R	EDDL_DURATION	6	X			The operating time since reset
1128	KEY_PERF_INDICATOR_DEVICE_TIME_IN_FAILURE	R	EDDL_DURATION	6	X			Operating time with NAMUR F status signal
1129	KEY_PERF_INDICATOR_DEVICE_NUMBER_OF_FAILURES	R	UNSIGNED16	2	X		Default: 0	Number of failure diagnostic messages
1130	KEY_PERF_INDICATOR_DEVICE_MTBF	R	EDDL_DURATION	6				Mean time between failures
1131	KEY_PERF_INDICATOR_DEVICE_MTTR	R	EDDL_DURATION	6				Mean time to repair
1902	IM_Tag_Function	R/W	VISIBLE_STRING_32	32	X		Default: TX:DeviceTAGDefault	*Device tag* Device description / TAG
1904	OrderID	R	VISIBLE_STRING_32	32				*Order code* Ordercode of the device
1905	SOFTWARE_REVISION	R	VISIBLE_STRING_16	16				Software version of the device
1906	HARDWARE_REVISION	R	VISIBLE_STRING_16	16				Hardware version of the device
1907	RTC_SETDATETIME	R/W	EDDL_DATE_AND_TIME	7			Default: 2009-01-01T12:00:00	*Date/Time* Real-Time Clock
1908	VendorID	R	UNSIGNED16	2	X		Default: 17	*Vendor ID*
1909	DeviceType	R	VISIBLE_STRING_16	16			Default: 0 Selection: 0: CM44x 1: CSF48 2: CA80	*Device class*
1910	DeviceID	R	UNSIGNED16	2			Default: 0 Selection: 0: CM44x 1: CSF48 2: CA80	*Device class* Manufacturer specific identification of the device.
1911	IM_Serial_Number	R	VISIBLE_STRING_16	16				*Serial number* Serial number of the device
1913	IM_Tag_Location	R/W	VISIBLE_STRING_22	22	X			*Tag location*
1914	IM_Revision_Counter	R	UNSIGNED16	2	X		Default: 0	*Config. changed*
1915	IM_Version	R	UNSIGNED16	2	X		Default: 257	
1916	IM_Profile_Specific_Type	R	UNSIGNED16	2	X		Default: 0	
1918	IM_Descriptor	R/W	VISIBLE_STRING_54	54	X			*Descriptor*
1920	IM_Date	R/W	VISIBLE_STRING_16	16	X			*Date*

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1921	STARTUP_PARAM_VALIDITY	R/W	ENUM8_STARTUP_PARAM_VALIDITY	1	X		Default: 0 Selection: 0: Ignored 1: Units only 2: Profile parameter	*Startup parameter validity*
1922	IP_ADDRESS	R/W	OCTET_STRING_4	4	X		Default: 0	*IP-Address* Ethernet setting: IP address of the device
1923	SUBNET_MASK	R/W	OCTET_STRING_4	4	X		Default: 4294967040	*Netmask*
1924	DEFAULT_GATEWAY	R/W	OCTET_STRING_4	4	X		Default: 0	*Gateway*
1925	NAME_OF_STATION	R/W	OCTET_STRING_240	240	X			*Name of station*
1926	MAC_ADDRESS	R	OCTET_STRING_6	6	X		Default: 0	*MAC-Address* MAC address of the device
1928	ALARM_DELAY	R/W	UNSIGNED16	2	X		Default: 0	*Alarm delay*
1930	UPDATE_EVENT_MODE	R/W	ENUM8_UPDATE_EVENT_MODE	1	X		Default: 0 Selection: 0: Automatic 1: Manual	*Update event mode*
1933	LATEST_CHANGE	R	VISIBLE_STRING_16	16	X			*Latest change*
1934	NE107_STATUS	R	UNSIGNED8	1			Default: 0	
1935	IM_Profile_ID	R	UNSIGNED16	2	X		Default: 0	
1936	HEARTBEAT_DEVICE_STATUS	R	FLOAT	4			Default: 0.0	Heartbeat status device
1937	HEARTBEAT_DEVICE_HEALTH_CONDITION	R	FLOAT	4		%	Default: 0.0 Range: 0.0 .. 100.0	Heartbeat health device
1938	MAINTENANCE_TIMER_VALUE	R	FLOAT	4			Default: 0.0	Heartbeat maintenance timer device
1939	HEARTBEAT_INDEX_DEVICE	R	FLOAT	4			Default: 0.0	Heartbeat index device

6.5.1.3 I/O Process values: API 0, Slot: 1, Subslot: 9

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
0	OUT_01	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
1	OUT_01_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
2	OUT_01_UNIT_TEXT	R	OCTET_STRING_8	8				
3	OUT_01_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
4	OUT_01_HI_LIMIT	R	FLOAT	4				Range of process value OUT.

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
5	OUT_01_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
6	OUT_02	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
7	OUT_02_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
8	OUT_02_UNIT_TEXT	R	OCTET_STRING_8	8				
9	OUT_02_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
10	OUT_02_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
11	OUT_02_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
12	OUT_03	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
13	OUT_03_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
14	OUT_03_UNIT_TEXT	R	OCTET_STRING_8	8				
15	OUT_03_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
16	OUT_03_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
17	OUT_03_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
18	OUT_04	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
19	OUT_04_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
20	OUT_04_UNIT_TEXT	R	OCTET_STRING_8	8				
21	OUT_04_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
22	OUT_04_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
23	OUT_04_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
24	OUT_05	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
25	OUT_05_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
26	OUT_05_UNIT_TEXT	R	OCTET_STRING_8	8				
27	OUT_05_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
28	OUT_05_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
29	OUT_05_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
30	OUT_06	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
31	OUT_06_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
32	OUT_06_UNIT_TEXT	R	OCTET_STRING_8	8				
33	OUT_06LO_LIMIT	R	FLOAT	4				Range of process value OUT.
34	OUT_06_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
35	OUT_06_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
36	OUT_07	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
37	OUT_07_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
38	OUT_07_UNIT_TEXT	R	OCTET_STRING_8	8				
39	OUT_07_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
40	OUT_07_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
41	OUT_07_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
42	OUT_08	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
43	OUT_08_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
44	OUT_08_UNIT_TEXT	R	OCTET_STRING_8	8				
45	OUT_08_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
46	OUT_08_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
47	OUT_08_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
48	OUT_09	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
49	OUT_09_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
50	OUT_09_UNIT_TEXT	R	OCTET_STRING_8	8				
51	OUT_09_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
52	OUT_09_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
53	OUT_09_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
54	OUT_10	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
55	OUT_10_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
56	OUT_10_UNIT_TEXT	R	OCTET_STRING_8	8				
57	OUT_10_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
58	OUT_10_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
59	OUT_10_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
60	OUT_11	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
61	OUT_11_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
62	OUT_11_UNIT_TEXT	R	OCTET_STRING_8	8				
63	OUT_11_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
64	OUT_11_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
65	OUT_11_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
66	OUT_12	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
67	OUT_12_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
68	OUT_12_UNIT_TEXT	R	OCTET_STRING_8	8				
69	OUT_12_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
70	OUT_12_HI_LIMIT	R	FLOAT	4				Range of process value OUT.

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
71	OUT_12_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
72	OUT_13	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
73	OUT_13_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
74	OUT_13_UNIT_TEXT	R	OCTET_STRING_8	8				
75	OUT_13_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
76	OUT_13_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
77	OUT_13_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
78	OUT_14	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
79	OUT_14_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
80	OUT_14_UNIT_TEXT	R	OCTET_STRING_8	8				
81	OUT_14_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
82	OUT_14_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
83	OUT_14_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
84	OUT_15	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
85	OUT_15_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
86	OUT_15_UNIT_TEXT	R	OCTET_STRING_8	8				
87	OUT_15_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
88	OUT_15_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
89	OUT_15_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
90	OUT_16	R	DS101	5				Measurement value of sensor or other analog value. This parameter is connected to the Analog Input Function Block (AI) with the same number.
91	OUT_16_UNIT	R	PA_UNIT	2				Engineering unit of process value OUT.
92	OUT_16_UNIT_TEXT	R	OCTET_STRING_8	8				
93	OUT_16_LO_LIMIT	R	FLOAT	4				Range of process value OUT.
94	OUT_16_HI_LIMIT	R	FLOAT	4				Range of process value OUT.
95	OUT_16_DESCRIPTION	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
96	OUT_D_01	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
97	OUT_D_01_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
98	OUT_D_02	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
99	OUT_D_02_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
100	OUT_D_03	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
101	OUT_D_03_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
102	OUT_D_04	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
103	OUT_D_04_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
104	OUT_D_05	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
105	OUT_D_05_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
106	OUT_D_06	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
107	OUT_D_06_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
108	OUT_D_07	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
109	OUT_D_07_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
110	OUT_D_08	R	DS105	2				Discrete process value, e.g. state of relay output. This parameter is connected to the Digital Input Function Block (DI) with the same number.
111	OUT_D_08_DESCR	R	VISIBLE_STRING_60	60				*Analog fieldbus device variable* Description of the data source for the value.
112	SP_01	R/W	DS101	5				Analog setpoint. This parameter is connected to an Analog Output Function Block (AO) with the same number.
118	SP_02	R/W	DS101	5				Analog setpoint. This parameter is connected to an Analog Output Function Block (AO) with the same number.
124	SP_03	R/W	DS101	5				Analog setpoint. This parameter is connected to an Analog Output Function Block (AO) with the same number.
130	SP_04	R/W	DS101	5				Analog setpoint. This parameter is connected to an Analog Output Function Block (AO) with the same number.
136	SP_D_01	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.
138	SP_D_02	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.
140	SP_D_03	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.
142	SP_D_04	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.
144	SP_D_05	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.
146	SP_D_06	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.
148	SP_D_07	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
150	SP_D_08	R/W	DS102	2				Discrete setpoint. Values >=1 are interpreted as 1. This parameter is connected to a Discrete Output Function Block (DO) with the same number.

6.5.1.4 CLEANING 1 ... 4: API 0, Slot 1, Subslot 1 ... 4

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
500	CLEANING_STATE_ACTIVE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: Off 1: Waiting 2: Waiting 3: Pre-rinse 4: Cleaning 5: Postrinsing 6: Failsafe 7: Manual mode 8: Waiting for execution	*State of cleaning* Current state of the cleaning program.

6.5.1.5 REGULATOR 1 ... 2 - API: 0, Slot: 1, Subslot: 1 ... 2

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
600	CONTROL_MODE	R	UNSIGNED8	1	X		Default: 1 Selection: 0: PID 1-sided 1: PID 2-sided	*Controller type*
610	SETPOINT	R/W	FLOAT	4	X		Default: 0.0	*Setpoint* Controller : set value for controller X
611	P_PART	R/W	FLOAT	4	X		Default: 10.0 Minimum: 0.0	*Xp* Controller : proportional band (Xp) for controller X
612	I_PART	R/W	FLOAT	4	X	*s*	Default: 0.0 Range: 0.0 .. 9999.0	*Tn* Controller : reset time (Tn) for controller X
613	D_PART	R/W	FLOAT	4	X	*s*	Default: 0.0 Range: 0.0 .. 9999.0	*Tv* Controller: rate time (Tv) for controller X

6.5.1.6 SENSOR 1 ... 8: API 0, Slot 1, Subslot 1 ... 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1000	SENSOR_ENABLE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: On 1: Off	*Port activation state* Activation of sensor channel

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1001	ACTIVE_SENSOR_TYPE	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: --- 1: Oxygen (amp.) 2: Oxygen (opt.) 3: pH Glass 5: pH ISFET 6: Cond c 7: Cond i 8: ORP 9: TU/TS 10: Nitrate 11: ISE 12: SAC 13: Ultrasonic interface 14: Chlorine (CCS142D) 18: pH/ORP 19: Cond c 4-pol 20: Oxygen (opt.) 21: TU 22: Inline photometer 23: TU/AU 24: Disinfection 25: Spectrometer 28: Fluorescence	*Sensor type* Selected sensor type. The selected type has to match with the connected sensor type.
1002	CONNECTED_SENSOR_TYPE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: --- 1: Oxygen (amp.) 2: Oxygen (opt.) 3: pH Glass 5: pH ISFET 6: Cond c 7: Cond i 8: ORP 9: TU/TS 10: Nitrate 11: ISE 12: SAC 13: Ultrasonic interface	*Sensor type* Connected sensor type

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							14: Chlorine (CCS142D) 18: pH/ORP 19: Cond c 4-pol 20: Oxygen (opt.) 21: TU 22: Inline photometer 23: TU/AU 24: Disinfection 25: Spectrometer 28: Fluorescence	
1003	SENSOR_TAG	R	VISIBLE_STRING_32	32				*Tag* Sensor description/TAG
1004	SENSOR_SERIAL	R	VISIBLE_STRING_16	16				*Serial number* Serial number of the sensor
1005	SENSOR_HW_VERSION	R	VISIBLE_STRING_16	16				*Hardware version* Hardware version of connected sensor
1006	SENSOR_SW_VERSION	R	VISIBLE_STRING_16	16				*Software version* Software version of connected sensor
1007	CURRENT_DIAG_CODE	R	UNSIGNED16	2			Default: 0	Current sensor-diagnosis : diagnosis code
1008	LAST_DIAG_CODE	R	UNSIGNED16	2			Default: 0	Past sensor-diagnosis: diagnosis code
1009	OP_TIME_TOTAL	R	FLOAT	4		s h	Default: 0.0	Operating hours of connected sensor
1010	OP_TIME_ABOVE_SPEC_TEMP	R	FLOAT	4		s h	Default: 0.0	Operating hours above maximal operating temperature
1011	OP_TIME_BELOW_SPEC_TEMP	R	FLOAT	4		s h	Default: 0.0	Operating hours below minimal operating temperature
1012	OP_TIME_LAMP_LIFE	R	FLOAT	4			Default: 0.0	Operating hours of lamp, uint seconds [s]
1013	OP_TIME_STERILISATIONS	R	UNSIGNED16	2			Default: 0	Number of sterilisation cycles
1014	OP_TIME_CIP_CYCLES	R	UNSIGNED16	2			Default: 0	Number of clean in place cycles
1015	OP_TIME_CAP_CALIBRATIONS	R	UNSIGNED16	2			Default: 0	Number of sensor-cap calibrations
1016	OP_TIME_CAP_CALIB_TIMER	R	FLOAT	4		s h	Default: 0.0	Calibration timer of sensor cap
1017	OP_TIME_CAP_STERILISATIONS	R	UNSIGNED8	1			Default: 0	Number of sensor-cap sterilisations
1018	OP_TIME_CAP_FILTER_CHANGED	R	FLOAT	4			Default: 0.0	Number of filter changes
1019	CAL_COUNT_0	R	UNSIGNED16	2			Default: 0	Number of calibrations
1020	CAL_COUNT_1	R	UNSIGNED16	2			Default: 0	Number of calibrations, 2nd parameter of multiparameter sensor
1021	CAL_COUNT_2	R	UNSIGNED16	2			Default: 0	Number of calibrations, 3rd parameter of multiparameter sensor
1022	CAL_COUNT_3	R	UNSIGNED16	2			Default: 0	Number of calibrations, 4th parameter of multiparameter sensor
1023	CAL_DATETIME_0	R	EDDL_DATE_AND_TIME	7				Time stamp of last calibration

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1024	CAL_DATETIME_1	R	EDDL_DATE_AND_TIME	7				Time stamp of last calibration, 2nd parameter of multiparameter sensor
1025	CAL_DATETIME_2	R	EDDL_DATE_AND_TIME	7				Time stamp of last calibration, 3rd parameter of multiparameter sensor
1026	CAL_DATETIME_3	R	EDDL_DATE_AND_TIME	7				Time stamp of last calibration, 4th parameter of multiparameter sensor
1027	CAL_COUNT_ZERO	R	UNSIGNED16	2			Default: 0	Number of zero-point calibrations
1028	CAL_DATETIME_ZERO	R	EDDL_DATE_AND_TIME	7				Time stamp of last zero point calibration
1029	CAL_COUNT_TEMP	R	UNSIGNED16	2			Default: 0	Number of temperature calibrations
1030	CAL_DATETIME_TEMP	R	EDDL_DATE_AND_TIME	7				Time stamp of last temperature calibration
1031	CAL_SELECT_DATA_SET	R/W	UNSIGNED8	1			Default: 0 Selection: 0: -- unnamed -- 1: -- unnamed -- 2: -- unnamed -- 3: -- unnamed -- 4: -- unnamed -- 5: -- unnamed -- 6: -- unnamed -- 7: -- unnamed -- 8: -- unnamed -- 9: -- unnamed -- 10: -- unnamed -- 11: -- unnamed --	Selecta specific data set
1032	CAL_SELECT_DATA_SET_TYPE	R/W	UNSIGNED8	1			Default: 0 Selection: 0: -- unnamed -- 1: -- unnamed -- 2: -- unnamed --	Select the type of calibration sets that shall be loaded
1033	CURRENT_DIAG_TIMESTAMP	R	EDDL_DATE_AND_TIME	7			Default: 0	Current sensor-diagnosis : time of diagnosis apperance
1034	SENSOR_MANUFACTURING_DATE	R	EDDL_DATE_AND_TIME	7				Manufacturing date of the sensor
1035	SENSOR_INITIAL_OPERATION_DATE	R	EDDL_DATE_AND_TIME	7				*Start date* Initial-operation date of sensor
1036	CAL_OFFSET	R	FLOAT	4			Default: 0.0	Calibration offset
1037	CAL_FACTOR	R	FLOAT	4			Default: 0.0	*Factor* Calibration factor
1038	CAL_VALIDITY	R	EDDL_DATE_AND_TIME	7				Last Cal/Adj Date + Alarm Limit
1039	SENSOR_EXTREME_TEMP_MIN	R	FLOAT	4		℃ ℉ K	Default: 0.0	Min. measured temperature value
1040	SENSOR_EXTREME_TEMP_MAX	R	FLOAT	4		℃ ℉ K	Default: 3.0	Max. measured temperature value

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1041	CURRENT_DIAG_NE107_STATUS	R	UNSIGNED8	1			Default: 0	Current sensor-diagnosis : status according to NAMUR NE107
1048	CAL_METHOD_0	R	UNSIGNED8	1			Default: 0 Selection: 0: --- 1: Numeric input 2: 1-point calibration 3: 2-point calibration 4: Multipoint calibration 5: Table 6: Sample calibration 7: Zero point 8: Air 100%% rh 9: H2O air-saturated 10: Air variable 11: Zero point sample 12: Slope sample 13: Offset 14: Slope 15: with temp. comp 16: without temp. comp 17: Standard addition 18: Numeric input 19: Numeric input zero point 20: Numeric input 21: Factory calib. 22: Test gas calibration 23: Value acquisition 24: 3-point calibration 25: Ext. reference 26: Int. reference 27: in water 28: in air 29: Solid state reference	Calibration method
1049	CAL_METHOD_1	R	UNSIGNED8	1			Default: 0 Selection:	Calibration method

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							0: --- 1: Numeric input 2: 1-point calibration 3: 2-point calibration 4: Multipoint calibration 5: Table 6: Sample calibration 7: Zero point 8: Air 100%% rh 9: H2O air-saturated 10: Air variable 11: Zero point sample 12: Slope sample 13: Offset 14: Slope 15: with temp. comp 16: without temp. comp 17: Standard addition 18: Numeric input 19: Numeric input zero point 20: Numeric input 21: Factory calib. 22: Test gas calibration 23: Value acquisition 24: 3-point calibration 25: Ext. reference 26: Int. reference 27: in water 28: in air 29: Solid state reference	

6.5.1.7 SENSOR_HEARTBEAT 1 ... 8: API 0, Slot 1, Subslot: 1 ... 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1500	HEARTBEAT_SENSOR_STATUS_CHx	R	DS60	12		%		Heartbeat status sensor

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
1501	HEARTBEAT_SENSOR_STATUS_CHx_UNIT	R	DS60	12		%		
1502	HEARTBEAT_SENSOR_STATUS_CHx_RANGE	R	DS60	12		%		
1503	HEARTBEAT_SENSOR_HEALTH_CONDITION_CHx	R	DS60	12		%		Heartbeat health sensor
1504	HEARTBEAT_SENSOR_HEALTH_CONDITION_CHx_UNIT	R	DS60	12		%		
1505	HEARTBEAT_SENSOR_HEALTH_CONDITION_CHx_RANGE	R	DS60	12		%		
1506	MAINTENANCE_TIMER_VALUE_CHx	R	DS60	12		%		Heartbeat maintenance timer sensor
1507	MAINTENANCE_TIMER_VALUE_CHx_UNIT	R	DS60	12		%		
1508	MAINTENANCE_TIMER_VALUE_CHx_RANGE	R	DS60	12		%		
1509	HEARTBEAT_INDEX_SENSOR_CHx	R	DS60	12		%		Heartbeat index sensor
1510	HEARTBEAT_INDEX_SENSOR_CHx_UNIT	R	DS60	12		%		
1511	HEARTBEAT_INDEX_SENSOR_CHx_RANGE	R	DS60	12		%		
1512	KEY_PERF_INDICATOR_SENSOR_AVAILABILITY_CHx	R	FLOAT	4		%	Default: 100.0	(Operating time - Time in failure) / Operating time * 100 %
1513	KEY_PERF_INDICATOR_SENSOR_OPERATING_TIME_CHx	R	EDDL_DURATION	6	X			The total operating time since commissioning
1514	KEY_PERF_INDICATOR_SENSOR_TIME_IN_FAILURE_CHx	R	EDDL_DURATION	6	X			Operating time with NAMUR F status signal
1515	KEY_PERF_INDICATOR_SENSOR_NUMBER_OF_FAILURES_CHx	R	UNSIGNED16	2	X		Default: 0	Number of failure diagnostic messages
1516	KEY_PERF_INDICATOR_SENSOR_MTBF_CHx	R	EDDL_DURATION	6				Mean time between failures
1517	KEY_PERF_INDICATOR_SENSOR_MTTR_CHx	R	EDDL_DURATION	6				Mean time to repair
1518	KEY_PERF_INDICATOR_SENSOR_TIME_IN_CALIBRATION_CHx	R	EDDL_DURATION	6	X			Operating time with calibration status
1519	KEY_PERF_INDICATOR_SENSOR_NUMBER_OF_CALIBRATIONS_CHx	R	UNSIGNED16	2	X		Default: 0	Number of calibrations and/or adjustments
1520	KEY_PERF_INDICATOR_SENSOR_MTBC_CHx	R	EDDL_DURATION	6				Mean time between calibrations

6.5.1.8 SENSOR_CONDUCTIVITY 1 … 8: API 0, Slot 1, Subslot 1 … 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
2000	COND_MEAS_PARAM	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Conductivity 1: Concentration 2: Resistance 3: TDS	*Operating mode*
2001	COND_CELL_CONSTANT	R	FLOAT	4			Default: 0.0	Cell constant
2002	COND_MEAS_ALPHA_VALUE	R/W	FLOAT	4	X	*%/K*	Default: 2.1 Range: 0.0 .. 20.0	*Coeff. Alpha* Alpha value [%/K]
2003	COND_TEMPERATUR_REF	R/W	FLOAT	4	X	℃ ℉ K	Default: 25.0 Range: -5.0 .. 100.0	*Alpha ref. temp.* Temperatur reference
2004	COND_CALIB_TEMPCOMP	R/W	UNSIGNED8	1	X		Default: 1 Selection:	*Temp. compensation* As an alternative to the compensated conductivity (Yes) you can also determine

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							0: No 1: Yes	the cell constant by calibrating the uncompensated conductivity (No). This setting affects only calibration.
2005	COND_MEAS_TEMPCOMP	R/W	UNSIGNED8	1	X		Default: 1 Selection: 0: --- 1: Linear 2: NaCl (IEC 746-3) 3: Water ISO7888 (25°C) 4: UPW NaCl 5: UPW HCl 6: %0V 7: %0V 8: %0V 9: %0V 10: Water ISO7888 (20°C)	*Compensation* As an alternative to the compensated conductivity (Yes) you can also determine the cell constant by calibrating the uncompensated conductivity (No). This setting affects only calibration.
2006	COND_MEAS_ALPHA	R/W	FLOAT	4	X	*%/K*	Default: 2.1 Range: 0.0 .. 20.0	*Factor alpha* Alpha value [%/K]
2007	COND_MEAS_TEMPREF	R/W	FLOAT	4	X	*°C* °F K	Default: 25.0 Range: -5.0 .. 100.0	*Ref. temp.* Temperatur reference
2008	COND_CELLCONSTANT	R/W	FLOAT	4	X	*1/m* 1/cm	Default: 1.0 Range: 0.25 .. 9999.0	*Current cell const.* Cell constant
2009	COND_INSTALLFACTOR	R/W	FLOAT	4	X		Default: 1.0 Range: 0.1 .. 5.0	*Inst. factor* Cell constant
2010	COND_TEMPERATURE_SLOPE	R	FLOAT	4			Default: 0.0	Calibrated slope for temperature measurement

6.5.1.9 SENSOR_DISINFECTION 1 … 8: API 0, Slot 1, Subslot 1 … 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3000	DISINFECTION_SLOPE	R	FLOAT	4		*A/(kg/m³)* pA/(mg/l) nA/(mg/l)	Default: -0.0000001	Slope
3001	DISINFECTION_ZERO_POINT	R	FLOAT	4		*A* nA	Default: -0.000000002	Zero point

6.5.1.10 SENSOR_ISE 1 … 8: API 0, Slot 1, Subslot: 1 … 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
4000	ISE_MEAS_TYPE_ELECTRODE_0	R	UNSIGNED8	1	X		Default: 0 Selection: 0: disabled 5: pH	*Electrode slot 1* Electrode type reference slot (measured parameter)
4001	ISE_MEAS_TYPE_ELECTRODE_1	R	UNSIGNED8	1	X		Default: 0 Selection: 0: disabled 1: Nitrate 2: Ammonium 3: Potassium 4: Chloride 5: pH 6: ORP 7: %0V	*Electrode slot 2* Electrode type slot 1 (measured parameter)
4002	ISE_MEAS_TYPE_ELECTRODE_2	R	UNSIGNED8	1	X		Default: 0 Selection: 0: disabled 1: Nitrate 2: Ammonium 3: Potassium 4: Chloride 5: pH 6: ORP 7: %0V	*Electrode slot 3* Electrode type slot 2 (measured parameter)
4003	ISE_MEAS_TYPE_ELECTRODE_3	R	UNSIGNED8	1	X		Default: 0 Selection: 0: disabled 1: Nitrate 2: Ammonium 3: Potassium 4: Chloride 5: pH 6: ORP 7: %0V	*Electrode slot 4* Electrode type slot 3 (measured parameter)
4004	ISE_MEAS_MODE_ELECTRODE_0	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: 11:	*Measured variable slot 1*
4005	ISE_MEAS_MODE_ELECTRODE_1	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0:	*Measured variable slot 2*

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							1: NH4-N 2: NH4 3: NO3-N 4: NO3 9: K 10: Cl 11: 12: mV 13: %0V	
4006	ISE_MEAS_MODE_ELECTRODE_2	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: 1: NH4-N 2: NH4 3: NO3-N 4: NO3 9: K 10: Cl 11: 12: mV 13: %0V	*Measured variable slot 3*
4007	ISE_MEAS_MODE_ELECTRODE_3	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: 1: NH4-N 2: NH4 3: NO3-N 4: NO3 9: K 10: Cl 11: 12: mV 13: %0V	*Measured variable slot 4*
4008	ISE_SLOPE_0	R	FLOAT	4			Default: 0.0	Slope reference slot
4009	ISE_SLOPE_1	R	FLOAT	4			Default: 0.0	Slope slot 1
4010	ISE_SLOPE_2	R	FLOAT	4			Default: 0.0	Slope slot 2
4011	ISE_SLOPE_3	R	FLOAT	4			Default: 0.0	Slope slot 3
4012	ISE_ZEROPOINT_0	R	FLOAT	4			Default: 0.0	Delta zero-point reference slot
4013	ISE_ZEROPOINT_1	R	FLOAT	4			Default: 0.0	Delta zero-point slot 1
4014	ISE_ZEROPOINT_2	R	FLOAT	4			Default: 0.0	Delta zero-point slot 2
4015	ISE_ZEROPOINT_3	R	FLOAT	4			Default: 0.0	Delta zero-point slot 3

6.5.1.11 SENSOR_OXYGEN 1 … 8: API 0, Slot 1, Subslot 1

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
6000	OXYGEN_MAIN_MEAS	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Concentration liquid 1: Concentration gaseous 2: Saturation 3: Partial pressure 4: Raw value nA 5: Raw value µs	*Main value*
6001	OXYGEN_SLOPE	R	FLOAT	4	X	%	Default: 100.0	*Current slope*
6002	OXYGEN_ZERO_POINT	R	FLOAT	4	X	*A* nA	Default: 0.0	*Current zero point*
6003	OXYGEN_INFO_PAO_KSV	R	FLOAT	4			Default: 0.0	Ksv (point at oxygen)
6004	OXYGEN_INFO_ZERO_KSV	R	FLOAT	4			Default: 0.0	Ksv (zero point)
6005	OXYGEN_INFO_PAO_TAU	R	FLOAT	4			Default: 0.0	Tau (point at oxygen)
6006	OXYGEN_INFO_ZERO_TAU	R	FLOAT	4			Default: 0.0	Tau (zero point)
6007	OXYGEN_INFO_PAO_QUALITY	R	FLOAT	4			Default: 0.0	Calibration quality (point at oxygen)
6008	OXYGEN_INFO_ZERO_QUALITY	R	FLOAT	4			Default: 0.0	Calibration quality (zero point)
6009	OXYGEN_INFO_SLOPE_ABS	R	FLOAT	4			Default: 0.0	Slope absolute
6010	OXYGEN_INFO_FERMENTER_SCALING_FACTOR	R	FLOAT	4			Default: 0.0	Fermenter scaling factor

6.5.1.12 SENSOR_NITRATE 1 … 8: API 0, Slot 1, Subslot 1 … 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
5000	NITRATE_SWITCHDATASET	R/W	UNSIGNED8	1			Default: 0 Selection: 0: Factory calib. 1: Dataset1 2: Dataset2 3: Dataset3 4: Dataset4 5: Dataset5 6: Dataset6 7: undefined 8: -- unnamed --	*Application* Dataset switch for SAK
5001	NITRATE_CAL_FACTOR	R	FLOAT	4			Default: 0.0	*Factor* Calibration factor
5002	NITRATE_CAL_OFFSET	R	FLOAT	4			Default: 0.0	Calibration offset

6.5.1.13 SENSOR_PHOTOMETER 1 ... 8: API 0, Slot 1, Subslot: 1 ... 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
7000	PEM_MEAS_DATASET_MC	R/W	UNSIGNED8	1			Default: 0 Selection: 0: Dataset 1 1: Dataset 2 2: Dataset 3 3: Dataset 4 4: Dataset 5	*Dataset* Dataset switch for Inline Photometer
7001	PEM_MEAS_DATASET_RC	R	UNSIGNED8	1			Default: 0 Selection: 0: Dataset 1 1: Dataset 2 2: Dataset 3 3: Dataset 4 4: Dataset 5	*Dataset* Dataset switch for Inline Photometer

6.5.1.14 SENSOR_PHORP 1 ... 8: API 0, Slot 1, Subslot 1

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
8000	PH_SLOPE	R	FLOAT	4		*V/pH* mV/pH	Default: 0.05916	
8001	PH_ZERO_POINT	R	FLOAT	4		*pH*	Default: 7.0	
8002	PH_CALIB_TEMPCOMP	R/W	UNSIGNED8	1	X		Default: 1 Selection: 0: Off 1: Automatic 2: Manual	*Temp. compensation* Select temperature compensation: ATC, MTC or none (if MTC, enter temperature) for calibration.
8003	PH_MEAS_TEMPCOMP	R/W	UNSIGNED8	1	X		Default: 1 Selection: 0: Off 1: Automatic 2: Manual	*Temp. compensation* Select temperature compensation: ATC, MTC or none (if MTC, enter temperature) during measurement operation.
8004	PH_CAL_SLOPE	R	FLOAT	4			Default: 0.0	Slope
8005	PH_CAL_ZEROPOINT	R	FLOAT	4			Default: 0.0	Zero point

6.5.1.15 SENSOR_SAC 1 ... 8: API 0, Slot 1, Subslot: 1 ... 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
9000	SAC_SWITCHDATASET	R/W	UNSIGNED8	1			Default: 0 Selection: 0: Factory calib.	*Application* Dataset switch for SAK

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							1: Dataset1 2: Dataset2 3: Dataset3 4: Dataset4 5: Dataset5 6: Dataset6 7: undefined	

6.5.1.16 SENSOR_TURBIDITY 1 … 8: API 0, Slot 1, Subslot: 1 … 8

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
10000	TURBIDITY_SWITCHDATASET	R/W	UNSIGNED8	1			Default: 0 Selection: 0: Formazine 1: Kaolin 2: SiO2 3: TiO2 4: Excess sludge 5: Digested sludge 6: Activated sludge 7: Dataset1 8: Dataset2 9: Dataset3 10: Dataset4 11: Dataset5 12: undefined 13: Thin sludge 14: PSL 15: Diatomite 16: Dataset6 17: Absorbance 18: ThinSludge 19: EBC 20: Milk 21: Apha 22: EBCColor 23: OEM Dataset 1 24: OEM Dataset 2 25: OEM Dataset 3 26: OEM Dataset 4 27: OEM Dataset 5 28: OEM Dataset 6 29: Product loss	*Application* Dataset switch for turbidity

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							30: Sludge 31: Auto sludge 32: Dataset7 33: Dataset8 34: Sludge, general	
10001	TURBIDITY_CAL_FACTOR	R	FLOAT	4			Default: 0.0	*Factor* Calibration factor
10002	TURBIDITY_CAL_OFFSET	R	FLOAT	4			Default: 0.0	Calibration offset

6.5.1.17 SENSOR_FLUORESCENCE 1 … 8: API 0, Slot 1, Subslot 1 … 8

Supported with software version 1.12.00 or newer.

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
12000	FLUORESCENCE_OP_TIME_LIGHTSOURCE_DEGRADATION	R	FLOAT	4			Default: 0.0	Lightsource degradation in %
12001	FLUORESCENCE_CAL_ADJUSTMENT_DEVIATION	R	FLOAT	4			Default: 0.0	Adjustment deviation in %
12002	FLUORESCENCE_CAL_OBV_DATA_VALID	R	UNSIGNED8	1			Default: false	
12003	FLUORESCENCE_CAL_OBV_DEVICE_SERIAL	R	VISIBLE_STRING_32	32				Serial of the Transmitter
12004	FLUORESCENCE_CAL_OBV_AIR_MEAS_TEMPERATURE	R	FLOAT	4		℃ ℉ K	Default: 0.0	Sensor air Temperature
12005	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_MEAS_TEMPERATURE	R	FLOAT	4		℃ ℉ K	Default: 0.0	Sensor solid Temperature
12006	FLUORESCENCE_CAL_OBV_AIR_MEAS_RAW_VALUE	R	FLOAT	4			Default: 0.0	Air measurement
12007	FLUORESCENCE_CAL_OBV_AIR_MEAS_THRESHOLD	R	FLOAT	4			Default: 0.0	Air measurement acceptance threshold (constant value)
12008	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_SERIAL	R	VISIBLE_STRING_32	32				Serial number of the solid state standard
12009	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_REF_VAL	R	FLOAT	4			Default: 0.0	Nominal value of the solid state standard
12010	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_MEAS_RAW_VAL	R	FLOAT	4			Default: 0.0	Solid state standard measurement raw value
12011	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_MEAS_PROCESSED_VAL	R	FLOAT	4			Default: 0.0	Solid state standard measurement
12012	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_MEAS_LOWER_THRESHOLD	R	FLOAT	4			Default: 0.0	Min. acceptance thresholds for the solid state standard measurement

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
12013	FLUORESCENCE_CAL_OBV_SOLID_STANDARD_MEAS_UPPER_THRESHOLD	R	FLOAT	4			Default: 0.0	Max. acceptance thresholds for the solid state standard measurement
12014	FLUORESCENCE_CAL_OBV_ADJUSTMENT_TYPE	R	UNSIGNED8	1			Default: 0 Selection: 0: Factory 1: Done 2: Unchanged 3: Failed	
12015	FLUORESCENCE_CAL_OBV_MEPC_STATE	R	UNSIGNED8	1			Default: 0 Selection: 0: Not OK 1: OK 2: n/a	
12016	FLUORESCENCE_ADJ_OBV_DATA_VALID	R	UNSIGNED8	1			Default: false	
12017	FLUORESCENCE_ADJ_OBV_DEVICE_SERIAL	R	VISIBLE_STRING_32	32				Serial of the Transmitter
12018	FLUORESCENCE_ADJ_OBV_AIR_MEAS_TEMPERATURE	R	FLOAT	4		℃ ℉ K	Default: 0.0	Sensor air Temperature
12019	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_MEAS_TEMPERATURE	R	FLOAT	4		℃ ℉ K	Default: 0.0	Sensor solid Temperature
12020	FLUORESCENCE_ADJ_OBV_AIR_MEAS_RAW_VALUE	R	FLOAT	4			Default: 0.0	Air measurement
12021	FLUORESCENCE_ADJ_OBV_AIR_MEAS_THRESHOLD	R	FLOAT	4			Default: 0.0	Air measurement acceptance threshold (constant value)
12022	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_SERIAL	R	VISIBLE_STRING_32	32				Serial number of the solid state standard
12023	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_REF_VAL	R	FLOAT	4			Default: 0.0	Nominal value of the solid state standard
12024	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_MEAS_RAW_VAL	R	FLOAT	4			Default: 0.0	Solid state standard measurement raw value
12025	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_MEAS_PROCESSED_VAL	R	FLOAT	4			Default: 0.0	Solid state standard measurement
12026	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_MEAS_LOWER_THRESHOLD	R	FLOAT	4			Default: 0.0	Min. acceptance thresholds for the solid state standard measurement
12027	FLUORESCENCE_ADJ_OBV_SOLID_STANDARD_MEAS_UPPER_THRESHOLD	R	FLOAT	4			Default: 0.0	Max. acceptance thresholds for the solid state standard measurement

6.5.1.18 SENSOR_ULTRASONIC 1 … 8: API 0, Slot 1, Subslot 1

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
11000	UIS_TURBIDITY_MEAS	R	UNSIGNED8	1	X		Default: 1 Selection: 0: Off 1: On	*Turbidity measurement*

6.5.2 Liquiline Sampler CSFxx only

6.5.2.1 SAMPLER - API: 0, Slot: 1, Subslot: 9

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
2000	RUNNING_PROGRAM_NAME	R	VISIBLE_STRING_16	16				*Program name:* Program name
2001	PROGRAM_NAME	R	VISIBLE_STRING_16	16			Default: TX:Program	*Program name* Name of current active program
2002	PROGRAM_STATE	R	UNSIGNED8	1			Default: 0 Selection: 0: Inactive 1: Active 2: Pause 3: Waiting for pause	*Program status* Program state
2003	PROGRAM_BOTTLE_POSITION	R	UNSIGNED8	1	X		Default: 0 Range: 0.0 .. 25.0	Current bottle position
2004	BOTTLE_CONFIGURATION	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: 1x - PE Direct distribution 1: 2x - PE Direct distribution 2: 4x - PE Direct distribution 3: 4x - Glass Direct distribution 4: 12x - PE Direct distribution 5: 12x - PE/Glass Plate distribution 6: 24x - PE Direct distribution 7: 24x - PE/Glass Plate distribution 8: 6x+1x - PE/Glass Plate distribution 9: 6x+2x - PE+PE Plate distribution 10: 6x+2x - PE+Glass Plate distribution 11: 12x+1x - PE/Glass Plate distribution 12: 12x+2x - PE+PE Plate distribution 13: 12x+2x - PE+Glass Plate distribution 14: 12x+6x - PE Direct distribution 15: 12x+6x - PE/Glass Plate	*Current bottle configuration* Bottle assignement

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							distribution 16: 4x - Glass Schott GLS80 Direct distribution	
2005	PROGRAM_SAMPLING_MODE	R	UNSIGNED8	1			Default: 0 Selection: 0: Time paced CTCV 1: Flow paced VTCV 2: Time/flow paced CTVV 3: Single sample 4: Sampling table 5: External signal 6: Manual 7: %0V	Mode of sampling
2006	DATETIME_NEXT_SAMPLING	R	EDDL_DATE_AND_TIME	7			Default: 2000-01-01T00:00:00 Range: 946684800.0 .. 4102444799.0	Date and time of next sampling
2007	FLOW_NEXT_SAMPLING	R	FLOAT	4			Default: 0.0	Date and time of next sampling
2008	SAMPLING_STATE	R	UNSIGNED8	1			Default: 0 Selection: 0: Waiting 1: Reference run 2: Dist. arm positioned 3: Purge process 4: Suction process 5: Medium detected 6: Dose process 7: sampling Ok 8: sampling nOk 9: Sampling delay 10: Sampling 11: Pre rinsing 12: Post rinsing 13: Launch bottle 14: Sample bottling 15: Emptying bottle 16: Rinsing bottle 17: Draining bottle	*Action message* Sampling progress
2009	MAN_SAMPLING_COMMAND	R/W	UNSIGNED8	1			Default: 0 Selection: 0: --- 1: Start 2: Stop	Manual sampling command
2010	MAN_SAMPLING_VOLUME_PERIST	R/W	FLOAT	4	X	m^3 ml	Default: 0.0001 Minimum: 2e-05	*Sample volume* Date and time of next sampling

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
2011	MAN_SAMPLING_BOTTLE_POS	R/W	UNSIGNED8	1			Default: 0 Selection: 0: Front 1: Bottle 1 2: Bottle 2 3: Bottle 3 4: Bottle 4 5: Bottle 5 6: Bottle 6 7: Bottle 7 8: Bottle 8 9: Bottle 9 10: Bottle 10 11: Bottle 11 12: Bottle 12 13: Bottle 13 14: Bottle 14 15: Bottle 15 16: Bottle 16 17: Bottle 17 18: Bottle 18 19: Bottle 19 20: Bottle 20 21: Bottle 21 22: Bottle 22 23: Bottle 23 24: Bottle 24 25: Back	*Free bottles* Manual sampling bottle position
2012	SAMPLING_VOLUME_VACUUM	R/W	FLOAT	4	X	m^3 ml	Default: 0.0002	*Dosing volume* Dosing volume of vacuum- or inline-sampler
2013	BOTTLE_VOLUME_LEFT	R/W	FLOAT	4	X	m^3 ml	Default: 0.03 Minimum: 0.0001	*Bottle volume left* Bottle volume
2014	BOTTLE_VOLUME_RIGHT	R/W	FLOAT	4	X	m^3 ml	Default: 0 Range: 0.0 .. 0.1	*Bottle volume right* Bottle volume of the right bottle box
2015	CURRENT_BOTTLE_FILL_LEVEL	R	FLOAT	4		m^3 ml	Default: 0.0 Minimum: 0.0	Liquid level of selected bottle
2016	SAMPLING_TECHNIQUE	R	UNSIGNED8	1			Default: 0 Selection: 0: Peristaltic 1: Vacuum 2: Inline	*Sampling device* Sampling mode
2017	MANUAL_SAMPLING_PARK_POS	R/W	UNSIGNED8	1	X		Default: 1 Selection:	*Distribution parking* Distribution arm park position

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							0: --- 1: Back	
2018	LAST_SAMPLING_START_TIME	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Start time of last sampling
2019	CAL_COUNT_DISTLEVER	R	UNSIGNED32	4	X		Default: 0	Number of distribution lever calibrations
2020	CAL_DATETIME_DISTLEVER	R	EDDL_DATE_AND_TIME	7	X		Default: 1970-01-01T00:00:00	Time stamp of last distribution lever calibration
2021	CAL_COUNT_PERISTVOLUME	R	UNSIGNED32	4	X		Default: 0	Number of peristaltic sampling volume calibrations
2022	CAL_DATETIME_PERISTVOLUME	R	EDDL_DATE_AND_TIME	7	X		Default: 1970-01-01T00:00:00	Time stamp of last peristaltic sampling volume calibration
2023	CAL_METHOD_PERISTVOLUME	R	UNSIGNED8	1	X		Default: 0 Selection: 0: --- 1: 1-point calibration 2: 2-point calibration	Calibration method of last peristaltic sampling volume calibration

6.5.3 Liquiline Analyzer CA80xx only

6.5.3.1 ANALYZER - API: 0, Slot: 1, Subslot: 9

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3500	ACTUATORMODULE_INFO_HW_VERSION	R	VISIBLE_STRING_16	16				Hardware version of the device
3501	ACTUATORMODULE_INFO_SW_VERSION	R	VISIBLE_STRING_16	16				Software version of the device
3502	PHOTOMETER_INFO_HW_VERSION	R	VISIBLE_STRING_16	16				*Hardware version* Hardware version of photometer
3503	PHOTOMETER_INFO_SW_VERSION	R	VISIBLE_STRING_16	16				*Software version* Software version of photometer
3504	MODE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: Manual 1: Automatic 2: Fieldbus	*Mode* Operation mode
3505	CURRENT_ACTIVITY	R	UNSIGNED8	1			Default: 0 Selection: 0: --- 1: Measurement %0V 2: Calibration 3: Cleaning 4: --- 5: --- 6: Emptying SC 7: --- 8: --- 9: Empty hoses 10: Initializing 11: Cleaning up 12: Cleaning sample preparation 13: Dispenser replacem. 14: Dispenser replacem. 15: Testing liquidmanager actuator 16: Bottle insertion 17: Bottle	Current activity

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							removal 18: Open valves 19: Close valves 20: Rinse reagents 21: Rinse with water 22: Commissioning 23: Empty reactor 24: Empty dosing unit 25: Empty dilution module 26: Rinse analyzer 27: Reactor heating test 28: Reactor pressure test 29: Custom 30: Rinsing 31: Rinsing 32: Rinsing 33: Rinsing 34: Preparing 35: Service function 1 36: Service function 2 37: Service function 3 38: Service function 4 39: Service function 5 40: Dispenser test 41: Dispenser test 42: Grab sample measurement 43: Reference	

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							sample inspection 44: Reference sample inspection 45: Photometer calibration 46: Photometer test 47: Factory calibration 48: Rinse reactor 49: Calibration 50: Calibration 51: Quality control measurement 52: Sample comparison measurement	
3506	CURRENT_ACTIVITY_REMAINING_TIME	R	EDDL_DURATION	6				Remaining time of current activity
3507	PHOTOMETER_TEMPERATURE	R	FLOAT	4		℃ ℉ K	Default: 25	*Temperature* Temperature of photometer cuvette
3508	OPHOURS_PHOTOMETER	R	FLOAT	4		*s* h	Default: 0.0 Minimum: 0.0	*Operating time photometer* Operating hours of photometer
3509	OPHOURS_FILTER_MAT	R	FLOAT	4	X	*s* d	Default: 0.0 Minimum: 0.0	*Operating time filter mats* Operating time of filter mat
3510	OPHOURS_PELTIER	R	FLOAT	4	X	*s* d	Default: 0.0 Minimum: 0.0	*Operating time cooling module* Operating time of peltier element
3511	POWER_FAIL_REACTION	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Last mode 1: Manual mode	*After power failure* Powerfail reaction
3512	SAMPLE_COLLECTOR_SENSOR	R	UNSIGNED8	1			Default: 0 Selection: 0: None 1: Conductive 2: Capacitive 3: Flow rate	Type of sample preparation
3513	ACTIVE_SAMPLINGPOINT	R	UNSIGNED8	1			Default: 0 Selection: 0: SP1 1: SP2 2: SP3 3: SP4	Active channel

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info 4: SP5 5: SP6 6: ---	Description
3514	MEASURED_VALUE_UNIT	R/W	PA_UNIT	2	X			*Unit* User selectable measurand unit
3515	MEASURED_VALUE_ACTIVE_INX	R/W	UNSIGNED8	1				Index of selected measurement value in measurement value list
3516	MEASURED_VALUE_LIST_SIZE	R	UNSIGNED8	1			Default: 0 Maximum: 8.0	Amount of available/selectable measurands
3517	MEASURED_VALUE_LIST_01	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3518	MEASURED_VALUE_LIST_02	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3519	MEASURED_VALUE_LIST_03	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3520	MEASURED_VALUE_LIST_04	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3521	MEASURED_VALUE_LIST_05	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3522	MEASURED_VALUE_LIST_06	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3523	MEASURED_VALUE_LIST_07	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3524	MEASURED_VALUE_LIST_08	R	VISIBLE_STRING_16	16				Descriptor of available/selectable measurand
3525	MEASUREMENT_DILUTION_FACTOR	R/W	FLOAT	4	X		Default: 1.0 Range: 0.5 .. 100.0	*External dilution factor* External dilution factor
3526	MEASUREMENT_OFFSET	R	FLOAT	4	X	*kg/m³* g/l mg/l µg/l ppm ppb	Default: 0.0	*Offset* Concentration offset for concentration value calculation
3527	CALIBRATION_RETRIES	R/W	UNSIGNED8	1	X		Default: 2 Range: 1.0 .. 3.0	*Calibration trials* Number of retries in case of failed calibration
3528	CALIBRATION_FACTOR	R/W	FLOAT	4			Default: 1.00 Range: 0.1 .. 100.0	*Calibration factor* Calibration factor of the photometer
3529	CALIBRATION_CONCENTRATION	R/W	FLOAT	4	X	*kg/m³* g/l mg/l µg/l ppm ppb	Default: 0.0	*Concentration* Concentration of the calibration standard
3530	CALIBRATION_FACTOR_DELTA	R/W	FLOAT	4	X	%	Default: 10	*Deviation cal. factor* Max. allowed deviation of calibration factor for calibration
3531	CALIBRATION_FACTOR_MAX	R/W	FLOAT	4	X		Default: 2.0	*Limit cal. factor max.* Max. allowed calibration factor
3532	CALIBRATION_FACTOR_MIN	R/W	FLOAT	4	X		Default: 0.5	*Limit cal. factor min.* Min. allowed calibration factor

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3533	MODE_CHANGE_REQUEST	R/W	UNSIGNED8	1			Default: 0 Selection: 0: None 1: Enter fieldbus mode 2: Continue automatic mode 3: Restart automatic mode	Mode change request
3534	MODE_CHANGE_REQUEST_REV_HIDDEN	R	UNSIGNED8	1			Default: 0	Internal use
3535	MODE_CHANGE_PROCESSED_REV_HIDDEN	R	UNSIGNED8	1			Default: 0	Internal use
3536	MODE_CHANGE_REQUEST_STATUS	R	UNSIGNED8	1			Default: 0	Status of the manual request to change the operating mode 0 = Ready to change the operating mode 1 = Device busy 2 = Change of operating mode not allowed
3537	COMMON_REQUEST	R/W	UNSIGNED8	1			Default: 0 Selection: 0: None 1: Abort current action	Abort current activity 0: Idle 1: Abort current activity
3538	COMMON_REQUEST_REV_HIDDEN	R	UNSIGNED8	1			Default: 0	Internal use
3539	ANALYZER_REQUEST	R/W	UNSIGNED8	1			Default: 0 Selection: 0: None 1: Start measurement 2: Start calibration 3: Start cleaning 4: Start Reference Sample Inspection 5: Start zero calibration 6: Start span calibration	Manual activity request
3540	ANALYZER_REQUEST_REV_HIDDEN	R	UNSIGNED8	1			Default: 0	Internal use
3541	ACTIVITY_PROCESSED_REV_HIDDEN	R	UNSIGNED8	1			Default: 0	Internal use
3542	ACTIVITY_STATE_HIDDEN	R	UNSIGNED8	1			Default: 0 Selection: 0: -- unnamed -- 1: -- unnamed -- 2: -- unnamed --	Internal use

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							3: -- unnamed -- 4: -- unnamed --	
3543	ACTIVITY_REQUEST_STATUS	R	UNSIGNED8	1			Default: 0	This parameter reads the status of processing the requested function. 0: Ready to start action. This state is entered, if the analyzer enters fieldbus mode, while nothing is running that disturbs the start of any function via fieldbus. 1: Action request accepted, but not yet started (request was inserted into the queue in automatic mode) 2: No request allowed, because the analyzer is in manual mode. 32: Current action abort in progress 33: Measurement in progress 34: Calibration in progress 35: Cleaning in progress 36: Reference sample inspection in progress 37: Zero calibration in progress 38: Slope calibration in progress 64: Last activity was aborted 65: Measurement finished successfully 66: Calibration finished successfully 67: Cleaning finished successfully 68: Reference sample inspection finished successfully 69: Zero calibration finished successfully 70: Slope calibration finished successfully 96: Reference sample inspection failed 97: Measurement failed 98: Calibration failed 99: Cleaning failed 100: Zero calibration failed 101: Slope calibration failed
3545	PHOTOMETER_RAW_VALUE	R	DS60	12				Raw value of photometer
3546	PHOTOMETER_RAW_VALUE_UNIT	R	PA_UNIT	2				
3548	SAMPLEPREPARATIONS_INSTALLATIONTYPE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: Others 1: Pressurized pipe sampling 2: Inlet pipe sampling	*Installation type* SP InstallationType

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3549	MEASPARAM_ACTIVE_TEXT	R	VISIBLE_STRING_32	32	X			*Measuring parameter* Measuring parameter
3550	MEASRANGE_ACTIVE_TEXT	R	VISIBLE_STRING_32	32	X			*Measuring range* Measuring range
3551	AUTOMEAS_RANGE_CHANGE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: Manual 1: Automatic	*Range switch* Automatic range switch
3552	CALIBRATION_ZEROPOINT_DELTA	R/W	FLOAT	4	X	*kg/m³* g/l mg/l µg/l ppm ppb	Default: 0.0	*Deviation zero point* Max. allowed deviation of zero-point for calibration
3553	CALIBRATION_ZEROPOINT_MAX	R/W	FLOAT	4	X	*kg/m³* g/l mg/l µg/l ppm ppb	Default: 0.0	*Limit zero point max.* Max. allowed calibration zero-point
3554	CALIBRATION_ZEROPOINT_MIN	R/W	FLOAT	4	X	*kg/m³* g/l mg/l µg/l ppm ppb	Default: 0.0	*Limit zero point min.* Min. allowed calibration zero-point
3555	CAL_COUNTER	R	UNSIGNED32	4	X		Default: 0	Number of calibrations
3556	CAL_DATETIME	R	EDDL_DATE_AND_TIME	7	X		Default: 1970-01-01T00:00:00	Time stamp of last calibration
3557	CAL_METHOD	R	UNSIGNED8	1	X		Default: 0 Selection: 0: --- 1: Zero point 2: Cal. factor 3: 2-point calibration 4: Application calibration 5: Numeric input zero point 6: Numeric input cal. factor 7: Numeric input appl. cal.	Calibration method of last calibration

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3558	TURBID_SAMPLE_MODE	R	UNSIGNED8	1	X		Default: 1 Selection: 0: Off 1: On 2: Automatic	*Turbid sample mode* Turbid sample mode
3559	SP_FOR_FIELDBUS_ACTIVITIES	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Sequence of measurements 1: SP1 2: SP2 3: SP3 4: SP4 5: SP5 6: SP6	*Channel* Sampling point for fieldbus activities
3560	SP0_OUT	R	DS60	12		*kg/m³* g/l mg/l µg/l ppm ppb		SP1: Measured value
3561	SP0_OUT_UNIT	R	PA_UNIT	2		*kg/m³* g/l mg/l µg/l ppm ppb		
3563	SP1_OUT	R	DS60	12		*kg/m³* g/l mg/l µg/l ppm ppb		SP2: Measured value
3564	SP1_OUT_UNIT	R	PA_UNIT	2		*kg/m³* g/l mg/l µg/l ppm ppb		
3566	SP2_OUT	R	DS60	12		*kg/m³* g/l mg/l µg/l		SP3: Measured value

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
						ppm ppb		
3567	SP2_OUT_UNIT	R	PA_UNIT	2		*kg/m³* g/l mg/l µg/l ppm ppb		
3569	SP3_OUT	R	DS60	12		*kg/m³* g/l mg/l µg/l ppm ppb		SP4: Measured value
3570	SP3_OUT_UNIT	R	PA_UNIT	2		*kg/m³* g/l mg/l µg/l ppm ppb		
3572	SP4_OUT	R	DS60	12		*kg/m³* g/l mg/l µg/l ppm ppb		SP5: Measured value
3573	SP4_OUT_UNIT	R	PA_UNIT	2		*kg/m³* g/l mg/l µg/l ppm ppb		
3575	SP5_OUT	R	DS60	12		*kg/m³* g/l mg/l µg/l ppm ppb		SP6: Measured value
3576	SP5_OUT_UNIT	R	PA_UNIT	2		*kg/m³* g/l mg/l µg/l ppm ppb		

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3578	SP0_TIME_OF_SAMPLE	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Time of take sample
3579	SP1_TIME_OF_SAMPLE	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Time of take sample
3580	SP2_TIME_OF_SAMPLE	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Time of take sample
3581	SP3_TIME_OF_SAMPLE	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Time of take sample
3582	SP4_TIME_OF_SAMPLE	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Time of take sample
3583	SP5_TIME_OF_SAMPLE	R	EDDL_DATE_AND_TIME	7			Default: 1970-01-01T00:00:00	Time of take sample

6.5.3.2 ANALYZERPROGRAM - API: 0, Slot: 1, Subslot: 9

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
3000	MEASUREMENT_TRIGGER	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Immediate 1: Date/time 2: Continuous 3: Disabled / external trigger	*Start condition* Start condition for measurment
3001	MEASUREMENT_STARTDATE	R/W	EDDL_DATE	3	X		Default: 1970-01-01T00:00:00	*Date* Start of first measurement: date
3002	MEASUREMENT_STARTTIME	R/W	EDDL_TIME	6	X		Default: 1970-01-01T00:00:00 Maximum: 86399.0	*Time* Start of first measurement: time
3003	MEASUREMENT_INTERVAL	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:30:00	*Measuring interval* Interval for measurement
3004	CALIBRATION_TRIGGER	R/W	UNSIGNED8	1	X		Default: 2 Selection: 0: Immediate 1: Date/time 2: Disabled / external trigger 3: Disabled / external trigger	*Time 1. calibration* Start condition for calibration
3005	CALIBRATION_STARTDATE	R/W	EDDL_DATE	3	X		Default: 1970-01-01T00:00:00	*Date* Start of first calibration: date
3006	CALIBRATION_STARTTIME	R/W	EDDL_TIME	6	X		Default: 1970-01-01T00:00:00 Maximum: 86399.0	*Time* Start of first calibration: time
3007	CALIBRATION_INTERVAL	R/W	EDDL_DURATION	6	X		Default: 1970-01-03T00:00:00	*Calibration interval* Interval for calibration
3008	CLEAN_ANALYZER_TRIGGER	R/W	UNSIGNED8	1	X		Default: 2 Selection: 0: Immediate	*Time 1. cleaning* Start condition for cleaning

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							1: Date/time 2: Disabled / external trigger 3: Disabled / external trigger	
3009	CLEAN_ANALYZER_STARTDATE	R/W	EDDL_DATE	3	X		Default: 1970-01-01T00:00:00	*Date* Start of first cleaning: date
3010	CLEAN_ANALYZER_STARTTIME	R/W	EDDL_TIME	6	X		Default: 1970-01-01T00:00:00 Maximum: 86399.0	*Time* Start of first cleaning: time
3011	CLEAN_ANALYZER_INTERVAL	R/W	EDDL_DURATION	6	X		Default: 1970-01-03T00:00:00	*Cleaning interval* Interval for cleaning

6.5.3.3 SAMPLEPREPARATION 1 … 2 - API: 0, Slot: 1, Subslot: 1 … 2

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
700	SP_INFO_TYPE	R	VISIBLE_STRING_16	16				*SP type* Type of sample preparation
701	SP_INFO_HW_VERSION	R	VISIBLE_STRING_16	16				*Hardware version* Hardware version of sample preparation
702	SP_INFO_SW_VERSION	R	VISIBLE_STRING_16	16				*Software version* Software version of sample preparation
703	SP_INFO_SERIAL	R	VISIBLE_STRING_16	16				*Serial number* Serial number of sample preparation
704	SP_INFO_ORDER_CODE	R	VISIBLE_STRING_32	32				*Order code* Ordercode of sample preparation
705	SP_INFO_ORDER_CODE_EXTENDED	R	VISIBLE_STRING_32	32				*Orig. order code ext.* Extended ordercode of sample preparation
706	CONTROL_MODE	R	UNSIGNED8	1	X		Default: 1 Selection: 0: Local control 1: Remote control	*SP control mode* Operating mode
707	CURRENT_STATE	R	UNSIGNED8	1			Default: 0 Selection: 0: Inactive 1: Sampling 2: Cleaning 3: Flush with air 4: Flush with cleaner 5: Flush filter 6: Flush with air 7: Flush with cleaner 8: Flush with air	Current state of sample preparation

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
							9: Flush with cleaner 10: Cleaning up 11: Cleaning up 12: Cleaning up 13: Cleaning up 14: Flush with air 15: Flush with cleaner 16: Flush with air 17: Flush with cleaner 18: Flush filter 19: Sampling 20: Pump backward 21: Cleaning up 22: Flush filter	
708	MEMOSENS_CONTROL_MODE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: Independent 1: Controlled	*Memosens control mode* Operating mode
709	OPHOURS_FILTER	R	EDDL_DURATION	6			Default: 1970-01-01T00:00:00 Minimum: 0.0	*Operating time filter* Operating hours of sample preparation filter
710	OPHOURS_HOSE	R	EDDL_DURATION	6			Default: 1970-01-01T00:00:00 Minimum: 0.0	*Operating time pump tubing* Operating hours of sample preparation hose
711	OPHOURS_MEMBRANE_PUMP	R	EDDL_DURATION	6			Default: 1970-01-01T00:00:00 Minimum: 0.0	*Operating time membrane pump* Operating hours of sample preparation membrane pump
712	HOUSING_HEATING_AVAILABLE	R	UNSIGNED8	1			Default: 1 Selection: 0: Available 1: Not available	*SP housing heating available* Cabinet heating
713	FILTER_TUBE_HEATING_AVAILABLE	R	UNSIGNED8	1			Default: 1 Selection: 0: Available 1: Not available	*SP filter tube heating available* Hose heating filter
714	ANALYZER_TUBE_HEATING_AVAILABLE	R	UNSIGNED8	1			Default: 1 Selection: 0: Available 1: Not available	*SP analyzer tube heating available* Hose heating analyzer
715	AMBIENT_TEMPERATURE_SENSOR_AVAILABLE	R	UNSIGNED8	1			Default: 1 Selection:	*SP ambient temperature sensor available* Ambient temperature sensor

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info 0: Available 1: Not available	Description
717	CLEANING_TRIGGER	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Immediate 1: Date/time 2: Disabled / external trigger	*Start condition* Start condition of first sample preparation cleaning
718	CLEANING_STARTDATE	R/W	EDDL_DATE	3	X		Default: 1970-01-01T00:00:00	*Date* Date of first sample preparation cleanig
719	CLEANING_STARTTIME	R/W	EDDL_TIME	6	X		Default: 1970-01-01T00:00:00 Maximum: 86399.0	*Time* Time of first sample preparation cleanig
720	CLEANING_INTERVAL	R/W	EDDL_DURATION	6	X		Default: 1970-01-02T00:00:00 Range: 3600.0 .. 7776000.0	*Cleaning interval* Interval for sample preparation cleaning
721	CLEANING_DURATION	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:01:00 Range: 30.0 .. 1200.0	*Residence time* Duration of sample preparation cleaning
722	MAXIMUM_TRANSPORT_TIME	R/W	EDDL_DURATION	6			Default: 1970-01-01T00:15:00 Range: 10.0 .. 3600.0	*Max. transport time* Max. transport time of sample preparation
723	HOUSING_HEATING_TRIGGER_TEMPERATURE	R/W	FLOAT	4	X	℃ ℉ K	Default: 5.0 Range: 4.0 .. 10.0	*Start temperature* Switch on temperature for outlet sample preparation cabinet heating
724	HOUSING_HEATING_TRIGGER_TEMPERATURE_INLET_SP	R/W	FLOAT	4	X	℃ ℉ K	Default: 10.0 Range: 4.0 .. 30.0	*Start temperature* Switch on temperature for inlet sample preparation cabinet heating
725	TUBE_HEATING_TRIGGER_TEMPERATURE	R/W	FLOAT	4	X	℃ ℉ K	Default: 5.0 Range: 4.0 .. 10.0	*Start temperature* Switch on temperature for sample preparation hose heating
726	TIMEOUT_SAMPLING	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:05:00 Range: 180.0 .. 1800.0	*Sampling timeout* Timeout no sample
727	TIMEOUT_SAMPLING_PPS	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:01:00 Range: 10.0 .. 1800.0	*Sampling timeout* Timeout no sample (pressurized pipe)
728	FILTER_CHANGE_WARN_LEVEL	R/W	EDDL_DURATION	6	X		Default: 1970-03-02T00:00:00 Range: 86400.0 .. 8553600.0	*Warning limit* Warn level for sample prepartion filter change

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
729	FILTER_CHANGE_ACTIVATION	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: Off 1: On	*Function* Limit change filter
730	HOSE_CHANGE_WARN_LEVEL	R/W	EDDL_DURATION	6	X		Default: 1970-03-02T00:00:00 Range: 86400.0 .. 8553600.0	*Warning limit* Warn level for sample prepartion hose change
731	HOSE_CHANGE_ACTIVATION	R/W	UNSIGNED8	1	X		Default: 1 Selection: 0: Off 1: On	*Function* Limit change hose
732	HOUSING_TEMPERATURE	R	DS60	12		℃ ℉ K		Cabinet temperature
733	HOUSING_TEMPERATURE_UNIT	R	PA_UNIT	2		℃ ℉ K		Cabinet temperature
735	AMBIENT_TEMPERATURE	R	DS60	12		℃ ℉ K		Ambient temperature
736	AMBIENT_TEMPERATURE_UNIT	R	PA_UNIT	2		℃ ℉ K		
741	ACTIVITY_REQUEST	R/W	UNSIGNED8	1			Default: 0 Selection: 0: -- unnamed --	
742	ACTIVITY_REQUEST_REV_HIDDEN	R	UNSIGNED8	1			Default: 0	Internal use
743	CLEANING_DISCARD_TIME	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:01:30 Range: 30.0 .. 180.0	*Cleaning discard time* Cleaning discard time
744	SAMPLEPREPARATION_TYPE	R	UNSIGNED8	1	X		Default: 0 Selection: 0: 3rd party 1: Inlet 2: Aeration/Outlet 3: Unknown	Type of sample preparation
745	PRESSURIZED_AIR_AVAILABLE	R	UNSIGNED8	1			Default: 0 Selection: 0: Available 1: Not available	*SP pressurized air available* Pressurized air available
746	FILTER_AIRCLEANING_DURATION	R/W	EDDL_DURATION	6	X	*s*	Default: 30.0 Range: 1.0 .. 60.0	*Filter air cleaning duration* Filter air cleaning duration

Index	Parameter	Access	Data Type	Bytes	Persistent	Units	Info	Description
747	FILTER_AIRCLEANING_INTERVAL	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T02:00:00 Range: 1800.0 .. 14400.0	*Filter air cleaning interval* Filter air cleaning interval
748	FILTER_AIRCLEANING_MODE	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: On 1: Off	*Filter air cleaning mode* Filter air cleaning mode
749	PPS_CLEANING_VALVE_INSTALLED	R	UNSIGNED8	1	X		Default: 0 Selection: 0: Not available 1: Available	*Cleaning valve* Cleaning valve
750	PPS_CLEANING_DURATION	R/W	EDDL_DURATION	6	X	*s*	Default: 10.0 Range: 10.0 .. 30.0	*Pressurized pipe cleaning duration* Pressurized pipe cleaning duration
751	PPS_CLEANING_DISCARD_TIME	R/W	EDDL_DURATION	6	X	*s*	Default: 180.0 Range: 0.0 .. 1800.0	*Pressurized pipe cleaning discard time* Pressurized pipe cleaning discard time
752	PPS_CLEANING_INTERVAL	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:30:00 Range: 600.0 .. 7200.0	*Cleaning interval* Interval for pressurized pipe cleaning
753	PPS_CLEANING_TRIGGER	R/W	UNSIGNED8	1	X		Default: 0 Selection: 0: On 1: Date/time 2: Off	*Start condition* Start condition of first pressurized pipe cleaning
754	PPS_CLEANING_DETERGENT_RESIDENCE_TIME	R/W	EDDL_DURATION	6	X		Default: 1970-01-01T00:01:00 Range: 30.0 .. 1200.0	*Cleaner residence time* Cleaner residence time

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