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Endress+Hauser
People for Process Automation

Liquiline M CM42 PROFIBUS® Guideline

Data transmission via PROFIBUS PA

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Table of contents

1 General information

1.1 Using the supplementary documentation

This Guideline complements the Operating Instructions of Liquiline M CM42 and is aimed at individuals who are responsible for integrating the device into a PROFIBUS network. The reader is expected to have sufficient knowledge of PROFIBUS technology.

The Guideline is valid for the Liquiline M CM42 instrument generation with firmware version 02.04.xx and higher.
Please refer to Section 1.4 for information on how to determine the instrument generation.

Please refer to the User Documentation for introductory information on how to commission and operate the device.

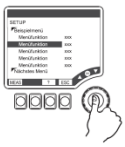
Additional information on PROFIBUS system integration and technical manuals for the device are available on our homepage:

- Liquiline M CM42
  www.endress.com/cm42

Furthermore, various guidelines on the installation and commissioning of a PROFIBUS network are available from the PROFIBUS User Organization at www.profibus.com, e.g.

- PROFIBUS PA - User and Installation Guideline
  www.profibus.com/download/installation-guide

1.2 Information symbols and icons

	General notes and information
	Notes on device operation

1.3 Abbreviations

Term	Description
AIx	Analog Input (PA Profile function block)
ATBx	Analyzer Transducer Block 1-n In the implementation of the PA Profile block model in the Liquiline M CM42, every process value is represented by an Analyzer Transducer Block (ATB)

Term	Description
ENP	Electronic nameplate
GSD	Device master data, new: general station description
I&M	Identification & Maintenance Functions to read the data structures for device identification and maintenance
Ident number / PNO ident number	16-bit device identification number to identify the device property in the PROFIBUS network; is assigned by the PROFIBUS User Organization.
Liquiline Cond	Device identifier for Liquiline M CM42 Ver.2.xx, conductivity configuration
Liquiline Oxygen	Device identifier for Liquiline M CM42 Ver.2.xx, oxygen configuration
Liquiline pHORP	Device identifier for Liquiline M CM42 Ver.2.xx, pH/ORP configuration
MBP	Manchester Coding Bus Powered Transmission technology for PROFIBUS-PA devices according to IEC 61158-2
n.a.	Not applicable
n.avail.	Not available
NAMUR	Standardization Working Group for Measurement and Control in the Chemical Industry in Germany
NAMUR NE107	Self-Monitoring and Diagnosis of Field Devices
Non_FR_parameters	Parameters that are exempted from a reset to the order configuration (see Section 6.4.1)
Octet	Designation for a byte in a PROFIBUS telegram
PI	PROFIBUS International (www.profibus.com)
PNO	PROFIBUS User Organization, Haid-und-Neu-Str. 7, 76131 Karlsruhe, Germany
SAP	Service Access Point Access address negotiated between the master and slave for executing services via the PROFIBUS data transmission layer
Factory default (Device menu)	Resets the device to the order configuration (factory setting). Note: Some parameters are exempted from the reset to factory settings (see Section 6.4.1)

1.4 Device identification

You have the following options for identifying the Liquiline M CM42 instrument generation during operation:

- Query the designation of the PROFIBUS PCB board via the Device menu
- Query the Physical Block parameter DEVICE_ID via PROFIBUS

1.4.1 Determining the fieldbus instrument generation via the Device menu

Path	Diag/Device information/Fieldbus module/Hardware identifier	
Format	Text field	
Display	FBPA3	The device is a Liquiline M CM42 Ver. 2.xx
	FBPA1	The device is a Liquiline M CM42 Ver. 1.xx[1]

1.4.2 Determining the fieldbus instrument generation via PROFIBUS

Physical Block parameter DEVICE_ID (length = 16 characters)			
	Configuration		
	pHORP	**Cond**	**Oxygen**
Liquiline M CM42 Ver. 2.xx	"Liquiline pHORP "	"Liquiline Cond "	"Liquiline Oxygen"
Liquiline M CM42 Ver. 1.xx[1]	"Liquiline M CM42"		

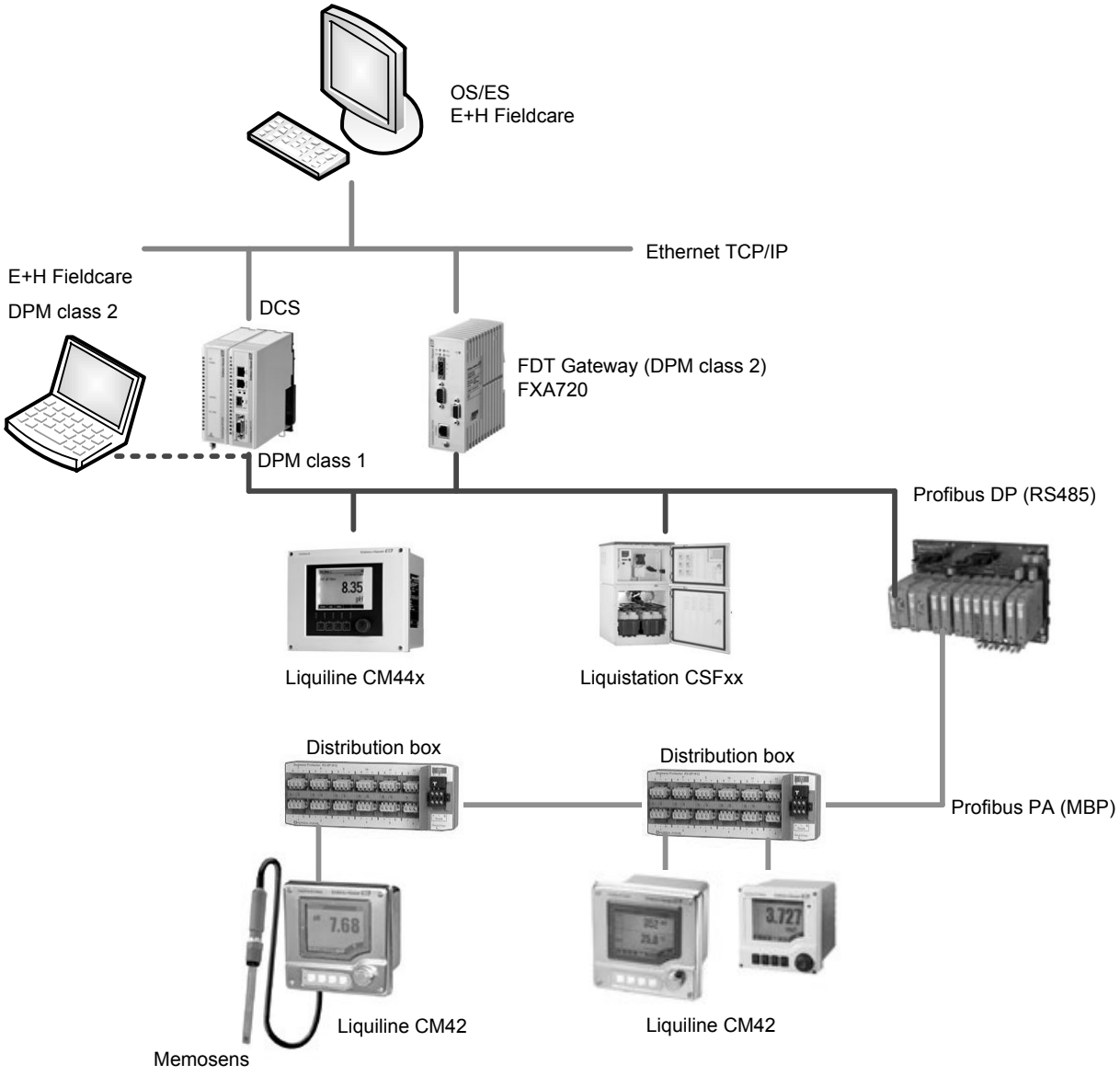
1.5 Normative documents and specifications

Standard/specification	**Description**
IEC 61158-2	Physical Layer specification (Type 1)
IEC 61158-3	Data link service definition (Type 3)
IEC 61158-4	Data Link Layer protocol specification (Type 3)
IEC 61158-5	Application Layer service definition (Type 3)
IEC 61158-6	Application Layer protocol specification (Type 3)
IEC 61784-1	Digital data communication for measurement and control (CPF 3/2)
PA Profile	PROFIBUS Profile for Process Control Devices, published by PROFIBUS User Organization, Haid-und-Neu-Str. 7, 76131 Karlsruhe, Germany
I&M	PROFIBUS Profile Guidelines – Part 1 – Identification & Maintenance Functions, published by PROFIBUS User Organization, Haid-und-Neu-Str. 7, 76131 Karlsruhe, Germany

[1] This document does not describe the PROFIBUS device behavior of Liquiline M CM42 Vers. 1.xx.

1.6 Network topology

The graphic below depicts Liquiline M CM42 in the process environment. The device can be operated on Master Class 1 and Class 2 systems.



Network topology of Liquiline M CM42

2 Performance characteristics

The PROFIBUS communication interface of Liquiline M CM42 has been developed and tested according to the IEC 61158 standard (Data Communication for Measurement and Control). Please refer to the following tables for information on the supported protocols, application profiles and diagnosis options, as well as the properties of the underlying transmission technology.

2.1 Transmission technology

Standard	IEC 61158-2
Physical signal coding	Manchester Coding Bus Powered (MBP)
Max. length from segment coupler	1900 m: standard and intrinsically safe applications, category ib 1000 m: intrinsically safe applications, category ia
Users	Max. 10 in the hazardous area (Ex-ia) Max. 24 in the hazardous area (Ex-ib) Max. 32 in the non-hazardous area
Transmission rate	31.25 kBit/s
Bus access method	Master-slave
Bus termination	External
Connection to PROFIBUS DP network	Via segment coupler (not hazardous area operation!)

2.2 Protocols

DP-V0/MS0	Cyclic communication, Master Class 1 ↔ slave
DP-V1/MS1	Acyclic communication channel Master Class 1 ↔ slave Services: ▪ MSAC_C1_Read & Write
DP-V1/MS2	Acyclic communication channel Master Class 1 ↔ slave, up to two master connections are possible in parallel. Services: ▪ MSAC_C2_Initiate & Abort ▪ MSAC_C2_Read & Write
GSD files	▪ EH3x1565.GSD - manufacturer-specific, pH/ORP sensors ▪ EH3x1566.GSD - manufacturer-specific, conductivity sensors ▪ EH3x1567.GSD - manufacturer-specific,

	oxygen sensors ▪ EH3x1543.GSD - manufacturer-specific, Liquiline M CM42 Ver. 1.xx compatibility mode (see Section 4.4), pH/ORP sensors ▪ EH3x1544.GSD - manufacturer-specific, Liquiline M CM42 Ver. 1.xx compatibility mode (see Section 4.4), conductivity sensor ▪ EH3x154B.GSD - manufacturer-specific, Liquiline M CM42 Ver. 1.xx compatibility mode (see Section 4.4), oxygen sensors ▪ PA139750.GSD (profile identifier, analyzer PA devices)
Freeze support	Provided
Alarms	n.avail.
Sync support	n.avail.

2.3 Application profile

Standard	PA Profile Version 3.02
Manufacturer ID	11_h
Identifier	▪ 1565_h - PNO manufacturer-specific, pH/ORP sensors ▪ 1566_h - PNO manufacturer-specific, conductivity sensors ▪ 1567_h - PNO manufacturer-specific, oxygen sensors ▪ 1543_h - PNO manufacturer-specific, Liquiline M CM42 Ver. 1.xx compatibility mode (see Section 4.4), pH/ORP sensors ▪ 1544_h - PNO manufacturer-specific, Liquiline M CM42 Ver. 1.xx compatibility mode (see Section 4.4), conductivity sensors ▪ $154B_h$ - PNO manufacturer-specific, Liquiline M CM42 Ver. 1.xx compatibility mode (see Section 4.4), oxygen sensors ▪ 9750_h (profile identifier, analyzer PA devices)
Status output	Classic & Condensed
Output variables	6 AI blocks
Input variables	n.avail.

2.4 Identification & Maintenance (I&M)

Supported structures	Content
I&M0 (65000):	Device-specific basic information
I&M1 (65001)	Tag function and location
I&M2 (65002)	Date of installation
I&M3 (65003)	PB.DESCRIPTOR
I&M-PA (65016)	Profile and version information

Note
All I&M structures can only be read-accessed via the I&M call service.

2.5 Diagnostics

Type	Description
Physical Block parameter (standard)	▪ DIAGNOSIS ▪ DIAGNOSIS_EXTENSION
Extended, manufacturer-specific diagnosis	▪ Supported (Physical Block parameter DEVICE_DIAGNOSIS)
Diagnostics configuration	Available via the Physical Block parameter DIAG_EVENT_SWITCH (see Section 5.4)

3 Installation and wiring

The installation and wiring are described in detail in the

Operating Instructions for Liquiline M CM42, Part 1, BA00381C.

In addition, please also follow the installation guide supplied by the PROFIBUS User Organization. An electronic copy can be downloaded free of charge from the PROFIBUS website.

www.profibus.com/downloads/installation-guide

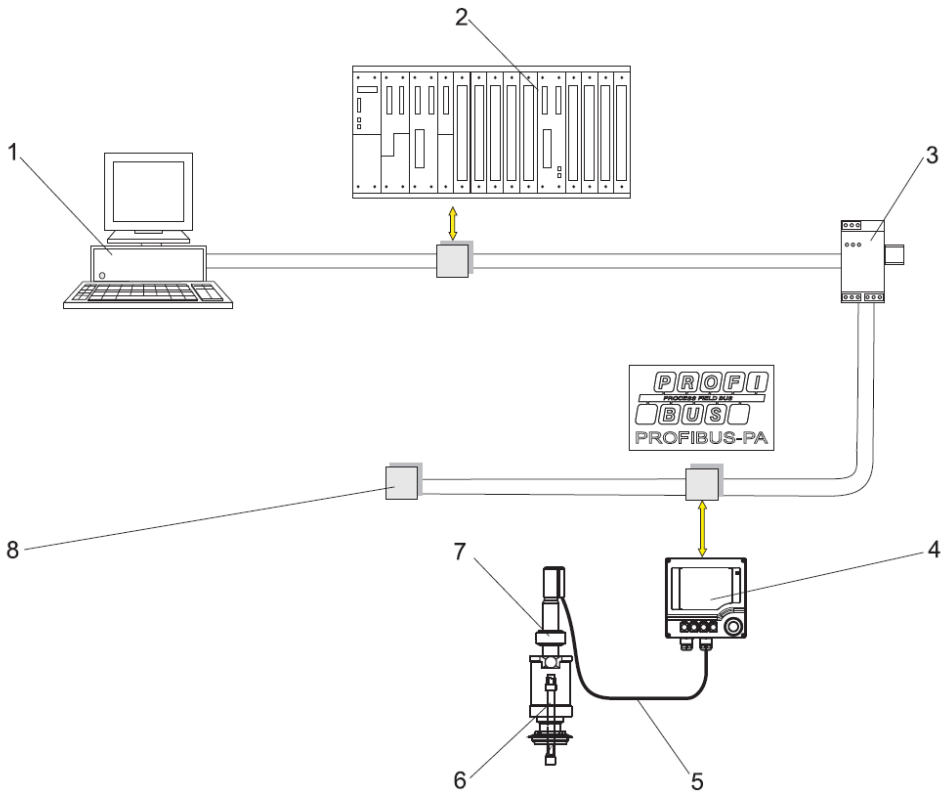
A quick guide to commissioning the Liquiline M CM42 fieldbus connection socket is provided on the following pages.

4 Commissioning

4.1 System overview

The following graphic shows the typical components of a system interconnected with PROFIBUS.
The system could consist of:

- Liquiline M CM42
- An immersion assembly, e.g. CPA140 or flow assembly, e.g. CPA240 or retractable assembly, e.g. CPA875; with or without a potential matching line (PML) in each case
- A pH/ORP sensor with Memosens technology: e.g. CPS11D
- A measuring cable CYK10
- A PROFIBUS-DP Master Class 1 or Class 2, e.g. PLC incl. PC and operating software
- DP/PA segment coupler
- Terminating resistor

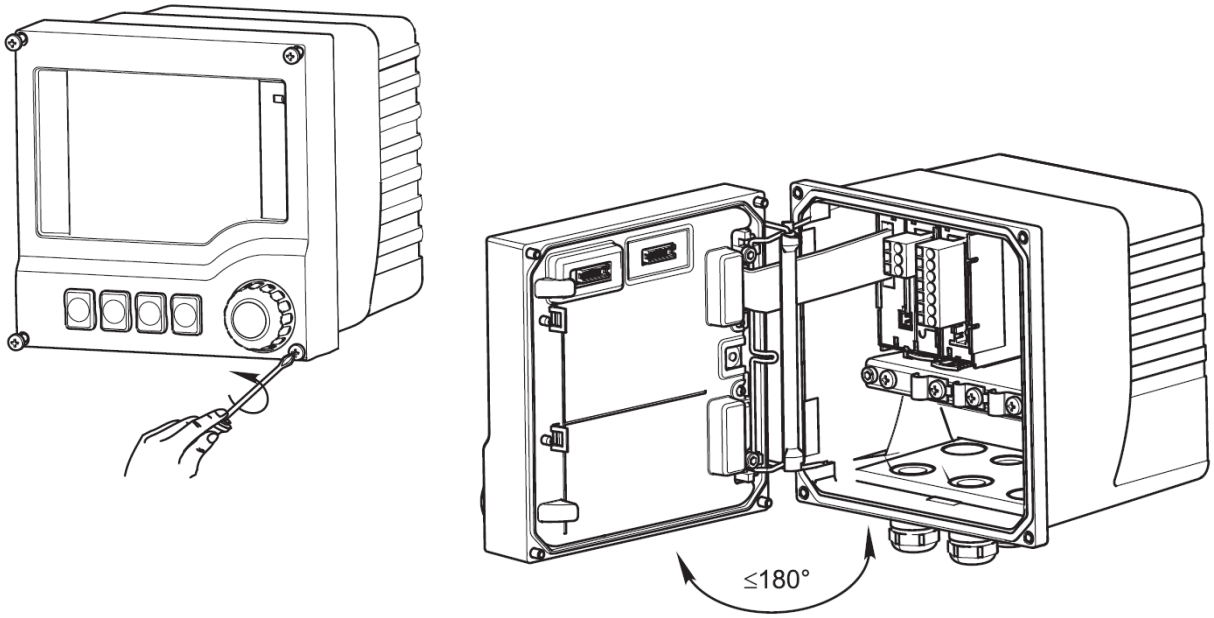


1 PC with operating software
2 PROFIBUS master (PLC)
3 Segment coupler
4 Liquiline M CM42
5 Measuring cable
6 Retractable assembly
7 pH/ORP sensor
8 Terminating resistor

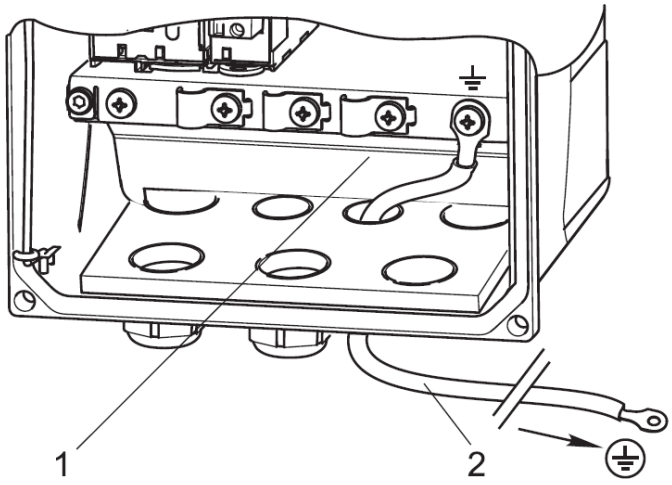
4.2 Connecting the fieldbus interface

4.2.1 Opening the housing

Loosen the four screws on the front using a Phillips screwdriver:



4.2.2 Grounding the housing

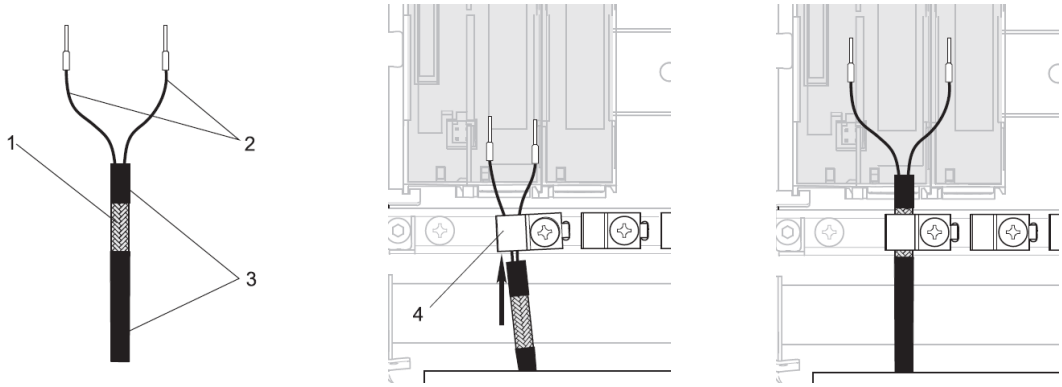


1 Cable mounting rail 2 2.5 mm² (14 AWG) functional ground

- Only use terminated original cables wherever possible
- Ground the sensor cable in the housing of the transmitter as illustrated in the following graphics (sample cable, is not necessarily the same as the original cable)

4.2.3 Connecting the fieldbus signal cable and the power supply

Tighten the ground screw. The cable shield is grounded by the grounding clip:



1 Outer shield (exposed)
2 Cable cores with ferrules
3 Cable sheath (insulation)
4 Grounding clip

You can use single-wire or multi-wire conductors with ferrules for the connection. Only one conductor per terminal is permitted.

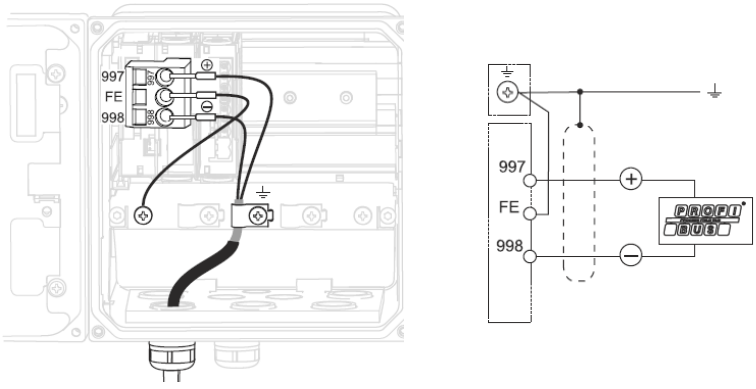
Note
To avoid damage or malfunctions from incorrect supply voltage, please comply with the specifications concerning the permitted and minimum supply voltage.

The connection can be performed in a variety of ways:

1. Two-wire cable shielded at both ends, "hard grounding" (generally to be given priority over "capacitance connection to ground")
2. Shielded two-wire cable, "capacitance connection to ground" (shielding grounded via capacitor on device side, "C-Module" accessory required) if there is the risk of large potential equalization currents
3. Use of the fieldbus connection socket (accessory)

"Hard grounding" connection:

Connect the cable shield to the cable mounting rail and connect the cable cores to the CPU module as per the assignment illustrated in the graphic below.



4.3 System integration

The following conditions must be met to couple the Liquiline M CM42 to a control system:

- Correct configuration of the Physical Layer communication parameters when operating via a segment coupler (DP network)
- Selection of a suitable GSD file and the device ident number linked to this file
- Correct addressing by adapting the bus address

Note

There is a direct relationship between the GSD file and the device ident number. In other words, the choice of GSD file defines the device ident number with which communication is to take place.

4.3.1 GSD files

The specific properties of the PROFIBUS devices are saved in GSD files. An individual GSD file is available for each of the three sensor types: pH/ORP (pHORP), conductivity (Cond) and oxygen (Oxygen). This file can be downloaded from www.endress.com/cm42.

Alternatively, the device can be operated with the generic Analyzer PA Profile GSD of the PROFIBUS User Organization. This is available from www.profibus.com. All the GSD files that can be used for the applications described above are listed in the following tables.

4.3.1.1 Liquiline M CM42

File	Type	Comments
EH3X1565.GSD	Manufacturer-specific	Physical Block DEVICE_ID → "Liquiline pHORP"
EH3X1566.GSD	Manufacturer-specific	Physical Block DEVICE_ID → "Liquiline Cond"
EH3X1567.GSD	Manufacturer-specific	Physical Block DEVICE_ID → "Liquiline Oxygen"
PA139750.GSD	Generic	Analyzer Profile for MBP Devices[2]

4.3.1.2 Liquiline M CM42 Ver. 1.xx (compatibility mode)

Users of the earlier Liquiline M CM42 Ver. 1.xx instrument generation can continue to use the GSD files developed for this generation. The device must be operated in a compatibility mode to this end. Please refer to Section 4.4.

[2] Liquiline M CM42 Ver. 2.xx supports these modules: EMPTY_MODULE, Analog Input (AI)

Note

To be able to use the full range of functions, it is advisable to use a manufacturer-specific GSD file for the current instrument generation.

4.3.2 Device ident numbers

The device ident number is a 16-bit number assigned by the PROFIBUS User Organization (PNO) which permanently links the device to a GSD file and therefore reveals the device behavior for the PROFIBUS master. The Liquiline M CM42 can be operated with a variety of ident numbers, each of which is dependent on the type of sensor that is connected. The following settings can be made with regard to the ident number by adjusting the Physical Block parameter IDENT_NUMBER_SELECTOR in the PA Profile:

- Fixed setting for the current PNO device ident number
- Fixed setting for the PNO ident number of Liquiline M CM42 Ver. 1.xx
- Fixed setting for the generic Analyzer Profile ident number (0x9750) of the PNO
- Automatic selection of one of the three settings mentioned by configuring the PROFIBUS master

In the last adjustment mode mentioned (Physical Block parameter IDENT_NUMBER_SELECTOR = 127), the Liquiline M CM42 adopts the ident number from the parameter telegram which is sent by the master.

It is also possible to configure the setting via the Setup Device menu, as illustrated below:

Path	Setup/General settings/Ident number selector		
Format	Enumeration		
Choose list	0x9750	IDENT_NUMBER_SELECTOR = 0 Analyzer profile GSD file (generic)
	Automatic mode	IDENT_NUMBER_SELECTOR = 127 Automatic selection
	Liquiline pHORP 0x1565	IDENT_NUMBER_SELECTOR = 128 Current device GSD file
	Liquiline M CM42 pH/ORP 0x1543	IDENT_NUMBER_SELECTOR = 129 Compatibility mode for Liquiline M CM42 Ver. 1.xx (see Section 4.4)

Note

The Physical Block parameter IDENT_NUMBER_SELECTOR is set to the adjustment mode in the order configuration. Resetting the device to the factory default settings does not affect the IDENT_NUMBER_SELECTOR.

4.3.2.1 Device ident numbers for Liquiline pHORP

IDENT_NUMBER_SELECTOR	Ident number	Selection	GSD file
0	9750_h	0x9750 (Analyzer Profile GSD, MBP)	PA139750.GSD
127	*	Automatic mode	Automatic
128	1565_h	Liquiline pHORP	EH3x1565.GSD

4.3.2.2 Device ident numbers for Liquiline Cond

IDENT_NUMBER_SELECTOR	Ident number	Selection	GSD file
0	9750_h	0x9750 (Analyzer Profile GSD, MBP)	PA139750.GSD
127	*	Automatic mode	Automatic
128	1566_h	Liquiline Cond CM42	EH3x1566.GSD

4.3.2.3 Device ident numbers for Liquiline Oxygen

IDENT_NUMBER_SELECTOR	Ident number	Selection	GSD file
0	9750_h	0x9750 (Analyzer Profile GSD, MBP)	PA139750.GSD
127	*	Automatic mode	Automatic
128	1567_h	Liquiline Oxygen CM42	EH3x1567.GSD

4.3.3 PROFIBUS address

The PROFIBUS address is used to uniquely identify a device in a functional PROFIBUS network. Therefore, the address can only be assigned once per device. After initial start-up, the address is set to 126 and should be changed during commissioning.

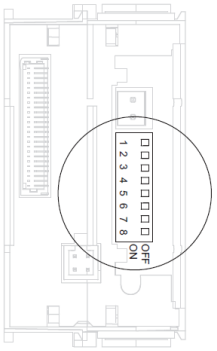
In Liquiline M CM42 users have the following ways to configure the PROFIBUS address:

- Via DIP switches in the device
- Via the Setup Device menu
- Via the PROFIBUS master using the DPV1-Set_Slave_Add service

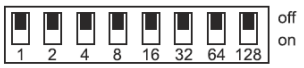
The various configuration options are described in the following section.

4.3.3.1 Configuration via DIP switches

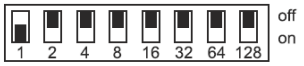
For this, you must open the housing as described in Section 4.2.1. At the CPU module, the DIP switches can be set in binary format as illustrated in the following example:



- **0**:



- **1**:



- **18** (2+16):

Note

Please note that the numerical value configured at the DIP switches is accepted by the device after a period of 10 seconds. This prevents accidental switching to undesired addresses.

Via the DIP switches it is possible to specify whether it should be possible to modify an address via the Set_Slave_Add service or via the Device menu. The mechanisms are described in the following sections.

Enabling the function to modify the address via the Set_Slave_Add service or via the Device menu:

The function to modify the address is enabled if you set a bus address greater than 125 at the DIP switches. The device then switches to address 126, which is the highest possible PROFIBUS address. The bus address can now be corrected by the PROFIBUS master via the DPV1 Set_Slave_Add service (value range 0 to 125) or via the CM42 Device menu (value range 0 to 126).

Disabling the function to modify the address via the Set_Slave_Add service or via the Device menu:

The function to modify the address is disabled if you set an address in the range between 0 and 125 at the DIP switches. In this case, the bus address set via the DIP switches is accepted by the device; it is not possible to correct the address via the Set_Slave_Add service or via the Device menu.

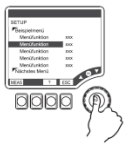
Note

The Set_Slave_Add service gives users the option of preventing future changes to the bus address via the Device menu and the PROFIBUS master. To remove this slave address lock, proceed as follows:

Using the DIP switches, change the bus address to a value less than or equal to 125. Wait for 10 seconds until the numerical value configured at the DIP switches is accepted by the device. After this, set the address to a value greater than or equal to 126. The address lock has been removed and the device can be accessed via address 126.

The slave address lock can also be removed by using the "Reset bus address" PROFIBUS service (FACTORY_RESET_2712). Please refer to Section 6.4.1.

4.3.3.2 Configuration via the Device menu



Path	Setup/General settings/Bus address
Format	Numerical
Value range	[0 to 126]

If the DIP switch setting in the device is set to an address greater than 125, you can configure any software address between 0 and 126 via the Device menu. The Bus Address menu item cannot be edited if the DIP switch setting is less than or equal to 125.

Note

In the order configuration, the bus address can be configured via the Device menu but a changeover to hardware addressing or the slave address lock state can mean that the Bus Address menu entry in the Device menu cannot be edited. Please refer to the instructions in Section 4.3.3.1 for information on reactivating software addressing.

4.3.3.3 Configuration via the DPV1-Set_Slave_Add service

The PROFIBUS master can change the bus address in the 0 to 125 range via the Set_Slave_Add service if the device is in the software addressing mode.

Note

In the order configuration, the bus address can be configured via the Set_Slave_Add service but a changeover to hardware addressing or the slave address lock state can cause a failure of a PROFIBUS master Set_Slave_Add request. Please refer to the instructions in Section 4.3.3.1 for information on reactivating software addressing.

4.4 Device replacement/compatibility mode

To enable operation on a control system which is set up for the older Liquiline M instrument generation, the Liquiline M CM42 Ver. 2.xx can be compatible with the previous Liquiline M CM42 Ver. 1.xx generation with regard to DPV0 and DPV1 basic functionalities.

The scope of the compatibility mode comprises:

- Querying diagnostics
- Cyclic data exchange
- Acceptance of GSD files from the previous model

To activate the compatibility mode, the Physical Block parameter IDENT_NUMBER_SELECTOR must be set to one of the following two values:

- IDENT_NUMBER_SELECTOR = 127 (adjustment mode, automatic adoption of ident number)
- IDENT_NUMBER_SELECTOR = 129 (compatibility mode for Liquiline M CM42 Ver. 1.xx)

The IDENT_NUMBER_SELECTOR parameter can be configured both via PROFIBUS and via the Setup Device menu. For this, one of the two modes must be selected as illustrated in the following table.

Path	Setup/General settings/Ident number selector		
Format	Enumeration		
Choose list (reduced)	Adjustment mode	IDENT_NUMBER_SELECTOR = 127 Automatic selection	
	Liquiline M CM42 XXXX 1543_h/1544_h/$154B_h$	IDENT_NUMBER_SELECTOR = 129 Compatibility mode for Liquiline M CM42 Ver. 1.xx	

4.4.1.1 Device ident numbers for Liquiline M CM42 Ver. 1.xx (pH/ORP)

IDENT_NUMBER_SELECTOR	Ident number	Selection	GSD file
0	9750h	0x9750 (Analyzer Profile GSD, MBP)	PA139750.GSD
127	*	Automatic mode	Automatic
129	1543_h	Liquiline M CM42 pH/ORP	EH3X1543.GSD

4.4.1.2 Device ident numbers for Liquiline M CM42 Ver. 1.xx (Cond)

IDENT_NUMBER_SELECTOR	Ident number	Selection	GSD file
0	9750h	0x9750 (Analyzer Profile GSD, MBP)	PA139750.GSD
127	*	Automatic mode	Automatic
129	1544h	Liquiline M CM42 Cond	EH3X1544.GSD

4.4.1.3 Device ident numbers for Liquiline M CM42 Ver. 1.xx (DOxygen)

IDENT_NUMBER_SELECTOR	Ident number	Selection	GSD file
0	9750h	0x9750 (Analyzer Profile GSD, MBP)	PA139750.GSD
127	*	Automatic mode	Automatic
129	154Bh	Liquiline M CM42 DOxygen CM42	EH3X154B.GSD

4.4.1.4 Liquiline M CM42 Ver. 1.xx GSD files

File	Type	Comments
EH3X1543.GSD	Manufacturer-specific	Physical Block DEVICE_ID → "Liquiline M CM42" (Liquiline M CM42 pH/ORP)
EH3X1544.GSD	Manufacturer-specific	Physical Block DEVICE_ID → "Liquiline M CM42" (Liquiline M CM42 Cond)
EH3X154B.GSD	Manufacturer-specific	Physical Block DEVICE_ID → "Liquiline M CM42" (Liquiline M CM42 DOxygen)
PA139750.GSD	Generic	Analyzer Profile for MBP Devices[3]

[3] In the Liquiline M CM42 Vers. 1.xx compatibility mode, Liquiline M CM42 Ver. 2.xx supports the modules Analog Input (AI) and EMPTY_MODULE

4.5 Cyclic data exchange

During cyclic data exchange, the Liquiline M CM42 sends process data to the control system via the DPV0 DataExchange service. To initiate this, a PROFIBUS Master Class 1 must process the following sequences in the order indicated:

1. Transmission of the parameterization via the DPV0 parameter telegram
2. Transmission of the module configuration via the DPV0 configuration telegram
3. Cyclic interrogation of the process data via the DPV0 DataExchange service

The other subsections describe the content of the parameterization and the configuration by the master, and the interpretation of the process data received from the master.

4.5.1 DPV0 parameter telegram

Octet	Name	Bit	Name	Values - description
1	Station_status	0 to 2	Reserved	0
		3	WD_On	Watchdog active (0/1)
		4	Freeze_Req	Freeze active (0/1)
		5	Sync_Req	(0, n.avail.)
		6	Unlock_Req	Master unlock (0/1)
		7	Lock_Req	Master lock (0/1)
2	WD_Fact_1			$T_{Watchdog}$ = 10 ms * WD_Fact_1 * WD_Fact_2 Once $T_{Watchdog}$ elapses, the PROFIBUS slave ends the cyclic connection to the master
3	WD_Fact_2			
4	TSDR			Time in t_{Bit} which the PROFIBUS slave must wait following a master request before initiating the telegram transmission process.
5	Identnumber		High byte	ID-H-CM42-V.2 (15_h) / ID-H-CM42-V.1 comp (15_h) / ID-H-profile (97_h)
6	Identnumber		Low byte	▪ ID-L-CM42-V.2 (65_h) / ID-L-CM42-V.1 comp (43_h) / ID-L-profile (50_h) pH/ORP sensors ▪ ID-L-CM42-V.2 (66_h) / ID-L-CM42-V.1 comp (44_h) / ID-L-profile (50_h) conductivity sensors ▪ ID-L-CM42-V.2 (67_h) / ID-L-CM42-V.1 comp ($4B_h$) / ID-L-profile (50_h) oxygen sensors
7	Group_Ident	0	Group 1	
		1	Group 2	
		2	Group 3	
		3	Group 4	

Octet	Name	Bit	Name	Values - description
		4	Group 5	
		5	Group 6	
		6	Group 7	
		7	Group 8	
8	DPV1_Status_1			00_h
9	DPV1_Status_2			00_h
10	DPV1_Status_3			Prm_Structure (avail./n.avail.) 00_h: Prm_Structure (octets 11 to 15) is not transmitted 08_h: Prm_Structure (octets 11 to 15) contained in the parameter telegram
11	User_param			05_h: Structure_Length
12				41_h: Structure_Type
13				00_h: Slot_Number
14				00_h: Reserved
15	Ext. User_param			PRM_COND 00_h: Classic Status 01_h: Condensed Status

Note

If the PROFIBUS master sends the parameter telegram without the Prm_Structure (octets 11 to 15), the Classic Status is output during cyclic data exchange.

4.5.2 DPV0 configuration telegram

The AI modules whose process values are transmitted to the control system during cyclic data exchange are selected in the configuration telegram.

If a manufacturer-specific GSD file is being used, the configuration must be performed in a special format as illustrated in the following tables.

The tables also contain the process values of the individual AI modules for the order configuration or following a reset to factory defaults. The process values can be selected any time by overwriting the channel assignment. For more information, please refer to Section 6.2.

4.5.2.1 DPV0 configuration for pH/ORP sensors

Slot	GSD modules	Index	Module identifier	Module name	Factory setting		
					Process value	Unit	ATB channel
1	AI: OUT Analog Input	0	$42_h,84_h,81_h,81_h$	AI01	pH (primary value)	pH	1
2	AI: OUT Analog Input	4	$42_h,84_h,81_h,81_h$	AI02	Temperature	°C	2
3	AI: OUT Analog Input	8	$42_h,84_h,81_h,81_h$	AI03	Raw measured value	mV	3
4	AI: OUT Analog Input	12	$42_h,84_h,81_h,81_h$	AI04	Damped raw value	mV	4
5	AI: OUT Analog Input	16	$42_h,84_h,81_h,81_h$	AI05	pH	pH	5
6	AI: OUT Analog Input	20	$42_h,84_h,81_h,81_h$	AI06	ORP mV	mV	6

4.5.2.2 DPV0 configuration for conductivity sensors

Slot	GSD modules	Index	Module identifier	Module name	Factory setting		
					Process value	Unit	ATB channel
1	AI: OUT Analog Input	0	42_h,84_h,81_h,81_h	AI01	Conductivity (primary value)	mS/cm	1
2	AI: OUT Analog Input	4	42_h,84_h,81_h,81_h	AI02	Temperature	°C	2
3	AI: OUT Analog Input	8	42_h,84_h,81_h,81_h	AI03	Uncompensated conductivity	mS/cm	3
4	AI: OUT Analog Input	12	42_h,84_h,81_h,81_h	AI04	Conductivity	mS/cm	4
5	AI: OUT Analog Input	16	42_h,84_h,81_h,81_h	AI05	Resistivity	MΩ*cm	5
6	AI: OUT Analog Input	20	42_h,84_h,81_h,81_h	AI06	Concentration	%	6

4.5.2.3 DPV0 configuration for oxygen sensors

Slot	GSD modules	Index	Module identifier	Module name	Factory setting		
					Process value	Unit	ATB channel
1	AI: OUT Analog Input	0	42_h,84_h,81_h,81_h	AI01	Liquid concentration (primary value)	mg/l	1
2	AI: OUT Analog Input	4	42_h,84_h,81_h,81_h	AI02	Temperature	°C	2
3	AI: OUT Analog Input	8	42_h,84_h,81_h,81_h	AI03	Compensation current	nA	3
4	AI: OUT Analog Input	12	42_h,84_h,81_h,81_h	AI04	Ambient pressure	hPa	4
5	AI: OUT Analog Input	16	42_h,84_h,81_h,81_h	AI05	Partial pressure	hPa	5
6	AI: OUT Analog Input	20	42_h,84_h,81_h,81_h	AI06	Saturation	%	6

Note

To reduce the amount of cyclic process data, individual AI modules can be deselected by using the placeholder module with the "EMPTY_MODULE" identifier (0x00) instead of the regular module identifier.

4.5.3 Interpretation of the cyclic process data

A block consisting of the process value and status is sent to the master during cyclic data exchange for every selected AI module in the configuration telegram.

4.5.3.1 Structure of the AI module data block

AI module block index [1 to 6]
n = 5 x AI module block index

Index	Content
n+0	Process value 32-bit floating point number as per IEEE-754
n+1	
n+2	
n+3	
n+4	Condensed Status (factory setting) Classic Status (optional)

4.5.3.2 Condensed Status decoding

Each process value is linked to a status that provides information about the validity, and thereby the usability, of this particular process value. When the manufacturer-specific GSD file is used, the status coding follows the definition of the PA Profile 3.02 for Condensed Status. It is possible to switch the status output to Classic if the Analyzer Profile GSD file or one of the Liquiline M CM42 Ver. 1.xx GSD files is used (see Section 6.3.1).

Condensed status code	Quality	Substatus	Limits	Description
0 (00_h)	Bad	Non specific	OK	This status is only used by proxies to indicate that a device is not communicating.
35 (23_h)	Bad	Passivated	OK	This status is set by the device if a process value has not been configured or cannot be made available for other reasons. No diagnostic events are reported via the Slave_Diag service.
36 (24_h)	Bad	Maintenance Alarm	OK	The value cannot be used because of an error.
37 (25_h)	Bad		LO_LIM	
38 (26_h)	Bad		HI_LIM	
39 (27_h)	Bad		CONSTANT	
40 (28_h)	Bad	Process related	OK	The value cannot be used because of an issue that can be attributed to the process.
41 (29_h)	Bad		LO_LIM	
42 ($2A_h$)	Bad		HI_LIM	
43 ($2B_h$)	Bad		CONSTANT	

Condensed status code	Quality	Substatus	Limits	Description
60 ($3C_h$)	Bad	Function Check	OK	The value cannot be used because of user intervention (e.g. calibration).
61 ($3D_h$)	Bad		LO_LIM	
62 ($3E_h$)	Bad		HI_LIM	
63 ($3F_h$)	Bad		CONSTANT	
75 ($4B_h$)	Uncertain	Substitute set	OK	A substitute value is configured and is used. This status is set by the fail-safe logic of a function block.
79 ($4F_h$)	Uncertain	Initial value	OK	Initial value if a measured value is not available.
104 (68_h)	Uncertain	Maintenance demanded	OK	The usability of the value depends on the application and must be assessed by the user.
105 (69_h)	Uncertain		LO_LIM	
106 ($6A_h$)	Uncertain		HI_LIM	
107 ($6B_h$)	Uncertain		CONSTANT	
115 (73_h)	Uncertain	Simulated value, Start	OK	Signals the start of the simulation of the output value of a function block.
116 (74_h)	Uncertain	Simulated value, End	OK	Signals the end of the simulation of the output value of a function block. The status remains active up to 10 seconds after the end of the simulation. The value cannot be used while the status is active.
117 (75_h)	Uncertain		LO_LIM	
118 (76_h)	Uncertain		HI_LIM	
119 (77_h)	Uncertain		CONSTANT	
120 (78_h)	Uncertain	Process related	OK	The process conditions are outside the operating range of the device. The value can have a limited quality or accuracy.
121 (79_h)	Uncertain		LO_LIM	
122 ($7A_h$)	Uncertain		HI_LIM	
123 ($7B_h$)	Uncertain		CONSTANT	
128 (80_h)	Good		OK	
129 (81_h)	Good		LO_LIM	
130 (82_h)	Good		HI_LIM	
131 (83_h)	Good		CONSTANT	
132 (84_h)	Good	Update event	OK	The value can be used. The function block triggered an update event, i.e. a parameter of the block with a static storage class has been changed.
133 (85_h)	Good		LO_LIM	
134 (86_h)	Good		HI_LIM	
135 (87_h)	Good		CONSTANT	
136 (88_h)	Good	Active advisory	OK	The value can be used and the block has an active

Condensed status code	Quality	Substatus	Limits	Description
137 (89_h)	Good		LO_LIM	alarm, e.g. if the OUT value of an AI Block exceeds the HI_LIM.
138 ($8A_h$)	Good		HI_LIM	
139 ($8B_h$)	Good		CONSTANT	
140 ($8C_h$)	Good	Active critical	OK	The value can be used and the block has an active alarm.
141 ($8D_h$)	Good		LO_LIM	
142 ($8E_h$)	Good		HI_LIM	
143 ($8F_h$)	Good		CONSTANT	
160 ($A0_h$)	Good	Initiate fail safe	OK	
161 ($A1_h$)	Good		LO_LIM	
162 ($A2_h$)	Good		HI_LIM	
163 ($A3_h$)	Good		CONSTANT	
164 ($A4_h$)	Good	Maintenance required	OK	
165 ($A5_h$)	Good		LO_LIM	
166 ($A6_h$)	Good		HI_LIM	
167 ($A7_h$)	Good		CONSTANT	
168 ($A8_h$)	Good	Maintenance demanded	OK	
169 ($A9_h$)	Good		LO_LIM	
170 (AA_h)	Good		HI_LIM	
171 (AB_h)	Good		CONSTANT	
188 (BC_h)	Good	Function check	OK	The value can be used and is kept at a constant value because of user intervention of some kind.
189 (BD_h)	Good		LO_LIM	
190 (BE_h)	Good		HI_LIM	
191 (BF_h)	Good		CONSTANT	

Note

Always check the quality to determine whether the measured value can be used. A status ≥ 128 indicates a usable value.

5 Diagnostics

Depending on the device behavior and operating status, the Liquiline M CM42 saves diagnostics information with bit encoding in a parameter list which can be accessed as follows:

- By reading out the relevant diagnostic parameters in the Physical Block
- Via the DPV0-GetDiagnostics service

The DIAGNOSIS, DIAGNOSIS_EXTENSION parameters stored in the Physical Block contain the bit combinations of standard diagnostics and advanced diagnostics. Additional, manufacturer-specific diagnostic bits are retained in the DEVICE_DIAGNOSIS parameter. The GLOBAL_STATUS parameter provides information about the NAMUR NE107 error class of the diagnostic events.

5.1 NE107 error classes

Every diagnostic event is assigned to an error class according to NAMUR NE107:

Class	Meaning according to NE107
M	Maintenance required
F	Failure
S	Out of specification, Invalid process condition
C	Function check
(OK)	GOOD

A full list of the diagnostic events is provided in Section 9.6

5.2 Diagnostic query via parameter access

5.2.1 Addressing

It is possible to access the diagnostic parameters in the following table via the asynchronous DPV1-Read service.

Diagnostic parameters of the Physical Block				
Parameter	**Slot**	**Rel. index**	**Abs. index**	**Length (bytes)**
GLOBAL_STATUS	0	39	55	2
DIAGNOSIS	0	13	29	4
DIAGNOSIS_EXTENSION	0	14	30	6
DEVICE_DIAGNOSIS	0	67	83	58

Note

DEVICE_DIAGNOSIS contains the full content of both the DIAGNOSIS and the DIAGNOSIS_EXTENSION parameters so these parameters do not need to be read separately.

5.2.2 Content

5.2.2.1 Physical Block parameter GLOBAL_STATUS

Bit	Description
0	**F** - Failure (NE107, see Section 5.1)
1	**M** - Maintenance required (NE107, see Section 5.1)
2	**C** - Function check (NE107, see Section 5.1)
3	**S** - Out of specification (NE107, see Section 5.1)
4 to 15	n.avail.

5.2.2.2 Physical Block parameter DIAGNOSIS

Byte index	Bit	Designation	Description
0	0	Hardware failure electronics	GSD-Unit_Diag_Bit(24)
	1	Hardware failure mechanics	GSD-Unit_Diag_Bit(25)
	2	Motor-temperature too high	GSD-Unit_Diag_Bit(26)
	3	Electronic temperature too high	GSD-Unit_Diag_Bit(27)
	4	Memory error	GSD-Unit_Diag_Bit(28)
	5	Failure in measurement	GSD-Unit_Diag_Bit(29)
	6	Device not initialized	GSD-Unit_Diag_Bit(30)
	7	Self calibration failed	GSD-Unit_Diag_Bit(31)
1	0	Zero point error (limit pos.)	GSD-Unit_Diag_Bit(32)
	1	Power supply failed	GSD-Unit_Diag_Bit(33)
	2	Configuration not valid	GSD-Unit_Diag_Bit(34)
	3	Re-start-up carried out	GSD-Unit_Diag_Bit(35)
	4	Warm-start-up carried out	GSD-Unit_Diag_Bit(36)

Byte index	Bit	Designation	Description
	5	**M** - Maintenance required (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(37)
	6	Characterization invalid	GSD-Unit_Diag_Bit(38)
	7	Invalid ident number	GSD-Unit_Diag_Bit(39)
2	0	**F** - Failure (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(40)
	1	Maintenance demanded	GSD-Unit_Diag_Bit(41)
	2	**C** - Function check (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(42)
	3	**S** - Out of specification (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(43)
3	7	Extension available	GSD-Unit_Diag_Bit(55)

5.2.2.3 Physical Block parameter DIAGNOSIS_EXTENSION

The following table comprises collective diagnostic numbers, defined in the PROFIBUS standard. For more detailed, device-specific diagnosis it is recommended to refer to parameter DEVICE_DIAGNOSIS (see Section 5.2.2.4).

Byte index	Bit	Designation	Description
0	0	Temperature sensor failure	GSD-Unit_Diag_Bit(56)
	1	Sensor communication failure	GSD-Unit_Diag_Bit(57)
	2	Sensor failure	GSD-Unit_Diag_Bit(58)
	3	Wrong sensor type	GSD-Unit_Diag_Bit(59)
	4	SCS alarm (sensor check system)	GSD-Unit_Diag_Bit(60)
	5	Sensor alarm	GSD-Unit_Diag_Bit(61)
	6	SCS warning (sensor check system)	GSD-Unit_Diag_Bit(62)
	7	Sensor warning	GSD-Unit_Diag_Bit(63)
1	0	Calibration active	GSD-Unit_Diag_Bit(64)
	1	Internal sensor failure	GSD-Unit_Diag_Bit(65)
	2	Module communication failure	GSD-Unit_Diag_Bit(66)
	3	Module failure	GSD-Unit_Diag_Bit(67)
	4	Module mismatch	GSD-Unit_Diag_Bit(68)
	5	Internal module failure	GSD-Unit_Diag_Bit(69)
	6	Simulation active	GSD-Unit_Diag_Bit(70)

Byte index	Bit	Designation	Description
	7	Hold active	GSD-Unit_Diag_Bit(71)
2	0	Power bad	GSD-Unit_Diag_Bit(72)
	1	Not supported	GSD-Unit_Diag_Bit(73)
	2	Limit alarm	GSD-Unit_Diag_Bit(74)
	3	Limit warning	GSD-Unit_Diag_Bit(75)
	4	Param menu active	GSD-Unit_Diag_Bit(76)
	5	Diag menu active	GSD-Unit_Diag_Bit(77)
	6	Software version incompatible	GSD-Unit_Diag_Bit(78)
	7	Internal software failure	GSD-Unit_Diag_Bit(79)
3	0	Software configuration failure	GSD-Unit_Diag_Bit(80)
	1	Software framework failure	GSD-Unit_Diag_Bit(81)
	2	Initialisation in progress	GSD-Unit_Diag_Bit(82)
	3	Initialisation failure	GSD-Unit_Diag_Bit(83)
	4	General operation failure	GSD-Unit_Diag_Bit(84)
	5	General operation warning	GSD-Unit_Diag_Bit(85)
	6	Internal process value failure	GSD-Unit_Diag_Bit(86)
	7	Process value limit alarm	GSD-Unit_Diag_Bit(87)
4	0	Process value limit warning	GSD-Unit_Diag_Bit(88)
	1	Process value alarm	GSD-Unit_Diag_Bit(89)
	2	Process value warning	GSD-Unit_Diag_Bit(90)
	3 to 7	0 (not supp. by GSD)	GSD-Unit_Diag_Bit(91 to 95)
5	0 to 7	0 (not supp. by GSD)	GSD-Unit_Diag_Bit(96 to 103)

5.2.2.4 Physical Block parameter DEVICE_DIAGNOSIS

Byte index	Bit	Designation	Description
0 to 3	0 to 31	Corresponds to the Physical Block parameter DIAGNOSIS (see Section 5.2.2.2)	GSD-Unit_Diag_Bit(24 to 55)

Byte index	Bit	Designation	Description
4 to 9	32 to 79	Corresponds to the Physical Block parameter DIAGNOSIS_EXTENSION (see Section 5.2.2.3)	GSD-Unit_Diag_Bit(56 to 103)
10	80 to 87	Corresponds to Diagnostic codes [11:x] (see Section 9.6)	GSD-Unit_Diag_Bit(104..)
..		..	..
57		Corresponds to Diagnostic codes [58:x] (see Section 9.6)	GSD-Unit_Diag_Bit(..487)

5.3 Diagnostic query via GetDiagnostics service

The master can query the diagnostics via the GetDiagnostics service at any time. The extent of the diagnostic message depends on the operational state of the device. The following types of messages can be generated:

GetDiagnostics responses		
Type	**Extent [octets]**	**Comments**
Standard diagnostic	1 to 6	PROFIBUS standard diagnostics
Advanced diagnostics	1 to 20	PROFIBUS standard diagnostics + parameter DIAGNOSIS + parameter DIAGNOSIS_EXTENSION
Manufacturer-specific device diagnostics	1 to 68	PROFIBUS standard diagnostics + parameter DIAGNOSIS + parameter DIAGNOSIS_EXTENSION + parameter DEVICE_DIAGNOSIS [10 to 57]

Note

If a diagnostic event occurs during cyclic data exchange, the Liquiline M CM42 will send the process data to the master with the higher priority. PROFIBUS Masters Class 1 are requested to perform the GetDiagnostics service via this mechanism.

Octet	Name	Bit	Designation	Description
1	Station_status_1	0	Station_Non_Existent	Station does not exist
		1	Station_Not_Ready	Device is not ready for data exchange
		2	Cfg_Fault	Error in the configuration telegram
		3	Ext_Diag	Extended diagnostics occurs in the telegram = 1: Severity = Alarm (Failure / Maintenance Alarm); = 0: Severity = Ok or Status/Warning

Octet	Name	Bit	Designation	Description
		4	Not_Supported	The requested function is not supported by the device.
		5	Invalid_Slave_Response	Invalid response from the device (is set by the master)
		6	Prm_Fault	Error in the parameter telegram
		7	Master_Lock	Device is already linked to another master
2	Station_status_2	0	Prm_Req	Slave must be parameterized again
		1	Stat_Diag	Static diagnostics
		2	--	1
		3	WD_On	Watchdog active
		4	Freeze_Mode	Freeze command received
		5	Sync_Mode	Sync command received
		6	--	0
		7	Deactivated	Device is disabled (is set by the master)
3	Station_status_3	0 to 6	--	0
		7	Ext_Diag_Overflow	No enough space in the telegram.
4	Diag_Master_Add			Address of the master after parameterization Factory setting is 255 (0xFF)
5	Ident_Number_High			ID-H-CM42-V2 (15_h) / ID-H-CM42-V1 comp (15_h) / ID-H-profile (97_h)
6	Ident_Number_Low			▪ ID-L-CM42-V2 (65_h) / ID-L-CM42-V1 (43_h) / ID-L-profile (50_h) pH/ORP sensors ▪ ID-L-CM42-V2 (66_h) / ID-L- CM42-V1 (44_h) / ID-L-profile (50_h) conductivity sensors ▪ ID-L-CM42-V2 (67_h) / ID-L- CM42-V1 ($4B_h$) / ID-L-profile (50_h) oxygen sensors
7	Header_Octet		None: Standard diagnosis $0E_h$: Extended diagnosis $3E_{h:}$: Man.-specific diagnosis	ID: device-related diagnostics with length information for the diagnostic block: ▪ Standard diagnostics ▪ Advanced diagnostics ▪ Manufacturer-specific diagnostics
8	Status_Type		FE_h	Highest manufacturer-specific status

Octet	Name	Bit	Designation	Description
9	Slot_Number			Origin of the status message
10	Specifier	0	Error appears	GSD-Unit_Diag_Bit(16)
		1	Error disappears	GSD-Unit_Diag_Bit(17)
11	Physical Block DIAGNOSIS[0]	0	Hardware failure electronics	GSD-Unit_Diag_Bit(24)
		1	Hardware failure mechanics	GSD-Unit_Diag_Bit(25)
		2	Motor-temperature too high	GSD-Unit_Diag_Bit(26)
		3	Electronic temperature too high	GSD-Unit_Diag_Bit(27)
		4	Memory error	GSD-Unit_Diag_Bit(28)
		5	Failure in measurement	GSD-Unit_Diag_Bit(29)
		6	Device not initialized	GSD-Unit_Diag_Bit(30)
		7	Self calibration failed	GSD-Unit_Diag_Bit(31)
12	Physical Block DIAGNOSIS[1]	0	Zero point error (limit pos.)	GSD-Unit_Diag_Bit(32)
		1	Power supply failed	GSD-Unit_Diag_Bit(33)
		2	Configuration not valid	GSD-Unit_Diag_Bit(34)
		3	Re-start-up carried out	GSD-Unit_Diag_Bit(35)
		4	Warm-start-up carried out	GSD-Unit_Diag_Bit(36)
		5	**M** - Maintenance required (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(37)
		6	Characterization invalid	GSD-Unit_Diag_Bit(38)
		7	Invalid ident number	GSD-Unit_Diag_Bit(39)
13	Physical Block DIAGNOSIS[2]	0	**F** - Failure of the device (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(40)
		1	Maintenance demanded	GSD-Unit_Diag_Bit(41)
		2	**C** - Function check (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(42)
		3	**S** - Invalid process condition (NE107, see Section 5.1)	GSD-Unit_Diag_Bit(43)
14	Physical Block DIAGNOSIS[3]	7	Extension available	GSD-Unit_Diag_Bit(55)
15	Physical Block DIAGNOSIS_EXTENSION[0]	0	Temperature sensor failure	GSD-Unit_Diag_Bit(56)
		1	Sensor communication failure	GSD-Unit_Diag_Bit(57)

Octet	Name	Bit	Designation	Description
		2	Sensor failure	GSD-Unit_Diag_Bit(58)
		3	Wrong sensor type	GSD-Unit_Diag_Bit(59)
		4	SCS alarm (sensor check system)	GSD-Unit_Diag_Bit(60)
		5	Sensor alarm	GSD-Unit_Diag_Bit(61)
		6	SCS warning (sensor check system)	GSD-Unit_Diag_Bit(62)
		7	Sensor warning	GSD-Unit_Diag_Bit(63)
16	Physical Block DIAGNOSIS_EXTENSION[1] DIAGNOSIS[1]	0	Calibration active	GSD-Unit_Diag_Bit(64)
		1	Internal sensor failure	GSD-Unit_Diag_Bit(65)
		2	Module communication failure	GSD-Unit_Diag_Bit(66)
		3	Module failure	GSD-Unit_Diag_Bit(67)
		4	Module mismatch	GSD-Unit_Diag_Bit(68)
		5	Internal module failure	GSD-Unit_Diag_Bit(69)
		6	Simulation active	GSD-Unit_Diag_Bit(70)
		7	Hold active	GSD-Unit_Diag_Bit(71)
17	Physical Block DIAGNOSIS_EXTENSION[2]	0	Power bad	GSD-Unit_Diag_Bit(72)
		1	Not supported	GSD-Unit_Diag_Bit(73)
		2	Limit alarm	GSD-Unit_Diag_Bit(74)
		3	Limit warning	GSD-Unit_Diag_Bit(75)
		4	Param menu active	GSD-Unit_Diag_Bit(76)
		7	Process value limit alarm	GSD-Unit_Diag_Bit(87)
19	Physical Block DIAGNOSIS_EXTENSION[4]	0	Process value limit warning	GSD-Unit_Diag_Bit(88)
		1	Process value alarm	GSD-Unit_Diag_Bit(89)
		2	Process value warning	GSD-Unit_Diag_Bit(90)
		3 to 7	0 (not supp. by GSD)	GSD-Unit_Diag_Bit(91 to 95)
20	Physical Block DIAGNOSIS_EXTENSION[5]	0 to 7	0 (not supp. by GSD)	GSD-Unit_Diag_Bit(96 to 103)
21	Physical Block DEVICE_DIAGNOSIS [10..]	0 to 7	Corresponds to PB:DEVICE_DIAGNOSIS[11:x] (see Section 9.6)	GSD-Unit_Diag_Bit(104..)
..	...		..	..

Octet	Name	Bit	Designation	Description
68	Physical Block DEVICE_DIAGNOSIS [..57]	0 to 7	Corresponds to PB:DEVICE_DIAGNOSIS[58:x] (see Section 9.6)	GSD-Unit_Diag_Bit(..487)

5.4 Diagnostics configuration

Each diagnostic event is assigned to a NAMUR NE107 class at the factory. This assignment can be defined flexibly via the fieldbus. For this, the DIAG_EVENT_SWITCH structures of the Physical Block must be described anew. This structure is described in detail in the following section.

5.4.1.1 DIAG_EVENT_SWITCH structure

The DIAG_EVENT_SWITCH structure of the Physical Block consists of a series of DIAG_STATUS_LINK-type parameters followed by a link (slot number, absolute index) to the subsequent DIAG_EVENT_SWITCH structure. Each DIAG_STATUS_LINK element defines the NE107 class of the individual diagnostic event.

The value 00_h has a special function as it causes the diagnostic event in question to be masked out.

Octet	Description
1 to 48	DIAG_STATUS_LINK elements. The following values are supported: 00_h : Diagnostic event has no effect on the status 10_h : **M** - Maintenance required (NE107, see Section 5.1) 30_h : **F** - Failure (NE107, see Section 5.1) 40_h : **S** - Out of specification (NE107, see Section 5.1) 50_h : **C** - Function check (NE107, see Section 5.1)
49	Slot number of the following DIAG_EVENT_SWITCH structure (0, if n. avail.)
50	Abs. index of the following DIAG_EVENT_SWITCH structure (0, if n. avail.)

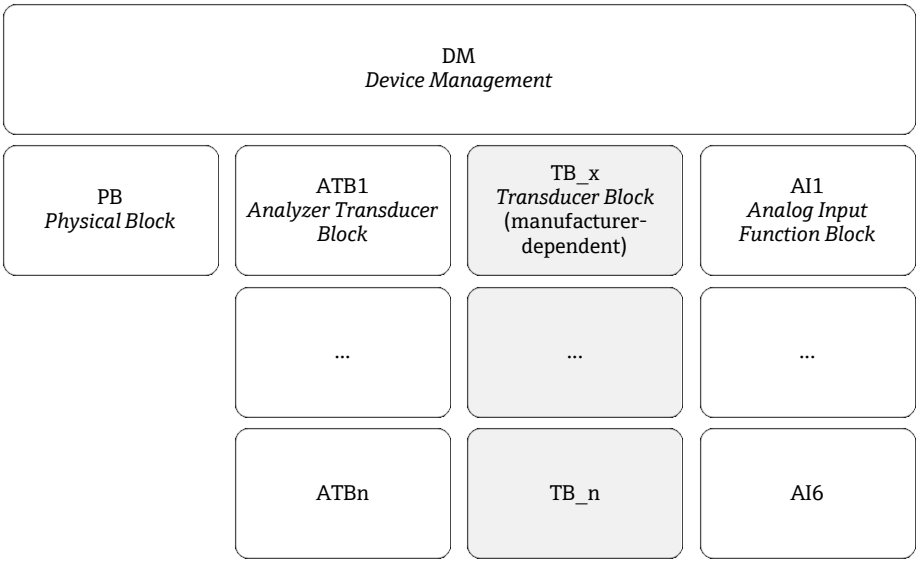
5.4.1.2 Addressing of the DIAG_EVENT_SWITCH structures

Designation	Slot / index
DIAG_EVENT_SWITCH	0 / 44
DIAG_EVENT_SWITCH_1	0 / 99

6 PA Profile implementation & services

6.1 Block configuration

The graphic below provides a schematic representation of the block configuration of the device. The DM, PB, ATBx and AIx block types are standard blocks in the PA Profile, while the implementation of the TB_x blocks is manufacturer-specific.



The following table contains information about the number of blocks in the individual configurations and a reference to Section 9 where the block layout and addressing is described in detail.

	Configuration		
Block type	**pHORP**	**Cond**	**Oxygen**
DM Device Management	(1)	(1)	(1)
PB Physical Block	(1) See Section 9.2	(1) See Section 9.2	(1) See Section 9.2
ATB Analyzer Transducer Block	(11) See Section 9.4	(6) See Section 9.4	(8) See Section 9.4
TB Transducer Block I (manufacturer-specific)	(1) TB_COMMON_1 See Section 9.5.2	(1) TB_COMMON_1 See Section 9.5.1	(1) TB_COMMON_1 See Section 9.5.1
TB Transducer Block II (manufacturer-specific)	(1) TB_COMMON_2 See Section 9.5.3	(1) TB_COMMON_2 See Section 9.5.1	(1) TB_COMMON_2 See Section 9.5.1
TB Transducer Block III (manufacturer-specific)	(2) TB_PH_x See Section 9.5.4 ff.	(1) TB_COND_1 See Section 9.5.8 ff.	(1) TB_DO_1 See Section 9.5.10
AI Analog Input function block	(6) See Section 9.3	(6) See Section 9.3	(6) See Section 9.3
Block – total number	23	17	20

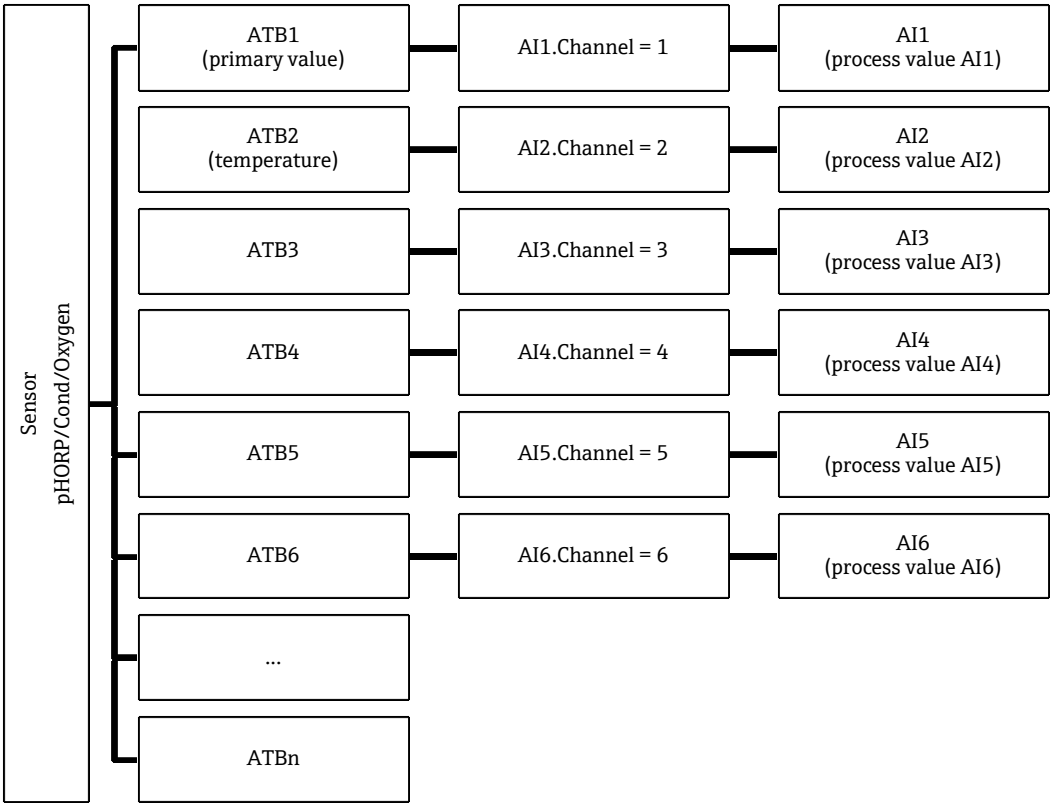
6.2 Selecting the process values in cyclic data exchange

Depending on the module configuration sent (see Section 4.5.2), 1-n process values ($1 \leq n \leq 6$) of the Analog Input function blocks AI1-AIn are transmitted to the control system during cyclic data exchange. In addition to the primary values (AI1) in the pH, conductivity and oxygen configurations and the temperature (AI2), the device delivers additional process values (AI3-AI6) which you can take from the following tables.

By changing the channel parameters in the AI blocks, it is possible to overwrite the factory setting and reorganize the transmission of process data.

For parameter addressing, please refer to the tables in Section 9.3.2 (Analog Input Blocks) or 9.4.4 (Analyzer Transducer Blocks).

The factory configuration is illustrated in the following graphic:



6.2.1 Process values for Liquiline pHORP

Analyzer Transducer Block (ATBx)	**Analyzer Transducer Block process value (ATBx.PV)**	**Analyzer Transducer Block process value unit (ATBx.PV_UNIT)**	**AI Block ATB reference channel, factory assignment (AIx.Channel)**
1	Primary value Factory setting: pH	pH (factory setting)	1 (AI1.Channel → ATB1)
2	Temperature	°C	2 (AI2.Channel → ATB2)
3	Raw measured value	mV	3 (AI3.Channel → ATB3)
4	Damped raw value	mV	4 (AI4.Channel → ATB4)
5	pH	pH	5 (AI5.Channel → ATB5)

Analyzer Transducer Block (ATBx)	Analyzer Transducer Block process value (ATBx.PV)	Analyzer Transducer Block process value unit (ATBx.PV_UNIT)	AI Block ATB reference channel, factory assignment (AIx.Channel)
6	ORP mV	mV	6 (AI6.Channel → ATB6)
7	ORP %	%	-
8	rH	[rH]	-
9	Glass impedance	MΩ	-
10	Slope	mV/pH	-
11	Zero point	pH	-

6.2.2 Process values for Liquiline Cond

Analyzer Transducer Block (ATBx)	Analyzer Transducer Block process value (ATBx.PV)	Analyzer Transducer Block process value unit (ATBx.PV_UNIT)	AI Block ATB reference channel, factory assignment (AIx.Channel)
1	Primary value Factory setting: conductivity	mS/cm (factory setting)	1 (AI1.Channel → ATB1)
2	Temperature	°C	2 (AI2.Channel → ATB2)
3	Uncompensated conductivity	mS/cm	3 (AI3.Channel → ATB3)
4	Conductivity	mS/cm	4 (AI4.Channel → ATB4)
5	Resistivity	MΩ*cm	5 (AI5.Channel → ATB5)
6	Concentration	%	6 (AI6.Channel → ATB6)

6.2.3 Process values for Liquiline Oxygen

Analyzer Transducer Block (ATBx)	Analyzer Transducer Block process value (ATBx.PV)	Analyzer Transducer Block process value unit (ATBx.PV_UNIT)	AI Block ATB reference channel, factory assignment (AIx.Channel)
1	Primary value Factory setting: Concentration (liquid)	mg/l (factory setting)	1 (AI1.Channel → ATB1)
2	Temperature	°C	2 (AI2.Channel → ATB2)
3	Compensation current	nA	3 (AI3.Channel → ATB3)
4	Ambient pressure	hPa	4 (AI4.Channel → ATB4)
5	Partial pressure	hPa	5 (AI5.Channel → ATB5)
6	% saturation	%	6 (AI6.Channel → ATB6)
7	Concentration (liquid)	mg/l	-
8	Concentration (gas)	%Vol	-
9	Tau	µs	-

6.3 Changing the process value unit

In the order configuration, the process values of Liquiline M CM42 are displayed in the unit saved in the Analyzer Transducer Blocks (ATBx.PV_UNIT), (see Section 9.4).

Example for Liquiline Cond: primary value is conductivity in mS/cm.

If the process value unit is to be changed to µS/cm, for example, this is accomplished by scaling the output value. To this end, it is necessary to modify the OUT_SCALE parameter of the AI Block (see Section 9.3.2) that has been connected to the Transducer Block in question.

Procedure:

1. Read the AI.OUT_SCALEx parameter out of the device.
2. Change the input scaling using a formula or by multiplying the value read by a factor.
3. Change the output scaling by using the same formula or the same factor as in (2) above.
4. If required, change the unit code and position of the decimal point in AI.OUT_SCALEx. This is optional.
5. Write the modified AI.OUT_SCALEx parameter to the device

Please refer to the following sections for examples of changing the unit.

6.3.1 Structure of the AI Block parameter OUT_SCALE

Octet	Content
1	Scaling upper-range value 32-bit floating point number as per IEEE-754
2	
3	
4	
5	Scaling lower-range value 32-bit floating point number as per IEEE-754
6	
7	
8	
9	Unit (see Section 8.1)[4]
10	
11	Decimal point

[4] The unit indicated here does not affect the scaling of the measured variable output.

6.3.2 Examples of unit conversion

A few typical examples of how to scale units via AI.OUT_SCALEx are listed in the following section.

6.3.2.1 Liquid concentration

Conversion formula:

$$[mg/l] \xrightarrow{x\ 1000} [\mu g/l]$$

Example for scaling the lower-range value/upper-range value (-0.02/120) [mg/l]:

Octet	Content	mg/l ↔ µg/l			
1	Upper-range value	42_h	120.0 [mg/l]	47_h	120000.0 [µg/l]
2		$F0_h$		EA_h	
3		00_h		60_h	
4		00_h		00_h	
5	Lower-range value	BC_h	-0.02 [mg/l]	$C1_h$	-20 [µg/l]
6		$A3_h$		$A0_h$	
7		$D7_h$		00_h	
8		$0A_h$		00_h	
9	Unit	0616_h		0617_h	
10					
11	Decimal point	02_h			

6.3.2.2 Conductivity

Conversion formula:

$$[S/cm] \xrightarrow{x\ 1000} [mS/cm] \xrightarrow{x\ 1000} [\mu S/cm]$$

Example for scaling the lower-range value/upper-range value (0/2000) [mS/cm]:

Octet	Content	S/cm ↔ mS/cm ↔ µS/cm					
1	Upper-range value	40_h	2.0 [S/cm]	44_h	2000.0 [mS/cm]	49_h	2000000.0 [µS/cm]
2		00_h		FA_h		$F4_h$	
3		00_h		00_h		24_h	
4		00_h		00_h		00_h	

Octet	Content	S/cm ↔ mS/cm ↔ µS/cm					
5	Lower-range value	00_h	0.0 [S/cm]	00_h	0.0 [mS/cm]	00_h	0.0 [µS/cm]
6		00_h		00_h		00_h	
7		00_h		00_h		00_h	
8		00_h		00_h		00_h	
9	Unit	$060F_h$		0516_h		0610_h	
10							
11	Decimal point	02_h					

6.3.2.3 Temperature

Conversion formula:

$$T_{[°F]} = T_{[°C]} \cdot 1.8 + 32$$

Example for scaling the lower-range value/upper-range value (-5/50) [°C]:

Octet	Content	Celsius ↔ Fahrenheit			
1	Upper-range value	42_h	50 [°C]	42_h	122 [°F]
2		48_h		$F4_h$	
3		00_h		00_h	
4		00_h		00_h	
5	Lower-range value	$C0_h$	-5 [°C]	41_h	23 [°F]
6		$A0_h$		$B8_h$	
7		00_h		00_h	
8		00_h		00_h	
9	Unit	$03E9_h$		$03EA_h$	
10					
11	Decimal point	02_h			

6.4 Changing from Condensed Status to Classic Status

In principle, the Condensed Status is output if the manufacturer-specific GSD file is used. If, on the other hand, the device is operated in the Liquiline M CM42 Ver. 1.xx compatibility mode or if the Analyzer Profile GSD file is used, the status can be output via the Physical Block parameter COND_STATUS_DIAG:

Status type	Value for COND_STATUS_DIAG	Condition
Classic	00_h	One of the following GSD files is used ▪ EH3x1565.GSD ▪ EH3x1566.GSD ▪ EH3x1567.GSD ▪ PA139750.GSD
Condensed	01_h	

Note
To change the status type via COND_STATUS_DIAG the device may not be in the process of cyclic data exchange.

6.4.1 Reset functions

The device offers the reset modes listed in the following table. These can be triggered by writing to the Physical Block parameter FACTORY_RESET.

Mode	Value for FACTORY_RESET	Description
Factory reset	1	The device is reset to the factory default
Restart	2506	Device is restarted and the customer-specific settings are retained.
Reset bus address	2712	The bus address is reset to the initial value of 126. The No_Add_Chg_Flag of the Set_Slave_Add service, which prevents a change to the bus address, is reset. The other device settings remain unchanged.

"Non_FR_parameters"
The following table lists parameters that are exempted from a reset to factory defaults (FACTORY_RESET = 1).

Parameter	Type	Description
Bus address	Device parameter	The PROFIBUS address of the device
No_Add_Chg	PROFIBUS stack parameter	This option can be activated by the master via the Set_Slave_Add service and prevents an additional bus address change. (Address Lock state).
Physical Block parameter IDENT_NUMBER_SELECTOR	PA Profile parameter	Configuration of the device ident number (see Section 4.3.2)

7 Plant asset management (PAM)

The following device driver is available to integrate the device into the process automation system:

PAM Tool	Technology	Functionality
Fieldcare®	FDT/DTM	Configuration of the PA Profile function blocks Display the available measured values Display diagnostic and service-related functionalities Upload/download the parameters in the DTM
SIMATIC PDM	PDM DD	Configuration of the PA Profile function blocks Display the available measured values Display diagnostic and service-related functionalities Upload/download the parameters

7.1 How to acquire the DTM

The DTM can be downloaded from our homepage via the following link.

www.endress.com

7.2 How to acquire the Siemens SIMATIC PDM[5]® DD

The Siemens SIMATIC PDM[5] DD can be downloaded from our homepage via the following link.

www.endress.com

® SIMATEC PDM is a registered trademark of Siemens AG

8 Appendix

8.1 Units

In the order configuration, the process values are transmitted with the unit saved in the ATBx.PV_UNIT parameters of the Transducer Blocks (see Section 6.2). It is only possible to indirectly adapt the unit to the process conditions by scaling the measured value appropriately. Please refer to Section 6.3.

The following list contains the unit codes for identifying the process value using the scaling configured. The user must make the entry in the AI.OUT_SCALE parameter.

Code	Description	Unit
1000 ($3E8_h$)	Kelvin	K
1001 ($3E9_h$)	Degree Celsius	°C
1002 ($3EA_h$)	Degree Fahrenheit	°F
1010 ($3F2_h$)	Meter	m
1011 ($3F3_h$)	Kilometer	km
1012 ($3F4_h$)	Centimeter	cm
1013 ($3F5_h$)	Millimeter	mm
1019 ($3FB_h$)	Inch	
1021 ($3FD_h$)	Mile	
1054 ($41E_h$)	Second	s
1056 (420_h)	Millisecond	ms
1057 (421_h)	Microsecond	µs
1058 (422_h)	Minute	min
1059 (423_h)	Hour	h
1130 ($46A_h$)	Pascal	Pa
1136 (470_h)	Hectopascal	hPa
1209 ($4B9_h$)	Ampere	A
1211 ($4BB_h$)	Milliampere	mA
1212 ($4BC_h$)	Microampere	µA
1213 ($4BD_h$)	Nanoampere	nA
1214 ($4BE_h$)	Picoampere	pA
1240 ($4D8_h$)	Volt	V
1243 ($4DB_h$)	Millivolt	mV

Code	Description	Unit
1244 ($4DC_h$)	Microvolt	µV
1281 (501_h)	Ohm	Ω
1282 (502_h)	Gigaohm	GΩ
1283 (503_h)	Megaohm	MΩ
1285 (505_h)	Kilo-ohm	kΩ
1287 (507_h)	Siemens	S
1289 (509_h)	Millisiemens	mS
1290 ($50A_h$)	Microsiemens	µS
1291 ($50B_h$)	Ohm-meter	Ωm
1293 ($50D_h$)	Megaohm-meter	MΩm
1294 ($50E_h$)	Kilo-ohmmeter	kΩm
1295 ($50F_h$)	Ohmcentimeter	Ωcm
1299 (513_h)	Siemens per meter	S/m
1302 (516_h)	Millisiemens per centimeter	mS/cm
1342 ($53E_h$)	Percent	%
1422 ($58E_h$)	pH	pH
1423 ($58F_h$)	parts per million	ppm
1424 (590_h)	parts per billion	ppb
1551 ($60F_h$)	Siemens per centimeter	S/cm
1552 (610_h)	Microsiemens per centimeter	µS/cm
1553 (611_h)	Millisiemens per meter	mS/m
1554 (612_h)	Microsiemens per meter	µS/m
1555 (613_h)	Megaohm centimeter	MΩ*cm
1556 (614_h)	Kilo-ohms centimeter	kΩcm
1558 (616_h)	Milligrams per litre	mg/l
1559 (617_h)	Micrograms per litre	µg/l
1562 ($61A_h$)	Percent volume	%Vol
1997 ($7CD_h$)	<None/Empty text>	
1998 ($7CE_h$)	Autorange	
34010 ($84DA_h$)	Amperes per pascal	A/Pa
34014 ($84DE_h$)	rH	[rH]
34019 ($84E3_h$)	Millivolts per pH	mV/pH

Code	Description	Unit
34020 ($84E4_h$)	Picoampere per hectopascal	pA/hPa
34021 ($84E5_h$)	ppm volume	ppm Vol.

9 PA Profile tables

9.1 Legend

Column title	Description	
Rel. Index	Index offset of the parameter relative to the first parameter of the block.	
Object Type Object type for the parameter value	Simple Record Array	Simple variable Structure of different simple variables Array of simple variables
Parameter usage	C I O	Contained Input Output
Kind of Transport	a cyc	acyclic cyclic
Access	R W	Indicates that the parameter can be read Indicates that the parameter can be written
Mandatory/Optional	M O	The parameter is mandatory for acyclic access. Cyclic access may be configured separately The parameter is optional
Data Type Data type for the parameter value	Name DS-n	Basic data type of Simple variable or array Data structure (Record) number n
Store Class of memory required	N S D Cst	**Non-volatile parameter** which will be remembered through a power cycle **Static** – Non-volatile and changing the parameter increases the static revision counter ST_REV **Dynamic** – the value is calculated by the block or read from another block **Constant** – The parameter does not change in a device

9.2 Physical Block

9.2.1 Addressing (Liquiline pHORP/Cond/Oxygen)

Physical Block addressing	
Slot	**Index**
0	16

9.2.2 Layout (Liquiline pHORP/Cond/Oxygen)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
16	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	This object contains the characteristics of the blocks.
17	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
18	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a	EH_CM42_<ORDERCODE>	
19	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
20	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	The alert parameter (0 - 255) has a user-assigned value which may be used in sorting alarms or events generated by a block.
21	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
22	6	MODE_BLK	Record	DS37	D	3	R	C/a	088808	
23	7	ALARM_SUM	Record	DS42	D	8	R	C/a		This parameter contains the current states of the block alarms.

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
24	8	SOFTWARE_REVISION	Simple	VISIBLE_STRING_16	Cst	16	R	C/a	<Firmware Version String> e.g. 02.04.00.xx	
25	9	HARDWARE_REVISION	Simple	VISIBLE_STRING_16	Cst	16	R	C/a	<Hardware Version String> e.g. 00.05.xx	
26	10	DEVICE_MAN_ID	Simple	UNSIGNED16	Cst	2	R	C/a	0x0011	
27	11	DEVICE_ID	Simple	VISIBLE_STRING_16	Cst	16	R	C/a	Liquiline pHORP/ Liquiline Cond/ Liquiline Oxygen	
28	12	DEVICE_SER_NUM	Simple	VISIBLE_STRING_16	Cst	16	R	C/a	----	
29	13	DIAGNOSIS	Simple	OCTET_STRING_4	D	4	R	C/a	0x0	
30	14	DIAGNOSIS_EXTENSION	Simple	OCTET_STRING_6	D	6	R	C/a	0x0	
31	15	DIAGNOSIS_MASK	Simple	OCTET_STRING_4	Cst	4	R	C/a	0x800FFFFF	
32	16	DIAGNOSIS_MASK_EXTENSION	Simple	OCTET_STRING_6	Cst	6	R	C/a	0x 0007FFFFFFFF	
33	17	DEVICE_CERTIFICATION	Simple	VISIBLE_STRING_32	Cst	32	R	C/a		
34	18	WRITE_LOCKING	Simple	UNSIGNED16	N	2	R/W	C/a	2457	Values: 0: on 2457: off
35	19	FACTORY_RESET	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 1: Factory reset 2712: Reset address to '126' 2506: Warm start 0: No function
36	20	DESCRIPTOR	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
37	21	DEVICE_MESSAGE	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
38	22	DEVICE_INSTAL_DATE	Simple	VISIBLE_STRING_16	S	16	R/W	C/a		
39	23	LOCAL_OP_ENA	Simple	UNSIGNED8	N	1	R/W	C/a	1	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Values: 0: Disabled 1: Enabled
40	24	IDENT_NUMBER_SELECTOR	Simple	UNSIGNED8	S	1	R/W	C/a	0x7F	Values: 127: Automatic mode 0: 0x9750 (6 AI) 128: E_IDSEL_CM42 129: E_IDSEL_CM42_OLD
41	25	HW_WRITE_PROTECTION	Simple	UNSIGNED8	D	1	R	C/a	0	Values: 0: None
42	26	FEATURE	Record	DS68	N	8	R	C/a		
43	27	COND_STATUS_DIAG	Simple	UNSIGNED8	S	1	R/W	C/a	1	
44	28	DIAG_EVENT_SWITCH	Record	Diag_Event_Switch	S	50	R/W	C/a	0	
52	36	DEVICE_CONFIGURATION	Simple	VISIBLE_STRING_32	D	32	R	C/a	0	
53	37	INIT_STATE	Simple	UNSIGNED8	S	1	R/W	C/a	2	Values: 2: RUNNING 5: MAINTENANCE
54	38	DEVICE_STATE	Simple	UNSIGNED8	D	1	R/W	C/a	2	Values: 2: RUNNING 5: MAINTENANCE
55	39	GLOBAL_STATUS	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 1: Failure (F) 2: Maintenance request (M) 4: Function check (C) 8: Out of specification (S) 0: Ok
64	48	CURRENT_ERROR	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
65	49	LAST_ERROR	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
69	53	DEVICE_BUS_ADDRESS	Simple	UNSIGNED8	N	1	R	C/a	126	Min: 0 Max: 126
74	58	PROFILE_REVISION	Simple	OCTET_STRING_58	N	58	R	C/a	3.02	
75	59	CLEAR_LAST_ERROR	Simple	UNSIGNED8	N	1	R/W	C/a	0	Values: 0: off 1: on
76	60	IDENT_NUMBER	Simple	UNSIGNED16	N	2	R	C/a	5477 / 5478 / 5479	
77	61	CHECK_CONFIGURATION	Simple	UNSIGNED8	D	1	R	C/a	0	
79	63	ORDER_CODE	Simple	VISIBLE_STRING_32	N	32	R	C/a	----	
80	64	TAG_LOCATION	Simple	VISIBLE_STRING_16	S	16	R/W	C/a		

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
81	65	SIGNATURE	Simple	OCTET_STRING_54	S	54	R/W	C/a		
82	66	ENP_VERSION	Simple	VISIBLE_STRING_16	N	16	R	C/a	2.02.00	
83	67	DEVICE_DIAGNOSIS	Simple	OCTET_STRING_58	N	58	R	C/a		
85	69	SERVICE_LOCKING	Simple	UNSIGNED16	S	2	R/W	C/a	0	
86	70	UDL_FEATURE	Simple	UNSIGNED16	N	2	R	C/a	3	
87	71	PTA_OP_CODE	Simple	UNSIGNED16	N	2	R/W	C/a	0	
88	72	PTA_STATUS	Simple	UNSIGNED16	D	2	R	C/a	1	
89	73	UDL_VERI_DELAY	Simple	UNSIGNED16	N	2	R	C/a	10	
90	74	UDL_REVISION	Simple	UNSIGNED16	N	2	R	C/a	0	
91	75	BUS_ADDRESS_SW_HW	Simple	UNSIGNED8	D	1	R	C/a	1	
92	76	BUS_ADDRESS_LOCKED	Simple	UNSIGNED8	D	1	R	C/a	0	
93	77	REV_COUNTER	Simple	UNSIGNED16	D	2	R	C/a	0	
99	83	DIAG_EVENT_SWITCH_1	Record	Diag_Event_Switch	S	50	R/W	C/a	0	
100	84	IDENT_NUMBER_SELECTOR_COPY	Simple	UNSIGNED8	N	1	R	C/a	255	
101	85	BUS_ADDRESS_LOCKED_COPY	Simple	UNSIGNED8	N	1	R	C/a	255	

9.3 Analog Input Blocks

9.3.1 Addressing (Liquiline pHORP/Cond/Oxygen)

Analog Input Block addressing		
AIx	**Slot**	**Index**
1	1	16
2	2	16
3	3	16
4	4	16
5	5	16
6	6	16

9.3.2 Layout (Liquiline pHORP/Cond/Oxygen)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
16	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
17	1	ST_REV	Simple	UNSIGNED16	N	2	R	C/a	0	
18	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
19	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
20	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
21	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
22	6	MODE_BLK	Record	DS37	D	3	R	C/a	089808	
23	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
24	8	BATCH	Record	DS67	S	10	R/W	C/a	0	
26	10	OUT	Record	DS101	D	5	R	O/cyc	0	
27	11	PV_SCALE	Array	FLOAT	S	8	R/W	C/a	0;0	
28	12	OUT_SCALE	Record	DS36	S	11	R/W	C/a	0;0;None;0	
29	13	LIN_TYPE	Simple	UNSIGNED8	S	1	R/W	C/a	0	Values: 0: Linear
30	14	CHANNEL	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values (pHORP): 0: None 1: Main value 2: Temperature 3: Raw value 4: Damped raw value 5: pH 6: ORP mV 7: ORP % 8: Combined pH/ORP 9: Glass impedance 10: Slope 11: Zero point Values (Cond): 0: None 1: Main value 2: Temperature 3: Uncompensated conductivity 4: Conductivity 5: Resistivity 6: Concentration Values (Oxygen): 0: None 1: Main value 2: Temperature 3: Measuring current 4: Ambient pressure value

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										5: Partial pressure 6: % saturation 7: Concentration 8: Conc. (gaseous) 9: Raw value Âµs
32	16	PV_FTIME	Simple	FLOAT	S	4	R/W	C/a	0	
33	17	FSAFE_TYPE	Simple	UNSIGNED8	S	1	R/W	C/a	1	Values: 0: Default value is used as output value 1: Storing last usable output value 2: The calculated output value is incorrect
34	18	FSAFE_VALUE	Simple	FLOAT	S	4	R/W	C/a	0.0	
35	19	ALARM_HYS	Simple	FLOAT	S	4	R/W	C/a	0.0	
37	21	HI_HI_LIM	Simple	FLOAT	S	4	R/W	C/a	1e+20	
39	23	HI_LIM	Simple	FLOAT	S	4	R/W	C/a	1e+19	
41	25	LO_LIM	Simple	FLOAT	S	4	R/W	C/a	-1e+19	
43	27	LO_LO_LIM	Simple	FLOAT	S	4	R/W	C/a	-1e+20	
50	34	SIMULATE	Record	DS50	S	6	R/W	C/a	4F0000000000	

9.4 Analyzer Transducer Blocks

9.4.1 Addressing (Liquiline pHORP)

Analyzer Transducer Block addressing (pHORP)				
ATBx	**ATBx.PV**	**ATBx.PV_UNIT**	**Slot**	**Index**
1	Primary value Factory setting: pH	pH (factory setting)	1	70
2	Temperature	°C	1	100
3	Raw measured value	mV	1	130
4	Damped raw value	mV	1	160
5	pH	pH	1	190
6	ORP mV	mV	2	70
7	ORP %	%	2	100
8	rH	[rH]	2	130
9	Glass impedance	MΩ	2	160
10	Slope	mV/pH	2	190
11	Zero point	pH	7	70

9.4.2 Addressing (Liquiline Cond)

Analyzer Transducer Block addressing (Cond)				
ATBx	**ATBx.PV**	**ATBx.PV_UNIT**	**Slot**	**Index**
1	Primary value Factory setting: conductivity	mS/cm (factory setting)	1	70
2	Temperature	°C	1	100
3	Uncompensated conductivity	mS/cm	1	130
4	Conductivity	mS/cm	1	160
5	Resistivity	MΩ*cm	1	190
6	Concentration	%	2	70

9.4.3 Addressing (Liquiline Oxygen)

Analyzer Transducer Block addressing (Oxygen)				
ATBx	**ATBx.PV**	**ATBx.PV_UNIT**	**Slot**	**Index**
1	Primary value Factory setting: concentration (liquid)	mg/l (factory setting)	1	70
2	Temperature	°C	1	100
3	Medium pressure compensation	nA	1	130
4	Ambient pressure	hPa	1	160
5	Partial pressure	hPa	1	190
6	% saturation	%	2	70
7	Concentration (liquid)	mg/l	2	100
8	Concentration (gas)	%Vol	2	130
9	Tau	µs	2	160

9.4.4 Layout (Liquiline pHORP/Cond/Oxygen)

Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
1	ST_REV	Simple	UNSIGNED16	N	2	R	C/a	0	
2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS)

Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
									4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
7	ALARM_SUM	Record	DS42	D	8	R	C/a		
8	COMPONENT_NAME	Simple	OCTET_STRING_32	S	32	R/W	C/a		
9	PV	Record	DS60	D	12	R	C/a	None	
10	PV_UNIT	Simple	UNSIGNED16	S	2	R/W	C/a	None	
11	PV_UNIT_TEXT	Simple	OCTET_STRING_8	S	8	R/W	C/a		
12	ACTIVE_RANGE	Simple	UNSIGNED8	S	1	R/W	C/a	1	
13	AUTORANGE_ON	Simple	BOOLEAN	S	1	R/W	C/a	0	
14	SAMPLING_RATE	Simple	TIME_DIFFERENCE	S	4	R/W	C/a	333	
25	NUMBER_OF_RANGES	Simple	UNSIGNED8	N	1	R	C/a	1	
26	RANGE_1	Record	DS61	N	8	R/W	C/a	None	

9.5 Transducer Blocks (manufacturer-specific)

9.5.1 TB_COMMON_x addressing (Liquiline pHORP/Cond/Oxygen)

Manufacturer-specific Transducer Block addressing (pHORP/Cond/Oxygen)		
Block name	**Slot**	**Index**
TB_COMMON_1	3	70
TB_COMMON_2	4	70

9.5.2 Layout TB_COMMON_1 (Liquiline pHORP/Cond/Oxygen)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
70	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
71	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
72	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
73	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
74	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
75	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
76	6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
77	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
78	8	ACTIVE_PACKAGE	Simple	UNSIGNED16	N	2	R	C/a	0	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: Basic 1: Advanced
79	9	FRAMEWORK_INIT_STATE	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0..29: Initialization 30: Ok
80	10	SENSOR_ANALOG_DIGITAL	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: Analog 1: Digital
81	11	DAMPING	Simple	FLOAT	S	4	R/W	C/a	0.0 s	Min: 0.0 s Max: 600.0 s
82	12	CAL_STABLE_DELTA_TEMP	Simple	FLOAT	S	4	R/W	C/a	0.5 K	Min: 0.1 K Max: 2.5 K
83	13	DIAG_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
84	14	CALTIMER_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
85	15	CALTIMER_HOURS	Simple	FLOAT	S	4	R/W	C/a	1000.0 h	Min: 1.0 h Max: 50000.0 h
86	16	CALTIMER_ELAPSED	Simple	FLOAT	D	4	R	C/a	0.0 h	
87	17	PCS_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
88	18	PCS_TIME	Simple	FLOAT	S	4	R/W	C/a	60.0 min	Min: 1.0 min Max: 240.0 min
89	19	OPERATING_TIME_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: off 1: on
90	20	OPERATING_TIME_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COMMON_1.OPERATING_TIME_ALARM - 1.0 h
91	21	OPERATING_TIME_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COMMON_1.OPERATING_TIME_WARNING + 1.0 h Max: 50000.0 h
92	22	OPERATING_TIME_80C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COMMON_1.OPERATING_TIME_80C_ALARM - 1.0 h
93	23	OPERATING_TIME_80C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COMMON_1.OPERATING_TIME_80C_WARNING + 1.0 h Max: 50000.0 h
94	24	OPERATING_TIME_100C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COMMON_1.OPERATING_TIME_100C_ALARM - 1.0 h
95	25	OPERATING_TIME_100C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COMMON_1.OPERATING_TIME_100C_WARNING + 1.0 h Max: 50000.0 h
96	26	CALTIMER_EXPIRED_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
97	27	CALTIMER_EXPIRED_WARNING	Simple	FLOAT	S	4	R/W	C/a	23.0 M	Min: 0.233333333333 M Max: TB_COMMON_1.CALTIMER_EXPIRED_

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										ALARM - 0.233333333333 M
98	28	CALTIMER_EXPIRED_ALARM	Simple	FLOAT	S	4	R/W	C/a	24.0 M	Min: TB_COMMON_1.CALTIMER_EXPIRED_ WARNING + 0.233333333333 M Max: 24.0 M
99	29	STERILISATION_COUNTER_ FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
100	30	STERILISATION_COUNTER_ WARNING	Simple	FLOAT	S	4	R/W	C/a	30.0	Min: 1.0 Max: TB_COMMON_1.STERILISATION_ COUNTER_ALARM - 1.0
101	31	STERILISATION_COUNTER_ ALARM	Simple	FLOAT	S	4	R/W	C/a	50.0	Min: TB_COMMON_1.STERILISATION_ COUNTER_WARNING + 1.0 Max: 99.0
102	32	DATETIME	Simple	DATETIME	D	7	R/W	C/a	systemDateTimeI nSecsSinceRef	
103	33	DATE_FORMAT	Simple	UNSIGNED16	S	2	R/W	C/a	13	Values: 13: DDMMYYYY 14: MMDDYYYY
104	34	TIME_FORMAT	Simple	UNSIGNED16	S	2	R/W	C/a	17	Values: 17: hhmmss (24h) 34: hhmmss (am/pm)
105	35	DEVICE_SENSOR_GROUP	Simple	FLOAT	S	4	R/W	C/a	1.0	Min: 0.0 Max: 65535.0
106	36	SENSOR_CHECK	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: TAG group 2: TAG
107	37	HOLD_ON_CALIB	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										1: No hold 2: Hold 3: freeze 4: set value (I1+I2)
108	38	HOLD_ON_SETUP	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 1: No hold 2: Hold 3: freeze 4: set value (I1+I2)
109	39	HOLD_ON_DIAG	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 1: No hold 2: Hold 3: freeze 4: set value (I1+I2)
110	40	HOLD_HANGOVER_TIME	Simple	FLOAT	S	4	R/W	C/a	15.0 s	Min: 0.0 s Max: 300.0 s
111	41	CASE_CONTROL	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
112	42	LOGBOOKS_ACTIVE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
113	43	DATALOGBOOK_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
114	44	DATALOGBOOK_TIME	Simple	FLOAT	S	4	R/W	C/a	60.0 s	Min: 5.0 s Max: 356400.0 s
115	45	DATALOGBOOK_PARAM	Simple	UNSIGNED16	S	2	R/W	C/a	2	Values: 0: Raw value 1: Temperature

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										2: Main value
116	46	LANGUAGE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: English 1: Second language
117	47	FORMAT_TEMP_VALUE	Simple	UNSIGNED16	S	2	R/W	C/a	0x111	Values: 0x110: xxx 0x111: xxx.x
118	48	SENSOR_ORDERCODE	Simple	VISIBLE_STRING_32	N	32	R	C/a		
119	49	SENSOR_SERIALNUMBER	Simple	VISIBLE_STRING_16	N	16	R	C/a		
120	50	SENSOR_TAG	Simple	VISIBLE_STRING_32	N	32	R	C/a		
121	51	SENSOR_GROUP	Simple	UNSIGNED16	N	2	R	C/a	0	
122	52	SENSOR_HW_VERSION	Simple	VISIBLE_STRING_16	N	16	R	C/a		
123	53	SENSOR_SW_VERSION	Simple	VISIBLE_STRING_16	N	16	R	C/a		
124	54	SENSOR_INITIAL_OPERATION	Simple	DATETIME	N	7	R	C/a	0	
125	55	SENSOR_MANUFACTURING_DATE	Simple	DATETIME	N	7	R	C/a	0	
126	56	SENSOR_SPEC_MEASVALUE_MIN0	Simple	FLOAT	N	4	R	C/a	0.0 pH	
127	57	SENSOR_SPEC_MEASVALUE_MAX0	Simple	FLOAT	N	4	R	C/a	0.0 pH	
128	58	SENSOR_SPEC_MEASVALUE_MIN1	Simple	FLOAT	N	4	R	C/a	0.0 mV	
129	59	SENSOR_SPEC_MEASVALUE_MAX1	Simple	FLOAT	N	4	R	C/a	0.0 mV	
130	60	SENSOR_SPEC_CELL_CONSTANT	Simple	FLOAT	N	4	R	C/a	0.0 1/cm	
131	61	SENSOR_SPEC_PRESSURE	Simple	FLOAT	N	4	R	C/a	0.0 Pa	
132	62	SENSOR_SPEC_TEMP_MIN	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
133	63	SENSOR_SPEC_TEMP_MAX	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
134	64	SENSOR_SPEC_EXTREME_MIN	Simple	FLOAT	N	4	R	C/a	0.0 S/cm	
135	65	SENSOR_SPEC_EXTREME_MAX	Simple	FLOAT	N	4	R	C/a	0.0 S/cm	
136	66	SENSOR_CAL_VALID	Simple	UNSIGNED8	N	1	R	C/a	False	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
137	67	SENSOR_CAL_TEMP_VALID	Simple	UNSIGNED8	N	1	R	C/a	False	
138	68	SENSOR_CAL_DATE	Simple	DATETIME	N	7	R	C/a	0	
139	69	SENSOR_CAL_MODE	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: None 1: Numeric input 2: 1 point 3: 2 point 4: Multipoint 5: table 6: Grab sample 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 18: Numeric input 19: Numeric input zero point 20: Numeric input 2-point 21: Factory 22: Test gas calibration 23: Value acquisition 24: 3 point cal.
140	70	SENSOR_CAL_COUNT	Simple	UNSIGNED16	N	2	R	C/a	0	
141	71	SENSOR_CAL_OFFSET	Simple	FLOAT	N	4	R	C/a	0.0 mV	
142	72	SENSOR_CAL_OPERATINGPOINT	Simple	FLOAT	N	4	R	C/a	0.0 mV	
143	73	SENSOR_CAL_ZEROPOINT	Simple	FLOAT	N	4	R	C/a	0.0 pH	
144	74	SENSOR_CAL_SLOPE	Simple	FLOAT	N	4	R	C/a	0.0 mV/pH	
145	75	SENSOR_CAL_ ISOTHERMINTERSECTION	Simple	FLOAT	N	4	R	C/a	0.0 pH	
146	76	SENSOR_CAL_BUFFER1	Simple	FLOAT	N	4	R	C/a	0.0 pH	
147	77	SENSOR_CAL_MEASURE1	Simple	FLOAT	N	4	R	C/a	0.0 mV	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
148	78	SENSOR_CAL_BUFFER2	Simple	FLOAT	N	4	R	C/a	0.0 pH	
149	79	SENSOR_CAL_MEASURE2	Simple	FLOAT	N	4	R	C/a	0.0 mV	
150	80	SENSOR_CAL_DELTA_ OPERATINGPOINT	Simple	FLOAT	N	4	R	C/a	0.0 mV	
151	81	SENSOR_CAL_DELTA_ZEROPOINT	Simple	FLOAT	N	4	R	C/a	0.0 pH	
152	82	SENSOR_CAL_DELTA_OFFSET	Simple	FLOAT	N	4	R	C/a	0.0 mV	
153	83	SENSOR_CAL_DELTA_SLOPE	Simple	FLOAT	N	4	R	C/a	0.0 mV/pH	
154	84	SENSOR_CAL_SERIAL	Simple	VISIBLE_STRING_ 32	N	32	R	C/a		
155	85	SENSOR_CAL_DATASET	Simple	UNSIGNED16	N	2	R/W	C/a	0	Values: 0: Current adj. 11: Current cal. 1: Recent 1 2: Recent 2 3: Recent 3 4: Recent 4 5: Recent 5 6: Recent 6 7: Recent 7 8: Recent 8 9: Factory 10: Reference
156	86	SENSOR_CAL_NUMDATASETS	Simple	UNSIGNED8	N	1	R	C/a	0	
157	87	SENSOR_CAL_DATASETTYPE	Simple	UNSIGNED16	N	2	R/W	C/a	0	Values: 0: pH 1: ORP
158	88	SENSOR_CAL_CELL_CONSTANT	Simple	FLOAT	N	4	R	C/a	0.0 1/cm	
159	89	SENSOR_CAL_DELTA_CELL_ CONSTANT	Simple	FLOAT	N	4	R	C/a	0.0 1/cm	
160	90	SENSOR_CAL_REF_VALUE1	Simple	FLOAT	N	4	R	C/a	0.0 S/cm	
161	91	SENSOR_CAL_REF_VALUE2	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
162	92	SENSOR_CAL_TRANSMITTER_ID	Simple	UNSIGNED16	N	2	R	C/a	0	
163	93	SENSOR_CALTEMP_METHOD	Simple	UNSIGNED16	N	2	R	C/a	0	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: None 1: Numeric input 2: 1 point 3: 2 point 4: Multipoint 5: table 6: Grab sample 7: Zero point 8: Air 100% rh 9: H2O air-saturated 10: Air variable 11: Zero point sample 12: Slope sample 13: 14: 15: with temp. comp. 16: without temp. comp. 17: 18: Numeric input 19: Numeric input zero point 20: Numeric input 2-point 21: Factory
164	94	SENSOR_CALTEMP_DATE	Simple	DATETIME	N	7	R	C/a	0	
165	95	SENSOR_CALTEMP_OFFSET	Simple	FLOAT	N	4	R	C/a	273.15 K	
166	96	SENSOR_CALTEMP_SLOPE	Simple	FLOAT	N	4	R	C/a	0.0	
167	97	SENSOR_CALTEMP_REF_VALUE1	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
168	98	SENSOR_CALTEMP_REF_VALUE2	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
169	99	SENSOR_CALTEMP_SERIAL	Simple	VISIBLE_STRING_32	N	32	R	C/a		
170	100	SENSOR_CALTEMP_COUNT	Simple	UNSIGNED16	N	2	R	C/a	0	
171	101	SENSOR_CALTEMP_TRANSMITTER_ID	Simple	UNSIGNED16	N	2	R	C/a	0	
172	102	SENSOR_CALZERO_DATE	Simple	DATETIME	N	7	R	C/a	0	
173	103	SENSOR_CALZERO_ZERO	Simple	FLOAT	N	4	R	C/a	0.0 nA	
174	104	SENSOR_CALZERO_DELTAZERO	Simple	FLOAT	N	4	R	C/a	0.0 nA	
175	105	SENSOR_OP_TIME	Simple	FLOAT	D	4	R	C/a	0.0 h	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
176	106	SENSOR_OP_TIME_SPECIFIC0	Simple	FLOAT	D	4	R	C/a	0.0 h	
177	107	SENSOR_OP_TIME_SPECIFIC1	Simple	FLOAT	D	4	R	C/a	0.0 h	
178	108	SENSOR_OP_TIME_SPECIFIC2	Simple	FLOAT	D	4	R	C/a	0.0 h	
179	109	SENSOR_OP_TIME_SPECIFIC3	Simple	FLOAT	D	4	R	C/a	0.0 h	
180	110	SENSOR_OP_TIME_SPECIFIC4	Simple	FLOAT	D	4	R	C/a	0.0 h	
181	111	SENSOR_OP_TIME_SPECIFIC5	Simple	FLOAT	D	4	R	C/a	0.0 h	
182	112	SENSOR_OP_STERILISATIONS	Simple	UNSIGNED16	N	2	R	C/a	0	
183	113	SENSOR_OP_CIP_CYCLES	Simple	UNSIGNED16	N	2	R	C/a	0	
184	114	SENSOR_OP_CAP_CALIBRATIONS	Simple	UNSIGNED16	N	2	R	C/a	0	
185	115	SENSOR_OP_CAP_STERILISATIONS	Simple	UNSIGNED16	N	2	R	C/a	0	
186	116	SENSOR_OP_CHARGE	Simple	FLOAT	N	4	R	C/a	0.0 nAs	
187	117	SENSOR_EXTREME_TEMP_MIN	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
188	118	SENSOR_EXTREME_TEMP_MAX	Simple	FLOAT	N	4	R	C/a	0.0 DegC	
189	119	DEVICE_HWID	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
190	120	DEVICE_PROJECTING	Simple	VISIBLE_STRING_16	N	16	R	C/a	---	
191	121	CPU_HWID	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
192	122	CPU_SERNUM	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
193	123	CPU_SAPCODE	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
194	124	BOOTLOADER_VERSION	Simple	VISIBLE_STRING_20	N	20	R	C/a	--.--.--	
195	125	SENSORMODULE_HWID	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
196	126	SENSORMODULE_SERNUM	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
197	127	SENSORMODULE_SAPCODE	Simple	VISIBLE_STRING_20	N	20	R	C/a	----	
198	128	SENSORMODULE_HWVER	Simple	VISIBLE_STRING_20	N	20	R	C/a	--.--.--	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
199	129	SENSORMODULE_SWVER	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	--.--.--	
200	130	FBMODULE_HWID	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	----	
201	131	FBMODULE_SERNUM	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	----	
202	132	FBMODULE_SAPCODE	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	----	
203	133	CPU_HWVER	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	--.--.--	
204	134	FBMODULE_SWVER	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	--.--.--	
205	135	DISPLAY_HWID	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	----	
206	136	DISPLAY_SERNUM	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	----	
207	137	DISPLAY_SAPCODE	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	----	
208	138	DISPLAY_HWVER	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	--.--.--	
209	139	DISPLAY_SWVER	Simple	VISIBLE_STRING_ 20	N	20	R	C/a	--.--.--	
210	140	LOGBOOK_COMMAND	Simple	LOGBOOK_ COMMAND	N	7	R/W	C/a		
211	141	LOGBOOK_RESPONSE	Simple	LOGBOOK_ RESPONSE	N	73	R	C/a		
212	142	TEMP_UNIT	Simple	UNSIGNED16	S	2	R/W	C/a	PU_Celsius	Values: 1001: Â°C 1002: Â°F
213	143	SENSOR_CAL_BUFFER_UNIT	Simple	UNSIGNED16	N	2	R	C/a	0.0 pH	
214	144	SENSOR_CAL_SLOPE_UNIT	Simple	UNSIGNED16	N	2	R	C/a	0.0 mV/pH	
215	145	SENSOR_CAL_SPEC_ MEASVALUE_1_UNIT	Simple	UNSIGNED16	N	2	R	C/a	0.0 mV	
216	146	SENSOR_CAL_OP_HOURS	Simple	FLOAT	N	4	R	C/a	0.0 h	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
217	147	SENSOR_CALTEMP_OP_HOURS	Simple	FLOAT	N	4	R	C/a	0.0 h	

9.5.3 Layout TB_COMMON_2 (Liquiline pHORP/Cond/Oxygen)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
70	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
71	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
72	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
73	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
74	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
75	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
76	6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
77	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
78	8	MEAS_SIM_ENABLED	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
79	9	MEAS_SIM_SELECTION	Simple	UNSIGNED16	S	2	R/W	C/a	3	Values: 0: Measuring current 5: Raw value Âµs

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										1: Partial pressure 2: % saturation 3: Conc. (liquid) 4: Conc. (gaseous)
80	10	MEAS_SIM_VALUE	Simple	FLOAT	S	4	R/W	C/a	0.0	
81	11	MEAS_SIM_VALUE_UNIT	Simple	UNSIGNED16	N	2	R	C/a	0.0	
82	12	TEMP_SIM_ENABLED	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
83	13	TEMP_SIM_VALUE	Simple	FLOAT	S	4	R/W	C/a	0.5 DegC	
84	14	AVAILABILTIY	Simple	FLOAT	D	4	R	C/a	100.0 %	
85	15	MTBC	Simple	FLOAT	D	4	R	C/a	0.0 h	
86	16	MTBF	Simple	FLOAT	D	4	R	C/a	0.0 h	
87	17	MTTR	Simple	FLOAT	D	4	R	C/a	0.0 h	
88	18	TOTAL_OPERATING_TIME	Simple	FLOAT	D	4	R	C/a	0.0 h	
89	19	OPERATING_TIME_SINCE_LAST_RESET	Simple	FLOAT	D	4	R	C/a	0.0 h	
90	20	NUMBER_OF_FAILURES	Simple	UNSIGNED32	D	4	R	C/a	0	
91	21	NUMBER_OF_CALIBRATIONS	Simple	UNSIGNED32	D	4	R	C/a	0	
92	22	TIME_IN_FAILURE	Simple	FLOAT	D	4	R	C/a	0.0 h	
93	23	TIME_IN_CALIB	Simple	FLOAT	D	4	R	C/a	0.0 h	
94	24	RESET_COUNTERS	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: No 1: Yes
95	25	DATE_OF_LAST_CALIB	Simple	DATETIME	N	7	R	C/a	0	
96	26	TIME_SINCE_LAST_CALIB	Simple	FLOAT	D	4	R	C/a	0.0 d	
97	27	HEARTBEAT	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: No 1: Yes
98	28	DATE_OF_CURRENT_CALIB_1	Simple	DATETIME	N	7	R	C/a	0	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
99	29	DATE_OF_CURRENT_CALIB_2	Simple	DATETIME	N	7	R	C/a	0	
100	30	DIAG_LIST_1	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
101	31	DIAG_LIST_2	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
102	32	DIAG_LIST_3	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
103	33	DIAG_LIST_4	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
104	34	DIAG_LIST_5	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
105	35	DIAG_LIST_6	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
106	36	DIAG_LIST_7	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										961: Cond kappa comp upper limit
107	37	DIAG_LIST_8	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
108	38	DIAG_LIST_9	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data 100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn 170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning 239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm 812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
109	39	DIAG_LIST_10	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: 3: Temp. sensor failure 4: Scanning sensor 10: Sensor initialization 11: Sensor no communication 12: Sensor failure 13: Wrong sensor type 14: Invalid sensor data

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										100: Glass impedance alarm 101: Ref. impedance alarm 102: Glass imp. too low alarm 103: Ref. imp. too low alarm 104: Sensor supply bad 106: Glass impedance warning 107: Ref. impedance warning 111: Glass imp. too low warning 112: Ref. imp. too low warning 119: Temp offset upper limit 120: Temp offset lower limit 127: Invalid TAG group 128: Invalid TAG 129: Sensor change aborted 130: Calibration active 131: PV not stable 132: Temperature not stable 133: Polarization warning 134: Zero pnt. too high alarm 135: Zero pnt. too high warning 136: Zero pnt. too low warning 137: Zero pnt. too low alarm 138: Slope too low alarm 139: Slope too low warning 140: Leakage current alarm 142: SCC electrode cond. bad 143: Slope too high alarm 144: Slope too high warning 145: Leakage current warn 148: SCC electrode sufficient 153: Operating point too high alarm 154: Operating point too high warning 155: Operating point too low warning 156: Operating point too low alarm 162: Oper.time >40Â°C alarm 163: Oper.time >120Â°C alarm 164: Oper.time >140Â°C alarm 165: Oper.time >80Â°C <100 nS alarm 166: Oper.time >15nA alarm 167: Oper.time >50nA alarm 168: Oper.time >40Â°C warn 169: Oper.time >120Â°C warn

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										170: Cap operating time alarm 171: Cap operating time warning 172: Operating time alarm 173: Oper.time >80Â°C alarm 174: Oper.time >100Â°C alarm 175: Oper.time <-300mV alarm 176: Oper.time >300mV alarm 177: Delta slope alarm 178: Delta zero alarm 179: Delta oper.point alarm 180: Cal. expired alarm 181: SIP, CIP, autoclaving alarm 182: Operating time warning 183: Oper.time >80Â°C warn 184: Oper.time >100Â°C warn 185: Oper.time <-300mV warn 186: Oper.time >300mV warn 187: Oper.time >125Â°C warn 188: Oper.time >150Â°C warn 189: Oper.time <5Â°C warn 190: Cal. expired warning 191: SIP, CIP, autoclaving warning 192: Oper.time >15nA warn 193: Oper.time >50nA warn 194: Oper.time >140Â°C warn 195: Oper.time >80Â°C <100 nS warn 196: Oper.time >125Â°C alarm 197: Oper.time >150Â°C alarm 198: Oper.time <5Â°C alarm 203: Wrong transmitter type 215: Simulation active 218: Current output not available 219: Power supply bad 222: Oper.time >160nA warn 223: Oper.time >160nA alarm 224: Oper.time >5Â°C warn 225: Oper.time >5Â°C alarm 226: Oper.time >30Â°C warn 227: Oper.time >30Â°C alarm 228: Oper.time >30nA warn 229: Oper.time >30nA alarm 238: Delta slope warning

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										239: Delta zero warning 240: Delta oper.point warning 310: Temp. slope alarm 311: Temp. slope alarm 312: No cond. detected 313: Sensor coil current too high 314: Sensor coil current too low 315: Airset not calibrated 316: Cell const. not calibrated 317: Temp. not calibrated 318: Glass imp. too high alarm 319: Ref. imp. too high alarm 320: Glass imp. too high warning 321: Ref. imp. too high warning 322: Meas. value out of range 325: Sensor value out of range 326: Internal sensor conn. broken 327: Selftest active 328: Electr. temp. 329: Sensor low signal amplitude 330: Sensor relaxation time low 331: Sensor relaxation time high 332: Sensor low signal decay 333: Sensor temperature too high 380: Comm. module defect 381: Comm. module incomp 404: Lower limit current output 405: Upper limit current output 406: SETUP active 407: Diag. active 408: Calibration aborted 409: Sensor change 501: Device open 513: Device alarm 514: Device warning 530: Logbook: 20 % remain 531: Logbook: full 532: Calibration timer expired 770: Sensor deactivated 802: PCS Alarm 810: PV upper limit alarm 811: PV lower limit alarm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										812: Temperature out of range 813: Sensor temperature out of range 814: USP alarm 840: PV upper limit warning 841: PV lower limit warning 844: USP warning 902: Cap SIP, CIP, autoclaving alm 903: Cap SIP, CIP, autoclaving warn 904: Calibration quality alarm 905: Calibration quality warning 906: Number of cap calibrations alarm 907: Number of cap calibrations warn 908: Reference calibration required 950: Conc. temp lower limit 951: Conc. temp upper limit 952: Conc. kappa lower limit 953: Conc. kappa upper limit 954: Conc. lower limit 955: Conc. upper limit 956: Cond temp lower limit 957: Cond temp upper limit 958: Cond kappa lower limit 959: Cond kappa upper limit 960: Cond kappa comp lower limit 961: Cond kappa comp upper limit
110	40	DIAG_LIST_NAMUR_1	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
111	41	DIAG_LIST_NAMUR_2	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
112	42	DIAG_LIST_NAMUR_3	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
113	43	DIAG_LIST_NAMUR_4	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
114	44	DIAG_LIST_NAMUR_5	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
115	45	DIAG_LIST_NAMUR_6	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
116	46	DIAG_LIST_NAMUR_7	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
117	47	DIAG_LIST_NAMUR_8	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
118	48	DIAG_LIST_NAMUR_9	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
119	49	DIAG_LIST_NAMUR_10	Simple	UNSIGNED16	D	2	R	C/a	0	Values: 0: Failure (F) 1: Maintenance request (M) 2: Function check (C) 3: Out of specification (S) 4: Ok 5: Not configured (NC)
120	50	DIAG_LIST_TIMESTAMP_1	Simple	DATETIME	D	7	R	C/a	0	
121	51	DIAG_LIST_TIMESTAMP_2	Simple	DATETIME	D	7	R	C/a	0	
122	52	DIAG_LIST_TIMESTAMP_3	Simple	DATETIME	D	7	R	C/a	0	
123	53	DIAG_LIST_TIMESTAMP_4	Simple	DATETIME	D	7	R	C/a	0	
124	54	DIAG_LIST_TIMESTAMP_5	Simple	DATETIME	D	7	R	C/a	0	
125	55	DIAG_LIST_TIMESTAMP_6	Simple	DATETIME	D	7	R	C/a	0	
126	56	DIAG_LIST_TIMESTAMP_7	Simple	DATETIME	D	7	R	C/a	0	
127	57	DIAG_LIST_TIMESTAMP_8	Simple	DATETIME	D	7	R	C/a	0	
128	58	DIAG_LIST_TIMESTAMP_9	Simple	DATETIME	D	7	R	C/a	0	
129	59	DIAG_LIST_TIMESTAMP_10	Simple	DATETIME	D	7	R	C/a	0	
130	60	SENSOR_CAL_TYPE	Simple	UNSIGNED16	N	2	R	C/a	0	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: Adjustment 1: Calibration
131	61	CURRENT_CAL_VALID	Simple	BOOLEAN	N	1	R	C/a	False	
132	62	CIP_SETTINGS_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
133	63	CIP_LOWER_TEMP_THRESHOLD_VALUE	Simple	FLOAT	S	4	R/W	C/a	75.0 DegC	Min: 5.0 DegC Max: TB_COMMON_2.CIP_UPPER_TEMP_THRESHOLD_VALUE - 1.0 DegC
134	64	CIP_DURATION_VALUE	Simple	FLOAT	S	4	R/W	C/a	0.5 min	Min: 0.0166666666667 min Max: 4.16666666667 min
135	65	CIP_UPPER_TEMP_THRESHOLD_VALUE	Simple	FLOAT	S	4	R/W	C/a	85.0 DegC	Min: TB_COMMON_2.CIP_LOWER_TEMP_THRESHOLD_VALUE + 1.0 DegC Max: 90.0 DegC
136	66	SENSOR_INFO_CAL_BUFFER3	Simple	FLOAT	N	4	R	C/a	0.0 pH	
137	67	SENSOR_INFO_MANUFACTURER	Simple	VISIBLE_STRING_32	N	32	R	C/a	---	
138	68	SENSOR_INFO_CAL_SECONDARY_DATE_TIME	Simple	DATETIME	N	7	R	C/a	0	
139	69	SENSOR_INFO_AUTO_CLAVINGS	Simple	UNSIGNED16	N	2	R	C/a	0	
140	70	SENSOR_INFO_CAL_BUFFER1_MV	Simple	FLOAT	N	4	R	C/a	0.0 mV	
141	71	SENSOR_INFO_CAL_BUFFER1_PERCENT	Simple	FLOAT	N	4	R	C/a	0.0 %	
142	72	SENSOR_INFO_CAL_BUFFER2_PERCENT	Simple	FLOAT	N	4	R	C/a	0.0 %	
143	73	LIMIT_SWITCH_DIGITAL_OP_TIME_T1_CRITERIA	Simple	VISIBLE_STRING_24	N	24	R	C/a	> 40 Â°C / 104 Â°F	
144	74	LIMIT_SWITCH_DIGITAL_OP_TIME_T2_CRITERIA	Simple	VISIBLE_STRING_24	N	24	R	C/a	> 80 Â°C / 176 Â°F	
145	75	LIMIT_SWITCH_DIGITAL_OP_TIME_T3_CRITERIA	Simple	VISIBLE_STRING_24	N	24	R	C/a	> 120 Â°C / 248 Â°F	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
146	76	LIMIT_SWITCH_DIGITAL_OP_TIME_T4_CRITERIA	Simple	VISIBLE_STRING_24	N	24	R	C/a	< 5 Â°C / 41 Â°F	
147	77	SENSOR_INFO_CAP_CIP_CYCLES	Simple	UNSIGNED16	N	2	R	C/a	0	
148	78	SENSOR_INFO_CAP_AUTO_CLAVINGS	Simple	UNSIGNED16	N	2	R	C/a	0	
149	79	SENSOR_INFO_CAL_ZERO_QUALITY_INDEX	Simple	FLOAT	N	4	R	C/a	0.0 %	
150	80	SENSOR_INFO_CAL_POINT_AT_OXYGEN_TAU	Simple	FLOAT	N	4	R	C/a	0.0 us	
151	81	SENSOR_INFO_CAL_POINT_AT_OXYGEN_KSV	Simple	FLOAT	N	4	R	C/a	0.0 1/MPa	
152	82	SENSOR_INFO_CAL_QUALITY_INDEX	Simple	FLOAT	N	4	R	C/a	0.0 %	
153	83	SENSOR_INFO_OP_TIME_SPECIFIC8	Simple	FLOAT	D	4	R	C/a	0.0 h	
154	84	SENSOR_INFO_OP_TIME_SPECIFIC9	Simple	FLOAT	D	4	R	C/a	0.0 h	
155	85	SENSOR_INFO_OP_TIME_SPECIFIC7	Simple	FLOAT	D	4	R	C/a	0.0 h	
156	86	SENSOR_INFO_OP_TIME_SPECIFIC6	Simple	FLOAT	D	4	R	C/a	0.0 h	
157	87	SENSOR_INFO_CAL_FERMENTER_TRANSMITTER_SERIAL	Simple	VISIBLE_STRING_32	N	32	R	C/a		
158	88	SENSOR_INFO_CAL_ZERO_KSV	Simple	FLOAT	N	4	R	C/a	0.0 1/MPa	
159	89	SENSOR_INFO_CAL_ZERO_CAP_CALIBRATIONS	Simple	UNSIGNED16	N	2	R	C/a	0	
160	90	SENSOR_INFO_CAL_ZERO_OP_HOURS	Simple	FLOAT	N	4	R	C/a	0.0 h	
161	91	SENSOR_INFO_CAL_CAP_ZERO_OP_HOURS	Simple	FLOAT	N	4	R	C/a	0.0 h	
162	92	SENSOR_INFO_CAL_PAO_CALIBRATIONS	Simple	UNSIGNED16	N	2	R	C/a	0	
163	93	SENSOR_INFO_CAL_PAO_CAP_CALIBRATIONS	Simple	UNSIGNED16	N	2	R	C/a	0	
164	94	SENSOR_INFO_CAL_PAO_OP_HOURS	Simple	FLOAT	N	4	R	C/a	0.0 h	
165	95	SENSOR_INFO_CAL_CAP_PAO_OP_HOURS	Simple	FLOAT	N	4	R	C/a	0.0 h	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
166	96	SENSOR_SPEC_RES_MIN	Simple	FLOAT	N	4	R	C/a	0.0 MOhm*cm	
167	97	SENSOR_SPEC_RES_MAX	Simple	FLOAT	N	4	R	C/a	0.0 MOhm*cm	
168	98	STERILIZATION_DURATIONVALUE	Simple	FLOAT	S	4	R/W	C/a	0.333333333333 min	Min: 0.0166666666667 min Max: 4.16666666667 min
169	99	STERILIZATION_TEMP_THRESHOLD_VALUE	Simple	FLOAT	S	4	R/W	C/a	121.0 DegC	Min: 120.0 DegC Max: 150.0 DegC
170	100	REFERENCE_CAL_VALID	Simple	BOOLEAN	N	1	R	C/a	False	

9.5.4 TB_PH_x addressing (Liquiline pHORP)

Manufacturer-specific Transducer Block addressing (pHORP)		
Block name	**Slot**	**Index**
TB_PH_1	5	70
TB_PH_2	6	70

9.5.5 Layout TB_PH_1 (Liquiline pHORP)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
70	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
71	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
72	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
73	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
74	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
75	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
76	6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
77	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
78	8	MEASURAND	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: pH 1: ORP mV 3: ORP %

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										2: rH
79	9	MEASURAND_ANALOG	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: pH 1: ORP mV 3: ORP % 2: rH
80	10	MEASURAND_DIGITAL	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: pH 1: ORP mV 3: ORP % 2: rH
81	11	POTENTIAL_EQUALISATION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: without PM 1: with PM
82	12	POTENTIAL_EQUALISATION_ NOTANTIMONY	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: without PM 1: with PM
83	13	POTENTIAL_EQUALISATION_ ANTIMONY	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: without PM 1: with PM
84	14	SENSOR_TYPE	Simple	UNSIGNED16	S	2	R/W	C/a	9	Values: 0: Glass 1: ISFET 2: ORP 3: ISFET 4: ORP 5: Pfaudler abs 6: Pfaudler rel 7: Antimony 9: Glass 10: Pfaudler pH/ORP 11: Combined pH/ORP 12: none

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										13: Glass V2
85	15	SENSOR_TYPE_ANALOG	Simple	UNSIGNED16	S	2	R/W	C/a	9	Values: 0: Glass 1: ISFET 2: ORP 3: ISFET 4: ORP 5: Pfaudler abs 6: Pfaudler rel 7: Antimony 9: Glass 10: Pfaudler pH/ORP 11: Combined pH/ORP 12: none 13: Glass V2
86	16	SENSOR_TYPE_DIGITAL	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Glass 1: ISFET 2: ORP 3: ISFET 4: ORP 5: Pfaudler abs 6: Pfaudler rel 7: Antimony 9: Glass 10: Pfaudler pH/ORP 11: Combined pH/ORP 12: none 13: Glass V2
87	17	REFERENCE_ELECTRODE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: AGAGel 1: AgAgCl
88	18	TEMP_SENSOR	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: Pt100/Pt1000
89	19	TEMP_SENSOR_DIGITAL	Simple	UNSIGNED16	S	2	R/W	C/a	1	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Values: 0: none 1: Pt100/Pt1000
90	20	TEMP_SENSOR_ANALOG	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: Pt100/Pt1000
91	21	TEMP_SENSOR_ANTIMONY	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: none 1: Pt100/Pt1000
92	22	INTERNAL_BUFFER	Simple	FLOAT	S	4	R/W	C/a	7.0 pH	Min: -2.0 pH Max: 16.0 pH
93	23	DAMPING_MV	Simple	FLOAT	S	4	R/W	C/a	0.0 s	Min: 0.0 s Max: 600.0 s
94	24	CAL_DATA_INPUT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
95	25	CAL_2_POINT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
96	26	CAL_1_POINT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
97	27	CAL_GRABSAMPLE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
98	28	CAL_ORP_DATA_INPUT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
99	29	CAL_ORP_1_POINT	Simple	UNSIGNED16	S	2	R/W	C/a	1	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Values: 0: off 1: on
100	30	CAL_ORP_PERC_DATA_INPUT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
101	31	CAL_ORP_PERC_2_POINT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
102	32	CAL_STABLE_BANDWIDTH	Simple	FLOAT	S	4	R/W	C/a	1.0 mV	Min: 1.0 mV Max: 10.0 mV
103	33	CAL_STABLE_TIMEFRAME	Simple	FLOAT	S	4	R/W	C/a	20.0 s	Min: 5.0 s Max: 60.0 s
104	34	CAL_TEMP_COMP	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: Auto comp.(ATC) 2: Man. comp.
105	35	CAL_TEMP_REFERENCE	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -50.0 DegC Max: 250.0 DegC
106	36	CAL_BUFFER_RECOGNITION	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: automatic 1: fixed 2: manual
107	37	CAL_BUFFER_RECOGNITION_ AUTO	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: automatic 1: fixed 2: manual
108	38	CAL_BUFFER_RECOGNITION_ NOTAUTO	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: automatic

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										1: fixed 2: manual
109	39	CAL_BUFFER_MANUFACTURER	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: E+H (NIST) 1: Ingold/Mettler 2: DIN 19266 3: DIN 19267 4: Merck/Riedel 6: Hamilton 5: Special buffer
110	40	CAL_BUFFER1_FIXED	Simple	UNSIGNED16	S	2	R/W	C/a	2	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
111	41	CAL_BUFFER1_FIXED_EH	Simple	UNSIGNED16	S	2	R/W	C/a	2	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
112	42	CAL_BUFFER1_FIXED_INGOLD	Simple	UNSIGNED16	S	2	R/W	C/a	7	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
113	43	CAL_BUFFER1_FIXED_DIN19266	Simple	UNSIGNED16	S	2	R/W	C/a	11	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
114	44	CAL_BUFFER1_FIXED_DIN19267	Simple	UNSIGNED16	S	2	R/W	C/a	16	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
115	45	CAL_BUFFER1_FIXED_MERCK	Simple	UNSIGNED16	S	2	R/W	C/a	21	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
116	46	CAL_BUFFER1_FIXED_SPECIAL	Simple	UNSIGNED16	S	2	R/W	C/a	24	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
117	47	CAL_BUFFER1_FIXED_HAMILTON	Simple	UNSIGNED16	S	2	R/W	C/a	32	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										27: Puffer 4
118	48	CAL_BUFFER2_FIXED	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
119	49	CAL_BUFFER2_FIXED_EH	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
120	50	CAL_BUFFER2_FIXED_INGOLD	Simple	UNSIGNED16	S	2	R/W	C/a	6	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
121	51	CAL_BUFFER2_FIXED_DIN19266	Simple	UNSIGNED16	S	2	R/W	C/a	10	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
122	52	CAL_BUFFER2_FIXED_DIN19267	Simple	UNSIGNED16	S	2	R/W	C/a	14	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
123	53	CAL_BUFFER2_FIXED_MERCK	Simple	UNSIGNED16	S	2	R/W	C/a	20	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
124	54	CAL_BUFFER2_FIXED_SPECIAL	Simple	UNSIGNED16	S	2	R/W	C/a	25	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH 8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
125	55	CAL_BUFFER2_FIXED_HAMILTON	Simple	UNSIGNED16	S	2	R/W	C/a	35	Values: 0: 2.00 pH 1: 4.00 pH 2: 7.00 pH 41: 9.00 pH 3: 9.22 pH 4: 10.00 pH 42: 12.00 pH 5: 2.00 pH 6: 4.01 pH 7: 7.00 pH

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										8: 9.21 pH 9: 1.68 pH 10: 4.01 pH 11: 6.86 pH 12: 9.18 pH 13: 1.09 pH 14: 3.06 pH 15: 4.65 pH 16: 6.79 pH 17: 9.23 pH 18: 12.75 pH 19: 2.00 pH 20: 4.01 pH 21: 6.98 pH 22: 8.95 pH 23: 12.00 pH 28: 1.09 pH 29: 1.68 pH 30: 2.00 pH 31: 3.06 pH 32: 4.01 pH 33: 5.00 pH 34: 6.00 pH 35: 7.00 pH 36: 8.00 pH 37: 9.21 pH 38: 10.01 pH 39: 11.00 pH 40: 12.00 pH 24: Puffer 1 25: Puffer 2 26: Puffer 3 27: Puffer 4
126	56	CAL_BUFFER1_MAN	Simple	FLOAT	S	4	R/W	C/a	7.0 pH	Min: -2.0 pH Max: 16.0 pH
127	57	CAL_BUFFER2_MAN	Simple	FLOAT	S	4	R/W	C/a	4.0 pH	Min: -2.0 pH Max: 16.0 pH
128	58	CAL_BUFFER_USERTAB	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: Puffer 1 1: Puffer 2 2: Puffer 3 3: Puffer 4
129	59	CAL_BUFFER_USERTAB_NAME1	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	Puffer 1	
130	60	CAL_BUFFER_USERTAB_NAME2	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	Puffer 2	
131	61	CAL_BUFFER_USERTAB_NAME3	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	Puffer 3	
132	62	CAL_BUFFER_USERTAB_NAME4	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	Puffer 4	
133	63	CAL_ISOTHERM_INTERSECTION	Simple	FLOAT	S	4	R/W	C/a	7.0 pH	Min: -2.0 pH Max: 16.0 pH
134	64	CAL_ISOTHERM_INTERSECTION_NOPFAUDLER	Simple	FLOAT	S	4	R/W	C/a	7.0 pH	Min: -2.0 pH Max: 16.0 pH
135	65	CAL_ISOTHERM_INTERSECTION_PFAUDLER3	Simple	FLOAT	S	4	R/W	C/a	1.35 pH	Min: -2.0 pH Max: 16.0 pH
136	66	CAL_ISOTHERM_INTERSECTION_PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	3.0 pH	Min: -2.0 pH Max: 16.0 pH
137	67	CAL_ORP_REFERENCE_BUFFER	Simple	FLOAT	S	4	R/W	C/a	220.0 mV	Min: -2000.0 mV Max: 2000.0 mV
138	68	CAL_ORPPERCENT_BUFFER1	Simple	FLOAT	S	4	R/W	C/a	20.0 %	Min: 0.0 % Max: 30.0 %
139	69	CAL_ORPPERCENT_BUFFER2	Simple	FLOAT	S	4	R/W	C/a	80.0 %	Min: 70.0 % Max: 100.0 %
140	70	TEMP_COMPENSATION	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: Auto comp.(ATC)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										2: Man. comp.
141	71	TEMP_REFERENCE	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -50.0 DegC Max: 250.0 DegC
142	72	MEDIUM_COMPENSATION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: 2 point 2: Table
143	73	MEDIUM_TEMP_REFERENCE	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -50.0 DegC Max: 250.0 DegC
144	74	MEDIUM_TEMPERATURE1	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -50.0 DegC Max: 250.0 DegC
145	75	MEDIUM_PH1	Simple	FLOAT	S	4	R/W	C/a	7.0 pH	Min: -2.0 pH Max: 16.0 pH
146	76	MEDIUM_TEMPERATURE2	Simple	FLOAT	S	4	R/W	C/a	40.0 DegC	Min: -50.0 DegC Max: 250.0 DegC
147	77	MEDIUM_PH2	Simple	FLOAT	S	4	R/W	C/a	7.5 pH	Min: -2.0 pH Max: 16.0 pH
148	78	SCS_REF_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
149	79	SCS_REF_FUNCTION_WITHOUTPAL	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
150	80	SCS_REF_FUNCTION_WITHPAL	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
151	81	SCS_REF_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	100.0 kOhm	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Min: TB_PH_1.SCS_REF_UPPER_WARNING + 0.1 kOhm Max: 1000.0 kOhm
152	82	SCS_REF_UPPER_WARNING	Simple	FLOAT	S	4	R/W	C/a	50.0 kOhm	Min: TB_PH_1.SCS_REF_LOWER_WARNING + 0.1 kOhm Max: TB_PH_1.SCS_REF_UPPER_ALARM - 0.1 kOhm
153	83	SCS_REF_LOWER_WARNING	Simple	FLOAT	S	4	R/W	C/a	1.0 kOhm	Min: TB_PH_1.SCS_REF_LOWER_ALARM + 0.1 kOhm Max: TB_PH_1.SCS_REF_UPPER_WARNING - 0.1 kOhm
154	84	SCS_REF_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	0.0 kOhm	Min: 0.0 kOhm Max: TB_PH_1.SCS_REF_LOWER_WARNING - 0.1 kOhm
155	85	SCS_GLASS_UPPER_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
156	86	SCS_GLASS_LOWER_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
157	87	SCS_GLASS_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	3000.0 MOhm	Min: TB_PH_1.SCS_GLASS_UPPER_WARNING + 0.1 MOhm Max: 10000.0 MOhm
158	88	SCS_GLASS_UPPER_WARNING	Simple	FLOAT	S	4	R/W	C/a	2500.0 MOhm	Min: TB_PH_1.SCS_GLASS_LOWER_WARNING + 0.1 MOhm Max: TB_PH_1.SCS_GLASS_UPPER_ALARM -

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0.1 MOhm
159	89	SCS_GLASS_LOWER_WARNING	Simple	FLOAT	S	4	R/W	C/a	0.1 MOhm	Min: TB_PH_1.SCS_GLASS_LOWER_ALARM + 0.1 MOhm Max: TB_PH_1.SCS_GLASS_UPPER_WARNING - 0.1 MOhm
160	90	SCS_GLASS_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	0.0 MOhm	Min: 0.0 MOhm Max: TB_PH_1.SCS_GLASS_LOWER_WARNING - 0.1 MOhm
161	91	SLOPE_WARNING	Simple	FLOAT	S	4	R/W	C/a	55.0 mV/pH	Min: TB_PH_1.SLOPE_ALARM + 0.01 mV/pH Max: 65.0 mV/pH
162	92	SLOPE_WARNING_NOPFAUDLER	Simple	FLOAT	S	4	R/W	C/a	55.0 mV/pH	Min: TB_PH_1.SLOPE_ALARM + 0.01 mV/pH Max: 65.0 mV/pH
163	93	SLOPE_WARNING_PFAUDLER3	Simple	FLOAT	S	4	R/W	C/a	52.0 mV/pH	Min: TB_PH_1.SLOPE_ALARM + 0.01 mV/pH Max: 65.0 mV/pH
164	94	SLOPE_WARNING_PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	48.0 mV/pH	Min: TB_PH_1.SLOPE_ALARM + 0.01 mV/pH Max: 65.0 mV/pH
165	95	SLOPE_ALARM	Simple	FLOAT	S	4	R/W	C/a	53.0 mV/pH	Min: 0.1 mV/pH Max: TB_PH_1.SLOPE_WARNING - 0.01 mV/pH
166	96	SLOPE_ALARM_NOPFAUDLER	Simple	FLOAT	S	4	R/W	C/a	53.0 mV/pH	Min: 0.1 mV/pH Max: TB_PH_1.SLOPE_WARNING - 0.01 mV/pH
167	97	SLOPE_ALARM_PFAUDLER3	Simple	FLOAT	S	4	R/W	C/a	50.0 mV/pH	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Min: 0.1 mV/pH Max: TB_PH_1.SLOPE_WARNING - 0.01 mV/pH
168	98	SLOPE_ALARM_PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	45.0 mV/pH	Min: 0.1 mV/pH Max: TB_PH_1.SLOPE_WARNING - 0.01 mV/pH
169	99	ZEROPOINT_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	9.0 pH	Min: TB_PH_1.ZEROPOINT_UPPER_WARNING + 0.01 pH Max: 16.0 pH
170	100	ZEROPOINT_UPPER_ALARM_ GLAS	Simple	FLOAT	S	4	R/W	C/a	9.0 pH	Min: TB_PH_1.ZEROPOINT_UPPER_WARNING + 0.01 pH Max: 16.0 pH
171	101	ZEROPOINT_UPPER_ALARM_ PFAUDLER3_AGAGEL	Simple	FLOAT	S	4	R/W	C/a	3.35 pH	Min: TB_PH_1.ZEROPOINT_UPPER_WARNING + 0.01 pH Max: 16.0 pH
172	102	ZEROPOINT_UPPER_ALARM_ PFAUDLER3_AGAGCL	Simple	FLOAT	S	4	R/W	C/a	10.65 pH	Min: TB_PH_1.ZEROPOINT_UPPER_WARNING + 0.01 pH Max: 16.0 pH
173	103	ZEROPOINT_UPPER_ALARM_ PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	12.0 pH	Min: TB_PH_1.ZEROPOINT_UPPER_WARNING + 0.01 pH Max: 16.0 pH
174	104	ZEROPOINT_UPPER_ALARM_ ANTIMONY	Simple	FLOAT	S	4	R/W	C/a	3.0 pH	Min: TB_PH_1.ZEROPOINT_UPPER_WARNING + 0.01 pH Max: 16.0 pH
175	105	ZEROPOINT_UPPER_WARNING	Simple	FLOAT	S	4	R/W	C/a	8.0 pH	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Min: TB_PH_1.ZEROPOINT_LOWER_WARNING + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_ALARM - 0.01 pH
176	106	ZEROPOINT_UPPER_WARNING_GLAS	Simple	FLOAT	S	4	R/W	C/a	8.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_WARNING + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_ALARM - 0.01 pH
177	107	ZEROPOINT_UPPER_WARNING_PFAUDLER3_AGAGEL	Simple	FLOAT	S	4	R/W	C/a	2.25 pH	Min: TB_PH_1.ZEROPOINT_LOWER_WARNING + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_ALARM - 0.01 pH
178	108	ZEROPOINT_UPPER_WARNING_PFAUDLER3_AGAGCL	Simple	FLOAT	S	4	R/W	C/a	9.65 pH	Min: TB_PH_1.ZEROPOINT_LOWER_WARNING + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_ALARM - 0.01 pH
179	109	ZEROPOINT_UPPER_WARNING_PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	11.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_WARNING + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_ALARM - 0.01 pH
180	110	ZEROPOINT_UPPER_WARNING_ANTIMONY	Simple	FLOAT	S	4	R/W	C/a	2.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_WARNING + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_ALARM -

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0.01 pH
181	111	ZEROPOINT_LOWER_WARNING	Simple	FLOAT	S	4	R/W	C/a	6.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_ALARM + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_WARNING - 0.01 pH
182	112	ZEROPOINT_LOWER_WARNING_GLAS	Simple	FLOAT	S	4	R/W	C/a	6.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_ALARM + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_WARNING - 0.01 pH
183	113	ZEROPOINT_LOWER_WARNING_PFAUDLER3_AGAGEL	Simple	FLOAT	S	4	R/W	C/a	0.35 pH	Min: TB_PH_1.ZEROPOINT_LOWER_ALARM + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_WARNING - 0.01 pH
184	114	ZEROPOINT_LOWER_WARNING_PFAUDLER3_AGAGCL	Simple	FLOAT	S	4	R/W	C/a	7.65 pH	Min: TB_PH_1.ZEROPOINT_LOWER_ALARM + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_WARNING - 0.01 pH
185	115	ZEROPOINT_LOWER_WARNING_PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	9.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_ALARM + 0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_WARNING - 0.01 pH
186	116	ZEROPOINT_LOWER_WARNING_ANTIMONY	Simple	FLOAT	S	4	R/W	C/a	0.0 pH	Min: TB_PH_1.ZEROPOINT_LOWER_ALARM +

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0.01 pH Max: TB_PH_1.ZEROPOINT_UPPER_WARNING - 0.01 pH
187	117	ZEROPOINT_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	5.0 pH	Min: -2.0 pH Max: TB_PH_1.ZEROPOINT_LOWER_WARNING - 0.01 pH
188	118	ZEROPOINT_LOWER_ALARM_GLAS	Simple	FLOAT	S	4	R/W	C/a	5.0 pH	Min: -2.0 pH Max: TB_PH_1.ZEROPOINT_LOWER_WARNING - 0.01 pH
189	119	ZEROPOINT_LOWER_ALARM_ PFAUDLER3_AGAGEL	Simple	FLOAT	S	4	R/W	C/a	-0.65 pH	Min: -2.0 pH Max: TB_PH_1.ZEROPOINT_LOWER_WARNING - 0.01 pH
190	120	ZEROPOINT_LOWER_ALARM_ PFAUDLER3_AGAGCL	Simple	FLOAT	S	4	R/W	C/a	6.65 pH	Min: -2.0 pH Max: TB_PH_1.ZEROPOINT_LOWER_WARNING - 0.01 pH
191	121	ZEROPOINT_LOWER_ALARM_ PFAUDLER18	Simple	FLOAT	S	4	R/W	C/a	8.0 pH	Min: -2.0 pH Max: TB_PH_1.ZEROPOINT_LOWER_WARNING - 0.01 pH
192	122	ZEROPOINT_LOWER_ALARM_ ANTIMONY	Simple	FLOAT	S	4	R/W	C/a	-1.0 pH	Min: -2.0 pH Max: TB_PH_1.ZEROPOINT_LOWER_WARNING - 0.01 pH
193	123	OPERATINGPOINT_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	300.0 mV	Min: TB_PH_1.OPERATINGPOINT_UPPER_ WARNING + 1.0 mV Max: 2000.0 mV

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
194	124	OPERATINGPOINT_UPPER_ WARNING	Simple	FLOAT	S	4	R/W	C/a	250.0 mV	Min: TB_PH_1.OPERATINGPOINT_LOWER_ WARNING + 1.0 mV Max: TB_PH_1.OPERATINGPOINT_UPPER_ ALARM - 1.0 mV
195	125	OPERATINGPOINT_LOWER_ WARNING	Simple	FLOAT	S	4	R/W	C/a	-250.0 mV	Min: TB_PH_1.OPERATINGPOINT_LOWER_ ALARM + 1.0 mV Max: TB_PH_1.OPERATINGPOINT_UPPER_ WARNING - 1.0 mV
196	126	OPERATINGPOINT_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	-300.0 mV	Min: -2000.0 mV Max: TB_PH_1.OPERATINGPOINT_LOWER_ WARNING - 1.0 mV
197	127	ORPMEAS_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
198	128	ORPMEAS_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	900.0 mV	Min: TB_PH_1.ORPMEAS_UPPER_WARNING + 1.0 mV Max: 2000.0 mV
199	129	ORPMEAS_UPPER_WARNING	Simple	FLOAT	S	4	R/W	C/a	700.0 mV	Min: TB_PH_1.ORPMEAS_LOWER_WARNING + 1.0 mV Max: TB_PH_1.ORPMEAS_UPPER_ALARM - 1.0 mV
200	130	ORPMEAS_LOWER_WARNING	Simple	FLOAT	S	4	R/W	C/a	-700.0 mV	Min: TB_PH_1.ORPMEAS_LOWER_ALARM + 1.0 mV Max: TB_PH_1.ORPMEAS_UPPER_WARNING - 1.0 mV
201	131	ORPMEAS_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	-900.0 mV	Min: -2000.0 mV Max:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										TB_PH_1.ORPMEAS_LOWER_WARNING - 1.0 mV
202	132	SCC_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
203	133	OPERATING_TIME_MINUS300MV_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_PH_1.OPERATING_TIME_ MINUS300MV_ALARM - 1.0 h
204	134	OPERATING_TIME_MINUS300MV_ ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_PH_1.OPERATING_TIME_ MINUS300MV_WARNING + 1.0 h Max: 50000.0 h
205	135	OPERATING_TIME_PLUS300MV_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_PH_1.OPERATING_TIME_ PLUS300MV_ALARM - 1.0 h
206	136	OPERATING_TIME_PLUS300MV_ ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_PH_1.OPERATING_TIME_ PLUS300MV_WARNING + 1.0 h Max: 50000.0 h
207	137	DELTA_SLOPE_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
208	138	DELTA_SLOPE_WARNING	Simple	FLOAT	S	4	R/W	C/a	5.0 mV/pH	Min: 0.1 mV/pH Max: TB_PH_1.DELTA_SLOPE_ALARM - 0.01 mV/pH
209	139	DELTA_SLOPE_ALARM	Simple	FLOAT	S	4	R/W	C/a	6.0 mV/pH	Min: TB_PH_1.DELTA_SLOPE_WARNING + 0.01 mV/pH Max: 10.0 mV/pH
210	140	DELTA_OPERATINGPOINT_ FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
211	141	DELTA_OPERATINGPOINT_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10.0 mV	Min: 1.0 mV Max: TB_PH_1.DELTA_OPERATINGPOINT_ALARM - 1.0 mV
212	142	DELTA_OPERATINGPOINT_ ALARM	Simple	FLOAT	S	4	R/W	C/a	15.0 mV	Min: TB_PH_1.DELTA_OPERATINGPOINT_ WARNING + 1.0 mV Max: 200.0 mV
213	143	DELTA_ZEROPOINT_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
214	144	DELTA_ZEROPOINT_WARNING	Simple	FLOAT	S	4	R/W	C/a	0.5 pH	Min: 0.0 pH Max: TB_PH_1.DELTA_ZEROPOINT_ALARM - 0.01 pH
215	145	DELTA_ZEROPOINT_ALARM	Simple	FLOAT	S	4	R/W	C/a	1.0 pH	Min: TB_PH_1.DELTA_ZEROPOINT_WARNING + 0.01 pH Max: 2.0 pH
216	146	FORMAT_PH_VALUE	Simple	UNSIGNED16	S	2	R/W	C/a	0x112	Values: 0x111: x.x 0x112: x.xx
217	147	FORMAT_RH_VALUE	Simple	UNSIGNED16	S	2	R/W	C/a	0x111	Values: 0x110: xx 0x111: xx.x

9.5.6 Layout TB_PH_2 (Liquiline pHORP)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
70	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
71	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
72	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
73	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
74	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
75	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
76	6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
77	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
78	8	SLOPE_ORPPERCENT	Simple	FLOAT	N	4	R	C/a	0.03	
79	9	OPERATING_POINT	Simple	FLOAT	N	4	R	C/a	0.0 mV	
80	10	OFFSET_PH	Simple	FLOAT	S	4	R/W	C/a	0.0 pH	
81	11	OFFSET_ORPMV	Simple	FLOAT	N	4	R	C/a	0.0 mV	
82	12	OFFSET_ORPPERCENT	Simple	FLOAT	N	4	R	C/a	0.0 mV	
83	13	REF_IMPEDANCE	Record	DS60	D	12	R	C/a	None	
84	14	REMOTECAL_COMMAND	Simple	UNSIGNED8	N	1	R/W	C/a	0	Values: 0: Command_NOP 1: Command_CalibrateBuffer1 2: Command_CalibrateBuffer2 3: Command_Takeover 4: Command_DiscardOrAbort
85	15	REMOTECAL_STATUS	Simple	UNSIGNED8	D	1	R	C/a	0	Values:

										0: Status_Inactive 1: Status_Buffer1Running 2: Status_Buffer1Unstable 3: Status_Buffer1Done 4: Status_Buffer2Running 5: Status_Buffer2Unstable 6: Status_Buffer2Done 7: Status_ResultsInvalid 8: Status_ResultsOK
86	16	REMOTECAL_ACTIVATION	Simple	UNSIGNED8	N	1	R/W	C/a	0	
87	17	REMOTECAL_ACTIVATIONSTATE	Simple	UNSIGNED8	D	1	R	C/a	0	
88	18	TABLE_BUFFER_ENTRY	Simple	UNSIGNED8	N	1	R/W	C/a		Min: -50.0 Max: 250.0
89	19	TABLE_BUFFER_X	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0 Max: 250.0
90	20	TABLE_BUFFER_Y	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0 Max: 250.0
91	21	TABLE_BUFFER_MIN	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
92	22	TABLE_BUFFER_MAX	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
93	23	TABLE_BUFFER_OP_CODE	Simple	UNSIGNED8	N	1	R/W	C/a		Min: -50.0 Max: 250.0
94	24	TABLE_BUFFER_STATUS	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
95	25	TABLE_BUFFER_CURRENT	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
96	26	TABLE_MEDIUMSCOMP_ENTRY	Simple	UNSIGNED8	N	1	R/W	C/a		Min: -50.0 Max: 250.0
97	27	TABLE_MEDIUMSCOMP_X	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0

										Max: 250.0
98	28	TABLE_MEDIUMSCOMP_Y	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0 Max: 250.0
99	29	TABLE_MEDIUMSCOMP_MIN	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
100	30	TABLE_MEDIUMSCOMP_MAX	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
101	31	TABLE_MEDIUMSCOMP_OP_CODE	Simple	UNSIGNED8	N	1	R/W	C/a		Min: -50.0 Max: 250.0
102	32	TABLE_MEDIUMSCOMP_STATUS	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
103	33	TABLE_MEDIUMSCOMP_CURRENT	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
104	34	CAL_BUFFER1_MVVALUE	Simple	FLOAT	N	4	R	C/a	0.0 mV	
105	35	CAL_BUFFER2_MVVALUE	Simple	FLOAT	N	4	R	C/a	0.0 mV	
106	36	CAL_ZEROPOINT_TEMPORARY	Simple	FLOAT	N	4	R	C/a	0.0 pH	
107	37	CAL_SLOPE_TEMPORARY	Simple	FLOAT	N	4	R	C/a	0.0 mV/pH	
108	38	ISFET_LEAKAGE_CURRENT	Record	DS60	D	12	R	C/a	None	
109	39	ADJUSTMENT_STORAGE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: Sensor 1: Transmitter
110	40	INTERFACE_LEVEL	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: Glass 1: Pfaudler
111	41	ZEROPOINT_UPPER_ALARM_ MEMOSENS_PFAUDLER	Simple	FLOAT	S	4	R/W	C/a	10.5 pH	Min: TB_PH_2.ZEROPOINT_UPPER_WARNING_ MEMOSENS_PFAUDLER + 0.01 pH Max: 16.0 pH
112	42	ZEROPOINT_UPPER_WARNING_ MEMOSENS_PFAUDLER	Simple	FLOAT	S	4	R/W	C/a	9.5 pH	Min:

										TB_PH_2.ZEROPOINT_LOWER_WARNING_ MEMOSENS_PFAUDLER + 0.01 pH Max: TB_PH_2.ZEROPOINT_UPPER_ALARM_ MEMOSENS_PFAUDLER - 0.01 pH
113	43	ZEROPOINT_LOWER_WARNING_ MEMOSENS_PFAUDLER	Simple	FLOAT	S	4	R/W	C/a	6.5 pH	Min: TB_PH_2.ZEROPOINT_LOWER_ALARM_ MEMOSENS_PFAUDLER + 0.01 pH Max: TB_PH_2.ZEROPOINT_UPPER_WARNING_ MEMOSENS_PFAUDLER - 0.01 pH
114	44	ZEROPOINT_LOWER_ALARM_ MEMOSENS_PFAUDLER	Simple	FLOAT	S	4	R/W	C/a	5.5 pH	Min: -2.0 pH Max: TB_PH_2.ZEROPOINT_LOWER_WARNING_ MEMOSENS_PFAUDLER - 0.01 pH
115	45	CIP_PH_TYPE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: acidic 1: alkaline
116	46	CUSTOM_SENSOR_TAG_INFO	Simple	VISIBLE_STRING_16	N	16	R	C/a	---	
117	47	CUSTOM_SENSOR_TAG	Simple	VISIBLE_STRING_16	N	16	R/W	C/a	---	
118	48	CIP_PH_THRESHOLD_VALUE	Simple	FLOAT	S	4	R/W	C/a	11.0 pH	Min: 2.0 pH Max: 11.0 pH
119	49	SENSOR_DEACTIVATION_STATE	Simple	UNSIGNED16	N	2	R	C/a	1	Values: 0: deactivated 1: active
120	50	NUMBER_AUTO_CLAV_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
121	51	LIMIT_SWITCH_DIGITAL_AUTO_ CLAV_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	50.0	Min: TB_PH_2.LIMIT_SWITCH_DIGITAL_ AUTO_CLAV_LIMIT_WARNING + 1.0 Max: 99.0
122	52	LIMIT_SWITCH_DIGITAL_AUTO_ CLAV_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	30.0	Min: 1.0 Max: TB_PH_2.LIMIT_SWITCH_DIGITAL_

										AUTO_CLAV_LIMIT_ALARM - 1.0
123	53	NUMBER_CIP_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
124	54	LIMIT_SWITCH_DIGITAL_CIP_ LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	80.0	Min: 1.0 Max: TB_PH_2.LIMIT_SWITCH_DIGITAL_ CIP_LIMIT_ALARM - 1.0
125	55	LIMIT_SWITCH_DIGITAL_CIP_ LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	100.0	Min: TB_PH_2.LIMIT_SWITCH_DIGITAL_ CIP_LIMIT_WARNING + 1.0 Max: 200.0

9.5.7 Addressing TB_COND_1 (Liquiline Cond)

Manufacturer-specific Transducer Block addressing (Cond)		
Block name	**Slot**	**Index**
TB_COND_1	5	70

9.5.8 Layout TB_COND_1 (Liquiline Cond)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
70	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
71	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
72	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
73	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
74	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
75	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
76	6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
77	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
78	8	MEAS_MODE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Conductivity 1: Resistivity 2: Concentration
79	9	MEAS_MODE_CONDUCTIVE	Simple	UNSIGNED16	S	2	R/W	C/a	0	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Values: 0: Conductivity 1: Resistivity 2: Concentration
80	10	MEAS_MODE_INDUCTIVE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Conductivity 1: Resistivity 2: Concentration
81	11	MEAS_PRINCIPLE	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: Conductive 1: Inductive
82	12	MEDIUM_TYPE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: NaOH 0..15% 1: NaOH 25..50% 2: HCl 0..20% 3: HNO3 0..25% 12: HNO3 24..30% 4: H2SO4 0..28% 5: H2SO4 40..80% 11: H2SO4 93..100% 6: H3PO4 0..40% 13: NaCl 0..26% 7: UserTabC1 8: UserTabC2 9: UserTabC3 10: UserTabC4
83	13	TEMP_COMP	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: None 1: linear 2: NaCl (IEC 746-3) 10: Water ISO7888 (20Â°C) 3: Water ISO7888 (25Â°C) 4: UPW NaCl 5: UPW HCl 6: UserTabT1 7: UserTabT2

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										8: UserTabT3 9: UserTabT4
84	14	FACTOR_ALPHA	Simple	FLOAT	S	4	R/W	C/a	2.1 %/K	Min: 0.0 %/K Max: 20.0 %/K
85	15	ALPHA_REF_TEMP	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -5.0 DegC Max: 100.0 DegC
86	16	TEMP_SOURCE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Temp.sensor 1: Manual input
87	17	TEMP_SOURCE_PT1000	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Temp.sensor 1: Manual input
88	18	TEMP_SOURCE_NOT_PT1000	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: Temp.sensor 1: Manual input
89	19	MEDIUM_TEMP	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -50.0 DegC Max: 250.0 DegC
90	20	SENSOR_TYPE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: 2 electr. sensor 1: 4 electr. sensor 2: 4 electr. sensor
91	21	CELL_CONSTANT	Simple	FLOAT	S	4	R/W	C/a	0.1 1/cm	Min: 0.0025 1/cm Max: 99.99 1/cm
92	22	CELL_CONSTANT_CONDUCTIVE	Simple	FLOAT	S	4	R/W	C/a	0.1 1/cm	Min: 0.0025 1/cm Max: 99.99 1/cm
93	23	CELL_CONSTANT_INDUCTIVE	Simple	FLOAT	S	4	R/W	C/a	2.0 1/cm	Min: 0.0025 1/cm Max: 99.99 1/cm

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
94	24	INSTALLATION_FACTOR	Simple	FLOAT	S	4	R/W	C/a	1.0	Min: 0.1 Max: 5.0
95	25	TEMP_SENSOR	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: Pt100/Pt1000
96	26	TEMP_SENSOR_DIGITAL	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: Pt100/Pt1000
97	27	TEMP_SENSOR_ANALOG	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: Pt100/Pt1000
98	28	CABLE_RESISTANCE	Simple	FLOAT	S	4	R/W	C/a	0.0 Ohm	Min: 0.0 Ohm Max: 99.99 Ohm
99	29	CABLE_LENGTH	Simple	FLOAT	S	4	R/W	C/a	0.0 m	
100	30	TC_TABLE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: UserTabT1 1: UserTabT2 2: UserTabT3 3: UserTabT4
101	31	TC_TABLE_NAME1	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabT1	
102	32	TC_TABLE_NAME2	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabT2	
103	33	TC_TABLE_NAME3	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabT3	
104	34	TC_TABLE_NAME4	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabT4	
105	35	TC_TABLE_MODE1	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Factor alpha 1: Conductivity

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
106	36	TC_TABLE_MODE2	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Factor alpha 1: Conductivity
107	37	TC_TABLE_MODE3	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: Factor alpha 1: Conductivity
108	38	TC_TABLE_MODE4	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: Factor alpha 1: Conductivity
109	39	TC_TABLE_ALPHA_REF_TEMP1	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -5.0 DegC Max: 100.0 DegC
110	40	TC_TABLE_ALPHA_REF_TEMP2	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -5.0 DegC Max: 100.0 DegC
111	41	TC_TABLE_ALPHA_REF_TEMP3	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -5.0 DegC Max: 100.0 DegC
112	42	TC_TABLE_ALPHA_REF_TEMP4	Simple	FLOAT	S	4	R/W	C/a	25.0 DegC	Min: -5.0 DegC Max: 100.0 DegC
113	43	CONC_TABLE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: UserTabC1 1: UserTabC2 2: UserTabC3 3: UserTabC4
114	44	CONC_TABLE_NAME1	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabC1	
115	45	CONC_TABLE_NAME2	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabC2	
116	46	CONC_TABLE_NAME3	Simple	VISIBLE_STRING_10	S	10	R/W	C/a	UserTabC3	
117	47	CONC_TABLE_NAME4	Simple	VISIBLE_STRING_	S	10	R/W	C/a	UserTabC4	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
				10						
118	48	CONC_TABLE_MODE1	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: without temp. comp 1: with temp. comp
119	49	CONC_TABLE_MODE2	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: without temp. comp 1: with temp. comp
120	50	CONC_TABLE_MODE3	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: without temp. comp 1: with temp. comp
121	51	CONC_TABLE_MODE4	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: without temp. comp 1: with temp. comp
122	52	CONC_TABLE_UNIT1	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: % 2: ppm 3: mg/l 4: TDS
123	53	CONC_TABLE_UNIT2	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: % 2: ppm 3: mg/l 4: TDS
124	54	CONC_TABLE_UNIT3	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: % 2: ppm 3: mg/l 4: TDS

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
125	55	CONC_TABLE_UNIT4	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: none 1: % 2: ppm 3: mg/l 4: TDS
126	56	PHARMAWATER_TYPE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 4: USP 1: EP 3: PW
127	57	PHARMAWATER_TYPE_ CONDUCTIVE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 4: USP 1: EP 3: PW
128	58	PHARMAWATER_TYPE_ INDUCTIVE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 4: USP 1: EP 3: PW
129	59	PHARMAWATER_THRESHOLD	Simple	FLOAT	S	4	R/W	C/a	80.0 %	Min: 10.0 % Max: 99.9 %
130	60	PHARMAWATER_HYSTERESIS	Simple	FLOAT	S	4	R/W	C/a	2.0 %	Min: 2.0 % Max: 9.9 %
131	61	PHARMAWATER_DELAY	Simple	FLOAT	S	4	R/W	C/a	0.0 s	Min: 0.0 s Max: 3600.0 s
132	62	PHARMAWATER_FALL_DELAY	Simple	FLOAT	S	4	R/W	C/a	0.0 s	Min: 0.0 s Max: 3600.0 s
133	63	CAL_AIRSET	Simple	UNSIGNED16	S	2	R/W	C/a	1	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Values: 0: off 1: on
134	64	CAL_CELL_CONSTANT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
135	65	CAL_INSTALLATION_FACTOR	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
136	66	OPERATING_TIME_140C_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COND_1.OPERATING_TIME_140C_ ALARM - 1.0 h
137	67	OPERATING_TIME_140C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COND_1.OPERATING_TIME_140C_ WARNING + 1.0 h Max: 50000.0 h
138	68	OPERATING_TIME_80C100NS_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COND_1.OPERATING_TIME_ 80C100NS_ALARM - 1.0 h
139	69	OPERATING_TIME_80C100NS_ ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COND_1.OPERATING_TIME_ 80C100NS_WARNING + 1.0 h Max: 50000.0 h
140	70	OPERATING_TIME_125C_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COND_1.OPERATING_TIME_125C_ ALARM - 1.0 h
141	71	OPERATING_TIME_125C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COND_1.OPERATING_TIME_125C_ WARNING + 1.0 h

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Max: 50000.0 h
142	72	OPERATING_TIME_150C_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COND_1.OPERATING_TIME_150C_ ALARM - 1.0 h
143	73	OPERATING_TIME_150C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COND_1.OPERATING_TIME_150C_ WARNING + 1.0 h Max: 50000.0 h
144	74	OPERATING_TIME_5C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COND_1.OPERATING_TIME_5C_ ALARM - 1.0 h
145	75	OPERATING_TIME_5C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COND_1.OPERATING_TIME_5C_ WARNING + 1.0 h Max: 50000.0 h
146	76	CONDUCTIVITY_UNIT	Simple	UNSIGNED16	S	2	R/W	C/a	PU_MilliSiemens PerCentiMeter	Values: 1552: ÂµS/cm 1302: mS/cm 1551: S/cm 1554: ÂµS/m 1553: mS/m 1299: S/m
147	77	RESISTIVITY_UNIT	Simple	UNSIGNED16	S	2	R/W	C/a	PU_MegaOhmCe ntiMeter	Values: 1555: MÎ©*cm 1294: kÎ©*m 1556: kÎ©*cm
148	78	TABLE_TC_ENTRY	Simple	UNSIGNED8	N	1	R/W	C/a		Min: -50.0 Max: 250.0
149	79	TABLE_TC_X_VALUE	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0 Max: 250.0

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
150	80	TABLE_TC_Y_VALUE	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0 Max: 250.0
151	81	TABLE_TC_Z_VALUE	Simple	FLOAT	N	4	R/W	C/a		Min: -50.0 Max: 250.0
152	82	TABLE_TC_MIN	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
153	83	TABLE_TC_MAX	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
154	84	TABLE_TC_OP_CODE	Simple	UNSIGNED8	N	1	R/W	C/a		Min: -50.0 Max: 250.0
155	85	TABLE_TC_STATUS	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
156	86	TABLE_TC_CURRENT	Simple	UNSIGNED8	N	1	R	C/a		Min: -50.0 Max: 250.0
157	87	TABLE_CONC_ENTRY	Simple	UNSIGNED8	N	1	R/W	C/a		Min: 0.0 Max: 200.0
158	88	TABLE_CONC_X_VALUE	Simple	FLOAT	N	4	R/W	C/a		Min: 0.0 Max: 200.0
159	89	TABLE_CONC_Y_VALUE	Simple	FLOAT	N	4	R/W	C/a		Min: 0.0 Max: 200.0
160	90	TABLE_CONC_Z_VALUE	Simple	FLOAT	N	4	R/W	C/a		Min: 0.0 Max: 200.0
161	91	TABLE_CONC_MIN	Simple	UNSIGNED8	N	1	R	C/a		Min: 0.0 Max: 200.0
162	92	TABLE_CONC_MAX	Simple	UNSIGNED8	N	1	R	C/a		

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Min: 0.0 Max: 200.0
163	93	TABLE_CONC_OP_CODE	Simple	UNSIGNED8	N	1	R/W	C/a		Min: 0.0 Max: 200.0
164	94	TABLE_CONC_STATUS	Simple	UNSIGNED8	N	1	R	C/a		Min: 0.0 Max: 200.0
165	95	TABLE_CONC_CURRENT	Simple	UNSIGNED8	N	1	R	C/a		Min: 0.0 Max: 200.0
166	96	PCS_BANDWIDTH	Simple	FLOAT	S	4	R/W	C/a	0.1 %	Min: 0.01 % Max: 2.0 %
167	97	OPERATING_TIME_120C_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_COND_1.OPERATING_TIME_120C_ ALARM - 1.0 h
168	98	OPERATING_TIME_120C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_COND_1.OPERATING_TIME_120C_ WARNING + 1.0 h Max: 50000.0 h
169	99	MEAS_VAL_FORMAT	Simple	UNSIGNED16	S	2	R/W	C/a	95	Values: 95: Auto 79: Auto 80: xxxx 81: xxx.x 370: xx.xx 371: x.xxx
170	100	MEAS_VAL_FORMAT_2POL	Simple	UNSIGNED16	S	2	R/W	C/a	95	Values: 95: Auto 79: Auto 80: xxxx 81: xxx.x

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										370: xx.xx 371: x.xxx
171	101	MEAS_VAL_FORMAT_4POL	Simple	UNSIGNED16	S	2	R/W	C/a	79	Values: 95: Auto 79: Auto 80: xxxx 81: xxx.x 370: xx.xx 371: x.xxx

9.5.9 Addressing TB_DO_1 (Liquiline Oxygen)

Manufacturer-specific Transducer Block addressing (Oxygen)		
Block name	**Slot**	**Index**
TB_DO_1	5	70

9.5.10 Layout TB_DO_1 (Liquiline Oxygen)

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
70	0	BLOCKOBJ	Record	DS32	Cst	20	R	C/a	0	
71	1	ST_REV	Simple	UNSIGNED16	D	2	R	C/a	0	
72	2	TAG_DESC	Simple	VISIBLE_STRING_32	S	32	R/W	C/a		
73	3	STRATEGY	Simple	UNSIGNED16	S	2	R/W	C/a	0	
74	4	ALERT_KEY	Simple	UNSIGNED8	S	1	R/W	C/a	0	
75	5	TARGET_MODE	Simple	UNSIGNED8	S	1	R/W	C/a	8	Values: 0: None 1: Remote output (ROUT) 2: Remote cascade (RCAS) 4: Cascade (CAS) 8: AUTO 16: MAN 32: Local override (LO) 64: Initialization manual (IMan) 128: Out of Service (O/S)
76	6	MODE_BLK	Record	DS37	D	3	R	C/a	080808	
77	7	ALARM_SUM	Record	DS42	D	8	R	C/a		
78	8	SENSOR_TYPE	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: COS21D A 1: COS21D B 2: COS21D C 3: COS51D 50um

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										4: COS51D 25um 5: COS81D 6: COS22D
79	9	MEASURED_VALUE	Simple	UNSIGNED16	S	2	R/W	C/a	3	Values: 0: Measuring current 5: Raw value Âµs 1: Partial pressure 2: % saturation 3: Conc. (liquid) 4: Conc. (gaseous)
80	10	CONC_UNIT	Simple	UNSIGNED16	S	2	R/W	C/a	PU_MilliGramPer Liter	Values: 1558: mg/l 1559: Âµg/l 1423: ppm 1424: ppb
81	11	CONC_GAS_UNIT	Simple	UNSIGNED16	S	2	R/W	C/a	PU_PercentVol	Values: 1562: %Vol 34021: ppmVol
82	12	MEDIUM_PRESSURE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Process pressure 1: Air pressure 2: Altitude
83	13	MEDIUM_PRESSURE_COMP	Simple	FLOAT	S	4	R/W	C/a	1013.0 hPa	Min: 500.0 hPa Max: 9999.9 hPa
84	14	AIR_PRESSURE	Simple	FLOAT	S	4	R/W	C/a	1013.0 hPa	Min: 500.0 hPa Max: 9999.9 hPa
85	15	ALTITUDE	Simple	FLOAT	S	4	R/W	C/a	0.0 m	Min: 0.0 m Max: 4000.0 m
86	16	SALINITY	Simple	FLOAT	S	4	R/W	C/a	0.0 g/kg	Min: 0.0 g/kg Max: 40.0 g/kg

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
87	17	POL_VOLTAGE_MODE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Internal 1: Variable 2: off
88	18	POL_VOLTAGE	Simple	FLOAT	S	4	R/W	C/a	650.0 mV	Min: 0.0 mV Max: 750.0 mV
89	19	CAL_SLOPE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
90	20	CAL_ZEROPOINT	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
91	21	CAL_GRABSAMPLE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
92	22	CAL_STABLE_DELTA_CURRENT	Simple	FLOAT	S	4	R/W	C/a	0.2 %	Min: 0.1 % Max: 2.0 %
93	23	CAL_STABLE_TIME	Simple	FLOAT	S	4	R/W	C/a	10.0 s	Min: 5.0 s Max: 60.0 s
94	24	CAL_MEDIUM_PRESSURE	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: Process pressure 1: Air pressure 2: Altitude 4: As in measurement
95	25	CAL_MEDIUM_PRESSURE_COMP	Simple	FLOAT	S	4	R/W	C/a	1013.0 hPa	Min: 500.0 hPa Max: 9999.9 hPa
96	26	CAL_AIR_PRESSURE	Simple	FLOAT	S	4	R/W	C/a	1013.0 hPa	Min: 500.0 hPa Max: 1500.0 hPa

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
97	27	CAL_ALTITUDE	Simple	FLOAT	S	4	R/W	C/a	0.0 m	Min: 0.0 m Max: 4000.0 m
98	28	CAL_REL_HUMIDITY	Simple	FLOAT	S	4	R/W	C/a	50.0 %	Min: 0.0 % Max: 100.0 %
99	29	SLOPE_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	160.0 %	Min: TB_DO_1.SLOPE_UPPER_WARNING + 0.1 % Max: 250.0 %
100	30	SLOPE_UPPER_WARNING	Simple	FLOAT	S	4	R/W	C/a	140.0 %	Min: TB_DO_1.SLOPE_LOWER_WARNING + 0.1 % Max: TB_DO_1.SLOPE_UPPER_ALARM - 0.1 %
101	31	SLOPE_LOWER_WARNING	Simple	FLOAT	S	4	R/W	C/a	60.0 %	Min: TB_DO_1.SLOPE_LOWER_ALARM + 0.1 % Max: TB_DO_1.SLOPE_UPPER_WARNING - 0.1 %
102	32	SLOPE_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	40.0 %	Min: 0.0 % Max: TB_DO_1.SLOPE_LOWER_WARNING - 0.1 %
103	33	ZEROPOINT_UPPER_ALARM	Simple	FLOAT	S	4	R/W	C/a	2.0 nA	Min: TB_DO_1.ZEROPOINT_UPPER_WARNING + 0.01 nA Max: 10.0 nA
104	34	ZEROPOINT_UPPER_WARNING	Simple	FLOAT	S	4	R/W	C/a	1.0 nA	Min: TB_DO_1.ZEROPOINT_LOWER_WARNING + 0.01 nA Max: TB_DO_1.ZEROPOINT_UPPER_ALARM - 0.01 nA
105	35	ZEROPOINT_LOWER_WARNING	Simple	FLOAT	S	4	R/W	C/a	-1.0 nA	Min:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										TB_DO_1.ZEROPOINT_LOWER_ALARM + 0.01 nA Max: TB_DO_1.ZEROPOINT_UPPER_WARNING - 0.01 nA
106	36	ZEROPOINT_LOWER_ALARM	Simple	FLOAT	S	4	R/W	C/a	-2.0 nA	Min: -10.0 nA Max: TB_DO_1.ZEROPOINT_LOWER_WARNING - 0.01 nA
107	37	OPERATING_TIME_40C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_40C_ALARM - 1.0 h
108	38	OPERATING_TIME_40C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_40C_WARNING + 1.0 h Max: 50000.0 h
109	39	OPERATING_TIME_15NA_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_15NA_ALARM - 1.0 h
110	40	OPERATING_TIME_15NA_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_15NA_WARNING + 1.0 h Max: 50000.0 h
111	41	OPERATING_TIME_50NA_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_50NA_ALARM - 1.0 h
112	42	OPERATING_TIME_50NA_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_50NA_WARNING + 1.0 h Max: 50000.0 h
113	43	OPERATING_TIME_5C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										Max: TB_DO_1.OPERATING_TIME_5C_ ALARM - 1.0 h
114	44	OPERATING_TIME_5C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_5C_ WARNING + 1.0 h Max: 50000.0 h
115	45	OPERATING_TIME_30C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_30C_ALARM - 1.0 h
116	46	OPERATING_TIME_30C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_30C_ WARNING + 1.0 h Max: 50000.0 h
117	47	OPERATING_TIME_30NA_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_30NA_ ALARM - 1.0 h
118	48	OPERATING_TIME_30NA_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_30NA_ WARNING + 1.0 h Max: 50000.0 h
119	49	OPERATING_TIME_160NA_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_160NA_ ALARM - 1.0 h
120	50	OPERATING_TIME_160NA_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_160NA_ WARNING + 1.0 h Max: 50000.0 h
121	51	SLOPE	Simple	FLOAT	N	4	R	C/a	100.0 %	
122	52	ZEROPOINT	Simple	FLOAT	N	4	R	C/a	0.0 nA	
123	53	SENSOR_CAL_ZERO_VALID	Simple	UNSIGNED8	N	1	R	C/a	False	
124	54	LED_TEMP_MODE	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										0: off 1: on
125	55	LED_TEMP_THRESHOLD	Simple	FLOAT	S	4	R/W	C/a	80.0 DegC	Min: 30.0 DegC Max: 130.0 DegC
126	56	LED_MEASURING_INTERVAL	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: 1 second 1: 3 seconds 2: 10 seconds 3: 30 seconds
127	57	OPERATING_TIME_U5C_WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_U5C_ ALARM - 1.0 h
128	58	OPERATING_TIME_U5C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_U5C_ WARNING + 1.0 h Max: 50000.0 h
129	59	OPERATING_TIME_120C_ WARNING	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: 1.0 h Max: TB_DO_1.OPERATING_TIME_120C_ ALARM - 1.0 h
130	60	OPERATING_TIME_120C_ALARM	Simple	FLOAT	S	4	R/W	C/a	15000.0 h	Min: TB_DO_1.OPERATING_TIME_120C_ WARNING + 1.0 h Max: 50000.0 h
131	61	ZEROPOINT_UPPER_ALARM_OPT	Simple	FLOAT	S	4	R/W	C/a	80.0 us	Min: TB_DO_1.ZEROPOINT_UPPER_WARNING_ OPT + 1.0 us Max: 1000.0 us
132	62	ZEROPOINT_UPPER_WARNING_ OPT	Simple	FLOAT	S	4	R/W	C/a	60.0 us	Min: TB_DO_1.ZEROPOINT_LOWER_WARNING _OPT + 1.0 us Max: TB_DO_1.ZEROPOINT_UPPER_ALARM_

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										OPT - 1.0 us
133	63	ZEROPOINT_LOWER_WARNING_OPT	Simple	FLOAT	S	4	R/W	C/a	40.0 us	Min: TB_DO_1.ZEROPOINT_LOWER_ALARM_OPT + 1.0 us Max: TB_DO_1.ZEROPOINT_UPPER_WARNING_OPT - 1.0 us
134	64	ZEROPOINT_LOWER_ALARM_OPT	Simple	FLOAT	S	4	R/W	C/a	30.0 us	Min: 0.0 us Max: TB_DO_1.ZEROPOINT_LOWER_WARNING_OPT - 1.0 us
135	65	ZEROPOINT_TAU	Simple	FLOAT	N	4	R	C/a	0.0 us	
136	66	SENSOR_CAL_ZERO_TAU	Simple	FLOAT	N	4	R	C/a	0.0 us	
137	67	PCS_TOLERANCE_WIDTH	Simple	FLOAT	S	4	R/W	C/a	2.0 hPa	Min: 0.01 hPa Max: 20.0 hPa
138	68	SENSOR_CAL_ZERO_COUNT	Simple	UNSIGNED16	N	2	R	C/a	0	
139	69	SENSOR_CAL_ZERO_METHOD	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: None 1: Numeric input 2: 1 point 3: 2 point 4: Multipoint 5: table 6: Grab sample 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

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										18: Numeric input 19: Numeric input zero point 20: Numeric input 2-point 21: Factory 22: Test gas calibration 23: Value acquisition 24: Numeric input 3-point
140	70	SENSOR_CAL_ZERO_SERIAL	Simple	VISIBLE_STRING_32	N	32	R	C/a		
141	71	MAIN_VALUE_FORMAT	Simple	UNSIGNED16	S	2	R/W	C/a	0x112	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx
142	72	MAIN_VALUE_FORMAT_CURRENT	Simple	UNSIGNED16	S	2	R/W	C/a	0x112	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx
143	73	MAIN_VALUE_FORMAT_PRESSURE	Simple	UNSIGNED16	S	2	R/W	C/a	0x111	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx
144	74	MAIN_VALUE_FORMAT_SATURATION	Simple	UNSIGNED16	S	2	R/W	C/a	0x112	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx
145	75	MAIN_VALUE_FORMAT_CONCENTRATIONLIQUID	Simple	UNSIGNED16	S	2	R/W	C/a	0x112	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
146	76	MAIN_VALUE_FORMAT_ CONCENTRATIONGAS	Simple	UNSIGNED16	S	2	R/W	C/a	0x112	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx
147	77	MAIN_VALUE_FORMAT_TAU	Simple	UNSIGNED16	S	2	R/W	C/a	0x111	Values: 0x110: xxxxx 0x111: xxx.x 0x112: xx.xx 0x113: x.xxx
148	78	SENSOR_LED_MEAS_FILTER	Simple	UNSIGNED16	S	2	R/W	C/a	2	Values: 0: off 1: low 2: medium 3: high 4: very high
149	79	LIMIT_SWITCH_DIGITAL_CAP_OP_ TIME_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ OP_TIME_LIMIT_WARNING + 1.0 h Max: 50000.0 h
150	80	LIMIT_SWITCH_DIGITAL_CAP_OP_ TIME_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	5000.0 h	Min: 1.0 h Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ OP_TIME_LIMIT_ALARM - 1.0 h
151	81	LIMIT_SWITCH_DIGITAL_CAP_OP_ TIME_T1_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	10000.0 h	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ OP_TIME_T1_LIMIT_WARNING + 1.0 h Max: 50000.0 h
152	82	LIMIT_SWITCH_DIGITAL_CAP_OP_ TIME_T1_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	5000.0 h	Min: 1.0 h Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ OP_TIME_T1_LIMIT_ALARM - 1.0 h

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
153	83	LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T2_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	694.444444444 h	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T2_LIMIT_WARNING + 1.0 h Max: 833.333333333 h
154	84	LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T2_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	555.555555556 h	Min: 1.0 h Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T2_LIMIT_ALARM - 1.0 h
155	85	LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T3_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	694.444444444 h	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T3_LIMIT_WARNING + 1.0 h Max: 833.333333333 h
156	86	LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T3_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	555.555555556 h	Min: 1.0 h Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T3_LIMIT_ALARM - 1.0 h
157	87	LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T4_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	694.444444444 h	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T4_LIMIT_WARNING + 1.0 h Max: 833.333333333 h
158	88	LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T4_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	555.555555556 h	Min: 1.0 h Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_OP_TIME_T4_LIMIT_ALARM - 1.0 h
159	89	LIMIT_SWITCH_DIGITAL_CAP_STERILISATION_CNT_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	100.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_STERILISATION_CNT_LIMIT_WARNING + 1.0 Max: 300.0
160	90	LIMIT_SWITCH_DIGITAL_CAP_STERILISATION_CNT_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	75.0	Min: 1.0 Max:

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ STERILISATION_CNT_LIMIT_ALARM - 1.0
161	91	LIMIT_SWITCH_CAL_QUALITY_ INDEX_ALARM	Simple	FLOAT	S	4	R/W	C/a	80.0 %	Min: 50.0 % Max: TB_DO_1.LIMIT_SWITCH_CAL_QUALITY_ INDEX_WARN - 1.0 %
162	92	LIMIT_SWITCH_CAL_QUALITY_ INDEX_WARN	Simple	FLOAT	S	4	R/W	C/a	85.0 %	Min: TB_DO_1.LIMIT_SWITCH_CAL_QUALITY_ INDEX_ALARM + 1.0 % Max: 100.0 %
163	93	CAL_CAP_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
164	94	NUMBER_CAP_CIP_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
165	95	LIMIT_SWITCH_DIGITAL_CAP_ CIP_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	100.0	Min: 1.0 Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ CIP_LIMIT_ALARM - 1.0
166	96	LIMIT_SWITCH_DIGITAL_CAP_CIP_ LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	125.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ CIP_LIMIT_WARNING + 1.0 Max: 300.0
167	97	NUMBER_CAP_AUTO_CLAV_ FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
168	98	LIMIT_SWITCH_DIGITAL_CAP_ AUTO_CLAV_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	75.0	Min: 1.0 Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
										AUTO_CLAV_LIMIT_ALARM - 1.0
169	99	LIMIT_SWITCH_DIGITAL_CAP_ AUTO_CLAV_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	100.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAP_ AUTO_CLAV_LIMIT_WARNING + 1.0 Max: 300.0
170	100	SENSOR_CAP_DATA_IDENTIFIER	Simple	VISIBLE_STRING_ 16	N	16	R	C/a		
171	101	FERMENTER_SCALING_FUNCTION	Simple	UNSIGNED8	S	1	R	C/a	0	
172	102	FERMENTER_SCALING	Simple	FLOAT	N	4	R	C/a	1.0	
173	103	LIMIT_SWITCH_DIGITAL_CAL_ CAP_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	6.0	Min: 1.0 Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAL_ CAP_LIMIT_ALARM - 1.0
174	104	LIMIT_SWITCH_DIGITAL_CAL_ CAP_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	75.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CAL_ CAP_LIMIT_WARNING + 1.0 Max: 1000.0
175	105	CAP_STERILISATION_COUNTER_ FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
176	106	SENSOR_DO_LATEST_CAL_SELECT	Simple	UNSIGNED16	N	2	R	C/a	0	Values: 0: Point at oxygen 1: Zero point
177	107	NUMBER_AUTO_CLAV_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
178	108	LIMIT_SWITCH_DIGITAL_AUTO_ CLAV_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	300.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_ AUTO_CLAV_LIMIT_WARNING + 1.0 Max: 600.0
179	109	LIMIT_SWITCH_DIGITAL_AUTO_	Simple	FLOAT	S	4	R/W	C/a	200.0	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
		CLAV_LIMIT_WARNING								Min: 1.0 Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_AUTO_CLAV_LIMIT_ALARM - 1.0
180	110	NUMBER_CIP_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
181	111	LIMIT_SWITCH_DIGITAL_CIP_LIMIT_WARNING	Simple	FLOAT	S	4	R/W	C/a	500.0	Min: 1.0 Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_CIP_LIMIT_ALARM - 1.0
182	112	LIMIT_SWITCH_DIGITAL_CIP_LIMIT_ALARM	Simple	FLOAT	S	4	R/W	C/a	800.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_CIP_LIMIT_WARNING + 1.0 Max: 1000.0
183	113	LIMIT_SWITCH_DIGITAL_STERILISATION_CNT_LIMIT_WARNING_DO	Simple	FLOAT	S	4	R/W	C/a	500.0	Min: 1.0 Max: TB_DO_1.LIMIT_SWITCH_DIGITAL_STERILISATION_CNT_LIMIT_ALARM_DO - 1.0
184	114	LIMIT_SWITCH_DIGITAL_STERILISATION_CNT_LIMIT_ALARM_DO	Simple	FLOAT	S	4	R/W	C/a	800.0	Min: TB_DO_1.LIMIT_SWITCH_DIGITAL_STERILISATION_CNT_LIMIT_WARNING_DO + 1.0 Max: 1000.0
185	115	CAL_POINT_AT_OXYGEN	Simple	UNSIGNED16	S	2	R/W	C/a	1	Values: 0: off 1: on
186	116	CAP_OPERATION_TIME_FUNCTION	Simple	UNSIGNED16	S	2	R/W	C/a	0	Values: 0: off 1: on
187	117	CURRENT_QUALITY_INDEX	Simple	FLOAT	N	4	R	C/a	100.0 %	
188	118	CURRENT_TAU_0	Simple	FLOAT	N	4	R	C/a	0.0 us	
189	119	CURRENT_KSV	Simple	FLOAT	N	4	R	C/a	0.0 1/MPa	

Index	Rel. index	Parameter name	Object type	Data type	Store	Size	Access	Parameter usage / Kind of transport	Default value	Description
190	120	TEMPERATURE_SENSOR	Simple	UNSIGNED16	N	2	R	C/a	1	Values: 0: none 1: Pt100/Pt1000
191	121	NUMBER_OF_CAL	Simple	UNSIGNED16	N	2	R	C/a	0	

9.6 Diagnostic codes

9.6.1 Liquiline pHORP

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
003	Temp. sensor failure	F	PB:DEVICE_DIAGNOSIS[11.0]	PB:DIAG_EVENT_SWITCH[0]
004	Scanning sensor	C	PB:DEVICE_DIAGNOSIS[11.1]	PB:DIAG_EVENT_SWITCH[1]
010	Sensor initialization	C	PB:DEVICE_DIAGNOSIS[11.2]	PB:DIAG_EVENT_SWITCH[2]
011	Sensor no communication	F	PB:DEVICE_DIAGNOSIS[11.3]	PB:DIAG_EVENT_SWITCH[3]
012	Sensor failure	F	PB:DEVICE_DIAGNOSIS[11.4]	PB:DIAG_EVENT_SWITCH[4]
013	Wrong sensor type	F	PB:DEVICE_DIAGNOSIS[11.5]	PB:DIAG_EVENT_SWITCH[5]
014	Invalid sensor data	C	PB:DEVICE_DIAGNOSIS[11.6]	PB:DIAG_EVENT_SWITCH[6]
100	Glass impedance alarm	F	PB:DEVICE_DIAGNOSIS[11.7]	PB:DIAG_EVENT_SWITCH[7]
101	Ref. impedance alarm	F	PB:DEVICE_DIAGNOSIS[12.0]	PB:DIAG_EVENT_SWITCH[8]
102	Glass imp. too low alarm	F	PB:DEVICE_DIAGNOSIS[12.1]	PB:DIAG_EVENT_SWITCH[9]
103	Ref. imp. too low alarm	F	PB:DEVICE_DIAGNOSIS[12.2]	PB:DIAG_EVENT_SWITCH[10]
104	Sensor supply bad	F	PB:DEVICE_DIAGNOSIS[12.3]	PB:DIAG_EVENT_SWITCH[11]
106	Glass impedance warning	M	PB:DEVICE_DIAGNOSIS[12.4]	PB:DIAG_EVENT_SWITCH[12]
107	Ref. impedance warning	M	PB:DEVICE_DIAGNOSIS[12.5]	PB:DIAG_EVENT_SWITCH[13]
111	Glass imp. too low warning	M	PB:DEVICE_DIAGNOSIS[12.6]	PB:DIAG_EVENT_SWITCH[14]
112	Ref. imp. too low warning	M	PB:DEVICE_DIAGNOSIS[12.7]	PB:DIAG_EVENT_SWITCH[15]
119	Temp offset upper limit	F	PB:DEVICE_DIAGNOSIS[13.0]	PB:DIAG_EVENT_SWITCH[16]
120	Temp offset lower limit	F	PB:DEVICE_DIAGNOSIS[13.1]	PB:DIAG_EVENT_SWITCH[17]
127	Invalid TAG group	F	PB:DEVICE_DIAGNOSIS[13.2]	PB:DIAG_EVENT_SWITCH[18]
128	Invalid TAG	F	PB:DEVICE_DIAGNOSIS[13.3]	PB:DIAG_EVENT_SWITCH[19]
129	Sensor change aborted	C	PB:DEVICE_DIAGNOSIS[13.4]	PB:DIAG_EVENT_SWITCH[20]
130	Calibration active	C	PB:DEVICE_DIAGNOSIS[13.5]	PB:DIAG_EVENT_SWITCH[21]
131	PV not stable	M	PB:DEVICE_DIAGNOSIS[13.6]	PB:DIAG_EVENT_SWITCH[22]
132	Temperature not stable	M	PB:DEVICE_DIAGNOSIS[13.7]	PB:DIAG_EVENT_SWITCH[23]
134	Zero pnt. too high alarm	M	PB:DEVICE_DIAGNOSIS[14.0]	PB:DIAG_EVENT_SWITCH[24]
135	Zero pnt. too high warning	M	PB:DEVICE_DIAGNOSIS[14.1]	PB:DIAG_EVENT_SWITCH[25]
136	Zero pnt. too low warning	M	PB:DEVICE_DIAGNOSIS[14.2]	PB:DIAG_EVENT_SWITCH[26]
137	Zero pnt. too low alarm	M	PB:DEVICE_DIAGNOSIS[14.3]	PB:DIAG_EVENT_SWITCH[27]
138	Slope too low alarm	M	PB:DEVICE_DIAGNOSIS[14.4]	PB:DIAG_EVENT_SWITCH[28]
139	Slope too low warning	M	PB:DEVICE_DIAGNOSIS[14.5]	PB:DIAG_EVENT_SWITCH[29]
140	Leakage current alarm	F	PB:DEVICE_DIAGNOSIS[14.6]	PB:DIAG_EVENT_SWITCH[30]
142	SCC electrode cond. bad	M	PB:DEVICE_DIAGNOSIS[14.7]	PB:DIAG_EVENT_SWITCH[31]
145	Leakage current warn	M	PB:DEVICE_DIAGNOSIS[15.0]	PB:DIAG_EVENT_SWITCH[32]
148	SCC electrode sufficient	M	PB:DEVICE_DIAGNOSIS[15.1]	PB:DIAG_EVENT_SWITCH[33]
153	Operating point too high alarm	M	PB:DEVICE_DIAGNOSIS[15.2]	PB:DIAG_EVENT_SWITCH[34]
154	Operating point too high warning	M	PB:DEVICE_DIAGNOSIS[15.3]	PB:DIAG_EVENT_SWITCH[35]
155	Operating point too low warning	M	PB:DEVICE_DIAGNOSIS[15.4]	PB:DIAG_EVENT_SWITCH[36]

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
156	Operating point too low alarm	M	PB:DEVICE_DIAGNOSIS[15.5]	PB:DIAG_EVENT_SWITCH[37]
172	Operating time alarm	M	PB:DEVICE_DIAGNOSIS[15.6]	PB:DIAG_EVENT_SWITCH[38]
173	Oper.time >80Â°C alarm	M	PB:DEVICE_DIAGNOSIS[15.7]	PB:DIAG_EVENT_SWITCH[39]
174	Oper.time >100Â°C alarm	M	PB:DEVICE_DIAGNOSIS[16.0]	PB:DIAG_EVENT_SWITCH[40]
175	Oper.time <-300mV alarm	M	PB:DEVICE_DIAGNOSIS[16.1]	PB:DIAG_EVENT_SWITCH[41]
176	Oper.time >300mV alarm	M	PB:DEVICE_DIAGNOSIS[16.2]	PB:DIAG_EVENT_SWITCH[42]
177	Delta slope alarm	M	PB:DEVICE_DIAGNOSIS[16.3]	PB:DIAG_EVENT_SWITCH[43]
178	Delta zero alarm	M	PB:DEVICE_DIAGNOSIS[16.4]	PB:DIAG_EVENT_SWITCH[44]
179	Delta oper.point alarm	M	PB:DEVICE_DIAGNOSIS[16.5]	PB:DIAG_EVENT_SWITCH[45]
180	Cal. expired alarm	M	PB:DEVICE_DIAGNOSIS[16.6]	PB:DIAG_EVENT_SWITCH[46]
181	SIP, CIP, autoclaving alarm	M	PB:DEVICE_DIAGNOSIS[16.7]	PB:DIAG_EVENT_SWITCH[47]
182	Operating time warning	M	PB:DEVICE_DIAGNOSIS[17.0]	PB:DIAG_EVENT_SWITCH_1[0]
183	Oper.time >80Â°C warn	M	PB:DEVICE_DIAGNOSIS[17.1]	PB:DIAG_EVENT_SWITCH_1[1]
184	Oper.time >100Â°C warn	M	PB:DEVICE_DIAGNOSIS[17.2]	PB:DIAG_EVENT_SWITCH_1[2]
185	Oper.time <-300mV warn	M	PB:DEVICE_DIAGNOSIS[17.3]	PB:DIAG_EVENT_SWITCH_1[3]
186	Oper.time >300mV warn	M	PB:DEVICE_DIAGNOSIS[17.4]	PB:DIAG_EVENT_SWITCH_1[4]
190	Cal. expired warning	M	PB:DEVICE_DIAGNOSIS[17.5]	PB:DIAG_EVENT_SWITCH_1[5]
191	SIP, CIP, autoclaving warning	M	PB:DEVICE_DIAGNOSIS[17.6]	PB:DIAG_EVENT_SWITCH_1[6]
203	Wrong transmitter type	F	PB:DEVICE_DIAGNOSIS[17.7]	PB:DIAG_EVENT_SWITCH_1[7]
215	Simulation active	C	PB:DEVICE_DIAGNOSIS[18.0]	PB:DIAG_EVENT_SWITCH_1[8]
218	Current output not available	F	PB:DEVICE_DIAGNOSIS[18.1]	PB:DIAG_EVENT_SWITCH_1[9]
219	Power supply bad	C	PB:DEVICE_DIAGNOSIS[18.2]	PB:DIAG_EVENT_SWITCH_1[10]
238	Delta slope warning	C	PB:DEVICE_DIAGNOSIS[18.3]	PB:DIAG_EVENT_SWITCH_1[11]
239	Delta zero warning	C	PB:DEVICE_DIAGNOSIS[18.4]	PB:DIAG_EVENT_SWITCH_1[12]
240	Delta oper.point warning	C	PB:DEVICE_DIAGNOSIS[18.5]	PB:DIAG_EVENT_SWITCH_1[13]
318	Glass imp. too high alarm	M	PB:DEVICE_DIAGNOSIS[18.6]	PB:DIAG_EVENT_SWITCH_1[14]
319	Ref. imp. too high alarm	M	PB:DEVICE_DIAGNOSIS[18.7]	PB:DIAG_EVENT_SWITCH_1[15]
320	Glass imp. too high warning	M	PB:DEVICE_DIAGNOSIS[19.0]	PB:DIAG_EVENT_SWITCH_1[16]
321	Ref. imp. too high warning	M	PB:DEVICE_DIAGNOSIS[19.1]	PB:DIAG_EVENT_SWITCH_1[17]
322	Meas. value out of range	S	PB:DEVICE_DIAGNOSIS[19.2]	PB:DIAG_EVENT_SWITCH_1[18]
380	Comm. module defect	F	PB:DEVICE_DIAGNOSIS[19.3]	PB:DIAG_EVENT_SWITCH_1[19]
381	Comm. module incomp	F	PB:DEVICE_DIAGNOSIS[19.4]	PB:DIAG_EVENT_SWITCH_1[20]
404	Lower limit current output	S	PB:DEVICE_DIAGNOSIS[19.5]	PB:DIAG_EVENT_SWITCH_1[21]
405	Upper limit current output	S	PB:DEVICE_DIAGNOSIS[19.6]	PB:DIAG_EVENT_SWITCH_1[22]
406	SETUP active	OK	PB:DEVICE_DIAGNOSIS[19.7]	PB:DIAG_EVENT_SWITCH_1[23]
407	Diag. active	OK	PB:DEVICE_DIAGNOSIS[20.0]	PB:DIAG_EVENT_SWITCH_1[24]
408	Calibration aborted	M	PB:DEVICE_DIAGNOSIS[20.1]	PB:DIAG_EVENT_SWITCH_1[25]
409	Sensor change	C	PB:DEVICE_DIAGNOSIS[20.2]	PB:DIAG_EVENT_SWITCH_1[26]
501	Device open	M	PB:DEVICE_DIAGNOSIS[20.3]	PB:DIAG_EVENT_SWITCH_1[27]
513	Device alarm	F	PB:DEVICE_DIAGNOSIS[20.4]	PB:DIAG_EVENT_SWITCH_1[28]
514	Device warning	M	PB:DEVICE_DIAGNOSIS[20.5]	PB:DIAG_EVENT_SWITCH_1[29]
530	Logbook: 20 % remain	S	PB:DEVICE_DIAGNOSIS[20.6]	PB:DIAG_EVENT_SWITCH_1[30]

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
531	Logbook: full	S	PB:DEVICE_DIAGNOSIS[20.7]	PB:DIAG_EVENT_SWITCH_1[31]
532	Calibration timer expired	M	PB:DEVICE_DIAGNOSIS[21.0]	PB:DIAG_EVENT_SWITCH_1[32]
770	Sensor deactivated	F	PB:DEVICE_DIAGNOSIS[21.7]	PB:DIAG_EVENT_SWITCH_1[39]
802	PCS Alarm	F	PB:DEVICE_DIAGNOSIS[21.1]	PB:DIAG_EVENT_SWITCH_1[33]
810	PV upper limit alarm	F	PB:DEVICE_DIAGNOSIS[21.2]	PB:DIAG_EVENT_SWITCH_1[34]
811	PV lower limit alarm	F	PB:DEVICE_DIAGNOSIS[21.3]	PB:DIAG_EVENT_SWITCH_1[35]
812	Temperature out of range	F	PB:DEVICE_DIAGNOSIS[21.4]	PB:DIAG_EVENT_SWITCH_1[36]
840	PV upper limit warning	M	PB:DEVICE_DIAGNOSIS[21.5]	PB:DIAG_EVENT_SWITCH_1[37]
841	PV lower limit warning	M	PB:DEVICE_DIAGNOSIS[21.6]	PB:DIAG_EVENT_SWITCH_1[38]

9.6.2 Liquiline Cond

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
003	Temp. sensor failure	F	PB:DEVICE_DIAGNOSIS[11.0]	PB:DIAG_EVENT_SWITCH[0]
004	Scanning sensor	C	PB:DEVICE_DIAGNOSIS[11.1]	PB:DIAG_EVENT_SWITCH[1]
010	Sensor initialization	C	PB:DEVICE_DIAGNOSIS[11.2]	PB:DIAG_EVENT_SWITCH[2]
011	Sensor no communication	F	PB:DEVICE_DIAGNOSIS[11.3]	PB:DIAG_EVENT_SWITCH[3]
012	Sensor failure	F	PB:DEVICE_DIAGNOSIS[11.4]	PB:DIAG_EVENT_SWITCH[4]
013	Wrong sensor type	F	PB:DEVICE_DIAGNOSIS[11.5]	PB:DIAG_EVENT_SWITCH[5]
014	Invalid sensor data	C	PB:DEVICE_DIAGNOSIS[11.6]	PB:DIAG_EVENT_SWITCH[6]
104	Sensor supply bad	F	PB:DEVICE_DIAGNOSIS[11.7]	PB:DIAG_EVENT_SWITCH[7]
119	Temp offset upper limit	F	PB:DEVICE_DIAGNOSIS[12.0]	PB:DIAG_EVENT_SWITCH[8]
120	Temp offset lower limit	F	PB:DEVICE_DIAGNOSIS[12.1]	PB:DIAG_EVENT_SWITCH[9]
127	Invalid TAG group	F	PB:DEVICE_DIAGNOSIS[12.2]	PB:DIAG_EVENT_SWITCH[10]
128	Invalid TAG	F	PB:DEVICE_DIAGNOSIS[12.3]	PB:DIAG_EVENT_SWITCH[11]
129	Sensor change aborted	C	PB:DEVICE_DIAGNOSIS[12.4]	PB:DIAG_EVENT_SWITCH[12]
130	Calibration active	C	PB:DEVICE_DIAGNOSIS[12.5]	PB:DIAG_EVENT_SWITCH[13]
131	PV not stable	M	PB:DEVICE_DIAGNOSIS[12.6]	PB:DIAG_EVENT_SWITCH[14]
132	Temperature not stable	M	PB:DEVICE_DIAGNOSIS[12.7]	PB:DIAG_EVENT_SWITCH[15]
133	Polarization warning	M	PB:DEVICE_DIAGNOSIS[13.0]	PB:DIAG_EVENT_SWITCH[16]
163	Oper.time >120Â°C alarm	M	PB:DEVICE_DIAGNOSIS[13.1]	PB:DIAG_EVENT_SWITCH[17]
164	Oper.time >140Â°C alarm	M	PB:DEVICE_DIAGNOSIS[13.2]	PB:DIAG_EVENT_SWITCH[18]
165	Oper.time >80Â°C <100 nS alarm	M	PB:DEVICE_DIAGNOSIS[13.3]	PB:DIAG_EVENT_SWITCH[19]
169	Oper.time >120Â°C warn	M	PB:DEVICE_DIAGNOSIS[13.4]	PB:DIAG_EVENT_SWITCH[20]
172	Operating time alarm	M	PB:DEVICE_DIAGNOSIS[13.5]	PB:DIAG_EVENT_SWITCH[21]
173	Oper.time >80Â°C alarm	M	PB:DEVICE_DIAGNOSIS[13.6]	PB:DIAG_EVENT_SWITCH[22]
174	Oper.time >100Â°C alarm	M	PB:DEVICE_DIAGNOSIS[13.7]	PB:DIAG_EVENT_SWITCH[23]
180	Cal. expired alarm	M	PB:DEVICE_DIAGNOSIS[14.0]	PB:DIAG_EVENT_SWITCH[24]
181	SIP, CIP, autoclaving alarm	M	PB:DEVICE_DIAGNOSIS[14.1]	PB:DIAG_EVENT_SWITCH[25]
182	Operating time warning	M	PB:DEVICE_DIAGNOSIS[14.2]	PB:DIAG_EVENT_SWITCH[26]
183	Oper.time >80Â°C warn	M	PB:DEVICE_DIAGNOSIS[14.3]	PB:DIAG_EVENT_SWITCH[27]
184	Oper.time >100Â°C warn	M	PB:DEVICE_DIAGNOSIS[14.4]	PB:DIAG_EVENT_SWITCH[28]
187	Oper.time >125Â°C warn	M	PB:DEVICE_DIAGNOSIS[14.5]	PB:DIAG_EVENT_SWITCH[29]
188	Oper.time >150Â°C warn	M	PB:DEVICE_DIAGNOSIS[14.6]	PB:DIAG_EVENT_SWITCH[30]
189	Oper.time <5Â°C warn	M	PB:DEVICE_DIAGNOSIS[14.7]	PB:DIAG_EVENT_SWITCH[31]
190	Cal. expired warning	M	PB:DEVICE_DIAGNOSIS[15.0]	PB:DIAG_EVENT_SWITCH[32]
191	SIP, CIP, autoclaving warning	M	PB:DEVICE_DIAGNOSIS[15.1]	PB:DIAG_EVENT_SWITCH[33]
194	Oper.time >140Â°C warn	M	PB:DEVICE_DIAGNOSIS[15.2]	PB:DIAG_EVENT_SWITCH[34]
195	Oper.time >80Â°C <100 nS warn	M	PB:DEVICE_DIAGNOSIS[15.3]	PB:DIAG_EVENT_SWITCH[35]
196	Oper.time >125Â°C alarm	M	PB:DEVICE_DIAGNOSIS[15.4]	PB:DIAG_EVENT_SWITCH[36]
197	Oper.time >150Â°C alarm	M	PB:DEVICE_DIAGNOSIS[15.5]	PB:DIAG_EVENT_SWITCH[37]
198	Oper.time <5Â°C alarm	M	PB:DEVICE_DIAGNOSIS[15.6]	PB:DIAG_EVENT_SWITCH[38]
203	Wrong transmitter type	F	PB:DEVICE_DIAGNOSIS[15.7]	PB:DIAG_EVENT_SWITCH[39]

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
215	Simulation active	C	PB:DEVICE_DIAGNOSIS[16.0]	PB:DIAG_EVENT_SWITCH[40]
218	Current output not available	F	PB:DEVICE_DIAGNOSIS[16.1]	PB:DIAG_EVENT_SWITCH[41]
219	Power supply bad	C	PB:DEVICE_DIAGNOSIS[16.2]	PB:DIAG_EVENT_SWITCH[42]
310	Temp. slope alarm	M	PB:DEVICE_DIAGNOSIS[16.3]	PB:DIAG_EVENT_SWITCH[43]
311	Temp. slope alarm	M	PB:DEVICE_DIAGNOSIS[16.4]	PB:DIAG_EVENT_SWITCH[44]
312	No cond. detected	S	PB:DEVICE_DIAGNOSIS[16.5]	PB:DIAG_EVENT_SWITCH[45]
313	Sensor coil current too high	F	PB:DEVICE_DIAGNOSIS[16.6]	PB:DIAG_EVENT_SWITCH[46]
314	Sensor coil current too low	F	PB:DEVICE_DIAGNOSIS[16.7]	PB:DIAG_EVENT_SWITCH[47]
315	Airset not calibrated	C	PB:DEVICE_DIAGNOSIS[17.0]	PB:DIAG_EVENT_SWITCH_1[0]
316	Cell const. not calibrated	OK	PB:DEVICE_DIAGNOSIS[17.1]	PB:DIAG_EVENT_SWITCH_1[1]
317	Temp. not calibrated	OK	PB:DEVICE_DIAGNOSIS[17.2]	PB:DIAG_EVENT_SWITCH_1[2]
322	Meas. value out of range	S	PB:DEVICE_DIAGNOSIS[17.3]	PB:DIAG_EVENT_SWITCH_1[3]
325	Sensor value out of range	S	PB:DEVICE_DIAGNOSIS[17.4]	PB:DIAG_EVENT_SWITCH_1[4]
326	Internal sensor conn. broken	F	PB:DEVICE_DIAGNOSIS[21.7]	PB:DIAG_EVENT_SWITCH_1[39]
380	Comm. module defect	F	PB:DEVICE_DIAGNOSIS[17.5]	PB:DIAG_EVENT_SWITCH_1[5]
381	Comm. module incomp	F	PB:DEVICE_DIAGNOSIS[17.6]	PB:DIAG_EVENT_SWITCH_1[6]
404	Lower limit current output	S	PB:DEVICE_DIAGNOSIS[17.7]	PB:DIAG_EVENT_SWITCH_1[7]
405	Upper limit current output	S	PB:DEVICE_DIAGNOSIS[18.0]	PB:DIAG_EVENT_SWITCH_1[8]
406	SETUP active	OK	PB:DEVICE_DIAGNOSIS[18.1]	PB:DIAG_EVENT_SWITCH_1[9]
407	Diag. active	OK	PB:DEVICE_DIAGNOSIS[18.2]	PB:DIAG_EVENT_SWITCH_1[10]
408	Calibration aborted	M	PB:DEVICE_DIAGNOSIS[18.3]	PB:DIAG_EVENT_SWITCH_1[11]
409	Sensor change	C	PB:DEVICE_DIAGNOSIS[18.4]	PB:DIAG_EVENT_SWITCH_1[12]
501	Device open	M	PB:DEVICE_DIAGNOSIS[18.5]	PB:DIAG_EVENT_SWITCH_1[13]
513	Device alarm	F	PB:DEVICE_DIAGNOSIS[18.6]	PB:DIAG_EVENT_SWITCH_1[14]
514	Device warning	M	PB:DEVICE_DIAGNOSIS[18.7]	PB:DIAG_EVENT_SWITCH_1[15]
530	Logbook: 20 % remain	S	PB:DEVICE_DIAGNOSIS[19.0]	PB:DIAG_EVENT_SWITCH_1[16]
531	Logbook: full	S	PB:DEVICE_DIAGNOSIS[19.1]	PB:DIAG_EVENT_SWITCH_1[17]
532	Calibration timer expired	M	PB:DEVICE_DIAGNOSIS[19.2]	PB:DIAG_EVENT_SWITCH_1[18]
802	PCS Alarm	F	PB:DEVICE_DIAGNOSIS[22.0]	PB:DIAG_EVENT_SWITCH_1[40]
810	PV upper limit alarm	F	PB:DEVICE_DIAGNOSIS[19.3]	PB:DIAG_EVENT_SWITCH_1[19]
811	PV lower limit alarm	F	PB:DEVICE_DIAGNOSIS[19.4]	PB:DIAG_EVENT_SWITCH_1[20]
812	Temperature out of range	F	PB:DEVICE_DIAGNOSIS[19.5]	PB:DIAG_EVENT_SWITCH_1[21]
813	Sensor temperature out of range	F	PB:DEVICE_DIAGNOSIS[19.6]	PB:DIAG_EVENT_SWITCH_1[22]
814	USP alarm	F	PB:DEVICE_DIAGNOSIS[19.7]	PB:DIAG_EVENT_SWITCH_1[23]
840	PV upper limit warning	M	PB:DEVICE_DIAGNOSIS[20.0]	PB:DIAG_EVENT_SWITCH_1[24]
841	PV lower limit warning	M	PB:DEVICE_DIAGNOSIS[20.1]	PB:DIAG_EVENT_SWITCH_1[25]
844	USP warning	M	PB:DEVICE_DIAGNOSIS[20.2]	PB:DIAG_EVENT_SWITCH_1[26]
950	Conc. temp lower limit	M	PB:DEVICE_DIAGNOSIS[20.3]	PB:DIAG_EVENT_SWITCH_1[27]
951	Conc. temp upper limit	M	PB:DEVICE_DIAGNOSIS[20.4]	PB:DIAG_EVENT_SWITCH_1[28]
952	Conc. kappa lower limit	M	PB:DEVICE_DIAGNOSIS[20.5]	PB:DIAG_EVENT_SWITCH_1[29]
953	Conc. kappa upper limit	M	PB:DEVICE_DIAGNOSIS[20.6]	PB:DIAG_EVENT_SWITCH_1[30]
954	Conc. lower limit	M	PB:DEVICE_DIAGNOSIS[20.7]	PB:DIAG_EVENT_SWITCH_1[31]

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
955	Conc. upper limit	M	PB:DEVICE_DIAGNOSIS[21.0]	PB:DIAG_EVENT_SWITCH_1[32]
956	Cond temp lower limit	M	PB:DEVICE_DIAGNOSIS[21.1]	PB:DIAG_EVENT_SWITCH_1[33]
957	Cond temp upper limit	M	PB:DEVICE_DIAGNOSIS[21.2]	PB:DIAG_EVENT_SWITCH_1[34]
958	Cond kappa lower limit	M	PB:DEVICE_DIAGNOSIS[21.3]	PB:DIAG_EVENT_SWITCH_1[35]
959	Cond kappa upper limit	M	PB:DEVICE_DIAGNOSIS[21.4]	PB:DIAG_EVENT_SWITCH_1[36]
960	Cond kappa comp lower limit	M	PB:DEVICE_DIAGNOSIS[21.5]	PB:DIAG_EVENT_SWITCH_1[37]
961	Cond kappa comp upper limit	M	PB:DEVICE_DIAGNOSIS[21.6]	PB:DIAG_EVENT_SWITCH_1[38]

9.6.3 Liquiline Oxygen

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
003	Temp. sensor failure	F	PB:DEVICE_DIAGNOSIS[11.0]	PB:DIAG_EVENT_SWITCH[0]
004	Scanning sensor	C	PB:DEVICE_DIAGNOSIS[11.1]	PB:DIAG_EVENT_SWITCH[1]
010	Sensor initialization	C	PB:DEVICE_DIAGNOSIS[11.2]	PB:DIAG_EVENT_SWITCH[2]
011	Sensor no communication	F	PB:DEVICE_DIAGNOSIS[11.3]	PB:DIAG_EVENT_SWITCH[3]
012	Sensor failure	F	PB:DEVICE_DIAGNOSIS[11.4]	PB:DIAG_EVENT_SWITCH[4]
013	Wrong sensor type	F	PB:DEVICE_DIAGNOSIS[11.5]	PB:DIAG_EVENT_SWITCH[5]
014	Invalid sensor data	C	PB:DEVICE_DIAGNOSIS[11.6]	PB:DIAG_EVENT_SWITCH[6]
104	Sensor supply bad	F	PB:DEVICE_DIAGNOSIS[11.7]	PB:DIAG_EVENT_SWITCH[7]
119	Temp offset upper limit	F	PB:DEVICE_DIAGNOSIS[12.0]	PB:DIAG_EVENT_SWITCH[8]
120	Temp offset lower limit	F	PB:DEVICE_DIAGNOSIS[12.1]	PB:DIAG_EVENT_SWITCH[9]
127	Invalid TAG group	F	PB:DEVICE_DIAGNOSIS[12.2]	PB:DIAG_EVENT_SWITCH[10]
128	Invalid TAG	F	PB:DEVICE_DIAGNOSIS[12.3]	PB:DIAG_EVENT_SWITCH[11]
129	Sensor change aborted	C	PB:DEVICE_DIAGNOSIS[12.4]	PB:DIAG_EVENT_SWITCH[12]
130	Calibration active	C	PB:DEVICE_DIAGNOSIS[12.5]	PB:DIAG_EVENT_SWITCH[13]
131	PV not stable	M	PB:DEVICE_DIAGNOSIS[12.6]	PB:DIAG_EVENT_SWITCH[14]
132	Temperature not stable	M	PB:DEVICE_DIAGNOSIS[12.7]	PB:DIAG_EVENT_SWITCH[15]
134	Zero pnt. too high alarm	M	PB:DEVICE_DIAGNOSIS[13.0]	PB:DIAG_EVENT_SWITCH[16]
135	Zero pnt. too high warning	M	PB:DEVICE_DIAGNOSIS[13.1]	PB:DIAG_EVENT_SWITCH[17]
136	Zero pnt. too low warning	M	PB:DEVICE_DIAGNOSIS[13.2]	PB:DIAG_EVENT_SWITCH[18]
137	Zero pnt. too low alarm	M	PB:DEVICE_DIAGNOSIS[13.3]	PB:DIAG_EVENT_SWITCH[19]
138	Slope too low alarm	M	PB:DEVICE_DIAGNOSIS[13.4]	PB:DIAG_EVENT_SWITCH[20]
139	Slope too low warning	M	PB:DEVICE_DIAGNOSIS[13.5]	PB:DIAG_EVENT_SWITCH[21]
140	Leakage current alarm	F	PB:DEVICE_DIAGNOSIS[13.6]	PB:DIAG_EVENT_SWITCH[22]
143	Slope too high alarm	M	PB:DEVICE_DIAGNOSIS[13.7]	PB:DIAG_EVENT_SWITCH[23]
144	Slope too high warning	M	PB:DEVICE_DIAGNOSIS[14.0]	PB:DIAG_EVENT_SWITCH[24]
145	Leakage current warn	M	PB:DEVICE_DIAGNOSIS[14.1]	PB:DIAG_EVENT_SWITCH[25]
162	Oper.time >40Â°C alarm	M	PB:DEVICE_DIAGNOSIS[14.2]	PB:DIAG_EVENT_SWITCH[26]
163	Oper.time >120Â°C alarm	M	PB:DEVICE_DIAGNOSIS[20.7]	PB:DIAG_EVENT_SWITCH_1[31]
166	Oper.time >15nA alarm	M	PB:DEVICE_DIAGNOSIS[14.3]	PB:DIAG_EVENT_SWITCH[27]
167	Oper.time >50nA alarm	M	PB:DEVICE_DIAGNOSIS[14.4]	PB:DIAG_EVENT_SWITCH[28]
168	Oper.time >40Â°C warn	M	PB:DEVICE_DIAGNOSIS[14.5]	PB:DIAG_EVENT_SWITCH[29]
169	Oper.time >120Â°C warn	M	PB:DEVICE_DIAGNOSIS[21.0]	PB:DIAG_EVENT_SWITCH_1[32]
170	Cap operating time alarm	M	PB:DEVICE_DIAGNOSIS[21.4]	PB:DIAG_EVENT_SWITCH_1[36]
171	Cap operating time warning	M	PB:DEVICE_DIAGNOSIS[21.5]	PB:DIAG_EVENT_SWITCH_1[37]
172	Operating time alarm	M	PB:DEVICE_DIAGNOSIS[14.6]	PB:DIAG_EVENT_SWITCH[30]
173	Oper.time >80Â°C alarm	M	PB:DEVICE_DIAGNOSIS[14.7]	PB:DIAG_EVENT_SWITCH[31]
180	Cal. expired alarm	M	PB:DEVICE_DIAGNOSIS[15.0]	PB:DIAG_EVENT_SWITCH[32]
181	SIP, CIP, autoclaving alarm	M	PB:DEVICE_DIAGNOSIS[15.1]	PB:DIAG_EVENT_SWITCH[33]
182	Operating time warning	M	PB:DEVICE_DIAGNOSIS[15.2]	PB:DIAG_EVENT_SWITCH[34]
183	Oper.time >80Â°C warn	M	PB:DEVICE_DIAGNOSIS[15.3]	PB:DIAG_EVENT_SWITCH[35]
189	Oper.time <5Â°C warn	M	PB:DEVICE_DIAGNOSIS[21.1]	PB:DIAG_EVENT_SWITCH_1[33]

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
190	Cal. expired warning	M	PB:DEVICE_DIAGNOSIS[15.4]	PB:DIAG_EVENT_SWITCH[36]
191	SIP, CIP, autoclaving warning	M	PB:DEVICE_DIAGNOSIS[15.5]	PB:DIAG_EVENT_SWITCH[37]
192	Oper.time >15nA warn	M	PB:DEVICE_DIAGNOSIS[15.6]	PB:DIAG_EVENT_SWITCH[38]
193	Oper.time >50nA warn	M	PB:DEVICE_DIAGNOSIS[15.7]	PB:DIAG_EVENT_SWITCH[39]
198	Oper.time <5Â°C alarm	M	PB:DEVICE_DIAGNOSIS[21.2]	PB:DIAG_EVENT_SWITCH_1[34]
203	Wrong transmitter type	F	PB:DEVICE_DIAGNOSIS[16.0]	PB:DIAG_EVENT_SWITCH[40]
215	Simulation active	C	PB:DEVICE_DIAGNOSIS[16.1]	PB:DIAG_EVENT_SWITCH[41]
218	Current output not available	F	PB:DEVICE_DIAGNOSIS[16.2]	PB:DIAG_EVENT_SWITCH[42]
219	Power supply bad	C	PB:DEVICE_DIAGNOSIS[16.3]	PB:DIAG_EVENT_SWITCH[43]
222	Oper.time >160nA warn	M	PB:DEVICE_DIAGNOSIS[16.4]	PB:DIAG_EVENT_SWITCH[44]
223	Oper.time >160nA alarm	M	PB:DEVICE_DIAGNOSIS[16.5]	PB:DIAG_EVENT_SWITCH[45]
224	Oper.time >5Â°C warn	M	PB:DEVICE_DIAGNOSIS[16.6]	PB:DIAG_EVENT_SWITCH[46]
225	Oper.time >5Â°C alarm	M	PB:DEVICE_DIAGNOSIS[16.7]	PB:DIAG_EVENT_SWITCH[47]
226	Oper.time >30Â°C warn	M	PB:DEVICE_DIAGNOSIS[17.0]	PB:DIAG_EVENT_SWITCH_1[0]
227	Oper.time >30Â°C alarm	M	PB:DEVICE_DIAGNOSIS[17.1]	PB:DIAG_EVENT_SWITCH_1[1]
228	Oper.time >30nA warn	M	PB:DEVICE_DIAGNOSIS[17.2]	PB:DIAG_EVENT_SWITCH_1[2]
229	Oper.time >30nA alarm	M	PB:DEVICE_DIAGNOSIS[17.3]	PB:DIAG_EVENT_SWITCH_1[3]
322	Meas. value out of range	S	PB:DEVICE_DIAGNOSIS[17.4]	PB:DIAG_EVENT_SWITCH_1[4]
327	Selftest active	F	PB:DEVICE_DIAGNOSIS[20.0]	PB:DIAG_EVENT_SWITCH_1[24]
328	Electr. temp.	M	PB:DEVICE_DIAGNOSIS[20.1]	PB:DIAG_EVENT_SWITCH_1[25]
329	Sensor low signal amplitude	M	PB:DEVICE_DIAGNOSIS[20.2]	PB:DIAG_EVENT_SWITCH_1[26]
330	Sensor relaxation time low	M	PB:DEVICE_DIAGNOSIS[20.3]	PB:DIAG_EVENT_SWITCH_1[27]
331	Sensor relaxation time high	M	PB:DEVICE_DIAGNOSIS[20.4]	PB:DIAG_EVENT_SWITCH_1[28]
332	Sensor low signal decay	F	PB:DEVICE_DIAGNOSIS[20.5]	PB:DIAG_EVENT_SWITCH_1[29]
333	Sensor temperature too high	S	PB:DEVICE_DIAGNOSIS[20.6]	PB:DIAG_EVENT_SWITCH_1[30]
380	Comm. module defect	F	PB:DEVICE_DIAGNOSIS[17.5]	PB:DIAG_EVENT_SWITCH_1[5]
381	Comm. module incomp	F	PB:DEVICE_DIAGNOSIS[17.6]	PB:DIAG_EVENT_SWITCH_1[6]
404	Lower limit current output	S	PB:DEVICE_DIAGNOSIS[17.7]	PB:DIAG_EVENT_SWITCH_1[7]
405	Upper limit current output	S	PB:DEVICE_DIAGNOSIS[18.0]	PB:DIAG_EVENT_SWITCH_1[8]
406	SETUP active	OK	PB:DEVICE_DIAGNOSIS[18.1]	PB:DIAG_EVENT_SWITCH_1[9]
407	Diag. active	OK	PB:DEVICE_DIAGNOSIS[18.2]	PB:DIAG_EVENT_SWITCH_1[10]
408	Calibration aborted	M	PB:DEVICE_DIAGNOSIS[18.3]	PB:DIAG_EVENT_SWITCH_1[11]
409	Sensor change	C	PB:DEVICE_DIAGNOSIS[18.4]	PB:DIAG_EVENT_SWITCH_1[12]
501	Device open	M	PB:DEVICE_DIAGNOSIS[18.5]	PB:DIAG_EVENT_SWITCH_1[13]
513	Device alarm	F	PB:DEVICE_DIAGNOSIS[18.6]	PB:DIAG_EVENT_SWITCH_1[14]
514	Device warning	M	PB:DEVICE_DIAGNOSIS[18.7]	PB:DIAG_EVENT_SWITCH_1[15]
530	Logbook: 20 % remain	S	PB:DEVICE_DIAGNOSIS[19.0]	PB:DIAG_EVENT_SWITCH_1[16]
531	Logbook: full	S	PB:DEVICE_DIAGNOSIS[19.1]	PB:DIAG_EVENT_SWITCH_1[17]
532	Calibration timer expired	M	PB:DEVICE_DIAGNOSIS[19.2]	PB:DIAG_EVENT_SWITCH_1[18]
802	PCS Alarm	F	PB:DEVICE_DIAGNOSIS[21.3]	PB:DIAG_EVENT_SWITCH_1[35]
810	PV upper limit alarm	F	PB:DEVICE_DIAGNOSIS[19.3]	PB:DIAG_EVENT_SWITCH_1[19]
811	PV lower limit alarm	F	PB:DEVICE_DIAGNOSIS[19.4]	PB:DIAG_EVENT_SWITCH_1[20]
812	Temperature out of range	F	PB:DEVICE_DIAGNOSIS[19.5]	PB:DIAG_EVENT_SWITCH_1[21]

Diag. Event	Name	NE107 class [default]	Mapped to PB_DEVICE_DIAGNOSIS [octet number.bit position]	Configured by PB_DIAG_EVENT_SWITCHx [byte index]
840	PV upper limit warning	M	PB:DEVICE_DIAGNOSIS[19.6]	PB:DIAG_EVENT_SWITCH_1[22]
841	PV lower limit warning	M	PB:DEVICE_DIAGNOSIS[19.7]	PB:DIAG_EVENT_SWITCH_1[23]
902	Cap SIP, CIP, autoclaving alm	M	PB:DEVICE_DIAGNOSIS[21.7]	PB:DIAG_EVENT_SWITCH_1[39]
903	Cap SIP, CIP, autoclaving warn	M	PB:DEVICE_DIAGNOSIS[21.6]	PB:DIAG_EVENT_SWITCH_1[38]
904	Calibration quality alarm	M	PB:DEVICE_DIAGNOSIS[22.1]	PB:DIAG_EVENT_SWITCH_1[41]
905	Calibration quality warning	M	PB:DEVICE_DIAGNOSIS[22.0]	PB:DIAG_EVENT_SWITCH_1[40]
906	Number of cap calibrations alarm	M	PB:DEVICE_DIAGNOSIS[22.2]	PB:DIAG_EVENT_SWITCH_1[42]
907	Number of cap calibrations warn	M	PB:DEVICE_DIAGNOSIS[22.3]	PB:DIAG_EVENT_SWITCH_1[43]
908	Reference calibration required	M	PB:DEVICE_DIAGNOSIS[22.4]	PB:DIAG_EVENT_SWITCH_1[44]

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