

PROFIBUS and PROFINET for wastewater pumping-systems

CIM 150 / CIU 152 for PROFIBUS DP

CIM 500 / CIU 502 Ethernet for PROFINET IO

Functional profile and user manual



Original functional profile and user manual.

This functional profile describes Grundfos PROFINET and PROFIBUS for wastewater pumping-systems.

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1. General information**1.1 Hazard statements**

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

**DANGER**

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

**WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

**CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

**SIGNAL WORD****Description of hazard**

Consequence of ignoring the warning.
- Action to avoid the hazard.

1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.



Read this document before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.

2. Introduction

2.1 About this functional profile

This functional profile describes the following modules and units:

- CIM 150 PROFIBUS DP
- CIM 500 ethernet for PROFINET IO
- CIU 152 PROFIBUS DP
- CIU 502 ethernet for PROFINET IO

This functional profile applies to the following Grundfos products:

- Grundfos Dedicated Controls (CU 361 and CU 362)
- Grundfos DP, EF, SL1, SLV and SEG AUTO_{ADAPT} wastewater pumps.
- Grundfos wastewater level-control system LC 231, LC 241.

In the following, the supported products are referred to as "wastewater system".

The two supported controllers CU 361 and CU 362 are referred to as CU 36X.

The two supported controllers LC 231 and LC 241 are referred to as LC 2X1.

Grundfos cannot be held responsible for any problems caused directly or indirectly by using information in this functional profile.

2.2 PROFIBUS DP-V0

The PROFIBUS DP interface conforms to the PROFIBUS DP-V0 standard for cyclic data transmission.

The option of setting the PROFIBUS DP address via bus is not supported as CIM 150 has two switches for setting the address.

2.3 PROFIBUS DP-V1

Only the diagnostic part and the extra three bytes of parameterisation data are supported. Acyclic data transmission is not supported.

2.4 Assumptions

This functional profile assumes that the reader is familiar with commissioning and programming of PROFIBUS and PROFINET devices.

2.5 Definitions and abbreviations

| | |
|--------------------|--|
| ARP | Address Resolution Protocol. Translates IP addresses to MAC addresses. |
| Auto-MDIX | Ensures that both crossover cable types and non-crossover cable types can be used. |
| CAT5 | Ethernet cable type with four twisted pairs of wires. |
| CAT5e | Enhanced CAT5 cable with better performance. |
| CAT6 | Ethernet cable compatible with CAT5 and CAT5e and with very high performance. |
| CIM | Communication Interface Module. |
| CIU | Communication Interface Unit. |
| CRC | Cyclic Redundancy Check. A data error detection method. |
| CU 36X | Grundfos Control Unit for Dedicated Controls (CU 361 and CU 362). |
| DHCP | Dynamic Host Configuration Protocol. Used to configure network devices so that they can communicate on an IP network. |
| DNS | Domain Name System. Used to resolve host names to IP addresses. |
| Enumeration | List of values. |
| GENIbus | Proprietary Grundfos fieldbus standard. |
| GENIpro | Proprietary Grundfos fieldbus protocol. |
| Grundfos GO Remote | A Grundfos application designed to control Grundfos products via infrared or radio communication. Available for iOS and Android devices. |

| | |
|--------------------|---|
| HTTP | Hyper Text Transfer Protocol. The protocol commonly used to navigate the world wide web. |
| IANA | Internet Assigned Numbers Authority. |
| IP | Internet Protocol. |
| LC 231 | Grundfos wastewater level-controller for one or two pumps also supporting some basic IO signals. It is a box for wall mounting. |
| LC 241 | Grundfos wastewater level-control system. Consists of a control cabinet with CU 241 control unit, IO 242 pump module for connection of one or two pumps and some basic IO signals and an optional IO 241 module for extra IO signals. |
| LED | Light-Emitting Diode. |
| MAC | Media Access Control. Unique network address for a piece of hardware. |
| MP 204 | Grundfos Motor Protector. |
| Ping | Packet InterNet Groper. A software utility that tests the connectivity between two TCP/IP hosts. |
| SELV | Separated or Safety Extra-Low Voltage. |
| SELV-E | Separated or Safety Extra-Low Voltage with earth connection. |
| SMA | SubMiniature version A. Coaxial radio-signal cable-connection standard. |
| SMTP | Simple Mail Transfer Protocol. |
| SNTP | Simple Network Time Protocol. Used for clocks synchronisation between computer systems. |
| TCP | Transmission Control Protocol. Protocol for internet communication and Industrial Ethernet communication. |
| TCP/IP | Transmission Control Protocol/Internet Protocol. Protocol for internet communication. |
| Transmission speed | Bits transferred per second, bits/s. |
| URL | Uniform Resource Locator. The address used to connect to a server. |
| UTC | Coordinated Universal Time. The primary time standard by which the world regulates clocks and time. |
| UTF-8 | Unicode Transformation Format. Character encoding. |
| VPN | Virtual Private Network. A network using the internet to connect nodes. These systems use encryption and other security mechanisms to ensure that only authorised users can access the network and that the data cannot be intercepted. |

3. System description

The system diagrams provide an overview for the different technologies of how to use the CIM module or CIU unit for connecting wastewater pumps to a PROFIBUS or PROFINET network.

CIM solution, Dedicated Controls (CU 36X)

The Grundfos Dedicated Controls CU 36X control unit can be connected to up to six Grundfos wastewater pumps. It offers status information as well as control and monitoring of a wastewater pit via a user-friendly operating panel with display. CIM 150/500 is an add-on communication module that you install in the CU 36X, using a 10-pin connection. This enables communication with a PLC, SCADA system, etc.

CIM solution, Level Control LC 2X1

The controller can be connected to one or two Grundfos wastewater pumps. It offers status information as well as control and monitoring of a wastewater pit. From the operating panel, basic status of the pit and the pumps are visible, and basic installation settings can be made. Detailed information is available via Grundfos GO Remote which is also used for more advanced installation settings. This is not shown in the pictures and is not discussed further in this manual.

CIU solution, AUTO_{ADAPT} wastewater pumps

The CIU XX2 unit constitutes a communication interface to a system consisting of up to four Grundfos DP, EF, SL1, SLV or SEG AUTO_{ADAPT} wastewater pumps installed in one or more pump pits. The pumps connect to the CIU XX2 running communication over a separate pair of wires.

Each pump has an integrated pressure sensor that enables it to monitor and control the water level in the pump pit according to a common reference level and an intermittent operation scheme. By monitoring the water level, the pump will obtain enough information to know when to start and stop pumping.

The CIU XX2 unit is not involved in the control of the water level, starting and stopping of pumps, but merely provides the interface necessary for the following:

- Configuration of the pump parameters required for the level control.
- Online monitoring of pit and pump values.
- Individual (manual) control of each pump (forced start and stop and pump-down).
- Obtaining of measured and logged data that is valuable for pump service and pit optimisation.

The CIU XX2 can communicate with Grundfos GO Remote. This is not shown in the pictures and is not discussed further in this manual.

3.1 PROFIBUS DP, CIM 150

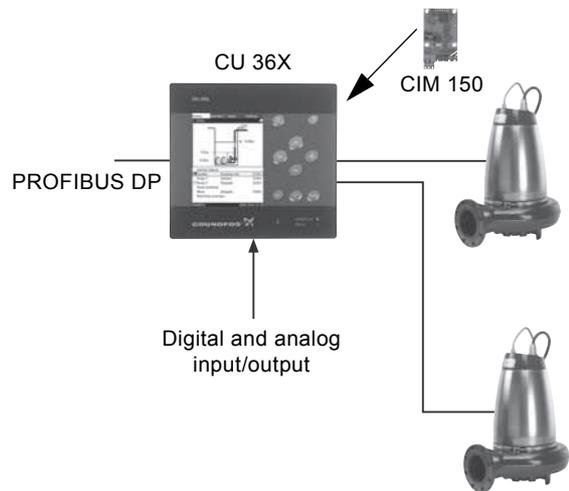


Fig. 1 CIM 150 solution for Dedicated Controls. Up to six pumps can be connected to CU 36X

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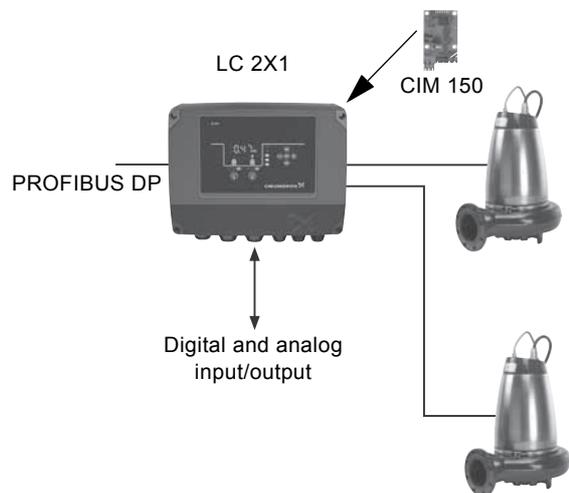


Fig. 2 CIM 150 solution for LC 2X1. Up to two pumps can be connected

TM07 0601 0718

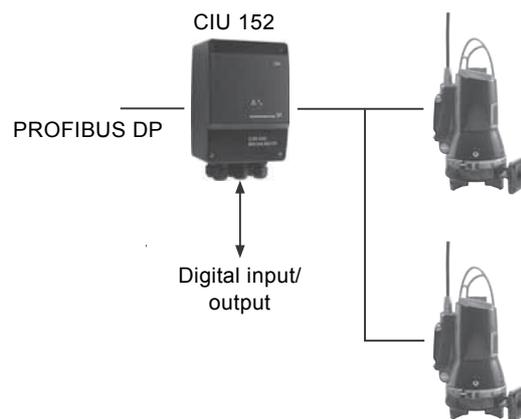


Fig. 3 CIU 152 solution for Grundfos DP, EF, SL1, SLV and SEG AUTO_{ADAPT} pumps

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3.2 PROFINET IO, CIM 500

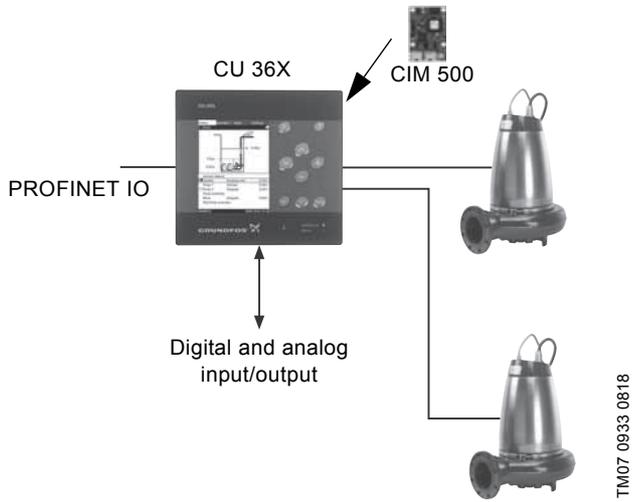


Fig. 4 CIM 500 solution for Dedicated Controls. Up to six pumps can be connected to CU 36X

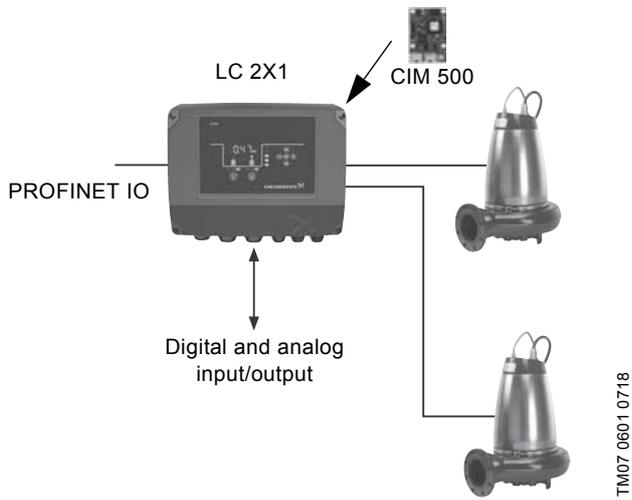


Fig. 5 CIM 500 solution for LC 2X1. Up to two pumps can be connected

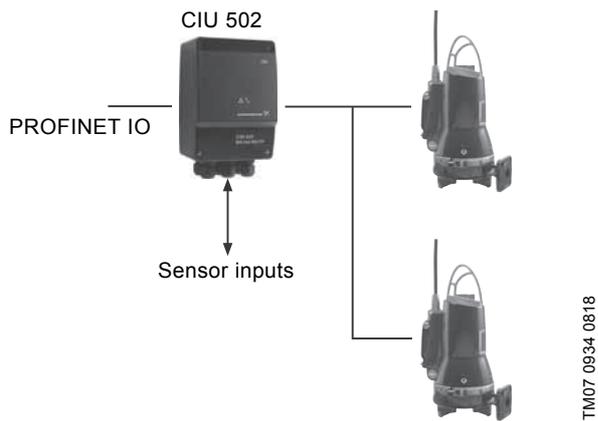


Fig. 6 CIU 502 solution for Grundfos DP, EF, SL1, SLV and SEG AUTO_{ADAPT} pumps

4. Specifications

4.1 CIM module

| General data | Description | Comments |
|--------------------------------|-------------------------|---|
| Ambient humidity | 30-95 % | Relative, non-condensing. |
| Operating temperature | -20 to +45 °C | |
| Storage temperature | -25 to +70 °C | |
| GENIbus visual diagnostics | LED2 | The LED will be in one of these states: Off, permanently green, flashing red, permanently red. See section 5.6 Status LEDs for PROFIBUS DP and section 6.5 Status LEDs for PROFINET IO. |
| Power supply (CIU) | 24-240 V | Located in the CIU. |
| GENIbus connection type (CIU) | RS-485, 3-wire + screen | Conductors: A, B and Y. |
| CIU-box enclosure class | IP54 | |
| CIU-box dimensions (H x W x D) | 182 x 108 x 82 mm | |

4.2 CIM 150 PROFIBUS DP

The table below provides an overview of the specifications for Grundfos CIM 150 and CIU 152. For further details, refer to the specific sections of this functional profile.

| PROFIBUS DP specifications | Description | Comments |
|--|-----------------------------|--|
| PROFIBUS implementation class | DP-V0 | Intelligent pump profile. |
| PROFIBUS connector | Screw-type terminal | A, B, DGND, VP (+5 V). |
| PROFIBUS connection type | RS-485, two-wire | Conductors: A, B. |
| Maximum cable length | 100 metres at 12 Mbits/s | Corresponds to 328 feet. See section 5.3.1 Data transmission rates and cable length . |
| Slave address | 1-126 | Set via rotary switches SW3 and SW4. See section 5.4 Setting the PROFIBUS address . |
| Line termination | On or off | Set via DIP switches SW1 and SW2. See section 5.5 Termination resistors . Auto detected. |
| Recommended cable cross-section | 0.20 - 0.25 mm ² | AWG24 or AWG23 |
| Supported transmission speed | 9.6 Kbits/s to 12 Mbits/s | Auto detected. |
| PROFIBUS visual diagnostics | LED1 | Off, permanently green, flashing red, permanently red. See section 5.6 Status LEDs . |
| Maximum number of PROFIBUS devices at a physical network segment | 32 | Using repeater, you can increase the number to 125 devices. Physically segmented network. |

4.3 CIM 500 PROFINET IO

The table below provides an overview of the specifications for Grundfos CIM 500 and CIU 502 ethernet for PROFINET IO. For further details, refer to the specific sections of this functional profile.

| PROFINET IO specifications | Description | Comments |
|-------------------------------|--|---|
| Application layer | DHCP, HTTP, Ping, FTP, SMTP, SNTP, PROFINET IO | Rotary switch in position 0. |
| Transport layer | TCP | |
| Internet layer | Internet protocol V4 (IPv4) | |
| Link layer | ARP, Media Access Control (ethernet) | |
| Ethernet cable | CAT5, CAT5e or CAT6 | Supports auto cable-crossover detecting (Auto-MDIX). |
| Maximum cable length | 100 metres at 10/100 Mbits/s | Corresponds to 328 feet. |
| Transmission speed | 10 Mbits/s, 100 Mbits/s | Auto-detected. |
| Industrial Ethernet protocols | PROFINET IO, Modbus TCP | Selected with rotary switch. See section 6.2 Setting the Industrial Ethernet protocol . |

5. PROFIBUS DP, CIM 150 setup

5.1 PROFIBUS bus topology

The PROFIBUS-preferred bus topology is daisy chaining as illustrated in fig. 7. The end devices of a physical bus segment must be terminated (LT = Line Termination). Each device must have a unique physical address [1-126]. Up to 32 PROFIBUS devices can be connected to a bus segment, and by using a repeater another 32 devices can be connected. This can be repeated until the maximum number of addresses are used. Make sure that each device is connected to a proper earth potential.

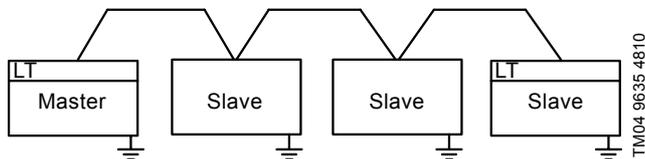


Fig. 7 Example of PROFIBUS bus segment with line termination

5.2 CIM 150 PROFIBUS module

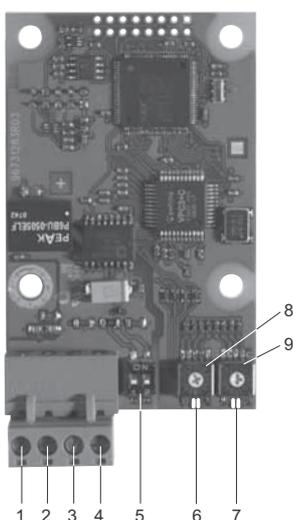


Fig. 8 CIM 150 PROFIBUS module

| Pos. | Designation | Description |
|------|----------------|--|
| 1 | B (Rx/D/TxD-P) | PROFIBUS terminal B, positive data signal |
| 2 | A (Rx/D/TxD-N) | PROFIBUS terminal A, negative data signal |
| 3 | DGND | PROFIBUS terminal DGND, only for external termination |
| 4 | VP | +5 VDC, only for external termination |
| 5 | SW1/SW2 | On and off switches for termination resistors |
| 6 | LED1 | Red and green status LED for PROFIBUS communication |
| 7 | LED2 | Red and green status LED for GENibus communication between CIM 150 and the wastewater system |
| 8 | SW3 | Hexadecimal rotary switch for setting the PROFIBUS address, four most significant bits), |
| 9 | SW4 | Hexadecimal rotary switch for setting the PROFIBUS address, four least significant bits |



The power supply, pos. 4, fig. 8, must only be used for external termination.

5.3 Connecting the PROFIBUS

5.3.1 Data transmission rates and cable length

We recommend using a cable according to IEC 61158.

Example

Siemens, 6XV1 830-0EH10.

| Kbits/s | Maximum cable length |
|---------|----------------------|
| | [m/ft] |
| 9.6 | 1200/4000 |
| 19.2 | 1200/4000 |
| 45.45 | 1200/4000 |
| 93.75 | 1000/3300 |
| 187.5 | 1000/3300 |
| 500 | 400/1300 |
| 1500 | 200/660 |
| 3000 | 100/330 |
| 6000 | 100/330 |
| 12000 | 100/330 |

Fitting the cable

See fig. 9.

1. Connect the red conductor(s) to terminal B (pos. 1).
2. Connect the green conductor(s) to terminal A (pos. 2).
3. Connect the cable screens to earth via the earth clamp (pos. 3).



For maximum safety and reliability, connect the cable screen to earth via the earth clamp, and make sure that all CIU 150 units are properly earthed via the mains supply earth-wire.

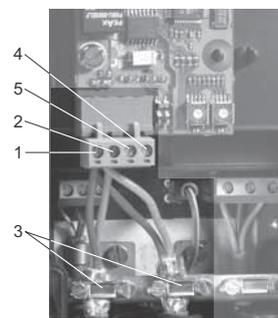


Fig. 9 Connecting the PROFIBUS

| Pos. | Description |
|------|---------------------|
| 1 | PROFIBUS terminal B |
| 2 | PROFIBUS terminal A |
| 3 | Earth clamp |
| 4 | +5 VDC |
| 5 | DGND |

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5.4 Setting the PROFIBUS address

The CIM 150 PROFIBUS module has two hexadecimal rotary switches for setting the PROFIBUS address. The two switches are used for setting the four most significant bits, SW3, and the four least significant bits, SW4, respectively. See fig. 10.

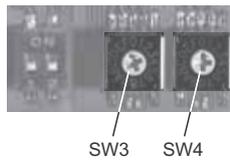


Fig. 10 Setting the PROFIBUS address

The table below shows examples of PROFIBUS address settings.



You must set the PROFIBUS address decimally from 1 to 126. The address 126 is normally used for special purposes and must not be used.

| PROFIBUS address | SW3 | SW4 |
|------------------|-----|-----|
| 8 | 0 | 8 |
| 20 | 1 | 4 |
| 31 | 1 | F |
| 126 | 7 | E |

A restart of CIM/CIU 150 has to be performed for a PROFIBUS address change to take effect.

For a complete overview of the PROFIBUS addresses, see section 10. [PROFIBUS address](#).

5.5 Termination resistors

The termination resistors are fitted on the CIM 150 PROFIBUS module. See fig. 11.

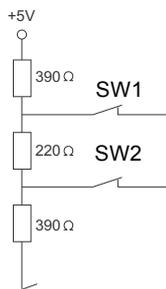


Fig. 11 Internal termination resistors

CIM 150 has a DIP switch with two switches, SW1 and SW2 for cutting the termination resistors in and out. Figure 12 shows the DIP switches in cut-out state.

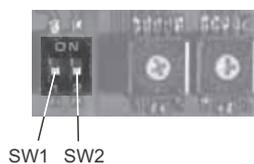


Fig. 12 Cutting termination resistors in and out

DIP switch settings

| Status | SW1 | SW2 |
|-----------------|-----|-----|
| Cut in | ON | ON |
| Cut out | OFF | OFF |
| Undefined state | ON | OFF |
| | OFF | ON |



To ensure stable and reliable communication, it is important that only the termination resistors of the first and last units in the PROFIBUS network are cut in.

5.6 Status LEDs

The CIM 150 PROFIBUS module has two LEDs. See fig. 8.

- Red and green status LED, LED1, for PROFIBUS communication.
- Red and green status LED, LED2, for GENibus communication between CIM 150 and the connected wastewater system.

LED1

| Status | Description |
|--------------------|--|
| Off. | CIM 150 has been switched off. |
| Permanently green. | CIM 150 is ready for PROFIBUS data transmission (Data Exchange State). |
| Permanently red. | CIM 150 module fault. CIM 150 does not support the connected wastewater system. |
| Flashing red. | Wrong or missing PROFIBUS configuration or no contact to the PROFIBUS master. |

LED2

| Status | Description |
|--------------------|--|
| Off. | CIM 150 is switched off. |
| Permanently green. | GENibus communication between CIM 150 and the wastewater system is OK. |
| Permanently red. | CIM 150 does not support the connected wastewater system. |
| Flashing red. | No GENibus communication between CIM 150 and the wastewater system. |



During startup, there may be a delay of up to 5 seconds before the LED2 status is updated.

5.7 Communication watchdog

The state of the PROFIBUS communication watchdog can be changed with a PROFIBUS commissioning tool, for example Siemens Simatic Manager. If the watchdog is enabled, all bits in the PROFIBUS output modules are automatically set to "0" if the PROFIBUS communication is broken.

As a result, the E-pump will be set to local mode and then be operating according to the local operating mode, local setpoint and local control mode.

5.8 Reaction to PLC "Stop button"

If the PLC is stopped by the operator, all output registers will be set to "0".

As a result, the control bit RemoteAccessReq will be cleared, and the wastewater system will be set to local mode.

6. PROFINET IO, CIM 500 setup

6.1 Connecting the ethernet cable



WARNING

Electric shock

Death or serious personal injury

- Connect CIM 500 only to SELV or SELV-E circuits.

Use RJ45 plugs and ethernet cable. Connect the cable shield to protective earth at both ends.



It is important to connect the cable shield to earth through an earth clamp or to connect the cable shield to earth in the connector.

CIM 500 is designed for flexible network installation; the built-in two port switch makes it possible to daisy chain from product to product without the need of additional ethernet switches. The last product in the chain is only connected to one of the ethernet ports. Each ethernet port has its own MAC address.

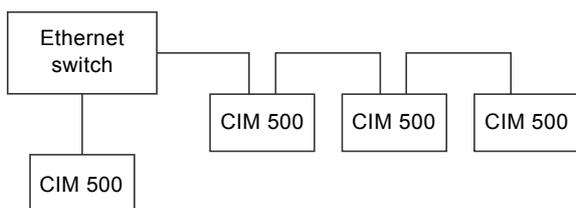


Fig. 13 Example of Industrial Ethernet network

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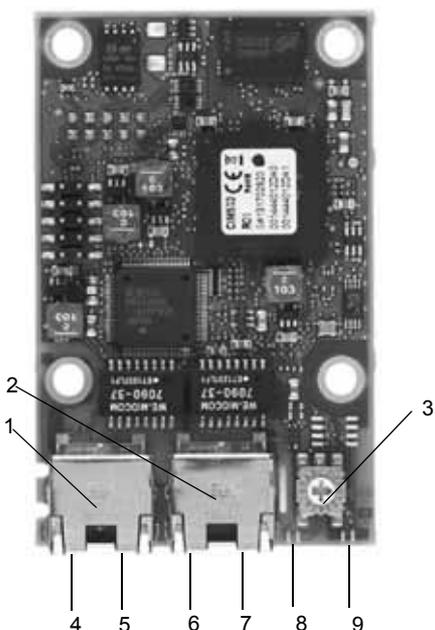


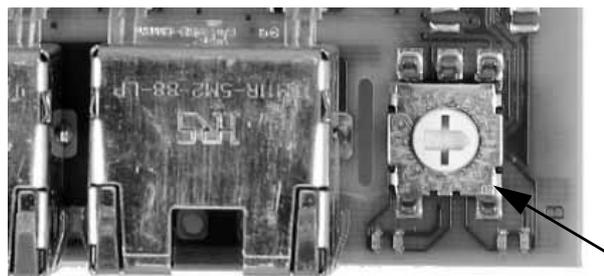
Fig. 14 Example of ethernet connection, CIM 500

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| Pos. | Description | Designation |
|------|--|-------------|
| 1 | Industrial Ethernet RJ45 connector 1 | ETH1 |
| 2 | Industrial Ethernet RJ45 connector 2 | ETH2 |
| 3 | Rotary switch for protocol selection | SW1 |
| 4 | Data activity LED for connector 1 | DATA1 |
| 5 | Link LED for connector 1 | LINK1 |
| 6 | Data activity LED for connector 2 | DATA2 |
| 7 | Link LED for connector 2 | LINK2 |
| 8 | Green and red status LED for ethernet communication | LED 1 |
| 9 | Green and red status LED for internal communication between the module and the pump. | LED 2 |

6.2 Setting the Industrial Ethernet protocol

The CIM 500 ethernet module has a rotary switch for selection of the Industrial Ethernet protocol. See fig. 15.



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Fig. 15 Selecting the Industrial Ethernet protocol

| Pos. | Description |
|------|---|
| 0 | PROFINET IO (default) |
| 1 | Modbus TCP |
| 2 | BACnet IP |
| 3 | EtherNet/IP |
| 4 | GRM IP. Requires a contract with Grundfos. |
| 5.E | Reserved, LED1 will be permanently red to indicate an invalid configuration |
| | Reset to factory default |
| F | Note: The rotary switch must be set in this position for 20 seconds before CIM 500 resets to factory default. During this period LED1 flashes red and green at the same time to indicate that a reset will occur. |



Every change of the rotary switch while the module is powered on will cause the module to restart.

6.3 Setting the IP addresses

The CIM 500 ethernet module is default set to a fixed IP address. It is possible to change the IP address settings from the built in webserver.

| | |
|---|---|
| Default IP settings used by the webserver | IP address: 192.168.1.100 Subnet mask: 255.255.255.0 Gateway: 192.168.1.1 |
| IP settings for Modbus TCP | Make the settings via the webserver |
| Device name and IP settings for PROFINET IO | Static configuration from the webserver or configuration from the PROFINET IO configuration tool. |

6.4 Establish connection to the webserver

You can configure CIM 500 using the built-in webserver. To establish a connection from a PC to CIM 500 the following steps are required:

- Connect the PC and CIM 500 using an ethernet cable.
- Configure the PC ethernet port to the same subnetwork as CIM 500, for example 192.168.1.101, and the subnet mask to 255.255.255.0. See section [A.2 Webserver configuration](#) on page 51.
- Open a standard internet browser and type 192.168.1.100 in the URL field.
- Log in to the webserver using the following:

| | |
|-----------|--------------------|
| User name | admin (default) |
| Password | Grundfos (default) |



User name and password may have been changed from their default values.



Fig. 16 CIM 500 connected to a PC



You can use both ETH1 and ETH2 to establish a connection to the webserver.



You can access the webserver while the selected Industrial Ethernet protocol is active.

6.5 Status LEDs

The CIM 500 ethernet module has two Status LEDs, LED1 and LED2. See fig. 14.

- Red and green status LED, LED1, for ethernet communication
- Red and green status LED, LED2, for internal communication between CIM 500 and the Grundfos product.

LED1

| Status | Description |
|---------------------------------------|--|
| Off | CIM 500 is switched off. |
| Flashing green | Wink function. LED flashes 10 times when activated from the master. |
| Permanently green | CIM 500 is ready for data transmission (data exchange state). |
| Flashing red (3 Hz, duty cycle 50 %) | Wrong or missing PROFINET IO configuration. See section 9.2.1 LED status . |
| Pulsing red (0.3 Hz, duty cycle 10 %) | Configured, but the connection to the master is lost. See section 9.2.1 LED status . |
| Permanently red | Product not supported. See section 9.2.1 LED status . |
| Permanently red and green | Error in the firmware download. See section 9.2.1 LED status . |
| Flashing red and green | After 20 seconds in this state, the CIM 500 factory settings are restored and the device is restarted. |

LED2

| Status | Description |
|---------------------------|--|
| Off | CIM 500 is switched off. |
| Flashing red | No internal communication between CIM 500 and the Grundfos product. |
| Permanently red | CIM 500 does not support the Grundfos product connected. |
| Permanently green | Internal communication between CIM 500 and the Grundfos product is OK. |
| Permanently red and green | Memory fault. |



During startup, there is a delay of up to 5 seconds before LED1 and LED2 status is updated.

6.6 DATA and LINK LEDs

The CIM 500 ethernet module has two connectivity LEDs related to each RJ45 connector. See fig. 14.

DATA1 and DATA2

These yellow LEDs indicate data traffic activity.

| Status | Description |
|--------------------|---|
| Yellow off | No data communication on the RJ45 connector. |
| Yellow flashing | Data communication ongoing on the RJ45 connector. |
| Permanently yellow | Heavy network traffic on the RJ45 connector. |

LINK1 and LINK2

These green LEDs show whether the ethernet cable is properly connected.

| Status | Description |
|-----------|---|
| Green off | No ethernet link on the RJ45 connector |
| Green on | Ethernet link on the RJ45 connector is OK |

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7. Detailed description of data modules

7.1 Data types

Grundfos CIM 150 and CIM 500 support the following data types. All data types, except for data type 10, comply with specification IEC 61158-6 standard data types for use in PROFIBUS/PROFINET profiles.

| Data type | Description |
|-----------|----------------|
| 1 | Boolean |
| 2 | Integer 8 |
| 3 | Integer 16 |
| 4 | Integer 32 |
| 5 | Unsigned 8 |
| 6 | Unsigned 16 |
| 7 | Unsigned 32 |
| 8 | Floating point |
| 9 | Visible string |
| 10 | Non-standard |

7.1.1 Explanation to event trigger

When a PROFIBUS/PROFINET master writes an output module, the write action is triggered by a specific event.

This can work in three ways:

Rising edge

Control bits with a rising-edge event trigger behave like a command that is executed when a bit transition from "0" to "1" occurs. Each of them has a corresponding acknowledge bit in PitStatus (module 43) or PumpControlAck (module 44) which is set when the command is executed and cleared when the control bit is written back to "0".

State

Control bits with a state-event trigger behave like a "state" that is forced upon the wastewater system. CIM 150 and CIM 500 will attempt to make the wastewater system operate according to the "requested" state.

Value change

Control bits/bytes with a value-change event trigger behave like a command that is executed when the bit/byte changes its value. CIM 150 and CIM 500 will attempt to make the wastewater system operate according to the "requested" value. The change is reflected in a bit/byte value in a corresponding input module.

7.1.2 Overview of the data modules

The table below shows how the PROFIBUS/PROFINET data modules are organised in this manual.

| Module type | Section | Modules |
|--------------------------|---|------------------------------|
| Control (output modules) | 7.2 Control of wastewater pit | 1 |
| | 7.3 Control of wastewater pumps | 2-7 |
| | 7.4 Setting of real-time clock | 8 |
| | 7.5 Setting of analog outputs | 9-11 |
| | 7.6 Level control settings | 12-40 |
| | 7.7 Setting of pump index | 41 |
| | 7.8 Pit measurement data modules, input modules | 43-110 |
| Status (input modules) | 7.9 Pump measurement data modules | 111-141 |
| | 7.10 User-defined counters | 144-147 |
| | 7.11 Dedicated Controls (CU 36X), alarms and warnings | 49-52, 57-59, 117-118 |
| | 7.12 Level Control (LC 2X1), alarms and warnings | 49-52, 57-59, 117-118 |
| | 7.13 AUTO_{ADAPT} system (CIU XX2), alarms and warnings | 49-50, 53-54, 57-59, 119-120 |
| | 7.14 Device identification (DeviceIdentification, module 142) | 142 |

7.2 Control of wastewater pit

All multi-byte data types are transmitted with MSB (Most Significant Byte) first.

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|--|---------------|---------------------------------|--|---|----------------------------------|---------------|---------------------------------|---|---|--------|---|---|-------|---|---|---|---|---|---|-------------|---|---|---|---|---|---|-------------|---|---|---|---|---|---|-------------|---|---|---|---|---|--|-------------|---|---|---|---|---|---|-------|---|---|---|---|-----|----------|---|---|---|---|---|--|--|--|
| | | | | | | Single pit | Multi-pit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Output module for the control of the wastewater pit. An acknowledge bit to each command can be found in input module PitStatus (module 43). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Name and description</th> <th>Event trigger</th> <th>CU 36X Dedicated Controls</th> <th>CIU XX2 AUTO_{ADAPT} Single pit</th> <th>CIU XX2 AUTO_{ADAPT} Multi-pit</th> <th>LC 2X1</th> </tr> </thead> <tbody> <tr> <td>0</td> <td> RemoteAccessReq The module is used to enable the writing to output modules. 0: Writing to output modules disabled. Control from bus (remote) is not possible. 1: Writing to output modules enabled. Control from bus (remote) is possible. </td> <td>State</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> </tr> <tr> <td>1</td> <td> ResetAlarm The module is used as remote, manual alarm acknowledgement. The command is acknowledged by the ResetAlarmAck bit. </td> <td>Rising edge</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> </tr> <tr> <td>2</td> <td> AutoPit The module is used to release an interlocked pit. The actual operating mode of the pit can be read from PitOperatingMode (module 45). The command is acknowledged by the AutoPitAck bit. </td> <td>Rising edge</td> <td>•</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>3</td> <td> InterlockPit The system will be interlocked and the wastewater system will stop pumping. The command is acknowledged by the InterlockPitAck bit. </td> <td>Rising edge</td> <td>•</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>4</td> <td> CustomRelayPulse The module will generate a toggle pulse at the CU 36X user-defined relay once it has been set to "bus-controlled". It must be set with the Grundfos PC Tool WW Controls. The command is acknowledged by the CustomRelayPulseAck bit. </td> <td>Rising edge</td> <td>•</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>5</td> <td> CustomRelayOnOff The module can be used to control the CU 36X user-defined relay once it has been set to "bus-controlled". It must be set with the Grundfos PC Tool WW Controls. </td> <td>State</td> <td>•</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>6-7</td> <td>RESERVED</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> | Bit | Name and description | Event trigger | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} Single pit | CIU XX2 AUTO _{ADAPT} Multi-pit | LC 2X1 | 0 | RemoteAccessReq The module is used to enable the writing to output modules. 0: Writing to output modules disabled. Control from bus (remote) is not possible. 1: Writing to output modules enabled. Control from bus (remote) is possible. | State | • | • | • | • | 1 | ResetAlarm The module is used as remote, manual alarm acknowledgement. The command is acknowledged by the ResetAlarmAck bit. | Rising edge | • | • | • | • | 2 | AutoPit The module is used to release an interlocked pit. The actual operating mode of the pit can be read from PitOperatingMode (module 45). The command is acknowledged by the AutoPitAck bit. | Rising edge | • | - | - | - | 3 | InterlockPit The system will be interlocked and the wastewater system will stop pumping. The command is acknowledged by the InterlockPitAck bit. | Rising edge | • | - | - | - | 4 | CustomRelayPulse The module will generate a toggle pulse at the CU 36X user-defined relay once it has been set to "bus-controlled". It must be set with the Grundfos PC Tool WW Controls. The command is acknowledged by the CustomRelayPulseAck bit. | Rising edge | • | - | - | - | 5 | CustomRelayOnOff The module can be used to control the CU 36X user-defined relay once it has been set to "bus-controlled". It must be set with the Grundfos PC Tool WW Controls. | State | • | - | - | - | 6-7 | RESERVED | - | - | - | - | - | | | |
| Bit | Name and description | Event trigger | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} Single pit | CIU XX2 AUTO _{ADAPT} Multi-pit | LC 2X1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | RemoteAccessReq The module is used to enable the writing to output modules. 0: Writing to output modules disabled. Control from bus (remote) is not possible. 1: Writing to output modules enabled. Control from bus (remote) is possible. | State | • | • | • | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ResetAlarm The module is used as remote, manual alarm acknowledgement. The command is acknowledged by the ResetAlarmAck bit. | Rising edge | • | • | • | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | AutoPit The module is used to release an interlocked pit. The actual operating mode of the pit can be read from PitOperatingMode (module 45). The command is acknowledged by the AutoPitAck bit. | Rising edge | • | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | InterlockPit The system will be interlocked and the wastewater system will stop pumping. The command is acknowledged by the InterlockPitAck bit. | Rising edge | • | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | CustomRelayPulse The module will generate a toggle pulse at the CU 36X user-defined relay once it has been set to "bus-controlled". It must be set with the Grundfos PC Tool WW Controls. The command is acknowledged by the CustomRelayPulseAck bit. | Rising edge | • | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | CustomRelayOnOff The module can be used to control the CU 36X user-defined relay once it has been set to "bus-controlled". It must be set with the Grundfos PC Tool WW Controls. | State | • | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6-7 | RESERVED | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Pit Control | 5 | Bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

7.3 Control of wastewater pumps

A pump control module is available for each of the possible wastewater pumps.

| Module | Name | Data type | Unit | Description | | | | | | | |
|--------|--------------|-----------|------------|--|--------------|-----------------|----------------------|----------------------------------|--|------------------|---------------|
| | | | | Output module for the control of pump 1. | | | | | | | |
| | | | | SetPump1OperatingMode [Enumeration] AUTO _{ADAPT} : The actual operating mode of the pump can be read from PumpOperatingMode (module 112). Dedicated Controls and Level Control (LC 2X1): PumpControlSource (module 114) and PumpPumpingMode (module 115) show how the pump operates. | | | | | | | |
| | | | Enum | Byte 1 (data type 5) | Value | Name | Event trigger | CU 36X Dedicated Controls | CIU XX2 AUTO_{ADAPT} Single pit | Multi-pit | LC 2X1 |
| | | | | | 0 | Auto | | • | • | • | • |
| | | | | | 1 | ForcedStart | Value change | • | • | • | • |
| | | | | | 2 | ForcedStop | | • | • | • | • |
| 2 | Pump1Control | 6 | | | 3-255 | - | - | - | - | - | - |
| | | | | Pump1Commands [bits] A command for resetting the pump alarms and a command for forcing a pump to pump the water level down to the stop level. | | | | | | | |
| | | | Bits | Byte 2 (data type 5) | Bit | Name | Event trigger | CU 36X Dedicated Controls | CIU XX2 AUTO_{ADAPT} Single pit | Multi-pit | LC 2X1 |
| | | | | | 0 | Pump1ResetAlarm | Rising edge | - | • | • | - |
| | | | | | 1 | Pump1PumpDown | Rising edge | - | • | • | - |
| | | | | | 2-7 | - | - | - | - | - | - |
| 3 | Pump2Control | 6 | Enum/ bits | Output module for the control of pump 2. See above. | | | | • | • | • | • |
| 4 | Pump3Control | 6 | Enum/ bits | Output module for the control of pump 3. See above. | | | | • | • | • | - |
| 5 | Pump4Control | 6 | Enum/ bits | Output module for the control of pump 4. See above. | | | | • | • | • | - |
| 6 | Pump5Control | 6 | Enum/ bits | Output module for the control of pump 5. See above. | | | | • | - | - | - |
| 7 | Pump6Control | 6 | Enum/ bits | Output module for the control of pump 6. See above. | | | | • | - | - | - |

7.4 Setting of real-time clock

Triggered by value change. Can also be set via the CU 36X "Settings" menu.

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|------------------|-----------|--------------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 8 | SetRealTimeClock | 7 | Unix time | Output module used for setting the internal real-time clock (RTC) in Unix Time format, seconds since 1 January 1970. Example Date: 14-09-2011, 10:30:00. Unix Time: 1316014200 (4E70C878hex). | • | - | - | - |

7.5 Setting of analog outputs

Before a bus-controlled analog output can be used, the CU 36X must be configured for this purpose. This can only be done with the Grundfos PC Tool WW Controls.

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|------------------|-----------|--------|--|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 9 | SetAnalogOutput1 | 6 | 0.01 % | Output module used for the control of Analog output 1. | • | - | - | - |
| 10 | SetAnalogOutput2 | 6 | 0.01 % | Output module used for the control of Analog output 2. | • | - | - | - |
| 11 | SetAnalogOutput3 | 6 | 0.01 % | Output module used for the control of Analog output 3. | • | - | - | - |

7.6 Level control settings

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|------------------------|-----------|--------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 12 | SetOverflowLevel | 6 | 0.01 m | Sets the overflow level. The actual level can be read from OverflowLevel (module 61). Can also be set via CU 36X. | • | - | - | - |
| 13 | SetHighLevel | 6 | 0.01 m | Sets the high level. The actual level can be read from HighLevel (module 62). CU 36X: can be set via the display. LC 2X1: can be set via Grundfos GO Remote or the operating panel. | • | - | - | • |
| 14 | SetAlarmLevel | 6 | 0.01 m | Sets the alarm level. The actual level can be read from AlarmLevel (module 63). It can also be set via CU 36X. | • | - | - | - |
| 15 | SetDryRunningLevel | 6 | 0.01 m | Sets the dry-running level. The actual level can be read from DryRunningLevel (module 64). CU 36X: can be set via the display. LC 2X1: can be set via Grundfos GO Remote or the operating panel. | • | - | - | • |
| 16 | SetFoamDrainLevel | 6 | 0.01 m | Sets the foam-draining level. The actual level can be read from FoamDrainLevel (module 65). It can also be set via CU 36X. | • | - | - | - |
| 17 | SetSinglePitStopLevel | 5 | 0.01 m | Sets the pit stop level in AUTO _{ADAPT} wastewater systems. The actual level can be read from SinglePitStopLevel (module 66). It can also be set with Grundfos GO Remote in service mode. Note: The factory-set value should not be changed, except in very special cases. | - | • | - | - |
| 18 | SetSinglePitStartLevel | 5 | 0.01 m | Sets the pit start level in AUTO _{ADAPT} wastewater systems. The actual level can be read from SinglePitStartLevel (module 67). It can also be set with Grundfos GO Remote. | - | • | - | - |
| 19 | SetSinglePitStartBand | 5 | 0.01 m | Sets the pit start band in AUTO _{ADAPT} wastewater systems. The actual band can be read from SinglePitStartBand (module 68). It can also be set with Grundfos GO Remote in service mode. Note: The factory-set value should not be changed, except in very special cases. | - | • | - | - |
| 20 | SetSinglePitHighLevel | 5 | 0.01 m | Sets the high level in AUTO _{ADAPT} wastewater systems. The actual level can be read from SinglePitHighLevel (module 69). It can also be set with Grundfos GO Remote. | - | • | - | - |
| 21 | SetStartLevelP1 | 6 | 0.01 m | Sets the pump start and stop levels in Dedicated Controls and LC 2X1 systems or AUTO _{ADAPT} wastewater systems operating in multi-pit mode. The actual levels can be read from the corresponding modules 70 to 81. Dedicated Controls: These levels can also be set via CU 36X. LC 2X1: These levels can also be set via Grundfos GO Remote or the operating panel. AUTO _{ADAPT} : These levels cannot be set with Grundfos GO Remote. | • | - | • | • |
| 22 | SetStopLevelP1 | 6 | 0.01 m | | • | - | • | • |
| 23 | SetStartLevelP2 | 6 | 0.01 m | | • | - | • | • |
| 24 | SetStopLevelP2 | 6 | 0.01 m | | • | - | • | - |
| 25 | SetStartLevelP3 | 6 | 0.01 m | | • | - | • | - |
| 26 | SetStopLevelP3 | 6 | 0.01 m | | • | - | • | - |
| 27 | SetStartLevelP4 | 6 | 0.01 m | • | - | • | - | |
| 28 | SetStopLevelP4 | 6 | 0.01 m | • | - | • | - | |
| 29 | SetStartLevelP5 | 6 | 0.01 m | • | - | - | - | |
| 30 | SetStopLevelP5 | 6 | 0.01 m | • | - | - | - | |
| 31 | SetStartLevelP6 | 6 | 0.01 m | • | - | - | - | |
| 32 | SetStopLevelP6 | 6 | 0.01 m | • | - | - | - | |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|------------------------|-----------|--------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 33 | SetMultiPitStartBandP1 | 5 | 0.01 m | | - | - | • | - |
| 34 | SetMultiPitHighLevelP1 | 5 | 0.01 m | Sets the pump start band and pump high-level alarm limit in AUTO _{ADAPT} wastewater systems operating in multi-pit mode. | - | - | • | - |
| 35 | SetMultiPitStartBandP2 | 5 | 0.01 m | | - | - | • | - |
| 36 | SetMultiPitHighLevelP2 | 5 | 0.01 m | The actual values can be read from the corresponding modules 82 to 89. | - | - | • | - |
| 37 | SetMultiPitStartBandP3 | 5 | 0.01 m | | - | - | • | - |
| 38 | SetMultiPitHighLevelP3 | 5 | 0.01 m | These values cannot be set with Grundfos GO Remote. | - | - | • | - |
| 39 | SetMultiPitStartBandP4 | 5 | 0.01 m | | - | - | • | - |
| 40 | SetMultiPitHighLevelP4 | 5 | 0.01 m | | - | - | • | - |

7.7 Setting of pump index

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|--------------|-----------|------|--|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 41 | SetPumpIndex | 5 | Enum | <p>Pump index</p> <p>This output module selects from which pump the measured data (modules 111 to 141) is to be read.</p> <p>Permissible range is [1; highest pump number].</p> <p>Its actual value can be read from PumpIndex (module 111).</p> | • | • | • | • |

7.8 Pit measurement data modules, input modules

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 | |
|--------|-----------------------|-----------------------------|------|---|---|----------------------------------|-----------|--------|---|
| | | | | | | Single pit | Multi-pit | | |
| 43 | PitStatus | 5 | Bit | <p>Status bits related to output module PitControl (module 1). The bits that are acknowledge bits will be set when the associated control bit is set and the command has been executed. It will be cleared when the control bit is cleared.</p> | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | ActRemoteAccess Indicates whether writing to output modules is enabled. 0: Writing to output modules disabled. Control from bus (remote) is not possible. 1: Writing to output modules enabled. Control from bus (remote) is possible. | • | • | • | • |
| | | | | 1 | ResetAlarmAck Acknowledge bit to ResetAlarm control bit. | • | • | • | • |
| | | | | 2 | AutoPitAck Acknowledge bit to AutoPit control bit. | • | - | - | - |
| | | | | 3 | InterlockPitAck Acknowledge bit to InterlockPit control bit. | • | - | - | - |
| | | | | 4 | CustomRelayPulseAck Acknowledge bit to CustomRelayPulse control bit. | • | - | - | - |
| | | | | 5 | PitMode Pit mode of AUTO _{ADAPT} wastewater system. 0: Single-pit mode 1: Multi-pit mode. | - | • | • | - |
| | 6-7 | RESERVED | | | - | - | | | |
| 44 | PumpControlAck | 6 | Bit | <p>Acknowledge bits related to commands in the pump control output modules Pump#Control (modules 2 to 7). A bit will be set when the associated control bit is set and the command has been executed. It will be cleared when the control bit is cleared.</p> | | | | | |
| | | | | Byte 1 bit | Name and description | | | | |
| | | | | 0 | Pump1ResetAlarmAck | - | • | • | - |
| | | | | 1 | Pump1PumpDownAck | - | • | • | - |
| | | | | 2 | Pump2ResetAlarmAck | - | • | • | - |
| | | | | 3 | Pump2PumpDownAck | - | • | • | - |
| | | | | 4 | Pump3ResetAlarmAck | - | • | • | - |
| | | | | 5 | Pump3PumpDownAck | - | • | • | - |
| | | | | 6 | Pump4ResetAlarmAck | - | • | • | - |
| | | | | 7 | Pump4PumpDownAck | - | • | • | - |
| | Byte 2 bit | Name and description | | | | | | | |
| | 0-7 | RESERVED | | | | | | | |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 | |
|--------|---|-----------|------|---|--|----------------------------------|-----------|--------|---|
| | | | | | | Single pit | Multi-pit | | |
| 45 | PitOperatingMode | 5 | Enum | Operating mode of pit | | | | | |
| | | | | Value | Description | | | | |
| | | | | 0 | Standby | • | • | - | • |
| | | | | 1 | Startup delay | • | • | - | • |
| | | | | 2 | Pumping (level control) | • | • | - | • |
| | | | | 3 | Stop delay | • | - | - | • |
| | | | | 4 | Pumping max. | • | - | - | • |
| | | | | 5 | Stopped (level control) | • | • | - | • |
| | | | | 6 | Foam draining | • | - | - | - |
| | | | | 7 | Daily emptying | • | - | - | - |
| | | | | 8 | Pump anti-seizing | • | - | - | • |
| | | | | 9 | Manuel control, all enabled pumps in manual control | • | • | - | • |
| | | | | 10 | Interlock control | • | - | - | - |
| | | | | 11 | Mains-supply fault | • | • | - | - |
| | | | | 12 | Level-sensor fault | • | - | - | • |
| | | | | 13 | All enabled pumps in alarm | • | • | - | • |
| 14 | All pumps out of operation | • | • | - | • | | | | |
| 15 | Service mode, alarms suppressed | • | - | - | - | | | | |
| 46 | FloatSwitchStatus | 5 | Bits | Status of float switches | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | FloatSwitch1Status 0: Off 1: On (float switch up). | • | - | - | • |
| | | | | 1 | FloatSwitch2Status 0: Off 1: On (float switch up). | • | - | - | • |
| | | | | 2 | FloatSwitch3Status 0: Off 1: On (float switch up). | • | - | - | • |
| | | | | 3 | FloatSwitch4Status 0: Off 1: On (float switch up). | • | - | - | • |
| 4 | FloatSwitch5Status 0: Off 1: On (float switch up). | • | - | - | • | | | | |
| 5 | ExtraOverflowSwitchStatus 0: Off 1: On (float switch up). | • | - | - | - | | | | |
| 47 | IOLogicOutput | 5 | Bits | Eight logic outputs from the I/O logic function (user-defined functions). These outputs are to be set via CU 36X. | | | | | |
| 48 | DigitalInputs | 5 | Bits | Status of digital inputs | | | | | |
| | | | | Bit | Name and description | | | | |
| 0 | DigitalInput1 0: Not active 1: High-level alarm. | - | • | • | - | | | | |
| 1 | DigitalInput2 0: Not active 1: General alarm. | - | • | • | - | | | | |
| 49 | AlarmCode | 5 | Enum | • | • | • | • | | |
| 50 | WarningCode | 5 | Enum | • | • | • | • | | |
| 51 | DCLCPitAlarmBits | 10 | Bits | • | - | - | • | | |
| 52 | DCLCPitWarningBits | 10 | Bits | • | - | - | • | | |
| 53 | AAPitAlarmBits | 6 | Bits | - | • | • | - | | |
| 54 | AAPitWarningBits | 6 | Bits | - | • | • | - | | |

See sections [7.11.4 Dedicated Controls \(CU 36X\)](#), [alarm and warning bits](#) and [7.13.4 AUTO_{ADAPT} systems \(CIU XX2\)](#), [alarm and warning bits](#).

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 | |
|--------|-------------------|-----------|------|--|---------------------------------|----------------------------------|-----------|--------|---|
| | | | | | | Single pit | Multi-pit | | |
| 55 | PitPumpsPresent | 5 | Bits | One bit for each pump. The bit is set if the pump is present. | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | Pump1Present | • | • | • | • |
| | | | | 1 | Pump2Present | • | • | • | • |
| | | | | 2 | Pump3Present | • | • | • | - |
| | | | | 3 | Pump4Present | • | • | • | - |
| | | | | 4 | Pump5Present | • | - | - | - |
| | | | | 5 | Pump6Present | • | - | - | - |
| 56 | PitPumpsRunning | 5 | Bits | One bit for each pump. The bit is set if the pump is running. | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | Pump1Running | • | • | • | • |
| | | | | 1 | Pump2Running | • | • | • | • |
| | | | | 2 | Pump3Running | • | • | • | - |
| | | | | 3 | Pump4Running | • | • | • | - |
| | | | | 4 | Pump5Running | • | - | - | - |
| | | | | 5 | Pump6Running | • | - | - | - |
| 57 | PitPumpsCommFault | 5 | Bits | One bit for each pump. The bit is set if the pump has a communication fault. | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | Pump1CommFault | • | • | • | • |
| | | | | 1 | Pump2CommFault | • | • | • | • |
| | | | | 2 | Pump3CommFault | • | • | • | - |
| | | | | 3 | Pump4CommFault | • | • | • | - |
| | | | | 4 | Pump5CommFault | • | - | - | - |
| | | | | 5 | Pump6CommFault | • | - | - | - |
| 58 | PitPumpsAlarm | 5 | Bits | One bit for each pump. The bit is set if the pump has an alarm. | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | Pump1Alarm | • | • | • | • |
| | | | | 1 | Pump2Alarm | • | • | • | • |
| | | | | 2 | Pump3Alarm | • | • | • | - |
| | | | | 3 | Pump4Alarm | • | • | • | - |
| | | | | 4 | Pump5Alarm | • | - | - | - |
| | | | | 5 | Pump6Alarm | • | - | - | - |
| 59 | PitPumpsWarning | 5 | Bits | One bit for each pump. The bit is set if the pump has a warning. | | | | | |
| | | | | Bit | Name and description | | | | |
| | | | | 0 | Pump1Warning | • | - | - | • |
| | | | | 1 | Pump2Warning | • | - | - | • |
| | | | | 2 | Pump3Warning | • | - | - | - |
| | | | | 3 | Pump4Warning | • | - | - | - |
| | | | | 4 | Pump5Warning | • | - | - | - |
| | | | | 5 | Pump6Warning | • | - | - | - |
| 6 | MixerWarning | • | - | - | - | | | | |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|---------------------|-----------|---------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| | | | | One bit for each pump. The bit is set if the pump is disabled. | | | | |
| | | | | Bit Name and description | | | | |
| 60 | PitPumpsDisabled | 5 | Bits | | • | - | - | - |
| | | | | 0 Pump1Disabled | • | - | - | - |
| | | | | 1 Pump2Disabled | • | - | - | - |
| | | | | 2 Pump3Disabled | • | - | - | - |
| | | | | 3 Pump4Disabled | • | - | - | - |
| | | | | 4 Pump5Disabled | • | - | - | - |
| | | | | 5 Pump6Disabled | • | - | - | - |
| | | | | 6 MixerDisabled | • | - | - | - |
| 61 | OverflowLevel | 6 | 0.01 m | Actual overflow level. It can be set with SetOverflowLevel (module 12). | • | - | - | - |
| 62 | HighLevel | 6 | 0.01 m | Actual high level. It can be set with SetHighLevel (module 13). | • | - | - | • |
| 63 | AlarmLevel | 6 | 0.01 m | Actual alarm level. It can be set with SetAlarmLevel (module 14). | • | - | - | - |
| 64 | DryRunningLevel | 6 | 0.01 m | Actual dry-running level. It can be set with SetDryRunningLevel (module 15). | • | - | - | • |
| 65 | FoamDrainLevel | 6 | 0.01 m | Actual foam-draining level. It can be set with SetFoamDrainLevel (module 16). | • | - | - | - |
| 66 | SinglePitStopLevel | 5 | 0.01 m | Actual, common pump-control settings for AUTO _{ADAPT} wastewater systems operating in single-pit mode. They can be set with the corresponding output modules 17 to 20. | - | • | - | - |
| 67 | SinglePitStartLevel | 5 | 0.01 m | | - | • | - | - |
| 68 | SinglePitStartBand | 5 | 0.01 m | | - | • | - | - |
| 69 | SinglePitHighLevel | 5 | 0.01 m | | - | • | - | - |
| 70 | StartLevelP1 | 6 | 0.01 m | Actual pump start and stop levels in Dedicated Controls systems or AUTO _{ADAPT} wastewater systems operating in multi-pit mode. They can be set with the corresponding output modules 21 to 32. | • | - | • | • |
| 71 | StopLevelP1 | 6 | 0.01 m | | • | - | • | • |
| 72 | StartLevelP2 | 6 | 0.01 m | | • | - | • | • |
| 73 | StopLevelP2 | 6 | 0.01 m | | • | - | • | - |
| 74 | StartLevelP3 | 6 | 0.01 m | | • | - | • | - |
| 75 | StopLevelP3 | 6 | 0.01 m | | • | - | • | - |
| 76 | StartLevelP4 | 6 | 0.01 m | | • | - | • | - |
| 77 | StopLevelP4 | 6 | 0.01 m | | • | - | • | - |
| 78 | StartLevelP5 | 6 | 0.01 m | | • | - | - | - |
| 79 | StopLevelP5 | 6 | 0.01 m | | • | - | - | - |
| 80 | StartLevelP6 | 6 | 0.01 m | | • | - | - | - |
| 81 | StopLevelP6 | 6 | 0.01 m | | • | - | - | - |
| 82 | MultiPitStartBandP1 | 5 | 0.01 m | Actual pump-start band and pump high-level alarm limit in AUTO _{ADAPT} wastewater systems operating in multi-pit mode. The actual values can be set with the corresponding output modules 33 to 40. | - | - | • | - |
| 83 | MultiPitHighLevelP1 | 5 | 0.01 m | | - | - | • | - |
| 84 | MultiPitStartBandP2 | 5 | 0.01 m | | - | - | • | - |
| 85 | MultiPitHighLevelP2 | 5 | 0.01 m | | - | - | • | - |
| 86 | MultiPitStartBandP3 | 5 | 0.01 m | | - | - | • | - |
| 87 | MultiPitHighLevelP3 | 5 | 0.01 m | | - | - | • | - |
| 88 | MultiPitStartBandP4 | 5 | 0.01 m | | - | - | • | - |
| 89 | MultiPitHighLevelP4 | 5 | 0.01 m | | - | - | • | - |
| 90 | PitWaterLevel | 6 | 0.01 m | Sensor-measured water level in the pit. It requires a level sensor for Dedicated Controls. | • | • | - | • |
| 91 | PitSwitchWaterLevel | 6 | Enum | Float-switch-detected water level in the pit. Requires one or more float switches. Range: 0 to 5. | • | - | - | - |
| 92 | PitDepth | 6 | 0.01 m | Depth of the pit. | • | - | - | - |
| 93 | ActualFlowIn | 6 | 0.1 l/s | Actual water flow into the pit. | • | - | - | - |
| 94 | AverageFlowIn | 6 | 0.1 l/s | Average water flow into the pit. | • | - | - | - |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|--------------------|-----------|--------------------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 95 | ActualFlowOut | 6 | 0.1 l/s | Actual water flow out of the pit. | ● | - | - | - |
| 96 | AverageFlowOut | 6 | 0.1 l/s | Average water flow out of the pit. | ● | - | - | - |
| 97 | SpecificEnergy | 6 | Wh/m ³ | Specific energy consumption. | ● | - | - | - |
| 98 | OverflowVolume | 6 | 0.1 m ³ | Overflow volume. | ● | - | - | - |
| 99 | OverflowTime | 6 | 1 min. | Time with overflow condition. | ● | - | - | - |
| 100 | OverflowCounter | 6 | - | Counter of overflow occurrences. | ● | - | - | - |
| 101 | Power | 7 | 1 W | Total power consumption of wastewater pit. | ● | ● | ●* | ● |
| 102 | Energy | 7 | 0.1 kWh | Total energy consumption of wastewater pit. | ● | ● | ●* | ● |
| 103 | RunTime | 7 | 1 min. | Running time, at least one pump has been running. | ● | ● | ●* | ● |
| 104 | Volume | 7 | 0.1 m ³ | Totally pumped volume of wastewater pit. | ● | - | - | - |
| 105 | AnalogInput1 | 6 | 0.10 % | Value of analog input 1 measurement. | ● | - | - | ● |
| 106 | AnalogInput2 | 6 | 0.10 % | Value of analog input 2 measurement. | ● | - | - | ● |
| 107 | AnalogInput3 | 6 | 0.10 % | Value of analog input 3 measurement. | ● | - | - | ● |
| 108 | MixerStartsPerHour | 6 | /h | Number of mixer starts per hour. | ● | - | - | - |
| 109 | MixerRuntime | 7 | 1 min. | Total running time of mixer. | ● | - | - | - |
| 110 | MixerStartCounter | 7 | - | Total number of mixer starts. | ● | - | - | - |
| 148 | PitOutletPressure | 6 | 0.001 bar | Outlet pressure at the pit | ● | - | - | - |
| 149 | AnalogInput4 | 6 | 0.10 % | Value of analog input 4 measurement | - | - | - | ● |
| 150 | AnalogInput5 | 6 | 0.10 % | Value of analog input 5 measurement | - | - | - | ● |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|-------------------|-----------|------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| | | | | Status of user digital inputs | - | - | - | • |
| | | | | Byte 1 | | | | |
| | | | | Bit Description | | | | |
| | | | | 0 LC 231: DI 1 LC 241: DI 1 (IO 242 pump module) | - | - | - | • |
| | | | | 1 LC 231: DI 2 LC 241: DI 2 (IO 242 pump module) | - | - | - | • |
| | | | | 2 LC 231: DIO 3 as DI LC 241: DI 3 (IO 242 pump module) | - | - | - | • |
| | | | | 3 LC 231: DIO 4 as DI LC 241: DI 4 (IO 242 pump module) | - | - | - | • |
| | | | | 4 LC 231: CIO 1 as DI LC 241: ADI as DI (IO 242 pump module) | - | - | - | • |
| | | | | 5 LC 231: CIO 2 as DI LC 241: DIO 1 as DI (IO 241 Ext IO module) | - | - | - | • |
| | | | | 6 LC 231: - LC 241: DIO 2 as DI (IO 241 Ext IO module) | - | - | - | • |
| 151 | UserDigitalInputs | 6 | Bits | 7 LC 231: - LC 241: DI 3 (IO 241 external IO module) | - | - | - | • |
| | | | | Byte 2 | | | | |
| | | | | Bit Description | | | | |
| | | | | 0 LC 231: - LC 241: DI 4 (IO 241 Ext IO module) | - | - | - | • |
| | | | | 1 LC 231: - LC 241: CIO 1 as DI (IO 241 external IO module) | - | - | - | • |
| | | | | 2 LC 231: - LC 241: CIO 2 as DI (IO 241 external IO module) | - | - | - | • |
| | | | | 3 LC 231: - LC 241: CIO 3 as DI (IO 241 external IO module) | - | - | - | • |
| | | | | 4 LC 231: - LC 241: CIO 4 as DI (IO 241 external IO module) | - | - | - | • |
| | | | | 5-7 Not in use | - | - | - | - |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|--------------------|-----------|------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| | | | | Status of user digital outputs | - | - | - | • |
| | | | | Byte 1 | | | | |
| | | | | Bit Description | | | | |
| | | | | 0 LC 231: Rel 1 LC 241: Rel 1 (IO 242 pump module) | - | - | - | • |
| | | | | 1 LC 231: Rel 2 LC 241: Rel 2 (IO 242 pump module) | - | - | - | • |
| | | | | 2 LC 231: DIO 3 as DO LC 241: DIO 1 as DO (IO 241 external IO module) | - | - | - | • |
| | | | | 3 LC 231: DIO 4 as DO LC 241: DIO 2 as DO (IO 241 external IO module) | - | - | - | • |
| | | | | 4 LC 231: CIO 1 as DO LC 241: CIO 1 as DO (IO 241 external IO module) | - | - | - | • |
| 152 | UserDigitalOutputs | 6 | Bits | 5 LC 231: CIO 2 as DO LC 241: CIO 2 as DO (IO 241 external IO module) | - | - | - | • |
| | | | | 6 LC 231: - LC 241: CIO 3 as DO (IO 241 external IO module) | - | - | - | • |
| | | | | 7 LC 231: - LC 241: CIO 4 as DO (IO 241 external IO module) | - | - | - | • |
| | | | | Byte 2 | | | | |
| | | | | Bit Description | | | | |
| | | | | 0 LC 231: - LC 241: Rel 1 (IO 241 external IO module) | - | - | - | • |
| | | | | 1 LC 231: - LC 241: Rel 2 (IO 241 external IO module) | - | - | - | • |
| | | | | 2-7 Not in use | - | - | - | - |

* For AUTO_{ADAPT} wastewater systems operating in multi-pit mode, this value is the sum of the values from all pits.

7.9 Pump measurement data modules

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|---------------------|-----------|---------|---|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 111 | PumpIndex | 5 | Enum | Actual pump index. It selects from which pump the measured data (modules 111 to 141) is to be read. It can be set via SetPumpIndex (module 41). | • | • | • | • |
| 112 | PumpOperatingMode | 5 | Enum | Operating mode of AUTO _{ADAPT} pump. 0: Auto (power-on default) 1: Forced start 2: Forced stop. | - | • | • | - |
| 113 | PumpConnectionType | 5 | Enum | Pump connection type. CU 36X: 0: CU 36X relay 1: IO 351 relay 2: CU 36X + frequency converter (VFD) 3: IO 351 + frequency converter (VFD). LC 2X1: 0: pump connected to wall-mounted controller or not present. 1: Pump connected via pump module. | • | - | - | • |
| 114 | PumpControlSource | 5 | Enum | Pump control source. 0: Auto, level control 1: Switch 2: Display 3: Remote-controlled/fieldbus. | • | - | - | • |
| 115 | PumpPumpingMode | 5 | Enum | Pumping mode of pump. 0: Running 1: Stopped 2: Disabled 3: Not present. | • | - | - | • |
| 116 | PumpAuxDevices | 10 | - | Presence and status of auxiliary electronic devices. Byte 1: IO 113 status [enum] 0: Not present 1: Present and working OK 2: Present, but faulty 3: Present, but no communication. Byte 2: MP 204 status [enum] 0: Not present 1: Present and working OK 2: Present, but faulty 3: Present, but no communication. Byte 3: CUEDrive status [enum] 0: Not present 1: Present and working OK 2: Present, but faulty 3: Present, but no communication. | • | - | - | - |
| 117 | DCLCPumpAlarmBits | 10 | Bits | See sections 7.11 Dedicated Controls (CU 36X) , alarms and warnings , 7.12 Level Control (LC 2X1) , alarms and warnings and 7.13 AUTO_{ADAPT} system (CIU XX2) , alarms and warnings . | • | - | - | • |
| 118 | DCLCPumpWarningBits | 10 | Bits | See sections 7.11 Dedicated Controls (CU 36X) , alarms and warnings , 7.12 Level Control (LC 2X1) , alarms and warnings and 7.13 AUTO_{ADAPT} system (CIU XX2) , alarms and warnings . | • | - | - | • |
| 119 | AAPumpAlarmBits | 6 | Bits | See sections 7.11 Dedicated Controls (CU 36X) , alarms and warnings , 7.12 Level Control (LC 2X1) , alarms and warnings and 7.13 AUTO_{ADAPT} system (CIU XX2) , alarms and warnings . | - | • | • | - |
| 120 | AAPumpWarningBits | 6 | Bits | See sections 7.11 Dedicated Controls (CU 36X) , alarms and warnings , 7.12 Level Control (LC 2X1) , alarms and warnings and 7.13 AUTO_{ADAPT} system (CIU XX2) , alarms and warnings . | - | • | • | - |
| 121 | PumpLatestRunTime | 6 | 1 s | The latest run time for the pump. | • | - | - | • |
| 122 | PumpStartsPerHour | 6 | /h | Number of pump starts per hour. | • | - | - | • |
| 123 | PumpFlow | 6 | 0.1 l/s | Current pump flow. | • | - | - | - |
| 124 | PumpLatestFlow | 6 | 0.1 l/s | Measured flow the last time the pump was running. | • | - | - | - |
| 125 | PumpCurrent | 6 | 0.1 A | Pump current consumption. | • | • | • | • |
| 126 | PumpLatestCurrent | 6 | 0.1 A | Pump current consumption last time the pump was running. | • | • | • | - |
| 127 | PumpInsulation | 6 | 10 kW | Motor-winding insulation. | • | - | - | - |
| 128 | PumpWaterInOil | 6 | 0.01 % | Water in motor oil. | • | - | - | - |
| 129 | PumpMotorTemp1 | 6 | 1 °C | Motor-winding temperature 1. | • | • | • | - |

| Module | Name | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|--------------------|-----------|------------|--|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | Single pit | Multi-pit | |
| 130 | PumpMotorTemp2 | 6 | 1 °C | Motor-winding temperature 2. | • | • | • | - |
| 131 | PumpCosPhi | 6 | 0.01 | Pump cos(ϕ), power factor. | • | • | • | - |
| 132 | PumpFrequency | 6 | 0.01 Hz | Pump frequency. | • | • | • | - |
| 133 | PumpVoltage | 6 | 0.1 V | Pump voltage. | • | • | • | - |
| 134 | PumpVFDMode | 5 | Enum | Mode of pump frequency converter (VFD). 0: VFD not controlled 1: - 2: Stopped 3: Reverse start 4: Start flushing 5: Normal 6: Run flushing. | • | - | - | - |
| 135 | PumpCurrentAsym | 5 | 0.10 % | Pump current asymmetry. | • | - | - | - |
| 136 | PumpRunTime | 7 | 1 min. | Pump running time. | • | • | • | • |
| 137 | PumpTimeToService | 7 | 1 min. | Time to next pump service. | • | - | - | • |
| 138 | PumpNumberOfStarts | 7 | - | Number of pump starts. | • | • | • | • |
| 139 | PumpPower | 7 | 1 W | Pump power consumption. | • | • | • | • |
| 140 | PumpEnergy | 7 | 0.1 kWh | Pump energy consumption. | • | • | • | • |
| 141 | PumpLevel | 6 | 0.01 m | Level in pit as measured by an integrated pump sensor. | - | • | • | - |

7.10 User-defined counters

The three user-defined counters uses digital inputs on the IO 351 module to show events. These events are defined by the user and the programming is done on the CU 36X controller display. Which scaling, text, to associate with the event is also programmed on CU 36X. The value of the counters can be transferred via PROFIBUS/PROFINET input modules 145, 146 and 147, and the values can be individually reset with the PROFIBUS/PROFINET output module 144.

| Module | Name | In/Out | Data type | Unit | Description | CU 36X Dedicated Controls | CIU XX2 AUTO _{ADAPT} | | LC 2X1 |
|--------|----------------------|--------|-----------|------|--|---------------------------------|----------------------------------|-----------|--------|
| | | | | | | | Single pit | Multi-pit | |
| | | | | | Bit | Name | Event trigger | | |
| 144 | ResetUserDefCounters | Output | 5 | Bits | 0 | ResetUserDefCounter1 | Rising edge | | |
| | | | | | 1 | ResetUserDefCounter2 | Rising edge | • | - |
| | | | | | 2 | ResetUserDefCounter3 | Rising edge | | - |
| | | | | | 3-7 | - | - | | - |
| 145 | UserDefCounter1 | Input | 6 | - | Value of user-defined counter 1, setup from CU 36X | | | | |
| 146 | UserDefCounter2 | Input | 6 | - | Value of user-defined counter 2, setup from CU 36X | | | | |
| 147 | UserDefCounter3 | Input | 6 | - | Value of user-defined counter 3, setup from CU 36X | | | | |

7.11 Dedicated Controls (CU 36X), alarms and warnings

7.11.1 Dedicated Controls (CU 36X), general alarm and warning behaviour

All alarms and warnings can be of acknowledge type "Auto" or "Manual".

If the acknowledge type is "Auto", for the event in question, CU 36X does not use any restart delay for the pumps. Except for the delay that might be present in the auxiliary devices, for MP 204 this is programmable, a pump restarts immediately when the alarm condition that caused its stop disappears. The belonging alarm or warning modules and the LED indication are also reset automatically. The alarm and warning relay has its own Auto/Manuel acknowledge setting.

If the acknowledge type is "Manual", for the event in question, CU 36X remains in alarm or warning state when the alarm or warning condition disappears. No pump is auto-restarted. The belonging alarm or warning indication in data modules remains and so will the LED indication. The alarm and warning relay has its own Auto/Manuel acknowledge setting. A ResetAlarm command or an alarm acknowledgement via the CU 36X display is necessary to clear the alarm and warning indication. This also deactivates the alarm and warning relay if it was set to manual acknowledgement.

7.11.2 Dedicated Controls (CU 36X), alarm and warning modules

| Module | Name | Data type | Unit | Description |
|--------|---------------------|-----------|------|---|
| 49 | AlarmCode | 5 | Enum | Code for active alarm in the Dedicated Controls system. Prioritised. See code description in section 7.11.3 Dedicated Controls (CU 36X), alarm and warning . |
| 50 | WarningCode | 5 | Enum | Code for active warning in the Dedicated Controls system. Prioritised. See code description in section 7.11.3 Dedicated Controls (CU 36X), alarm and warning . |
| 51 | DCLCPitAlarmBits | 10 | Bits | All active system alarms in the Dedicated Controls system. One bit for each alarm. See bit description in section 7.11.4 Dedicated Controls (CU 36X), alarm and warning bits . |
| 52 | DCLCPitWarningBits | 10 | Bits | All active system warnings in the Dedicated Controls system. One bit for each warning. See bit description in section 7.11.4 Dedicated Controls (CU 36X), alarm and warning bits . |
| 57 | PitPumpsCommFault | 5 | Bits | Bits 0-5: Communication fault status for pumps 1 to 6. One bit for each pump. |
| 58 | PitPumpsAlarm | 5 | Bits | Bits 0-5: Alarm status for pumps 1 to 6. One bit for each pump. |
| 59 | PitPumpsWarning | 5 | Bits | Bits 0-5: Warning status for pumps 1 to 6. One bit for each pump. |
| 117 | DCLCPumpAlarmBits | 10 | Bits | All active pump alarms in the Dedicated Controls system. One bit for each alarm. The pump in question is selected by PumpIndex (module 111). See bit description in section 7.11.4 Dedicated Controls (CU 36X), alarm and warning bits . |
| 118 | DCLCPumpWarningBits | 10 | Bits | All active pump warnings in the Dedicated Controls system. One bit for each warning. The pump in question is selected by PumpIndex (module 111). See bit description in section 7.11.4 Dedicated Controls (CU 36X), alarm and warning bits . |

7.11.3 Dedicated Controls (CU 36X), alarm and warning

The codes below are used for data module 49, AlarmCode, and 50, WarningCode.

| Code | Description of alarm and warning | Source of the alarm and warning |
|------|---|---|
| 1 | Leakage current | CUE |
| 2 | Missing phase | MP 204/CUE |
| 3 | External fault signal | System |
| 4 | Too many pump auto-restarts per 24 h | MP 204 |
| 6 | Mains fault | System/DI |
| 9 | Phase sequence reversal | MP 204 |
| 10 | Communication fault, pump | IO 113, pump no [1; 6] |
| 11 | Water-in-oil fault, motor oil | AI/IO 113 |
| 12 | Time for service, general service information | System |
| 15 | Communication fault, main system, SCADA | System |
| 16 | Other | CUE |
| 18 | Motor-protector commanded test trip | MP 204 |
| 20 | Motor-insulation resistance low | IO 113/MP 204 |
| 21 | Too many motor starts per hour | System |
| 22 | Moisture switch alarm, digital | IO 113 |
| 24 | Motor/pump vibration high | IO 113 |
| 25 | Setup conflict | IO 113, pump no [1; 6] |
| 26 | Load continues even if the motor has been switched off | MP 204 |
| 27 | External motor protector activated | DI |
| 30 | Change bearings, specific service information | CUE |
| 32 | Overvoltage | MP 204/CUE |
| 40 | Undervoltage | MP 204/CUE |
| 48 | Overload | AI/MP 204/CUE |
| 49 | Overcurrent (i_line, i_dc, i_mo) | CUE |
| 51 | Blocked motor or pump | System |
| 55 | Motor current protection activated, MCP | CUE |
| 56 | Underload | AI/MP 204 |
| 57 | Dry running | System/CUE |
| 58 | Low pump flow | System |
| 64 | Motor-stator temperature high (T1, Pt1000/Pt100) | IO 113/CUE |
| 69 | Thermal relay 1 in motor, for example Klixon | IO 113 |
| 70 | Thermal relay 2 in motor, for example thermistor | IO 351/MP 204/CUE |
| 71 | Motor-stator temperature high (T2, Pt1000/Pt100) | MP 204 |
| 72 | Hardware fault (general) | CU 36X/IO 351/IO 113/MP 204, pump no [1; 6] |
| 77 | Communication fault, twin-head pump | CUE |
| 88 | Sensor fault, motor current | AI, pump no [1; 6] |
| 89 | Signal fault, (feedback) sensor 1 | CUE |
| 91 | Signal fault, temperature 1 sensor | CUE |
| 93 | Signal fault, sensor 2 | CUE |
| 102 | Dosing pump not ready | System |
| 103 | Emergency stop | System |
| 111 | Current asymmetry | MP 204 |
| 112 | Cos(φ) too high | MP 204 |
| 113 | Cos(φ) too low | MP 204 |
| 115 | Too many grinder reversals or failed reversal attempts | Grinder |
| 116 | Overtemperature of motor for grinder | Grinder |
| 117 | Intrusion (door opened) | System |
| 118 | Sensor fault, Hydrogen sulphide (H ₂ S) | System |
| 145 | Motor support-bearing temperature high (Pt100) | IO 113 |
| 146 | Motor main-bearing temperature high (Pt100) | IO 113 |
| 148 | Motor-bearing temperature high (Pt100) in drive end (DE) | CUE |
| 149 | Motor-bearing temperature high (Pt100) in non-drive end (NDE) | CUE |
| 155 | Inrush fault | CUE |
| 159 | CIM fault (Communication Interface Module) | Add-on CIM |

| Code | Description of alarm and warning | Source of the alarm and warning |
|-------------|---|--|
| 160 | SIM card fault | Add-on CIM |
| 168 | Signal fault, pressure sensor, outlet line | AI (pressure sensor) |
| 169 | Signal fault, flow sensor | AI (flow sensor) |
| 170 | Signal fault, water-in-oil (WIO) sensor | AI |
| 175 | Signal fault, Pt100 sensor | IO 113/MP 204/CUE |
| 176 | Signal fault, temperature 3 sensor (t_mo3) | CUE |
| 179 | Signal fault, motor support-bearing temperature-sensor | IO 113 |
| 180 | Signal fault, motor main-bearing temperature-sensor | IO 113 |
| 181 | Signal fault, PTC sensor, short circuited | IO 113 |
| 186 | Signal fault, power meter sensor | AI (power sensor) |
| 188 | Signal fault, user-defined sensor 1 | AI (user-defined sensor 1) |
| 188 | Signal fault, user-defined sensor 2 | AI (user-defined sensor 2) |
| 188 | Signal fault, user-defined sensor 3 | AI (user-defined sensor 3) |
| 189 | Signal fault, level sensor | AI (level sensor) |
| 190 | Alarm-level alarm | System |
| 191 | High-level alarm | System |
| 192 | Overflow level alarm | System |
| 204 | Inconsistency between float switches and sensors | System |
| 205 | Float-switch sequence inconsistency | System |
| 213 | VFD not ready | IO 351 |
| 220 | Fault, motor-contactor feedback | DI |
| 221 | Fault, mixer-contactor feedback | DI (mixer contactor) |
| 222 | Time for service, mixer | Mixer |
| 223 | Maximum number of mixer starts per hour exceeded | System |
| 224 | Pump fault, due to auxiliary component or general fault | System |
| 225 | Communication fault, pump module | IO 113 |
| 226 | Communication fault, I/O module | IO 351 |
| 227 | Combi event 1 | System |
| 227 | Combi event 2 | System |
| 227 | Combi event 3 | System |
| 227 | Combi event 4 | System |
| 229 | Water on floor | DI |
| 231 | Ethernet: No IP address from DHCP server | System |
| 232 | Ethernet: Auto-disabled due to misuse | System |
| 235 | Gas detected | DI |
| 240 | Lubricate bearings, specific service information | CUE |
| 241 | Motor-phase failure | DI/CUE |
| 242 | Automatic motor-model recognition failed | CUE |
| 243 | Motor relay has been forced (manually operated or commanded) | DI |
| 245 | Pump continuous runtime too long | System |
| 246 | User-defined relay has been forced (manually operated/ commanded) | CU 36X |
| 247 | Power-on notice, the device or system has been switched off | System |
| 248 | Fault, battery/UPS | Battery/UPS |
| 249 | User-defined event 1 | User-defined |
| 250 | User-defined event 2 | User-defined |
| 251 | User-defined event 3 | User-defined |
| 252 | User-defined event 4 | User-defined |

7.11.4 Dedicated Controls (CU 36X), alarm and warning bits

| Module | Name | Data type | Unit | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|--|-----------|---------------------------|--|------------|-------------|------|--------|---|-----------------------------|-----|-----------------|---|----------------------------------|-----|------------------|---|--|-----|---------------------|---|---------------------------------------|-----|--------|---|---|-----|------------|---|--|-----|---------------------------|---|--|-----|---------------------------|---|-------------------------------------|-----|---------------------------|
| | | | | All active system alarms in the Dedicated Controls system. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 1 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Overflow level alarm</td> <td>192</td> <td>System</td> </tr> <tr> <td>1</td> <td>High-level alarm</td> <td>191</td> <td>System</td> </tr> <tr> <td>2</td> <td>Alarm-level alarm</td> <td>190</td> <td>System</td> </tr> <tr> <td>3</td> <td>Dry running</td> <td>57</td> <td>System</td> </tr> <tr> <td>4</td> <td>Mains fault</td> <td>6</td> <td>System</td> </tr> <tr> <td>5</td> <td>Float switch sequence inconsistency</td> <td>205</td> <td>System</td> </tr> <tr> <td>6</td> <td>Inconsistency between float switches and sensors</td> <td>204</td> <td>System</td> </tr> <tr> <td>7</td> <td>Signal fault, level sensor</td> <td>189</td> <td>AI, level sensor</td> </tr> </tbody> </table> | Byte 1 bit | Description | Code | Source | 0 | Overflow level alarm | 192 | System | 1 | High-level alarm | 191 | System | 2 | Alarm-level alarm | 190 | System | 3 | Dry running | 57 | System | 4 | Mains fault | 6 | System | 5 | Float switch sequence inconsistency | 205 | System | 6 | Inconsistency between float switches and sensors | 204 | System | 7 | Signal fault, level sensor | 189 | AI, level sensor |
| Byte 1 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Overflow level alarm | 192 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | High-level alarm | 191 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Alarm-level alarm | 190 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Dry running | 57 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Mains fault | 6 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Float switch sequence inconsistency | 205 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Inconsistency between float switches and sensors | 204 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Signal fault, level sensor | 189 | AI, level sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 2 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Signal fault, flow sensor</td> <td>169</td> <td>AI, flow sensor</td> </tr> <tr> <td>1</td> <td>Signal fault, power meter sensor</td> <td>186</td> <td>AI, power sensor</td> </tr> <tr> <td>2</td> <td>Fault, mixer-contactor feedback</td> <td>221</td> <td>DI, mixer contactor</td> </tr> <tr> <td>3</td> <td>Communication fault, I/O module</td> <td>226</td> <td>IO 351</td> </tr> <tr> <td>4</td> <td>CIM fault, Communication Interface Module</td> <td>159</td> <td>Add-on CIM</td> </tr> <tr> <td>5</td> <td>SIM card fault</td> <td>160</td> <td>Add-on CIM</td> </tr> <tr> <td>6</td> <td>Communication fault, main system, SCADA</td> <td>15</td> <td>System</td> </tr> <tr> <td>7</td> <td>Power-on notice</td> <td>247</td> <td>System</td> </tr> </tbody> </table> | Byte 2 bit | Description | Code | Source | 0 | Signal fault, flow sensor | 169 | AI, flow sensor | 1 | Signal fault, power meter sensor | 186 | AI, power sensor | 2 | Fault, mixer-contactor feedback | 221 | DI, mixer contactor | 3 | Communication fault, I/O module | 226 | IO 351 | 4 | CIM fault, Communication Interface Module | 159 | Add-on CIM | 5 | SIM card fault | 160 | Add-on CIM | 6 | Communication fault, main system, SCADA | 15 | System | 7 | Power-on notice | 247 | System |
| Byte 2 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Signal fault, flow sensor | 169 | AI, flow sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Signal fault, power meter sensor | 186 | AI, power sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault, mixer-contactor feedback | 221 | DI, mixer contactor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Communication fault, I/O module | 226 | IO 351 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | CIM fault, Communication Interface Module | 159 | Add-on CIM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | SIM card fault | 160 | Add-on CIM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Communication fault, main system, SCADA | 15 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Power-on notice | 247 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | DCLCPitAlarmBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 3 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Fault, battery or UPS fault</td> <td>248</td> <td>Battery/UPS</td> </tr> <tr> <td>1</td> <td>Hardware fault (general)</td> <td>72</td> <td>CU 36X/IO 351</td> </tr> <tr> <td>2</td> <td>Ethernet: No IP address from DHCP server</td> <td>231</td> <td>System</td> </tr> <tr> <td>3</td> <td>Ethernet: Auto-disabled due to misuse</td> <td>232</td> <td>System</td> </tr> <tr> <td>4</td> <td>Time for service, mixer</td> <td>222</td> <td>Mixer</td> </tr> <tr> <td>5</td> <td>Maximum number of mixer starts per hour exceeded</td> <td>223</td> <td>System</td> </tr> <tr> <td>6</td> <td>User-defined relay has been forced</td> <td>246</td> <td>CU 36X</td> </tr> <tr> <td>7</td> <td>RESERVED</td> <td>-</td> <td>-</td> </tr> </tbody> </table> | Byte 3 bit | Description | Code | Source | 0 | Fault, battery or UPS fault | 248 | Battery/UPS | 1 | Hardware fault (general) | 72 | CU 36X/IO 351 | 2 | Ethernet: No IP address from DHCP server | 231 | System | 3 | Ethernet: Auto-disabled due to misuse | 232 | System | 4 | Time for service, mixer | 222 | Mixer | 5 | Maximum number of mixer starts per hour exceeded | 223 | System | 6 | User-defined relay has been forced | 246 | CU 36X | 7 | RESERVED | - | - |
| Byte 3 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Fault, battery or UPS fault | 248 | Battery/UPS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Hardware fault (general) | 72 | CU 36X/IO 351 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Ethernet: No IP address from DHCP server | 231 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ethernet: Auto-disabled due to misuse | 232 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Time for service, mixer | 222 | Mixer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Maximum number of mixer starts per hour exceeded | 223 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | User-defined relay has been forced | 246 | CU 36X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | RESERVED | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 4 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>External fault signal</td> <td>3</td> <td>System</td> </tr> <tr> <td>1</td> <td>Combi event 1</td> <td>227</td> <td>System</td> </tr> <tr> <td>2</td> <td>Combi event 2</td> <td>227</td> <td>System</td> </tr> <tr> <td>3</td> <td>Combi event 3</td> <td>227</td> <td>System</td> </tr> <tr> <td>4</td> <td>Combi event 4</td> <td>227</td> <td>System</td> </tr> <tr> <td>5</td> <td>Signal fault, user-defined sensor 1</td> <td>188</td> <td>AI, user-defined sensor 1</td> </tr> <tr> <td>6</td> <td>Signal fault, user-defined sensor 2</td> <td>188</td> <td>AI, user-defined sensor 2</td> </tr> <tr> <td>7</td> <td>Signal fault, user-defined sensor 3</td> <td>188</td> <td>AI, user-defined sensor 3</td> </tr> </tbody> </table> | Byte 4 bit | Description | Code | Source | 0 | External fault signal | 3 | System | 1 | Combi event 1 | 227 | System | 2 | Combi event 2 | 227 | System | 3 | Combi event 3 | 227 | System | 4 | Combi event 4 | 227 | System | 5 | Signal fault, user-defined sensor 1 | 188 | AI, user-defined sensor 1 | 6 | Signal fault, user-defined sensor 2 | 188 | AI, user-defined sensor 2 | 7 | Signal fault, user-defined sensor 3 | 188 | AI, user-defined sensor 3 |
| Byte 4 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | External fault signal | 3 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Combi event 1 | 227 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Combi event 2 | 227 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Combi event 3 | 227 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Combi event 4 | 227 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Signal fault, user-defined sensor 1 | 188 | AI, user-defined sensor 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Signal fault, user-defined sensor 2 | 188 | AI, user-defined sensor 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Signal fault, user-defined sensor 3 | 188 | AI, user-defined sensor 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Module | Name | Data type | Unit | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-----------|------------|---|---|-------------|---------------------|--------|---|--|-----|---------------------|---|--|-----|-------------------|---|---|-----|---------------|---|--|-----|--------------|---|--|-----|--------------|---|---|-----|--------------|---|---------------------------------|-----|---------------|---|--|-----|------------|
| 51 | DCLCPitAlarmBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 5 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Signal fault, pressure sensor, outlet line</td> <td>168</td> <td>AI, pressure sensor</td> </tr> <tr> <td>1</td> <td>Water on floor</td> <td>229</td> <td>DI</td> </tr> <tr> <td>2</td> <td>Gas detected</td> <td>235</td> <td>DI</td> </tr> <tr> <td>3</td> <td>User-defined event 1</td> <td>249</td> <td>User-defined</td> </tr> <tr> <td>4</td> <td>User-defined event 2</td> <td>250</td> <td>User-defined</td> </tr> <tr> <td>5</td> <td>User-defined event 3</td> <td>251</td> <td>User-defined</td> </tr> <tr> <td>6</td> <td>User-defined event 4</td> <td>252</td> <td>User-defined</td> </tr> <tr> <td>7</td> <td>Sensor fault, Hydrogen sulphide (H₂S)</td> <td>118</td> <td>System</td> </tr> </tbody> </table> | Byte 5 bit | Description | Code | Source | 0 | Signal fault, pressure sensor, outlet line | 168 | AI, pressure sensor | 1 | Water on floor | 229 | DI | 2 | Gas detected | 235 | DI | 3 | User-defined event 1 | 249 | User-defined | 4 | User-defined event 2 | 250 | User-defined | 5 | User-defined event 3 | 251 | User-defined | 6 | User-defined event 4 | 252 | User-defined | 7 | Sensor fault, Hydrogen sulphide (H ₂ S) | 118 | System |
| | | | | Byte 5 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Signal fault, pressure sensor, outlet line | 168 | AI, pressure sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Water on floor | 229 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Gas detected | 235 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | User-defined event 1 | 249 | User-defined | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | User-defined event 2 | 250 | User-defined | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | User-defined event 3 | 251 | User-defined | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | User-defined event 4 | 252 | User-defined | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7 | Sensor fault, Hydrogen sulphide (H ₂ S) | 118 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 6 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Dosing pump not ready</td> <td>102</td> <td>System</td> </tr> <tr> <td>1</td> <td>Emergency stop</td> <td>103</td> <td>System</td> </tr> <tr> <td>2</td> <td>Too many grinder reversals or failed reversal attempt</td> <td>115</td> <td>Grinder</td> </tr> <tr> <td>3</td> <td>Overtemperature of motor for grinder</td> <td>116</td> <td>Grinder</td> </tr> <tr> <td>4</td> <td>Intrusion, door opened</td> <td>117</td> <td>System</td> </tr> </tbody> </table> | Byte 6 bit | Description | Code | Source | 0 | Dosing pump not ready | 102 | System | 1 | Emergency stop | 103 | System | 2 | Too many grinder reversals or failed reversal attempt | 115 | Grinder | 3 | Overtemperature of motor for grinder | 116 | Grinder | 4 | Intrusion, door opened | 117 | System | | | | | | | | | | | | |
| | | | | Byte 6 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Dosing pump not ready | 102 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Emergency stop | 103 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Too many grinder reversals or failed reversal attempt | 115 | Grinder | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Overtemperature of motor for grinder | 116 | Grinder | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Intrusion, door opened | 117 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All active pump alarms in the Dedicated Controls system. The pump in question is selected by PumpIndex (module 111). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | DCLCPumpAlarmBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 1 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Thermal relay 1 in motor, for example Klixon</td> <td>69</td> <td>IO 113</td> </tr> <tr> <td>1</td> <td>Thermal relay 2 in motor, for example thermistor</td> <td>70</td> <td>IO 351/MP 204/CUE</td> </tr> <tr> <td>2</td> <td>Motor-stator temperature high (T1, Pt1000/Pt100)</td> <td>64</td> <td>IO 113/CUE</td> </tr> <tr> <td>3</td> <td>Motor stator temperature high (T2, Pt1000/Pt100)</td> <td>71</td> <td>MP 204</td> </tr> <tr> <td>4</td> <td>Motor support-bearing temperature high (Pt100)</td> <td>145</td> <td>IO 113</td> </tr> <tr> <td>5</td> <td>Motor main-bearing temperature high (Pt100)</td> <td>146</td> <td>IO 113</td> </tr> <tr> <td>6</td> <td>Motor-insulation resistance low</td> <td>20</td> <td>IO 113/MP 204</td> </tr> <tr> <td>7</td> <td>Undervoltage</td> <td>40</td> <td>MP 204/CUE</td> </tr> </tbody> </table> | Byte 1 bit | Description | Code | Source | 0 | Thermal relay 1 in motor, for example Klixon | 69 | IO 113 | 1 | Thermal relay 2 in motor, for example thermistor | 70 | IO 351/MP 204/CUE | 2 | Motor-stator temperature high (T1, Pt1000/Pt100) | 64 | IO 113/CUE | 3 | Motor stator temperature high (T2, Pt1000/Pt100) | 71 | MP 204 | 4 | Motor support-bearing temperature high (Pt100) | 145 | IO 113 | 5 | Motor main-bearing temperature high (Pt100) | 146 | IO 113 | 6 | Motor-insulation resistance low | 20 | IO 113/MP 204 | 7 | Undervoltage | 40 | MP 204/CUE |
| | | | | Byte 1 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Thermal relay 1 in motor, for example Klixon | 69 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Thermal relay 2 in motor, for example thermistor | 70 | IO 351/MP 204/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Motor-stator temperature high (T1, Pt1000/Pt100) | 64 | IO 113/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | Motor stator temperature high (T2, Pt1000/Pt100) | 71 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | Motor support-bearing temperature high (Pt100) | 145 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | Motor main-bearing temperature high (Pt100) | 146 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | Motor-insulation resistance low | 20 | IO 113/MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7 | Undervoltage | 40 | MP 204/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 2 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Overvoltage</td> <td>32</td> <td>MP 204/CUE</td> </tr> <tr> <td>1</td> <td>Phase sequence reversal</td> <td>9</td> <td>MP 204</td> </tr> <tr> <td>2</td> <td>Overload</td> <td>48</td> <td>AI/MP 204/CUE</td> </tr> <tr> <td>3</td> <td>Underload</td> <td>56</td> <td>AI/MP 204</td> </tr> <tr> <td>4</td> <td>External motor protector activated</td> <td>27</td> <td>DI</td> </tr> <tr> <td>5</td> <td>Missing phase</td> <td>2</td> <td>MP 204/CUE</td> </tr> <tr> <td>6</td> <td>Current asymmetry</td> <td>111</td> <td>MP 204</td> </tr> <tr> <td>7</td> <td>Load continues even if the motor has been switched off</td> <td>26</td> <td>MP 204</td> </tr> </tbody> </table> | Byte 2 bit | Description | Code | Source | 0 | Overvoltage | 32 | MP 204/CUE | 1 | Phase sequence reversal | 9 | MP 204 | 2 | Overload | 48 | AI/MP 204/CUE | 3 | Underload | 56 | AI/MP 204 | 4 | External motor protector activated | 27 | DI | 5 | Missing phase | 2 | MP 204/CUE | 6 | Current asymmetry | 111 | MP 204 | 7 | Load continues even if the motor has been switched off | 26 | MP 204 |
| | | | | Byte 2 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Overvoltage | 32 | MP 204/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Phase sequence reversal | 9 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Overload | 48 | AI/MP 204/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Underload | 56 | AI/MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | External motor protector activated | 27 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Missing phase | 2 | MP 204/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Current asymmetry | 111 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Load continues even if the motor has been switched off | 26 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Module | Name | Data type | Unit | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---|-----------|-------------------------------|---|---|-------------|------------------------|--------|---|---|-----|------------------------|---|--------------------------------------|-----|------------------------|---|---|-----|-------------------------------|---|----------------------------------|-----|--------------------|---|---|-----|-----------|---|---|-----|--------|-----|--|-----|--------|---|---|-----|--------|
| 117 | DCLCPumpAlarmBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 3 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr><td>0</td><td>Motor-protector commanded test trip</td><td>18</td><td>MP 204</td></tr> <tr><td>1</td><td>Motor-phase failure</td><td>241</td><td>DI/CUE</td></tr> <tr><td>2</td><td>Moisture switch alarm, digital</td><td>22</td><td>IO 113</td></tr> <tr><td>3</td><td>Motor/pump vibration high</td><td>24</td><td>IO 113</td></tr> <tr><td>4</td><td>Water-in-oil fault, motor oil</td><td>11</td><td>AI/IO 113</td></tr> <tr><td>5</td><td>Mains fault</td><td>6</td><td>DI</td></tr> <tr><td>6</td><td>Fault, motor-contactor feedback</td><td>220</td><td>DI</td></tr> <tr><td>7</td><td>Too many motor starts per hour</td><td>21</td><td>System</td></tr> </tbody> </table> | Byte 3 bit | Description | Code | Source | 0 | Motor-protector commanded test trip | 18 | MP 204 | 1 | Motor-phase failure | 241 | DI/CUE | 2 | Moisture switch alarm, digital | 22 | IO 113 | 3 | Motor/pump vibration high | 24 | IO 113 | 4 | Water-in-oil fault, motor oil | 11 | AI/IO 113 | 5 | Mains fault | 6 | DI | 6 | Fault, motor-contactor feedback | 220 | DI | 7 | Too many motor starts per hour | 21 | System |
| | | | | Byte 3 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Motor-protector commanded test trip | 18 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Motor-phase failure | 241 | DI/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Moisture switch alarm, digital | 22 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | Motor/pump vibration high | 24 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | Water-in-oil fault, motor oil | 11 | AI/IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | Mains fault | 6 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | Fault, motor-contactor feedback | 220 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7 | Too many motor starts per hour | 21 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 4 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr><td>0</td><td>Time for service, general service information</td><td>12</td><td>System</td></tr> <tr><td>1</td><td>Too many pump auto-restarts per 24 h</td><td>4</td><td>MP 204</td></tr> <tr><td>2</td><td>Low pump flow</td><td>58</td><td>System</td></tr> <tr><td>3</td><td>Pump continuous runtime too long</td><td>245</td><td>System</td></tr> <tr><td>4</td><td>Cos(ϕ) too high</td><td>112</td><td>MP 204</td></tr> <tr><td>5</td><td>Cos(ϕ) too low</td><td>113</td><td>MP 204</td></tr> <tr><td>6-7</td><td>RESERVED</td><td>-</td><td>-</td></tr> </tbody> </table> | Byte 4 bit | Description | Code | Source | 0 | Time for service, general service information | 12 | System | 1 | Too many pump auto-restarts per 24 h | 4 | MP 204 | 2 | Low pump flow | 58 | System | 3 | Pump continuous runtime too long | 245 | System | 4 | Cos(ϕ) too high | 112 | MP 204 | 5 | Cos(ϕ) too low | 113 | MP 204 | 6-7 | RESERVED | - | - | | | | |
| | | | | Byte 4 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Time for service, general service information | 12 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Too many pump auto-restarts per 24 h | 4 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Low pump flow | 58 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | Pump continuous runtime too long | 245 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | Cos(ϕ) too high | 112 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | Cos(ϕ) too low | 113 | MP 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6-7 | RESERVED | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 5 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr><td>0</td><td>Pump fault, due to auxiliary component or general fault</td><td>224</td><td>System</td></tr> <tr><td>1</td><td>Communication fault, pump module</td><td>225</td><td>IO 113</td></tr> <tr><td>2</td><td>Motor relay has been forced (manually operated/commanded)</td><td>243</td><td>DI</td></tr> <tr><td>3</td><td>Signal fault, Pt100 sensor</td><td>175</td><td>IO 113/MP 204/CUE</td></tr> <tr><td>4</td><td>Signal fault, PTC sensor, short-circuited</td><td>181</td><td>IO 113</td></tr> <tr><td>5</td><td>Signal fault, water-in-oil (WIO) sensor</td><td>170</td><td>AI</td></tr> <tr><td>6</td><td>Signal fault, motor support-bearing temperature sensor</td><td>179</td><td>IO 113</td></tr> <tr><td>7</td><td>Signal fault, motor main-bearing temperature sensor</td><td>180</td><td>IO 113</td></tr> </tbody> </table> | Byte 5 bit | Description | Code | Source | 0 | Pump fault, due to auxiliary component or general fault | 224 | System | 1 | Communication fault, pump module | 225 | IO 113 | 2 | Motor relay has been forced (manually operated/commanded) | 243 | DI | 3 | Signal fault, Pt100 sensor | 175 | IO 113/MP 204/CUE | 4 | Signal fault, PTC sensor, short-circuited | 181 | IO 113 | 5 | Signal fault, water-in-oil (WIO) sensor | 170 | AI | 6 | Signal fault, motor support-bearing temperature sensor | 179 | IO 113 | 7 | Signal fault, motor main-bearing temperature sensor | 180 | IO 113 |
| | | | | Byte 5 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Pump fault, due to auxiliary component or general fault | 224 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Communication fault, pump module | 225 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Motor relay has been forced (manually operated/commanded) | 243 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | Signal fault, Pt100 sensor | 175 | IO 113/MP 204/CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | Signal fault, PTC sensor, short-circuited | 181 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | Signal fault, water-in-oil (WIO) sensor | 170 | AI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | Signal fault, motor support-bearing temperature sensor | 179 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7 | Signal fault, motor main-bearing temperature sensor | 180 | IO 113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 6 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr><td>0</td><td>Communication fault, pump</td><td>10</td><td>IO 113, pump no [1; 6]</td></tr> <tr><td>1</td><td>Setup conflict</td><td>25</td><td>IO 113, pump no [1; 6]</td></tr> <tr><td>2</td><td>Hardware fault (general)</td><td>72</td><td>IO 113/MP 204, pump no [1; 6]</td></tr> <tr><td>3</td><td>Sensor fault, motor current</td><td>88</td><td>AI, pump no [1; 6]</td></tr> <tr><td>4</td><td>Inrush fault</td><td>155</td><td>CUE</td></tr> <tr><td>5</td><td>Signal fault, sensor 2</td><td>93</td><td>CUE</td></tr> <tr><td>6</td><td>Motor-bearing temperature high (Pt100) in drive end (DE)</td><td>148</td><td>CUE</td></tr> <tr><td>7</td><td>Motor-bearing temperature high (Pt100) in non-drive end (NDE)</td><td>149</td><td>CUE</td></tr> </tbody> </table> | Byte 6 bit | Description | Code | Source | 0 | Communication fault, pump | 10 | IO 113, pump no [1; 6] | 1 | Setup conflict | 25 | IO 113, pump no [1; 6] | 2 | Hardware fault (general) | 72 | IO 113/MP 204, pump no [1; 6] | 3 | Sensor fault, motor current | 88 | AI, pump no [1; 6] | 4 | Inrush fault | 155 | CUE | 5 | Signal fault, sensor 2 | 93 | CUE | 6 | Motor-bearing temperature high (Pt100) in drive end (DE) | 148 | CUE | 7 | Motor-bearing temperature high (Pt100) in non-drive end (NDE) | 149 | CUE |
| | | | | Byte 6 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Communication fault, pump | 10 | IO 113, pump no [1; 6] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Setup conflict | 25 | IO 113, pump no [1; 6] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Hardware fault (general) | 72 | IO 113/MP 204, pump no [1; 6] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Sensor fault, motor current | 88 | AI, pump no [1; 6] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Inrush fault | 155 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Signal fault, sensor 2 | 93 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Motor-bearing temperature high (Pt100) in drive end (DE) | 148 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Motor-bearing temperature high (Pt100) in non-drive end (NDE) | 149 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Module | Name | Data type | Unit | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|----------------------------------|-----------|--------|---|--|-------------|--------|--------|---|-------------------------------------|----|-----|---|--|-----|-----|---|-----------------------------------|----|-----|---|----------------------------------|-----|--------|---|---|----|-----|---|---|----|--------|---|--|-----|-----|---|--|-----|-----|
| 117 | DCLCPumpAlarmBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 7 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Leakage current</td> <td>1</td> <td>CUE</td> </tr> <tr> <td>1</td> <td>Signal fault, temperature 3 sensor (t_mo3)</td> <td>176</td> <td>CUE</td> </tr> <tr> <td>2</td> <td>Signal fault, (feedback) sensor 1</td> <td>89</td> <td>CUE</td> </tr> <tr> <td>3</td> <td>Overcurrent (i_line, i_dc, i_mo)</td> <td>49</td> <td>CUE</td> </tr> <tr> <td>4</td> <td>Motor current protection activated, MCP</td> <td>55</td> <td>CUE</td> </tr> <tr> <td>5</td> <td>Change bearings, specific service information</td> <td>30</td> <td>CUE</td> </tr> <tr> <td>6</td> <td>Lubricate bearings, specific service information</td> <td>240</td> <td>CUE</td> </tr> <tr> <td>7</td> <td>Automatic motor-model recognition failed</td> <td>242</td> <td>CUE</td> </tr> </tbody> </table> | Byte 7 bit | Description | Code | Source | 0 | Leakage current | 1 | CUE | 1 | Signal fault, temperature 3 sensor (t_mo3) | 176 | CUE | 2 | Signal fault, (feedback) sensor 1 | 89 | CUE | 3 | Overcurrent (i_line, i_dc, i_mo) | 49 | CUE | 4 | Motor current protection activated, MCP | 55 | CUE | 5 | Change bearings, specific service information | 30 | CUE | 6 | Lubricate bearings, specific service information | 240 | CUE | 7 | Automatic motor-model recognition failed | 242 | CUE |
| | | | | Byte 7 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Leakage current | 1 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Signal fault, temperature 3 sensor (t_mo3) | 176 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Signal fault, (feedback) sensor 1 | 89 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | Overcurrent (i_line, i_dc, i_mo) | 49 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | Motor current protection activated, MCP | 55 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | Change bearings, specific service information | 30 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | Lubricate bearings, specific service information | 240 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7 | Automatic motor-model recognition failed | 242 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 8 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Communication fault, twin-head pump</td> <td>77</td> <td>CUE</td> </tr> <tr> <td>1</td> <td>Signal fault, temperature 1 sensor</td> <td>91</td> <td>CUE</td> </tr> <tr> <td>2</td> <td>Dry running</td> <td>57</td> <td>CUE</td> </tr> <tr> <td>3</td> <td>VFD not ready</td> <td>213</td> <td>IO 351</td> </tr> <tr> <td>4</td> <td>Other</td> <td>16</td> <td>CUE</td> </tr> <tr> <td>5</td> <td>Blocked motor or pump</td> <td>51</td> <td>System</td> </tr> <tr> <td>6</td> <td>Signal fault, power meter sensor</td> <td>186</td> <td>AI</td> </tr> <tr> <td>7</td> <td>RESERVED</td> <td>-</td> <td>-</td> </tr> </tbody> </table> | Byte 8 bit | Description | Code | Source | 0 | Communication fault, twin-head pump | 77 | CUE | 1 | Signal fault, temperature 1 sensor | 91 | CUE | 2 | Dry running | 57 | CUE | 3 | VFD not ready | 213 | IO 351 | 4 | Other | 16 | CUE | 5 | Blocked motor or pump | 51 | System | 6 | Signal fault, power meter sensor | 186 | AI | 7 | RESERVED | - | - |
| | | | | Byte 8 bit | Description | Code | Source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | Communication fault, twin-head pump | 77 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | Signal fault, temperature 1 sensor | 91 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | Dry running | 57 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | VFD not ready | 213 | IO 351 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Other | 16 | CUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Blocked motor or pump | 51 | System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Signal fault, power meter sensor | 186 | AI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | RESERVED | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | DCLCPumpWarningBits | 10 | Bits | <p>All active pump warnings in the Dedicated Controls system. The pump in question is selected by PumpIndex (module 111). Bit description is identical to DCLCPumpAlarmBits (module 117).</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

7.12 Level Control (LC 2X1), alarms and warnings

7.12.1 Level Control (LC 2X1), general alarm and warning behaviour

All alarms and warnings can be of acknowledge type "Auto" or "Manual".

If the acknowledge type is "Auto", for the event in question, LC 2X1 does not use any restart delay for the pumps. A pump restarts immediately when the alarm condition that caused its stop disappears. The belonging alarm and warning modules and the display indication are also reset automatically.

If the acknowledge type is "Manual", for the event in question, LC 2X1 remains in alarm or warning state when the alarm or warning condition disappears. No pump is auto-restarted. The belonging alarm or warning indication in data modules remain and so will the display indication. A ResetAlarm command or an alarm acknowledgement via the LC 2X1 display is necessary to clear the alarm or warning indication.

7.12.2 Level Control (LC 2X1), alarm and warning modules

| Module | Name | Data type | Unit | Description |
|--------|---------------------|-----------|------|---|
| 49 | AlarmCode | 5 | Enum | Code for active alarm in wastewater Level Control, LC 2X1. Prioritised. See code description in section 7.12.3 Level Control (LC 2X1), alarm and warning . |
| 50 | WarningCode | 5 | Enum | Code for active warning in wastewater Level Control, LC 2X1. Prioritised. See code description in section 7.12.3 Level Control (LC 2X1), alarm and warning . |
| 51 | DCLCPitAlarmBits | 10 | Bits | All active system alarms in wastewater Level Control, LC 2X1. One bit for each alarm. See bit description in section 7.12.4 Level Control (LC 2X1), alarm and warning bits . |
| 52 | DCLCPitWarningBits | 10 | Bits | All active system warnings in wastewater Level Control, LC 2X1. One bit for each warning. See bit description in section 7.12.4 Level Control (LC 2X1), alarm and warning bits . |
| 57 | PitPumpsCommFault | 5 | Bits | Bits 0-1: Communication fault status for pumps 1 to 2. One bit for each pump. |
| 58 | PitPumpsAlarm | 5 | Bits | Bits 0-1: Alarm status for pumps 1 to 2. One bit for each pump. |
| 59 | PitPumpsWarning | 5 | Bits | Bits 0-1: Warning status for pumps 1 to 2. One bit for each pump. |
| 117 | DCLCPumpAlarmBits | 10 | Bits | All active pump alarms in wastewater Level Control, LC 2X1. One bit for each alarm. The pump in question is selected by PumpIndex (module 111). See bit description in section 7.12.4 Level Control (LC 2X1), alarm and warning bits . |
| 118 | DCLCPumpWarningBits | 10 | Bits | All active pump warnings in wastewater Level Control, LC 2X1. One bit for each warning. The pump in question is selected by PumpIndex (module 111). See bit description in section 7.12.4 Level Control (LC 2X1), alarm and warning bits . |

7.12.3 Level Control (LC 2X1), alarm and warning

The codes below are used for data module 49, AlarmCode, and 50, WarningCode.

| Code | Description of alarm and warning | Source of the alarm and warning |
|------|--|---------------------------------|
| 2 | Missing phase | Pump module |
| 4 | Too many pump auto-restarts per 24 h | Pump module |
| 9 | Phase sequence reversal | Pump module |
| 12 | Time for service | - |
| 22 | Moisture switch alarm, digital | Pump module |
| 25 | Setup conflict | System hardware |
| 48 | Overload | Pump module |
| 57 | Dry running | System |
| 69 | Thermal relay 1 in motor, for example Klixon | Pump module |
| 72 | Hardware fault (general) | Pump module |
| 76 | Internal communication failure | System hardware |
| 84 | Memory-access error | System hardware |
| 85 | Parameter-verification error (EEPROM) | Pump module |
| 117 | Intrusion (open door) | System |
| 159 | CIM fault (Communication Interface Module) | System hardware |
| 163 | Setup conflict, current measurement | Pump module |
| 165 | Signal fault, user-defined sensor 1 | AI (user-defined sensor 1) |
| 190 | Alarm-level alarm | System |
| 191 | High-level alarm (limit exceeded, sensor 2) | System |
| 205 | Float switch sequence inconsistency | System |
| 225 | Communication fault, pump module | Pump module |
| 226 | Communication fault, I/O module | IO 241 |
| 229 | Water on floor | System |
| 249 | User-defined event 1 | User-defined |
| 250 | User-defined event 2 | User-defined |

7.12.4 Level Control (LC 2X1), alarm and warning bits

| Module | Name | Data type | Unit | Description | | | | | | | |
|-------------------|-------------------------|-------------|-----------------|---|-------------------------------------|-------------|----------------------------|--|--|-------------|-----------------|
| 51 | DCLCPitAlarmBits | 10 | Bits | All active system alarms in the Level Control system. | | | | | | | |
| | | | | Byte 1 bit | Description | Code | Source | | | | |
| | | | | 1 | High-level alarm | 191 | System | | | | |
| | | | | 3 | Dry running | 57 | System | | | | |
| | | | | 5 | Float switch sequence inconsistency | 205 | System | | | | |
| | | | | Byte 2 bit | Description | Code | Source | | | | |
| | | | | 3 | Communication fault, I/O module | 226 | IO 241/IO 242 | | | | |
| | | | | Byte 4 bit | Description | Code | Source | | | | |
| | | | | 5 | Signal fault, user-defined sensor 1 | 165 | AI (user-defined sensor 1) | | | | |
| | | | | Byte 5 bit | Description | Code | Source | | | | |
| | | | | 3 | User-defined event 1 | 249 | User-defined | | | | |
| | | | | 4 | User-defined event 2 | 250 | User-defined | | | | |
| | | | | Byte 6 bit | Description | Code | Source | | | | |
| | | | | 6 | Internal communication failure | 76 | System hardware | | | | |
| | | | | 7 | Setup conflict | 25 | System hardware | | | | |
| | | | | 52 | DCLCPitWarningBits | 10 | Bits | System warnings in Level Control, LC 2X1 | | | |
| | | | | | | | | Byte 2 Bit | Description | Code | Source |
| | | | | | | | | 4 | CIM fault (Communication Interface Module) | 159 | System hardware |
| | | | | | | | | Byte 5 Bit | Description | Code | Source |
| 1 | Water on floor | 229 | System | | | | | | | | |
| 3 | User-defined event 1 | 249 | User-defined | | | | | | | | |
| 4 | User-defined event 2 | 250 | User-defined | | | | | | | | |
| Byte 6 Bit | Description | Code | Source | | | | | | | | |
| 4 | Intrusion (door opened) | 117 | System | | | | | | | | |
| 5 | Memory-access error | 84 | System hardware | | | | | | | | |

| Module | Name | Data type | Unit | Description | | | | | | | | | | | | | | | | |
|------------|--|-----------|-------------|--|------------|-------------|------|--------|---|--|-----|-------------|---|---------------------------------------|----|-------------|---|---------------|---|-------------|
| | | | | All active pump alarms in the Level Control system. The pump in question is selected by PumpIndex (module 111). | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 1 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Thermal relay 1 in motor, for example Klixon</td> <td>69</td> <td>Pump module</td> </tr> </tbody> </table> | Byte 1 bit | Description | Code | Source | 0 | Thermal relay 1 in motor, for example Klixon | 69 | Pump module | | | | | | | | |
| Byte 1 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 0 | Thermal relay 1 in motor, for example Klixon | 69 | Pump module | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 2 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Phase sequence reversal</td> <td>9</td> <td>Pump module</td> </tr> <tr> <td>2</td> <td>Overload</td> <td>48</td> <td>Pump module</td> </tr> <tr> <td>5</td> <td>Missing phase</td> <td>2</td> <td>Pump module</td> </tr> </tbody> </table> | Byte 2 bit | Description | Code | Source | 1 | Phase sequence reversal | 9 | Pump module | 2 | Overload | 48 | Pump module | 5 | Missing phase | 2 | Pump module |
| Byte 2 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 1 | Phase sequence reversal | 9 | Pump module | | | | | | | | | | | | | | | | | |
| 2 | Overload | 48 | Pump module | | | | | | | | | | | | | | | | | |
| 5 | Missing phase | 2 | Pump module | | | | | | | | | | | | | | | | | |
| 117 | DCLCPumpAlarmBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 3 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Moisture switch alarm, digital</td> <td>22</td> <td>Pump module</td> </tr> </tbody> </table> | Byte 3 bit | Description | Code | Source | 2 | Moisture switch alarm, digital | 22 | Pump module | | | | | | | | |
| Byte 3 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 2 | Moisture switch alarm, digital | 22 | Pump module | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 4 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Too many pump auto-restarts (per 24 h)</td> <td>4</td> <td>Pump module</td> </tr> <tr> <td>6</td> <td>Parameter-verification error (EEPROM)</td> <td>85</td> <td>Pump module</td> </tr> </tbody> </table> | Byte 4 bit | Description | Code | Source | 1 | Too many pump auto-restarts (per 24 h) | 4 | Pump module | 6 | Parameter-verification error (EEPROM) | 85 | Pump module | | | | |
| Byte 4 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 1 | Too many pump auto-restarts (per 24 h) | 4 | Pump module | | | | | | | | | | | | | | | | | |
| 6 | Parameter-verification error (EEPROM) | 85 | Pump module | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 5 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Communication fault, pump module</td> <td>225</td> <td>Pump module</td> </tr> </tbody> </table> | Byte 5 bit | Description | Code | Source | 1 | Communication fault, pump module | 225 | Pump module | | | | | | | | |
| Byte 5 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 1 | Communication fault, pump module | 225 | Pump module | | | | | | | | | | | | | | | | | |
| | | | | <table border="1"> <thead> <tr> <th>Byte 6 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Setup conflict, current measurement</td> <td>163</td> <td>Pump module</td> </tr> <tr> <td>2</td> <td>Hardware fault (general)</td> <td>72</td> <td>Pump module</td> </tr> </tbody> </table> | Byte 6 bit | Description | Code | Source | 1 | Setup conflict, current measurement | 163 | Pump module | 2 | Hardware fault (general) | 72 | Pump module | | | | |
| Byte 6 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 1 | Setup conflict, current measurement | 163 | Pump module | | | | | | | | | | | | | | | | | |
| 2 | Hardware fault (general) | 72 | Pump module | | | | | | | | | | | | | | | | | |
| | | | | Pump warnings in Level Control, LC 2X1 | | | | | | | | | | | | | | | | |
| 118 | DCLCPumpWarningBits | 10 | Bits | <table border="1"> <thead> <tr> <th>Byte 4 bit</th> <th>Description</th> <th>Code</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Time for service</td> <td>12</td> <td>-</td> </tr> </tbody> </table> | Byte 4 bit | Description | Code | Source | 0 | Time for service | 12 | - | | | | | | | | |
| Byte 4 bit | Description | Code | Source | | | | | | | | | | | | | | | | | |
| 0 | Time for service | 12 | - | | | | | | | | | | | | | | | | | |

7.13 AUTO_{ADAPT} system (CIU XX2), alarms and warnings

7.13.1 AUTO_{ADAPT} systems (CIU XX2), general alarm and warning behaviour

A pump will automatically restart after an alarm when the alarm condition disappears. Overcurrent is not detected before the pump attempts to restart. To prevent rapid and continuous switching out and in of a pump due to an overcurrent alarm appearing and disappearing, the pump uses an overcurrent alarm restart-delay with a fixed factory value of 5 minutes.

All other alarm conditions can be detected while the pump is stopped. A value hysteresis for the measured voltage and temperature values eliminates continuous switching in and out in these situations.

7.13.2 AUTO_{ADAPT} systems (CIU XX2), alarm and warning modules

| Module | Name | Data type | Unit | Description |
|--------|-------------------|-----------|------|--|
| 49 | AlarmCode | 5 | Enum | Code for active alarm in the AUTO _{ADAPT} wastewater system. Prioritised. See code description in section 7.13.3 AUTO_{ADAPT} systems (CIU XX2), alarm and warning codes . |
| 50 | WarningCode | 5 | Enum | Code for active warning in the AUTO _{ADAPT} wastewater system. Prioritised. See code description in section 7.13.3 AUTO_{ADAPT} systems (CIU XX2), alarm and warning codes . |
| 53 | AAPitAlarmBits | 6 | Bits | All active system alarms in the AUTO _{ADAPT} wastewater system. One bit for each alarm. See code description in section 7.13.4 AUTO_{ADAPT} systems (CIU XX2), alarm and warning bits . |
| 54 | AAPitWarningBits | 6 | Bits | All active system warnings in the AUTO _{ADAPT} wastewater system. One bit for each warning. See code description in section 7.13.4 AUTO_{ADAPT} systems (CIU XX2), alarm and warning bits . |
| 57 | PitPumpsCommFault | 5 | Bits | Bits 0-3: Communication fault status for pumps 1 to 4. One bit for each pump. |
| 58 | PitPumpsAlarm | 5 | Bits | Bits 0-3: Alarm status for pumps 1 to 4. One bit for each pump. |
| 59 | PitPumpsWarning | 5 | Bits | Bits 0-3: Warning status for pumps 1 to 4. One bit for each pump. |
| 119 | AAPumpAlarmBits | 6 | Bits | All active pump alarms in the AUTO _{ADAPT} wastewater system. One bit for each alarm. The pump in question is selected by PumpIndex (module 111). See code description in section 7.13.4 AUTO_{ADAPT} systems (CIU XX2), alarm and warning bits . |
| 120 | AAPumpWarningBits | 6 | Bits | All active pump warnings in the AUTO _{ADAPT} wastewater system. One bit for each warning. The pump in question is selected by PumpIndex (module 111). See code description in section 7.13.4 AUTO_{ADAPT} systems (CIU XX2), alarm and warning bits . |

7.13.3 AUTO_{ADAPT} systems (CIU XX2), alarm and warning codes

The codes below are used for data modules 49, AlarmCode, and 50, WarningCode.

| Code | Description of alarm and warning | Source of the alarm and warning |
|------|--|---------------------------------|
| 3 | External fault signal | Digital input, DI1 |
| 10 | Communication fault, pump | CIU XX2 |
| 25 | Setup conflict, parameter inconsistency | CIU XX2 |
| 82 | Verification error, code area (ROM, FLASH) | CIU XX2 |
| 83 | Verification error, FE parameter area (EEPROM) | CIU XX2 |
| 191 | Limit exceeded, sensor 2 (high level) | Digital input, DI0 |
| 230 | Network alarm | CIU XX2 |
| 236 | Pump 1 fault | Pump 1 |
| 237 | Pump 2 fault | Pump 2 |
| 238 | Pump 3 fault | Pump 3 |
| 239 | Pump 4 fault | Pump 4 |

7.13.4 AUTO_{ADAPT} systems (CIU XX2), alarm and warning bits

| Module | Name | Data type | Unit | Description | | | |
|--------|---------------------------|-----------|---------------|--|--|-------------|--------------------|
| 53 | AAPitAlarmBits | 6 | Bits | All active system alarms in the AUTO _{ADAPT} wastewater system. The pump in question is selected by PumpIndex (module 111). | | | |
| | | | | Byte 1 bit | Description | Code | Source |
| | | | | 0 | External fault signal | 3 | Digital input, DI1 |
| | | | | 1 | Communication fault, pump | 10 | CIU XX2 |
| | | | | 2 | Verification error, code area (ROM, FLASH) | 82 | CIU XX2 |
| | | | | 3 | Pump 1 fault | 236 | Pump 1 |
| | | | | 4 | Pump 2 fault | 237 | Pump 2 |
| | | | | 5 | Pump 3 fault | 238 | Pump 3 |
| | | | | 6 | Pump 4 fault | 239 | Pump 4 |
| | | | | 7 | High-level alarm | 191 | Digital input, DI0 |
| | | | | Byte 2 bit | Description | Code | Source |
| | | | | 0 | Setup conflict | 25 | CIU XX2 |
| | | | | 1 | Network alarm | 230 | CIU XX2 |
| | | | | 2 | Verification error, FE parameter area (EEPROM) | 83 | CIU XX2 |
| | | | | 3-7 | RESERVED | - | - |
| 54 | AAPitWarningBits | 6 | Bits | All active system warnings in the AUTO _{ADAPT} wastewater system. Same bit interpretation as AAPitAlarmBits (module 53). | | | |
| 119 | AAPumpAlarmBits | 6 | Bits | All active pump alarms in the AUTO _{ADAPT} wastewater system. The pump in question is selected by PumpIndex (module 111). | | | |
| | | | | Byte 1 bit | Description | Code | Source |
| | | | | 0 | Phase sequence reversal | 9 | Pump |
| | | | | 1 | Motor high voltage | 32 | Pump |
| | | | | 2 | Motor low voltage | 40 | Pump |
| | | | | 3 | Motor overload, maximum current exceeded | 48 | Pump |
| | | | | 4 | Blocked motor or pump | 51 | Pump |
| | | | | 5 | Dry running | 57 | Digital sensor |
| | | | | 6 | Motor temperature high | 65 | Pump |
| | | | | 7 | High temperature, control electronics | 66 | Pump |
| | | | | Byte 2 bit | Description | Code | Source |
| | | | | 0 | Thermal relay 1 in motor, for example Klixon | 69 | Pump |
| | | | | 1 | Thermal relay 2 in motor, for example thermistor | 70 | Pump |
| | | | | 2 | Verification error, code area (ROM, FLASH) | 82 | Pump |
| | | | | 3 | Verification error, FE parameter area (EEPROM) | 83 | Pump |
| 4 | Sensor fault | 88 | Analog sensor | | | | |
| 5 | High-water level exceeded | 191 | Analog sensor | | | | |
| 6 | Too many restarts | 4 | Pump | | | | |
| 7 | RESERVED | - | - | | | | |
| 120 | AAPumpWarningBits | 6 | Bits | All active pump warnings in the AUTO _{ADAPT} wastewater system. The pump in question is selected by PumpIndex (module 111). Bit description is identical to AAPumpAlarmBits (module 119). | | | |

7.14 Device identification (DeviceIdentification, module 142)

The data type is 10, non-standard.

| Byte | Name and description | |
|------|---|--|
| | UnitFamily [enumeration] | UnitType [enumeration] |
| | 1: UPE/MAGNA circulator pump | 5: UPE, 3-phase 7: MAGNA, 1-phase 9: MAGNA, 1-phase, small 10: MAGNA 3 |
| | 2: E-pump, 1-phase/3-phase, based on MGE motor or CUE frequency converter | 2: MGE, 1-phase 3: MGE, 3-phase 4: MGE, 3-phase, large 5: CUE frequency converter 6: MGE, 3-phase, model G 7: MGE, 3-phase, model H and later |
| | 7: MP 204 motor protector | 1: MP 204 |
| 1 | 17: Hydro Multi-E model G and earlier models | 1: With 3-phase pumps 2: With 1-phase pumps |
| | 21: Hydro MPC/Control MPC, Hydro Multi-B | 1: Hydro MPC/Control MPC, CU 351 2: Hydro Multi-B, CU 323 |
| | 25: CR Monitor | 1: CR Monitor, CU 351 |
| | 26: Dedicated Controls | 1: Dedicated Controls, CU 36X |
| | 28: CIU XX2 AUTO _{ADAPT} | 1: CIU XX2 |
| | 30: Smart Digital Dosing, DDA | 1: Smart Digital Dosing, DDA |
| | 28: MAGNA twin pump | 1: MAGNA3-D 2: MAGNA1-D |
| | 39: Hydro Multi-E model H and later models | 1: With 3-phase pumps 2: With 1-phase pumps |
| | 48: Wastewater level controller | 1: Modular type LC 241 2: Wall-mount type LC 231 |
| 2 | UnitType [enumeration] According to description above. | |
| 3 | UnitVersion [enumeration] Used by Grundfos. | |
| 4 | CIMSoftwareVersion [number] | |
| 5 | CIMSoftwareRevision [number] | |
| 6 | CIMModel [enumeration] | |

8. Product simulation

The CIM module can be put in product simulation mode in which case it will generate life-like simulated values of all the PROFIBUS/PROFINET input data modules.

It will thus be possible to connect a PROFIBUS/PROFINET master to a CIU 152 or CIU 502 without this device being connected to a real pump in a real-life system. In an office environment, it can then be verified that communication works and data is being received and handled correctly by the PROFIBUS/PROFINET master application program, for example PLC program, before the equipment is installed under real-life conditions.

8.1 CIM 150 product simulation

Product simulation mode is entered when the hexadecimal address switch has one of the values shown in the table below:

| Address setting. See section 5.4 Setting the PROFIBUS address | | Simulated product |
|---|-----|--------------------------------|
| SW3 | SW4 | |
| F | 0 | Pump profile |
| F | 1 | Booster-system profile |
| F | 2 | CR Monitor profile |
| F | 3 | MP 204 motor-protector profile |
| F | 4 | Digital Dosing DDA profile |
| F | 5 | Wastewater-system profile |

The effective address will be 15 (0x0F).

Only input modules are simulated. The data read has dummy values and no real product functionality is simulated.

8.2 CIM 500 product simulation

Product simulation mode is entered via the webserver. See section [A.4 PROFINET IO configuration](#) on page 52.

9. Fault finding the product

9.1 CIM/CIU 150

You can detect faults in a CIM 150 PROFIBUS module by observing the status of the two communication LEDs. See the table below.

9.1.1 LED status

CIM 150 fitted in Grundfos CU 35X

| Fault (LED status) | Possible cause | Remedy |
|--|---|--|
| 1. Both LED1 and LED2 remain off when the power supply is connected. | a) CIM 150 is fitted incorrectly in CU 35X. | Check that CIM 150 is fitted and connected correctly. |
| | b) CIM 150 is defective. | Replace CIM 150. |
| 2. LED2 for internal communication is flashing red. | a) No internal communication between CIM 150 and CU 35X. | Check that CIM 150 is fitted correctly in CU 35X. |
| 3. LED2 for internal communication is permanently red. | a) CIM 150 does not support the connected Grundfos product. | Contact the nearest Grundfos company. |
| 4. The PROFIBUS LED1 is permanently red. | a) Fault in CIM 150. | Contact the nearest Grundfos company. |
| | b) Connected product is not supported | Contact the nearest Grundfos company. |
| 5. The PROFIBUS LED1 is flashing red. | a) Fault in the CIM 150 PROFIBUS configuration. | <ul style="list-style-type: none"> • Check that the PROFIBUS address, switches SW3 and SW4, has a valid value [1-126]. See section 5.4 Setting the PROFIBUS address. • Check that the GSD file used is correct. • Check that the PROFIBUS cable has been fitted correctly. See section 5.3 Connecting the PROFIBUS. • Check that the PROFIBUS termination is correct. See section 5.5 Termination resistors. |
| | b) No contact to PROFIBUS master. | <ul style="list-style-type: none"> • Check cable connections. • Check that the PROFIBUS master is running. |

CIM 150 fitted in Grundfos LC 2X1

| Fault (LED status) | Possible cause | Remedy |
|--|---|--|
| 1. Both LED1 and LED2 remain off when the power supply is connected. | a) CIM 150 is fitted incorrectly in LC 2X1. | Check that CIM 150 is fitted and connected correctly. |
| | b) CIM 150 is defective. | Replace CIM 150. |
| 2. LED2 for internal communication is flashing red. | a) No internal communication between CIM 150 and LC 2X1. | Check that CIM 150 is fitted correctly in LC 2X1. |
| 3. LED2 for internal communication is permanently red. | a) CIM 150 does not support the connected Grundfos product. | Contact the nearest Grundfos company. |
| 4. The PROFIBUS LED1 is permanently red. | a) Fault in CIM 150. | Contact the nearest Grundfos company. |
| | b) Connected product is not supported | Contact the nearest Grundfos company. |
| 5. The PROFIBUS LED1 is flashing red. | a) Fault in the CIM 150 PROFIBUS configuration. | <ul style="list-style-type: none"> • Check that the PROFIBUS address, switches SW3 and SW4, has a valid value [1-126]. See section 5.4 Setting the PROFIBUS address. • Check that the GSD file used is correct. • Check that the PROFIBUS cable has been fitted correctly. See section 5.3 Connecting the PROFIBUS. • Check that the PROFIBUS termination is correct. See section 5.5 Termination resistors. |
| | b) No contact to PROFIBUS master. | <ul style="list-style-type: none"> • Check cable connections. • Check that PROFIBUS master is running. |

CIM 150 fitted in CIU 152

| Fault (LED status) | Possible cause | Remedy |
|--|---|---|
| 1. Both LED1 and LED2 remain off when the power supply is connected. | a) CIU 150 is defective. | Replace CIU 150. |
| 2. LED2 for internal communication is flashing red. | a) No internal communication between CIU 150 and CIU 152. | Check that CIM 150 is fitted correctly in CIU 152. |
| 3. LED2 for internal communication is permanently red. | a) CIM 150 does not support the connected Grundfos product. | Contact the nearest Grundfos company. |
| 4. The PROFIBUS LED1 is permanently red. | a) Fault in CIM 150. | Contact the nearest Grundfos company. |
| | b) Connected product is not supported | Contact the nearest Grundfos company. |
| 5. The PROFIBUS LED1 is flashing red. | a) Fault in the CIM 150 PROFIBUS configuration. | <ul style="list-style-type: none"> • Check that the PROFIBUS address, switches SW3 and SW4, has a valid value [1-126]. See section 5.4 Setting the PROFIBUS address. • Check that the GSD file used is correct. • Check that the PROFIBUS cable has been fitted correctly. • Check that the PROFIBUS termination is correct. See section 5.5 Termination resistors. |

9.2 CIM/CIU 500

You can detect faults in CIU 500 by observing the status of the two communication LEDs. See the table below and section [4.3 CIM 500 PROFINET IO](#).

9.2.1 LED status

CIM 500 fitted in Grundfos CU 35X

| Fault (LED status) | Possible cause | Remedy |
|--|--|---|
| 1. Both LED1 and LED2 remain off when the power supply is connected. | a) CIM 500 is fitted incorrectly in the Grundfos product. | Check that CIM 500 is fitted and connected correctly. |
| | b) CIM 500 is defective. | Replace CIM 500. |
| 2. The PROFINET IO LED1 remains off. | a) The protocol selection switch, SW1, has been set in wrong position | Set the switch to "0". |
| 3. LED2 for internal communication is flashing red. | a) No internal communication between CIM 500 and the Grundfos product. | Check that CIM 500 is fitted correctly in the Grundfos product. |
| 4. LED2 for internal communication is permanently red. | a) CIM 500 does not support the Grundfos product connected. | Contact the nearest Grundfos company. |
| 5. The PROFINET IO LED1 is permanently red. | a) Connected Grundfos product is not supported. | Contact the nearest Grundfos company. |
| | b) Illegal position of protocol switch, SW1. | Check that the rotary switch SW1 is set to "0". |
| 6. The PROFINET IO LED1 is flashing red. | a) Fault in the CIM 500 PROFINET IO configuration. | Check that the right GSDML file is used. Check that PROFINET IO IP address configuration is correct. See section A.4 PROFINET IO configuration on page 52. Check the device name in CIM 500 and PROFINET IO master. |
| 7. The PROFINET IO LED1 is pulsing red. | a) Connection to the master is lost. | Check that the cables are connected correctly. Check that the master is running. |
| 8. LED1 is permanently red and green at the same time. | a) Error in firmware download. | Use the webserver to download the firmware again. |
| 9. LED2 is permanently red and green at the same time. | a) Memory fault. | Replace CIM 500. |

CIM 500 fitted in Grundfos LC 2X1

| Fault (LED status) | Possible cause | Remedy |
|--|--|---|
| 1. Both LED1 and LED2 remain off when the power supply is connected. | a) CIM 500 is fitted incorrectly in the Grundfos product. | Check that CIM 500 is fitted and connected correctly. |
| | b) CIM 500 is defective. | Replace CIM 500. |
| 2. The PROFINET IO LED1 remains off. | a) The protocol selection switch, SW1, has not been set in PROFINET position | Set the switch to "0". |
| 3. LED2 for internal communication is flashing red. | a) No internal communication between CIM 500 and the Grundfos product. | Check that CIM 500 is fitted correctly in the Grundfos product. |
| 4. LED2 for internal communication is permanently red. | a) CIM 500 does not support the Grundfos product connected. | Contact the nearest Grundfos company. |
| 5. The PROFINET IO LED1 is permanently red. | a) Connected Grundfos product is not supported. | Contact the nearest Grundfos company. |
| | b) Illegal position of protocol switch, SW1. | Check that the rotary switch SW1 is set to "0". |
| 6. The PROFINET IO LED1 is flashing red. | a) Fault in the CIM 500 PROFINET IO configuration. | Check that the right GSDML file is used. Check that PROFINET IO IP address configuration is correct. See section A.4 PROFINET IO configuration on page 52. Check the device name in CIM 500 and PROFINET IO master. |
| 7. The PROFINET IO LED1 is pulsing red. | a) Connection to the master is lost. | Check that the cables are connected correctly. Check that the master is running. |
| 8. LED1 is permanently red and green at the same time. | a) Error in firmware download. | Use the webserver to download the firmware again. |
| 9. LED2 is permanently red and green at the same time. | a) Memory fault. | Replace CIM 500. |

CIM 500 fitted in CIU 502

| Fault (LED status) | Possible cause | Remedy |
|---|--|--|
| 1. Both LED1 and LED2 remain off when the power supply is connected | a) CIU 502 is defective. | Replace CIU 502. |
| 2. The PROFINET IO LED1 remains off. | a) The protocol selection switch, SW1, has not been set in PROFINET position | Set the switch in position "0". |
| 3. LED2 for internal communication is flashing red. | a) No internal communication between CIM 500 and CIU 502. | Check that CIM 150 is fitted correctly in CIU 502. |
| 4. LED2 for internal communication is permanently red. | a) CIM 500 does not support the Grundfos product connected. | Contact the nearest Grundfos company. |
| 5. The PROFINET IO LED1 is permanently red. | a) Connected Grundfos product is not supported. | Contact the nearest Grundfos company. |
| | b) Illegal position of protocol switch, SW1. | Check that the rotary switch SW1 is set to "0". |
| 6. The PROFINET IO LED1 is flashing red. | a) Fault in the CIM 500 PROFINET IO configuration. | <ul style="list-style-type: none"> • Check that the right GSDML file is used. • Check that PROFINET IO IP address configuration is correct. See section 6. PROFINET IO, CIM 500 setup. • Check the device name in CIM 500 and PROFINET IO master. |
| 7. The PROFINET IO LED1 is pulsing red. | a) Connection to the master is lost. | <ul style="list-style-type: none"> • Check that the cables are connected correctly. • Check that the master is running. |
| 8. LED1 is permanently red and green at the same time | a) Error in firmware download. | Use the webserver to download the firmware again. |
| 9. LED2 is permanently red and green at the same time | a) Memory fault. | Replace CIM 500. |

10. PROFIBUS address

Decimal to hexadecimal conversion table for setting of the PROFIBUS address switches. See section [5.4 Setting the PROFIBUS address](#).

| PROFIBUS address | SW3 | SW4 | PROFIBUS address | SW3 | SW4 | PROFIBUS address | SW3 | SW4 |
|------------------|-----|-----|------------------|-----|-----|------------------|-----|-----|
| 1 | 0 | 1 | 46 | 2 | E | 91 | 5 | B |
| 2 | 0 | 2 | 47 | 2 | F | 92 | 5 | C |
| 3 | 0 | 3 | 48 | 3 | 0 | 93 | 5 | D |
| 4 | 0 | 4 | 49 | 3 | 1 | 94 | 5 | E |
| 5 | 0 | 5 | 50 | 3 | 2 | 95 | 5 | F |
| 6 | 0 | 6 | 51 | 3 | 3 | 96 | 6 | 0 |
| 7 | 0 | 7 | 52 | 3 | 4 | 97 | 6 | 1 |
| 8 | 0 | 8 | 53 | 3 | 5 | 98 | 6 | 2 |
| 9 | 0 | 9 | 54 | 3 | 6 | 99 | 6 | 3 |
| 10 | 0 | A | 55 | 3 | 7 | 100 | 6 | 4 |
| 11 | 0 | B | 56 | 3 | 8 | 101 | 6 | 5 |
| 12 | 0 | C | 57 | 3 | 9 | 102 | 6 | 6 |
| 13 | 0 | D | 58 | 3 | A | 103 | 6 | 7 |
| 14 | 0 | E | 59 | 3 | B | 104 | 6 | 8 |
| 15 | 0 | F | 60 | 3 | C | 105 | 6 | 9 |
| 16 | 1 | 0 | 61 | 3 | D | 106 | 6 | A |
| 17 | 1 | 1 | 62 | 3 | E | 107 | 6 | B |
| 18 | 1 | 2 | 63 | 3 | F | 108 | 6 | C |
| 19 | 1 | 3 | 64 | 4 | 0 | 109 | 6 | D |
| 20 | 1 | 4 | 65 | 4 | 1 | 110 | 6 | E |
| 21 | 1 | 5 | 66 | 4 | 2 | 111 | 6 | F |
| 22 | 1 | 6 | 67 | 4 | 3 | 112 | 7 | 0 |
| 23 | 1 | 7 | 68 | 4 | 4 | 113 | 7 | 1 |
| 24 | 1 | 8 | 69 | 4 | 5 | 114 | 7 | 2 |
| 25 | 1 | 9 | 70 | 4 | 6 | 115 | 7 | 3 |
| 26 | 1 | A | 71 | 4 | 7 | 116 | 7 | 4 |
| 27 | 1 | B | 72 | 4 | 8 | 117 | 7 | 5 |
| 28 | 1 | C | 73 | 4 | 9 | 118 | 7 | 6 |
| 29 | 1 | D | 74 | 4 | A | 119 | 7 | 7 |
| 30 | 1 | E | 75 | 4 | B | 120 | 7 | 8 |
| 31 | 1 | F | 76 | 4 | C | 121 | 7 | 9 |
| 32 | 2 | 0 | 77 | 4 | D | 122 | 7 | A |
| 33 | 2 | 1 | 78 | 4 | E | 123 | 7 | B |
| 34 | 2 | 2 | 79 | 4 | F | 124 | 7 | C |
| 35 | 2 | 3 | 80 | 5 | 0 | 125 | 7 | D |
| 36 | 2 | 4 | 81 | 5 | 1 | 126 | 7 | E |
| 37 | 2 | 5 | 82 | 5 | 2 | | | |
| 38 | 2 | 6 | 83 | 5 | 3 | | | |
| 39 | 2 | 7 | 84 | 5 | 4 | | | |
| 40 | 2 | 8 | 85 | 5 | 5 | | | |
| 41 | 2 | 9 | 86 | 5 | 6 | | | |
| 42 | 2 | A | 87 | 5 | 7 | | | |
| 43 | 2 | B | 88 | 5 | 8 | | | |
| 44 | 2 | C | 89 | 5 | 9 | | | |
| 45 | 2 | D | 90 | 5 | A | | | |

11. Grundfos alarm and warning codes

This is a complete list of alarm and warning codes for Grundfos products. For the codes supported by this product, see the alarms and warnings section.

| Code | Description | Code | Description | Code | Description |
|------|---|------|---|------|---|
| 1 | Leakage current | 36 | Outlet valve leakage | 71 | Motor temperature 2 (Pt100, t_mo2) |
| 2 | Missing phase | 37 | Inlet valve leakage | 72 | Hardware fault, type 1 |
| 3 | External fault signal | 38 | Vent valve defective | 73 | Hardware shutdown (HSD) |
| 4 | Too many restarts | 39 | Valve stuck or defective | 74 | Internal supply voltage too high |
| 5 | Regenerative braking | 40 | Undervoltage | 75 | Internal supply voltage too low |
| 6 | Mains fault | 41 | Undervoltage transient | 76 | Internal communication fault |
| 7 | Too many hardware shutdowns | 42 | Cut-in fault (dV/dt) | 77 | Communication fault, twin-head pump |
| 8 | PWM switching frequency reduced | 43 | - | 78 | Fault, speed plug |
| 9 | Phase sequence reversal | 44 | - | 79 | Functional fault, add-on module |
| 10 | Communication fault, pump | 45 | Voltage asymmetry | 80 | Hardware fault, type 2 |
| 11 | Water-in-oil fault (motor oil) | 46 | - | 81 | Verification error, data area (RAM) |
| 12 | Time for service (general service information) | 47 | - | 82 | Verification error, code area (ROM, FLASH) |
| 13 | Moisture alarm, analog | 48 | Overload | 83 | Verification error, FE parameter area (EEPROM) |
| 14 | Electronic DC-link protection activated (ERP) | 49 | Overcurrent (i_line, i_dc, i_mo) | 84 | Memory access error |
| 15 | Communication fault, main system (SCADA) | 50 | Motor protection function, general shutdown (MPF) | 85 | Verification error, BE parameter area (EEPROM) |
| 16 | Other | 51 | Blocked motor or pump | 86 | Fault (add-on) I/O module |
| 17 | Performance requirement cannot be met | 52 | Motor slip high | 87 | - |
| 18 | Commanded alarm standby (trip) | 53 | Stalled motor | 88 | Sensor fault |
| 19 | Diaphragm break (dosing pump) | 54 | Motor protection function, 3 sec. limit | 89 | Signal fault, (feedback) sensor 1 |
| 20 | Insulation resistance low | 55 | Motor current protection activated (MCP) | 90 | Signal fault, speed sensor |
| 21 | Too many starts per hour | 56 | Underload | 91 | Signal fault, temperature sensor 1 |
| 22 | Moisture switch alarm, digital | 57 | Dry running | 92 | Calibration fault, (feedback) sensor |
| 23 | Smart trim gap alarm | 58 | Low flow | 93 | Signal fault, sensor 2 |
| 24 | Vibration | 59 | No flow | 94 | Limit exceeded, sensor 1 |
| 25 | Setup conflict | 60 | Low input power | 95 | Limit exceeded, sensor 2 |
| 26 | Load continues even if the motor has been switched off | 61 | - | 96 | Setpoint signal outside range |
| 27 | External motor protector activated (for example MP 204) | 62 | - | 97 | Signal fault, setpoint input |
| 28 | Battery low | 63 | - | 98 | Signal fault, input for setpoint influence |
| 29 | Turbine operation (impellers forced backwards) | 64 | - | 99 | Signal fault, input for analog setpoint |
| 30 | Change bearings (specific service information) | 65 | Motor temperature 1 (t_m or t_mo or t_mo1) | 100 | RTC time synchronisation with GSM occurred |
| 31 | Change varistor(s) (specific service information) | 66 | Temperature, control electronics (t_e) | 101 | - |
| 32 | Overvoltage | 67 | Temperature too high, internal frequency converter module (t_m) | 102 | Dosing pump not ready |
| 33 | Soon time for service (general service information) | 68 | External temperature or water temperature (t_w) | 103 | Emergency stop |
| 34 | No priming water | 69 | Thermal relay 1 in motor, for example Klixon | 104 | Software shutdown |
| 35 | Gas in pump head, deaerating problem | 70 | Thermal relay 2 in motor, for example thermistor | 105 | Electronic rectifier protection activated (ERP) |

| Code | Description | Code | Description | Code | Description |
|------|---|------|---|------|---|
| 106 | Electronic inverter protection activated (EIP) | 141 | - | 176 | Signal fault, temperature sensor 3 (t_mo3) |
| 107 | - | 142 | - | 177 | Signal fault, Smart trim gap sensor |
| 108 | - | 143 | - | 178 | Signal fault, vibration sensor |
| 109 | - | 144 | Motor temperature 3 (Pt100, t_mo3) | 179 | Signal fault, bearing temperature sensor (Pt100), general or top bearing |
| 110 | Skew load, electrical asymmetry | 145 | Bearing temperature high (Pt100), in general or top bearing | 180 | Signal fault, bearing temperature sensor (Pt100), middle bearing |
| 111 | Current asymmetry | 146 | Bearing temperature high (Pt100), middle bearing | 181 | Signal fault, PTC sensor (short circuited) |
| 1112 | Cosφ too high | 147 | Bearing temperature high (Pt100), bottom bearing | 182 | Signal fault, bearing temperature sensor (Pt100), bottom bearing |
| 113 | Cosφ too low | 148 | Motor bearing temperature high (Pt100) in drive end (DE) | 183 | Signal fault, extra temperature sensor |
| 114 | Motor heater function activated (frost protection) | 149 | Motor bearing temperature high (Pt100) in non-drive end (NDE) | 184 | Signal fault, general-purpose sensor |
| 115 | Too many grinder reversals or grinder reversal attempt failed | 150 | Fault (add-on) pump module | 185 | Unknown sensor type |
| 116 | Grinder motor overtemperature | 151 | Fault, display (HMI) | 186 | Signal fault, power meter sensor |
| 117 | Intrusion (door opened) | 152 | Communication fault, add-on module | 187 | Signal fault, energy meter |
| 118 | Signal fault, hydrogen sulfide H2S sensor | 153 | Fault, analog output | 188 | Signal fault, user-defined sensor |
| 119 | Signal fault, analog input AI4 | 154 | Communication fault, display | 189 | Signal fault, level sensor |
| 120 | Auxiliary winding fault (single phase motors) | 155 | Inrush fault | 190 | Limit exceeded, sensor 1 (for example alarm level in WW application) |
| 121 | Auxiliary winding current too high (single-phase motors) | 156 | Communication fault, internal frequency converter module | 191 | Limit exceeded, sensor 2 (for example high level in WW application) |
| 122 | Auxiliary winding current too low (single-phase motors) | 157 | Real-time clock out of order | 192 | Limit exceeded, sensor 3 (for example overflow level in WW application) |
| 123 | Start capacitor, low (single-phase motors) | 158 | Hardware circuit measurement fault | 193 | Limit exceeded, sensor 4 (for example low level in WW/tank filling application) |
| 124 | Run capacitor, low (single-phase motors) | 159 | CIM fault (Communication Interface Module) | 194 | Limit exceeded, sensor 5 |
| 125 | Signal fault, outdoor temperature sensor | 160 | GSM modem, SIM card fault | 195 | Limit exceeded, sensor 6 |
| 126 | Signal fault, air temperature sensor | 161 | Sensor supply fault, 5 V | 196 | Operation with reduced efficiency |
| 127 | Signal fault, shunt relative pressure sensor | 162 | Sensor supply fault, 24 V | 197 | Operation with reduced pressure |
| 128 | Strainer clogged | 163 | Measurement fault, motor protection | 198 | Operation with increased power consumption |
| 129 | - | 164 | Signal fault, LiqTec sensor | 199 | Process out of range (monitoring, estimation, calculation, control) |
| 130 | - | 165 | Signal fault, analog input 1 | 200 | Application alarm |
| 131 | - | 166 | Signal fault, analog input 2 | 201 | External sensor input high |
| 132 | - | 167 | Signal fault, analog input 3 | 202 | External sensor input low |
| 133 | - | 168 | Signal fault, pressure sensor | 203 | Alarm on all pumps |
| 134 | - | 169 | Signal fault, flow sensor | 204 | Inconsistency between sensors |
| 135 | - | 170 | Signal fault, water-in-oil (WIO) sensor | 205 | Level float switch sequence inconsistency |
| 136 | - | 171 | Signal fault, moisture sensor | 206 | Water shortage, level 1 |
| 137 | - | 172 | Signal fault, atmospheric pressure sensor | 207 | Water leakage |
| 138 | - | 173 | Signal fault, rotor position sensor (Hall sensor) | 208 | Cavitation |
| 139 | - | 174 | Signal fault, rotor origo sensor | 209 | Non-return valve fault |
| 140 | - | 175 | Signal fault, temperature sensor 2 (t_mo2) | 210 | High pressure |

| Code | Description | Code | Description | Code | Description |
|------|---|------|---|------|---|
| 211 | Low pressure | 226 | Communication fault, I/O module | 241 | Motor phase failure |
| 212 | Diaphragm tank precharge pressure out of range | 227 | Combi event | 242 | Automatic motor model recognition failed |
| 213 | VFD not ready | 228 | Night flow max. limit exceeded | 243 | Motor relay has been forced (manually operated or commanded) |
| 214 | Water shortage, level 2 | 229 | Water on floor | 244 | Fault, On/Off/Auto switch |
| 215 | Soft pressure buildup time-out | 230 | Network alarm | 245 | Pump continuous runtime too long |
| 216 | Pilot pump alarm | 231 | Ethernet: No IP address from DHCP server | 246 | User-defined relay has been forced (manually operated or commanded) |
| 217 | Alarm, general-purpose sensor high | 232 | Ethernet: Auto-disabled due to misuse | 247 | Power-on notice, (device or system has been switched off) |
| 218 | Alarm, general-purpose sensor low | 233 | Ethernet: IP address conflict | 248 | Fault, battery/UPS |
| 219 | Pressure relief not adequate | 234 | Backup pump alarm | 249 | User-defined event 1 |
| 220 | Fault, motor contactor feedback | 235 | Gas detected | 250 | User-defined event 2 |
| 221 | Fault, mixer contactor feedback | 236 | Pump 1 fault | 251 | User-defined event 3 |
| 222 | Time for service, mixer | 237 | Pump 2 fault | 252 | User-defined event 4 |
| 223 | Time for service, mixer | 238 | Pump 3 fault | 253 | SMS data from DDD sensor not received within time |
| 224 | Pump fault, due to auxiliary component or general fault | 239 | Pump 4 fault | 254 | Inconsistent data model |
| 225 | Communication fault, pump module | 240 | Lubricate bearings (specific service information) | | |

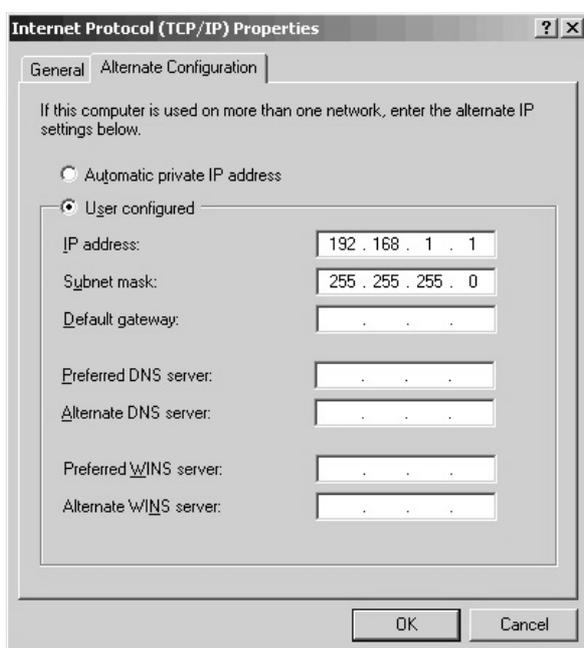
Appendix

The appendix describes the parts of the CIM 500 webserver needed for the configuration of a PROFINET IO ethernet connection. For other CIM 500 webserver features, not specifically related to PROFINET IO, see the installation and operating instructions for CIM 500.

A.1 How to configure an IP address on your PC

For connecting a PC to CIM 500 via ethernet, the PC must be set to use a fixed (static) IP address belonging to the same subnetwork as CIM 500.

1. Open "Control Panel".
2. Enter "Network and Sharing Center".
3. Click "Change adapter settings".
4. Right-click and select "Properties" for the ethernet adapter. Typically "Local Area Connection".
5. Select properties for "Internet Protocol Version 4(TCP/IPv4).
6. Select the "Alternate Configuration" tab.
7. Configure an IP address and subnet mask to be used by your PC. See fig. 1.



TM05 7422 0913

Fig. 1 Example from Windows

A.2 Webserver configuration

The built-in webserver is an easy and effective way to monitor the status of CIM 500 and configure the available functions and Industrial Ethernet protocols. The webserver also makes it possible to update the firmware of the module and store or restore settings.

Before configuration

- Check that the PC and CIM 500 are connected via an ethernet cable.
- Check that the PC ethernet port is set to the same network as CIM 500. For network configuration, see section [A.1 How to configure an IP address on your PC](#).

To establish a connection from a PC to CIM 500 the first time, the following steps are required:

1. Open a standard web browser and type 192.168.1.100 in the URL address field.
2. Log in to the webserver.

A.3 Login

Fig. 2 Login

User name Enter user name. Default: admin.

Password Enter password. Default: Grundfos.



You can change the user name and password on the webserver under "User Management".

A.4 PROFINET IO configuration

This web page is used to configure all the parameters relevant to the PROFINET IO protocol standard. All settings can also be configured from a standard PROFINET IO configuration tool, for instance Siemens Primary Setup Tool (PST). It is available on the internet.

Fig. 3 Real Time Ethernet Protocol Configuration - PROFINET IO

| Object | Description |
|-----------------------------|--|
| Device Name | The PROFINET IO device name. It must be unique. |
| IP Address | The static IP address for CIM 500 on the PROFINET IO network. It must be unique. |
| Subnet Mask | Configure the subnet mask for CIM 500 on the PROFINET IO network. |
| Gateway | Configure the default gateway for the PROFINET IO network. |
| Use DHCP | CIM 500 can be configured to automatically obtain the IP address from a DHCP server on the network. |
| Grundfos product simulation | CIM 500 can be put in product simulation mode to generate realistic simulated values of all the PROFINET IO input data modules. It will thus be possible to connect a PROFINET IO master to CIM 500 fitted in a CIU unit or E-box without installing this device in a real industrial process system. In an office environment, it can then be verified that communication works and data are received and handled correctly by the PROFINET IO master application program, for example PLC program, before installing the device. To enable product simulation, select a product type from the drop down list. Product simulation will be terminated by a module power cycle. |

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