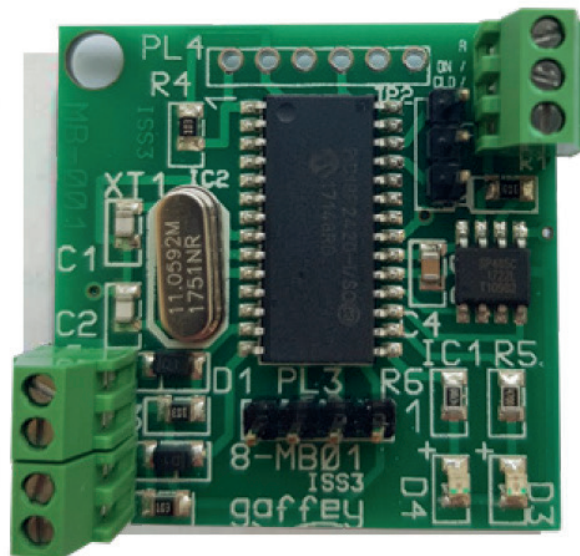


## Modbus Interface Module for EASYCHLORGEN & MINICHLORGEN SYSTEMS

### Operating instructions



Read the operating manual!

The user is responsible for installation and operation related mistakes!



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## 1 Notes for the Reader

These Operating instructions contain information and behaviour rules for safe and designated operation of the Modbus Interface Module for EASYCHLORGEN & MINICHLORGEN SYSTEMS.

Observe the following principles:

- Read the entire operating manual prior to starting-up the device.
- Ensure that everyone who works with or on the dosing pump has read the operating instructions and follows them.
- Keep the operating instructions for the entire service life of the dosing pump.
- Pass on the operating instructions to any subsequent owner of the dosing pump.

### 1.1 General non-discrimination

In this operating manual, only the male gender is used where grammar allows gender allocation. The purpose of this is to make the text easy to read. Men and women are always referred to equally. We would like to ask female readers for understanding of this text simplification.

### 1.2 Explanation of the signal words

Different signal words in combination with warning signs are used in this operating manual. Signal words illustrate the gravity of possible injuries if the risk is ignored:

| Signal word | Meaning                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
| DANGER      | Refers to imminent danger. Ignoring this sign may lead to death or the most serious injuries.                                   |
| WARNING     | Refers to a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injuries.           |
| CAUTION     | Refers to a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property. |
| NOTE        | Refers to a danger which, if ignored, may lead to risk to the machine and its function.                                         |

Table 1: Explanation of the signal words

### 1.3 Explanation of the warning signs

Warning signs represent the type and source of a danger:

| Warning sign                                                                      | Type of danger                                       |
|-----------------------------------------------------------------------------------|------------------------------------------------------|
|  | Danger from electrical voltage                       |
|  | Danger from automatic startup                        |
|  | Danger from electromagnetic radiation                |
|  | Danger of damage to machine or functional influences |

Table 2: Explanation of the warning signs

### 1.4 Identification of warnings

Warnings are intended to help you recognise risks and avoid negative consequences.

This is how warnings are identified:

| Warning sign                                                                                                                              | SIGNAL WORD |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Description of danger.</b><br>Consequences if ignored.<br>⇒ The arrow signals a safety precaution to be taken to eliminate the danger. |             |

### 1.5 Instruction for action identification

This is how instructions for action are identified:

- ➔ Separate step with no follow-up action.
- 1. First step in a series of steps.
- 2. Second step in a series of steps.
  - ▶ Result of the above action.
- ✓ Action completed, aim achieved.

## 2 Safety

### 2.1 General warnings

The following warnings are intended to help you to eliminate the dangers that can arise while handling the dosing pump. Risk prevention measures always apply regardless of any specific action.

Safety instructions warning against risks arising from specific activities or situations can be found in the respective sub-chapters.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                                                                                                                                                                                                                                                      | <b>DANGER</b> |
| <p><b>Mortal danger from electric shock!</b></p> <p>Wrongly connected or located cables or damaged ones can injure you.</p> <ul style="list-style-type: none"> <li>⇒ Connect the device only to a SCHUKO socket outlet protected by a ground fault circuit interrupter (GFCI).</li> <li>⇒ Replace damaged cables without delay.</li> <li>⇒ Do not use extension cables.</li> <li>⇒ Do not bury cables.</li> <li>⇒ Secure cables to avoid being damaged by other equipment.</li> </ul> |               |

|                                                                                                                                                                                                                                                                                                                                                                   |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                                                                                                                                                                                                                                                                                | <b>WARNING</b> |
| <p><b>Danger of automatic start up!</b></p> <p>After connecting the mains supply, residual dosing media in the dosing head can spray out.</p> <ul style="list-style-type: none"> <li>⇒ Before connecting the mains supply, connect the dosing lines.</li> <li>⇒ Check that all the screw connections have been tightened correctly and are leak-proof.</li> </ul> |                |

|                                                                                                                                                                                                                                                                                                                                                                                                          |                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                                                                                                                                                                                                                                                                                                                       | <b>WARNING</b> |
| <p><b>Danger from electromagnetic radiation!</b></p> <p>Solenoid diaphragm dosing pumps In operation, solenoid diaphragm dosing pumps emit a stray magnetic field. If you do not keep far enough away, the function of a pacemaker can be negatively affected.</p> <ul style="list-style-type: none"> <li>⇒ People with pacemakers must always keep at least 50 cm away from the dosing pump.</li> </ul> |                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>CAUTION</b> |
| <p><b>Increased risk of accidents due to insufficient qualification of personnel!</b></p> <p>Dosing pumps and their accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.</p> <ul style="list-style-type: none"> <li>⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.</li> <li>⇒ Prevent access to the system for unauthorised persons.</li> </ul> |                |

### 2.2 Hazards due to non-compliance with the safety instructions

Failure to follow the safety instructions may endanger not only persons, but also the environment and the device.

The specific consequences can be:

- Failure of vital functions of the dosing pump and the system
- Failure of required maintenance and repair methods
- Danger to the environment caused by substances leaking from the system

### 2.3 Working in a safety-conscious manner

Besides the safety instructions specified in this operating manual, further safety rules apply and must be followed:

- Accident prevention regulations
- Safety and operating provisions
- Environmental protection provisions
- Applicable standards and legislation

### 2.4 Personnel qualification

Any personnel who work on the Modbus Interface Module for EASYCHLORGEN & MINICHLORGEN SYSTEMS must have appropriate special knowledge and skills.

Anybody who works on the Modbus Interface Module for EASYCHLORGEN & MINICHLORGEN SYSTEMS must meet the conditions below:

- Attendance at all the training courses offered by the owner,
- personal suitability for the respective activity,
- sufficient qualification for the respective activity,
- Training in handling of the dosing pump,
- knowledge of safety equipment and the way this equipment functions,
- knowledge of this operating manual, particularly of safety instructions and sections relevant for the activity,
- knowledge of fundamental regulations regarding health and safety and accident prevention.

All persons must generally have the following minimum qualification:

- Training as specialists to carry out work on the

ModbusInterfaceModuleforEASYCHLORGEN&MINICHLOGENSYSTEMS  
unsupervised,

- sufficient training that they can work on the  
ModbusInterfaceModuleforEASYCHLORGEN&MINICHLOGENSYSTEMS  
under the supervision and guidance of a trained specialist.

### 2.4.1 Specialist staff

Thanks to their professional training, knowledge, experience and knowledge of the relevant specifications, specialist staff are able to perform the job allocated to them and recognise and/or eliminate any possible dangers by themselves.

### 2.4.2 Electrically qualified person

Qualified electrician is a person who is allowed to carry out and supervise electronical work commercially.

### 2.4.3 Trained persons

Trained persons have received training from the operator about the tasks they are to perform and about the dangers stemming from improper behaviour.

In the table below you can check what qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

| Qualification                 | Activities                                                                                                                                                                                                                           |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specialist staff              | <ul style="list-style-type: none"> <li>■ Electrical installation</li> <li>■ Maintenance</li> <li>■ Repairs</li> <li>■ Commissioning</li> <li>■ Taking out of operation</li> <li>■ Disposal</li> <li>■ Fault rectification</li> </ul> |
| Electrically qualified person | <ul style="list-style-type: none"> <li>■ Eliminate electrical faults</li> </ul>                                                                                                                                                      |
| Trained persons               | <ul style="list-style-type: none"> <li>■ Storage</li> <li>■ Transportation</li> <li>■ Control</li> <li>■ Fault rectification</li> </ul>                                                                                              |

Table 3: Personnel qualification

## 3 Intended use

### 3.1 Notes on product warranty

Any non-designated use of the product can compromise its function or intended protection. This leads to invalidation of any warranty claims!

Please note that liability is on the side of the user in the following cases:

- The modbus is operated in a manner which is not consistent with these operating instructions, particularly safety instructions, handling instructions and the section "Intended Use".
- If people operate the product who are not adequately qualified to carry out their respective activities.
- No original spare parts or accessories of Lutz-Jesco GmbH are used.
- Unauthorised changes are made to the device by the user.

### 3.2 Foreseeable misuse

Below, there is information about the applications of the modbus or associated equipment that are not considered to be intended use. This section is intended to allow you to detect possible misuse in advance and to avoid it.

Foreseeable misuse is assigned to the individual stages of the product lifetime:

#### 3.2.1 Incorrect electrical installation

- Connecting the mains voltage without a protective earth.
- Unsecured mains or one that does not conform to standards.
- Not possible to immediately or easily disconnect the power supply
- Wrong connecting cables for mains voltage
- Protective earth removed

#### 3.2.2 Incorrect start-up

- Start-up with damaged system
- Personnel was not informed before the start-up
- System was recommissioned after maintenance without all the protective equipment and fixtures, etc. being reconnected.

#### 3.2.3 Incorrect operation

- Protective equipment not functioning correctly or dismantled
- Ignoring operational disturbances
- Elimination of operational disturbances by personnel without adequate qualifications
- Bridging the external fuse
- Operation made more difficult due to inadequate lighting or machines that are difficult to access

#### 3.2.4 Incorrect decommissioning

- Device not disconnected from the power supply
- Using the wrong dismantling tools

## 4 Introduction

The following information describes the installation and configuration of the Modbus interface modules, for use with the EASYCHLORGEN & MINICHLORGEN systems.

The interface provides a read only serial communication link from a data gathering system (SCADA/BMS) to the EASYCHLORGEN & MINICHLORGEN family of disinfection systems, for live remote viewing of the systems status/parameters which include:

- Alarm notification and reasons
- Status of digital I/O
- Value of analogue inputs
- Generating hours

Refer to the EASYCHLORGEN & MINICHLORGEN manuals for details information on the operation of the systems.

## 5 Installation

These instructions are for systems built before 01/05/2018 without the plug-in Modbus interface feature on the PCB.

The module is fitted inside of a polypropylene enclosure, supplied with one M20 gland for quick installation of cables. The enclosure can be directly mounted to a surface or fixed to the mounting clip provided.

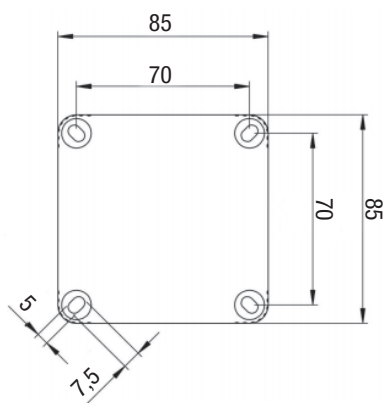


Fig. 1: Enclosure - dimensions

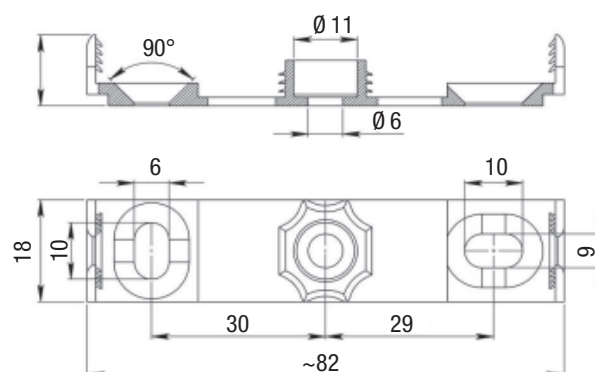


Fig. 3: Mounting Clip - dimensions (mm)

### 5.1 Location

Install the Modbus interface as close as reasonably possible to the EASYCHLORGEN & MINICHLORGEN system, it is recommended that the RS-232 cable link is no longer than 5 meters.

### 5.2 Connections

Use the connections diagram below to connect the Modbus interface module (B) to the EASYCHLORGEN & MINICHLORGEN system (A) and the master device (C).

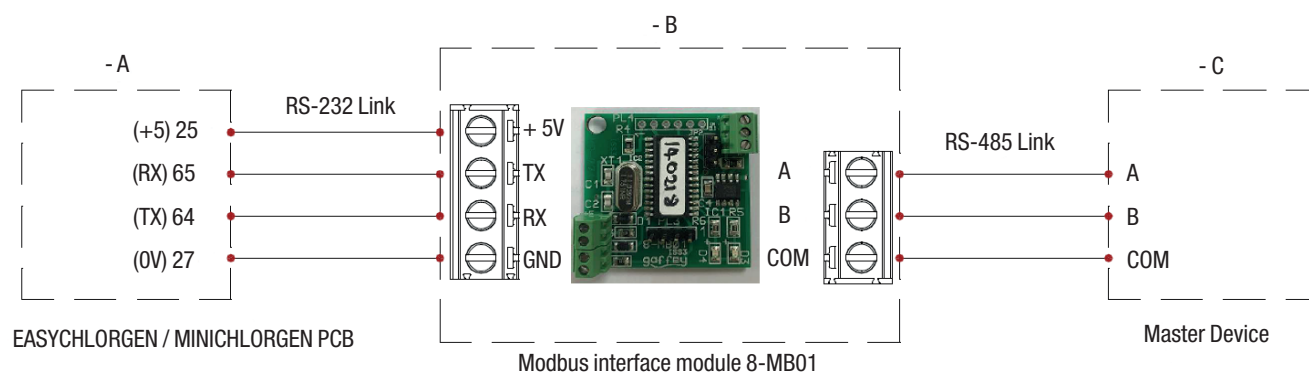


Fig. 2: Connection diagram

## 6 Installation (Plug-in module)

Turn off power to the EASYCHLORGEN & MINICHLORGEN system and open the control panel enclosure. Plug the module into space provided on the PCB labelled “Modbus add on card”, see diagram below.

EASYCHLORGEN & MINICHLORGEN PSB:

Light Gray indicate s RS-485 connections (next figure, number 1).

Dark gray box indicates installation location of plug-in module (next figure, number 2).

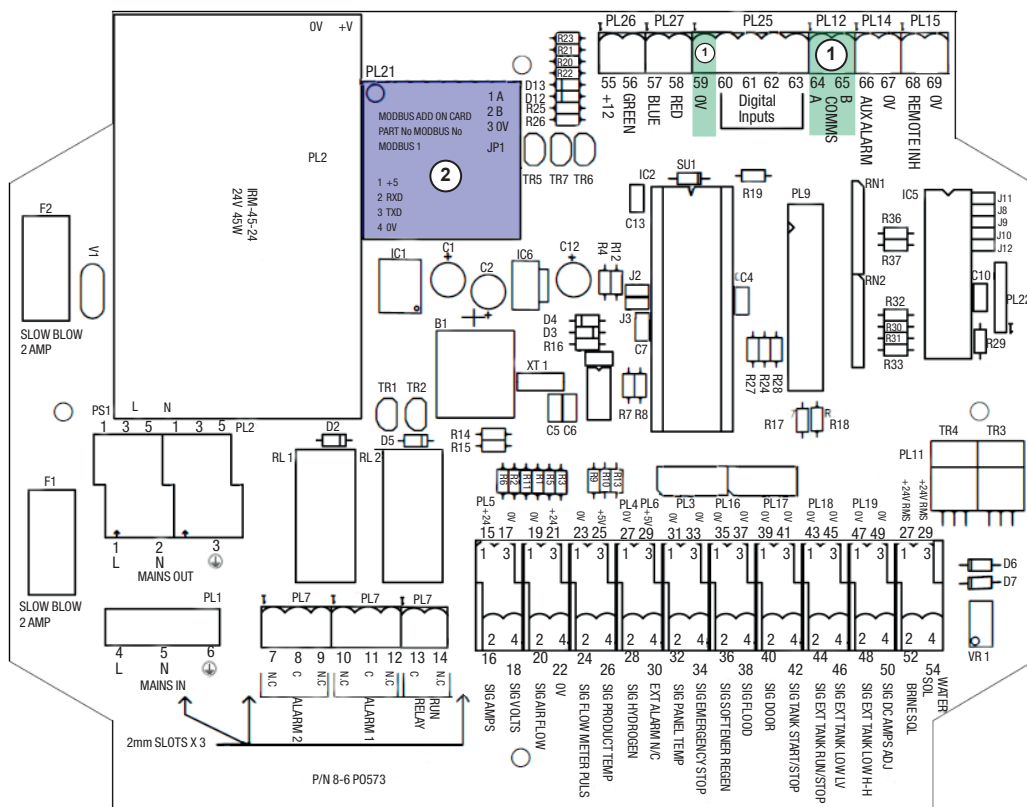


Fig. 4: Plug-in module

### 6.1 Connections

Use the connections diagram below to connect the EASYCHLORGEN & MINICHLORGEN PCB (A) the master device (C). Follow RS-485 wiring protocol for connecting the devices together.

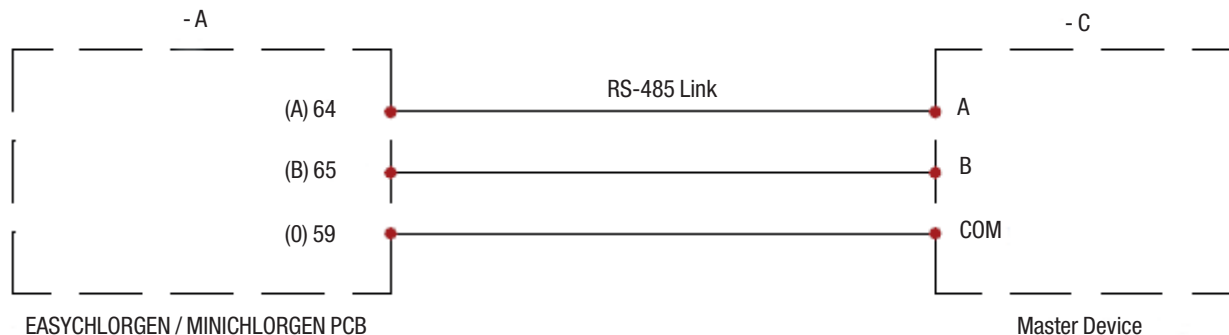


Fig. 5: Connection diagram

## 7 Configuration

The EASYCHLORGEN & MINICHLORGEN have a total of 16 and 12 16-bit registers respectively. Any number of these can be read by using Modbus function 3 and setting the register start address and register quantity in the Modbus query message. See the Modbus Map in section 4.4 for more information.

### 7.1 Physical - EASYCHLORGEN & MINICHLORGEN jumper setting

No jumper is necessary when using the module.

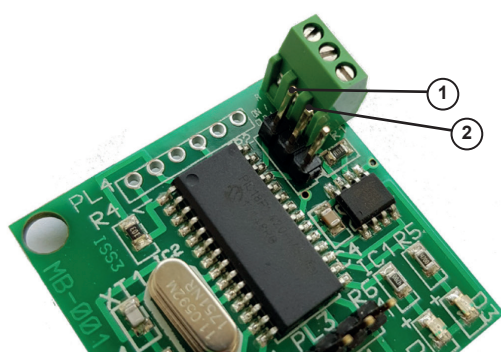


Fig. 6: Jumper setting

### 7.2 Master device

Use the table below to configure your Master device.

| Modbus gateway settings |            |
|-------------------------|------------|
| Physical                | RS 485     |
| Protocol                | Modbus RTU |
| Baud rate               | 9600 bps   |
| Parity                  | None       |
| Stops bits              | 2          |
| Slave address           | *          |

Table 4: Modbus gateway settings

\* The slave address of the EASYCHLORGEN & MINICHLORGEN system needs to be configured in its software, see the “Start Up” procedure in section 4 for details of how to perform this action.

### 7.3 Modbus query message

| Query message          |                            |
|------------------------|----------------------------|
| Protocol               | Modbus RTU                 |
| Function               | 03 - Read holding register |
| Register start address | 0 (40001)                  |

Table 5: Modbus query message

Example Modbus poll:

| C9 03 0000 000C 5587 |                                                    |
|----------------------|----------------------------------------------------|
| C9                   | EASYCHLORGEN & MINICHLORGEN slave address = 201    |
| 03                   | Function code 3 (Read output holding registers)    |
| 0000                 | Data address of first register requested = (40001) |
| 000C                 | Total number of registers requested = 12           |
| 5587                 | CRC                                                |

Table 6: Example Modbus poll

### 7.4 EASYCHLORGEN & MINICHLORGEN

Use the Modbus map to configure your master device and read information from the EASYCHLORGEN & MINICHLORGEN.

| 16-bit register         |                         |
|-------------------------|-------------------------|
| MSB (Hi 8-bit datatype) | LSB (Lo 8-bit datatype) |
| 00000000                | 00000000                |
| b15                     | b0                      |

Table 7: Modbus Map

## Modbus Map

| Register | Datatype<br>(All UINT) | Name          | Description                                                                                                                                                                                                                                                                                                                                                                                                                    | Presentation - Show as: |
|----------|------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 1        | Hi 8-bit               | Year          | Real time clock                                                                                                                                                                                                                                                                                                                                                                                                                | Value                   |
|          | Lo 8-bit               | Month         |                                                                                                                                                                                                                                                                                                                                                                                                                                | Value                   |
| 2        | Hi 8-bit               | date          |                                                                                                                                                                                                                                                                                                                                                                                                                                | Value                   |
|          | Lo 8-bit               | Hour          |                                                                                                                                                                                                                                                                                                                                                                                                                                | Value                   |
| 3        | Hi 8-bit               | Minute        |                                                                                                                                                                                                                                                                                                                                                                                                                                | Value                   |
|          | Lo 8-bit               | Spare         | Unused byte                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |
| 4        | Hi 8-bit               | RS-232 Link   | Health status of RS-232 link                                                                                                                                                                                                                                                                                                                                                                                                   | Value with enumeration  |
|          | Lo 8-bit               | System health | System health status                                                                                                                                                                                                                                                                                                                                                                                                           | Value with enumeration  |
| 5        | Hi 8-bit               | Alarm reason  | Reason for alarm                                                                                                                                                                                                                                                                                                                                                                                                               | Value with enumeration  |
|          | Lo 8-bit               | System status | Systems current operational status                                                                                                                                                                                                                                                                                                                                                                                             | Value with enumeration  |
| 6        | 16-bit                 | Volts         | PSU voltage output (V)                                                                                                                                                                                                                                                                                                                                                                                                         | Value (Scaling = 10)    |
| 7        | 16-bit                 | Amps          | PSU current output(A)                                                                                                                                                                                                                                                                                                                                                                                                          | Value                   |
| 8        | 16-bit                 | Air-flow      | Air blower output (m3/hr)                                                                                                                                                                                                                                                                                                                                                                                                      | Value                   |
| 9        | Hi 8-bit               | H2 Sensor     | H2 value from sensor (%)                                                                                                                                                                                                                                                                                                                                                                                                       | Value                   |
|          | 32-bit                 |               |                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |
| 10       |                        | Run hours     | Systems product generation time                                                                                                                                                                                                                                                                                                                                                                                                | Value                   |
| 11       | 16-bit                 | I/O Status    | Live status of the systems digital I/O<br>bit15 - Spare<br>bit14 - Alarm relay<br>bit13 - Run relay<br>bit12 - Auxiliary alarm<br>bit11 - Remote inhibit<br>bit10 - Brine solenoid<br>bit9 - Water solenoid<br>bit8 - Ext tank high<br>bit7 - Ext tank low level<br>bit6 - Ext start stop<br>bit5 - Tank start-stop<br>bit4 - Enclosure door<br>bit3 - Bund flood<br>bit2 - Softener regeneration<br>bit1 - Temperature switch | Value                   |
| 12       | 16-bit                 | Product Temp  | Temperature of product (C)                                                                                                                                                                                                                                                                                                                                                                                                     | Value (Scaling = 10)    |

Table 8: Modbus Map

For data presented as values with enumeration: view the table below to find what the values represent.

Value enumeration table

Value enumeration table

| Address | Byte | Name          | Enumeration value | Description                    |
|---------|------|---------------|-------------------|--------------------------------|
| 4       | MSB  | RS-232 Link   | 0                 | Serial link OK                 |
|         |      |               | 1                 | Serial Link broken             |
|         | LSB  | System Health | 0                 | System is healthy              |
|         |      |               | 1                 | System is in an alarm status   |
|         |      |               | 2                 | System is in an warning status |
| 5       | MSB  | Alarm reason  | 0                 | No alarm or warning            |
|         |      |               | 2                 | Current low (Not in use)       |
|         |      |               | 3                 | Current High (Not in use)      |
|         |      |               | 4                 | Voltage low                    |
|         |      |               | 5                 | Voltage high                   |
|         |      |               | 6                 | Airflow low                    |
|         |      |               | 7                 | Hydrogen = 100% (2.5% of LEL)  |
|         |      |               | 8                 | Low water flow                 |
|         |      |               | 9                 | Bund flood switch              |
|         |      |               | 10                | External tank high switch      |
|         |      |               | 11                | External tank low switch       |
|         |      |               | 12                | Auxiliary alarm                |
|         |      |               | 13                | Emergency stop                 |
|         |      |               | 14                | High panel temperature         |
|         |      |               | 99                | Unknown alarm                  |
|         | LSB  | System status | 1                 | Startup cycles                 |
|         |      |               | 2                 | Generating                     |
|         |      |               | 3                 | Tank full                      |
|         |      |               | 4                 | Manual inhibit                 |
|         |      |               | 5                 | Remote inhibit                 |
|         |      |               | 6                 | Softener regeneration          |
|         |      |               | 7                 | Softener regeneration          |
|         |      |               | 9                 | Unknown                        |

Table 9: Value enumeration table

## 8 Start-up Procedure

1. Install and connect your devices together using section 2 for guidance.
2. Enter the chosen slave address into the EASYCHLORGEN / MINICHLORGEN software:
3. Go to the systems control panel and enter the “Engineers menu”.
4. Proceed to program 26 in the EASYCHLORGEN & MINICHLORGEN software.
5. Enter your desired slave ID for the system
6. Exit the menu and allow the system to resume normal operation.
7. Power on and configure your master device using section 3 for guide.

✓ **Start up complete**

## 9 LED Indicators

| LED | Colour | Indication | Meaning                      |
|-----|--------|------------|------------------------------|
| D3  | Green  | Off        | Off during Modbus activity   |
|     |        | On         | Idle                         |
| D4  | Red    | Off        | Unit is operational          |
|     |        | On         | Fault with RS-232 link       |
|     |        | 1 Flash    | Bad CRC                      |
|     |        | 2 Flash    | Modbus command not supported |

Table 10: LED Indicators

## 10 Notes on conformity

The Modbus Interface Module does not fall within the scope of the Machinery Directive 2006/42/EC.

This is a component that cannot be operate alone.

The component is located in the systems EASYCHLORGEN and MINI-CHLORGEN. We therefor refer you to the CE marking in the operating instructions for the EASYCHLORGEN and MINICHLORGEN.

The manufacturer and distributor of the EASYCHLORGEN and MINICHLORGEN is the:

Lutz-Jesco GmbH / Am Bostelberge 19 / 30900 Wedemark / Germany

## 11 Warranty claim

### Warranty claim

Please copy and send it back with the unit!

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty claim.

#### Sender

Company: ..... Phone: ..... Date: .....

Address: .....

Contact person: .....

Manufacturer order no.: ..... Date of delivery: .....

Device type: ..... Serial number: .....

Nominal capacity / nominal pressure: .....

Description of fault: .....

.....

.....

.....

.....

.....

.....

.....

.....

#### Service conditions of the device

Point of use / system designation: .....

.....

.....

Accessories used (suction line etc.): .....

.....

.....

.....

.....

Commissioning (date): .....

Duty period (approx. operating hours): .....

Please describe the specific installation and enclose a simple drawing or picture of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.





