

# ***eNeon user manual***



## Table of Content

<b>1. Introduction .....</b>	<b>3</b>
<b>2. Safety .....</b>	<b>3</b>
2.1 ESD Damage Prevention .....	3
2.2 Applicable Directives, Standards and Compliance .....	3
2.2.1 Conformity to European Directives .....	3
2.2.2 Safety Standards .....	3
2.2.3 FCC Compliance .....	4
2.2.4 Certifications .....	4
2.3 Reference Standards for Type Tests .....	4
2.4 Field Implementation & Environmental Conditions .....	5
2.4.1 Protection .....	5
2.4.2 Environmental Limits .....	5
<b>3. Hardware .....</b>	<b>5</b>
3.1 Layout and Interfaces .....	5
3.2 Extension Cards .....	6
3.3 LEDs .....	6
3.4 I/O .....	8
3.4.1 Terminal Pin Out for Power Supply (X1) .....	8
3.4.2 Terminal Pin Out for Analogue Input (X2) .....	8
3.4.3 Connector Pin Out Extension Card .....	9
<b>4. Installation .....</b>	<b>10</b>
4.1 Digital Inputs .....	10
4.1.1 Modules in DataCenter .....	10
<b>5. Operating / Commands .....</b>	<b>11</b>
5.1 Status command .....	11
5.2 Routine call command and log Interval .....	11
5.3 Analogue Settings .....	12

## 1 Introduction

The integrated 4G module makes the eNeon an ideal solution for remote monitoring of analogue and digital inputs. The eNeon communicates directly with our DataCenter through the 4G data connection and has an additional fallback to 2G/3G.

The eNeon comes with an I/O extension card and an 4G extension card preinstalled. The eNeon is expandable to up to 3 I/O extension cards, each with 4 analogue inputs, 8 digital inputs and 2 digital outputs.

After starting the eNeon, it sends a routine call of the current status every 60 minutes, including all logged 15-minute values of the past hour. Changes to the unit in the DataCenter and passing an alarm range will also result in a notification to the DataCenter.

## 2 Safety

### 2.1 ESD Damage Prevention

- wait 30 seconds after turning off before inserting or removing an extension card
- use ESD precautions when handling with extension cards and/or open base unit
- precaution:
  - Grounded ESD functionals work surface
  - personal grounding
  - verification that the configuration is compatible with firmware capabilities

### 2.2 Applicable Directives, Standards and Compliance

#### 2.2.1 Conformity to European Directives

Base unit and extension cards are in conformity with EC directives:

- RoHS Directive 2011/65/EU
- EMC Directive 2014/30/EU (not 4G module)
- RE Directive 2014/53/EU (not I/O module)

#### 2.2.2 Safety Standards

Base unit and extension cards are in conformity with safety standards:

- IEC/EN 60950-1
- UL 60950-1
- CSA-C22.2 No 60950-1-07
- EN/IEC 62368-1
- UL 62368-1
- CAN 62368-1

### 2.2.3 FCC Compliance

Base unit and extension cards comply with part 15 of the FCC rules.

Operating is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

### 2.2.4 Certifications

Base unit and extensions have been duly certified by authorized bodies:

- UL Certificate of Compliance (COC) # 20190529\_E350576
- CB certificate # DK-84039-UL

## 2.3 Reference Standards for Type Tests

Base unit and extensions have been validated on temp., vibration and shock against the requirements of the following standards:

Operating & Storage Temperature	
Test nature	Reference Standard
Cold test	IEC 60068-2-1
Dry heat test	IEC 60068-2-2
Temperatur change test	IEC 60068-2-14
Cyclic damp heat test	IEC 60068-2-30
Vibration & Shock Tests	
Test nature	Reference Standard
Programmable controllers test	IEC 61131-2
Vibration test (sinusoidal)	IEC 60068-2-6
Vibration test (broad-band random)	IEC 60068-2-64
Shock test	IEC60068-2-27

## 2.4 Field Implementation & Environmental Conditions

### 2.4.1 Protection

- IP65 Rating in enclosure

### 2.4.2 Environmental Limits

Unit:

Characteristic	Value
Operating temperature	-25° to +60°C
Storage temperature	-40° to +70°C
Relative humidity	10 to 95% non-condensing
Operating altitude	Up to maximum 2000m
Storage altitude	Up to maximum 3000m
Mounting	Latch for DIN rail EN50022-compliant

## 3 Hardware

### 3.1 Layout and Interfaces

T1: Power Supply  
- 24VDC/1.3A

T2: eNeon Telemetry Unit

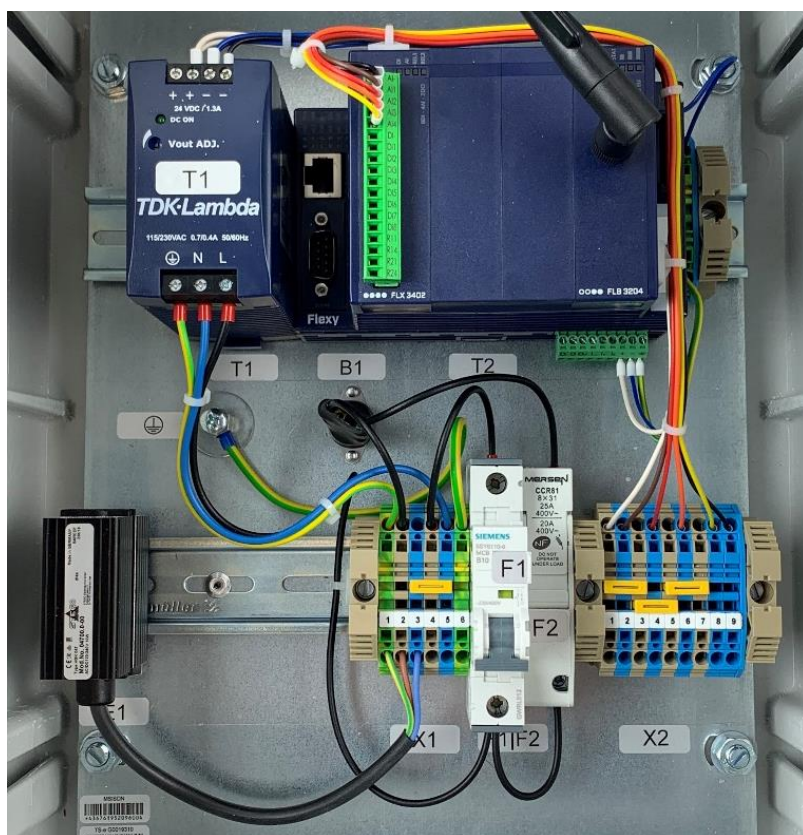
E1: Heater

X1: Terminal for 230 V

X2: Terminals for analogue  
inputs

F1 / F2: Ground fault  
circuit interrupter

B1: Ground point





## 3.2 Extension Cards

### - 4G LTE modem

Frequencies: 4G: B7(2600), B1(2100), B3(1800), B8(900), B20(800) MHz

3G: B1(2100), B8(900) MHz

2G: B3(1800), B8(900) MHz

Operating temperature: -25 °C to +70 °C

### - I/O Cards

- Analogue inputs (AI): 4 inputs, set to 4...20 mA  
Used for analogue sensors  
Converted to 0 – 100% in DataCenter
- Digital inputs (DI): 8 inputs, 0-12/24 VDC  
Digital inputs with integrated pullups (optional) can be used for Trailer-Detection
- Digital outputs (DO): 2 switching relays  
R11 input max. 3A /34V, R14 output  
ON: relay closed, OFF: relay open

## 3.3 LEDs

On base module:

PWR: Power

steady green = unit is powered on

USR: User

blinking green slowly = unit is ok

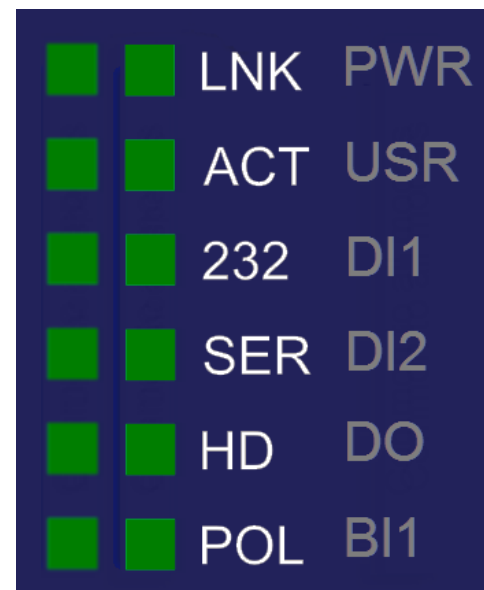
Red pattern = special attention required

DI1: Digital input 1 (base unit, not in use)

Green = On: signal on Input 1 detected

DI2: Digital input 2 (base unit, not in use)

Green = On: signal on Input 2 detected



DO: Digital output (base unit, not in use)  
Green = On: signal on Output detected

BI1: Button BI1 input at the right side of eNeon: sends test message to server  
Steady green = button is being pressed

LNK: Ethernet link (not in use)  
Green steady = Ethernet link OK

ACT: Ethernet activity (not in use)  
Green flashing = Ethernet traffic (RX & TX)

232: RS232 mode (serial interface not in use)  
Green steady = port configured in RS232 mode

SER: Green flashing = RX/TX traffic on serial port

HD: Half duplex  
Green steady = configured in RS485 mode

POL: Polarization resistors  
Green steady = Polarization and termination ON

On 4G module:

STAT: On = connected to the network

Orange LEDs: Signal strength

On I/O module:

DI: Reflects a DI status change. Toggles between ON and OFF at every digital input status change

AI: Blinking Green = Acquisition running on all analogue inputs (permanent even if no tag was configured and/or no input was wired)

REL1: ON Green when relay 1 is closed

REL2: ON Green when relay 2 is closed

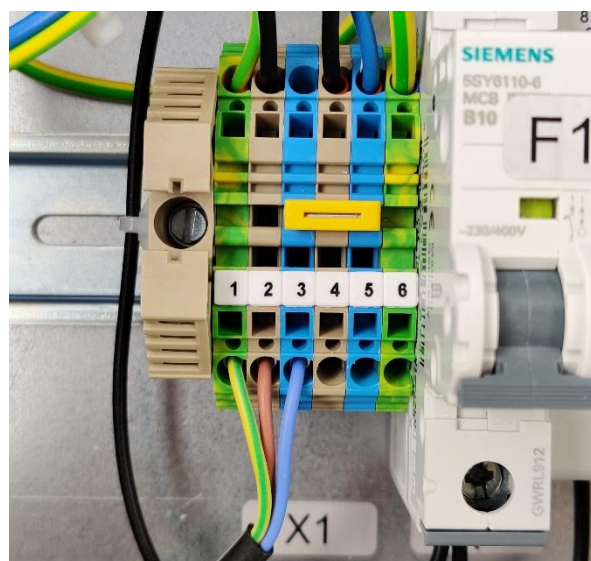
## 3.4 I/O

### 3.4.1 Terminal Pin Out for Power Supply (X1)

1, 2 and 3: Heater

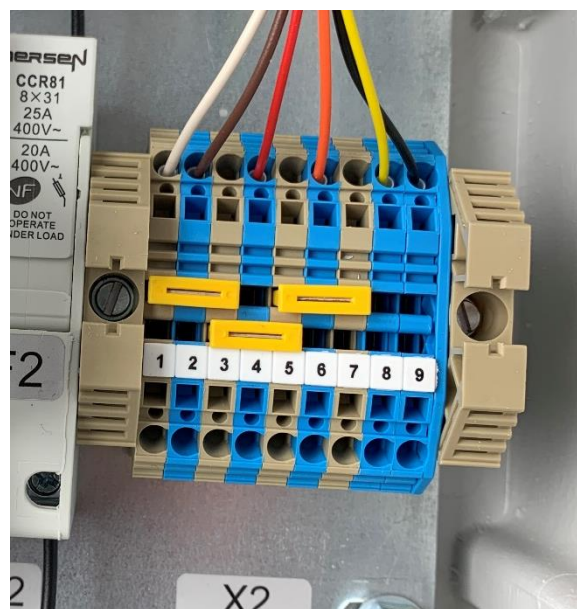
Connectors for 230 V power supply:

- 4: L
- 5: N
- 6: PE



### 3.4.2 Terminal Pin Out for Analogue Input (X2)

Clamp	Input
1	24V Sensor 1
2	4...20 mA Sensor 1 (AI1)
3	24V Sensor 2
4	4...20 mA Sensor 2 (AI2)
5	24V Sensor 3
6	4...20 mA Sensor 3 (AI3)
7	24V Sensor 4
8	4...20 mA Sensor 4 (AI4)
9	GND





## 3.4.3 Connector Pin Out Extension Card

Clamp	Assignment	Usage
AI-	GND	
AI1	A1	Analogue Input 4...20 mA
AI2	A2	Analogue Input 4...20 mA
AI3	A3	Analogue Input 4...20 mA
AI4	A4	Analogue Input 4...20 mA
DI-	GND	
DI1	D1	Digital Input 0-12/24 VDC
DI2	D2	Digital Input 0-12/24 VDC
DI3	D3	Digital Input 0-12/24 VDC
DI4	D4	Digital Input 0-12/24 VDC
DI5	D5	Digital Input 0-12/24 VDC
DI6	D6	Digital Input 0-12/24 VDC
DI7	D7	Digital Input 0-12/24 VDC
DI8	D8	Digital Input 0-12/24 VDC
R11	24V	Input for Digital Output 1
R14	---	Digital Output 1 closed by relay
R21	24V	Input for Digital Output 2
R24	---	Digital Output 2 closed by relay

## Connector Pin Out for Trailer-Detection

Clamp	Assignment	Usage
AI-	GND	
AI1	A1	Analogue Input 4...20 mA
AI2	A2	Analogue Input 4...20 mA
AI3	A3	Analogue Input 4...20 mA
AI4	A4	
DI-	GND	
DI1	D1	Digital Input for switch to GND
DI2	D2	Digital Input for switch to GND
DI3	D3	Digital Input for switch to GND
DI4	D4	Digital Input for switch to GND
DI5	D5	Digital Input for switch to GND
DI6	D6	Digital Input for switch to GND
DI7	D7	Digital Input for switch to GND
DI8	D8	Digital Input for switch to GND
R11	24V	Input for Digital Output 1
R14	---	Digital Output 1 closed by relay
R21	24V	Input for Digital Output 2
R24	---	Digital Output 2 closed by relay



## 4. Installation

- Make sure switch F1 is in off state
- Connect the 230 V Power supply to terminal X1, see 3.4.1
- Connect the 4...20 mA analogue sensors to the Input Unit (X2)
  - Analogue input 1:
    - 24 V to pin 1
    - 4-20 mA to pin 2
    - Further sensors to pins 3&4, 5&6, 7&8
- Make sure that everything is properly connected
- Power on the unit by switching F1 on
- Check the LEDs at 4G LTE modem after boot-up, this can take a few minutes:
  - STAT for network operator connection
  - GSM Signal strength
  - device will transmit as soon as a data connection is established
- Check device and transmitted values on Global DataCenter (account required)
  - [www.global-datacenter.de](http://www.global-datacenter.de)
- Push Button BT1 at the right side of the eNeon (T2) unit to trigger a test message, if needed

### 4.1 Digital Inputs

- Connect the power supply (24 V) to R11 and GND to DI- (digital input common ground)
- Connect outputs to the digital inputs (DI1-8)
  - check extension module on DataCenter for digital input changes (MM01-03, refers to expansion slot)
- Trailer-Detection:
  - check on DataCenter if the "Bit-code" changes to the wanted order
  - check on DataCenter if the analogue setup changes to the wanted values

#### 4.1.1 Modules in DataCenter

- The I/O expansions are separated into master module and expansion modules
- Master module: shows the 4 analogue inputs and 2 digital outputs of the first expansion module in slot 1
- Expansion modules:
  - MM01: Shows digital inputs of expansion module in slot 1
  - MM02: Shows digital inputs of expansion module in slot 2
  - MM03: Shows digital inputs of expansion module in slot 3
  - SM02: Shows digital output (relays) of expansion module in slot 2
  - SM03: Shows digital output (relays) of expansion module in slot 3

- AM02: Shows analogue inputs of expansion module in slot 2
- AM03: Shows analogue inputs of expansion module in slot 3

## 5. Operating / Commands

If a Digital Input changes its state, an alarm is sent to the DataCenter

Command requests via DataCenter

- Choose the module you want to edit.
- Choose "Configure -> Expert mode -> Send commands"
- Choose the command

### 5.1 Status command

- select "Status" to request the current status of the device

### 5.2 Routine call command and log Interval (fixed)

- Routine call: default fixed interval of 60 minutes
  - minute of routine call within an hour is randomly set, but can be changed to a specific minute, e.g. 01:15 (still 60 minutes interval)
  - The current values and states are transferred to DataCenter
  - The logger values (analogue input 1 - 4) of the last interval are also transmitted

To change the minute of the routine call:

- select "Routine call"
- select "Hourly" and set to "All 01 Hours"
- set the minutes as wanted
- click on "Use parameters" and send

Choose / enter command

Routine call

interval*		
<input checked="" type="radio"/> Hourly All <input type="text" value="01"/> Hours and <input type="text" value="00"/> minutes	<input type="radio"/> Daily at <input type="text" value="00"/> clock and <input type="text" value="00"/> minutes	<input type="radio"/> Weekly <input checked="" type="radio"/> monday <input type="radio"/> tuesday <input type="radio"/> wednesday <input type="radio"/> thursday <input type="radio"/> friday <input type="radio"/> saturday <input type="radio"/> sunday at <input type="text" value="00"/> clock and <input type="text" value="00"/> minutes

PLEASE NOTE: The time settings apply to the INTERNAL timezone setting of the device which may differ from your current local timezone.  
Current timezone of the device: UTC+00

- Data logger: default fixed interval 15 min
  - The storage is relative to the start time of the device
  - The logger values for AI1-4 are transmitted at the routine call time

## 5.3 Analogue Settings

- Configure limits for analogue inputs on device
- Every overstepping of limits is reported to DataCenter (both directions)  
(-> "Send SMS" option doesn't care)
- fixed 4-20 mA setting
- Analogue input 1 and 2 limits can be linked to digital output 1 and 2 (relay switches) with "Output on in" feature

Basic Setting		
Input:	<input type="text" value="Input 1"/>	
Lower limit [0-100]:	<input type="text"/> %	<input type="button" value="Use parameters"/>
Upper limit [0-100]:	<input type="text"/> %	<input type="button" value="Get server settings"/>
Hysteresis [0-20]:	<input type="text"/> %	
Mode-Flags		
Send SMS when	<input type="checkbox"/> under lower threshold	<input type="checkbox"/> over upper threshold
Sensor Input:	<input type="radio"/> 0 - 20 mA	<input checked="" type="radio"/> 4 - 20 mA
Connect to output:	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Output on in:	<input type="checkbox"/> lower range	<input type="checkbox"/> normal range <input type="checkbox"/> upper range