

# Eckelmann

## Specification of the Modbus data interface

for connection of the E\*LDS system to external systems

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Specification of the Modbus data interface - for connection of the E\*LDS system to external systems - 19.01.2022

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**Date:** 19.01.2022

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**File name:** Specification\_Modbus\_LDS\_Data\_Interface\_EN\_V1.24.docx

**Version:** V1.24

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## Change log

Version	Date	Changed by	Change: Chapter / content
01:00	13/08/2003	H. Gaarz	First created
01:01	15/12/2003	H. Gaarz	Pin assignment of COM2 added
01:02	02/02/2004	H. Gaarz	Energy and performance values added
01:03	12/06/2006	H. Gaarz	Minor corrections
01:04	18/01/2007	S. Junghenn	UA 300 E / UA 300 V added
01:05	12/02/2007	S. Junghenn, J. Essig	Update / new CI / diagrams
01:06	30/05/2007	F. Uhlemann	Minor corrections chapter 3 (xxx2 -> xxx8)
01:07	09/05/2008	S. Junghenn	FS 3000 added
01:08	23/03/2009	S. Junghenn, J. Essig	<ul style="list-style-type: none"> <li>• Addition, from which version of the store computer the screen for COM2 configuration is available</li> <li>• VS 300 added</li> <li>• VS 3000 series - &gt; VS 3010 series</li> </ul>
01:09	15/02/2010	S. Junghenn	TS 30 added
01:10	21/06/2010	B. Ritter	BMS added
01:11	24/03/2011	S. Junghenn	Specific data points added
01:12	07/03/2013	H. Gaarz	IEC61331 addresses added to chapter 4.9
01:13	17/11/2014	H. Gaarz	Compact controller UA 30 added
01:14	20/09/2015	S. Junghenn	M-bus meter added
01:15	05/07/2016	S. Junghenn	Minor changes
01:16	25/10/2016	M. Suhre	Layout, CI 4x00 configuration added
01:17	10/02/2017	M. Knapp	CI 4000: new data points for UA 300 E / UA 400 E
01:18	04/05/2017	T. Mehnert	<ul style="list-style-type: none"> <li>• Chapter 4.9 "CI 3000/CI 3100 Store Computer" revised.</li> <li>• Chapter 4.10 "CI 4x00 System Centre" added.</li> </ul>
01:19	17/07/2017	T. Mehnert	VS 3015 C added
01:20	09/08/2017	T. Mehnert	Chapter 4.10 - cooling meter added
01:21	10/01/2018	SJ	VS 3015 CT and SPITK added to the range
1.34	07/01/2022	C. Häßelbarth	UA 401 E added
1.24	19.01.2022	J. Essig	New logo / Boards

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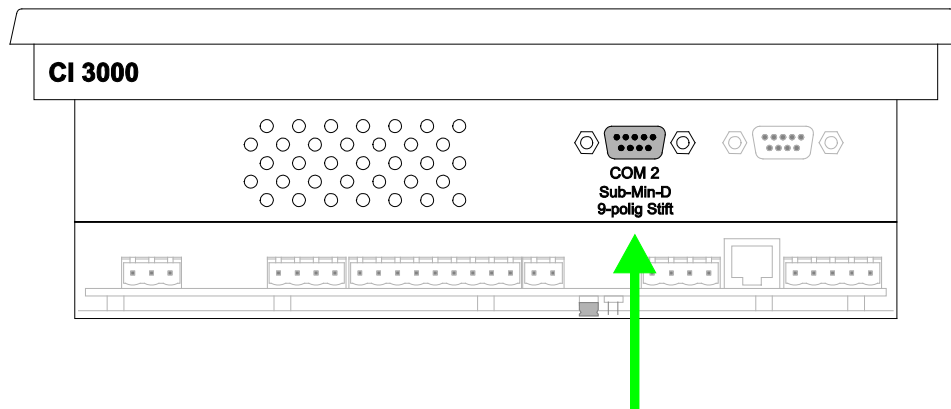
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## 1 Store computer / system centre interface

### 1.1 CI 3000 / CI 3100

The connection to an external system such as PRIVA HX 8E is made via the COM2 interface of the CI 3000 / CI 3100 store computer:



Pin assignment of the COM2 interface:

Pin 2:	RxD (receive data)
Pin 3:	TxD (transmit data)
Pin 5:	GND (signal ground)

Interface parameters:

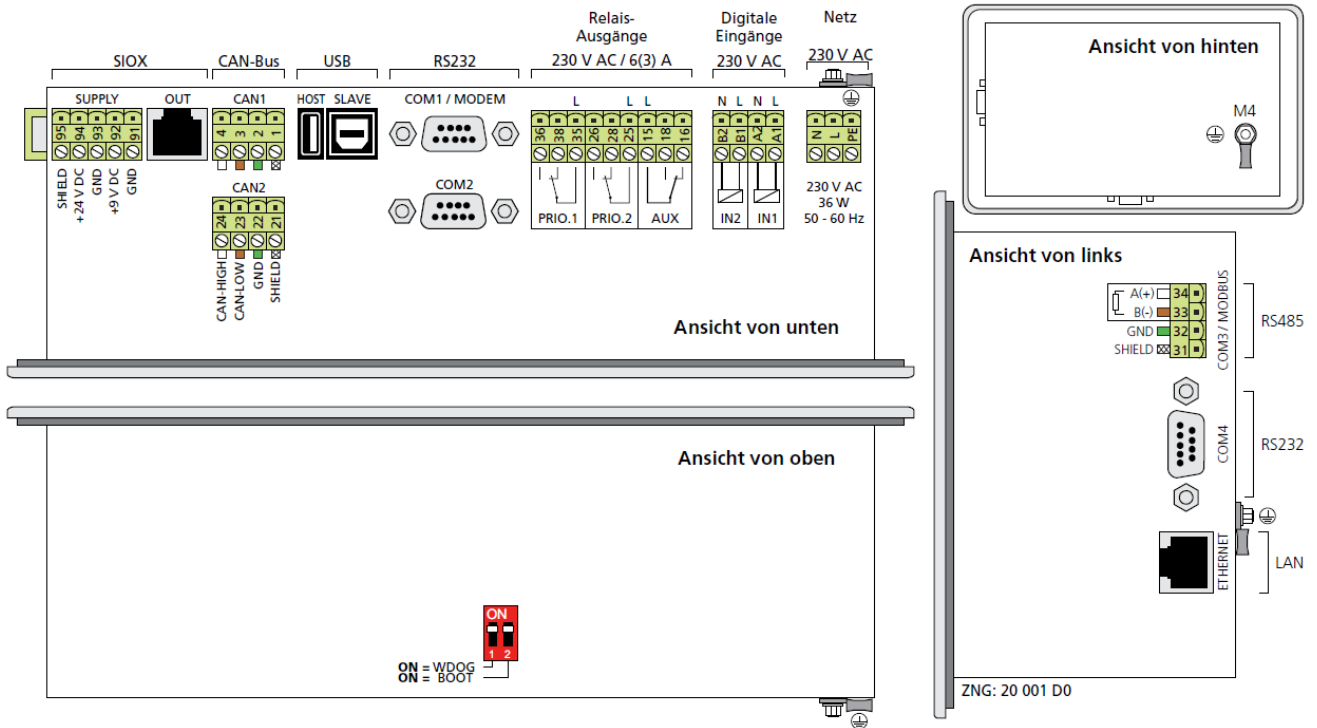
Baud rate:	9600
Data bits:	8
Parity:	none
Stop bits:	1
Handshake:	none (no DTR/DSR, no RTS/CTS)
Protocol:	Modbus RTU, the CI 3x00 is SLAVE

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## 1.2 CI 4x00

The connection to an external system such as PRIVA HX 8E is made via the COM4 interface of the CI 4x00 system centre:



Pin assignment of the COM4 interface:

Pin 2: RxD (receive data)  
 Pin 3: TxD (transmit data)  
 Pin 5: GND (signal ground)

Interface parameters:

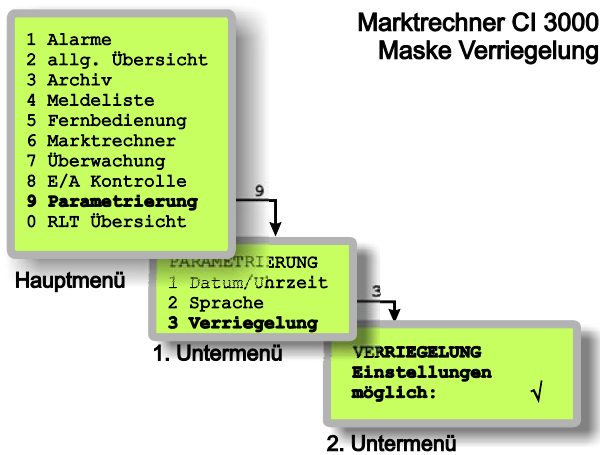
Baud rate: 9600  
 Data bits: 8  
 Parity: none  
 Stop bits: 1  
 Handshake: none (no DTR/DSR, no RTS/CTS)  
 Protocol: Modbus RTU  
 CI 4x00 is slave

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## 2 Settings on the CI 3000 / CI 3100 store computer

Before entering the values, the input locking of the store computer must first be unlocked with the ENTER key using the screen **9 (Parametrisation) → 3 (Locking)**:

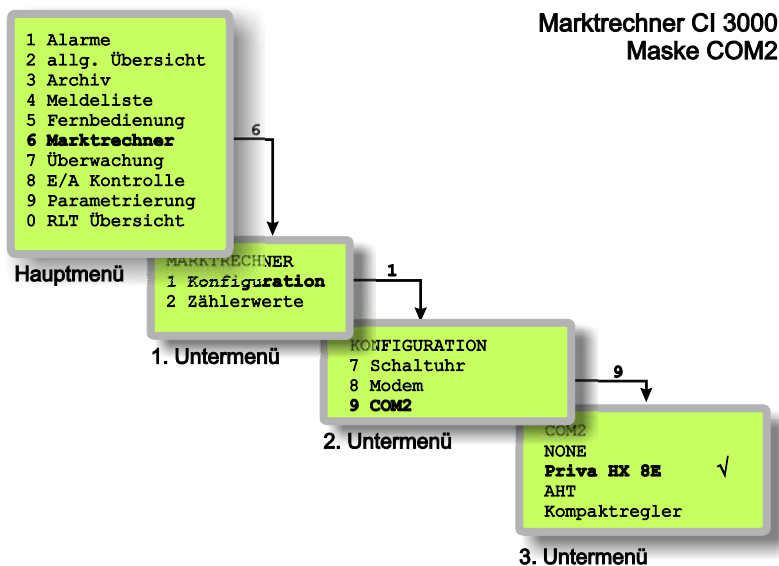


See the documentation of the CI 3000 / C3100 store computer for further information about the operation.

### Version information:

Version 2.06 .. 2.09: Connection to an external system such as "PRIVA HX 8E". is **permanently** configured on COM2 as default.

Version >2.09: The interface protocol "PRIVA HX 8E" or "Modbus GLT" must be activated via screen **6 (Store Computer) → 1 (Configuration) → 9 (COM2)**:



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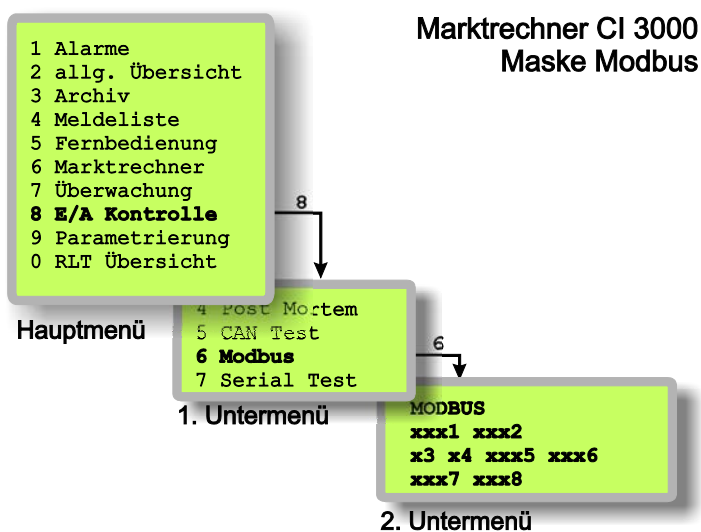
## 3 Diagnostics options

Diagnostics options for examining the Modbus are possible in the CI 3000 / CI 3100 store computer for Version 2.09 and higher.

A simple diagnostics display can be found in the CI 3000 / CI 3100 store computer under the menu item

**8 (I/O Control) → 6 (Modbus)**

:



Description of the second *MODBUS* submenu:

**xxx1**            Number of received frames  
**xxx2**            Number of frames with errors (checksum errors)

Values of the last frame of the master:

**x3**                Slave address  
**x4**                Function code  
**xxx5**             Start address  
**xxx6**             Register number  
**xxx7**             Number of transmitted frames  
**xxx8**             Number of failed requests (invalid register numbers,...)



## 4 Address ranges in the E.LDS system

Every controller in the E.LDS system has a unique address both on the E.LDS system bus (CAN bus) as well as via the Modbus connection.

E.LDS component	CAN bus addresses
Case controllers UA 300, UA 300 D, UA 300 E and UA 300 L	1 – 99
Pack controllers VS 300, VS 3010, VS 3010 BS, FS 3010	101 – 109
CI 3000, CI 3100, CI 4000 Store Computer	111
WR 300	117-120
Building Management System BMS	122 – 125
Case controller UA 30 and external controller on the Modbus, addresses 1 - 40	201 - 240
All other addresses are reserved	

### Example:

If the data are requested from the CI 3000 / CI 3100 store computer by the UA 300 case controller with the CAN bus address "10", the Modbus request must also be sent to the device address 10.



All Modbus protocols described in this documentation are supported in the CI 3000 / CI 3100 store computer with Version 4.11 or higher.

Therefore, it is strongly recommended **BEFORE** the connection of the store computer to an external system to update this store computer to Version 4.11 or higher using a firmware update (see the store computer manual for information about the firmware update).

## 4.1 UA 300 / UA 400 case controllers

Controller types: UA111, UA121, UA131, UA131LS, UA141, UR141NK, UR141TK, UA111D, UA131DD

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling Zone 1
3	Cooling Zone 2
4	Defrost Zone 1
5	Defrost Zone 2
6	Cold room door open
7	Alarm / controller failure
....	-reserved-

### Actual Values (Function 4 – read input register)

- Controller with one temperature zone:

Register Address PDU	Meaning	
0	-invalid-	
1	Return air temperature, pilot case	R4.1
2	Return air temperature, 2nd add-on case	R4.3
3	Return air temperature, 1st add-on case	R4.2
4	Return air temperature, 3rd add-on case	R4.4
5	Return air temperature, 4th add-on case (only for UA111D)	R4.5
....	-invalid-	

- controller with 2 temperature zones:

Register Address PDU	Meaning	
0	-invalid-	
1	Return air temperature, pilot case, zone 1	R4.1
2	Return air temperature, pilot case, zone 2	R4.3
3	Return air temperature, add-on case, zone 1	R4.2
4	Return air temperature, add-on case, zone 2	R4.4
5	-reserved-	
...	-invalid-	



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

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## 4.2 UA 300 D / UA 410 D discounter controllers

Controller types: UA111X, UA111XP, UR141

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling Zone 1
3	Cooling Zone 2
4	Defrost Zone 1
5	Defrost Zone 2
6	Cold room door 1 open
7	Alarm / controller failure
8	Cold room door 2 open
....	-reserved-

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning	
0	-invalid-	
1	Return air temperature, zone 1	R4.1
2	Return air temperature, zone 2	R4.2
....	-invalid-	



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

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## 4.3 Compact controller UA 30

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling
3	Defrost
4	Cold room door open
5	Alarm / controller failure
....	-reserved-

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning
0	-invalid-
1	Control sensor
....	-reserved-



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

## 4.4 Temperature recording UA 300 L / UA 410 L

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Cooling Zone 1
2	Cooling Zone 2
3	Cooling Zone 3
4	Cooling Zone 4
5	Cooling Zone 5
6	Defrost Zone 1
7	Defrost Zone 2
8	Defrost Zone 3
9	Operation
10	Defrost Zone 4
11	Defrost Zone 5
12	Alarm Zone 1
13	Alarm Zone 2
14	Alarm Zone 3
15	Controller failure
16	Alarm Zone 4
17	Alarm Zone 5
18	Alarm Zone 6
19	Alarm Zone 7
20	Alarm Zone 8
21	Alarm Zone 9
22	Alarm Zone 10
....	-reserved-

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning
0	-invalid-
1	Temperature Zone 1
2	Temperature Zone 2
3	Temperature Zone 3
4	Temperature Zone 4
5	Temperature Zone 5
6	Temperature Zone 6
7	Temperature Zone 7
8	Temperature Zone 8
9	Temperature Zone 9
10	Temperature Zone 10
....	-invalid-



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

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## 4.5 UA 300 E/UA 400 E/UA 410 E case controllers

Controller types: UA121E, UA131E, UA131ELS, UA141E, UR141NE, UR141TE, UK100E

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling Zone 1
3	Cooling Zone 2
4	Defrost Zone 1
5	Defrost Zone 2
6	Cold room door 1 open
7	Alarm
8	Cold room door 2 open
9	Superheat operation, zone 1
10	Superheat operation, zone 2
...	Reserved

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning	
0	-invalid-	
1	Return air temperature, Z1	R4.1
2	Return air temperature, Z2	R4.2
3	Evaporator outlet temperature, Z1	R1.1
4	Evaporator outlet temperature, Z2	R1.2
5	Opening degree, Z1	
6	Opening degree, Z2	
7	Supply air sensor R2.1	R2.1
8	Supply air sensor R2.2	R2.2
....	-invalid-	



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

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## 4.6 UA 401 E case controller (Virtus 5 V7.10.0 or higher, CI 5000 V7.10.0 or higher)

Controller types: UA121E, UA131E, UA131ELS, UA141E, UR141NE, UR141TE

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling Zone 1
3	Value always 0
4	Defrost Zone 1
5	Value always 0
6	Cold room door 1 open
7	Alarm
8	Value always 0
9	Superheat operation, zone 1
10	Value always 0
...	Reserved

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning	
0	-invalid-	
1	Return air temperature, Z1	R4.1
2	Value always -128	
3	Evaporator outlet temperature, Z1	R1.1
4	Value always -128	
5	Opening degree, Z1	
6	Value always -128	
7	Supply air sensor R2.1	R2.1
8	Value always -128	
....	-invalid-	



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

## 4.7 Case controller UA 412S/UA 413S –SPIR410

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling
3	---
4	Defrost
5	---
6	Condenser fan
7	Alarm / controller failure
....	-reserved-

### Actual Values (Function 4 – read input register)

- Controller with one temperature zone:

Register Address PDU	Meaning	Factor
0	-invalid-	
1	Supply air temperature R2	1
2	Return air temperature R4	1
3	Evaporator inlet	1
4	Brine outlet	1
5	Compression final temperature V1	1
	Available from CI 4000 V6.04.x	
6	Defrost sensor R1	1
7	Evaporator outlet R6	1
8	Condensation temperature R8	1
9	Brine inlet R9	1
10	Reserved RX	1
11	Speed, pump	1
12	Speed, compressor	1
13	To	1
14	Tc	1



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.



## 4.8 Case controller UA 412S/UA 413S –SPIR290

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling
3	---
4	Defrost
5	---
6	Condenser fan
7	Alarm / controller failure
....	-reserved-

### Actual Values (Function 4 – read input register)

- Controller with one temperature zone:

Register Address PDU	Meaning	Factor
0	-invalid-	
1	Supply air temperature R2	1
2	Return air temperature R4	1
3	HACCP sensor	1
4	Brine outlet	1
5	Compression final temperature V1	1
	Available from CI 4000 V6.04.x	Available
6	Defrost sensor R1	1
7	Defrost sensor R1.2	1
8	Compression final temperature V2	1
9	Compression final temperature V3	1
10	Compression final temperature V4	1
11	Speed, pump	1
12	Speed, compressor	1
13	To	1
14	Tc	1



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

## 4.9 Case controller UA 213S –SPIR290

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling
3	---
4	Defrost
5	---
6	Condenser fan
7	Alarm / controller failure
....	-reserved-

### Actual Values (Function 4 – read input register)

- Controller with one temperature zone:

Register Address PDU	Meaning	Factor
0	-invalid-	
1	Supply air temperature R2	1
2	Return air temperature R4	1
3	HACCP sensor	1
4	Brine outlet	1
5	Compression final temperature V1	1
6	Defrost sensor R1	1
7	Defrost sensor R1.2	1
8	Compression final temperature V2	1
9	Compression final temperature V3	1
10	---	1
11	---	1
12	Speed, compressor	1



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

## 4.10 Case controller UA 412S/UA413S –SPITK (TK Velando)

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	Cooling
3	---
4	Defrost
5	---
6	Condenser fan
7	Alarm / controller failure
....	-reserved-

### Actual Values (Function 4 – read input register)

- Controller with one temperature zone:

Register Address PDU	Meaning	Factor
0	-invalid-	
1	Supply air temperature R2	1
2	Return air temperature R4	1
3	HACCP sensor	1
4	Defrost water sensor	1
5		1
6	Defrost sensor R1	1
7	Defrost sensor R1.2	1
8		1
9		1
10		1
11		1
12	Speed, compressor	1
13		1
14		1



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

## 4.11 Pack controllers

### Status (Function 2 – read status register)

#### - VS 300 / VS 3010 BS / FS 3010 pack controller

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	-reserved-
3	-reserved-
4	-reserved-
5	-reserved-
6	-reserved-
7	Alarm / controller failure
....	-reserved-

#### - Pack controller VS 3010/VS 3010 C/VS 3015 C/VS 3010 CT/ VS 3015 CT

Register Address PDU	Meaning
0	-invalid-
1	Operation
2	-reserved-
3	-reserved-
4	-reserved-
5	-reserved-
6	-reserved-
7	Alarm / controller failure
8	-reserved-
9	Compressor 1
10	Compressor 2
11	Compressor 3
12	Compressor 4
13	Compressor 5
14	Compressor 6
15	Compressor 7
16	Compressor 8
....	-reserved-

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## Actual Values (Function 4 – read input register)

### - VS 300 pack controller

Register Address PDU	Meaning
0	-invalid-
1	Temperature control circuit 1 ( $t_0$ / $t_c$ , depending on controller configuration)
2	Temperature control circuit 2 ( $t_0$ / $t_c$ , depending on controller configuration)
3	-reserved-
....	-invalid-

### - Pack controller VS 3010/VS 3010 C/VS 3015 C/VS 3010 CT/VS 3015 CT

Register Address PDU	Meaning
0	-invalid-
1	Temperature $t_0$
2	Temperature $t_c$
3	-reserved-
4	PL / ND suction pressure
5	PH / HD high pressure
6	PM / MD medium pressure (only if CO2 regulation is activated)
....	-invalid-

### - VS 3010 BS pack controller

Register Address PDU	Meaning
0	-invalid-
1	Temperature $t_0$ (Z1, e.g. normal temperature refrigeration)
2	Temperature $t_c$
3	Temperature $t_0$ (Z2, e.g. low-temperature refrigeration)
....	-invalid-

### - FS 3010 pack controller

Register Address PDU	Meaning
0	-invalid-
1	Temperature $t_0$ , refrigerant inlet or outlet
2	Temperature $t_c$ , heat transfer medium inlet or outlet
3	Temperature $t_c$ or heat transfer medium 2nd circuit
....	-invalid-



If the sensor is not present or is defective, the value -128 is transmitted instead of the temperature.

## 4.12 Store computer CI 3000/CI 3100

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning
0	-invalid-
1	Meter SIOX 1 input 1: power*1
2	Meter SIOX 1 input 1: energy low tariff**
3	Meter SIOX 1 input 1: energy high tariff**
4	Meter SIOX 1 input 2: power*1
5	Meter SIOX 1 input 2: energy low tariff**
6	Meter SIOX 1 input 2: energy high tariff**
....	....
34	Meter SIOX 1 input 12: power*1
35	Meter SIOX 1 input 12: energy low tariff**
36	Meter SIOX 1 input 12: energy high tariff**
37	Meter SIOX 2 input 1: power*1
38	Meter SIOX 2 input 1: energy low tariff**
39	Meter SIOX 2 input 1: energy high tariff**
....	....
142	Meter SIOX 4 input 12: power*1
143	Meter SIOX 4 input 12: energy low tariff**
144	Meter SIOX 4 input 12: energy high tariff**
....	-reserved-



If meters or meter values are not available, the register value -32640 (0x8080) is transmitted instead of the value.

\*1 Average value of the last minute with one decimal place

\*\* Value from previous day

## 4.13 CI 4x00 System Centre

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning
0	-invalid-
1	Meter SIOX 1 input 1: power*1
2	Meter SIOX 1 input 1: energy low tariff**
3	Meter SIOX 1 input 1: energy high tariff**
4	Meter SIOX 1 input 2: power*1
5	Meter SIOX 1 input 2: energy low tariff**
6	Meter SIOX 1 input 2: energy high tariff**
....	....
34	Meter SIOX 1 input 12: power*1
35	Meter SIOX 1 input 12: energy low tariff**
36	Meter SIOX 1 input 12: energy high tariff**
37	Meter SIOX 2 input 1: power*1
38	Meter SIOX 2 input 1: energy low tariff**
39	Meter SIOX 2 input 1: energy high tariff**
....	....
142	Meter SIOX 4 input 12: power*1
143	Meter SIOX 4 input 12: energy low tariff**
144	Meter SIOX 4 input 12: energy high tariff**
....	-reserved-
201	M-bus meter 501: power / flow rate*2
202	M-bus meter 501: Consumption**
203	M-bus meter 501: Meter reading Low Word
204	M-bus meter 501: Meter reading High Word
205	M-bus meter 502: power / flow rate*2
206	M-bus meter 502: Consumption**
207	M-bus meter 502: Meter reading Low Word
208	M-bus meter 502: Meter reading High Word
....	....



If meters or meter values are not available, the default value 32896 (0x8080) is transmitted instead of the value for SIOX meters; in the case of M-bus meters, the default value according to the following table is transmitted.,

All values are transmitted as unsigned values.

\*1 Average value of the last minute with one decimal place

\*2 Average value of the last 15 minutes with one decimal place

\*\* Value from previous day

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## Default values and units for M-bus meters

Meter type	Value	Unit	Output if no value available (default value)
<b>Energy</b>	Power	kW	6553.5 (0xFFFF)
	Consumption (previous day)	kWh	65535 (0xFFFF)
	Meter reading	kWh	0 (0x00000000)
<b>Heat quantity</b>	Power	kW	6553.5 (0xFFFF)
	Consumption (previous day)	kWh	65535 (0xFFFF)
	Meter reading	kWh	0 (0x00000000)
<b>Water</b>	Flow rate	Litre / h	6553.5 (0xFFFF)
	Consumption (previous day)	Litre	65535 (0xFFFF)
	Meter reading	Litre	0 (0x00000000)
<b>Oil</b>	Flow rate	Litre / h	6553.5 (0xFFFF)
	Consumption (previous day)	Litre	65535 (0xFFFF)
	Meter reading	Litre	0 (0x00000000)
<b>Gas</b>	Flow rate	m <sup>3</sup> / h	6553.5 (0xFFFF)
	Consumption (previous day)	m <sup>3</sup>	65535 (0xFFFF)
	Meter reading	m <sup>3</sup>	0 (0x00000000)
<b>Cooling</b>	Power	kW	6553.5 (0xFFFF)
	Consumption (previous day)	kWh	65535 (0xFFFF)
	Meter reading	kWh	0 (0x00000000)



# Eckelmann

Specification of the Modbus data interface - for connection of the E\*LDS system to external systems - 19.01.2022

## 4.14 WR 300/TS 30 W

### Status (Function 2 – read status register)

Register Address PDU	Meaning	
0	-invalid-	
1	Module Offline	TS 30 ID 1
2	Manual shutdown	
3	Alarm	
4	Defrost	
5	Battery voltage	
6	-reserved-	
7	Cleaning mode	
8	-reserved-	
9	Module Offline	TS 30 ID 2
10	Manual shutdown	
...	...	...

### Actual Values (Function 4 – read input register)

Register Address PDU	Meaning
0	-invalid-
1	Temperature TS 30 ID 1
2	Temperature TS 30 ID 2
...	...
99	Temperature TS 30 ID 99
100	Temperature TS 30 ID 100
...	-invalid-

## 4.15 BMS

### Status (Function 2 – read status register)

Register Address PDU	Meaning
0	-invalid-
1	BMS input bit IX0.0
2	BMS input bit IX0.1
...	...
16	BMS input bit IX0.15
17	BMS input bit IX1.0
...	...
32	BMS input bit IX1.15
33	BMS input bit IX2.0
...	...
Register Address PDU	Meaning
16000	-invalid-
16001	BMS input memory bit MX4.0.0
16002	BMS input memory bit MX4.0.1
...	...
16016	BMS input memory bit MX4.0.15
16017	BMS input memory bit MX4.1.0
...	...
16032	BMS input memory bit MX4.1.15
16033	BMS input memory bit MX4.2.0
...	...
Register Address PDU	Meaning
32000	-invalid-
32001	BMS output bit QX0.0
32002	BMS output bit QX0.1
...	...
32016	BMS output bit QX0.15
32017	BMS output bit QX1.0
...	...
32032	BMS output bit QX1.15
32033	BMS output bit QX2.0
...	...
Register Address PDU	Meaning
48000	-invalid-
48001	BMS output memory bit MX5.0.0
48002	BMS output memory bit MX5.0.1
...	...
48016	BMS output memory bit MX5.0.15
48017	BMS output memory bit MX5.1.0
...	...
48032	BMS output memory bit MX5.1.15
48033	BMS output memory bit MX5.2.0
...	...

## Actual Values (Function 4 – read input register)

Register Address PDU	Meaning
0	-invalid-
1	BMS input word IW0
2	BMS input word IW1
...	...
127	BMS input word IW126
128	BMS input word IW127
all others	-invalid-

Register Address PDU	Meaning
0	-invalid-
1001	BMS input memory word MW4.0
1002	BMS input memory word MW4.1
...	...
1127	BMS input memory word MW4.126
1128	BMS input memory word MW4.127
all others	-invalid-

Register Address PDU	Meaning
0	-invalid-
2001	BMS output word QW0
2002	BMS output word QW1
...	...
2127	BMS output word QW126
2128	BMS output word QW127
all others	-invalid-

Register Address PDU	Meaning
0	-invalid-
3001	BMS output memory word MW5.0
3002	BMS output memory word MW5.1
...	...
3127	BMS output memory word MW5.126
3128	BMS output memory word MW5.127
all others	-invalid-

## 4.16 Project-specific data points (**only** CI 3000, Version 4.24 and higher)



This chapter is **only** applicable for CI 3000, Version 4.24 and higher!

### (Function 4 – read input register)

Register Address PDU	Meaning
0x1000	first data point
...	
0x1F1F	last data point

The PDU register address for project-specific and controller-specific data points is composed according to the following pattern.

The 16-bit address is divided into 3 segments and looks like the following hex value: 0x1YZZ

The first segment is always 0x1...

The second segment Y corresponds to the data point type (ring buffer type) in the value range of 0..F.

The third segment ZZ corresponds to the data point number (ring buffer number) in the value range of 0..F.