



# ISOMETER® isoPV1685 RTU

## Modbus register table

### 1 General information

This appendix provides a complete description of the Modbus register for the ISOMETER® isoPV1685 RTU to facilitate access to information.

The adjustable parameters for individual keys are listed.

The ISOMETER® isoPV1685 RTU supports 4-digit addressing and the following Modbus functions:

1. Holding registers for reading values (Read Holding Register; function code 0x03)
2. Registers for device programming (Preset Multiple Registers; function code 0x10)
3. The protocol parameters (Modbus address, baudrate, data bits and stop bits) are described in the manual.
4. A timeout of at least 100 ms must be met. (timeout is the minimum time, that the modbus master is waiting for a response from a Modbus slave.)

For the complete Modbus protocol specification, visit <http://www.modbus.org>.

### 2 Data access using the Modbus RTU protocol

Requests to the ISOMETER® can be made using the function code 0x03 (read multiple registers) or the command 0x10 (write multiple registers). The ISOMETER® generates a function-related answer and sends it back.

#### 2.1 Reading out the Modbus register from the ISOMETER®

The required Words of the process image can be read out from the ISOMETER® „holding registers“ using the function code 0x03. For this purpose, the start address and the number of the registers to be read out have to be entered. Up to 125 Words (0x7D) can be read out by one single request.

##### 2.1.1 Command of the master to the ISOMETER®

In the following example, the ISOMETER® master requests the content of the register 8198 with the address 2. The register contains the measuring value of system voltage  $U_n$ .

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x03
Byte 2, 3	Start address	0x2006
Byte 4, 5	Number of registers	0x0001
Byte 6, 7	CRC16 Checksum	0x6FF8

### 2.1.2 ISOMETER® answer to the master

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x03
Byte 2	Number of data bytes	0x02
Byte 3, 4	Data	0x0060
Byte 7, 8	CRC16 Checksum	0xFC6C

## 2.2 Write Modbus register (parameter setting)

Registers in the device can be modified with the Modbus command 0x10 (set multiple registers). Parameter registers are available from address 12288.

### 2.2.3 Command of the master to the ISOMETER®

In this example, in the ISOMETER® with address 2 the content of the register address 12289 is set to 40.000 (= 40 kΩ). The value describes the prewarning response value  $R_{1an}$

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x10
Byte 2, 3	Start register	0x3001
Byte 4, 5	Number of registers	0x0002
Byte 6	Number of data bytes	0x04
Byte 7, 8	Data	0x00009C40
Byte 9, 10	CRC16 Checksum	0x01D6

### 2.2.4 ISOMETER® answer to the master

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x10
Byte 2, 3	Start register	0x3001
Byte 4, 5	Number of registers	0x0002
Byte 6, 7	CRC16 Checksum	0x1F3B

### 2.2.5 Exception code

If a request cannot be answered, the ISOMETER® will send an exception code with which possible faults can be narrowed down.

Exception code	Description
0x01	Impermissible function
0x02	Impermissible data access
0x03	Impermissible data value
0x04	Internal fault
0x05	Acknowledgement of receipt (answer will be time delayed)
0x06	Request not accepted (repeat request, if necessary)

## 2.2.6 Structure of the Exception-Code

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x03
Byte 1	Function code (0x03) + 0x80	0x83
Byte 2	Data (exception code)	0x04
Byte 3, 4	CRC16 Checksum	0xE133

## 3 Modbus Registerbelegung

Registeraddr. hexadecimal	Registeraddr. decimal	Description	Number	Data type	Mode	Range	Unit	Comment / Value
Device information								
0x510	1296	Device name	10	String UTF 8	RO			„isoPV1685RTU-425“
0x578	1400	D-No. software	1	UInt16	RO			532
0x579	1401	Software-version	1	UInt16	RO			z.B. 9206
0x57A	1402	Build-No.	1	Int16	RO			Build-No. from Build-Prozesses
Measuring values								
0x2000	8192	Insulation resistance	2	UInt32	RO		Ω	
0x2002	8194	Leakage capacity	2	Float	RO		F	
0x2004	8196	Prewarning (Insulation resistance)	1	UInt16	RO			0 - OK; 4 - Warning
0x2005	8197	Alarm (Insulation resistance)	1	UInt16	RO			0 - OK; 4 - Warning
0x2006	8198	net voltage	1	Int16	RO		V	
0x2007	8199	Voltage U+ /Earth	1	Int16	RO		V	(Code 213 during Test)
0x2008	8200	Voltage U- /Earth	1	Int16	RO		V	(Code 213 during Test)
0x2009	8201	Temperature coupling L+	1	Int16	RO		°C	
0x200A	8202	Temperature coupling L-	1	Int16	RO		°C	
0x200B	8203	Alarm Overtemperature coupling L+	1	UInt16	RO			0 - OK; 4 - Warning (> 150°C)
0x200C	8204	Alarm Overtemperature coupling L-	1	UInt16	RO			0 - OK; 4 - Warning (> 150°C)
0x200D	8205	Connection Earth (E/KE)	1	UInt16	RO			0 - OK; 2 - Error
0x200E	8206	Device error	1	UInt16	RO			"0 - no Error; > 0 - Error code according to manual (without decimal point)"
0x200F	8207	Status Test	1	UInt16	RO			"0 - no Test; 1 - Internal Test; 2 - External Test"

Registeraddr. hexadecimal	Registeraddr. decimal	Description	Number	Data type	Mode	Range	Unit	Comment / Value
Parameter								
0x3000	12288	Response value Prewarning	2	UInt32	R/W	200 ... 1,000,000	Ω	
0x3002	12290	Response value Alarm	2	UInt32	R/W	200 ... 1,000,000	Ω	
0x3004	12292	Memory	1	UInt16	R/W	0 ... 1		0 = Off, 1 = On
0x3005	12293	Relay K1 (Prewarning)	1	UInt16	R/W	5 ... 10		5 = N/O, 6 = N/C, 9 = N/O-T, 10 = N/C-T
0x3006	12294	Relay K2 (Alarm)	1	UInt16	R/W	5 ... 10		5 = N/O, 6 = N/C, 9 = N/O-T, 10 = N/C-T
0x3007	12295	ModbusRTU baud rate	1	UInt16	R/W	9,600 ... 57,600		9600, 19200, 38400, 57600
0x3008	12296	Year	1	UInt16	R/W	2,000 ... 2,136		
0x3009	12297	Month	1	UInt16	R/W	1 ... 12		
0x300A	12298	Day	1	UInt16	R/W	1 ... 31		
0x300B	12299	Hour	1	UInt16	R/W	0 ... 23		
0x300C	12300	Minute	1	UInt16	R/W	0 ... 59		
Command control								
0x3100	12544	Factory setting	1	UInt16	WO			Factory setting = 0xFF00
0x3101	12545	Start Test	1	UInt16	WO			Start Test = 0xFF00
0x3102	12546	Reset (Memory)	1	UInt16	WO			Reset (Memory) = 0xFF00



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