VARIABLE LIST

RCW-M, WIRELESS RECEIVER

GO WIRELESS

READY STEADY GO

≋ REGIN
THE CHALLENGER

Variable list, Wireless receiver RCW-M

Contents

Chapter 1 RCW-M, Wireless receiver with Modbus communication

1.1 Introduction

The wireless receiver communicates with up to 16 wireless sensors and detectors.

RCW-M is a Modbus slave that uses RTU (see below 1.1.1 and 1.1.2)

The variable list is a compilation of all the variables that can be read and variables that can be changed in the wireless system.

1.1.1 Modbus protocol in general

The Modbus protocol is a general-purpose protocol for data exchange between for instance control units, SCADA systems, instruments, and electricity meters. It's an asynchronous, serial Master Slave protocol. It's widely used, well documented and simple to understand.

A Modbus master can communicate with up to 247 slave units with the device ID 1-247.

A protocol like Modbus consists of several layers (OSI-model). The bottom layer is always the physical layer; the number of wires and signal levels. The next layer describes the communication digits (number of data bits, stop-bits, parity etc.). Next are the layers describing the Modbus-specific functions (number of digits per message, the meaning of different messages, etc.).

1.1.2 RTU/ASCII modes

The Modbus protocol has two modes: binary (RTU) or character based (ASCII). In RTU mode all registers are transferred in binary format with two hexadecimal digits (0x00-0xFF) in each byte. In ASCII mode, the registers are transferred with one ASCII character (0-9, A-F) in each byte, and therefore twice as many bytes are needed compared to RTU format. On the other hand, the ASCII format has defined start of message and end of message characters which gives faster and more reliable detection of start and end of each message and is not so sensitive to delay in the messages. According to the Modbus standard all devices must have the RTU mode implemented.

RCW-M is a Modbus slave that uses RTU.

RTU character format:

☐ 1 start bit
☐ 8 data bits
☐ Odd, even or no parity bit
☐ 1 or 2 stop bits. Normally if no parity is used then 2 stop bits should be used.
☐ Check sum: 16 bits CRC

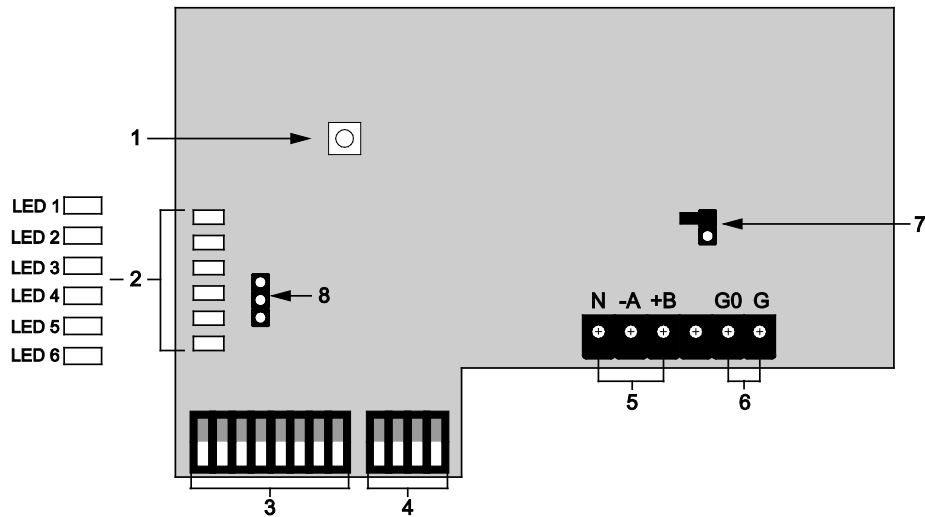### 1.1.3 Modbus register types

1 = Coil Status Register (Modbus function = 1, 5 and 15)
2 = Discrete Input (Modbus function = 2)
3 = Holding Register (Modbus function = 3, 6 and 16)
4 = Input Register (Modbus function = 4)

Supported Modbus functions:
2 = Read Discrete Input
3 = Read Holding Register
4 = Read Input Register
6 = Write Single Register
16 = Write Multiple Registers

1.2 RCW-M

Number	Description	Number	Description
1	Communication/Test button	5	RS485 terminal
2	LED lights	6	Power terminal
3	DIP switch set 2	7	RS485 terminal resistor (jumper)
4	DIP switch set 1	8	Service connection

Table 1

1.3 Configuration

The receiver has two sets of DIP-switches for configuration.

Set 1: RS-485 Parity and Baud rate setting

Function	Switch 1	Switch 2	Value
Parity	Off	Off	None*
	On	Off	Even*
	Off	On	None*
	On	On	Odd*

*1 or 2 stop bits

Function	Switch 3	Switch 4	Value
Baud rate	Off	Off	9600
	On	Off	19200
	Off	On	38400
	On	On	38400

Table 2

Set 2: Receiver Modbus device ID setting

DIP-switch	Bit	Position
1	Bit0	On
2	Bit1	On
3	Bit2	On
4	Bit3	On
5	Bit4	On
6	Bit5	On
7	Bit6	On
8	Bit7	On

Table 3

1.4 Pairing sensors to the receiver with Modbus (register 47001-47016)

Up to 16 sensors and/or detectors can be connected to one receiver.

Connect/pair one sensor at the time.

Use function F16 "Pre-set Multiple Registers"

1. Set "Holding register" 47001 to **1** to pair a sensor in zone 1. All 6 LED will start flashing.
2. Press the Test button on your sensor. If the pairing was successful, you will hear a short beep from the receiver, and LED 1 will light up. The sensor is now connected to zone 1.
3. To pair a sensor to zone 2, set Modbus register 47002 to **1** and so on (up to 47016).

Note: If more than 4 sensors are connected, all LEDs will shine. You will not see any difference on the LEDs when you pair more units.

1.4.2 Delete sensors from the receiver with Modbus
1. Set "Holding register" 47001 to **3** to delete the sensor in zone 1.
2. To delete a unit in zone 2, set Modbus register 47002 to **3** and so on (up to 47016)

Value	Function
1	Connect/Add to zone
3	Disconnect/Delete from zone

Table 4

1.5 Sensor device ID (register 37101-37116)

Every sensor and detector has a label with a unique serial number. The 4-digit device ID is imbedded in the serial number, written in hexadecimal code. The Modbus register displays the device ID in decimal code. To identify the device in the Modbus register, you have to recalculate the hexadecimal value to its decimal value.

The 4-digit hexadecimal ID is located after the first two digits in the serial number, see picture below.

Device ID in Hexadecimal form

This example:
0ECA = Device ID 3786

1.6 Device type (register 37001-37016)

Name	Description	Device type
DCW	Wireless door contact	10
IRW / IRCW	Wireless IR detector	21
TG-R5W	Wireless room temperature sensor	100
TG-R6W	Wireless outdoor temperature sensor	120
EPRW	Wireless optical pulse counter	200

Table 5

1.7 Setting "wake-up" times (register 40101-40116)

The "wake-up" time for a sensor, i.e. the time interval when the sensor collects information from the surroundings, can be set via Modbus. The factory setting is 2 minutes.

Note: If the wake-up time is changed, the battery life will change as well.

Chapter 2 Variable list

2.1 Discrete Input

Modbus register	Device	Description
10001-10016	DCW/IRW	DCW/IRW condition
10101-10116	All	Sensor low battery alarm
10201-10216	DCW/IRW/IRCW	Sensor tamper alarm
10301-10316	All	Sensor supervision alarm

Table 6

2.2 Input registers

Modbus register	Device	Description	Unit	Scale
30001-30016	TG-R5W TG-R6W	Temperature	°C	100
30101-30116	EPRW	Power	Watt	
30201-30232	EPRW	Energy (2 registers/channel)	kWh	10
37001-37016	All	Device type (see 1.7 above)		
37101-37116	All	Device Id of connected device (see 1.6 above)		
37201-37216	All	RSSI signal strength	dB	-1
37301-37316	All	RSSI min signal strength 48 Hour (worst level the last 48 hours)	dB	-1
39001-39020	All	F/W version		

Table 7

2.2 Holding registers

Modbus register	Device	Description	Unit	Scale
40001-40016	DCW / IRW	Counter for DI		
40101-40116	TG-R5W/TG-R6W	Wake up time (Adjustable: R/W)	Seconds	10
40201-40232	EPRW	Energy (2 registers/channel)	kWh	10
40301-40316	EPRW	Pulse counter	Imp/kWh	
47001-47016	All	Commission device (see 1.4) Decommission device (see 1.4.2)		

Table 8

Modbus register	Device	Description	Unit	Default
49001	IRW / IRCW	Time for active on-signal	Seconds	5
49002	DCW / IRW / IRCW	Supervision time out (min. 7200s)	Seconds	14400
49003	EPRW	Supervision time out (min. 7200s)	Seconds	14400
49004	TG-R5W / TG-R6W	Supervision time out (min. 7200s)	Seconds	14400
49006	TG-R5W / TG-R6W	Default wake up time	Seconds x10	12
49007	EPRW	Default imp/kWh	Imp/Kwh	1000
49010	All	The time left of 48Hrs (RSSI)	Minutes	-
49011	RCW-M	EPRW reporting time	Seconds	300

Table 9