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## RMIS MODBUS PROTOCOL

**READ AND SAVE  
THESE INSTRUCTIONS**

**LEGGI E CONSERVA  
QUESTE ISTRUZIONI**

***RMIS Models covered in this manual:***

Model	Code
RMIS 30A/2 RACK	99150200
RMIS 60A/2 RACK LIGHT	99150210
RMIS 3A/2 RACK	99150250
RMIS 3A/2 20K RACK	99150251

***This manual is written from RMIS firmware version 10087.***

***Please check the latest manual version at [www.elettrotestspa.it](http://www.elettrotestspa.it)***

***To consult older manual versions, please contact our support at [service@elettrotestspa.it](mailto:service@elettrotestspa.it)***

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## 1. MODBUS PROTOCOLS

There are two modbus protocols available for the RMIS:

- **MODBUS RTU** (For both serial and LAN connections)
- **MODBUS TCP** (only for LAN connections)

both ModBus RTU and ModBus TCP has the same Input Registers and Holding Registers.

Standard configurations for the ModBus protocol are:

- **ModBus RTU for Serial Interfaces (RS232-RS485)**
- **ModBus TCP for Ethernet connections**

### 1.1. MODBUS RTU CONFIGURATION

**Start:** 1  
**Data:** 8  
**Parity:** None  
**Stop:** 1.  
**Retry:** 500 ms  
**End message:** 3,5 tbyte  
**Baudrate:** 1200,9600,19200 (Programmable)  
**Timeout:** 4s (Suggested for reading bypass)

### 1.2. MODBUS TCP CONFIGURATION

**IP Address:** Same IP address as the one set locally in the RMIS  
**Port:** 502  
**Timeout:** 4s (Suggested for reading bypass)

### 1.3. ENABLED MODBUS COMANDS

Comando	Function Code
Read Holding Registers	03
Read Input Registers	04
Write Single Register	06

#### 1.3.1. Maximum Variables

Maximum number of variables for each register:

- **HOLDING REGISTER = 43**
- **INPUT REGISTER = 32**

## 2. HOLDING REGISTER

Variable	Address	Range	Factory value	Ris	Description
Not used	0	0	0	1	Elettrotest use
Address Mod	1	1-250	1 (*)	1	Address Mosbus
Address IP1	4		192 (*)		
Address IP2	5		168 (*)		
Address IP3	6		1 (*)		
Address IP4	7		1 (*)		
Subnet mask 1	8		255 (*)		
Subnet mask 2	9		255 (*)		
Subnet mask 3	10		255 (*)		
Subnet mask 4	11		0 (*)		
Gateway 1	12		192 (*)		
Gateway 2	13		168 (*)		
Gateway 3	14		1 (*)		
Gateway 4	15		0 (*)		
PORT SELECTION	17	0..2	0 (*)	1	0= RS232 1= RS485 2= LAN
LAN OPERATION	18	0..1	0 (*)	1	0 = LAN – REAL COM MODE 1 = TCP SERVER MODE
PROTOCOL	19	0..2	0 (*)	1	2 = MODBUS RTU 3 = MODBUS TCP
BAUD	20	0..2	1 (*)	1	0 = 1200 1 = 9600 2 = 19200
STATE	21	b0-b15	0	1	Bit 0= BYPASS                    0 = No Bypass – 1 = BYPASS Bit 1= START EUT RHM1        0 = NO START , 1 = START Bit 2= START EUT RHM2        0 = NO START , 1 = START Bit 3= START ACQ RHM1        0 = NO START , 1 = START Bit 4= START ACQ RHM2        0 = NO START , 1 = START Bit 5= REMOTE                    0 = LOCAL , 1 = REMOTE Bit6 =TEMPERATURE            0 = PROBE , 1 = MANUALE Bit7 =BYPASS ERROR            0 = NO ERROR (read only) , 1 = ERROR (set 0 to force reset) Bit8 = RHM1 voltage overrange (read only) Bit9 = RHM1 resistance polarity (read only) Bit10 = RHM1 resistance overrange (read only) Bit11 = RHM2 voltage overrange (read only) Bit12 = RHM2 resistance polarity (read only) Bit13 = RHM2 resistance overrange (read only) Bit14 = RHM1 communication error Bit15 = RHM2 communication error
Range Ohm 1	22	b0-b3	0 (*)	1	Range Ohm RHM1 b0-b1 ( <i>10xFull scale RHM1 can be found on IR.018</i> ) 0 = (0b00000000) = Range 1 = Full scale/1000 1 = (0b00000001) = Range 2 = Full scale/100 2 = (0b00000010) = Range 3 = Full scale/10 3 = (0b00000011) = Range 4 = Full scale
Range Ohm 2	23	b0-b3	0 (*)	1	Range Ohm RHM2 b0-b1 ( <i>10xFull scale RHM2 can be found on IR.019</i> ) 0 = (0b00000000) = Range 1 = Full scale/1000 1 = (0b00000001) = Range 2 = Full scale/100 2 = (0b00000010) = Range 3 = Full scale/10 3 = (0b00000011) = Range 4 = Full scale
Filter RHM1	24	b0-b3	0 (*)	1	Filter Level RHM1 b0-b1 0 = (0b00000000) = Filter = None 1 = (0b00000001) = Filter = Low 2 = (0b00000010) = Filter = Medium 3 = (0b00000011) = Filter = High

Filter RHM2	25	b0-b3	0 (*)	1	Filter Level RHM2 b0-b1 0 = (0b00000000) = Filter = None 1 = (0b00000001) = Filter = Low 2 = (0b00000010) = Filter = Medium 3 = (0b00000011) = Filter = High
R0 RHM1 dec	32	0.999	0	1	Decimal part R0 RHM1 (espressa in millesimi)
R0 RHM1 int	33	0.20000	0	1	Int. part R0 RHM1
R0 RHM2 dec	34	0.999	0	1	Decimal part R0 RHM2 (expressed)
R0 RHM2 int	35	0.20000	0	1	Int. part R0 RHM2
t0 RHM1	36	0.2000	0	1	RHM1 t0 (°C x10)
t0 RHM2	37	0.2000	0	1	RHM2 t0 (°C x10)
K (material)	38	0 .. 3	2 (*)	1	0 = 225 (alluminium ≥ 85%) 1 = 229,75 (15% > Copper > 85 %) 2 = 234,5 (Copper ≥ 85%) 3 = user K (setting via HR 41)
Temper. MAN	39	0 .. 2000	0 (*)	1	Manual temperature expressed in °C X 10
Operating mode	40	b0	0 (*)	1	b0: bypass mode (0>manual, 1=auto )
K User	41	20000...30000	0 (*)	1	User K[x 100]
Graph	42	0 .. 2	0 (*)	1	0 = delta t 1 = temperature 2 = resistance

(\*) = Setting saved in memory when RMIS is switch off

### 3. INPUT REGISTER

Variable	Address	Range	Def	Ris	Description
Not used	0	0	0	1	Elettrotest use
RES Range base RHM1	1	0 .. 20000	2	1	Resistance Range base RHM1
RES Range base RHM2	2	0 .. 20000	2	1	Resistance Range base RHM2
VOLT base	3	0 .. 10000	5000	1	Full scale voltage value x10
RES 1	4	0 .. 4095	R	1	Value expressed in 4095 of the RHM1 resistance
RES 2	5	0..4095	R	1	Value expressed in 4095 of the RHM2 resistance
Volt 1	6	0..4095	R	1	Value expressed in 4095 of the RHM1 base VOLT voltage
Volt 2	7	0..4095	R	1	Value expressed in 4095 of the RHM1 base VOLT voltage
Temper RHM	8	0 .. 2000	R	1	Temperature expressed in 2000 di 50°C
Dt RHM1	9	0..4095	R	1	Instantaneous value dt in °C x 10 RHM1
Dt RHM2	10	0..4095	R	1	Instantaneous value dt in °C x 10 RHM2
Bypass read	11	0..1	R	1	Bypass state (0=Open, 1=Close)
Bypass set	12	0..1	R	1	Bypass set (0=Open, 1=Close)
HW	13	0.100	R	1	HW Revision
SW	14	0.100	R	1	FW REvision
ID	15	0.100	R	1	ID Machine tbd
Temper per dt	16	0 .. 2000	R	1	Temperature expressed in °C x 10 (manual or from probe)
Bypass info	17	b0-b3	R	1	b0: Bypass set (0=open, 1=close) b1: Bypass state (0=open, 1=close) b2: Bypass error (0=no error, 1=error) b3: Bypass failure (0=NO failure, 1=failure)
Scale Code RHM1	18	0..65535	R	1	Range max in Ohm Channel 1 (ex. 2000 if max scale is 2000Ω)
Scale Code RHM2	19	0..65535	R	1	Range max in Ohm Channel 2 (ex. 2000 if max scale is 2000Ω)
Current Code LOW	20	0..65535	R	1	Current code for input LOW (Ampere x10) (example 30 if LOW is 3A)
Current Code HIGH	21	0..65535	R	1	Current code for input High (Ampere x10) (example 300 if HIGH is 30A)
Kuser Range 1 RHM1	22	9500..15000	R	1	Kuser set for the range 1* in the RMIS channel 1 (range between 95% and 105%)
Kuser Range 1 RHM2	23	9500..15000	R	1	Kuser set for the range 1* in the RMIS channel 2 (range between 95% and 105%)
Kuser Range 2 RHM1	24	9500..15000	R	1	Kuser set for the range 2* in the RMIS channel 1 (range between 95% and 105%)
Kuser Range 2 RHM2	25	9500..15000	R	1	Kuser set for the range 2* in the RMIS channel 2 (range between 95% and 105%)
Kuser Range 3 RHM1	26	9500..15000	R	1	Kuser set for the range 3* in the RMIS channel 1 (range between 95% and 105%)
Kuser Range 3 RHM2	27	9500..15000	R	1	Kuser set for the range 3* in the RMIS channel 2 (range between 95% and 105%)
Kuser Range 4 RHM1	28	9500..15000	R	1	Kuser set for the range 4* in the RMIS channel 1 (range between 95% and 105%)
Kuser Range 4 RHM2	29	9500..15000	R	1	Kuser set for the range 4* in the RMIS channel 2 (range between 95% and 105%)
Read Alarms RHM1	30	b0..b4	R	1	b0 = Bypass Error (same for each channel) b1 = Voltage overrange RHM1 b2 = Resistance polarity RHM1 b3 = Resistance overrange RHM1 b4 = Kuser RHM1 modified (Active only if in the set range is modified)
Read Alarms RHM2	31	b0..b4	R	1	b0 = Bypass Error (same for each channel) b1 = Voltage overrange RHM2 b2 = Resistance polarity RHM2 b3 = Resistance overrange RHM2 b4 = Kuser RHM2 modified (Active only if in the set range is modified)

(\*) = Range 1 to 4 are respectively the lowest range to the highest range installed in the RMIS.

## 4. REVISION INDEX

04_	Update fw 10087 for RMIS 60A version	10/07/24	Ferro	Ferro	Veronese
03_	Update fw 10086 for User and Elettrotest K factor (SPE001.24)	11/01/24	Ferro	Ferro	Veronese
02_	Update fw 10084 for RMIS 3A/2 20K (SPC014.23)	15/12/23	Ferro	Ferro	Veronese
01_	New Manual design	30/09/22	Ferro	Ferro	Veronese
00_	Definitive version from Beta11 User K and Graph Type	15.12.2021	Rigobello	Ferro	Veronese
<b>Rev</b>	<b>Description</b>	<b>Date</b>	<b>Author</b>	<b>Verified</b>	<b>Approved</b>