USER MANUAL

Z-KEY MBUS

R-KEY MBUS

MODBUS (TCP-IP / RTU) TO M-BUS (METER BUS) GATEWAY

Introduction

The content of this documentation refers to products and technologies described in it.

All technical data contained in the document may be changed without notice.

The content of this documentation is subject to periodic review.

To use the product safely and effectively, read the following instructions carefully before use.

The product must be used only for the use for which it was designed and manufactured: any other use is under the full responsibility of the user.

Installation, programming and set-up are allowed only to authorized, physically and intellectually suitable operators.

Set-up must be performed only after correct installation and the user must follow all the operations described in the installation manual carefully.

Seneca is not responsible for failures, breakages and accidents caused by ignorance or failure to apply the stated requirements.

Seneca is not responsible for any unauthorized modifications.

Seneca reserves the right to modify the device, for any commercial or construction requirement, without the obligation to promptly update the reference manuals.

No liability for the contents of this document can be accepted.

Use the concepts, examples and other content at your own risk.

There may be errors and inaccuracies in this document that could damage your system, so proceed with caution, the author(s) will not take responsibility for it.

Technical specifications are subject to change without notice.

CONTACT US	
Technical support	supporto@seneca.it
Product information	commerciale@seneca.it

Document revisions

DATE	REVISION	NOTES	AUTHOR
05/09/2022	0	First revision Aligned with firmware 109 revision	MM
13/03/2023	1	Aligned the chapter "MAPPING OF THE TAG AREA (HOLDING REGISTERS)" with the firmware 110 revision.	MM

This document is the property of SENECA srl.
Copies and reproduction are prohibited unless authorised.

www.seneca.it

Doc: MI-00592-IT | Rev. 1 | Page 3

TABLE OF CONTENTS

www.seneca.it   Doc: MI-00592-IT   Rev. 1   Page 4

1. *INTRODUCTION*

⚠️ **ATTENTION!**

This user manual extends the information from the installation manual to the configuration of the device. Use the installation manual for more information.

⚠️ **ATTENTION!**

In any case, SENECA s.r.l. or its suppliers will not be responsible for the loss of data/revenue or consequential or incidental damages due to negligence or bad/improper management of the device, even if SENECA is well aware of these possible damages.
SENECA, its subsidiaries, affiliates, group companies, suppliers and distributors do not guarantee that the functions fully meet the customer's expectations or that the device, firmware and software should have no errors or operate continuously.

⚠️ **ATTENTION!**

**Button PS1 is not used at the moment in the Z-KEY-MBUS instrument.**

1.1. DESCRIPTION

The Z-KEY-MBUS / R-KEY-MBUS products autonomously read the registers of the devices on the Meter Bus (M-BUS) and make them available for access via the serial ports, the USB port (Z-KEY-MBUS only) or via the ethernet port using the Modbus RTU or Modbus TCP-IP protocols (Holding Register-type registers).

Seneca devices can be connected to a maximum of 25 M-BUS devices and can manage up to 500 M-BUS variables (tags) (since an M-BUS variable can occupy up to 2 Modbus registers, the device makes available up to 1000 Modbus registers (to which 32 Modbus diagnostic registers must be added).
To configure the device, the integrated webserver can be used without the need for external software.

www.seneca.it   Doc: MI-00592-IT   Rev. 1   Page 5

Below are the connection configurations working simultaneously for both models:
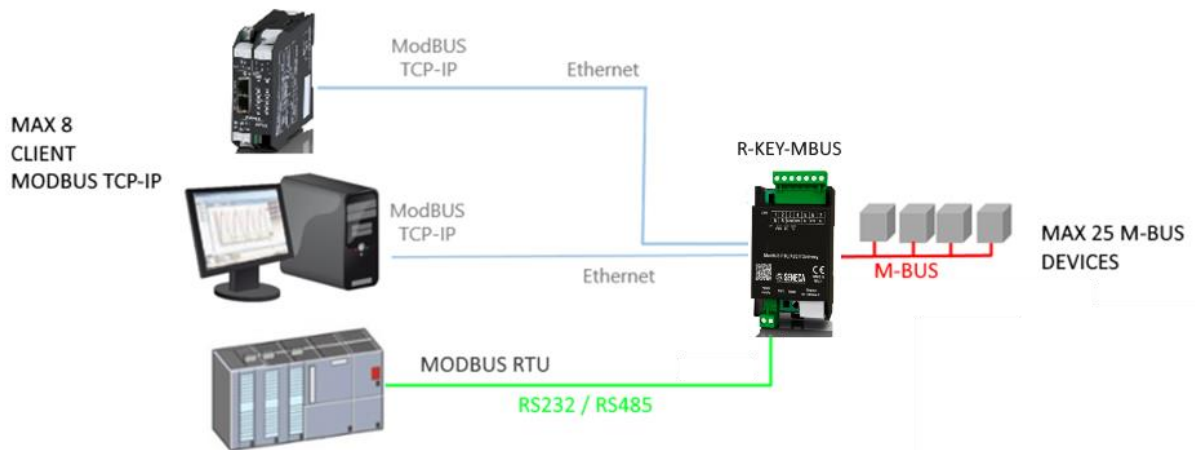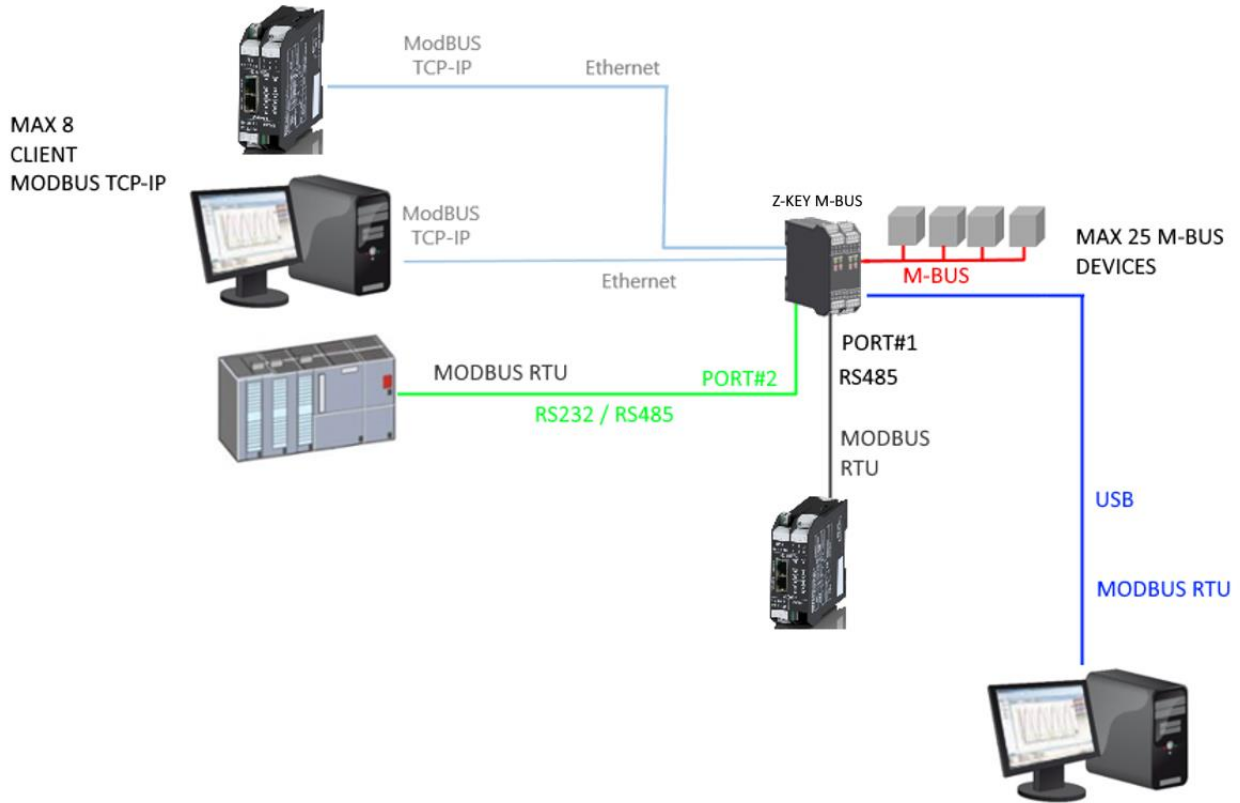
1.2. **COMMUNICATION PORT SPECIFICATIONS**

ETHERNET COMMUNICATION PORT	
Type	Ethernet 100 baseT RJ45 front
Configuration	Through integrated Webserver
Industrial communication protocol	Modbus TCP-IP server (max 8 simultaneous clients)
Ethernet device search	Through Seneca Discovery software
Factory address	Static address 192.168.90.101

RS485/RS232 SERIAL COMMUNICATION PORTS (Z-KEY-MBUS ONLY)	
Number of ports	2
Type	COM#1 RS485 port for IDC10 connector Terminal COM#2 RS485/RS232 port
Baud Rate	From 1200 to 115200 bit/s
Protocol	Modbus RTU Slave
RS485/RS232 SERIAL COMMUNICATION PORTS (R-KEY-MBUS ONLY)	
Number of ports	1
Type	Terminal RS485/RS232 port
Baud Rate	From 1200 to 115200 bit/s
Protocol	Modbus RTU Slave
USB COMMUNICATION PORT (Z-KEY-MBUS ONLY)	
Number of ports	1
Type	Driver Windows/Linux Virtual Com CDC standard
Protocol	Modbus RTU Slave
Configuration	Not modifiable 38400 bit/s, 8 bits, No parity, 1 stop bit, station address 1

METER BUS COMMUNICATION PORT	
Number of ports	1
Number of maximum Slave MBUS	25
Baud Rate	From 300 to 38400 bit/s

| **www.seneca.it** | Doc: MI-00592-IT | Rev. 1 | Page 7

2. APPLICATION FIELDS

2.1. CONNECTION WITH A PLC

The most classic sphere of application is the Z/ R-KEY-MBUS connection with a PLC, in this case it is sufficient for the PLC to support one of the following protocols:

- MODBUS RTU Master (via RS232 or RS485)
- MODBUS TCP-IP Client (via Ethernet)

The following example is related to Z-KEY-MBUS but is interchangeable with R-KEY-MBUS:
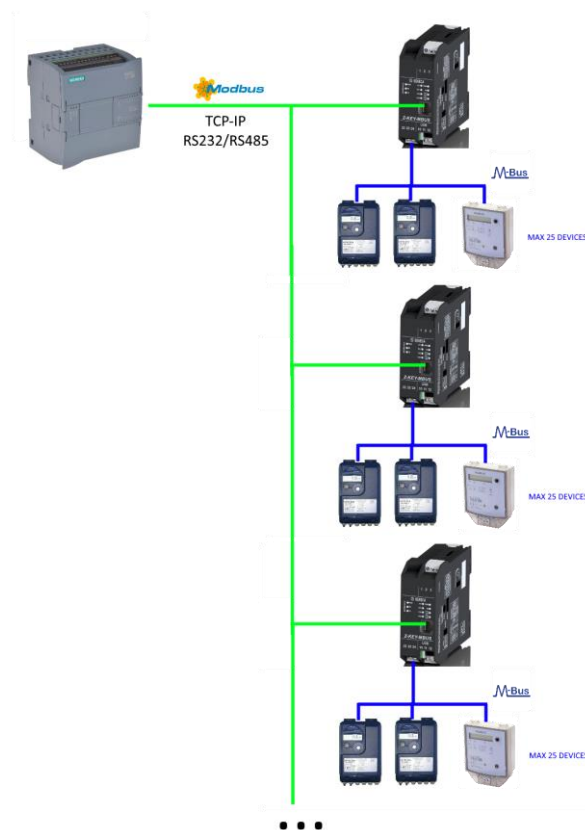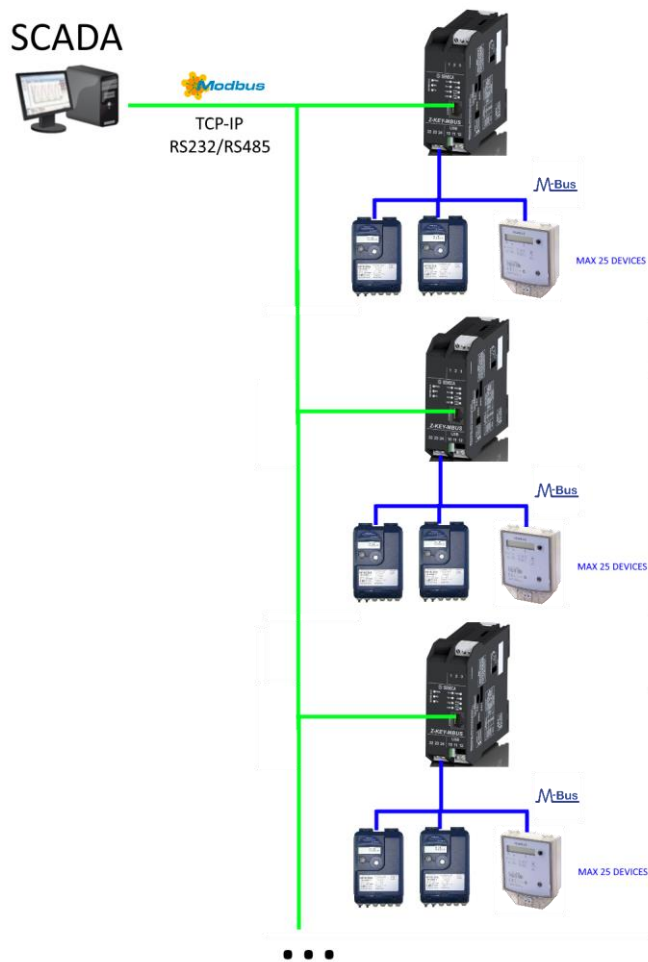
2.2. CONNECTION WITH A SCADA

To connect a SCADA to the Z/ R-KEY-MBUS gateway, the SCADA must support at least one of the following protocols:

- MODBUS RTU Master (via RS232 or RS485)
- MODBUS TCP-IP Client (via Ethernet)

Practically all SCADAs support these protocols.
Virtually there are no limits to the number of Z/ R-KEY-MBUS gateways that can be connected to a SCADA:

3. ETHERNET PORT

The factory configuration of the Ethernet port is:

STATIC IP: 192.168.90.101
SUBNET MASK: 255.255.0.0
GATEWAY: 192.168.90.1

Multiple devices must not be inserted on the same network with the same static IP.
If you want to connect multiple devices on the same network, you need to change the IP address configuration using the Webserver or the Seneca Discovery software.

⚠️ATTENTION!

DO NOT CONNECT 2 OR MORE FACTORY-CONFIGURED DEVICES ON THE SAME ETHERNET NETWORK, OR THE DEVICE WILL NOT WORK (192.168.90.101 IP ADDRESS CONFLICT)

If the addressing mode with DHCP is activated and an IP address is not received within 2 minutes, the device will set an error IP address such as:

169.254.x.y

Where x.y are the last two values of the MAC ADDRESS.

## 4. STEP BY STEP GUIDE FOR THE FIRST ACCESS TO THE WEBSERVER

STEP 1: POWER AND CONNECT THE ETHERNET PORT

STEP 2: SENECA DISCOVERY DEVICE SOFTWARE INSTALLATION
Download (from the Seneca website in the Z/R-KEY-MBUS section) the Seneca Discovery Device software.

STEP 3: SEARCH FOR THE DEVICE
Run the software and press the "SCAN" button: the software will search for the Ethernet devices in the network. Locate the Z/R-KEY-MBUS device (factory default address 192.168.90.101):

   www.seneca.it   Doc: MI-00592-IT   Rev. 1   Page 10
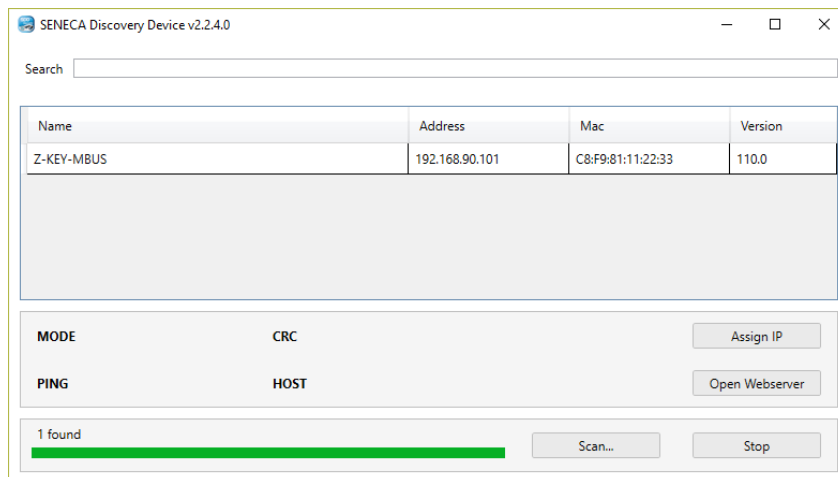
The software works at Ethernet Layer 2 level and it is therefore not necessary to have an Ethernet configuration compatible with the device you are looking for.

STEP 4 CHANGE OF IP ADDRESS

Select the device and press the "Assign IP" button, set a configuration compatible with your PC, for instance:
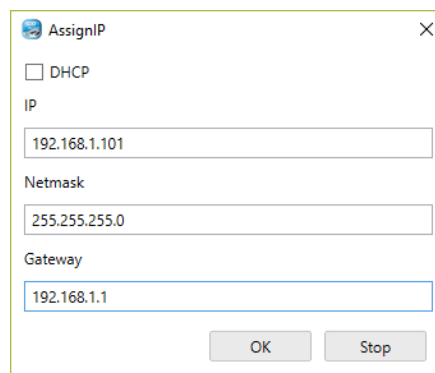
Confirm with OK. Now the device can be reached via Ethernet from your PC.

STEP 5 ACCESS TO THE CONFIGURATION WEBSERVER

Wait for the device to restart and press the "Open Webserver" button.
ENTER your access credentials:
user: admin
password: admin

⚠️**ATTENTION!**

THE WEB BROWSERS WHICH HAVE BEEN TESTED FOR COMPATIBILITY WITH THE DEVICE WEBSERVER ARE:
MOZILLA FIREFOX AND GOOGLE CHROME.
THEREFORE, THE OPERATION WITH OTHER BROWSERS IS NOT GUARANTEED

5.   WEBSERVER DEVICE CONFIGURATION

For further information on the access to the webserver of a new device, please refer to chapter 4.

⚠️**ATTENTION!**

THE WEB BROWSERS WHICH HAVE BEEN TESTED FOR COMPATIBILITY WITH THE DEVICE
WEBSERVER ARE:
MOZILLA FIREFOX AND GOOGLE CHROME.
THEREFORE, THE OPERATION WITH OTHER BROWSERS IS NOT GUARANTEED

5.1.   ACCESS TO THE WEB SERVER

Access to the web server takes place using a web browser and entering the IP address of the device.
To find out the IP address of the device, use the "search" function of the "Seneca Discovery Device" software
(see chapter 4).

On first access the user name and password will be requested.
The default values are:

Username: admin   Password: admin

⚠️**ATTENTION!**

AFTER THE FIRST ACCESS CHANGE USER NAME AND PASSWORD IN ORDER TO PREVENT
ACCESS TO THE DEVICE TO UNAUTHORIZED PEOPLE.

⚠️ **ATTENTION!**

IF THE PARAMETERS TO ACCESS THE WEBSERVER HAVE BEEN LOST, TO ACCESS IT, IT IS
NECESSARY TO GO THROUGH THE PROCEDURE TO RESET THE FACTORY-SET CONFIGURATION

5.2. **WEBSERVER SECTIONS**

The Webserver is divided into pages (sections) representing the various gateway functions:

Status
It is the section that displays the values of the configured tags in real time.

Setup
It is the section that allows the device basic configuration.

M-Bus Devices
It is the section that allows adding/modifying the M-bus devices connected to the gateway.

Scan M-Bus
It is the section that allows scanning and automatically adding the M-bus devices to the gateway.

Setup Tag
It is the section that allows adding/modifying the tags (that is the variables) of the M-bus devices connected to the gateway.

Update
It is the section that allows updating the firmware and database for the manual addition of the M-BUS meters.

www.seneca.it | Doc: MI-00592-IT | Rev. 1 | Page 13

5.3.   "STATUS" SECTION

In the status section, it is possible to view the tag values in real time together with their fail/ok status:

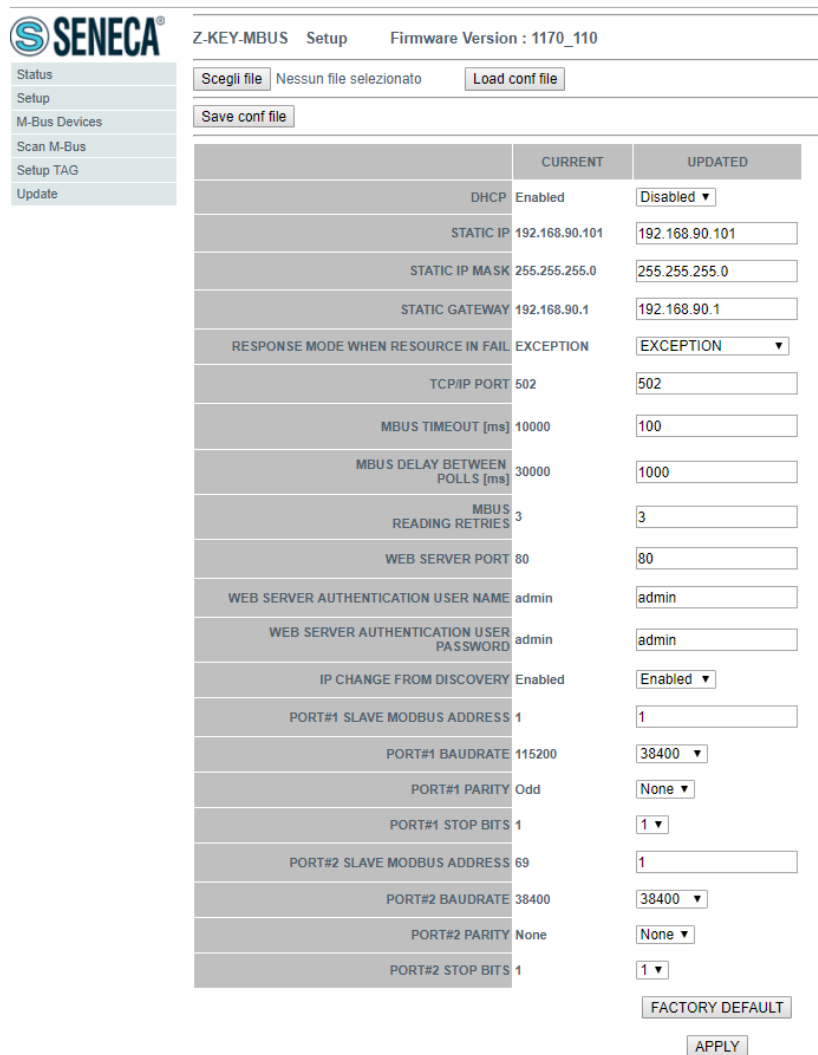| Z-KEY-MBUS Status	Firmware Version : 1170_110
DHCP :	Enabled
ACTUAL IP ADDRESS :	192.168.82.2
ACTUAL IP MASK :	255.255.255.0
ACTUAL GATEWAY ADDRESS:	192.168.82.1
ACTUAL MAC ADDRESS:	c8-f9-81-11-22-33
MBUS LOOP TIME [ms]:	33868

REBOOT

Page : 1/10 PREVIOUS PAGE   NEXT PAGE

GATEWAY TAG NR	GATEWAY TAG NAME	GATEWAY MODBUS START REGISTER	TAG DATA TYPE	TAG VALUE	TAG READING STATUS
1	FLOW_TEMP	40001	32BIT REAL MSW	-327.000000	OK
2	RETURN_TEMP	40003	32BIT REAL MSW	-327.000000	OK
3	VOLUME1	40005	32BIT REAL MSW	1000.000000	OK
4	VOLUME2	40007	32BIT REAL MSW	256.000000	OK

50 tags per page maximum can be displayed, the maximum number of pages is 10.
Some basic information among which the device interrogation loop time is displayed in the top part of the page.

5.4.   **"SETUP" SECTION**

DHCP (ETH) (default: Disabled)
Sets the DHCP client to get an IP address automatically.

STATIC IP (default: 192.168.90.101)
Sets the device static address. Careful not to enter devices with the same IP address into the same network.

STATIC IP MASK (default: 255.255.255.0)
Sets the mask for the IP network.

STATIC GATEWAY (default: 192.168.90.1)
Sets the gateway address.

RESPONSE MODE WHEN RESOURCE IN FAIL (default: EXCEPTION)
Selects what answer to give if the M-BUS meter connected does not answer the requests. It is possible to choose between:

Exception: The response to the modbus request of the tag in fail will be an exception.
Last Value Read: The response to the modbus request of the tag in fail will the last valid value.
Max: The response to the tag modbus request will be the maximum value that can be represented by the type of data.
Min: The response to the tag modbus request will be the minimum value that can be represented by the type of data.
Zero: The response to the tag modbus request will be 0.

TCP-IP PORT (default: 502)
Sets the communication port for the Modbus TCP-IP server protocol.

MBUS TIMEOUT [ms] (default 10000 ms)
Sets the waiting time for a request to be considered in timeout.

MBUS CYCLE PAUSE [s] (default 5 s)
Sets the waiting time after completing a round of requests on all M-BUS devices.

MBUS READING RETRIES (default 3)
Sets the number of request retries before considering a tag in fail.

WEB SERVER AUTHENTICATION USER NAME (default: admin)
Sets the username to access the webserver.

WEB SERVER PASSWORD (default: admin)
Sets the password to access the webserver and to read/write the configuration (if enabled).

WEB SERVER PORT (default: 80)
Sets the communication port for the web server.

IP CHANGE FROM DISCOVERY (default: Enabled)
Selects whether or not the device accepts the IP address change from the Seneca Discovery Device software.

PORT #1 SLAVE MODBUS ADDRESS (default: 1)
Selects the Modbus slave station address of COM #1 port (on IDC10 connector for Z-KEY-MBUS, on terminal for R-KEY-MBUS).

PORT #1 BAUDRATE (default: 38400 baud)
Selects the communication speed of COM #1 serial port (on IDC10 connector for Z-KEY-MBUS, on terminal for R-KEY-MBUS).

PORT #1 PARITY (default: None)

Selects the parity for the COM #1 serial communication port (on IDC10 connector for Z-KEY-MBUS, on terminal for R-KEY-MBUS).

PORT #1 STOP BIT (default: 1)

Sets the number of stop bits for the COM #1 serial communication port (on IDC10 connector for Z-KEY-MBUS, on terminal for R-KEY-MBUS).

PORT #2 SLAVE MODBUS ADDRESS (default: 1) (Z-KEY-MBUS ONLY)

Selects the Modbus slave station address of the COM #2 port (on terminal).

PORT #2BAUDRATE (default: 38400 baud) (Z-KEY-MBUS ONLY)

Selects the communication speed of the COM #2 serial port (on terminal)

PORT #2 PARITY (default: None) (Z-KEY-MBUS ONLY)

Sets the parity for the COM #2 serial communication port (on terminal).

PORT #2 STOP BIT (default: 1) (Z-KEY-MBUS ONLY)

Sets the number of stop bits for the COM #2 serial communication port (on terminal).

In addition, a configuration can be exported / imported via the webserver.

5.4.1. SAVING A CONFIGURATION ON A FILE

A configuration that includes:

CONFIGURATION
M-BUS DEVICE
TAG

It can be saved to a file this way:

Go to the Setup section and select the file to save, press the "Save config" button

| Scegli file | Nessun file selezionato | Load conf file |

| Save conf file |

5.4.2. IMPORTING A CONFIGURATION FROM A FILE

A configuration that includes:

CONFIGURATION
M-BUS DEVICE
TAG

It can be imported from a file this way:

Go to the Update section and select the file to load, press the "Load config" button

5.5. "M-BUS DEVICES" SECTION

This section shows the M-BUS devices inserted in the gateway.
It is possible to delete all the tags related to a device by deleting the device from the list of devices.

5.5.1. REPLACEMENT OF AN M-BUS DEVICE

It is also possible to change the address (for example in case of replacement) using the "MODIFY" button:

5.5.2. MANUAL ADDITION OF AN M-BUS DEVICE

By means of the "ADD" button, instead, it is possible to access the addition of an M-BUS device in manual mode. Z/R-KEY-MBUS has a database growing continuously with the devices of the main brands.

A = Select the brand of the device to insert
A = Select the model of the device to insert
C = Select if the device must be interrogated via primary or secondary address
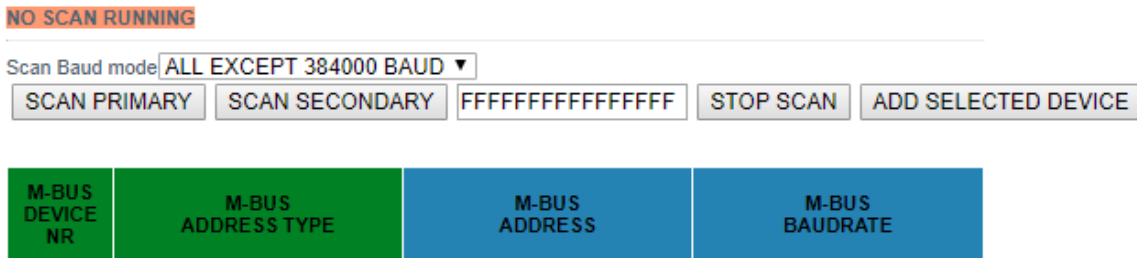D = Device address
E = Device Baud rate

If you only want to insert the device without the tags, press the "APPLY WITHOUT DATA POINTS SELECTED" button
If you only want to insert both the device and the selected tags, press the "APPLY WITH DATA POINTS SELECTED" button

5.6. "SCAN M-BUS" SECTION

5.6.1. SCANNING THE M-BUS

In the SCAN M-BUS section it is possible to automatically scan the bus.

If you do not know the primary address nor the baudrate of the M-BUS devices, we recommend you perform a secondary scan at all baud rates (it may take several minutes).
If a priori it is known that there are no conflicts of primary address it is possible to carry out a scan by primary address.

As devices are found they appear on the screen, for example:

M-BUS DEVICE NR	M-BUS ADDRESS TYPE	M-BUS ADDRESS	M-BUS BAUDRATE
1	SECONDARY	00008431614C0402	2400
2	SECONDARY	00008432614C0402	2400
3	SECONDARY	00008434614C0402	2400
4	SECONDARY	00008435614C0402	2400
5	SECONDARY	00008436614C0402	2400
6	SECONDARY	00008441614C0402	2400
7	SECONDARY	00008444614C0402	2400
8	SECONDARY	00008446614C0402	2400
9	SECONDARY	00008449614C0402	2400
10	SECONDARY	00008454614C0402	2400
11	SECONDARY	00008458614C0402	2400

The scan remains saved in the flash memory of the device until a new scan is requested.

www.seneca.it

| Doc: MI-00592-IT | Rev. 1 | Page 21 |

5.6.2. ADDITION OF AN M-BUS DEVICE AND YOUR TAGS

Once the bus has been scanned, it can be added to the list of M-BUS devices by selecting it from the list and pressing the "Add Selected Device" button:

At this point you can choose which device tags to add to the Z/R-KEY-MBUS device:

> ⚠️**ATTENTION!**
>
> **IF NO TAG IS SELECTED, THE SYSTEM WOULD ADD TO THE LIST ONLY**
> **THE M-BUS DEVICE.**

It is also possible to enter a mnemonic name of the tag.

Now press the "ADD DEVICE WITH DATA POINT SELECTED" button, at which point the tags and the device are automatically added to the Z/R-KEY-MBUS list.

To verify the addition of the M-BUS device you are automatically returned to the M-BUS DEVICES section:

Added tags can be seen in the instant view (Status section) and/or in the Tag Setup section.

5.7. "TAG SETUP" SECTION

In this section it is possible to modify the tags manually:

With the ADD button it is possible to add a new tag related to an M-BUS device.

It is possible to delete all the tags related to a device by deleting the device itself from the list in the M-BUS Devices section.

5.8. "UPDATE" SECTION

www.seneca.it   Doc: MI-00592-IT   Rev. 1   Page 23

5.8.1. FIRMWARE UPDATE

In order to improve, add, optimize the functions of the product, Seneca releases firmware updates on the device section on the www.seneca.it website

Then select the new firmware file and press the "Update firmware" button

Firmware Scegli file   Nessun file selezionato   Update firmware

---

⚠ATTENTION!

NOT TO DAMAGE THE DEVICE DO NOT REMOVE THE POWER SUPPLY DURING THE FIRMWARE UPDATE OPERATION.

5.8.2. DATABASE UPDATE

Seneca releases new updated Database tool files on the device section of the website www.seneca.it.
The Database is used when a new M-BUS device is entered in manual mode.
To update the database, select the file and press the "Update Database" button.
The device is already updated at the factory with the most recent database at the time of production

6. SUPPORTED MODBUS COMMUNICATION PROTOCOLS

The Modbus communication protocols supported are:

- Modbus RTU Slave (from #1 and #2 serial ports and from the USB port)
- Modbus TCP-IP Server (from the Ethernet port) 8 simultaneous clients max.

For more information on these protocols, see the website:
http://www.modbus.org/specs.php.

6.1. SUPPORTED MODBUS FUNCTION CODES

The following Modbus functions are supported:

- Read Holding Register   (function 3)
- Write Single Register   (function 6)

⚠ATTENTION!

All 32-bit values are contained in 2 consecutive registers

---

www.seneca.it   Doc: MI-00592-IT   Rev. 1   Page 24

7. MODBUS REGISTER MAPPING

Z/R-KEY-MBUS provides two different data areas accessible via Modbus RTU / Modbus TCP-IP protocols: The TAG area and the Diagnostic area.

In the Tag area, the values coming from the M-BUS are contained, in the diagnostic area the fail/ok statuses of the tags are contained:

REGISTER 40001 (4x 0001) (offset 0)	TAG AREA START
….	…
…	…
REGISTER 41001 (4x 1001) (offset 1000)	TAG AREA END
REGISTER 41002 (4x 1002) (offset 1001)	Reserved Area start
….	…
REGISTER 49000 (4x 9000) (offset 8999)	Reserved Area end
REGISTER 49001 (4x 9001) (offset 9000)	DIAGNOSTIC AREA START
….	…
REGISTER 49032 (4x 9032) (offset 9031)	DIAGNOSTIC AREA END

7.1.   **MAPPING OF THE TAG AREA (HOLDING REGISTERS)**

Measurement variables from M-BUS are converted into tags accessible from the Modbus bus. The Seneca product will add the new tags in the area as new M-BUS devices or new tags are entered.

Each variable coming from M-BUS can occupy 1 or more Modbus registers depending on the type of conversion that is carried out (for further details see the following table):

TYPE OF M-BUS DATA	*MODBUS RTU/TCP-IP CONVERSION (AUTOMATIC)*	*NUMBER OF MODBUS REGISTERS OCCUPIED*
SIGNED 8-BIT INTEGER	SIGNED 16-BIT INTEGER	1
SIGNED 16-BIT INTEGER	SIGNED 16-BIT INTEGER	1
SIGNED 32-BIT INTEGER	SIGNED 32-BIT INTEGER	2
SIGNED 48-BIT INTEGER	REAL 32 BIT (MSW FIRST)	2
SIGNED 64-BIT INTEGER	REAL 32 BIT (MSW FIRST)	2
FLOATING POINT 32 BIT	REAL 32 BIT (MSW FIRST)	2
DATE / HOUR	32-BIT DATE/TIME TYPE	2
BCD (BINARY CODED DECIMAL) FROM 2 TO 4 FIGURES	16-BIT UNSIGNED INTEGER	1
BCD (BINARY CODED DECIMAL) 8 FIGURES	32-BIT UNSIGNED INTEGER	2
BCD (BINARY CODED DECIMAL) 12 FIGURES	64-BIT UNSIGNED INTEGER	4

⚠️**ATTENTION!**

When converting to a 32-bit Floating Point data type, precision losses may occur.
This conversion, in fact, can lead to differences between the readings on the M-BUS device and those converted on Modbus.

The Modbus register for which the tag is found and the type of data is automatically calculated by Z/R-KEY-MBUS, it is however possible to modify it in the "Setup Tag" section:

The types of data converted automatically are:

16-BIT SIGNED INTEGER DATA TYPE	
RANGE	-32768 / +32767
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	1

16-BIT UNSIGNED INTEGER DATA TYPE	
RANGE	0 / +65535
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	1

32-BIT SIGNED INTEGER DATA TYPE	
RANGE	-2147483648 / +2147483647
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	2

Occupying 2 modbus registers, the data is represented as follows:

REGISTER n	Most significant part
REGISTER n+1	Least significant part

32-BIT UNSIGNED INTEGER DATA TYPE	
RANGE	0 / +4294967295
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	2

www.seneca.it | Doc: MI-00592-IT | Rev. 1 | Page 27

Occupying 2 modbus registers, the data is represented as follows:

REGISTER n	Most significant part
REGISTER n+1	Least significant part

64-BIT UNSIGNED INTEGER DATA TYPE	
RANGE	0 / +18446744073709551615
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	4

Occupying 4 modbus registers, the data is represented as follows:

REGISTER n	Most Most significant part
REGISTER n+1	Most significant part
REGISTER n+2	Least significant part
REGISTER n+3	Least Least significant part

REAL 32-BIT MSW DATA TYPE (FLOATING POINT IEEE-754)	
RANGE	1.175495e−38 / 3.40282346e+38
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	2

Occupying 2 modbus registers, the data is represented as follows:

ADDRESS REGISTER n	Most significant part
ADDRESS REGISTER n+1	Least significant part

For further information on the type of 32-bit Real data, refer to the following website:
https://en.wikipedia.org/wiki/IEEE_754

For online conversion tools, refer to the website:
https://www.h-schmidt.net/FloatConverter/IEEE754.html

DATE/TIME DATA TYPE	
RANGE	01/01/2000 / 31 December 2127
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	2

ADDRESS	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT
REGISTER	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
n	HOURS								MINUTES:							
ADDRESS	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT
REGISTER	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
n+1	YEAR							MONTH				DAY				

It is possible to change the type of data selected automatically by Z/ R-KEY-MBUS in the "TAG Setup" section.
In particular it is possible, for instance, to change the data type from Real 32 BIT MSW to LSW (Reverse Real):

REAL 32-BIT LSW DATA TYPE (FLOATING POINT IEEE-754)	
RANGE	1.175495e−38 / 3.40282346e+38
NUMBER OF HOLDING REGISTER MODBUS REGISTERS	2

Occupying 2 modbus registers, the data is represented as follows:

ADDRESS REGISTER n	Least significant part
ADDRESS REGISTER n+1	Most significant part

7.2. MAPPING OF THE DIAGNOSTIC AREA (HOLDING REGISTERS)

A diagnostic bit is available in the holding registers for each tag.

For example, in the 16-bits register 49001 (offset 9000) the statuses of the first 16 tags are contained in this way:

BIT 16	*BIT 15*	*BIT 14*	*BIT 13*	*BIT 12*	*BIT 11*	*BIT 10*	*BIT 9*	*BIT 8*	*BIT 7*	*BIT 6*	*BIT 5*	*BIT 4*	*BIT 3*	*BIT 2*	*BIT 1*
TAG 16	TAG 15	TAG 14	TAG 13	TAG 12	TAG 11	TAG 10	TAG 9	TAG 8	TAG 7	TAG 6	TAG 5	TAG 4	TAG 3	TAG 2	TAG 1

Where the meaning of the bit is the following:
Bit = 0 M-BUS TAG READ TIMEOUT
Bit = 1 M-BUS TAG READ TIMEOUT

ADDRESS	*ADDRESS (4x)*	*OFFSET*	*REGISTER*	*W/R*	*REGISTER TYPE*
49001	4x9001	9000	DIAGNOSTIC TAG 1..16	RO	UNSIGNED 16 BIT
49002	4x9002	9001	DIAGNOSTIC TAG 17..32	RO	UNSIGNED 16 BIT
...	...	...	...	...	...
49031	4x9031	9031	DIAGNOSTIC TAG 481..496	RO	UNSIGNED 16 BIT
49032	4x9032	9032	DIAGNOSTIC TAG 497..500	RO	UNSIGNED 16 BIT

8. *RESETTING TO FACTORY CONFIGURATION*

If the credentials to access the webserver are lost, it is always possible to return the device to its factory conditions:
Static IP 192.168.90.101
user: admin password: admin

this way:

Turn off the device

1) Turn all SW1 dip switches ON:

2) Turn on the device
3) Wait at least 10 seconds
4) Turn off the device
5) Turn all SW1 dip switches OFF:

When the device is switched on again, it will start with its factory configuration.

⚠ ATTENTION!

In some models there are 4 dip switches, in this case dip switches 3 and 4 must ALWAYS be kept in the "OFF" state

---

www.seneca.it

| Doc: MI-00592-IT | Rev. 1 | Page 30 |