

## DEVICE USER MANUAL

### RM-470 REMOTE DISPLAY

## 1. Introduction

RM-470 remote display is designed to display measurement results transmitted by weighing terminals. The display operates in the automatic mode by default (see Autolearn) and in standard installations does not require prior configuration. For advanced options, it is necessary to adjust the settings via RGB WagSet RM software, or through the user menu embedded in the device, or Web-panel. RGB WagSet RM software is available for download at: <http://kazel-displays.com/remote-displays/rm-470>.

RGB WagSet RM software enables advanced configuration of the device:

- precise defining of the communication protocol with any weighing terminal;
- restoring the factory settings, displaying the software version, displaying the saved communication protocol, and changing the network settings,
- setting the response to events reported by the weighing terminal (e.g. overloading, underloading, instability, scale error),
- setting advertising text in the following languages: PL, EN, RU, DE, CZ, SK, HU, UA, LT, LV, NO, SE, FR, NL, BR, RO, ES, TR, FI.

The detailed information concerning the configuration from a computer can be found in the manual supplied with RGB WagSet RM software<sup>1</sup>. The way of connecting the display to a PC is described in section 4 of this manual.

The embedded Web-panel allows:

- checking and selecting the communication protocol of the weighing terminal,
- changing the network settings,
- checking the software version and updating the display software,
- checking the status and the regional settings for the display.

The user menu embedded in the device allows basic device configuration without using a PC:

- manual selection of a communication protocol from the list enabling operation with selected weighing terminals,
- restoring the factory settings, displaying the software version, displaying the saved communication protocol and the communication ports, displaying the IP address and the subnet mask

## 2. Autolearn mode

The Autolearn mode is enabled by default (position no. 0 is set in the 'proto' submenu). In order to disable it, the communication protocol must be set manually using the embedded Web-panel or RGB WagSet RM software.

When this mode is active, each time the device is started, it detects the parameters of the communication with the weighing terminal and analyses the structure of the data frames it sends. Then it adjusts the remote display settings to enable correct communication with the terminal. The whole operation lasts several seconds, depending on the baud rate and the time interval between consecutive frames. All remote display communication interfaces, i.e. RS232/RS485/CL and the Ethernet<sup>2</sup>, are supported.

The Autolearn procedure is as follows:

1. Baud rate detection - dot 1 flashing on display;
2. Baud rate verification - dot 1 solid, dot 2 flashing;
3. Analysis of the protocol and its frame structure - dots 1 and 2 solid, dot 3 flashing.

During the analysis of the protocol and its frame structure, the measurement unit sent is also recognised. The following tags are recognised - "kg" "K" "t" "T" "t" "g" "gr" "G" "g" "lb" "L" "l" "oz" "o" "O". In case the terminal does not send the unit or sends a unit that is not recognised by the Autolearn function, the default unit will be set. Depending on the purchased regional version, it is "kg" or "lb".

<sup>1</sup> Click on the Help tab > Help or use the F1 button.

<sup>2</sup> If, first, the data is sent via the Ethernet to the display and, then, one of the other interfaces, i.e. RS232 / RS485 / CL, is connected - the Autolearn procedure will be carried out again in order to determine the UART parameters and the protocol (the protocol for serial interfaces may differ from the Ethernet protocol).

The Autolearn function also detects gross/net measurements if the following tags are sent in the frame:

- for the net measurement: 'n' and 'N' from the ASCII table,
- for the gross measurement: 'g' and 'G' from the ASCII table,

In this case, the tag position will also be saved. If, during the operation of the device, the transmitted measurement tag changes, e.g. from "n" to "g" - the indicator will change accordingly.

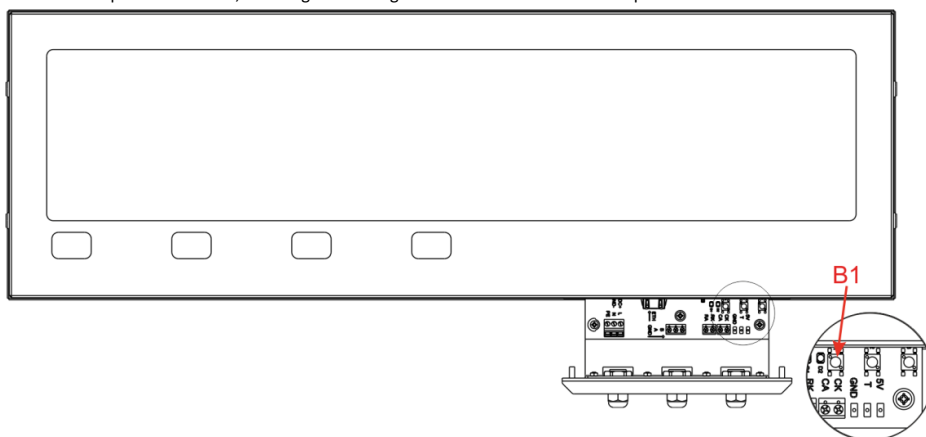
The Autolearn function supports the following transmission parameters:

**Table 1**

Baud rate:	2400, 4800, 9600, 19200
Transmission parameters (data bits, parity, stop bits):	8N1, 7E1, 7O1

### 3. Embedded user menu

In order to activate the embedded user menu, use the microbutton marked as B1 in Fig. 1. To access the button, you need to unscrew the slide-out drawer where the controller board is located. When you have finished using the embedded menu, push the drawer back and replace the screws, ensuring that the tightness of the device is not compromised.



**Fig. 1**

The user menu has the following options:

- info,
- proto,
- custm,
- reset.

To activate a specific option, hold the microbutton down until the description of this option appears ("info", "proto", "custm" or "reset" message). The option is selected after releasing the microbutton when its name is being displayed. If the button is released when the screen is blank between two consecutive options, the display will return to its normal operation.

The "info" option allows you to display the device software version and the network settings (IP address, network mask, communication port for RGB WagSet RM program and communication port for the weighing terminal).

The „proto" option allows you to select the display communication protocol to work with selected weighing terminals (Tab. 1). You can change the protocol by short pressing the microbutton. Saving the selected protocol is accomplished by long holding down the microbutton (until the message "Saved" appears). Exiting the "proto" option happens automatically after 30 seconds of the user inactivity.

The "custm" option allows you to select a dedicated communication protocol to work with weighing terminals of selected clients. These protocols have special, custom settings required by those clients. Setting the protocol is done in the same way as in the case of the "proto" option - saving the selected protocol is accomplished by long holding down the microbutton (until the message "Saved" appears), while exiting the "custm" option happens automatically after 30 seconds of the user inactivity.

The "reset" option allows you to restore the remote display to its default settings, activate the Autolearn mode and restore the network layer settings (IP address, network mask, communication port). Hold the button down until the message "reset" starts blinking and do not release it until the message "default" is displayed. Releasing the button before the message "default" appears will result in interrupting the process of restoring the default settings and the display will continue working according to the previously determined parameters. Uploading new network settings is possible using RGB WagSet RM software and through the Web-panel.

Table 2. List of the supported protocols.

Seq. no.	Terminal name	Protocol	Seq. no.	Terminal name	Protocol
0	Autolearn mode		28	CAS NT570A	
1	Rhewa 83 Plus		29	Cardinal 825	
2	Radwag		30	Cardinal 204 225 748P	
3	HBM WE2108		31	AMCS Group	
4	HBM WE2110		32	A&D AD4329 AD4401	
5	Rinstrum 320 420	Auto1	33	Ian Fellows SGO	
6	SysTec / Pronova		34	Ian Fellows SGO Status	
7	SysTec		35	Zemic	
8	Precia Molen	Master D	36	Pfister DWT800	
9	Precia Molen I300 Slave A+		37	Pfister DWT410	
10	Precia Molen I300 Master A+		38	Axis Long	
11	Dini Argeo	Standard String	39	Avery L225	
12	Mettler Toledo IND560		40	T – Scale U8	
13	Fawag	P2	41	Rice Lake 480 920i	
14	Leon Engineering	W-OUT	42	Vishay VT300	
15	Soehnle 3010 3011 3015	13	43	Belt Way	
16	Eurobil Balance Iscale	Continua	44	Axtec	
17	Compatible with the SMA protocol	SMA	45	GSE 460 465	
18	Sartorius	Remote Control	46	GSE 250	AUTO1
19	Sensocar		47	STB-22	
20	Flintec		48	Utilicell Matrix II	Format1
21	Schenck	Disomat B	49	Precia Molen i35	Master A+
22	Schenck Opus Serial		50	Precia Molen i35	Master D
23	Gravex GX25S		51	SMART SWIFT	
24	Gravex GX18		52	Epelsa: BC, BI, Dexal, Cyber, Orion, Orion Plus, Cyber Plus, V-36	Epelsa Cada LetraB1
25	IHG TMI LP7510				
26	Arpege MasterK				
27	Bilanciai D410				

## 4. Connecting the display to a computer for configuration purposes

### 4.1 RGB WagSet RM<sup>3</sup>

Before configuring the display from RGB WagSet RM program, connect it to a computer. The display should be connected to the RS232 computer port as shown in Fig. 2. The location of the remote display RA and RK connectors is shown in section 5 of this manual.

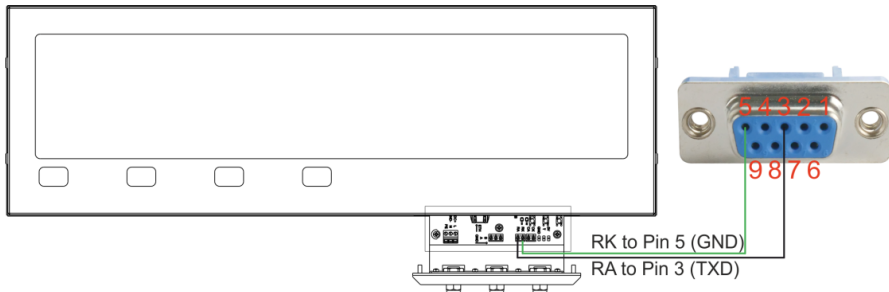


Fig. 2

<sup>3</sup> The software compatible only with the Windows operating system.

## 4.2 Web-panel

RM-470 remote display is equipped with a network communication module (the Ethernet module). It allows intuitive configuration through the embedded website - Web-panel. In order to configure the network connection, please follow the **"Network Card Configuration Instruction"** available for download at: <http://rgbtechnology.pl/soft/>.

### 4.2.1 Connection with the device

The connection with RM-470 display is established through the Ethernet interface; the integrated website is operated via a web browser (recommended browser: Mozilla Firefox version 16.0.2 or later).

To connect to the device, enter the IP address assigned to the device into the browser (by default **192.168.0.11**).

Then, the device will ask you to enter the username and the password (by default User: **admin**, Password: **dbps**).

**NOTICE!** If several RM470 remote displays are connected to the same network, the devices should be connected sequentially, giving them unique IP addresses, to avoid the conflict of addresses (initially, they all have the same default address).

### 4.2.2 Description of the Web-panel tabs



Fig. 3

The Web-panel is divided into six main tabs:

- 1) Network settings - allows you to set parameters for connecting with the device via the Ethernet. This tab allows you to change the IP address, subnet mask, gateway and port. All changes must be confirmed by clicking on the "Save" button.

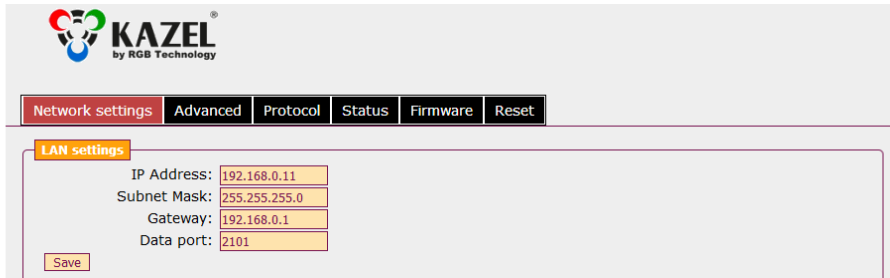


Fig. 4

- 2) Advanced - allows you to change the Web-panel access password. To do this, enter the current password in the "Old password" field, and enter a new password in the "New password" field. All changes must be confirmed by clicking on the "Change password" button.

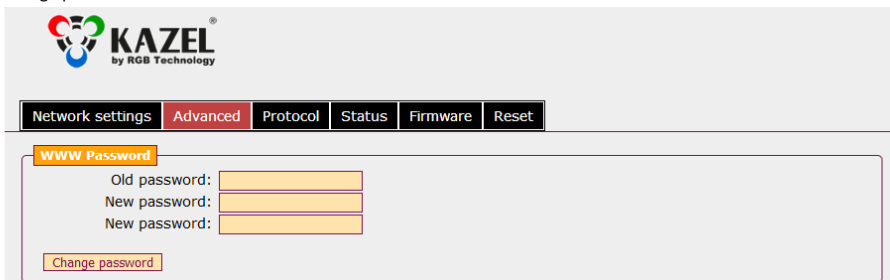
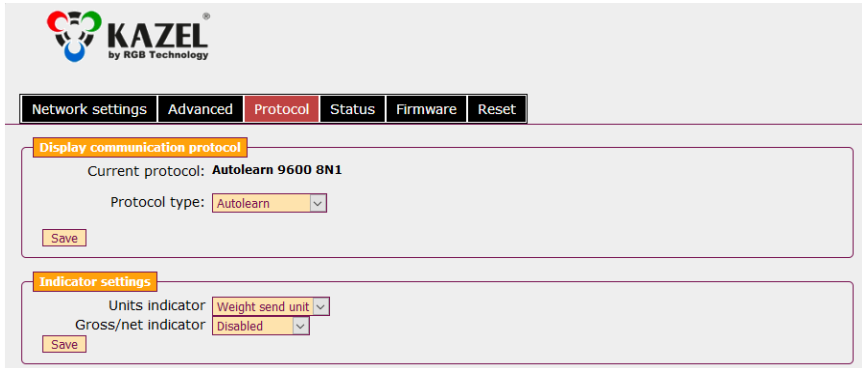


Fig. 5

3) Protocol - displays the currently selected protocol with its parameters, and allows you to select another protocol from the list of the ones saved in the device. In the lower part of the tab, you can choose the weight unit and the weighing mode (net/gross). All changes must be confirmed by clicking on the "Save" button.



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Network settings | **Advanced** | Protocol | Status | Firmware | Reset

**Display communication protocol**

Current protocol: **Autolearn 9600 8N1**

Protocol type: **Autolearn** ▼

**Save**

**Indicator settings**

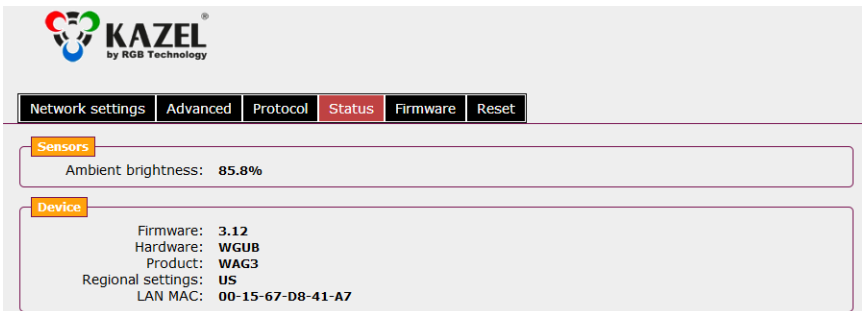
Units indicator: **Weight send unit** ▼

Gross/net indicator: **Disabled** ▼

**Save**

Fig. 6

4) Status - displays information about the current brightness level, and general information about the device, such as software version, MAC address and regional settings,



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Network settings | Advanced | Protocol | **Status** | Firmware | Reset

**Sensors**

Ambient brightness: **85.8%**

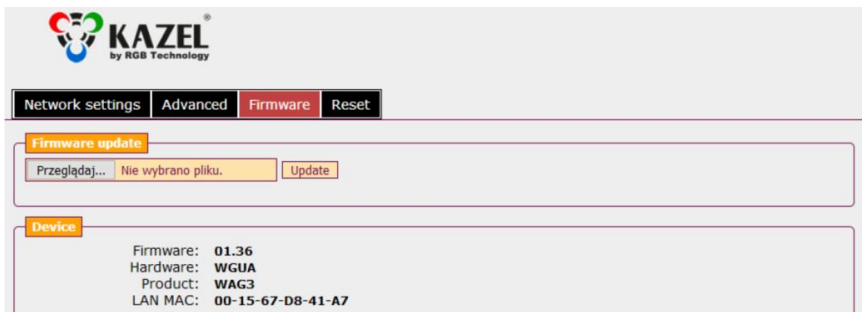
**Device**

Firmware: **3.12**  
 Hardware: **WGUB**  
 Product: **WAG3**  
 Regional settings: **US**  
 LAN MAC: **00-15-67-D8-41-A7**

Fig. 7

5) Firmware - displays the current software version and the possibility to update the software. The configuration file is required to update the software. The software update procedure is as follows:

1. Select the "Switch to update mode" button and confirm your choice in the pop up window.
2. Wait 10 seconds for the page to refresh.
3. After refreshing, the page should look like presented in Fig. 8:



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Network settings | Advanced | **Firmware** | Reset

**Firmware update**

Przeglądaj... Nie wybrano pliku. **Update**

**Device**

Firmware: **01.36**  
 Hardware: **WGUA**  
 Product: **WAG3**  
 LAN MAC: **00-15-67-D8-41-A7**

Fig. 8

4. In the "Firmware update" field, choose the file with the new software,
5. Select the "Update" button and confirm your choice in the pop up window.
6. Wait for the update process to complete and for the page to refresh again.
- 6) Reset - gives the possibility to restore the device factory settings (all changes and network settings will be removed) or to reset it.

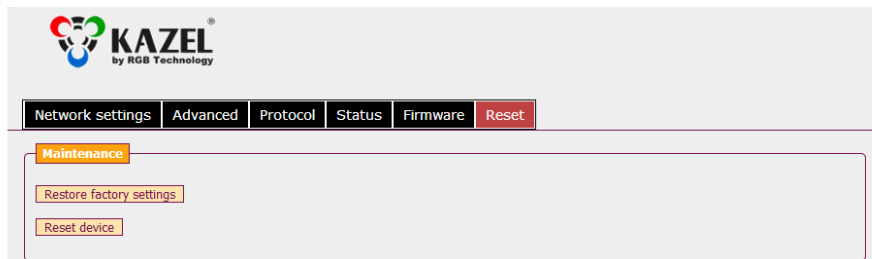


Fig. 9

## 5. List of the remote display connectors

Table 3 describes RM-470 remote display connectors.

**NOTICE!** The controller board should be accessed only when the power supply is disconnected. Take special care when doing this because of the danger of an electric shock.

Table 2 List of RM-470 remote display connectors

Interface / Function	Connector marking	Notes
RS232	RA	RXD line of the RS232 interface. The line should be connected with the weighing terminal TXD output.
	RK	GND line of the RS232 interface.
0/20mA (CL) digital current loop	CA	CL line of the current loop. The line should be connected with the weighing terminal TXD output.
	CK	GND line of the current loop interface.
RS485 RS422	A	RS485 and RS422 interface non-inverting line.
	B	RS485 and RS422 interface inverting line.
	GND	GND line of the RS485 and RS422 interfaces for use at risk of a significant difference in the potentials of the display and the weighing terminal.
Ethernet (option)	ETH	RJ-45 socket
Power supply 110 ÷ 230 VAC	L	Phase conductor
	N	Neutral conductor
	PE	Protective conductor



**Fig. 10**