DEVICE USER MANUAL
RM-470 REMOTE DISPLAY

1. Introduction

RM-470 remote displays are designed to display measurement results transmitted by weighing terminals. The displays operate in the automatic mode by default (see Autolearn) and in standard installations do not require any prior configuration.

For advanced options, it is necessary to adjust the settings via the RGB WagSet 2 software or through the user menu embedded in the device. RGB WagSet 2 can be downloaded from: http://kazel-displays.com/software/rgb_wagset_2.zip.

The RGB WagSet 2 software enables advanced configuration of the device:
- precise defining of the communication protocol with any weighing terminal,
- restoring the default 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: EN, PL, RU, DE, CZ, SK, HU, UA, LT, LV, NO, SE, FR, NL, BR, RO, ES, TR, FI.

The detailed information concerning the display configuration from a PC can be found in the manual supplied with the RGB WagSet 2 software. Click Help > Help or press th F1 button. The way of connecting the display to a PC is described in item 3 of this manual.

The user menu embedded in the device allows the basic display configuration without using a PC:
- manual selection of the communication protocol from the list, enabling the operation with selected weighing terminals,
- restoring the default 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 user menu or the RGB WagSet 2 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's settings to enable correct communication with the terminal. The whole operation lasts several seconds, depending on the baud rate and the time intervals between consecutive frames. All remote display's communication interfaces are supported, i.e. RS232/RS485/CL and the Ethernet[1].

The Autolearn procedure is as follows:
1. Baud rate detection - dot 1 flashing on the 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 a 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".

The Autolearn mode supports the following transmission parameters:

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

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[1] 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).

3. Embedded user menu

The microbutton used to operate the menu is located on the controller board inside the display housing and marked **B1**. To get access, unscrew and slide out the controller board drawer. Once you have finished the configuration, push the drawer back, making sure that the tightness is not compromised.
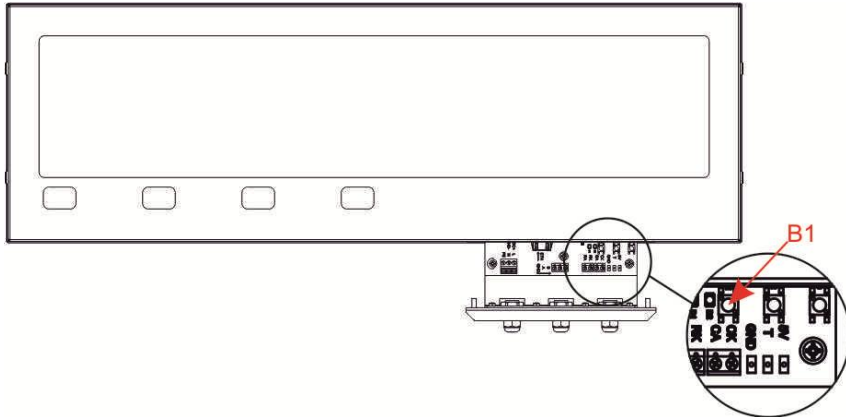

Fig. 1
Location of microbuton B1

The user menu has the following options:
- info,
- proto,
- custm,
- reset.

To activate a specific option, keep the microbutton pressed until this option appears on the screen ("info", "proto", "custm" or "reset"). The option is entered 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 layer settings (IP address, network mask, communication port for the RGB WagSet 2 software and communication port for the weighing terminal).

The „proto" option allows you to select the display communication protocol to work with the 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 user inactivity.

The „custm" option allows you to select the display communication protocol to work with the weighing terminals of the selected clients. These protocols have special, custom settings needed for the given client. 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 user inactivity.

The „reset" option allows you to restore the default settings of the remote display and to activate the Autolearn mode. The default network layer settings will also be restored (IP address: 192.168.0.11, network mask: 255.255.255.0, configuration port for the RGB WagSet 2 software: 2101, communication port for the weighing terminal: 2102). To restore the default settings you should press the microbutton and hold it down until the message "reset" appears during the normal operation of the device. Hold the button down until the message "reset" starts flashing 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 set parameters. Uploading new network settings is possible using the RGB WagSet 2 software or via web panel.

Tab. 1. List of supported protocols.

Item no.	Terminal name	Protocol	Item 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 SG0	
6	SysTec / Pronova		34	Ian Fellows SG0 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 bilance Iscale	Continua	44	Axtec	
17	Compatible with SMA protocol	SMA	45	GSE 460 465	
18	Sartorius	Remote Control	46	GSE 250	AUTO1
19	Sensocar		47	STB-22	
20	Flintec		48	Utilcell 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 GX2SS		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 2 (Windows operating system only)

Before configuring the display from RGB WagSet 2, connect it to a computer. The display should be connected to the RS232 port of the computer as shown in Fig. 3. The location of the RA and RK connectors of the remote display is shown in item 5 of this manual. The display can also be connected via the Ethernet.

Fig. 2
The way of connecting the display without the Ethernet interface to a computer for configuration purposes.
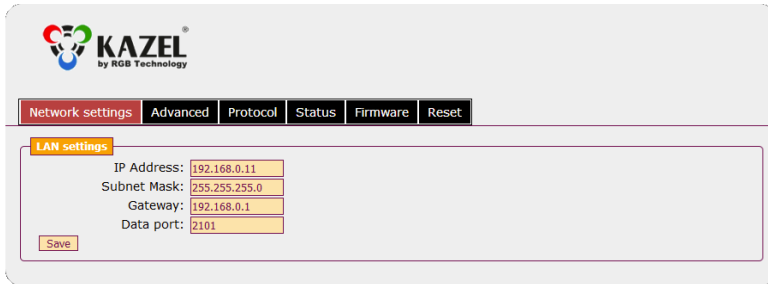
4.2 Web Panel

To access the Web panel, follow the instructions below:

1. In the network card properties select "Internet Protocol Version 4 (TCP/IPv4)", and click "Properties"
2. In the "Internet Protocol Version 4 (TCP/IPv4) Properties", select "Use the following IP address" option, and then complete the following fields: IP address: 192.168.0.55, Subnet mask: 255.255.255.0 and confirm changes.
3. Connect the display to the power source and to your network.
4. In your web browser, enter thedefault device IP address: 192.168.0.11, Login: admin, Password: dbps

Description of Web Panel tabs

1. Network settings

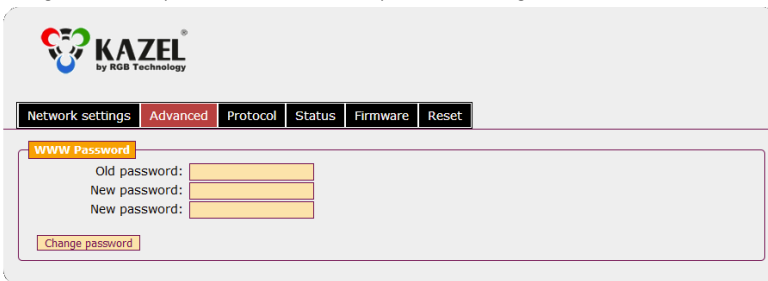After the first login, LAN settings can be changed to match your network's.

Fig. 1

2. Advanced

After the first login, the default password to access the web panel can be changed.
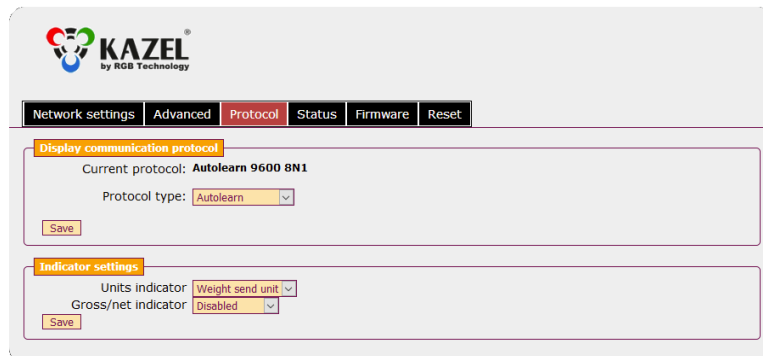
Fig. 2

3. Protocol

This tab displays the currently set communication protocol and allows to choose one of the protocols saved in the device.
The bottom part allows tochoose which weight unit is to be displayed, as well as, whether and which weighing mode indicator should be shown.

Fig. 3

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V2.96

4. Status

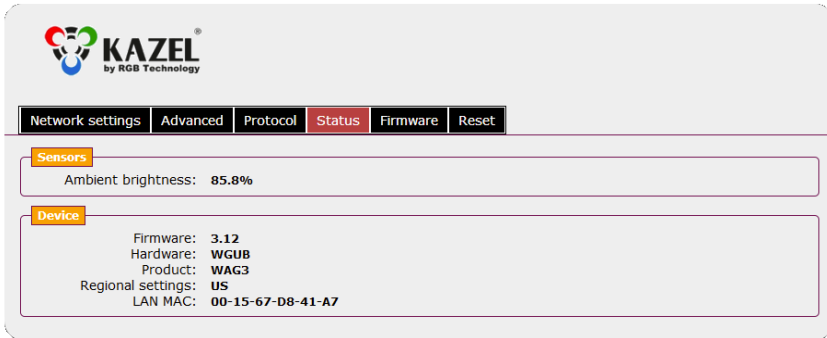This tab shows the current brightness level and displays general info about the device.

Fig. 4

5. Firmware

If there is a requirement to update the firmware and a configuration file has been received, the update process will be carried out under this tab.
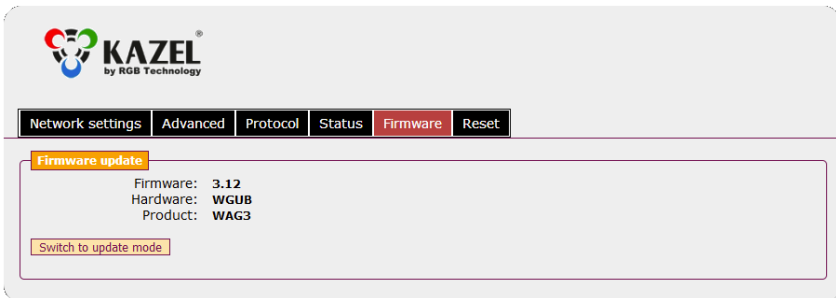

Fig. 5

6. Reset

This tab allows to restore the factory settings (all customs settings will be deleted) or reset the device (restart).
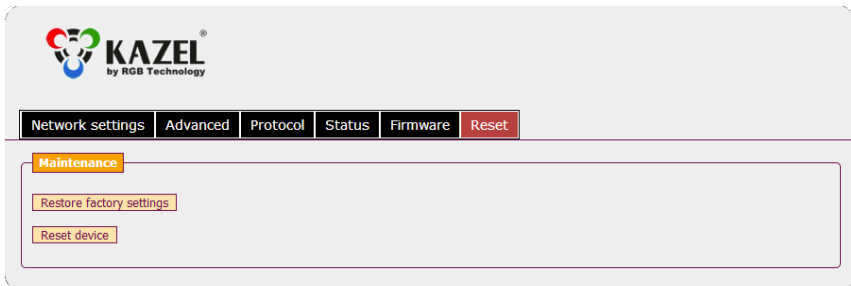

Fig. 6

5. List of the weighing scale display connectors

Table 2 contains the descriptions of the connectors in RM-470 remote display.

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

Tab. 2. List of the RM-470 display connectors.

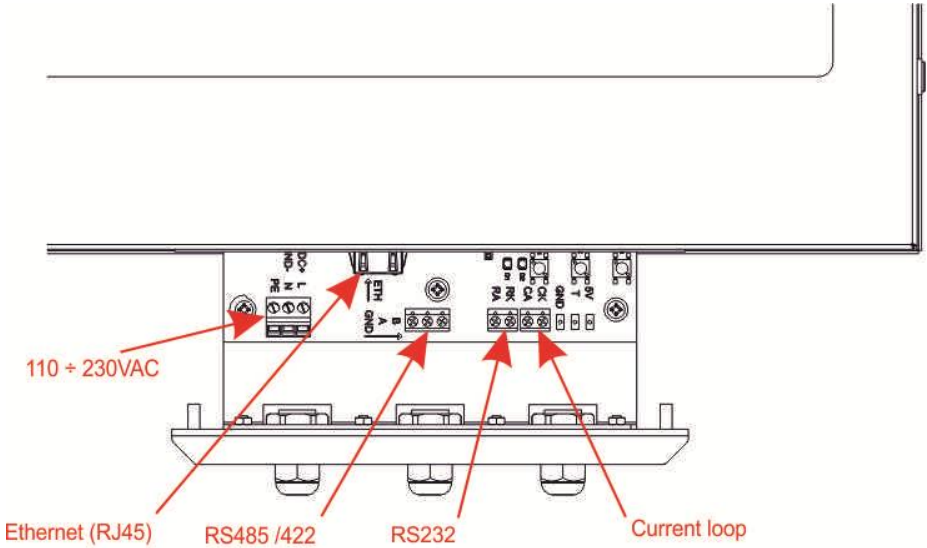| Interface / Function	Connector marking	Notes
RS232	RA	RXD line of the RS232 interface. The line should be connected with the weighing terminal TXD output
	RK	GND line of the RS232 interface
0/20mA digital current loop	CA	CL line of the current loop. The line should be connected with the weighing terminal TXD output
	CK	GND line of the current loop interface
RS485 RS422	A	RS485 and RS422 interface receive RX A+
	B	RS485 and RS422 interface receive RX B-
	GND	GND line of the RS485 and RS422 interfaces for use at risk of a significant difference in the potentials of the display mass and the weighing terminal mass
Ethernet	RJ45	RJ45 connector
110 ÷ 230 VAC power supply	L	Phase conductor
	N	Neutral conductor
	PE	Protective conductor

RM-470 display connectors