DEVICE OPERATION MANUAL
ANALOG CLOCK ZE/ZF30 SERIES (331-XX-XX / 332-XX-XX)

Default clock configuration:
- IP address obtained automatically (DHCP), time zone: Warsaw (UTC+1:00, DST).
- If the DHCP address is not obtained in about one minute, the clock will take the address from the following pool: 169.254.0.1 - 169.254.255.254. The clock can be detected using the software: **RGB Devicer**.

1. Introduction

The AC series devices are analog clocks with the ability to personalize settings. The clocks are equipped with a network communication module that allows remote configuration through the website and time synchronization using Internet time servers or a GPS module.[1]

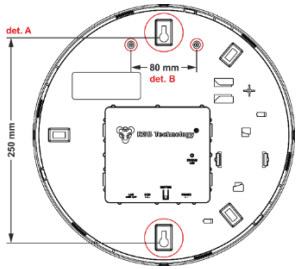
The clock enables:
- automatic time change from the standard time (winter time) to the daylight saving time (summer time) and from the daylight saving time to the standard time for different locations (Europe, Australia, the United States of America, Canada),
- manual date configuration for automatic time change,
- synchronization using NTP Internet servers,
- time synchronization using a GPS module,
- configuration through a built-in website,
- creating double-sided COM clocks (Master - Slave),
- setting an individual clock name,
- DHCP client function,
- using the NTP server pool (pool.ntp.org).

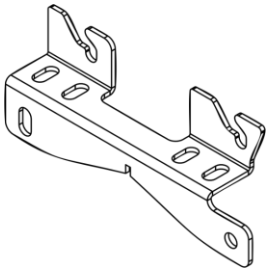
2. Power supply

The clocks can be powered by:
- 5V POWER connector[2];
- LAN connector - "Power over Ethernet" technology. This allows you to use a single cable for energy and data transmission;
- second clock (MASTER) connected via a COM port.

3. Installation

Correct installation involves placing the device in a specific location on the wall. There are two mounting methods provided for hanging the clock in the housing. By use of mounting holes (det. A) or holes for attaching the wall mount (det. B – requires an additional mount provided with the device).





NOTE!
Before you begin any installation operations or start using the device, you should refer to the manual supplied by the manufacturer. Improper connection to the mains power supply, incautious device installation, or improper use may cause property damage, loss of health or death from electric shock! Moreover, any failure to follow the Manufacturer's instructions may void your warranty.

NOTE!
It is forbidden to make any additional mounting points or any holes in the device assembly components.

[1] The GPS module is an optional device.
[2] The 5V power supply unit is an optional device.

4. Initial start-up

Step 1: Connect the device to a PoE power source or optionally – when using the APV-8-5 power supply – a 230 VAC mains power source.
Step 2: If properly connected, the clock should proceed to reset the hands to 12:00 and then set the current time.
NOTE!
The clock checks the exact position of the hands relative to the updated time. This will be manifested by the hands moving much faster on the dial and this is an intended action. After this operation, the clock will return to normal activity.

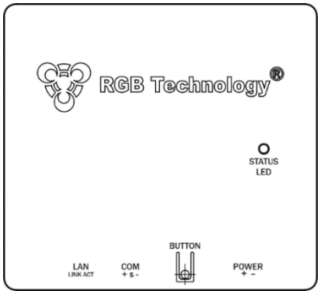
5. Connection with the clock

The clock can be connected via Wi-Fi and LAN.

- **Wi-Fi** – find the name of the network (SSID) belonging to the clock. By default, it is: **RGB-CLOCK-XX-XX**, where XX-XX are the last 4 characters of the clock's MAC address. The MAC address can be found on the back of the clock, above the device's rating sticker. The default Wi-Fi password is: **0123456789**
  After connecting to the network, log in to the clock's administration panel (website). The default login details for the device via Wi-Fi are:
  IP address - **192.168.10.1**
  Username – **admin**
  Password – **dbps**
- **LAN** – by default, the clock has the DHPC function enabled. If no address is obtained within approximately one minute, the clock will accept one from the pool 169.254.0.1 - 169.254.255.254. To find the IP address of a given device, use the **RGB Devicer** program (available for download from Google Play, the App Store, or http://rgbtechnology.pl/soft/). Now, using a web browser, you can connect to the built-in web page (Web panel), where you can personalize the device. The default login details for the device via LAN are:
  Username – **admin**
  Password – **dbps**

NOTICE: Restoring factory settings can be done via the website or by holding the "BUTTON" on the back of the device for 3 seconds until the yellow diode (STATUS LED) lights up. The default clock IP addressing mode is the DHCP client mode.

6. Description of the clock rear panel

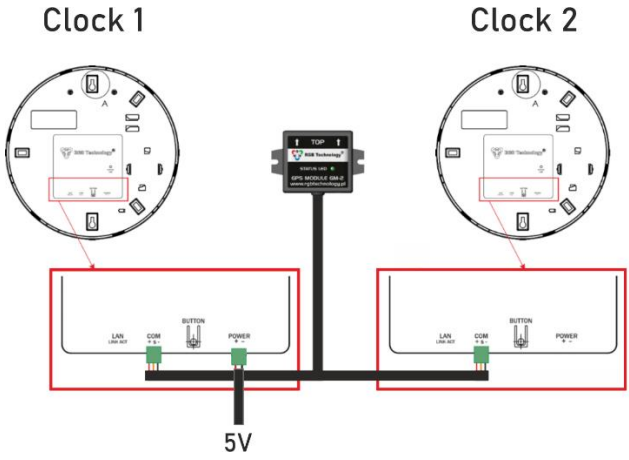


- LAN (LINK ACT) – LAN connector enables the clock to be powered via PoE technology and data transfer;
- COM – allows you to connect an optional GPS module or a second clock;
- BUTTON – button for restoring factory settings;
- POWER – allows you to power the clock with 5V constant voltage;
- STATUS LED – LED informing about the device operating status:
  - Green color – normal operation mode;
  - Yellow color – other actions, e.g.: restoring default settings;
  - Red color – service activities.

7. Connection diagram and configuration of double-sided clocks

We distinguish between two types of double-sided clocks:

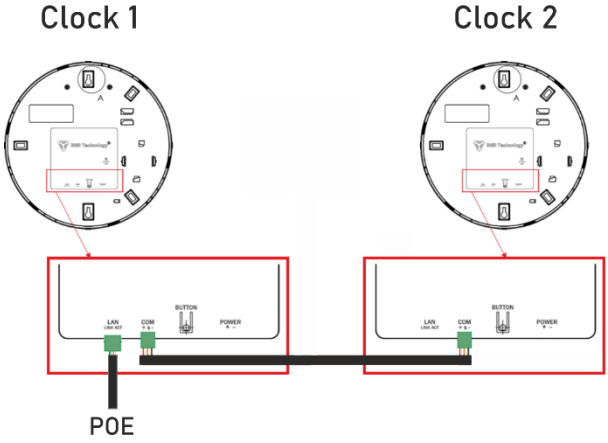
1. Double-sided GPS:



Tab. 2. GPS clock configuration

Clock 1	Clock 2
Time Source: **COM**	Time Source: **COM**
COM mode: **Slave**	COM mode: **Slave**
Power: **5V**	Power: **COM**

2. Double-sided POE:



Tab. 3. POE clock configuration

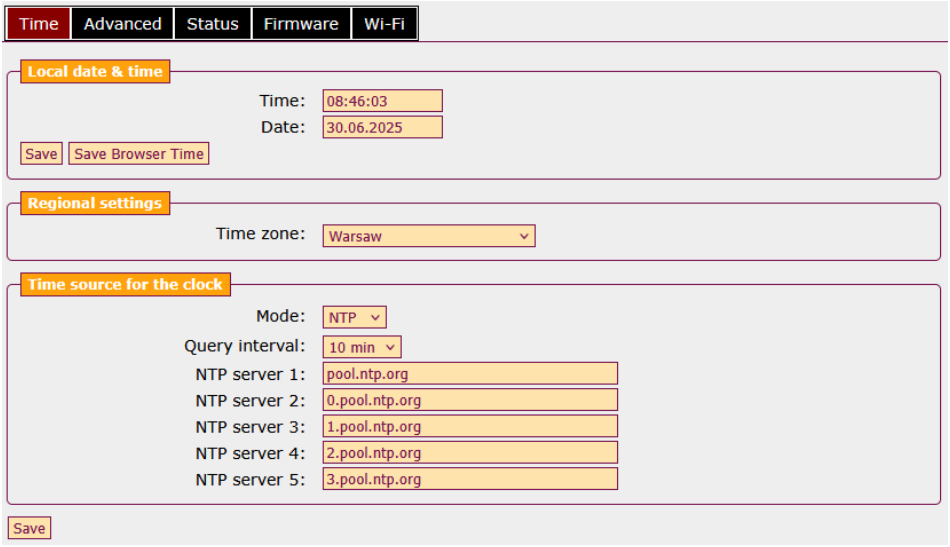
Clock 1	Clock 2
Time Source: **NTP**	Time Source: **COM**
COM mode: **Master**	COM mode: **Slave**
Power: **POE**	Power: **COM**

8. Webpanel

The ZE/ZF series clocks are equipped with a Wi-Fi module and a network communication module (Ethernet module) enabling intuitive personalization via the built-in website. The page consists of five subpages allowing you to configure individual device functions.

NOTE!
Any changes of the device parameter settings should be confirmed each time using the "Save" buttons.

7.1 „Time" tab

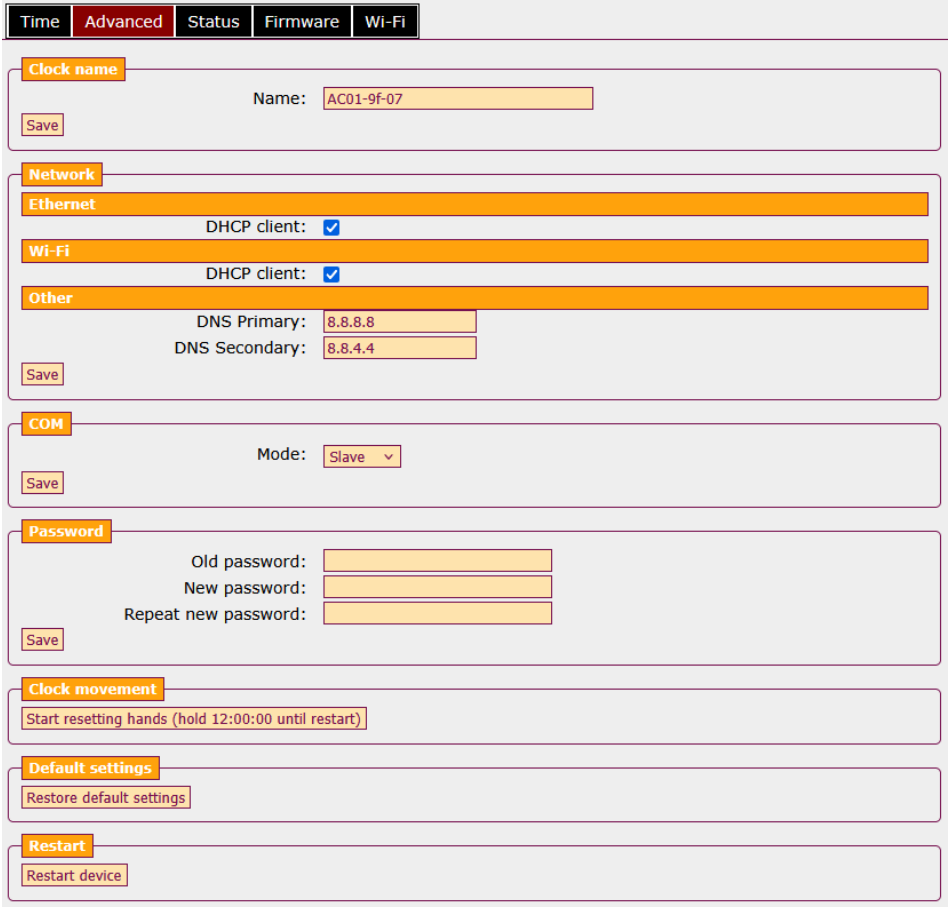


The tab that allows you to configure time-related parameters.

- **Local date & time** – manual entering time and date settings;
- **Regional settings** – time zone configuration, daylight saving time adjustment, daylight saving time rule;
- **Time source for the clock** – time synchronization source selection:
  - NTP – synchronization via NTP servers,
  - COM – synchronization using a GPS module or another analog clock in the Master mode,
  - OFF – manual setting of date and time in the administration panel (website).

NOTE!
If automatic downloading from the DHCP server is disabled, time synchronization from NTP servers requires correct (taking into account local network addresses) configuration of the following parameters in the **Advanced** tab: "IP address", "Mask", "Gateway", "DNS server", and also demands connection of the device to the Internet.

7.2 Advanced tab



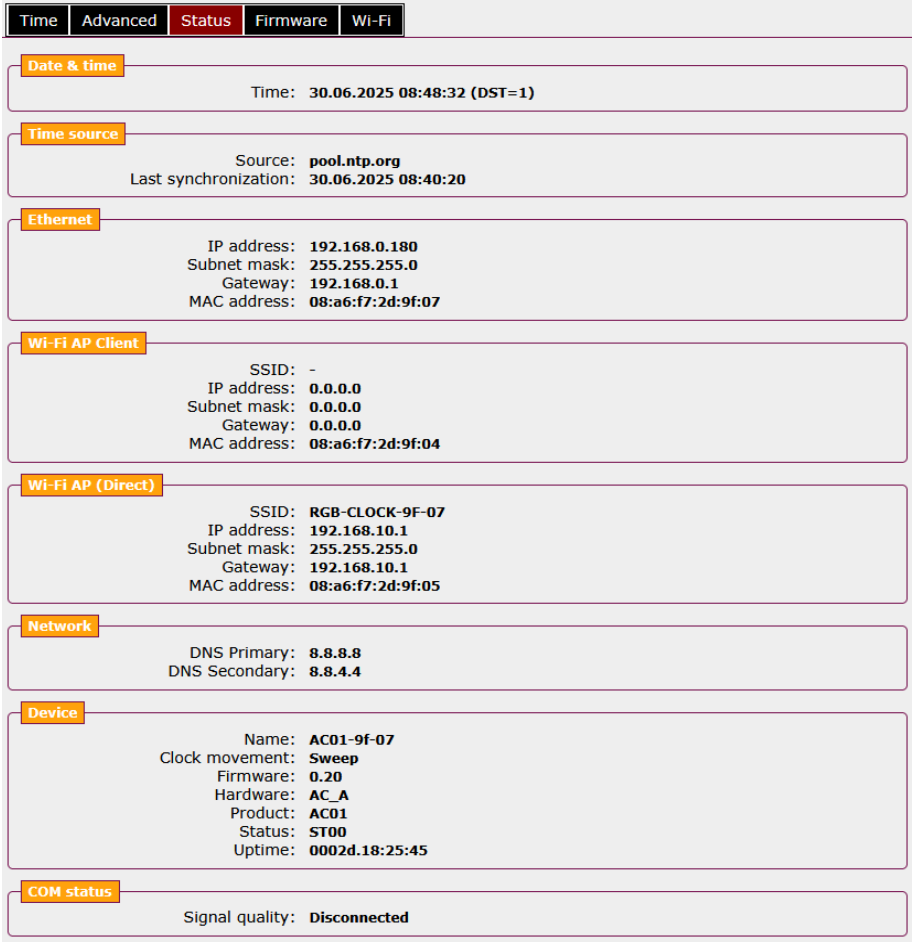
The tab that allows you to configure the device advanced parameters:

- **Clock name** - individual name of the clock, e.g. "Hall", "Warehouse",
- **Network** - network settings (IP address, subnet mask, default gateway, DNS server addresses), activating the DHCP function,
- **COM** – selecting the device operating mode:
  - Master – the clock sends time information via the COM connector,
  - Slave - the clock receives time information via the COM connector (from the MASTER clock or GPS module),
- **Password** – changing user password,
- **Clock movement** – sets and holds the clock hands at 12:00 until the device is restarted,
- **Default settings** - restores factory settings,
- **Restart** - restarts the clock.

NOTE!

The "Restore default settings" function fully restores factory settings, including the setting of the default network configuration.

7.3 "Status" tab (Information)

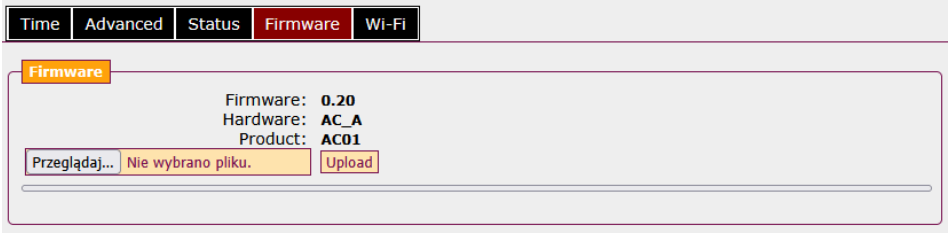


The tab for reading the device status;

- **Date & time** – reading time, date and whether summer time correction (DST - Daylight Saving Time) is currently in effect,
- **Time source** – reading information about communication with NTP or COM (GPS or Master) pattern and the last synchronization time,
- **Ethernet** – reading information about the IP address, subnet, mask and MAC address,
- **Wi-Fi AP Client** – reading information about the name of the Wi-Fi network to which the device is connected in the Client mode and the network configuration of this interface,
- **WiFi AP (Direct)** – reading information about the network configuration of the access point (Access Point) - used to connect directly to the device,
- **Network** - reading network interface configuration,
- **Device** – reading the clock proper name, clock type (step, sweep), software version, hardware and product version, device status and clock operation time,
- **COM status** – reading the quality of the connected GPS device signal (optional).

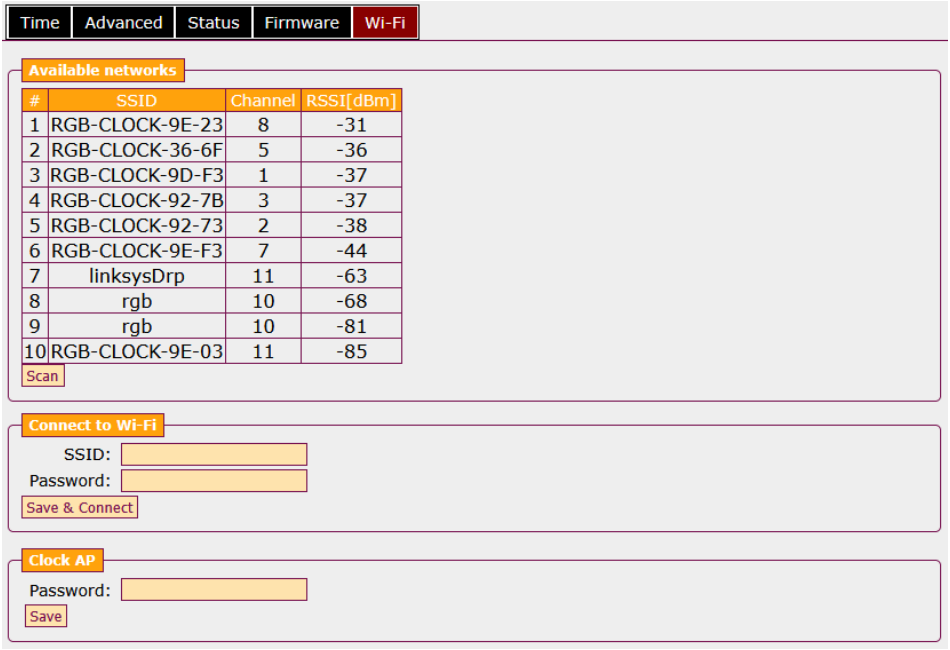
7.4 „Firmware" tab

The tab that allows you to read information about the firmware version and to update the software.



7.5 „Wi-Fi" tab

The tab that allows you to read information about available Wi-Fi networks and allows you to connect the clock to a given network.



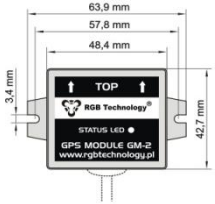
The tab that allows you to read and configure the Wi-Fi network:

1. **Available networks –** reading available Wi-Fi networks near the device,
2. **Connect to Wi-Fi** – you must enter the Wi-Fi network name and password to connect your device to the network,
3. **Clock AP** – change the Wi-Fi access password in the "Wi-Fi AP (direct)" mode.

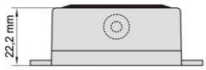
8. Accessories (sold separately)

8.1 GPS receiver (102-02-34)

The GM-2 GPS receiver is used for real time synchronization in RGB Technology products. The synchronization signal is sent from satellite transmitters located in the Earth's orbits. This solution ensures time synchronization anywhere in the world. The condition for correct operation is the "visibility" of the sky through the receiver module.



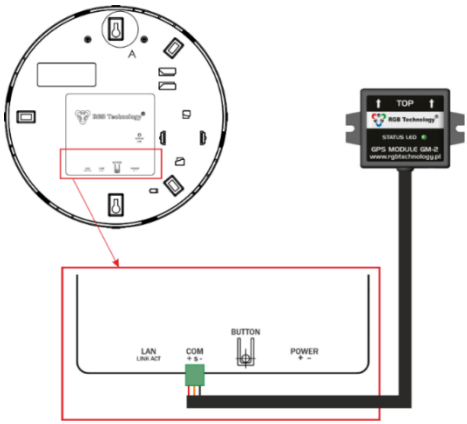
GM-2 GPS receiver module - general view



Receiver dimensions

The receiver is weatherproof – IP67 protection class. To mount the receiver, depending on your needs, you can use the adhesive tape placed on the bottom of the receiver, fix it by cable ties or screw it by means of expansion bolts. The orientation of the receiver is important - the arrows next to the "TOP" inscription must be directed upwards. The receiver should be placed under the "open sky", which will ensure stable reception of the signal from the satellite. When searching for a suitable antenna location, the receiver should be given sufficient response time - after selecting a suitable location, place the antenna in this area and wait for several or a dozen or so minutes. This is a standard procedure for cold boot of a GPS receiver. The GPS receiver has a LED indicating the receiver operation.

LED	Meaning	What to do
does not light up	no power supply or receiver initialization	If the LED does not light up within a minute, check the receiver power supply
does not light up for 1 second / / **glows** for a split second	no time synchronization, signal search	If this situation persists for more than 15 minutes, change the antenna location
glows for 1 second / / **does not glow** for a split second	time synchronization searching for a stronger signal	if the LED does not glow with steady light within 15 minutes, change the antenna location
glows with steady light	time synchronization very good signal	correct operation no changes required

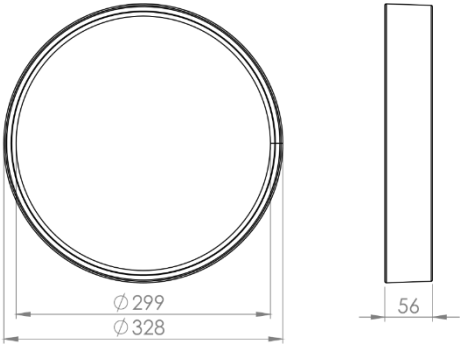


How to connect a GPS module to the clock

Legend:		**Alternate color scheme:**	
Red	- 0.25 mm² - 5VDC "+"	Brown	- 0.25 mm² - 5VDC "+"
Orange	- 0.25 mm² - GPS signal core "s"	White	- 0.25 mm² - GPS signal core "s"
Black	- 0.25 mm² - GND "-"	Green	- 0.25 mm² - GND "-"

8.2 Rim (107-02-01)

The ZE/ZF30 clock can be further equipped with a stainless steel housing. The rim is mounted using dedicated springs.
NOTE! To mount the rim, first remove the plastic clock ring.



8.3 Switching power supply APV-8-5 230 V (100-03-01)

Optionally, the ZE/ZF30 clock can be further equipped with an APV-8-5 switching power supply for use in locations with standard power infrastructure (230V). The power supply has a plug for connecting the wires to the connector in the controller and a quick coupler for the power cable. The clock has a special socket for mounting the power supply without the need to use screws.
NOTE! Due to individual customer needs regarding the length of the power cord, the manufacturer does not provide it with the power supply.

8.4 Side mount for single/double sided analog clock

You can buy a dedicated bracket/side frame for the device, which allows you to mount the clock to the wall. The central point of the clock mounted in this holder will be 40 cm away from the wall (approximately 24-25 cm from the outer edge of the housing). In the case of a single-sided clock holder, the rear part of the holder is plugged with a dedicated steel powder-coated cover. The clock is mounted by pressing the clock into the three dedicated clamps located on the holder.
107-01-37 – side holder for a double-sided analog clock;
107-01-38 – side holder for a single-sided analog clock + frame cover.