REVELTRONICS

REVELATORY ELECTRONICS

RComp

ALL-IN-ONE GAUGE

User & assembly manual.

Last update (v1.0.0): ***2024-10-15***

www.REVELTRONICS.com

Please read this manual carefully before using the device.

Contents

1. Basic information

RCOMP All-in-One Gauge developed and manufactured by **REVELTRONICS** is a computer that collects data from various sources (analog sensors, digital inputs, CAN-BUS) and displays it on an Android device with a user-friendly interface. It offers customizable user alerts and can record data to its internal memory (data logger), which can be viewed as charts within the application.

1.1. Technical parameters

- Power supply: compatible with 12V or 24V systems (safe range from +7 to +42V DC)
- Power consumption in sleep mode: typically 7mA @ 12V
- Power consumption in idle mode: typically 70mA @ 12V, max 350mA @ 12V
- Operating temperature: -40°C to +85°C
- Analog input measurement accuracy: +/- 0.02V
- CAN-BUS 2.0 support: 250kbps / 500kbps / 1Mbps

1.2. Features

- **Dashboards with real-time data** from various sources (refer to section 1.3. Gauges & Requirements)
- **RCOMP Android** App with bluetooth communication (available on the Google Play Store or REVELTRONICS website)
- **Data Logger** with internal memory (CSV file or visualization through charts)
- **Alerts** with configurable thresholds, hysteresis, and dependencies on other measurements
- **12x analog inputs** for sensors and voltage signals
- **4x digital inputs** for on/off detection and impulse signals
- **2x digital outputs**
- **2x CAN-BUS** (CAN1: RCOMP communication | CAN2: basic OBD2 data)
- Gauge scaling from different sources (analog inputs, digital inputs, CAN-BUS)
- Metric or imperial units (km/h or mph, Celsius or Fahrenheit, bar or psi)

1.3. Gauges & Requirements

To activate the following features of the RCOMP, certain signals need to be connected. The table below shows the type of signal required for each function. You should only connect the signals relevant to your needs; there is no requirement to connect all of them.

Group	Gauge	Signal Source	Connections (no of wires)
I	• Vehicle speed	• VSS impulses from hall sensor • OBD2 PID • RCOMP ID	• DigInX (1) • CAN2 (2) • CAN1 (2)
II	• RPM Engine • RPM User	• RPM impulses from hall sensor • OBD2 PID • RCOMP ID	• DigInX (1) • CAN2 (2) • CAN1 (2)
III	• Pressure Boost	• Analog signal 0-5V (MAP sensor) • OBD2 PID • RCOMP ID	• AdcInX (1) • CAN2 (2) • CAN1 (2)
IV	• Pressure General • Pressure Oil • Pressure Fuel	• Analog signal 0-5V (pressure sensor) • RCOMP ID	• AdcInX (1) • CAN1 (2)
V	• AFR1 • AFR2	• Analog signal 0-5V (wideband controller) • RCOMP ID	• AdcInX (1) • CAN1 (2)
VI	• EGT1 • EGT2 • EGT3 • EGT4 • EGT5 • EGT6 • EGT7 • EGT8	• Analog signal 0-5V (EGT-K amplifier) • RCOMP ID	• AdcInX (1) • CAN1 (2)

VII	• Temperature Engine Coolant (ECT) • Temperature Air Intake (IAT)	• Analog signal 0-5V (NTC sensor) • OBD2 PID • RCOMP ID	• AdcInX (1) • CAN2 (2) • CAN1 (2)
VIII	• Temperature Oil • Temperature In • Temperature Out • Temperature Gearbox • Temperature User1 • Temperature User2 • Temperature User3 • Temperature User4	• Analog signal 0-5V (NTC sensor) • RCOMP ID	• AdcInX (1) • CAN1 (2)
IX	• Fluid Level Fuel 1 • Fluid Level Fuel 2 • Fluid Level Coolant • Fluid Level General	• Analog signal 0-5V (fluid level sensor) • RCOMP ID	• AdcInX (1) • CAN1 (2)
X	• Battery Voltage (Main) • Ignition Time • Trip Time	• Power supply (internal calculations)	• GND + BAT + IGN (3)
XI	• Battery Voltage (Secondary)	• Analog signal (voltage divider on input required) • OBD2 PID • RCOMP ID	• AdcInX (1) • CAN2 (2) • CAN1 (2)
XII	• Mileage • Distance • Trip Distance • Trip Vmax • Trip Vavg	• Req. group I (vehicle speed)	• Group I

1.4. RCOMP vs. UTCOMP-PRO

	RCOMP	UTCOMP-PRO
Display options:	RCOMP Android App (bluetooth)	OLED 256x64pix (3,2") (+ HUD mode available) UTCOMP Android App (USB)
Configuration & Settings:	RCOMP Android App (bluetooth)	UTCOMP PC Windows App (USB)
Digital inputs: *(e.g. speed signal, rpm, etc.)*	4	5
Digital outputs: *(e.g. relay switch control 5V@100mA)*	2	1
Analog sensor inputs 0-5V: **(high impedance for voltage signals)**	8 (12)	5 (7)
Analog inputs with 5V pull-up: **(for resistance or NTC temperature sensors)**	4 (0)	2 (0)
Digital temperature sensors: *(additional inputs for DS18B20 sensors)*	-	4
CAN-BUS:	CAN1: RCOMP communication CAN2: OBD2 supported	-
Data-Logger: *(data recording in internal memory)*	logging up to 15 parameters max sampling freq. 10Hz data length: 32k * 15 params	logging up to 10 parameters max sampling freq. 10Hz data length: 10k * 10 params
Alerts:	2-step user alerts for 10 selected gauges + conditional checking	1-step user alerts for most popular gauges without conditional checking

2. Assembly manual

IMPORTANT: Read the following instruction before installing RCOMP. The warranty does not cover damage caused by improper installation.

2.1. Important information

RCOMP features a 10-pin and 20-pin MOLEX connectors. The kit includes a plug with cables for soldering. In the following pages of this manual, you will find the connector pinout, wiring diagram and additional information for assemby. **Please read these information carefuly**.

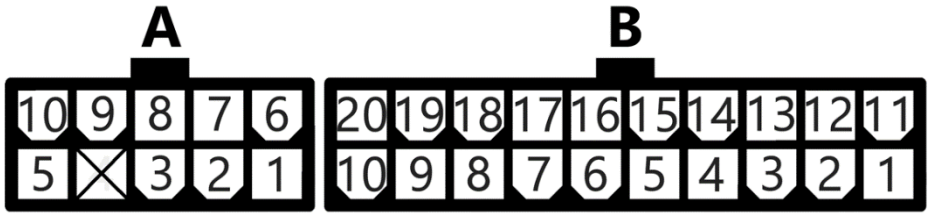
Assembly guidelines:

- Before installation, study the pinout and wiring diagram, and plan the locations of components in advance
- Do not install the central unit surrounded by metal cages or other components that may negatively affect the Bluetooth connection
- Pay special attention to the numbered pins. Before connecting the signal to the device, ensure that you connect the appropriate cable (check the signal with a multimeter or oscilloscope).
- All cables used for installation must be dedicated automotive FLRY cables, with a recommended cross-section of 0.35–0.5 mm², and insulation resistant to mechanical damage (e.g. abrasions, cracks)
- All connections must be properly soldered, and heat-shrink insulation should be applied (including on unconnected wires)
- First, solder all the necessary wires to the pins, and only then connect the plug to the device socket
- When connecting or disconnecting the plug wires, do not pull on the cables—only pull on the housing
- Before connecting the plug to the device for the first time, ensure that the correct signals have been soldered to the corresponding pins

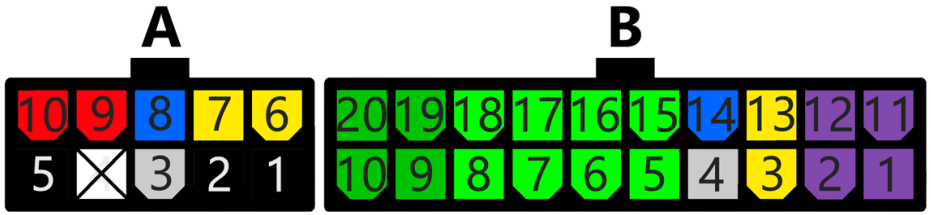
Warranty does not cover damage caused by unprofessional or improper installation.

2.2. Pinout

Connector pinout (module side):



Plug pinout (wire side):



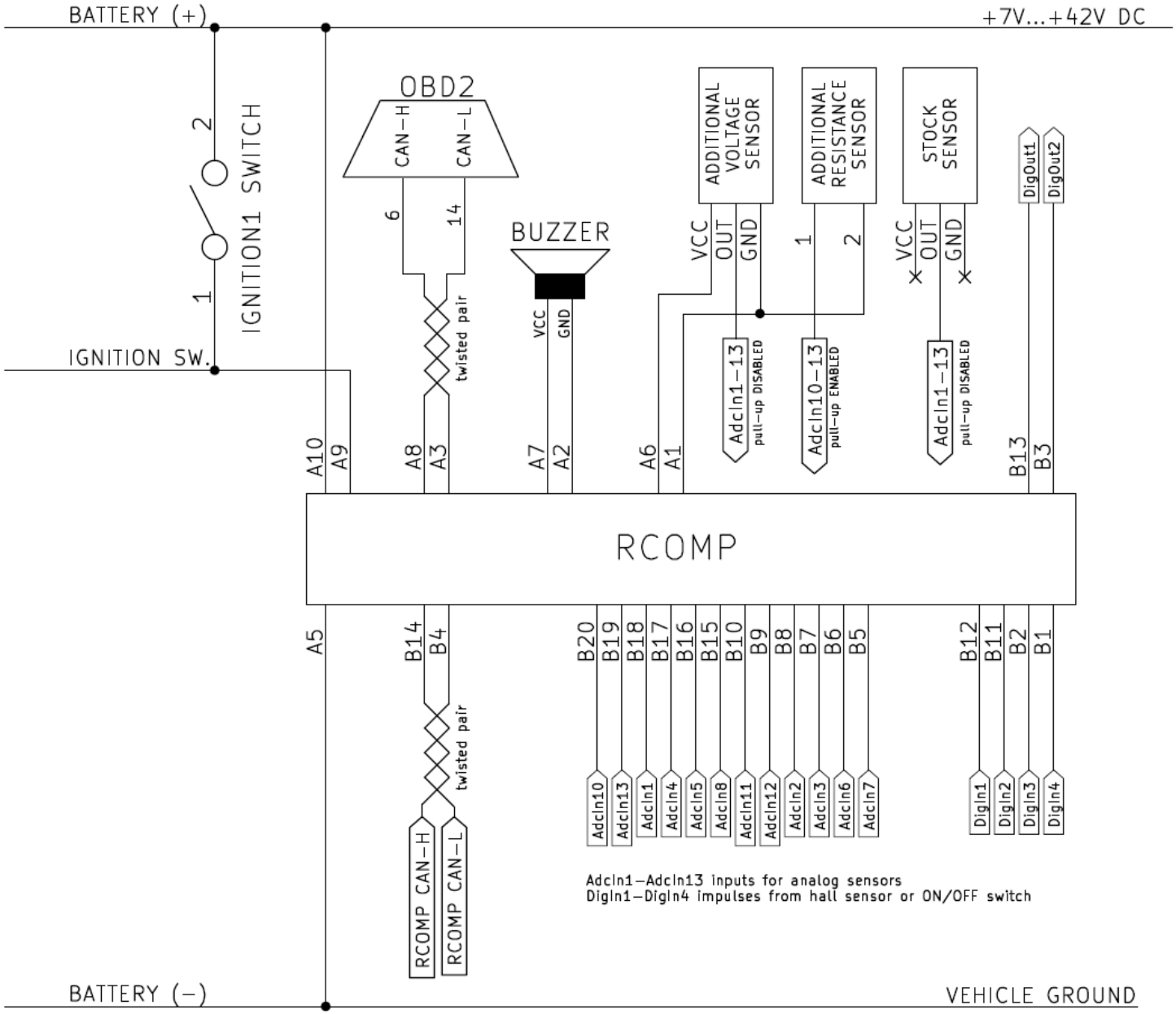
Connector "A" 10-pin				**Connector "B" 20-pin**			
PIN	**LABEL**	**PIN**	**LABEL**	**PIN**	**LABEL**	**PIN**	**LABEL**
A10	+12/+24V BATTERY	A5	GND (vehicle ground)	B20	AdcIn10 (0-5V) with optional pullup	B10	AdcIn11 (0-5V) with optional pullup
A9	+12/+24V IGNITION	A4	-	B19	AdcIn13 (0-5V) with optional pullup	B9	AdcIn12 (0-5V) with optional pullup
A8	CAN2-H (OBD2)	A3	CAN2-L (OBD2)	B18	AdcIn1 (0-5V)	B8	AdcIn2 (0-5V)
A7	BUZZER_VCC (+5V OUT)	A2	BUZZER_GND	B17	AdcIn4 (0-5V)	B7	AdcIn3 (0-5V)
A6	SENSORS_VCC (+5V OUT)	A1	SENSORS_GND	B16	AdcIn5 (0-5V)	B6	AdcIn6 (0-5V)
				B15	AdcIn8 (0-5V)*[1]	B5	AdcIn7 (0-5V)*
				B14	CAN1-H (RCOMP)	B4	CAN1-L (RCOMP)
				B13	DigOut1 (5V max 100mA)	B3	DigOut2 (5V max 100mA)
				B12	DigIn1	B2	DigIn3
				B11	DigIn2	B1	DigIn4

*[1] AdcIn7 & AdcIn8: Possible hardware modification for extended input range (0-30V or higher)

2.3. Pinout description

LABEL	DESCRIPTION
BATTERY (A10+, A5-)	power supply for the device, safe range is +7V...+42V DC (PTC fuse is built in RCOMP module)
IGNITION (A9+)	positive voltage from ignition switch (0V - low state, 5V and more - high state) - wake up RCOMP from sleep mode
CAN2 OBD2 (A8-H, A3-L)	can-bus for OBD2 to receive basic from vehicle OBD2 such as vehicle speed, RPM, coolant temperature etc.
CAN1 RCOMP (B14-H, B4-L)	can-bus for RCOMP communication to receive data from other modules
BUZZER VCC/GND (A7+, A2-)	+5V power supply for external buzzer
SENSORS VCC/GND (A6+, A1-)	+5V power supply for additional external sensors, e.g. MAP sensor, pressure transducer etc.
AdcIn1 – AdcIn8	inputs for analog sensors (0-5V voltage signals). AdcIn7 & AdcIn8 have possibility of hardware mod for 0-10V | 0-30V | 0-50V | 0-100V input range.
AdcIn10 – AdcIn13	inputs for analog sensors (0-5V voltage signals) OR pullup & measurement for resistance sensors (possibility to enable/disable internal pull-up for NTC)
DigIn1 – DigIn4	inputs for digital signals (e.g. impulses from hall sensor or ON/OFF switch | LO state 0…+1V | HI state +4...+42V)
DigOut1 – DigOut2	ON/OFF output switch, e.g. +5V relay control (LO state disconnected | HI state +5V@100mA). Hardware mod possible to control 12V or 24V relays.

2.4. Wiring diagram



2.4.1. POWER SUPPLY

Connect pin **A10** to +12V/+24V (BAT), and pin **A9** to the +12V/+24V ignition switch (voltage is present when the ignition key is turned on). Connect pin **A5** to the vehicle ground (GND). The power line is already protected by a 0.3A PTC fuse built into the RCOMP, so an additional fuse is not necessary.

2.4.2. CAN2 OBD2

Connect pin **A8** (CAN2-H) and **A3** (CAN2-L) to the OBD2 CAN-H and CAN-L inputs in the vehicle (located at the back of the OBD2 socket) to receive basic data such as vehicle speed, engine RPM, engine coolant temperature, boost pressure etc. Both CAN-H and CAN-L cables should be twisted together along their entire length.

2.4.3. CAN1 RCOMP

Connect pin **B14** (CAN1-H) and **B4** (CAN1-L) to the corresponding CAN1 inputs on other REVETRONICS RCOMP module to send and receive data between the modules. Both CAN-H and CAN-L cables should be twisted together along their entire length.

2.4.4. BUZZER

Connect pin **A7** (BUZZER_VCC) and **A2** (BUZZER_GND) to an external 5V buzzer with integrated generator. Buzzer is used e.g. for user alerts.

2.4.5. POWER SUPPLY FOR EXTERNAL SENSORS

Pins **A6** (+5V) and **A1** (GND) can be used to power additional external sensors (not powered by the vehicle), such as extra MAP sensors, pressure transducers etc. Multiple sensors can be powered, but the total current drawn by the sensors should not exceed 100mA. If a sensor is stock and already powered by the vehicle (e.g. from ECU), do not connect additional power to it. Additionally, do not power NTC sensors; these should be connected to analog input with the pull-up resistor enabled.

2.4.6. ANALOG SENSORS (STOCK or ADDITIONAL)

RCOMP supports 13 analog inputs:

- AdcIn1-AdcIn6 (0-5V): general purpose analog inputs
- AdcIn7-AdcIn8 (0-5V): general purpose analog inputs with the possibility of hardware modification for an extended range (0-30V or higher)
- AdcIn9 (0-32V): used internally for battery voltage measurement (from the power supply)
- AdcIn10-AdcIn13 (0-5V): general purpose analog inputs with pull-up enable/disable feature

General purpose analog inputs can be used for various applications, such as boost pressure from MAP, oil pressure, lambda o2 sensors, AFR readings from wideband O2 controllers, exhaust temperature from EGT amplifiers, stock NTC sensors, stock fluid level sensors, gear indicators and more. Enabling the pull-up resistor allows the connection of additional resistance or NTC sensors.

Additional voltage sensors, such as extra MAP sensor or 3-wire pressure sensor, will require power. Inputs A6 and A1 can be used for this purpose (please check the 2.4.5. POWER SUPPLY FOR EXTERNAL SENSORS section). The signal wire should be connected to AdcInX input.

Additional 2-wire resistance sensors, such as NTC temperature sensors or 2-pin pressure sensors, require the pull-up resistor to be enabled on the analog input. Connect one wire of the sensor to AdcIn10/AdcIn11/AdcIn12/AdcIn13 inputs, and the second wire to ground. You will need to enable the pull-up resistor for this input in the settings; only analog inputs AdcIn10 – AdcIn13 supports pull-up enabling.

2.4.7. DIGITAL INPUTS and OUTPUTS

RCOMP supports 4 digital inputs and 2 outputs:

- DigIn1-DigIn4: general purpose digital inputs
- DigOut1-DigOut2: relay switch outputs or digital output switches (5V@100mA[2]).

General purpose digital inputs can be used for impulse signals (e.g. RPM) or ON/OFF switches (e.g. fan enabled/disabled status). Digital outputs can be used for low-frequency external ON/OFF switches, such as controlling external relays to enable or disable external peripherals.

[2] It is possible hardware modification where DigOutX provides +BAT instead of +5V on output.

3. User manual

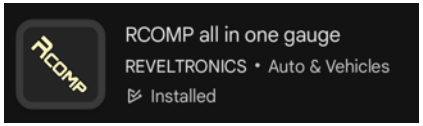
3.1. First start in the vehicle

3.1.1 Power up!

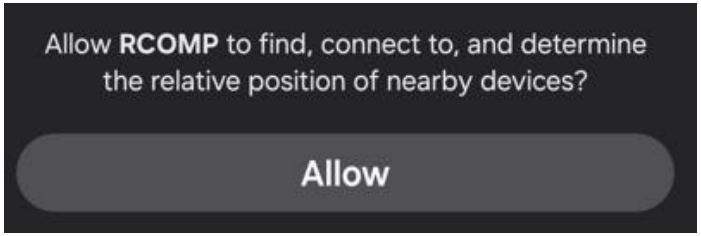
If the installation was performed correctly, you can connect the 20-pin and 10-pin connectors to the device. Connect the B connector (20-pin) first, followed by the A connector (10-pin). The RCOMP should power up, with the LED blinking RED three times. It will then enter sleep mode, where the LED will blink GREEN intermittently. When you turn the ignition key, the RCOMP should wake up, and the LED will blink RED every second as the module waits for a Bluetooth connection.

3.1.2 Install RCOMP Android application

Please download and install the **RCOMP All-in-One Gauge** application from Google Play or the REVELTRONICS website.



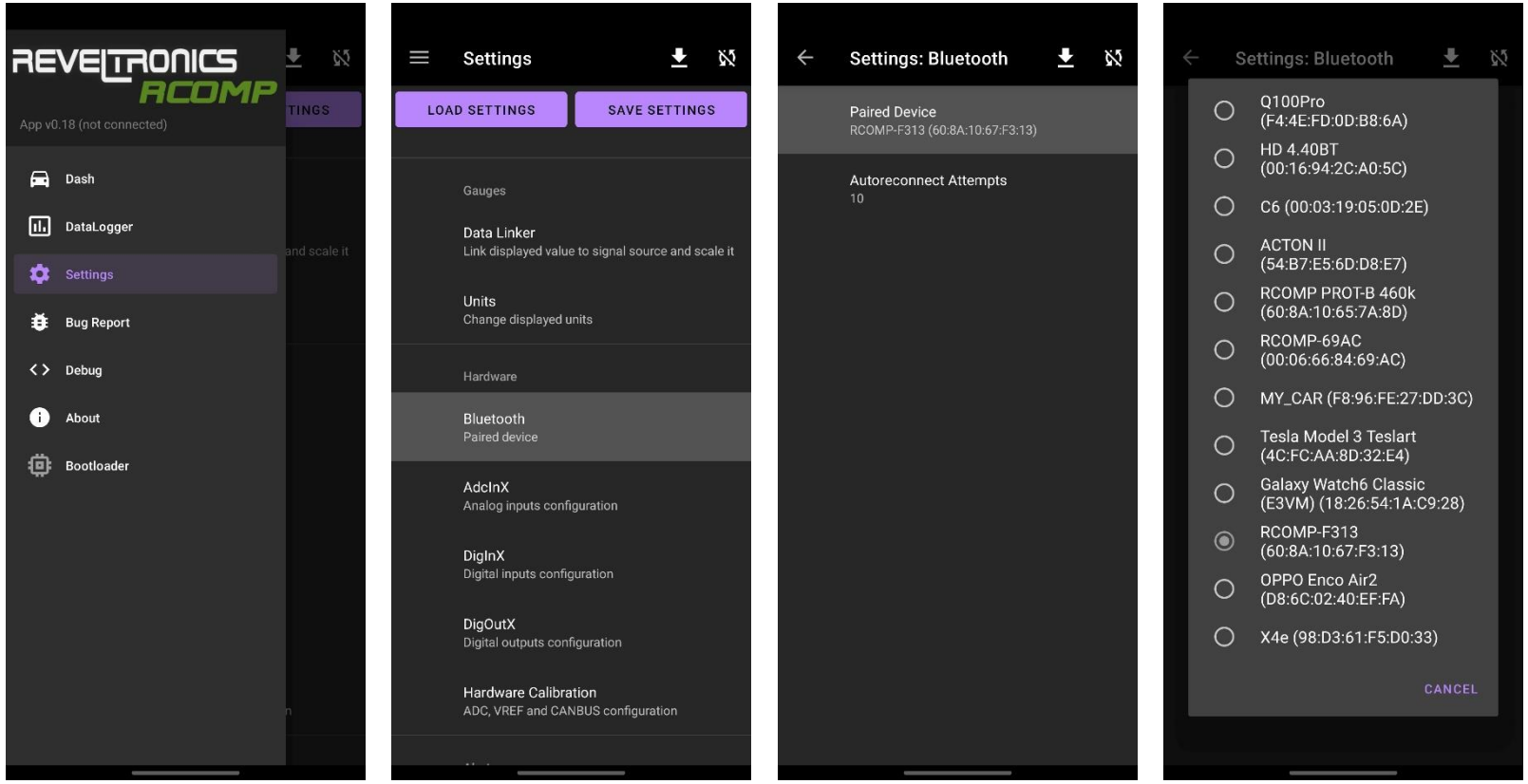
Launch the application, click the connection icon in the upper right corner, and select the Bluetooth icon . Grant permission for Bluetooth scanning and connection.



3.1.3 Bluetooth Connection

Launch the application. Go to **Settings** → **Bluetooth** → **Paired Devices**, and select the **RCOMP-XXXX** device.

If the device is not listed, ensure the ignition switch is ON and that the RCOMP LED is blinking RED every second. If the device is still not listed, run the Bluetooth manager on your Android device, scan for new devices, and restart the application.



If the device does not connect automatically, return to the **Dashboard**, click the connection icon in the upper right corner, and select Bluetooth Bluetooth. The device should connect within a few seconds. Once connected, the Bluetooth icon will appear in the upper right corner and you should receive a Toast Notification saying „Connected to RCOMP-XXXX" at the bottom of the screen: Connected to RCOMP-F313

3.2. Settings

You need to complete the basic configuration based on your connection setup: link selected gauges to signal sources using the **Data Linker**, choose **Units** and configure **Hardware** by setting up inputs and outputs.

3.2.1 Data Linker

Data Linker connects selected **Gauge** with **Signal Source**: AdcInX input, DigInX input, OBD2 (CAN2), RCOMP (CAN1) or internal calculations. To configure, go to **Settings -> Data Linker -> Selected Gauge**. Available gauges with their requirements are listed in *1.3. Gauges & Requirements* section.

Signal Source

For each gauge, you can can configure few additional options based on selected **Signal Source**:

- **AdcInX**
  - AdcInX Input Type:
    - Voltage Signal
    - Resistance Signal
- **DigInX**
  - DigInX Input Type:
    - Pulse Signal
    - On/Off Signal
- **OBD2**
  - OBD2 PID (0-255)
- **CAN**
  - RCOMP ID (0-65536)

Scaling

Data from sensors can be calibrated using linear scaling (a factor and b offset) or NTC scaling (R25 and Beta). You can also rescale data received from other signal sources. Scaling should be done using metric units. If you prefer to display data using imperial using, please use dedicated setting for it (refer to section 3.2.2 Units)

RCOMP ID

Data can be transmitted to other RCOMP devices via CAN1 bus. Ensure each data gauge you want to make visible on the CAN1 bus has a unique RCOMP ID (0-65536).

3.2.2 Units

You can switch between the following units: km/h or mph, Celsius or Farentheits and Bar, Psi or mmHg.

3.2.3 Hardware

Hardware settings allows you to adjust following parameters:

- **averaging time [ms]** and **voltage divider [multiplier]** for selected AdcInX input (voltage or resistance)
- **noise filtering [µs]** for selected DigInX input
- **data source** (other gauge), **thresholds** (Lo/Hi/Hysteresis) and **mode of operation** for selected DigOutX output
- **CAN bus termination** (120 ohm resistors enabled/disabled) for CAN2 (OBD2) and CAN1 (RCOMP)
- internal hardware **calibration paramaters** (VREF, ADC Offset, ADC Resolution)
- Bluetooth **paired device**

3.2.4 Alerts

You can configure custom alerts for gauges, allowing you to set dual warnings (notice + alert) for each gauge. Thresholds can be configured for high (HI), low (LO) values or both. Additionaly you can set conditions, where one value depends on another to trigger the alert. Here are some examples of possible configurations:

- Notice for low oil temperature (<60°C) and alert for high oil temperature (>120°C).
- Alert for high engine coolant temperature (>98°C).
- Alert for low oil pressure (<2 bar) only when engine RPM is below 2000 RPM.
- Notice for EGT (Exhaust Gas Temperature) above 900°C and alert above 950°C.
- Alert for AFR (Air-Fuel Ratio) out of range (<13 AFR or >16 AFR) with a condition enabled when boost pressure exceeds 0.5 bar.
- Notice for gearbox temperature above 100°C and alert above 130°C.
- Alert for low battery voltage (<12.8V) when the engine is running (RPM >700).
- And more. Please note that you can also configure DigOutX outputs based on selected signal source, e.g. FAN ON/OFF via relay switch.

Alerts are fully customizable by the user. Please download RCOMP app, go to Settings -> Alerts and explore possible options.

3.2.5 Data logger

You can select up to 15 configured gauges and record these paramaters to internal memory (Bank 0 – Bank 14). To save memory space, you can limit recording to only when vehicle is moving (speed > 0) or when engine is running (rpm > 0). Sampling frequency can be set to 1Hz, 2Hz, 5Hz or 10 Hz. Recorded logs can be viewed as charts using Data Logger tool, as described in section 3.4. Data-Logger. The datalogger memory should be erased each time you change the data logger settings to prevent data inconsistency – please refer to section 3.5.3 Erase DataLogger Memory

3.2.6 Apperance

You can change toolbar color and adjust the auto-hide time for top bar– this feature is especially useful when using the RCOMP app in windowed mode or split-screen. Additionaly, you can customize each gauge by long-pressing it directly on the dashboard.

3.3. Dashboards

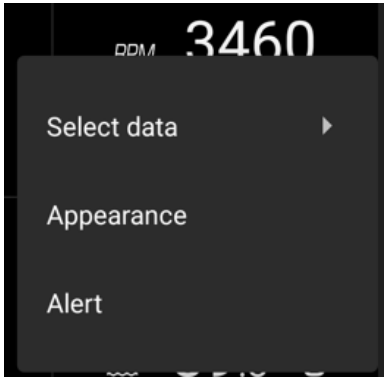
User can configure an unlimited number of dashboards displaying real-time data on gauges. Each dashboard can be set up with a different grid size. Additionally, each gauge can be customized by adjusting the font size, icon size and background color. To keep the interface clear and simple, dashboards are grayscale only - colors are reserved for alerts and peak values.

Customize Dashboards

Click the **Dash** icon in upper right corner. From there, you can change the grid size Change Grid (columns and rows), add a new dashboard Add Screen or delete the current dashboard Delete Screen. To switch between dashboards, swipe left or right. The title bar Dash [1/2] displays the total number of configured dashboards and the currently selected one.

Gauge Select

Long-press the selected gauge to display the context menu. From here, you can change the selected data, appearance and alert.



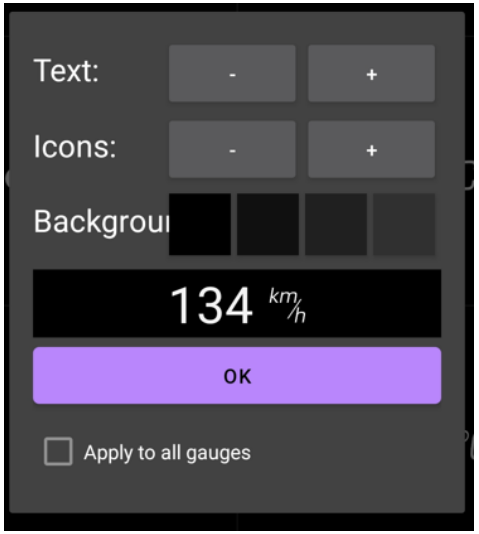
For a full list of available gauges, refer to section 1.3. Gauges & Requirements

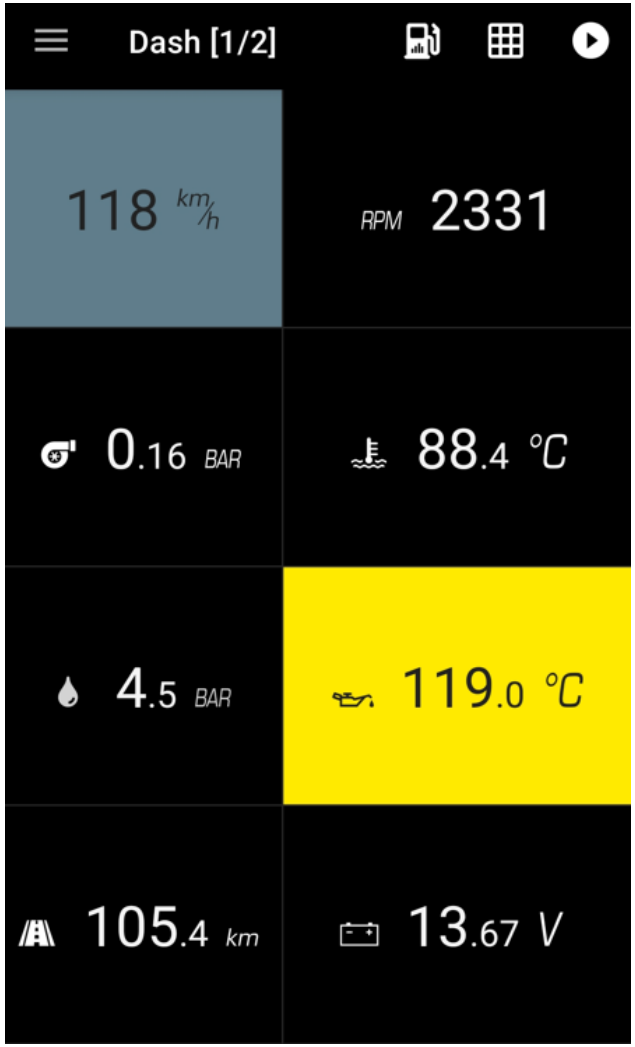
Gauge Peak Values

Short-press a gauge to display the peak values from the current session.

Gauge Appearance

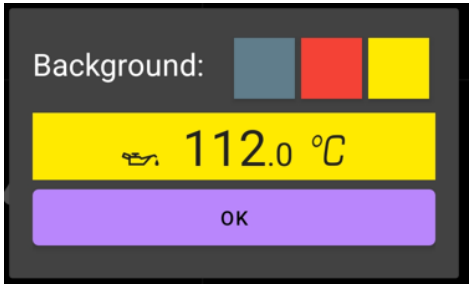
You can customize the text size, icon size and background color for each gauge.





Gauge Alert

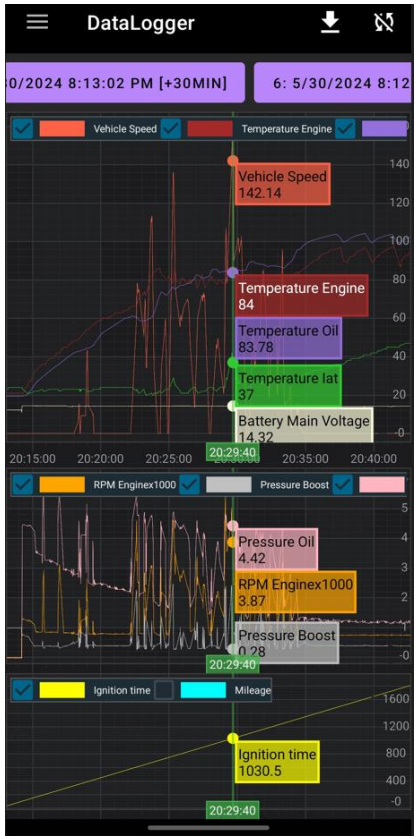
You can modify the alert appearance from the dash menu.

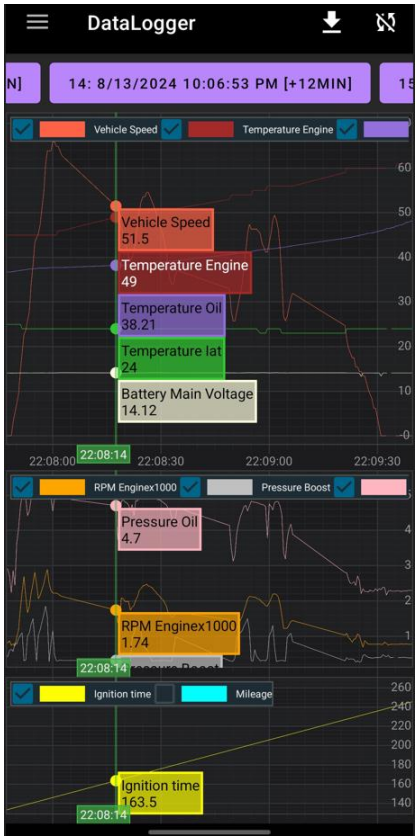


Custom alert thresholds and conditions should be configured in **Settings -> User Alerts**.

3.4. Data-Logger

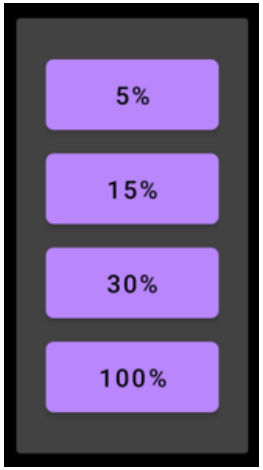
You can record up to 15 parameters and store them in internal memory. The parameters are logged simultaneously at a constant interval. The maximum sampling frequency is **10 samples per second for 15 parameters**. The memory capacity is 32 768 samples * 15 parameters, resulting in a total of 491 520 records. Recording 15 parameters at the maximum frequency provides approximately 55 minutes of recording time. Reducing the sampling frequency proportionally extends the recording time; for example, at 1 Hz, you will get about 9 hours of recording. To conserve memory, you can configure the system to record only when the engine is running (RPM > 0) or the vehicle is moving (Speed > 0). If the memory becomes full, new data will overwrite the oldest data.





Download data

To download data from the RCOMP, click the *download* icon in the top-right menu and then click download from module icon Download from module Downloading full memory via bluetooth may take a few minutes, so you also have option to download only portion of logs, such as last 5% of the memory.

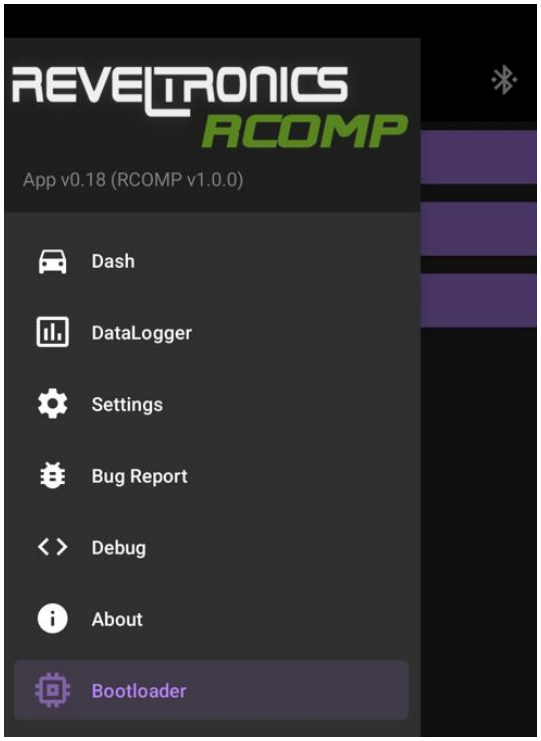


Export data

You can export downloaded logs to a .CSV file and open them in other applications, such as MS Excel. To do this, click the *download* icon in the top right corner, then click the *save as* icon Save CSV file. The file will be saved to your user files (the location may vary depending on the Android device). You can also open a previously saved .CSV file by clicking the *open* file icon Open CSV file.

3.5. Bootloader

RCOMP Android application (software) and RCOMP device (firmware) both can be updated to latest version free of charge. Each time you update RCOMP Android app you will need also to update RCOMP device. Current version of application and firmware version of connected RCOMP device are displayed in application menu: App v0.18 (RCOMP v1.0.0) on below screenshot.



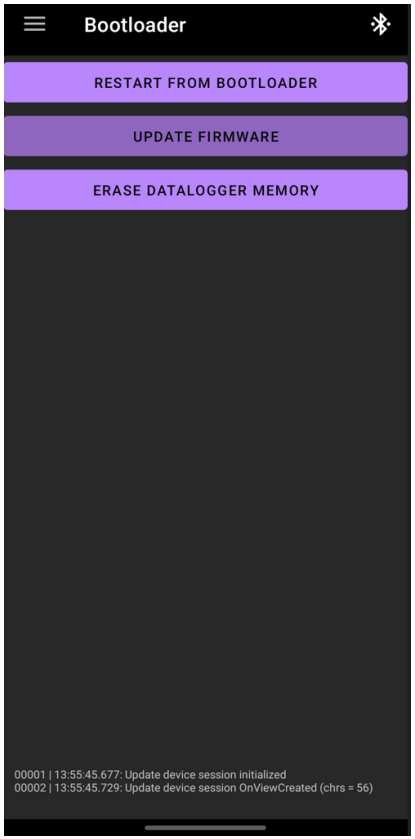
3.5.1 Software update

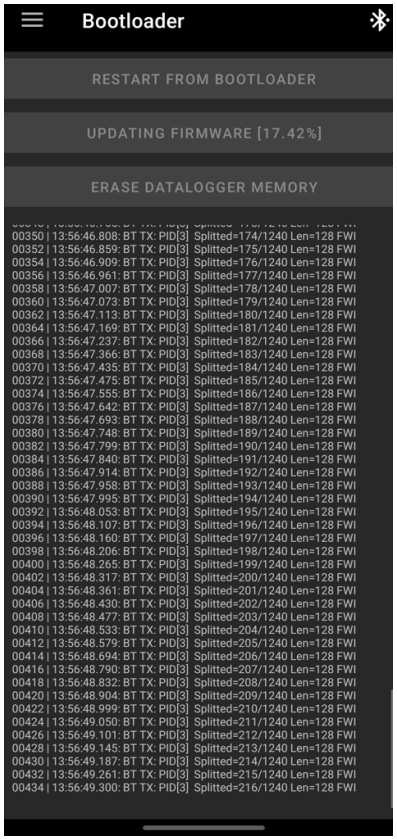
You can install latest RCOMP Android app directly from Google Play Store or download it and install as APK from REVELTRONICS website. Please refer to chapter 3.1.2 Install RCOMP Android application

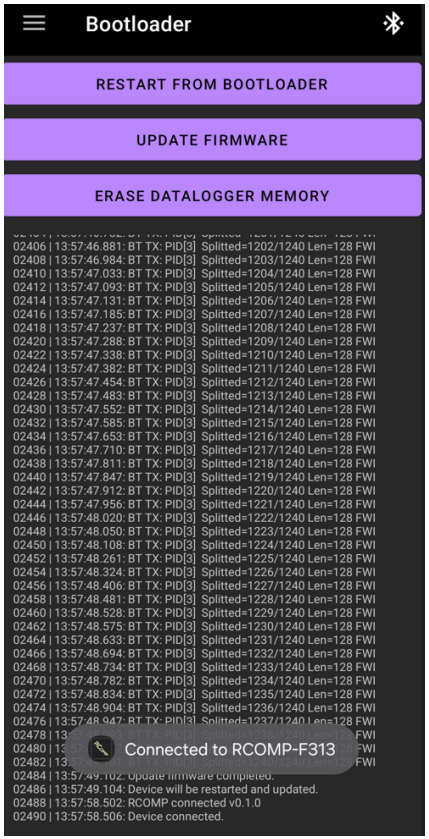
3.5.2 Firmware update

When you install a new version of the RCOMP Android application, it may no longer be compatible with the current RCOMP device, requiring a firmware update. To update the firmware, follow these steps:

1. Start the RCOMP Android application and wait for the Bluetooth connection to establish.
2. Go to the **Bootloader** menu.
3. Click the **Update Firmware** button. The new firmware will be sent to the RCOMP device.







This process may take a few minutes. **Do not interrupt** the update. You will see logs displaying the current progress. Once the update is complete, the RCOMP device should restart from the bootloader, and the firmware update will begin with a long buzzer beep. This process should take only a few seconds.

During the update, you will hear a series of beeps: 3 short beeps, followed by another 3 short beeps, and ending with a 1-second-long beep. An unsuccessful update will result in a single, 3-second-long beep. After either outcome, the device should attempt to reconnect.

If the update fails, press the **Restart From Bootloader** button to retry the process. If it fails again, the stored firmware may be corrupted. In this case, press the **Update Firmware** button to resend the firmware to the device and repeat above steps.

3.5.3 Erase DataLogger Memory

The datalogger memory should be erased each time you change the data logger settings to prevent data inconsistency. To erase the memory, go to the **Bootloader** menu and press the **Erase Datalogger Memory** button. This process should take 10–20 seconds. You will hear a fast-switching buzzer sound while the memory is being erased.