

# PIGEON RB700

versions: ESSENCE, STANDARD, ADVANCE

Pigeon RB700 is a computer designed for use in industrial control and automation systems. Pigeon RB700 is powered by Raspberry Pi Compute Module 4 and Linux system. RB700 model is available in three versions: ESSENCE, STANDARD and ADVANCE. The versions differ in the number of available interfaces. The ESSENCE version is the simplest and does not have UPS, HDMI, analog I/O and TPM compared to the STANDARD version. The ADVANCE version, compared to the STANDARD version, has two M.2 connectors and two additional RS-232 ports. M.2 connectors allow mounting a modem with support for dual SIM and SSD disk or any other module that supports PCIe 2.0. Built-in UPS based on supercapacitors ensures elimination of short power interruptions and safe system shutdown. The UPS is controlled by the microcontroller, which ensures the restart of the system in the event of the return of the power supply. All versions have the following interfaces: two RS-485, two Ethernet, CAN, 1-WIRE, RS-232, 12 digital inputs (8 opto-isolated, 4 dry contact) and 8 digital outputs.

## FEATURES

- **Powered by Raspberry Pi CM 4**
  - Broadcom BCM2711 quad-core
  - ARM Cortex-A72 64-bit SoC 1.5GHz
  - 1 GB RAM LPDDR4 (optionally up to 8GB)
  - 8 GB eMMC Flash (optionally up to 32GB)
- **A lot of inputs and outputs**
  - 8 x digital opto-isolated inputs
  - 4 x dry contact inputs
  - 8 x open drain outputs
  - 4 x analog inputs 0-10V
  - 2 x analog outputs 0-10V
- **Rich set of interfaces**
  - 3 x USB 2.0
  - 3 x RS-232
  - 2 x RS-485
  - 2 x Ethernet
  - CAN
  - 1-Wire
  - HDMI
- **Expansion connectors**
  - M.2 2242 key B, PCIe 2.0 x1
  - M.2 3042 key B, modem with dual SIM
- **Real Time Clock**
  - Real Time Clock with battery backup
- **Robust design**
  - Two watchdogs
  - Meets requirements of EN IEC 61326-1:2021 for basic and industrial electromagnetic environments
- **Trusted Platform Module**
  - Compliant to TPM Main Specification, Family 2.0
- **Integrated UPS**
  - Supercapacitor based UPS
  - Safe shut down procedure
  - Power button
  - Battery-free, eco-friendly
- **Created for long life**
  - Designed, developed and produced in European Union
  - No electrolytic capacitors (except UPS supercaps)
  - No moving parts
- **Low power consumption**
  - High efficiency DC/DC converters
  - Peripherals power supply control
- **Linux on board**
  - Small and stable distribution that is fully compatible with official Raspberry Pi OS
  - Large community
  - Full support for all interfaces
- **Easy programmable**
  - Installed Linux supports almost all of the major programming languages (C/C++, Python, , Java, etc.)
  - Open source and commercial software for automation and control systems
- **DIN rail enclosure**
  - DIN rail enclosure with the optional wall mount

## APPLICATIONS

- Industrial control and automation systems
- Building automation
- Factory automation
- Industrial control networks

## 1. TECHNICAL SPECIFICATIONS

CPU & memory			
SoC	BCM2711, quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz <sup>1</sup>		
RAM memory	1 GB LPDDR4 (optionally up to 8GB)		
Flash memory	8 GB eMMC (optionally up to 32GB)		
Power supply			
Supply voltage	24V DC (20 ... 32V)		
Power consumption <sup>2</sup>	Conditions	Supply current @ 24V	
	CPU 100% load	0,25A	
	CPU 1% load	0,16A	
Interfaces & I/O			
	Version		
	Essence	Standard	Advance
Ethernet 1Gbit, RJ-45	Yes	Yes	Yes
Ethernet 100Mbit, RJ-45	Yes	Yes	Yes
2 x RS-485, terminal blocks	Yes	Yes	Yes
RS-232, DB9 male	Yes	Yes	Yes
2 x RS-232, terminal blocks	No	No	Yes
1-WIRE, terminal blocks	Yes	Yes	Yes
CAN FD, terminal blocks	Yes	Yes	Yes
8 x digital opto-isolated inputs	Yes	Yes	Yes
4 x dry contact inputs	Yes	Yes	Yes
8 x open drain outputs	Yes	Yes	Yes
4 x analog inputs	No	Yes	Yes
2 x analog outputs	No	Yes	Yes
M.2 2242 key B, PCIe 2.0 x1	No	No	Yes
M.2 3042 key B, dual SIM, nano SIM	No	No	Yes
Trusted Platform Module	No	Yes	Yes
Supercapacitor based UPS	No	Yes	Yes
Mini USB 2.0 Type B	Yes	Yes	Yes
USB host 2.0 Type A	3	3	2
I/O parameters			
Digital opto-isolated inputs	Low-level input voltage	0 ... +5 V DC	
	High-level input voltage	+10 ... +28V DC	
	Isolation voltage	5 kV <sub>RMS</sub>	
	Input resistance	>=10kΩ	
Open drain outputs	Maximum current	500 mA	
	Maximum voltage	28 V DC	
Analog inputs	Voltage Range	0 ... +10V	
	Resolution	10-bit	
Analog outputs	Voltage Range	0 ... +10V	
	Resolution	10-bit	

1) depending on processor workload, CPU throttling may occur

2) power consumption of devices connected to USB and M.2 is not included

5V output DC	Maximum current	0.1 A
Terminal blocks	Wire range	0.5 - 1.5 mm <sup>2</sup> , 28 -16 AWG
	Torque	0.2 Nm
	Strip length	7 mm
<b>Standards</b>		
EU standard	EN IEC 61326-1:2021	
<b>Environment</b>		
EMC emission	Group 1 class A and class B equipment according to EN IEC 61326-1:2021	
EMC immunity	Industrial electromagnetic environment according to EN IEC 61326-1:2021	
Operating Temperature	0 °C ~ 50 °C	
Operating Relative Humidity	5 ~ 90%, non-condensing	
Storage Temperature	-25 °C ~ 50 °C	
Protection Rating	IP20	
<b>Miscellaneous</b>		
Watchdog	Two watchdogs: - SoC BCM2711 built-in, - connected to GPIO.	
RTC backup battery	CR2032, 3V	
Dimension	212 x 114 x 59 mm (including terminal blocks connectors)	
Enclosure	Mount	Din-rail, wall mount
	Material	ABS
Weight	Essence: 306g Standard: 351g Advance: 358g	

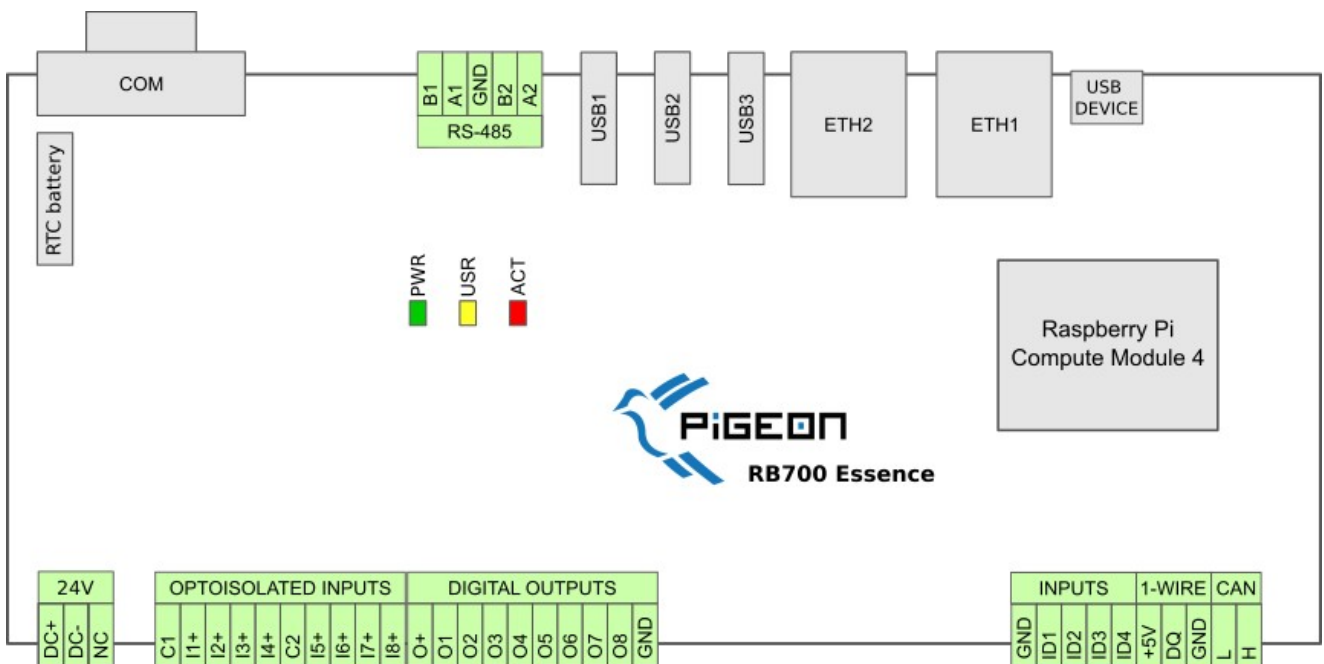


Fig. 1. RB700 version Essence



Fig. 2. RB700 version Standards

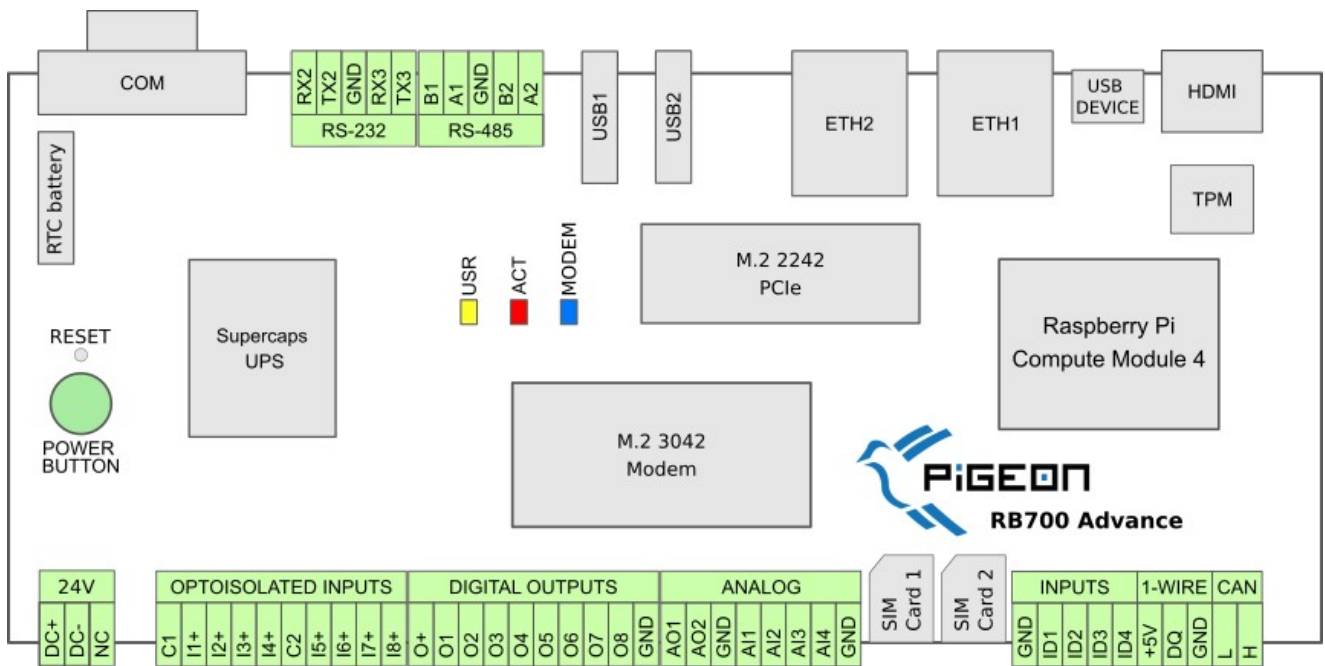


Fig. 3. RB700 version Advance

## 2. CONNECTIONS

### 2.1. POWER SUPPLY

Pigeon RB700 should be connected to AC mains using an AC/DC power supply.  
 Recommended power supply: MEAN WELL model HDR-30-24 (24V DC, 1,5A).

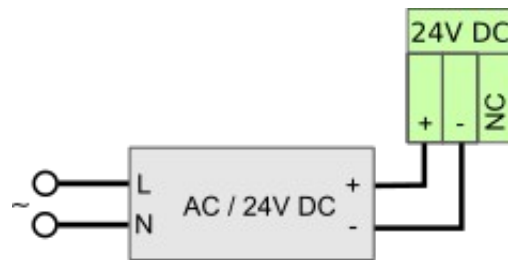


Fig. 4. Dry contact inputs connections

### 2.2. DRY CONTACT INPUTS

Fig. 5 shows dry contact inputs connections.

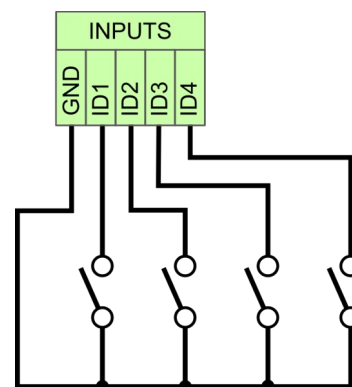


Fig. 5. Dry contact inputs connections

### 2.3. DIGITAL OPTO-ISOLATED INPUTS

Fig. 6 shows digital opto-isolated inputs connections.

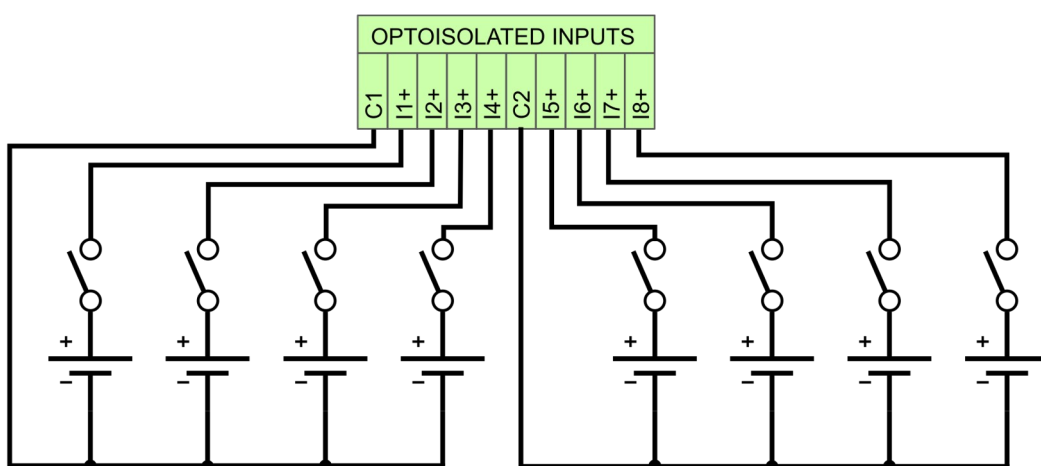


Fig. 6. Digital opto-isolated inputs connections

## 2.4. OPEN DRAIN OUTPUTS

Recommended connection of LED (a) and relays (b,c) to open drain outputs is shown on fig. 7. O+ is terminal to connect + potential when switching inductive load. The internal diodes protect the output transistors from transient voltage peaks (b). In case of long cables to relay, connection with external diode (c) is recommended.

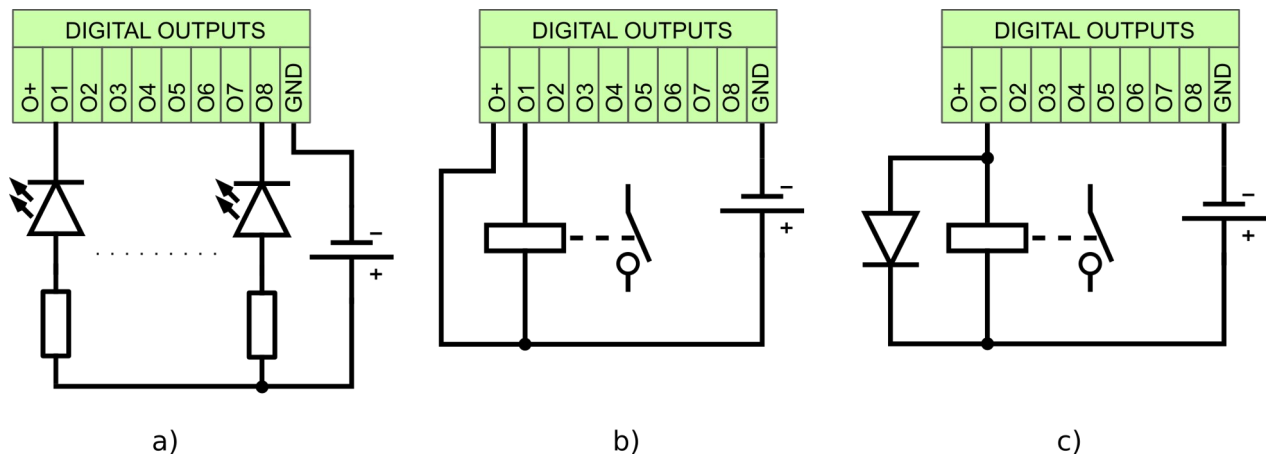


Fig. 7. Example digital outputs connections: (a) LED, (b,c) relay

## 2.5. ANALOG INPUTS AND OUTPUTS

Fig. 8 shows analog inputs and outputs connections.

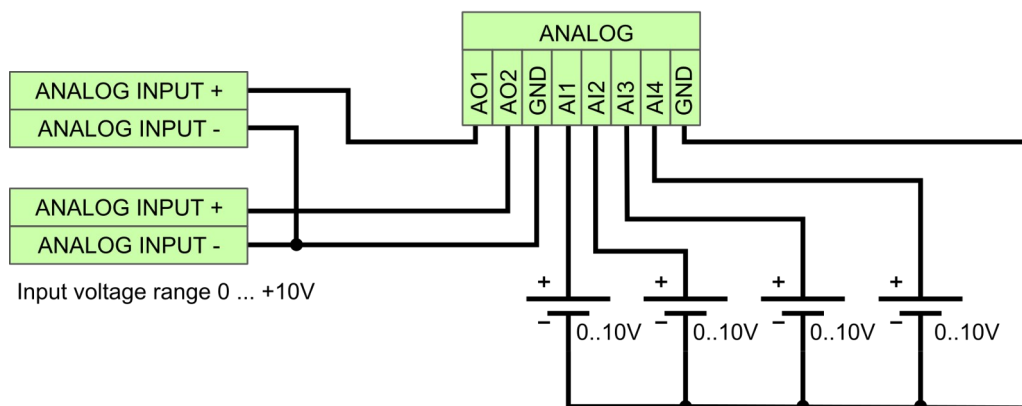


Fig. 8. Analog inputs and outputs connections

## 2.6. CABLE LENGTH

Connector	Maximum cable length
Power supply	3 m
USB	3 m
HDMI	3 m
1-wire	3 m
Analog inputs/outputs	3 m
Digital inputs/outputs	3 m
RS-232	3 m
Ethernet	30 m
CAN	30 m
RS-485	30 m

### 3. DIMENSIONS

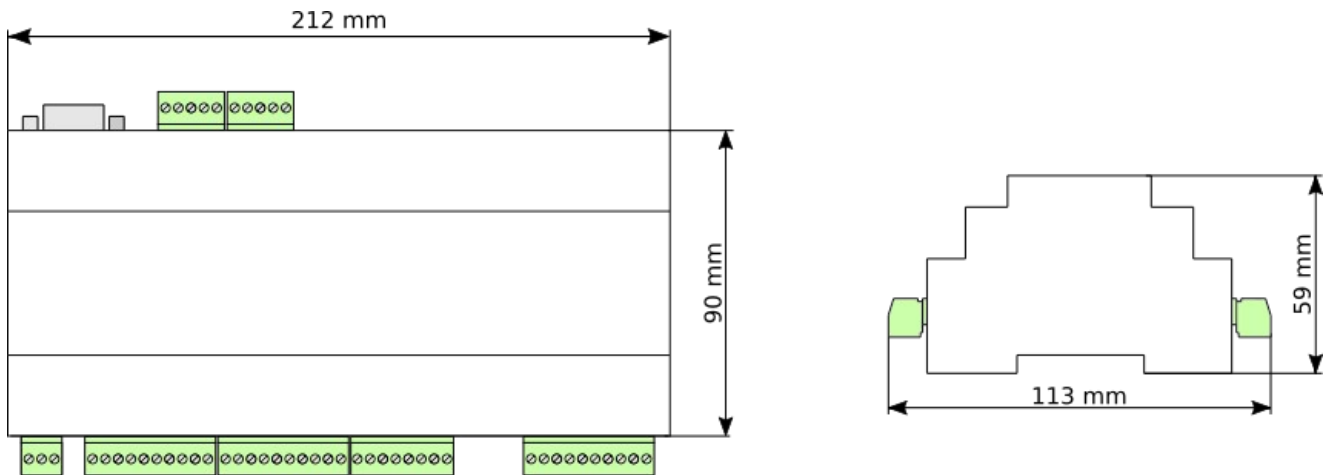


Fig. 9. RB700 dimensions

### 4. ENVIRONMENTAL PROTECTION



This marking on the product, accessories or literature indicates that the product and its electronic accessories should not be disposed of with other household waste. To prevent possible harm to the environment please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

### 5. ORDER CODES

We offer customization of this product. Rebranding and hardware customization are possible. For available options or for further information on any aspect of this device, please contact KRISTECH.

Order codes	Descriptions
RB700-ESSENCE	RB700 ESSENCE version
RB700-STANDARD	RB700 STANDARD version
RB700-ADVANCE	RB700 ADVANCE version

### 6. SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry, and be familiar with standard practices for preventing accidents.

Only qualified personnel should be allowed to install, replace, or service this equipment.

We cannot guarantee that no accidents or damage will occur due to improper use of the device. Please use this product with care and operate at your own risk.

Any external power supply used with PIGEON RB700 shall comply with relevant regulations and standards applicable in the country of intended use.

This product is intended to be installed indoors. Keep this product away from water, fire, humidity or hot environments.

PIGEON RB700 is not authorized for use in safety-critical applications.

In the case of device failure, please disconnect it from power.

All devices used with this product should comply with relevant standards for the country of use and be marked accordingly to ensure that safety and performance requirements are met.

Take care whilst handling to avoid mechanical or electrical damage to the printed circuit board and connectors. To prevent electrostatic discharge (ESD) from damaging the system, be aware of the precautions to consider when setting up the system or handling parts. In particular, when installing devices in M.2 slots. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices.



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<http://pigeoncomputers.com>

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