

# AC-RTK\_Base-000

## **2D RTK-GNSS Base Station**



## Introduction (2D RTK description)

RTK (Real Time Kinematic) is a method for correcting positional data received from GNSS (Global Navigation Satellite System) by usage of correction data provided by public or privately owned base stations.

Base stations generally consist of a RTK GPS/GNSS receiver that detects the current position to create what is known as correction data. Through an interface, this correction data is transmitted in a standardized data transfer format called *RTCM* (Radio Technical Commission for Maritime services) to the Rover(s) to improve their positional accuracy.

# **Key Features**

- > Multimode GNSS Receiver (GPS, Galileo, Beidou, GLONASS)
- > Compact, lightweight, robust carry case is easily transportable
- > Any 5 V power input (for 24/7 operation) can be used
- > Built-in uninterruptible, standalone power-supply (for power supply hot-swap)
- > IP68 housing, including compartments for WiFi-HotSpot/Smartphone & USB 5V wall charger
- RTCM correction data interface (RTK Link)
  - Output via built-in Wi-Fi hotspot (can be connected to any Wi-Fi or hotspot) or via radio frequency interface (433/688/2400 MHz)
  - Any internet connection through Wi-Fi, Mobile HotSpot or Smartphone HotSpot can be used.
  - Full RTK infrastructure available for NTRIP access to server provided by 2D as a subscription service or on premises
- Setup
  - Easy, browser-based configuration via web interface and provided by built-in Wi-Fi hotspot and integrated color display for status information
  - o Survey mode for self-detection of reference position

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Available Options				
OPT-001:	Small helical antenna (direct mounting thread)			
OPT-002:	High end base station antenna (direct mounting thread)			
OPT-003:	Extension lead between antenna and base station (3 m)			
OPT-004:	NTRIP online broadcaster hosted by 2D (subscription)			
OPT-005:	HolyBro 433 MHz telemetry transceiver (≈ 1 km range), ideal for Karting and other nearfield applications (approx. 250 EUR) (check country RF rules before use)			
OPT-006	HolyBro 900 MHz telemetry transceiver (≈ 20 km range), ideal for large circuit connectivity (approx. 600 EUR) (check country RF rules before use)			

#### **Power supply**

- Low power consumption (< 180 mA @ 5V)</p>
- Power supply modes:
  - Any 5 V input (for 24/7 operation)
    - Power supply by any 5V power source (e.g., USB wall adapter)
    - Power supply by USB Powerbank
  - Built in uninterruptible power supply:  $\approx$  30 minutes (for power supply hot swap)

#### **RTK configuration**

- > Easy configuration through private browser web interface accessible through Wi-Fi hotspot
- NTRIP Rev1 and Rev2 compatibility
- Survey mode for self-detection of reference position
- Cold start survey time programmable (default 10 minutes)
- Multimode GNSS Receiver (GPS, Galileo, Beidou, GLONASS) with 5 m included (length can be modified on costumer request)
  - → other antennas are also available → see **OPT-001 / -002**

#### **Mechanical Characteristics**

- Base Station:
  - Case dimensions: 240 x 200 x 120 mm
  - o Weight: 1,2 kg
  - Protection class: IP68
  - Ambient operating temperature range: -30 ... 75°C
- Antennas:
  - Multimode GNSS u-blox antenna (included): 60 x 80 x 23 mm
  - Small helical antenna (**OPT-001**): 60 x 27 mm
  - High end base station antenna (**OPT-002**): 152 x 62 mm

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### **System Overview**



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#### Web interface with configuration and event log

2D	RTK	Gateway	/
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Adjust the settings below and then click on "Apply". The device will restart with the new settings applied. If you have adjusted WiFi settings the device may be moved onto a new IP address, or require you to reconnect to its access point.

Log	OTA FV	update	SD Card browser		
WiFi Not Connected	No internet	Admin (this page)			
SSID	Password	Auth method User	rname Password		
2D-Development	▼ Scan ●●●● ●	Open 🗢			
IP config ?		Config load	Config save		
DHCP	Static				
IP address Gat	eway and subnet	LIAPTO 6151110 in (14/c) / 0 out (0			
192 . 168 . 0 . 100 19	02 . 168 . 0 . 1 / 24≑				
DNS	Backup DNS	Baud rate	Parity		
1 . 1 . 1 . 1	1 . 0 . 0 . 1	57600 \$	baud Disabled \$		
		Data bits	Stop bits		
WiFi hotspot 2D_Base_3 (OPEN) (Ch:28 192.168.4.2(-5dBm)	) / 192.168.4.1 / 1 device	8 ÷	bits 1 $\Leftrightarrow$ bits		
SSID/Hostname	Security	UART1 72331108 in (164/s) / 0 out	t (0/s)		
2D_Base_3 Hidden	Open 🗢	Baud rate	Parity		
Gateway and subnet	Min/max IP address	460800 <b>≑</b>	baud Disabled +		
192.168. 4 . 1 / 24 🕈	192.168.4. 1 - 254	Data bits	Stop bits		
Stop time		8 +	bits 1 + bits		
unlimited \$					
		Can-Bus [Msg/s]			
Modem Deactivated					

14	01:57:43.572ms	INFO	MAIN	()
13	01:57:43.572ms	INFO	MAIN	2d-rtk-gateway dev-1.2.1-20-gc997952
12	01:57:43.572ms	INFO	MAIN	
11	01:57:43.572ms	INFO	MAIN	Compiled: 14:00:56 Apr 13 2022
10	01:57:43.572ms	INFO	MAIN	ELF SHA256: ebf45704b8413447
9	01:57:43.572ms	INFO	MAIN	ESP-IDF: vesp-idf-2d-4.4.0-1.1.1
8	01:57:43.572ms	INFO	MAIN	
7	01:57:43.571ms	INFO	MAIN	Reset reason: SOFTWARE
6	01:57:43.571ms	INFO	MAIN	l
5	01:57:43.571ms	INFO	MAIN	2D Debus & Diebold Meßsysteme GmbH
4	01:57:43.571ms	INFO	MAIN	Alte Karlsruher Str.8
3	01:57:43.571ms	INFO	MAIN	D-76227 Karlsruhe
2	01:57:43.571ms	INFO	MAIN	
1	00:00:00.000ms	RESET	ESP32	Device Restarted
6	21:34:56.634ms	INFO	WIFI	WIFI_EVENT_STA_DISCONNECTED: ssid: 2D-Development, reason: 201 (NOT_FOUND)
5	21:34:54.191ms	INFO	WIFI	Station Reconnecting: 2D-Development, attempts: 10
4	21:34:44.674ms	WARN	httpd_uri	httpd_uri: uri handler execution failed
3	21:34:44.671ms	WARN	httpd_txrx	httpd_resp_send_err: 404 Not Found - Directory does not exist
2	21:34:44.670ms	ERROR	WEB	Failed to stat dir : /sdcard
1	21:34:29.645ms	INFO	WEB	Sending file /bs-4.3.1.min.css (153438 bytes)

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### **Antenna Overview**

## u-blox antenna (magnetic):

60 x 80 x 23 mm



# Small helical antenna (direct mounting thread):

60 x 27 mm



# High end base station antenna (direct mounting thread):

152 x 62 mm

