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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
  - *Survey mode* for self-detection of reference position

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)
- 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: ≈ 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***

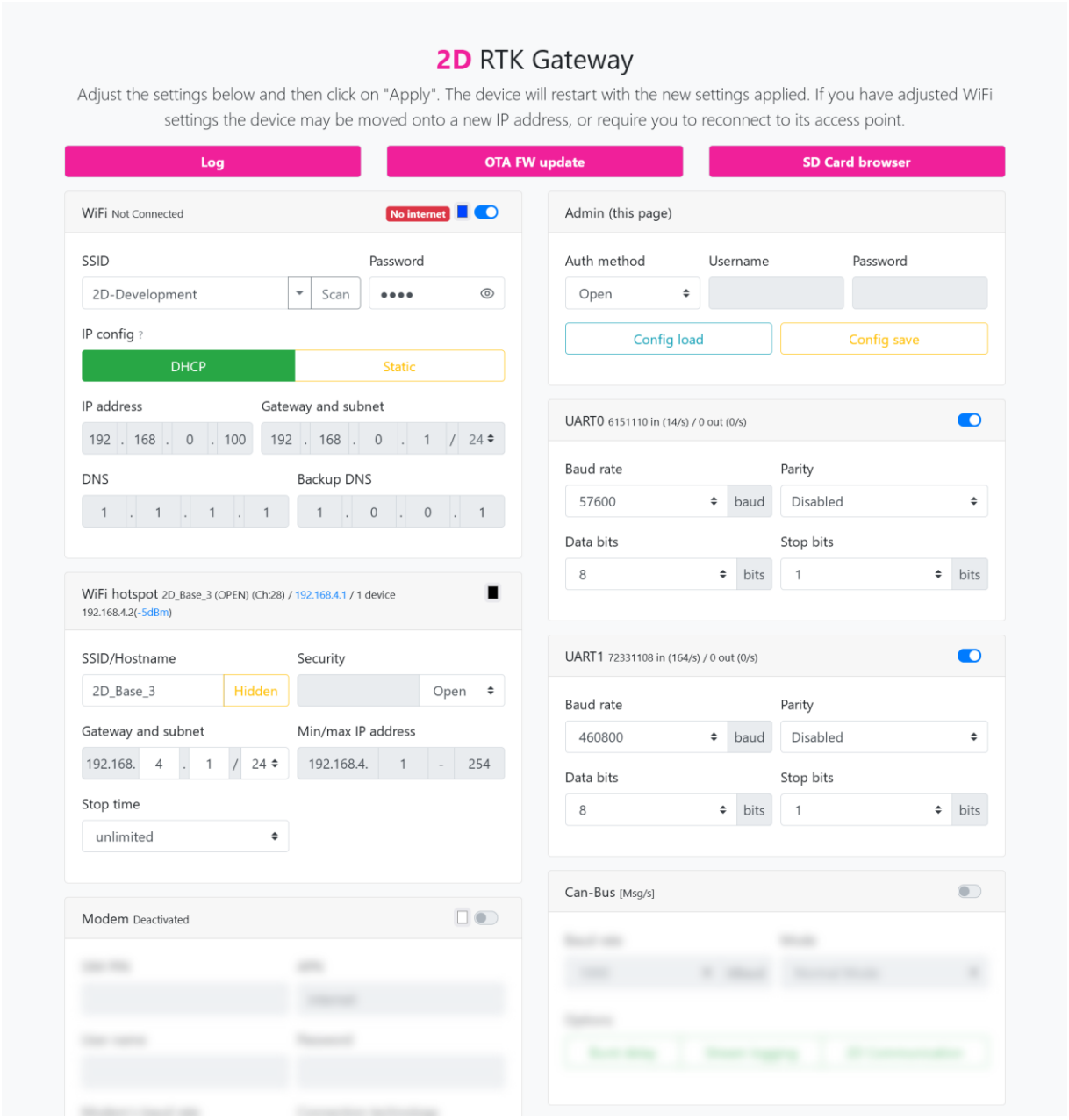
Mechanical Characteristics

- Base Station:
  - Case dimensions: 240 x 200 x 120 mm
  - 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

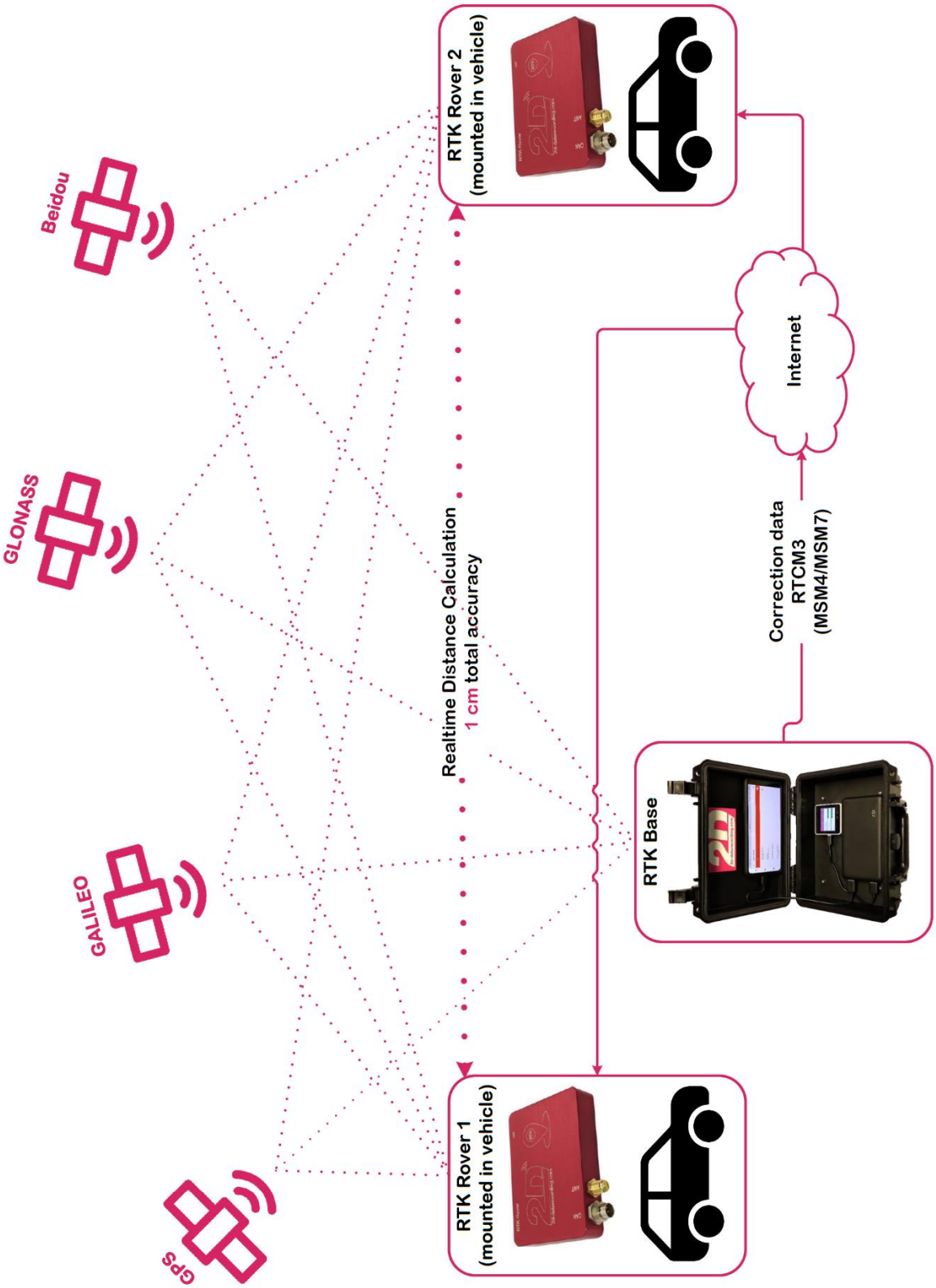
System Overview

Web interface with configuration and event log




```
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  ╠═══════════════════════════════════════╣
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)...
```

System Overview



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