BLIP 13

REV. 1.1
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DATASHEET & TECHNICAL DESCRIPTION

Passive drone detector and direction finder · 100 MHz – 13 GHz

OVERVIEW

BLIP 13 is a handheld passive RF detector and direction finder for drones (UAS). It continuously scans 100 MHz – 13 GHz, detects drone control, video and telemetry links, and gives the operator a bearing to the source. In detection mode the device emits nothing, so the operator cannot be located by RF reconnaissance.

KEY FEATURES

- Continuous coverage from 100 MHz to 13 GHz with no gaps, including the full X-band (8–12 GHz). Reception confirmed up to 13.4 GHz.
- Sweep in ≈ 3 s for 100 MHz – 7.3 GHz and ≈ 3 s for the X-band preset; full 100 MHz – 13 GHz in ≈ 7 s.
- Drone Only mode with Smart Motion Filter: alerts only on approaching sources and ignores static emitters such as cell towers, Wi-Fi and background noise. No signature library to update.
- Two modes in one device: 360° early warning with the omnidirectional whip (up to 2 km) and direction finding with the Arrow antenna (up to 5 km, DF sector ≈ 60°).
- Analog and digital links, including frequency-hopping (FHSS) drones.
- Spectrum and waterfall views: drone control and video links are shown separately from Wi-Fi, GSM and LTE.
- Up to 12 simultaneous targets.
- Built-in LNA; DANL down to −169 dBm/Hz.
- Programmable TTL outputs to trigger external systems: alarms, perimeter automation, EW systems.
- PC interface (USB-C) for fixed monitoring posts with remote access.

TWO OPERATING MODES

360° dome — omnidirectional whip antenna. The device continuously scans the selected frequency range. Any source within range is detected automatically and an alarm is generated. The operator does not rotate the device: 360° coverage comes from the antenna's radiation pattern. Suited to early warning at posts and perimeters. Shows that a source is present and its approximate distance by signal level, but not its direction. Range up to 2 km.

Direction finding — Arrow antenna on the pistol grip. The log-periodic Arrow antenna is mounted on the pistol-grip housing. The operator scans the horizon by turning the device. The bearing is where the signal amplitude is highest: the signal level rises (for example, from −80 dBm to −60 dBm) and more signal bars appear. Amplitude is the most accurate indicator. The directional pattern gives much higher gain than an omnidirectional antenna, which increases detection range — up to 5 km. Signals from behind (back lobe) are strongly attenuated; to cover the rear hemisphere, the operator turns around. DF sector ≈ 60° (main lobe).

Both antennas are in the standard kit, so one operator can switch between all-round early warning and direction finding.

SMART MOTION FILTER — DRONE ONLY MODE

The Smart Motion Filter detects the movement of any target, on the ground and in the air. It ignores static interference — base stations, Wi-Fi signals, radio noise and general RF congestion. There is no need for a huge signature database and its constant updates: BLIP 13 looks only for moving objects, so it detects any type of drone — older and modern, fixed-wing and multirotor — without database updates.

How to enable Drone Only mode

1. Open **APPROACH**.
2. Untick **GREEN**; keep **YELLOW** and **RED** ticked.
3. Done.

Smart filtering responds to an approaching target. If the target moves away from the operator or stops moving (hovers), the alarm and signal capture are cleared.

Sensitivity. To make triggering more sensitive, open **APPROACH** and change **ACCUMULATION** from the factory value **2** to **1**. The system then reacts even to minimal movement in the sky or on the ground, with a higher risk of false alarms from unstable neighboring signals. Use **1** when the RF environment is quiet and **2** when the spectrum is congested.

OTHER MODES AND FUNCTIONS

Detect All. Alerts on any new RF source in the selected bands.

Auto-Exclude. One press adds everything currently on air to the exclusions; from then on the device reacts only to new signals. Specific sources are masked without disabling the band: if a drone appears next to an excluded base station on the same band, BLIP 13 still raises the alarm.

Manual Exclusions. Up to 12 frequency bands the device ignores, each with its own start and end frequency. Kept after a restart.

Signal Hold. Keeps a signal on screen after it disappears. Required for drones that keep changing frequency.

Band presets. Ready sub-bands for typical drone links, with GSM, LTE and handheld radio bands excluded. X-band preset: 8–12 GHz in ≈ 3 s.

Spectrum analyzer. With Detector Mode off, the device works as a spectrum analyzer.

SPECIFICATIONS

Parameter	Value
Type	Handheld wideband drone detector and direction finder (passive receiver)
Frequency range	100 MHz – 13 GHz, continuous coverage; reception confirmed up to 13.4 GHz
Sweep time	≈ 3 s (100 MHz – 7.3 GHz); ≈ 3 s (X-band preset, 8–12 GHz); ≈ 7 s (full 100 MHz – 13 GHz)
Max detection range	Up to 5 km (Arrow directional antenna); up to 2 km (omnidirectional whip)
Simultaneous targets	Up to 12
Direction finding	Arrow directional antenna; DF sector ≈ 60° (main lobe)
Target types	Drones (FPV, commercial, specialized), relays, beacons, handheld radios, video and control link sources
Signal types	Analog and digital, including frequency hopping
Moving / static discrimination	Hardware; color indication: moving — red, static — green
Sensitivity	DANL down to −169 dBm/Hz with LNA on
LNA	Built-in, software-controlled
Frequency stability	< 1 ppm (−10 … +55 °C)
Display	Color LCD; spectrum view and waterfall; detected signals marked (FPV control link, FPV video link, Wi-Fi, GSM, LTE) with frequencies
Alerts	Audible; visual (backlight); on-screen text for silent operation
Backlight	Auto-dims by 80 % when there are no new targets, restores on detection; auto-dim can be disabled
Alarm range threshold	Operator-configurable, 1 m – 5 km
Scan modes	Full Sweep (100 MHz – 13 GHz); band presets for drone links with GSM, LTE and handheld radio bands excluded
Interference handling	Auto-Exclude (masks specific sources without disabling the band); Manual Exclusions (up to 12 bands)
Event log	microSD card inside the device, saved on detection events
Firmware	Internal memory; updatable
Manual	Built into the firmware, shown on the display
PC interface	USB-C; device control and spectrum view on a large PC screen

Parameter	Value
TTL outputs	4 programmable lines (RX, TX, PB13, PB14), 3 V, up to 25 mA, configured on the device; PA4 tone output (~3 kHz)
RF connectors	RF (SMA female); CAL (calibration only, no reception)
Battery	Li-Po, 5000 mAh
Charge indication	Two indicators on the display: segment bar and voltage
Battery life	Up to 8 h continuous; power bank supported
Charging	USB-C, from a phone charger or power bank
Operating temperature	−20 … +55 °C (frequency stability may vary below −10 °C)
No moisture protection	The housing has no dust or moisture protection; protect from rain and moisture
Receiver size	110 × 70 mm
Weight	≈ 200 g (receiver)

ANTENNAS

Antenna	Frequency range	Peak gain (~2.4 GHz)	Purpose	Supply
Arrow — log-periodic directional, pistol grip	400 MHz – 13 GHz	6 dB; main lobe ≈ 60°	Direction finding	Standard kit
Omnidirectional whip	600 MHz – 8 GHz	7 dB	360° coverage, early warning	Standard kit
Dual-band auxiliary	130–180 MHz and 400–500 MHz	—	Low-band control links, handheld radios	Standard kit

Gain values are peak values. Gain is lower at the band edges, which is typical of wideband antennas.

DETECTION RANGE

Up to 5 km with the Arrow directional antenna; up to 2 km with the omnidirectional whip.
Range depends on the link type (video links are detected farther than control links), drone transmitter power (1, 3 or 5 W), the drone's antenna, flight altitude, terrain and line of sight, RF congestion, and the receiving antenna and its polarization. Where more range is needed, a higher-gain antenna with a different mount can be used.

INTEGRATION

TTL outputs. Four pins — RX, TX, PB13, PB14 — are configured by the operator directly on the device, without an external programmer. On a new-signal event, a 3 V TTL pulse of set duration goes to the selected pins. Max load current — 25 mA. Allowed loads: transistor, LED, optocoupler. Do not connect relays or other power loads directly — use MOSFET switches or driver boards with a signal input. Typical uses:

- switching on an EW system when a drone is detected;
- triggering an alarm or perimeter automation;
- starting recording on third-party recorders;
- any other TTL-level scenario.

EW Monitor. BLIP 13 remembers the signal levels of your own EW system in every band. If they drop — the EW system fails or is switched off — it gives a warning and a sound signal.

PC interface and fixed posts. Over USB-C, BLIP 13 connects to a Windows PC running BLIP 13 software: device control and spectrum on a large screen. For fixed monitoring posts — remote access over the Internet or LAN; the operator connects to each post separately. Integration with third-party software is possible with individual adaptation.

KIT

- BLIP 13 detector unit with color display
- Pistol-grip housing with sun hood
- Arrow directional antenna
- Omnidirectional whip antenna, 600 MHz – 8 GHz
- Dual-band auxiliary antenna, 130–180 MHz and 400–500 MHz
- RF cable for the Arrow antenna
- USB-C power cable
- User manual built into the firmware
- Option: transport case

NOTES

- BLIP 13 detects drones that emit RF signals. Drones that transmit nothing cannot be detected by a passive RF detector.
- The full menu reference is in the separate document BLIP 13 User Manual.