

END-USER INTEGRATOR GUIDE



R2-D2

INTEGRATOR ONBOARDING

Connect your UXV to the fleet · netbird.office.ilab.zone

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STANAG 4817 / AEP-105 · HIBW RC4

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Who this guide is for

You are an **End-User Integrator** — an industry or partner team bringing one or more unmanned vehicles (UXVs) onto the fleet. This guide takes you from “*we have a platform and a token*” to “*our telemetry and video are flowing into the operating picture*,” and explains how we scale that from your first UXV to your whole fleet.

You do not need to operate R2-D2 to use this guide. You need network access, an endpoint or two, and an agreed data format — we handle the rest on our side.

What you'll end up with. A secure private tunnel (NetBird) into two assigned endpoints — one for **telemetry/data** (a Node-RED ingest endpoint) and one for **video** (a restreamer endpoint) — carrying your platform's data in STANAG 4817 (preferred) or a format we agree during onboarding.

Step 1 — Get on the network (NetBird)

All integration traffic rides a private overlay network; nothing is exposed to the public internet.

1. **Receive your token.** We issue you a NetBird **setup key** (token), scoped to your organisation and your assigned access group.
2. **Install the NetBird client** on the host(s) that will connect — your ground station, gateway, or bridge box.
3. **Connect to our network** at netbird.office.ilab.zone and enrol your peer with the token. Your peer joins your group automatically.
4. **You see only what you're authorised for.** Access is granted by group: once enrolled, you can reach the specific network resources assigned to you — your telemetry endpoint and your restreamer endpoint — and nothing else.

Step 2 — Your assigned endpoints

Once you're on the network, we assign the endpoints your platform will use. Both are reached over the NetBird overlay (a private IP and port) — never the open internet.

Telemetry endpoint (data)

An assigned **Node-RED ingest endpoint** — an IP and port on the overlay where your platform delivers its telemetry and data products. This is the front door for everything that is *not* video: position, status, tasking feedback, results, and world-model updates.

Restreamer endpoint (video)

An assigned **restreamer endpoint** for EO/IR and other video. The port and protocol depend on the direction of the stream:

- **You push to us.** We assign the IP, port, and protocol — **RTSP, SRT, or UDP** to suit your platform — and you publish your stream to it.
- **We pull from you.** You provide the **RTSP details**: the stream and sub-stream URLs and ports for each sensor (EO/IR, etc.), and we pull them in.

Either way, the protocol and port are matched to how your platform actually emits video. Tell us what it does, and we align to it.

Step 3 — Tech onboarding (telemetry & data)

This is a joint working session between your team and ours to agree the data.

- **We prefer STANAG 4817 natively.** If your platform already speaks 4817 (AEP-105 / HIBW), that is the shortest path — it drops straight onto the bus.
- **We are flexible on format.** Where 4817 native isn't available, we ingest a range of other formats — around **15**, including **OTH-GOLD** feeds — and adapt on our side. New formats can be agreed case by case.

The list below is representative; the definitive set for your platform is confirmed during onboarding.

Preferred / native	Also accepted (representative)
STANAG 4817 / AEP-105 (HIBW)	OTH-GOLD · Link 16 (STANAG 5516) · VMF (STANAG 5524)
	NFFI (STANAG 5527) · Cursor-on-Target (CoT) · KLV (STANAG 4609)
	GMTI (STANAG 4607) · ASTERIX · AIS · ADS-B
	NMEA 0183 · MAVLink · JSON / REST · CSV

During the session we align on the schema, the fields that matter, the update cadence, and how we validate what arrives.

Step 4 — Validate & go live

Once data is flowing, we verify it before it reaches the operating picture:

- Your telemetry is published as STANAG 4817 onto the broker.
- We confirm the **operational baseline** and **validate** the messages — the pre-COP check — before they are trusted downstream.
- When the baseline is clean, your platform's contacts flow into the **COP**.

Scaling — one UXV at a time

Integration is incremental. Once your first UXV is set up end to end — network, endpoints, format, validation — we repeat the same pattern for the next, and the next. There are two ways to engage:

- **UXV Registration first (preferred).** Register your platforms up front so we can plan the whole fleet — endpoints, formats, and sequencing — before we start. This is the smoothest path for anything beyond a couple of vehicles.
- **Ad-hoc.** For one or two UXVs, we can integrate directly without a full registration and formalise it later.

National authority & custom solutions

- **Industry support on a nation's behalf.** With national authority, we can work directly with an industry integrator on that nation's behalf, so the nation does not have to broker every technical detail.
- **Custom bridges.** Where a platform has its own dedicated API, we can build a **stand-alone bridge** that translates it onto STANAG 4817 — for example, a dedicated bridge for a **Saildrone** USV that speaks its native API on one side and our bus on the other.

Exception — API-based vendors. If your platform is reached through your own API (as with Saildrone), the NetBird enrolment and endpoint assignment above do **not** apply to you. We stand up the bridge on our side and pull from your API. From you we only need three things:

- an **API key** (scoped to what we need to read),
- your **API documentation**, and
- a **point-of-contact (POC) confirmation** — who owns the integration on your side.

The API documentation is the critical piece: the more complete it is, the faster the bridge comes together.

What we need from you

To start an integration, have these ready:

- A point of contact to receive the NetBird token, and the host that will connect.
- Platform details: the type/domain of the UXV and the sensors aboard (EO/IR, etc.).
- **Push or pull** for video — and, if pull, the RTSP stream/sub-stream URLs and ports per sensor.
- Your telemetry **data format** (ideally STANAG 4817; otherwise what you emit).
- Whether you'd like to start with a **UXV Registration** or go ad-hoc.
- **API-based vendor instead?** Skip the network and endpoint items above — we just need an **API key**, your **API documentation**, and a **POC confirmation**.

Lexicon

The abbreviations below cover the networking, video, and ISR terms used in this guide.

Abbreviation	Expansion
ADS-B	Automatic Dependent Surveillance — Broadcast
AEP	Allied Engineering Publication
AIS	Automatic Identification System (maritime)
API	Application Programming Interface
ASTERIX	All-Purpose Structured Eurocontrol Surveillance Info Exchange
CoT	Cursor-on-Target
COP	Common Operating Picture
CSV	Comma-Separated Values
EO/IR	Electro-Optical / Infrared
GMTI	Ground Moving Target Indicator (STANAG 4607)
HIBW	High-Information-Bandwidth
HLS	HTTP Live Streaming
KLV	Key-Length-Value metadata (STANAG 4609)
NFFI	NATO Friendly Force Information (STANAG 5527)
OTH-GOLD	Over-the-Horizon Targeting GOLD message format
RTMP	Real-Time Messaging Protocol
RTSP	Real-Time Streaming Protocol
SRT	Secure Reliable Transport
STANAG	Standardization Agreement (NATO)
UDP	User Datagram Protocol
USV	Unmanned Surface Vehicle
UXV	Unmanned Vehicle (any domain)
VMF	Variable Message Format (STANAG 5524)