

# Portable AI PTZ Security Camera Node

Compact mobile security unit combining PTZ video, edge AI processing, 4G/LTE connectivity and mobile operator viewing.

Client product information - concept system

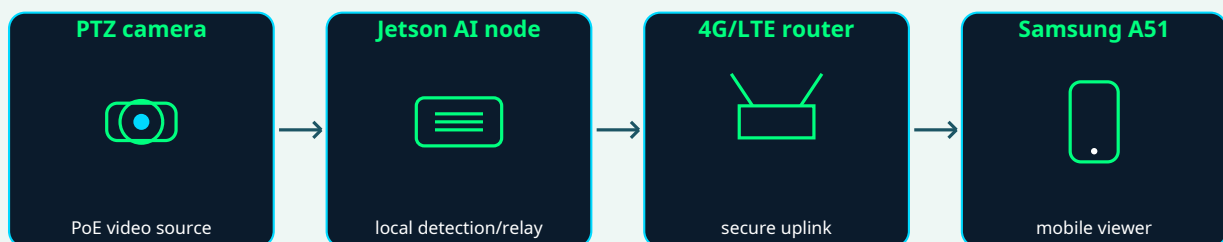


## Product overview

The Portable AI PTZ Security Camera Node is a compact security and inspection system designed for temporary workplaces, engineering sites, R&D; rooms, mobile installations and high-value equipment monitoring. It combines a PTZ PoE camera, an edge AI computer, secure network access and a mobile operator viewing workflow.

The system is intended as a portable base case with the PTZ camera mounted externally on top, on a pole or on a tripod. This keeps the camera free to pan, tilt and zoom, while keeping the electronics protected and serviceable.

### Typical compact system architecture



Camera remains external/on-top for free pan-tilt movement; electronics sit in the protected portable base case.

## Client benefits

- Rapid deployment for temporary or sensitive areas without building a permanent camera installation.
- Remote viewing from a Samsung A51 or similar operator phone over local Wi-Fi or secure 4G/LTE access.
- Edge AI processing on a Jetson node for future detection, event filtering, snapshots and dashboard integration.
- Useful for construction sites, technical rooms, AI R&D; workplaces, server/rack areas and equipment delivery monitoring.
- Works as an add-on module to a Security Monitor dashboard, with alerts, event status and investigation workflow.

## Recommended compact configuration

| Component                           | Purpose                                                           | Client-oriented recommendation                                                                           |
|-------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Reolink PTZ PoE camera              | Physical video layer with pan, tilt and optical zoom.             | Mount outside the case on top, tripod or short mast. Use PoE+ power and a protected Ethernet cable path. |
| Jetson AI node                      | Local AI / edge processing, stream handling and dashboard bridge. | Use as the local intelligence layer for detection, snapshots and secure relay.                           |
| 4G/LTE router                       | Remote access when no trusted site network is available.          | Use SIM/M2M subscription for mobile field deployments. Prefer private VPN/tunnel access.                 |
| PoE injector or compact PoE+ switch | Power and data for the camera.                                    | For one camera, a single-port PoE+ injector is more compact than an 8-port PoE switch.                   |
| Battery / DC UPS                    | Portable operation and short power backup.                        | Size depends on target runtime. Provide separate runtime options: short inspection, half-day, full-day.  |
| Samsung A51 / operator phone        | Mobile viewer and alert receiver.                                 | Use as phone viewer for PTZ stream, Telegram alerts, approval actions and site inspection support.       |

## Smallest practical system dimension

For a client-ready portable system using a Reolink PTZ PoE camera, Jetson AI node, 4G/LTE router, PoE power and battery/UPS, the smallest practical base-case dimension is:

**Recommended portable base case: +/- 40 x 30 x 20 cm**

Total operating height with camera mounted on top: typically +/- 40-45 cm, depending on bracket, pole or quick-release mount.

| Case class                      | Approximate dimension | Best use                                                                                  |
|---------------------------------|-----------------------|-------------------------------------------------------------------------------------------|
| Ultra-compact prototype         | 35 x 25 x 18 cm       | Testing only. Tight cabling, limited battery capacity and more heat-management risk.      |
| Practical portable product case | 40 x 30 x 20 cm       | Best balance between portability, cable management, cooling and serviceability.           |
| Rugged client-ready case        | 45 x 35 x 22-25 cm    | Better for waterproof connectors, larger battery, fan, strain relief and safer transport. |

### Design note

The PTZ camera should normally not be enclosed inside the box during operation. The portable case should act as the AI/network/power base, while the camera remains outside or mounted on top. This improves movement, heat management and maintenance.

## Streaming options and expected operating distance

| Streaming method        | Typical practical distance                                                          | Use case                                                                 |
|-------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Same local Wi-Fi        | 5-25 m indoors; 30-80 m outdoor line-of-sight depending on router and obstacles.    | Office, workshop, lab, client site with nearby operator.                 |
| Node hotspot to phone   | 5-20 m indoors; 30-50 m outdoor line-of-sight.                                      | Portable field demo or quick temporary setup.                            |
| Bluetooth               | Not recommended for video.                                                          | Use only for wearable presence, tags and small sensor signals.           |
| 4G/LTE remote streaming | Distance is not the limiting factor; coverage, bandwidth, latency and security are. | Remote client monitoring, delivery follow-up, off-site operator viewing. |

## Security and access protection

Camera streams should never be exposed as public unauthenticated URLs. A professional client setup should include HTTPS, operator login, strong password policy and ideally a private tunnel or VPN.

- Preferred: WireGuard, Tailscale, ZeroTier, Cloudflare Tunnel or a controlled HTTPS reverse proxy.
- Dashboard access should be separated from raw camera access.
- Add emergency stream-off and PTZ stop controls for operator safety.
- Keep local recording or snapshot fallback on the Jetson when the LTE connection is weak.
- Log important operator actions such as viewing, stop, home preset, snapshot and manual incident notes.

## Product information for clients

The system can be presented to clients as a portable security and inspection node rather than a fixed CCTV installation. It is especially useful when the client needs a temporary, movable, technically controlled system with professional monitoring and later AI expansion.

| Client need                     | How the system helps                                                                    |
|---------------------------------|-----------------------------------------------------------------------------------------|
| Temporary site visibility       | Deploy camera and AI base without installing permanent cabling.                         |
| Sensitive project area          | Use controlled access, mobile operator view and event logging.                          |
| Equipment delivery or transport | Monitor high-value technical equipment during delivery, testing or handover.            |
| R&D; workplace security         | Combine camera, network health, device integrity checks and operator investigation.     |
| Remote support                  | Technician can inspect status through dashboard and phone viewer without being on-site. |

## Optional service levels

| Option                         | Included focus                                                                          | Typical client profile                                           |
|--------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Portable inspection setup      | Camera, base case, local network, phone viewing, basic dashboard access.                | Small project, short site inspection, temporary monitoring.      |
| Remote 4G/LTE monitoring setup | Adds LTE router, secure remote viewing and connection status monitoring.                | Sites without reliable internet or mobile deployments.           |
| AI security node setup         | Adds Jetson AI workflow, detection pipeline, event snapshots and dashboard integration. | R&D; workplace, technical rooms, NDA-sensitive areas.            |
| Managed monitoring add-on      | System checks, alert tuning, updates, monthly report and operator support.              | Clients who want ongoing service instead of only hardware setup. |

## Implementation considerations

- Battery runtime must be chosen per client scenario. Video streaming and PoE PTZ cameras consume significantly more power than simple sensors.
- For one PTZ camera, prefer a PoE+ injector or compact PoE+ switch to keep the portable box small.
- Use external antenna options for LTE when deploying in technical rooms, basements, racks or reinforced buildings.
- Use cable strain relief, ventilation openings and quick-disconnect mounting if the system will be transported often.
- For production clients, document who can view the camera, when recording is active and how incident data is retained.

## Indicative physical layout

Recommended layout: PTZ camera mounted externally; inside the case: Jetson AI node, LTE router, PoE injector/switch, DC power distribution, small fan, battery/UPS and cable management. External connectors should be labelled for camera PoE, charging, antenna and service access.

| Inside portable base case                                                                                                              | Outside / mounted                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Jetson AI node; 4G/LTE router; PoE+ injector or compact PoE switch; battery/DC UPS; fan; cable management; protected dashboard bridge. | Reolink PTZ camera; short mast or tripod plate; optional LTE antenna; optional status LED; optional weather cover depending on installation. |

## Source notes

Hardware values in this document are indicative and should be rechecked against the exact product version before purchase. Relevant manufacturer references consulted: Reolink RLC-823A / RLC-823A 16X product information; NVIDIA Jetson Orin Nano Developer Kit documentation; TP-Link TL-SG1008MP and Omada ER605 product specifications.

Prepared for Systems Studio - Portable AI PTZ Security Camera Node - Client Product Information