



AXIS SPATIAL

V52 Satellite Imagery Pipeline

End-to-end automation: from new investigation to delivered imagery — integrated via Telegram



Watches V52 Orders

Polls every 30s, extracts AOI & dates



7 Satellite Catalogs

Planet + 6 UP42 sats, all previews free



Telegram-Integrated

Co-signed previews + command interface



Full Delivery

Download, clip to AOI, deliver & notify

No AI — pure rule-based automation • **Zero-touch** on V52's infrastructure • **Runs 24/7** — polls every 30 seconds



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End-to-End Pipeline

Every step is automated — only ordering is manual (cost control). Commands shown in brackets.

DISCOVERY & PREVIEW



New Order
on V52

[auto-detected]

Extract AOI
& Search 7 Sats

[auto]

Generate
Previews

[auto / /search]

Co-signed
to Telegram

[auto]



ORDER & DELIVERY



Select Best
Preview

[/select]

Order Image
(only manual step)


[Planet Explorer]


Download, Clip
to AOI, Convert

[/ordered]

Deliver to V52
& Notify User

[/approve]

 Automated

 Manual (ordering only)

Everything automated except ordering — kept manual for satellite imagery cost control. Can be fully automated when ready.

Satellite Coverage & Commands

7 SATELLITES • ALL PREVIEWS FREE

| Satellite | Res. | Source |
|--------------|-------|--------------|
| PlanetScope | 3.7m | Planet Tiles |
| Pleiades Neo | 0.3m | UP42 |
| Pleiades | 0.5m | UP42 |
| Beijing-3N | 0.3m | UP42 |
| Beijing-3A | 0.5m | UP42 |
| SkySat | 0.73m | UP42 |
| SPOT | 1.5m | UP42 |

TELEGRAM COMMANDS

| Command | Action |
|--------------------|--------------------------------|
| /select 604 planet | Select preview, get scene IDs |
| /select 604 pneo 2 | Select by satellite + option |
| /ordered 604 | Fetch order, clip to AOI, send |
| /approve 604 | Deliver image to V52 |
| /reject 604 | Skip investigation |
| /search 604 60 | Re-search last 60 days |
| /extend 604 30 | Extend search window |
| /status | Show all active items |

FULLY AUTOMATED

- Detect new orders & extract AOI
- Search 7 satellite catalogs
- Generate co-signed previews
- Send previews to Telegram
- Download TIF when order ready
- Clip to AOI via GDAL, convert to PNG
- Deliver to V52 & notify customer

COMMAND-TRIGGERED (VIA TELEGRAM)

- Select best preview → /select
- Fetch ordered imagery → /ordered
- Approve & deliver → /approve
- Reject investigation → /reject
- Re-search dates → /search

ONLY MANUAL STEP

- Place order on Planet Explorer (cost control)

Production & Handover

CURRENT SETUP

Server: Hetzner CX23 (€3.99/mo)

Stack: Python 3, GDAL 3.8.4, PIL

Runtime: systemd (auto-restart, journal logs)

Polling: Every 30s for V52 + Telegram

Interface: Telegram bot (@vertical52_bot)

State: Persistent JSON (survives restarts)

HANDOVER TO V52

- Migrate service to V52's own server
- Create Telegram group with V52 board
- Add bot to their group / shared channel
- Move credentials to environment variables
- Remove email allow-list filter
- Document commands & train operators

COST

Free

Previews — Planet Tiles + UP42 quicklooks

Paid

Imagery Orders — Operator decides per case

€3.99/mo

Server — Hetzner CX23

FUTURE OPTIONS

→ Automate ordering → Multi-operator Telegram → Monitoring & alerting

