AutarchPad

Launcher-independent launcher driver

> Any launcher, one interface: AutarchPad turns AutarchC2 decisions into launcher actions through the launcher manufacturer's own plug-in.

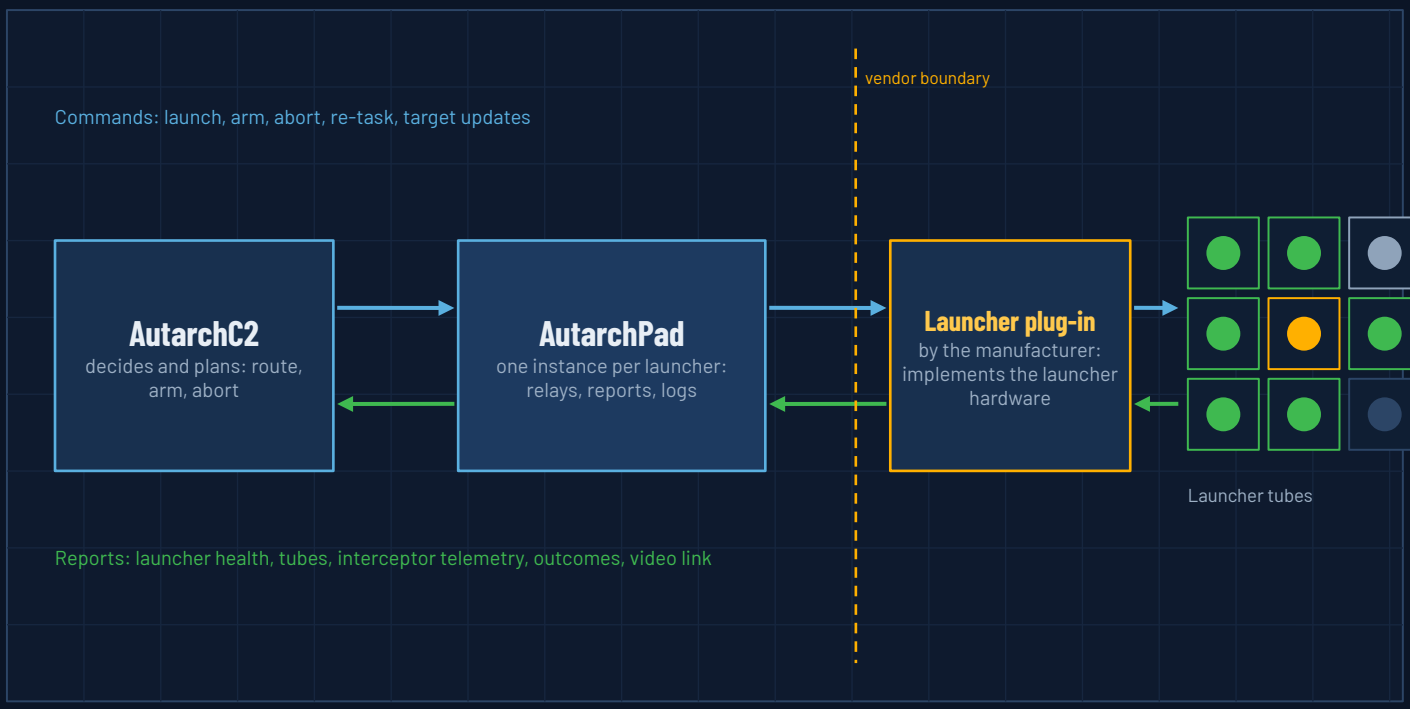


Illustration: AutarchPad sits between AutarchC2 and one launcher; everything launcher-specific stays in the manufacturer's plug-in.

AutarchPad (formerly LauncherManager) is a thin launcher driver between AutarchC2 and a launcher. AutarchC2 does all the planning; AutarchPad carries its launch, arm, abort and re-task commands and the live target track to the launcher, and relays launcher status, tube states, interceptor telemetry, video links and outcomes back. All launcher-specific behaviour, including any hardware control, is implemented by the launcher manufacturer in its plug-in, so a new launcher or interceptor type is integrated without changing AutarchC2.

STATUS

Validated in a full simulation environment with the simulation-only reference plug-in and simulated interceptors. No live launch or real hardware integration is claimed; the hardware side is implemented by the manufacturer in its plug-in.

Manufacturer plug-in
Launcher-specific code outside the core.

Commands relayed
Launch, arm, abort, re-task and target updates from AutarchC2.

Status returned
Tubes, interceptors, telemetry, outcomes and video links.

Audit trail
Every command and update logged.

Illustrative diagrams, not to scale. Validated in a full simulation environment.

HOW IT WORKS

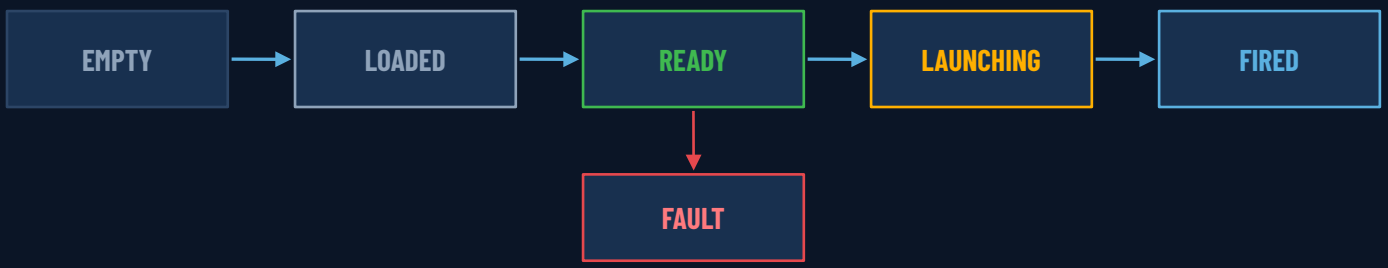
Commands down, status up, nothing decided in between

Each AutarchPad instance manages exactly one launcher, so a site with several launchers runs several instances side by side and AutarchC2 connects to each. AutarchPad itself holds no zones, no plans and no target logic: it checks, relays and reports. The launcher's position comes from AutarchC2; its tube inventory and interceptor performance come from the manufacturer's plug-in.

From AutarchC2 to the launcher	What AutarchPad does
Launch with the full mission	Passes the C2-planned route, launch heading, arm point, intercept time and the no-fly zones to the plug-in; returns an accept or refuse with the tube and interceptor used.
Live target track	Forwards position, course, speed, climb rate, turn rate and measurement age of each engaged target, twice a second by default.
Re-task	Hands a new route and aim point to an interceptor in flight; the plug-in refuses once the interceptor is in its terminal phase.
Arm and disarm	Relays the arm command that AutarchC2 issues on live geometry. The interceptor never arms itself.
Abort	Relays the abort with its mode (land or detonate) and the point AutarchC2 chose from its zones, plus an optional route there.
Launcher position and tube actions	Passes the launcher position from AutarchC2 to the plug-in; supports tube state changes, run / fault flags and a simulated reload for test.

From the launcher to AutarchC2	What is reported
Launcher status	Name, type, running and fault state, health, environment readings, ready and total tubes, interceptor types available, and whether the launcher is SIMULATED or REAL as reported by the plug-in.
Tube changes	Per tube: state, interceptor type, serial number and temperature.
Interceptor telemetry	Phase, armed state, position, altitude, heading, speed, distance to target, time airborne and remaining, current route and trail, video link when provided.
Outcome	Intercepted, missed, landed, detonated or aborted, with time, closest approach and number of re-tasks.

Tube life cycle



Tube states come from the plug-in and are shown in AutarchPad and on the AutarchC2 map. Only READY tubes are offered to the planner, and a tube committed to a launch is not offered again until the launcher reports it.

Interceptor phases relayed: launch delay, boost, climb along the route, cruise, terminal, abort to landing, abort to detonation.

ENGAGEMENT LOOP

Where AutarchPad sits in an engagement

Plan	Launch	Fly-out	Re-task	Arm	Terminal	Outcome
AutarchC2	C2, Pad, plug-in	C2, Pad, plug-in	C2, Pad, plug-in	AutarchC2	Plug-in	Plug-in, Pad, C2
Route, launch heading, arm point, abort legs, debris check	Full mission with no-fly zones for the terminal phase	Target track forwarded; C2 re-predicts about once a second	New route and aim point when the intercept moves	On live distance or time-to-go	Interceptor's own pursuit on the latest track	Reported back and recorded

Clear responsibilities

AutarchC2 decides

- Which track may be engaged (Rules of Engagement)
- Route, arm point, intercept and abort points
- When to re-task, when to arm, when to abort
- Refuses to launch through a launcher that does not report SIMULATED in this build

AutarchPad relays

- Checks each command and its message version
- Passes commands to the plug-in unchanged in meaning
- Reports status, telemetry and outcomes to every connected console
- Logs every command, track summary and phase change

The plug-in executes

- Implements the launcher and interceptor interface, including any hardware control
- Reports tubes, health and the interceptor performance catalogue
- Flies the C2 route; never re-plans it or chooses abort zones
- Never arms by itself

Behaviour when things go wrong

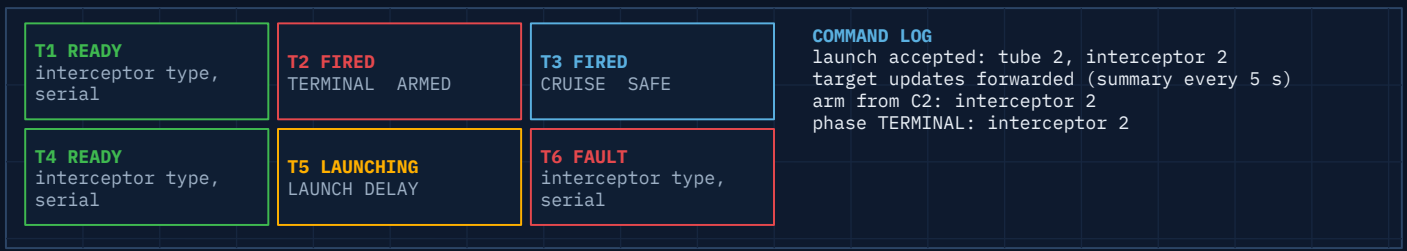
Contact with AutarchC2 lost
The interceptor continues its last route and then its terminal pursuit on the last known track; it does not abort on its own. AutarchC2 shows telemetry lost and resynchronises when contact returns.

Console reconnects
On reconnection AutarchPad re-sends its status, the interceptor performance catalogue and the telemetry of interceptors in flight.

Commands refused
A launch that cannot be executed is refused with a reason, such as no ready tube of the type requested or no launcher position yet; AutarchC2 shows the reason to the operator.

Several engagements per target
Each launch carries its own command identity, so salvo and re-engagement against the same target are tracked separately.

What the AutarchPad window shows



Status. The complete loop above runs in simulation with the reference plug-in, which simulates the tubes and flies the interceptor with the same flight model AutarchC2 plans with. It has no real launch path.

INTEGRATION AND AUDIENCE

One plug-in instead of a full C2 interface

A launcher manufacturer integrates with Autarch by writing a single plug-in against AutarchPad's published integration interface. The plug-in receives already-planned missions and simple commands, and reports what its launcher and interceptors are doing. AutarchC2, its planner and its Rules of Engagement stay unchanged.

1 Build
Implement the launcher interface from the documented template.

→

2 Describe
Report tubes, health and the interceptor performance the planner will use.

→

3 Test
Run the full chain against simulated targets, as the reference plug-in does.

→

4 Connect
Point an AutarchPad instance at the plug-in; AutarchC2 sees the launcher.

Vendor freedom
Keep C2, planning and Rules of Engagement unchanged when the launcher or interceptor vendor changes, or mix vendors on one site.

Safety stays with C2
Arming and abort decisions stay with AutarchC2, which uses its zones and live geometry; the launcher's operating mode is reported, never assumed.

Fast integration
The manufacturer implements one well-defined plug-in instead of a full command-and-control interface.

Performance from the source
The interceptor performance catalogue (speed, climb, endurance, range, turn and bank limits) comes from the plug-in and is what AutarchC2 plans with.

Transparent operation
The AutarchPad window shows every tube with interceptor type and serial, each interceptor's phase and armed state, and a running command log.

Several launchers
One AutarchPad per launcher; AutarchC2 connects to each and keeps them apart by launcher identity.

Operating mode, reported not assumed

Each launcher reports whether it is SIMULATED or REAL, as declared by its plug-in, and AutarchC2 displays exactly that. The current Autarch build sends launch commands only to a launcher that reports SIMULATED.

Who it is for

- Launcher and interceptor-drone manufacturers integrating with Autarch
- Counter-UAS system integrators combining launchers from several vendors
- Test and evaluation teams running the full engagement chain in simulation

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