Uchuva AutoCAD MCP - Plugin documentation

Version: 1.8.1 (see installer/version.txt for the installer build)

Uchuva connects AutoCAD to AI assistants (Claude Desktop, Cursor, or any MCP-capable client). The assistant talks to a Python MCP server, which calls a local HTTP API inside AutoCAD (localhost:8767). The active DWG is the single source of truth.

Architecture

1. Assistant - MCP (stdio) - mcp-server/autocad_server.py
2. MCP server - HTTP - Uchuva.AcadMcp.dll (runs inside the AutoCAD process)
3. Plugin - AutoCAD .NET API - open drawing

Default port 8767 (documented separately from Metrika360 on 8766).

Requirements

- AutoCAD 2024, 2025, 2026, or 2027 (64-bit Windows), AutoLoader bundle under %AppData%\Autodesk\ApplicationPlugins\Uchuva.AcadMcp.bundle\
- .NET plugin built three ways from one codebase, one per AutoCAD engine (see AcadMcp/AcadMcp.csproj):
  - AutoCAD 2024 → .NET Framework 4.8
  - AutoCAD 2025 / 2026 → .NET 8
  - AutoCAD 2027 (new engine) → .NET 10
- Python MCP: uv + mcp-server project (pyproject.toml), installed dependencies via uv sync

Installation (summary)

1. Installer (installer/quick-build-installer.bat / build-installer.bat, or the shipped Uchuva.AcadMcp-v*-Setup.exe): deploys the bundle, optional MCP server under %LocalAppData%\Uchuva\AcadMcp, and registers Claude Desktop if you select that component. Requires admin privileges to run.
2. Wizard: if AutoCAD is detected, you can choose which years (2024-2027) receive the plugin; PackageContents.xml is adjusted accordingly.
3. Claude: setup_autocad_mcp.ps1 / .bat adds the uchuva-autocad MCP server entry pointing at uv.exe and the mcp-server folder.
4. Verify: start AutoCAD with a drawing open; command line should show: Uchuva - AutoCAD MCP active on port 8767. A "Uchuva" ribbon tab also appears with Status / License / Website buttons — see Ribbon UI below.

Licensing (Free / Pro)

Tools split into two tiers, gated in the plugin itself:

- Free — every read/query tool, plus selection, zoom-to-selection, and the drawing health audit. Usable with no license at all.
- Pro — every tool that creates, updates, deletes, renames, or batch-modifies drawing content. Requires an active license key.

Purchase and activate a Pro license from [Gumroad](https://uchuva.gumroad.com/l/UchuvaInc_AutoCAD_Claude) — enter the key via the Activate License button on the Uchuva ribbon tab. While you are online the plugin re-validates the key with Gumroad about once a day; a refunded or disputed key loses Pro access. Offline use: Pro keeps working for up to 7 days after the last successful check; after that Pro pauses (free tools are unaffected, and the ribbon button reads Verify License) until the computer is online and the check succeeds, which happens automatically. See docs/Uchuva-AcadMcp-EULA.md and docs/Uchuva-AcadMcp-PrivacyPolicy.md for full terms and what's sent to Gumroad during activation (just the license key — never drawing data).

Ribbon UI

A "Uchuva" tab is added to the AutoCAD ribbon with three small stacked buttons:

- Status — reports whether the MCP bridge is listening, on which port, and license state.
- Activate License (relabels to Activated once a Pro key is active, or Verify License when Pro is paused for lack of an online check) — opens the activation dialog, or re-checks the stored key.
- Website — opens uchuvalab.com in your default browser.

Icons follow AutoCAD's light/dark ribbon theme automatically. A partial CUIX bundled with the plugin also adds a small panel to the built-in Add-ins tab, per Autodesk App Store publisher guidelines.

Layouts (paper space)

Everything that scans or creates drawing content works on Model Space by default, and can be pointed at a layout instead with an optional space argument (MCP tools) / space query parameter or body field (HTTP API):

space value	Meaning
model (default)	Model Space
a layout name, e.g. Layout1, A-101	That layout's paper space
current	Whichever tab is active
paper	The active layout (or the first layout if the Model tab is active)
all	Model Space plus every layout — for read, filter, export and find/replace only

Typical uses: read or update title-block attributes, replace text across every sheet at once (autocad_find_replace_text with space="all"), add notes or dimensions on a sheet, inspect viewports (center, size, scale, locked state). Use autocad_get_layouts to list the tabs.

Notes: entity handles are drawing-wide, so handle-based tools (update, move, delete, block attributes) work on layout content with no space at all. Zoom and select act on the visible view, so the target layout must be the active tab — call autocad_set_current_layout first. Renaming a block attribute tag always cascades to inserts in every space, and the drawing health audit judges "unused" layers/blocks across Model Space and all layouts.

Local HTTP API (plugin)

Base URL: http://localhost:8767/ — JSON responses, UTF-8.

GET (reads)

- GET /health - Liveness: status, port, app
- GET /drawing/layouts - Layout tabs in order: paper size, entity and viewport counts, active tab
- GET /drawing/info - File path, units, limits, optional full entity count (include_entity_count) for the requested space
- GET /drawing/layers - All layers, colors, linetypes, state
- GET /drawing/layers/summary - Per-layer entity counts by type
- GET /drawing/blocks - Block definitions; optional per-block entity counts (include_entity_counts)
- GET /drawing/summary - Entity counts by type; optional layer breakdown (include_layer_breakdown)
- GET /drawing/health - Advisory audit: unused layers/blocks, entities on layer "0", other CAD-standard hygiene issues
- GET /drawing/linetypes - Linetypes loaded in the drawing
- GET /drawing/textstyles - Text styles in the drawing
- GET /drawing/dimstyles - Dimension styles in the drawing
- GET /entities - Filtered entity list (layer, type, text_contains, block_name, limit, offset, after_handle, include_vertices, return_meta)
- GET /entities/count - Count matching entities (same filters as /entities)
- GET /entity/{handle} - Single entity by hex handle
- GET /drawing/blocks/{name}/attributes - Attribute definitions for a block
- GET /entity/{handle}/block-attributes - Current attribute values on a block insert
- GET /elements/comparison - Normalised export for cross-app comparison (layers, block_names, types query params)
- GET /documents - Open drawings and which is active
- GET /sheets/index - One row per sheet: title-block attributes, optional text from given layers, viewports with scale
- GET /xrefs - External references with resolved path, status and insert count
- GET /measure/totals, /measure/areas, /measure/extents, /measure/distance - Lengths/areas per layer, closed-shape areas, bounding boxes, distances

Every route also accepts space (see Layouts above) and document (a file name or full path of an open drawing; default the active one) as query parameters.

POST / PATCH / DELETE (writes — all Pro-gated except selection/zoom)

- POST /entities - Create entity (line, circle, arc, text, mtext, polyline, aligned/linear dimension)
- POST /entities/batch - Create many entities in one call

- POST /blocks - Define a new reusable block from geometry + attribute definitions
- PATCH /entity/{handle} - Update entity (layer, color_index, text, linetype, lineweight, linetype_scale, text_height, rotation, scale, text_style — as applicable, all-or-nothing)
- POST /entities/transform - Copy (with array count) / rotate / scale / mirror / offset entities
- PATCH /sheets/attributes - Set title-block attributes across many sheets (dry-run by default)
- PATCH /viewport/{handle} - Viewport scale, lock, on/off, position/size, view center, per-viewport layer freeze/thaw
- POST /layouts/manage - Create / copy / rename / delete a layout (delete is a preview by default)
- POST /xrefs/manage - Reload / unload / detach (preview by default) / repath an xref
- POST /export/pdf - Plot layouts to one multi-page PDF
- POST /export/image - Plot a layout or Model Space to a PNG
- POST /documents/active - Make another open drawing active — free
- POST /entity/{handle}/move - Move by deltas dx, dy, dz
- DELETE /entity/{handle} - Erase entity
- DELETE /entities/batch - Delete every entity matching filters/handles (dry-run by default)
- PATCH /entities/batch - Apply a layer/color change to every entity matching filters/handles
- PATCH /entity/{handle}/block-attributes - Update attributes on a block insert (JSON body: tag to value map)
- POST /layers - Create a layer
- PATCH /layers/{name} - Update layer properties
- POST /layers/{name}/rename, /blocks/{name}/rename, /linetypes/{name}/rename, /textstyles/{name}/rename, /dimstyles/{name}/rename, /blocks/{name}/attributes/{tag}/rename - Rename symbol-table entries; block/attribute renames cascade to every existing insert
- POST /drawing/find-replace - Find/replace text across DBText, MText, and attributes (dry-run by default)
- POST /drawing/purge - Purge unused layers/blocks/linetypes/text styles (dry-run by default, uses AutoCAD's own whole-database dependency check)
- POST /selection - Select/highlight entities (handles or filters) — free
- DELETE /selection - Clear implied selection — free
- POST /view/zoom - Zoom to matching entities and highlight them — free
- POST /view/layout - Make a layout the active tab (layout in the body) — free
- GET /export/csv - Export entities to CSV on disk

Note: destructive operations modify the DWG. Every write runs on AutoCAD's main thread as a single undo group, so one Ctrl+Z reverses a whole tool call (a batch edit, a find/replace, a layout delete...). If AutoCAD is busy (a command or dialog is active) a plain write falls back to running ungrouped, and layout / xref / export operations ask you to press Esc and retry instead. Several (find-replace, batch-delete, purge) default to a dry-run preview for exactly this reason.

MCP tools (Python server)

Each tool maps to the HTTP API above. Names, tiers, and behaviour match mcp-server/autocad_server.py — treat this section as a map, not the source of truth; the code wins if they ever disagree.

Diagnostics & drawing context (free)

- autocad_health_check - Bridge and plugin reachable.
- autocad_get_drawing_info - Drawing metadata; optional full entity count.

- autocad_get_entity_summary - Counts by entity type; optional per-layer breakdown.
- autocad_get_layers_summary - Per-layer statistics (prefer summary+breakdown in one call when possible).
- autocad_drawing_health - Advisory audit: unused layers/blocks, entities on layer "0", other hygiene issues.
- autocad_get_layouts - Layout tabs (paper space) with paper size, entity/viewport counts, active tab.
- autocad_set_current_layout - Make a layout the active tab (needed before zoom/select on layout content).

Symbol tables (free to list, Pro to rename)

- autocad_get_layers - Layer table.
- autocad_get_blocks - Block definitions; optional inner counts.
- autocad_get_block_attributes - Attribute defs for a block name.
- autocad_get_block_reference_attributes - Attribute values on an insert (by handle).
- autocad_get_linetypes - Linetypes loaded in the drawing.
- autocad_get_text_styles - Text styles in the drawing.
- autocad_get_dim_styles - Dimension styles in the drawing.

Entities & selection (free)

- autocad_get_entities - Filtered list with pagination (limit / offset or after_handle + return_meta); includes layout content (title blocks, notes, dimensions, viewports) via space.
- autocad_count_entities - Count with same filters.
- autocad_get_entity_by_handle - One entity.
- autocad_select_entities - Highlight by handles or filters.
- autocad_clear_selection - Clear pick set.
- autocad_zoom_to_entities - Zoom the viewport to matching entities and highlight them.

Comparison & export

- autocad_get_elements_for_comparison - Normalised elements (e.g. vs other BIM tools in a broader stack). Free.
- autocad_export_csv - [Pro] Export entities (Model Space by default; a layout or all via space) to CSV on disk.

Create / update / delete (all [Pro])

- autocad_create_entity - line, circle, arc, text, mtext, polyline, aligned dimension, linear dimension.
- autocad_create_block_definition - Define a new reusable block from geometry + attribute definitions.
- autocad_update_entity - Partial update by handle: layer, color, text, linetype, lineweight, linetype scale, text height, rotation, block scale, text style (all-or-nothing).
- autocad_move_entity - Translate by dx, dy, dz.
- autocad_delete_entity - Erase by handle.
- autocad_update_block_attributes - Tag to value map on a block insert.

Batch operations (all [Pro])

- autocad_batch_create_entities - Create many entities in one call.
- autocad_batch_update_entities - Apply a layer/color change to every entity matching filters or handles.
- autocad_batch_delete_entities - Delete every entity matching filters or handles. Dry-run by default.

Layers ([Pro])

- autocad_create_layer - Create a new layer.
- autocad_update_layer - Update properties of an existing layer.

Renaming (all [Pro]; block/attribute renames cascade to every existing insert)

- autocad_rename_layer
- autocad_rename_block
- autocad_rename_linetype
- autocad_rename_text_style
- autocad_rename_dim_style
- autocad_rename_block_attribute_tag

Drawing-wide cleanup (all [Pro]; dry-run by default)

- autocad_find_replace_text - Find/replace across DBText, MText, and non-constant block attributes.
- autocad_purge_unused_elements - Purge unused layers/blocks/linetypes/text styles using AutoCAD's own whole-database dependency check (more thorough than autocad_drawing_health's Model-Space-only counts).

Documents (free)

- autocad_list_documents - Every drawing open in the session, and which is active.
- autocad_set_active_document - Switch the active drawing. Other tools take an optional document argument: reads work on any open drawing; edits, zoom and selection run only on the active one.

Sheets, layouts & viewports

- autocad_get_sheet_index - Free. One row per sheet: title-block attribute values (or text from chosen layers for text-based title blocks), paper size, viewports with scale.
- autocad_update_sheet_attributes - [Pro] Set title-block attributes across many sheets at once, shared values plus per-sheet values (sheet numbers, titles). Dry-run by default.
- autocad_update_viewport - [Pro] Plot scale (scale_denominator: 100 = 1:100), lock, on/off, position and size, shown model point, per-viewport layer freeze/thaw. A locked viewport is unlocked for the edit and re-locked.
- autocad_manage_layout - [Pro] Create, copy (keeps viewports and title block), rename or delete a layout. Delete is a preview unless dry_run=false.

Xrefs

- autocad_get_xrefs - Free. Name, stored path, where AutoCAD found the file, load status, overlay/attachment, insert count; flags the ones needing attention.
- autocad_manage_xref - [Pro] Reload, unload, detach (preview by default) or repath an xref.

Transforms ([Pro])

- autocad_transform_entities - Copy (optionally an array of N), rotate, scale, mirror or offset entities by handle, in one undo step. Copies are full clones (block attributes included) and their new handles are returned.

Measurement (free)

- autocad_measure_totals - Length and (closed shapes) area per layer / entity type.
- autocad_get_closed_areas - Closed polylines, circles and hatches with area, perimeter and center, largest first (e.g. room outlines).
- autocad_get_extents - Bounding box of entities picked by handle or filter.
- autocad_measure_distance - Between two entities (bounding-box centers and gap) or two points.

Export (plot to file) ([Pro])

- autocad_export_pdf - Plot layouts to one multi-page PDF using AutoCAD's own "DWG To PDF" device, at each layout's paper size. Model plots Model Space fitted to the page.
- autocad_export_view_image - Plot a layout or Model Space to a PNG with AutoCAD's PNG device and return the image to the assistant, so it can look at the drawing. Files are written locally (next to the DWG for PDFs, a temp folder for images); nothing is uploaded anywhere.

Exports plot through the layout's own plot settings and switch to each layout in turn, restoring your active tab afterwards.

Prompts: The server also exposes suggested read (autocad_read_drawing_overview) and block-attribute editing (autocad_edit_block_attributes_flow) workflows — see autocad_server.py's prompts section.

Security

The plugin exposes your open drawings on a local HTTP port, so that port is locked down:

- Access token. On first start the plugin creates a random per-install token in %LocalAppData%\Uchuva\AcadMcp\bridge.token. Every request must carry it in the X-Uchuva-Token header; without it the plugin answers 401 (only a bare liveness reply is given to /health). The Python MCP server reads the token from that file. Websites, other Windows accounts and other machines cannot read it.
- No browser access. Requests with an Origin header (i.e. from a web page), OPTIONS preflights and unexpected Host headers (DNS rebinding) are refused with 403, and no CORS headers are sent. Earlier versions allowed any origin, which would have let a malicious website read drawing data from localhost; upgrade to 1.8.0 or later.
- Loopback only. The server listens on localhost:8767 only. Request bodies are capped at 8 MB (413 beyond that).
- Startup and busy handling. For the first minute or so after AutoCAD launches the plugin answers 503 "still starting up" rather than touching drawings, and edits run only on AutoCAD's main thread once it is idle. If AutoCAD is busy (a command, dialog or regeneration is active) an edit is refused with a "busy, retry" message instead of being forced through from a background thread.
- Safe file output. Export tools (CSV, PDF, PNG) accept only those file types, refuse network (UNC) paths and system/startup/Program Files folders. Xref repath refuses network paths.
- Encrypted license cache. The license key and activation state are stored in license.dat, encrypted with Windows DPAPI for the current user; a plain-text cache from older versions is re-verified with Gumroad and replaced.
- Pinned dependencies. The Python server's packages are locked (uv.lock, with hashes) and the MCP SDK is held below 2.x until that major version has been tested.
- Destructive operations are previewable and undoable. Delete, purge, find/replace, layout and xref detach default to a dry-run preview, and each write is a single AutoCAD UNDO step.
- Prompt-injection note. Text inside a drawing is data, not instructions; an AI assistant may still be misled by it, which is why those safeguards exist. Review what the assistant proposes before approving bulk edits on drawings from untrusted sources.

Package bundle (PackageContents.xml)

- Product: Uchuva - AutoCAD MCP; AppVersion tracks the release.
- Three DLL components, one per .NET runtime — see Requirements above. AutoCAD's internal "R" series number does not track the marketing year 1:1 (2024 = R24.3; 2025 and 2026 both report R25.x; 2027 = R26.0) — always confirm via acad.exe's file version info before adding a new year, don't assume.
- Ribbon component: a fourth ComponentEntry points at Uchuva.AcadMcp.cuix (built by installer/CuixGenerator), loaded on startup so its content is available before the ribbon first constructs. This is what adds the panel to the built-in Add-ins tab.
- Load: all ComponentEntry items use LoadOnAutoCADStartup="true".

Security & operations

- Traffic is localhost only; do not expose port 8767 to the network.
- The only data that ever leaves your machine is a license key sent to Gumroad during Pro activation/revalidation — no drawing content is ever transmitted by the plugin itself.
- Close AutoCAD (or at least save) before trusting bulk automated edits.
- Prefer health check and small count/summary calls before scanning huge drawings.
- Prefer the dry-run default on find-replace, batch-delete, and purge — commit only after reviewing what would change.

Release history

See installer/RELEASES.md in the repository for dated changelog entries.

Troubleshooting

- Cannot connect / health fails: AutoCAD open with a drawing? Plugin message on command line? Firewall blocking localhost?
- Tool errors with help / connection hints: Use autocad_health_check; confirm uv run uses the same mcp-server path as the installer.
- Slow responses: Use include_entity_count=false, pagination, and autocad_count_entities before large autocad_get_entities scans.
- Pro tools rejected: Check license status via the Status ribbon button. If it says Pro is *paused*, the computer hasn't reached Gumroad for more than 7 days: get online and click Verify License (it also retries by itself within moments). If it says *not activated*, use Activate License.

Generated documentation. For the latest MCP tool schemas, always refer to mcp-server/autocad_server.py.

Release history (installer/RELEASES.md)

Uchuva AutoCAD MCP — Release history

v1.8.1 - 2026-10-24

- Pro license now works offline for up to 7 days after the last online check, then pauses until verified; license re-checked about once a day; ribbon shows Verify License when paused.

v1.8.0 - 2026-10-24

- SECURITY: the local bridge now requires a per-install access token and refuses browser/cross-origin requests (previously any website could read open drawings); export/xref paths restricted; license cache encrypted with Windows DPAPI; Python dependencies pinned. STABILITY: edits wait for AutoCAD to finish starting up and never run from a background thread (this could crash AutoCAD right after launch). FIX: installers built since v1.6.2 did not load in AutoCAD (obfuscation defect); the build now checks this automatically.

v1.7.0 - 2026-10-24

- Layout (paper space) support on read/edit tools; sheet index, multi-sheet title-block updates, viewport editing, layout management; xref tools; copy/rotate/scale/mirror/offset; measurement tools; PDF and image export (the assistant can see the drawing); multi-drawing support; every write is one AutoCAD undo step; extended entity properties

v1.6.2 - 2026-09-26

- Fix deprecated IsComponentSelected call (Inno Setup 6.7 rename)

v1.6.1 - 2026-09-26

- Uninstaller now removes locally stored license/log data automatically

v1.6.0 - 2026-09-01

- AutoCAD 2027 support (net10.0-windows); ribbon icon theme/DPI fixes; Website button; Add-ins tab panel via CUIX; installer now requires admin elevation

v1.5.0 - 2026-08-14

- Add free/paid tier split (16 free tools, 17 Pro tools requiring an activated license); add 7 rename tools (layer, block, linetype, text style, dim style, block attribute tag) and find-and-replace text with dry-run safety

v1.4.0 - 2026-08-09

- Add 5 new AutoCAD tools: zoom-to-entities (visual confirm), layer create/update, batch entity updates, and a drawing-health audit (unused layers, unreferenced blocks, layer-0 usage, explicit colors)

v1.3.0 - 2026-07-26

- Add license activation: a Gumroad license key is now required to use the plugin. Adds an Activate License button to the Uchuva ribbon tab, gates the HTTP bridge until activated, and periodically re-validates the subscription with Gumroad (every 7 days, offline-safe).

v1.2.1 - 2026-07-25

- Fix AutoCAD 2026 plugin silently failing to load: PackageContents.xml wrongly required series R26.x for AutoCAD 2026, but AutoCAD 2026 actually reports R25.1 (2025 and 2026 share the R25.x series). Merged the 2025/2026 entries into one correct range.

v1.2.0 - 2026-07-23

- Fix AutoCAD 2024 plugin load failure (net48/net8.0-windows multi-target); add CSV export tool; add ribbon Connection Status button; misc error-handling fixes

v1.1.1 - 2026-07-22

- Routine build

v1.1.0 - 2026-05-05

- English throughout: AutoCAD messages, API errors, MCP tool descriptions, installer wizard, and setup scripts.
- MCP connection errors now expose help and connected (replacing Spanish ayuda / conectado).
- PackageContents.xml AppVersion aligned with installer (1.1.0).

v1.0.0 - 2026-05-04

- Initial layout: .NET AutoCAD plugin + Python MCP server (based on Metrika360 architecture).