MODEL CONTEXT PROTOCOL SERVER · RUST

jlcpcb-mcp

Find and evaluate JLCPCB / LCSC electronic components for PCB assembly from any MCP-capable AI assistant.

Live search | Basic / Preferred / Extended | Stock & price breaks | Alternatives | No credentials needed

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Version 0.1.0 · MIT License · github.com/shubhxho/jlcpcb-mcp
Sample outputs captured live from the JLCPCB and LCSC endpoints on 11 Nov 2026, 16:19 IST. Stock and prices change continuously.

Contents

1. Overview
2. Install
3. Client configuration per OS
4. Tool reference with live outputs
5. Errors
6. Data sources
7. PCB estimate model
8. Limitations

1. Overview

jlcpcb-mcp is a single Rust binary that speaks MCP over stdio (built on the official `rmcp` SDK). It gives an assistant six read-only tools to search JLCPCB's assembly parts library, inspect a part's live stock and pricing, find cheaper or better-stocked substitutes, browse categories and get a rough bare-PCB cost.

- **Live data, no download.** Queries go to the same public endpoints that power jlcpcb.com/parts. There's no catalog to download, and responses are cached in memory for 5 minutes (24 h for categories).
- **Assembly-aware ranking.** Results are ordered Basic → Preferred Extended → Extended, then by JLCPCB assembly stock, then by unit price.
- **Two stock pools reported separately.** `jlc_assembly_stock` is what matters for PCBA. `lcsc_retail_stock` is LCSC's retail warehouse and is often 0 for parts JLCPCB has plenty of.
- **Optional official API.** Set `JLCPCB_APP_ID`, `JLCPCB_API_KEY` and `JLCPCB_API_SECRET` to add the official record to part details.

The server negotiated protocol version `2025-06-18` in the run used for this guide and advertised `6` tools.

2. Install

Requires Rust 1.89+ (`rustup`).

```
cargo install --git https://github.com/shubhxho/jlcpcb-mcp
# or from a checkout
git clone https://github.com/shubhxho/jlcpcb-mcp && cd jlcpcb-mcp
cargo install --path .
jlcpcb-mcp --version
```

The binary goes to `~/.cargo/bin/jlcpcb-mcp` (`%USERPROFILE%\.cargo\bin\jlcpcb-mcp.exe` on Windows). Without a Rust toolchain, build an MCP Bundle with `scripts/build-mcpb.sh` on each target platform and open the `.mcpb` file in Claude Desktop.

3. Client configuration per OS

Copy-ready files are in `examples/`. If a config file already exists, merge the `"jlcpcb"` entry into its `mcpServers` object. Claude Desktop doesn't read your shell `PATH`, so its examples use an absolute path to the binary.

Client / OS	Config file	Example in repo
Claude Desktop · macOS	`~/Library/Application Support/Claude/claude_desktop_config.json`	`examples/claude-desktop/macos.claude_desktop_config.json`
Claude Desktop · Windows	`%APPDATA%\Claude\claude_desktop_config.json`	`examples/claude-desktop/windows.claude_desktop_config.json`
Claude Desktop · Linux (community builds)	`~/.config/Claude/claude_desktop_config.json`	`examples/claude-desktop/linux.claude_desktop_config.json`
Cursor · project	`<project>/.cursor/mcp.json`	`examples/cursor/project/.cursor/mcp.json`
Cursor · global	`~/.cursor/mcp.json`	`examples/cursor/global/mcp.json`
Claude Code	`claude mcp add jlcpcb -- jlcpcb-mcp`	

macOS (Claude Desktop)

```
{
  "mcpServers": {
    "jlcpcb": {
      "command": "/Users/YOUR_USERNAME/.cargo/bin/jlcpcb-mcp",
      "args": []
    }
  }
}
```

Windows (Claude Desktop)

```
{
  "mcpServers": {
    "jlcpcb": {
      "command": "C:\\Users\\YOUR_USERNAME\\.cargo\\bin\\jlcpcb-mcp.exe",
      "args": []
    }
  }
}
```

Linux (Claude Desktop community builds)

```
{
  "mcpServers": {
    "jlcpcb": {
      "command": "/home/YOUR_USERNAME/.cargo/bin/jlcpcb-mcp",
      "args": []
    }
  }
}
```

Cursor (project or global)

```
{
  "mcpServers": {
    "jlcpcb": {
      "command": "jlcpcb-mcp",
      "args": []
    }
  }
}
```

One-click Cursor link (after installing the binary): `cursor://anysphere.cursor-deeplink/mcp/install?name=jlcpcb&config=eyJjb21tYW5kIjoiamxjcGNiLW1jcCIsImFyZ3MiOltdfQ%3D%3D`

Environment variables

Variable	Default	Purpose
`JLCPCB_APP_ID`, `JLCPCB_API_KEY`, `JLCPCB_API_SECRET`	unset	Optional official API (all three required)
`JLCPCB_MCP_TIMEOUT_SECS`	20	Per-request timeout
`JLCPCB_MCP_LOG`	warn	Log filter; logs go to stderr

4. Tool reference with live outputs

The outputs below are real responses from the run on 11 Nov 2026, 16:19 IST, trimmed to the most useful fields for print. The full responses also include parameters, every price break, URLs and notes. Prices are USD component prices and exclude assembly fees.

`search_components`

Search JLCPCB/LCSC parts live by keyword and filters. Results are ranked Basic first, then Preferred, then Extended, then by JLCPCB assembly stock (desc), then unit price (asc). Example: {"query": "10k", "category": "Resistors", "package": "0402", "basic_only": true}.

Argument	Type	Description
`basic_only`	boolean/null	Only return Basic parts (no per-part extended setup fee). Default false.
`category`	string/null	Category or sub-category name (see `list_categories`), e.g. "Resistors" or "Multilayer Ceramic Capacitors MLCC - SMD/SMT". Partial names work if unambiguous.
`include_preferred`	boolean/null	With `basic_only`, also include Preferred Extended parts. Default false.
`max_results`	integer/null	Maximum results to return (1-50, default 10).
`min_stock`	integer/null	Minimum JLCPCB assembly stock. Default 1 (in-stock only); use 0 to include out-of-stock parts.
`package`	string/null	Exact JLCPCB package name(s), comma-separated, e.g. "0402" or "SOT-23-3,SOT-23".
`quantity`	integer/null	Quantity used to pick the price tier for ranking (default 100).

`query`	string/null	Free-text keyword: value + type ("10k resistor", "100nF"), MPN ("AMS1117-3.3"), or LCSC number ("C25744").

Live call: `{"query": "10k", "category": "Resistors", "package": "0402", "max_results": 4}`


```
{
  "filters": {
    "category": "Resistors",
    "library": "any",
    "min_stock": 1,
    "packages": ["0402"],
    "price_qty": 100,
    "query": "10k",
    "subcategory": null
  },
  "total_matches": 192,
  "returned": 4,
  "results": [
    {
      "lcsc": "C25744",
      "mfr_part": "0402WGF1002TCE",
      "manufacturer": "UNI-ROYAL(Uniroyal Elec)",
      "package": "0402",
      "library_type": "basic",
      "jlc_stock": 20649570,
      "unit_price_usd": 0.001,
      "price_qty": 100
    },
    {
      "lcsc": "C60489",
      "mfr_part": "RC0402JR-0710KL",
      "manufacturer": "YAGEO",
      "package": "0402",
      "library_type": "extended",
      "jlc_stock": 21834449,
      "unit_price_usd": 0.0019,
      "price_qty": 100
    },
    {
      "lcsc": "C60490",
      "mfr_part": "RC0402FR-0710KL",
      "manufacturer": "YAGEO",
      "package": "0402",
      "library_type": "extended",
      "jlc_stock": 5731638,
      "unit_price_usd": 0.0016,
      "price_qty": 100
    },
    {
      "lcsc": "C174175",
      "mfr_part": "RCT0210KJLF",
      "manufacturer": "HKR(Hong Kong Resistors)",
      "package": "0402",
      "library_type": "extended",
      "jlc_stock": 4141793,
      "unit_price_usd": 0.0008,
      "price_qty": 100
    }
  ]
}
```


Live call: `{"query": "100nF", "package": "0402", "basic_only": true, "max_results": 3}`


```
{
  "total_matches": 2,
  "results": [
```

```
    {
      "lcsc": "C1525",
      "mfr_part": "CL05B104KO5NNNC",
      "manufacturer": "Samsung Electro-Mechanics",
      "package": "0402",
      "library_type": "basic",
      "jlc_stock": 31378672,
      "unit_price_usd": 0.0031,
      "price_qty": 100
    },
    {
      "lcsc": "C307331",
      "mfr_part": "CL05B104KB54PNC",
      "manufacturer": "Samsung Electro-Mechanics",
      "package": "0402",
      "library_type": "basic",
      "jlc_stock": 20447373,
      "unit_price_usd": 0.0085,
      "price_qty": 100
    }
  ]
}
```


`get_component_details`

Full live details for one LCSC part number (e.g. "C25744"): JLCPCB assembly stock and price breaks, LCSC retail stock and price breaks, Basic/Preferred/Extended class, parameters, datasheet URL, image, MSL and assembly process.

Argument	Type	Description
`lcsc`	string	LCSC / JLCPCB part number, e.g. "C25744" (the "C" is optional).
`quantity`	integer/null	Quantity used to pick the headline price tier (default 100).

Live call: `{"lcsc": "C25744"}`


```
{
  "lcsc": "C25744",
  "mfr_part": "0402WGF1002TCE",
  "manufacturer": "UNI-ROYAL(Uniroyal Elec)",
  "package": "0402",
  "category": "Resistors",
  "subcategory": "Chip Resistor - Surface Mount",
  "library_type": "basic",
  "jlc_assembly_stock": 20649570,
  "lcsc_retail_stock": 0,
  "price_qty": 100,
  "jlc_unit_price_usd": 0.001,
  "assembly_process": "SMT",
  "moisture_sensitivity_level": null,
  "datasheet_url": "https://www.lcsc.com/datasheet/lcsc_datasheet_2411221126_UNI-ROYAL-Uniroyal-Elec-
0402WGF1002TCE_C25744.pdf",
  "sources": ["JLCPCB parts detail", "LCSC product detail"],
  "warnings": [],
  "jlc_price_breaks": [
    {"max_qty": 999, "min_qty": 1, "unit_price_usd": 0.001},
    {"max_qty": 2999, "min_qty": 1000, "unit_price_usd": 0.0008},
    {"max_qty": 9999, "min_qty": 3000, "unit_price_usd": 0.0006},
    "…"
  ],
  "attributes": [
    {"name": "Resistance", "value": "10kΩ"},
    {"name": "Operating Temperature", "value": "-55℃~+155℃"},
    {"name": "Power(Watts)", "value": "62.5mW"},
```

```
    {"name": "Type", "value": "Thick Film Resistor"},
    "…"
  ]
}
```


`suggest_alternatives`

Suggest cheaper, better-stocked or Basic-library substitutes for an LCSC part: same category, same package (by default) and same value (resistance/capacitance/inductance/frequency/output voltage), with ratings at least as good. Each suggestion lists its reasons.

Argument	Type	Description
`basic_or_preferred_only`	boolean/null	Only suggest Basic / Preferred parts (default false).
`lcsc`	string	LCSC part number to replace, e.g. "C25531".
`max_results`	integer/null	Maximum alternatives (1-25, default 8).
`min_stock`	integer/null	Minimum JLCPCB assembly stock for a candidate (default 100).
`quantity`	integer/null	Quantity used for price comparison (default 100).
`same_package`	boolean/null	Require the same package (default true).

Live call: `{"lcsc": "C25531", "max_results": 3}`


```
{
  "original": {
    "lcsc": "C25531",
    "mfr_part": "0402WGJ0103TCE",
    "manufacturer": "UNI-ROYAL(Uniroyal Elec)",
    "package": "0402",
    "library_type": "extended",
    "jlc_stock": 245060,
    "unit_price_usd": 0.0026,
    "price_qty": 100
  },
  "match_criteria": [
    "same category: Resistors / Chip Resistor - Surface Mount",
    "same package: 0402",
    "same Resistance: 10kΩ",
    "at least the same voltage/power/current rating, no worse tolerance or dielectric (where parseable)"
  ],
  "alternatives": [
    {
      "lcsc": "C25744",
      "mfr_part": "0402WGF1002TCE",
      "manufacturer": "UNI-ROYAL(Uniroyal Elec)",
      "package": "0402",
      "library_type": "basic",
      "jlc_stock": 20649570,
      "unit_price_usd": 0.001,
      "price_qty": 100,
      "reasons": [
        "Basic part (avoids the extended-part setup fee)",
        "61.5% cheaper at qty 100",
        "84.3x the stock (20649570 vs 245060)"
      ]
    },
    {
      "lcsc": "C174175",
      "mfr_part": "RCT0210KJLF",
      "manufacturer": "HKR(Hong Kong Resistors)",
      "package": "0402",
```

```
      "library_type": "extended",
      "jlc_stock": 4141793,
      "unit_price_usd": 0.0008,
      "price_qty": 100,
      "reasons": ["69.2% cheaper at qty 100", "16.9x the stock (4141793 vs 245060)"]
    },
    {
      "lcsc": "C173683",
      "mfr_part": "RCT0210KFLF",
      "manufacturer": "HKR(Hong Kong Resistors)",
      "package": "0402",
      "library_type": "extended",
      "jlc_stock": 3578273,
      "unit_price_usd": 0.0009,
      "price_qty": 100,
      "reasons": ["65.4% cheaper at qty 100", "14.6x the stock (3578273 vs 245060)"]
    }
  ]
}
```


`list_categories`

List JLCPCB component categories with live part counts. With no arguments returns top-level categories; use `parent` or `search` (e.g. "mosfet") to see sub-categories. Names can be passed as `category` to search_components.

Argument	Type	Description
`include_subcategories`	boolean/null	Include sub-categories for every parent (default: only when `parent` or `search` is set).
`parent`	string/null	Only show this top-level category (and its sub-categories).
`search`	string/null	Case-insensitive substring filter on category / sub-category names, e.g. "mosfet".

Live call: `{"search": "mosfet"}`


```
{
  "categories": [
    {
      "id": 5,
      "name": "Transistors/Thyristors",
      "part_count": 118749,
      "subcategories": [{"id": 2954, "name": "MOSFETs", "part_count": 76199}],
      "subcategory_count": 11
    },
    {
      "id": 66,
      "name": "Silicon Carbide (SiC) Devices",
      "part_count": 5231,
      "subcategories": [{"id": 2090, "name": "Silicon Carbide Field Effect Transistor (MOSFET)",
"part_count": 2429}],
      "subcategory_count": 3
    }
  ],
  "total_categories": 2
}
```

`estimate_pcb_quote`

ROUGH bare-PCB fabrication cost estimate from size, layers, quantity, thickness and finish. This is an approximate parametric model with documented assumptions, NOT an official JLCPCB quote (JLCPCB has no public pricing API); always confirm at https://cart.jlcpcb.com/quote.

Argument	Type	Description
`height_mm`	number	Board height in mm.
`layers`	integer	Copper layers: 1, 2, 4, 6 or 8.
`quantity`	integer	Number of boards.
`surface_finish`		Surface finish.
`thickness_mm`	number	Board thickness in mm (1.6 is standard).
`width_mm`	number	Board width in mm.

Live call: `{"width_mm": 100, "height_mm": 80, "quantity": 10, "layers": 2}`


```
{
  "is_official_quote": false,
  "method": "approximate parametric model (not a JLCPCB quote)",
  "low_usd": 9.75,
  "typical_usd": 13.0,
  "high_usd": 19.5,
  "per_board_typical_usd": 1.3,
  "breakdown": [
    {"item": "engineering/setup (2L)", "usd": 5.0},
    {"item": "area cost 80.0 cm² × 10 @ $0.010/cm² × volume factor 1.00", "usd": 8.0}
  ],
  "official_quote_url": "https://cart.jlcpcb.com/quote"
}
```


`service_status`

Check that the live JLCPCB and LCSC endpoints are reachable, whether official API credentials are configured, and cache size. Useful when other tools report network errors.

Argument	Type	Description
no arguments		

Live call: `{}`


```
{
  "version": "0.1.0",
  "jlcpcb_parts_api": {"detail": "reachable (live search probe)", "latency_ms": 384, "ok": true},
  "lcsc_api": {"detail": "reachable", "latency_ms": 141, "ok": true},
  "official_api_configured": false
}
```


5. Errors

Tool failures come back as MCP tool errors (`isError: true`) with a message you can act on. Network failures, timeouts, HTTP 429/403 throttling (retried with backoff first), upstream rejections and format

changes each get their own message. If JLCPCB or LCSC is down, `get_component_details` still returns the other source's data and adds a warning.

Live: unknown part number

```
{"isError": true, "message": "part C999999999 was not found at JLCPCB or LCSC"}
```

Live: ambiguous category

```
{
  "isError": true,
  "message": "invalid input: category \"mlcc\" is ambiguous (2 matches). Use one of: Multilayer Ceramic Capacitors MLCC - Leaded (in Capacitors); Multilayer Ceramic Capacitors MLCC - SMD/SMT (in Capacitors)"
}
```

6. Data sources

Endpoint	Used for	Auth
`POST jlcpcb.com/api/overseas-pcb-order/v1/shoppingCart/smtGood/selectSmtComponentList/v2`	Search, filters, category tree, alternatives	none
`GET jlcpcb.com/api/overseas-pcb-order/v1/smtComponentShopCart/getComponentDetail`	Exact part detail: assembly stock, price ladder, MSL, process	none
`GET wmsc.lcsc.com/ftps/wm/product/detail`	LCSC retail stock and price breaks	none
`POST open.jlcpcb.com/overseas/openapi/component/getComponentDetailByCode`	Official record (optional)	HMAC-SHA256

The endpoint shapes were worked out from the public JLCPCB parts site and the open-source projects yaqwsx/jlcparts, Eyalm321/jlcpcb-mcp, peterb154/jlcpcb-search-mcp, mageoch/JLCPCB-MCP-Server and PatrickWalther/go-jlcpcb-parts.

7. PCB estimate model

Not an official quote. JLCPCB has no public, unauthenticated PCB pricing API. `estimate_pcb_quote` is a parametric model whose coefficients are the author's assumptions, and it always returns `is_official_quote: false`. Get the real price at cart.jlcpcb.com/quote.

	1 L	2 L	4 L	6 L	8 L
≤5 pcs, ≤100×100 mm (flat)	$2	$2	$7	$30	$60
Otherwise: setup fee	$5	$5	$15	$45	$80
+ area cost per cm²	$0.008	$0.010	$0.025	$0.055	$0.085

Volume factor: ×0.8 above 1 m², ×0.65 above 5 m². Non-1.6 mm thickness: +10 % (min $2). Lead-free HASL: +5 % (min $1). ENIG: +$15 + 10 %. Returned range: −25 % / +50 %. Shipping, taxes, assembly and

components are excluded.

8. Limitations

- The JLCPCB and LCSC endpoints are undocumented and can change. If a format changes, the tools return a decode error rather than wrong data.
- Official API support follows the community-documented signing scheme and hasn't been verified with real credentials. With invalid credentials the official API returns HTTP 401, the tool reports it as a warning, and the other sources still answer.
- The package filter needs JLCPCB's exact package string (e.g. `SOT-23-3`, not `SOT23`).
- Alternatives are rule-based. Check pinout, ratings and footprint in the datasheet before substituting.
- Stock and prices are point-in-time values. The figures in this guide will be out of date when you read it.
- An MCPB bundle contains a binary for one OS/arch, so build one per platform.