

SunEnergyXT 500 Series Local API

1. Key Corrections

- The stable `/read` response shape is `{"state":{"reported":{...}}}`. Business data must be read from `state.reported`.
- The stable `/write` request shape is `{"state":{"FIELD": value}}`. Partial field updates are recommended.
- MS means meter status, not manufacturer.
- ES / AS / DS / BS0..BS5 are firmware version fields, not generic status strings.
- BP is the documented battery power field.
- GD1 / GD2 / LD are raw daily energy counters in Wh, not kWh.
- MM is the Local Zero Feed-in mode switch, and MD is the meter connection string used by that mode.
- TZ is a POSIX timezone field, not a country or region name. Germany should use a DST-aware POSIX timezone string such as CET-1CEST,M3.5.0,M10.5.0/3.
- MD and TZ take effect immediately after a write, but the device may not echo the exact written value back.

2. Scope and General Contract

- This document covers the local HTTP API exposed by the AIO device on the LAN.
- The current stable public endpoints are:
 - GET `/read`
 - POST `/write`
- `/write` follows an asynchronous desired-state model. HTTP 2xx only means the device accepted the request.
- The real result must always be confirmed by reading `/read` again.
- Field presence may vary slightly across firmware branches, models, and topology. Integrations should ignore unknown keys and tolerate missing optional keys.
- Unless otherwise stated:
 - Power is in W
 - Current is in A
 - Voltage is in V
 - SOC is in %
 - Daily energy counters are in Wh

3. Endpoints

Endpoint	Method	Description
<code>/read</code>	GET	Read the current device snapshot from <code>state.reported</code>
<code>/write</code>	POST	Partially write one or more target fields under <code>state</code>

3.1 GET `/read`

Request:

```
GET http://{device_ip}:{port}/read
```

Stable response shape example:

```
{
  "state": {
    "reported": {
      "SN": "TBe072a1edb090",
```

```

    "PK": 2,
    "ST": 1,
    "PV": 1820,
    "PV1": 460,
    "PV2": 455,
    "PV3": 450,
    "PV4": 455,
    "II1": 2.1,
    "II2": 2.1,
    "II3": 2.0,
    "II4": 2.1,
    "VP1": 219.0,
    "VP2": 218.6,
    "VP3": 218.8,
    "VP4": 218.9,
    "IW": 1820,
    "OP": 1510,
    "GP": -1530,
    "LP": 0,
    "BP": 1450,
    "SC": 54,
    "SC0": 54,
    "GD1": 5683,
    "GD2": 4789,
    "LD": 0,
    "GS": -1550,
    "IS": 2400,
    "LM": 0,
    "MM": 1,
    "MS": 1,
    "IP": "192.168.1.102",
    "COM": 80,
    "ES": "1.1.3",
    "AS": "1.0.6",
    "DS": "1.0.5",
    "BS0": "4.0.5",
    "timestamp": 1712476800000
  }
}
}

```

Parsing rules:

- Stable business data must be parsed from `state.reported`.
- Some keys may be absent depending on firmware version, topology, or current mode.

3.2 POST /write

Request:

```

POST http://{device_ip}:{port}/write
Content-Type: application/json

{
  "state": {
    "GS": -1500
  }
}

```

Write contract notes:

- Only send the fields you want to change. Partial writes are recommended.
- Do not rely on a fixed response body format. Use `HTTP 2xx + /read echo` as the success rule.
- If a field is unsupported by the current firmware, the device may silently ignore it and keep the previous value.
- MD and TZ take effect immediately after a successful write, but the device may not echo the same value back. Confirm them by the resulting effect, not by direct field echo.
- For high-risk actions such as RT, use a fire-and-confirm flow rather than fire-and-forget.

4. Stable Writable Fields and Fill Rules

Field	Type	Readback	Description	Fill Rule
GS	integer	Yes	On-grid power setpoint. >0 means export/feed-in, <0 means grid import / grid charging, 0 means neutral.	Recommended export range: 0 . . 800 for 500 Standard, 0 . . 2400 for 500 Pro. Recommended import range: -2400 . . 0 for both models. Recommended step: 10W.
IS	integer	Yes	Max inverter output power setpoint.	Recommended range: 1 . . 2400. When the EMS/Wi-Fi firmware version is not above 1.1.1, the device may ignore this write.
MG	integer	Yes	Maximum grid-connected output power.	Recommended range: 1 . . 800 for 500 Standard, 1 . . 2400 for 500 Pro. Recommended step: 1W.
SI	integer	Yes	On-grid minimum discharge SOC.	Recommended values: 1, 10, or 20.
SA	integer	Yes	On-grid maximum charge SOC.	Recommended values: 70, 80, 90, or 100.
S0	integer	Yes	Off-grid minimum discharge SOC.	Recommended values: 1, 10, or 20.
LM	integer	Yes	Local mode switch. 0 = off, 1 = on.	Once local mode is enabled, most cloud-side remote control is expected to be restricted until local mode is turned off.
MM	integer	Yes	Local Zero Feed-in mode switch. 0 = off, 1 = on.	The safest pattern is to prepare a valid MD first, or submit MM = 1 together with MD in the same request. The Home Assistant integration clears MD when turning MM off. Confirm final meter status via MS.
LFB	integer	Yes	Load priority switch. 0 = off, 1 = on.	Use only when the device firmware supports load priority.
LPS	integer	Yes	Off-grid output switch. 0 = off, 1 = on.	Use only when the device firmware supports off-grid output control.
MD	string	Effect only	Meter local connection JSON string.	Fill MD with the final device-side JSON string content shown in Section 5. The setting takes effect immediately, but the device may not echo the written MD value back. Confirm the result via MS and actual meter data.
RT	integer	Trigger	Device restart trigger.	Write 1 only. Read / read again after the device comes back online.
TZ	string	Effect only	POSIX timezone field.	It must be a POSIX timezone string, not a country or region name. Germany should use CET-1CEST, M3.5.0, M10.5.0/3; China can use CST-8. Do not write Europe/Berlin, Europe/Paris, PRC, UTC+1, UTC+2, CET, or CEST. The setting takes effect immediately, but the device may not echo the written TZ value back.
NT	integer	Not guaranteed	Nation / safety profile identifier.	Example: Germany commonly uses 60. Only write this field when the country-to-profile mapping is clear.
U0	integer	Yes	UPS mode switch. 0 = off, 1 = on.	When U0 = 1, many non-UPS settings may no longer take effect until UPS mode is disabled.
UG	integer	Yes	UPS grid charging power.	0 means no grid charging in UPS mode. Recommended non-zero range: 20 . . 2400.
FP	integer	Yes	Max PV bypass output power after the battery is full.	Recommended range: 20 . . current allowed max output power. The upper limit usually follows the device's currently allowed max grid output capability.

4.1 Reserved Fields

The following fields may appear on some devices or firmware versions, but they are not recommended for normal integrations. Use them only when the device protocol has been explicitly confirmed.

Field	Type	Meaning	Notes
SI1	integer	Discharge SOC hysteresis	Not recommended as a default integration field
SA1	integer	Charge SOC hysteresis	Not recommended as a default integration field
P0	integer	Power enable/stopp control	Not recommended as a default integration field

Field	Type	Meaning	Notes
PT	integer	Auto power-off time	A common range is 30 . . 1440 minutes, but this should not be treated as a fixed public guarantee
SD	integer	Power on/off field	Use only after firmware behavior is confirmed
CF	integer	Clear-fault trigger	Use only after firmware behavior is confirmed

5. MD Fill Rules and Meter Classification

MD is the JSON string written into state.MD. It tells the device how to discover and read the local meter.

Fill rules:

- In the examples below, MD is shown as the final device-side JSON string content, without extra escape slashes.
- When your HTTP client serializes a JSON request body, the outer string escaping is usually handled automatically.
- For mdns meters, the host part inside dat_url must remain 0.0.0.0. Do not replace it with the real LAN IP manually.
- In some clients, = may appear as \u003d during serialization. This is equivalent and can be sent as-is.
- In Home Assistant, MD is exposed as the Local Meter Connection Settings text entity. It is used for writing the meter connection string and may be cleared or not echoed exactly after a write; verify the result through MS and live meter behavior.

5.1 Final MD Field Shape

Fill MD with a value in the following final device-side format:

```
{"mode": "mdns", "mdns": {"sn": "8c4f00c31844", "dat_url": "http://0.0.0.0/rpc/EM.GetStatus?id\u003d0"}, "dat_str": {"pwr": "total_act_power"}}
```

Field meanings:

Path	Meaning
mode	Meter discovery mode. The device currently uses mdns or direct
mdns.sn	Meter SN or SN prefix used for local mDNS matching
mdns.dat_url	Final URL stored by the device for mDNS mode
direct.dat_url	Final full URL stored by the device for direct mode
dat_str.pwr	Power field name or expression in the meter payload

5.2 Supported Meter Categories

The device currently supports the following four meter categories for Local Zero Feed-in mode:

Meter Type	Final mode	Final Conn ection Fiel ds	Final dat_str.pwr	Fill Notes
ECOTRACKER	direct	direct.da t_url = http://{m eter_ip}/ v1/json	power	The current LAN IP of the meter is required. Do not use a placeholder
SHELLY_3EM_ METER	mdns	mdns.sn = meter SN; mdns.d at_url = http://0. 0.0.0/sta tus	total_power	Use the meter SN directly

Meter Type	Final mode	Final Connection Fields	Final dat_str.pwr	Fill Notes
SHELLY_PRO3EM_METER	mdns	mdns.sn = meter SN; mdns.dat_url = http://0.0.0.0/rpc/EM.GetStatus?id\u003d0	total_act_power	Use the meter SN directly
TASMOTA	mdns	mdns.sn = SN prefix without the last 4 characters; mdns.dat_url = http://0.0.0.0/cm?cmd=Status%208	Depends on subtype	dat_str.pwr must match the exact current subtype. See the full list in Section 5.4

5.3 MD Examples by Meter Category

5.3.1 EcoTracker

Fill this MD value:

```
{"mode":"direct","direct":{"dat_url":"http://192.168.1.50/v1/json"},"dat_str":{"pwr":"power"}}
```

5.3.2 Shelly 3EM

Fill this MD value:

```
{"mode":"mdns","mdns":{"sn":"B929CC","dat_url":"http://0.0.0.0/status"},"dat_str":{"pwr":"total_power"}}
```

5.3.3 Shelly Pro 3EM

Fill this MD value:

```
{"mode":"mdns","mdns":{"sn":"8c4f00c31844","dat_url":"http://0.0.0.0/rpc/EM.GetStatus?id\u003d0"},"dat_str":{"pwr":"total_act_power"}}
```

5.3.4 Tasmota

Notes:

- mode is always mdns
- mdns.dat_url is always http://0.0.0.0/cm?cmd=Status%208
- mdns.sn is not the full device SN. It uses the prefix with the last 4 characters removed. Example: tasmota-c28338-0824 becomes tasmota-c28338
- dat_str.pwr must match the exact meter subtype

Fill this MD value:

```
{"mode":"mdns","mdns":{"sn":"tasmota-c28338","dat_url":"http://0.0.0.0/cm?cmd=Status%208"},"dat_str":{"pwr":"Power"}}
```

5.4 Full BitShake / Tasmota dat_str.pwr Mapping List

The following table contains the complete currently available BitShake / Tasmota dat_str.pwr values:

Subtype	dat_str.pwr
APOX	Power
LEPUS	power
Norax	Power

Subtype	dat_str.pwr
PICUS	power
GS303	Power
DWZE12	Power
DWS7410	Power
DWS7412	Power
DWS7420	Power
DWS7612	Power
DWSB12	Power
DWSB20	Power
DWSE20	Power
M60	Power
Q3A	Power
Q3B	Power
Q3C	Power
Q3D	Power
Q1A	Power
Q3M	Power
eBZ	Power
SGM	Power
AS1440	power_in - power_out
AS2020	Power
AS3500	Power
T510	Power_total
eBZD	Power
ED300L	Power
ED300S	Power
eHZ	Power - Power2
EMH	Power
EHZ161	watt_l1 + watt_l2 + watt_l3
EHZ361	watt_l1 + watt_l2 + watt_l3
EHZ363	Power - Power2
HBZ	Power
DTZ	Power
EHZ	Power
MT175	Power
MT176	Power
MT382	Power
MT631	Power
MT681	Power
MT691	Power
Itron	Power

Subtype	dat_str.pwr
KAIFA	Power
E220	Power
E230	Power_in * 1000
E320	Power
E350	Power_in * 1000
E650	((1-5-0) - (2-5-0)) * 1000
ZMB120	(kW_L1+L2+L3) * 1000
L20	Power
LK13BE	Power current
Metcom	power_in - power_out
Siemens	(Pp - Pm) * 1000
Smarty	power
SML	Power

If the current meter subtype is not listed above, do not fill MD for that Tasmota meter. Otherwise the device will not be able to read the meter correctly in Local Zero Feed-in mode.

6. Stable Reported Fields

Field	Type	Description	Notes
SN	string	Device serial number	Stable identifier
PK	integer	Device power type. 1 = 500 Standard (800W), 2 = 500 Pro (2400 W)	Prefer this over model display text for logic branching
ST	integer	System status code	Only 0 = off is currently confirmed; other values are firmware-defined
WT	integer	Wi-Fi / network state code	Firmware-defined integer enum
PV	number	Total PV input power	Unit W
PV1..PV4	number	MPPT 1..4 PV power	Unit W
II1..II4	number	MPPT 1..4 current	Unit A
VP1..VP4	number	MPPT 1..4 voltage	Unit V
GP	number	Grid power. Positive means export/feed-in, negative means import/grid charging	Unit W
LP	number	Load power	Unit W
BP	number	Battery power. Positive means charging, negative means discharging	Unit W
IW	number	Total input power	Unit W

Field	Type	Description	Notes
OP	number	Total output power	Unit W
SC	number	Total system SOC	Unit %
SC0 . . SC5	number	Master and slave battery SOC values	SC0 is the master battery, SC1 . . SC5 are slaves
BN	integer	Total battery pack count	Useful for topology awareness
ON	integer	Online battery pack count	Useful for multi-pack awareness
GD1	number	Daily grid charging energy	Raw unit Wh
GD2	number	Daily grid export energy	Raw unit Wh
LD	number	Daily off-grid load output energy	Raw unit Wh
GS	integer	Echo of the current on-grid power setpoint	Sign semantics match the write contract
IS	integer	Echo of the current max grid output setting	Upper bound depends on model
SI / SA / SO	integer	SOC limits	SI1 / SA1 are reserved fields and should not be assumed by default
LM	integer	Local mode state	0 = off, 1 = on
MM	integer	Local Zero Feed-in mode state	0 = off, 1 = on
MD	string	Meter connection runtime value when present	Do not use it as guaranteed echo of the last written MD
MS	integer	Meter state	Current known values: 0 = no meter bound, 1 = online, 2 = offline, 3 = requesting IP
IP	string	Local mode IP address	Reported by the device
COM	integer	Local mode port	Reported by the device
TZ	string	Timezone runtime value when present	Do not use it as guaranteed echo of the last written TZ
ES	string	Wi-Fi / module firmware version	Stable version field
AS	string	AC firmware version	Stable version field
DS	string	DC firmware version	Stable version field
BS0 . . BS5	string	BMS firmware versions	BS0 is the master pack, BS1 . . BS5 are slave packs
TF / EF / DF1 / DF2 / AF1 / AF2 / BF	integer	Fault bitmasks for prompt, EMS, DC, AC, and BMS domains	Treat these as bitmasks, not as single status codes
FP	integer	Full-charge PV bypass max output power	Unit W
U0	integer	UPS mode state	0 = off, 1 = on

Field	Type	Description	Notes
UG	integer	UPS grid charging power	Unit W
timestamp	integer	Collection timestamp	Usually milliseconds

7. Request Examples

7.1 Read Current Snapshot

GET http://192.168.1.102/read

7.2 Enable Local Mode

POST http://192.168.1.102/write
Content-Type: application/json

```
{
  "state": {
    "LM": 1
  }
}
```

7.3 Set Grid Charging Power to 1500W

POST http://192.168.1.102/write
Content-Type: application/json

```
{
  "state": {
    "GS": -1500
  }
}
```

7.4 Set Germany POSIX Timezone

POST http://192.168.1.102/write
Content-Type: application/json

```
{
  "state": {
    "TZ": "CET-1CEST,M3.5.0,M10.5.0/3"
  }
}
```

The setting takes effect immediately, but the device may not echo the same TZ value back.

7.5 Enable Local Zero Feed-in mode with Shelly Pro 3EM

POST http://192.168.1.102/write
Content-Type: application/json

Write the following values under state:

Field	Value
MM	1
MD	{"mode": "mdns", "mdns": {"sn": "8c4f00c31844", "dat_url": "http://0.0.0.0/rpc/EM.GetStat us?id\u003d0"}, "dat_str": {"pwr": "total_act_power"}}

MD takes effect immediately, but the device may not echo the same value back. Confirm success through MS and live meter data.

7.6 Restart the Device

POST http://192.168.1.102/write
Content-Type: application/json

```
{
  "state": {
    "RT": 1
  }
}
```

8. Integration Notes

- Always use `/read` as the source of truth after every write.
- For MD and TZ, confirm the result by the resulting effect. Do not rely on those fields as guaranteed direct echo values.
- For normal monitoring, 2s ~ 5s polling is usually reasonable. For short-term write confirmation, 1s ~ 2s can be used temporarily.
- Avoid mixing unrelated actions in the same `/write` request, especially RT together with configuration updates.
- If a Home Assistant zero feed-in automation blueprint controls the device, keep the device's Local Zero Feed-in mode (MM) disabled. The blueprint follows Home Assistant meter entities and Home Assistant automation logic, while MM + MD lets the device read the configured local meter directly.
- Use only one zero feed-in control path at a time. Device-local MM + MD and the Home Assistant blueprint are separate control paths. In the SunEnergyXT app, Smart Strategy - Local Network (WLAN) configures the same device-local zero feed-in path.
- Device-local MM + MD supports only the meter categories documented in Section 5. Meters that are only available as Home Assistant entities should use the Home Assistant blueprint instead.
- If you need to support multiple firmware branches, implement only against the stable core fields defined in this document. Do not assume undocumented fields are always present.