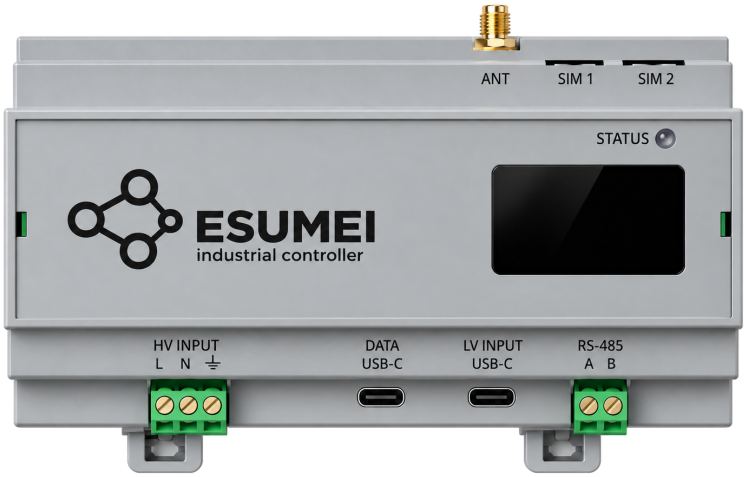
ESUMEI G3

User Manual

Field setup, operation and service reference | Type IOT-KB08



Use of this manual	For trained personnel working under approved site electrical procedures. This guide covers G3 operating behavior and service checks; it does not replace site wiring drawings or safety authorization.

Document basis

G3 hardware and installation information: Esumei_g3_user_manual.docx, revision 2026.1. USB, shell, configuration, telemetry and firmware behavior: Manual_v0.8.12.html. Verify actual device firmware and terminal markings before service.

1 Before you begin

Record model, serial alias, device ID and firmware version. Confirm the approved power, RS-485, antenna and meter wiring at the site. Back up the current configuration with `config dump` before making changes. Eject the USB mass-storage volume before disconnecting it.

> **Electrical safety** The G3 draft describes CT/VT test-block and DC auxiliary wiring. Apply only the site-approved electrical procedure and current meter/terminal drawings. Never open an energized CT secondary circuit.

G3 connections named in the draft

Interface	Field check
Auxiliary input	24-250 VDC. Confirm V+, V- and chassis ground markings against the delivered unit and site drawing.
RS-485	Connect meter D+ to controller A+ and D- to B- only after checking device markings.
Cellular	Check antenna connection and installed SIM provisioning.
USB	DATA is the service data connection; LV INPUT is the service power input in the G3 draft.

2 First setup

1. Mount and wire the gateway under the approved site procedure.
2. Connect the service computer to the configured USB serial port. Read `status.json` or run `diag status`.
3. Record identity, firmware and provisioning state.
4. Run `login` before configuration or file uploads.
5. Apply the approved site, cellular, MQTT and meter configuration.
6. Verify the reported config, status, metrics and meter telemetry topics.

3 USB service and access

File or mode	Purpose
Production mode	Serial shell and USB mass-storage status/upload surface.
Programming mode	Firmware loading service mode; mass storage is disabled.
status.json	Read-only identity, firmware, config and upload status.
config.json	Compact JSON configuration upload after login.
SCRIPT.BE	Authenticated meter script upload.
FIRMWARE.BIN	Authenticated firmware package staging when supported.

The shell starts restricted. A successful `login` unlocks service commands and USB upload acceptance. Use `logout` when finished. Password changes use `security set_password <new_password>`; the documented length is 8-63 characters.

Useful read-only commands

Command	What to inspect
diag status	Identity, firmware, uptime and configuration state
diag connectivity	Network, modem, MQTT and queued telemetry counters
diag meters	Meter script and polling state
diag storage / diag errors	Storage health and recent errors
g3_power status	G3 charger, battery voltage and fault registers

4 Configuration

USB uses strict JSON. Cloud desired configuration uses the device binary format; do not publish raw JSON to the cloud config topic. The device validates all sections before applying changes. An invalid configuration leaves the running configuration unchanged.

Apply a USB configuration

1. Generate `config.json` from an approved configuration source or a verified `config dump`.
2. Log in, copy the compact file to the USB volume root, then eject the volume.
3. If automatic detection has not applied it, run `config apply_usb`.
4. Check `config status`, `status.json` and `config show`.

Section	Purpose
mqtt	Broker host/port, keepalive and publish acknowledgement timeout
site	Deployment site identity
cellular	APN where cellular runtime configuration is enabled
Meter script	Polling settings, meter list and optional script path

Config control Cloud desired config requires meta.config_id. Stale IDs are skipped unless meta.force is true. Record the applied config ID and result in the service log.

5 Meter setup and telemetry

The built-in meter pipeline polls configured Modbus meter IDs and applies CT/VT primary and secondary ratios. Confirm meter address, baud rate, CT/VT ratios and polarity against the installed meter and approved drawings.

```
{ "enabled": true, "poll_ms": 2000, "meters": [
{ "id": 1, "enabled": true, "name": "main",
"ct_p": 100, "ct_s": 5, "vt_p": 415, "vt_s": 415 }
] }
```

This is an illustrative configuration from the EsumeiOS manual; substitute approved site values. A valid reading uses status code 0. Documented error codes include Timeout (1), CommError (2), generic Error (3), CRC (4) and Malformed (5).

Topic pattern

```
d/v1/<device_id>/u/meter/<meter_id>/telemetry
```

Telemetry includes device and meter identity, frame counter, status, timestamp, voltages, currents, active/reactive/apparent power, power factor, frequency and energy counters.

6 MQTT and outage operation

Topic	Function
d/v1/<id>/d/config	Cloud desired configuration: binary payload
d/v1/<id>/u/config	Reported configuration and apply result
d/v1/<id>/u/status	Health, power, radio and update status
d/v1/<id>/u/metrics	Diagnostic metric groups
d/v1/<id>/u/meter/<meter>/telemetry	Meter reading

The gateway stores readings during a network outage and drains stored records after MQTT connectivity returns. Confirm queue and storage health with `diag connectivity` and `diag storage`. The supplied sources do not establish a guaranteed buffer duration.

7 Status and firmware

State	Strip LED indication
Booting / Operational	Green; use status data to distinguish the states
Provisioning	Blue
Degraded	Orange
Sentinel	Dim green when supported
Updating	Purple
Shutdown	Off

Update-capable firmware validates an authenticated offer, device model, power policy, available space and signed image before test boot. Post-boot validation confirms the image; otherwise the system can revert. A staged `FIRMWARE.BIN` is not proof of installation. Check `status.json`, MQTT status and firmware version after any update.

8 Field troubleshooting

Symptom	Checks and action
USB upload does not apply	Check login and status.json usb_uploads_accepted; copy again, eject and run config apply_usb for config uploads.
Config rejected	Check config status, last_error and JSON validity; cloud config requires binary format.
No meter telemetry	Check diag meters, meter ID, enabled state, RS-485 wiring, Modbus address and script result.
Broker outage	Check diag connectivity queue counters, storage and broker reachability; verify backlog drains after recovery.
Degraded indicator	Run diag all, diag errors and diag connectivity; identify the affected subsystem.
G3 battery anomaly	Use g3_power status; inspect charger health, battery voltage validity and fault registers.

9 Service record

Record date/site, unit serial alias and device ID, firmware before/after, configuration source and ID, APN/broker, meter IDs and CT/VT ratios, status observations, open faults and technician sign-off.

Publication notes

The G3 draft contains detailed breaker, terminal-test-block, firmware flashing, default credential, storage technology and compliance statements that are not confirmed by the newer EsumeiOS manual. They are intentionally excluded from this field procedure pending engineering approval. Formal electrical ratings, certifications and warranty terms require separate verification.