DODOTiK



DODO LOGGER

SD · Wi-Fi · LoRaWAN · 4G LTE

Industrial IoT Sensor Data Logger
DODOTiK · Made in Türkiye · Models: DL-X4 · V2 · PRO
Datasheet Rev 1.1 · October 2026

1. Overview

The **DODO LOGGER** is a rugged, field-deployable IoT data logger that reads industrial sensors over **RS-485 / Modbus** and **analog (0–10 V / 4–20 mA)** inputs, records every reading to a local **SD card**, and delivers data to the cloud over the connectivity option of your choice — **Wi-Fi**, **LoRaWAN**, or **4G LTE**.

It is designed for unattended, 24/7 operation in agriculture, greenhouses, irrigation, water/reservoir monitoring, cold chain, environmental, and industrial-process applications. A built-in web dashboard lets an installer configure the device and view live readings from a phone or laptop — with **no app to install** — and a fully **offline mode** *(firmware v2.5.0)* lets the logger run as a self-contained recorder with no internet at all.

Headline capabilities

- **Three versions — Wi-Fi, LoRaWAN, 4G LTE** — same hardware and firmware, different uplink radio; **all three log to microSD**
- **1 to 4 sensors per logger** — 4 universal slots, each independently configurable as Modbus or analog
- **No-code sensor library** — add new Modbus sensors from the web UI; no firmware reflash
- **Local + cloud** — SD-card logging always on; cloud delivery optional and selectable
- **Works fully offline** *(firmware v2.5.0)* — local Wi-Fi access point + SD logging, zero internet required
- **Schema-discovery cloud** — device self-describes; the platform renders any sensor with no backend changes
- **Secure by default** — TLS to the cloud, signed OTA firmware updates, WPA2-protected local access
- **Multi-protocol cloud** — DODOTiK Platform (MQTT/TLS) or your own HTTPS server
- **Battery-backed real-time clock**, timezone-aware timestamps, automatic NTP calibration (when online)

2. Connectivity variants (product family)

DODO LOGGER comes in three versions — Wi-Fi, LoRaWAN and 4G LTE. They differ only in the uplink radio fitted; the firmware, web interface, enclosure, sensor inputs and connectors are identical across all three. **All three log to a microSD card**, so every version keeps a complete local record whether or not the uplink is up.

Variant	Uplink	Typical use	Local access	SD logging
DODO LOGGER Wi-Fi	2.4 GHz Wi-Fi (802.11 b/g/n)	Sites with existing Wi-Fi / LAN	Yes	Yes
DODO LOGGER LoRaWAN	LoRaWAN Class A	Long-range, low-power, no local network	Yes (setup)	Yes
DODO LOGGER 4G LTE	Cellular LTE Cat-1 (A7670G)	Remote sites, no Wi-Fi/LAN	Yes (setup)	Yes

> The **Wi-Fi variant** is fully specified in this datasheet (sections 4–9 reflect verified firmware behaviour). The **LoRaWAN** (RAK3172, EU868) and **4G LTE** (A7670G) variants share the same sensor inputs, SD logging, enclosure, and configuration workflow.

SD logging and the local web interface are available on every variant, so even cellular and LoRaWAN units can be inspected on-site and never lose data to a connectivity outage.

PRO configuration: beyond the connectivity choice, the **DL-X4 PRO** adds on-board **relay control outputs**, combining sensor logging **and** actuation (pumps, valves, lighting) in a single unit.

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3. Operating modes

The logger always records to SD. How (and whether) it sends data to the cloud is selected in the web interface under **Telemetry Protocol**.

Mode	Internet needed	What it does
MQTT — DODOTiK Platform *(default)*	Yes	Streams readings over MQTT/TLS to the DODOTiK cloud dashboard
HTTPS — Custom Endpoint	Yes	POSTs self-describing JSON to **your own** HTTPS server (optional Bearer token)
Offline — Local Only *(firmware v2.5.0)*	**No**	Radio runs as a local access point only; logs to SD continuously; connect to view live data + download CSV
Setup Mode	No	Temporary access point for first-time configuration (button-held at boot)

3.1 Online operation

The device joins your Wi-Fi (or cellular/LoRaWAN network on those variants), publishes readings on a configurable interval (default **10 minutes**, minimum **1 minute**), and remains reachable on your LAN at `http://dodo-logger-XXXX.local/` (Wi-Fi variant) for live viewing and configuration. It self-heals across network outages and auto-reconnects.

3.2 Offline operation *(local-only mode — firmware v2.5.0)*

Selected from the Telemetry Protocol menu. The device:

- **Disables the uplink radio entirely** — no cloud, no NTP, no remote update
- **Broadcasts its own password-protected Wi-Fi network** (WPA2) at all times
- **Logs every reading to the SD card** on the normal interval
- Serves the **same web dashboard** for **live readings** and **CSV download/delete**

The customer connects a phone or laptop to the device's Wi-Fi (network name `DODO-LOGGER-XXXX`, unique per unit) using the device password, and opens the dashboard. Timestamps come from the on-board battery-backed RTC; the clock can be set from the browser on connection. This mode is ideal for sites with no connectivity, for data-sovereignty requirements, or as a guaranteed local record.

3.3 Setup mode

Holding the configuration button for 3 seconds at power-on opens an open access point for first-time setup (Wi-Fi credentials, sensor slots, time). This is the guaranteed recovery path and is always available regardless of mode.

4. Sensor & I/O support

One logger reads from 1 to 4 sensors. There are **4 universal slots**, and each is independently assignable to a Modbus sensor or an analog input. Fit as few or as many as the site needs — a single sensor is a valid configuration, four is the maximum, and slots left empty cost nothing and are simply not logged.

Sensors reach those slots through **two GX12 sockets** (section 10.3):

Socket	Carries	Sensors
Modbus RS-485 (GX12, 4-pin)	Multi-drop RS-485 bus	**Up to 4**, daisy-chained, each on its own slave address
Analog (GX12, 4-pin)	AN0 (0–10 V) and AN1 (4–20 mA)	**Up to 2** — one per channel

Any mix that totals **4 or fewer** works: 4 Modbus; 3 Modbus + 1 analog; 2 Modbus + 2 analog; 1 analog on its own. The only ceiling beyond the 4 slots is the analog socket's two channels — **at most 2 analog sensors**, and because the channels are fixed-function, those two must be one **0–10 V** sensor and one **4–20 mA** sensor. Everything else goes on the Modbus bus.

4.1 Modbus / RS-485

- **RS-485 multi-drop bus**, Modbus RTU master
- Function codes **0x03** (Holding) and **0x04** (Input) registers
- Per-sensor address and baud rate
- **Built-in sensor presets:**

Preset	Measures	Interface
XY-MD02	Temperature, Humidity	Modbus, 9600 baud
VES500	Soil 7-in-1 (Moisture, Temp, EC, pH, N, P, K)	Modbus, 4800 baud
SHT40	Temperature, Humidity	Modbus, 4800 baud

- **No-code custom sensor library** — define any FC 03/04 sensor from the web UI: ID, name, function code, start register, register count, default address/baud, and up to **8 fields** each with key, label, unit, data type (**int16 / uint16 / int32 / uint32**), byte order (**ABCD / CDAB**), and scale factor. Up to **10 custom sensor definitions** stored on-device. New sensors appear in every slot's menu instantly — **no firmware reflash required**.

4.2 Analog inputs

On-board 12-bit ADC with hardware signal conditioning:

Channel	Socket pin	Range	Front-end	Notes
AN0 — voltage	**Pin 3**	0–10 V	43 kΩ / 10 kΩ divider (on PCB)	Slot transport "Analog V"
AN1 — current	**Pin 4**	0–20 mA / 4–20 mA	100 Ω burden resistor (on PCB)	Slot transport "Analog mA"

- Per-slot **scaling**: label, key, unit, input range → engineering-output range
- **NAMUR NE43 wire-break / out-of-range detection** for 4–20 mA loops
- Analog front-end auto-detected; if unpopulated on a given build, Modbus features are unaffected

4.3 Relay control outputs — PRO configuration

The **DL-X4 PRO** combines sensing with on-board relay control, so one unit can both monitor and actuate (pumps, valves, lighting, heaters):

Parameter	Value
Relay channels	Up to **32**
Contact rating	**16 A @ 250 VAC**

Parameter	Value
Contact type	**NO / NC** (normally-open / normally-closed)

5. Data logging (microSD card)

- **CSV files** written to a removable microSD card (FAT)
- **Daily file rotation** — `/sensors-YYYYMMDD.csv` — keeps files Excel-friendly and limits any power-loss damage to the current day only
- **One column per enabled sensor field**, with a header row, plus a timestamp column
- **Local-time timestamps** so files open with the site's wall-clock time
- **Hot-pluggable** — insert/remove the card without rebooting; the logger auto-detects and resumes
- **Power-loss hardened** — explicit flush-before-close on every write
- Logging interval configurable (default **60 s**, minimum **5 s**)
- Storage media: removable **microSD card** (FAT), **up to 32 GB** — *card not included*

6. Cloud data delivery

6.1 DODOTiK Platform (MQTT/TLS)

- Encrypted **MQTT over TLS** to the DODOTiK cloud
- **Schema-discovery contract** — the device publishes its own sensor structure; the platform stores and renders any sensor generically, with **no per-sensor backend deployment**
- Topics: `schema` (retained), `telemetry` (periodic), `status` (online/offline LWT)
- Live dashboards, history, alerts, and device management in the DODOTiK web/mobile app

6.2 Your own server (Custom HTTPS)

- HTTPS **POST of self-describing JSON** to a customer-owned endpoint
- Optional **Bearer-token** authentication; TLS mandatory (plain HTTP refused)
- Headers include `X-Device-ID` and `X-Firmware-Version`
- Built-in **Test Send** button verifies the endpoint before going live
- Example payload, plus Express / FastAPI / Node-RED receiver recipes, are provided in the integration guide

7. Configuration & web interface

- **Browser-based dashboard** — no app required; works on phone, tablet, laptop
- Reachable in **Setup Mode** (`http://192.168.4.1/`), **Online Mode** (`http://dodo-logger-XXXX.local/` via mDNS, or device IP), and **Offline Mode** (device's own AP)
- Configure Wi-Fi, telemetry protocol, sensor slots, analog scaling, logging interval, time/timezone, and the offline AP password
- **Live readings** view with per-slot status
- **File browser** — list, download, and delete SD-card CSV files
- **Captive portal** auto-opens the page when joining the device's access point
- **Per-device unique network name** (`DODO-LOGGER-XXXX` , from the device MAC)

8. Time & clock

- **Battery-backed real-time clock (RTC)** — keeps time across power loss
- **Automatic NTP calibration** when online
- **Timezone-aware** — the browser supplies the local offset once during setup; works in any country, including DST, with no per-region firmware

- Clock can be set from the browser, including in fully offline operation

9. Firmware, updates & security

- **Over-the-air (OTA) firmware updates** with **MD5 integrity verification**; device configuration and sensor library are preserved across updates
- **TLS encryption** for all cloud connections
- **WPA2 password protection** on the local access point in offline mode (per-device default password, customer-changeable, 8+ characters)
- **Boot diagnostics** — records and reports the cause of every restart (power-on, brownout, watchdog, etc.) for field support
- **Resilient networking** — outage self-healing, no "stuck offline" failure mode

10. Indicators, controls & connectors

10.1 LED indicators (×2)

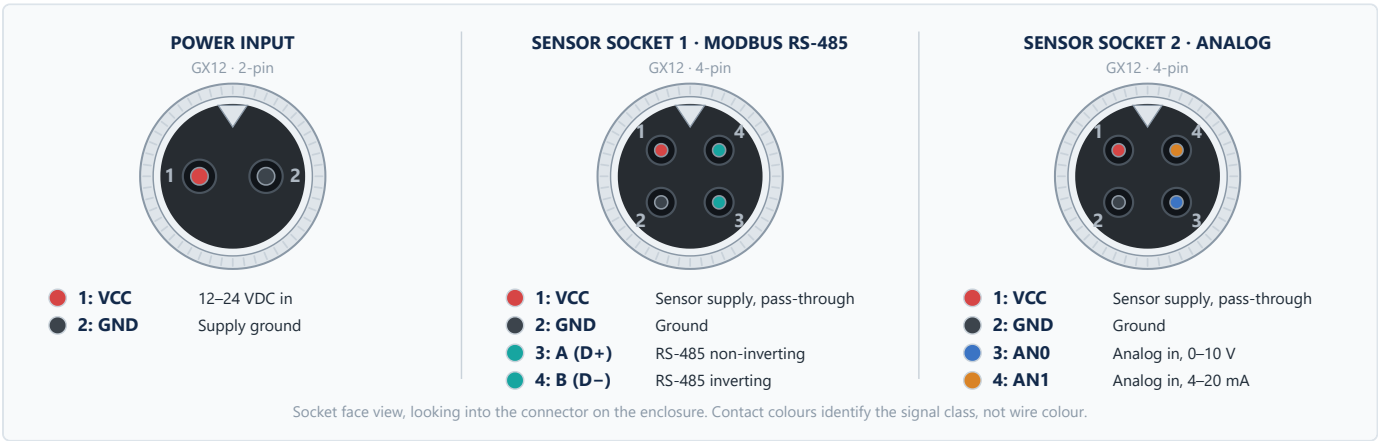
LED	Indication
Status LED	**Solid ON** — network link established · **Slow blink** (≈1 s on / 1 s off) — normal operation (online or offline logging) · **Medium blink** (≈0.5 s on / 0.5 s off) — Setup Mode active · **Rapid double-flash** — connecting to network
Signal / GSM LED	Cellular / network signal & link status (4G LTE and LoRaWAN variants); driven by the radio module

10.2 Controls

Control	Function
Configuration button (internal)	Hold 3 s at boot → Setup Mode; long-press → reconfigure
Magnetic actuation point (top of enclosure)	Trigger Setup Mode with a magnet — no need to open the case

10.3 Connectors & pinout

The enclosure carries **three GX12 aviation connectors** — one power inlet and two sensor sockets — plus the antenna and the card slot:



Socket face view, looking into the connector on the enclosure. Contact colours identify the signal class, not wire colour.

Connector	Type	Pinout
Power input	GX12, **2-pin**	1: VCC (12–24 VDC) · 2: GND
Sensor socket 1 — Modbus RS-485	GX12, **4-pin**	1: VCC · 2: GND · 3: A (D+) · 4: B (D−)
Sensor socket 2 — Analog	GX12, **4-pin**	1: VCC · 2: GND · 3: AN0 (0–10 V) · 4: AN1 (4–20 mA)

Connector	Type	Pinout
Antenna	External (SMA)	Connectivity radio — *antenna included*
microSD	Card slot	Removable data storage, up to 32 GB — *card not included*

The power inlet is **2-pin** and the sensor sockets are **4-pin**, so a power lead cannot be pushed into a sensor socket. VCC on both sensor sockets is a **pass-through of the logger's own input voltage** (12 V in → 12 V out), not a separately regulated rail — size the supply for the logger plus every sensor it feeds.

> **The analog socket's two channels are not interchangeable.** Pin 3 is the **0–10 V** input (43 kΩ / 10 kΩ divider) and pin 4 is the **4–20 mA** input (100 Ω burden). Those front ends are hardware, so a current loop landed on pin 3 will not read and a voltage source on pin 4 will not read. Match each sensor's output type to its pin.

11. Technical specifications

11.1 Power

Parameter	Value
Supply voltage	**12–24 VDC**
Power connector	**GX12 aviation connector, 2-pin** (1: VCC · 2: GND)
Power consumption	Varies with the number and type of connected sensors
Sensor supply output (VCC)	**Pass-through of input voltage** (12 V in → 12 V out; 24 V in → 24 V out)
Reverse-polarity protection	**Yes**

11.2 Processing & memory

Parameter	Value
Program memory	16 MB onboard flash
Configuration storage	Non-volatile memory — retains settings & sensor library across power loss
Data storage	Removable microSD card, up to 32 GB (not included)

11.3 Wireless — Wi-Fi variant

Parameter	Value
Wi-Fi	802.11 b/g/n, 2.4 GHz
Access-point mode	WPA2 (offline / setup), unique SSID per device
Local discovery	mDNS (`.local`)

11.4 Wireless — LoRaWAN variant

Parameter	Value
Module	RAK3172
Frequency band	EU868
Class	Class A
Activation	OTAA / ABP (configurable)

Parameter	Value
Range	Up to 10 km (line of sight)

11.5 Wireless — 4G LTE variant

Parameter	Value
Modem	A7670G (LTE Cat-1)
Bands	Global multi-band LTE
Fallback	2G (GSM)
SIM	Full-size (standard) SIM card

11.6 Mechanical & environmental

Parameter	Value
Enclosure	Wall-mount, flanged tabs (as pictured)
Material	ABS
Ingress protection	**IP68**
Dimensions (L × W × H)	**150 × 45 × 95 mm** (15 × 4.5 × 9.5 cm)
Weight	**150 g**
Operating temperature	**−20 … +70 °C**
Humidity	**0–95 % RH** (non-condensing)
Mounting	Wall-mount

12. Compliance, quality & warranty

- **Conformity assessment** — CE (RED/EMC), RoHS and REACH assessment is carried out per production order; the **Declaration of Conformity and test reports are issued with the first volume shipment**
- **Destination-market type approval** — where the destination country operates its own approval scheme, this is arranged per market; please ask
- **Made in Türkiye**
- **Warranty: 1 year**

13. Ordering information

Order code	Description
DL-X4-V2-WIFI	DODO LOGGER, 4 universal slots, Wi-Fi uplink
DL-X4-V2-LORA	DODO LOGGER, 4 universal slots, LoRaWAN uplink (RAK3172, EU868)
DL-X4-V2-4G	DODO LOGGER, 4 universal slots, 4G LTE uplink (A7670G)
DL-X4-PRO	**PRO** — combined **sensor + relay** unit: sensing inputs **and** up to 32 relay outputs (16 A @ 250 VAC, NO/NC) in one device

> Model marking on the enclosure: **DL-X4, V2, PRO**. The **PRO** configuration adds on-board relay outputs, so a single unit both reads sensors and switches loads (pumps, valves, lighting, etc.).

What's in the box:

- DODO LOGGER unit
- External antenna *(included)*
- Quick-start guide

Not included: microSD card, power supply.

14. Applications

- Smart agriculture & greenhouses (soil NPK, moisture, temperature/humidity)
- Irrigation & water-reservoir monitoring
- Environmental & air-quality monitoring
- Cold-chain & warehouse logging
- Industrial process & utility metering (any Modbus / 4–20 mA sensor)

15. Support & contact

Company	**DODOTiK — industrial IoT hardware, designed and built in Türkiye**
Address	**Aykosan Sanayi Sitesi, Çarşı Blok No: 416, Başakşehir, Istanbul, Türkiye**
Phone	**+90 538 282 6257**
WhatsApp	**+90 538 282 6257**
Email	**info@dodotik.com**
Website	**www.dodotik.com**
Cloud platform	**https://platform.dodotik.com**
Technical support	**info@dodotik.com — quote the model number from the unit label**
Sales & distribution	**info@dodotik.com — export pricing, volume tiers and partner terms on request**

Quote the model marking on the enclosure (**DL-X4 · V2 · PRO**) and the uplink variant when you contact support; it tells us which radio and which firmware branch you are on before the first reply.

Integration guides — Custom-HTTPS receiver recipes and the no-code sensor-library workflow — are available in the product documentation. The companion **DODO SOIL (DOT-SMPS-V2)** 8-in-1 soil probe has its own datasheet and is supported by the no-code sensor library out of the box.

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