

DODO AQUA LEVEL

Submersible Hydrostatic Water-Level Sensor

MODEL **DOT-WLS-200**

ORDER CODE **DA-LVL**

Water Level · Hydrostatic Head

Works with **DODO LOGGER** · **DODOTiK Platform** · **DODOLINK mobile app** · any Modbus-RTU master



Two ranges: 0–5 m and 0–10 m

±0.3 % F.S. (±15 mm on 5 m)

RS-485 Modbus-RTU

Cable 6 m or 11 m, moulded in

Stainless steel, detachable nose cap

DC 12–36 V

Datasheet Rev 1.0

1. Overview

DODO AQUA LEVEL (DOT-WLS-200) is a submersible hydrostatic level sensor. It hangs on its own cable in the liquid and reports the depth of water standing above its diaphragm over **RS-485 Modbus-RTU**.

Hydrostatic measurement is the method of choice for boreholes, tanks, reservoirs and wet wells because nothing has to be mounted above the liquid and nothing has to see the surface. Foam, vapour, steep walls and awkward geometry do not affect it. A float has moving parts; an ultrasonic head needs a clear line of sight and loses foam; a radar unit costs several times as much. A pressure sensor sitting at the bottom simply reads the water standing on top of it.

The sensing element is a piezoresistive pressure chip with laser-trimmed temperature compensation, packaged behind a **stainless steel** diaphragm. The nose is a **detachable stainless anti-blocking cap** with a **3 mm guide hole at 45°**, so the measuring chamber can be unscrewed and rinsed on site rather than returned to a workshop.

The cable is the installation. There is no thread, no bracket and no stilling well: the probe is lowered to depth and the cable carries it. Each range therefore ships with a cable a metre longer than it — **6 m on the 5 m range, 11 m on the 10 m range** — so the probe can sit on the bottom while the gland still lands dry above the top. The cable is moulded into the sealed body and cannot be extended in the field, so order the range that matches the depth.

Headline capabilities

- **Two ranges** — 0–5 m of water on a 6 m cable, or 0–10 m on an 11 m cable
- **Cable matched to the range** — long enough to reach the bottom and still land dry at the top, and moulded into the sealed body
- **Accurate** — ±0.3 % F.S.: **±15 mm** on the 5 m range, **±30 mm** on the 10 m range. ±0.2 % F.S. to order
- **Stable** — ±0.1 % F.S. per year, ±0.02 % F.S. per °C
- **Serviceable in place** — detachable anti-blocking nose cap, 3 mm guide hole
- **No structure needed** — suspended by its own cable, no thread or bracket
- **Reports in the unit you want** — m H₂O, mm H₂O, kPa, bar, psi and more, selectable over the bus
- **Protected supply** — reverse-polarity and current-limiting protection built in

2. Product identification

Item	Value
Product name	DODO AQUA LEVEL — Submersible Hydrostatic Water-Level Sensor
Model number	DOT-WLS-200
Order code	DA-LVL (<i>see section 14 for configured variants</i>)
Product family	DODO AQUA — Industrial Online Water Sensors
Brand	DODOTiK · www.dodotik.com
Interface	RS-485, Modbus-RTU
Cable termination	GX12 aviation connector, 4-pin , female (socket contacts), fitted as standard

Marking on the unit. The body is laser-marked with five lines: the model number, the measuring range, the supply and output, a unique serial number, and *dodotik.com*. On a DA-LVL-R5-C6 that reads:

```
DOT-WLS-200
0-5 m
12-36VDC   RS-485
S/N LVL-2610-0001
dodotik.com
```

Quote the serial number. The model number names the product and the range names the variant, but the serial is the only identifier unique to your unit, and it maps to the exact configuration shipped. The order code is **not** marked — section 14 lists the codes, and the serial resolves which one you have.

3. Measured parameters

Parameter	Unit	Range	Accuracy	Resolution
Water level (hydrostatic head)	m H ₂ O	0–5 m or 0– 10 m	±0.3 % F.S. — ±15 mm (5 m) · ±30 mm (10 m) (±0.2 % F.S. <i>option</i>)	1 count — see the decimal-point register

How the value arrives. DODO AQUA LEVEL returns its reading as an integer plus a decimal-place count; for this product the count is **set by register 0x0003**, so the reading is $\text{raw} / 10^{\text{set by register 0x0003}}$. Section 9.2 gives the register map.

4. How it works

Hydrostatic pressure. The pressure a column of liquid exerts on the diaphragm is $p = \rho gh$ — density times gravity times height. With the probe resting at a known depth, the pressure it reads is the head of liquid directly above it, and that converts straight into a level.

Piezoresistive chip, laser-trimmed compensation. The sensing element is a diffused-silicon pressure chip whose bridge output is amplified and temperature-compensated inside the stainless body. The compensation resistors are laser trimmed at the factory, which is what holds the ±0.02 % F.S. per °C drift figure across the working range.

Measured from the diaphragm, not from the floor. The sensor reads the head **above its own diaphragm**. Whatever depth of liquid sits below the probe is invisible to it. Hang the probe at the lowest level you need to measure, and add the offset in the host if your datum is the tank floor.

Density matters. The reading is a pressure converted on an assumed density. For clean water that assumption holds. For brine, slurry, fuel or any liquid whose specific gravity is not 1.0, multiply the indicated level by the actual specific gravity to get true depth — or build it into the host's scaling.

The reported unit is configurable. Register 0x0002 decides what the measured value means: **7 = m H₂O** and **8 = mm H₂O** report level directly, while 0–6 report pressure in MPa, kPa, Pa, bar, mbar, kg/cm² or psi. Read it at commissioning — the integer in register 0x0004 means nothing without it.

5. Technical specifications

5.1 Measurement

Parameter	Value
Measured parameter	Water level (hydrostatic head)
Measuring principle	Piezoresistive pressure chip , laser-trimmed temperature compensation
Measuring range	0–5 m or 0–10 m of water column — factory-set , specify at order
Accuracy	±0.3 % F.S. standard — ±15 mm on the 5 m range, ±30 mm on the 10 m range · ±0.2 % F.S. to order
Long-term stability	±0.1 % F.S. per year
Temperature drift	±0.02 % F.S. per °C
Overload capacity	1.5 × full scale
Reported unit	Selectable — m H ₂ O, mm H ₂ O, MPa, kPa, Pa, bar, mbar, kg/cm ² , psi
Warm-up	30 minutes from power-on for full stability
Calibration	Zero offset user-settable over the bus; span is factory-set

5.2 Electrical

Parameter	Value
Supply voltage	DC 12–36 V (<i>24 V typical</i>)
Output	RS-485, Modbus-RTU
Baud rate	9600 (<i>default</i>) — 1200 to 115200 selectable over the bus
Frame format	8 data bits, 1 stop bit, no parity (8N1)
Default slave address	1
Addressing	Field-changeable over the bus, range 1–255
Protection	Reverse polarity and current limiting on the supply
Cable	6 m with the 5 m range · 11 m with the 10 m range; moulded into the body, GX12 4-pin female fitted

5.3 Mechanical and environmental

Parameter	Value
Body material	Stainless steel
Nose cap	Detachable stainless steel anti-blocking cap
Medium inlet	3 mm guide hole , 45° tilt
Mounting	Suspended by its own cable — no thread, bracket or stilling well
Measuring medium	Liquids non-corrosive to stainless steel
Medium temperature	0 ... +50 °C , non-freezing
Ambient temperature	–20 ... +85 °C

Parameter	Value
Immersion	Continuous submersion — sealed body and moulded cable gland

6. Dimensions

Overall body length and diameter are not published by the manufacturer; a dimensioned drawing is available on request. The figures below are the mechanical facts that affect installation and service.



Nose detail. The stainless anti-blocking cap unscrews for cleaning, and the medium reaches the diaphragm through a 3 mm guide hole set at 45 degrees.

Dimension	Value
Cable length	6 m (0–5 m range) · 11 m (0–10 m range)
Nose cap	Detachable , stainless steel anti-blocking
Medium inlet	3 mm guide hole at 45°
Body material	Stainless steel
Suspension	By cable — no thread or bracket required

7. Installation and wiring

7.1 Connector and pinout

The cable is terminated in a **GX12 4-pin female aviation connector**, fitted as standard. It screws directly onto the **DODO LOGGER** Modbus RS-485 sensor socket — no stripping, no terminal block, no tools.

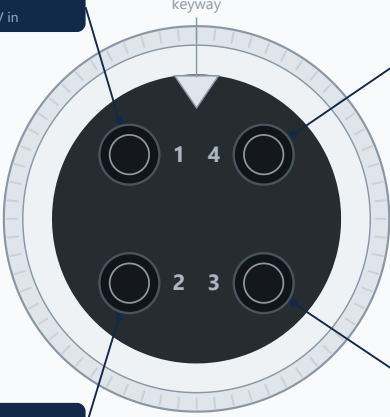
1: VCC
DC 12–24 V in

keyway

4: B (D–)
RS-485 B

2: GND
Ground

3: A (D+)
RS-485 A



Socket face view · looking into the connector

GX12 aviation connector
4-pin female, fitted to the sensor cable
Threaded coupling nut, screw-locking
Mates the DODO LOGGER Modbus RS-485 socket

4-core cable



coupling nut

Keyed: one mating orientation only

Numbering as marked on the insert. The solder side of the connector is the mirror of this view.

Pin	Signal	Function
1	VCC	Power + (DC 12–36 V)
2	GND	Ground
3	A (D+)	RS-485 A
4	B (D–)	RS-485 B



The GX12 4-pin female connector fitted to the sensor cable, seen on the socket face. The four socket contacts and the keyway notch are visible; the drawing above gives the signal that lands on each.

Connector	Value
Type	GX12 aviation connector, 4-pin
Gender on sensor cable	Female (socket contacts)
Coupling	Threaded nut, screw-locking
Keying	Moulded keyway — one mating orientation only
Mates with	DODO LOGGER Modbus RS-485 sensor socket (GX12, 4-pin)

The logger passes its own input voltage straight through to VCC, so a 12 V or 24 V logger supply sits inside this sensor's DC 12–36 V window with no separate PSU.

Pin numbering is read from the **socket face** — looking into the connector, as drawn. The solder side is the mirror of that view.

The connector is not the wet part. The **IP68** rating covers the sensor body and its moulded cable gland. The GX12 mating pair is a screw-locking dry-side connector: keep it above water, inside the logger enclosure or in a sealed junction box. A connector standing in water eventually tracks between contacts, and the symptom is an intermittent Modbus timeout rather than an obvious failure.

Third-party controllers. The sensor is a plain Modbus-RTU device, so a PLC, DCS, recorder or any other RS-485 master reads it directly. Mate the GX12 to a matching panel socket or a GX12-to-flying-lead patch lead; the pin numbering above is all the information needed. Never cut the cable at the sensor's own gland — that gland is part of the IP68 seal.

Ordering without the connector. Order code **DA-LVL-BL** ships bare-ended instead. Those four cores are red VCC, black GND, blue 485A, white 485B, and that is the only variant where the colours matter — on every other order the cable is moulded and terminated, and no conductor is ever exposed.

7.2 Installation

Lower it to the depth you want to measure from. The probe reads the head above its own diaphragm, so its resting position *is* the zero of the measurement. In a tank that normally means just clear of the floor; in a borehole, below the lowest expected drawdown.

Keep the nose out of the silt. Settled solids over the 3 mm guide hole damp the response and eventually block it. Where there is sediment, hang the probe a little above the floor or inside a perforated guide tube.

Stay out of the fill stream. Liquid falling onto or past the probe adds dynamic pressure and makes the reading jump on every fill cycle. Hang it away from the inlet, and away from a running pump or agitator.

Take the weight at the top, not at the gland. Clamp or cleat the cable at the head of the installation. The cable is rated to carry the probe, but it should not be left swinging against a wall or chafing over a concrete edge.

Allow the warm-up. The output settles fully about **30 minutes** after power-on. Commission against a dip tape after that, not before.

7.3 Handling and maintenance

- Unscrew the **anti-blocking nose cap** and rinse the chamber and the 3 mm guide hole with clean water. That is the whole routine service, and it is done in place.
- Never poke the diaphragm. It is a thin stainless membrane, and a screwdriver, a wire or a jet of grit will end the sensor — the factory excludes a punctured diaphragm from warranty.
- Rinse the body after service in saline or dirty water; do not scrape it.
- Re-zero after cleaning if the dry reading has moved — see section 8.
- Lift by the cable steadily. Do not jerk a probe that has silted in; free it with water rather than force.

8. Calibration

Zero offset is the only user calibration. The span is set at the factory and the calibration registers are locked: a controller that tries to write them gets an exception code back, not a silent change.

To re-zero. Lift the probe clear of the liquid, let it settle, and read the measured value at register **0x0004**. In air it should read zero; whatever it reads instead is the offset to cancel. Write the negative of that to register **0x000C** with function code 0x06, then **save** with a write to **0x000F**. Writing 0 to 0x000C clears the offset and returns the sensor to its factory zero.

The device applies it as *output = calibrated measurement + zero offset*, so the sign matters: a sensor reading +12 counts in air needs **-12** written to 0x000C.

A zero offset does not fix a span error. If the sensor is right at zero and wrong at depth, the range or the liquid density is the problem, not the offset. Check the specific gravity of the liquid before asking for a recalibration.

9. Modbus-RTU interface

9.1 Link settings

Setting	Value
Protocol	Modbus-RTU
Slave address	1 (default), range 1–255
Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

DODO AQUA LEVEL ships on slave address 1. Every unit of a given product leaves the factory on the same address, so two of them on one RS-485 bus collide on first power-up — and the symptom is garbled or missing replies rather than a clean error. Address each sensor individually, one on the bus at a time, before wiring the bus up. Section 9.5 has the command.

9.2 Register map

The reading is held in **holding registers starting at 0x0000**, read with function code **0x03**. DODO AQUA LEVEL returns **1 registers** in one transaction.

Register	Name	Access	Notes
0x0000	Slave address	Read / Write	1 by default, range 1–255
0x0001	Baud rate	Read / Write	A code, not a value: 0 =1200 · 1 =2400 · 2 =4800 · 3 =9600 · 4 =19200 · 5 =38400 · 6 =57600 · 7 =115200
0x0002	Reported unit	Read	0 =MPa · 1 =kPa · 2 =Pa · 3 =bar · 4 =mbar · 5 =kg/cm ² · 6 =psi · 7 =m H ₂ O · 8 =mm H ₂ O
0x0003	Decimal-point position	Read	0–3 — divide the value by 10 ⁿ
0x0004	Measured value	Read	Signed 16-bit, –32768 ... 32767
0x0005	Range zero point	Read	Factory-set
0x0006	Range full scale	Read	Factory-set
0x000C	Zero offset	Read / Write	Factory default 0
0x000F	Save to user area	Write	Commits address, baud and zero offset
0x0010	Restore factory parameters	Write	Write 1

The decimal point travels with the value. The reading is $\text{value} / 10^{\text{decimals}}$. The exponent is fixed for a given product and range, so an integrator can treat it as a constant - but it must be read once at commissioning and checked, because it is the device that decides it, not the datasheet.

9.3 Reading the measured value

Request — read 1 registers from 0x0000 on slave 6:

```
01 03 00 04 00 01 C5 CB
```

Response:

```
01 03 02 09 C4 BF 87
```

Bytes	Raw	Decodes to
09 C4	0x09C4 = 2500	measured value, raw
reg 0x0003	3	decimal places → 2.500
reg 0x0002	7	unit is m H ₂ O → 2.500 m of water

9.4 Calibration commands

Written with function code **0x06**. The sensor echoes the frame back on success.

Calibration	Request frame	Response
Write a –12 count zero offset	01 06 00 0C FF F4 09 BE	01 06 00 0C FF F4 09 BE
Read back the stored zero offset	01 03 00 0C 00 01 44 09	value returned
Save settings to the user area	01 06 00 0F 00 00 B9 C9	01 06 00 0F 00 00 B9 C9
Restore factory parameters	01 06 00 10 00 01 49 CF	01 06 00 10 00 01 49 CF

9.5 Changing the slave address

Write the new address to register **0x0000** with function code **0x06**. Changing a sensor from address 1 to address 2:

```
01 06 00 00 00 02 08 0B
```

Bytes	Meaning
01	Current slave address
06	Function code 0x06 — write single register
00 00	Register 0x0000
00 02	New address = 2
08 0B	CRC16, low byte first

The reply carries the **new** address, not the old one. Valid addresses are 1–255.

Baud rate. Baud rate lives in register 0x0001 as a **code, not a number**: 3 means 9600. Writing the wrong code makes the sensor unreachable until the bus is swept for it.

9.6 Error responses

If the sensor cannot execute a command it replies with the function code plus 0x80 and an error code:

Field	Value
Address	The sensor's own address
Function code	Requested function code + 0x80
Error code	0x01 — function-code error · 0x03 — data error
CRC	CRC16, low byte first

10. DODO LOGGER, DODOTiK Platform and the DODOLINK app

DODO AQUA LEVEL is a complete monitoring point on its own: plug it into a **DODO LOGGER** and the readings are recorded locally, sent to the cloud, and visible on a phone — with no firmware work and no integration project.



DODO LOGGER — the companion data logger. The sensor's fitted GX12 connector screws straight onto its Modbus RS-485 socket; up to four sensors per logger, uplink over Wi-Fi, LoRaWAN or 4G LTE.

10.1 Reading the sensor with DODO LOGGER

DODO AQUA LEVEL is read through the logger's **no-code sensor library**. An installer defines the sensor once in the logger's web interface, assigns it to one of the four universal slots, and the readings begin logging to SD and publishing to the cloud — no firmware reflash and no backend change, because the logger self-describes its schema to the platform.

Item	Behaviour
Slot type	Modbus RS-485 (GX12 4-pin socket)
Connection	Plug-in — the fitted GX12 connector mates directly; no wiring
Function code	0x03 (read holding registers)
Start register	0x0000
Register count	1
Baud rate	9600 , 8N1
Power	Supplied by the logger; pass-through of its 12–24 V input
Sensors per logger	Up to 4 slots; each sensor on the bus needs a unique address
Logging	Every reading to microSD, always on, offline included
Cloud	MQTT/TLS to the DODOTiK Platform, or POST to your own HTTPS endpoint

Suggested field definitions

Field	Data type	Scale	Unit
level	int16	from register 0x0003	m H ₂ O

The device also returns its decimal-place registers. The logger's sensor library carries a fixed scale factor per field, so the exponent registers are normally left undefined and the scale above is used instead. Read them once at commissioning to confirm the exponent is what this datasheet states; it is the device that decides it.

10.2 DODOTiK Platform and the DODOLINK mobile app

Readings published by the logger arrive at the **DODOTiK Platform** (`platform.dodotik.com`) over MQTT/TLS, and at the **DODOLINK** mobile app for iOS and Android. Because the logger publishes its own schema, a new sensor appears in both with no backend deployment and no app update.

Where	What you get
DODO LOGGER — on the device	Browser dashboard served by the logger itself, on the local network or its own access point. Live readings, slot configuration, and CSV download straight off the microSD card. No app, no internet.
DODOTiK Platform — web	Live dashboards, full history, alert thresholds and device management across every logger on the account.
DODOLINK — iOS and Android	The same live readings and alerts on a phone, for operators who are not at a desk.
Your own system — instead of, or alongside	The logger can POST self-describing JSON to your HTTPS endpoint, or the sensor can be read directly by any Modbus-RTU master — PLC, DCS, SCADA or a paperless recorder.

Nothing here is a lock-in. DODO AQUA LEVEL is a standard Modbus-RTU device on a standard RS-485 bus. The DODO LOGGER, the platform and the app are the fastest route from probe to dashboard, not the only one — the register map in section 9 is everything a third-party integrator needs.

11. The DODO AQUA family

DODO AQUA is the DODOTiK water-sensor line. Every member outputs RS-485 Modbus-RTU and carries the same GX12 4-pin female connector, so any mix of them runs on a single DODO LOGGER bus — up to four slots, each on its own address.

Product	Measures	Range	Order code
DODO AQUA pH	Industrial Online pH Sensor	0–14 pH	DA-PH
DODO AQUA ORP	Online ORP / Redox Potential Sensor	–1500 ... +1500 mV	DA-ORP
DODO AQUA EC/TDS	Online Conductivity & TDS Sensor	Six ranges - see section 14	DA-EC
DODO AQUA SAL	Inductive Salinity Sensor	0–70 PSU	DA-SAL
DODO AQUA CL	Amperometric Free Chlorine Sensor	0–2.000 mg/L	DA-CL
DODO AQUA LEVEL ←	Submersible Hydrostatic Water-Level Sensor	0–5 m or 0–10 m	DA-LVL
DODO AQUA PRESSURE	Industrial Line Pressure Transmitter	0–6, 0–10 or 0–16 bar	DA-PRS

What they share is the bus: RS-485, Modbus-RTU at 9600 8N1, with the GX12 4-pin female connector fitted as standard. Where they differ is mounting, supply and cable. The five water-quality sensors are 3/4" NPT bodies on DC 12–24 V $\pm 10\%$ with a 5 m cable, rated IP68 — except **DODO AQUA CL**, which is supplied with a flow cell and is not immersed at all. **DODO AQUA LEVEL** hangs on its own cable and **DODO AQUA PRESSURE** screws into a G1/2 port; both run on DC 12–36 V.

Default slave addresses are not the same across the line: DODO AQUA LEVEL and DODO AQUA PRESSURE on **address 1**; the five water-quality sensors on **address 6**. Address every sensor individually before putting them on one bus.

12. Quality and warranty

- Stainless steel body and diaphragm, rated for continuous submersion
- Detachable nose cap — the part that fouls is serviceable without a return
- **Warranty: 1 year** from date of sale
- Excluded: pressure overload beyond $1.5 \times$ full scale, incorrect wiring, and a punctured or abraded diaphragm

13. Applications

- **Boreholes and wells** — static and pumping water level, drawdown monitoring
- **Reservoirs, tanks and cisterns** — stored volume and fill control
- **Irrigation storage** — canal, pond and buffer-tank level
- **Sewage and effluent wet wells** — pump start/stop level, where the liquid is non-corrosive to stainless steel
- **Groundwater monitoring** — aquifer level networks and abstraction compliance
- **Pump protection** — dry-run cut-out and refill control, with a DODO COMMAND relay unit on the same bus

14. Ordering information

Order code	Description
DA-LVL-R5-C6	0–5 m range · 6 m cable · ±15 mm · RS-485 Modbus-RTU, GX12 4-pin female fitted
DA-LVL-R10-C11	0–10 m range · 11 m cable · ±30 mm · RS-485 Modbus-RTU, GX12 4-pin female fitted
...-A02	Either of the above to ±0.2 % F.S. instead of ±0.3 %
...-BL	Either of the above with bare leads instead of the GX12 connector

Before you order: Cable length is fixed to the range and moulded into the sealed body - it cannot be extended in the field, so order the range that matches the depth.

Before you order: Measuring range is factory-set and cannot be changed afterwards.

Before you order: This sensor answers on address 1, where the rest of the family answers on 6.

What's in the box:

- DODO AQUA LEVEL sensor with the ordered cable length, GX12 4-pin female connector fitted
- Test certificate

Not included: power supply, RS-485 interface or logger.

15. Support & contact

Company	DODOTiK — industrial IoT hardware and instrumentation
Address	Aykosan Sanayi Sitesi, Çarşı Blok No: 416, Başakşehir, İstanbul, 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 **serial number** laser-marked on the sensor body when you contact support or reorder. It is the only unique identifier on the unit; the model number **DOT-WLS-200** and the order code are not marked, and the serial is what resolves which configuration you have.

The other six DODO AQUA sensors — **DODO AQUA pH**, **DODO AQUA ORP**, **DODO AQUA EC/TDS**, **DODO AQUA SAL**, **DODO AQUA CL**, **DODO AQUA PRESSURE** — each have their own datasheet. The **DODO LOGGER** data logger and the **DODO SOIL** 8-in-1 soil probe are documented separately.

16. Revision history

Rev	Change
1.0	First release.

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