

DDK-G Series CMOS Laser Displacement Sensor

Laser triangulation · 655 nm Class 2 laser · reference distances 30–250 mm · resolution to 2 μm · 4-20 mA / 0-10 V / RS485 · IP64 · 50 × 60 × 20.4 mm, 65 g

1. Model List — 20 Standard Models

Order code: **DDK-G{range}{N|P}{M | -485}** — range 30/50/85/120/250 mm; N = NPN, P = PNP switching outputs; M = analog (state 4-20 mA or 0-10 V at order); -485 = RS485. Example: DDK-G50N-485.

Reference distance	Measuring range (F.S.)	Measuring window	Analog models	RS485 models
30 mm	±4 mm	26–34 mm	DDK-G30NM / DDK-G30PM	DDK-G30N-485 / DDK-G30P-485
50 mm	±10 mm	40–60 mm	DDK-G50NM / DDK-G50PM	DDK-G50N-485 / DDK-G50P-485
85 mm	±20 mm	65–105 mm	DDK-G85NM / DDK-G85PM	DDK-G85N-485 / DDK-G85P-485
120 mm	±60 mm	60–180 mm	DDK-G120NM / DDK-G120PM	DDK-G120N-485 / DDK-G120P-485
250 mm	±150 mm	100–400 mm	DDK-G250NM / DDK-G250PM	DDK-G250N-485 / DDK-G250P-485

2. Specifications by Range Grade

Item	DDK-G30	DDK-G50	DDK-G85	DDK-G120	DDK-G250
Reference distance	30 mm	50 mm	85 mm	120 mm	250 mm
Measuring range	±4 mm	±10 mm	±20 mm	±60 mm	±150 mm
Resolution (high-res)	2 μm	5 μm	10 μm	30 μm	75 μm
Resolution (fast)	4 μm	8 μm	15 μm	45 μm	150 μm
Linearity	±0.1% F.S. (8 mm)	±0.1% F.S. (20 mm)	±0.1% F.S. (40 mm)	±0.1% F.S. (120 mm)	±0.3% F.S. (300 mm)
Spot — near end *1	0.15 × 0.15 mm	0.6 × 1.2 mm	0.9 × 1.5 mm	1.2 × 1.8 mm	1.5 × 2.5 mm
Spot — centre *1	0.1 × 0.1 mm	0.5 × 1.0 mm	0.75 × 1.25 mm	1.0 × 1.5 mm	1.75 × 3.5 mm
Spot — far end *1	0.15 × 0.15 mm	0.4 × 0.9 mm	0.6 × 1.0 mm	0.5 × 0.8 mm	2.0 × 4.5 mm
Response — fast	max 2 ms (1 sample + sensitivity switch max 1 ms)				max 2.5 ms
Response — standard	max 11.5 ms (16 samples, 8.5 ms + max 3 ms)				max 15.5 ms
Response — high-res	max 36.5 ms (64 samples, 32.5 ms + max 4 ms)				max 48.5 ms
Sampling cycle	500 μs (factory setting)				750 μs

*1 Spot defined at 1/e² (13.5%) of centre intensity; stray light exists outside the defined spot — nearby objects of higher reflectance than the target can cause false readings. Rated under factory test conditions: 23 °C, DC24 V, high-resolution mode, target at range centre, 50 × 50 mm white ceramic.

3. Output Versions — Electrical

Item	Analog current type (...N/PM)	Analog voltage type (...N/PM)	RS485 type (...N/P-485)
Supply voltage	DC12–24 V (+10%/–5%)	DC18–24 V (+10%/–5%)	DC12–24 V (+10%/–5%)
Current consumption	max 60 mA (incl. analog out)	max 40 mA	max 40 mA
Measurement output	4–20 mA, load $\leq 300\ \Omega$	0–10 V, impedance $100\ \Omega$	RS485 (grey = A+, shield = B–)
Switching outputs	2 × NPN/PNP, max 100 mA / DC30 V, residual 1.8 V	same as current type	1 × NPN/PNP (per circuit diagram — confirm with factory)
Cable	$\varnothing 5$, 6-core, 2 m PVC, AWG24	$\varnothing 5$, 6-core, 2 m PVC, AWG24	$\varnothing 5$, 8-core, 2 m PVC, AWG24

4. Wire Colours

Colour	Function
Brown	DC supply +
Blue	0 V (internally connected to shield/analog ground — use blue for supply negative)
Black	Switching output 1 (NPN or PNP per model)
White	Switching output 2 (analog types)
Pink	MF multifunction input — zero-set / teach / laser-off (menu-selectable); pulse >20 ms to 0 V (NPN) or +24 V (PNP), then release
Grey	Analog output 4-20 mA / 0-10 V — or RS485 A+ on -485 models
Shield	Analog ground — or RS485 B– on -485 models

Verify wiring before power-up. Keep the analog output line clear of other conductors.

5. Common Ratings (All Grades)

Measurement principle	Laser triangulation onto CMOS line array (spot centroid, sub-pixel interpolation, factory calibration)
Light source	Red semiconductor laser, 655 nm, max output 1 mW
Laser class	Class 2 (IEC/JIS) · Class II (FDA)
Temperature drift	±0.08% F.S./°C
Display / keys	OLED (threshold Q1 + live value), SET + ▲▼ keys, OUT1/OUT2 orange indicators
Protection circuits	Reverse-connection protection, overcurrent protection
Protection rating	IP64
Ambient (operating)	−10 to +45 °C (no freezing), 35–85% RH (no condensation)
Storage	−20 to +60 °C, 35–95% RH
Ambient illuminance	Sunlight ≤10,000 lx · incandescent ≤3,000 lx
Vibration	10–55 Hz, 1.5 mm double amplitude, 2 h each X/Y/Z
Shock	Approx. 50 G (500 m/s ²), 3 times each X/Y/Z
Warm-up	Internal circuit stable ≈1.5 s · full warm-up max 15 min
Material	Housing aluminum alloy · lens PMMA
Dimensions / mounting	50 (W) × 60 (H) × 20.4 (D) mm · 2 × ø4.5 holes
Weight	65 g cable type (excl. cable) · 90 g connector type

6. Installation & Target-Surface Guidance

- Mount so the target's normal position sits near the **reference distance**, not at the window edges — triangulation linearity and signal margin are best mid-range.
- **Mirror / polished metal:** specular reflection misses (or floods) the receiver — tilt the sensor off the specular angle and verify by trial.
- **Transparent targets:** weak front-surface echo plus a rear-surface echo → unstable readings; sample-test first.
- **Deep matte black:** low reflectance shrinks margin — consider a nearer-range grade.
- **Red-hot workpieces:** their own radiation interferes with the 655 nm band — evaluate separately.
- Keep higher-reflectance objects away from the spot's surroundings (stray light outside the 1/e² spot).
- IP64 = dust-protected + splash-proof only: shield from coolant spray, washdown and persistent oil mist (window guard or air purge).
- Allow ≈1.5 s stabilization after power-up and up to 15 min warm-up before rated accuracy; re-zero periodically where temperature swings (drift ±0.08% F.S./°C).

7. Typical Applications

1. **Battery electrode coating/calendering:** two opposed DDK-G30 in a C-frame, differential thickness, high-res mode, 4-20 mA.
2. **3C float-height inspection:** G30's 0.1 × 0.1 mm spot on narrow bezels; standard mode; RS485 for SPC logging.
3. **Automotive in-line dimensioning:** G50/G85; fast mode (max 2 ms) for rotating parts; 0-10 V to the PLC.

4. **Steel plate/profile thickness & flatness:** G120/G250 for long standoff; large flat surfaces only for G250.
5. **Wood/building-board inspection:** G85/G120, standard mode, 4-20 mA, air purge in dusty zones.
6. **Robot & line positioning:** G120/G250 for large scatter; RS485 transfer; MF as one-touch zero-set.

8. Ordering Checklist

- Grade: 30 / 50 / 85 / 120 / 250 (pick by the target's real standoff, not by maximum margin)
- Output: M analog — state 4-20 mA or 0-10 V (supply ranges differ) — or -485
- Polarity: N (NPN) or P (PNP) switching outputs
- Termination: 2 m cable (6-core analog / 8-core RS485) or connector version (90 g)
- Not printed in the datasheet — request from factory: RS485 protocol/register map, repeatability data

Foshan DAIDISIKE Optoelectronics Technology Co., Ltd. · www.fsddsk.com · Tel/WhatsApp +86 15218909599

Values transcribed from the 2026 DDK-G factory datasheet with printing errata corrected (linearity typos, MF wire colour). Specifications subject to change; confirm critical values in writing at order time. DDK-G was formerly listed as "GDK" on some catalog pages — same product.