

M70LL

Laser Distance Sensor

for automated manufacturing
with Ethernet interface
to connect with PLC

» 100 kHz Measuring frequency
for high-speed measurements



- Ethernet interface
- Analog output
- Ranges 0.5 mm up to 200 mm
- Measuring frequency 100 kHz
- Low noise
- Reliable results also with white/black transition
- Replacable protection glasses

The analog sensors of series M70LL use a PSD for their receiver optics. This assures a continuous position measurement at high-speed movements. Replacable protection glasses and a robust casing allow the use even in dirty environments.

Applications:



Roundness Measurement:

The sensor is mounted in a defined distance to the rotating object. Even smallest deviations from roundness are recognised due to a continuous displacement measurement.



IC check:

To avoid error during placement the ICs are detected by a M70LL laser sensor. Bent or absent pins are realised and can be signaled to the machine control. Thus waste will be recognised immediately and the appropriate corrective action can be initiated without delay.



Thickness Measurement:

Two sensors are measuring onto the top and the bottom side of the target. The thickness of the object results from the measured distance values.



Vibration Measurement:

The M70LL measures the deflection of a membrane at vibrations up to 100 kHz.

Specifications

| Sensor M70LL/ | | 0.5 | 2 | 4 | 10 | 20 | 50 | 100 | 200 |
|-------------------------|--|-------|-----|-----|------|-----|-----|-----|-----|
| Measuring range | [mm] | 0.5 | 2 | 4 | 10 | 20 | 50 | 100 | 200 |
| Range begin | [mm] | 23.75 | 23 | 22 | 40 | 55 | 115 | 170 | 240 |
| Linearity ± | [μm] | 1.5 | 6 | 12 | 30 | 60 | 150 | 300 | 600 |
| Resolution ¹ | [μm] | 0.8 | 3.5 | 7 | 17.5 | 35 | 50 | 100 | 330 |
| Resolution ² | [μm] | 0.05 | 0.2 | 0.4 | 1 | 2 | 7.5 | 15 | 50 |
| Light spot diameter | [mm] | 0.1 | 0.2 | 0.3 | 0.6 | 0.9 | 1.5 | 1.5 | 2 |
| Laser class | class 2 according to DIN EN 60825-1:2001-11, optionally enhanced laser power | | | | | | | | |
| Light source | Laser, wave length 650 ... 670 nm, red visible | | | | | | | | |
| Measurement rate | 400 kHz | | | | | | | | |
| Interface | Ethernet | | | | | | | | |
| Distance output | 4-20 mA; ±10 V (optional 0-20 mA, 0-10 V, 0-5 V, ±5 V) | | | | | | | | |
| Impedance | approx. 0 Ohm (10 mA max.) | | | | | | | | |
| Output rate | 100 kHz (-3 db) | | | | | | | | |
| Temperature drift | 0.02% of range / K | | | | | | | | |
| Light intensity output | 0-10 V | | | | | | | | |
| MIN | +24 V / 10 mA when lower than MIN, LED yellow | | | | | | | | |
| OK | +24 V / 10 mA when higher than MIN and lower than MAX, LED green | | | | | | | | |
| MAX | +24 V / 10 mA when higher than MAX, LED orange | | | | | | | | |
| Error output | +24 V / 10 mA, LED red | | | | | | | | |
| Switching hysteresis | approx. 0.5% of range | | | | | | | | |
| Ambient light | 20,000 Lux | | | | | | | | |
| Operation time | 50,000 h for laser diode | | | | | | | | |
| Isolation voltage | 200 VDC, 0 V against casing | | | | | | | | |
| Max. vibration | 5 g up to 1 kHz | | | | | | | | |
| Operation temperature | 0° ... +50°C | | | | | | | | |
| Storage temperature | -20° ... +70°C | | | | | | | | |
| Humidity | up to 90% RH, non condensing | | | | | | | | |
| Protection class | Sensor head: IP 64, electronic unit: IP 40 | | | | | | | | |
| Power supply | +24 VDC / 250 mA (10 ... 30 V) | | | | | | | | |

All specifications are valid for measurements on matt white objects

¹ Measuring rate 100 kHz ² Measuring rate 230 Hz

Pin assignment 25 pin SUB-D

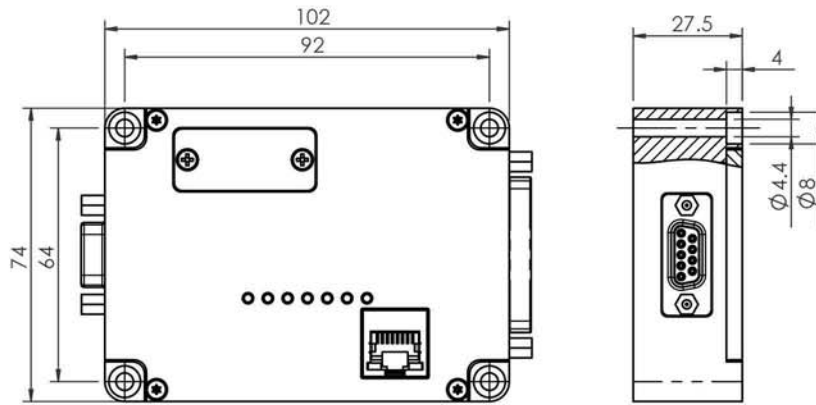
| Pin | Signal | Level | Pin | Signal | Level |
|-----|-------------------|-------------|---------|--------------------|-----------|
| 1 | Distance output | ±10 V | 14 | Analog GND | 0 V |
| 2 | Error output | 0 / 24 V | 15 | n.c. | |
| 3 | n.c. | | 16 | Digital output MAX | 0 / 24 V |
| 4 | n.c. | | 17 | Distance input | 0 ... 5 V |
| 5 | Digital output OK | 0 / 24 V | 18 | Digital GND | 0 V |
| 6 | Distance output | 4 ... 20 mA | 19 | Digital output MIN | 0 / 24 V |
| 7 | n.c. | | 20 | Intensity output | ±10 V |
| 8 | GND power supply | 0 V | 21 | Supply voltage | +24 V |
| 9 | n.c. | | 22 | n.c. | |
| 10 | n.c. | | 23 | n.c. | |
| 11 | n.c. | | 24 | n.c. | |
| 12 | n.c. | | 25 | n.c. | |
| 13 | n.c. | | Housing | EMV | |

Dip switch settings

| Output rate | S1 | S2 | S3 | S4 | S5 | S6 |
|----------------|----|----|----|----|----|----|
| 100 kHz | - | - | - | - | - | - |
| 70 kHz | x | - | - | - | - | - |
| 40 kHz | x | x | - | - | - | - |
| 10 kHz | - | x | x | - | - | - |
| 2,5 kHz | - | - | - | x | - | - |
| 1 kHz | - | - | - | - | x | - |
| 250 kHz | - | - | - | - | x | x |
| 230 kHz | x | x | x | x | x | x |

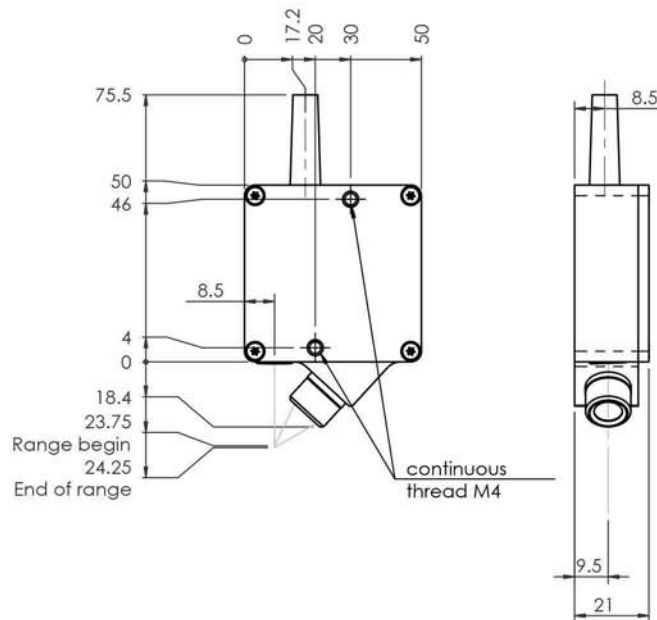
bold text: factory settings

M70LL - Electronic unit



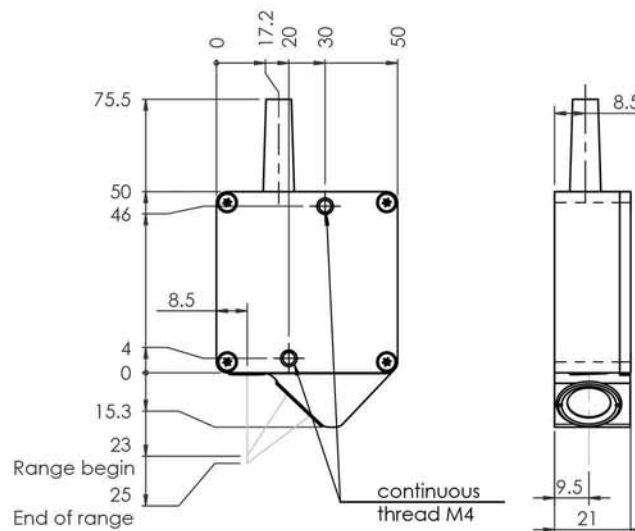
Weight 300 g

Sensor head M70LL/0.5



Weight 250 g

Sensor head M70LL/2



Weight 250 g

Error and technical modification reserved

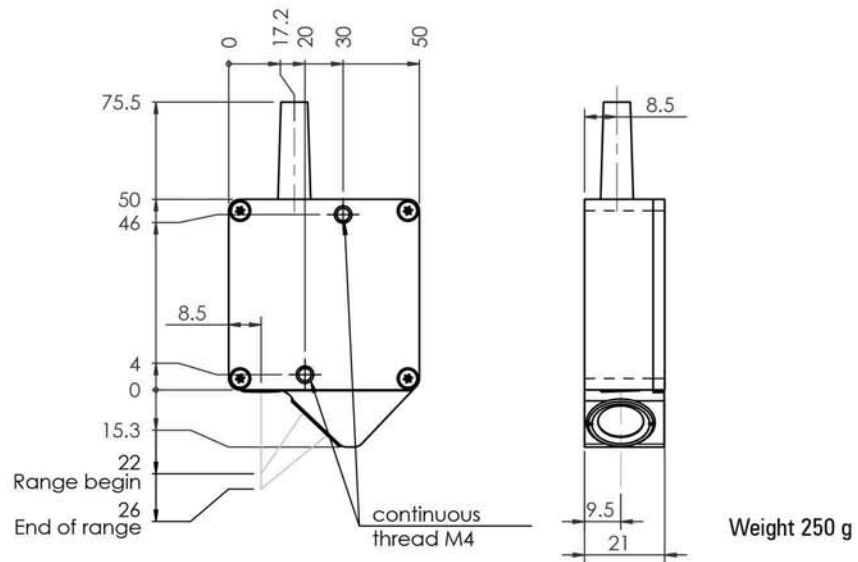
DB-M70LL_5-05-E

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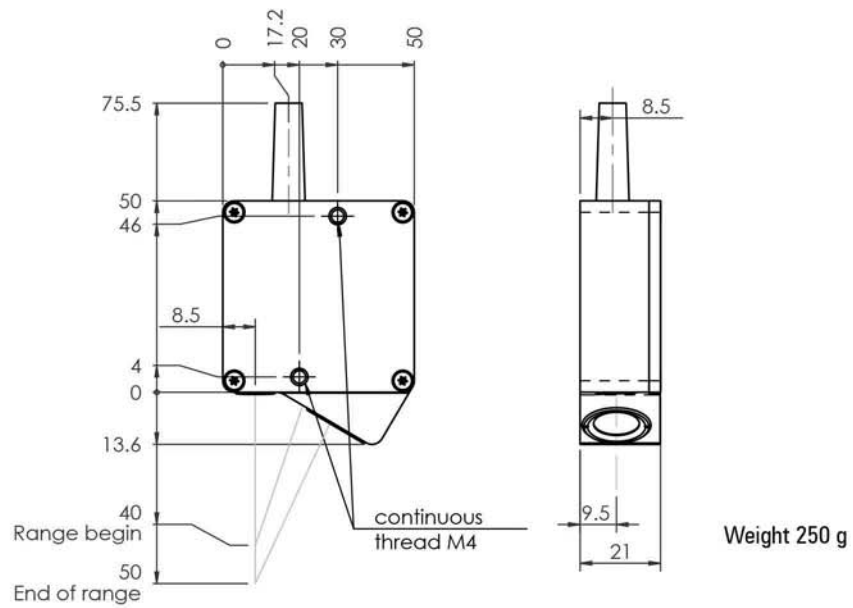
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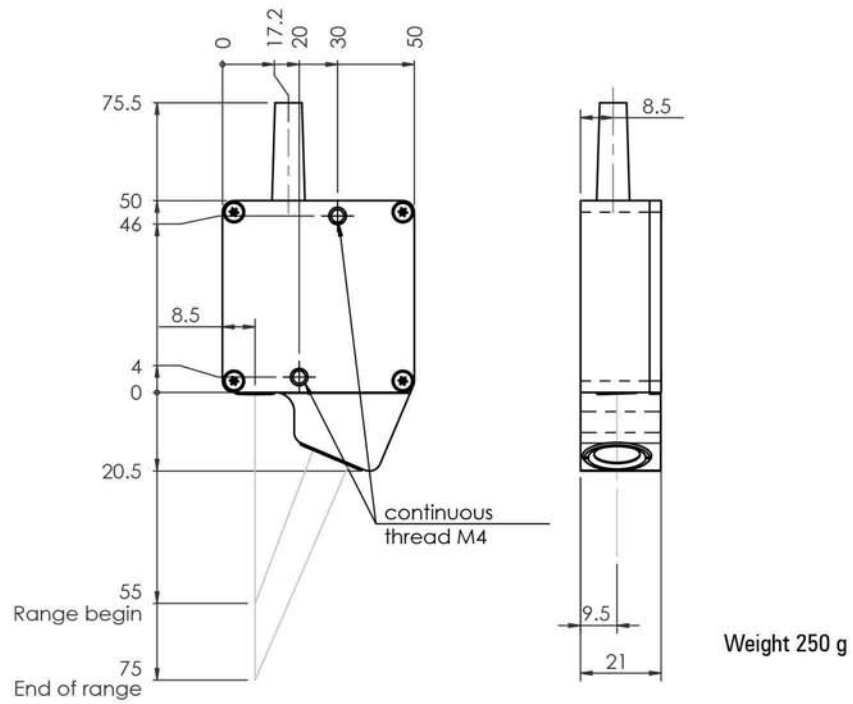
Sensor head M70LL/4



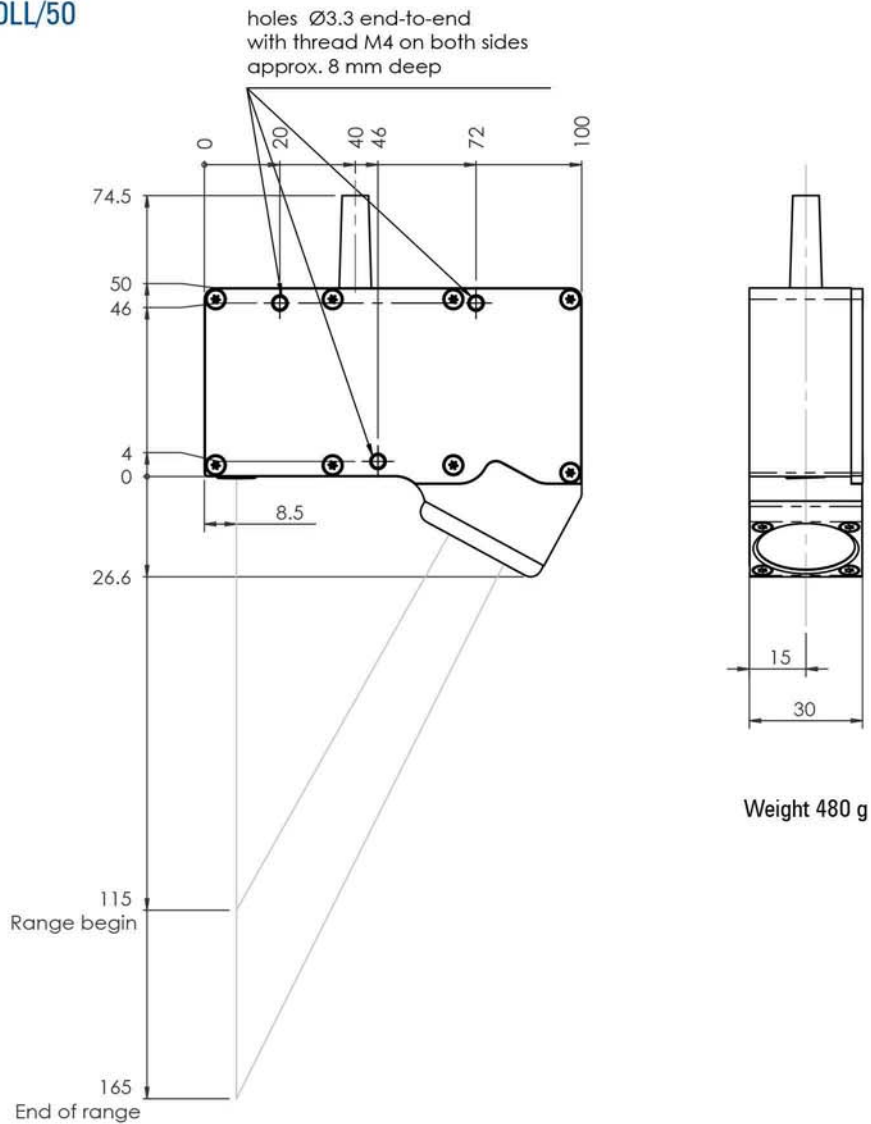
Sensor head M70LL/10



Sensor head M70LL/20



Sensor head M70LL/50



Error and technical modification reserved

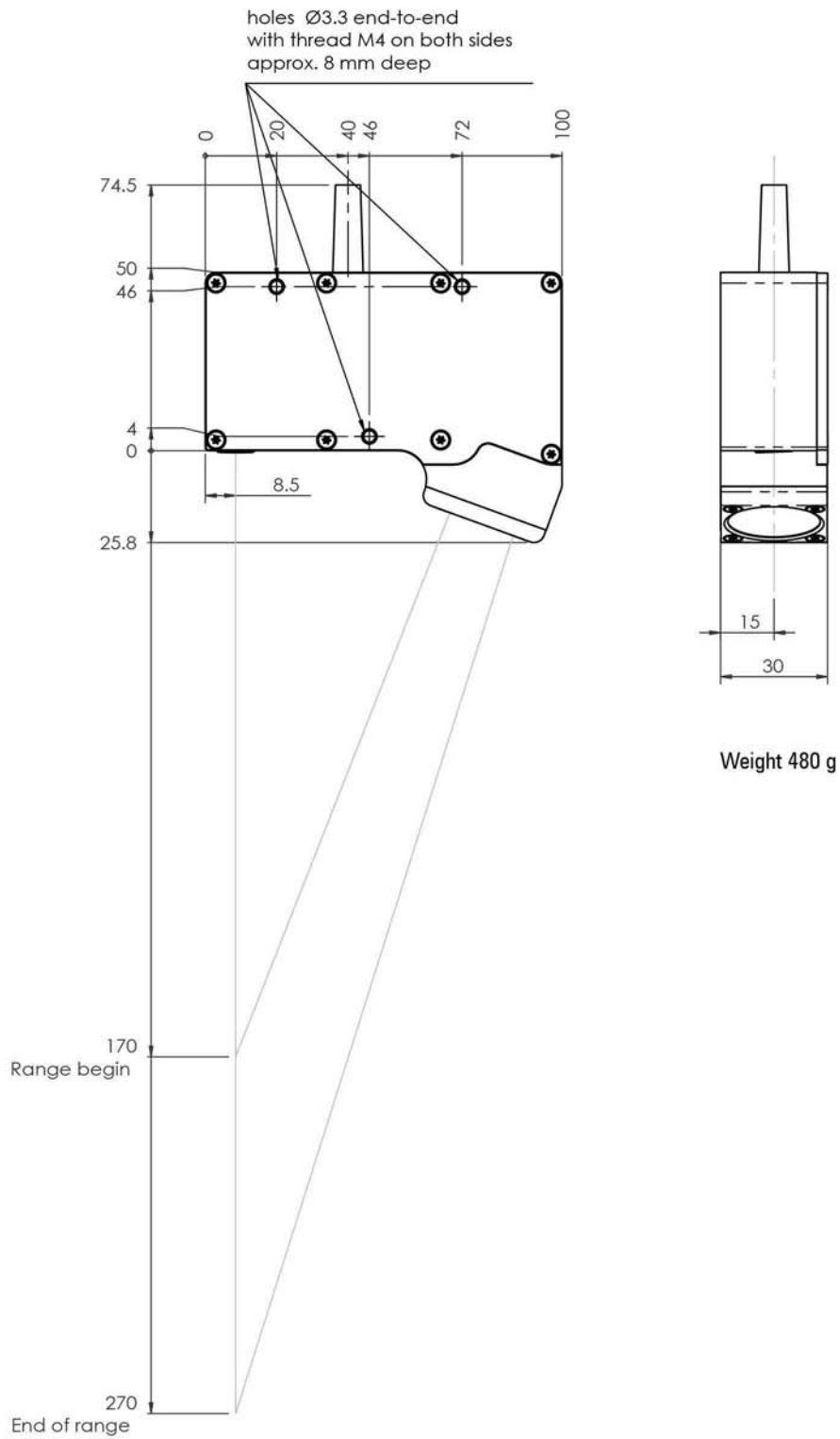
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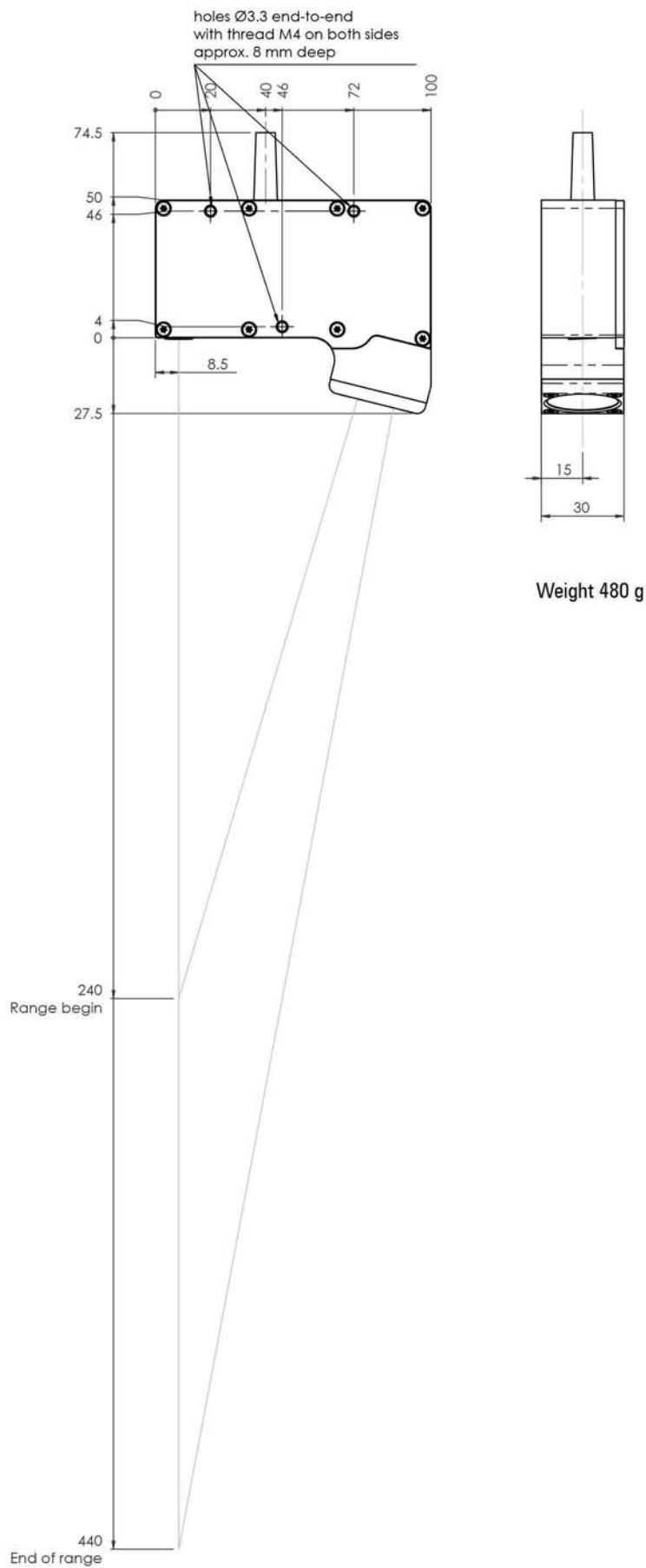
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Sensor head M70LL/100



Sensor head M70LL/200



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