LIMAX2M
Magnetic Absolute Shaft Information System

- Absolute measurement for hoisting heights up to 130 m
- Resolutions: 62.5 / 125 / 250 / 500 or 1000 µm
- Insensitive to dirt, smoke and humidity
- Travel speed up to 4 m/s
- Diverse interfaces available
- No referencing necessary
- Easy and flexible to install
- Vertical installation of the magnetic tape
- Wear-free, contactless and noiseless measuring principle
General:
The absolute shaft information system LIMAX2M with its significant advantages is a particularly affordable, non-sensitive and easy-to-install alternative to conventional shaft information systems. Due to the absolute measurement principle, referencing is not required after commissioning. Compared to other shaft information systems, LIMAX2M is characterized by an extraordinarily low price.

LIMAX2M is able to cover lifting heights up to 130 meters and speeds up to 4 m/s.

The 2M in the type designation stands for “Mini” and means the smallest sensor design of the LIMAX2 series. With its low space requirement, LIMAX2M is also ideally suited for retrofitting and modernization of existing elevator systems.

A simple and flexible mounting ensures quick installation or replacement of the measuring system.

Magnetic Tape:
For measurement of the lift position, the sensor requires an absolute coded magnetic tape of the type AB20-80-10-1-R-D-15-BK80, which carries the unique position information as a magnetic code. The magnetic tape is mounted free-hanging in the shaft by using an ELGO mounting set (see accessories on the last page). At the lower end, the tape is tensioned while it is guided along the cabin by a plastic guidance at the sensor. The actual measurement resp. scanning is basically contactless. The guidance merely serves to keep the correct distance to the sensor.

Resolution:
Depending on the requirements, an appropriate system resolution can be defined with the order (see type designation). The available standard resolutions are 62.5 / 125 / 250 / 500 and 1000 µm.

Available Interfaces:
For communication with the lift control, an interface can be defined with the order (see type designation). Available are CANopen, RS485, RS422 or SSI interfaces with different protocols resp. codings. Customer-specific solutions are also available on request.

Status LEDs:
The LIMAX2M sensor has 3 status LEDs which serve for various messages, e. g. operational readiness or error states of the system, magnetic tape and interface.

Connections:
By default the LIMAX2M sensor is supplied with a M12 round connector and without a signal cable. Depending on the interface selected, the circular connector is designed as a 5- or 8-pin connector. Various cables with the appropriate round connector (on the sensor side) and on the customer side with open cable ends or a 9-pin D-SUB connector can be ordered separately as an accessory.

Sensor Installation:
In order to mount the sensor to the lift cabin, the mounting angle kit LIMAX2M MW SET must be used, which is available as an ELGO accessory. This mounting kit includes two screws with sliding nuts which can be inserted into the mounting groove of the sensor housing in order to fix the angle to the sensor housing. With the remaining long holes, the unit can be fastened on the cabin roof. The tape guidance at the sensor permanently ensures the correct distance between magnetic tape and sensor.

Magnetic Tape Installation:
For elevator applications, the magnetic tape is attached free hanging to the upper end of the shaft and is tensioned at the lower end of the shaft by using a tension spring. Several mounting sets are available for the tape installation, which contain different components depending on the respective requirements. All variants and their order designations are summarized in the table “Accessories” on the last page. Available are various mounting sets as well for central guided cabins as for rucksack-guided systems.
## Technical Data:

### Mechanical Data:
- **Measuring principle**: absolut
- **Repeat accuracy**: ± 1 increment
- **System accuracy in µm at 20 °C**: ± (1000 + 50 x L)
  - L = Messlänge in Meter
- **Distance sensor / tape**: the correct distance is guaranteed by guidance
- **Housing material**: aluminium
- **Housing dimensions**: L x W x H = 247 x 54 x 27 mm
- **Required magnetic tape**: AB20-80-10-1-R-D-15-BK80
- **Basic pole pitch (tape)**: 8 mm
- **Max. measuring length**: 130 m
- **Connections**: standard: M12 round connector
- **Sensor cable**: accessorial part
- **Weight**: approx. 320 g without cable
  - approx. 60 g per meter

### Electrical Data:
- **Power supply voltage**: 10 … 30 VDC
- **Residual ripple**: <200 mVpp
- **Current consumption**: max. 200 mA
- **Interface (order-specific)**: CAN, CANopen (DS406 or DS417), RS422, RS485, SSI (Gray or binary)
- **Resolution (order-specific)**: 1.0 / 0.5 / 0.25 / 0.125 / 0.0625 mm
- **Operating speed**: max. 4 m/s
- **Cycle time**: 10 ms

### Environmental conditions:
- **Storage temperature**: -25 … +85 °C
- **Operating temperature**: -10 … +70 °C
  - (-25 … +85 °C on request)
- **Operating altitude**: max. 200 m above sea level
- **Humidity**: 95 %, non-condensing
- **Protection class**: IP54 (standard)
  - IP67 (on request)

### Sensor with LIMAX2 MW mounting angle:

(see from above)

### Type Designation:

**LIMAX2M**: A A - B B - CCCC - DDDD - E E E E

#### A Version
- **00** = ELGO standard version
- **01** = first special version (etc.)

#### B Signal cable length
- **CON** = no cable, M12 connector on device (standard)

#### C Resolution
- **62N5** = 62.5 µm (0.0625 mm)
- **0125** = 125 µm (0.125 mm)
- **0250** = 250 µm (0.25 mm)
- **0500** = 500 µm (0.5 mm)
- **1000** = 1000 µm (1 mm)

#### D Interface
- **422X** = RS422 [special protocol separately defined by version no.]
- **4220** = RS422 [standard protocol / position]
- **4221** = RS422 [extended protocol / position & speed]
- **485X** = RS485 [special protocol, separately defined by version no.]
- **4850** = RS485 [standard protocol RS485]
- **CNX** = CAN [special protocol, separately defined by version no.]
- **CN0** = CAN [standard protocol Basic-CAN]
- **COX** = CANopen [special profile, separately defined by version no.]
- **CO0** = CANopen [encoder Profile DS406]
- **CO1** = CANopen [elevator Profile DS417]
- **SSBX** = SSI [special protocol, separately defined by version no.]
- **SSBO** = SSI [25-bit binary code / position]
- **SSGX** = SSI [special protocol, separately defined by version no.]
- **SSGO** = SSI [25-bit gray code / Position]

**CAUTION:**
1. Assembly of CAN-load resistor is selectable

<table>
<thead>
<tr>
<th>CAN- Interface</th>
<th>With termination 120R (T)</th>
<th>Without termination</th>
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<tbody>
<tr>
<td>With termination 120R (T)</td>
<td>CNX</td>
<td>CN</td>
</tr>
<tr>
<td>Without termination 120R (T)</td>
<td>CN0T</td>
<td>CN0</td>
</tr>
<tr>
<td>With termination 120R (T)</td>
<td>CNX0T</td>
<td>CNX0</td>
</tr>
<tr>
<td>Without termination 120R (T)</td>
<td>CO1T</td>
<td>CO1</td>
</tr>
</tbody>
</table>

2. RS422 / RS485 / SSI interfaces are basically terminated by 120R!

#### E Options (multiple indications possible)
- **U** = unguided housing version
- **M12M** = 5- resp. 8-pin M12 round connector
  - [5 or 8 pins resp. assignment depends on the type of selected interface]

**Order example:**
- **LIMAX2M - 0 0 - CON - 1 0 0 0 - 4850 - M12M**
  - A A - B B - CCCC - DDDD - E E E E

ELGO standard LIMAX2M without cable, with 1 mm resolution, RS485 interface (standard protocol) and M12 round connector
Dimensions of LIMAX2M:

![Diagram of LIMAX2M dimensions]

Accessories for LIMAX2M:

<table>
<thead>
<tr>
<th>Order designation</th>
<th>Description</th>
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<tr>
<td>LIMAX2M MW SET</td>
<td>LIMAX2M mounting angle for attachment to the lift cabin</td>
</tr>
<tr>
<td>AB20-80-10-1-R-D-15-BK80</td>
<td>Magnetic tape for LIMAX2M, absolute coding, single track system</td>
</tr>
<tr>
<td>LIMAX MKF</td>
<td>Mounting set for suspended installation with dowel</td>
</tr>
<tr>
<td>LIMAX MKB</td>
<td>Mounting set for suspended installation with guiding rails and rail holder</td>
</tr>
<tr>
<td>LIMAX RMS</td>
<td>Mounting set for suspended installation with crossbeam for standard layout</td>
</tr>
<tr>
<td>LIMAX RMS 90</td>
<td>Mounting set for suspended installation with crossbeam for Rucksack-layout</td>
</tr>
<tr>
<td>CABLE-LIMAX2M-M12F5-03.0</td>
<td>LIMAX2M signal cable, 3 m (standard length)</td>
</tr>
<tr>
<td></td>
<td>sensor side CAN &amp; RS485 assignment</td>
</tr>
<tr>
<td>CABLE-LIMAX2M-M12F5-03.0-D9M</td>
<td>LIMAX2M signal cable, 3 m (standard length)</td>
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<td>sensor side CAN &amp; CANopen assignment</td>
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<tr>
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<td>LIMAX2M signal cable, 3 m (standard length)</td>
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<td>sensor side CAN &amp; RS422 assignment</td>
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<tr>
<td>CABLE-LIMAX2M-M12F8-03.0-D9M1</td>
<td>LIMAX2M signal cable, 3 m (standard length)</td>
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<tr>
<td></td>
<td>sensor side CAN &amp; CANopen assignment</td>
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*) other lengths on request