LIMAX2
Magnetic Absolute Shaft Information System

- Absolute measurement for hoisting heights up to 260 m
- Wear-free, contactless and noiseless measuring principle
- High accuracy and repeatability
- Resolutions: 62,5 / 125 / 250 / 500 or 1000 µm
- Very robust against dust, dirt and smoke
- Travel speed up to 10 m/s
- Absolute position is always directly available no referencing even after long power failure
- Compatible with many established controls with absolute encoder interface
- Several interfaces available e. g. CAN, CANopen, RS422, RS232, SSI or PROFIBUS
- Easy and flexible to install
- Vertical installation of the magnetic tape
General:
The magnetic absolute shaft information system LIMAX2 is able to cover lifting heights up to 260 meters and speeds up to 10 m/s. Thanks to the contactless and very robust magnetic tape technology, the measurement is not affected by dust, dirt or smoke. On request, the system can be equipped so that moisture and increased temperatures do not affect the measurement quality, which makes the LIMAX2 system ideally suited for use in firefighter lifts. The magnetic tape itself is also resistant to the sometimes harsh conditions during assembly and operation of elevators.

Various available interfaces allow that the system can be directly connected to most common lift controls. Another advantage of the system is the easy and flexible installation. The installation itself can be done by experts in less than one hour. The installation can take place at any position in the elevator shaft according to the given space.

Magnetic Tape:
For measurement of the lift position, the dual-sensor which is integrated in aluminium profile housing requires an absolute coded magnetic tape (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.

Interface:
For communication with the lift control, different interfaces e. g. CAN, CANopen (DS406, DS417), RS485, RS422, SSI (Gray, binary) or PROFIBUS are available depending on the order. On request, other interfaces as well as customer-specific solutions can be realized.

Status LEDs:
The LIMAX02 housing front has four status LEDs which serve for various messages, e. g. operational readiness or error states of the system, magnetic tape and interface. Versions equipped with PROFIBUS interface also have two additional status LEDs on the housing top.

Connections:
By default the LIMAX2 encoder is supplied with a 3 meter long signal cable with open cable ends. Optionally the signal cable can be delivered with diverse connectors (see Type Designation).

Sensor Installation:
In order to mount the sensor to the lift cabin, the mounting angle kit LIMAX2 MW SET can be used, which is available as an ELGO accessory. This mounting kit includes also the required 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**: absolute, redundant
- **Repeat accuracy**: ± 1 increment
- **System accuracy in μm** at 20 °C: ± (1000 + 100 x L) mm, where L is the measuring length in meters
- **Distance sensor / tape**: the correct distance is guaranteed by guidance
- **Housing material**: aluminium
- **Housing dimensions**: L x W x H = 246 x 55 x 55 mm
- **Required magnetic tape**: AB20-80-10-1-R-D-15-BK80
- **Basic pole pitch (tape)**: 8 mm
- **Max. measuring length**: 260 m
- **Connections**: standard: open cable ends, optional: plug connector
- **Sensor cable**: standard length: 3.0 m, optional: 5.0 m, others on request
- **Weight**: approx. 460 g without cable, approx. 60 g per meter

#### Electrical Data:
- **Power supply voltage**: 10 ... 30 VDC
- **Residual ripple**: <10 %
- **Current consumption**: max. 200 mA
- **Interface**: CAN, CANopen (DS406, DS417), RS422, RS232 or SSI (Gray, binary), PROFIBUS, others on request
- **Resolution**: 1.0 [standard] or 0.5 / 0.25 / 0.125 / 0.0625 mm (optionally)
- **Operating speed**: max. 10 m/s

#### Environmental conditions:
- **Storage temperature**: -25 ... +85 °C
- **Operating temperature**: -10 ... +70 °C (-25 ... +85 °C on request)
- **Operating altitude**: max. 3000 m above sea level
- **Humidity**: 95 %, non-condensing
- **Protection class**: IP50 (higher on request)

### Type Designation:

**LIMAX2** - Magnetic Absolute Shaft Information System

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

#### B Signal Cable Length
- 030 = 3.0 m (standard)
- 050 = 5.0 m (other lengths on request)

#### C Resolution
- 62NS = 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
- 2320 = RS232 [standard protocol / position]
- 2321 = RS232 [extended protocol / position & speed]
- 4220 = RS422 [standard protocol / position]
- 4221 = RS422 [extended protocol / position & speed]
- 4850 = RS485 [on request]
- CN0 = CAN [standard protocol CAN-basic]
- CO0 = CANopen [encoder profile DS406]
- CO1 = CANopen [elevator profile DS417]
- PNO = PROFIBUS [according to IEC61158/IEC61784, standard ID 5, others on request]
- SSBO = SSI [25 Bit binary code / position]
- SSGO = SSI [25 Bit Gray code / position]

**CAUTION:**
- CAN Interface is optionally available with galvanic isolation / assembly 120R CAN-load resistor selectable (T, see below)
- RS232 interface is never terminated
- RS422, RS485 and SSI interfaces are basically terminated

**CAN- Schnittstelle**

<table>
<thead>
<tr>
<th>CAN- Schnittstelle</th>
<th>ohne galvанической Trennung</th>
<th>mit galvанической Trennung (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mit Trennung 120R (T)</td>
<td>CN0T (Standard)</td>
<td>CN0TG</td>
</tr>
<tr>
<td>ohne Trennung</td>
<td>CN0</td>
<td>CN0G</td>
</tr>
<tr>
<td>mit Trennung 120R (T)</td>
<td>CO0T (Standard)</td>
<td>CO0TG</td>
</tr>
<tr>
<td>ohne Trennung</td>
<td>CO0</td>
<td>CO0G</td>
</tr>
<tr>
<td>mit Trennung 120R (T)</td>
<td>OTT (Standard)</td>
<td>OTTG</td>
</tr>
<tr>
<td>ohne Trennung</td>
<td>OT0</td>
<td>OT0G</td>
</tr>
</tbody>
</table>

**SSI- Schnittstelle**

<table>
<thead>
<tr>
<th>SSI- Schnittstelle</th>
<th>ohne Optokoppler im Takt- Eingang (terminiert mit 120R)</th>
<th>mit Optokoppler im Takt- Eingang (G) (terminiert mit 300R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSBO</td>
<td>SSBOG</td>
<td></td>
</tr>
<tr>
<td>SSGB</td>
<td>SSGBG</td>
<td></td>
</tr>
</tbody>
</table>

#### E Options (multiple indications possible, more options on request)
- **U** = unguided version
- **PNO** = 1 pc. flange plug M8, 1 pc. flange plug M12 and 1 pc. flange socket M12
- **D9M** = 9-pin D-SUB (male) [CAN & CANopen]
- **D9M1** = 9-pin D-SUB (male) [SSI / option NEWLIFT FST2]
- **D9M9** = 9-pin D-SUB (male) [SSI / option Lüdfsew]
- **D9F0** = 9-pin D-SUB (female) [RS232 / for DEE/DTE connection]

**Order example:**
- LIMAX2 - 00 - 030 - 10 0 0 - CN0T - D9M
- AA - BBB - CCCC - DDDD - E E E

ELGO standard LIMAX02 with 3 m cable, 1 mm resolution, CAN basic interface (terminated,120R) and 9-pin (male) D-SUB connector

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**Top view LIMAX2 MW mounting angle set:**

(Dimensions of the long holes for mounting on the cabin roof)

8.40 X 63.40

![Diagram of LIMAX2 MW mounting angle set](image)
**Dimensions of LIMAX2:**

![Diagram of LIMAX2 dimensions]

**Accessories for LIMAX2:**

<table>
<thead>
<tr>
<th>Order designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMAX2 MW SET</td>
<td>LIMAX2 mounting angle set for attachment on the lift cabin</td>
</tr>
<tr>
<td>AB20-80-10.1-R-15-BK80</td>
<td>Magnetic tape for LIMAX2, 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>LIMAX S-RMS</td>
<td>Mounting set for suspended installation with crossbeam and tape detection</td>
</tr>
<tr>
<td>CD-ROM with GSD File</td>
<td>Supplied with option PROFIBUS</td>
</tr>
<tr>
<td>Connection cable power supply PNO</td>
<td>M8 coupling, 4-pin 5 m length</td>
</tr>
<tr>
<td>PROFIBUS - signal line</td>
<td>M12 connector, 5-pin, b-coded (assembled at one end), 5 m length</td>
</tr>
<tr>
<td>PROFIBUS - signal line</td>
<td>M12 coupling, 5-pin, b-coded (assembled at one end), 5 m length</td>
</tr>
<tr>
<td>PROFIBUS - signal line</td>
<td>M12 plug / socket (assembled at both ends), 5 m length</td>
</tr>
<tr>
<td>PROFIBUS - terminator</td>
<td>M12 4-pin, b-coded</td>
</tr>
</tbody>
</table>

* Cable length depends on order