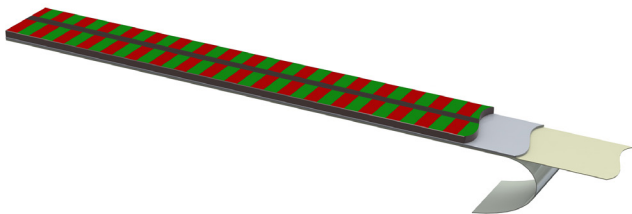




Counting



Controlling



## LMSN

### Linear Magnetic Scale Nonius

- Linear applications
- Different scale materials available
- Different pole pitches

#### Features

- Different accuracies available on demand
- Two or three track magnetization
- Different scale geometries
- Customizable for many applications
- No attrition from usage
- Resistant to dust, cooling lubricant emulsion, oil, etc.

## Controlling movements with the LMSN

### Simple – precise – economic

BOGEN produces magnetic scales for a large variety of different applications. The Linear Magnetic Scale Nonius can be written two or three tracks. Using different accuracy classes scales can be tailored to the requirements. The scales can be used for many different solutions.

## Linear Magnetic Scale

### Characteristics Linear Magnetic Scale

|                             |                                                                               |
|-----------------------------|-------------------------------------------------------------------------------|
| Accuracy class              | $\pm 3 \mu\text{m}, \pm 10 \mu\text{m}, \pm 20 \mu\text{m}$                   |
| Material                    | Magnetic Tape: Elastomer filled with ferrite<br>Carrier Tape: Stainless Steel |
| Width [mm]                  | 6, 8, 10                                                                      |
| Thickness [mm]              | 0.5 to 1.66 (depending on scale setup)                                        |
| Pole pitch [mm]             | 1.28; 1.5                                                                     |
| Magnetic flux               | tbd                                                                           |
| Operating temperature       | -20°C to +100°C max.                                                          |
| Expansion coefficient       | $\sim 17 \times 10^{-6}/\text{K}$                                             |
| Minimum bending radius [mm] | 65                                                                            |
| Length in pieces            | see page 4 supply                                                             |
| End processing for pieces   | Multiple hole combinations and angle cuts possible (on request)               |

### Characteristics Adhesive Tape (optional)

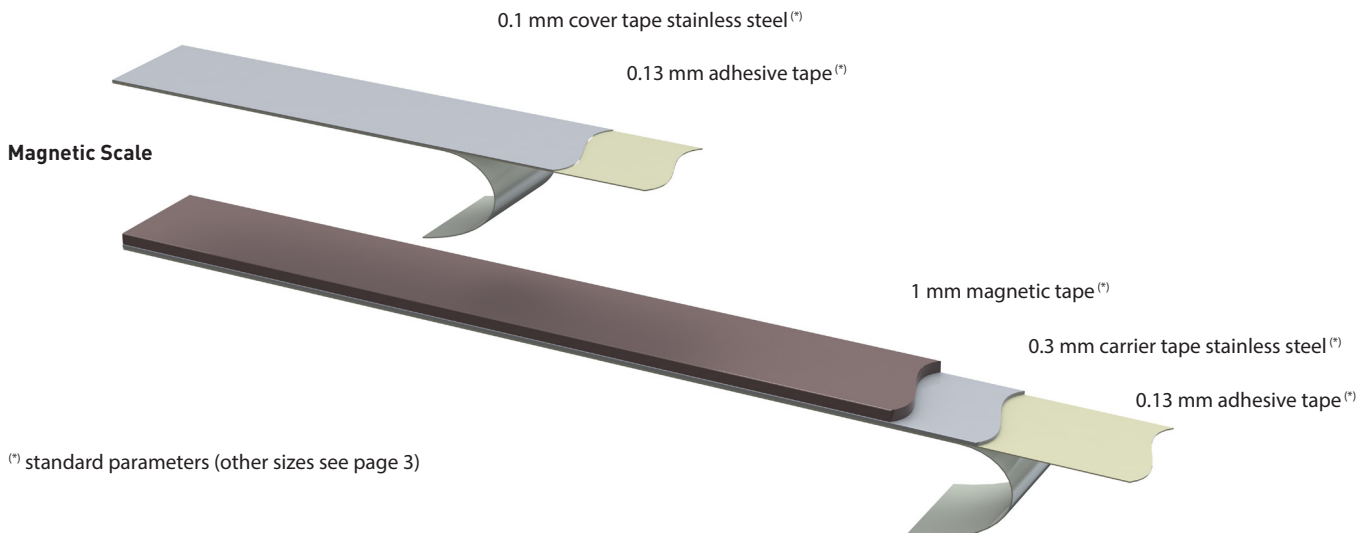
|                |                                    |
|----------------|------------------------------------|
| Material       | Double sided acrylic adhesive tape |
| Width [mm]     | 5, 7, 9                            |
| Thickness [mm] | 0.13                               |

### Characteristics Cover Tape (separate accessory)

|                |                                                                                         |
|----------------|-----------------------------------------------------------------------------------------|
| Material       | Cover tape:<br>Stainless steel, non magnetic<br>Adhesive tape:<br>Acrylic adhesive tape |
| Width [mm]     | $5 \pm 0.2$<br>$8 \pm 0.2$<br>$10 \pm 0.2$                                              |
| Thickness [mm] | 0.23 total thickness<br>(0.1 mm stainless steel tape<br>+ 0.13 mm adhesive tape)        |

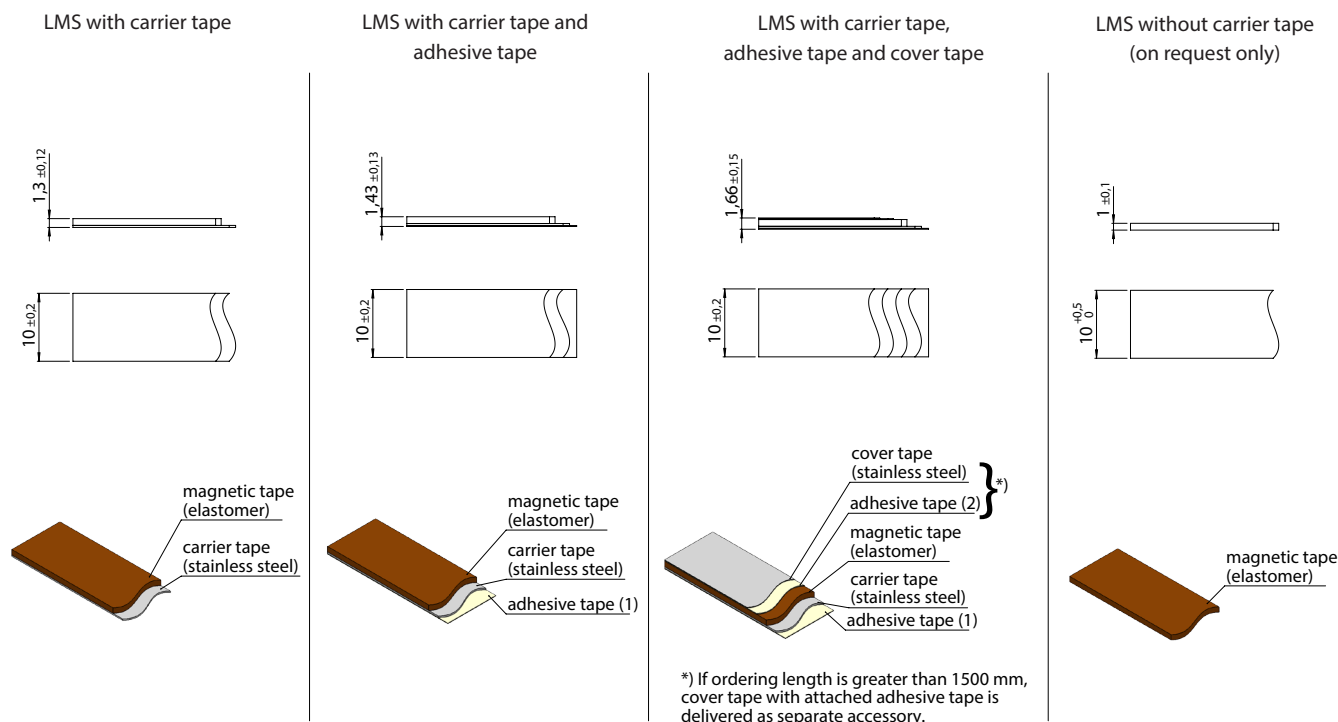
### Dimension Magnetic Scale

#### Cover Tape (separate accessory)



<sup>(\*)</sup> standard parameters (other sizes see page 3)

### Scale Dimensions with Standard Layer Stackup



### Scale Dimensions with optional Layer Stackup (\*)

For individual scale setups following layer dimensions can be used

|               |                                 |
|---------------|---------------------------------|
| Magnetic tape | 0.5 mm or <b>1.0 mm</b>         |
| Carrier tape  | 0.1 mm or <b>0.3 mm</b>         |
| Adhesive tape | <b>0.13 mm</b> or 0.55 mm       |
| Cover tape    | 0.076mm, <b>0.1 mm</b> , 0.15mm |

(\*) standard parameters are bold

### Length

Linear magnetic scales cut in pieces or supplied on reel

### Marking<sup>1)</sup>

The marking distance is 250 mm and builds up as follows:

accuracy class . pole pitch [µm] . year/week . reel no. . magnetic strip counter (optional)

e.g. A20.2000.1605.19 (marking every 250 mm)

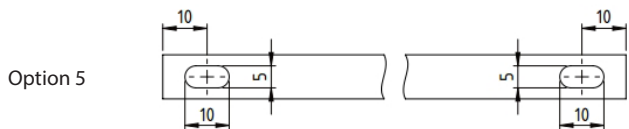
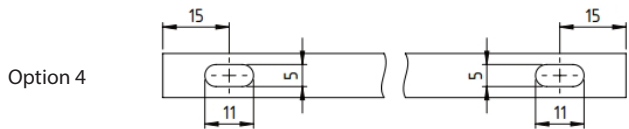
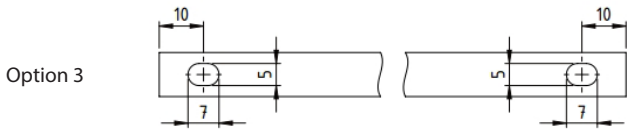
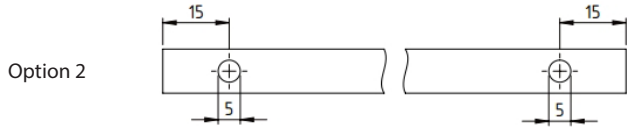
A20.2000.1608.19.012 ( marking one time per magnetic strip)

<sup>1)</sup> The magnetic strip counter indicates the number of remaining strips on the reel. The strip is marked only once per length.

### Optional Accessory

- Extruded aluminum profile
- Scale applicator

Standard Mounting Holes



Order Code

Parameters

LMS N - P - L - W - S - H - A - C - K - T - EB

|                   |                                      | Code                              | Explanation <sup>(1)</sup>                                                                                  |                                                                                                              |
|-------------------|--------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Parameters</b> | <b>N</b>                             | <b>Number of Tracks</b>           | ... number of tracks (2 or 3)                                                                               |                                                                                                              |
|                   | <b>P</b>                             | <b>Track Parameters</b>           | N ... - ... pole pitch of master track <sup>(2)</sup> - number of pole pairs of master track <sup>(3)</sup> |                                                                                                              |
|                   | <b>L</b>                             | <b>Length</b>                     | L ... piece, length in mm <sup>(4)</sup>                                                                    |                                                                                                              |
|                   | <b>W</b>                             | <b>Width (mm)</b>                 | W6                                                                                                          | 6 mm                                                                                                         |
|                   |                                      |                                   | W8                                                                                                          | 8 mm                                                                                                         |
|                   |                                      |                                   | W8-10                                                                                                       | 8 mm Elastomer (only for P95-05 extrusion)<br>10 mm stainless steel carrier tape (only for P95-05 extrusion) |
|                   |                                      |                                   | W10                                                                                                         | 10 mm                                                                                                        |
|                   | <b>S</b>                             | <b>Magnetic Track Height (mm)</b> | <b>track height corresponds to scale width</b><br>S ... height of encoded track in mm                       |                                                                                                              |
|                   | <b>H</b>                             | <b>Scale Height (mm)</b>          |                                                                                                             | <b>1 mm magnetic tape, 0.3 mm carrier tape</b>                                                               |
|                   |                                      |                                   | H1-0.1                                                                                                      | 1 mm magnetic tape, 0.1 mm carrier tape                                                                      |
|                   |                                      |                                   | H0.5-0.3                                                                                                    | 0.5 mm magnetic tape, 0.3 mm carrier tape                                                                    |
|                   | <b>A</b>                             | <b>Accuracy Class</b>             | A3                                                                                                          | ± 3 µm/m (only delivered up to piece length 2300 mm)                                                         |
|                   |                                      |                                   | A10                                                                                                         | ± 10 µm/m (only delivered up to piece length 2300 mm)                                                        |
|                   |                                      |                                   | A20                                                                                                         | ± 20 µm/m                                                                                                    |
|                   |                                      |                                   | <b>A40</b>                                                                                                  | <b>± 40 µm/m</b>                                                                                             |
|                   | <b>C</b>                             | <b>Cover</b>                      |                                                                                                             | <b>without cover tape</b>                                                                                    |
|                   |                                      |                                   | C                                                                                                           | equipped with cover tape (only delivered up to piece length 1500 mm)                                         |
|                   | <b>K</b>                             | <b>Adhesive Tape</b>              |                                                                                                             | without adhesive tape                                                                                        |
|                   | <b>T</b>                             | <b>Text Imprint</b>               | <b>K</b>                                                                                                    | <b>equipped with adhesive tape</b>                                                                           |
|                   |                                      |                                   |                                                                                                             | <b>with BOGEN text imprint</b>                                                                               |
| T0                |                                      |                                   | without text imprint                                                                                        |                                                                                                              |
| <b>EB</b>         | <b>Mounting Holes <sup>(5)</sup></b> | T2                                | with customer specific text imprint (on request)                                                            |                                                                                                              |
|                   |                                      | 1                                 | please see drawings on the previous page                                                                    |                                                                                                              |
|                   |                                      | 2                                 |                                                                                                             |                                                                                                              |
|                   |                                      | 3                                 |                                                                                                             |                                                                                                              |
|                   |                                      | 4                                 |                                                                                                             |                                                                                                              |
| 5                 |                                      |                                   |                                                                                                             |                                                                                                              |

<sup>(1)</sup> standard parameters are bold

<sup>(2)</sup> 1.28 mm or 1.5 mm

<sup>(3)</sup> number of pole pairs = 2<sup>x</sup> whereat 4 ≤ x ≤ 10 (16, 32, 64, 128, 256, 512 or 1024)

<sup>(4)</sup> measuring length + 5 mm non-magnetized scale at each end; measuring length = number of poles x pole pitch

<sup>(5)</sup> for other options than listed please contact our sales team

Ordering Example

LMS3-N1.28-128-L338-W10-A10-K-EB2  
 Linear magnetic scale nonius, 3 tracks, 1.28 mm pole pitch on master track, 128 pole pairs on master track, 338 mm length, 10 mm width, width of scale encoded completely, height 1mm magnetic tape and 0.3 mm carrier tape, accuracy class ± 10 µm/m, without cover tape, with adhesive tape, with standard text imprint, mounting hole option 2

LMS2-N1.5-64-L202-W10-H0.5-0.3-A20  
 Linear magnetic scale nonius, 2 tracks, 1.5 mm pole pitch on master track, 64 pole pairs on master track, 202 mm length, 10 mm width, width of scale encoded completely, height 0.5 mm magnetic tape and 0.3 mm carrier tape, accuracy class ± 20 µm/m, without cover tape, without adhesive tape, with standard text imprint