

## LMS Series

“Non-Contact Measurement With Laser; Analog, CANopen, MODBUS, Switch Output”



- Non-contact distance measurement with laser
- 2000mm measuring range
- 12mm small body diameter
- Analog, CANopen, MODBUS and switch output options
- LED status indicator
- Resistant to environmental conditions, IP67 protection class
- Long service life
- Low power consumption

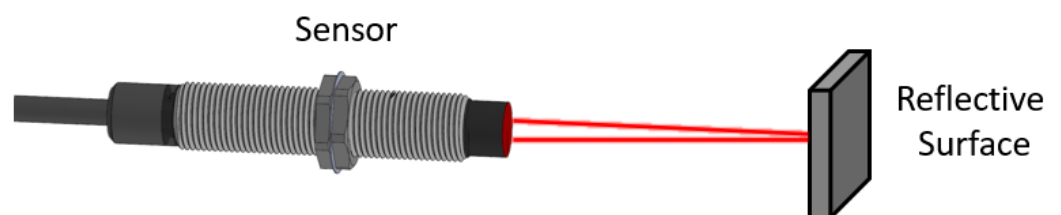
LMS Series Laser Distance Sensor is used in various applications for measurement of distance or detect approximation non-contactly with laser light. It precisely determines the distance between the sensor and the object through the flight time of the light.

The operation of the product is based on the principle of sending the laser beam and receiving it back from the reflective surface / reflector. A laser beam is sent by the sensor to the reflective surface to be measured. The time difference between sending and receiving the beam indicates the actual distance of the target in millimeters.

LMS series laser distance sensors are easily mounted with their small and compact structure. Additionally, they are easily integrated into your system with Analog, switch, CANopen and MODBUS interface options.

### APPLICATIONS

- Distance measurement
- Asset control
- Motion control
- Positioning
- Obstacle detection
- Altitude monitoring



## TEHNICAL FEATURES

### Optical Data

<b>Working Principle</b>	Time-of-Flight, reflected from reflector
<b>Measuring Range</b>	0...2000mm
<b>Light Type</b>	Invisible Laser
<b>Wavelength</b>	940 nm
<b>Field Of View</b>	18°
<b>Recommended Reflector Size</b>	5x5cm for distance ≤1000mm 10x10cm for distance >1000mm
<b>Max. Permissible external light</b>	1000 lux (effected by intense sunlight)

### Electrical Data

Supply	Analog	CANopen	RS-485	Switch*
		12...30 Vdc		6...30 Vdc
<b>Output Types</b>	Analog : 0-10V, 0-5V, 0.5-4.5V, 0-20mA, 4-20mA CANopen RS-485 Switch (1 x PNP open collector)**			
<b>Power Consumption</b>	0,24 Watt max.			
<b>Current Consumption</b>	10mA @24VDC max			
Sampling Rate	Analog	CANopen	RS-485	Switch
		20Hz		100Hz
<b>Accuracy</b>	±%1			
<b>Minimum Resolution</b>	1 mm			
<b>Analog Output Load</b>	500 Ω			
<b>Analog Output Resolution</b>	12 Bit (1 mm resolution)			
<b>Indicator</b>	RGB LED			
<b>Reverse Polarity Protection</b>	Yes			
<b>Temperature Compensation</b>	Yes			
<b>Watchdog</b>	Yes			

\* **Completely isolated switch output:** Switch output can be fed from a separate source. Between 6-30 volts, the device can be powered by a source independent of the power source.

\*\* **Switch short circuit protection:** There is a maximum current limit of 200mA. When it reaches the 200mA current limit, the device cuts off the switch output. It ensures the protection of the source and connected devices. In order for the device to start giving output again, the short circuit condition must be eliminated and the device must be restarted.

### Mechanical Data

<b>Protection Class</b>	IP67	
<b>Operating Temperature</b>	-20...+85°C	
<b>Storage Temperature</b>	-20...+85°C	
<b>Material</b>	<b>Body</b>	Nickel plated brass
	<b>Cable</b>	PVC
<b>Electrical Connection</b>	Cable or M12 connector	

### RS-485 FEATURES

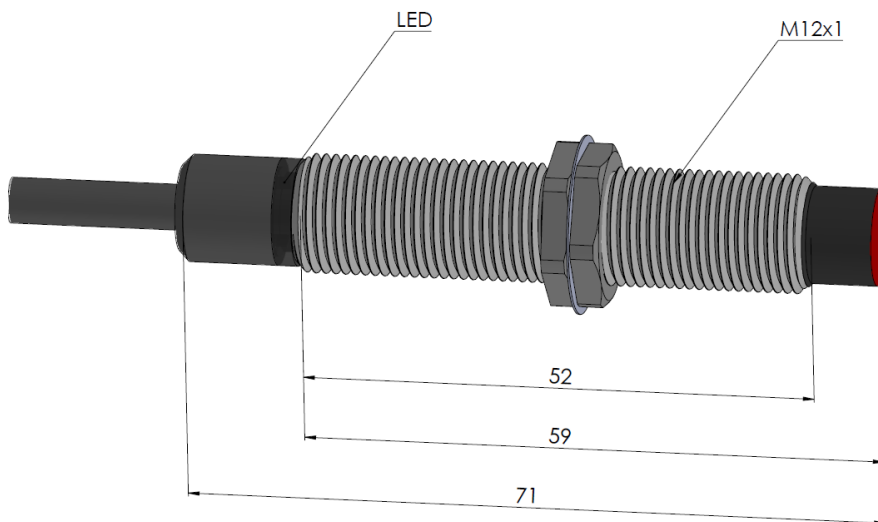
<b>Communication Protocol</b>	Modbus RTU
<b>Baud Rate</b>	600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 Default: 9600
<b>Parity</b>	None, Odd, Even Default: None
<b>Adres</b>	Between 1 and 247 Default: 1

## CANopen FEATURES

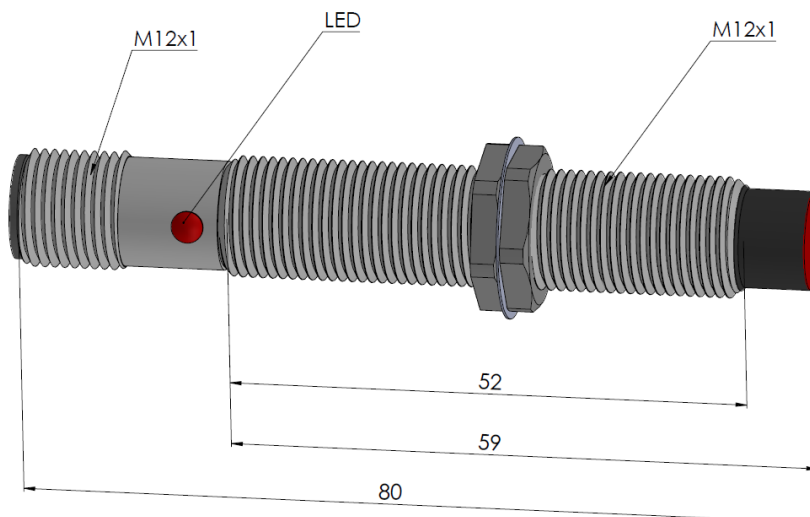
<b>Communication Profile</b>	Ds406
<b>Response Frequency</b>	20 Hz.
<b>Device Type</b>	CANopen, DS406
<b>Node ID</b>	1 ile 127 arası LSS ya da SDO ile ayarlanabilir.
<b>Baud Rate</b>	10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 Mbit/s
<b>PDO Data Rate</b>	100 ms
<b>Error Check</b>	Heartbeat, Emergency Message
<b>PDO</b>	1 Tx PDO
<b>PDO Modes</b>	Event/Time triggered, Synch/Asynch
<b>SDO</b>	1 server
<b>Position data</b>	Object Dictionary 6004
<b>Terminating Resistor</b>	No

## MECHANICAL DIMENSIONS (mm)

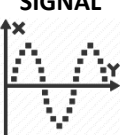
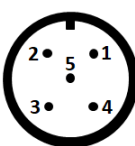

**-With Cable-**


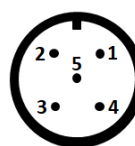




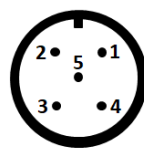

**-With M12 Connector-**


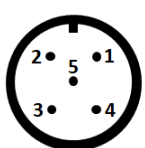



## ELECTRICAL CONNECTIONS

ANALOG OUTPUT (0-10V, 0-20mA, 4-20mA)		
SIGNAL	M12 5 PIN MALE CONN.	CABLE
		
+V (12...30VDC)	Pin 1	Red
GND	Pin 2	Black
Analog Out +	Pin 3	Yellow
N/C	Pin 4	Green
N/C	Pin 5	Pink

RS-485 MODBUS OUTPUT		
SIGNAL	M12 5 PIN MALE CONN.	CABLE
		
+V (12...30VDC)	Pin 1	Red
GND	Pin 2	Black
RS485 - B	Pin 3	Yellow
RS485 - A	Pin 4	Green
N/C	Pin 5	Pink

CANopen OUTPUT		
SIGNAL	M12 5 PIN MALE CONN.	CABLE
		
+V (12...30VDC)	Pin 1	Red
GND	Pin 2	Black
CAN-L	Pin 3	Yellow
CANL-H	Pin 4	Green
N/C	Pin 5	Pink

SWITCH OUTPUT (PNP OPEN COLLECTOR)		
SIGNAL	M12 5 PIN MALE CONN.	CABLE
		
+V Cihaz (6...30VDC)	Pin 1	Red
GND Device	Pin 2	Black
+V Switch (6...30VDC)	Pin 3	Yellow
GND Switch	Pin 4	Green
Switch Out	Pin 5	Pink

**Completely isolated switch output:** Switch output can be fed from a separate source. Between 6-30 volts, the device can be powered by a source independent of the power source.

**Switch short circuit protection:** There is a maximum current limit of 200mA. When it reaches the 200mA current limit, the device cuts off the switch output. It ensures the protection of the source and connected devices. In order for the device to start giving output again, the short circuit condition must be eliminated and the device must be restarted.

## LED INDICATOR

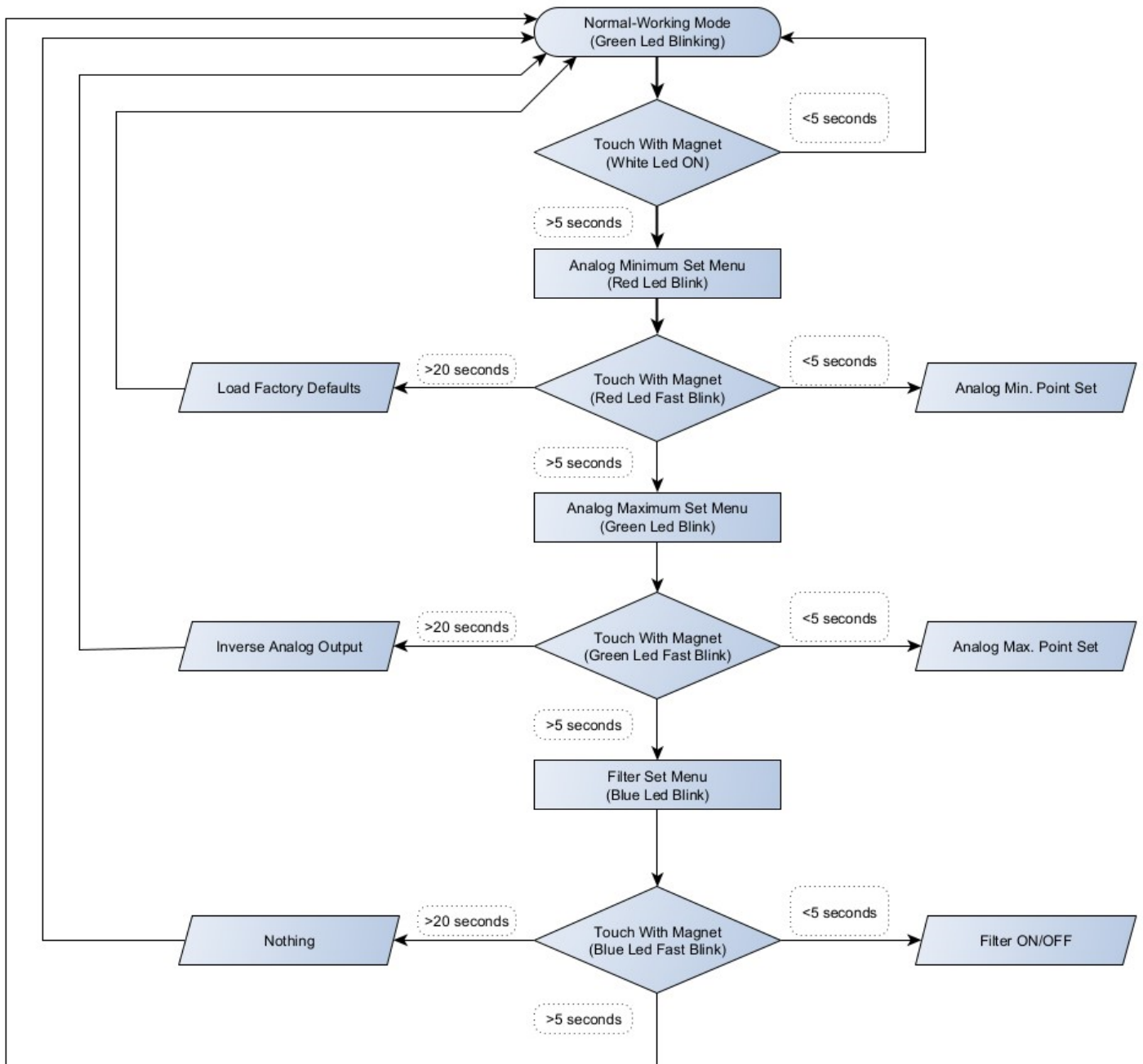
There is 1 RGB LED indicator on the device. This LED color and blinking speed changes depending on normal operation, error and configuration situations.

**Normal Operating Status:** When the device is in normal operating mode, the LED indicator flashes green once per second.

**Error Status:** If the maximum measurement distance is exceeded, the Red LED flashes once a second. If there is insufficient light reflection, the blue LED will flash once per second. If the blue and red LEDs flash together, this indicates that two errors are present at the same time.

**Configuration Status with Magnet:** While the device is configured with a magnet, when it starts to detect the magnet, the LED color changes depending on the setting menu it is in (analog output or switch setting). LED color indicates which setting menu you are in and which setting can be made. As long as the magnet is detected, the blinking speed of the LED increases, flashing 10 times per second. Blinks for one second unless the magnet is detected.

## ANALOG OUTPUT CONFIGURATION WITH MAGNET



→ The zone where the adjustment magnet is approached

### 1. Setting the analog output minimum point:

Depending on output type; the distance at which the minimum analog value will be given is set.

When the device is in Normal Operation mode, the magnet is held to the magnetic reader area while the Green LED flashes for one second. If the magnet is detected, the sign LED starts to emit white light. If the magnet is held for more than 5 seconds, the device enters the menu where the analog minimum set point will be adjusted. In this case, the indicator LED starts to blink red and at one-second intervals.

Operations that can be done in this menu;

- **Setting the analog minimum point at the desired distance:** The LMS is positioned at the position where minimum analog output is desired. The magnet is read for a period of time greater than 1 second and less than 5 seconds.
- **Go to next menu:** The magnet is read for more than 5 seconds. If the analog minimum point is not set at this stage, the point that was previously set as the analog minimum point will be valid.
- **Return to factory settings:** If the magnet is read for more than 20 seconds, it restores the analog minimum, analog maximum, switch point1, switch point2 points made when the device was delivered to the user. The device exits the settings menus and returns to normal operating mode.

## 2. Setting the analog output maximum point:

Depending on output type; the distance at which the maximum analog value will be given is set.

If the magnet is read for more than 5 seconds and less than 15 seconds while the sign LED is red and flashing at one-second intervals, this menu is entered. The indicator LED starts blinking green and at one-second intervals.

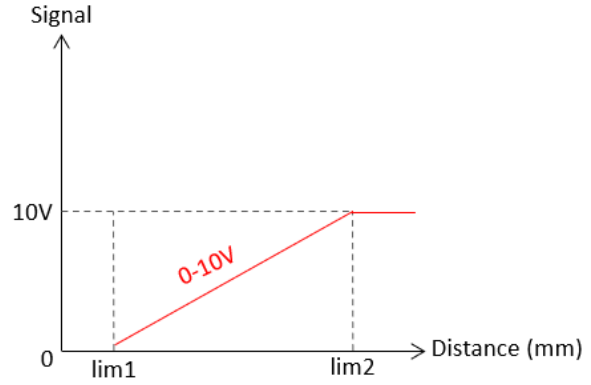
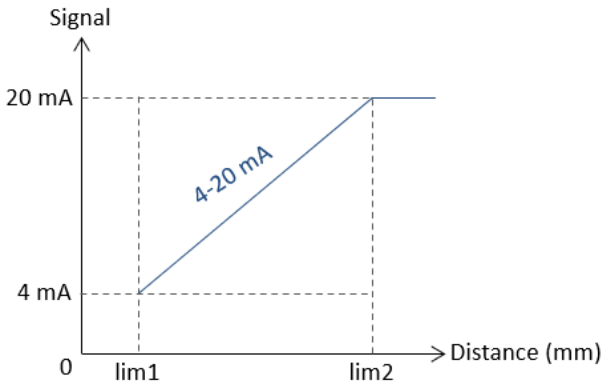
Operations that can be done in this menu;

- **Setting the analog maximum point at the desired distance:** The LMS is positioned at the position where maximum analog output is desired. The magnet is read for a period of time greater than 1 second and less than 5 seconds.

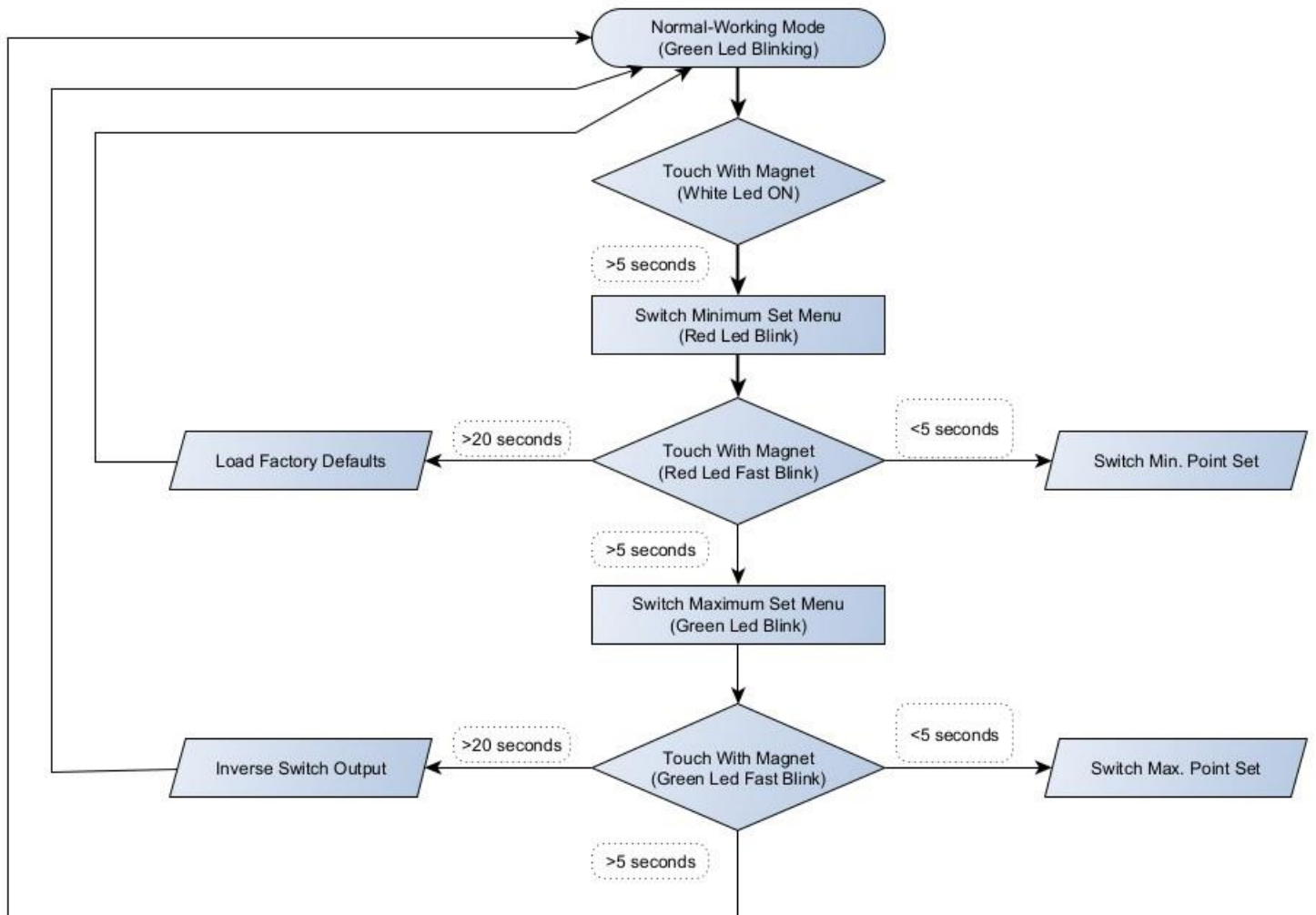
- **Inverting analog output:** If the magnet is read for more than 20 seconds, it gives the analog maximum value (e.g. 20mA) at the minimum range point (e.g. 0 meters) and the analog minimum value (e.g. 4mA) at the maximum range point (e.g. 4 meters).

- **Go to the next menu:** The magnet is read for more than 5 seconds. If the analog maximum point is not set at this stage, the point that was previously set as the analog maximum point will be valid.

### ANALOG OUTPUT SCALE SETTINGS- SAMPLE SIGNAL OUTPUT GRAPHICS



### SWITCH OUTPUT CONFIGURATION WITH MAGNET





The zone where the adjustment magnet is approached

In this menu, the minimum and maximum distance range at which the Switch output of the product will be active is determined.

### 1. Setting the switch minimum point:

If the magnet is read for more than 5 seconds while the sign LED is green and flashing at one-second intervals, the switch is entered into its minimum setting. The indicator LED starts blinking red and at one-second intervals.

If the magnet is read for more than 1 second and less than 5 seconds, the LMS switch minimum point is saved.

If the magnet is read for more than 20 seconds, the device returns to factory settings and restarts.

- **Go to the next menu:** The magnet is read for more than 5 seconds. If the switch minimum point is not set at this stage, whatever point was previously set will be valid.

**Default:** Min:0mm, Max:1300mm

### 2. Setting the switch maximum point:

If the magnet is read for more than 5 seconds while the sign LED is green and flashing at one-second intervals, the switch is entered into its maximum setting. The indicator LED starts blinking green and at one-second intervals.

If the magnet is read for more than 1 second and less than 5 seconds, the LMS switch maximum point is saved.

If the magnet is read for more than 20 seconds, the device switch output is inverted. In other words, the transition is made from NO to NC.

If the magnet is read for more than 5 seconds, it returns to normal operating mode.

**Warning(!)** If a magnet is brought close to the magnetic reader area and the indicator light does not start blinking rapidly, it means that the magnet is not detected. It should be tried by changing the direction of the magnet, or if the magnet is a weak magnet, it should be tried with a stronger magnet.

## ORDER CODE

<b>Model</b>		<b>Output Type</b>				
112 : Ø12 mm		<b>V0</b> : 0-10 VDC <b>V1</b> : 0-5 VDC <b>V3</b> : 0.5-4.5 VDC <b>A0</b> : 0-20 mA <b>A4</b> : 4-20 mA <b>NV0</b> : 10-0 VDC <b>NV1</b> : 5-0 VDC <b>NV3</b> : 4.5-0.5 VDC <b>NA0</b> : 20-0 mA <b>NA4</b> : 20-4 mA  <b>C:</b> CANopen <b>S2:</b> RS-485  <b>SW1:</b> PNP open collector-NO <b>SW2:</b> PNP open collector-NC				
<b>LMS 112</b>	-	<b>XXXX</b>	-	<b>XXX</b>	-	<b>XXXX</b>
<b>Masuring Range</b>			<b>Electrical Connection</b>			
Can be selected between 0...2000mm			<b>2M</b> : 2m cable (std) <b>S13M</b> : M12/5 pin male connector *Optional others			