LMS5xx – More than meets the eye!

Auto Identification
LMS5xx – Familiar Housing

- LMS500 looks like the familiar S3000 safety scanner
- But -- the housing is only shared component!
- LMS500
  - Faster rotating mirror
  - More powerful laser
  - More powerful micro-processing
  - More memory
  - Higher accuracy
  - Different connectors
  - Configures with SOPAS
  - 5-Echo technology
  - Multiple communication channels
  - Heated outdoor model uses the same size housing
    - Much smaller than LMS211
LMS5xx - Laser Measurement Scanner

- LMS500 will replace LMS200 Series
  - LMS200 available in limited quantities only this year.
- Faster rotating mirror
  - Higher scanning speed (100Hz)
- More powerful processing for enhanced signal evaluation
  - 5-echoes
- Configuration via SOPAS
- More powerful laser
  - Longer range @10% reflectivity - Up to 40m
- Reflectivity values with position values
- Better accuracy
- Additional communication interfaces
  - USB
  - Ethernet
  - Serial COM
- Lower power consumption with heater
LMS5xx Display

- Screw-on cap covers the USB configuration port
LMS5xx - Modular

Connector - Indoor

Housing - Indoor - blue

Sensor head - HR - Indoor

Sensor head - HR - Outdoor

Sensor head - SR - Outdoor

Applications Module - Standard

Connector - Outdoor

housing - Outdoor - grey
LMS5xx Advanced Product Family

- PRO Series High Resolution (HR) & Standard Resolution (SR)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS500 – 20000 PRO</td>
<td>HR</td>
<td>1047668</td>
</tr>
<tr>
<td>LMS511-20100 PRO</td>
<td>HR</td>
<td>1047782</td>
</tr>
<tr>
<td>LMS511-10100 PRO</td>
<td>SR</td>
<td>1040135</td>
</tr>
</tbody>
</table>

HIGH RESOLUTION (HR)

STANDARD RESOLUTION (SR)
LMS5xx Advanced Product Family

- Lite Series High Resolution (HR) & Standard Resolution (SR)

- LMS500 – 21000 Lite
  HR
  PN: 1054153

- LMS511-21100 Lite
  HR
  PN: 1054154

- LMS511-11100 Lite
  SR
  PN: 1054155

HR & SR Scanning Range Diagrams
LMS5xx Features

- Higher Performance
  - Up to 100Hz scanning speed (@ 0.66 or 1 )
  - Smaller angle resolution (down to 0.167 )
  - Longer range @10% remission (up to 40m)
  - 190 angle view
  - Multi-echo technology (5 echo-pulses per shot)
  - Reflectivity values with every distance value
  - 10 field shapes for scan areas

- Easy connectivity
  - M12 connectors (IP67 units)
  - Connection plug with cloning memory module (IP65 units)
  - Synch signal between several LMS500s
  - CAN bus (networking and external outputs module)
  - USB configuration interface
  - Ethernet
  - Serial COM

- Additional industrial features
  - IP65 & IP67 enclosures
  - Lower power consumption (22 W)
LMS5xx Multi-echo Technology

- High Speed Sampling Technology
  - Can process 5 echo-pulses from every sending pulse
  - Provides high visibility even in the adverse weather conditions such as fog, rain or dust
LMS5xx Field Evaluations

: SOPAS
- Field evaluation contours

PRO Series - 4 Inputs or 2 Inputs + 2 encoder
Lite Series - 2 Inputs

Evaluation case

1

10
Lite Series - 4 Fields

5

4

3

2

1

PRO Series - 6 Onboard outputs
Lite Series – 3 Onboard outputs

Can Module
HW outputs

USB (Config Only)
Ethernet
Sync
RS232
RS422
CAN
Features

- Powerful and efficient laser scanner for up to 80m measurement range
- High weather immunity due to multi-echo technology
- IP 67 enclosure, built-in heater, lower power consumption
- Up to ten programmable fields - PRO
- Multiple I/O

Applications

- Traffic sensor for fast triggering and measurement applications
- Measurement applications for automated ports, mines and any low visibility environment
- Security sensor for protection applications on facades, roofs and high profile security buildings (nuclear plants, prisons, etc)
- Navigation device for automated AGV's (with or without reflectors)

Benefits

- Fast, reliable object detection and measurement in any weather conditions
- Low maintenance costs due to high immunity to rough weather conditions
- More accurate positioning
LMS5xx Product Positioning

- LMS 1xx: Short Range
- LMS 5xx: Mid Range
- LD-LRS: Long Range

Performance Range vs. Price
Outdoor Applications

Outdoor applications have proven difficult for laser scanners, especially when exposed to rain, fog, dust and snow.

- Weather affects the quality of measurement and detection

The LMS2xx had limited capability to overcome heavy weather situations

The LMS5xx has much improved algorithms

- Discriminate rain drops, heavy dust or fog and snow

Faster rotating mirror, faster processing unit, more powerful laser diode, and with more inputs and outputs enables the LMS5xx to offer improved value for these challenges.
# LMS5xx Application Summary

<table>
<thead>
<tr>
<th>LMS 500 family</th>
<th>LMS 511 HR family</th>
<th>LMS 511 SR family</th>
</tr>
</thead>
<tbody>
<tr>
<td>suited for indoor Accuracy</td>
<td>suited for outdoor Accuracy &amp; IP67</td>
<td>suited for outdoor Long range</td>
</tr>
<tr>
<td>high angular resolution / Accuracy</td>
<td>Outdoor measurement</td>
<td>Outdoor anti-collision</td>
</tr>
<tr>
<td>high scanning speed</td>
<td>free navigation</td>
<td>Outdoor security</td>
</tr>
<tr>
<td>indoor navigation</td>
<td>container profiling</td>
<td>harsh weather condition applications</td>
</tr>
<tr>
<td>collision avoidance (machine-machine)</td>
<td>indoor IP67 conditions</td>
<td>traffic free flow</td>
</tr>
</tbody>
</table>
LMS5xx or LMS1xx?

- Choose the LMS500 where more than 18m (10% remission targets) is needed
- Choose the LMS500 where higher speed or better angular resolution is needed

<table>
<thead>
<tr>
<th>Sectors</th>
<th>USP</th>
<th>Hit rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harbor</td>
<td>Size, price, weight, outdoor availability, field functionalities, rain filters</td>
<td>Very good</td>
</tr>
<tr>
<td>Traffic</td>
<td>Size, speed, price, outdoor availability, flexible programming, rain filters</td>
<td>Very good</td>
</tr>
<tr>
<td>Security</td>
<td>Size, functionality, range, output setup</td>
<td>Very good</td>
</tr>
<tr>
<td>Navigation</td>
<td>Size, outdoor availability,</td>
<td>Very good</td>
</tr>
<tr>
<td>Mapping / Geodata</td>
<td>Size, outdoor availability, range, speed, angular resolution</td>
<td>Very good</td>
</tr>
<tr>
<td>Factory automation/Automotive</td>
<td>Size, field sets, dust filters, mounting behind windows</td>
<td>Good</td>
</tr>
<tr>
<td>Factory automation</td>
<td>Anti-collision in ex-proof areas (depending on the ex-class)</td>
<td>Good</td>
</tr>
</tbody>
</table>
LMS Upgrades

- LMS500 can replace existing LMS200 units
  - New replacement model for LMS200: LMS500-LITE
    - Similar or more functional capability as LMS200
    - Similar pricing
    - Telegram, connectors or software not compatible with LMS200
      - The data strings are significantly different
      - LMSIBS Software vs SOPAS

- LMS500 can upgrade LMS100 applications
  - Same cables - different designations, increased capability
  - Device approval certificates
    - CE
    - UL
    - EMC Industrial and household standard
    - RoHS
    - Laser class 1
The LMS5xx Family

Range

- **LMS 511-10100 PRO / LMS 511-11100 Lite (SR Outdoor)**
  - Max. Range: 40 / 80 m

- **LMS 511-20100 PRO / LMS 511-21100 Lite (HR Outdoor)**
  - Max. Range: 26 / 80 m

- **LMS 211 (Outdoor)**
  - Max. Range: 30 / 80 m

- **LMS 500-20000 PRO / LMS 500-21000 Lite (HR Indoor)**
  - Max. Range: 26 / 80 m

- **LMS 200 (Indoor)**
  - Max. Range: 10 / 80 m

- **LMS 100 / LMS 111**
  - Max. Range: 18 / 20 m

Max. Range: 40 / 80 m

Max. Range: 26 / 80 m

Max. Range: 30 / 80 m

Max. Range: 26 / 80 m

Max. Range: 10 / 80 m

Max. Range: 18 / 20 m

@ 10%
### LMS2x1 vs LMS5x1

<table>
<thead>
<tr>
<th></th>
<th>Speed</th>
<th>Range @ 10%</th>
<th>Statistical Error</th>
<th>Angle of coverage</th>
<th>Communication</th>
<th>Spot Size</th>
<th>High Speed</th>
<th>Inputs / Outputs</th>
<th>Power (with heat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS2x1</td>
<td>75Hz</td>
<td>30M</td>
<td>10mn</td>
<td>180</td>
<td>RS232, RS422</td>
<td>11.9 mrad</td>
<td>75Hz @ 1</td>
<td>1 Inputs / 3 Outputs</td>
<td>150W</td>
</tr>
<tr>
<td>LMS511 PRO (SR)</td>
<td>100Hz</td>
<td>40M</td>
<td>8mm</td>
<td>190</td>
<td>RS232, RS422, RS485, USB, Ethernet, CAN</td>
<td>11 mrad</td>
<td>100Hz @ 0.66</td>
<td>4 Inputs (2 Encoder) / 6 Outputs</td>
<td>70W</td>
</tr>
</tbody>
</table>
LMS5xx Accessories

Mounting Brackets
:Sames as LMS200
: Outdoor duty
   Mounting set 1 PN 2015623
   Mounting set 2 PN 2015624
   Mounting set 3 PN 2015625

Weather hood
: Reversible operation
: Rust proof
PN 2056850
### LMS5xx Connection Cables

#### recommended accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>LMS5500</th>
<th>LMS511-PRO</th>
<th>LMS511-Lite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet cable, 4-pole, M12 plug, 4-pin (D-type encoded) / RJ-45 plug, 8-pin, 5 m</td>
<td>6034415</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Ethernet cable, 4-pole, M12 plug, 4-pin (D-type encoded) / RJ-45 plug, 8-pin, 10 m</td>
<td>6030928</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Ethernet cable, 4-pole, M12 plug, 4-pin (D-type encoded) / RJ-45 plug, 8-pin, 20 m</td>
<td>6036158</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>I/O connection cable, 12-pole, M12 plug 12-pin (A-type encoded) / open end, 5 m</td>
<td>6042732</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>I/O connection cable, 12-pole, M12 plug 12-pin (A-type encoded) / open end, 10 m</td>
<td>6042733</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>I/O connection cable, 12-pole, M12 plug 12-pin (A-type encoded) / open end, 20 m</td>
<td>6042734</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>Data (RS-232/422) and I/O connection cable, 12-pole, M12 socket / open end, 5 m</td>
<td>6042735</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>Data (RS-232/422) and I/O connection cable, 12-pole, M12 socket / open end, 10 m</td>
<td>6042736</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>Data (RS-232/422) and I/O connection cable, 12-pole, M12 socket / open end, 20 m</td>
<td>6042737</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>Power supply cable, 4 x 0.50 mm² (AWG 22), M12 socket 5-pin / open end, 5 m</td>
<td>6036159</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>Power supply cable, 4 x 0.75 mm² (AWG 20), M12 socket 5-pin / open end, 10 m</td>
<td>6042565</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>Power supply cable, 4 x 0.75 mm² (AWG 20), M12 socket 5-pin / open end, 20 m</td>
<td>6042564</td>
<td>–</td>
<td>–</td>
<td>●</td>
</tr>
<tr>
<td>USB cable, 4-pole, plug type mini B / plug type A, 3 m</td>
<td>6042517</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
# LMS5xx Connection Cables

## recommended accessories

### Plug connectors and cables

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>LM5500</th>
<th>LM5511-PRO</th>
<th>LM5511-Lite</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O connection cable, 8-pole, M12 plug 8-pin (A-type encoded) / open end, 5 m</td>
<td>6036153</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>I/O connection cable, 8-pole, M12 plug 8-pin (A-type encoded) / open end, 10 m</td>
<td>6028420</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>I/O connection cable, 8-pole, M12 plug 8-pin (A-type encoded) / open end, 20 m</td>
<td>6036154</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Data (RS-232) and Input connection cable, 8-pole, M12 socket / open end, 5 m</td>
<td>6036155</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Data (RS-232) and Input connection cable, 8-pole, M12 socket / open end, 10 m</td>
<td>6036156</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Data (RS-232) and Input connection cable, 8-pole, M12 socket / open end, 20 m</td>
<td>6036157</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
LMS5xx Warranty

- 1-year basic warranty
- **No** field hardware repairs
- All repairs must be done by SICK
- Firmware updates by
  - Authorized customers only
- Free exchange under warranty within first year.
  - For factory defect failures only
- Repair completed only after estimate-of-costs and customer’s approval
LMS5xx Available Documents

Product Information LMS500
: PN 8013793

Online Data Sheet
: German / English

LMS500 Operating Instructions
: 8013796

CAD Drawings / FAB Sheets and additional documents
: sickusa.com LMS500 Product Pages
LMS5xx Target Applications

: Ports
  - Anti-collision crane boom
  - Anti-collision RTG/RMG
  - Container position

: Traffic
  - Camera Trigger
  - Vehicle classification on free flow
  - Vehicle Separation on free flow
LMS5xx Target Applications

- **Security:**
  - Indoor security
    - Optical ceiling
    - Wall protection
  - Outdoor security
    - Facade, roof & perimeter protection
    - Area monitoring
    - Camera tracking

- **Geo-Mapping / Navigation:**
  - Geodata
  - Tunnel profiling
LMS5xx Target Applications

- Steel Industry
  - Slab monitoring, measuring
  - Bulk material, profiling
  - Pile Scanning

- Dimensioning
  - Profiling
  - Large object dimensioning
  - Part verification
  - Part identification
LMS5xx Contact

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