LMS/LMI 400
User Software
New functions from
Version 4.1 up to Version 5.1
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1 Common changes

1.1 Translating to 32-Bit

The User software has been translated into a 32 Bit version. A operating system WIN 95™ or higher is required. The advantages are:

- Long file names possible
- Firmware downloads are possible with WIN-NT™ systems
- Using WIN-NT™ it is no longer necessary to change the process priority.
- 32-Bit Programs are faster on 32-Bit Operating Systems.
- In case of a program crash 32-Bit programs are easier to handle from the operating system.
- The program has the look and feel of a 32-Bit Program
- Multiple instances of the program are possible therefore multiple devices can be connected over different ports simultaneously.
- Smoother communications.
- Win 9XTM allows parallel use of other programs.

1.2 Change of fields

Editing the fields can be facilitated by using the mouse to 'Click & Drag' thus creating a rectangular selection area. All field points are thereby selected at once.
2 New LMS type

2.1 New LMS type “LMS special type 90°/0.5°”

The LMS IBS supports the version LMS Special 90°/0.5°. The sensor has a 90° view and a 0.5° angular resolution. For one scan 13.32 ms are needed.

In the LMS IBS the sensor is described by "LMS special type 90°/0.5° configuration”

When this sensor is selected all menu items inclusive to LMS Type 6 and all menu items and functions relating to field evaluation are deactivated. The assistant is not available with this selection.

For this device type there are only three tabs (Sensor, In-/Outputs, Extras) available in the ‘Configuration’ window (LMS → Configuration → Edit).

Under the Sensor tab only the type of sensor is displayed and can not be changed.

Under the list item MEASUREMENT MODE the user is able to define how many bits are used for the measurement value.

- 13 bits for the measurement range of 8/80 meter
- 14 bits for the measurement range of 16/160 meter
- 15 bits for the measurement range of 32/320 meter

This sensor does not have flags.
The tab IN-/OUTPUTS replaced tab RESTART of the standard sensors. Under this tab only the master-slave functionality can be configured since the special sensor type does not support field applications.

Under the EXTRAS the parameters are the same as those for the standard sensor.

3 “LMS-CONFIGURATION“ menu

3.1 New: Real time indices

LMS → Configuration → Edit → Sensor

It is possible to send indices for scans and transmitted telegrams with the request for the measurement values. There is no further influence on the LMSiBS user software.
3.2 New: Contour on plain

LMS → Configuration → Edit → Contour

For the outdoor devices LMS 211/221/291 there is an additional function for ConTour As Reference available.

Most reference contours are straight. To get a parallel contour band around a straight plane the function ConTour As Reference has been expanded with the option ConTour On Plane. The function used in the past was Radial.

Attention!

The laser scanners LMS 200/220 only accept Radial.

Pitch angle

If the option ConTour On Plain is selected there is (under Settings) the possibility to set the angle at which the LMS is installed relative to reference plane. 0° means the scanner back plane is parallel to the reference plane. The angle is the so called 'pitch angle'. The pitch angle is selectable between + 90° and - 90°. Note that the LMS scanner is scanning counterclockwise. Every scan beam has a defined angle to the back plane. The 90° scan beam is perpendicular to the back plane of the LMS. At a pitch angle of 0° the 90° scan beam is perpendicular to the reference plane.

At +10° pitch angle of the scanner (scan is counter clockwise top view) the 80° scan beam is the new perpendicular to the reference plane.
The function **CONTOUR AS REFERENCE** should only be used if the working angle around the perpendicular to the contour plane stays within $+70^\circ$ and $-70^\circ$.

As an example:
- **Pitch Angle 0°** creates a maximum start angle for contour as reference of $20^\circ$ and a stop angle of $180^\circ$.
- **Pitch Angle 10°** creates a maximum start angle for contour as reference of $10^\circ$ and a stop angle of $150^\circ$.
- **Pitch Angle -10°** creates a maximum start angle for contour as reference of $30^\circ$ and a stop angle of $170^\circ$.

Since this function is not available on the scanners LMS 200/220 the pitch angle must be set to 0°.
3.3 Available levels

LMS → Configuration → Edit → Extras

In this window the available levels can be selected. These levels implement, among other things, the response to dazzling.

Dazzling explained: Scanners of the LMS series work on the pulse travelling time with an emitting light source of 905 nm. Direct exposure to sun light or similar light sources leads to dazzling at a certain angle. There is no measurement possible by a dazzled beam. The dazzled beam is marked in the scanner.

The factory settings of all LMS scanners are at Level 1.

3.3.1 Availability level 1

Level 1 indicates that a dazzled beam is interpreted as a field infringement. The dazzling is temporarily ignored until the number of scans, specified by Maximum Duration of Dazzling, is reached at which point a field infringement is reported. Within the input window the user can set the number of scans required to activate this level. A scan is 13.32 ms. 1 to 255 scans can be selected. (13.32 ms to 3.4 s). Default is 2 scans.

3.3.2 Availability level 2

Level 2 indicates that a dazzled beam does not affect the field functionality. The beam is ignored.

3.3.3 Availability level 3

Level 3 is not related to dazzling. It is related the previously delivered LMS hardware (Typ 1-5). These are devices that can not be delivered anymore and are replaced by type 6 scanners. Since the LMS scanners are regularly upgraded some parameters have different defaults. To assure full compatibility to types 1-5 scanners this menu point can be selected. If selected the differences are:

- During regular self testing of the scanners the dazzling results in an info message instead an error.
- The contamination level is set to be active at 50% instead of 25%
- An error in the reference channels for contamination results in an info message instead an error.
- The detection of oil contamination results in an info message instead a warning/error.
- At the loss of synchronization with a slave configuration of the LMS scanner results in an info message instead an error.
4 Teach-In

4.1 Automatic Teach-In

LMS → Monitored Field → Teach-In (F5)

For automatic teach-in of fields a separate window gives the possibility to set a specified distance between the defined field borders and the reference. The field is made shorter than the given distance. The default is 70mm. Values between 50 and 400 mm can be selected.

4.2 Teach-In

LMS → Monitored Field → Reflector Teach-In (F5)

or with the quick button in the tool bar
If reflectors are placed at the corners of fields which have to be created those reflectors can be used for automatic field teach in.

With the Teach-In With Reflectors Field A and B are always created simultaneously. For every field taught in a contour as reference will be defined at the end.

If the LMS Sensor is a LMS 200/220 and a pixel orientated evaluation is selected it will be reconfigured to scan oriented evaluation with the appropriate message.

Attention:
The function teach in by reflectors is only possible with the 100° view. If the LMS sensor is configured as a 180° view device it will be automatically reconfigured with the appropriate message.

5 “SICK DIAGNOSIS“ menue

5.1 New: Operating and switch-on counter

Measurement Technique → SICK Diagnosis
The LMS 211/221/291 are equipped with an operating counter and a switch-on counter. Every ‘switch-on’ is documented. The operating counter is triggered every two hours.

5.2 New telegram: Examining all logical levels of the output

**MEASUREMENT TECHNIQUE → SICK DIAGNOSIS**

By selecting the telegram ‘REQUEST FOR STATE OF FIELD OUTPUTS’ all logical levels of the output can be examined.