The TiM displays the measured values of the recorded environment as a non-contact measurement system. The device is designed for portable or stationary use indoors or outdoors in standalone operation, with a scanning range of up to 10 m. The purpose of this instruction manual is to allow you to familiarize yourself with the device and its functions.

**Commissioning and configuration**

**Step 1: Electrical installation**

1. Connect the communication interface of the TiM to the PC (Ethernet or USB; recommended Ethernet, 4-pin M12 cutout).
   
   - If using a USB, connect the TiM’s Micro USB port (behind the black plastic cover on the side) to a free USB port (type A) on the PC using a suitable shielded high-speed USB cable (e.g. no. 6036106, 2 m).
   
   - The USB cable may not exceed 3 m in length.

2. During installation make sure there is no reflective surface behind the reference target (see “Device overview Page 3”, point 8).

3. Provide power to the TiM (5-pin M12 plug). Using the power supply unit it must be ensured that the supply voltage does not drop below 8 V for longer than 2 ms and never rises above 30 V.

   - Following successful initialization, the green LED lights up (device ready for operation).

**Step 2: Mounting and alignment**

1. Optional: mount the TiM to separately ordered mounting accessories (mounting kit 2), see “Mounting” Chapter in the Technical Information (Nr. 8015883).

2. Otherwise, mount the two straight plates from the enclosed mounting kit 1 on the TiM using two M3 screws. Use the two blind-hole threads either on the underside or back of the housing (see “Device overview Page 3”). If the straight plates are not used, the screws provided by the customer max. 2.8 mm into the thread.

3. Mount the TiM on a prepared bracket. The device should be as free from shock and vibration as possible during operation (e.g. using vibration dampers).

4. Align the 90° axis of the TiM’s scanning angle with the center of the area to be monitored. The marking on the lid of the optical hood serves as a bearing alignment aid (see “Device overview Page 3”, point 9).

**Safety information**

- Read these instructions before commissioning the TiM in order to familiarize yourself with the device and its functions.
- The TiM corresponds to laser class 1 (see “Laser radiation! Page 3”).
- Mounting and electrical installation are to be performed only by qualified technicians.
- Electrical connections between the TiM and other devices may only be created or fixed when there is no power to the system. Otherwise, the devices may be damaged.
- Conducting cross sections of the supply cable from the customer’s power system should be designed in accordance with the applicable standards.
- Secure the TiM with a 0.8 A slow-blow fuse at the switch or PELV circuits. (SELV = Safety Extra Low Voltage, PELV = Protective Extra Low Voltage).
- Use the device only under permitted environmental conditions (e.g. temperature, grounding potential, see “Technical data Page 3”).
- Turn the swivel connector unit with the electrical connections max 180° from end position to end position.
- Protect the TiM against moisture and dust when the cover is open.
- The TiM corresponds to laser class 1 (see “Device overview Page 3”).
- Further information on the mechanical and electrical installation as well as on the measured value output is available in the Technical Information (Nr. 8015883). This information is available for download on the TiM product page (www.sick.com/tim55x).
- The TiM is certified to IEC/EN/UL/CSA 61010-1:2007. These standards for machines.
- The TiM is intended for use as a non-contact measurement system. Further information on the mechanical and electrical installation as well as on the measured value output is available in the Technical Information (Nr. 8015883). This information is available for download on the TiM product page (www.sick.com/tim55x).
- The TiM is certified to IEC/EN/UL/CSA 61010-1:2007. These standards for machines.
- The USB cable may not exceed 3 m in length!
Step 3: Commissioning/Configuration

a. Installing and launching the SOPAS configuration software

The SOPAS configuration software is used as standard to display the surrounding contour (measuring line) recorded by the TiM, as well as diagnostic information in the event of an error.

1. Download and install on the PC the software from the website “www.sick.com/SOPAS_ET”, software type SOPAS ET. In this case, select the “Complete” option as selected by the installation wizard. Administrator rights may be required on the PC to install the software.
2. Start the “SOPAS” program option after completing the installation.
3. Establish communication between SOPAS and TiM via the wizard that has started automatically: Select CONNECT TO A NEW DEVICE.

4. Follow the steps in the Connection Wizard until the FOUND DEVICES window.
5. Select the appropriate TiM from the list of available devices:
   - Use TiM on port 2111 to configure the device.
   - Use TiM on port 2112 to view only measurement data.
Default IP address of the TiM: 

6. Manually:
The IP address/subnet mask should correspond to the address space of the later application.
7. Click Finish to quit the Connection Wizard.
SOPAS ET establishes communication with the TiM, loads its current device description (parameters), and displays it in the navigation tree.

b. Output of measured values

If the TiM receives one of the two following commands by telegram over the Ethernet or USB interface it will start the output of measured values in real time over these data interfaces.

The detailed construction of the output telegram as well as the flow of requests and outputs is described in the “Measured value output” in the Technical Information (Nr. 8015883).

Example:

<table>
<thead>
<tr>
<th>Telegram part</th>
<th>Description</th>
<th>Variable type</th>
<th>Length (byte)</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command type</td>
<td>Request (SOPAS read by name)</td>
<td>string</td>
<td>3</td>
<td>sRN</td>
</tr>
<tr>
<td>Command</td>
<td>Request data</td>
<td>string</td>
<td>11</td>
<td>LMDscandata</td>
</tr>
</tbody>
</table>

Telegram layout: sRN LMDscandata

Example:

<table>
<thead>
<tr>
<th>Telegram part</th>
<th>Description</th>
<th>Variable type</th>
<th>Length (byte)</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command type</td>
<td>Request (SOPAS read by name)</td>
<td>string</td>
<td>3</td>
<td>sEN</td>
</tr>
<tr>
<td>Command</td>
<td>Request data</td>
<td>string</td>
<td>11</td>
<td>LMDscandata</td>
</tr>
</tbody>
</table>

Continuous output of measured values:

Telegram structure: sEN LMDscandata measurement start/stop

Example:

<table>
<thead>
<tr>
<th>Telegram part</th>
<th>Description</th>
<th>Variable type</th>
<th>Length (byte)</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command type</td>
<td>Request (SOPAS event by name)</td>
<td>string</td>
<td>3</td>
<td>sEN</td>
</tr>
<tr>
<td>Command</td>
<td>Request data</td>
<td>string</td>
<td>11</td>
<td>LMDscandata</td>
</tr>
</tbody>
</table>

Output range of the measured values

The TiM scans an angle range of 270°(-45° to 225°) and outputs 271 measured values per scan in the default setting. The angle range for which measured values can be output can be set via OUTPUT RANGE (TIM55x: resolution 1°, TIM56x: resolution 0.33°).

Some other useful functions

- button: Display the fields in the polar coordinate system
- button: Change the view of the TiM from above (TiM: black) to the view from below (TiM: blue)
- button: Switch off the display of the full measuring line or display a dotted measuring line.

Completing the configuration

- Permanently save the entire configuration: Parameter set in: TiM click the button.
- Configuration file on the PC: click the button.

Activate the output of the measured values in SOPAS on a trial basis:
1. Start the terminal emulator with the button.
2. Select the command in the CONNECTIONS menu in the dialog window and establish communication with the TiM over the Ethernet or USB interface.
3. Enter one of the two telegrams in the “Send telegram” input line as they appear (automatically framed by STX and ETX when sending in the default setting). Pay attention to blank characters in the string.
4. Use the button to transfer the telegram to the TiM. The TiM responds by providing the data as a one-off or continuously in the display area of the terminal emulator.

Data output format of the measured values

The data output format per scan is comprised of the measured values (radial distance, RSSI), device and status information and time stamp.

In the default settings, the distance is output as a measured value (in mm).

In order to output remission values in the telegram, select the RSSI checkbox.

To display the remission values in the scan as well, select the RSSI checkbox.

Data output format of the measured values
**Description of the device**

**Device overview**

- **Mounting set 1**
- **Micro USB port, behind the black rubber plate**
- **Swivel connector unit with electrical connections**
- **Red and green LED (status displays)**
- **Push-button (no function)**
- **Transmission range (light emission)**
- **Optical hood**
- **M3 threaded mounting hole, 2.8 mm deep (blind hole thread)**
- **2 x straight plates with M3 x 4 mm screw (included in delivery)**

**Device overview (continued)**

- **All dimensions in mm (inch)**
- **Status displays**
- **Push-button with no function**
- **Status indicators, functions**
- **Function of the synchronization output (SYNC/Device Ready)**

**Function of the synchronization output (SYNC/Device Ready)**

The synchronization output works with the following levels:

<table>
<thead>
<tr>
<th>Function</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Ready</td>
<td>High</td>
</tr>
<tr>
<td>Index signal (15 Hz), corresponds to measurement at 90°</td>
<td>Low peaks</td>
</tr>
<tr>
<td>Error</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Technical data**

- **Model name**
  - TIM55x (Artikel-Nr. 1060445)
  - TIM56x (Artikel-Nr. 1071419)
  - TIM57x (Artikel-Nr. 1075951)

- **Scanning range**
  - TIM55x: 61 mm (TIM55x/TIM57x) / 121 mm (TIM56x/TIM57x)
  - TIM56x/TIM57x: 0.05 m ... 10 m (TIM56x/TIM57x), typically 8 m at 10% remission

- **Angular resolution**
  - TiM55x: 1°
  - TiM56x/TiM57x: 0.33°

- **Response time**
  - Typical 87 ms (2 scans)

- **Scanning range**
  - 0.05 m ... 10 m (TIM55x/TIM56x), 0.05 m ... 25 m (TIM57x), typically 8 m at 10% remission

- **Remission**
  - Typical 4% ... 1,000 % (reflector)

- **Physical Minimum object size (cross-section)**
  - TIM55x: 0.15 mm (TIM55x/TIM57x) for a scanning range of 8 m, 0.12 mm (TIM55x/TIM57x) for a scanning range of 4 m, 0.11 mm (TIM55x/TIM57x) for a scanning range of 2 m, and 0.07 mm for a scanning range of 1 m

- **Measurement error (typically)**
  - 0.001 mm / 0.001 mm

- **Band width (scan field flatness)**
  - ± 3°

- **Ambient light immunity**
  - 80,000 lx (indirect)

- **Light source**
  - Laser diode, infrared (λ = 850 nm)

- **Max. radiation power**
  - 2.0 W (TIM55x)
  - 1.5 W (TIM56x/TIM57x)

- **Max. pulse duration**
  - 5 ms

- **Device laser class**
  - Laser class 1 according to EN 60825-1: 20144, eye-safe

- **Output of measured values**
  - Radial distance, reflectivity value, device and status information, time stamp

- **Aux Interface**
  - USB 2.0 for configuration and measure value outputs (15 Hz), connecting cable max. 3 m.

- **Ethernet interface**
  - Max. data rate: 10 Mbit and 100 Mbit, cable length limited to max. 100 m

- **Switching inputs**
  - 1 x SYNC/Device Ready (I ≤ 100 mA), not electrically isolated from the supply voltage, short-circuit protected / temperature protected

- **Electrical connections**
  - 3 x 4-pin M12 plug (Ethernet)
  - 5 x 5-pin M12 plug (power)
  - 1 x Micro-USB port, type B (covered)

- **Optical indicators**
  - 2 x LED

- **Supply voltage**
  - DC 9 ... 28 V SELV and PEAL according to IEC 60364-4-41: 2005-12

- **Power consumption**
  - 4 W (with unloaded synchronization output)

---

1. 2 x straight plates with M3 x 4 mm screw (included in delivery)
2. M3 threaded mounting hole, 2.8 mm deep (blind hole thread)
3. Optical hood
4. Receiving range (light inlet)
5. Transmission range (light emission)
6. Push-button (no function)
7. Red and green LED (status displays)
8. Switch connector unit with electrical connections and Micro USB port, behind the black rubber plate (‘Aux interface’ connection for configuration with PC)

**Status displays**

- **LED (red)**
  - Device ready/monitoring mode
  - Error
  - Device without supply voltage

- **LED (green)**
  - Device ready/monitoring mode

- **Status**
  - = illuminated; = flashing
The TiM is designed to be operated in a system with professional grounding of all connected devices and mounting surfaces to the same ground potential. If this condition is not met, potential equalization currents may flow through the cable shields, causing the following hazards:

- **Risks linked to courants d’équipotentialité**

Le TIM a été conçu pour être utilisé dans une installation prévoyant une mise à la terre correcte de tous les appareils et surfaces de montage raccordés sur un même potentiel de sol. Si cette condition n’est pas remplie, des courants d’équipotentialité risquent dans certaines conditions de passer par les blindages des câbles et d’exposer aux risques suivants :
- tension de contact dangereuse sur le boîtier en métal,
- comportement incorrect ou destruction du TIM.
- chauffe des câbles jusqu’à leur inflammation spontanée.

Pour des mesures de prévention de tels risques, voir le chapitre « Installation électrique » de l’Information technique (no. 8015883) ou sur la page produit sur internet (www.sick.com/tim5xx).

### Pin assignment for swivel connector unit

**POWER connection (supply voltage)**

<table>
<thead>
<tr>
<th>Pin Signal</th>
<th>Function</th>
<th>Wire color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24 V</td>
<td>Supply voltage IN (9…28 V)</td>
</tr>
<tr>
<td>2</td>
<td>SYNC/Device Ready</td>
<td>Synchronization output</td>
</tr>
<tr>
<td>3</td>
<td>GND SYS</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Not assigned</td>
<td></td>
</tr>
</tbody>
</table>

Cable no. 6036159 (5 m)

**“Ethernet” connection (6034415)**

- **Scope of delivery**

  - TIM including mounting kit 1 (two straight plates, 2 M3 x 4 mm screws)
  - Printed operating instructions in German and English, in other languages, as necessary.
  - Other optional accessories (if these have been ordered)

**Maintenance and care**

The TIM does not contain any components that require maintenance. Maintenance is not necessary to ensure compliance with laser class 1.

- If it is dirty, clean the infrared light permeable, black housing using a damp cloth (with a mild cleaning agent).

**Transport and storage**

The TIM must be transported and stored in its original packaging with the USB protective cap plugged in. Do not expose to aggressive media (e.g., solvents). Storage conditions: dry, dust-free, no direct sunlight, as little vibration as possible, storage temperature –40°C to +75°C, relative air humidity max. 90% (non-condensing).

**Repair**

Repair work on TIM may only be performed by qualified and authorized service personnel from SICK AG.

**Removal and disposal**

Any TIM which can no longer be used at the end of its product life cycle must be disposed of in an environmentally friendly manner in accordance with the respective applicable country-specific waste disposal regulations.

The TIM is electronic waste and must under no circumstances be disposed of with general waste!