Operating Instructions

Cooling Jacket Advanced

Cooling Jacket Advanced Extended
Cooling housing for TIM series, video pyrometer and laser pyrometer at high ambient temperatures
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1 General Notes

1.1 Intended Use
The cooling housing Cooling Jacket Advanced is intended to use for TIM series, video thermometers CTVideo and CSVide as well as CTLaser and CSLaser for application at high ambient temperatures.

- Read the manual carefully before the initial start-up. The producer reserves the right to change the herein described specifications in case of technical advance of the product.

- In case of problems or questions which may arise when you use the infrared camera, please contact our service department.

- All accessories can be ordered according to the referred part numbers in brackets ( ).
1.2 Warranty

All components of the device have been checked and tested for perfect function in the factory. In the unlikely event that errors should occur despite our thorough quality control, this should be reported immediately to MICRO-EPSILON.

The warranty period lasts 12 months following the day of shipment. Defective parts, except wear parts, will be repaired or replaced free of charge within this period if you return the device free of cost to MICRO-EPSILON. This warranty does not apply to damage resulting from abuse of the equipment and devices, from forceful handling or installation of the devices or from repair or modifications performed by third parties.

No other claims, except as warranted, are accepted. The terms of the purchasing contract apply in full. MICRO-EPSILON will specifically not be responsible for eventual consequential damages. MICRO-EPSILON always strives to supply the customers with the finest and most advanced equipment. Development and refinement is therefore performed continuously and the right to design changes without prior notice is accordingly reserved.

For translations in other languages, the data and statements in the German language operation manual are to be taken as authoritative.
1.3 Scope of Supply

1.3.1 Versions

Cooling Jacket Advanced

- Cooling Jacket Advanced for TIM series
  (Part-No.: TM-CJA-TIM), consisting of housing and chassis
  The focusing unit or the front part must be ordered separately.
- Cooling Jacket Advanced for CSLaser, CTLaser as well as CTVideo and CSVideo
  (Part-No.: TM-CJA-CTL)
  The front part must be ordered separately.
- Installation instructions

Cooling Jacket Advanced Extended

- Cooling Jacket Advanced for TIM series
  (Part-No.: TM-CJAExxx-TIM), consisting of housing and chassis
- Cooling Jacket Advanced for CSLaser, CTLaser as well as CTVideo and CSVideo
  (Part-No.: TM-CJAExxx-CTL), consisting of housing and chassis
  The front part must be ordered separately.
- incl. mounting accessories for
  - TIM NetBox or USB server Gigabit
  - Industrial PIF
  - Installation instructions

Operation without focusing or front attachment is not possible.
1.4 Mounting Accessories

1.4.1 Accessories for TIM NetBox

Figure 1: Accessories for TIM NetBox

1 Support rods for Industrial PIF (2x distance bolt SW 5,5x6 - M3x6, 2x cylinder head screw M3x10 and 2x cylinder head screw M3x5)
2 Shaft for fixing the TIM NetBox
3 Holding plate (2x cylinder head screw M3x5)
4 Fastening rail (4x cylinder head screw M4x8)
1.4.2 Accessories for USB Server Gigabit

Figure 2: Accessories for USB-Server Gigabit

1. DIN rail plate for fixing the USB server Gigabit
2. Distance rings
3. Screws
4. Support rods for Industrial PIF, with thread and without
## 2 Technical Data

### 2.1 General Specifications

<table>
<thead>
<tr>
<th></th>
<th>Cooling Jacket Advanced</th>
<th>Cooling Jacket Advanced Extended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental rating</td>
<td>IP 65</td>
<td>IP 65</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>up to 315 °C¹</td>
<td>up to 315 °C¹</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10 ... 95 %, non-condensing</td>
<td>10 ... 95 %, non-condensing</td>
</tr>
<tr>
<td>Material (housing)</td>
<td>V2A</td>
<td>V2A</td>
</tr>
<tr>
<td>Dimensions</td>
<td>271 mm x 166 mm x 182 mm</td>
<td>426 mm x 166 mm x 182 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>5.7 kg</td>
<td>7.8 kg</td>
</tr>
<tr>
<td>Air purge collar</td>
<td>G1/4&quot; Internal thread</td>
<td>G1/4&quot; Internal thread</td>
</tr>
<tr>
<td></td>
<td>G3/8&quot; External thread</td>
<td>G3/8&quot; External thread</td>
</tr>
<tr>
<td>Cooling water fittings</td>
<td>G1/4&quot; Internal thread</td>
<td>G1/4&quot; Internal thread</td>
</tr>
<tr>
<td></td>
<td>G3/8&quot; External thread</td>
<td>G3/8&quot; External thread</td>
</tr>
<tr>
<td>Cooling water pressure</td>
<td>15 bar (217 psi)</td>
<td>15 bar (217 psi)</td>
</tr>
</tbody>
</table>

¹ Cable available up to 250 °C ambient temperature as well as cable cooling up to 315 °C.
2.1.1 Focusing Unit and Front Part

Is needed for mounting a thermoIMAGER TIM or pyrometer.

**Focusing unit**

- for 6°, 48° and 72° optics (Part-No.: TM-CJAFU6-TIM)
- for 23° optics (Part-No.: TM-CJAFU23-TIM)

**TIM 160**

**Focusing unit**

- for 18° optics (Part-No.: TM-CJAFU18-TIM)
- for 29° optics (Part-No.: TM-CJAFU29-TIM)
- for 53° optics (Part-No.: TM-CJAFU53-TIM)

**TIM QVGA / QVGA-HD**
Focusing unit
for 15° optics (Part-No.: TM-CJAFU15-TIM)
for 33° optics (Part-No.: TM-CJAFU33-TIM)
for 60° optics (Part-No.: TM-CJAFU60-TIM)
for 90° optics (Part-No.: TM-CJAFU90-TIM)

Focusing unit
for 16 mm (Part-No.: TM-CJAFUO16-TIM)
for 25 mm (Part-No.: TM-CJAFUO25-TIM)
for 50 mm (Part-No.: TM-CJAFUO50-TIM)
for 75 mm (Part-No.: TM-CJAFUO75-TIM)

Front part
for TIM 2xx (Part-No.: TM-CJAFP2xx-TIM)
Technical Data

**Front-part**
for the 80° optics (TIM QVGA) the protection window *(Part-No.: TM-CJAFP80-TIM)*
must be ordered separately!

**TIM QVGA**

**Front part**
for CTLaser, CSLaser, CTVideo, CSVideo *(Part-No.: TM-CJAFP-CTL)*

**CTLaser, CSLaser, CTVideo, CSVideo**
2.2 Accessories

2.2.1 High Temperature Cable

High temperature Ethernet cable cat.6 (180 °C), 10 m, incl. 2x RJ45 connector
(Part-No.: TM-CJAETC10H-TIM)

High temperature Ethernet cable cat.6 (180 °C), 20 m, incl. 2x RJ45 connector
(Part-No.: TM-CJAETC20H-TIM)

High temperature Ethernet cable cat.6 (250 °C), 10 m, incl. 2x RJ45 connector
(Part-No.: TM-CJAETC10H2-TIM)

High temperature Ethernet cable cat.6 (250 °C), 20 m, incl. 2x RJ45 connector
(Part-No.: TM-CJAETC20H2-TIM)

High temperature USB cable (180 °C), 5 m
(Part-No.: TM-USB5PC5HCJA-TIM)

High temperature USB cable (180 °C), 10 m
(Part-No.: TM-USB5PC10HCJA-TIM)

High temperature USB cable (250 °C), 5 m
(Part-No.: TM-USB5PC5H2CJA -TIM)

High temperature USB cable (250 °C), 10 m
(Part-No.: TM-USB5PC10H2CJA -TIM)

Pyrometer cable (available separately)

Note: A pre-installed cable gland … CGx is mandatory for the usage of the CoolingJacket. The cables listed here already contain this cable gland.
### 2.2.2 Protection Window

Adequate protection windows are available for all versions.

<table>
<thead>
<tr>
<th>Part-No.</th>
<th>Description</th>
<th>Spectral range</th>
<th>Transmission¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM-CJAPWL-TIM</td>
<td>Protective window (50.8 x 3 mm/ Ge) for TIM QVGA-G7, TIM VGA-G7</td>
<td>7.9 µm</td>
<td>0.96</td>
</tr>
<tr>
<td>TM-CJAPWL-TIM</td>
<td>Protective window (50.8 x 3 mm/ Ge) for TIM 160, TIM QVGA, TIM QVGA-HD, TIM 640</td>
<td>7.5 - 13 µm</td>
<td>0.92</td>
</tr>
<tr>
<td>TM-CJAPWL2xx-TIM</td>
<td>Protective window (67 x 3 mm/ ZnS) for TIM 2xx (VIS + IR transmittive), TIM 160, TIM QVGA (80° optics), TIM QVGA-HD, TIM QVGA-G7, TIM 640, TIM VGA-G7 if used together with air purge laminar</td>
<td>7.5 - 13 µm</td>
<td>0.91</td>
</tr>
<tr>
<td>TM-CJAPWZNS-TIM</td>
<td>Protective window (50.8 x 3 mm/ ZnS) for für TIM QVGA-G7, TIM VGA-G7</td>
<td>7.9 µm</td>
<td>0.93</td>
</tr>
<tr>
<td>TM-CJAPWZNS-TIM</td>
<td>Protective window (50.8 x 3 mm/ ZnS) for TIM 160, TIM QVGA (without 80° optics), TIM QVGA-HD, TIM 640</td>
<td>7.5 - 13 µm</td>
<td>0.91</td>
</tr>
<tr>
<td>TM-CJAPWS-CTL</td>
<td>Protective window (67 x 3 mm/ Borofloat 33) for 1M/ 2M/ 3M-models of CTlaser-, CSlaser-, CTvideo-, CSvideo series</td>
<td>1.0/ 1.6/ 2.3 µm</td>
<td>0.92</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Wavelength Range</td>
<td>Transmittance</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>TM-CJAPWM05-TIM</td>
<td>Protective window (67 x 3 mm/ Borofloat 33) for TIM M-05</td>
<td>450 - 650 nm</td>
<td>0.98</td>
</tr>
<tr>
<td>TM-CJAPWM1-TIM</td>
<td>Protective window (67 x 3 mm/ Borofloat 33) for TIM M-1</td>
<td>0.85 – 1.1 µm</td>
<td>0.98</td>
</tr>
</tbody>
</table>

1) The shown values are standard values and may vary between different delivery batches.
2.2.3 Mounting Flange
Mounting flange (Part-No.: TM-CJAMF-TIM) for front mounting of the Cooling Jacket Advanced (Standard and Extended) including mounting screws and washers

2.2.4 Laminar Air Purge
Laminar air purge for front mounting of the Cooling Jacket Advanced (Standard and Extended). Two different versions are available: One for standard IR camera applications [Part-No.: TM-CJAAPLS] and the other for line scanning applications [Part-No.: TM-CJAAPLL].

Those two versions are fitting to all focusing units with production date ≥01/2018. A protective window (67 x 3 mm) has to be ordered separately. If you like to mount the air purge on an older CJ, the focusing unit should be exchanged to the current version.

### Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective rating</td>
<td>IP65</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Up to 315 °C (with water cooling)</td>
</tr>
<tr>
<td>Material</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>200 x 189 x 43 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.9 kg</td>
</tr>
<tr>
<td>Air purge connection</td>
<td>NW 7.2</td>
</tr>
<tr>
<td>Cooling water connection</td>
<td>G3/8&quot; external thread</td>
</tr>
<tr>
<td>Cooling water pressure</td>
<td>Max. 8 bar</td>
</tr>
<tr>
<td>Volume flow</td>
<td>40 - 120 l/min</td>
</tr>
<tr>
<td>Air pressure</td>
<td>1.1 - 8 bar</td>
</tr>
<tr>
<td>Protective window</td>
<td>Necessary¹)</td>
</tr>
</tbody>
</table>

¹) A protective window (67 x 3 mm) has to be ordered separately.
Air purge workspace is between 1.1 bar to 6 bar and a volumeflow of 40 l/min to 120 l/min!

Dimensions of laminar air purge
Dimensions of laminar air purge (line scanner version)

Air purge workspace is between 1.1 bar to 8 bar and a volumeflow of 40 l/min to 120 l/min.
2.2.5 Additional Accessories

Industrial PIF without housing (Part-No.: TM-CJAPIF500V2-TIM), 500 VAC\textsubscript{RMS} isolation voltage between TIM and process, 25 cm connection cable.

Industrial PIF without housing
2.3  Dimensions

2.3.1  Cooling Jacket Advanced

Figure 3: Cooling Jacket Advanced - side view
Figure 4: Cooling Jacket Advanced - top view
Figure 5: Cooling Jacket Advanced - front view
Figure 6: Cooling Jacket Advanced, standard version – complete view
2.3.2 Cooling Jacket Advanced Extended

Figure 7: Cooling Jacket Advanced Extended - side view
Figure 8: Cooling Jacket Advanced, extended version - top view
Figure 9: Cooling Jacket Advanced, extended version - front view
Figure 10: Cooling Jacket Advanced, extended version – complete view
2.3.3 Mounting Flange (Accessories) TM-CJAMF-TIM

Figure 11: Mounting flange for Cooling Jacket Advanced (Standard and Extended)
2.4 Fittings

2.4.1 Cooling Water Fitting

- The cooling water input and output has a G1/4"-internal thread and a G3/8"-external thread.

- The maximum cooling water pressure is 15 bar (271 psi).

- While connecting the hoses keep inclined the Cooling Jacket at an angle of approx. 45° to avoid air bubbles.

2.4.2 Air Purge Collar

- Use oil-free, technically clean air only.

- The needed amount of air (approx. 120 l/min., 5 – 8 bar) depends on the application and the installation conditions on-site.

- The air purge collar has a G1/4"-internal thread and a G3/8"-external thread.

The lens must be kept clean at all times from dust, smoke, fumes and other contaminants in order to avoid reading errors. These effects can be reduced by using an air purge collar.
The following classes according to ISO 8573-1 are recommended for the quality of compressed air:

<table>
<thead>
<tr>
<th>Classes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil content:</td>
<td>class 2 or better</td>
</tr>
<tr>
<td>Water content:</td>
<td>class 4 or better</td>
</tr>
<tr>
<td>Solid content:</td>
<td>class 2 or better</td>
</tr>
</tbody>
</table>
2.4.3 Cable Glands on the Back

Figure 12: Cable glands with seal insert
2.5 Cooling Properties

<table>
<thead>
<tr>
<th>Flow</th>
<th>Temperature at 1 l/min</th>
<th>Temperature at 2.5 l/min</th>
<th>Temperature at 5 l/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature [255 °C]</td>
<td>Cooling water input [°C]</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Camera/ Thermometer [°C]</td>
<td>36</td>
<td>34</td>
</tr>
</tbody>
</table>

Table 1: Cooling properties with a steady cooling water input temperature and various flow

<table>
<thead>
<tr>
<th>Flow</th>
<th>Temperature at 2.5 l/min of flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature [255 °C]</td>
<td>Cooling water input [°C]</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Camera/ Thermometer [°C]</td>
</tr>
<tr>
<td></td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>51</td>
</tr>
</tbody>
</table>

Table 2: Cooling properties with a steady flow and various cooling water input temperature
2.5.1 Condensation

- For applications at ambient temperatures until 100 °C and a high humidity there is danger of condensation (see Table 3).

- To avoid condensation, the temperature of the cooling media and the flow rate must ensure a minimum device temperature.

- Consider the operation temperature of the applied devices.

Example (see Table 3):

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>25 %</td>
</tr>
<tr>
<td>Minimum device temperature</td>
<td>45 °C</td>
</tr>
</tbody>
</table>

At an ambient temperature of 80 °C and a relative humidity of 25 % the device temperature must not be below 45 °C. Otherwise condensation occurs on the lens or the electronic.
<table>
<thead>
<tr>
<th>Relative humidity [%]</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
<th>60</th>
<th>65</th>
<th>70</th>
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<th>85</th>
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**Table 3:** Minimum device temperature in relation to ambient temperature and relative humidity in [°C]
Please respect the maximum ambient temperature of your measuring system!
3  Installation

3.1  Installation

The Cooling Jacket Advanced both versions can be installed in the desired position via the mounting bracket.

Figure 13: Cooling Jacket Advanced with mounting bracket (TM-JAB-TIM)

1  Mounting bracket, adjustable in two axes
3.2 Installation of TIM Camera, Infrared Video Thermometer and Infrared Thermometer

3.2.1 Assembling of the Focusing Unit

The focusing unit consists of two parts, external (1) and internal (2) part. The external part focuses the camera. The internal part fixes the camera.

Figure 14: Focusing unit (external and internal part)

1. External part of the focusing unit
2. Internal part of the focusing unit
Figure 15: Assembling of the 6°, 9°, 23°, 26°, 29°, 33°, 39°, 41°, 53°, 72° optics
Figure 16: Assembling of the 13° and 15° optics
**Note:** For the installation of the 60° and 90° optics, the camera must be fixed upside down on a supplied bracket.

**Figure 17:** Assembling of the 60° and 90° optics
3.2.2 Assembling of the Front Part

Figure 18: Assembling of the TIM 2xx
**Note:** The subsequent focusing on the focusing unit in the built-in cooling housing should be done wisely. If you use too much force, the optics can be over-twisted and damaged.

**Figure 19:** Assembling of the TIM M-1 / TIM M-05
Figure 20: Assembling of the CTLaser, CSLaser, CTVideo, CSVideo
3.2.3 Mounting of the Protective Window at Focusing Unit

Step 1: Loosen the three countersunk head screws M2 x 5 (inside) and remove them!

Step 2: Turn six countersunk head screws M1.6 x 4 (outside) by two turns to the left! (Do not unscrew or remove!)

Step 3: Now carefully pull the nozzle ring out of the focusing unit!

Step 4: Place the protective window in the provided platform of the focusing unit and the O-ring 50 x 1.5 in the provided nut of the nozzle ring!

Step 5: Plug the nozzle ring back into the focusing unit and secure it with the three countersunk head screws M2 x 5 (inside)!

Step 6: Now tighten the six countersunk head screws M1.6 x 4 (outside) by twisting them two turns to the right!
Figure 22: Individual components of the focusing unit
3.2.4 Assembly of the Laminar Air Purge

Dismount cover plate from Airpurge.

**Figure 23**: Assembly of the laminar air purge
**Figure 24: Assembly of the laminar air purge**

For the focusing unit, the standard air purge must be removed! When mounting from the chassis to the CJA, the nut of the focusing unit must match the spring of the focus ring (see picture Z).
Adjustment of air flow

Figure 25: Adjustment of air outflow

To change the air outflow direction on the air purge, turn the knurled head screws 1 and 2 simultaneously to the left or right to move the drawer up or down.
Figure 26: Change of the protective window

Loosen the screws from the clamping ring and remove it! Now take out the O-ring and the protective window!
3.2.5  Assembling to the Cooling Jacket Advanced Standard Version

Depending on the chassis either a camera of the TIM series, a laser infrared thermometer or an infrared video thermometer can be installed.

![Diagram of Cooling Jacket Advanced](image)

**Figure 27**: Cooling Jacket Advanced

1. Housing  
2. Front part (or focusing unit)  
3. Chassis
Installation of TIM camera

1. Mount the camera to the focusing unit or the front part as described in Chapter 3.2.1 respectively Chapter 3.2.2. (exception for the camera TIM M-1/ M-05).

2. Seat the focusing unit or front part in the chassis (Figure 28). Position it as shown in Figure 31, by pushing it to the bottom. The TIM M-1/ TIM M-05 camera is first placed into the chassis without the front part. After that the front part is attached to the optic. Make sure that the front part is placed at a height of approx. 5 mm above the optic in order to be able to slide it over the chassis front plate (Figure 31).

Figure 28: Inserting of the focusing unit
Figure 29: Long holes on the bottom of the chassis

Figure 30: Positioning the two bars in the slot for different cameras
Figure 31: Focusing unit with camera

3. Fix the camera with the provided screw on the bottom of the chassis.
Figure 32: Mounting of the camera to the chassis

4. Then connect the TIM camera with the provided USB cable and lead it out of the cable gland.

5. Slide the chassis with the camera in the housing. Put the pins of the hinges to the slits of the chassis and lock the hinge by pushing it forward (Figure 33).
6. Move the locking lever to the left (symbol: 🔒), so that the chassis is fitted close to the inner surface of the housing (Figure 34).
The alternate contact of the cooling jaws with the camera/ infrared thermometer and inner housing generates an optimal cooling effect.

1  Contact of the cooling jaws and inner housing
2  Contact of the cooling jaws and camera/ infrared thermometer
Figure 34: Back side of the Cooling Jacket with locking lever

1 Locking lever
7. Dismount in reverse order.

Figure 35: Unlocking of the hinge
Installation of video thermometer or infrared thermometer

1. Screw the infrared thermometer in the thread (M48x1.5) of the front part (see Figure 20) and seat the front part in the chassis (Figure 36).

![Figure 36: Front part with infrared thermometer](image)

2. Lead the sensor cable out of the cable gland.
Figure 37: Infrared thermometer mounted

3. Slide the chassis with the camera in the housing. Put the pins of the hinges to the slits of the chassis and lock the hinge by pushing in forward (Figure 33).

4. Move the locking lever to the left (symbol:🔒), so that the chassis is fitted close to the inner surface of the housing (Figure 34).

5. Dismount in reverse order (Figure 35).
3.2.6 Assembling to the Cooling Jacket Advanced Extended

The extended version of the Cooling Jacket Advanced provides an installation of the TIM series together with the TIM NetBox and an Industrial PIF or with the USB server Gigabit and an Industrial PIF.

Figure 38: Cooling Jacket Advanced, extended version

1 Housing
2 Focusing unit
3 Chassis
Installation of TIM camera

Steps 1-3, see page 54.

Figure 39: Camera implemented (extended version)

Assembling of TIM NetBox and Industrial PIF

4. Mount the holding plate (screws M3x5). Then attach the two support rods complete with the distance bolts (SW 5,5x6 - M3x6) with the provided screws (M3x10) to the bottom of the chassis. At last mount the shaft to fix the TIM NetBox (Figure 40).
Figure 40 (a-c): Mounting of the accessories for TIM NetBox: a) Holding plate for TIM NetBox (top view), b) Support rods for Industrial PIF (view from the bottom), c) Shaft to fix the TIM NetBox (view from the bottom)
5. Fix the Industrial PIF with the screws (M3x5) as shown in Figure 41.

![Figure 41: Mounting of the Industrial PIF (top view)](image)

6. To mount the TIM NetBox to the chassis screw it to the fastening rail (screws M4x8).
Figure 42: TIM NetBox with fastening rail

At first push the fastening rail with the TIM NetBox into the left notch (1) of the shaft. Afterwards into the right notch (1) (**Figure 43**) until it is engaged (**Figure 44**).

By locking the chassis the shaft pushes the TIM NetBox to the inner surface of the housing. This guarantees an optimal cooling of the TIM NetBox.
Figure 43: Notch to fix the TIM NetBox (top view)

1  Notch
7. Then connect the TIM camera and the TIM NetBox with the provided USB cable and the Industrial PIF with the camera. Combine the network connector and the TIM NetBox (Figure 45).

The USB angle plug is a reversible plug. This means that the plug can be plugged freely around in the USB socket and works in both orientations.
Figure 45: Chassis with TIM camera, Industrial PIF and TIM NetBox

Follow as step 5, page 57.
Assembling of USB server Gigabit and Industrial PIF

4. Mount the DIN rail plate with the screws (M3x5) to fix the USB server Gigabit. Then attach the support rods with the provided screws (M3x10) to one side of the chassis; use the distance ring on the left (Figure 46).

![Figure 46 (a + b): Mounting of the accessories for USB server Gigabit: a) DIN rail plate for USB server Gigabit (view from the bottom), b) Support rods for Industrial PIF (right hand view)](image)

5. Fix the Industrial PIF with the screws (M3x5) as shown in Figure 47.
6. Engage the USB server Gigabit to the DIN rail plate (Figure 48).
Figure 48 (a + b): Fitting the USB server Gigabit into the chassis (top view and right hand view)

7. Then connect the TIM camera and the USB server Gigabit with the provided USB cable and the Industrial PIF with the camera. Combine the network connector and the USB server Gigabit (Figure 49).

The USB angle plug is a reversible plug. This means that the plug can be plugged freely around in the USB socket and works in both orientations.
Figure 49: Chassis with TIM camera, Industrial PIF and USB server Gigabit

Follow as step 5, page 57.

The USB Server can only be powered via PoE (Power of Ethernet) in the built-in CoolingJacket.
Figure 50: Mounting USB and network connector to USB server

Follow as step 5, page 57.
4 Example of Installation

- TIM camera
- Cooling Jacket Advanced
- PIF cable
- Industrial PIF
  - 3x Analog Output
  - 2x Analog Input
  - 1x Digital Input
- HT-USB cable
- TIM camera
- TIM NetBox
- USB server Gigabit
- Cooling Jacket Advanced
- HT-Ethernet cable Cat. 6
- HT-Ethernet cable Cat. 6
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**Cooling Jacket**
- **Advanced**
- **Extended**

**TIM camera**
- Industrial-PIF

**TIM NetBox**
- USB server
- Gigabit

**CT Box**
- Industrial-PIF

**CT Laser**
- HT cable

**HT-Ethernet cable Cat. 6**
- PIF cable
  - 3x Analog Output
  - 2x Analog Input
  - 1x Digital Input

**COOLING JACKET ADVANCED**

**PIF cable**
- 3x Analog Output
- 2x Analog Input
- 1x Digital Input
Example of installation

CTVideo

Cooling Jacket Advanced

HT cable video signal

CT Box

HT cable
sensor signals + laser

CSLaser

HT cable (analog [4-20 mA]/ digital)

Cooling Jacket Advanced
*All high temperature cables are available for temperatures up to 180 °C / 250 °C:

- IR video thermometer and IR thermometer: 3 m, 8 m, 15 m
- HT-Ethernet cable Cat.6: 10 m und 20 m
- HT-USB cable: 5 m, 10 m
Example of installation

**Figure 51**: CoolingJacket (Standard) with CSvideo

**Figure 52**: Cooling Jacket Advanced (Extended) with TIM Netbox and industrial PIF

**Figure 53**: Cooling Jacket Advanced (Extended-Version) with USB Server and industrial PIF