XR/XB-LED Illumination System
SXR/SXB-LED Illumination System
X-Illumination Controller

HW Service Module

DANTEC DYNAMICS

Dantec Dynamics, a Nova Instruments company NOVA INSTRUMENTS

List of Changes

› Before **<May 2023**, the DSM 47100, DSM 47120, DSM 47130, and DSM 47140 was cited as „**V1-CT+“** or **„V1-MT+“** .

› As of **May 2023**, the DSM 47100, DSM 47120, DSM 47130, and DSM 47140 was re-cited to „**V2-CT+“** or **„V2-MT+“** , which incorporated the following changes to „**V1-CT+“** or **„V1-MT+“**;

- diffuse filters can be **inserted into the slit** on the upper side of the illumination system,
- a **different power connection** is used (**Molex-design**), and
- a **different polfilter mounting design** is incorporated

› As of **April 2024**, the DSM 47100, DSM 47120, DSM 47130, and DSM 47140 was re-cited as „**V3-CX+“** or **„V3-MX+“**, which incorporates the following changes to „**V2-CT+“** or **„V2-MT+“**;

- **new compatabiltiy** with the **DSM 47250: X-Illumination Controller**,
- the **DSM 47120** and **DSM 47140** are offered with **royal blue** wavelength,
- the **DSM 47100** and **DSM 47120** are rated to an **IEC 62471** rating to **Risk Group 3**,
- the **mounting bracket** is offered as a separate, optional item, and
- the power supply for the **DSM 47100** and **DSM 47120** is of **different design** and **connection capability.**

XR/XB-Power Connection V3/V2

1x XR/XB-Illumination Unit V3/V2
- 1x conntector with trigger/power type molex *(1)*

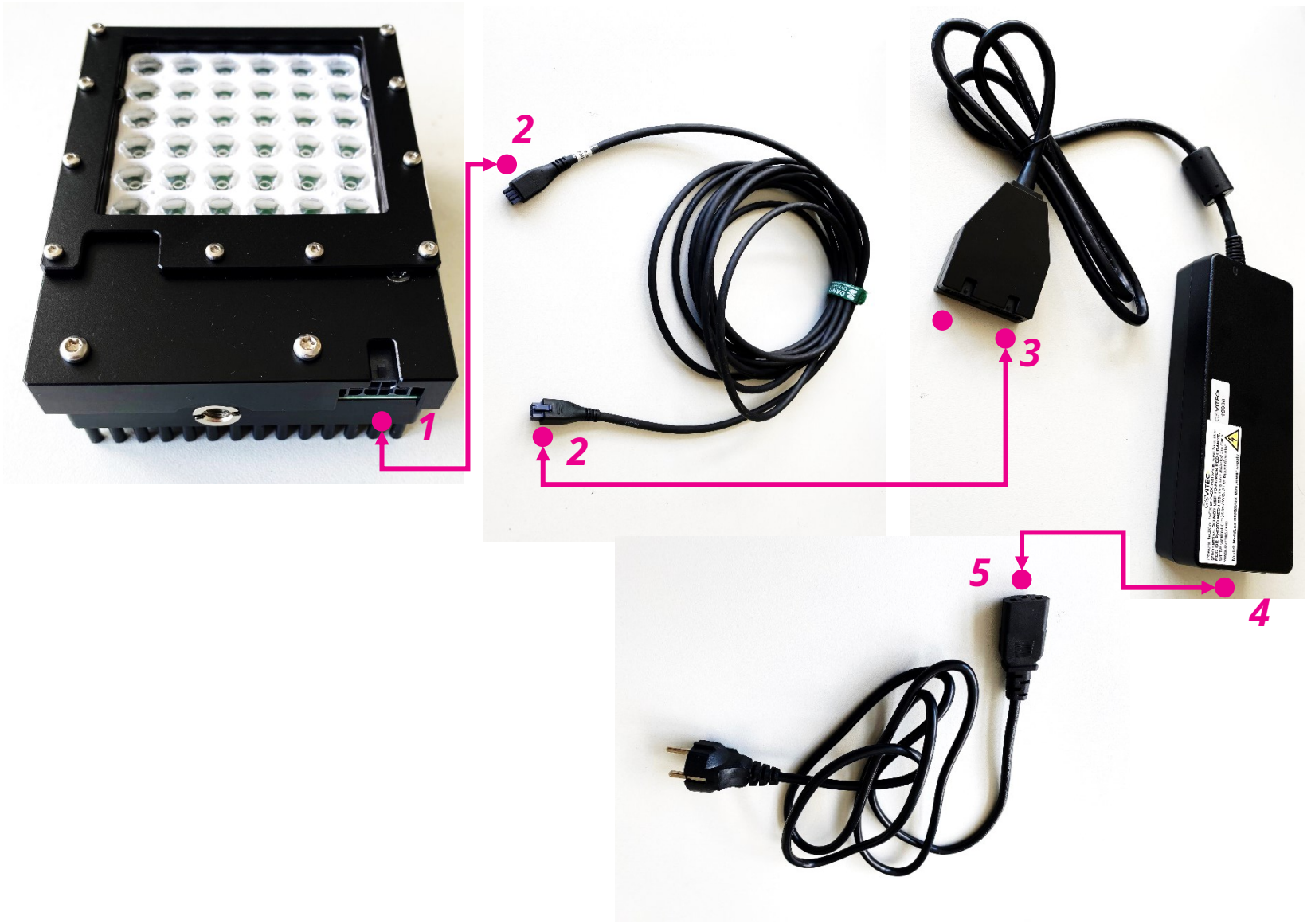
1x XR/XB-Cable
- 1x 7m cable *(2)*

1x Power Transformer
- 2x connector with trigger/power type molex *(3)*
- Power Network adapter *(4)*

1x Power Cable *(5)*

Key
Power
Data
Data + Power
Trigger
Trigger + Power

Component No. / „**1**“-“X“-“X“
Type No. / „X“-“**1**“-“X“
Connection No. / „X“-“X“-“**1**“



SXR/SXB-Power Connection V3/V2

1x SXR/SXB-Illumination Unit V3/V2
- 1x conntector with trigger/power type molex *(1)*

1x XR/XB-Cable
- 1x 7m cable *(2)*

1x X-Illumination Controller
- 8x connectors with trigger/power type molex *(3)*
- 2x power injectors *(4)*

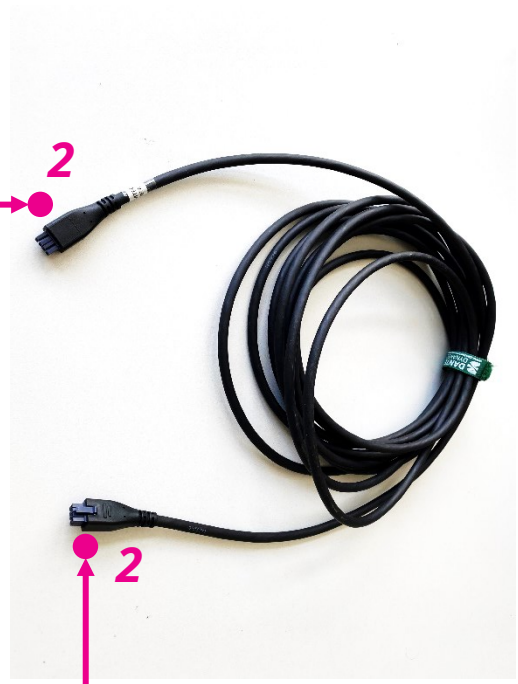
1x Power Transformer
- 1x power injector *(5)*
- Power network adapter *(6)*

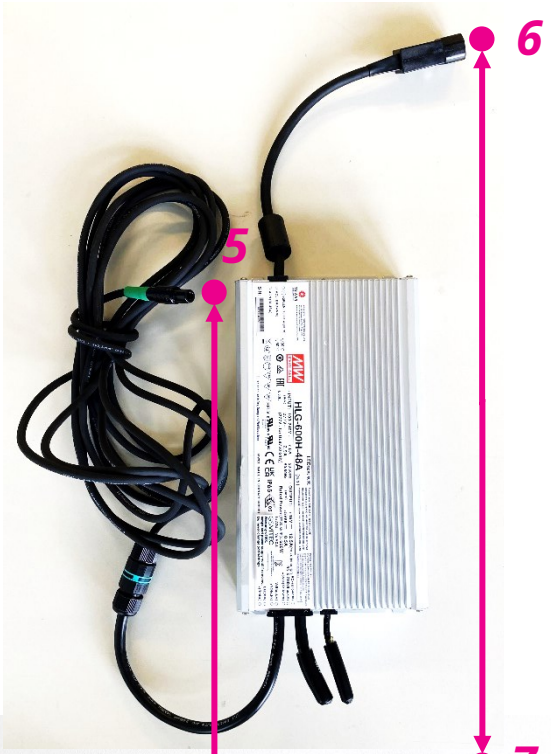
1x Power Cable *(7)*

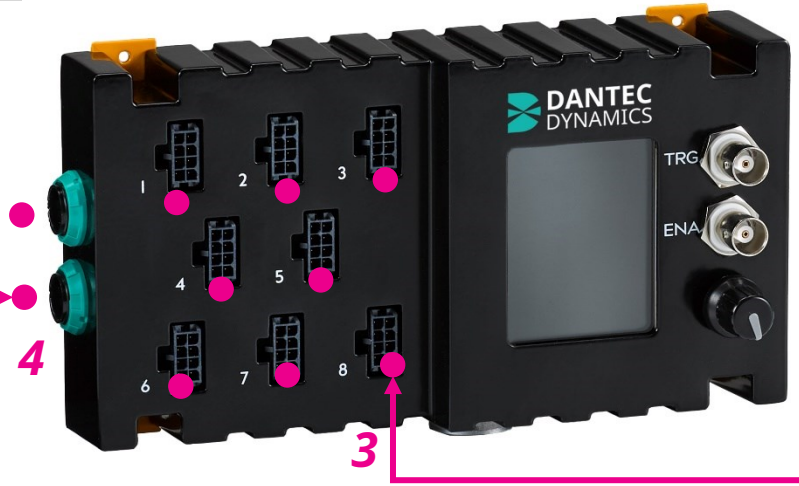
Key
Power
Data
Data + Power
Trigger
Trigger + Power

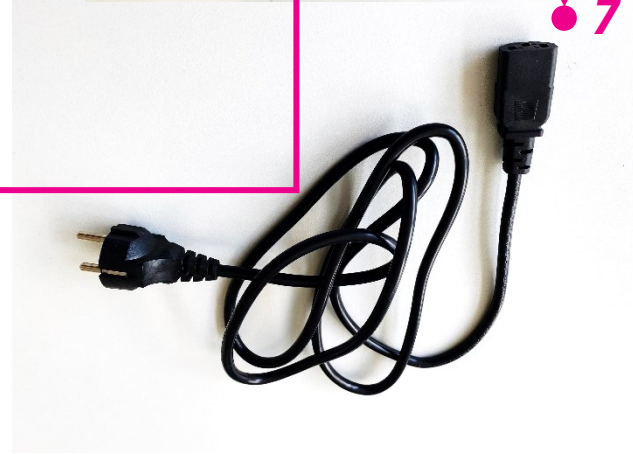
Component No. / „**1**“-“X“-“X“
Type No. / „X“-“**1**“-“X“
Connection No. / „X“-“X“-“**1**“



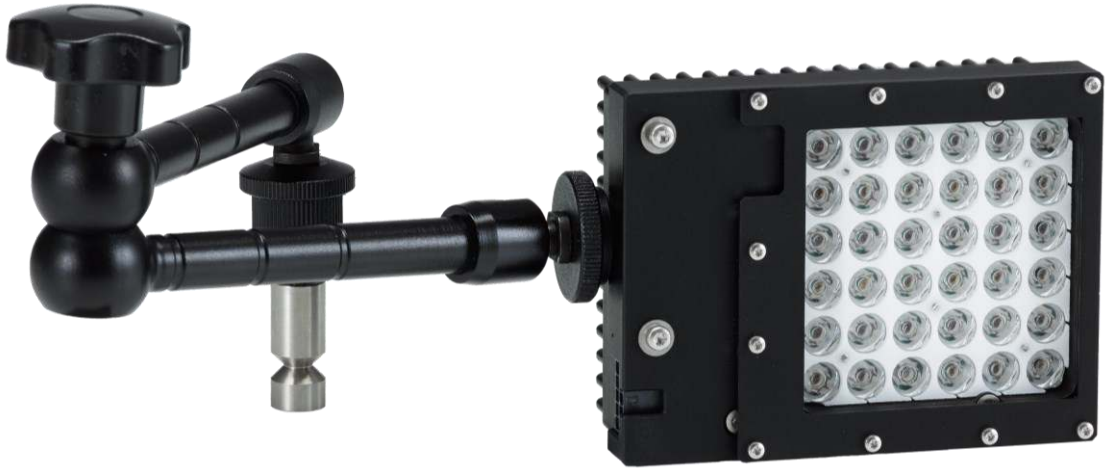








XR-LED/XB-LED Lens Assembly – V3/V2 (I)

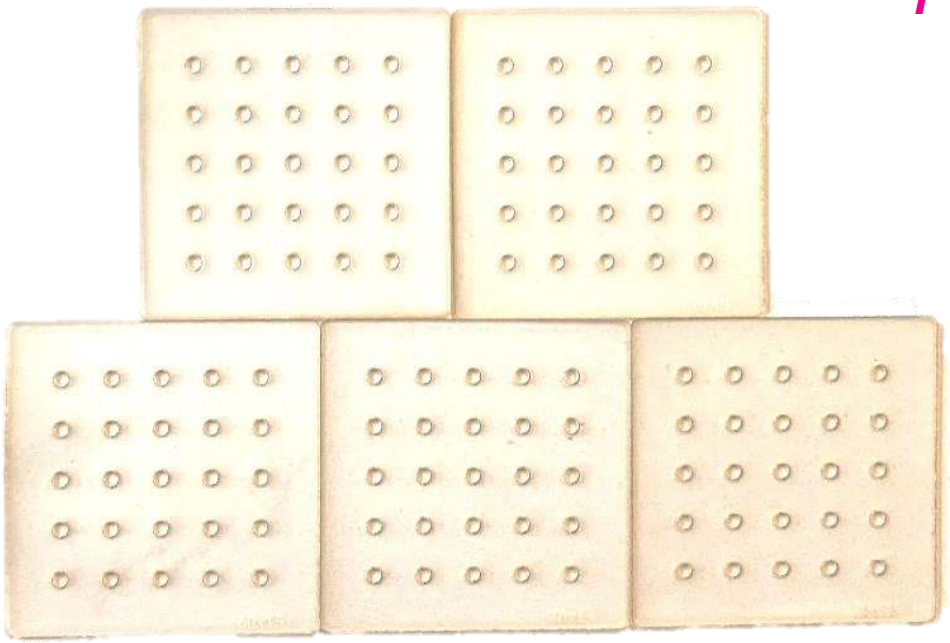


5x Exchangable Diffuse Filters

1. *20° x 20°*
2. *40° x 40°*
3. *60° x 60°*
4. *30° x 15°*
5. *60° x 15°*

- *The illumination angle is described as a divergence angle in X° x Y° directions, respectively*
- *The optics can be mounted in 0° or 90° orientation with text legible in corner of filter*

1



Components

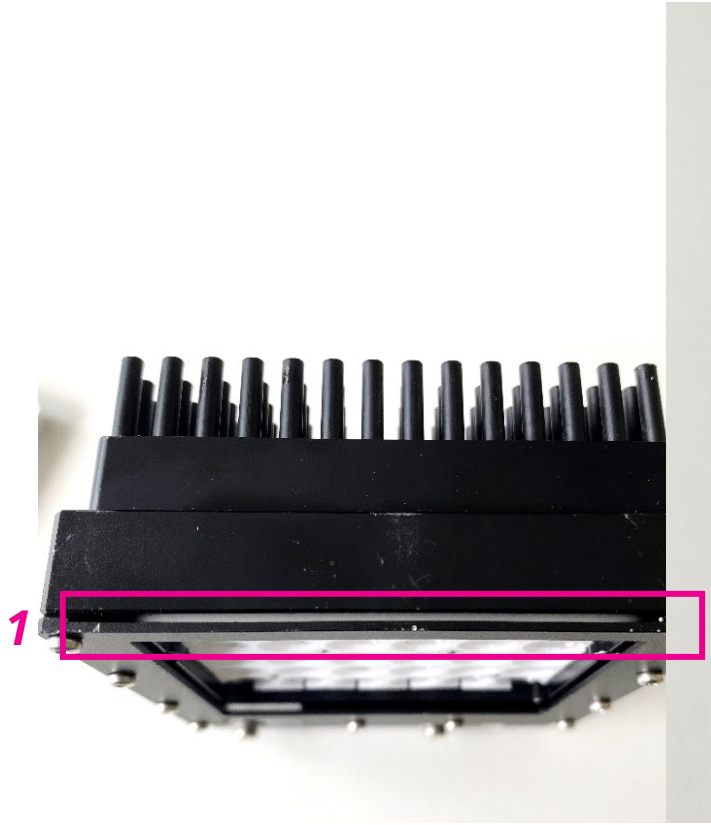
- *5x Exchangable Diffuse Filters **(1)***

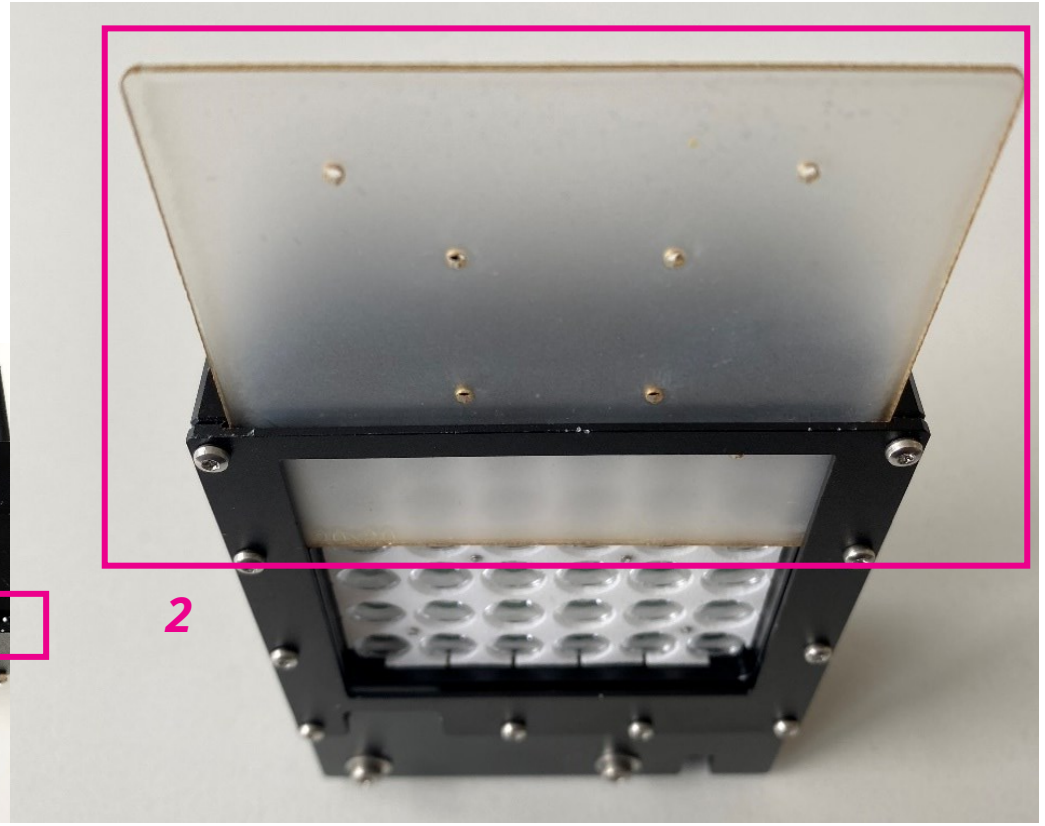
Equipment/Tooling

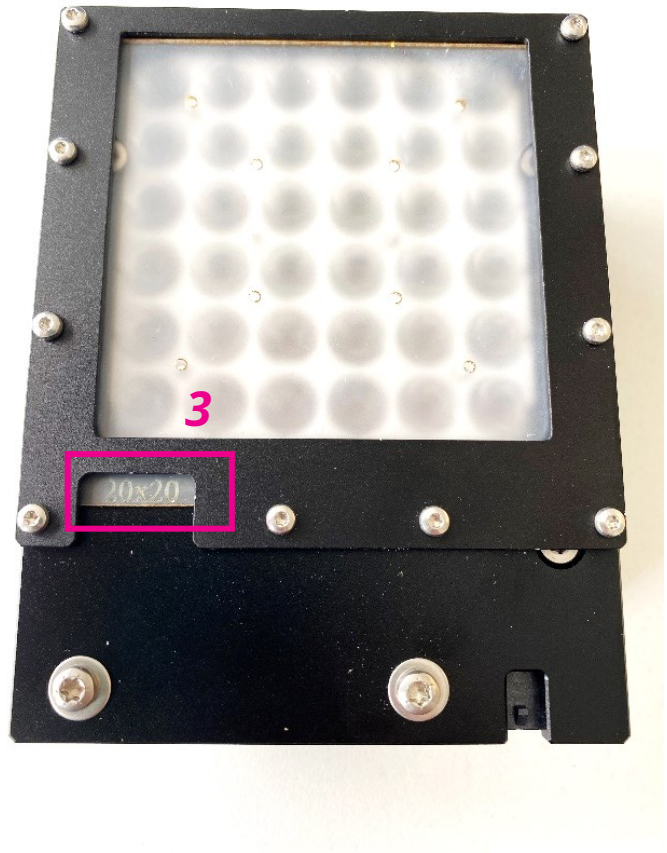
N/A

XR-LED/XB-LED Lens Assembly – V3/V2 (II)

1. *Place one of the **exchangable diffuse filters** in the slit at the top **(1)** of the illumination system*
2. *Slide the **exchangable diffuse filter** down **(2)** to end of bracket.*
3. *The illumination angle of the **exchangable diffuse filter** should be legible in the bottom left-hand cornor of the illumination system **(3)***







SXR-LED/SXB-LED Lens Assembly – V3/V2 (I)



Components

- *5x Exchangable Diffuse Filters **(1)***

Equipment/Tooling

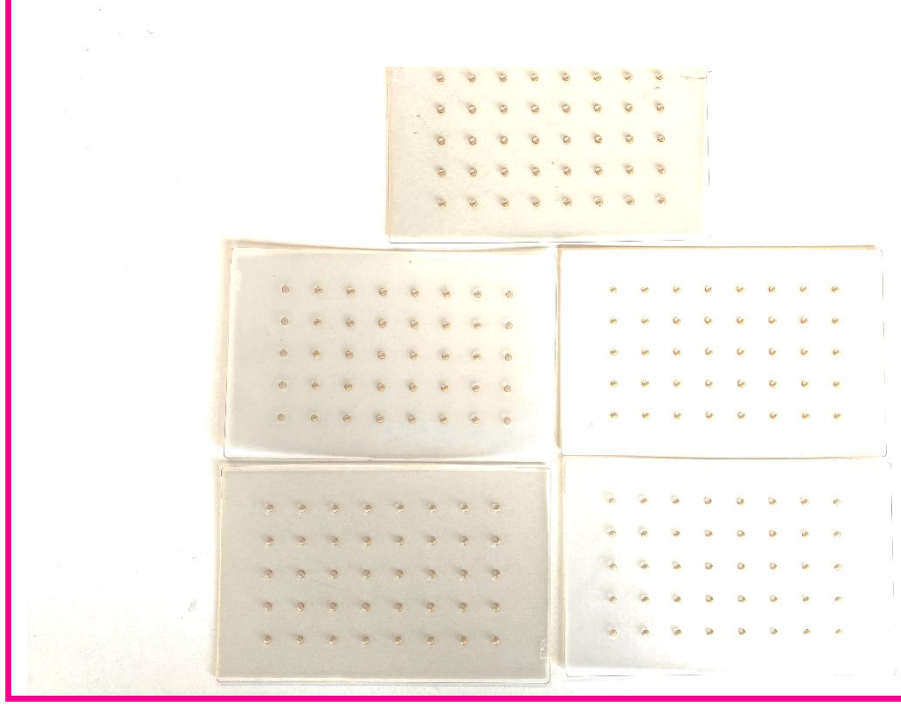
N/A

5x Exchangable Diffuse Filters

1. *20° x 20°*
2. *40° x 40°*
3. *60° x 60°*
4. *30° x 15°*
5. *60° x 15°*

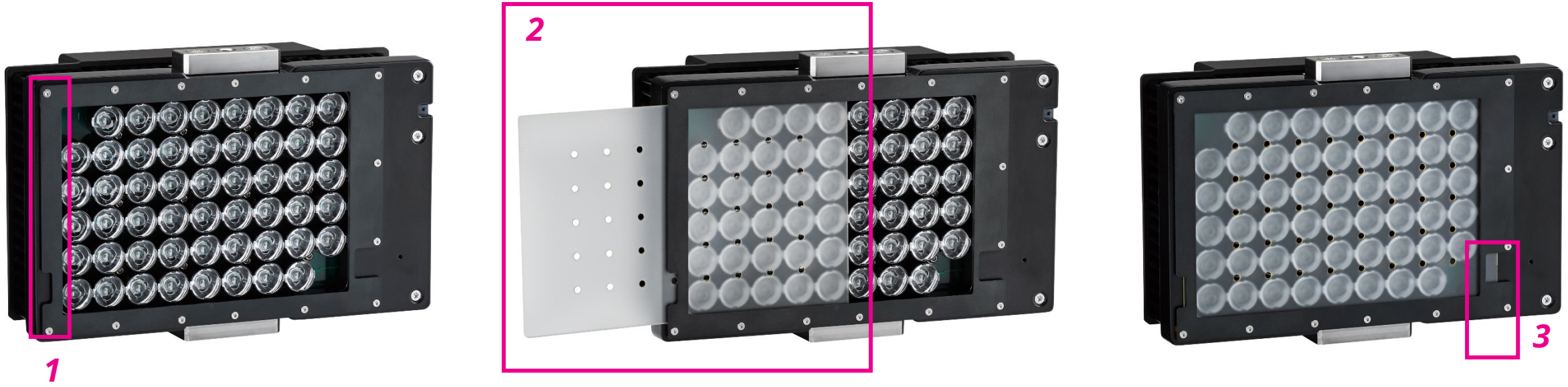
- *The illumination angle is described as a divergence angle in X° x Y° directions, respectively*
- *The optics can be mounted in 0° or 90° orientation with text legible in corner of filter*

1

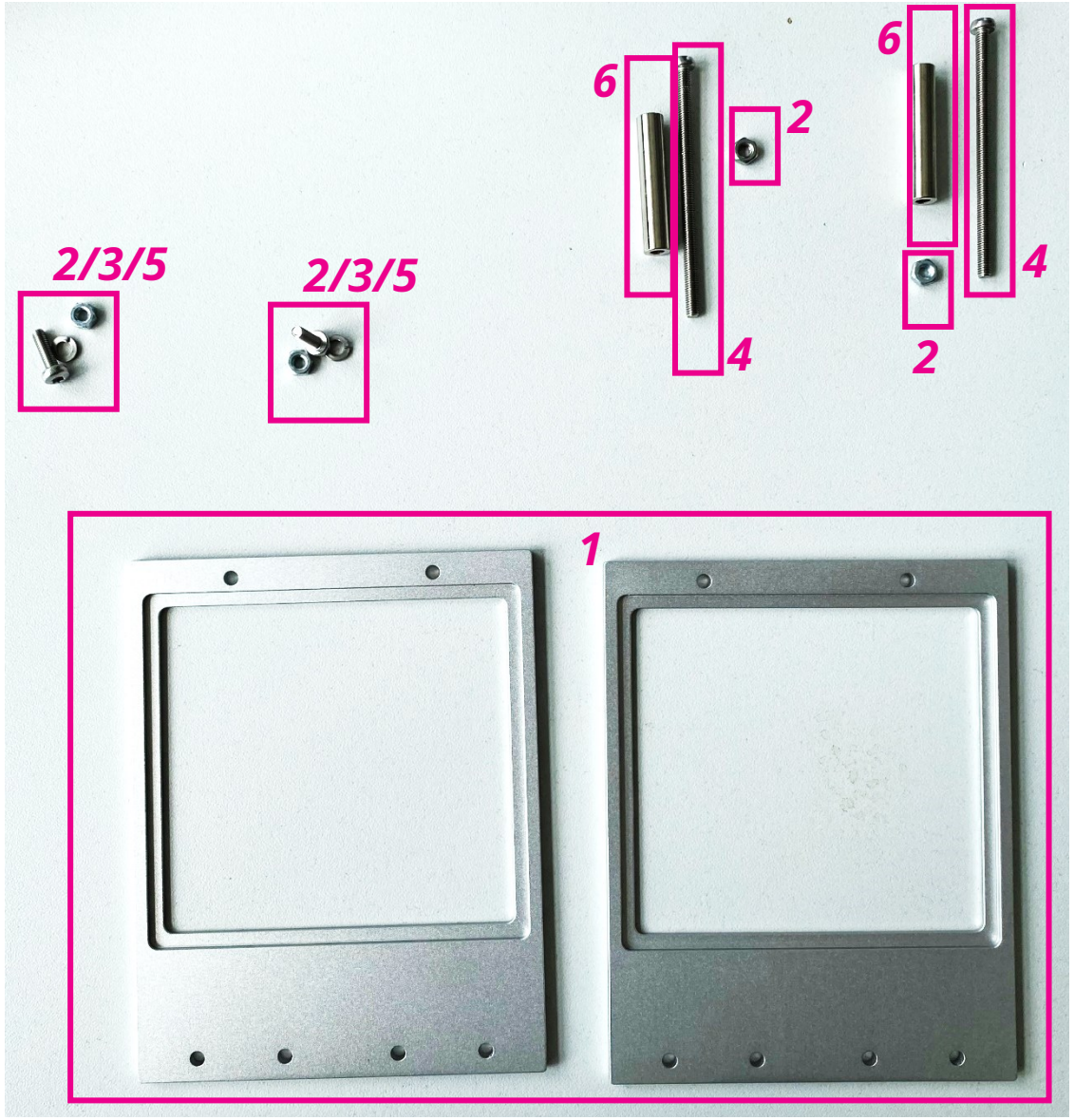


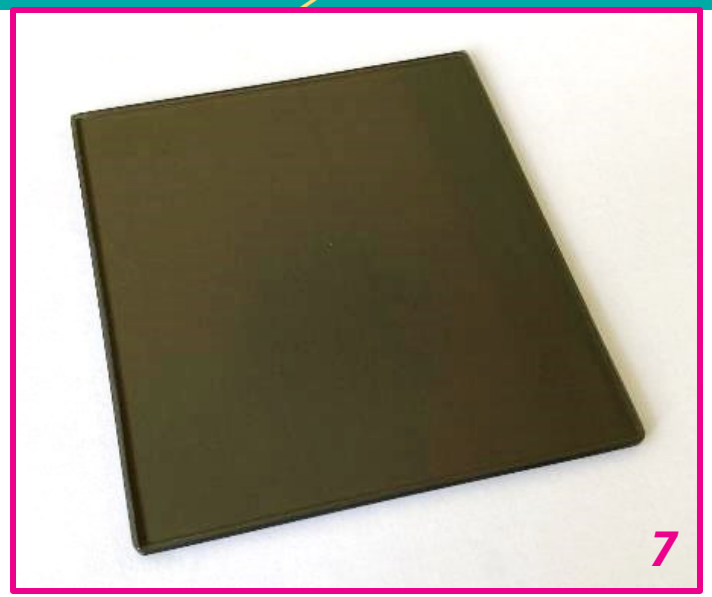
SXR-LED/SXB-LED Lens Assembly – V3/V2 (II)

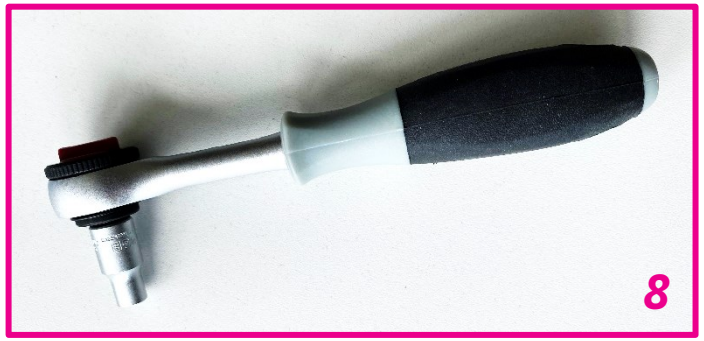
1. *Place one of the **exchangable diffuse filters** in the slit at the side **(1)** of the illumination system*
2. *Slide the **exchangable diffuse filter** sideways **(2)** to end of bracket.*
3. *The illumination angle of the **exchangable diffuse filter** should be legible in the bottom right-hand cornor of the illumination system **(3)***



XR-LED/XB-LED Polarization Filter Assembly – V3/V2 (I)







Components

- *1x Polarization filter bracket (2 halves) **(1)***
- *4x 5.5 mm Nuts **(2)***
- *2x Washers **(3)***
- *2x T9 Screws (Long) **(4)***
- *2x T9 Screws (Small) **(5)***
- *2x Spacers **(6)***
- *1x Polarization Filter **(7)***

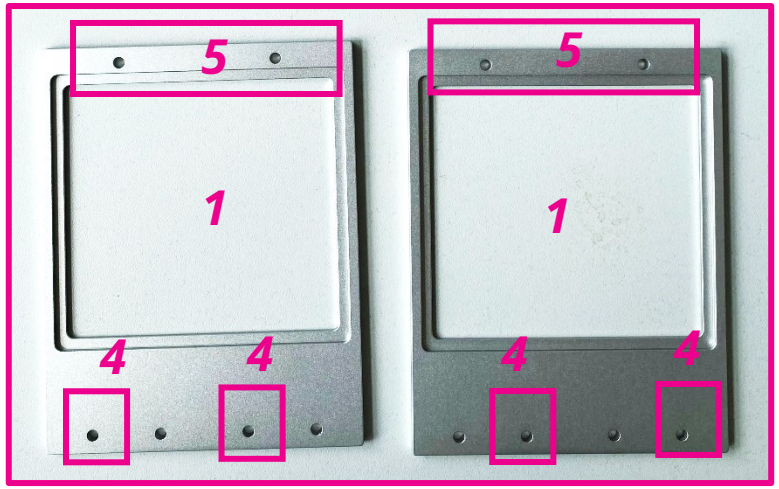
Equipment/Tooling

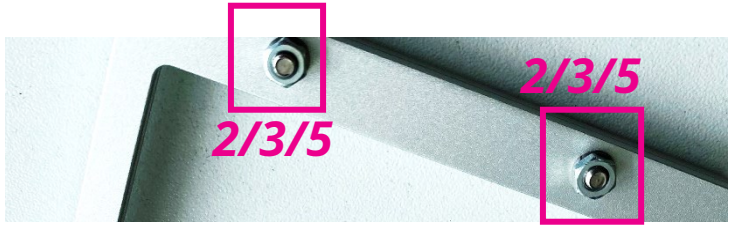
- *1x 5.5 mm hex wrench/spanner **(8)***
- *1x T9 star screwdriver **(9)***

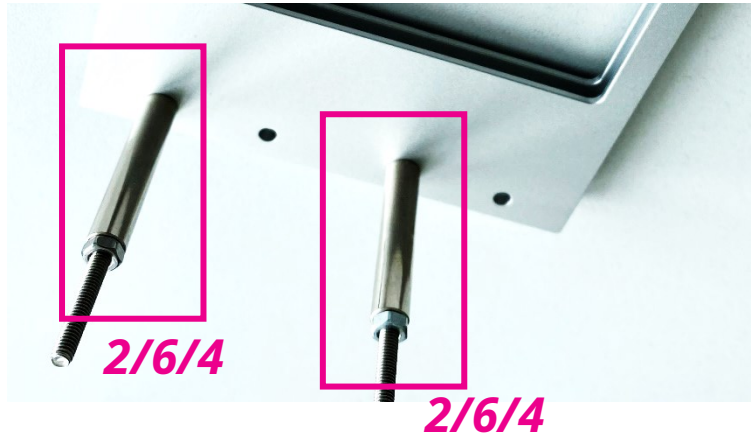


XR-LED/XB-LED Polarization Filter Assembly – V3/V2 (II)

1. *Dissassemble the **polarization filter assembly** via removing the **4x 5.5 mm Nuts** (2) with the **1x 5.5 mm hex wrench/spanner** (8)*
2. *Oepn the **1x Polarization filter bracket (2 halves)** (1) and place the **1x Polarization Filter** (7) in the middle*
3. *Close the **1x Polarization filter bracket (2 halves)** (1) and insert the **2x T9 Screws (Small)** (5) into the **top holes** (5) and insert the **2x T9 Screws (Long)** (4) into the **bottom holes** (4). All screws must be inserted from/in the same direction*
4. *Fix the **1x Polarization filter bracket (2 halves)** (1) together via applying **2x Washers** (3) and **2x 5.5 mm Nuts** (2) to either of the **2x T9 Screws (Small)** (5). Tighten the **2x T9 Screws (Small)** (5) with a **1x 5.5 mm hex wrench/spanner** (8)*
5. *Place each of the **2x Spacers** (6) over the **2x T9 Screws (Long)** (4) and then apply each of the **2x 5.5 mm Nuts** (2). Tighten the **2x T9 Screws (Long)** (4) with a **1x 5.5 mm hex wrench/spanner** (8)*
6. *Screw each of the **2x T9 Screws (Long)** (4) into the XR/XB-LED illumination unit with the **1x T9 star screwdriver** (9).*

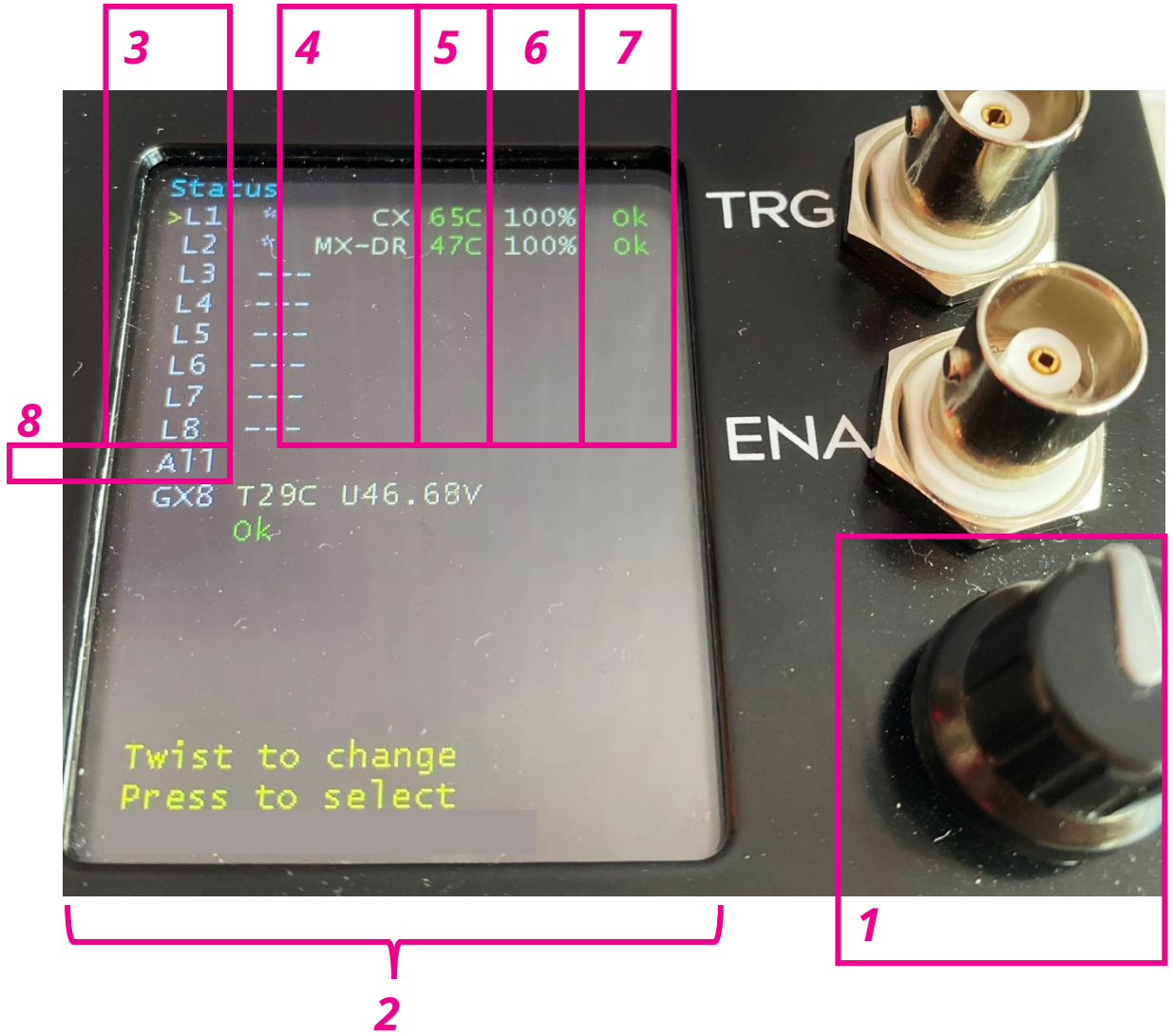






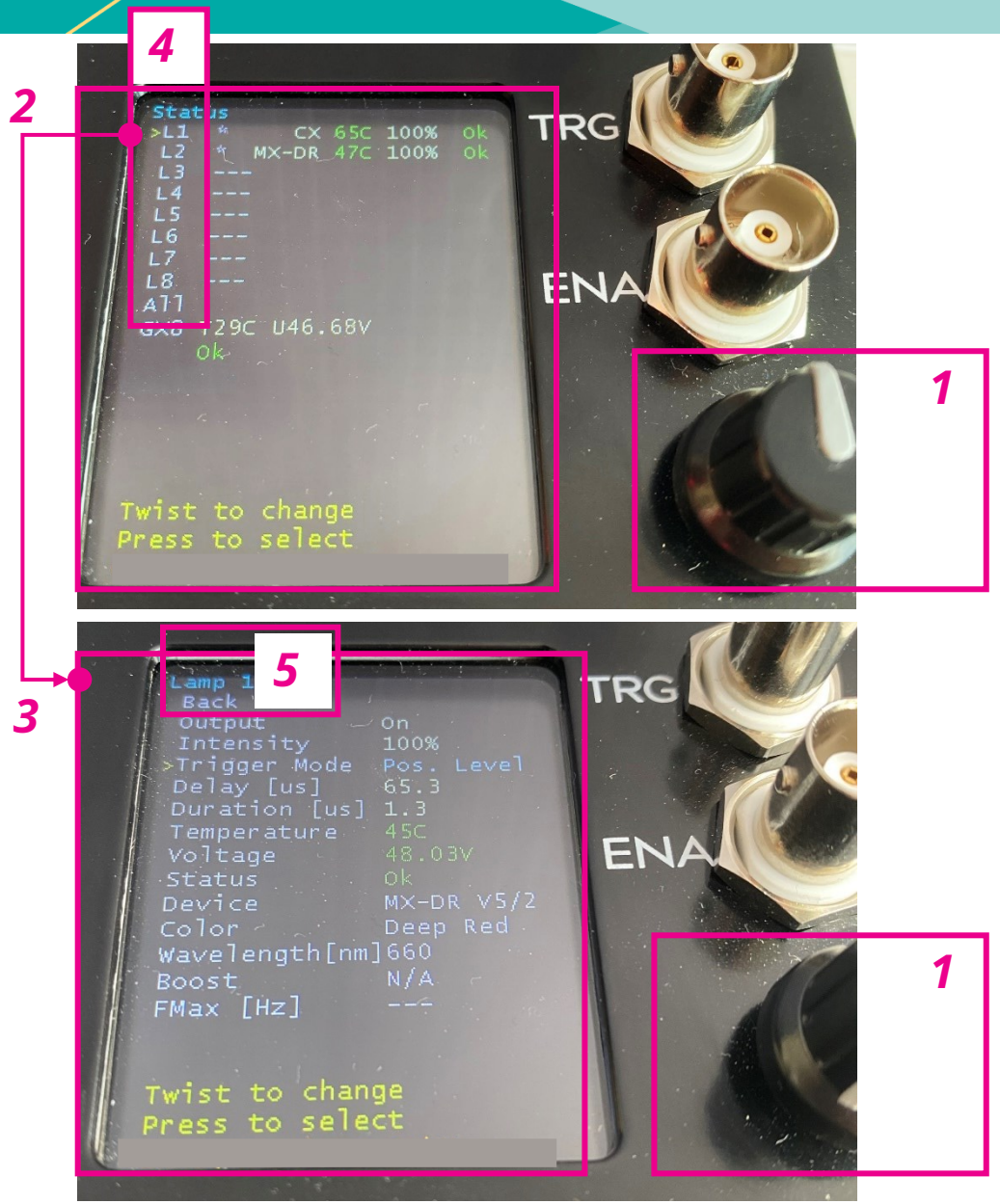
X-Illumination Controller Operation (I)

- The **DSM 47250: X-Illumination Controller** has a **level hierachy/menu-based layout** that users can navigate via **operation** of the **mechanical knob**. ***(1)***
  - *At the **top level** **(2)** is the list of **selectable** **lamp channels & controller status overview.***
  - *At the **second level** is the **selected** **lamp control options.***
- The **selectable lamp channels** are listed from L1 → L8 ***(3)***
  - *Connected lamp channels will inlcude 4 columns of settings data*
    - ***Type** of connected illum. unit **(4)***
    - ***Operation temperature** of connected illum. unit **(5)***
    - ***Output intensity** of connected illum. unit **(6)***
    - ***Status** of connected illumination unit **(7)** (**OK** or **OT**)*
  - *Unconnected channels will contain „**---**“*
- **All channels control** ***(8)*** *is listed as only one option, for all connected channels.*



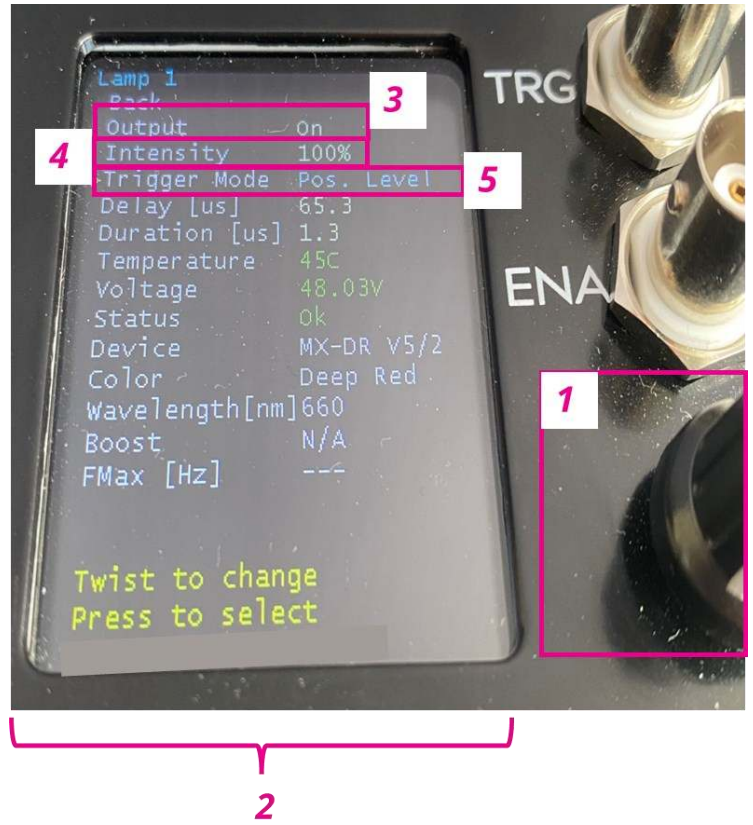
X-Illumination Controller Operation (II)

- *At the **top level** (2) is the list of **selectable** lamp channels & controller **status overview.***
- *At the **second level** (3) is the **selected** lamp control options.*
- *To **choose** or **scroll between** options:*
  - *turn the **mechanical knob** (1)*
- *To **navigate** from the **top level** (2) to the **second level** (3):*
  - *select an **lamp channel** listed from L1 → L8 (4) and press the **mechanical knob** (1)*
- *To **return/go back** from the **second level** (3) to the **top level** (2):*
  - *turn the **mechanical knob** (1) to scroll to the option „**Back**“ (5) and press the **mechanical knob** (1)*



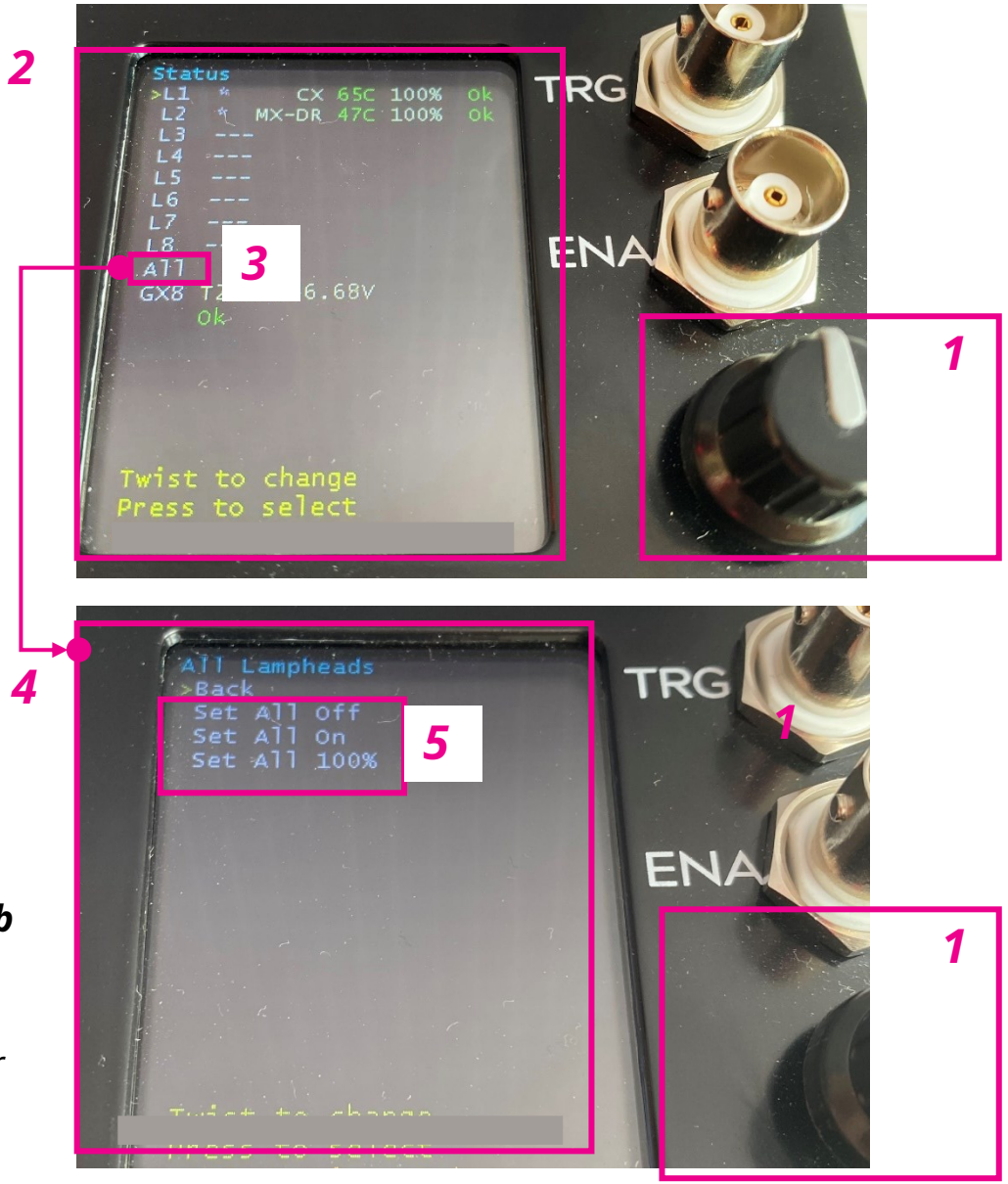
X-Illumination Controller Operation (III)

- *To **switch/turn** a lamp **ON/OFF** in the **second level (2)**:*
  - *turn the **mechanical knob (1)** to scroll to the option „**Output**“ **(3)** and press the **mechanical knob (1).** Turn the **mechanical knob (1)** to toggle between the options of „**ON**“ & „**OFF**“and press the **mechanical knob** to confirm **(1).***
- *To **chnage** the **output intensity** of a lamp in the **second level (2)**:*
  - *turn the **mechanical knob (1)** to scroll to the option „**Intensity**“ **(4)** and press the **mechanical knob (1).** Turn the **mechanical knob (1)** to toggle between the intensity of „**100% → ….. → 0%**“and press the **mechanical knob** to confirm **(1).***
  - ***NOTE** → Maximum Intensity for CX+ (XR/XB) illumination systems is **18 %** for continuous (constant) illumination (see **Slide 17** for more information)*
- *To **change** the **illumination trigger mode** of a lamp in the **second level (2)**:*
  - *turn the **mechanical knob (1)** to scroll to the option „**Trigger Mode**“ **(5)** and press the **mechanical knob (1).** Turn the **mechanical knob (1)** to toggle between the mode options of „**Constant**“ = **Continuous** or „**Pos. Level**“ = **Strobe** and press the **mechanical knob** to confirm **(1).***
- *NOTE → The delay and duration settings are not used on the **X-Illumination Controller.***



X-Illumination Controller Operation (IV)

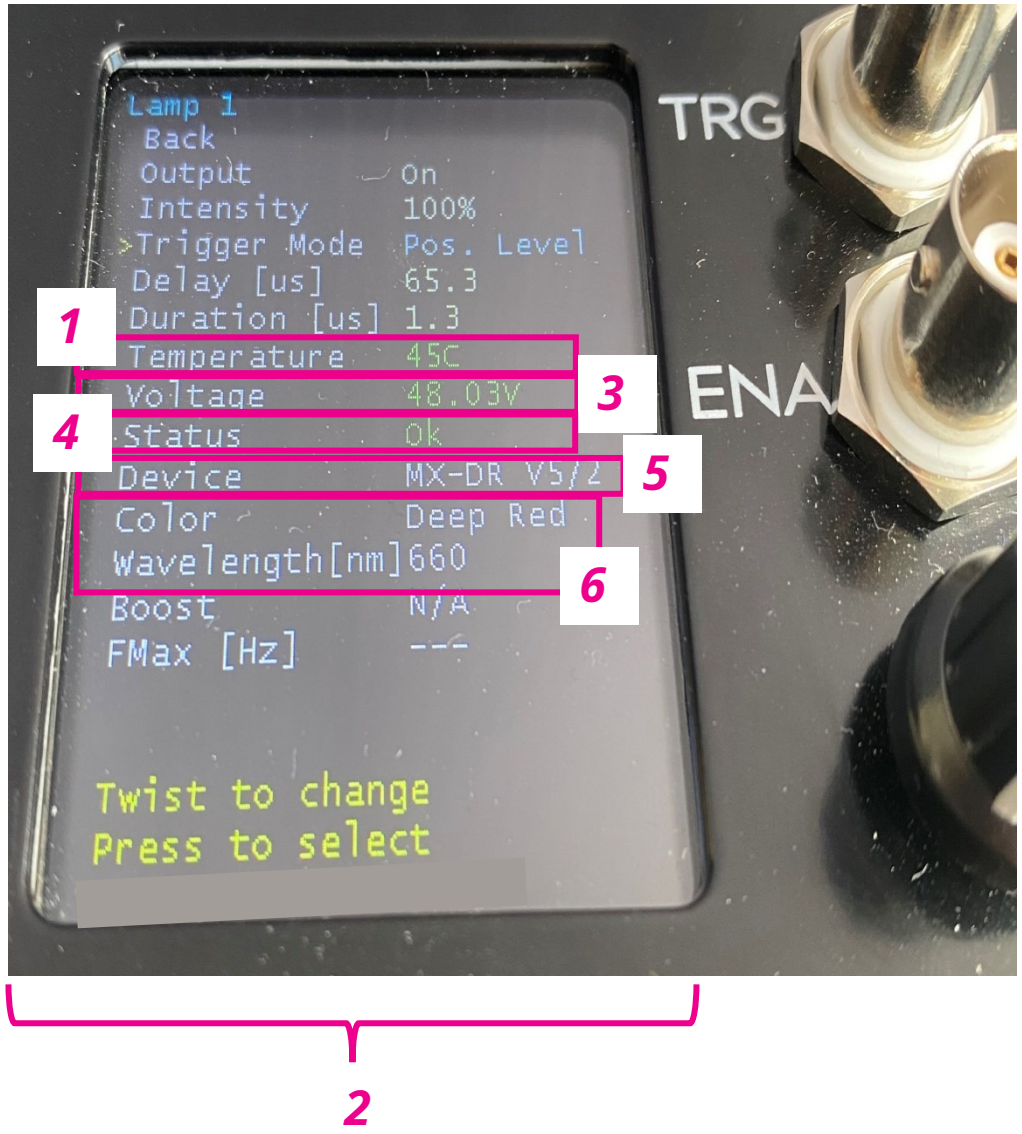
- *To **navigate** from the **top level** (2) to the **second level** (4):*
  - *select an **lamp channel** listed „**All**“ (3) and press the **mechanical knob** (1)*
- *To **switch/turn ALL** lamps **OFF** in the **second level** (4):*
  - *turn the **mechanical knob** (1) to scroll to the option „**Set All Off**“ (5) and press the **mechanical knob** to confirm (1).*
- *To **switch/turn ALL** lamps **ON** in the **second level** (4):*
  - *turn the **mechanical knob** (1) to scroll to the option „**Set All On**“ (5) and press the **mechanical knob** to confirm (1).*
- *To **chnage** the **output intensity** of **ALL** lamps in the **second level** (4):*
  - *turn the **mechanical knob** (1) to scroll to the option „**Set All 100%**“ (5) and press the **mechanical knob** (1). Turn the **mechanical knob** (1) to toggle between the intensity of „**100%** → ..... → **0%**“and press the **mechanical knob** to confirm (1).*
  - ***NOTE** → Maximum Intensity for CX+ (XR/XB) illumination systems is **18 %** for continuous (constant) illumination (see **Slide 17** for more information)*



X-Illumination Controller Operation (V)

› **Information** about the;

- *selected **lamp channel status** is listed within the **second level (2)**:*
  - ***Operation temperature** of connected illum. unit **(1)** „**Green** < 65°C and **Red** > 65°C„*
  - ***Operation voltage** of connected illum. unit **(3)***
  - ***Status** of connected illumination unit **(4)** (**OK** or **OT**)*
- *selected **lamp channel properties** is also listed within the **second level (2)**:*
  - ***Type** of connected illum. unit **(5)***
  - ***Gen. Colour & Wavelength** of connected illum. unit **(6)***



X-Illumination Controller & XR-LED/XB-LED – V3/V2

- The operating voltage of the **DSM 47250: X-Illumination Controller** and the **SXR-LED**/**SXB-LED** is 48 VDC. Whereby the operating voltage for the **XR-LED**/**XB-LED** is lower.
- During continuous (constant) mode illumination triggering the **XR-LED**/**XB-LED** willl **overheat** **within 1 minute** and **turn off**, if the intensity is set to 100 %. To prevent this from occuring, users must reduce the intensity to **18 %** for **continuous (constant) mode illumination triggering**.
- Users can set the intensity **higher than** 18 % however the **XR-LED**/**XB-LED** willl eventually over **overheat** and **turn off**.

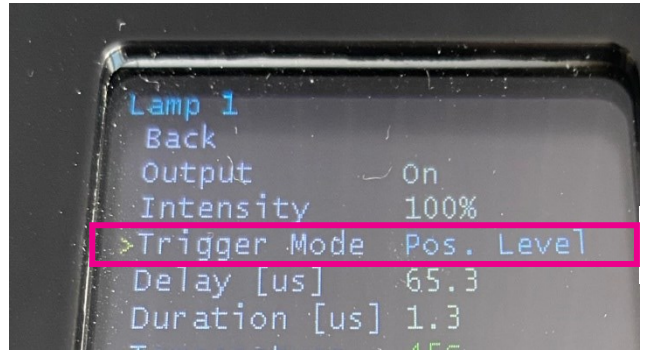


Duration until Overheat (min)	Intensity (%)
N/A	18 %
60 mins	39 %
40 mins	45 %
20 mins	55 %
10 mins	65 %
5 mins	76 %
< 1 min	100 %

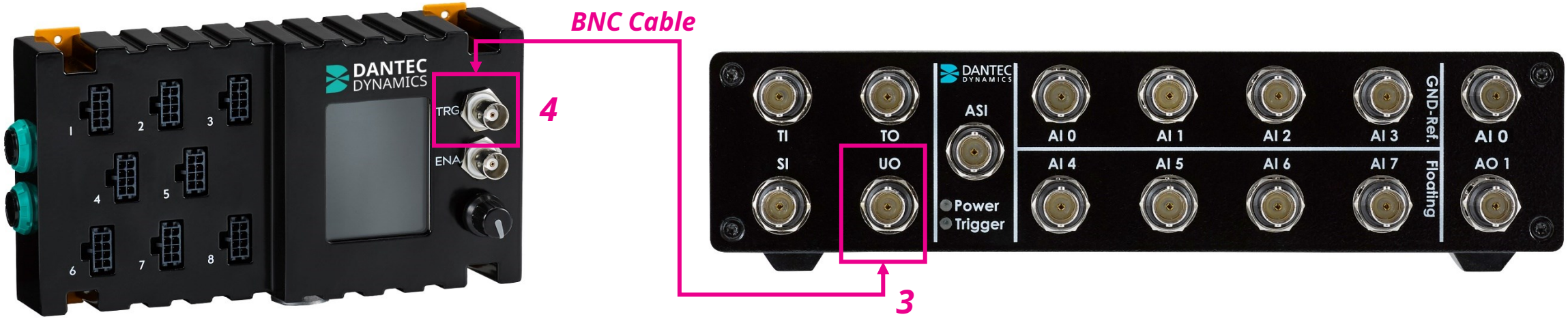
X-Illumination Controller: Stroboscopic Mode

› In order to operate the **X-Illumination Controller** in **stroboscopic mode** (aka. strobe), the following must be observed;

- ***illumination trigger mode*** *for each* **V3-CX+** or **V3-MX+** illumination **lamp channel** unit must be set in „***Pos. Level***“. ***(1)***
- *a* ***BNC cable (2)*** *must be connected from a* ***Data Acquisition (DAQ) Controller*** ***(Gen4)*** ***„Universal Output (UO)“ Port*** ***(3)*** *to the* **X-Illumination Controller** ***„Trigger (TRG)“ Port.*** ***(4)***



1



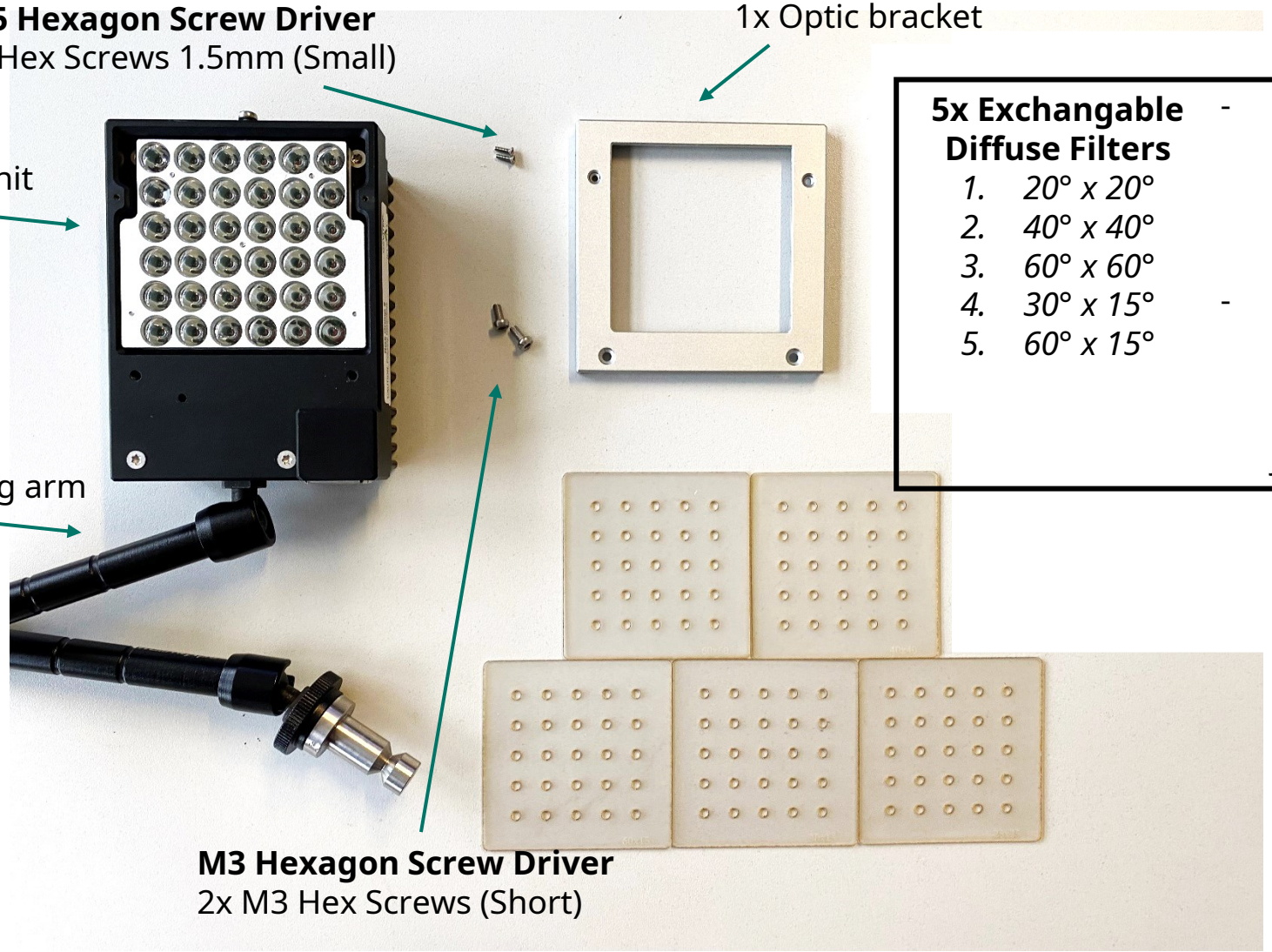
XR-LED/XB-LED Lens Assembly – V1 (I)

Tx5 Hexagon Screw Driver
2x Hex Screws 1.5mm (Small)

1x Optic bracket

1x XR/XG-Lighting Unit

1x Articulated mounting arm



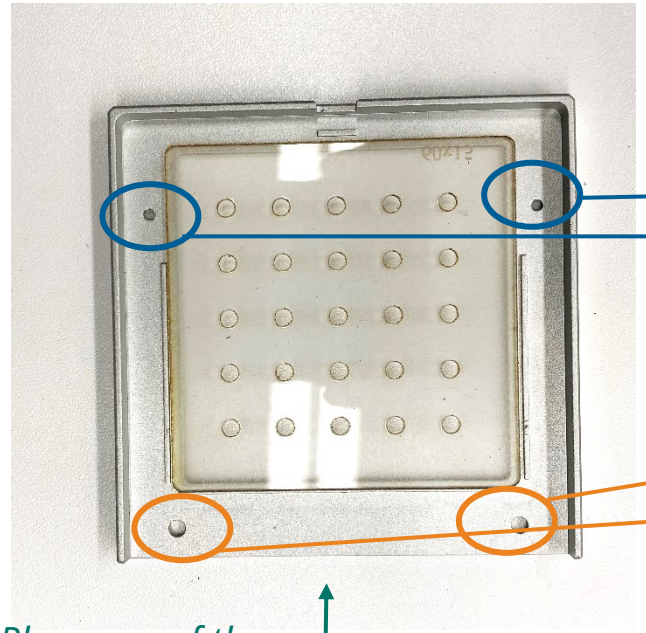
M3 Hexagon Screw Driver
2x M3 Hex Screws (Short)

5x Exchangable Diffuse Filters

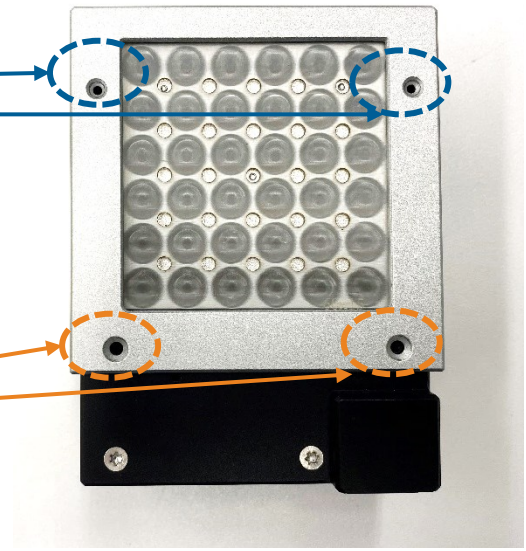
1. *20° x 20°*
2. *40° x 40°*
3. *60° x 60°*
4. *30° x 15°*
5. *60° x 15°*

- *The illumination angle is described as a divergence angle in X° x Y° directions, respectively*
- *The optics can be mounted in 0° or 90° orientation with text legible in corner of filter*

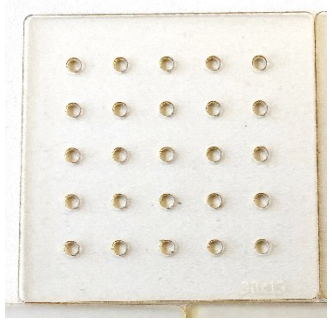
XR-LED/XB-LED Lens Assembly – V1 (II)



*2. Fasten the **2x Hex Screws 1.5mm (Small)** into the holes **indicated** on the **XR/XG-Lighting Unit** using a **Tx5 Hexagon Screw Driver***



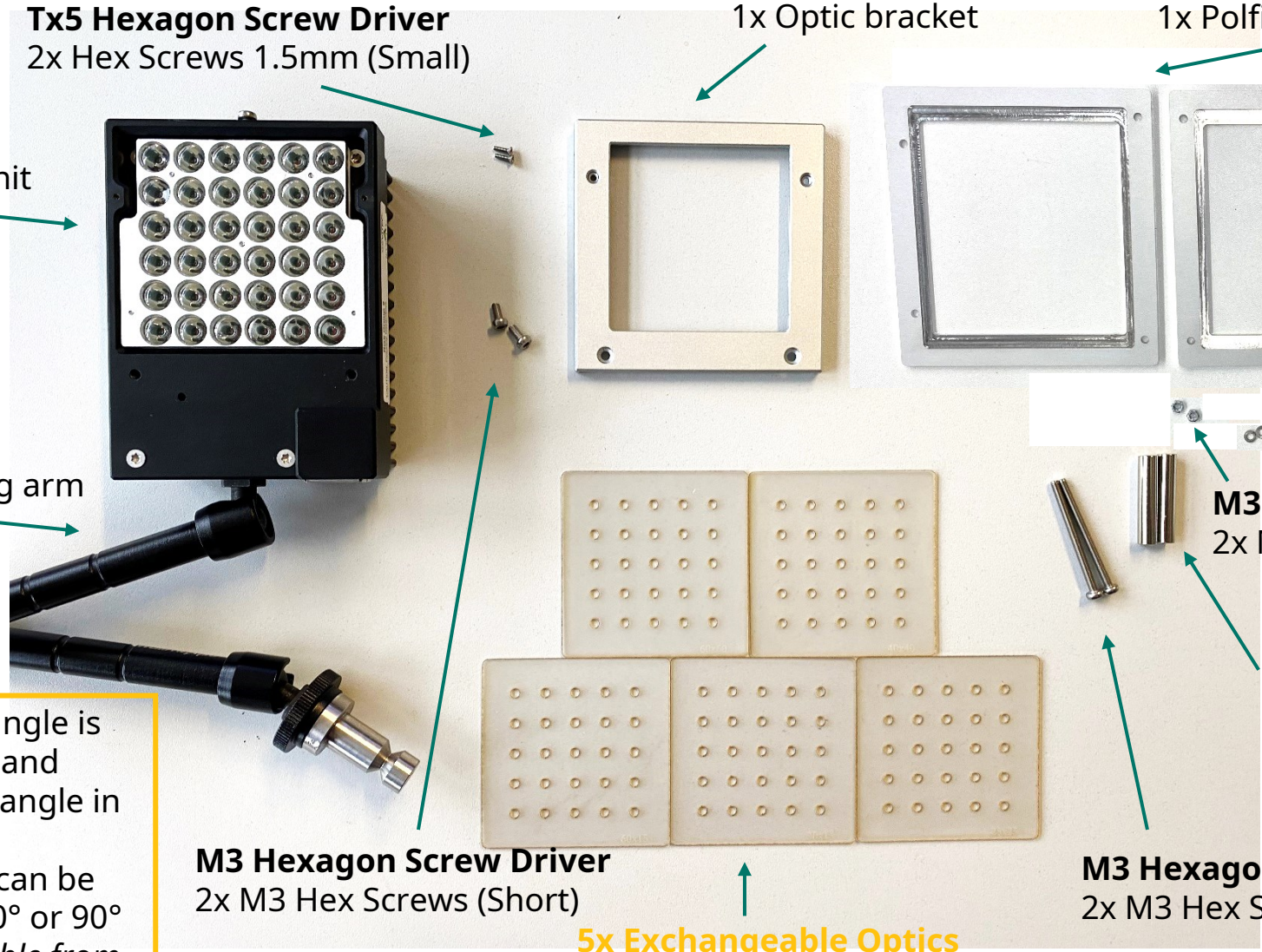
*1. Place one of the **exchangeable optics** in the **optic bracket**.*



*3. Fasten the **2x M3 Hex Screws (Short)** into the holes **indicated** on the **XR/XG-Lighting Unit** using a **Wera 118040 Tx5 Hexagon Screw Driver***

XR-LED/XB-LED Polarization Filter Assembly – V1 (I)

NOTE** >> **Polfilter** must be **seperately purchased.



Tx5 Hexagon Screw Driver
2x Hex Screws 1.5mm (Small)

1x Optic bracket

1x Polfilter bracket

1x XR/XG-Lighting Unit

1x Articulated mounting arm

2x M3 washers

M3 Hexagon Nut Driver
2x M3 nuts

2x Spacing Cylinders

M3 Hexagon Screw Driver
2x M3 Hex Screws (Short)

M3 Hexagon Screw Driver
2x M3 Hex Screws (Long)

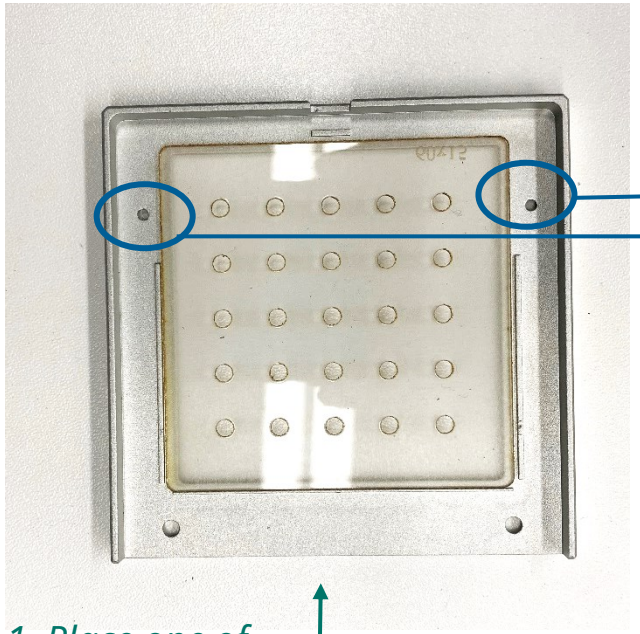
5x Exchangeable Optics

5x Exchangeable Optics

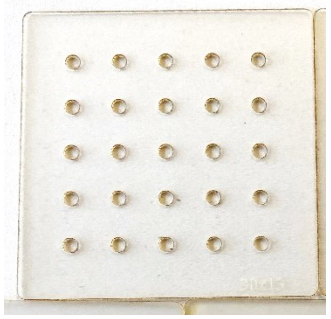
- *60° x 15°*
- *40° x 40°*
- *60° x 60°*
- *25° x 25°*
- *30° x 15°*

- Illumination angle is asymmetric and described as an angle in X° x Y°.
- The optics can be mounted in 0° or 90° *(with text legible from front – as pictured)*

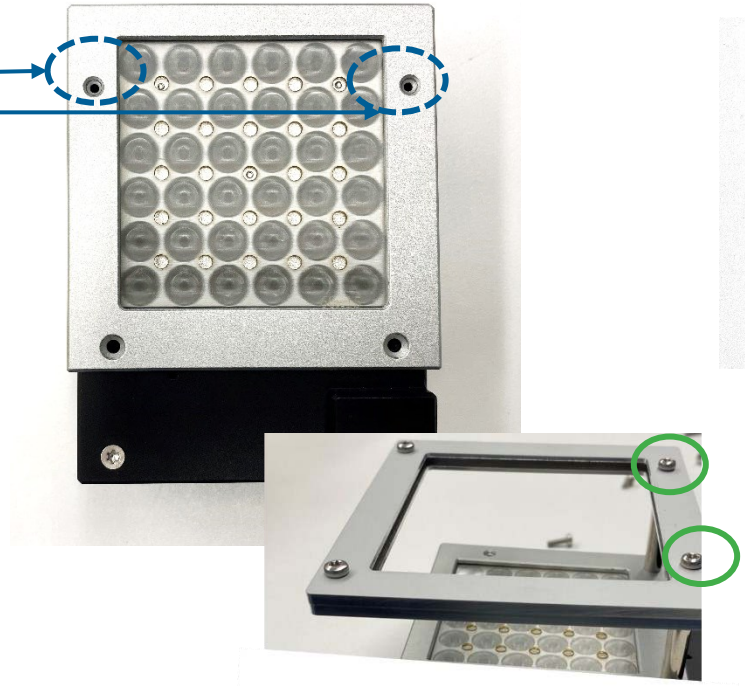
XR-LED/XB-LED Polarization Filter Assembly – V1 (II)



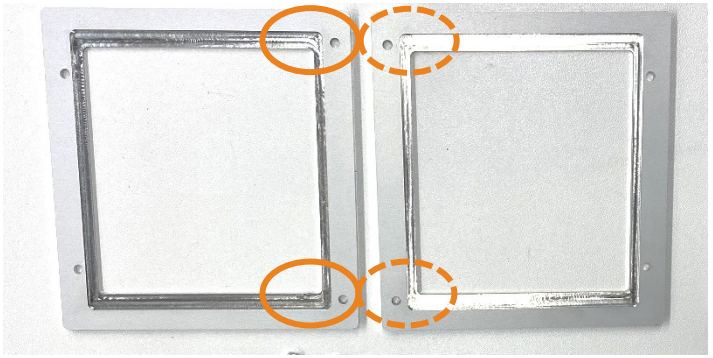
*(Optional) 1. Place one of the **exchangeable optics** in the **optic bracket**.*



*2. Fasten the **2x Hex Screws 1.5mm (Small)** into the holes **indicated** on the **XR/XG-Lighting Unit** using a **Tx5 Hexagon Screw Driver***



NOTE** >> **Polfilter** must be **seperately purchased.



*3. Place the **polfilter** into the **Polfiler bracket** and close both sides so that the holes align.*

*4. **Fasten** the **Polfiler bracket together** using the **2x M3 Hex Screws (Short)** on one side and the **2x M3 washers** with **2x M3 nuts** on the other side using a* **M3 Hexagon Screw Driver** *and* **M3 Hexagon Nut Driver**

*5. **Fasten** the **Polfiler bracket** to the **XR/XG-Lighting Unit** using the **2x M3 Hex Screws (Long)** with the **2x Spacing Cylinders** using a* **M3 Hexagon Screw Driver**