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LAB SETUP ASSEMBLY MANUAL

BROADBAND LED ILLUMINATION

IMEC HSI LAB SETUP ASSEMBLY MANUAL

BROADBAND LED ILLUMINATION

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I. Introduction

This manual will guide you through the assembly of the imec Lab Setup with broadband LED illumination from Effilux. It provides an overview of all components in the setup and instructions to assemble it. (Figure I)

The imec Lab Setup is designed to provide an efficiently illuminated workspace to work with imec hyperspectral cameras. Lamp and the camera distances are modifiable so that the users can work with different distances for different optical systems and applications. It also includes a high-quality reflective surface for referencing.

The imec Lab Setup comes with its own tool set, so that it can be assembled without the need of other tools.

If you have purchased the imec Lab Setup with other illumination source, please check the respective manual for assembly.

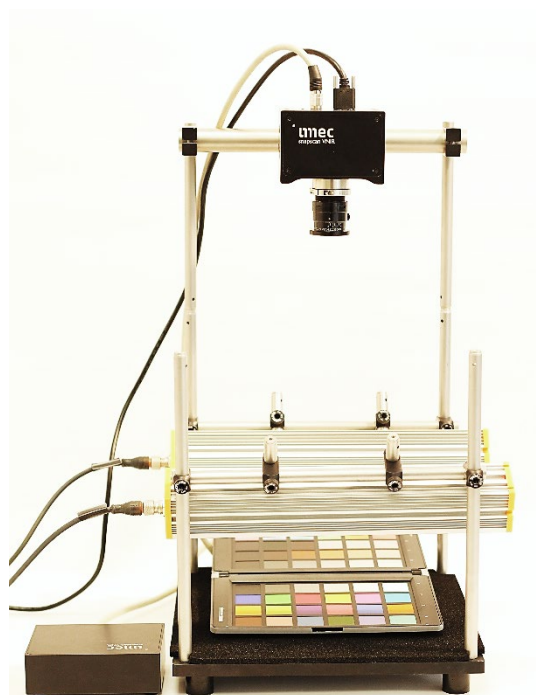


Figure I: Fully assembled setup with an imec Snapscan VNIR camera.

2. Safety

The imec Lab Setup may be assembled and used by adults (18 years old or more) as long they have read this manual or have received instructions concerning the safe use of the setup.

The imec Lab Setup is intended to be used in industrial and lab environments. Assembling the setup in extreme temperature, humidity, dust, and corrosive vapor might damage the setup and cause health risks.

Environments with liquid water can corrode the metal structure and harm the electrical parts, creating serious hazards.

3. Package Contents

The imec Lab Setup comes in a single package and includes:

- Metal base, posts, and screws to build the main structure of the system.
- 2x Effilux Effi-Flex 300mm lamps, their cables and power supply.
- Tripod ball head and adapter for holding the camera.
- Set of tools that are used for assembly.
- Black background foam.

Before assembly, please check the contents of the Lab Setup box and compare them with the picture in Figure 2 and Table 1.



Figure 2: Contents of the Lab Setup Box

Ref. No	Components	Quantity
1.	Reflectance standard 95% 200x200mm	1
2.	Post 300x Ø25.0 mm	1
3.	Post 300x Ø12.7mm	6
4.	Post 200x Ø12.7mm	2
5.	Post 50x Ø12.7mm	4
6.	Set Hex keys L-shape (1.5mm-10mm)	1
7.	Threaded studs M6 (20mm), black	4
8.	Threaded studs M6 (20mm), metal	4
9.	Threaded stud ¼"-20 (3/4"), metal	1
10.	Hex cap screw M6, 16mm, black	4
11.	Hex cap screw M6, 40mm, metal	1
12.	Camera post clamp, Ø1"	1
13.	Right angle Ø25.5 mm to Ø12.7mm post clamp	2
14.	Right angle Ø12.7mm post clamp	8
15.	LED Bar 30cm	2
16.	Diffuse filters (2x opaque, 2x transparent)	4
17.	Cable M12, 30 cm	2
18.	T-connector M12	1
19.	T-nut M6	4
20.	Base breadboard 300x300	1
21.	Black scanning backgrounds	1
22.	Color checkerboard card	1
23.	Feet Ø27mm, female M6	4
24.	Tripod ball head with 3/8" to 1/4" adapter	1
25.	Power supply, 90W	1
26.	Power cable	1

Table 1: List of the components and their quantities in the Lab Setup

4. Assembly

4.1. Assemble the base plate

Components	Quantity
Hex cap screw M6, 16mm, black	4
Base breadboard 300x300	1
Feet Ø27mm, female M6	4

Table 2: Required parts

Attach the 4 feet to the breadboard, through the holes, offset from the array. The screw should sink completely in the hole, creating a flat surface. Tighten well.

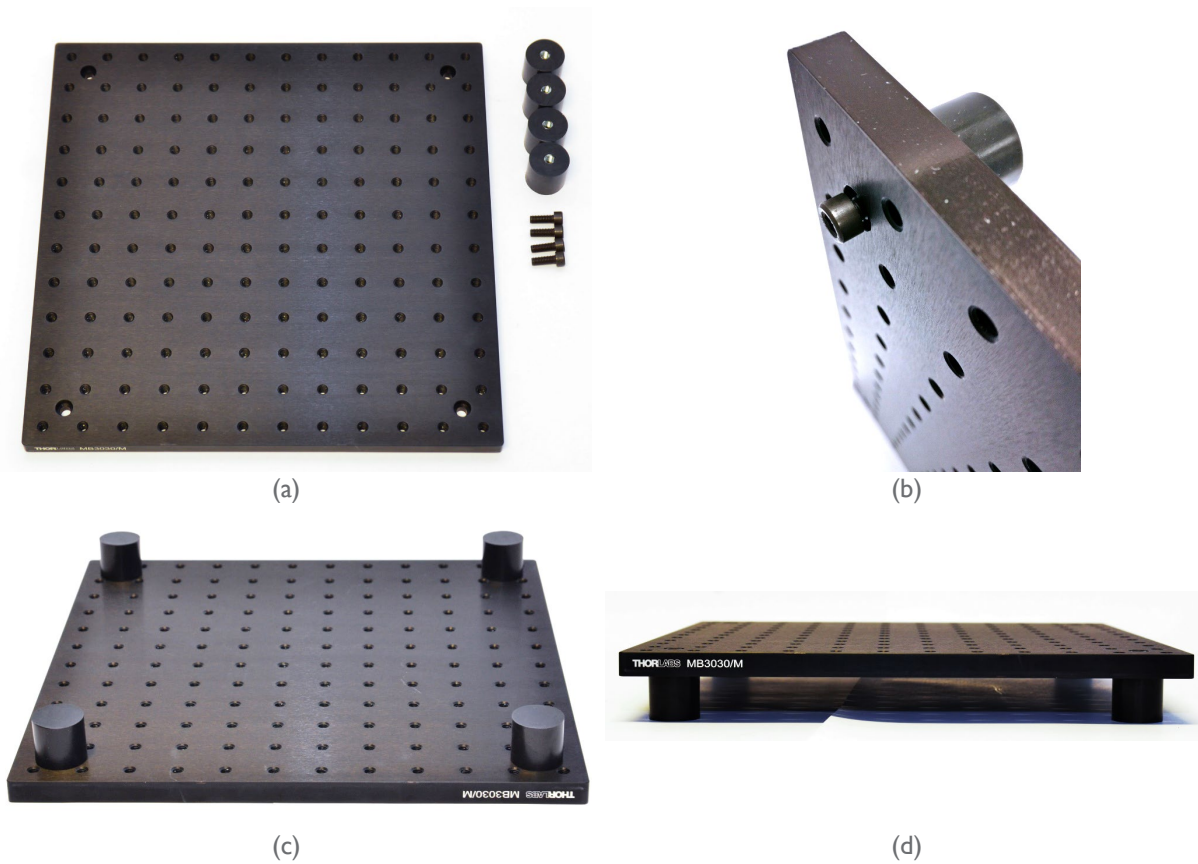


Figure 3: Assembly of the base plate.

4.2. Assemble the vertical posts

Components	Quantity
Post 300x Ø12.7mm	4
Post 200x Ø12.7mm	2
Threaded studs M6 (20mm), black	4

Table 3: Required parts



Figure 4: Assemble the vertical camera holder posts

- Insert and screw the black threaded studs, with its conical end, in the bottom end of the 30 cm posts.
- Unscrew the stainless-steel setscrew from the top of the 20 cm posts and two of the 30 cm posts.

- c) Screw the top of short posts onto the top of the long posts, connecting them with a stainless-steel setscrew.
- d) Prepare two 50 cm combined posts and two 30 cm single posts.
- e) Mount the posts on the base plate such that the end of the post with the black threaded stud is screwed into the base plate. Use the first hole in the corner. Make sure that same length posts are side by side as shown in Figure 5.



Figure 5: Vertical camera holder posts connected to the breadboard.

4.3. Assemble the lamp holders and the lamp

Components	Quantity
Post 300x Ø12.7mm	2
Post 50x Ø12.7mm	4
LED Bar 30cm	2
Right angle Ø12.7mm post clamp	8
Threaded studs M6 (20mm), metal	4
T-nut M6	4

Table 4: Required parts

- a. Insert and screw the studs to the bottom of 5 cm posts. Then screw the the t-nuts over the studs.
- b. Loosen the screws of the post clamps and mount them on 30 cm posts as shown in the Figure 6. The post clamps are symmetrical so you can select the side you want. Tighten the screws that hold the 30 cm posts.



Figure 6: Assembly of the lamp holders

- c. Mount the 5 cm posts to the lamps by placing the side with the t-nuts inside the rail and turning it 90 degrees clockwise.

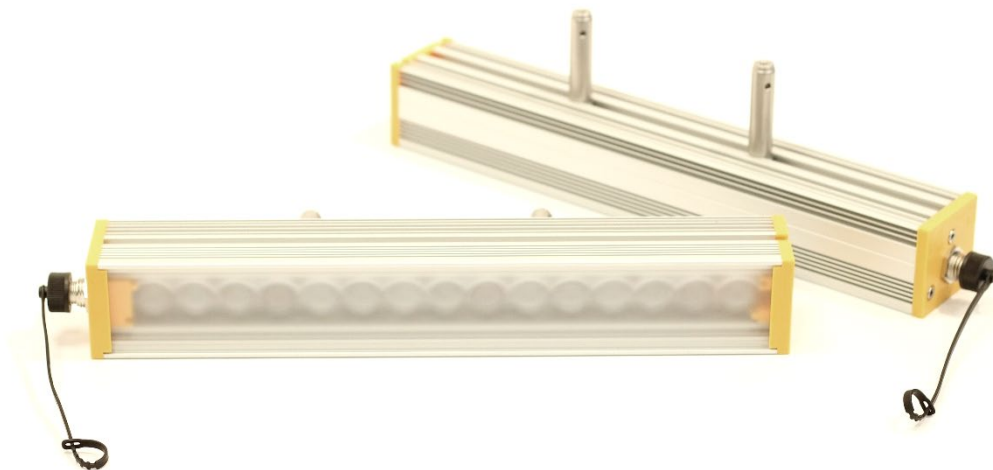


Figure 7: Assembly of 5cm mounts to the lamp.

- d. Mount the lamp to the post by connecting 5 cm posts to the middle two clamps. You can loosen the clamp screws to ease the process. Screw the clamp screws that hold the posts.



Figure 8: Assembly of the lamp to the mount.

- e. Mount the lamp posts to the vertical posts as shown in Figure 9.
- f. The recommended height of the lamps is 10 cm. The recommended angle to the vertical posts is 20 degrees. You can later fine tune the lamps depending on your application's needs.

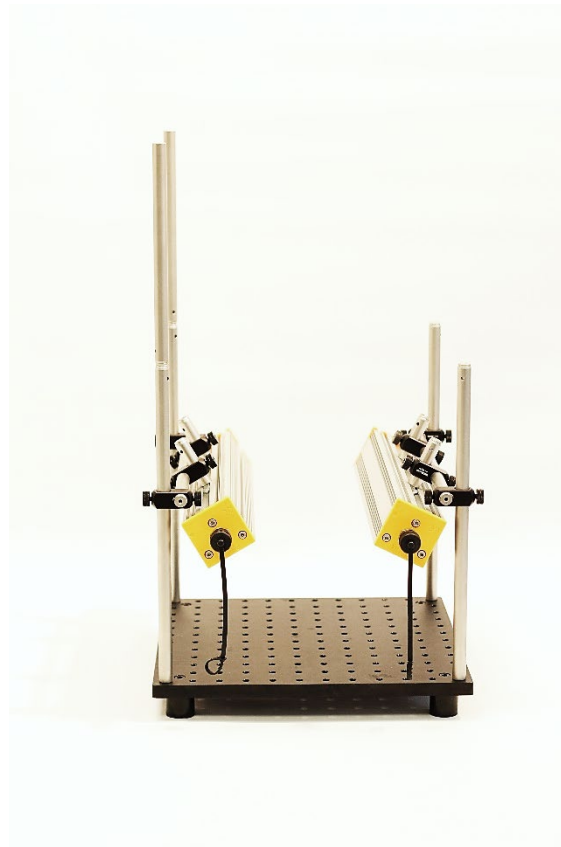


Figure 9: Lamps and lamp holders assembled to the vertical posts.

4.4. Assemble the tripod head and the camera post

Components	Quantity
Post 300x Ø25.0 mm	1
Threaded stud ¼"-20 (3/4"), metal	1
Hex cap screw M6, 40mm, metal	1
Camera post clamp, Ø1"	1
Right angle Ø25.5 mm to Ø12.7mm post clamp	2
Tripod ball head with 3/8" to 1/4" adapter	1

Table 5: Required parts.



Figure 10: Tripod head assembly.

- Remove the stainless-steel ring from the top of the tripod ball head (adapter), revealing the black thread on top.
- Mount this removed stainless-steel adapter piece into the bottom of the tripod ball head.
- Screw the M6 metal stud into the bottom of the tripod ball head.
- Screw the camera post clamp onto the metal stud.



Figure 11: Camera holder post assembly.

- e) Slide the post clamps onto both ends of the 30 cm thick (25 mm) post and tighten the screw with allen number 5.
- f) Place the assembled tripod mount over the post in the middle, align the hole of the tripod mount with the hole of the post and tighten the hex screw with the allen key 2.
- g) Slide the M6 screw in the hole to prevent unwanted tilting under camera's weight.



Figure 12: Camera holder post placed.

- h) Slide the assembled camera post on to the vertical posts and fix them on the top edge, as shown in Figure 12. You can slide the camera holder post to the height you require by loosening the clamps and tightening them again to hold.

4.5. Connect the lamps to the power adapter

Components	Quantity
Cable M12, 30 cm	2
T-connector M12	1
T-nut M6	4
Power supply, 90W	1
Power cable	1

Table 6: Required parts.

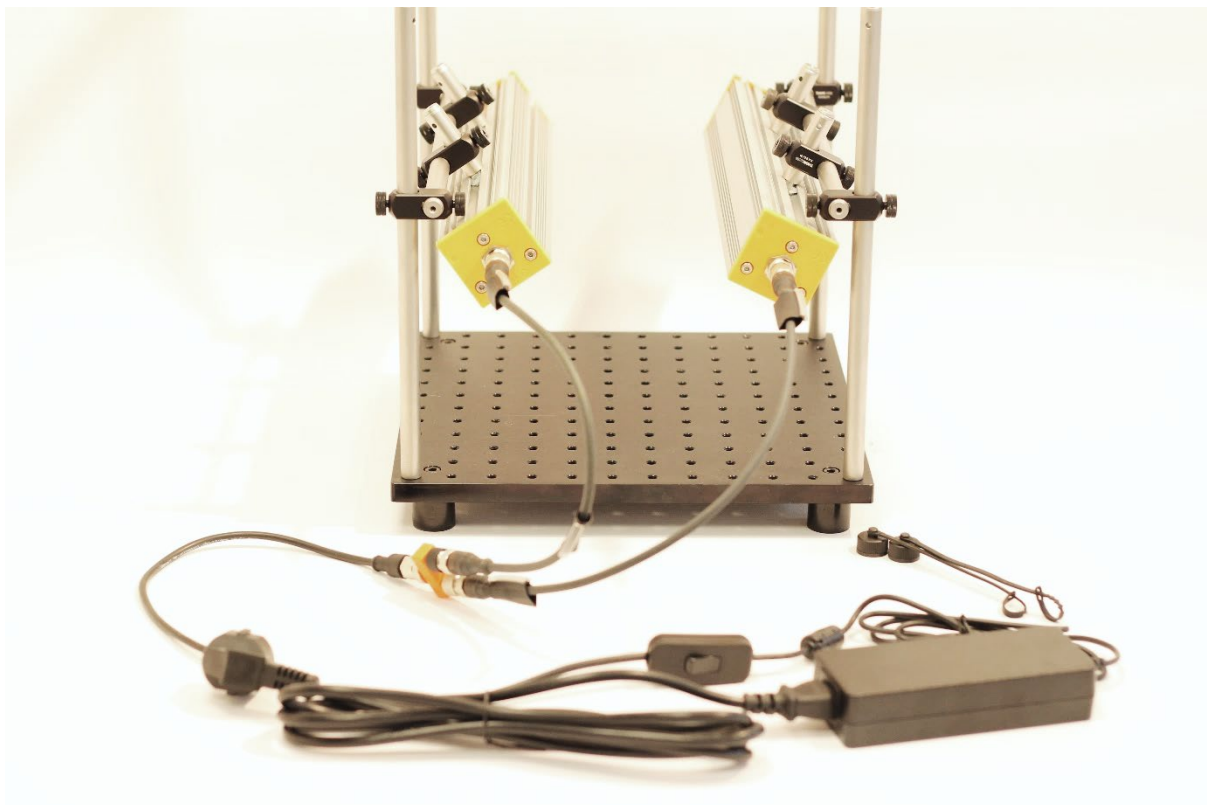


Figure 13: Connection of the electrical parts.

- Remove the protection caps from the electrical connectors of the lamps.
- Connect the 220V power cable to the power adapter.
- Connect the splitter's male connector to the output cable's female connector of the power adapter. Because the plugs can only match in one position, do not try to force the plugs if they don't match, instead turn one of the plugs until you find a matching position. Turn the screws tight and refrain from using excessive force.
- Connect the lamp power cables to the splitter like above.

4.6. Finalizing the assembly

Place the black scanning background foam on the breadboard and plug the 220V cable to the mains. You can control the lamps by the switch on the adapter power cable.

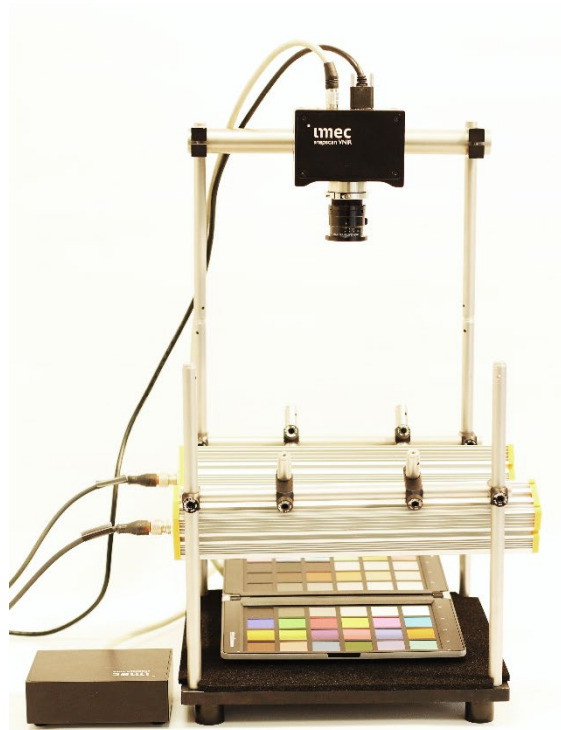


Figure 14: Setup assembled and ready.

