3D LIGHT Mounting and Installation Guideline

Document TBS-040

NOTE: The latest version of this document always available at:
https://cloud1.tbs-biometrics.com/index.php/s/ZeFnJkb4L4y4gNT

Release	Author	Comment
Feb 15, 2018	TM	First version
June 29, 2018	TM	Supported interfaces added, mounting instructions revised
Nov 07, 2018	TM	Wiegand requires external pull-ups
Oct 22, 2020	TM/AG	Added Thermal option and wall mount picture with dimensions
Nov 25, 2021	TM/AG	Updated powering table, GPIN & port assignments
April 19, 2022	TM/AG	Name change from 2D EYE to 3D LIGHT
Dec 02, 2022	TM/AG	Tamper Switch & Wifi Support added
May 23, 2024	TM/AG	Added multi-modal, updated power supply specs, ports & document links

Content

1 Introduction

The TBS Terminal series brings Access Control and Time & Attendance applications featuring biometrics to a new level. They combine highest security with user convenience and the most flexible configuration options on the market.

This document describes the mounting and installation of the 3D LIGHT.

3D LIGHT (see left picture on front page) can be equipped with a thermal sensor (TBS article no. TBS-040-TH) to read body temperatures of users, upgrading the reader to become a 3D LIGHT THERMAL (see middle picture on front page).

Alternatively, a 2D optical Fingerprint Sensor (TBS article no. TBS-040-MM) can be connected to the internal USB port, upgrading the reader to become a 3D LIGHT MULTI-MODAL (see right picture on front page).

The configuration options are explained in the TechNote 'TN 3D LIGHT Thermal Getting Started':

https://cloud1.tbs-biometrics.com/index.php/s/jID2LB3vzXuBVjP

TBS Support

For any additional information please get in touch with TBS support:

email: support@tbs-biometrics.com

phone: +41 (55) 533 2000

2 Legal and Safety Instructions

Allowed Applications

TBS products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of a TBS product can reasonably be expected to result in personal injury, death or severe property or environmental damage. TBS accepts no liability for inclusion and/or use of TBS products in such applications.

Inspection of goods received

If the packaging or product has been damaged in transport, or should you suspect that it may have a fault, the product must not be put into service. In this case, contact your TBS company representative.

Installation and Servicing

Installation, setup and servicing of our appliances must only be carried out by suitably trained personnel.

- Installation and electrical connections must only be made by correspondingly qualified specialists. The relevant national Electrical Engineers construction regulations must be observed.
- Setup and servicing must only be made by persons who have the know how to do so e.g. by reading the respective TBS manuals or attending TBS trainings / webinars.

When not otherwise stated, the following safety instructions apply:

- Installation and servicing of our appliances must be carried out when disconnected from the power supply, in particular appliances that are normally supplied by low-voltage current.
- It is prohibited to alter the device or to remove protective shields and covers.
- Do not attempt to repair an appliance after a defect, failure or damage, or to put it back into operation again. Please contact in such case your TBS company representative or the TBS hotline.

If there are still some points on which you are not entirely clear, please do not take a chance. All queries can be clarified by your TBS company representative, or by ringing the TBS hotline.

Disclaimers

TBS accepts no responsibility for any injuries or damage caused as a result of improper use.

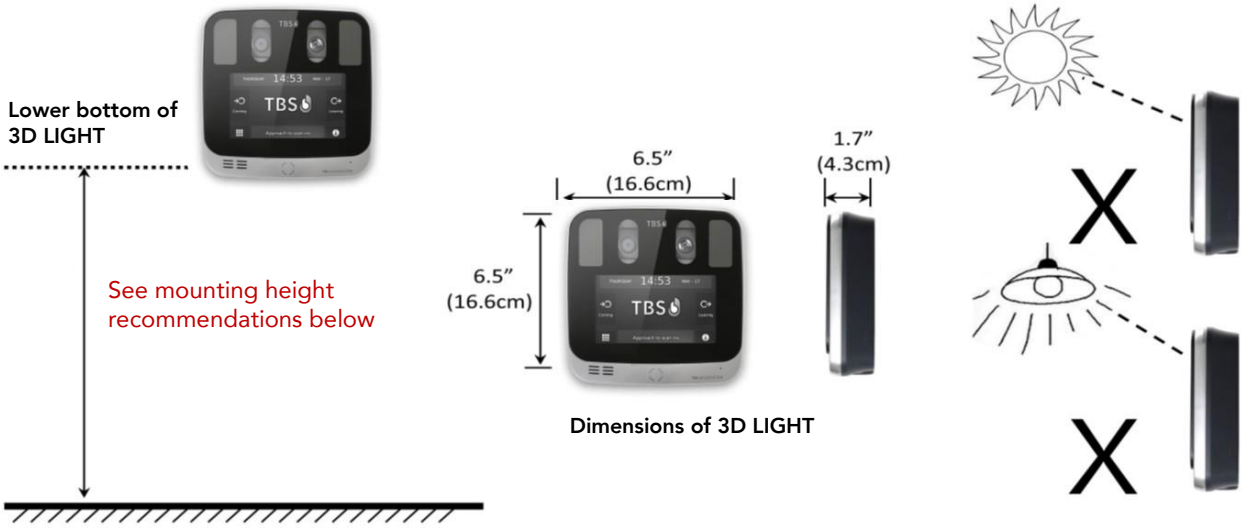
Information in this document is believed to be accurate and reliable. However, TBS does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Should you discover any fault with the product or in its documentation, or have any suggestions for improvement, please confidently approach your TBS company representative or TBS hotline.

TBS reserves the right to make changes to information published in this document at any time and without notice.

3 Mounting and Installation

3.1 Recommended Mounting Information



- The recommended mounting height for the 3D LIGHT is 144 cm (57 inches) from ground to the bottom of 3D LIGHT (device mounted vertically, no tilting!). This refers to a user height of 154 to 190 cm (60.5 to 75 inches).
  To handle smaller persons in your installation, please adapt mounting height accordingly.
- Strong ambient light and / or direct light into the front side of the 3D LIGHT should be avoided. Sunlight, halogen lamps or other strong illumination may reduce the performance of the 3D LIGHT and may result in increased failure-to-capture rates or failed authentication events.
- The 3D LIGHT was designed for indoor use only. This unit is not weatherproof and must not be exposed to water, ice, extreme temperatures, or other adverse weather conditions.

NOTE:
Installation in extreme environments without proper protection may cause permanent damage and voids warranty.

3.2 Wiring and Power Requirements

3D LIGHT requires at least the following wiring:

- Ethernet cable: Cat5 cable or better is recommended.
- Power input cable:
  - AWG 14 to 18: recommended
  - AWG 19 or 20: usable depending on the cable length (less than 10 meters)
- Power input requirement depends on the model:
  3D LIGHT (23) requires **12 to 24** VDC +/- 5%.
  3D LIGHT (18) requires **12 to 15** VDC +/- 5%. Do not supply higher voltage !
- Peak power consumption is 16W for both models. PoE is possible using an external PoE+ splitter.
- The power supply included with each reader provides 45W (15 VDC @ 3A), suiting both models.

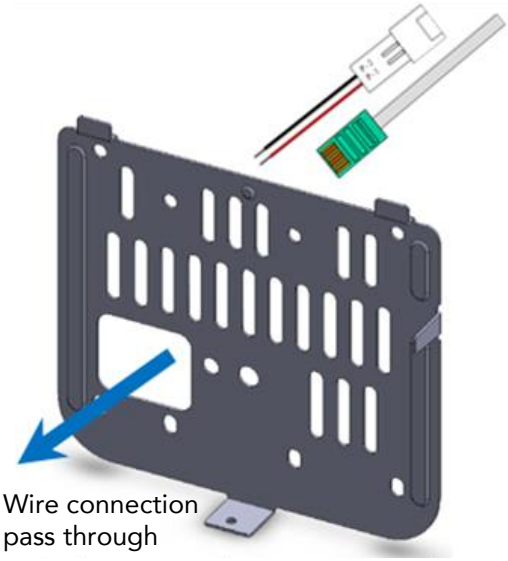
IMPORTANT:
Use stable power supply and short power input cable if possible, with correct gauge wire.
Any over- or under-voltage applied to this unit may cause permanent damage and void the warranty.

3.3 Standard Installation to Wall Surface

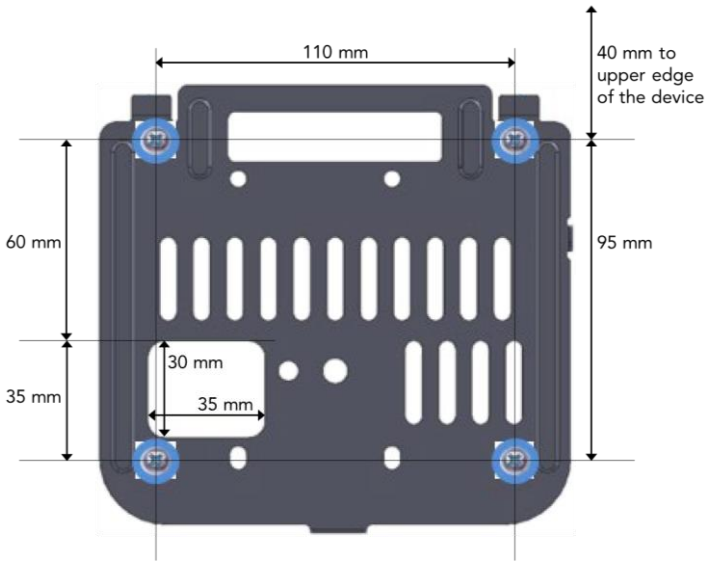
Detach the installation plate from the 3D LIGHT by removing the screw (M3 x 6mm) at the bottom of the unit. Separate the wall plate from the rear cover by sliding the plate downward. The screw will be re-used to attach the 3D LIGHT to the wall plate following installation of the wall plate and wiring.

M3 x 6mm screw. Can be replaced with a M3 security type screw of proper length.

- Installation can be accomplished by mounting directly to a wall (Surface Mount).
- For a Surface Mount installation, place the installation (wall) plate on the desired wall location and screw it into the wall as indicated in the Surface Mount diagram below. Please ensure that the bottom tab in the plate faces outward and the cable routing opening in 3D LIGHT matches the opening in the wall. Utilization of wall anchors is mandatory.

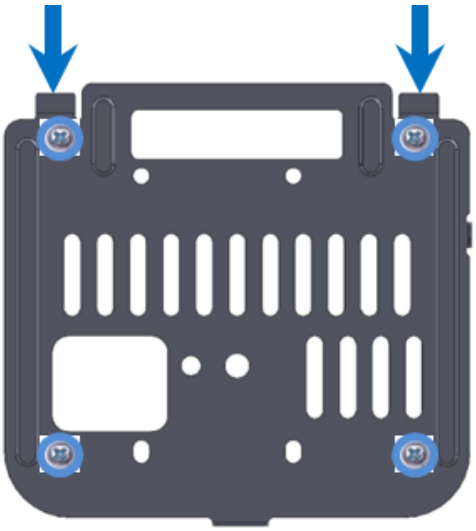


Wire connection pass through



Front view of installation plate as mounted to the wall (bottom tab faces outward towards the viewer)

3.4 Attaching 3D LIGHT to Wall Bracket

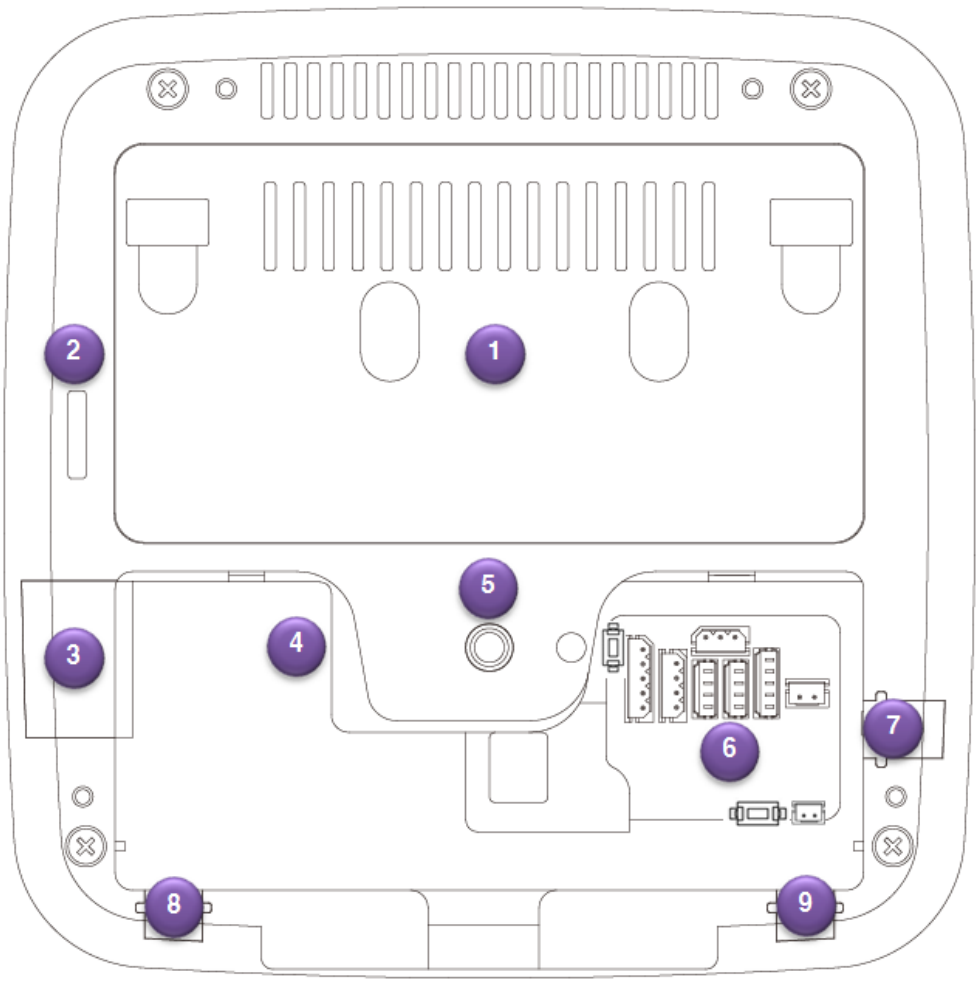


Slide the 3D LIGHT into the installation wall bracket (back plate) from the top.

Lock the 3D LIGHT with bracket using M3 x 6mm screw on bottom. Please use security type screws if needed.

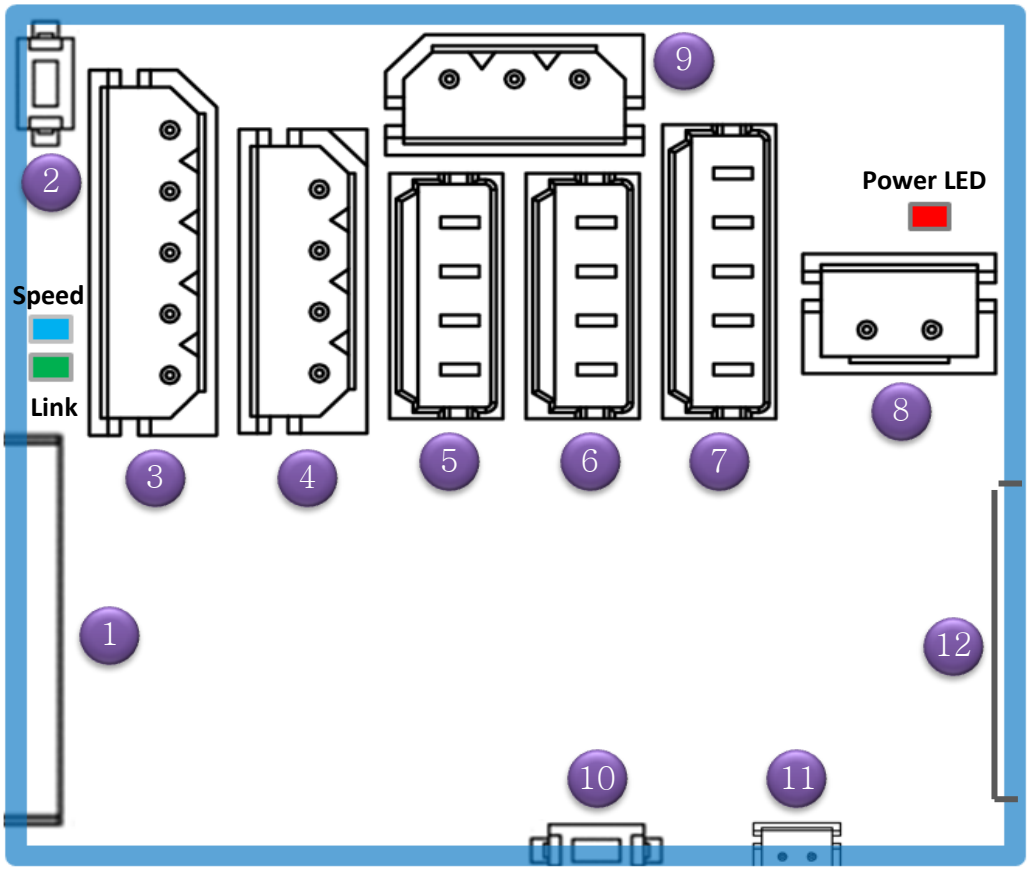
4 Connections

4.1 Back View with Connectors



1. Wall mount plate, functions also as heat sink
2. Tamper Switch (supported in Firmware 2.09.2 or higher)
3. External WiFi Antenna Outlet
4. External USB Socket
   In case of 3D LIGHT: connection for WiFi dongle
   In case of 3D LIGHT THERMAL: connection for thermal sensor module
5. Tri-pod mount: ¼ - 20 UNC (standard consumer camera mount)
6. Power Input and I/O Interface
7. I/O Interface Cable Outlet
8. I/O Interface Cable Outlet
9. I/O Interface Cable Outlet

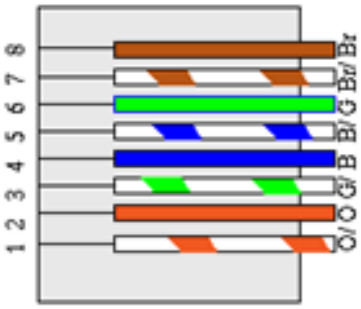
4.2 Power Input and I/O Interface Block



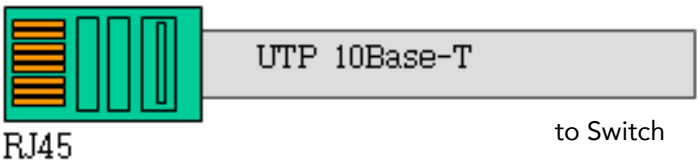
1. LAN Connector (RJ45)
2. RS-485 Termination Resistor Switch
3. RS-485 Connector
4. RS-232 Connector
5. GPIN Connector
6. Wiegand Input Connector (not supported)
7. Wiegand Output Connector
8. DC Power Input Connector
9. Relay Connector
10. Reboot Switch
11. External Audio Output Connector (not supported)
12. Serial Debug Port

4.3 LAN Connector

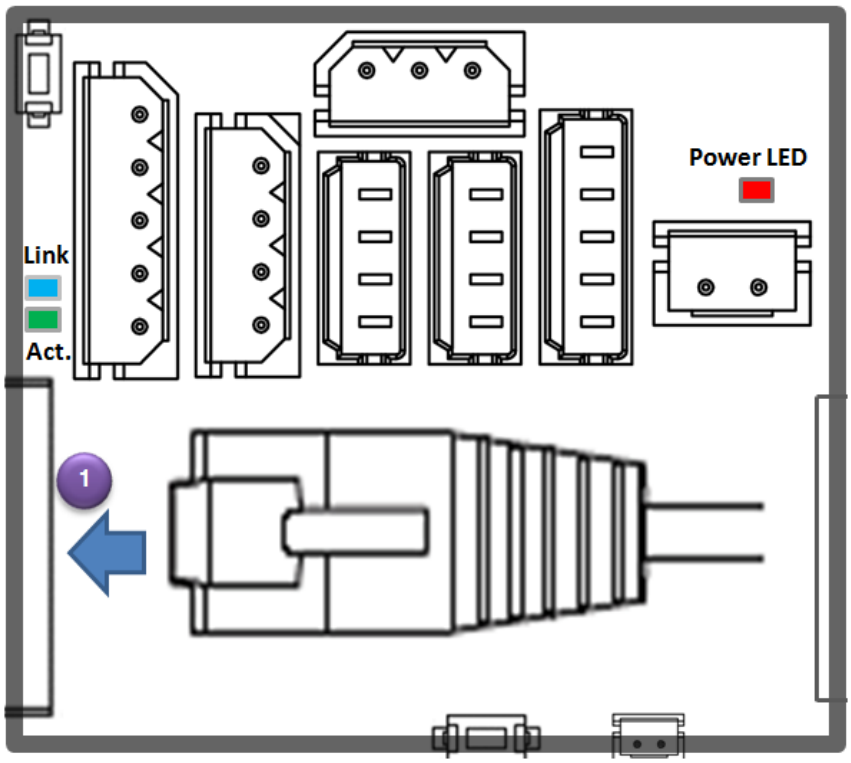
RJ-45 connector for 10/100Base-T Ethernet communication, minimum CAT5 cable.



Hook is facing downside



UTP Connector



4.4 RS-485 Termination Resistor Switch

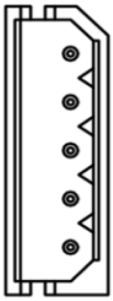
Switch for 100 Ohm termination resistor activation when 3D LIGHT is connected to the end of RS-485 wire connection.

Default: Turned off

2	Switch	Function	Etc.
OFF (Default)	OFF	Disconnect RS-485 Termination Resistor	
ON	ON	Connect RS-485 Termination Resistor	

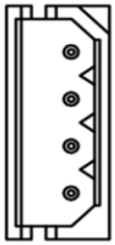
4.5 RS-485 Connector

RS-485 connector is used to communicate to external controller.

3	Pin Number	Pin Name	Etc.
	1	DATA -	
	2	DATA +	
	3	GROUND	
	4	SHIELD GROUND	
	5	SHIELD GROUND	

4.6 RS-232 Connector

RS-232 connector is used to communicate to external controller.

4	Pin Number	Pin Name	Etc.
	1	TX	
	2	RX	
	3	GROUND	
	4	SHIELD GROUND	

4.7 GPIN Connector

5	Pin Number	Pin Name	Etc.
	1	GPI 1	
	2	GPI 2	
	3	GROUND	
	4	SHIELD GROUND	

The GPIN connector supports a voltage of maximum 5 VDC.

When no voltage is supplied, GPIN will read ‘high‘. When GPIN is connected to ground, it will read ‘low‘. By default, GPIN is in ‘high‘ state. One possibility to switch the state is to use an external relay to connect GPIN to ground or to disconnect it.

Please pay attention that in the TBS CONTROLLER LITE or SMART, GPIN are by default in ‘low‘ state and need input voltage to switch to ‘high‘ state.

This GPIN transition could be used to provide an input to 3D LIGHT via external buttons. One possible application could be to create 'touchless time & attendance buttons': using foot pedals or wall switches, the ‘Coming‘ and ‘Leaving‘ buttons displayed on the touchscreen could be selected by foot or elbow. In that case, iris scanning would start only after pushing the external button. Such a solution would allow to create a touchless, hygienic time & attendance solution.

4.8 Wiegand Output Connector

The Wiegand Output connector is used to communicate with external controller. The standard TBS formats (26/37bit) are supported.

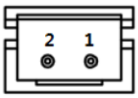
7	Pin Number	Pin Name	Etc.
	1	DATA 0	
	2	DATA 1	
	3	GROUND	
	4	SHIELD GROUND	
	5	SHIELD GROUND	

IMPORTANT:

DATA0 / DATA1 lines are not pulled up internally in the 3D LIGHT. If the Wiegand receiver does not already have an internal pull-up resistor, DATA0 and DATA1 should be pulled up by 1K Ohm resistor.

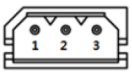
4.9 DC Power Input Connector

Clean and sustainable 12 to 15 VDC power is needed for reliable 3D LIGHT operation. Using the Power Supply Unit provided by TBS (included with the device) is recommended.

8	Pin Number	Pin Name	Etc.
	1	DC+12V INPUT	
	2	GROUND	

4.10 Relay Connector

Internal relay interface with nominal switching capacity of 1A 30 VDC or 0.3A 124 VAC, resistive load.

9	Pin Number	Pin Name	Etc.
	1	Normal Close(NC)	
	2	COM	
	3	Normal Open(NO)	

5 Appendix

5.1 Powering Instructions

The TBS Terminals are made for permanent powering. The TBS power supply (or another model with similar specifications) must be able to drive the peak power as per the below table.

By standard, 3D LIGHT is always delivered with an external power supply with these ratings:

Type: pluggable power supply
Input: 100-240 V~ 50/60Hz compliant
Output: 15 VDC, max. 3 A, 45 W

Please note that 3D LIGHT (18, former name 2D EYE) shipped before Q3/2020 came with 12 VDC power supply. This model can be operated maximum with 15 VDC!

All TBS Terminals are made for permanent powering. The TBS power supply (or another model with similar specifications) must be able to drive the peak power as per the below table.

Power demand of TBS Devices: PoE compatibility, power supply type and power consumption during startup and operation without accessories (Bluetooth, WLAN, RFID)

PoE supply type	Power supply *			Operating range	Consumption Watts **		TBS Devices without accessories
	V	A	Watts	V	idle	peak	
Direct PoE support	19	2.1	40	12-24	8	11	3D AIR (Series 22)
	19	2.1	40	12-24	6	7	2D IRON
External PoE+ with splitter	19	2.1	40	12-24	10	18	3D AIR (Series 12)
	15	3	45	12-24	6	16	3D LIGHT (Series 23, PSU incl.)
External PoE with splitter	15	4	60	15-24	8	12	3D FLASH+ (PSU included)
	5	4	20	5-24	8	11	3D ENROLL (Series 22)
	19	2.1	40	12-24	3	5	2D SENSE, 2D STATION
	12	3	36	12	7	10	2D MINI, 2D TIME (PSU included)
	19	2.1	40	12-24	1.4	3	TBS CONTROLLER SMART
	-	-	-	12-24	0.1	0.1	TBS CONTROLLER LITE
No PoE support	5	1	5	5			2D MOVE (battery)
	12	3	36	12	2.6	2.6	TBS MINI SERVER (PSU included)
	-	-	-	5	0.1	0.1	WLAN & BLUETOOTH adapter

** this power supply (PS) can be ordered from TBS as an option, it is included where noted*
*** includes 10% on top of values measured at TBS. Idle screen with TBS logo at 100% brightness*

The power supply plug must be accessible externally to enable power cycling of devices.

All TBS devices feature the same relay type with output switching capacity 60 W, 220 VDC or 125 VAC.

5.2 TBS port assignments

The following table lists all TCP/UDP ports that are used in TBS software and firmware as part of the biometric subsystem infrastructure.

In case an installation is not going to use all TBS components TBS offers, some of the available services will not be needed, and the respective ports do not have to be open.

Table 3: Port Assignments for BIOMANAGER ENTERPRISE installations (BME, Firmware 3.xx):

Machine	Port	Protocol	Comment	Inbound	Outbound
BME Server PC					
Secure device channel (1)	8808	HTTPS	default communication channel. BME installer sets required firewall settings by default	Yes	No
Biometric Client Service PC					
BME channel (1)	8808	HTTPS	communication channel to BME server and Device Control Center (DCC)	No	Yes
Enrollment API	8281, 8282, 8284	HTTP/S	communication channel between enrollment components.	Yes (2)	No
	8283	MQTT			
Enrollment PC					
BME channel (1)	8808	HTTPS	communication channel to BME server and Device Control Center (DCC)	No	Yes
Terminal					
BME On-Prem (1)	8808	HTTPS	communication channel to BME local server and Device Control Center (DCC)	No	Yes
BME CLOUD	443	HTTPS	communication channel to BME Cloud server	No	Yes
DeviceConfig	443	HTTPS	public web interface to configure devices	Yes	No
DeviceConfig (3)	18883	MQTT	additional web sockets based control channel	Yes	No
DeviceControl	8200	HTTPS	public interface to remotely control devices	Yes	No

(1) Can be customized during installation

(2) Ports are bound only to localhost

(3) Not used anymore in FW3

Table 4: Port Assignments for WebEdition installations using Firmware 2.xx, thus only applicable for the older model 3D LIGHT (18):

Machine	Port	Protocol	Comment	Inbound	Outbound
WE Server PC					
Device channel	80	HTTP	default communication channel (SOAP needs to be enabled in firewall settings, if deep inspection mechanisms are used)	Yes	No
Secure device channel (1)	443	HTTPS	optional secure communication channel (SOAP needs to be enabled, see above)	Yes	No
Biometric Client Service PC					
WE channel (1)	80/443	HTTP/S	communication channel to WE server and Device Control Center (DCC)	No	Yes
Enrollment API	8281, 8282, 8284	HTTP/S	communication channel between NT service and JavaScript component	Yes (2)	No
	8283	MQTT			
Enrollment PC					
WE channel (1)	80/443	HTTP/S	communication channel to WE server and Device Control Center (DCC)	No	Yes
Series12 terminal					
WebEdition (1)	80/443	HTTP/S	communication channel to WE server and Device Control Center (DCC)	No	Yes
DeviceConfig Firmware 1 or 2 (1)	443	HTTPS	public web interface to configure devices	Yes	No
DeviceConfig Firmware 2.xx	18883	MQTT	additional web sockets based control channel	Yes	No
DeviceControl	8200	HTTPS	public interface to remotely control devices	Yes	No
RemoteControl	8220	HTTPS	internal interface to remotely control devices, incl. enrollment	Yes	No
RemoteEnroll (3)	8282	HTTPS	internal interface required for remote enrollment	Yes	No
Terminal Updater PC					
UDP channel	47815	UDP	required for remote firmware update	Yes	No
TCP channel	47816	TCP	required for remote firmware update	Yes	No

(1) Can be customized during installation

(2) Ports are bound only to localhost

(3) Port is not mandatory in FW 2.xx since DCC channel is used for enrollment

5.3 References to other TBS documents

TBS 3D LIGHT Mounting and Installation Guideline

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/zbMFeqpLitKR3K3

The QR code printed on the product opens this link, leading to the 3D LIGHT product folder from where this manual is available.

TechNote 'TN 3D LIGHT Thermal Getting Started'

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/jID2LB3vzXuBVjP

The reader can be equipped with a thermal sensor to read body temperatures of users. This TechNote explains the configuration options, also relating face mask detection.

TBS Terminal Firmware

https://biometrics.talentlms.com

TBS Partner Portal with full product documentations and access to latest firmware for terminals. Access is restricted to registered TBS Partners.

TBS System Requirements

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/q8V3hzrLyR0Mnyg

Summarizes the prerequisites a site needs to offer regarding server & network to host a TBS installation.

TBS Enrollment with 3D LIGHT

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/XdoX83OUEOOHHIQ

Description of the two available enrollment options, comprehensive manual for TBS system operators.

TBS Short instruction - Biometric Enrollment on 3D LIGHT

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/VA4cRbhxu0xlbdZ

One-pager providing guidance for the local enrollment process to TBS system operators.

TBS Manuals for TBS System Operators (Endusers)

Permanent link: https://cloud1.tbs-biometrics.com/index.php/s/JBNh6zAMJbRQoZD

Access all published manuals for TBS system operators, including the above short instructions.