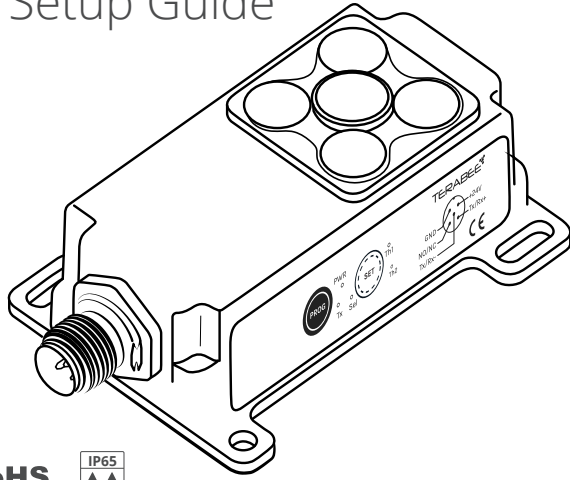


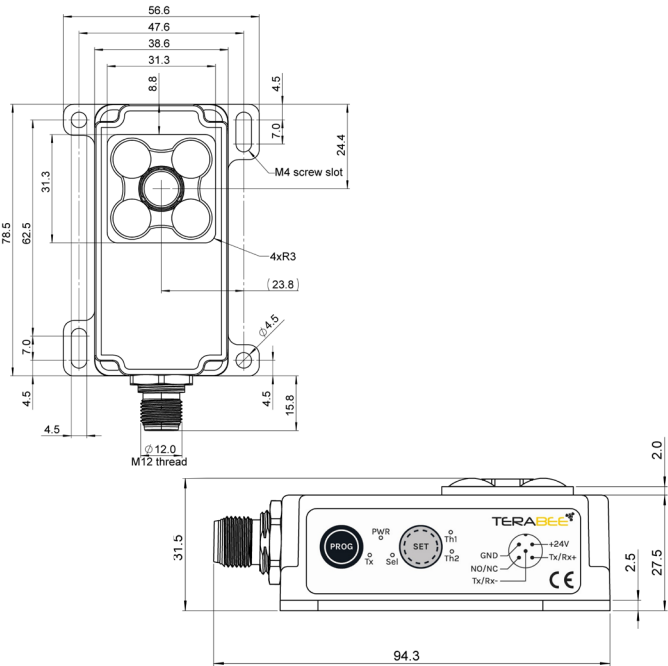
TERABEE

IND-TOF-1

Quick Setup Guide



Dimensions



Operation and Indicators

COMMUNICATION

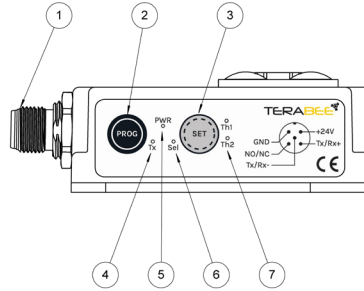
- 1 | M12 | A-coded male connector, 5-pin

TEACH-IN BUTTONS

- 2 | PROG | Program background threshold
- 3 | SET | Program threshold 1 and 2

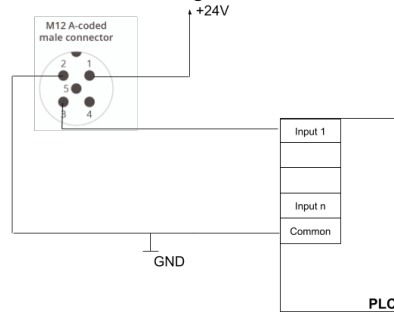
LED INDICATORS

- 4 | Tx | RS485 Data transmission | Red
- 5 | PWR | Power indicator | Red
- 6 | Sel | Sensor selected | Blue
- 7 | Th1/Th2 | Threshold breach notification, error indication | Green/Red

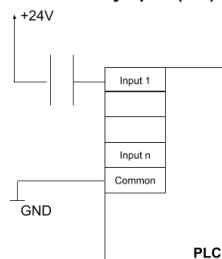


PLC Connection

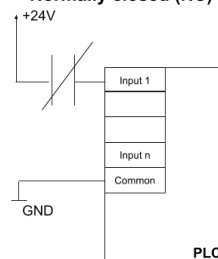
PNP configuration



Normally open (NO)



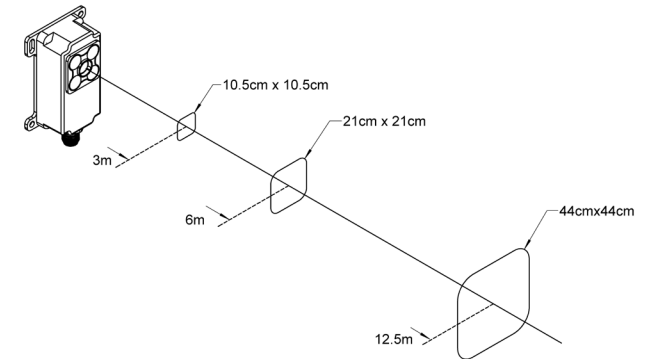
Normally closed (NC)



Technical Specifications

Product code	TB-IND-TOF-1-RS485
Performance	
Detection Principle	Infrared Time-of-Flight
Range	0.5 m to 12.5 m
Output Distance Resolution	5 mm
Accuracy	±4 cm in the first 4 m, ±1% beyond 4 m
Repeatability	±5 mm
Field of View	Approx. 2°
Projected Reception Area	10.5 cm x 10.5 cm @ 3 m range
Light Source Wavelength	940 nm
Access Time for Distance Measurements	11 ms
Response time for NO/NC State Change	35 ms to 100 ms
Electronics	
Supply Voltage V_{IN}	24V $_{\pm 5\%}$ DC
Current Consumption (max. @ V_{IN} = 24V DC)	90 mA
Warm-up Time (advised)	≥ 15 min
Initialization Time	< 1 s
Interfaces	
Digital Output	Switching (NO/NC in PNP/NPN configuration), 0V - 24V Maximum output current: 450 mA (@ V_{IN} = 24V DC), unfused
Serial Interface (distance measurement and remote settings)	RS485 (half-duplex, 19.2 kbps)
Communication Protocol	Modbus
Visual Notification	5 x LEDs (multicolor)
Mechanics	
Dimensions (LxWxH)	94 mm x 56 mm x 31 mm
Weight	99 g
Enclosure Rating	IP65
Housing Material	Main body: ABS Backplate: Aluminium
Type of Connection	M12 A-coded male connector, 5-pin
Ambient Temperature Operation (@ V_{IN} = 24 V DC)	-20°C to +45°C
Mounting Style	4 slots for M4 screws
Conformity	
Reference Standard	CE, RoHS, Eye-Safety, Vibration & Shock

Projected Reception Area



MODE 1 Default	SETUP	OPERATION	
	1 threshold	Switching output (NO/NC)	Distance data
		Output triggered as soon as an object BREAKS the light beam in the trigger zone. Output remains triggered as long as the light beam in the trigger zone is broken.	
Available via RS485			

SETUP	STEPS	1	2
FUNCTION		SET BACKGROUND	SENSOR READY FOR OPERATION
TEACH-IN SEQUENCE		HOLD 1s 	
LED FEEDBACK		TH1 <input type="radio"/> OFF* TH2 <input type="radio"/> OFF*	TH1 <input checked="" type="radio"/> ON TH2 <input checked="" type="radio"/> ON

*LED status OFF for 2s during "time delay for operation mode"

OPERATION

MODE 2	SETUP	OPERATION	
	1 threshold	Switching output (NO/NC)	Distance data
		Output is triggered as soon as an object LEAVES the light beam in the trigger zone	
Available via RS485			

SETUP	STEPS	1	2
FUNCTION		SET BACKGROUND	SENSOR READY FOR OPERATION
TEACH-IN SEQUENCE		HOLD 1s 	
LED FEEDBACK		TH1 <input type="radio"/> OFF* TH2 <input type="radio"/> OFF*	TH1 <input checked="" type="radio"/> ON TH2 <input checked="" type="radio"/> ON

*LED status OFF for 2s during "time delay for operation mode"

OPERATION

MODE 3	SETUP	OPERATION			
	3 thresholds	Switching output (NO/NC)	Distance data		
		Output is triggered as soon as an object ENTERS the trigger zone. Output remains triggered as long as the light beam in the trigger zone is broken.			
Available via RS485					

SETUP	STEPS	1	3	2	4
FUNCTION		SET BACKGROUND	SET TH2	SET TH1	SENSOR READY FOR OPERATION
TEACH-IN SEQUENCE		HOLD 1s 	PRESS 	PRESS 	
LED FEEDBACK		TH1 <input checked="" type="radio"/> BLINKS TH2 <input type="radio"/>	<input type="radio"/> OFF* <input type="radio"/> OFF*	<input checked="" type="radio"/> ON <input checked="" type="radio"/> BLINKS	TH1 <input checked="" type="radio"/> ON TH2 <input checked="" type="radio"/> ON

*LED status OFF for 2s during "time delay for operation mode"

OPERATION

The trigger zone can be changed by accessing the sensors NO/NC active region parameter

MODE 4	SETUP	OPERATION			
	3 thresholds	Switching output (NO/NC)	Distance data		
		Output is triggered as soon as an object LEAVES the trigger zone of the light beam			
Available via RS485					

SETUP	STEPS	1	3	2	4
FUNCTION		SET BACKGROUND	SET TH2	SET TH1	SENSOR READY FOR OPERATION
TEACH-IN SEQUENCE		HOLD 1s 	PRESS 	PRESS 	
LED FEEDBACK		TH1 <input checked="" type="radio"/> BLINKS TH2 <input type="radio"/>	<input type="radio"/> OFF* <input type="radio"/> OFF*	<input checked="" type="radio"/> ON <input checked="" type="radio"/> BLINKS	TH1 <input checked="" type="radio"/> ON TH2 <input checked="" type="radio"/> ON

*LED status OFF for 2s during "time delay for operation mode"

OPERATION

The trigger zone can be changed by accessing the sensors NO/NC active region parameter

MODE 5	SETUP	OPERATION		
	3 thresholds	Switching output (NO/NC)	Distance data	
		Output is triggered as soon as an object LEAVES the trigger zone of the light beam		
Available via RS485				

SETUP	STEPS	1	2	3
FUNCTION		SET BACKGROUND	PASS AN OBJECT THROUGH THE ENTIRE FOV	SENSOR READY FOR OPERATION
TEACH-IN SEQUENCE		HOLD 1s 		
LED FEEDBACK		TH1 <input checked="" type="radio"/> BLINKS TH2 <input checked="" type="radio"/> BLINKS	<input type="radio"/> OFF* <input type="radio"/> OFF*	TH1 <input checked="" type="radio"/> ON TH2 <input checked="" type="radio"/> ON

*LED status OFF for 2s during "time delay for operation mode"

OPERATION

The trigger zone can be changed by accessing the sensors NO/NC active region parameter

MODE 6	SETUP	OPERATION	
	No setup	Switching output (NO/NC)	Distance data
		No output	Available via RS485

OPERATION

PLEASE READ BEFORE USING THE SENSOR

- During setup and operation, please make sure that the sensor is not pointing at a distance longer than the maximum offered range (12.5 meters). Please ensure that a physical object/obstruction (e.g wall) is covering the sensors entire Field of View, no further than the maximum range (12.5 meters)
- Please respect the sensor warm up time (at least 15 mins), before operating mode setup and sensor operation. Using the sensor before the recommended warm-up time may negatively impact its performance

Please refer to the IND-TOF-1 user manual for more detailed instructions on mode setup and operation