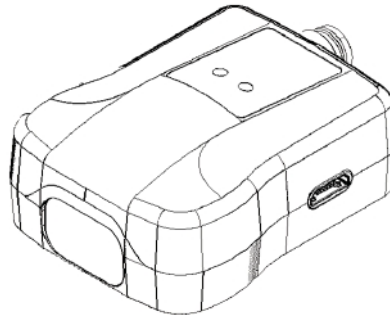


VO330570

Contactless optical incremental encoder

**Contents**

1	General notes	Page 2
	1.1 Safety instructions	Page 2
	1.2 Notes	Page 2
	1.3 Intended use	Page 2
	1.4 Disposal	Page 3
	1.5 Fault diagnosis	Page 3
	1.6 Maintenance / cleaning	Page 3
	1.7 Repair	Page 3
2	Appearance	Page 4
3	Electrical connection	Page 5
4	Mechanical installation	Page 6
5	Equipment	Page 7
6	Technical data	Page 8
7	Application tips	Page 9
8	VO330570-Connect (software for configuration and visualization)	Page 10
	8.1 Configuration	Page 11
	8.2 Advanced configuration	Page 12

1 General notes

1.1 Safety instructions

- The VO330570 may only be used for its intended purpose.
- The installation of the VO330570 must be carried out by qualified personnel in the field of electronics and precision mechanics.
- Observe the safety and accident prevention regulations of the employers' liability insurance association applicable in your country.
- Switch off the operating voltage to all devices / machines and systems affected by the installation before carrying out the connection work.
- Electrical connections must never be made or disconnected under voltage!
- Ensure that the VO330570 is earthed and that the shield connection is EMC-compliant to ensure proper function.
- Protect the device from contamination!
- Before start-up, please ensure that all safety instructions in the product documentation have been observed!

Not a safety component according to the EU Machinery Directive.

The application of these products is prohibited if they have a direct impact on personal safety.

1.2 Notes

- The more accurate the mounting of the sensor in the bracket between the sensor and the object, as well as the distance in relation to the respective surface, the lower the measurement deviations caused by this.
- Vibrations must be avoided.

1.3 Appropriate use

- The VO330570 is used for contactless detection of moving objects. It uses a VCSEL class 1 laser with dot matrix recognition.
- The output of the PWM signal is a relation to the speed. The units (pulses/mm, m/min & mm) can only be used after the sensor has been calibrated (correction factor).
- Any other use or modifications to the product will invalidate any warranty claim against ipf electronic gmbh.

1.4 Disposal

- The sensor must be disposed of in accordance with the country-specific regulations at a suitable disposal point for recycling electrical and electronic equipment. (WEEE no. 40951076)



1.5 Fault diagnosis

- The sensor is working when the status LEDs on the device light up (with correct installation and configuration).
- Contact your sales partner for further analysis.

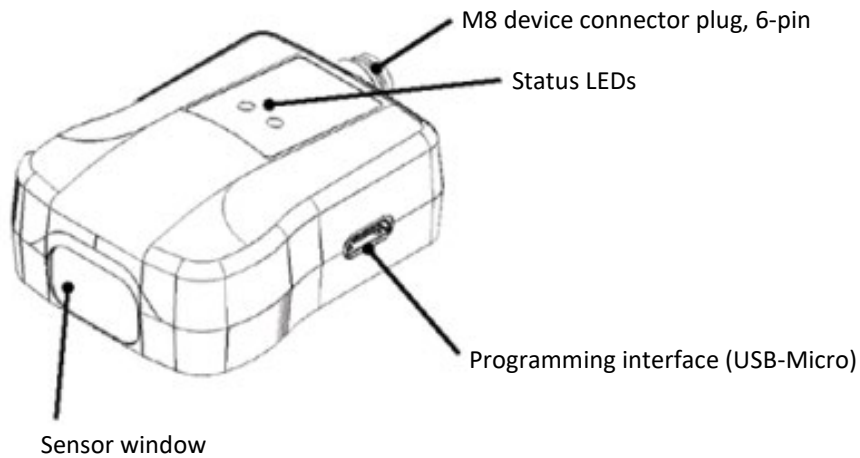
1.6 Maintenance / cleaning

- The VO330570 is maintenance-free.
- It is recommended to check the sensor window for damage or contamination at regular intervals.
- If necessary, remove dust from the sensor window with a brush. In connection, clean it carefully by dabbing with a lint-free cloth soaked in alcohol. Avoid scratches or streaks.
- Antistatic plastic cleaner and special optical cloths are recommended for cleaning.



1.7 Repair

- In the event of a defect, the sensor can be repaired by ipf electronic gmbh. Please contact your sales partner for this.





2 Appearance



LED 1

-  lights up red: Error threshold value has been overrun (difference sensor 1 & 2)
-  lights up white: Trigger is active (with each trigger the LED lights up briefly and goes out again)

LED 2

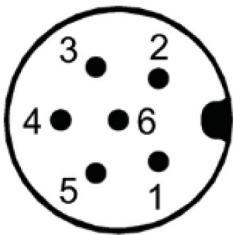
-  lights up white: Standstill
-  flashes white: Movement (frequency according to speed)
-  lights up green: Image quality good
-  lights up yellow/orange: Poor image quality - change distance if necessary

3 Electrical connection

Core no.	Color of the core	Signal	Explanation
1	brown	+5 ... 30V DIAGNOSTIC COVERAGE	Voltage supply, 100mA required
2	white	TR 1	Trigger signal 1
3	blue	GND	Mass
4	black	TR2	Trigger signal 2 (e.g. camera or cutting device)
		ERR	Error - Difference between the two sensors overruns the limit value
		DIR	Direction: X+ / Y+ -> highX- / Y- -> low When at a standstill, the current status is held.
5	gray	A	Track A encoder
6	pink	B	Track B encoder

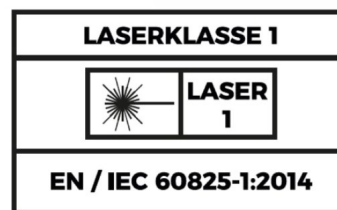
IMPORTANT NOTE: Never connect core 1 (brown) to one of the other cores!

Attention! Incorrect connection can destroy the sensor or cause problems with connected machines!



View M8-
6-pin appliance plug

CE RoHS



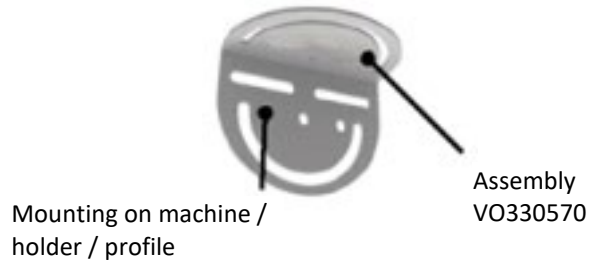
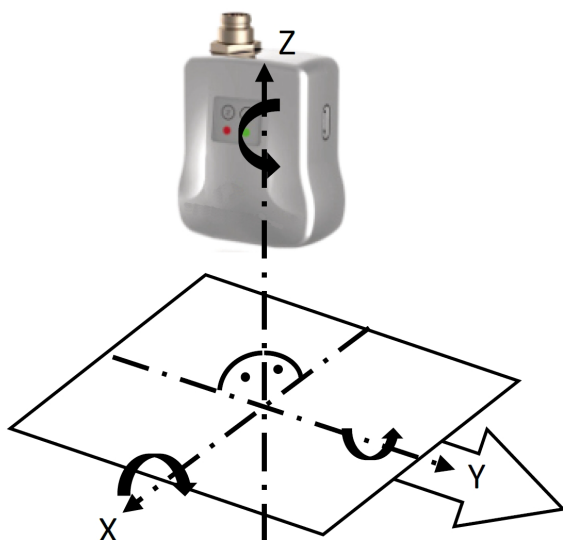
MADE IN GERMANY

4 Mechanical installation



Alignment in the three angular axes

Mounting bracket AV000150



Alignment notes:

- The sensor must be mounted perpendicular to the surface to be measured and the measuring axis must be aligned parallel to the movement direction - otherwise there will be a systematic deviation (see figure)!
- The sensor must be mounted at a distance of between 15 and 60 mm. Depending on the surface condition, the optimum value is visualized by a "green" display on LED 2.

5 Equipment

- Distance and speed measurement and output of up to two trigger signals.

- Redundancy: 2 sensors are installed behind the sensor window.
If the difference between the two measured values is too great, this is output as an error.
The permissible error tolerance is set in the VO330570-Connect software (see chapter 8.2 "Error threshold").

- Possible operational modes
Both sensors always measure the product speed. You can choose between the following data outputs:
 - Sensor 1 only
 - Sensor 2 only

ATTENTION!

Changing measuring distances (e.g. due to convex or concave surfaces) and/or materials lead to different measurement results!

- Scanning direction / measuring orientation:
The scanning direction (= the conveying direction of the object) can be configured in the VO330570-Connect software (see chapter 8.2).



6 Technical data

measuring distance	15 ... 60mm
operating voltage	5 ... 30V DIAGNOSTIC COVERAGE
Current consumption (without load)	100mA
Sampling rate	0.9ms
response time	3.6ms
transmitting element	Laser diode, infrared
Laser protection class	1
wavelength	850nm
Reverse polarity protection	Yes
accuracy	± 0,3%**
Speed	0.5 ... 135m/min ***
Acceleration	< 8G
Trigger output	PNP / NPN / Push-Pull
Output error	PNP
protection class	III
Housing material	aluminum
Full grouting	Yes
degree of protection	IP67, on housing side, with cable socket mounted
Programming port	Micro-USB
Software	VO330570-Connect
Accessories (mounting bracket)	AV000150
Connection accessories (operating voltage, outputs)	VK200K75
Connection accessories (USB)	VK100U44

This product is a standard product and not a safety component within the meaning of the Machinery Directive. Calculation based on nominal load of the components, average ambient temperature 25°C, frequency of use 8760 h/a. All electronic failures are considered as dangerous failures.

- **) Error limit for the systematic measurement deviation according to DIN 1319-1:1995, valid between 1 m/min - 120 m/min. Smaller deviations are achieved up to 40 m/min. Regular adjustment required.
- ***) This value is better or worse depending on the material. The highest speed can be expected from glossy, metallic surfaces and the lowest maximum speed from white matt paper.

7 Application tips

- The VO330570 works with 5V via the programming interface and/or via the machine's supply voltage in the range of 5... 30V diagnostic coverage.
- The optimum distance between the sensor and the material/object surface is 15 - 60 mm.
- The distance to the product should first be adjusted or varied until LED2 lights up green. Check LED 2 both when the object is moving and when it is stationary.
- Any surface in front of the sensor window is recognized. Transparent materials can also be recognized as long as they are not glass panes. However, it is not possible to measure through a transparent film or glass pane.
- If the sensor recognizes that the measured object is moving from a standstill, a trigger signal is generated. The output delay of this trigger signal is defined in millimetres. The setting is made in the VO330570-Connect software.
- The sensitivity ("standstill threshold") can be adjusted separately (e.g. for ambient noise, vibration with foils, etc.).
- For marking systems, a resolution setting of around 22 pulses/mm is recommended.
- Trigger 2 can be used for triggering a second system (e.g. a tracking camera, cutter, etc.).
- Product direction changes can be recognized via the comparison of the A and B tracks or via output 2 (direction). It should be noted that the previous status is retained at standstill.

Saving and mirroring configurations

- Various configurations can be saved as files and called up again for the purpose of quick product changes and customization (symbol "Open" < > "Save as")

Correction factor

- By default, the correction factor is set to 1.000 in the advanced settings.
- To achieve an accurate result, this value can be adjusted using a hand tachometer or other reference source. Pay attention to your safety when doing this!
- Place the hand tachometer on the moving object (e.g. shaft, conveyor belt) and compare the speed displayed there with the digital speed display in the VO330570-Connect software. Adjust the correction factor until both speeds are approximately the same.
- When detecting rotating parts (shafts, axles), the following values are recommended as a guide:

Diameter of the axle/shaft	65mm - Correction factor 0.7
	100mm - correction factor 0.75
	160mm - correction factor 0.8

8 VO330570-Connect

Software for configuration and visualization

Functions

- Visualization of the data generated by the sensor
- Configuration of the sensors
- Saving the configuration
- Mirroring the configuration

Prerequisites

- Compatible with Windows 10 / 11, Linux and MacOS X
- Available languages: German, English, Spanish, French, Polish
- Requires a micro USB to USB-A adapter cable to connect to the computer

Download

- You can find the software at <https://www.ipf-electronic.de/en/online-shop/product-details/vo330570>

Installation

- Windows: Version of the file "VO330570_connect_setup_X_X_X.exe"

8.1 Configuration



1. **Reload**
Renews the list of connected devices.
2. **Connection**
Select the COM port to which the VO330570 is connected.
3. **Connect**
Connects the software to the VO330570.
4. The graphs of the real-time monitor change according to the speed signals of the two sensors.
5. Selecting the language

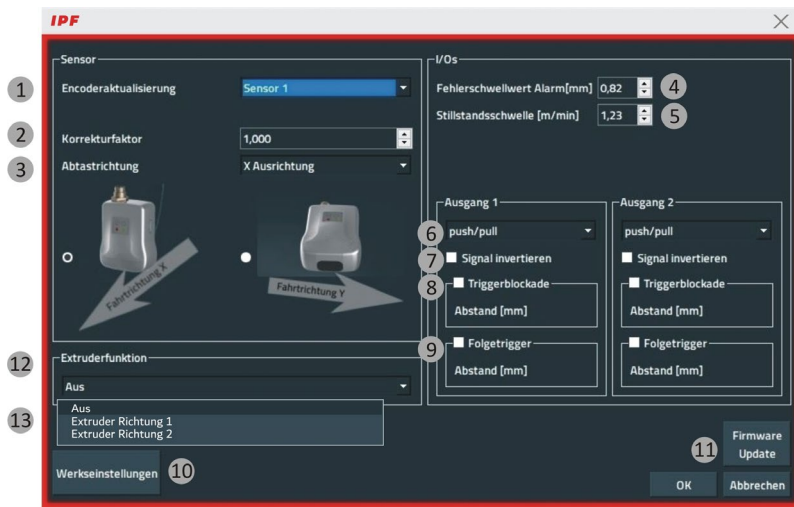


1. Time-speed diagram of the both individual sensors.
2. Instantaneous speed in m/min
3. Status bar
4. "Parameter saved" confirms the Changing the current configuration
5. Resolution in pulses/mm
6. Start distance trigger 1 in mm (if active)
7. Start distance trigger 2 in mm (if active)
8. Signal quality
Image quality of sensor 1 and sensor 2
9. Error threshold



1. **Notes**
Notes can be stored here. These are saved on the device.
2. **Switching level**
Configuration of the encoder signal (HTL/TTL).
3. **Output 1**
Switching trigger 1 on / off.
4. **Output 2**
Switching trigger 2 or alarm or direction signal on / off
5. **Version**
Displays the version of hardware / software.

8.2 Advanced configuration



1. Evaluation of the respective sensor (sensor 1 or sensor 2)
2. Calibration of the sensor to the exact speed e.g. for rotating objects
3. Change between measuring directions X / Y
4. Limit value for triggering the error output if the difference between sensor 1 and 2 overruns the set error threshold value.
5. Sensor sensitivity at standstill
6. Signal type trigger (npn / pnp / pushpull)
7. Changing the trigger signal (high / low)
8. Suppresses all pulses within the specified distance that would be caused by a standstill.
9. Transducer emits trigger pulses consecutively, even without standstill.
10. After resetting to factory settings, the sensor must be restarted by acknowledging the message.
11. After the update, the sensor must be restarted by acknowledging the message.
12. Blocks a backward movement of an object and continues counting the pulses from this point when the forward movement resumes.
13. Indicates the direction of the blockade.