

Track & Trace Fingerprint Flex

Marker-free component traceability – flexible, mobile, reliable

To optimize complex manufacturing processes, flexible systems are needed that reliably identify components anywhere and at any time. Track & Trace Fingerprint by Fraunhofer IPM relies on a component's individual surface microstructure for marker-free component identification and tracing. Track & Trace Fingerprint Flex is a cordless, portable system for mobile use.


Established in the production line

Reliable traceability of components usually requires individual component marking. Applying markers such as data matrix codes to a component, however, often incurs high costs and in some cases, it simply is technically unfeasible. Track & Trace Fingerprint by Fraunhofer IPM makes it possible to identify components solely by their individual surface microstructure, without the need for additional markers. The camera system records a high-resolution image of the component's surface and converts it into a digital fingerprint, which is then linked to an individual object ID. Subsequently, the downstream fingerprint algorithm can identify an individual component among millions of identical components in a matter of seconds.

The Track & Trace Fingerprint Inline camera system is permanently installed in the production line, where it captures automatically positioned components. The system is designed for inline application in industrial production. Track & Trace Fingerprint Flex, in contrast, can be used for mobile, flexible component identification outside of fully automatized manufacturing lines.

Nearline application

Track & Trace Fingerprint Flex is designed as a hand-held or robot-assisted system for sample identification. Mounted on a moving robot or a robot arm, Track & Trace Fingerprint Flex identifies components at varying positions along the production process. As a portable, cordless device, Track & Trace Fingerprint Flex



The compact, battery-powered Track & Trace Fingerprint Flex reader enables mobile, marker-free component tracing.



Advantages at a glance

- Traceability without the need for markers
- For assembly, logistics and quality assurance
- Suitable for a broad variety of component geometries and materials
- Control and data transfer via WLAN using a laptop, tablet or PC
- Total weight 2.5 kg



The portable Track & Trace Fingerprint Flex system measures 30 cm in height and 10 cm in width. It is suitable for sample component identification at varying locations.

The system works for components with a broad range of surface materials and geometries.

can be used for component identification anywhere in a production plant. All that is required is a laptop or tablet in addition to the reading system. Once set up, the system is ready for use within a few seconds, independent of location and without a permanently installed setup.

Compact design, cordless, WLAN connectivity

The Track & Trace Fingerprint Flex camera system including electronic control unit and battery is housed in a compact casing. Operation via power supply unit is also supported. Communication between the system and the laptop or tablet runs via WLAN, which facilitates network integration and eliminates the need for PLC interfaces and cables or additional control electronics.





For sample quality checks or to verify the product history, Track & Trace Fingerprint Flex can easily be carried along to identify components in the warehouse or at various places on the production site. All that is required is a fixture for positioning the components. The system can also be installed on mobile platforms, robots or as a fixed installation in the line as the communication interface is the same as for the permanently installed reading systems.

Track & Trace Fingerprint Flex can also be used for authentication of wear parts or for remote maintenance of equipment. The mobile system enables service staff or users to check on site whether a component actually comes from the original manufacturer. At the same time, production data can also be queried as required.

A wide range of applications

Track & Trace Fingerprint Flex can be used to both read, i.e. register, and identify components. The system is also able to identify components, that were previously registered by the stationary Track & Trace Fingerprint Inline. It is only necessary to adjust the configuration.

Track & Trace Fingerprint systems

	Track & Trace FINGERPRINT INLINE	Identification in the production line Permanently installed reading system
	Track & Trace FINGERPRINT FLEX	Identification on the production site Cordless reading system for robust component detection
	Track & Trace FINGERPRINT APP	Identification via smartphone app Quick and easy to use
	Track & Trace FINGERPRINT TEST	Optimum preparation for the use of Track & Trace Fingerprint Test stand for purchase or rental

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