- Simple optical scanning technology minimises operator training while providing accurate 3D scan data for GD&T and form measurement
- Large measurement volume designed to match build volume of industrial 3D printers; optimised for additive manufactured components
- High speed acquisition (under a minute for 360° scans of regular, non-occluded components)
- Designed for additive manufacturing workflow integration; compatible with industry standard data formats and networking protocols
- Utilises Taraz Information-Rich-Metrology (IRM) software to deliver unmatched scanning cycle time and surface coverage
- Available as a turnkey system, integration component or licensable reference design

The TZF1300 is full-featured scanning system designed to complement industrial 3D printing systems, providing quality control and calibration/feedback data into the 3D print environment. The system uses advanced, camera-based optical metrology and is optimised for the inspection of additively manufactured parts, greatly enhancing speed and versatility. Scan data from the TZF1300 family can be used in industry-standard point cloud processing software, either for analysis, reverse engineering or process development. TZF1300 is a member of the TZF family which offers options on measurement volume, feature accuracy and scanning speed. The family is also supported with a bespoke design service, allowing the design to be optimised to a specific requirement, or to be fine-tuned to match a specific printer.

Technology

The TZF1000 family breaks the mould of optical scanners, moving away from the traditional approach of the fixed triangulation schemes typically used in typical laser, fringe projection or structured light scanners. Instead, a "variable triangulation" technology is used, allowing far greater freedom in generating the different viewing angles required to fully inspect an object. By also eliminating the projection systems required for fixed-triangulation scanners, cost is eliminated – and acquisition performance is greatly enhanced. These enhancements are enabled through the use of Taraz's innovative IRM software. Using artificial intelligence techniques to optimise the measurement process, IRM delivers cost savings and speed benefits – while retaining accuracy.

Applications

Many applications benefit from the TZF1300's capability, including:

Quality Assurance	The TZF1300 provides an accurate scan of the manufactured component and can automate comparison of the part's form to CAD – or can be scripted with industry-standard inspection software to instigate formal GD&T inspections.
Reverse Engineering	For existing parts lacking design data, the TZF1300 can provide a detailed scan for reverse engineering in seconds.
Part Identification	When unpacking a build volume with mixed components, the TZF1300 will confirm identification of a part – and optionally provide a pass/fail indication.
Printer Calibration	Knowledge of parts manufactured enables optimisation of print processes, yielding increased accuracy for production parts. Taraz Metrology can assist with the design and manufacture of bespoke artefacts designed for printer calibration.
Process Compensation	For multi-stage processes (such as finishing, or the curing of "green" parts) the process can introduce significant change from the as-printed geometry or dimensions. TZF1300 provides feedback on the stage-by-stage component geometry, allowing pre-compensation of the build job – and enhancing yield.

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User Interfaces

The TZF family is intended for use alongside high-capacity printing systems in the industrial environment. IRM software features a user interface designed for the printer operator; when integrated with the printer's build manager software, it offers the user a choice of parts which are due to be unpacked from the printer. When the user selects a part, the IRM software will prompt the user to load it into the inspection volume, while reading the associated CAD file – and PMI / GD&T data where available. Scanning and inspection (which can be scripted with industry-standard inspection packages) are then automated, with user feedback provided throughout the process.

Finally, as the part is unloaded, the software can print an identification label for the part – including a pass/fail for final quality inspection if required.

The software has three operating modes:

- User – a simple interface with the ability to select parts, start a scan, and see results
- Developer – adding the ability to store data for offline analysis, and to scan parts without CAD – for example for reverse engineering or process development applications
- Administrator – with the capability to perform all configuration, set up batch jobs and policies, perform annual calibration or system checks etc.

In addition, remote operation modes are available, providing options for training, application and product support.

Supply Formats

While the TZF1300 is a powerful scanning system capable of operation in a bench-top format, it is intended to be capable of use as a system component for integration into end-user equipment. Taraz Metrology can provide the TZF1300 as a reference design supported by a bespoke design service – as a component for integration – or as a complete system, ready for use. Contact us for details of licensing plans.

The TZF Family Range

The TZF family was conceived to bring high accuracy scanning to the additive manufacturing market, enabling quality assurance, part identification, process control – and additional revenue opportunities such as reverse engineering.

Other product formats are available, along with a bespoke capability. Common requests for variants include:

- Measurement volume – TZF1300 is designed for measurements within a 300mm cube. The TZF family can be scaled up to match the largest 3D printers – or down, to match high resolution small-part printers.
- Measurement resolution – TZF1300 has been specified to capture the finest details of additive manufactured parts on polymer processes. The TZF family can be specified to match the finest details that can be created with high-resolution additive manufacturing processes – such as LPBF metal printers.

Please contact us to discuss any specific requirements.

Specifications

Note: TZF1300 is one of a family of scanners capable of measuring a broad range of component sizes. The family is also supported by a bespoke design service for specialist requirements – contact us for more details.

Metrology Performance	Measurement Volume	300x300x300 mm cube
	Layer Thickness	Layer thickness down to 25 µm
	Feature Size	Recommended minimum of 50 µm
	Pixel Resolution	Single 12MP industrial imaging cameras, providing pixel spacing of 2.5 µm
	Acquisition Time:	Under one minute, based on a single 360° scan. Complex geometries may require additional imaging to inspect occlusions etc
	Measurement Cycle:	Under two minutes, based on a single 360° scan (using standard processing option).
Accuracy	Target Accuracy	15 µm
	VDI / VDE 2634 Part 2	To be published
Computing & Integration	Communications:	Gigabit Ethernet (10/100/1000Base-T), supporting TCP/IP, DHCP, TLS/SSL
	Data formats:	Exports data for use in industry standard GD&T software
	Scan Storage:	Limited only by available network storage
Physical & Environment	Dimensions (l*w*h):	950 x 675 x 1200 mm
	Electrical:	Voltage: 90-230 VAC 50-60 Hz Peak Power: 0.7 kW Operating Power: To be published
	Operating Environment:	0-35°C 10-90%RH non-condensing
	Weight:	32kg
Regulatory	Periodic system certification	Annual calibration and certification to traceable artefacts
	Certifications & Standards	VDI/VDE 2634 Part 2 standard for optical measurement systems (to be published). Traceability to NIST metrology standard artefacts
	Warranty	One-year limited hardware warranty; extended service plans are available

Contact Us

For more information, or an informal discussion of your application, contact us at:

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