

T-Ray 5000
TCU57yz Terahertz Control Unit

How does it work?
The T-Ray 5000 TCU57yz Control Unit delivers precisely controlled optical signals to the T-Gauge Sensor Heads enabling them to generate and receive terahertz signals. The processed waveforms enable multiple measurements to be made simultaneously with a single sensor head.

Why is it the best choice for Terahertz gauging and imaging?
The newest generation of T-Ray 5000 is characterized by high precision, short measurement time, and robust construction. Measured signals are processed at a rate of up to 1,000 times per second making T-Ray 5000 the fastest industrial terahertz system available.

The TCU57yz control unit utilizes an external PC, allowing the operating system to be maintained by the customer IT/Cyber Security department. The TCU connects to the external PC via a USB A/B cable carrying Ethernet.

APPLICATIONS
- Thickness measurement during coating application processes
- Multi-point measurements of extruded tubing and shapes (ie OD, ID, concentricity, ovality, etc)
- Top and bottom balance of steel and textile cord tire ply
- Density and basis weight measurements for multiple materials

KEY FEATURES AND BENEFITS
- Ultra high speed measurements of moving samples for online process monitoring
- High precision thickness measurements of single and multi-layer material structures
- Dual parallel optical channels for multiple simultaneous measurements in either reflection or transmission
- Simple user interface with independent measurement recipes

EXTENSIONS
- Powerful and user-friendly application oriented software platform
- Abundance of communication protocols and I/O options
- Provides measurement data in engineering units
- Easy integration with industrial automation and robotics

Measurement Performance	TCU5710	TCU 5711	TCU5712	TCU5713
Bandwidth	1.5 GHz to 5 THz (depends on sensor type and measurement time)			
Dynamic Range	90 dB (varies by sensor type)			
Delay	320 ps	80 ps	160 ps	700 ps
Spot Diameter	Nominal 2 mm			
Working Distance	1, 3, and 6 inches			
Measurement Range	50 mm	12 mm	25 mm	**100 mm**
Measurement Precision	< 1 µm			
Measurement Rate	Up to 100 Hz	Up to 1,000 Hz	Up to 1,000 Hz	Up to 100 Hz
Minimum Thickness	15 µm (depends on sensor type and measurement time)			

Data Storage / Communication Interfaces	
Communication Interfaces	2 x Ethernet TCP/IP, 4 x USB
Communication Protocols	XML over Ethernet , TCP / IP
Programmable Inputs / Outputs	Digital I/O, 24 V
External Inputs	6 Encoder Inputs [A/B/Z or Step and Direction]
Storage	No Internal Storage

Mechanical Data	
Dimension (H x W x D)	17.5 x 21.5 x 7.5 inches / 44.5 x 54.6 x 19 cm
Weight	40 lbs /18.2 kg

Electrical Data	
Power Consumption	400 Watts
Input Voltage	110/120 VAC; 50/60 Hz

Environmental Data	
Storage Temperature	0-40^{O}C
Operating Temperature	0-40^{O}C
Relative Humidity	20-90% non-condensing

Conformance to Standards	
Safety	2 x Ethernet TCP/IP, 4 x USB
Electromagnetic Compatibility	XML over Ethernet , TCP / IP
Hazardous Substances	Digital I/O, 24 V
FCC	6 Encoder Inputs [A/B/Z or Step and Direction]

Notes:

1. Bandwidth, dynamic range, and minimum thickness measurements taken with EPG sensor type over 60 second measurement time.
2. Optional external hard drive may be purchased separately and connected via designated communications interface

RELATED PRODUCTS

Sensors And Gauges	Accessories	Software
• Individual Tx / Rx gauges	• Umbilical Cable (10 or 30 meter)	• T-Ray Basic
• Industrial Colinear Transceivers (VRS option)	• Lens options (1”, 3”, or 6” focal length)	• T-Ray Server
• Online EGP Sensor	• Wall, shelf, or rack mount brackets	• T-Ray Imaging
• Line Scan Gauge	• Spectroscopy Rail	• T-Ray Security
• Single Point Gauge	• T-image Platform	• T-Ray Server Emulator
• Class 1 Div 1 / Class 1 Div 2 Sensor Kits		

Industry Leading Regulatory Compliance

The T-Ray® 5000 intelligent TCU has been certified by Underwriters Laboratories has received the CE mark, is fully compliant with FDA CDRH laser safety regulations, and has been tested to meet FCC part 18 regulations.

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