



T-Ray 5000 Terahertz Control Unit

How does it work? The T-Ray 5000 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.

| KEY FEATURES AND BENEFITS | EXTENSIONS | APPLICATION EXAMPLES |
|--|---|---|
| <ul style="list-style-type: none"> Ultra high speed measurements of moving samples for online process monitoring | <ul style="list-style-type: none"> Powerful and user-friendly application oriented software platform | <ul style="list-style-type: none"> Thickness measurement during coating application processes |
| <ul style="list-style-type: none"> High precision thickness measurements of single and multi-layer material structures | <ul style="list-style-type: none"> Abundance of communication protocols and I/O options | <ul style="list-style-type: none"> Multi-point measurements of extruded tubing and shapes (ie OD, ID, concentricity, ovality, etc) |
| <ul style="list-style-type: none"> Dual parallel optical channels for multiple simultaneous measurements in either reflection or transmission | <ul style="list-style-type: none"> Provides measurement data in engineering units | <ul style="list-style-type: none"> Top and bottom balance of steel and textile cord tire ply |
| <ul style="list-style-type: none"> Simple user interface with independent measurement recipes | <ul style="list-style-type: none"> Easy integration with industrial automation and robotics | <ul style="list-style-type: none"> Density and basis weight measurements for multiple materials |

TECHNICAL SPECIFICATIONS

| Measurement Performance | TCU5610 | TCU5611 | TCU5612 | TCU5613 |
|-------------------------|--|----------------|----------------|--------------|
| 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 | < 1µe | | | |
| Measurement Rate | Up to 100 Hz | Up to 1,000 Hz | Up to 1,000 Hz | Up to 100 Hz |
| Minimum Thickness | 15 µe (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 | 128 GB Internal SSD, Optional External HD |
| 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°C |
| Operating Temperature | 0-40°C |
| Relative Humidity | 20-90% non-condensing |
| Conformance to Standards | |
| Safety | UL 61010-1 / CE; IEC 6825 Laser Class 3R |
| Electromagnetic Compatibility | FCC Part 18; RSS-210/RSS Gen-210; EN 61326-1; EN 305 550-2 |
| Hazardous Substances | RoHS directive 2011/65/EC, WEEE directive 2002/96/EC |
| FCC | Designed to conform with Part 18 |

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 |
|---|---|---|
| <ul style="list-style-type: none"> • Individual Tx / Rx gauges | <ul style="list-style-type: none"> • Umbilical Cable (10 or 30 meter) | <ul style="list-style-type: none"> • T-Ray Basic |
| <ul style="list-style-type: none"> • Industrial Colinear Transceivers (VRS option) | <ul style="list-style-type: none"> • Lens options (1", 3", or 6" focal length) | <ul style="list-style-type: none"> • T-Ray Server |
| <ul style="list-style-type: none"> • Online EGP Sensor | <ul style="list-style-type: none"> • Wall, shelf, or rack mount brackets | <ul style="list-style-type: none"> • T-Ray Imaging |
| <ul style="list-style-type: none"> • Line Scan Gauge | <ul style="list-style-type: none"> • Spectroscopy Rail | <ul style="list-style-type: none"> • T-Ray Security |
| <ul style="list-style-type: none"> • Single Point Gauge | <ul style="list-style-type: none"> • T-image Platform | <ul style="list-style-type: none"> • T-Ray Server Emulator |
| <ul style="list-style-type: none"> • 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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