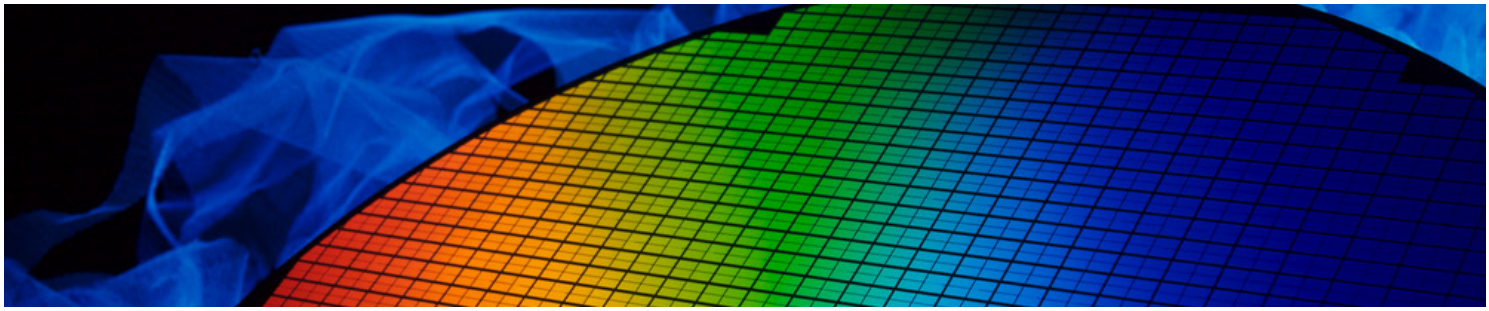

T-I Max
Next-Generation AMC Monitors

GASES & CHEMICALS | CEMS | ENERGY | SEMI & HB LED | ATMOSPHERIC | LAB & LIFE SCIENCE

Based on Tiger Optics' new global platform, the T-I Max series monitors for Airborne Molecular Contaminants (AMCs) deliver unprecedented performance, including:

- Sensitive, absolute measurement technique, using Cavity Ring-Down Spectroscopy (CRDS)
- Dramatically improved speed of response
- Parts-per-trillion detection limits
- Drift-free, with calibration traceable to the world's leading reference labs
- Lowest Cost of Ownership and maintenance

Next-Generation Trace Gas Analyzers for Detection & Continuous Monitoring of Airborne Molecular Contaminants in Semiconductor Cleanrooms

You can spend a long time "looking" for Airborne Molecular Contaminants (AMCs) when the catastrophic product performance or yield loss is discovered at your device final test stage; or you can deploy Tiger Optics' T-I Max series analyzers to locate and to monitor these invisible defect generators, commonly found lurking in and around equipment, personnel, wafer carriers and cleanroom bays.

In today's advanced semiconductor processing, the residual gases, vapors and chemicals emanating from the various materials, accelerated processing operations, and substrate storage and transport have become a critical concern. So much so that the International Technology Roadmap for Semiconductors (ITRS) now highlights AMC contamination as a key technical challenge in achieving & sustaining low defect rates on devices.

With a particular focus on the major contributors to the "chemical contamination" element of AMCs, the T-I Max series, based on Tiger's new analyzer platform, can detect and continuously monitor HF, HCl, and NH_3 with an unprecedented combination of sensitivity, selectivity, and speed of response.

Tiger Optics' GO-cart for AMCs adds additional flexibility by providing a mobile platform that can be moved quickly to different critical monitoring points.

Tiger Optics
a Process Insights Brand

T-I Max
Next-Generation AMC Monitors

Performance	
Operating range	See table below
Detection limit (LDL, 3σ@100s)	See table below
Precision (1σ@100s, greater of)	± 0.5% or 1/3 of LDL
Accuracy at span	± 4% of reading
Accuracy at zero	See table below
Speed of response @ 20ppb	See table below
(T10/90 + T90/10)	
Environmental conditions	10°C to 40°C
	10% to 90% RH (non-condensing)
Sample conditions	30% to 70% RH at 20°C
	20% to 50% RH at 25°C
	15% to 40% RH at 30°C
Storage temperature	-10°C to 50°C

Gas Handling System and Conditions*	
Wetted materials	Optimized for ppt-level AMCs
	and fast speed of response
Gas connections	1/4" PFA Swagelok® inlet & outlet
Inlet pressure	Atmospheric pressure†
Outlet pressure	Vacuum (<10 Torr)
Flow rate	~3 slpm@1 atm pressure (NH_3)
	~2 slpm@1 atm pressure (HF, HCl)
Sample gases	Cleanroom air, CDA or N_2
Gas temperature	Up to 60°C

Dimensions	H x W x D [in (mm)]
Standard sensor	8.73 x 8.57 x 23.6 (222 x 218 x 599)
(w/o ext. particle filter)	
Sensor rack	8.73 x 19.0 x 23.6 (222 x 483 x 599)
(fits up to two sensors)	
GO-cart	50 x 23 x 36 (1270 x 584 x 914)

Weight	
Standard sensor	33 lbs (15 kg)
GO-cart	260 lbs (118 kg)
(both excl. vacuum pump)	

Electrical and Interfaces	
Platform	Max series analyzer
Alarm indicators	2 user programmable
	1 system fault
	Form C relays
Power requirements	90 – 240 VAC, 50/60 Hz
Power consumption	40 Watts max.
Signal output	Isolated 4–20 mA
User interfaces	5.7" LCD touchscreen
	10/100 Base-T Ethernet
	USB, RS-232, RS-485
	Modbus TCP (optional)
Data storage	Internal or external flash drive
Certification	CE Mark

Performance in cleanroom air:	Range	LDL (3σ@100s)	Accuracy at zero	Speed of Response (T10/90+T90/10)
T-I Max HF	0 – 1 ppm	20 ppt	± 20 ppt	< 3 minutes @ 20 ppb
T-I Max HCl	0 – 4 ppm	100 ppt	± 100 ppt	< 30 seconds @ 20 ppb
T-I Max NH_3	0 – 40 ppm	300 ppt	± 300 ppt	< 3 minutes @ 20 ppb

*Vacuum source with >2 slpm @ 10 Torr required
†Contact us for details about operating the analyzer at elevated inlet pressure.

Contact us for additional analytes.
U.S. Patent # 7,277,177

Tigeroptics
a Process Insights Brand

T-I Max
Next-Generation AMC Monitors

Tiger Optics GO-cart™

Surveying different micro-environments in a fab is now fast and easy with Tiger Optics' mobile **GO-cart**. It can be equipped with any combination of **T-I Max** units to monitor simultaneously for the most critical contaminants in cleanroom air.

The GO-cart is easy to move around the fab and comes with the following features:

- Space for up to three **T-I Max** analyzers with low-power, fanless vacuum pumps
- Top-mounted central control touchscreen
- Integrated back-up power supply (optional)
- Conductive ESD paint (optional)

Annual Performance Verification

- Low-cost and easy remote verification process, with no need to return the analyzer to the factory
- Annual verification by Tiger Optics ensures that your analyzer continues to meet its original specifications
- Up-to-date Verification Certificate to comply with your QA/QC standards


Tiger Optics
High-Performance Gas Analyzers

Verification Certificate

Customer: The Trusted Gas Company
Item: HALO 3
Serial Number: 3252-0-24
Date Tested: 4 February 2019

This certifies that Tiger Optics

Tiger Optics, LLC
275 Gibraltar Road, Horsham, PA 19044
Phone: +1 (215) 656 4000 · Fax: +1 (215) 343 7168
sales@tigeroptics.com · www.tigeroptics.com

Made in U.S.A.

Tiger Optics
a Process Insights Brand

4/2022