

TDLS500

INTEGRATED CAVITY
OUTPUT SPECTROSCOPY (ICOS)



TDLS500

High Sensitivity Laser Analysis

- Rapid measurement (5-20s typical)
- Interference free
- TruePeak measurement
- Optical measurement - allows enhanced diagnostics
- Low long term cost of ownership
- Off-Axis ICOS technique reduces alignment sensitivity and particulate effects
- Superior performance over traditional multipass technologies

Bulletin 11Y01B03-01E-A

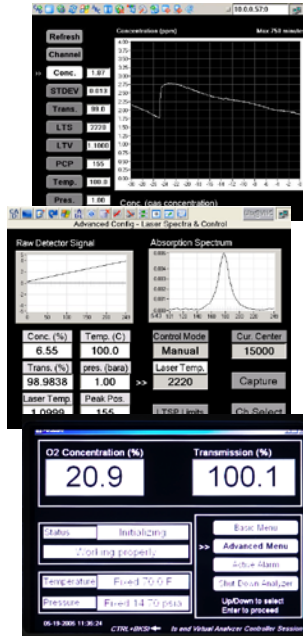
<http://www.yokogawa.com/an/index.htm>

USER INTERFACE

- **BUILT IN**
 - 7" Color Screen with Keypad
- **REMOTE INTERFACE**
 - Remote analyzer operation and data transfer through ethernet connection
 - TruePeak RIU (Remote Interface Unit) available to connect to multiple TruePeak TDLS or ICOS analyzers

RELIABILITY

- **ENHANCED DIAGNOSTICS** Built In diagnostics with on board CPU, data storage, and retrieval. No PC required to record data, spectra, and critical diagnostics.
 - Data transfer via wired/wireless ethernet, memory stick or PDA
 - Spectra capture (timed, manual capture, event-based)
- **MAINTENANCE**
 - All components field repairable
 - Remote diagnostics and analyzer control



COMMUNICATIONS

- **WIRED**
 - Analog Outputs (2, 4-20mA)
 - Digital Outputs (Warning/Fault Relays + Valve Control)
 - Ethernet (standard)
 - USB Data Transfer (standard)
 - Other Options Available
- **FULLY NETWORK READY**

PROCESS HARDENED

Unlike traditional multi-pass cells or ring-down cells the Off-Axis ICOS design does not require precise alignment. Also mirror fouling can be compensated for during routine (automated) calibrations.

Split architecture (separate sample and electronics enclosures), cell design and process hardened electronics ensure reliable operation in process environments.



ICOS Internal View



ICOS Optical Bench

HAZARDOUS AREA

- **ZONE/DIV 1/2 PURGE SYSTEM**
 - Suitable for Zone/Div 1/2 Installations with Purge System

Fast, ultra-sensitive analysis of trace level

INNOVATIVE

Off-axis ICOS uses highly reflective mirrors to provide up to thousands of meters of pathlength. This results in rapid, trace level measurements with sub-ppm detection limits for many gases.

ACCURATE

The TruePeak measurement integrates the area of the absorbance rather than measuring peak height or peak width value alone. This means you get a true **interference free** analysis.

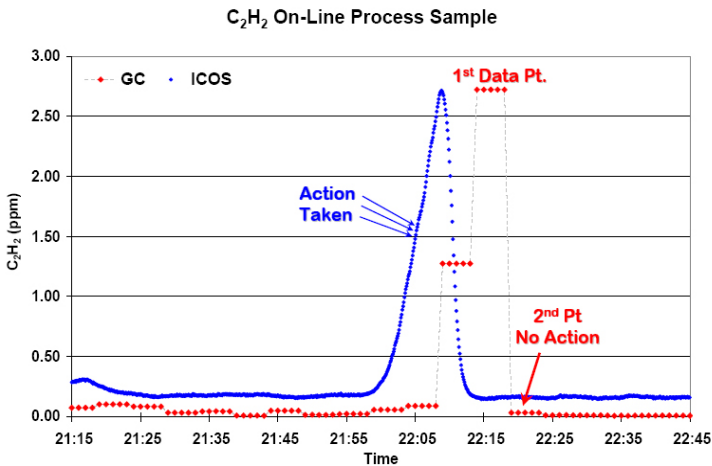
RAPID ANALYSIS

Traditionally trace level analysis in process conditions has required the use of process gas chromatographs. The major drawback of this approach has been the analysis time required (typically minutes), and the fact that a continuous measurement is not possible.

With the Yokogawa TDL500 (ICOS) Analyzer, rapid, continuous measurements are possible for the first time in a process hardened analyzer.

As can be seen in the chart below, rapid analysis can allow both detection and action not possible with longer analysis times. In this example the GC reading showed it's first response 8 minutes after the ICOS analyzer started reacting to the process event. Compounding the problem is the fact that the first GC reading was below the action level, the second GC reading was above the action level (5 minutes later and 8 minutes after the ICOS reading went above the action level).

In control systems where at least 2 successive readings are required for action, the GC reading would have resulted in no action taken since the third GC reading was below the action level. The ICOS analyzer not only recorded the process upset 8 minutes sooner, it also provided over 50 measurements of the event (above action level) while the GC provided only one.

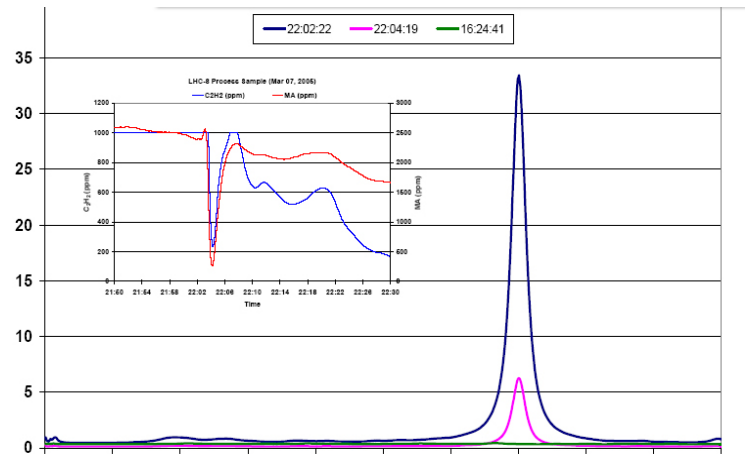


MEASUREMENT VALIDATION

As well as speed of response, the fact that the ICOS analyzer uses a first principles measurement provides the ability to "prove" the measurement using live or historical spectra.

With the historical spectra stored in the ICOS analyzer, it is possible to look at measurements days later in order to "validate" the analyzer response.

This is especially useful to confirm process events for operations and control.



Fast, ultra-sensitive analysis of trace level gases in a process hardened design

gases in a process hardened design

DEPENDABLE

All components are field repairable. Electronics are common with Yokogawa's field proven TruePeak TDL platform. Unlike conventional multi-pass or cavity ring down systems, the ICOS cell does not rely on a unique beam trajectory, providing robust optical alignment for field conditions

PROCESS HARDENED

Split architecture (separate sample and electronics enclosures), cell design and process hardened electronics ensure reliable operation in process environments.

TECHNICAL SPECIFICATIONS

Response Time	5-20 seconds
Accuracy	2% FSD
Linearity	R2=0.9999
Ambient Temperature	Requires standard analyzer shelter
Analog I/O (optional)	Outputs: Concentration (2@0/4-20mA isolated) Sub 4mA for warnings/faults
Digital I/O	Outputs: <ul style="list-style-type: none"> Warning/Fault/Concentration Limit Relays (3 Form C Relay SPDT rated 1A@24VDC) Valve Control (3@24VDC, Max 10W per valve), zero/span/dynamic spiking Inputs: Remote Validation (3 voltage free floating contacts) for zero/span
Area Classification	Zone/Div 1/2 with purge
Communications	Ethernet, IEEE 802.3, 10/100 Mbps, RJ45 Automatic USB data transfer (upload/download settings and data)

Technical specifications are subject to change without notice.

MEASUREMENTS

C₂H₂, H₂S, NH₃, CO₂, CO, H₂O All typically sub-ppm detection limits (application dependant)

Other gases available, contact Yokogawa with application requests



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Vig-PMK-G-NL-10E

Printed in USA, 107 (KP) [Ed 02b]