YOKOGAWA

Co-innovating tomorrow™

OpreX™ Analyzers

Tunable Diode Laser Spectrometer

TDLS8000

Bulletin 11Y01D01-01EN

The best just got better

Yokogawa's new TDLS8000 houses all of the industry's leading features in one robust device.

- SIL2 TruePeak combined with smart laser technology
- Intuitive touchscreen HMI
- HART and Modbus TCP communications standard
- 8-stage auto-gain adapts to difficult applications
- Fully field repairable with 50 days of data and spectra storage
- Compact design for one-man installation without sacrificing ruggedness
- Area classification Zone2/Div2 or Zone1/Div1
- Marine certification: DNV Type Approval

Fired Heater Combustion, Safety, and Lifecycle Management

Yokogawa TDLS8000 O_2 and CO + CH_4 measurements provide reliable information to achieve;

- Combustion Efficiency Improvement
- Safety Improvement
- Longer Life time of the coils and coil hangers
- Higher throughput of the process heating

Limiting O_2 Concentration for safety and process monitoring & control

Yokogawa TDLS8000 O_2 analyzer achieves;

- No Sampling system Operation
- Fast Response Analysis
- No Interference Analysis
- Less Maintenance Operation

System Configuration

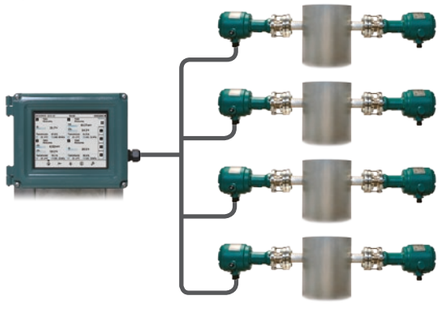
Standard System configuration

- HART communication available

System configuration with HMI

Multi Analyzer configuration with Remote HMI

- Up to 4 units connection available



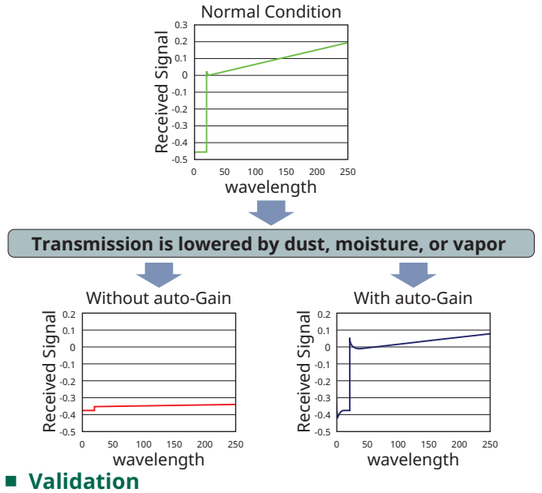
High Reliability

Reference Cell

- Internal reference cell in the laser module ensures peak locking during trace measurement.

Auto gain

- Auto-gain enables wide signal ranges against dynamic variation of transmission.



Validation

- Validation can be initiated manually, remotely, or automatically on a daily, weekly or monthly basis defined by the user.

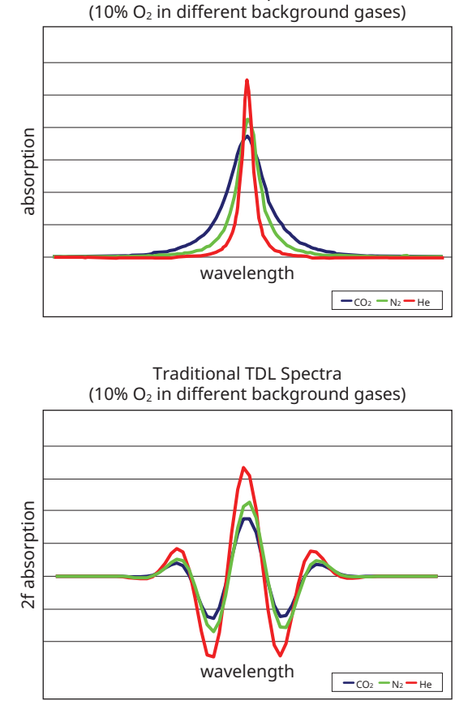
SIL2 certified

- IEC61508 SIL designed & approved, SIL2 capability for single analyzer use, SIL3 capability for dual analyzer use.

Marine certification: DNV Type Approval

- Certificate No: TAA000030E

TruePeak

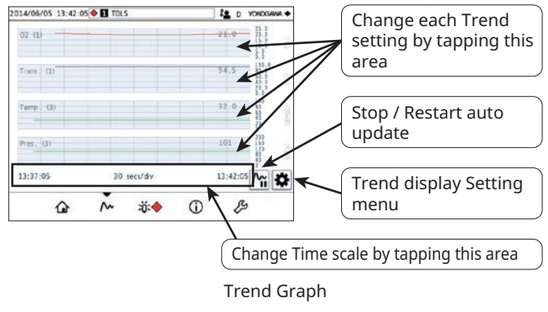


The TruePeak we can measure the area of the absorbance peak. This eliminates effects from changing background gases, allowing for simple pressure and temperature compensation.

Intuitive touchscreen HMI

Touchscreen 7.5 inch color LCD on HMI

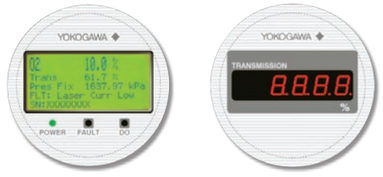
- Makes it simple to operate.
- Gives all the information including trend graph and eliminate PC to maintenance.
- Can be remotely installed.



Trend Graph

Mini Display

- Optical transmission at both the ends for easy alignment.



Sensor Control unit Laser unit

Specifications

TDLS8000

STANDARD SPECIFICATIONS

Measurement object	O_2, CO, CO or CH_4, CO_2, CO + CO_2, H_2O, NH_3, H_2S, HCl concentration in combustion exhaust gas and process gas			
Measurement system	Tunable diode laser spectroscopy			
Measured components and ranges	Measured component		Min. range	Max. range
	O_2		0-1%	0-25%
	CO (ppm)		0-200 ppm	0-10,000 ppm
	CO or CH_4	CO	0-200 ppm	0-10,000 ppm
		CH_4	0-5%	
	NH_3		0-30 ppm	0-5,000 ppm
	H_2O (ppm) in non HC		0-30 ppm	0-30,000 ppm
	H_2O (ppm) in HC		0-30 ppm	0-30,000 ppm
	CO (%)		0-20%	0-50%
	CO (%) + CO_2 (%)		0-30%	0-100%
	H_2S		0-5%	0-100%
	CO_2 (%) High Range		0-1%	0-5%
	CO_2 (%) Extend. Range		0-30%	0-50%
	H_2O (%)		0-10%	0-100%
	HCl		0-50 ppm	0-5,000 ppm
Optical path length	Optical distance between the laser unit and the sensor control unit Standard; 0.5 to 6 m, Max; 30 m (With LAO)			
Analog output	2 points, 4 to 20 mA DC Output types; Gas concentration, Transmission, Process gas temperature, Process gas pressure Output range; 3.0 to 21.6 mA DC			
Digital communication	HART, Ethernet			
Digital output	2 points, contact rating 24 V DC, 1 A DO; Function: Activate during Warning / Calibration / Validation / Warm up / Maintenance conditions Fault; Function: Activate during Fault condition or when the system power is off			
Valve control output	2 points Function; Activate calibration or validation solenoid valves for zero, span or validation gas Output signal; 24 V DC, 500 mA Max. per terminal			
Digital input	2 points Function; External alarm/Calibration start/Validation start/Stream switch Contact specification; Zero voltage contact input Input signal; Open signal; 100 kΩ or more, Close signal; 200 Ω or less			
Analog input	2 points, 4 to 20 mA DC Input types; Process gas temperature, Process gas pressure			
Self-diagnostics	Laser Unit temperature, Sensor Control Unit temperature, Laser temperature, Detector signal level, Memory read/write function, Peak locking condition			
Calibration	Calibration method; Zero/Span calibration Calibration mode; Manual, Auto (Time initiate, Remote initiate (DI/Modbus)), Semi-Auto (YH8000/HART)			
Validation	Validation method; Up to 2 points Validation mode; Manual, Auto (Time initiate, Remote initiate (DI/Modbus)), Semi-Auto (YH8000/HART)			
Power supply	24 V DC ± 10%			
Warm-up time	5 min.			
Protection degree	IP66, NEMA Type 4X			
Hazardous area classifications	Division 1, Zone 1; Explosion-proof/ Flame-proof type; IECEx, ATEX, FM (US, Canada), Korea Ex, EAC, INMETRO, Japan Ex Division 2, Zone 2; Non-Incendive/Type n; IECEx, ATEX, FM (US, Canada), Korea Ex, NEPSI, EAC, INMETRO, Japan Ex			
Process gas condition	Process gas temperature; Max. 1500˚C Process gas pressure; Max. 1 MPa abs., Min. 90 kPa abs. Dust in process gas; 20 g/m^3 or less			
Installation condition	Ambient operating temperature; -20 to 55˚C Storage temperature; -30 to 70˚C Humidity; 0 to 95%RH at 40˚C (Non-condensing) Mounting flange type; ASME B 16.5, DIN, JIS Gas connections; 1/4 NPT or Rc1/4			

PERFORMANCE

Measured gas		Repeatability	Linearity
O_2		+/- 1% reading or +/- 0.01% O_2, whichever is greater	+/- 1% F.S.
CO (ppm)		+/- 2% reading or +/- 1 ppm CO, whichever is greater	+/- 1% F.S.
CO or CH_4	CO	+/- 2% reading or +/- 1 ppm CO, whichever is greater	+/- 2% F.S.
	CH_4	+/- 4% reading or +/- 0.02% CH_4, whichever is greater	+/- 4% F.S.
NH_3		+/- 2% reading or +/- 1 ppm NH_3, whichever is greater	+/- 2% F.S.
H_2O (ppm) in non HC		+/- 2% reading or +/- 0.1 ppm H_2O, whichever is greater	+/- 1% F.S.
H_2O (ppm) in HC		+/- 2% reading or +/- 0.1 ppm H_2O, whichever is greater	+/- 1% F.S.
CO (%)		+/- 1% reading or +/- 0.01% CO, whichever is greater	+/- 1% F.S.
CO (%) + CO_2 (%)	CO	+/- 1% reading or +/- 0.1% CO, whichever is greater	+/- 1% F.S.
	CO_2	+/- 1% reading or +/- 0.1% CO_2, whichever is greater	+/- 1% F.S.
H_2S		+/- 1% reading or +/- 0.005% H_2S, whichever is greater	+/- 1% F.S.
CO_2 (%) High Range		+/- 1% reading or +/- 0.005% CO_2, whichever is greater	+/- 1% F.S.
CO_2 (%) Extend. Range		+/- 1% reading or +/- 0.02% CO_2, whichever is greater	+/- 1% F.S.
H_2O (%)		+/- 1% reading or +/- 0.004% H_2O, whichever is greater	+/- 1% F.S.
HCl		+/- 1% reading or +/- 2.5 ppm HCl, whichever is greater	+/- 2% F.S.

YH8000

Display	Touchscreen 7.5 inch TFT color LCD panel, 640 x 480 (VGA)
Communication	Ethernet; RJ-45 connector, Communication speed; 100 Mbps
Protection degree of enclosure	IP65, NEMA Type 4X
Weight	Approx. 4 kg
Mounting	Analyzer mount (Front, left-side, right-side) with tilt function, Pipe mount or Panel mount
Cable Entries	1/2NPT or M20 x 1.5 mm, two holes
Installation conditions	Ambient operating temperature; -20 to 55˚C Storage temperature: -30 to 70˚C Humidity: 10 to 90%RH at 40˚C (Non-condensing)
Power Supply	24 V DC ±10%
Hazardous area classifications	Division 2, Zone2: Non-Incendive/Type n; IECEx, ATEX, FM (US, Canada), Korea Ex, EAC, INMETRO, Japan Ex

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