Laser Spectrum Analyzer

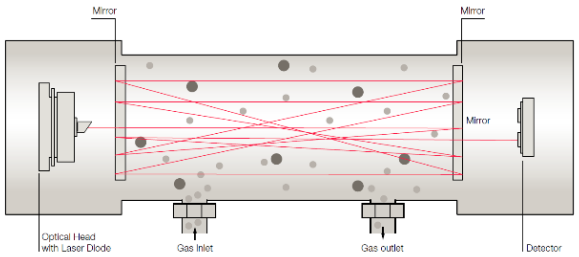
Overview

The measurement principle of the high-precision laser absorption spectrometer is based on the detection of the absorption of molecules passing through the light of a specific wavelength. As light sources, we use laser diodes with wavelengths ranging from the visible to the mid-infrared range, depending on the gas. By evaluating the intensity of the transmitted light (I) and incident light (I0) of the detector (Lambert-Beer law), the current gas concentration in the measurement chamber can be determined.

The measured spectra were compared with theoretical spectra based on the HITRAN database, which contains information about gas absorption lines. The deviation between these two spectra (which we call "spectral correlation") is continuously analyzed and verified.

Features

- Direct physical measurement
  Selective and continuous measurement from visible to MID-IR spectral range.
- No cross sensitivity
  The narrow-band tunable laser source ensures the highest selectivity for the measured gas. By choosing the ideal absorption line, other gases will not affect the measurement
- No condensation, fast response time, low adsorption effect
  Due to the pressure- and temperature-stabilized measuring chamber operating under vacuum, (due to the correspondingly lowered dew point) the formation of condensation is prevented. High (adjustable) flow rates and vacuum allow faster response times and minimize adsorption and delay effects.
- No consumables required
  No chemicals or replacement of service parts required. Lowest operating cost.



Measurement components and ranges

- NH3: 0~10 up to100ppm
- HCl: 0~10 up to100ppm
- H2O: 0~30%
- CH4: 0~100ppm up to 4%
- C2H2: 0~100ppm up to 10%

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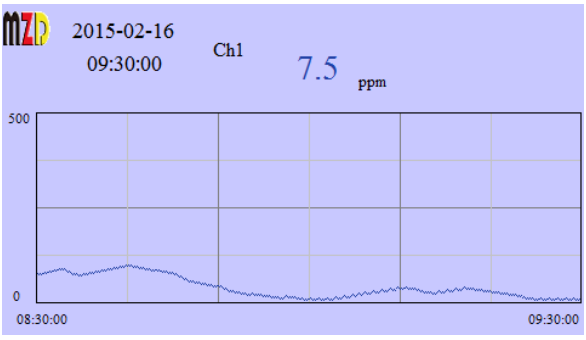

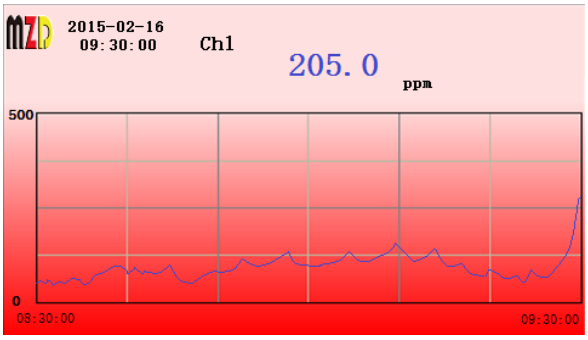

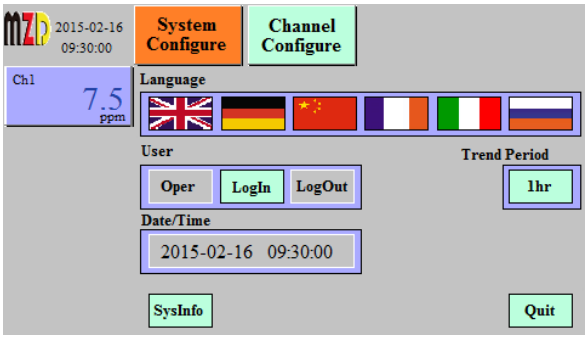

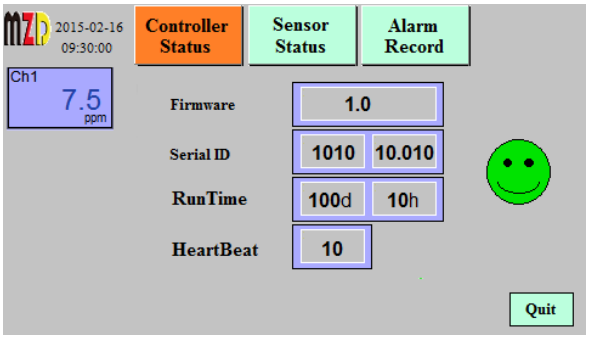

Features

❖ **Quick and convenient**

The navigation menu contains 6 languages, which can be operated easily.

❖ **Process safety**

4.3” or 7" large size color LCD touch screen, convenient and safe touch operation and debugging

Large size screen with red flashing alarm, clearly visible from long distances and in dark areas

Alarm immediately, safe the process

❖ **Alarm event record**

Real-time data curve display

Record function for up to 6,000 alarms

❖ **Expert calibration function**

Multi-point calibration function up to 9 point

❖ **Powerful self-diagnosis function**

Built-in heartbeat monitoring function and watchdog

Monitor the status of analyzer and sensors, and promptly remind customers to take necessary maintenance

High-standard hardware and software security and password protection

❖ **Powerful control function**

High(low) limit control function

Optional: Timer control(automatic cleaning) function

Optional: analog PID control function

Optional: PWM control function

❖ **Flexible fieldbus communication functions for IOT4.0**

Optional fieldbus MODBUS, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, etc.

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Parameters

Measuring principle	TDLAS (Tunable Diode Laser Absorption Spectroscopy)		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Linearity error	<0.5ppm/1ppm(0~1000ppm range) or 1% of the measured value		
Sensitivity	10ppb		
Warmup time	1-30 Minutes		
Response Time	Less than 1 s		
Zero point stability	≤±50 or 100ppb (8 hours)		
T90-time	<1sec at flow rate higher 60l/h		
Detection limit (4·STDW)	≤25 ppb (2σ); <5 ppb (2σ) under specified conditions, constant ambient temperature, flow, and inlet pressure		
Lifetime of the UV Radiation source	> 20,000h		
Gas pressure	200-1000 hPa (mbar)		
max. Pressure	2bar		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Mass flow monitoring or controller, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI / RFI CEI-EN55011 – 05/99		
Ambient Temperature	10 ~ 35℃		
Storage and transport temperature	-25 ~ 70℃		
Process Connection	6mm Pipe		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213x185x84mm	IP65
	Aluminum,Gray	230x200x157mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	Aluminu,natural-coloured	483x133x238mm	IP40
Explosion-proof	Exd IICT4 Controller optional		

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Note:

* Enhanced Version

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MZD Analytik GmbH
Enderstraße 94
01277 Dresden, Germany
Tel: +49-(0)351-850-710-10
Email: info@mzdd.de