

# Laser Spectrum Analyzer

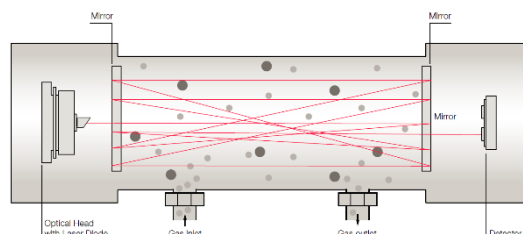
## Overview

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 ( $I_0$ ) 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

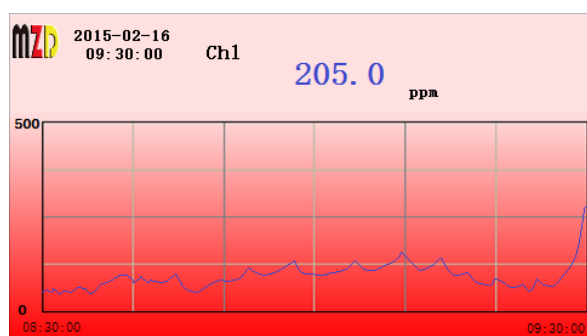
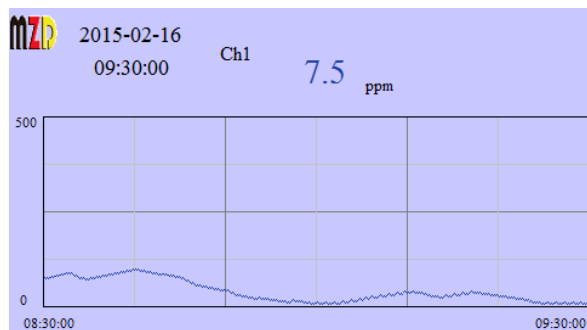
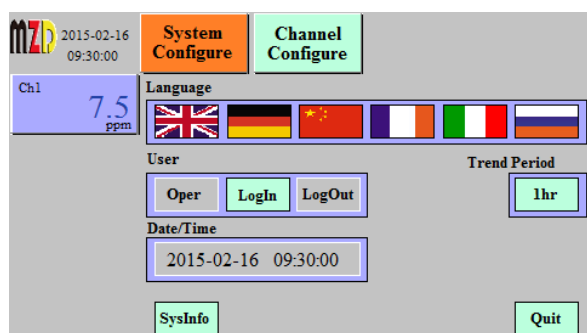
- ❖ Direct physical measurement
  - Selective and continuous measurement from visible to MID-IR spectral range.
- ❖ No cross sensitivity
  - The narrow-band tunable laser source ensures the highest selectivity for the measured gas. By choosing the ideal absorption line, other gases will not affect the 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.



## Measurement components and ranges

- ❖ NH<sub>3</sub>: 0~10 up to 100ppm
- ❖ HCl: 0~10 up to 100ppm
- ❖ H<sub>2</sub>O: 0~30%
- ❖ CH<sub>4</sub>: 0~100ppm up to 4%
- ❖ C<sub>2</sub>H<sub>2</sub>: 0~100ppm up to 10%

## Laser Spectrum Analyzer

2015-02-16  
09:30:00

System Configure Channel Configure

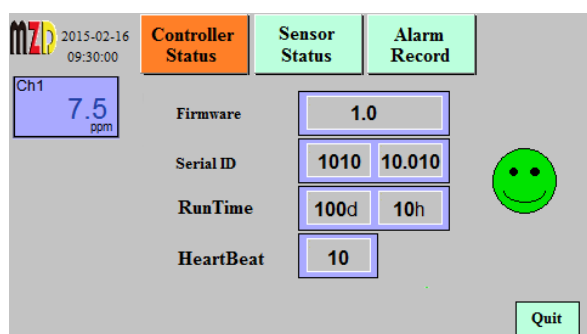
Ch1 7.5 ppm

Language

User Oper Login Logout Trend Period 1hr

Date/Time 2015-02-16 09:30:00

SysInfo Quit



2015-02-16  
09:30:00

Controller Status Sensor Status Alarm Record

Ch1 7.5 ppm

Firmware 1.0

Serial ID 1010 10.010

RunTime 100d 10h

HeartBeat 10

Quit

### Features

#### ❖ Quick and convenient

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

#### ❖ Process safety

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.



# Laser Spectrum Analyzer

## Parameters

<b>Measuring principle</b>	TDLAS ( Tunable Diode Laser Absorption Spectroscopy)		
<b>Display</b>	4.3" or 7" industrial color touch screen		
<b>Language</b>	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
<b>Linearity error</b>	<0.5ppm/1ppm(0~1000ppm range) or 1% of the measured value		
<b>Sensitivity</b>	10ppb		
<b>Warmup time</b>	1-30 Minutes		
<b>Response Time</b>	Less than 1 s		
<b>Zero point stability</b>	$\leq \pm 50$ or 100ppb (8 hours)		
<b>T90-time</b>	<1sec at flow rate higher 60l/h		
<b>Detection limit (4·STDW)</b>	$\leq 25$ ppb ( $2\sigma$ ); $< 5$ ppb ( $2\sigma$ ) under specified conditions, constant ambient temperature, flow, and inlet pressure		
<b>Lifetime of the UV Radiation source</b>	> 20,000h		
<b>Gas pressure</b>	200-1000 hPa (mbar)		
<b>max. Pressure</b>	2bar		
<b>Analog Output(Galvanic)</b>	4~20mA, maximum load 500Ω		
<b>Relay Output(Galvanic)</b>	Relay(2A, 230V AC freely set alarm), System alarm		
<b>Diagnosis function</b>	Mass flow monitoring or controller, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
<b>Event Logger</b>	Internal Flash,up to 6,000 alarm records		
<b>Control function</b>	Optional Timer control function,PID,PWM		
<b>Calibration</b>	Expert calibration function,Multi-point calibration function up to 9 point		
<b>Communication</b>	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
<b>Power</b>	80~264V AC,1A or 19~28V DC,3A		
<b>Electrical protection</b>	EMI / RFI CEI-EN55011 – 05/99		
<b>Ambient Temperature</b>	10 ~ 35°C		
<b>Storage and transport temperature</b>	-25 ~ 70°C		
<b>Process Connection</b>	6mm Pipe		
<b>Wall-mounted(1~2Channels)</b>	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
<b>Laboratory Desktop(1~2Channels)</b>	Aluminum,Black	250x144x184mm	IP40
<b>Portable(1~2Channels)</b>	ABS, Yellow	420x325x180mm	IP67
<b>19" Rack(1~6Channels)</b>	Aluminu,natural-coloured	483x133x238mm	IP40

Note:

\* Enhanced Version

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