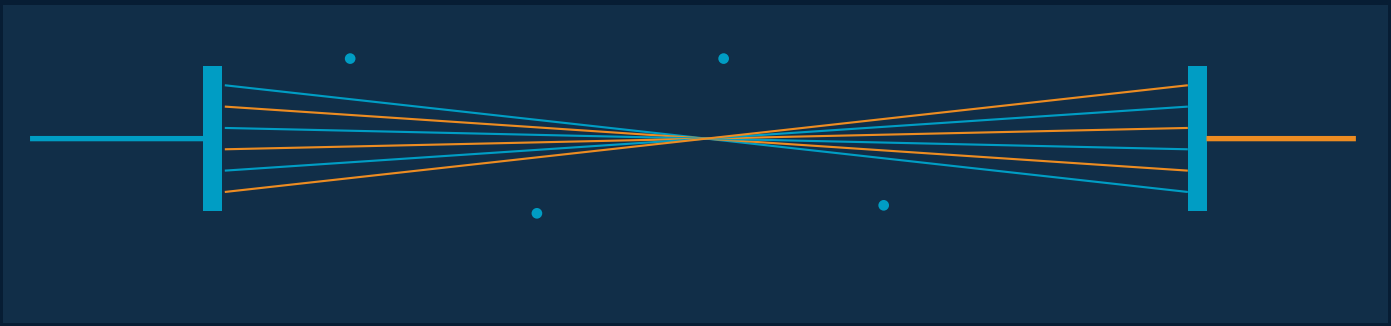
Sartec Photoelectronics

OPTICAL MEASUREMENT / OEM INTEGRATION

Optical Gas Analysis Modules & OEM Solutions

NDIR · UV-DOAS/NDUV · TDLAS · CRDS

Configurable sensing platforms and CRDS components for gas analyzer integration.



OPTICAL PATH CONCEPT / NOT A MECHANICAL DRAWING

Define the gas. Understand the matrix. Engineer the measurement.

APPLICATION-LED CONFIGURATION

Gas species · Measurement range · Integration requirements

SOLUTIONS GUIDE | SEPTEMBER 2026

01 / PLATFORM OVERVIEW

Select by measurement need

The appropriate optical platform depends on the target gas, concentration range, gas matrix and operating conditions.

Platform	Configurations in this guide	Integration focus
NDIR	CO flow-through module CO_2 compact sensor	Infrared absorption with serial output; CO_2 also provides analog voltage output.
UV-DOAS / NDUV	H_2S UV module 0-20 ppm configuration	UV absorption measurement with configurable serial communication.
TDLAS	CH_4, O_2 and H_2S Gas-specific modules	Tunable laser absorption with RS485 / Modbus connectivity.
CRDS	200 / 400 mm cavities Switch and control components	Optical cavity, laser switching, signal acquisition and ring-down fitting.

Two integration levels

Gas concentration modules

NDIR, UV and TDLAS configurations provide gas measurement outputs for integration into the customer analyzer.

CRDS building blocks

Cavities and electronics support system development. Gas-specific concentration performance requires a defined optical system and calibration.

> Published values apply to the named configurations. F.S. means full scale. Detection limit, accuracy, linearity and repeatability are distinct specifications and should not be treated as interchangeable.

Customer analyzer architecture

SAMPLE	OPTICS	SIGNAL	HOST
Conditioning	Measurement	Processing	Analyzer

02 / NDIR

Infrared sensing, two formats

Flow-through CO measurement and compact CO_2 sensing for OEM integration.

Parameter	SR-NDIR-CO	SR-NDIR-CO2
Target gas	Carbon monoxide (CO)	Carbon dioxide (CO_2)
Range	0-100 ppm	Defined by configured version [1]
Accuracy	±2% F.S.	Defined by configured version [1]
Detection / resolution	Detection limit: 1% F.S.	Resolution: 0.01% vol
Response time, T90	≤10 s	<30 s
Sampling / humidity	Flow: 0.2-1.5 L/min	0-95% RH, non-condensing
Output	RS232 [2]	UART (TTL) + analog voltage
Power supply	12 V ±1 V DC; supply >500 mA	5-6 V DC; 5 V recommended
Operating current	≤200 mA; peak ≤300 mA	<60 mA
Dimensions	105 × 50 × 50 mm [3]	Ø20 × 16.3 mm, excluding pins
Weight	<2 kg	25 g

[1] CO_2 range and accuracy are confirmed in the configuration-specific datasheet.
[2] The CO interface section also describes selectable RS485; confirm the selected interface at order stage.
[3] CO dimensions depend on measuring range.

Integration details

CO
4/6 mm PTFE gas connections. Use a dry, dust-free installation and prevent liquid ingress. Custom ranges ≥100 ppm and lower measurement error can be evaluated.

CO_2
Five-pin connection. Analog measurement span: 0.4-2.0 V for 0-100% F.S. Warm-up: 30 s. Customer-specific calibration is supported.

03 / UV-DOAS / NDUV

UV absorption for H_2S

SR-UV-H2S | A documented 0-20 ppm configuration for flow-through gas analysis.

0-20 ppm	0.1 ppm	≤20 s
MEASURING RANGE	DETECTION LIMIT	T90 RESPONSE

Parameter	SR-UV-H2S configuration
Measurement principle	Ultraviolet absorption; DOAS
Accuracy	±2% F.S.
Gas flow	1-1.5 L/min
Output	RS232; RS485 selectable per interface configuration
Communication	Modbus ASCII or Modbus RTU; one interface selected at a time
Supply / current	12 V ±1 V DC; supply >500 mA Operating ≤200 mA; peak ≤300 mA
Gas connection	4/6 mm
Envelope / weight	350 × 110 × 110 mm; <2 kg

This H_2S configuration illustrates the UV platform. Other target gases, ranges and gas matrices require an application-specific technical review; the listed performance is not transferable to other configurations.

Build the sample conditions into the specification

Provide the complete background gas composition and expected interfering gases. Use a dry, ventilated installation, prevent condensation and liquid ingress, and account for sample conditioning when specifying total system response.

04 / TDLAS

Gas-specific laser modules

SR-TDLAS series | CH_4, O_2 and H_2S configurations with RS485 / Modbus communication.

Parameter	SR-TDLAS-CH4	SR-TDLAS-O2	SR-TDLAS-H2S
Target gas	Methane	Oxygen	Hydrogen sulfide
Range	0-100 ppm	0-20% vol	0-200 ppm
Accuracy	±2% F.S.	±2% F.S.	Not specified [1]
Detection limit	1 ppm	≤1% F.S.	2 ppm
Linearity / repeatability	Not stated here	Not stated here	Each: within ±2% F.S.
T90 response	≤10 s	≤12 s at 500 mL/min	≤30 s
Gas flow	0.2-1.5 L/min	0.2-1.5 L/min	0.2-1.5 L/min [1]
Dimensions (mm)	156 × 126 × 55	156 × 126 × 55	200 × 175 × 76
Weight	<2 kg	<2 kg	<2 kg

[1] H_2S values follow the supplied SarTEC manual dated November 2025. Linearity and repeatability are not an overall accuracy specification. Confirm the applicable configuration before integration.

Common integration provisions

Flow-through sampling • 4/6 mm PTFE gas connections • 12 V ±1 V DC supply, rated >500 mA • RS485 serial connection, 9600 baud, 8 data bits, no parity, 1 stop bit.

> Use adequately conditioned, dry, particle-free sample gas and observe the marked flow direction. Include tubing, filtration and sample transport delay in the analyzer response budget.

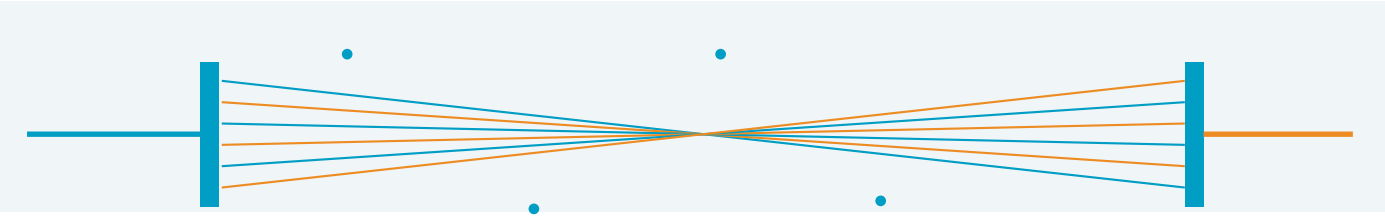
Configuration requests

Discuss alternative full-scale ranges and response targets. The CH_4 and O_2 manuals also identify lower-error customization. Final specifications depend on the gas and operating conditions.

05 / CRDS CAVITIES

Long optical paths. Modular integration.

SR-CRDS-C series | Optical ring-down cavities with thermal control and integrated detection.



Parameter	SR-CRDS-C200 / C200-PZT	SR-CRDS-C400 / C400-PZT
Working wavelength	1600-1660 nm	1600-1660 nm
Cavity length	200 mm	400 mm
Ring-down optical path	≥5 km	≥10 km
Gas volume	36 mL	72 mL
Envelope	58 × 52 × 310 mm	58 × 52 × 510 mm
Weight	≤1500 g	≤3000 g
Ambient temperature	-30 to +40 °C	-30 to +40 °C

Shared optical and thermal specifications

Optical input: FC/APC, single-mode fiber, 1 m.
Detector: 800-1700 nm; DC-1 MHz bandwidth; 0-3.5 V output via SMA.
Cavity temperature: 45 °C; stated control accuracy ±0.001 °C; stabilization ≤15 min.
Variants: base cavity and PZT-designated options; actuator details confirmed per configuration.

> Optical path length and temperature-control accuracy describe the cavity components. Gas detection limit, concentration accuracy and response time are established at the configured system level.

06 / CRDS ELECTRONICS

Control, switch and acquire

SR-CRDS components support cavity excitation, laser shutoff and ring-down signal processing.

SR-CRDS-CTRL / Main control unit

Function	Specification
Cavity-mode modulation	Sawtooth: 1-1000 Hz; -5 to +5 V; 14-bit; BNC
Laser shutoff control	Threshold: 0-5 V; square-wave levels within -5 to +5 V Shutoff time ≤10 ns; duration 1-1000 µs; BNC
Detector acquisition	10 MS/s; 14-bit; -5 to +5 V input; BNC
Host / supply	Ethernet / UDP; +12 V DC
Envelope / environment	230 × 212 × 61 mm; ≤500 g; -30 to +70 °C

SR-CRDS-LS / Fiber laser switch

Function	Specification
Optical characteristics	Selectable wavelength within 1000-1700 nm Insertion loss ~3.5 dB; extinction ratio ≥30 dB
Speed	Bandwidth ≥10 GHz; theoretical switching time <1 ns [1]
Control / optical ports	SMA control; FC/APC optical ports; single-mode fiber, 1 m
Drive / power	Recommended ON level: 0 V; OFF level: -7 V No separate DC supply; power ≤10 mW
Envelope / weight	80 × 29 × 10 mm; ≤200 g

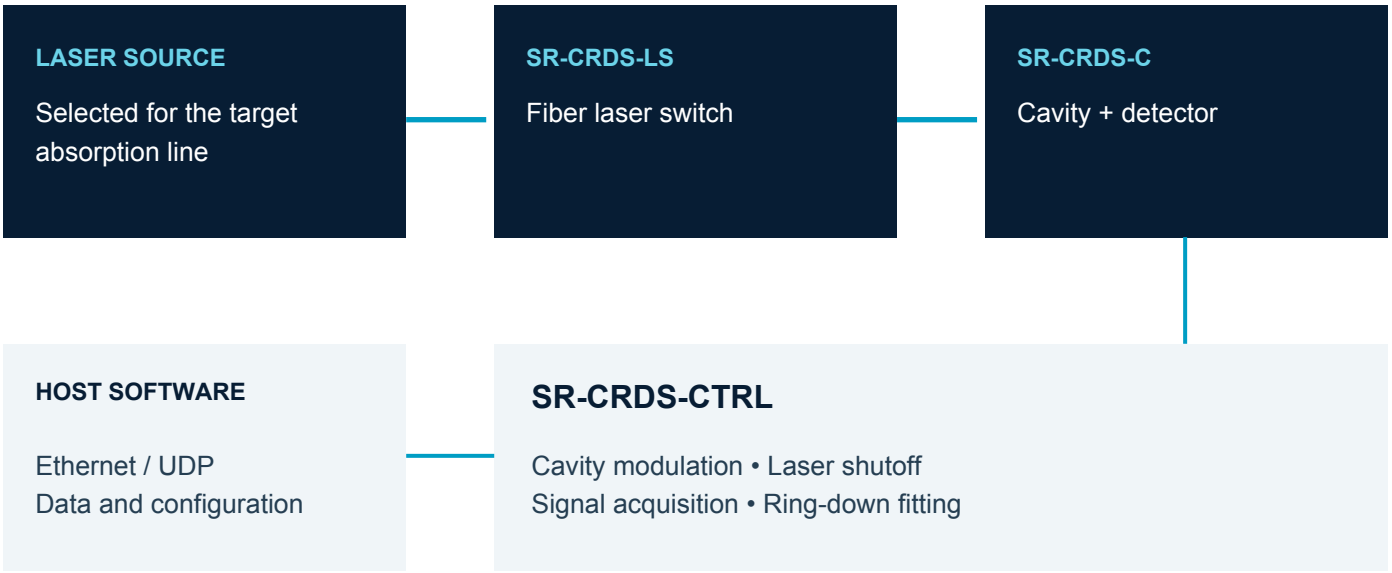
[1] Switching time is described as theoretical in the component introduction; it is not a verified system response specification.

> Interface engineering: the control unit output range is ±5 V, while the switch specifies a recommended -7 V OFF level. Review driver levels, signal conditioning and connector adaptation before interconnection.

07 / SYSTEM INTEGRATION

Define the component boundaries

A CRDS system combines the optical source, cavity, switching and acquisition functions with application-specific gas handling and calibration.



Functional architecture only. Electrical adaptation, laser source selection and gas-specific calibration are part of system engineering.

SR-CRDS-EC / Cavity support electronics

Parameter	SR-CRDS-EC / SR-CRDS-EC-PZT
Detector supply	±5 V DC; ripple ≤1 mVpp
Thermal control	Active PID; maximum temperature-control current 7 A Stated control accuracy ±0.001 °C
Supply options	220 V AC or +24 V DC
Operating temperature	-30 to +70 °C
PZT version only	Input -1.7 to +10 V; output -20 to +150 V High-voltage bandwidth: 10 kHz

> System interfaces should be checked together: voltage levels, polarity, signal bandwidth, grounding, connectors, gas ports and software timing. Component specifications do not establish analyzer-level performance.

08 / APPLICATION ENGINEERING

Configured around your gas matrix

Specify the measurement conditions first. SarTEC evaluates the optical platform, gas path and integration requirements against the application.

Define	Information for engineering review
Target gas & range	Gas species; minimum, normal and maximum concentration; units; required full scale and detection limit.
Accuracy & stability	Required accuracy and whether stated as % F.S., % reading or an absolute value; repeatability, drift and calibration interval.
Background / balance gas	Full gas composition with typical and maximum concentrations; expected variations; dry or wet basis.
Interfering gases	Potential interferents and concentration ranges; cross-sensitivity acceptance criteria.
Pressure & temperature	Sample and ambient limits; nominal pressure; pressure basis (absolute or gauge); transient conditions.
Humidity & conditioning	Water content or dew point; condensation risk; particulates, oil and other contaminants; conditioning method.
Flow & response time	Available flow; allowed pressure drop; required T90; sample transport and conditioning delay.
Interface & mechanics	Power budget; serial / analog / Ethernet requirements; protocol; connectors; envelope, mounting and gas ports.

> Customization is subject to technical feasibility and configuration review. Final range, accuracy, gas-matrix compatibility and operating limits are defined in the agreed configuration-specific specification.

09 / START YOUR OEM PROJECT

Turn application data into a specification

Share a complete measurement brief with Sartec Photoelectronics to begin configuration review.

01 Define the measurement

Target gas, full-scale range, detection limit, accuracy definition and required response.

02 Describe the sample

Balance gas, interferents, moisture, pressure, temperature, flow and conditioning.

03 Specify integration

Power, communication protocol, output format, available space and mounting constraints.

04 Agree the configuration

Review the selected platform and define the configuration-specific performance and acceptance conditions.

DISCUSS YOUR APPLICATION

info@sartecphotoelectronics.com

www.sartecphotoelectronics.com

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Configuration examples are provided for technical selection. Confirm the applicable datasheet, interfaces and operating conditions before design release.