

# Solar & Semi Solutions

“We sell solutions, not boxes”

CIC Photonics, Inc. is dedicated to providing today's growing industries with the highest sensitivity and fastest time response instrumentation. Our analyzers are used worldwide in a variety of different arenas; although we have a set of core systems, we pride ourselves on truly meeting the needs of our customers by adapting the core analyzers to their specifications, for both semiconductor and solar applications.

CIC Photonics has had extensive experience in the semiconductor industry over providing low level ppb limits of detection (LOD) for their process gases. As a result of the semiconductor and solar industries using similar gases in their processes (SiF<sub>4</sub>, NF<sub>3</sub>, NH<sub>3</sub>, SiH<sub>4</sub>, B<sub>2</sub>H<sub>6</sub>, and SF<sub>6</sub>) the same levels can be achieved for solar process gases as have been for the semiconductor gases.

All of CIC Photonics IRGAS Analyzers are equipped to handle the analysis of solar gases. Depending on the gases being analyzed and the required LODs the system could consist of a FTIR or EPIR, and a long path or short path gas cell.

## System Specifications

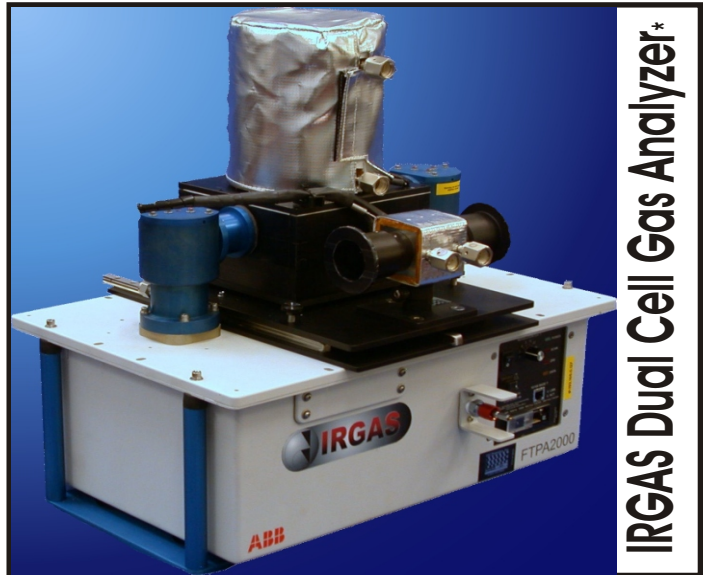
Spectrometer  
Bomen WorkIR FTIR  
OR  
Aspectrics EPIR

Gas Cell:  
9.6m Ranger or 4-6m 4Runner  
OR  
2,5,10,15, & 20 cm Scout-EN

Sensitivity Range  
Long path gas cell: ppm level to ppb  
Short path gas cell: % level to 50 ppm

Pressure Range  
Atmospheric to 200 psi

Temperature Range  
0°C to 300°C



\* Analyzer pictured is a 4Runner and 5cm Scout

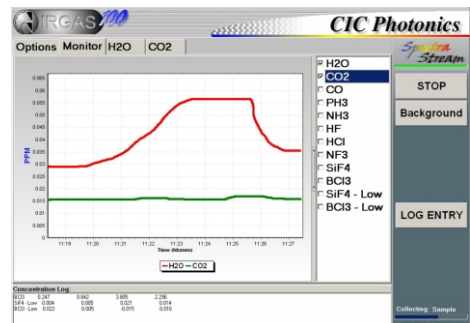
IRGAS Dual Cell Gas Analyzer\*

The FTIR systems provide a rugged, compact spectrometer that can be placed in any orientation. This FTIR is cost competitive with its very low failure rate. Systems that include FTIRs are the IRGAS LPA and IRGAS SPA.

If a range of % to ppb level is necessary CIC Photonics can provide their dual gas cell system which incorporates one of the long path (LP) gas cells as well as a short path (SP) gas cell mounted on a FTIR spectrometer.

Included with the FTIR Gas Analyzers is CIC Photonics patented SPGAS analytical software package, which includes the following softwares: IRGAS 100 or IRGAS 100 with SpectraStream, Qmax, Configuration Manager, and Reprocessing Tool.

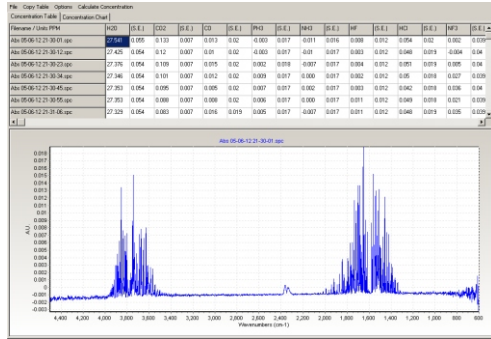
The IRGAS-100 software provides real-time monitoring of species concentrations, while also having the capabilities to control various hardware components within the system. Some of the hardware components that can be managed by the software are valves, pressure transducers,



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software that allows users to view the fast concentration tracker to be able to see an early warning of potential concentration issues.

The system calibrations are generated in the Qmax program which permits the user to easily generate calibrations and/or add new gas species to preexisting calibrations.

The IRGAS Configuration Manager is a program that contains all of the information regarding the system in one central location. The Configuration Manager has the flexibility to allow the user to change various parameters for the system as new conditions or processes dictate that can be altered to his or her needs.

Our most recent program addition to the software package is the Quantification Reprocessing Tool. This program allows the user to recalculate data that had been previously collected. Instead of having to recollect data for temperature and pressure changes, a user can enter the new parameters in the Quantification Reprocessing Tool and the program will recalculate the data with the new parameters. As well as recalculating new parameters, it can reprocess new calibration files that have more or fewer gas species being quantified. The Quantification Reprocessing Tool can also be used to determine the accuracy of a calibration file and help to determine the correction factor needed for calibrations.

### Analyzer Options

- Digital Analog Output
- Valving Manifold
- Automated Manifold
- Script Editor Software (runs automated manifold)
- Moisture Reduction Stack
- Additional Analyzers (O2, H2, THC)
- SpectralID software (spectral identification program)
- Cabinets/Rack Mount
- Computer
- Pump
- Multipoint Monitoring
- Heated/Unheated Sampling Systems

temperature controllers, pumps, heating package options, etc....

The software also comes with the CIC Photonics patented SpectraStream

The EPIR systems use the Aspectrics encoded photometric infrared spectrometer. These systems are vibration insensitive, have no hygroscopic materials or consumables, and like the FTIR can provide real time multiple species analysis. The EPIR systems can also be mounted with the long path or short path gas cells.

Each system is supplied with one of CIC Photonics state of the art 316L stainless steel, nickel plated gas cells. The long path gas cells are designed to provide faster gas exchange and eliminate dead space thru the use of laminar gas flow both in and out of the cell. The stainless steel mirrors with proprietary gold coated, are hand aligned in the factory to specific pathlengths to direct the beam path within the cell so that they provide the highest energy throughputs (36-48%, depending on the pathlengths) in the industry.



**IRGAS EP-IR Long Path Gas Analyzer**

For information regarding LODs for these systems please refer to our IRGAS SPA and IRGAS LPA specification sheets or contact us at directly.

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