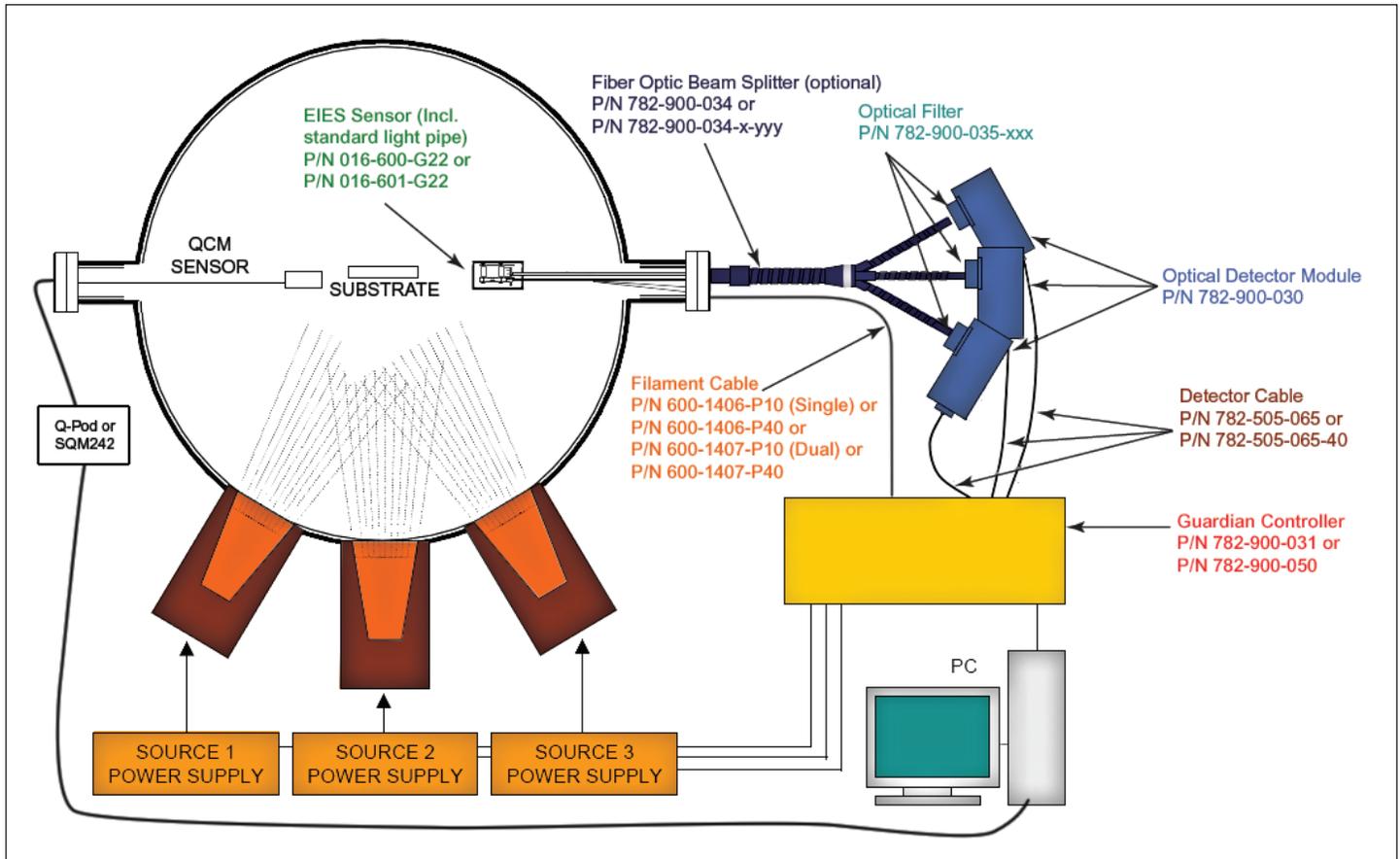# INFICON

Guardian™ Configuration Guide

Guardian uses EIES (Electron Impact Emission Spectroscopy) technology to detect and monitor the deposition of thin films. It is especially useful for CIGS applications. A complete Guardian system includes a Guardian controller, an EIES Sensor with the appropriate filament cable, and an Optical Detector with the appropriate detector cable and filter. Up to four materials can be monitored at once with a single sensor (8 materials for two sensors) using the optional beam splitter and the appropriate number of detectors. Guardian can also be paired with a Q-pod or SQM242 QCM system for automatic calibration through the Guardian software.

The following guide will help you select the options and accessories needed to build a complete Guardian system.

NOTE: Diagram is for reference only. Sources and sensors must be aligned per the installation instructions.

Guardian Part Numbers and Descriptions

Guardian Controller (choose one)

782-900-031 **Guardian Controller for One Sensor (Standard or Gas Compensating)**
Guardian EIES Controller with one sensor input. This will work with either a standard or gas compensating sensor.

782-900-050 **Guardian Controller for Two Sensors (Standard or Gas Compensating)**
Guardian EIES Controller with two sensor inputs. This will work with either a standard or gas compensating sensor in each of two inputs.

EIES Sensor (choose one)

016-600-G22 **Guardian Standard Single Sensor & Feedthrough Assembly, 22" (539 mm), CF40 flange**
Standard EIES single sensor. Includes CF40 (2-3/4" ConFlat) feedthrough assembly and in-vacuum hardware, standard 20" (508 mm) light pipe and in-vacuum EIES cable, 22" (539 mm). Other lengths available on request, min. 6.25" (159 mm), max. 32" (813 mm).

016-601-G22 **Guardian Gas Compensating Sensor & Feedthrough Assembly, 22" (539 mm), CF40 flange**
Gas compensating EIES sensor. Uses an additional filament to subtract the signal emitted by residual gas to achieve an accurate baseline. Detects materials that have difficulty when using a standard single sensor due to residual gas. Other lengths available on request, min. 9" (229 mm), max. 34.6" (879 mm).

Beam Splitter (optional)

782-900-034 **Guardian Fiber Optic Beam Splitter (1:3) - 400 mm length**
Splits the light beam from the sensor into 3 separate beams. Allows the detection of 3 materials from the same sensor. *An optical detector and optical filter must be attached to each of the 3 ends.*

782-900-034-x-yyy **Guardian Fiber Optic Beam Splitter (1:x) - yyy mm length**
A custom version of the standard beam splitter. The x value determines how many ways the beam is split (2 or 4 are the choices) and yyy determines the length of the splitter (400 mm is typical).

Filament Cable (choose one per sensor)   New design attaches securely to feedthrough.

Cable that connects a standard single sensor feedthrough to the Guardian Controller.
600-1406-P10 Guardian Single Filament Cable, 10' (3m)
600-1406-P40 Guardian Single Filament Cable, 40' (12m)

Cable that connects a gas compensating sensor feedthrough to the Guardian Controller.
600-1407-P10 Guardian Dual Filament Cable, 10' (3m)
600-1407-P40 Guardian Dual Filament Cable, 40' (12m)

Optical Detector (select appropriate quantity)

782-900-030 **Guardian Optical Detector Module**
Works in conjunction with an optical filter to isolate and detect the light from the sensor for a given material being deposited. Optical filters sold separately.

Optical Detector Cable (select appropriate quantity and length)

Cable that connects the optical detector to the Guardian.
782-505-065 Guardian Detector Cable, 10' (3m)
782-505-065-40 Guardian Detector Cable, 40' (12m)

Guardian Part Numbers and Descriptions

Guardian EIES Optical Filters (select appropriate quantity and wavelength)

Filters the beam of light received by the optical detector to single out a specified wavelength. This allows the Guardian to monitor the specific material being deposited. Other filters available on request.

782-900-035-202	Guardian Optical Filter - Center Wavelength - 202nm, BP10nm, (Zn)
782-900-035-241	Guardian Optical Filter - Center Wavelength - 241nm, BP10nm, (Co, Au)
782-900-035-252	Guardian Optical Filter - Center Wavelength - 252nm, BP10nm, (Si)
782-900-035-265	Guardian Optical Filter - Center Wavelength - 265nm, BP10nm, (Ge, Pt, Ta, Ir)
782-900-035-267	Guardian Optical Filter - Center Wavelength - 267nm, BP3nm, (Au)
782-900-035-294	Guardian Optical Filter - Center Wavelength - 294nm, BP2nm, (Hf) (Ga [when using a gas compensating sensor])
782-900-035-304	Guardian Optical Filter - Center Wavelength - 304nm, BP2nm (Ba, In [when using a gas compensating sensor])
782-900-035-325	Guardian Optical Filter - Center Wavelength - 325nm, BP10nm, (Cu, Cd)
782-900-035-358	Guardian Optical Filter - Center Wavelength - 358nm, BP10nm, (Nb, U, Cr)
782-900-035-364	Guardian Optical Filter - Center Wavelength - 364nm, BP10nm, (Ti, Pb)
782-900-035-396	Guardian Optical Filter - Center Wavelength - 396nm, BP10nm, (Al)
782-900-035-417	Guardian Optical Filter - Center Wavelength - 417nm, BP2nm, (Ga)
782-900-035-451	Guardian Optical Filter - Center Wavelength - 451nm, BP5nm, (In)
782-900-070	**Monochromator** Adjustable optical filter that allows the user to specify which wavelength to single out. Adjustable from 200 - 800nm.

Replacement Parts for New Sensors and Feedthrough Assembly 016-600-Gxx and -601-Gxx

016-400-G1	Flux Sensor, High Rate for 016-600-Gxx Sensor and Feedthrough Assembly
016-400-G2	Flux Sensor, Standard Rate for 016-600-Gxx Sensor and Feedthrough Assembly
016-400-G5	Gas Sensor, for 016-601-Gxx Sensor and Feedthrough Assembly
016-400-G6	Flux Sensor, for 016-601-Gxx Sensor and Feedthrough Assembly
016-201-G1	Emitter Assembly for all 016-400-Gx Sensors used in 016-600-Gxx and -601-Gxx

782-900-038	**Guardian Photomultiplier Tube Replacement** Replaces the Photomultiplier tube in the optical detector.

016-509-G22	**Guardian Sensor EIES In-vacuum Cable, 22" (559 mm), other lengths available** A gas compensating sensor uses two cables. For retrofit to new sensors.

Replacement Part for Discontinued Sensors

782-530-015	**Guardian Sensor Filament Replacement (for discontinued 782-900-029 and -052 sensors)** Replacement filaments for EIES sensors. A gas compensating sensor uses two filaments.

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