SGX Europe Sp. z o.o.
Building 11
Ligocka St. 103,
40-568 Katowice,
Poland

T: +48 (0) 32 438 4778

E: sales.is@sgxsensortech.com
www.sgxsensortech.com

ECVQ-EK3 Datasheet

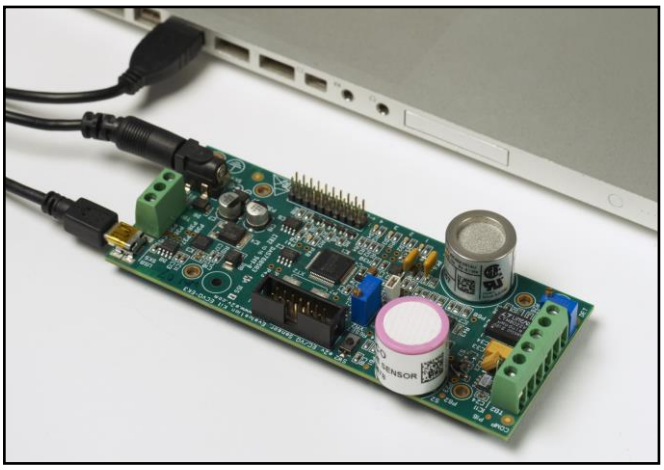
Electrochemical and Pellistor Gas Sensor Evaluation Kit

Get started quickly in gas sensor instrument design using pellistor and electrochemical gas sensors from SGX.

Simply attach the universal power supply, connect to a PC USB port and plug in an SGX pellistor or electrochemical gas sensor.

The SGX data logging and control software allows the performance of electrochemical and pellistor gas sensors to be assessed and makes it easy to capture performance data.

Users can experiment with different settings before designing their own instrument. Circuit diagram and parts list supplied.



Gas sensors to be ordered separately

INTRODUCTION

The SGX ECVQ-EK3 Gas Sensor Evaluation Kit will drive the SGX range of electrochemical and pellistor (including thermal conductivity) gas sensors, automatically measure the sensor outputs and calculate gas concentration levels.

Sensors can be monitored automatically via the USB interface with an easy-to-use control and data logging PC application provided on CD. Alternatively a terminal program such as HyperTerminal can be used to send simple commands to the on-board microcontroller. The user manual provides a comprehensive set of commands.

The PCB provides sockets for use with SGX electrochemical and pellistor gas sensors. Electrochemical devices and VQ500 series pellistor heads can be plugged directly onto the PCB. Terminal blocks are also provided for individual pellistor devices or for connecting to VQ600 series pellistor head cables. A temperature sensing IC is provided on the PCB close to the sensor socket positions.

For electrochemical sensors the bias voltage can be adjusted or set to zero and the output is given in nA or mA. For pellistor devices the bridge voltage can be adjusted and the bridge output is given in mV. In both cases, where the sensor has a linear response to concentration, a basic calibration can be performed using the supplied software to give a concentration reading in ppm, %volume or %LEL (Lower Explosive Limit).

An expansion connector provides access to four configurable alarms (open collector), two analog outputs and four digital inputs. LEDs on the board mimic the status of each alarm. A JTAG header allows advanced users to upload their own software to the microcontroller (MSP430F2616) and make full use of the available interfaces.

A universal mains adapter is also supplied or the user may connect a 9 V power supply to the terminal block connector.

FEATURES

- For use with SGX electrochemical gas sensors
- For use with SGX pellistor/thermal conductivity gas sensors:
  - Individual bead pairs
  - VQ500 series heads
  - VQ600 series heads
- Simple control and set-up of sensors
- USB interface to a Personal Computer (PC)
- Free PC application software for easy control and data logging
- Adjustable pellistor bridge voltage (1.6 V to 4.6 V)
- Adjustable electrochemical bias voltage (-700mV to +350mV)
- 16-bit Analog to Digital Conversion (ADC) for sensor outputs
- Calibrate sensors with linear response and monitor gas concentration levels
- PCB mounted temperature sensor IC
- Four configurable alarm outputs
- Two configurable analog outputs (12-bit DAC)
- Four digital inputs
- Expansion header for additional applications
- JTAG header for user software upload
- Supplied with universal mains adapter
- Supplied with user manual on CD
- Gas flow hoods available separately

Note: The ECVQ-EK3 cannot be used with SGX-4OX, SGX-7OX & SGX-4DT sensors.

ELECTRICAL DATA

Universal Mains Adapter

Input Voltage	90 - 264 V ac
Input Frequency	50 – 60 Hz
Adapters supplied	UK, Europe, USA, Australia.
Output	9 V dc

PCB Interfaces

DC Supply Input

SK4	2.1 x 5.5 mm Socket, centre positive
TB1	Terminal Block
Input Voltage	9 V ± 10%
Input Protection	Over voltage & current, Reverse voltage

Gas Sensor Sockets

S1	VQ500 Series Pellistor
S2	Electrochemical Sensor
TB2	VQ600 or individual compensator
TB3	VQ600 or individual pellistor

Expansion Connector

PL2 2 x 10-pin 0.1” PCB Header

3V3 Regulated	1	2	9 V Unregulated
0 V	3	4	0 V
Input 1 (3V3 logic)	5	6	Output 1 (Open collector)
Input 2 (3V3 logic)	7	8	Output 2 (Open collector)
Input 3 (3V3 logic)	9	10	Output 3 (Open collector)
Input 4 (3V3 logic)	11	12	Output 4 (Open collector)
0 V	13	14	Analog Out 1 (0 - 2.048 V)
0 V	15	16	Analog Out 2 (0 - 2.048 V)
Spare RXD (3V3)	17	18	Spare TXD (3V3)
0 V	19	20	Spare

JTAG Connector

PL1 2 x 7-pin 0.1” Box Header

TDO	1	2	VCCO
TDI	3	4	VCCI
TMS	5	6	Unused
TCK	7	8	Unused
0 V	9	10	Unused
TRST	11	12	Unused
Unused	13	14	Unused

Microcontroller Reset

SW2 Push Button

Indicators

D1 – D4	Green LEDs (ON = Alarm asserted)
D5	Green LED (Flash = PCB functional)

User Adjustments

VR1	Pellistor bridge voltage (1.6 to 4.6V)
VR2	Electrochemical bias voltage (-700mV to +350mV)
LK1	1-2 (unbiased); 1-3 (biased)

USB

SK5 Mini-USB type B

MECHANICAL DATA

Dimensions

Mains Adapter	72 x 45 x 29 mm
Evaluation Kit PCB	130 x 55 mm

ENVIRONMENTAL DATA

Operating Temperature Range

Mains Adapter	Operating temp: 0 °C to +40 °C Storage temp: -25 °C to +85 °C Operating humidity: 10 to 90%
PCBs	Operation and storage from -30 °C to +75 °C
Sensors	See individual sensor data sheets

PERFORMANCE DATA

ADC Resolution	16-Bit
DAC Resolution	12-Bit
Pellistor bridge voltage	1.6 to 4.6V (adjustable)
Electrochemical bias	-700mV to +350mV (adjustable)
ADC Resolution (Pel)	<0.1mV
ADC Resolution (Elect.)	5nA (low range, +/-164uA) 25nA (high range, +/-819uA)
Temperature sensor IC accuracy	± 2 °C (at 25 °C) ± 3 °C (-25 °C to +85 °C)

RECOMMENDED PC SYSTEM

For Control and Data logging Software:

Processor	Pentium 4/M or equivalent
Operating System	Windows XP, Vista or 7
Screen resolution	1024 x 768 Pixels
RAM	1 GB
Disk Space	1.6 GB

ORDERING INFORMATION

ECVQ-EK3 – Electrochemical/Pellistor Gas Sensor Evaluation Kit containing:

- Evaluation PCB
- Universal Mains Adapter & USB lead
- Data Logging Software and User Guide on CD
- 4-Series to 7-Series Electrochemical Sensor Adapter

ACCESSORIES (Order separately if required)

- **JAS767906AA** – Standard Gas Flow Hood for VQ500 series, Infrared mini-sensors and electrochemical (non-reactive gas) sensors
- **JAS769638AA** – Premium Gas Flow Hood recommended for reactive gases e.g. H_2S, NO_2, Cl_2, ClO_2, ETO

Notes: Gas Sensors should also be ordered separately. The ECVQ-EK3 cannot be used with SGX-4OX, SGX-7OX & SGX-4DT sensors.