

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

# **IR-EK2 Datasheet**

## Infrared Gas Sensor Evaluation Kit

Get started quickly in gas sensor instrument design using Infrared Gas Sensors from SGX.

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

The SGX data logging and control software allows the performance of single gas or twin 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.



The SGX IR-EK2 Gas Sensor Evaluation Kit will drive the SGX range of infrared gas sensors and automatically measure the sensor outputs and calculate gas concentration levels.

Sensors can be controlled 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 6- and 7-pin (single gas) or 8-pin (twin gas) infrared gas sensors. For devices which do not have integrated temperature monitoring, a temperature sensing IC is provided on the PCB close to the gas sensor socket positions.

The evaluation kit allows experimentation with different bulb drive voltages. Reference and active channel gains can also be adjusted or set to a fixed level. This allows operation with the full range of SGX infrared gas sensors. Sensors can be calibrated and then the gas concentration levels monitored.

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.



Gas sensors to be ordered separately

#### **FEATURES**

- For use with SGX Infrared Gas Sensors
- Simple control and set-up of sensors
- Operates 6- or 7-pin (single gas) sensor or 8-pin (twin gas) sensor
- USB interface to a Personal Computer (PC)
- Free PC application software for easy control and data logging
- Adjustable bulb drive voltage (3.0 V to 5.0 V)
- Adjustable reference and active channel gains
- 16-bit Analog to Digital Conversion (ADC) for reference and active channels
- Calibrate sensors and monitor gas concentration levels
- Monitor gas sensor temperature on devices with integrated thermistor or IC temperature sensor
- PCB mounted temperature sensor IC provided for devices without integrated temperature monitoring
- 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
- Supplied with gas flow hood

Note: The IR-EK2 cannot be used with INIR and Smart IR gas sensors.

Whilst SGX has taken care to ensure the accuracy of the information contained herein it accepts no responsibility for the consequences of any use thereof and also reserves the right to change the specification of goods without notice. SGX accepts no liability beyond the set out in its standard conditions of sale in respect of infringement of third party patents arising from the use of SGX products in accordance with information contained herein. In case of modification of the product, SGX disclaims all liability.

## **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  $9 V \pm 10\%$ 

Input Protection Over voltage & current, Reverse voltage

#### Gas Sensor Sockets

S1 6-Pin or 7-Pin IR Gas Sensor S2 8-Pin IR Gas Sensor Only one device can be fitted at a time.

#### Signal Monitor

PL3 8-pin 0.1" Friction Lock (Molex)

| 1 | Reference signal monitor |
|---|--------------------------|
| 2 | 0 V                      |
| 3 | Active 1 signal monitor  |
| 4 | 0 V                      |
| 5 | Active 2 signal monitor  |
| 6 | 0 V                      |
| 7 | Bulb control (3V3 logic) |
| 8 | 0 V                      |

#### **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

VR0 Ref. channel gain (single/twin gas)
VR1 Active Ch.1 gain (single/twin gas)
VR2 Active Ch.2 gain (twin gas only)
VR3 Lamp drive voltage (3.0 V to 5.0 V)

**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 Lamp drive frequency 4 Hz

Lamp drive voltage 3.0 V to 5.0 V (adjustable)

Channel gain (at 4 Hz) Minimum 41

Maximum 400 (approx)
Channel bandwidth
Temperature sensor IC

200 (25 00 to 25 00 to

accuracy  $\pm$  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 or Vista
Screen resolution 1024 x 768 Pixels

RAM 1 GB Disk Space 1.6 GB

# **ORDERING INFORMATION**

IR-EK2 - IR Gas Sensor Evaluation Kit containing:

- Evaluation PCB & Gas flow hood
- Universal Mains Adapter & USB lead
- Data Logging Software and User Guide on CD

JAS767906AA - Additional Gas flow hood

Note: Gas Sensors ordered separately.