



Instruction Manual

UA1373A Analog /
Relay Interface Module

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1.0 Introduction

The UA1373A is a factory installed multipurpose interface module to be used with the Photoacoustic Gas Monitor INNOVA 1314i.

The UA1373A provides

- 8 Analogue outputs of either 0-20mA, 4-20mA, or 0-10V for measured values of gas concentrations, pressure and Channel Information
- 1 relay output for Warnings and Errors detected
- 1 relay output used as watch dog
- 12 relay outputs for alarms for the 6 Optical Filters A to E and W

The analog output values for the 6 Optical Filters A - W are scaled according to the values entered in set-up of the analog output.

The analog output for pressure is with a fixed scale and always in kPa.

The analog output for Channel information is with a fixed scale. (See [section 4.3](#)).

2.0 Specifications

Accuracy:	Zero Drift: $\pm 0.25\%$,
Current output:	$\pm 0.5\%$ of full scale
Voltage output:	$\pm 1.5\%$ of full scale
Resolution:	16 bit (0-20mA and 0-10V)

Measurement Range:	
Gas concentrations:	Range and zero-point are scalable in the set-up
Pressure:	50 kPa to 200 kPa

Current output load:	Maximum 800 Ω
Voltage output load:	Minimum 1000 Ω .
Relay output load:	Maximum 100mA/25V.

External Connectors:	2 x D-sub 37 pins female
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The analog outputs are galvanic isolated from the rest of the instrument, but they are NOT from each other.

The Relay output are selectable as Normal Open (NO) or Normal Closed (NC)

2.1 Specifications fixed relay 13 and 14

2.1.1 Warning/Error relay

Relay 13 is fixed configured to be activated if any warnings or errors occur in the Gas Monitor.

2.1.2 Watch Dog Relay

Relay 14 is fixed configured to be triggered if any of the following conditions occur:

Measurement task stopped, Warning occurred, Error occurred and Power off.

3.0 Accessories

The following accessories are available:

LumaSense Part No.	Description
AO1431A	Cable 1m, 37 pin sub D male/male,
AO1432A	Cable 3m, 37 pin sub D male/male,
JZ0102A	Screw terminal box, 37 pin sub D female to 37 pin screw terminal.

4.0 Setting up the Analog/Relay interface module

When the UA1373A is installed in the 1314i the following additions will be available in the set-up menu: Units for analog output, analog output scaling and selection of Relay output mode and limits for Relay output.

Before the UA1373A can be used, the analog output units, analog concentration limits and the relay output limits parameters must be entered.

Please note that these set-up menus only are available, when the UA1373A is installed in the instrument.

The set-up of the Analog/Relay interface Module can be performed either from the Front Panel of the Gas Monitor or by using the BZ7007 Remote and Offline SW. Please consult the BZ7007 User Manual (BE6042) for guidance in using the Remote and Offline Software to set-up the Analog/Relay Module.

The present User Manual describes the set-up using the Front Panel of the Gas Monitor only. For further instructions in the use of the front panel for set-up please consult the Gas Monitor user manual.

4.1 Analog unit set-up:

To set the Analog units for the UA1373A/follow the left branch of the **Analog/Relay** branch in the Set Up Tree as shown in [Figure 1](#).

The following Analog output units are available for Gas Concentrations:

Units	output	Min. output	Max. output	Gas Conc. unit
0-20mA/(mg/m ³)	Current	0mA	20mA	mg/m ³
4-20mA/(mg/m ³)	Current	4mA	20mA	mg/m ³
0-20mA/ppm	Current	0mA	20mA	ppm
4-20mA/ppm	Current	4mA	20mA	ppm
V/(mg/m ³)	Voltage	0V	10V	mg/m ³
V/ppm	Voltage	0V	10V	ppm

The Analog output unit for the ambient pressure.

0-20mA

The barometric pressure is in kPa.

Barometric pressure limits are always from 50kPa to 200kPa.

Continue to the next level in the set-up tree to set-up the concentration levels for the measured gases related to the Analog output units after Selection of the Relay output Mode:

4.2 Relay output Mode

The Relay output mode can be set to either **Gas Mode** (see [section 4.2.1](#)) or **Channel Mode** (see [section 4.2.2](#)) for further description. **Channel Mode** is only available when a Multipoint Sampler is connected via the USB Host

4.2.1 Limits set-up Gas Mode:

Example: In this example, the following parameters will be used:

Filter	A	B	W
Analog unit*	4-20mA/ppm	4-20mA/ppm	4-20mA/ppm
Analog min. concentration*	5	0	0
Analog max. concentration*	20	150	25000
Relay high alarm limit 1	10	75	10000
Relay high alarm limit 2	15	125	20000

* From the Analog set-up Branch: Left part of the-Analog Relay set-up tree.

I.e. when the set up for Filter A is completed a value of 5ppm will give an analog output of 4mA, and a value of 20ppm will give an analog output of 20mA.

1. First set the "Select Concentration Unit" and "Select Humidity Unit" to **ppm** in the **Gas Monitor** Branch of the Set-Up Tree (Press **SET-UP-Gas Monitor-Configuration-Units**) now select the units.

2. In the Analog/Relay Branch Select the analog units to **4-20mA/ppm**, by following the Set-Up Tree (Press **SET-UP-Analog/Relay-Analog**-Select Analog Units).

Now enter the **limits** for the analog output and relays by following the **Analog/Relay** – Relay Branch to the next level in the Set-Up Tree:

Enter 5.00E00 for the *Gas A Analog Minimum Concentration*

Enter 20.00E00 for the *Gas A Analog Maximum Concentration*

Enter 0E00 for the *Gas B Analog Minimum Concentration*

Enter 150E00 for the *Gas B Analog Maximum Concentration*

Enter 0E00 for the *Gas W Analog Minimum Concentration*
Enter 25E03 for the *Gas W Analog Maximum Concentration*

To set-up of the Relay High alarm limit 1 and limit 2 follow the Set-Up Tree: (Press Set-up-Gas Monitor-Filters)

➤ Select Filter A

Enter 10 ppm for the *Gas A High Alarm Limit 1*

Enter 15 ppm for the *Gas A High Alarm Limit 2*

Filter A is now set

➤ Select filter B

Enter 75 ppm for the *Gas B High Alarm Limit 1*

Enter 125 ppm for the *Gas B High Alarm Limit 2*

Filter B is now set.

➤ Select filter W

Enter 10000 ppm for the *Gas W High Alarm Limit 1* Enter
20000 ppm for the *Gas W High Alarm Limit 2*

Filter W is now set and the UA1373A/ is ready for use.

4.2.2 Limits set-up Channel Mode:

Before setting up the Relay output in Channel Mode please verify/or set-up Alarm limits in the Gas Monitor Branch of the Set-Up Tree: (Press Set-up-Gas Monitor-Configuration-Filters) to set-up the Alarm limits to be used . In Channel Mode You have to Select Either Alarm Limit 1 or 2 .

To Set-up of the Relay High alarm limit 1 or alarm limit 2 follow the Set-Up Tree: (Press **SET-UP-Gas Monitor-Configuration-Filters**)

➤ Select Filter A

Enter 10 ppm for the *Gas A High Alarm Limit 1*

Enter 15 ppm for the *Gas A High Alarm Limit 2*

Filter A is now set

➤ Select filter B

Enter 75 ppm for the *Gas B High Alarm Limit 1*

Enter 125 ppm for the *Gas B High Alarm Limit 2*

Filter B is now set.

➤ Select filter W

Enter 10000 ppm for the *Gas W High Alarm Limit 1*

Enter 20000 ppm or the *Gas W High Alarm Limit 2*

To set-up the Analog/Relay Output in Channel Mode follow the Set-Up Tree: (Press **SET-UP-Analog/Relay-Select Relay Output Mode-Channel Mode**). The number of Channels is dependent on the Type 1409: 1409-06 (6 Channels), 1409-12 (12 Channels) and 1409-24 (24 Channels).

Check and/or Change set-up for Channel 1

Now select if Channel 1 is to be changed:

If NO

You will be directed to Channel 2.

If YES:

Select the Number for the Relay for Channel 1 after that the Alarm limit H (High Alarm Limit 1) or HH (High alarm Limit 2) for this Relay. Any Gas with an H or HH alarm limit set in the Gas Monitor will ticker the Alarm if exceeded.

Repeat for the remaining Channels.

4.3 Analog output Channel Information

The Analog output for the Channel information is with fixed scale. The scale depends on the selected Gas Concentration Unit set-up (see [section 4.1](#)).

Using 0-10V the Channel information is:

0.4 V per Channel

Using 4-20 mA or 0-20 mA the Channel information is:

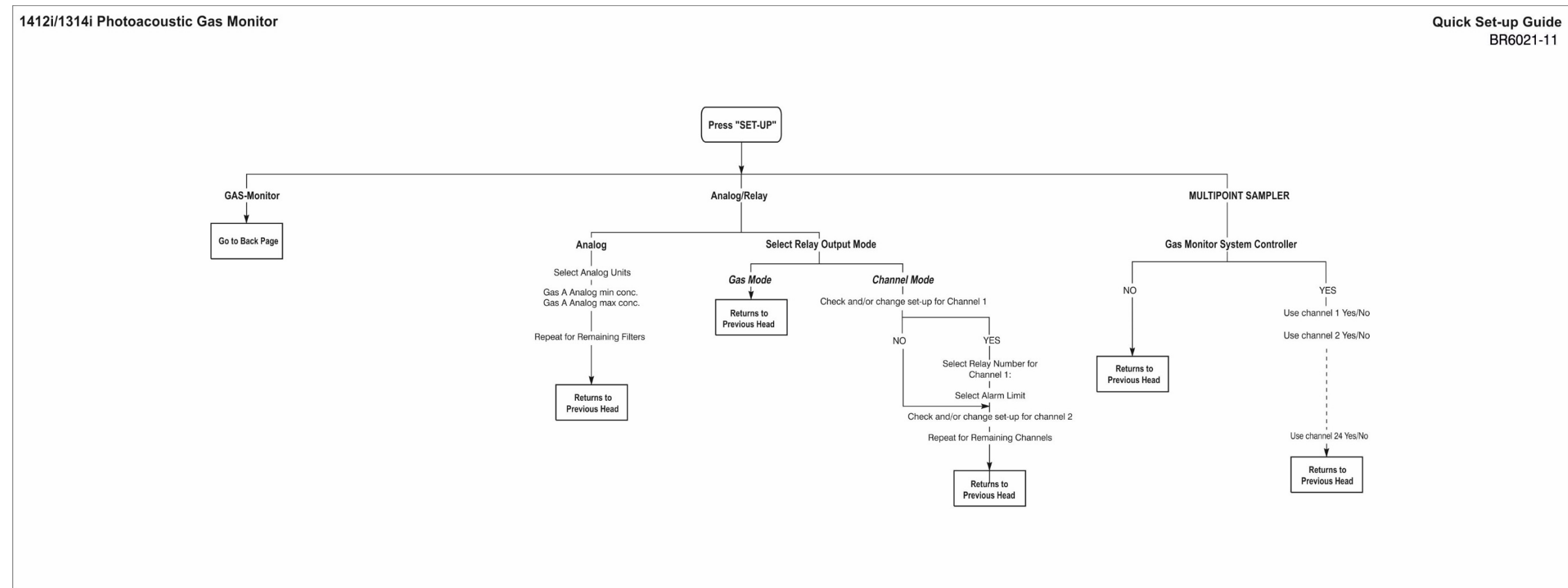
0.6 mA per Channel

For further information, see the Table below.

Analog output scaling Channel Information

Multiplexer Channel no.	V output (0-10 V)	mA output (4-20 mA)	mA output (0-20 mA)
0	0	4	0
1	0.4	4.6	0.6
2	0.8	5.2	1.2
3	1.2	5.8	1.8
4	1.6	6.4	2.4
5	2	7	3
6	2.4	7.6	3.6
7	2.8	8.2	4.2
8	3.2	8.8	4.8
9	3.6	9.4	5.4
10	4	10	6
11	4.4	10.6	6.6
12	4.8	11.2	7.2
13	5.2	11.8	7.8
14	5.6	12.4	8.4
15	6	13	9
16	6.4	13.6	9.6
17	6.8	14.2	10.2
18	7.2	14.8	10.8
19	7.6	15.4	11.4
20	8	16	12
21	8.4	16.6	12.6
22	8.8	17.2	13.2
23	9.2	17.8	13.8
24	9.6	18.4	14.4

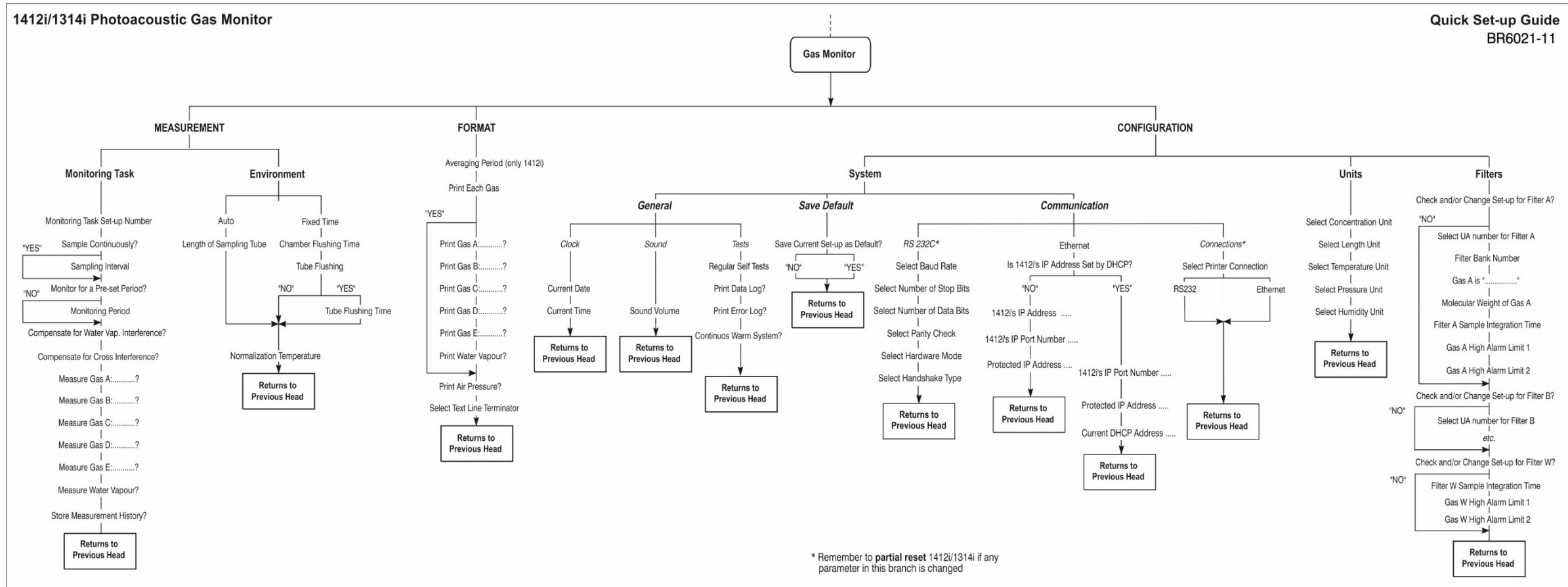
Figure 1. Set-up tree

**Please Note:**

The Analog/Relay branch is only available when a UA1373 Analog/Relay Module is installed in a Type 1314i.

The Multipoint Sampler branch is only available if a Type 1409 is attached to a Gas Monitor (Type 1412i, 3434i, or 1314i)

The Channel Mode in the Relay Output Mode is only available if a Multipoint Sampler is connected via the USB Host.



5.0 Cable connection:

5.1 Analog output connector.

Analog output connector.		
D-sub pin No.	Description	
32	R13 COMMON	Error/Warning Detected # Background information in display
33	R13 NO	
34	R13 NC	
35	R14 COMMON	Watch Dog detected # Background information in display
36	R14 NO	
37	R14 NC	
20	Analog GND	Filter A
21	CO1	
22	Analog GND	Filter B
23	CO2	
24	Analog GND	Filter C
25	CO3	
26	Analog GND	Filter D
27	CO4	
28	Analog GND	Filter E
29	CO5	
30	Analog GND	Filter W
31	CO6	
1	Analog GND	Filter A
2	VO1	
3	Analog GND	Filter B
4	VO2	
5	Analog GND	Filter C
6	VO3	
7	Analog GND	Filter D
8	VO4	
9	Analog GND	Filter E
10	VO5	
11	Analog GND	Filter W
12	VO6	
13	CO7	Channel Information
14	Analog GND	
15	VO7	
16	CO8	Barometric Pressure
17	Analog GND	
18	VO8	

5.2 Relay output connector Gas Mode.

Relay output connector Gas Mode.		
D-sub pin No.	Description	
1	R1 COMMON	Filter A limit 1
2	R1 NO	
3	R1 NC	
4	R2 COMMON	Filter A limit 2
5	R2 NO	
6	R2 NC	
7	R3 COMMON	Filter B limit 1
8	R3 NO	
9	R3 NC	
10	R4 COMMON	Filter B limit 2
11	R4 NO	
12	R4 NC	
13	R5 COMMON	Filter C limit 1
14	R5 NO	
15	R5 NC	
16	R6 COMMON	Filter C limit 2
17	R6 NO	
18	R6 NC	
19	Not used	Not used
20	R7 COMMON	Filter D limit 1
21	R7 NO	
22	R7 NC	
23	R8 COMMON	Filter D limit 2
24	R8 NO	
25	R8 NC	
26	R9 COMMON	Filter E limit 1
27	R9 NO	
28	R9 NC	
29	R10 COMMON	Filter E limit 2
30	R10 NO	
31	R10 NC	
32	R11 COMMON	Filter W limit 1
33	R11 NO	
34	R11 NC	
35	R12 COMMON	Filter W limit 2
36	R12 NO	
37	R12 NC	

VO: Voltage output.
CO: Current output.
NO: Normally opened
NC: Normally closed.

The behaviour of the 12 relays will then be according to the following table (for the Gas Mode):

Gas	Relay	Alarm Limit
A	1	1
A	2	2
B	3	1
B	4	2
C	5	1
C	6	2
D	7	1
D	8	2
E	9	1
E	10	2
W	11	1
W	12	2

5.3 Relay output connector Channel Mode.

In **Channel Mode** the Channel-Relay-Alarm Limits are to be correlated. Number of Channels is dependent on the Type 1409 can be from 6 to 24 Channels.

For each Channel, a Relay can be selected or it can be set to **None** Meaning no relay will be ticked. For the selected Channel relay combination it is then to be determined if the Alarm limit 1 or Alarm limit 2 is to be used. Be aware that any Gas in the Gas Monitor set-up with a 1 or 2 alarm limit set will ticker the alarm relay.

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