

# TECHNICAL NOTE

## The Advantages of an RGA with Analog Outputs

Residual Gas Analyzers (RGAs) have been used in vacuum research applications for 25 years. Their role has changed in the last 10 years as they have moved from purely a research instrument to a production tool. As a production tool, the RGA can increase productivity, improve product yield, increase throughput, and reduce costs, all of which ultimately increases profits.

However, it is up to the user to determine how the tool can best meet the needs of a specific application. This Tech Note is concerned with the various advantages and uses of Analog Outputs for an RGA.

### HOW AN RGA WITH ANALOG OUTPUTS IS USED

Analog Outputs provide the user with a means to obtain signals proportional to amplitude information on four selected peak channels. A 0 to +10 volt signal (can also be configured for 0 - 5 volts) is provided for each of these measurement channels. Analog Outputs are typically used by two groups of people. One group is normally in the research market. In this case, the user already has other devices, such as ion gauges, power supplies, and mass flow controllers, that send analog signals to a PLC or other data collection device used for analysis and control. Analog Outputs allow the user to quickly and easily integrate the sensor with other devices.

The second group of users want to implement an RGA as a partial pressure controller. These people will use the analog signals to help control devices, such as

valves or mass flow controllers, in order to regulate gas pressure of a particular species. Examples of processes where partial pressure controllers are used include reactive sputtering and reactive evaporation.

### ANALOG OUTPUT OPTION FOR TRANSPECTOR® 2 FAMILY OF RGAs

The Analog Output accessory provides four external connections which carry voltage that varies in proportion to the abundance of the specified ions. They are set up within the TWare32™ software and are configurable by the user. (Figure 1) The setup screen shows how the first four masses that are entered into the selected peaks window of the software are chosen and how any or all of these masses can be enabled. The screen also allows the user to set a minimum and maximum level of output so that the greatest dynamic range of data can be seen. The minimum output column specifies the ion current which corresponds to 0 Volts. The maximum output column specifies the ion current which can be adjusted by jumpers to values of 5 volts and 10 volts (default). If a channel is not enabled or analog outputs are not used, then the output value is zero. The span resolution of the Analog Output is always 12 bits.

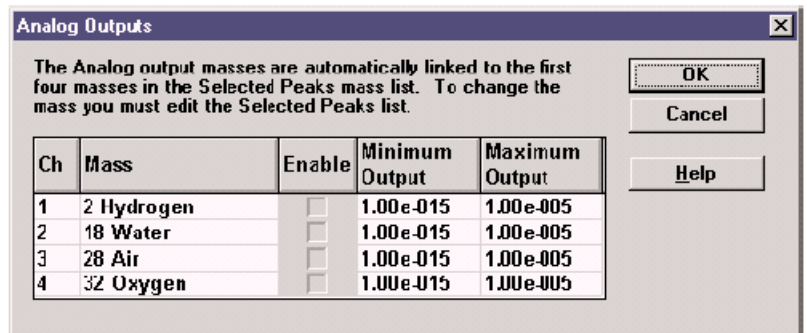


Figure: 1

Additionally, the Analog Output has a normally open status relay that is closed whenever the Analog Output is updating. This status relay also controls an LED visible on the rear of the unit. This relay and LED provide the user with information concerning the validity of the analog signal.

The Analog Output add-on feature is available for Transpector XPR 3, Preclude™, and Transpector 2. The Analog Output option for the above mentioned sensor models can be

retrofitted in the field or in the factory, depending on the date of manufacture. If “Analog Outputs” is installed, then an additional connector will appear above the RS-232 connector. Table 1 shows the pin-outs for the Analog Output Connector.

Analog Outputs is a useful option for the many groups of users that desire analog data, and is available for the Transpector® 2 family of RGAs.

### Pin-Outs for the Analog Output Connector

Pin #	Signal Name	Pin #	Signal Name
1	Channel 1 Output	9	Ground Reference
2	Channel 2 Output	10	Ground Reference
3	Channel 3 Output	11	Ground Reference
4	Channel 4 Output	12	Ground Reference
5	Unused	13	Unused
6	Status Relay Common	14	Unused
7	Status Relay (NO)	15	Cable Shield
8	Unused		

Table 1

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