Tech Note

TCA-485
A New Approach to a Platform Independent RS-485 Controller

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 increase 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 an independent RS-485 network platform for the operation of multiple Transpector® RGAs.

How an RGA is Used

Many production vacuum systems, especially those used within semiconductor equipment, are made up of multiple chambers. These "cluster tools" utilize separate RGAs for each of the chambers, typically 4-6 instruments, but it is impractical and wasteful to have individual computers for each sensor. It is therefore necessary to use a communications BUS, like RS-485, to communicate at the same time with all RGAs on the tool. RS-485 communications normally require a board to be added to the controlling PC. This limits the use of a laptop computer to only one sensor at a time. Additionally, some mainstream users are switching from the Microsoft® Windows™ 95/98 operating system to Microsoft NT, which will not operate with 16 bit application software. The TCA-485 is a new dependable and universal hardware solution that will work with 32 bit applications software and not be restricted by the limitations of the controlling PC.

TCA-485 Hardware

The TCA-485 has two 9 pin D-Sub connectors at each end. One connector will attach via a 9-pin female to female cable, to the desktop, or laptop RS-232 port. The other connector on the TCA-485 will connect directly to the RS-485 cable on the Transpector. Figure 1 shows a typical set of system connections. The TCA-485 is powered by an external 12 volt power supply. This power source is a wall-mountable transformer type. A picture of the new RS-232 to RS-485 converter is shown in Figure 2.

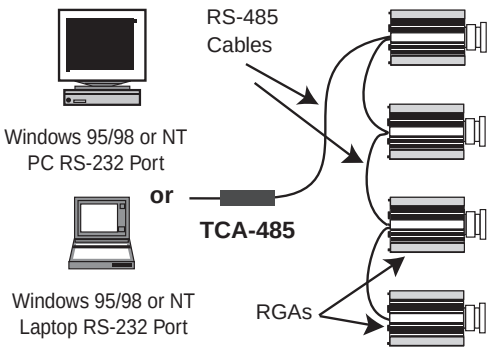

Figure 1: TCA-485 System Configuration

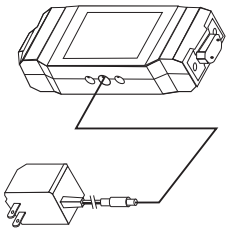

Figure 2: TCA-485

TCA-485 Requirements and Use

Once all the connections have been made the communications are seamless. The only other requirements are that the computer must be operating on Windows 95 and later or Windows NT 4.0 and later. The user must also be running TWare 32, version 1.0 or later to control the Transpector RGAs. Additionally, the TCA-485 can be used with an Inficon 32 bit DDE Driver (Dynamic Data Exchange). The TCA-485 will not operate with TranspectorWare™ software.

The Advantages of the TCA-485

- Hardware multiplexing solution that minimizes CPU time
- Independent of PC interrupts, addresses and other hardware issues
- Multiplexing capability with notebook and laptop computers
- No computer slots required
- No computer disassembly required for board installation

TCA-485 Specifications

Power requirement	12 v DC, +/- 30% @ 1 watt
Power input	External transformer (supplied)
Baud range (KB)	460.8, 230.4, 115.2, 76.8, 57.6, 38.4, 19.2, 9.6
Default baud rate	57.6 KB
Indicators	Two green LEDs (Power and Transmit)
Multiplexing capability	Up to 31 Transpectors
Cable length	Maximum 1200 foot (~360 meters)
PC communications required	Standard RS-232 serial communications port
Transpector communications required	RS-485 cables daisy chained as normal

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