**OMEGABUS® Digital Transmitters**

The D1000 and D2000 Series digital transmitters are a complete family of easy to use interface modules for personal computers and other processor based equipment with standard serial I/O ports. The modules convert analog input signals to engineering units and transmit, in ASCII format, to any host computer with a standard RS-232C or RS-485 port. This modular design enables anyone familiar with a personal computer to construct a flexible and cost effective data acquisition system.

These modules can measure temperature, pressure, flow, voltages, currents and various types of digital signals. The D1000 series provide direct interface to a wide variety of sensors and perform all signal conditioning, scaling, linearization and conversion to engineering units. Each module also provides digital I/O lines for controlling devices through solid state relays or TTL signals. These digital I/O lines along with integral limit setting capability provide alarm and control outputs. With the exception of the D1400 RTD and D1500 bridge modules, every D1000 module contains an on-board event counter. The event counter will count up to ten million transitions on the digital input line.

All user selectable options (address, baud rate, alarms, etc.) are done through the communications port and stored in nonvolatile memory thereby eliminating switches or external adjustments of any kind.

The flexibility of this system allows users to mix and match the modules to fit their exact requirements. As many as 124 modules can be connected on one 4 wire cable. They can be placed remote from the host computer and from each other.

The D2000 series of user-programmable data acquisition and control modules allow direct interface of non-linear analog sensors to computers with serial I/O ports.
D1000 and D2000 Modules are Easily Arranged in Multidrop Fashion for Multiple Inputs

Use of these modules enables downloading up to 23 breakpoints through the communications port. With these breakpoints the user can program a module to virtually any transfer function.

The ability to provide an arbitrary user programmable nonlinear transfer function is the most powerful feature of the D2000 series. Use this feature to linearize non-standard sensors or to provide outputs in engineering units, which are nonlinear to the input. The D2000 series can be programmed to approximate square law, root, log, high-order polynomial or any other non-linear function.

The D2000 may also be empirically field-programmed when the exact transfer function is unknown.

If transmitting long distances is required, selection of the RS-485 communications format is encouraged. This permits remote operation of up to four thousand feet from the host computer. For computers which do not include a RS-485 port, OMEGA offers the A1000 RS-232C signal converter.

The modules are also capable of operating in a multidrop fashion supporting up to 32 units one one cable set. The A1000 may also be used as a repeater to allow as many as 124 modules to be joined together. A utility software package (for IBM PC or compatibles) is also available. This software eliminates the need for programming skills to easily communicate with the modules. This software package is available upon request at no charge. Request model D1000-SW, for D1000, D2000, D3000 and D4000 models. (One per order).

All modules are supplied with screw terminal plug connectors and captive mounting hardware. Their encapsulated design allows for mounting in virtually any location including explosion proof housings and DIN rails.
Input Modules
For Virtually Any Process Monitoring Application

Common Specifications
ANALOG
✓ Single channel analog input
✓ Analog Input isolation to 500 VRMS
✓ 15-bit measurement resolution
✓ 2 samples/sec throughout
✓ Autozero & autocalibration

DIGITAL
✓ 8-bit CMOS microcomputer

COMMUNICATIONS
✓ RS-232C, RS-485
✓ Up to 124 multidrop modules per communications port
✓ ASCII Format command/response protocol
✓ Can be used with ‘dumb’ terminal
✓ Parity options: odd, even, none
✓ All communications setups stored in memory
✓ Checksum can be added to any command or response
✓ User selectable channel address
✓ Selectable baud rates: 300, 600, 1200, 2400, 4800, 9600, 19.2 K, 38.4 K

Power Requirements: 10 to 30 Vdc, 0.75 W max
Case: ABS with captive mounting hardware
Connectors: Screw terminal plug (supplied)
TEMPERATURE RANGE
Operating: -25 to 70°C
Storage: -25 to 85°C
Relative Humidity: 0 to 95% noncondensing

Specifications for Specific Modules
D1100/D2100 VOLTAGE INPUT MODULES
Voltage Ranges: ±10 mV, ±100 mV, ±1V, ±5 V, ±10 Vdc, ±100 Vdc
Resolution: 0.01% of FS (4 digits)
Accuracy: ±0.02% of FS max
Zero Drift: ±1 count max (auto zero)
Span Tempco: ±50 ppm/°C max
Input Burnout Protection: 250 Vac
Input Impedance: 1 MΩ min (> ±5V input), 100MΩ min (< ±1V input)
1 Digital Input/Event Counter, 2 Digital Outputs

D1200/D2200 CURRENT INPUT MODULES
Current Ranges: ±1 mA, ±10 mA
±100 mA, ±1A, ±20 mA dc
Resolution: 0.01% of FS (4 digits), 0.04% of FS (4-20 mA)
Accuracy: ±0.02% of FS, 0.04% of FS (4-20 mA)
Zero Drift: ±1 count max. (autozero)
Span Tempco: ±80 ppm/°C max
Voltage Drop: ±0.1V max
1 Digital Input/Event Counter, 2 Digital Outputs

D1300 THERMOCOUPLE INPUT MODULES
✓ Open thermocouple indication
✓ Input burnout protection to 250 Vac
✓ User selectable °C or °F
✓ Overrange indication
✓ Automatic cold junction compensation and linearization
Thermocouple Types: J, K, T, E, R, S, B, C
RANGES:
J = -200 to 760°C;
K = -150 to 1250°C;
T = -200 to 400°C;
E = -100 to 1000°C;
B = 0 to 1820°C;
S = 0 to 1750°C;
R = 0 to 1750°C;
C = 0 to 2315°C
Resolution: ±1.0°
Overall Accuracy From 0 to +40°C
Ambient: ±1.0°C max (J, K, T, E), ±2.5°C max (R, S, B, C)
Input Impedance: 100 MΩ min.
Lead Resistance Effect: <20µ V per 350Ω
2 Digital Inputs, Event Counter, 3 Digital Outputs

D1400 RTD INPUT MODULE
✓ Input protection to 120 Vac
✓ Automatic linearization and lead compensation
✓ User selectable °C or °F

D1500 Bridge Input Modules are ideally suited for most load cells. See OMEGA’s Pressure, Strain and Force Handbook for a complete line of load cells.

RTD Types: α = .00385, .00392, 100 Ω @ 0°C
Ranges: .00385 = -200 to 850°C; .00392 = -200 to 600°C
Resolution: 0.1°
Accuracy: ±0.3°C
Input Connections: 2, 3, or 4 wire
Excitation Current: 0.25 mA
Lead resistance effect: 3 wire – 2.5°C per Ω of unbalance; 4 wire – negligible
Max Lead Resistance: 50Ω

Shown in Multidrop Fashion
1 Digital Output
D1450 THERMISTOR INPUT
Range: 0 to 100°C
Thermistor Type: 2252Ω
Accuracy: ±0.2°C
Resolution: 0.01°C/F
Input Protection: 30 Vdc

1 Digital Input/Event Counter,
2 Digital Outputs

D1500/2500 BRIDGE INPUT MODULE
Range: ±30, ±100 mV, 1 to 6 Vdc
Accuracy: ±0.05% of FS max
Resolution: 10 µV (mV spans), 0.02% FS (V span)
Common Mode Rejection: 100 dB at 50/60 Hz
Input Protection: 30 Vdc
Excitation Voltage: 10 V, 5 Vdc

1 Digital Output
D1600/D2600 TIMER AND FREQUENCY INPUT MODULES
The D1600 module has two modes: frequency input with output data in hertz, or timer input with output data in seconds
Input impedance: 1 MΩ
Switching Level: Selectable 0V, 2.5V
Hysteresis: adjustable 10 mV to 1.0V
Input Protection: 250 Vac
1 Digital Input/Event Counters
FREQUENCY INPUT
Range: 1 Hz to 20 kHz
Accuracy: ±0.01% of reading, ±0.01 Hz
Resolution: 0.005% of reading, 0.01 Hz
Resolution: 0.01% (4 digits)
Tempco: ±20 ppm/°C
TIMER INPUT
Range: 100 µs to 30 s
Resolution: 0.005% of reading +10 µs
Accuracy: ±0.01% of reading ±10 µs
EVENT COUNTER
Input Bandwidth: 60 Hz, (optional 20 kHz max)
Up to 10 million positive transitions

D1700 DIGITAL INPUTS/OUTPUTS MODULE
D1711, D1712: 15 digital input/output bits, user can define any bit as an input or an output
Input Voltage Levels: 0 to 30V without damage
Input Switching Levels: High, 3.5V min., Low, 1.0V max
Outputs: Open collector to 30V, 100 mA max load
Vsat: 1.0V max @ 100 mA

D1701, D1702: 7 DIGITAL INPUTS AND 8 DIGITAL OUTPUTS
Input Voltage Levels: ±30V without damage
Input Switching Levels: high, 3.5V min, low, 1.0V max

Outputs: Open collector to 30V, 30 mA max load
Vsat: 0.2V max @ 30 mA
Internal pull up resistors for direct switch input
Inputs/Outputs are read/set in parallel

Voltage, current and bridge input modules are readily interfaced to most pressure transducers. See OMEGA’s Pressure, Strain and Force Handbook for a complete line of pressure transducers.
### OMEGABUS® Digital Transmitters

#### D1000 and D2000 Models

**D2000 Series Transmitter Modules**

<table>
<thead>
<tr>
<th>To Order</th>
<th>Voltage Inputs</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS232C Output</td>
<td>RS485 Output</td>
<td>Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS232C Output</td>
<td>RS485 Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2111</td>
<td>D2112</td>
<td>100 mV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2121</td>
<td>D2122</td>
<td>1 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2131</td>
<td>D2132</td>
<td>5 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2141</td>
<td>D2142</td>
<td>10 V</td>
<td></td>
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</tr>
</tbody>
</table>

**Pulse and Frequency Inputs**

<table>
<thead>
<tr>
<th>RS232C Output</th>
<th>RS485 Output</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2601</td>
<td>D2602</td>
<td>Frequency</td>
</tr>
<tr>
<td>D2611</td>
<td>D2612</td>
<td>Pulse</td>
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</tbody>
</table>

**Current Inputs**

<table>
<thead>
<tr>
<th>RS232C Output</th>
<th>RS485 Output</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2221</td>
<td>D2222</td>
<td>1 mA</td>
</tr>
<tr>
<td>D2211</td>
<td>D2212</td>
<td>10 mA</td>
</tr>
<tr>
<td>D2231</td>
<td>D2232</td>
<td>100 mA</td>
</tr>
<tr>
<td>D2241</td>
<td>D2242</td>
<td>1 A</td>
</tr>
<tr>
<td>D2251</td>
<td>D2252</td>
<td>4 to 20 mA</td>
</tr>
</tbody>
</table>

**Bridge Inputs**

<table>
<thead>
<tr>
<th>RS232C Output</th>
<th>RS485 Output</th>
<th>Input</th>
<th>Excitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2511</td>
<td>D2512</td>
<td>30 mV</td>
<td>5 V</td>
</tr>
<tr>
<td>D2521</td>
<td>D2522</td>
<td>30 mV</td>
<td>10 V</td>
</tr>
<tr>
<td>D2531</td>
<td>D2532</td>
<td>100 mV</td>
<td>5 V</td>
</tr>
<tr>
<td>D2541</td>
<td>D2542</td>
<td>100 mV</td>
<td>10 V</td>
</tr>
</tbody>
</table>

**OMEGACARE** extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE covers parts, labor and equivalent loaners.