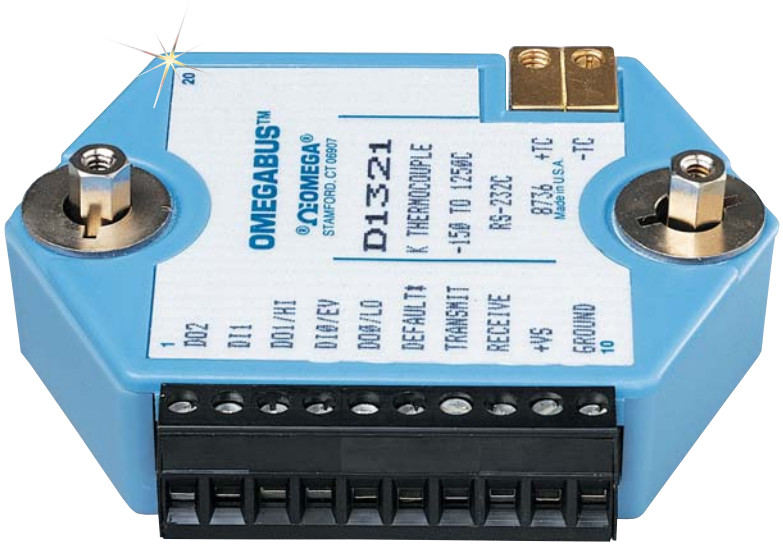
D1000 and D2000 OMEGABUS® Digital Transmitters

$250
Basic Unit

MADE IN USA | 1 YEAR WARRANTY | OMEGA CARE Extended Warranty Program

- **Complete Sensor To RS-232C or RS-485 Interface**
- **Input Modules for Thermocouples, RTDs, Voltages, Currents, Pulse and Frequency, and Bridge Inputs**
- **Isolated Inputs**
- **RS-485 Format Permits Remote Communications Up to Four Thousand Feet**
- **D2000 Series Provide Linearization of Non-Standard Sensors**
- **Connect Up To 32 Modules On One Cable, Up to 124 Using a Repeater**
- **Alarm Outputs Standard**
- **Continuous Self Calibration, No Adjustment Requirements**



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 polynominal 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

Shown in Multidrop Fashion

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 V 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, ±1 V, ±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: ±50ppm/°C max.
Input Burnout Protection: 250 V ac
Input Impedance: 1 MΩ min (≥ ±5 V 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, 4 to 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: ±0.1 V 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
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 0 V, +2.5 V
Hysteresis: adjustable 10 mV to 1.0 V
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 30 V without damage
Input Switching Levels: High, 3.5 V min., Low, 1.0 V max.
Outputs: open collector to 30 V, 100 mA max. load
Vsat: 1.0 V max. @ 100 mA

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.

D1701, D1702: 7 DIGITAL INPUTS AND 8 DIGITAL OUTPUTS

Input Voltage Levels: ±30 V without damage
Input Switching Levels: high, 3.5 V min., low, 1.0 V max.
Outputs: open collector to 30 V, 30 mA max. load
Vsat: 0.2 V max. @ 30 mA
Internal pull up resistors for direct switch input
Inputs/Outputs are read/set in parallel

MOST POPULAR MODELS HIGHLIGHTED

Digital Inputs/Outputs			
RS-232 Output	RS-485 Output	Price	Description
D1701	D1702	$275	7 Digital in, 8 digital out
D1711	D1712	275	15 Digital in/out

Frequency, Time and Event Inputs			
RS-232 Output	RS-485 Output	Price	Description
D1601	D1602	$250	Frequency input
D1611	D1612	250	Timer input
D1621	D1622	200	Event counter

Voltage Inputs			
RS-232C Output	RS-485 Output	Price	Input
D1101	D1102	$250	10 mV
D1111	D1112	250	100 mV
D1121	D1122	250	1 V
D1131	D1132	250	5 V
D1141	D1142	250	10 V
D1151	D1152	250	100 V

Current Inputs			
RS-232C Output	RS-485 Output	Price	Input
D1211	D1212	$250	10 mA
D1221	D1222	250	1 mA
D1231	D1232	250	100 mA
D1241	D1242	250	1 A
D1251	D1252	250	4 to 20 mA

Thermocouple Inputs			
RS-232C Output	RS-485 Output	Price	Input
D1311	D1312	$325	J
D1321	D1322	325	K
D1331	D1332	325	T
D1341	D1342	325	E
D1351	D1352	325	R
D1361	D1362	325	S
D1371	D1372	325	B
D1381	D1382	325	C

RTD Inputs			
RS-232C Output	RS-485 Output	Price	Input Curve
D1411	D1412	$325	0.00385
D1421	D1422	325	0.00392

Thermistor Inputs			
RS-232C Output	RS-485 Output	Price	Description
D1451	D1452	$250	2252 ohm thermistor

Bridge Inputs				
RS-232C Output	RS-485 Output	Price	Input	Excitation
D1511	D1512	$325	30 mV	5 V
D1521	D1522	325	30 mV	10 V
D1531	D1532	325	100 mV	5 V
D1541	D1542	325	100 mV	10 V
D1561	D1562	325	1 to 6 V	10 V

Each unit is supplied with a CD ROM that includes a complete operator's manual and Windows setup software.

D1000 Series digital transmitters are also available with Modbus RTU protocol. To order transmitters Modbus RTU protocol, add suffix "M" at the end of the model number, no additional charge

***Ordering Example: D1311** type J thermocouple input RS-232C output digital transmitter and **OMEGACARE**℠ 1-year extended warranty for **D1311** (adds 1 year to standard 1-year warranty), $325 + 33 = **$358**.*

OMEGABUS® Digital Transmitters

D1000 and D2000 Models

MOST POPULAR MODELS HIGHLIGHTED

Shown in Multidrop Fashion

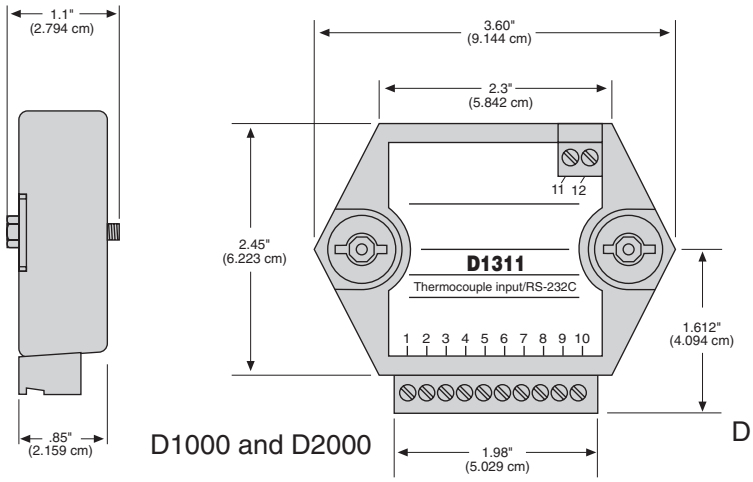
D2000 Series Transmitter Modules

To Order *(Specify Model Number)*			
Voltage Inputs			
RS-232C Output	**RS-485 Output**	**Price**	**Input**
D2111	**D2112**	**$275**	100 mV
D2121	**D2122**	**275**	1 V
D2131	**D2132**	**275**	5 V
D2141	**D2142**	**275**	10 V

Pulse and Frequency Inputs			
RS-232C Output	**RS-485 Output**	**Price**	**Input**
D2601	**D2602**	**$275**	Frequency
D2611	**D2612**	**275**	Pulse

Current Inputs			
RS-232C Output	**RS-485 Output**	**Price**	**Input**
D2221	**D2222**	**$275**	1 mA
D2211	**D2212**	**275**	10 mA
D2231	**D2232**	**275**	100 mA
D2241	**D2242**	**275**	1 A
D2251	**D2252**	**275**	4 to 20 mA

Bridge Inputs				
RS-232C Output	**RS-485 Output**	**Price**	**Input**	**Excitation**
D2511	**D2512**	**$350**	30 mV	5 V
D2521	**D2522**	**350**	30 mV	10 V
D2531	**D2532**	**350**	100 mV	5 V
D2541	**D2542**	**350**	100 mV	10 V



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