OMEGA®
An OMEGA Technologies Company

Digital Transmitters and Acquisition Software
D1000 and D2000 OMEGABUS® System

Basic Unit
$250

- ☑ Complete Sensor To RS-232C or RS-485 Interface
- ☑ Input Modules for Thermocouples, RTDs, Voltages, Currents, Pulse and Frequency, and Bridge 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 Set; 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 based on 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 1000 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

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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-standard analog sensors to computers with serial I/O ports. 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 functions of the input. The 2000 Series can be programmed to approximate square law, root, log, high-order polynominal or any other non-linear function. The 2000 may also be empirically field-programmed when the exact transfer function is unknown.

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.

COMMON SPECIFICATIONS
Analog
- ☑ Single channel analog input
- ☑ Analog Input isolation to 500 RMS
- ☑ 15-bit measurement resolution
- ☑ 2 samples/sec throughout
- ☑ Auto zero

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, 19.2K, 38.4K

Power Requirements: +10 V to +30 Vdc, 0.75 W max.
Dimensions: 9.1 x 6.2 x 2.2 cm (3.6" x 2.45" x 0.85")
Case: ABS with captive mounting hardware
Connectors: Screw terminal plug (supplied)
Temperature Range: Operating: 0 to +70°C
Storage: -25 to 85°C
Relative Humidity: 0 to 95% noncondensing

SPECIFICATIONS FOR SPECIFIC MODULES
D1100 Voltage Input Modules
Voltage ranges: ±100 mV, ±1 V, ±5 V, ±10 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 to 250 V ac
Input impedance: 10 MΩ min.
1 Digital Input/Event Counter; 2 Digital Outputs
Voltage drop: ±0.1 V max.
D1200 Current Input Modules
Current ranges: ±10 mA, ±100 mA, ±1A, 4-20 mA dc
Resolution: 0.01% of FS (4 digits)
Accuracy: ±0.02% of FS
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
- ☑ User selectable °C or °F
- ☑ Overrange indication
- ☑ Automatic cold junction compensation and linearization

See Reverse Side for Additional Information Information.

Thermocouple types: J, K, T, E, R, S, B, C
Ranges:

J = -200 to 760°C	B = 0 to 1820°C
K = -150 to 1250°C	S = 0 to 1750°C
T = -200 to 400°C	R = 0 to 1750°C
E = -100 to 1000°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: 1000MΩ 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
RTD Types: α = .00385, .00390, 100Ω @ 0°C
Ranges: .00385 = -200 to 850°C; .00390 = -200 to 600°C
Resolution: 0.1°
Accuracy: ±0.3°C
Input Connections: 2, 3,or 4 wire
1 Digital Output
Lead resistance effect: 3 wire –2.5°C per Ω of unbalance; 4 wire – negligible
Max. lead resistance: 50Ω

D1500 Bridge Input Module
☑ ±30 and ±100 mV spans
Accuracy: ±0.05% max.
Common mode rejection: 100 dB at 50/60 Hz
Excitation Voltage: 10 V, 5 Vdc
1 Digital Output
D1600 Pulse and Frequency Input Modules
The D1600 module has two modes: frquency input with output data in hertz, or pulse input with output data in seconds.
Input impedance: 100KΩ
Switching level: selectable 0 V, +2.5 V
Hysteresis: Adjustable 10 mV - 1.0 V
Input Protection: 250 Vac
Frequency Input
Range: 5 Hz to 20 KHz
Accuracy: 0.01% ±5μs
Resolution: 0.01% ±5μs
Resolution: 0.01% (4 digits)
Tempco: ±20 ppm/°C
Accuracy: ±0.02%

D1450 Thermistor Input
Range: 0 to 100°C
Tempco: ±20 ppm/°C
Timer Input:
Accuracy: ±0.2°C
Range: 100μs to 30s
Resolution: 0.01°C/°F

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: 0-30 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
D1701, D1702: 7 digital inputs and 8 digital outputs
☑ Input voltage levels: ±30V 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
Event Counter
☑ Input Bandwidth: 60 Hz, (optional 20 KHz max.)
☑ Up to 10 million positive transitions

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**	0.00390

Thermistor Inputs

RS-232C Output	RS-485 Output	Price	Description
D1411	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
D1511	D1552	**325**	0-6 V	8 V
D1561	D1562	**325**	0-6 V	10 V

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	**250**	Event counter

Voltage Inputs

RS-232C Output	RS-485 Output	Price	Input
D1111	D1112	**$250**	100 mV
D1121	D1122	**250**	1 V
D1131	D1132	**250**	5 V
D1141	D1142	**250**	10 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**	4-20 mA

To Order *(Specify Model Number)*

D2000 Series Transmitter Modules

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

Voltage Inputs

RS-232C Output	RS-485 Output	Price	Input
D2221	**D2222**	**$275**	10 mA
D2231	**D2232**	**275**	1 mA
D2241	**D2242**	**275**	5 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

Voltage Inputs

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

D1000 and D2000

D1700 Models