



## BBG-2003E/O-VME Universal Conversion Engine

### Description



The Universal Conversion Engine is a stand-alone unit, which provides data format conversion of digital, analog, serial, step, synchro, and resolver signals.

This 19-inch rack mount system is factory configurable to customer requirements for easy field installation.

An onboard microcontroller controls the processing of these signals to provide conversions to user requested outputs.

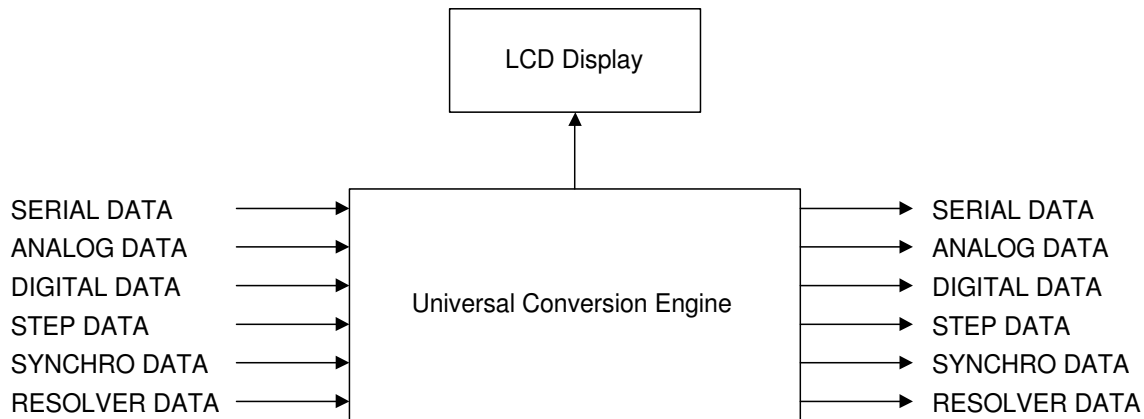
### Applications

- Radar Systems (antenna azimuth)
- Navigation Systems (gyrocompass, speedlog, course, pitch, and roll)
- Industrial Processes (position, velocity)
- Meteorology Instruments (wind speed and direction)
- Many Others

### Features

- NEMA-0183 Compatible
- Optional LCD Display
- 90V, 11.8V Synchro, 6.8V resolver
- 6 and 12 STEP/DEGREE
- RS-232, RS-422, RS-423, RS-485, MIL-STD-188C Protocols
- Custom Serial Data Formats and Frequencies are available upon request



**Chart**

During power up or reset, an onboard microcontroller reads the configuration switch, configures the interface card, and provides all signals and control necessary to read the desired interface, process and display the data, and output the converted data.

**OVERVIEW**

The BBG-2003E/O-VME is a stand alone system which interfaces to several types of analog and digital inputs and outputs (I/O). An onboard microcontroller controls the processing of these signals to provide conversion to user requested outputs. An optional LCD display enables display of raw or converted data.

During power up or reset, an onboard microcontroller reads the configuration switch, configures the interface card, and provides all signals and control necessary to read the desired interface, process and display the data, and output the converted information.

Examples of uses include: radar systems (antenna azimuth), navigation systems (gyrocompass, speedlog, course, pitch, and roll), industrial processes (position, velocity), and meteorology instruments (wind speed and direction).



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**Technical Specifications**

<b>Parameter</b>	<b>Value</b>	<b>Units</b>
<b>Power Supply</b>	115	Volts
	20	MiliAmps
<b>Temperature Range</b> Operating Storage		
	0 to +50	C°
	-65 to +150	C°
<b>Input/Output</b>		
Synchro	90 and 11.8	Volts
	0-2000	Hertz
Resolver	6.8	Volts
	0-2000	Hertz
Serial message	NMEA-0183	
Serial Protocol	RS-232/422/423/485 or MIL-STD-188C	
Step	6 Step/Degree, 12 Step/Degree	
Digital	8 bit	TTL
	70	Vdc
Analog	0/+5, -5/+5, -10/+10	Volts
<b>Accuracy</b>	+/-2	arc minutes
<b>Dimensions</b>	19.0 x 20.75 x 3.5	in
	48.3 x 52.7 x 8.9	cm



**INPUTS/OUTPUTS**

Inputs and outputs are available on DB-9 male connectors located on the rear panel. Inputs and outputs are listed below:

**Serial Interfaces**

Serial data interfaces use the standard National Marine Electronics Association(NMEA) message formats NMEA-0183 as shown below. This I/O is available in RS-232, RS-422, RS-423, RS-485, or MIL-STD-188C protocols. Standard output update rate is once per second. Custom serial data formats and frequencies are available upon request.

Serial baud rate selection and checksum checking is determined from the configuration switches at power up or reset. Selectable baud rates include: 2400, 4800, 9600, 19,200 and 37,400 bits per second. Default data output is 9600, 8 bits, no parity, and one stop bit (9600, 8, N, 1). Table 3 defines the switch position for the available baud rates.

<b>UCE BAUD RATE SELECTION AND CHECKSUM VALIDATION</b>								
BAUD RATE (bits per sec)	Configuration Switch S1							
	1	2	3	4	5	6	7	8
1200	X	X	X	X	X	0	1	1
2400	X	X	X	X	X	1	0	0
4800	X	X	X	X	X	1	0	1
9600	X	X	X	X	X	1	1	0
19200	X	X	X	X	X	1	1	1
1 = off, 0 = on, X = Don't Care								

Table 2. UCE Configuration Switch



**NMEA-0183 Format**

The UCE can be factory programmed for any NMEA-0183 data format. Default data format for the BBG-2003E/O-VME is as follows:

**Input**

\$HEHRC31397,-015\*7ACRLF

\$ - start of message ascii character 24 Hex

HE - Gyro, North Seeking

HRC - Heading

31397 - angular information in degrees (ex: 313.97)

-015 - rate of change (ex: -015)

\* - ascii character 2A Hex

CS - checksum (8 bit XOR of characters between \$ and \*)  
(ex: 7A)

CR - carriage return

LF - Line feed

**Output**

\$HEHDT,000.97,T\*11CRLF

\$ - start of message ascii character 24 Hex

HE - Gyro, North Seeking

HDT - Heading, Gyro

000.97 - angular information in degrees (ex: 000.97)

T - True

\* - ascii character 2A Hex

CS - checksum (8 bit XOR of characters between \$ and \*)  
(ex: 11)

CR - carriage return

LF - Line feed



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**CONNECTOR LIST****SERIAL IN**

I/O CONNECTOR TYPE: DB9M

CONNECTOR MATE: DB9F

PIN NO	SIGNAL	PIN NO	SIGNAL
1	Not Used	6	Not Used
2	Not Used	7	Not Used
3	RXD232 (INPUT)	8	Not Used
4	Not Used	9	Not Used
5	GND		

**SERIAL OUT**

I/O CONNECTOR TYPE: DB9M

CONNECTOR MATE: DB9F

PIN NO	SIGNAL	PIN NO	SIGNAL
1	Not Used	6	Not Used
2	RXD232 (OUTPUT)	7	Not Used
3	Not Used	8	Not Used
4	Not Used	9	Not Used
5	GND		

