



## **BBG-SIU-OSI4 Synchro Distribution System**

### *Description*



The BBG-SIU-OSI4 is a stand-alone system, which provides data format conversion of serial data into synchro signals. The SIU is a 3U 19-inch rack mountable unit.

The SIU is factory configurable to customer requirements for easy field installation.

### *Applications*

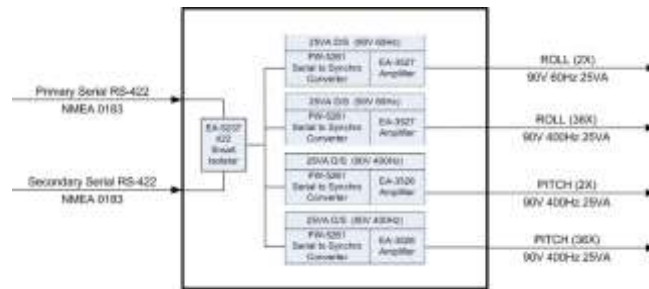
- Radar Systems (antenna azimuth)
- Navigation Systems (gyrocompass, speedlog, course, pitch, and roll)
- Industrial Processes (position, velocity)
- Meteorology Instruments (wind speed and direction)
- Many Others

### *Features*

- One to Eight Channel Synchro Outputs
- 90V 60/400Hz Synchro
- One to Four RS-422 Inputs
- NMEA-0183 Message Formats
- Custom Serial Data Formats and Frequencies are available upon Request
- (Optional Network Input)



## Chart



Example Configuration

The BBG-SIU-OSI4 operates on 115 VAC 60 Hz power input and 115 VAC 60/400 Hz reference input and is capable of interfacing to two serial input channels and four high power synchro output channels and eight low power output channels. The unit has four locations for synchro modules each location can support one high power or one low power synchro module. The high power unit will drive one 25VA synchro output. The low power unit will drive two synchro outputs at [1.5VA@60Hz](#) or [4.5VA@400Hz](#).

## Technical Specifications

Parameter	Value	Units
<b>Inputs</b>		
Power (60Hz)	115	Volts AC
	60	Hertz
	Fused at 3.15	Amp
Reference (400Hz)	115	Volts
	400	Hertz
	3.15	Amp
Serial message	NMEA-0183	
Serial Protocol	RS-232/422	
<b>Outputs</b>		
Reference (60/400Hz)	115	Volts AC
	Fused at 1	Amp
Synchro (2X, 36X, 2X, 36X)	90	Volts
	60/400	Hertz
	<a href="#">1.5@60Hz/4.5@400Hz</a> (Low Power)	VoltAmps (VA)
	25 (High Power)	
<b>Accuracy</b>	+/-4	arc minutes
<b>Temperature Range</b>		
Operating	0 to +50	C°
Storage	-65 to +150	C°



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Parameter	Value	Units
Weight	~35 (varies based on configuration)	Lbs.
Dimensions	19.0 W x 21.0 D x 5.25 H	In
	48.3 x 53.4 x 13.3	Cm

*Table 1- Technical Specifications*

## OVERVIEW

The BBG-SIU-OSI4 (SIU) is a standalone system which interfaces between serial data channels and synchro output channels. Example configuration: the SIU operates on 115 Volt, 60 Hz AC power and 115 Volt, 400Hz AC reference to convert serial inputs into high power synchro outputs. The SIU accepts a Primary and Secondary RS-422 serial channel of NMEA-0183 data and outputs one 2X, 90 Volt, 400 Hz, 25 VA (Roll 2X), one 36X, 90 Volt, 400 Hz, 25 VA (Roll 36X), one 2X, 90 Volt, 400 Hz, 25 Volt Amps (Pitch 2X) and one 36X, 90 Volt, 400 Hz, 25 VA (Pitch 36X) of synchro data. Contact [sales@bbginc.com](mailto:sales@bbginc.com) for a solution to fit your specific needs.

Each output channel of the SIU is fault protected against over current and over temperature faults. In addition, the SIU provides internal kick circuitry for added control and protection. Synchro data formats, power outputs, synchro and resolver voltages and frequencies are factory configured to user requirements.

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).

## INPUTS/OUTPUTS

Inputs and outputs are available on circular MIL connectors provided with the SIU. Inputs and outputs are listed below:

### Power Interface

Power Input:

The SIU operates on 115 VAC, 60 Hertz power fused at 3.15 Amps.

### Reference Interface

Reference Input:

Reference input is 115 VAC, 400 Hertz fused at 3.15 Amps.



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**Serial Interface****Serial Input:**

The serial data interfaces use the RS-422 serial communication protocol in a NMEA-0183 message format. Custom serial data formats and frequencies are available upon request. Example: BBG-SIU-OSI4 configuration accepts the following NMEA 0183 serial message format:

NMEA - \$PIXSE,ATITUD,{0:00.000},{1:00.000}\*

The BBG-SIU-OSI4 example data input configuration is:

(230400, 8, N, 1),  
 Baud: 230400 bps  
 Bits: 8  
 Parity: None  
 Stop bit: 1  
 Checksum: Enabled

The BBG-SIU-OSI4 can be configured with an auto switch input which supports switching automatically from a primary input to a secondary input signal. The incoming message baud rate of BBG-SIU-OSI4 is configured to match the configuration of the EA-5237 - 422 Smart Isolator input. The standard incoming baud rates are 230400 bps or 115200 bps set by changing the S1 dip switch setting as shown in Table 2. The output of EA-5237 - 422 Smart Isolator is fixed at 38400 bps configured in a proprietary message format and communicates directly to the PW-5261 Serial to Synchro converter modules. The serial baud rate of the PW-5261 Serial to Synchro converter modules must remain set for 38400 bits per second to properly communicate within the system.

*Table 2 - EA-5237 422 smart Isolator Configuration Switch*

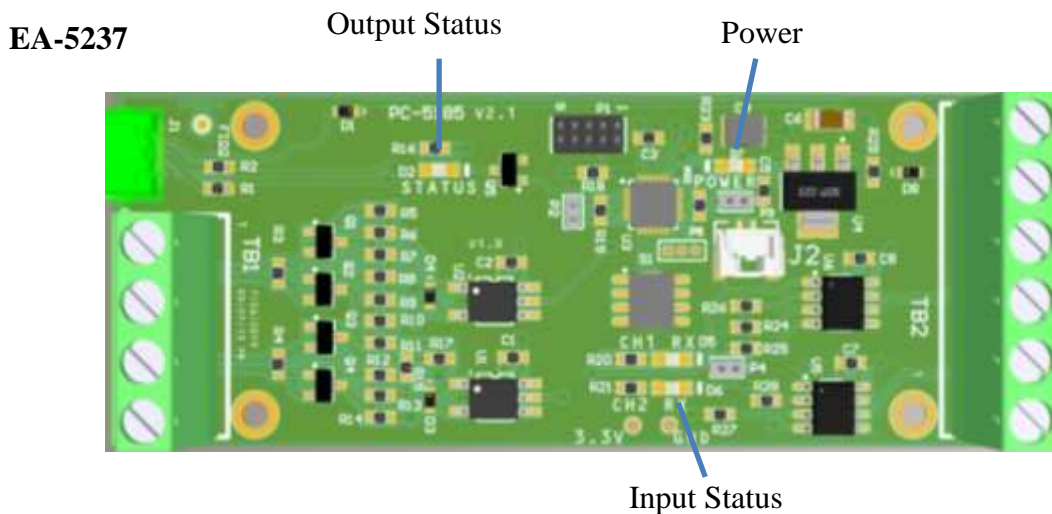
<b>EA-5237 422 SMART ISOLATOR DIP SWITCH SETTINGS</b>				
<b>INCOMING BAUD RATE (bits per sec)</b>	<b>Configuration Switch S1</b>			
	4	3	2	1
230400	X	X	1	1



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EA-5237 422 SMART ISOLATOR DIP SWITCH SETTINGS				
115200	X	X	1	0
ROLL POLARITY : STANAG/U.S. NAVY	1	X	1	X
PITCH POLARITY : STANAG/U.S. NAVY	X	1	1	X
1 = off, 0 = on, X = Don't Care				

Table 2 - EA-5237 422 smart Isolator Configuration Switch



PW-5237 422 Smart Isolation Switch Indicators

**Power:** 5V Power Ok

**Input Status:** Flashes on incoming NMEA data

**Output Status:**

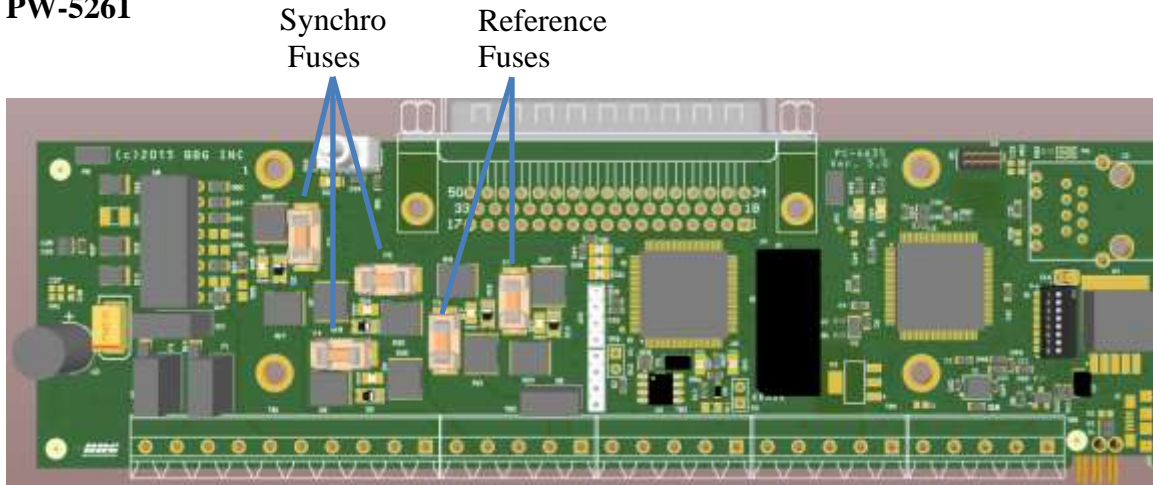
Solid: Primary data source valid on output

Flashing: Secondary data source valid on output, primary Lost.



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**PW-5261**



PW-5261 Synchro Converter Module

**Fuses:**

Designator	Description	Indicator	Designator	Description	Indicator
F3	Synchro S3, 0.5A	D5	F6:	Reference RH, 1.0A	D17
F4	Synchro S2, 0.5A	D4	F7:	Reference RL, 1.0A	D12
F5	Synchro S1, 0.5A	D16			

Indicators D5,D4,D16,D17, and D12 provide a visual indication of when a fuse is open. The intensity of the indicator’s illumination is dependent upon the “S” lead output at an associated angle. At certain angles the “S” lead indicator may be dim or not illuminated at all due to the voltage level being transmitted to that particular “S” lead. If an open fuse is suspected but the indicator is not illuminated, step through different cardinal angles to evaluate the indicator status.

**Synchro Interface**

**Synchro Output:**

Outputs are factory configured for one 2X, 90 Volt, 400 Hz, 25 VA (2X Roll), one 36X, 90 Volt, 400 Hz, 25 VA (36X Roll), one 2X, 90 Volt, 400 Hz, 25 VA (2X Pitch) and one 36X, 90 Volt, 400 Hz, 25 VA (36X Pitch) synchro data. Custom synchro outputs are available upon request. The synchro scaling is determined from the configuration of the PW-5261 Serial to Synchro converter module switch (S1) at power up or reset. Table 3



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defines the switch position for the available baud rates and output scaling for the serial to parallel converters (PCB1, PCB2, and PCB3 and PCB4).

<b>BAUD RATE AND SCALING SELECTION</b>								
BAUD RATE (bits per sec)	Configuration Switch S1							
	8	7	6	5	4	3	2	1
38400	X	X	X	X	X	X	1	1
ROLL 2X	0	0	1	0	0	X	X	X
ROLL 36X	0	0	1	0	1	X	X	X
PITCH 2X	0	1	0	0	0	X	X	X
PITCH 36X	0	1	0	0	1	X	X	X
1 = off, 0 = on, X = Don't Care								

Table 3. PCB1, PCB2, PCB3 and PCB4 Configuration Switch



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## CONNECTOR LIST

Inputs and outputs are available on circular MIL connectors provided with the BBG-SIU-OSI4. Inputs and outputs are listed below:

### **J1 POWER (115V 60Hz)**

I/O CONNECTOR TYPE: MS3470L12-3P

CONNECTOR MATE: MS3475L12-3S

Signal	Connector
R1 115V AC 60 Hz NEUTRAL (FUSED INPUT) (3.15 Amp)	J1 – A
R2 115V AC 60 Hz LINE (FUSED INPUT) (3.15 Amp)	J1 – B
Chassis Ground (E1)	J1 – C

### **J2 REFERENCE (115V 400Hz)**

I/O CONNECTOR TYPE: MS3470L12-3PY

CONNECTOR MATE: MS3475L12-3SY

Signal	Connector
R1 115V AC 400 Hz NEUTRAL (FUSED INPUT) (3.15 Amp)	J2 – A
R2 115V AC 400 Hz LINE (FUSED INPUT) (3.15 Amp)	J2 – B
Chassis Ground (E1)	J2 – C

### **J3 SYNCHRO (90V 400Hz ROLL 2X/36X)**

I/O CONNECTOR TYPE: MS3470L18-32S

CONNECTOR MATE: MS3475L18-32P

Signal	Connector
R1 115V AC 400 Hz NEUTRAL (FUSED INPUT) (1 Amp)	J3 – A
R2 115V AC 400 Hz LINE (FUSED INPUT) (1 Amp)	J3 – B
ROLL S1 OUT 2X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J3 – C, H, M
ROLL S2 OUT 2X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J3 – D, J, N
ROLL S3 OUT 2X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J3 – W, Z, c
ROLL S1 OUT 36X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J3 – F, K, R



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Signal	Connector
ROLL S2 OUT 36X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J3 – G, L, S
ROLL S3 OUT 36X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J3 – X, a, d

**J4 SYNCHRO (90V 400Hz Pitch 2X/36X)**

I/O CONNECTOR TYPE: MS3470L18-32S

CONNECTOR MATE: MS3475L18-32P

Signal	Connector
R1 115V AC 400 Hz NEUTRAL (FUSED INPUT) (1 Amp)	J4 – A
R2 115V AC 400 Hz LINE (FUSED INPUT) (1 Amp)	J4 – B
PITCH S1 OUT 2X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J4 – C, H, M
PITCH S2 OUT 2X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J4 – D, J, N
PITCH S3 OUT 2X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J4 – W, Z, c
PITCH S1 OUT 36X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J4 – F, K, R
PITCH S2 OUT 36X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J4 – G, L, S
PITCH S3 OUT 36X 400 Hz (FUSED OUTPUT) (0.5 Amp)	J4 – X, a, d

**J5 SERIAL (RS-422)**

I/O CONNECTOR TYPE: MS3470L10-6S

CONNECTOR MATE: MS3475L10-6P

Signal	Connector
RS232/422- (A) Serial (PRIMARY INPUT)	J5 – A
RS232/422+ (B) Serial (PRIMARY INPUT)	J5 – B
RS232/422 RETURN	J5 – C
Chassis Ground (E1)	CHASSIS



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# BBG-SIU-OSI4

# Product Specifications

## J6 SERIAL (RS-422)

I/O CONNECTOR TYPE: MS3470L10-6S

CONNECTOR MATE: MS3475L10-6P

Signal	Connector
RS232/422- (A) Serial (SECONDARY INPUT)	J6 – A
RS232/422+ (B) Serial (SECONDARY INPUT)	J6 – B
RS232/422 RETURN	J6 – C
Chassis Ground (E1)	CHASSIS

## BBG-SIU-OSI4 MOUNTING INFORMATION

**NOTE:** The BBG-SIU-OSI4 is a standard 19 inch rack mount unit 19.0 inch (W) x 5.25 inch (H) x 21 inch (D).



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**NOTES**



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