BBG-SSC-XXXXX-1G Synchro Signal Converter

Description

The BBG-SSC-XXXXX-1G (SSC) is a stand-alone system, which provides interfacing between an Ethernet interface and a dual channel synchro interface. The SSC performs data format conversion of multicast ethernet data into synchro signals.

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

Applications

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

Features

- Gigabit Ethernet (GbE) Input (TCP, UDP, etc.)
- Two Low Power Synchro Outputs
- Meets MIL-DTL-901E
- Meets MIL-STD-167-1A
- Meets MIL-STD-461G
- Meets MIL-STD-108E
- Custom messages formats including NAVSSI OD19 are available upon request.

BBG Incorporated
1708 South Park Court, Chesapeake, VA 23320
Phone: 757.366.9211 • Fax: 757.366.9170 • E-mail: sales@bbginc.com • Website: www.bbginc.com

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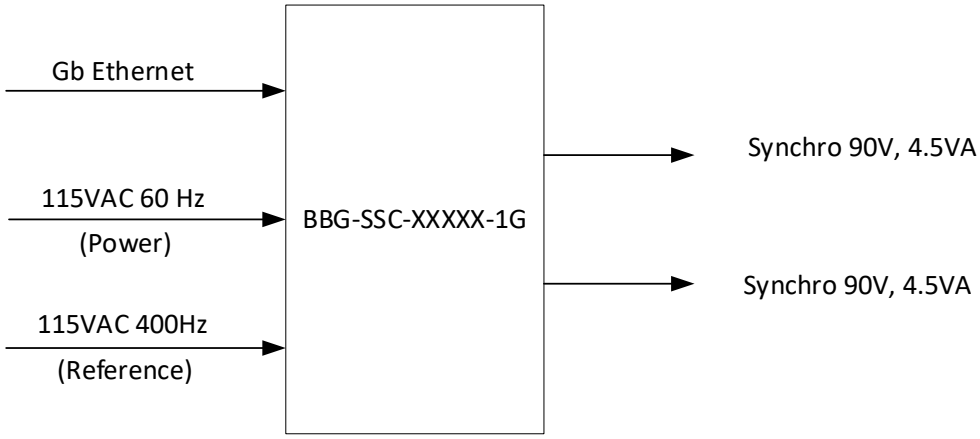
Revision History

Revision Number	Date	Page	Changes

Block Diagram



The BBG-SSC-XXXXX-1G operates on 115 VAC 60 Hz power and 115 VAC reference inputs and is capable of interfacing one Gb Ethernet I/O channel and two synchro output channels.

Technical Specifications

Unit Name	Synchro Signal Converter			
Unit Part Number	BBG-SSC-XXXXX-1G			
Unit Color	AMS-STD-595-26307 Gray			
Parameter	**Value**			**Units**
	Min	**Nom**	**Max**	
Power Input				
Voltage	90	115	132	VAC
Frequency	47	60	63	Hz
Current	-	-	500	mA
Phase	-	-	1	
Isolation	1260	-	1500	VDC
Inrush	-	1.5	30	A
Power	-	50	100	W
Reference Input				
Voltage	104	115	126.5	VAC
Frequency	360	400	440	Hz
Current (Load Dependent)	-	200	500	mA
Data Input				
Ethernet	10/100/1000 Base-T			*
Message Rate	Up to 1000**			Hz

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Outputs		
Reference	115	VAC
	400	Hz
	1	A
Synchro	90	VAC
	400	Hz
	4.5	VA
Accuracy	+/- 4	arc minutes

Note: Reference input frequency is factory configured. Synchro output frequency matched to reference input frequency. 60 Hz outputs available at 1.5 VA.

** Custom protocols available*

*** Custom message rates available*

Environmental and Physical Characteristics

Environmental Qualifications			
Ambient Temperature	Storage Operating	-4 to 176° F 32 to 104° F	-20 to 80° C 0 to 40° C
Relative Humidity	MIL-STD-810H	0 to 95%, non-condensing	
Shock	MIL-DTL-901E	Grade A, Class 1, Unrestricted Orientation	
Vibration	MIL-STD-167-1A	4-33 Hz Ship's Deck	
Electromagnetic Compatibility	MIL-STD-461G	Submarine, Internal: CE101, CE102, CS101, CS114, RE101, RE102, RS103	
Ingress	MIL-STD-108E	Spray-Tight	
Power Quality/ Personnel Safety	MIL-STD-1399 Section 300B	5.3.1 - Voltage/Frequency Tolerance 5.3.2 - Voltage/Frequency Transient Recovery 5.3.3 - Voltage Spike Test* 5.3.9 - Human Body Leakage LF: 60Hz – 700Hz, <5mA HF: 700Hz – 100kHz, <70mA	
Hi-Pot	Common Mode	1260VDC, 1 Min, <1mA	
Physical Characteristics			
Size	Height	11.75 in	29.85 cm
	Width	9.75 in	24.77 cm
	Depth	5.75 in	14.60 cm
Weight		12 lbs.	5.4 kg
Heat Dissipation	<100 Watts (Air Cooled)		

Mounting Clearances	Top	3 in.	7.62 cm
	Bottom	12 in.	30.48 cm
	Side	3 in.	7.62 cm
	Front Ventilation	3 in.	7.62 cm
	Front Service	24 in.	60.96 cm

**requires user interaction*

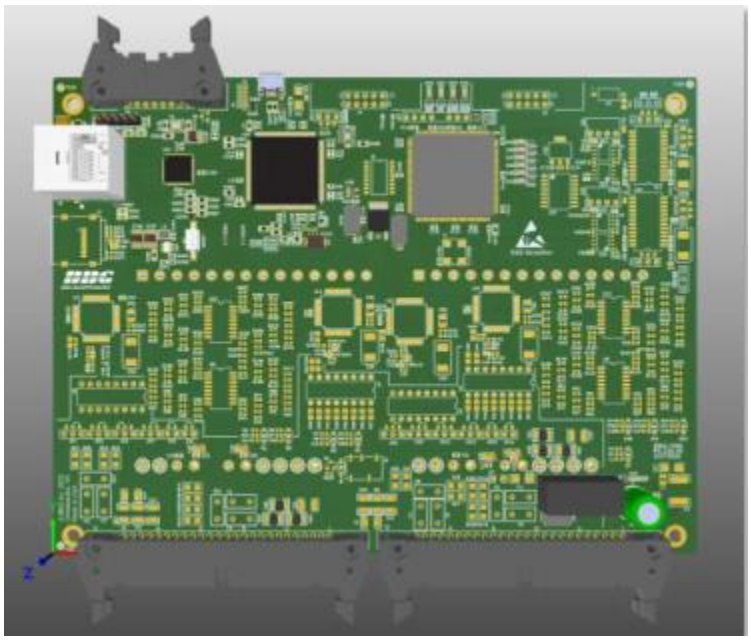
Overview

The BBG-SSC-XXXXX-1G (SSC) is a stand-alone system, which provides interfacing between one Gigabit Ethernet interface and a dual channel synchro interface. The SSC is powered by 115VAC, 60HZ power at J1 and receives data messages via gigabit ethernet at connector J3. PC1 receives, interprets, and provides the data to the digital to synchro converter modules located on the underside of PC1. The digital to synchro converter modules receive the "digital" angle and drives the attached equipment to that angle via connectors J4 and J5. 115VAC, synchro system reference is required at connector J2. LED indicators on the front panel provide quick visual reference of the system's state. The SSC can deliver a continuous 4.5VA at 400Hz (1.5 VA at 60Hz) to attached synchro loads. The synchro scaling is determined from PC1 configuration switch S1 at power-on or reset.

Serial to Synchro Converter (PC1)

The SSC contains one (1) BBG-7000 printed circuit assembly designated PC1. PC1 receives, interprets, and provides the data to the digital to synchro converter modules located on the underside of PC1. PCB functionality is determined by jumpers and configuration switch (S1) at power-on or reset. The PCB has one ethernet input channel and two output synchro channels. A 3-port on-board gigabit ethernet switch provides high bandwidth packet filtering and routing while also supplying interfacing and buffering. During power-on or reset, an onboard microcontroller reads the configuration switch and internal memory, configures the network interface, and provides all signals and control necessary to read the desired interface, process the data, and output the converted information. The digital to synchro converter modules receive the "digital" angle and drives the attached equipment to that angle. A serial console is provided via USB for configuration and debugging.

PW-6632 Serial to Synchro Module



PCB operating modes are defined in **Table 1**. PC1 comes factory set to customer requirements. Configuration changes can be made based on **Table 1.** A power reset is required after any configuration changes.

Table 1. PCB Mode Selection

PC1 CONFIGURATION SETTINGS								
	Configuration Switch S1							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Factory Default	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Reference Invert	-	-	-	-	-	-	-	ON
CH1 Invert Direction	-	-	-	-	-	-	ON	-
CH2 Invert Direction	-	-	-	-	-	ON	-	-
Swap CH1 and CH2	-	-	-	-	ON	-	-	-

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Each configuration option is independent. To reset the configuration to factory default, simply set all the switches off. The meanings of the configuration options are provided below.

Reference Invert: During installation, the "high" and "low" synchro reference inputs may be swapped. This causes both synchro channels to add 180° to their direction. Set SW1-1 high to subtract this offset. Since both synchro channels use the same reference, this switch will remove the offset from both channels.

Invert Direction: By default, we consider a positive angle to be a clockwise rotation. Should your equipment or software require a counter-clockwise rotation, you can use SW1-2 and SW1-3 to invert the direction.

Swap CH1 and CH2: This allows the user to switch inputs between CH1 and CH2.

The SSC provides one channel of a network based 10/100/1000BaseT ethernet protocol input. The interface comes factory set with a static IP address per customer requirements. The Ethernet Interface is user configurable via a micro-USB port located on PC1. The interface port enumerates on Windows, Mac, and Linux as a serial COM port, and can be communicated with over any standard serial terminal program, such as Hyperterm, PuTTY, Screen, and many others.

Default Configurations

PCB Configuration comes factory set to customer requirements. Configuration changes can be made based on the above configuration tables. A power reset is required after any configuration changes. Below are PCB factory default configuration settings:

SERIAL TO SYNCHRO CONVERTER DEFAULT CONFIGURATION SETTINGS								
	Configuration Switch S1							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
PC1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Connector List

Inputs and outputs are available on circular connectors provided with the BBG-SSC-XXXXX-1G. Inputs and outputs are listed below:

J1 AC POWER

I/O CONNECTOR TYPE: D38999/24FD5PN

CONNECTOR MATE: D38999/26FD5SN

BACKSHELL: STRAIGHT – M85049/1815N03

Signal	Pin Number
AC 115V AC 60 Hz	A
AC 115V AC 60 Hz	B
Chassis Ground (E1)	C
Spare	D
Spare	E

J2 REFERENCE

I/O CONNECTOR TYPE: D38999/24FD5PA

CONNECTOR MATE: D38999/26FD5SA

BACKSHELL: STRAIGHT – M85049/1815N03

Signal	Pin Number
AC 115V Reference (FUSED INPUT)	A
AC 115V Reference (FUSED INPUT)	B
Chassis Ground (E1)	C
Spare	D
Spare	E

J3 ETHERNET

I/O CONNECTOR TYPE: RJFTV71N

CONNECTOR MATE: RJFTV6MN

Signal	Pin
BI-DIRECTIONAL (DA+)	1
BI-DIRECTIONAL (DA-)	2
BI-DIRECTIONAL (DB+)	3
BI-DIRECTIONAL (DC+)	4
BI-DIRECTIONAL (DC-)	5
BI-DIRECTIONAL (DB-)	6
BI-DIRECTIONAL (DD+)	7
BI-DIRECTIONAL (DD-)	8
Shield	CGND

NOTE: Terminated per TIA/EIA -T568B

J4 SYNCHRO CHANNEL 1

I/O CONNECTOR TYPE: D38999/24FD5SN

CONNECTOR MATE: D38999/26FD5PN

BACKSHELL: STRAIGHT – M85049/1815N04

Signal	Pin Number
R1 115V AC 400 Hz (OUTPUT)	A
R2 115V AC 400 Hz (OUTPUT)	B
S1 OUT 1X 400 Hz (OUTPUT)	C
S2 OUT 1X 400 Hz (OUTPUT)	D
S3 OUT 1X 400 Hz (OUTPUT)	E

J5 SYNCHRO CHANNEL 2

I/O CONNECTOR TYPE: D38999/24FD5SA

CONNECTOR MATE: D38999/26FD5PA

BACKSHELL: STRAIGHT – M85049/1815N04

Signal	Pin Number
R1 115V AC 400 Hz (OUTPUT)	A
R2 115V AC 400 Hz (OUTPUT)	B
S1 OUT 1X 400 Hz (OUTPUT)	C
S2 OUT 1X 400 Hz (OUTPUT)	D
S3 OUT 1X 400 Hz (OUTPUT)	E

NOTE: External cable shielding terminated through back shells if required by installation activity.

Mounting Information