Innovative Solutions in Engineering

BBG-1553-TM

MIL-STD-1553 to Ethernet

Description

The BBG-1553-TM is an Electronic interface designed to allow a computer residing on a 10/100BaseTX network to communicate with devices connected to a MIL-STD-1553 data bus. The card supports Bus Controller (BC), Remote Terminal (RT), and Bus Monitor (MT) roles on the MIL-STD-1553 bus. The BBG-1553-TM can act as one or all of the device types on the MIL-STD-1553 bus during one bus cycle.

Applications

- Selective Monitoring of Data on 1553 bus
- Control of Devices Using BC Mode
- Reporting of Information Using RT Mode
- Monitoring of Selective Messages Using MT mode of Operation
- Allows access to 1553 data from any IP based network
- Allows any networked computer access to MIL-STD-1553 bus from any location
- Serial to Ethernet Interface

Features

- Direct or Transformer Coupled MIL-STD-1553 Interface
- 10/100BaseTX Interface
- NEMA-0183 Compatible
- RS-232, RS-422, RS-423, RS-485
- Web Based Configuration of Communications
- Custom Serial Data Formats and Functionality

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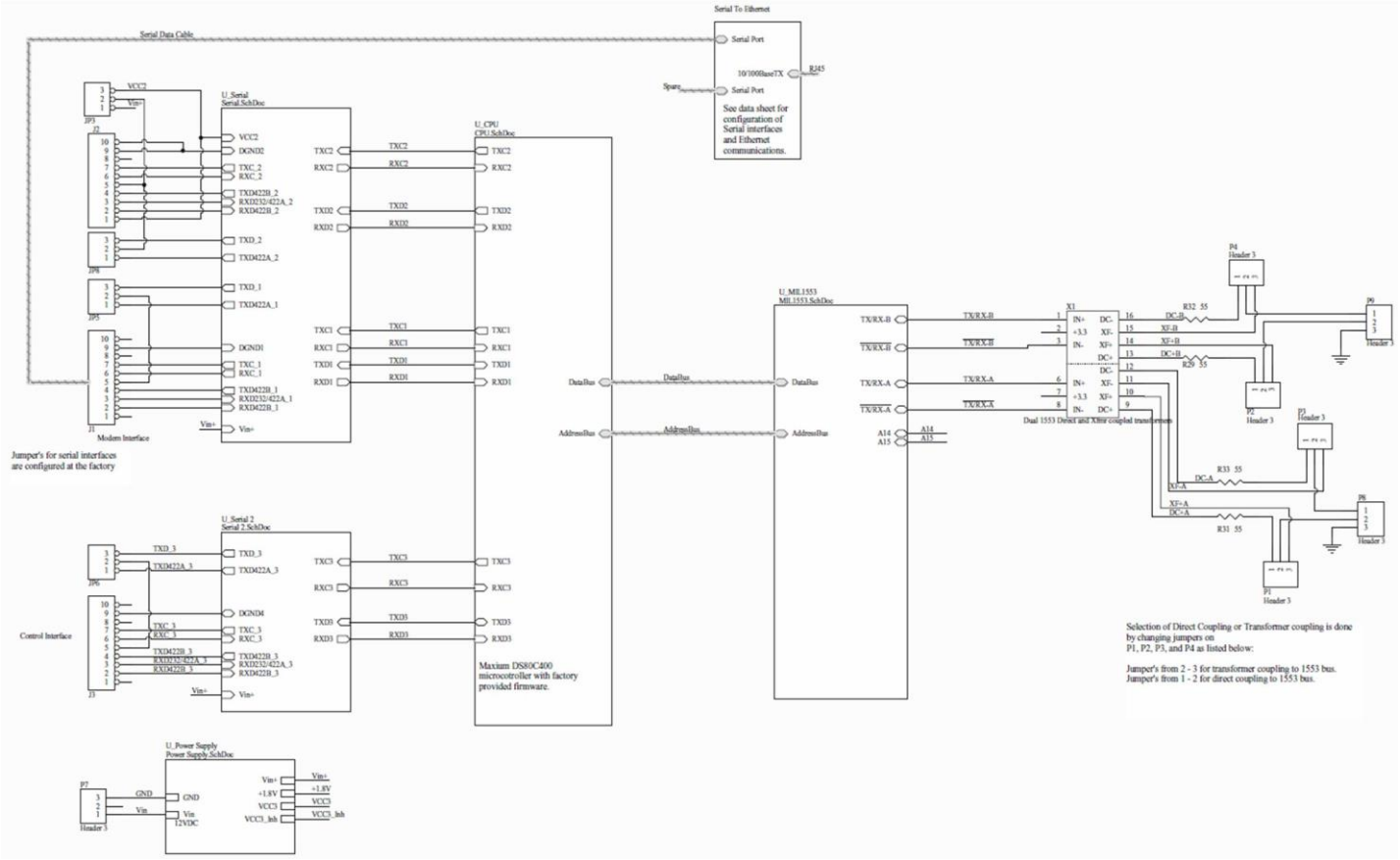
BBG-1553-TM Product Specifications

Flow Diagram



Technical Specifications

Parameter	Value	Units
Power Supply	9-30	Volts
	300	Milli-Amps
Temperature Range		
Operating	-20 to +85	C°
Storage	-65 to +150	C°
Input/Output		
Serial message	Custom	Based on NMEA-0183
Serial Protocol	RS-232/422/423/485	
Network	MIL-STD-1553	
	10/100BaseX	
Dimensions	3.84x6.00x1.0	in
	9.754x15.24x2.54	cm
ROHS Compliant	No	

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Functional Overview

MIL-STD-1553 Interface

MIL-STD-1553 is the military specification defining a Digital Time Division Comand/Response Multiplexed Data Bus. The 1553 databus features a dual redundant bidirectional, Manchester II encoded databus with high bit error reliability and up to 31 remote terminals (devices). The BBG-1553-TM can be configured to support direct coupled or transformer coupled bus stubs.

10/100BaseTX Network Interface

Communications to the card are handled through a network interface. The connection to the card is based on Berkley Sockets. The interface is configured using web based configuration pages. The computer can configure the communications so the BBG-1553-TM will connect to the computer or the computer can connect to the BBG-1553-TM.

Serial Interface

The BBG-1553-TM is comprised of a 1553 base module and a Serial to Ethernet daughter card BBG P/N: BBG-S2ENET2. The 1553 base module provides two user configurable serial ports and a third serial port for programming. In the BBG-1553-TM configuration, the first serial port J1 provides the communication interface between the 1553 base module and the network interface daughter card. The second serial port J2 can be configured as required by the end customer. For custom configurations, please contact the factory. The network interface card is available as a standalone product; for more information contact BBG Inc. and inquire about the BBG-S2ENET2.

Firmware Options

Three versions of firmware are currently available:

1) User Configurable Selective Monitoring of Data Fields (default)
   The information extracted from the 1553 bus and sent to the host computer is fully configurable using a custom application which will run on a Windows based computer. The application allows any of the captured data to also trigger a discrete IO pin on the main PCB to toggle whenever a specific item is seen on the 1553 data bus. A complete description of this interface and application is available from the factory. Request "Selective Capture Software" document.
2) Trigger Interface sends a message out on J2 when a trigger pull is detected or when Pin 6 on J2 is pulled to +5VDC. The message sent out on the J2 connector is "@T" and can be configured using a second port for reception of data over the network. (Default uses port 9976 for connect and 9977 for accept.

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3) Software for Monitoring M1A2 and M2A3 Data Bus Information (Custom 1) This firmware extracts specific data from specific messages on the 1553 data bus of either an M1A2 or M2A3 vehicle. Specific data fields include weapon selection, firing status, turret angle and hull direction, speed, and many other fields. A complete description of this interface is available by requesting the "Custom_1_IDD_Gen.doc".

Note: Custom firmware is available. Please contact a BBG Inc. Applications Engineer for more information.

System Configuration

The BBG-1553-TM can be configured to support direct coupled or transformer coupled bus stubs, RS232 or RS422 serial interface, and isolated power /grounding. The BBG-1553-TM is factory configured for a transformer coupled bus stub, RS232 serial communications and isolated power/ground.

Jumper Configurations BBG-1553-TM Standard

Jumper	Pin	Pin	Connector	Description
JP1	-	-	J1 – 9	Interface Ground to PCB Digital Ground isolated
JP7	2	3	J1 – 3, 6	RS422/RS232 interface select
JP5	2	3	J1 – 5	RS232 TX select
JP2	1	2	J2 – 9	Interface Ground to PCB Digital Ground (non-isolated)
JP3	1	2	J2 – 5	Provides 12V power to GPS on Pin 5
JP8	-	-	J2 – 5	Must be open if a jumper is on JP3
JP10	2	3	J2 – 3, 6	RS422/RS232 Interface select
JP4	1	2	J3 – 9	Interface Ground to PCB Digital Ground (non-isolated)
JP6	2	3	J3 – 5	RS232 TX select
JP9	2	3	J3 – 3, 6	RS422/RS232 interface select
JP11	1	2		Enable Internal memory access
P1	2	3		Transformer Coupled
P3	2	3		Transformer Coupled
P2	2	3		Transformer Coupled
P4	2	3		Transformer Coupled
P19	1	2		Revision Configuration: BU-64863-G8 &DS-1003
P19	2	3		Revision Configuration: BU-64863G**C** & DS-1630

Table 2: Jumper Installation BBG-1553-TM Standard

Jumper Configurations BBG-1553-TM Trigger Interface

Jumper	Pin	Pin	Connector	Description
JP1	-	-	J1 – 9	Interface Ground to PCB Digital Ground isolated
JP7	2	3	J1 – 3, 6	RS422/RS232 interface select
JP5	2	3	J1 – 5	RS232 TX select
JP2	-	-	J2 – 9	Interface Ground to PCB Digital Ground (isolated)
JP3	-	-	J2 – 5	Provides 5V power to J2 on Pin 5 (Open if Jumper on JP8)
JP8	2	3	J2 – 5	TXD232 (Open if a jumper is on JP3)
JP10	2	3	J2 – 3, 6	RS422/RS232 Interface Select
JP4	1	2	J3 – 9	Interface Ground to PCB Digital Ground (non-isolated)
JP6	2	3	J3 – 5	RS232 TX select
JP9	2	3	J3 – 3, 6	RS422/RS232 interface select
JP11	1	2		Enable Internal memory access
P1	2	3		Transformer Coupled
P3	2	3		Transformer Coupled
P2	2	3		Transformer Coupled
P4	2	3		Transformer Coupled
P19	1	2		Revision Configuration: BU-64863-G8 &DS-1003
P19	2	3		Revision Configuration: BU-64863GC & DS-1630

Table 3: Jumper Installation BBG-1553-TM Trigger Interface

Connector Definitions

BBG-1553-TM Module

Power

Connector	Pin	Description	Connector Mate
P7		Power Connector	Molex P/N: 35363-0360
	1	+12VDC	
	2	N/C	
	3	GND	

MIL-STD-1553 Interface

Connector	Pin	Description		Connector Mate
P8		MIL-STD-1553 Interface		Molex P/N: 35363-0360
		Direct Coupled	Transformer Coupled	
	1	Bus A DC-	Bus A XF-	
	2	Bus A DC+	Bus A XF+	
	3	Bus A DC+	GND	
P9		MIL-STD-1553 Interface		Molex P/N: 35363-0360
		Direct Coupled	Transformer Coupled	
	1	Bus A DC-	Bus A XF-	
	2	Bus A DC+	Bus A XF+	
	3	Bus A DC+	GND	

Serial Port 1 – Data and Comand Port

Connector	Pin	Description		Connector Mate
J1	Pin	Serial Interface – Data and Command Port		Molex P/N: 35507-1000
		RS232	RS422	
	1	N/C	N/C	
	2	RXD422B	RXD422B	
	3	RXD232	RXD422A	
	4	TXD422B	TXD422B	
	5	TXD232	TXD422A	
	6	RXC	RXC	
	7	TXC	TXC	
	8	N/C	N/C	
	9	GND/isoGND	GND/isoGND	
	10	N/C	N/C	

Serial Port 2 – Trigger Interface

Connector	Pin	Description		Connector Mate
J2	Pin	Serial Interface – Data and Command Port		Molex P/N: 35507-1000
		RS232	RS422	
	1	+5V DC	+5V DC	
	2	RXD422B	RXD422B	
	3	RXD232	RXD422A	
	4	TXD422B	TXD422B	
	5	TXD232	TXD422A	
	6	RXC/Discrete Trigger Input	RXC/Discrete Trigger Input	
	7	TXC	TXC	
	8	N/C	N/C	
	9	GND/isoGND	GND/isoGND	
	10	GND	GND	

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Serial Port 3 – Spare Port

Connector	Pin	Description		Connector Mate
J3	Pin	Serial Interface – Data and Command Port		Molex P/N: 35507-1000
		RS232	RS422	
	1	+5V DC	+5V DC	
	2	RXD422B	RXD422B	
	3	RXD232	RXD422A	
	4	TXD422B	TXD422B	
	5	TXD232	TXD422A	
	6	RXC/Discrete Trigger Input	RXC/Discrete Trigger Input	
	7	TXC	TXC	
	8	N/C	N/C	
	9	GND/isoGND	GND/isoGND	
	10	GND	GND	

BBG-S2ENET2 – Serial to Ethernet Module

Serial Interface 1 – Standard

Connector	Pin	Description		Connector Mate
J1		Serial Interface – Data and Command Port		Molex P/N: 35507-0900
		RS232	RS422	
	1	N/C	N/C	
	2	RXD	RXDA	
	3	TXD	TXDB	
	4	N/C	N/C	
	5	GND	GND	
	6	N/C	N/C	
	7	RTS	TXDA	
	8	CTS	RXDB	
	9	N/C	N/C	

Serial Interface 2 – Trigger Interface

Connector	Pin	Description		Connector Mate
J2		Serial Interface – Data and Command Port		Molex P/N: 35507-0900
		RS232	RS422	
	1	N/C	N/C	
	2	RXD	RXDA	
	3	TXD	TXDB	
	4	N/C	N/C	
	5	GND	GND	
	6	N/C	N/C	
	7	RTS	TXDA	
	8	CTS	RXDB	
	9	N/C	N/C	

Document History

Revision	By:	Date	Description
V1			Initial Release
V2	DW	10/22/12	Updated Operating Temperature Specification

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