

BASIC OPERATION

The *BiSS* AN22 application note explains how to analyze an external *BiSS* communication with the Acute logic analyzer and the protocol analyzer.

The BiSS C sensor data (point-to-point) single cycle data (SCD) and BiSS C register access are analyzable.

The basic operation of the BiSS logic/protocol analyzer is based on:

- Acute USB logic and protocol analyzer hardware TravelBus (16 Channels)
- Acute USB logic analyzer hardware TravelLogic (36 channels)
- Acute USB digital storage oscilloscope hardware TravelScope (2 channels)



Figure 1: TravelBus



Figure 2: TravelLogic



Figure 3: TravelScope

The devices TravelScope and TravelLogic/TravelBus can be combined for a synchronized operation and incorporate other analog or digital signals with the *BiSS* communication signals.

Clock Rates

Full BiSS clock rates up to 10 MHz are possible.

BiSS analyzer modes

Position data:

- Serial Data/Position 9 32 bit (selectable)
- NERR (low active error flag)
- NWARN (low active warning flag)
- CRC 6 bit (based on 0x43 CRC polynomial)

Register communication:

- read access
- · sequential read access
- write access (only without delay time)

BiSS Interface AN22: BISS C ANALYZER



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SOFTWARE DOWNLOAD

The software is free to download from the following links: See also: → http://www.acute.com.tw/eng/p4_download.php?did=1 http://www.acute.com.tw/Software/Ia/LA27819.zip (TravelLogic) http://www.acute.com.tw/Software/TBA/TBA_InstallPack_20160330.rar (TravelBus) http://www.acute.com.tw/Software/dso/DSO14101.zip (TravelScope)

See also:

 \rightarrow http://www.BiSS-Interface.com/ AN22 Acute Analyzer Demo data package ZIP file including configuration, screenshots and data: http://www.BiSS-Interface.com/files/BiSSDEMOAN22.zip

BISS ANALYZER INSTALLATION

The analyzer hardware needs to be installed completely and all files and functions are needed to be accessible by the user's standard operation.

ELECTRICAL INTERFACE

BiSS Interface PHY standards

On embedded BiSS applications TTL signals are directly accessible.

On standard BiSS applications RS422 signals are directly accessible.

The typical electric interface of a *BiSS* communication is an unidirectional RS422 link between *BiSS* master (drive) and *BiSS* slave (sensor) and an unidirectional RS422 link between *BiSS* slave(sensor) and *BiSS* master(drive).

Electrical power supply and Ground connection

To run the analyzer, a GND Ground connection is mandatory and needs to be connected first. To run the analyzer, a supply of optional interface adapters is mandatory.

Attention:

Please ensure the correct connection sequence and input voltage ranges of all devices.

Attention:

Please ensure the correct signal connection on positive signal of MA and SLO(SLO of sensor is connected with SL of master).

Attention:

Please ensure that there is no line delay compensation required for the analyzer.

This is uncritical on short cable lengths and standard MA clock frequencies or the capturing with the analyzer close to the *BiSS* sensor and not close to the *BiSS* master.

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LOGIC ANALYZER SOFTWARE CONFIGURATION

TravelLogic Settings for BiSS Settings for single cycle data communication The setting window opens and needs the following settings:

- Which channels capture the signals
 - MA: master clock output
 - SLO: slaves data output
- · What type of data / communication to be analyzed
 - Single Cycle Data communication
- · Serial data length

Settings for register data communication The setting window opens and needs the following settings:

- Which logic analyzer channels capture the signals
 - MA: master clock output
 - SLO: slaves data output
- What type of data / communication to be analyzed
 - Register Data communication

Labeling the channels The color of the BiSS related content is configurable:

- ACK/ADR
- START
- · CDS/CTS
- Data/Cmd
- Flag/ID/IDL
- CRC
- STOP/EX
- Read/IDS
- Write/IDA

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				Flag/IDL/ID	
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	-			Stop/Ex	_
From	Buffer Head	-		Read/IDS	
То	Buffer Tail	•		Write/IDA	
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Figure 4: Configure the TravelLogic - BiSS protocol settings

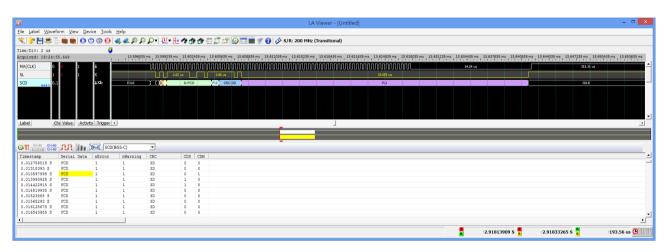
AN22: BISS C ANALYZER

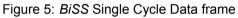


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BISS SINGLE CYCLE DATA FRAME

Complete BiSS Single Cycle Data (SCD) frame





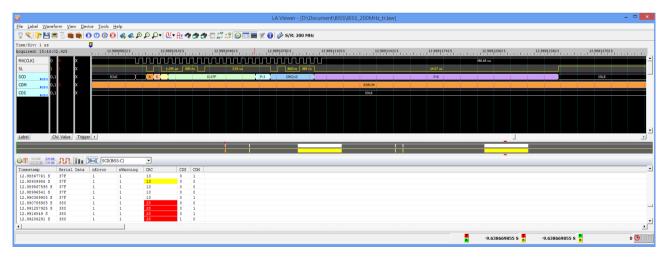


Figure 6: BiSS Single Cycle Data frame

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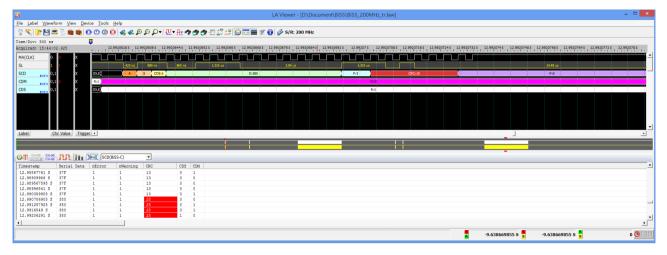


Figure 7: BiSS Single Cycle Data frame detecting a CRC error

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BISS REGISTER ACCESS

BiSS Register Access

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Figure 8: BiSS control communication

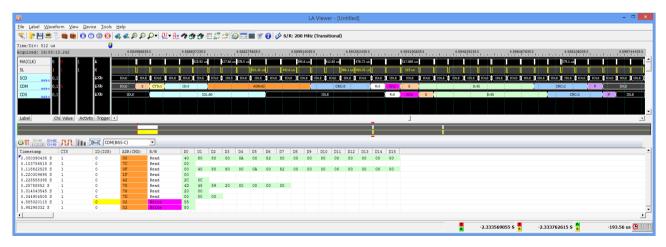


Figure 9: BiSS control communication for register access



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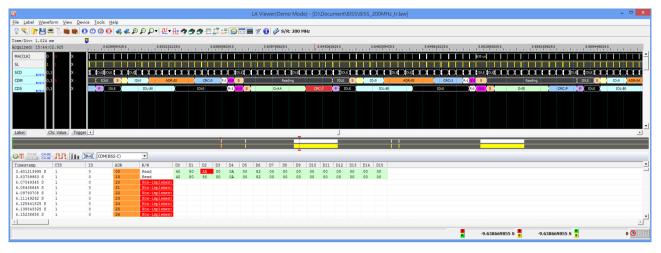


Figure 10: *BiSS* control communication for register access detecting a CRC error

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Figure 11: BiSS control communication for register access detecting unimplemented registers



Figure 12: BiSS Single Cycle Data frame with TravelScope DSO waveform

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PROTOCOL ANALYZER SOFTWARE CONFIGURATION

TravelBus Settings for BiSS protocol analyzer

The setting window opens and needs the following settings:

- Which channels capture the signals
 - MA: master clock output
 - SLO: slaves data output
- Serial data length
- Threshold

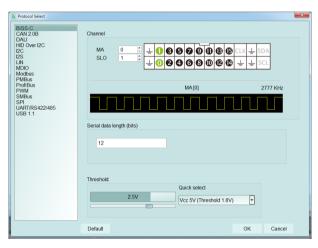


Figure 13: Configure the TravelBus - *BiSS* Protocol Analyzer

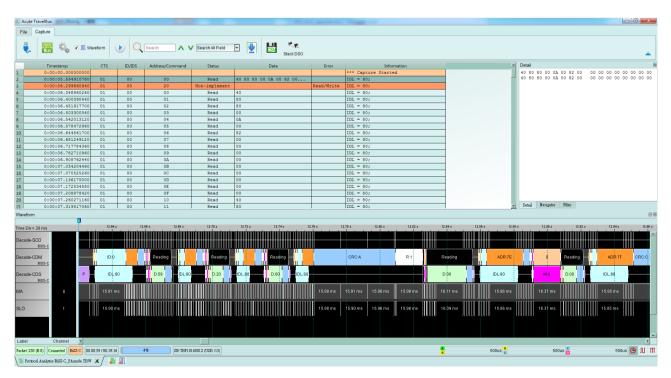


Figure 14: BiSS control communication - TravelBus BiSS Protocol Analyzer

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TravelBus Settings for BiSS Logic analyzer

The setting window opens and needs the following settings:

- Which channels capture the signals
 - MA: master clock output
 - SLO: slaves data output
- · What type of data / communication to be analyzed
 - Single Cycle Data communication
 - Register Data communication
- · Serial data length

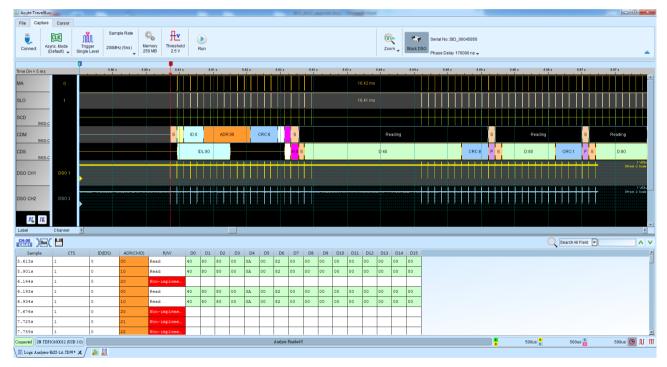


Figure 15: BiSS control communication - TravelBus Logic Analyzer with TravelScope DSO

RE\	VISION H	ISTORY		
Rel	Rel Date*	Chapter	Modification	Page

Rel.	Rel. Date*	Chapter	Modification	Page
A1	2016-04-26		Initial release	all