



### SD 2.0 PROTOCOL ANALYZER

The ComProbe<sup>®</sup> SD 2.0 Protocol Analyzer allows developers and engineers to thoroughly analyze SD, SDIO, MMC and SPI communications, as well as *Bluetooth*<sup>®</sup> data carried over the SDIO physical layer, by simultaneously capturing, decoding, displaying, filtering, and detecting errors - *all live*.

Powered by USB, this small form-factor analyzer provides non-intrusive analysis without any compromises; the ComProbe SD comes loaded with support for SPI and MMC specification, and captures data at High-Speed 480 Mbps - it's the ideal field or bench tool for developers of SD/SDIO/MMC-equipped devices or *Bluetooth* devices that use SDIO technology.

### **Big Window into a Small Format**

The ComProbe SD provides developers and engineers with one compact and portable point of access to multiple bus types, including SD, SDIO, MMC and SPI, and supports 1 and 4-bit modes ensuring compatibility with current specifications. Not only does the device provide a non-intrusive window into native-format bus performance and command and response tokens, but also allows *Bluetooth* developers to capture *Bluetooth* data as it's transported over the SDIO bus.

Once captured, data can be viewed, debugged and target-searched for errors with the powerful and mature ComProbe software. The ComProbe SD can significantly reduce the time you spend debugging SD/SDIO device protocol and timing issues, and help to bring your SD, SDIO, MMC, SPI or *Bluetooth* product to market faster.

Summary Pane displays a one line overview of each data frame/message. Click on any line to reveal detail in mutiple panes below.

Frame 1,037: (Controller) Len=18 SDIO/SPI: Frame Header Msg Size: 6	Unfiltered	📄 🔓 🎎 ( SDIO/SPI/HCI	0000	Find:		•	🔎 🔎 🔊 Summary: SDIO/S
- Msg Type: Card Resp R1b ⊟-Card Resp R1b	B Frame#	Msg Size	Msg Type	Cmd #	Fram	Delta	Timestamp
Start Bit: 0	1,029	4	Card Interrupt		16	00:00:00.000900	9/20/2012 3:23:12.759300 PM
- Transmission Bit: Card	1,030	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.759300 PM
Cmd: 12 (STOP_TRANSMISSION)     Grad Status: 0x00000000	1,031	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.759300 PM
- OUT OF RANGE: No Error	1,032	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.759300 PM
ADDRESS_ERROR: No Error	1,033	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.759300 PM
- BLOCK_LEN_ERROR: No Error	1,034	4	Card Interrupt		16	00:00:00.000100	9/20/2012 3:23:12:759400 PM
ERASE_SEQ_ERROR: No Error	1,035	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.759400 PM
- ERASE_PARAM: No Error	1,036	6	Host Cmd	12	18	00:00:00.000100	9/20/2012 3:23:12.759500 PM
- WP_VIOLATION: Not Protected	1,037	6	Card Resp R1b		18	00:00:00.000000	9/20/2012 3:23:12.759500 PM
CARD_IS_LOCKED: card unlocked	1,038	6	Host Cmd	18	18	00:00:00.000100	9/20/2012 3:23:12.759600 PM
LOCK_UNLOCK_FAILED: No Error	1,039	6	Card Resp R1		18	00:00:00.000000	9/20/2012 3:23:12.759600 PM
- COM_CRC_ERROR: No Error - ILLEGAL_COMMAND: No Error	1,040	4	Card Interrupt		16	00:00:00.000900	9/20/2012 3:23:12.760500 PM
- CARD_ECC_FAILED: success	1,041	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.760500 PM
- CC_ERROR: No Error	1,042	4	Host Cmd Card Interrupt	12	18 16	00:00:00.000000	9/20/2012 3:23:12.760500 PM 9/20/2012 3:23:12.760500 PM
ERROR: No Error	1,043	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.760500 PM
- CSD_OVERWRITE: No Error	1,044	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.760500 PM
WP_ERASE_SKIP: Not Protected	1.045	7	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12.760500 PM
CARD_ECC_DISABLED: No Error	1.047	4	Card Interrupt		16	00:00:00.000000	9/20/2012 3:23:12:760500 PM
ERASE_RESET: Cleared CURRENT_STATE: data	4						
- READY_FOR_DATA: ready	B00000	110 000		0 0 0 0 0		00000 000	00101 00000000
- APP_CMD: Disabled	NOODOO			01100			00000 00000000
- AKE_SEQ_ERROR: No Error	R00001			00000			00000 01111111
- CRC: 0x3f	Ŷ						
L End Bit 1	PA						
	R06 00	00 00	05 00 00	00 0c	0.0	00 00 0c	00 00 <mark>0</mark> b 00 7f
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**Decode Pane** shows comprehensive layered decoders of each frame/message with clear, concise descriptions.

Logical Data Pane shows data in bindary, hex and character formats.

The ComProbe SD Protocol Analyzer includes powerful ComProbe software and the SD/SDIO/SPI/MMC hardware interface.

#### **Key Features and Benefits**

- Data You Can Trust
   Non-intrusive in-line capture
   and analysis provides
   uncontaminated views of the
   data you need
- Current and Compatible Support for 1 bit, 4-bit, and SPI modes makes sure you're compatible with current SD, SDIO and MMC specifications
- Compact unit delivers big features to developers of SD, SDIO, SPI and MMC technologies, in the field or at the bench
- Comprehensive Protocol
   Analysis

Can be used in conjunction with other ComProbe devices for interoperability analysis over multiple bus types

• Faster to Market Reduces debug time with simultaneous live capture, display, decode, filtering and detection of protocol errors

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#### Dimensions:

89mm x 51mm x 127mm

#### Supported Specifications:

- SD Specification v2.0, Part 1 & 2
- Security commands, SD specification
- v2.0, Part 3
- SDIO v2.0
  MMC v3 3
- MMC v3.3

#### Transfer Modes:

- 1-bit
- 4-bit
- SPI

#### Signals:

- CMD
- DATA0
- DATA1
- DATA2
- DATA3

#### Timestamp:

- 100 μs
- Clock Rate
- Up to 50 MHz

#### **Operating voltages:**

- 1.8V
- 3.3V

#### Data Decoded:

- SPI
- SD/SDIO
- Bluetooth

#### Power Supply:

- USB Bus powered
- Supports "Automation" feature to remotely control ComProbe software and bypass Microsoft Windows UI
- Displays clock frequency
   Debug SD (SDIO device protection)
- Debug SD/SDIO device protocol and timing issues
- Non-intrusive capture and analysis
- Use with both standard SD form factor connection and embedded applications
- Comes with Micro SD card adapter, compatible with cell phones
- Single-click export
- Packets with protocol violations are flagged in red
- Data captured to PC hard disk
- Session notes and annotated bookmarks allow for quick identification of questionable packets
- Portable main unit size (mm) is 89 x 51 x 127

# The ComProbe SD Hardware Interface

The ComProbe SD 2.0 Protocol Analyzer includes the portable and robust SD/SDIO/SPI/MMC hardware interface, which supports connectivity to SD, SDIO, SPI and MMC-equipped devices. In addition to the standard SD card adapter, a micro SD card adapter is included for sniffing communications between micro SD cards and cell phones.

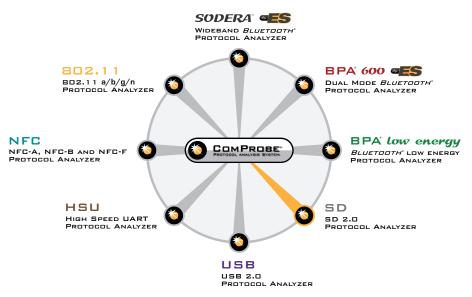
The SD/SDIO/SPI/MMC interface is one member of an extensive arsenal of technology-specific hardware interfaces, all functioning with the powerful ComProbe software. This modular approach allows greater flexibility in protocol analysis and debugging, and provides comprehensive coexistence views over virtually any combination of protocols.

# **Supported Configurations**

- OS Supported: Win 7 and Win 8
- USB Port: USB 2.0 or USB 3.0 High-Speed

## **Minimum System Requirements**

- Processor: Core i5 at 2.7 GHz or faster
- 4 GB of RAM
- 20 GB free disk space



## The ComProbe Modular Approach

ComProbe software is at the core of Frontline protocol analysis, allowing technologyspecific hardware interfaces to work individually or in combination with other hardware interfaces. This modular approach gives the developer or analyst the widest possible range of scenarios for debugging complex communications.

### To order or for more information:

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