

# frontline

# SD

## SD 2.0 PROTOCOL ANALYZER



The Frontline SD Protocol Analyzer includes powerful Frontline 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 Frontline 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

The Frontline® SD 2.0 Protocol Analyzer allows developers and engineers to thoroughly analyze SD, SDIO, MMC and SPI communications, as well as *Bluetooth*® 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 Frontline 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 Frontline 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 Frontline software. The Frontline 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 multiple panes below.

Frame#	Msg Size	Msg Type	Cmd #	Fram...	Delta	Timestamp
1,029	4	Card Interrupt	16	00:00:00.000900	9/20/2012 3:23:12.759300 PM	
1,030	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.759300 PM	
1,031	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.759300 PM	
1,032	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.759300 PM	
1,033	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.759300 PM	
1,034	4	Card Interrupt	16	00:00:00.000100	9/20/2012 3:23:12.759400 PM	
1,035	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.759400 PM	
1,036	6	Host Cmd	12	00:00:00.000100	9/20/2012 3:23:12.759500 PM	
1,037	6	Card Resp R1b	18	00:00:00.000000	9/20/2012 3:23:12.759500 PM	
1,038	6	Host Cmd	18	00:00:00.000100	9/20/2012 3:23:12.759600 PM	
1,039	6	Card Resp R1	18	00:00:00.000000	9/20/2012 3:23:12.759600 PM	
1,040	4	Card Interrupt	16	00:00:00.000900	9/20/2012 3:23:12.760500 PM	
1,041	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.760500 PM	
1,042	6	Host Cmd	12	00:00:00.000000	9/20/2012 3:23:12.760500 PM	
1,043	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.760500 PM	
1,044	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.760500 PM	
1,045	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.760500 PM	
1,046	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.760500 PM	
1,047	4	Card Interrupt	16	00:00:00.000000	9/20/2012 3:23:12.760500 PM	

Decoded data for Frame 1,037 (Card Resp R1b):

```

BINARY: 00000110 00000000 00000000 00000000 00000000 00000101 00000000
HEX: 00000110 00000000 00000000 00000110 00000000 00000000 00000000
CHAR: 00001100 00000000 00000000 00010111 00000000 01111111
  
```

**Decode Pane** shows comprehensive layered decoders of each frame/message with clear, concise descriptions.

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

## Specifications

### 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

### Transfer Modes:

- 1-bit
- 4-bit
- SPI

### Signals:

- CMD
- DATA0
- DATA1
- DATA2
- DATA3

### Timestamp:

- 100  $\mu$ s

### 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 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 Frontline SD Hardware Interface

The Frontline 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 Frontline software. This modular approach allows greater flexibility in protocol analysis and debugging, and provides comprehensive coexistence views over virtually any combination of protocols.

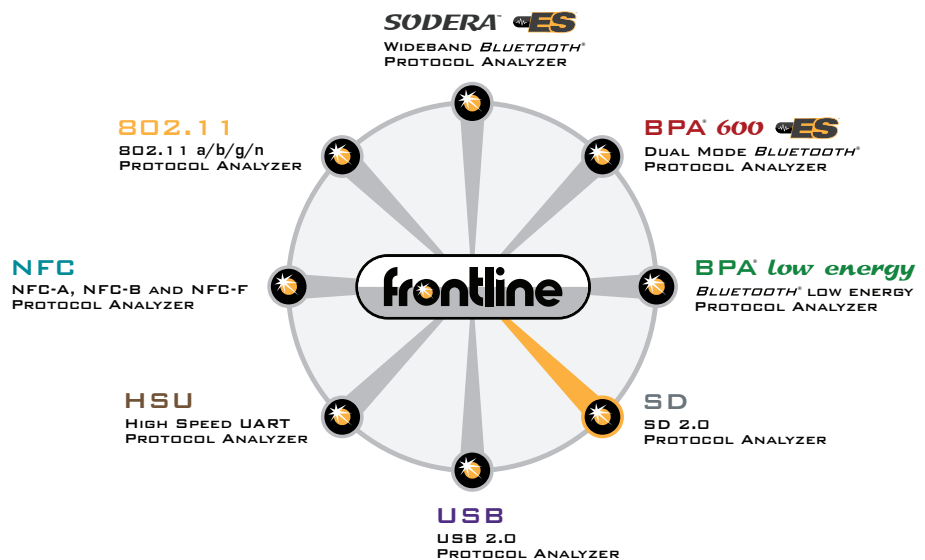


## Supported Configurations

- 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 Frontline Modular Approach

Frontline software is at the core of Frontline protocol analysis, allowing technology-specific 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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