

## BusPro-I™

# I<sup>2</sup>C and SMBus Monitor, Debugger, and Programmer

#### Features

- Supports I<sup>2</sup>C and SMBus
- Supports Standard-mode, Fast-mode, and Fast-mode Plus (Fm+) with  $\rm I^2C$  bus data rates up to 5 Mbit/s
- Supports High-speed mode (Hs-mode) monitoring up to 5 Mbit/s
- Passive traffic monitoring with unlimited state and timing recording
- Time stamping, message filtering, and symbolic translating
- Programmable trigger event to highlight bus transactions of interest
- Automatic detection of bus voltage and signal thresholds
- Two general purpose I/O channels
- Programmable bus voltage reference and software configurable pull-up resistors on the SDA and SCL lines
- In-System Programming of I<sup>2</sup>C serial EEPROMs
- High-speed USB 2.0 interface
- Robust and portable bus-powered USB device, no external power supply required
- I2C Exerciser software supports Windows® XP, Windows Vista®, and Windows 7, and Windows 8 operating systems
- 32- and 64-bit APIs for integration with third party languages, including Python and LabVIEW

#### **Benefits**

- Monitor displays high-level view of I<sup>2</sup>C bus traffic. Bit and protocol level information is also available and graphically displayed as a timing waveform.
- Debugger allows direct read/write access to peek and poke device registers on the I<sup>2</sup>C bus. The BusPro-I acts as a master to generate I<sup>2</sup>C transactions while simultaneously monitoring the traffic on the bus.
- I2C Exerciser software is easy to learn and use. Graphical interface allows quick access to the powerful functionality and filters out the noise so that you may focus on the trace data that you actually need to see.
- Everything needed to get started is provided. No need to purchase additional "optional" modules or adapter cables to be compatible.

In the world of rapidly accelerating product development cycles, engineers developing products which utilize the I<sup>2</sup>C and SMBus interfaces need a bus analyzer that is easy to use fast and simple.

Unforeseen problems such as functional bugs can cause schedules to slip so it is important to have the right tool to resolve them quickly by isolating the root cause.

The Corelis BusPro-I analyzer is designed with that idea in mind—the right tool at the right price.

#### **Applications**

- Software development Monitor and log I<sup>2</sup>C bus traffic in real-time
- Hardware debugging Generate traffic to exercise the bus and communicate with its peripheral components
- In-system programming Read, erase, program and verify I<sup>2</sup>C serial EEPROMs

#### Ordering Information:

#### Part Number—90010

For more information, or to order this product online, please visit out website at www.corelis.com



Hardware Specifications

#### **I2C Exerciser Monitor Screen**

Please see the BusPro-I User's Manual or the free downloadable software demonstration for more information and detailed technical specifications.

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Shortcuts	Line	Marker	Type	Location	Addr (Hex)	AddrType	RAV	NAK	Error	KHz	I/O 1	I/O 2	Data Byte (Hex)	Time (us)	
	29		Data	Analyzer	18	7-Bit	Read			400	0	1	4F	2,164	_
Monitor Debugger	30		Data	Analyzer	18	7-Bit	Read			400	0	1	27	2,189	
	31		Data	Analyzer	18	7-Bit	Read			400	0	1	9A	2,215	
	32		Data	Analyzer	18	7-Bit	Read			400	0	1	AF	2,241	
	33		Data	Analyzer	18	7-Bit	Read			400	0	1	4F	2,267	
	34		Data	Analyzer	18	7-Bit	Read			403	1	1	12	2,293	
	35		Address	Analyzer	ADC	7-Bit	Read			107	1	1		2,476	
	36		Data	Target	ADC	7-Bit	Read			104	1	1	10	2,632	
	37		Data	Target	ADC	7-Bit	Read			104 402	1	1	DONE	2,730	
	38		Address Data	Target Target	54 54	7-Bit 7-Bit	Write Write			402	1	1	17	3,441 3,469	
	40		Data	Target	54	7-Bit	Write			402	1	1	5D	3,409	
	40		Data	Target	54	7-Bit	Write			400	1	1	35	3,434	
0110100 1001001	42		Data	Target	54	7-Bit	Write			403	1	1	OF	3,545	
Programmer	43		Address	Analyzer	36	7-Bit	Read			107	1	1	01	3,729	
	44		Data	Target	36	7-Bit	Read			104	1	1	54	3,884	
	45	Trigger	Data	Target	36	7-Bit	Read		1	104	1	1	DANGER	3,982	
	46		Address	Target	18	7-Bit	Read			402	1	1		4.694	
	47		Data	Analyzer	18	7-Bit	Read			402	1	1	3D	4,735	
	48		Data	Analyzer	18	7-Bit	Read			401	1	1	63	4,761	
	49		Data	Analyzer	18	7-Bit	Read			400	1	1	52	4,786	
	50		Data	Analyzer	18	7-Bit	Read			403	1	1	16	4,811	
	51		Address	Analyzer	ADC	7-Bit	Read			107	1	1		4,995	
	52		Data	Target	ADC	7-Bit	Read			104	1	1	1F	5,151	
	53		Data	Target	ADC	7-Bit	Read			104	1	1	BUSY	5,249	
	54		Address	Target	PLL	7-Bit	Write			402	1	1		5,960	
	<														Þ
	Scale: FIEL BIT I SD		/div - (		to Fit Line:	45 Dat				val A to Data 0 1 1	, ,	9.4	22762 ms		

The BusPro-I is an entry level, yet feature-packed and robust I<sup>2</sup>C debugging tool. The BusPro-I allows engineers to save precious development time by providing low level visibility and control of an I<sup>2</sup>C bus. There is no longer a need to hook up a logic analyzer to capture traffic on the bus and then spend hours sifting through mountains of data in order to find that one particular bit. The Corelis hardware and software provide a convenient and intuitive environment for hardware debugging, software development, and in-system programming.

For engineers requiring an I<sup>2</sup>C tool with even more advanced feature sets, Corelis offers the CAS-1000-I2C/E. This advanced unit provides significantly enhanced functionality such as I<sup>2</sup>C compliance testing, master and slave emulation, bus parameter measurement, glitch injection, clock stretching and adjustable timing skew.

### **Certification & Appraisal**

#### General Mechanical Dimensions 5.50 x 1.00 x 4.75 (+/- 0.10) inches 2 pounds (approximate) Shipping Weight Certifications RoHS Compliant, CE Marked **USB** Interface USB Transfer Rate High-speed USB 2.0 USB Cable Ships with a 6 foot USB 2.0 A to B cable I<sup>2</sup>C Interface I<sup>2</sup>C Bus Connector RI45 (AMP P/N 406549-1) I<sup>2</sup>C Bus Cable Ships with a 12 inch interface cable that terminates in flying leads suitable for connection to 0.025 inch square posts. Test clips are also included.





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