KETEREX

USB-910H
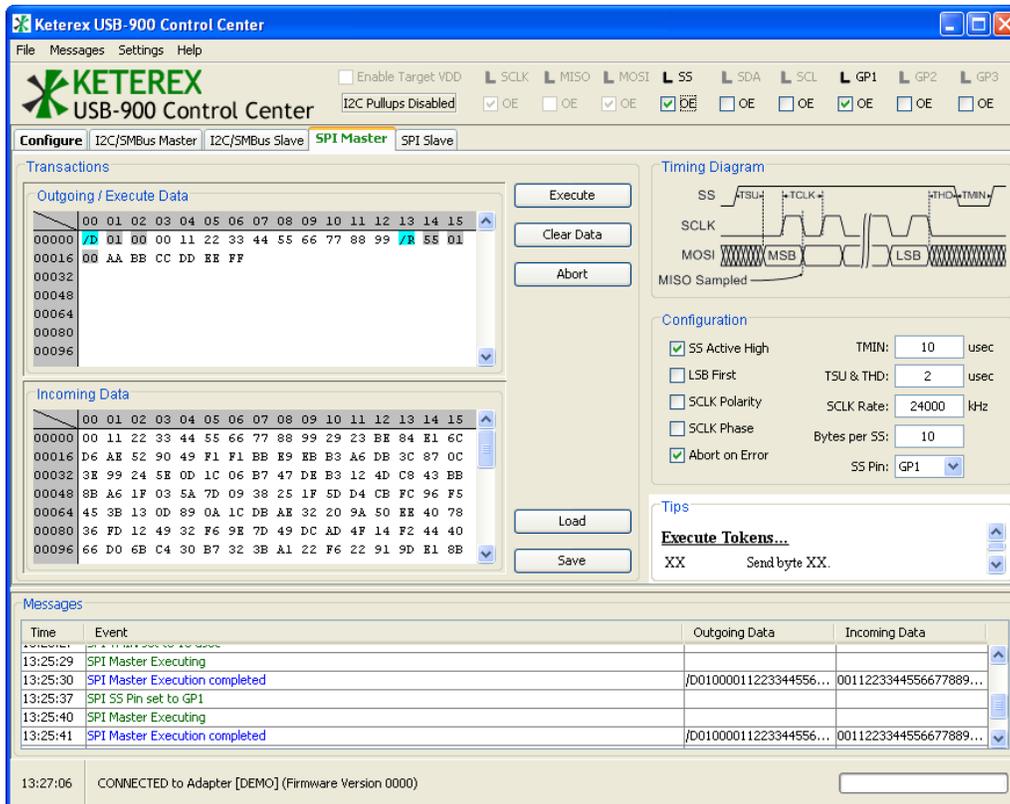## Embedded Systems Interface

FEATURES

- SPI, I2C, SMBus, PMBus, Master or Slave

- Full I2C/SMBus/PMBus Multi-Master Support

- Provides up to 9 General-Purpose I/O

- Configurable I/O Levels from 1.65V to 5V

- SPI up to 24MHz, I2C/SMBus to 1.5MHz

- Powers the Target from the Adapter

- Supports 16 Slave Addresses

- USB 2.0 Full-Speed (12Mbps) HID Device

- Up to 64kBytes Transferred per Transaction

- Powerful Scripting Feature

- Easy-to-use API for Software Development

- No User-Installed Device Drivers Required

GENERAL DESCRIPTION

The Keterex USB-910H Embedded Systems Interface provides connectivity between a host PC and an embedded system requiring an I2C, SMBus, PMBus, or SPI protocol. Other protocols can be supported by "bit-banging" up to 9 available general-purpose I/O. USB transactions are generated on the host PC using either the Keterex USB-900 Control Center application or calls to a provided API. The USB-910H Adapter converts these transactions to I2C, SMBus, SPI, or general-purpose I/O operations. Built-in scripting accommodates complex bus protocols, including combining bus transactions, timing, and general-purpose I/O operations.

The USB-910H Adapter provides configurable I/O voltage levels from 1.65V to 5V. In addition to setting the drive and sense logic levels, this voltage can be connected to the target hardware, providing up to 400mA to the target device.

Keterex USB-900 Control Center Application

PERFORMANCE CHARACTERISTICS

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Over-voltage Tolerance	except GP3	-0.3		VBUS+0.3	V
	GP3	-0.3		V_{IO}+0.3	V
Target I/O Voltage (V_{IO})	configurable mode	1.65		3.6	V
	USB 5V bypass mode		5.0		
Target I/O Voltage Error	configurable mode	-3		+3	%
Low-level Input Voltage (except SDA and SCL)				V_{IO} x 0.3	V
High-level Input Voltage (except SDA and SCL)		V_{IO} x 0.7			V
Low-level Input Voltage (SDA and SCL only)				0.8	V
High-level Input Voltage (SDA and SCL only)		2.0			V
Low-level Output Voltage	I_{OL}=4mA, V_{IO}=1.65V			0.5	V
	I_{OL}=8mA, V_{IO}=2.3V			0.4	
	I_{OL}=24mA, V_{IO}=3V			0.8	
	I_{OL}=32mA, V_{IO}=4.5V			0.9	
High-level Output Voltage	I_{OH}=-4mA, V_{IO}=1.65V	1.2			V
	I_{OH}=-8mA, V_{IO}=2.3V	1.8			
	I_{OH}=-24mA, V_{IO}=3V	2.8			
	I_{OH}=-32mA, V_{IO}=4.5V	4.2			
Input Leakage Current	0V ≤ V_{IN} ≤ 5V			±2	µA
SCL and SDA Pull-ups	when enabled		2.2		kΩ
I2C/SMBus Bit Rate		31.75		1500	kbits/sec
SPI Master Bit Rate		93.75		24000	kbits/sec
SPI Byte Throughput	Transactions < 4kbytes		170		kbytes/sec
SPI Slave Bit Rate			4000		kbits/sec
SPI Slave SS Setup		3			µsec
SCL Idle Bus Free Period	when enabled		3.3		SCL periods
SCL Low Timeout Period	when enabled (infinite timeout when disabled)			32.7	msec

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