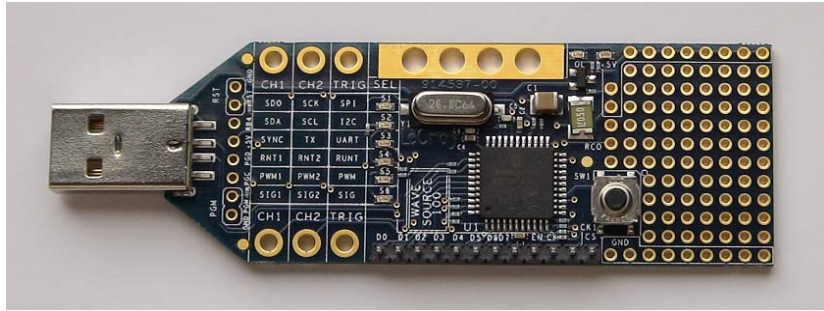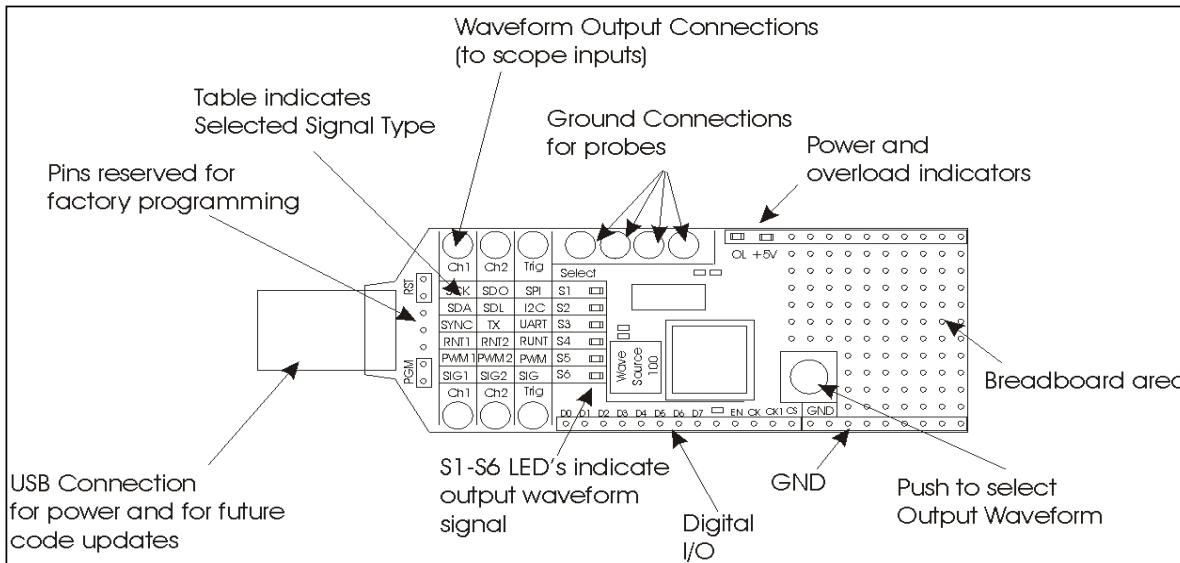# LeCroy WaveSource 100
Quick Reference Guide
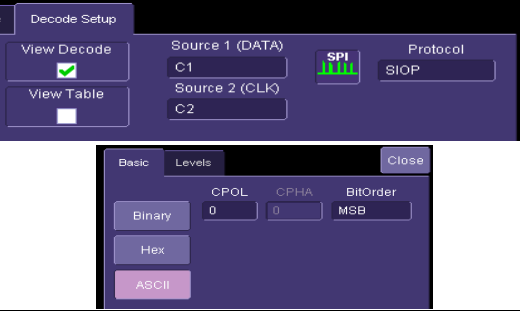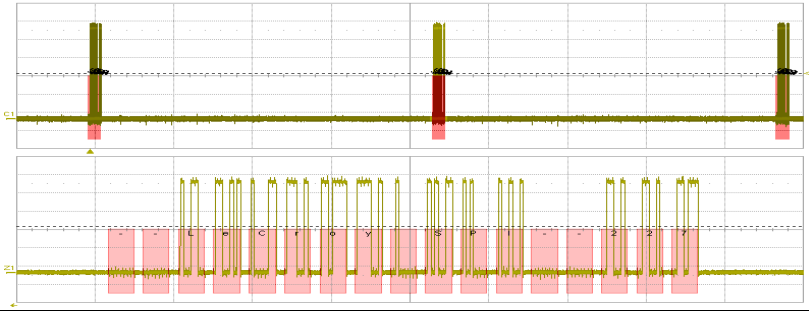
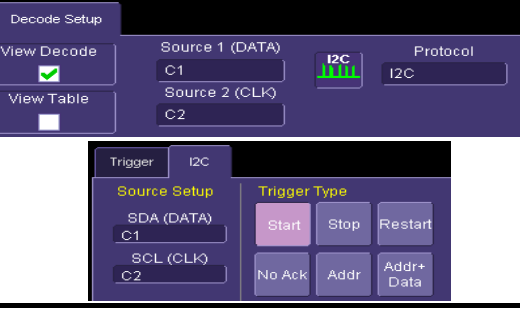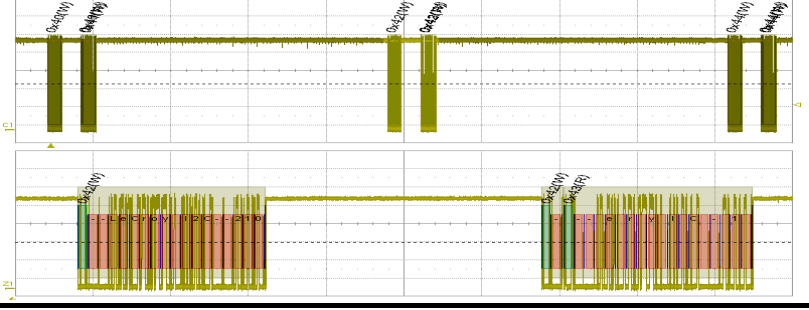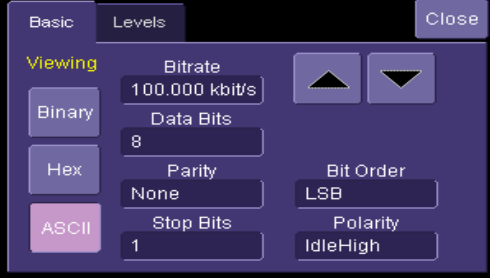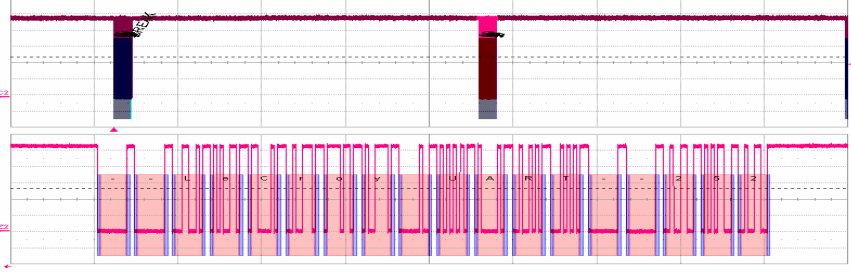### SIGNAL OUTPUTS

SIGNAL	PROTOCOL		CHANNEL 1	CHANNEL 2
S1	SPI		DATA (SDO)	CLOCK (SCK)
S2	I2C		DATA (SDA)	CLOCK (SCL)
S3	UART		Not Used	TRANSMIT (100 kbits/sec)
S4	RUNT		RUNT (positive) JITTER (35%)	RISE TIME (slow = 100 nsec) GLITCH (pos. width = 165 nsec) JITTER (35%)
S5	PWM		PERSISTENCE (9 pulse widths incrementing in width and quantity	LONG MEMORY (500 KHz and 750 KHz, 33 msec delay)
S6	SIG		Not Used	NON MONOTONIC Edge RUNT (negative)
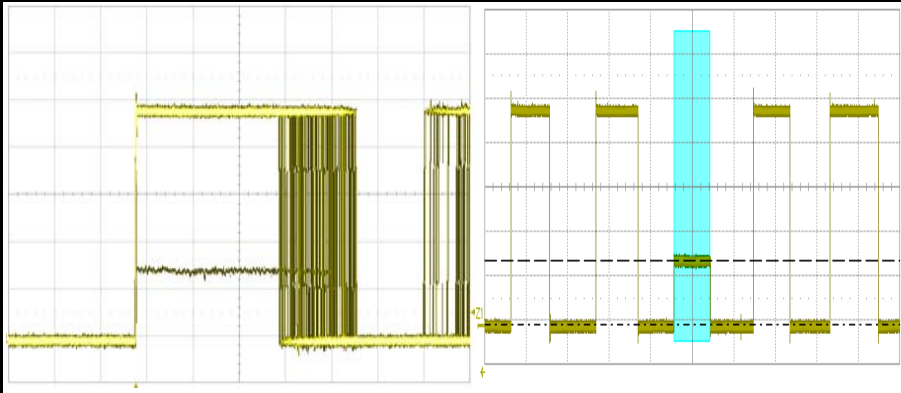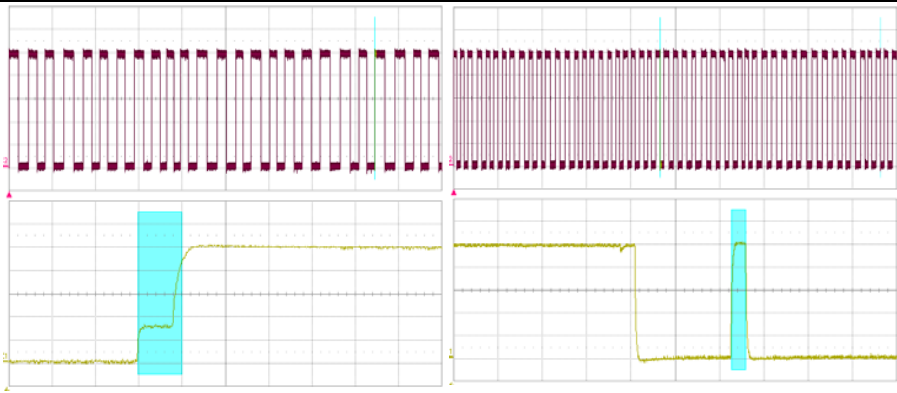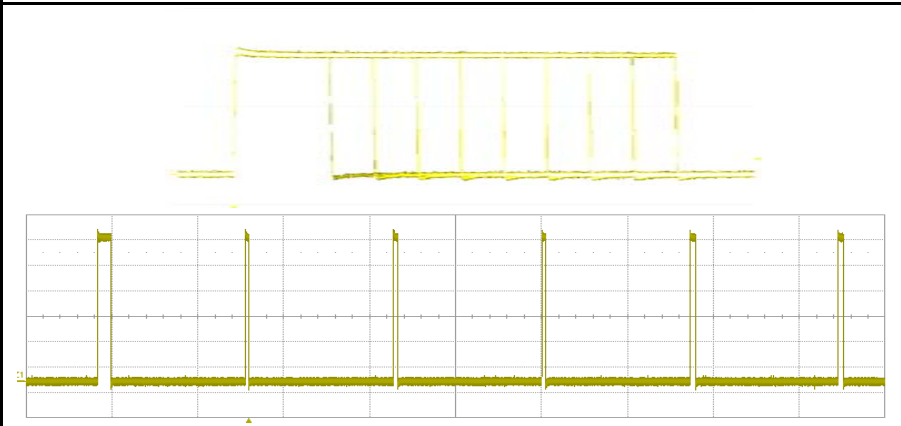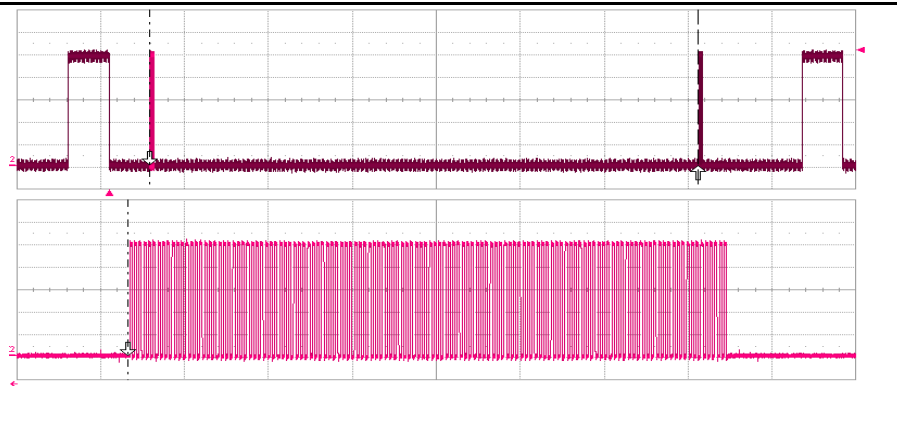
Waveform Output Connections (to scope inputs)

Table indicates Selected Signal Type

Ground Connections for probes

Power and overload indicators

Pins reserved for factory programming

Breadboard area

USB Connection for power and for future code updates

S1-S6 LED's indicate output waveform signal

Digital I/O

GND

Push to select Output Waveform

SIGNAL PROTOCOL	OUTPUT SIGNALS		OUTPUT AND SCOPE SETUP SUMMARY
	CHANNEL 1	CHANNEL 2	
S1 SPI	SDO DATA	SCK CLOCK	Bit Rate=100 kbit/s, CPOL= CPHA=0, Bit Order= MSB, Message= "LeCroy SPI <cnt>", repeat rate= 44ms, idle low, cnt= 1 to 3 digits, 0 to 255
S2 I2C	SDA DATA	SCL CLOCK	Bit Rate= 100 kbps, Message= "LeCroy I2C <cnt>", repeat rate= 44ms, idle high. 25-byte long frame every 61 messages. 10-bit address every few messages. Incrementing address from 10h to 2Fh. Write frame followed with Read frame.
S3 UART	Not Used	TRANSMIT	Bit Rate= 100 kbit/s, Data Bits= 8, Parity= NONE, Stop Bits= 1, Bit Order= LSB, Polarity= IdleHigh, Message= " LeCroy UART <cnt>". Repeat rate = 44ms. Break sent at end of every few messages.

WaveSource 100 - Quick Reference Card - page 2

SIGNAL PROTOCOL	OUTPUT SIGNALS	
	CHANNEL 1	**CHANNEL 2**

<table>
<tr><th>SIGNAL PROTOCOL</th><th colspan="2">CHANNEL 1</th><th colspan="2">CHANNEL 2</th></tr>
<tr><td rowspan="2">S4   RUNT</td><td colspan="2" align="center">JITTER (35%)
RUNT (positive)</td><td colspan="2" align="center">RISE TIME (slow=105 nsec)
WIDTH (pos.glitch = 165 nsec)
JITTER (35%)</td></tr>
<tr><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td colspan="5">Both outputs are 5 V square waves with freq.= 2.0-3.2 KHz and jitter = 35%; <u>**Channel 1**</u>: has positive runt (1/3 height) occurs every 200 msec. or 1:500 pulses; <u>**Channel 2**</u>: Risetimes averaging 26-35 nsec. with a slow rise of 105 nsec. every 200 usec. or 1:500 pulses; Widths range 152-240 usec. with a narrow glitch of 165 nsec. occuring 3 and 51 edges before the glitch (10 msec's apart and repeating every 200 msec.)</td></tr>
<tr><td rowspan="2">S5   PWM</td><td colspan="2" align="center">PERSISTENCE TRACE
(incrementally repeating pulse width pattern)</td><td colspan="2" align="center">LONG MEMORY TRACE
(short bursts of 500 KHz and 750 KHz square waves separated by long delay)</td></tr>
<tr><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td colspan="5"><u>**Channel 1**</u>: 5V positive pulse width pattern starts from single pulse of 1.66 usec. width, linearly increases number of pulses for each increasing value of pulse widths. Widths increment in 0.75 usec steps, i.e.. 2 pulses at 2.41 usec., 3 pulses at 3.16 usec. until reach 9 pulses at 7.66 usec. widths. Repeats every 86 usec.   <u>**Channel 2**</u>: 5V 500 KHz and 750 KHz bursts of 127 cycles each, starting 33 msec. apart. Effectively short bursts separated by long delay. This repeating output is preceded by positive 2.4 usec. pulse and 2.4 usec. delay. Repeats complete pattern every 44 msec.</td></tr>
</table>

WaveSource 100 - Quick Reference Guide   - page 3

SIGNAL PROTOCOL	OUTPUT SIGNALS	
	CHANNEL 1	**CHANNEL 2**
S6 SIG	Not Used	**NON MONOTONIC Edge** **RUNT** (negative)

Channel 2 only: 3V square wave that has a non-monotonic edge (starts at 1.8V from ground on the positive slope, drops 1.25 V before transitioning to the high level. Signal also contains a negative runt on the top of a positive pulse. This is 1.5 KHz signal with the negative runt and non onotonic edge occuring every 680 msec.or 1:1,000 pulses.

DIGITAL OUTPUTS

8 Parallel digital ouputs always available at the Digital I/O connector, 40 KHz clock.