

PRL-4503 4-CHANNEL HIGH-SPEED LINE DRIVER/LEVEL TRANSLATOR

APPLICATIONS

- Long Line Driver/Level Translator
- Laser Diode Driver
- TTL/CMOS/ECL Device Testing
- Amplifier Large Signal Response Testing
- TDR Source for Cable Testing
- A Basic Laboratory Tool (BLT)



PRL-4503 Front View

FEATURES

- Four Independent I/O Channels
- $t_r = 900$ ps Typical @ 5V Output into 50 Ω
- +5 V/-2 V Output HL/LL into 50 Ω
- Normal or Inverted Output
- f/2 Mode for Square Wave Output
- f_{max} to 250 MHz @ 3V Output
- TTL and Single-ended NECL Compatible Inputs (logically ORed)
- Standard 19-in. Rack-Mount Chassis



PRL-4503 Rear View

GENERAL DESCRIPTION

The PRL-4503 is a high-speed, 4-Channel 50 Ω Line Driver/Level Translator with independently variable output Hi and Lo levels. Each channel has TTL- and NECL-compatible inputs. The TTL input has a 50 Ω to ground termination, and the single-ended NECL input has a 50 Ω /-2 V termination. The TTL and NECL inputs are logically ORed; therefore a Hi level applied to either input can be used as a gate signal.

The output Hi and Lo levels of each channel are independently variable from 0 V to +5 V and 0 V to -2 V into 50 Ω , respectively, or +10 V and -4 V into 1 M Ω . The maximum output peak-to-peak swing is 7 V into 50 Ω , or 14 V into 1 M Ω . The back-terminated 50 Ω output can drive long 50 Ω lines with or without load termination. For each channel, a Normal/Invert switch provides output logic polarity selection, and an f/2 switch provides square wave output. The 50 Ω TTL input requires less than 1 V for triggering. Each channel also has a greater than 1V into 50 Ω scope trigger output that can drive another suitable PRL-series module, such as the PRL-260ANT, PRL-420ND, PRL-470B, etc.

The <1 ns rise-time output makes the PRL-4503 a suitable TDR source for testing cables. Typical maximum clock rate is 250 MHz @ 3.5 V output and 200 MHz @ 5 V output, well suited for testing logic circuits of different families, amplifiers and many semiconductor devices.

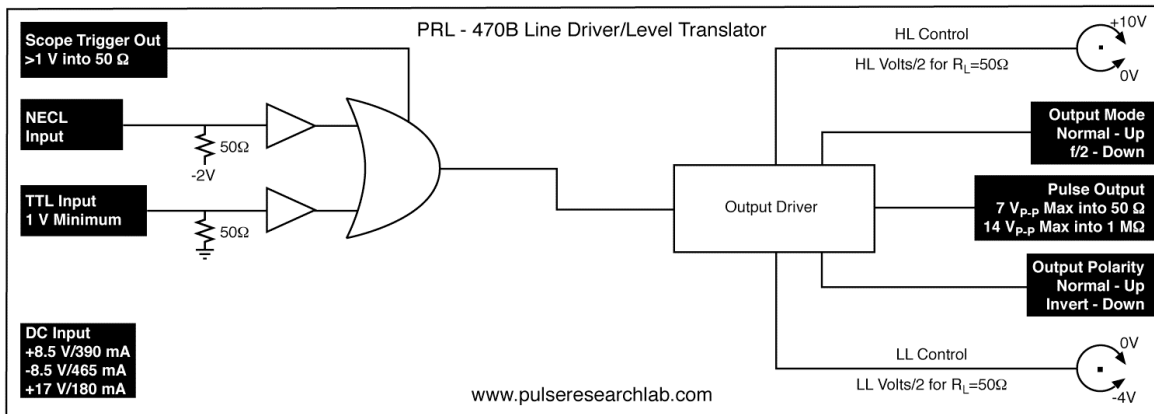
The PRL-4503 contains four PRL-470B modules mounted inside a standard 19-in. rack, powered by an internal power supply intended for 120 V/60 Hz operation.



SPECIFICATIONS (0° C ≤ TA ≤ 35° C)

Unless otherwise specified, dynamic measurements are made with all rear-panel outputs terminated into 50 Ω, using maximum 30-in.long RG-58C/U cables.

SYMBOL	PARAMETER	Min	Typ	Max	UNIT	Comments
R_{in}	Input Resistance	49.5	50	50.5	Ω	
R_{in}/V_{TT}	TTL Input Termination NECL Input Termination		50 Ω to ground 50 Ω/-2 V			
V_{IL}	TTL input Low Level NECL input Low Level	-0.5 -2.2	0 -1.8	0.5 -1.5	V	
V_{IH}	TTL input High Level NECL Input High Level	0.8 -1.0	0.85 -0.8	3.5 -0.5	V	
V_{OL}	Output Low Level	-2/-4		0	V	$R_L=50\ \Omega/1\ M\Omega$
V_{OH}	Output High Level	0		5/10	V	$R_L=50\ \Omega/1\ M\Omega$
V_{p-p}	Output Voltage Swing	0.8/1.6		7/14	V	$R_L=50\ \Omega/1\ M\Omega$
V_{AC}	AC/DC Adapter Input Voltage	108	120	132	V	
t_{PLH}/t_{PHL} V_o	Prop. Delay to Output ↑/↓		10		ns	$V_{OL}=0\ V, V_{OH}=5\ V$
t_{PLH}/t_{PHL} V_{OT}	Prop. Delay to Trigger Output ↑/↓		7.5		ns	
t_{r1}/t_{f1}	Output Rise/Fall Times (10%-90%)		0.9/1.1	<1/1.3	ns	$V_{OL}=0\ V, V_{OH}=5\ V$
t_{r2}/t_{f2}	Output Rise/Fall Times (10%-90%)		0.8/0.95	<0.85/1.1	ns	$V_{OL}=0\ V, V_{OH}=3.0\ V$
t_{r3}/t_{f3}	Output Rise/Fall Times (10%-90%)		0.8/0.95	<0.85/1.1	ns	$V_{OL}=-2\ V, V_{OH}=2.5\ V$
t_{r4}/t_{f4}	Output Rise/Fall Times (10%-90%)		1.1/1.35	1.2/1.5	ns	$V_{OL}=-2\ V, V_{OH}=5\ V$
T_{SKEW}	Skew between $V_o\uparrow$ and $V_o\downarrow$		100	300*	ps	$V_{OL}=0\ V, V_{OH}=5\ V$ $F=50\ MHz, PW=5\ ns$
F_{max1}	Maximum Clock Frequency	200	225		MHz	$V_{OL}=0\ V, V_{OH}=5\ V$
F_{max2}	Maximum Clock Frequency	250	275		MHz	$V_{OL}=0\ V, V_{OH}=3.5\ V$
F_{max3}	Maximum Clock Frequency	225	250		MHz	$V_{OL}=-2\ V, V_{OH}=2.5\ V$
F_{max4}	Max. Input Clock Frequency	400	500		MHz	Square Wave Mode
PW_{Min}	Minimum Output Pulse Width		2.5	3	ns	$V_{p-p}=5\ V$
ΔPW	Output PW change, $V_o\uparrow$ and $V_o\downarrow$		200	400*	ps	$V_o=0$ to 5 V, $PW=5\ ns$
V_o Trig	Trigger Output	1	1.2		V	$R_L=50\ \Omega, f \leq 250\ MHz$
	Size	19-in. W X 5.25 H X 15-in. D			in.	
	Weight	15			lb	



PRL-470B (Internal Module) Block Diagram

* Skew and ΔPW may vary with different output level, frequency and pulse width settings