Protek 디지털오실로스코프 5000 시리즈

Protek5XXX 시리즈 모델:

Protek5020, Protek5060, Protek5100, Protek5200,Protek5072E, Protek5102E

Protek5071,Protek5202E,Protek5202,Protek5302,

주요특징:

- 작은 사이즈로 휴대성이 용이한 디지털 오실로스코프
- 7인치 와이드 컬러 TFT LCD 디스플레이
- 2채널, 주파수대역폭: 25MHz~ 300 MHz
- 실시간 샘플링 : 500MSa/s~ 2GSa/s
- 등가 샘플링 : 25GSa/s - 50GSa/s
- 메모리 depth : 4k ~ 40kpts
- 지원 트리거 종류: Edge, Pulse, Video , Slope and Alternative
- 특별한 Digital Filter 와 Waveform recorder 기능
- 자동 측정 기능 및 32가지의 파라미터 측정 가능
- 내부저장 : reference waveforms(2개 혹은 4개) 파형 저장(20개),설정조건(20개) 및 외부 USB를 통한 저장 가능
- Cursor 측정 종류 : Manual mode, Track mode, Auto mode.
- 채널 파형과 FFT 파형을 화면에서 분리 표시 가능
- 파형 감도 및 눈금 밝기 조절 기능
- 디스플레이메뉴 팝업 기능으로 사용의 편리성 제공
- 디스플레이 바탕화면 스타일 선택 : Classical, Modern, Tradition, Succinct.
- 다국적 언어 제공
- 다국적 언어 도움말 온라인 시스템
- 기본 인터페이스 : USB Host; USB Device; RS-232; Pass/Fail Out

(상기 특징들은 제품 모델에 따라 각각 다를 수도 있습니다.)

주의 사항

아래 모든 사양은 10X 프로브를 기준으로 하며 아래 조건을 만족한 상태 입니다.

◆ 특정 동작 온도에서 약 30분이상 제품 구동을 실시 해야 합니다.

◆ 주변온도가 5도 이상 차이 나는 경우 UTILITY → Do Self Cal 동작을 수행 후 제품을 구동 해야 하며, 측정 환경에 따라 제품 성능은 달라질 수 있습니다.

◆ 오실로스코프는 공장 출하 후 교정 주기 이내에 있어야 합니다.

◆ 하기 사양서는 제품 성능 향상 및 품질 개선에 따라 달라질 수도 있습니다.

사양서 (Specifications)

Inputs(입력단)	
Input Coupling	AC, DC, GND
Input Impedance	1MΩ ±2% || 16Pf±3Pf, 50Ω+/-2%(Protek5200 contain this function)
Maximum Input voltage	400V （DC+AC PK-PK，1MΩ input impedance，X10），CAT I
Ch to Ch Isolation (Both channels in same V/div setting)	>100:1 at 100MHz >100:1 at 70MHz >100:1 at 50MHz >100:1 at 35MHz >100:1 at 25MHz >100:1 at 10MHz
Probe Attenuator	1X,10X
Probe Attenuator Factors Set	1X,5X,10X,50X,100X,500X,1000X

수직축	
Vertical Sensitivity	2mV/div -10V/div(1-2-5 order) [Except Protek5200 : 2mV/div -5V/div]
Channel Voltage Offset Range	2mV –200mV: ±1.6V 206mV - 10V: ±40V (Protek5200: 2mV-100mV: ±800MV 102mV-10V: ±40V)
Vertical Resolution	8 bit
Channels	2
Analog Bandwidth	300MHz 200MHz 100MHz 70MHz 60MHz 25MHz

BW Flatness at BNC input	DC -10% of rated BW: +/- 1dB 10% - 50% of rated BW: +/- 2dB 50% - 100% of rated BW: + 2dB/-3dB
Lower frequency limit (AC -3dB)	≤10Hz(at input BNC)
Noise: Pk-Pk for 3K record	≤0.6 Div for average of 10 Pk-Pk readings, Fixed gain settings ≤0.7 Div for average of 10 Pk-Pk readings, Variable gain settings
SFDR including harmonics (measured with FFT)	>=35dB
DC Gain Accuracy	＜±3.0%: 5mv/div to 10V/div in Fixed Gain Ranges ＜±4.0%: 2mv/div Variable Gain Ranges
DC Measurement Accuracy: All Gain settings ≤100mv/div	± [3%* （ |reading|+|offset| ） +1% *of |offset| +0.2div+2mv]
DC Measurement Accuracy: All Gain settings ＞100mv/div	± [3%* （ |reading|+|offset| ） +1%* of |offset| +0.2div+100mv]

Rise time	<1.8ns **Protek 52xx,53xx 시리즈** <2.3ns **Protek 52xx, 시리즈** <3.5ns **Protek51xx시리즈** <5.0ns **Protek507X 시리즈** <7.0ns **Protek5060 시리즈** <14ns **Protek5020 시리즈**
Overshoot, Typical (using 500ps pulse)	<10% with probe or BNC input w/ 50 Ohm feed thru
Ch to Ch Skew (both channels in same V/div setting)	<1ns: **Protek51xx, 52xx, 53xx 시리즈** <2ns: **Protek507X 시리즈** <4ns: **Protek5060 시리즈** <10ns: **Protek5020 시리즈**

	(Equivalent to 2 minor divisions in smallest t/div)
Math operation	+, -, *, /, FFT
FFT	Window mode: Hanning, Hamming, Blackman, Rectangular
	Sampling points: 1024
Bandwidth limited	20MHz ±40% (Note: BW limited below 20MHz when using probe in x1)

수평축	
Real Time (실시간) Sampling Rate	Protek5020,5100,5200 : 500MSa/s(Single Channel); 250MSa/s (Dual Channel); Time base 250ns/div Protek5060,5071,5072E,5102E,5202E : 1GSa/s(Single Channel); 500MSa/s (Dual Channel); Time base 50ns/div (5201,5301동일) Protek5201,5301 : 2GSa/s(Single Channel); 1GSa/s(Dual Channel)
Equivalent (등가) Sampling Rate	The highest equivalent sampling rate of other Models is 50GSa/s
Measure Display Modes	MAIN, WINDOW, WINDOW ZOOM, ROLL, X-Y
Timebase Accuracy	±50ppm measured over 1ms interval
Horizontal Scan Range	2.5nS/DIV - 50S/DIV
	Scan: 100mS/DIV ~50S/DIV (1-2.5-5 sequence)

트리거	
트리거 Types	Edge, Pulse Width, Video, Slope, Alternative
트리거 Source	CH1,CH2,EXT,EXT/5,AC Line
트리거 Modes	Auto, Normal, Single
트리거 Coupling	AC, DC, LF rej, HF rej
트리거 Level Range	CH1,CH2: ±6divisions from center of screen
	EXT: ±1.2V
	EXT/5: ±6V
트리거 Displacement	Pre-트리거 : (Memory depth/(2*sampling)), Delay 트리거 : 271.04DIV
트리거 Level Accuracy (typical) applicable for the signal of rising and falling time ≥20ns	Internal: ±(0.2 div×V/div)(within±4 divisions from center of screen) EXT: ±(6% of setting + 40 mV) EXT/5: ±(6% of setting + 200 mV)
트리거 Sensitivity	For fixed gain ranges 1 Divisions: DC-10MHz 1.5 Divisions: 10MHz - Max BW
	EXT: 200mVpp DC-10MHz, 300mVpp 10MHz - Max BW
	EXT/5: 1Vpp DC-10MHz, 1.5Vpp 10MHz - Max BW
Pulse Width 트리거	트리거 Modes: (>,<, =)positive Pulse Width, (>, <, =)Negative Pulse Width
	Pulse Width Range: 20ns – 10s

Video 트리거	Support signal Formats: PAL/SECAM, NTSC
	트리거 condition : odd field, even field, all lines, line Num
Slope 트리거	(>,<, =) Positive slope, (>,<, =) Negative slope
	Time: 20ns-10s
Alternative 트리거	CH1 트리거 type: Edge, Pulse, Video, Slope
	CH2 트리거 type: Edge, Pulse, Video, Slope

X-Y Mode	
X-pole Input / Y-Pole Input	Channel 1 (CH1) / Channel 2 (CH2)
Sample Frequency	XY mode has a breakthrough that trad oscilloscopes restrict sampling rate at 1MSa/s. Support 25Ksa/s～250Msa/s adjusted.

Hard Ware Frequency Counter (하드웨어 주파수 측정)	
Reading resolution	1Hz
Range	DC Couple, 10Hz to MAX Bandwidth
Signal Types	Satisfying all Trigger signals(Except Pulse width trigger and Video Trigger)

Control Panel Function (제어 판넬 기능)	
Auto Set	Auto adjusting the Vertical, Horizontal system and Trigger Position
Save/Recall	Support 2 Group referenced Waveforms, 20 Group setups, 20 Group captured Waveforms internal Storage/Recall function and USB flash driver storage function.

Measure System (주요 측정)	
Auto Measure (32 Types) (자동 측정 32가지)	Vpp, Vmax, Vmin, Vamp, Vtop, Vbase, Vavg, Mean,Crms, Vrms, ROVShoot, FOVShoot, RPREShoot, FPREShoot, Rise time, Fall time, Freq, Period,+ Wid,－Wid, ＋Dut, －Dut, BWid, Phase, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF
Cursor Measure	Manual mode, Track mode and Auto mode

부록 B : 일반 사양 및 기본 설정

Display System (디스플레이 시스템)	
Display Mode	Color TFT 7.0in.(177.8mm)diagonal Liquid Crystal Display
Resolution	480 horizontal by 234 vertical pixels
Display Color	24 bit
Display Contrast （Typical state）	150:1
Backlight Intensity（Typical state）	300nit
Wave display range	8 x 18 div
Wave Display Mode	Dots, Vector
Persist	Off, 1 sec, 2 sec, 5 sec, Infinite
Menu Display	2 sec, 5 sec, 10 sec, 20 sec, Infinite
Screen-Saver	Off,1min,2min,5min,10min,15min,30min,1hour,2hour,5hour
Skin	Classical, Modern, Tradition, Succinct
waveform interpolation	Sin(x)/x，Linear
Color model	Normal , Invert
Language (언어)	Simplified Chinese, Traditional Chinese, English, Arabic, French, German, Russian, Portuguese Spanish, Japanese, 한국어 , Italian

Environments (동작 환경)	
Temperature	Operating:10℃ to +40℃ (동작온도) Not operating: -20℃ to +60℃ (보관온도)
Cooling	The fan forces it cold. (강제냉각)
Humidity	Operating: 85%RH, 40℃, 24 hours (동작시) Not operating: 85%RH, 65℃, 24 hours(보관시)
Height	Operating: 3000m (동작 높이) Not operating: 15,266m (보관 높이)

Power Supply (전원)	
Input Voltage	100-240 VAC, CAT II, Auto selection
Frequency Scope	50/60 Hz
Power	50W Max

Mechanical		
Dimension	length	323.1mm
	Width	135.6mm
	Height	157mm
weight	2.5kg (제품무게)	

메뉴 및 시스템	옵션메뉴,노브,버튼	기본 설정 (Default)
CH1,CH2	Coupling	DC
	BW limit	Off
	Volts/div	Coarse
	Probe	1X
	Invert	Off
	Filter	Off
	Volts/div	1.00V
MATH	Operation	CH1+CH2
	CH1 Invert	Off
	CH2 Invert	Off
	FFT operation:	
	Source	CH1
	Window	Hanning
	FFT Zoom	1X
	Scale	dBVrms
	Display	Split
HORIZONTAL	Window	Main
	Position	0.00μs
	Sec/div	500μs
	Window Zone	50.0μs
	Trigger knob	level
CURSOR	Type	Off
	Source	CH1
	Horizontal (voltage)	+/-3.2divs
	Vertical (time)	+/-5divs
ACQUIRE	three mode options	Sampling
	Averages	16
	Sampling mode	Real Time
DISPLAY	Type	Vectors
	Persist	off
	Gird	
	Intensity	60%
	Brightness	40%
	Format	YT

	Menu Display	infinite
SAVE/RECALL	Type	Setups
	Save To	Device
	Setup	No.1
REF	REFA/REFB	REFA
	Source	CH1
	REFA	off
	REFB	off
UTILITY	Sound	on
	Counter	On
	Back USB	USBTMC
	Pass/Fail	off
	Record	off
TRIGGER (edge)	Type	edge
	Source	CH1
	Slope	Rising
	Mode	Auto
	Coupling	DC
	LEVEL	0.00V
TRIGGER (pulse)	Type	pulse
	Source	CH1
	When	=
	Set Pulse Width	1.00ms
	Mode	Auto
	Coupling	DC
TRIGGER (Video)	Type	Video
	Source	CH1
	Polarity	Normal
	Sync	All Lines
	Standard	NTSC
	Mode	Auto
TRIGGER (Slope)	Type	Slope
	Source	CH1
	Time	1.00ms
	Mode	Auto
TRIGGER (Alternative)	Type	Alternative
	Source	CH1
	Mode	Edge
	Coupling	DC

기본 제공 액세서리:

- 1:1/10:1 일반형 기본 프로브 세트 (2 세트)
- 기본 전원 코드
- Certification 1장
- PC GUI 프로그램 CD (PC용 소프트웨어)
- 사용설명서 1부
- USB 케이블