Specifications

- Nominal, Typical, Supplement and Approximate values show the supplemental data of this product and these do not guarantee the performance.
- -1-2-5 sequence; A sequence of numbers that repeats like 1,2,5,10,20,50,100,200,500.

Measured signal system

Input coupling	A, A-B: AC/DC selectable AC coupling with two-stage cascaded 1st order HPF, fc: 0.1Hz (nominal) I: AC/DC selectable, after converting the voltage C (LI5660 only) : DC (Always automatically cancel DC component) HF (LI5660 only): AC, when input impedance is 50 Ω, the AC-couple stage is positioned after the 50 Ω termination one. fc: 1 kHz (nominal)
Input ground	Float/Connect to chassis selectable Withstand voltage : ± 1 Vpk max. (DC+AC) Impedance to chassis: 10 kΩ (float, nominal), 11 Ω (connected to the chassis, nominal)
Line filter	Selectable: through (disabled), fundamental wave rejection (50 Hz or 60 Hz), 2nd order harmonic rejection (100 Hz or 120 Hz), or rejection of both fundamental and 2nd order harmonic Attenuation: 20 dB or more (at f_0) * When using the input C and HF, Line filter is disable regardless of Line filter settings.

Voltage measurement

		LI5660	LI5655	LI5650	LI5645
Input connector		BNC (front panel A, B, C, HF)	BNC (front panel A, B)		
Input type		A, C, HF (single-end), A-B (differential)	A (single-end), A-B (differential)		
Frequency range		A, A-B, C: 0.5 Hz to 3 MHz HF: 10 kHz to 11 MHz	A, A-B: 0.5 Hz to 3 MHz	A, A-B: 1 mHz to 250 kHz	
Sensitivity		A, A-B: 10 nV to 1 V F. S. (1-2-5 sequence)			
		C: 1 mV to 10 V F. S. (1-2-5 sequence)	——		
		HF: 1 mV to 1 V F. S. (1-2-5 sequence)	——		
Voltage accuracy	A, A-B	±0.5 % (1 kHz, signal level ≥ 1 mV, at 23 ±5°C)*1 ±2 % (1 kHz, signal level ≥ 1 μV)*1 ±0.5 % (≤ 20 kHz, sensitivity 100 mV to 1 V, at 23 ±5°C)*2 ±1 % (≤ 50 kHz, sensitivity 100 mV to 1 V)*2 ±2 % (≤ 100 kHz, sensitivity 100 mV to 1 V)*2 ±3 % (≤ 1 MHz, sensitivity 100 mV to 1 V)*2 ±5 % (≤ 3 MHz, sensitivity 100 mV to 1 V)*2		±0.5 % (1 kHz, signal level ≥ 1 mV, at 23 ±5°C)*1 ±2 % (1 kHz, signal level ≥ 1 μV)*1 ±0.5 % (≤ 20 kHz, sensitivity 100 mV to 1 V at 23 ±5°C)*2 ±1 % (≤ 50 kHz, sensitivity 100 mV to 1 V)*2 ±2 % (≤ 100 kHz, sensitivity 100 mV to 1 V)*2 ±3 % (≤ 250 kHz, sensitivity 100 mV to 1 V)*2	
	C	±0.5 % (≤ 20 kHz) ±1 % (≤ 50 kHz) ±2 % (≤ 100 kHz) ±3 % (≤ 1 MHz) ±5 % (≤ 3 MHz) 1 V to 10 V sensitivity, with full-scale signal, dynamic reserve LOW	——		
	HF	±3 % (≤ 1 MHz, input impedance 1 MΩ) ±5 % (≤ 3 MHz, input impedance 1 MΩ) ±7 % (≤ 10 MHz, input impedance 50 Ω) ±14 % (≤ 11 MHz, input impedance 50 Ω) Dynamic reserve LOW, sensitivity 100 mV to 1 V, full-scale signal	——		
Voltage accuracy temperature drift	A, A-B	± 100 ppm / °C (supplementary value) 1 kHz, dynamic reserve LOW, input A, sensitivity 1 V, signal level 100% of F. S.			
Input impedance	A, B	10 MΩ (nominal), 50 pF in parallel (supplementary)			
	C	1 MΩ (nominal), 50 pF in parallel (supplementary)	——		
	HF	1 MΩ (nominal), 50 pF in parallel (supplementary) 50 Ω (nominal)	——		
Input referred noise	A, A-B	4.5 nV/√Hz (supplementary) Dynamic reserve LOW, sensitivity 1 mV or less, 1 kHz, input short			
Common-mode rejection ratio (CMRR)	A-B	at least 100 dB AC coupling, 50 Hz to 1 kHz, signal source impedance 0 Ω, dynamic reserve LOW and sensitivity 20 mV or less (or MED and 2 mV or less)			
Harmonic distortion	A, A-B	–80 dBc or less (10 Hz to 5 kHz, 2 to 3rd order harmonics, each order) Dynamic reserve LOW, sensitivity 1 V, signal level 30% of F.S.			
Maximum input voltage (linear operating range)	A, B, A-B	± 3 V (Each terminal voltage and differential voltage at DC coupling) Dynamic reserve HIGH, sensitivity 1 V			
	C	± 30 V Dynamic reserve HIGH, sensitivity 10 V	——		
	HF	± 3 V Dynamic reserve HIGH, sensitivity 1 V	——		
Non-destructive maximum input voltage	A, B	AC coupling: 10 Vrms (sine), DC±42 V DC coupling: ±14 V			
	C	± 42V	——		
	HF	± 5V	——		

*1 at least 30 % full-scale signal (sensitivity), dynamic reserve LOW

*2 DC coupling, dynamic reserve LOW and full-scale signal

Current measurement (not equipped with LI5645)

	LI5660	LI5655	LI5650
Input connector	BNC (Front panel)		
Input type	Single-end		
Frequency range	0.5 Hz to maximum values shown in the table below (nominal, 3 dB reduction frequency)		1 mHz to maximum values shown in the table below (nominal, 3 dB reduction frequency)
	Cs: Signal source capacitance + connected cable capacitance / Conversion gain: 1 M (10^6) [V/A]	100 M (10^8) [V/A]	Cs: Signal source capacitance + connected cable capacitance / Conversion gain: 1 M (10^6) [V/A]	100 M (10^8) [V/A]
	None: 1 MHz	10 kHz	None: 250 kHz	10 kHz
	150 pF: 1 MHz	10 kHz	150 pF: 250 kHz	10 kHz
	1000 pF: 150 kHz	1.5 kHz	1000 pF: 150 kHz	1.5 kHz
Sensitivity	100 fA to 1μA full-scale (at 1 M [V/A]) 10 fA to 10 nA full-scale (at 100 M [V/A]) Both 1-2-5 sequence		
Current accuracy	±1% (nominal) At 23 ±5°C, dynamic reserve LOW, sensitivity 1 μA (1 M V/A at 1 kHz) as well as sensitivity 10 nA (100 M V/A at 125 Hz), 30 % or more of full-scale sensitivity signal, both typical value.		
Current accuracy temperature drift	± 150 ppm / °C Dynamic reserve LOW, supplementary value for (1 M [V/A], 1 kHz) and (100 M [V/A], 125 Hz)		
Input referred noise	150 fA/√Hz (1M [V/A], 1kHz) 15 fA/√Hz (100M [V/A], 125Hz) Both supplementary value		
Input impedance	1 kΩ (1M [V/A]) ,100 kΩ (100M [V/A]) Both supplementary value		
Maximum input current (linear operating range)	±3 μA DC coupling, dynamic reserve HIGH, conversion gain 1 M [V/A], sensitivity 1 μA		
Non-destructive maximum input current	± 10mA		

Noise density measurement

	LI5660	LI5655	LI5650	LI5645
Sensitivity	Voltage: 20 nV/√Hz to 1 V/√Hz(A, A-B) 1 mV/√Hz to 10 V/√Hz (C*) 1 mV/√Hz to 1 V/√Hz (HF*)		Current: 1 pA/√Hz to 1 μA/√Hz (at 1 M [V/A]) 100 fA/√Hz to 10 nA/√Hz (at 100 M [V/A]) All in 1-2-5 sequence *LI5660 only	Voltage: 20 nV/√Hz to 1 V/√Hz (A, A-B), 1-2-5 sequence

Phase sensitive detector section

	LI5660	LI5655	LI5650	LI5645
Phase sensitive detector (PSD)	2 phase (Rcos θ, Rsin θ), Dual PSD (primary PSD secondary PSD).			2 phase (Rcos θ, Rsin θ), 1 PSD (primary PSD).
PSD settings items	Sensitivity, time constant, phase, XY offset, dynamic reserve			
Detection mode	Detection mode / Measurement frequency: Primary PSD / Secondary PSD*1 SINGLE*2: Fundamental/Fraction Harmonic / None DUAL1*1 *3: Fundamental/Fraction Harmonic / Fundamental/Harmonic DUAL2*1 *4: Primary frequency / Secondary frequency CASCADE*1 *5: Primary frequency / Secondary frequency *1 Not equipped with LI5645 *2 2-phase detection is at one frequency. *3 The fundamental and a harmonic component of one input signal are measured simultaneously. *4 Two independent frequency components (primary and secondary) of one input signal are measured simultaneously. *5 The secondary PSD is connected in cascade with the primary PSD, so after a signal is detected by the primary PSD, it is further detected by the secondary PSD.			
Dynamic reserve	At least 100 dB (supplementary) LOW/MEDIUM/HIGH 3-point selectable (common in primary PSD and secondary PSD)			
Time constant filter	Time constant: 1 μs to 50 ks (1-2-5 sequence) Attenuation slope: 6, 12, 18. 24 dB/oct Synchronous filter: On/Off		Time constant: 5 μs to 50 ks (1-2-5 sequence) Attenuation slope: 6, 12, 18. 24 dB/oct Synchronous filter: On/Off	
Phase noise	0.001° rms (at 1 kHz, attenuation slope : 18 dB/oct or more) 0.003° rms(at 100 kHz, attenuation slope : 12 dB/oct or more) 0.01° rms (at 3 MHz, attenuation slope : 12 dB/oct or more) Supplementary; reference signal is external sine wave 1 Vrms, time constant 100 ms, synchronization filter OFF		0.001° rms (at 1 kHz, attenuation slope : 18 dB/oct or more) 0.003° rms(at 100 kHz, attenuation slope : 12 dB/oct or more) 0.01° rms (at 250 kHz, attenuation slope : 12 dB/oct or more) Supplementary; reference signal is external sine wave 1 Vrms, time constant 100 ms, synchronization filter OFF	
Phase temperature drift	± 0.01°/ °C (100 Hz ≤ frequency ≤ 10 kHz) ± 0.03°/ °C (10 kHz < frequency ≤ 100 kHz) ± 0.2°/ °C (100 kHz < frequency ≤ 3 MHz) Supplementary value when input A and external reference signal are both sine wave 1Vrms.		± 0.01°/ °C (100 Hz ≤ frequency ≤ 10 kHz) ± 0.03°/ °C (10 kHz < frequency ≤ 100 kHz) ± 0.2°/ °C (100 kHz < frequency ≤ 250 kHz) Supplementary value when input A and external reference signal are both sine wave 1Vrms.	

Reference signal system

Reference signal source	• REF IN: the external reference signal is used as the primary PSD' s reference frequency at SINGLE, DUAL1*, and DUAL2*, and is used as the secondary one at CASCADE* • INT OSC: internal oscillator • SIGNAL: measurement signal (cannot be used when input HF is selected) *Except for LI5645

External reference signal

	LI5660	LI5655	LI5650	LI5645
Waveform	SIN POS, TTL POS, TTL NEG			
Input connector	BNC (Front panel REF IN)			
Input impedance	1 MΩ (nominal value), 100 pF in parallel (supplementary value)			
Input voltage range	SIN: 0.3 to 20 Vp-p (sine), TTL: 0 to 5 V, High 2.6 V or more, Low 0.8 V or less (square)			
Pulse width (square wave)	40 ns or more (both High and Low level)			
Non-destructive maximum input voltage	± 15V			
Synchronization frequency range	Signal input / Detection mode / External reference signal / Synchronization frequency range A, A-B, C, I: SINGLE, DUAL1, DUAL2, CASCADE: SIN POS, TTL POS, TTL NEG: 0.3Hz to 3.2MHz HF: SINGLE, DUAL1, DUAL2: TTL POS, TTL NEG: 8kHz to 11.5MHz HF: CASCADE: SIN POS, TTL POS, TTL NEG: 0.3Hz to 3.2MHz	A, A-B, I: SINGLE, DUAL1, DUAL2, CASCADE: SIN POS, TTL POS, TTL NEG: 0.3Hz to 3.2MHz	A, A-B, I: SINGLE, DUAL1, DUAL2, CASCADE: SIN POS: 0.3Hz to 260 kHz A, A-B, I: SINGLE, DUAL1, DUAL2, CASCADE: TTL POS, TTL NEG: 0.5mHz to 260kHz	A, A-B: SINGLE: SIN POS: 0.3Hz to 260kHz A, A-B: SINGLE: TTL POS, TTL NEG: 0.5mHz to 260kHz
Synchronization time	2 periods + 50 ms (supplementary)			
Frequency display resolution	6 digits (0.1 mHz at less than 100 Hz)			
Frequency measurement accuracy	± (40 ppm + 1 count)			

Internal Oscillator

		LI5660	LI5655	LI5650	LI5645
Frequency (primary and secondary)		0.3 Hz to 3.2 MHz (A, A-B, C, I) 8 kHz to 11.5 MHz (HF)	0.3 Hz to 3.2 MHz	0.5 mHz to 260 kHz	
		• Resolution: 6 digits (0.1 m Hz, less than 100 Hz) • Accuracy: ± 40 ppm • Oscillates two independent frequencies (primary frequency and secondary* frequency) at detection mode DUAL2*, CASCADE*			
Reference frequency source		Internal / external selectable			
Reference frequency source	Frequency range	10 MHz ± 0.2 %			
	Waveform	Sine Wave or Square Wave (duty 45 to 55%)			
	Signal level	0.5 Vp-p to 5 Vp-p			
	Non-destructive maximum input voltage	10 Vp-p			
	Input impedance	1 kΩ (nominal)			
	Input coupling	AC			
	Withstand voltage	± 42 Vpk max. (DC+AC) (Allowable voltage to ground)			
Sine wave output	Frequency	Primary frequency (with detection mode SINGLE, DUAL1*) Primary frequency/secondary* frequency (Selectable at detection mode DUAL2*, CASCADE*)			
	Amplitude	0 to 10.00 mVrms (res: 0.01 mVrms) / 0 to 100.0 mVrms (res: 0.1 mVrms) / 0 to 1.000 Vrms (res: 0.001 Vrms) When > 3.2 MHz (LI5660 / LI5655) or > 260 kHz (LI5650 / LI5645), 0 Vrms regardless of the setting			
	Amplitude accuracy	±(2% of setting + 1 mV) ≤ 20 kHz ±(3% of setting + 1 mV) ≤ 100 kHz ±(4% of setting + 2 mV) ≤ 1 MHz ±(7% of setting + 5 mV) ≤ 3.2 MHz		±(2% of setting + 1 mV) ≤ 20 kHz ±(3% of setting + 1 mV) ≤ 100 kHz ±(4% of setting + 2 mV) ≤ 260 kHz	
	Maximum output current	± 15 mA			
	Output impedance	50 Ω (nominal)			
	Harmonic distortion (Output voltage setting 1 Vrms, supplementary)	–80 dBc or less (20 Hz ≤ frequency ≤ 5 kHz, no load, 2nd to 5th order) –70 dBc or less (5 kHz < frequency ≤ 100 kHz, no load, 2nd to 5th order) –60 dBc or less (100 kHz < frequency ≤ 1 MHz, 50 Ω, 2nd to 3rd order) –50 dBc or less (1 MHz < frequency ≤ 3 MHz, 50 Ω, 2nd to 3rd order)		–80 dBc or less (20 Hz ≤ frequency ≤ 5 kHz, no load, 2nd to 5th order) –70 dBc or less (5 kHz < frequency ≤ 100 kHz, no load, 2nd to 5th order) –60 dBc or less (100 kHz < frequency ≤ 250 kHz, 50 Ω, 2nd to 3rd order)	
Square wave output	Frequency	Primary frequency (with detection mode SINGLE, DUAL1*) Primary frequency/secondary* frequency (at detection mode DUAL2*, CASCADE*, selectable)			
	Signal level	TTL (0 to 3.3 V, nominal at no load), ±8 mA max. (supplementary) Less than 3.2 MHz, Output level fixed in High or Low (LI5660 / LI5655 only)			
Harmonic measurement	Detection mode SINGLE	The primary frequency to the PSD is n/m times of reference signal frequency n range (harmonic) : 1 to 63 m range (sub harmonic) : 1 to 63			
	Detection mode DUAL1*	The primary frequency to the primary PSD is n/m times of the reference signal frequency. The secondary frequency to the secondary PSD is n times of the reference signal frequency. n PRI range (harmonics number of primary PSD) : 1 to 63 m PRI range (sub harmonics number of primary PSD) : 1 to 63 n SEC range (harmonics number of secondary PSD) : 1 to 63			
	Allowable frequency range of Harmonic measurement	Reference signal source: REF IN — Fundamental frequency range: Synchronization frequency range to external reference signal — Harmonic frequency range: Same as at left Reference signal source: INT OSC — Fundamental frequency range: Internal oscillator frequency setting range — Harmonic frequency range: Same as at left Reference signal source: SIGNAL — Fundamental frequency range: Synchronization frequency to external reference signal — Harmonic frequency range: Regardless of n, m settings, always operates at n = 1 and m = 1			
Phase adjustment range		–180.000° to +179.999° (resolution 0.001°)			
Orthogonality		± 0.001° or better (supplementary)			
Phase accuracy		±1° (DC coupling, ≤ 10 kHz) ±2° (DC coupling, ≤ 100 kHz) ±5° (DC coupling, ≤ 1 MHz) ±10° (DC coupling, ≤ 3 MHz)		±1° (DC coupling, ≤ 10 kHz) ±2° (DC coupling, ≤ 100 kHz) ±5° (DC coupling, ≤ 250 kHz)	
		Supplementary value; at Sine wave 1 Vms, both input A (sensitivity 1 V) and external reference signal input			

* Except for LI5645

Arithmetic processing

Offset adjustment	X, Y: sensitivity of ± 105% (resolution 0.001%) Both of primary PSD and secondary PSD* can be set
Expand	X, R:1, 10, 100 (Ratio of X and R is common) Y:1, 10, 100 • Primary PSD and secondary PSD* can be set individual • Apparent sensitivity (signal full-scale) is 1 / EXPAND magnification • Unusable when normalize or ratio calculation is running.
Normalize (normalize calculation not available or select from right)	% value = (measured value / standard value) x 100 dB value = 20 × log10 | Measurement values / standard values | % FS value = (measured value / sensitivity) × 100 • When detection mode is SINGLE, DUAL1*, DUAL2*, the above measurement value = primary PSD output (X or R) • When detection mode is CASCADE*, the above measurement value = secondary PSD output (X or R) Standard value range: voltage 1 nV to 10 V, current 1 fA to 1 μA*, resolution 6-digit • Unusable when EXPAND or Ratio calculation is running.
Ratio (ratio calculation not available or select from right)	Ratio of measured value A and standard value B ratio = K × A ÷ B K: 0.1 to 10 (resolution 0.00001) A, B: Select from a combination of the right * Maximum update rate of B is 10 k sample/s • When executing expand or normalizing, ratio processing cannot be performed.

A (measured value)	B (standard value)	Detection mode
Primary PSD output (X, Y, R) / Sensitivity	AUX IN 1 Measurement value / 10 V	SINGLE, DUAL1*, DUAL2*
Primary PSD output (X, Y, R) / Sensitivity	Secondary PSD X output / Sensitivity	DUAL1*, DUAL2*
Secondary PSD output (X, Y, R) / Sensitivity	AUX IN 1 Measurement value / 10 V	CASCADE*

* Except for LI5645

Measured value output and display

Parameter	Output/Display	Detection mode: SINGLE	Detection mode: DUAL1*, DUAL2*, CASCADE*
	DATA1	X, R, AUX IN 1, NOISE	Xp, Rp, Yp, θp, Xs, Rs, AUX IN 1, NOISE
	DATA2	Y, θ, AUX IN 1, AUX IN 2	Yp, θp, Xs, Rs, Ys, θs, AUX IN 1, AUX IN 2
	DATA3	X, R	Xp, Rp, Yp, θp, Xs, Rs
	DATA4	Y, θ	Yp, θp, Xs, Rs, Ys, θs
	Remarks: X, Y, R, θ suffix	n: harmonic (At harmonic value settings, n as a suffix. Ex.: Xn)	p: primary ditector s: secondary ditector n: harmonic (At harmonic value settings, n as a suffix. Ex.: Xpn)

* Except for LI5645

		LI5660	LI5655	LI5650	LI5645
Analog output	Full scale voltage	± 10 V (bipolar signal) , +10 V (unipolar signal)			
	Output voltage range	± 12 V (no-load)			
	Maximum output current	± 10 mA			
	Output impedance	470 Ω (nominal value)			
	Output voltage accuracy	± (0.3% + 10 mV) to measurement value			
	Maximum update rate	DATA OUT 1/DATA OUT2 (Front panel) 312.5 k sample/s. DATA OUT 3/DATA OUT4 (Rear panel) 1.5625 M sample/s.		DATA OUT 1/DATA OUT2 (Front panel) 156.25 k sample/s. DATA OUT 3/DATA OUT4 (Rear panel) 781.25 k sample/s.	
Measurement screen display		Normal: show the measured values (DATA1, DATA2) and key settings Large: enlarged display the measured values (DATA1, DATA2) Fine: Show the measured values (DATA1, DATA2, DATA3, DATA4) and advanced settings On Normal and Large measurement screens, displays measured values as bar graphs as well as numerical values.			
Numeric display					

Parameter	Numeric display: Range	Numeric display: Resolution	Measurement value for the full scale voltage of the analog output
X, Y	Sensitivity / EXPAND (±120%)	6 digits, at full-scale sensitivity	± sensitivity / EXPAND ratio
R	Sensitivity / EXPAND (0 to 120%)	6 digits, at full-scale sensitivity	Sensitivity / EXPAND ratio
θ	–180.000 to +179.999 °	0.001 °	± 180 °
NOISE (Noise density)	Sensitivity 0 to 120 %	6 digits, at full-scale sensitivity	Sensitivity
AUX IN 1, 2	± 12 V	0.001 V	± 10 V
Ratio	± 2.4	0.00001	± 2
Normalize %	± 240 %	0.001 %	± 200 %
Normalize % of full-scale	± 120 % of F.S.	0.001 % of F.S.	± 100 % of F.S.
Normalize dB	± 120 dB	0.001 dB	± 100 dB

Monitor output

Monitor signal	Phase sensitive detector input signal
Maximum output	Maximum output voltage ± 3 V (no-load), maximum output current ± 20 mA
Output impedance	50 Ω (nominal value)

Auxiliary input (DC voltage measurement)

Number of channels	2
Maximum allowable input voltage	± 12 V
Non-destructive maximum input voltage	± 42 V
Input impedance	1 MΩ (nominal), 50 pF in parallel (supplementary)
Voltage measurement accuracy	± (0.3% + 10 mV), when the input ground is equal to the chassis potential
Frequency bandwidth	Highest: 5 kHz (–3 dB) (supplementary value)
Sampling rate	Highest: 125 k sample / s
Floating characteristics	Signal Ground Maximum voltage to ground (non-destructive): ± 42 Vpk max. (DC+AC) Ground impedance: 1 MΩ (nominal value) Signal Maximum voltage to ground: ± 42 Vpk max. (DC+AC)

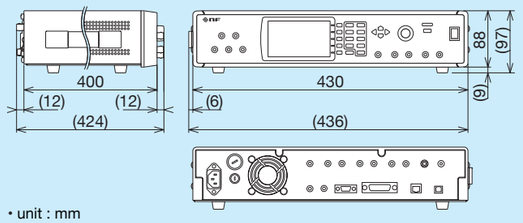
Auxiliary output (DC voltage output)

Number of channels	2
Output voltage range	± 10.500 V (resolution 0.001 V)
Maximum output current	± 5 mA
Output impedance	1 kΩ (nominal value)
Output voltage accuracy	± (0.3% + 10 mV), at no load

Automatic setting items

Measurement	Perform the following items “time constant” , “sensitivity” , “phase”
Time constant	Set the time constant and attenuation slope corresponding to the frequency of the reference signal.
Sensitivity	Set the sensitivity and dynamic reserve according to the input signal.
Phase	Set the phase shift value as Y and phase output to a zero
Offset	Set each offset value, X and Y outputs to a zero

Dimensions (LI5660)



• unit : mm
• The LI5600 series all have the same dimensions, but the number of terminals on the front and back is different.

Data Memory

Record data	For each sample data, select arbitrary up to five words from the recorded data
Recording capacity	Buffer 1, 2: 16 to 8192 sample Buffer 3: 16 to 65536 sample (FIFO)
Trigger Signal	Internal timer/External trigger/Remote control commands/Manual trigger 1 sample recorded when trigger signal is received
Sampling interval	**LI5660 / LI5655** Internal timer Range: 1.92 μs to 20 s, repeated at equal intervals, resolution: 640 ns, 6 digits max. External trigger/Remote control commands/Manual trigger Range: ≥ 2.6 μs arbitrary intervals, trigger jitter 640 ns (nominal) **LI5650 / LI5645** Internal timer Range: 9.6 μs to 20 s, repeated at equal intervals, resolution: 640 ns, 6 digits max. External trigger/Remote control commands/Manual trigger Range: ≥ 10 μs arbitrary intervals, trigger jitter 640 ns (nominal)
External trigge	Signal level: TTL (0 to 5 V, High 2.6 V or more, Low 0.8 V or less), Minimum pulse width: 500 ns (both high and low level) Effective edge: Falling, input impedance: 10 kΩ (nominal) Non-destructive maximum input voltage: ± 15 V
Trigger delay time	0 to 100 s (resolution: 640 ns, 6 digits max.)

General

Interface	USB	USBTMC, USB 2.0 High speed
	RS-232	4800 / 9600 / 19200 / 38400 / 57600 / 115200 / 230400 bps
	GPIB	Compliance standards IEEE 488.1, IEEE 488.2
	LAN	10BASE-T / 100BASE-TX, TCP/IP
Display		4.3-inch WQVGA, color LCD
Power supply		AC 100 V ± 10% / 120 V ± 10% / 230 V+10%, –14% However 250 V or less 50 Hz / 60 Hz ± 2 Hz, power consumption 75 VA or less, over voltage category II
Operating temperature / humidity range		0 to +40°C 5 to 85% RH, absolute humidity 1 to 25 g / m^3, no condensation
Warm-up time		30 minutes
Setting memory		9 sets
Resume		Return to the last settings at power-on state
Power output for Preamp		± 15 V (nominal) 100 mA max. (rear panel PREAMP POWER)
RoHS		Directive 2011/65/EU
Safety / EMC		EN 61010-1:2010, EN 61010-2-030:2010, EN 61326-1:2013, EN 61326-2-1:2013
External dimensions (mm)		430 (W) × 88 (H) × 400 (D) Excluding protrusions
Weight		Approx. 7.5 kg Except for accessories

Accessories and options

Accessories	Instruction manual, CD-ROM (remote control driver etc.) power cord set (3-pin, 2 m) fuse (time lag, 1.0 A / 250 V, φ 5.2 × 20 mm) protective cap* (for current input terminal)
Option	PA-001-2779 EIA rack-mount kit PA-001-2780 JIS rack-mount kit

* Except for LI5645

The contents of this catalog are current as of September 3rd, 2021.