

PRODUCT GUIDE

Information

We make your measurements easier since more than 60 years



In 1947 SEFRAM started with the design and production of oscillographic recorders. 63 years on, SEFRAM has become European leader for recorders & data acquisition systems, is a major manufacturer of TV field strength meters and now offers an extensive range of test & measurement instruments. Today, SEFRAM is one of the globally recognised instrument manufacturers. Our main strengths are :

- Technical innovation and service in response to customer requests
- All our activities are integrated into one modern 4000m2 plant in Saint-Etienne
- ISO9001 : 2000 quality accreditation

SEFRAM has reached its 63rd anniversary due to the ongoing support of our many customers and partners throughout the world. We would like to thank you all for your confidence in Sefram.



Pascal Oses
General Manager

Roger Marenthier
Marketing & Sales Director

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INSTRUMENTS & SYSTEMES



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Generators Overview

Selection Guide

	Frequency	Output Channel Number	External frequency Counter	Wobulation	Modulation	Arbitrary mode	Interface	Page
Pulse Generator	Sefram 4451	50 MHz	1			-	IEEE	3
	Sefram 4453	50 MHz	2			-	IEEE	3
DDS Function Generator	BK 4007 DDS	7 MHz	1	-	yes	-	-	8
	BK 4013 DDS	12 MHz	1	-	yes	-	-	8
	Sefram 4415	15 MHz	1	yes	yes	AM/FM	RS-232 / USB	9
	BK 4040 DDS	20 MHz	1	yes	yes	AM/FM	RS-232 / USB	8
	BK 4084	20 MHz	1	yes	yes	AM/FM/FSK/PSK	RS-232	6
	BK 4085	40 MHz	1	yes	yes	AM/FM/FSK/PSK	RS-232	6
	BK 4086	80 MHz	1	yes	yes	AM/FM/FSK/PSK	RS-232	6
	BK 4087	120 MHz	1	yes	yes	AM/FM/FSK/PSK	RS-232	6
Arbitrarily Waveform Generator	BK 4045	20 MHz	1	-	yes	AM/ FM	yes USB	9
	BK 4084 AWG	20 MHz	1	-	yes	AM/FM/FSK/PSK	yes RS-232	7
	BK 4075	25 MHz	1	-	yes	AM/FM/FSK	yes RS-232 / USB / IEEE	4
	BK 4078	25 MHz	2	-	yes	AM/FM/FSK	yes RS-232 / USB / IEEE	4
	BK 4076	50 MHz	1	-	yes	AM/FM/FSK	yes RS-232 / USB / IEEE	4
	BK 4079	50 MHz	2	-	yes	AM/FM/FSK	yes RS-232 / USB / IEEE	4
	BK 4086 AWG	80 MHz	1	-	yes	AM/FM/FSK/PSK	yes RS-232	7

selection guide





Sefram 4451

The SEFRAM 4453 provides 2 independent outputs. Each output has the same characteristics as SEFRAM 4451.

Capabilities

Sefram 4451/4453

- Generate pulse from 10ns to 10s
- Triggered, burst, gate operation
- Single or double pulse modes
- Delay mode
- Adjustable transition time
- GPIB interface
- SCPI programmable
- Memory up to 99 stored setups

Technical Specification

Sefram 4451/4453

4451 : 1 channel - 4453 : 2 channels

Function	Pulse : single or dual
Frequency	0,1Hz to 50MHz
Resolution	6 digits, 0,1ns min
Pulse width	10ns to 9,9s
Delay	0ns to 9,9s

Amplitude (50 ohm load)

High level	- 9,90V to +10V
Low level	- 10V to +9,90V
Amplitude	0,1V to +10V
Variable transition	6 ns to 10ms
Mode	Trigger, gate, burst
External Trigger	adjustable from - 9.99 to + 9.99 V

GENERAL SPECIFICATION

Setup memory	99 setups
Display	LCD with backlight
Power supply	100-240V, 48-66Hz
Consumption (4451)	50 VA max
Consumption (4453)	150 VA max
Dimensions (4451)	213 x 300 x 89 mm
Dimensions (4453)	213 x 420 x 133 mm
Weight	3kg (4451) and 3,5kg (4453)

Optional accessories : see page 44,45

Function / Arbitrary Generators



BK 4078

25 MHz DUAL CHANNEL GENERATOR
Sampling Rate. 100MS/s
Mem. 400 kpoints



BK 4079

NEW
2010

50 MHz DUAL CHANNEL GENERATOR
Sampling Rate. 125MS/s
Mem. 4 Mpoints

Capabilities

- Function Generator 25 MHz (sine, square) or 50MHz
- Arbitrary generator :
 - sampling rate : 100 MS/s
 - Memory : 400 kpoints or 4 Mpoints
 - Vertical resolution: 14 Bit
- Pulse generator : 10MHz
- Modulation : AM, FM, FSK (Internal and external)
- Sweep Linear and logarithmic
- Interface RS232 , USB (option), IEEE (factory option)
- Graphic Display with Backlight
- Fully automatic calibration
- WaveX software included



BK 4078 :
Two Independent channels



SI 641 : USB Interface for the 4 models



BK 4075



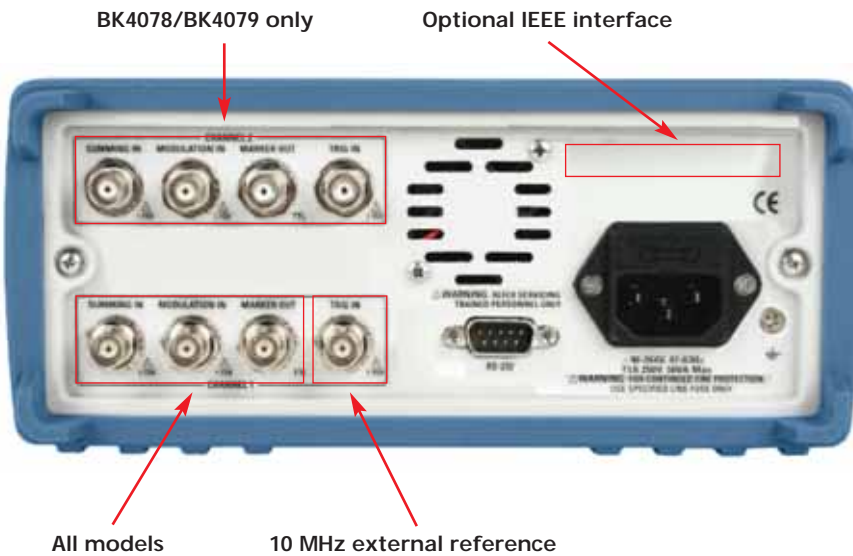
BK 4076

Single channel output model

Technical Specification	BK4075	BK4078	BK4076	BK4079
Arbitrary Mode				
Number of channel1	1	2	1	2
Sampling rate	100MS/s		125 MS/s	
Vertical resolution	14 bits		14 bits	
Horizontal resolution	400 kpoints		4 Mpoints	
External synchronisation	yes		yes	
External pilot input	yes (10MHz)		yes (10MHz)	
Predefined waveform	yes		yes	
Function generator mode				
Resolution	12 digits		12 digits	
Sinus	1µHz - 25MHz		10µHz - 50MHz	
Square	1µHz - 25MHz		10µHz - 50MHz	
Triangle	1µHz - 5MHz		10µHz - 5MHz	
Pulse	1mHz - 10MHz		1mHz - 10MHz	
Amplitude	10mV - 10V (50 ohms)		10mV - 10V (50 ohms)	
Offset	±5V (50 ohms)		±5V (50 ohms)	
Sweep	lin and Log		lin and Log	
Modes	trigger, gate, burst, phase		trigger, gate, burst, phase	
AM Modulation	0,01Hz - 20KHz		0,01Hz - 20KHz	
FM Modulation	0,01Hz - 20KHz		0,01Hz - 20KHz	
FSK Modulation	0,01Hz - 1MHz		0,02Hz - 1MHz	
Symmetry	variable 20% to 80%		variable 20% to 80%	
GENERAL SPECIFICATION				
Set up memory	50 setups			
Interface	RS-232, USB (option) and IEEE (factory option)			
Display	LCD graphic with backlight			
power supply	85-265V - 50/60Hz / 40VA			
Size	213 x 210 x 88mm			
Weight	3kg			

Optional accessories : see page 44,45

Rear panel



Flexible interface

Built-in 10 MHz external reference is included at no extra cost (both models). This input/output let's you synchronize with another BK4075 / BK4076 / BK4078 / BK4079 generator or to an external 10 MHz clock for precise phase adjustment.

Connect the programmable marker output to the trigger input of additional generators to create complex polyphase scenarios.

Flexible memory management

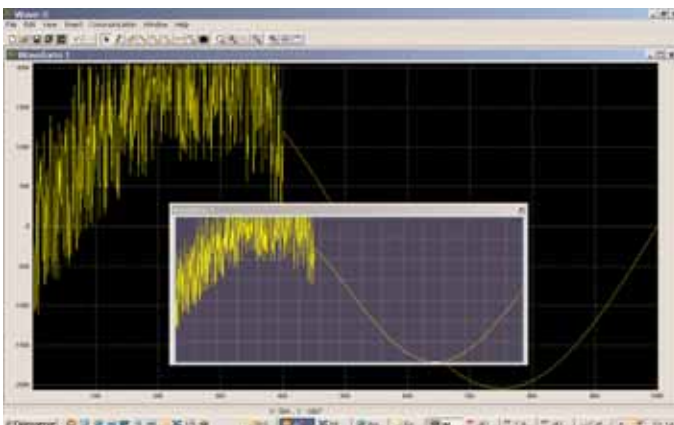
Unlike other comparable generators, which typically contain only a few fixed-size memory locations for waveform storage, the BK4076 and BK4079 give users more freedom - the 4,000,000 points flash memory can be allocated to one large waveform or up to 50 different waveforms, each with a customizable length.

Versatile noise generation

In Arb mode you can conveniently add noise to your waveform directly from the front panel and precisely adjust the scale of the noise amplitude.

Programmable Markers

Models BK4075 / BK4076 / BK 4078 and BK4079 provide fully programmable markers, allowing you to generate a positive TTL level output signal at the points specified by address and length up to 4000 points. This feature is available in Arbitrary mode and can not be found in other comparable waveform generators. It could be used for applications requiring polyphase signal generation, e.g. simulation of a real world 3 phase AC network where one of the phases is degraded with spikes or noise.



Generate waveforms with ease

The included PC Software allows you to easily generate, edit and download custom arbitrary waveforms. Generate waveforms by importing a text file, or define via freehand, point draw or waveformmath. Waveforms can also be uploaded from the generator for documentation purposes.

Function/arbitrary
generators

DDS Function generators

A complete range from 20MHz to 120MHz



BK 4084

20MHz, 40MHz, 80MHz and 120MHz
DDS function generators

Capabilities (all models)

- Sine, square, ramp function generator
- 27 predefined waveforms
- Modulation : AM, FM, FSK, PM
- Burst mode
- Lin / Log sweep
- Counter / frequencymeter: 100MHz
- RS-232 interface and USB (with optional accessory)
- 10 setup memory

Technical Specification	BK 4084	BK 4085	BK 4086	BK 4087
Function generator mode				
Resolution				
Sine	1µHz to 20MHz	1µHz to 40MHz	1µHz to 80MHz	1µHz to 120MHz
Square	1µHz to 20MHz	1µHz to 40MHz	1µHz to 40MHz	1µHz to 40MHz
Triangle		1µHz to 100kHz		
Pulse		1µHz to 100kHz		
Duty cycle		from 0,1% to 99%		
Predefined waveforms		27 predefined waveforms (4096 dots, 10 bit, 200Ms/s)		
Amplitude		1mV to 10Vpp (under 50 ohm)		
Offset		±10V, limited to 2 x amplitude pp		
Symmetry		variable 20% to 80%		
Sweep		lin and log		
Modes		1ms to 800s (lin.) and 100ms to 800s (log)		
AM Modulation		triggered, gate, burst		
FM Modulation		from 100µHz to 20kHz		
FSK Modulation		from 100µHz to 10kHz		
PSK Modulation		internal or external		
Burst mode		internal or external		
External frequencymeter		1 to 10000 cycles		
Range		1Hz to 100MHz		
Resolution		8 digit max.		
Sensitivity		50mVrms Typical		
Coupling		AC		
GENERAL SPECIFICATION				
Setup memory		10, non volatile		
Interface		RS-232		
Display		VFD		
Power supply		198-242V - 47/63Hz / 40VA		
Dimensions		255 x 100 x 370mm		
Weight		3kg		

Supplied with : BNC cable, RS232 cable

Optional accessories : Interface RS232/USB P/N : ITE-132. see page 44, 45

Function / Arbitrary Generators

DDS 20 MHz
ARBITRARY: 200 Ms/s



BK 4084AWG

Capabilities

- 20MHz DDS function generator (sine and square)
- 27 predefined waveforms
- Arbitrary mode : 200Ms/s, 16k memory
- Modulation: AM, FM, FSK, PM
- Burst mode
- Lin / Log sweep
- Counter / frequencymeter: 100MHz
- RS-232 interface and USB (with optional accessory)
- 10 setup memory

Technical Specification

BK 4084AWG

Function generator mode	
Resolution	
Sine	1µHz to 20MHz
Square	1µHz to 20MHz
Triangle	1µHz to 100kHz
Pulse	1µHz to 100kHz
Duty cycle	from 0,1% to 99%
Predefined waveforms	27 predefined waveforms (4096 dots, 10 bit, 200Ms/s)
Amplitude	1mV to 10Vpp (under 50 ohm)
Offset	±10V, limited to 2 x amplitude pp
Symmetry	variable from 20% to 80%
Sweep	lin and log 1ms to 800s (lin.) and 100ms to 800s (log)
Modes	triggered, gate, burst
AM Modulation	from 100µHz to 20kHz
FM Modulation	from 100µHz to 10kHz
FSK Modulation	internal or external

Supplied with : BNC cable, RS232 cable and external software p/n : 408x
Optional accessories : Interface RS232/USB P/N : ITE-132. see page 44, 45

Technical Specification

BK 4084AWG

PSK Modulation	internal or external
Burst mode	1 to 10000 cycles
Arbitrary mode	
Sampling rate	200Ms/s
Vertical resolution	10 bit
Memory	8 ~16000 points
External synchro	yes
External frequencymeter	
Range	1Hz to 100MHz
Resolution	8 digit max.
Sensitivity	50mVrms Typical
Coupling	AC

General Specification

Setup memory	10, non volatile
Interface	RS-232
Display	VFD
Power supply	198-242V - 47/63Hz / 40VA
Dimensions	255 x 100 x 370mm
Weight	3kg

DDS 80 MHz
ARBITRARY: 200 Ms/s



BK 4086AWG

Capabilities

- 80MHz DDS function generator (sine) and 40MHz (square)
- 27 predefined waveforms
- Arbitrary mode : 200Ms/s, 16k memory
- Modulation: AM, FM, FSK, PM
- Burst mode
- Lin / Log sweep
- Counter / frequencymeter: 100MHz
- RS-232 interface and USB (with optional accessory)
- 10 setup memory

Technical Specification

BK 4086AWG

Function generator mode	
Resolution	
Sine	1µHz to 80MHz
Square	1µHz to 40MHz
Triangle	1µHz to 100kHz
Pulse	1µHz to 100kHz
Duty cycle	from 0,1% to 99%
Predefined waveforms	27 predefined waveforms (4096 dots, 10 bit, 200Ms/s)
Amplitude	1mV to 10Vpp (under 50 ohm) 1mV to 2Vpp, F>40MHz
Offset	±10V, limited to 2 x amplitude pp ±2V, limited to 2 x amplitude pp, F>40MHz
Symmetry	variable from 20% to 80%
Sweep	lin and log 1ms to 800s (lin.) and 100ms to 800s (log)
Modes	triggered, gate, burst
AM Modulation	from 100µHz to 20kHz
FM Modulation	from 100µHz to 10kHz
FSK Modulation	internal or external
PSK Modulation	internal or external

Supplied with : BNC cable, RS232 cable and external software p/n : 408x
Optional accessories : Interface RS232/USB P/N : ITE-132. see page 44, 45

Technical Specification

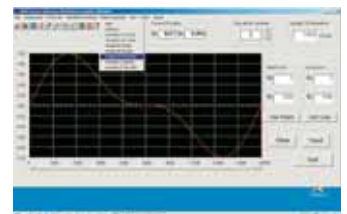
BK 4086AWG

Burst mode	1 to 10000 cycles
Arbitrary mode	
Sampling rate	200Ms/s
Vertical resolution	10 bit
Memory	8 ~16000 points
External synchro	yes
External frequencymeter	
Range	1Hz to 100MHz
Resolution	8 digit max.
Sensitivity	50mVrms Typical
Coupling	AC

General Specification

Setup memory	10, non volatile
Interface	RS-232
Display	VFD
Power supply	198-242V - 47/63Hz / 40VA
Dimensions	255 x 100 x 370mm
Weight	3kg

Custom Waveform generation made easy. Create and edit waveforms and download them to the instrument with a single click. Waveforms can be generated in many ways : draw Waveforms freehand, import them from a text file or start out with standard functions, and customise them with the provided math functions.



DDS function generators

A complete range from 7MHz to 20MHz

DDS 7 MHz



BK 4007DDS

Capabilities

- DDS (Direct Digital Synthesis) function generator
- Max. frequency: 7MHz
- Variable amplitude, offset and symmetry
- Lin / Log sweep
- LCD display
- TTL output

Technical Specification

	BK 4007DDS
Max. frequency	7MHz (sine, square), 100kHz (triangle)
DC, sine, square, triangle	yes
Amplitude (under 50 ohms)	up to 10V pp.
Offset	yes
Sweep	Lin, Log
Variable symmetry	yes
Auxiliary output	TTL
Display	frequency, with symbols and units
Display type	LCD
Dimensions, weight	213 x 210 x 88mm, 2kg

Optional accessories : see page 44,45

Technical Specification

	BK 4013DDS
Max. frequency	12MHz (sine, square), 100kHz (triangle)
DC, sine, square, triangle	yes
Amplitude (under 50 ohms)	up to 10V pp.
Offset	yes
Sweep	Lin, Log
Variable symmetry	yes
Auxiliary output	TTL
Display	frequency, with symbols and units
Display type	LCD
Dimensions, weight	213 x 210 x 88mm, 2kg

Optional accessories : see page 44,45

DDS 12 MHz



BK 4013DDS

Capabilities

- same as 4007DDS
- Max. frequency: 12MHz

DDS 20 MHz



BK 4040DDS

Capabilities

- DDS (Direct Digital Synthesis) function generator
- Max. frequency: 20MHz
- Variable amplitude, offset and symmetry
- Frequncymeter: 50MHz (external)
- Lin / Log sweep
- AM, FM modulation
- Gate and triggered modes
- Graphic LCD with backlight
- RS-232 interface
- USB interface with SI 641 (option)

Technical Specification

	BK 4040DDS
Max. frequency	20MHz (sine, square), with 5 digit max. display
DC, sine, square, triangle	yes
Amplitude (under 50 ohms)	50mV to 10V pp
Offset	yes
Sweep	Lin, Log
Modulation	AM, FM (internal, external)
Frequencymeter	50MHz
Variable symmetry	yes
Auxiliary output	Trigger, Sync (out), Modulation (in)
Interface	RS-232, USB option
Display type	LCD, graphic with backlight
Dimensions, weight	213 x 210 x 88mm, 2,5kg

Optional accessories : see page 44,45

DDS function generators

A complete range from 7MHz to 20MHz



Sefram 4415

Capabilities

- DDS (Direct Digital Synthesis) function generator
- Max. frequency: 15MHz
- Variable amplitude, offset and symmetry
- Frequency meter: 100MHz (external)
- Lin / Log sweep
- AM, FM modulation
- Gate and triggered modes
- Graphic LCD with backlight
- RS-232 interface
- USB interface with SI641 (option)

Technical Specification

	Sefram 4415
Max. frequency	15MHz, with 6 digit display max.
DC, sine, square, triangle	yes
Amplitude (under 50 ohms)	20mV to 10V pp
Offset	yes
Sweep	Lin, Log
Fréquency meter	100MHz
Variable symmetry	yes
Auxiliary output	Trigger, Sync (out), Modulation (in)
Interface	RS-232
Display	LCD, graphic with backlight
Dimensions, weight	213 x 210 x 88mm, 2,5kg

Optional accessories : see page 44,45

20 MHz GENERATOR
Sampling Rate. 50MS/s
Mem. 1kpoints



BK 4045

Capabilities

- DDS (Direct Digital Synthesis) function generator
- Max. frequency: 20MHz
- Variable amplitude, offset and symmetry
- Lin / Log sweep
- AM, FM modulation
- Gate and triggered modes
- Graphic LCD with backlight
- Arbitray mode: 50MS/s, 1k memory
- USB interface

Technical Specification

	BK 4045
Max. frequency	20MHz, with 6 digit display max.
DC, sine, square, triangle	yes
Amplitude (under 50 ohms)	20mV to 10V pp
Offset	yes
Sweep	Lin, Log
Fréquency meter	100MHz
Variable symmetry	yes
Auxiliary output	Trigger, Sync (out), Modulation (in)
Interface	USB
Display	LCD, graphic with backlight
Dimensions, weight	213 x 210 x 88mm, 2,5kg

Supplied with : WaveX software

Optional accessories : see page 44,45

Function/arbitrary generators

Power supplies Overview

Selection Guide

Linear Models

	Output channel	Output Voltage	Output Current	Interface	page Power	
BK 1621A	Single	0-18V	0-5A	90W	-	16
BK 1627A	Single	0-30V	0-3A	90W	-	16
BK 1735A	Single	0-30V	0-3A	90W	-	16
BK 1743A	Single	0-35V	0-6A	210W	-	16
BK 1745A	Single	0-35V	0-10A	350W	-	16
BK 1623A	Single	0-60V	0-1,5A	90W	-	16
BK 1715A	Single	0-60V	0-2A	90W	-	16
BK 1760A	Triple	2x0-30V + 1x4-6,5V	0-2A + 1x5A	150W	-	17
BK 1672	Triple	2x0-32V + 1x1-5V	0-3A + 1x3A	200W	-	17
BK 1761	Triple	2x0-35V + 1x2-6,5V	0-3A + 1x5A	220W	-	17
BK 1762	Triple	2x0-60V + 1x4-6,5V	0-2A + 1x5A	300W	-	17
BK 9150	Single	0-5,2V	0-60A	312W	RS-232 / USB	19
BK 9121A	Single	0-20V	0-5A	100W	RS-232 / USB	12
BK 9151	Single	0-20V	0-27A	540W	RS-232 / USB	19
BK 9123A	Single	0-30V	0-5A	150W	RS-232 / USB / IEEE	12
BK 9152	Single	0-30V	0-18A	540W	RS-232 / USB	19
BK 9120A	Single	0-32V	0-3A	96W	RS-232 / USB	12
BK 9122A	Single	0-60V	0-2,5A	150W	RS-232 / USB	12
BK 9153	Single	0-60V	0-9A	540W	RS-232 / USB	19
BK 9124	Single	0-72V	0-1,2A	86W	RS-232 / USB	12
BK 9130	Triple	2x0-30V + 1x0.5V	2x0-3A, 1x0.3A	90W	RS-232 / USB	12

Switching Models

BK 1665	Single	1-19V	0-10A	200W	-	18
BK 1550	Single	1-36V	0-3A	100W	-	18
BK 1666	Single	1-40V	0-5A	200W	-	18
BK 1667	Single	1-60V	0-3,3A	200W	-	18
BK 9110	Single	0-60V	0-5A	100W	-	18
BK 1785B	Single	0-18V	0-5A	90W	RS-232 / USB	11
BK 1786B	Single	0-32V	0-3A	90W	RS-232 / USB	11
BK 1788	Single	0-32V	0-6A	90W	RS-232 / USB	11
BK 1787B	Single	0-72V	0-1,5A	90W	RS-232 / USB	11
XLN10014	Single	0-100V	0-14A	1440W	RS-485 / USB	14
XLN10014-GL	Single	0-100V	0-14A	1440W	RS-485 / USB / Ethernet / IEEE	14
XLN3640	Single	0-36V	0-40A	1440W	RS-485 / USB	14
XLN3640-GL	Single	0-36V	0-40A	1440W	RS-485 / USB / Ethernet / IEEE	14
XLN6024	Single	0-60V	0-24A	1440W	RS-485 / USB	14
XLN6024-GL	Single	0-60V	0-24A	1440W	RS-485 / USB / Ethernet / IEEE	14
XLN8018	Single	0-80V	0-18A	1440W	RS-485 / USB	14
XLN8018-GL	Single	0-80V	0-18A	1440W	RS-485 / USB / Ethernet / IEEE	14

A complete family of programmable power supplies



BK 1785B
BK 1786B
BK 1787B
BK 1788

Capabilities

- RS-232 interface
- 10mV/10mA stability resolution
- Low ripple and noise
- Excellent temperature stability
- Serial interface cable and software included

programmable power supplies

Technical Specification	BK 1785B	BK 1786B	BK 1787B	BK1788
Number of channels	1	1	1	1
Display	LED (green)	LED (green)	LED (green)	LED (green)
Output voltage	0-18V	0-32V	0-72V	0-32V
Output current	0-5A	0-3A	0-1,5A	0-6A
Ripple and noise	< 1 mVrms	< 1 mVrms	< 1 mVrms	< 1 mVrms
Load regulation	0,02% + 5mV	0,02% + 5mV	0,02% + 5mV	0,02% + 5mV
Line regulation	≤ 0,01% + 3mV	≤ 0,01% + 3mV	≤ 0,01% + 3mV	≤ 0,01% + 3mV
General Specification				
Display	LED 3 digits	LED 3 digits	LED 3 digits	LED 3 digits
Safety	Protected against short circuit, overload, overheat, over current and reverse polarity.			
Power supply	220VAC ± 10%, 47 to 63Hz	220VAC ± 10%, 47 to 63Hz	220VAC ± 10%, 47 to 63Hz	220VAC ± 10%, 47 to 63Hz
Interface	RS-232	RS-232	RS-232	RS-232
Dimension	256 x 106 x 383 mm	256 x 106 x 383 mm	256 x 106 x 383 mm	256 x 106 x 383 mm
Weight	6,4 Kg	7,5 Kg	7,5 Kg	7,5 Kg
IEC 1010	Mains : CAT II Output : 60V CAT I			

Supplied with one power cord.

Lab View® driver for all models on request

Optional accessories : Rack mounting kit : IT-151 (for all models)

Programmable power supplies

BK 9120A, BK 9121A, BK 9122A, BK 9123A, BK 9124,

These power supplies are designed to meet the needs of today's applications in R&D design verification, university labs, production testing and other applications that require clean/reliable power and excellent performance. With meter resolution of 10mV and 1mA, these power supplies are ideal for low power surface mount circuits that require very precise voltage and current settings.



BK 9120A - BK 9121A - BK 9122A - BK 9123A - BK 9124



BK 9130

Capabilities

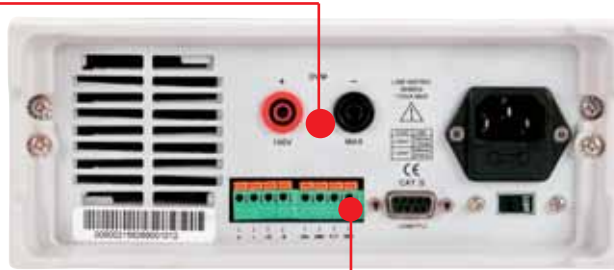
- 10mV & 1mA Display Resolution
- Over-voltage protection and remote sensing
- Excellent regulation and very low noise
- Fast Transient Response Time
- Closed Case Calibration
- SCPI compatible
- RS-232 Interface
- IEEE interface for BK9123A

Technical Specification	BK 9120A	BK 9121A	BK 9122A	BK 9123A	BK 9124	BK 9130
Number of channels	1	1	1	1	1	3
Output voltage	0-32V	0-20V	0-60V	0-30V	0-72V	2x0-30V and 0-5V
Output current	0-3A	0-5A	0-2,5A	0-5A	0-1,2A	2x0-3A and 0-3A
VOLTAGE REGULATION						
Line regulation	≤ 0,01% + 1mV	≤ 0,01% + 1mV	≤ 0,01% + 2mV	≤ 0,01% + 1mV	≤ 0,01%+1mV	≤ 0,01%+3mV
Load regulation	≤ 0,01%+2mV	≤ 0,01%+2mV	≤ 0,01%+2mV	≤ 0,01%+2mV	≤ 0,01%+2mV	≤ 0,01%+3mV
Response time	< 150µs	< 150µs	< 150µs	< 150µs	< 150µs	≤ 500µs
Ripple and noise	≤ 4mVpp	≤ 3mVpp	≤ 5mVpp	≤ 4mVpp	≤ 5mVpp	≤ 3mVpp (ripple) ≤ 3mVpp (noise)
Temperature coefficient	< 0,02% + 3mV	< 0,02% + 3mV	< 0,02% + 6mV	< 0,02% + 3mV	≤ 0,02%+5mV	≤ 0,02% + 10mV
CURRENT REGULATION						
Current regulation						
Line regulation	< 0,05% + 0,1mA	< 0,05% + 0,1mA	< 0,05% + 0,05mA	< 0,05% + 0,1mA	< 0,05% + 0,05mA	≤ 0,1% + 3mA
Ripple and noise	< 0,05% + 1mA	< 0,05% + 1mA	< 0,05% + 0,5mA	< 0,05% + 1,5mA	< 0,05% + 0,3mA	≤ 0,01% + 3mA
Temperature coefficient	< 0,05% + 2mA	< 0,05% + 2mA	< 0,05% + 1mA	< 0,05% + 2mA	< 0,05% + 0,5mA	≤ 0,1% + 5mA
General Specification						
Display	LED display with backlight					
Safety	Protected against short circuit, overload, overheat, over current and reverse polarity.					
Power supply	220 VAC ±10%, 47-63Hz					
Interface	RS-232	RS-232	RS-232	RS-232 + IEEE	RS-232	RS-232
Dimensions	215 X 88 X 355 mm					
Weight	9Kg	9Kg	9,6Kg	9,6Kg	9Kg	9Kg
IEC 1010	Mains : CAT II Output 60V CAT I					

Supplied with one power cord, RS232/USB cable and external software p/n : PV 912Ax
 Optional accessories : RS232/USB cable p/n : IT-E 132. Rack mounting kit : IT-151 (for all models)
 Lab View® driver for all models on request

Programmable power supplies BK 9120A, BK 9121A, BK 9122A, BK 9123A, BK 9124,

DVM and mΩ meter
for model BK 9120A,
9121A, 9124 only



Remote Sense and digital
port functionality



Triple Output Programmable DC Power Supply Model BK 9130

The 9130 is a fully programmable triple output DC Power Supply delivering 0-30V/0-3A on 2 outputs and 0-5V/0-3A on 1 output. Each output is fully floating and outputs can be adjusted independently or connected in series or parallel to produce higher voltages or currents. The 9130 is ideally suited for applications in electronic Test, Production Service where multiple independent DC supplies are required and bench space is at a premium.

Accessories / Communication cable

IT-E132
RS-232 to USB cable



IT-E151
Rack Mounting kit



High power switching power supplies

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Capabilities

- Compact, high density, 1U package
- External analog programming interface
- List mode: Execute 150 step test sequences from instrument memory
- Programmable voltage and current slew rate allow for "soft starting" of loads

- Internal memory stores up to 10 instrument settings
- Control up to 31 power supplies from one PC via the RS-485 interface
- LabVIEW™ drivers available



*J -GL version



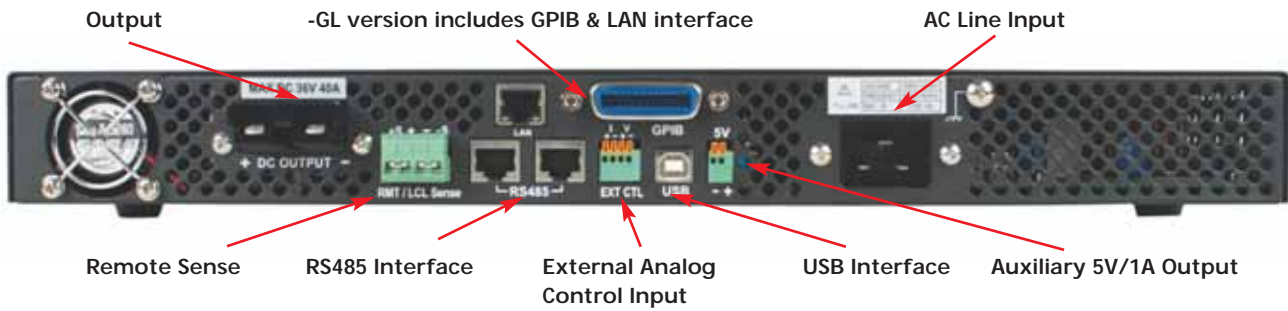
Technical Specification	XLN3640	XLN6024	XLN8018	XLN10014
Output Rating				
Output Voltage	0-36 V	0-60 V	0-80 V	0-100 V
Output Current	0-40 A	0-24 A	0-18 A	0-14.4 A
Output Protection				
OVP Adjustment Range	2-38 V	3-64 V	4-85 V	5-105 V
Accuracy	200 mV	300 mV	400 mV	500 mV
Line Regulation				
Voltage	≤4 mV	≤6 mV	≤8 mV	≤10 mV
Current	≤4 mA	≤4 mA	≤4 mA	≤4 mA
Load Regulation				
Voltage	≤8 mV	≤8 mV	≤10 mV	≤12 mV
Current	≤8 mA	≤7 mA	≤6.5 mA	≤6mA
Ripple and Noise (200Hz-20MHz)				
Normal Mode Voltage (Load ≥ 0.5 % of max load)	≤5 mVrms/≤60 mVpp	≤6 mVrms/≤70 mVpp	≤7 mVrms/≤80 mVpp	≤8 mVrms/≤80 mVpp
Normal Mode Current	≤90 mA	≤70 mA	≤50 mA	≤40 mA
Programming Resolution				
Programming & Readback	1 mV/1 mA	1.5 mV/1 mA	2 mV/1 mA	2.5 mV/1 mA
Programming Accuracy (% output+offset)				
Voltage	± (0.05 % +10 mV)	± (0.05 % +15 mV)	± (0.05 % +20 mV)	± (0.05 % +25 mV)
Current	0.05 % +10 mA)	± (0.05 % +18 mA)	± (0.05 % +7 mA)	± (0.05 % +6 mA)
Readback Accuracy (% output+offset)				
Voltage	± (0.05 % +10 mV)	± (0.05 % +15 mV)	± (0.05 % +20 mV)	± (0.05 % +25 mV)
Current	± (0.05 % +10 mA)	± (0.05 % +18 mA)	± (0.05 % +7 mA)	± (0.05 % +6 mA)
General Specification				
Average Command Response Time	≤50 ms			
Power Factor Correction (PFC)	≥0.99 (Full load)			
Efficiency	80% (Full load)			
Remote Sense Compensation	2V			
Rise Time at Full & No Load	≤15 ms	≤20 ms	≤25 ms	≤30 ms
Fall Time at Full/No Load	≤15 ms/≤1000 ms	≤20 ms/≤1000 ms	≤25 ms/≤1000 ms	≤30 ms/≤1000 ms
Transient Response Time	≤1ms			
AC Line Rated Input Voltage/Hz	100-240 VAC / 47 Hz-63 Hz			
Tolerance/Variation in Voltage	-15 % to +10 % (10 % power de-rating mode when voltage under 95 Vac)			
Maximum Rated Input Power	1700 VA			
Temperature Ratings	Operation (0 °C - 40 °C) / Storage (-10 °C - 70 °C)			
Standard Interface	USB			
Optional Interface	LAN & GPIB			
Dimensions(W*H*D)	16.5 x 1.7 x 17 inch (420 x 43.6 x 432 mm)Weight19.8 lbs. (9 kg)			
IEC 1010	CATII			
Warranty	2 years			

Supplied with: power card, terminal blocks for rapid plug connector, rackmount kit.

Optional accessories : see page 44,45

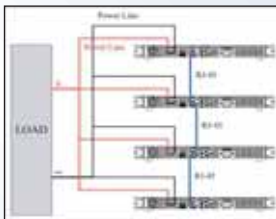
High power switching power supplies

Rear Panel

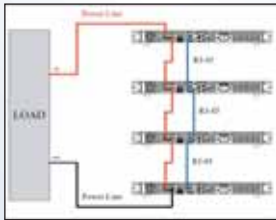


Flexible Configuration

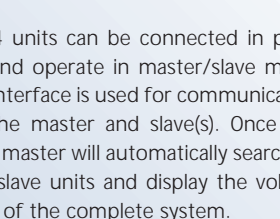
Master/Slave Operation



Parallel Configuration

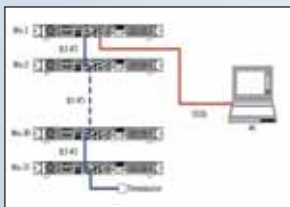


Series Configuration



Up to 4 units can be connected in parallel or series and operate in master/slave mode. The RS485 interface is used for communication between the master and slave(s). Once configured, the master will automatically search for and detect slave units and display the voltage and current of the complete system.

Multi-unit Control (up to 31 units)



In multi-unit control mode, up to 31 units can be daisy chained via RS485 and controlled from one "master" unit via the USB interface (also GPIB and Ethernet).

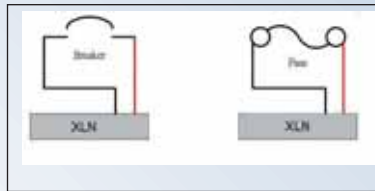
Application Software

Included with the power supply is a PC software for creating test sequences for execution in list mode via the GPIB or USB interface.

Create, save & load program lists. View output characteristic curves and export data to a file.

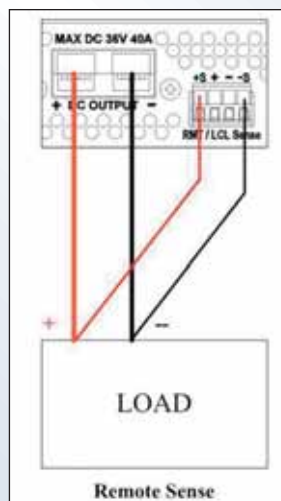
Pass/Fail test monitors maximum and minimum voltage and current values over a specified period of time.

Current Flow Timer for Breaker or Fuse Testing



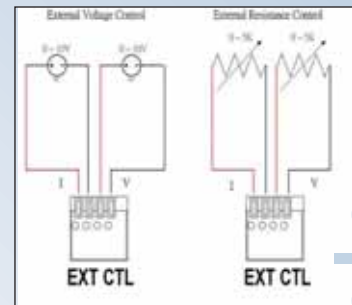
The XLN series can be used to accurately measure the time for a fuse or circuit breaker to open. After the voltage and current levels are set, the ON/OFF button turns on the output and the time when the fuse/breaker opens is measured to the nearest 100 μ s. The maximum counting period is one hour.

Remote Sense



The remote sense feature can compensate for up to 2 volts of voltage drop in the load wiring. Two small wires connect to the +S and -S sense terminals (high input impedance) and the power supply changes its output to make the voltage on these sense lines equal to the voltage set on the front panel.

External Analog Programming Interface



The output voltage and current can be controlled by either analog voltages or resistances. 0-10 V voltages and 0-5 k Ω resistances control from zero to full scale output.

Fixed 5V/1A Output The XLN series offer an extra output with a constant output voltage of 5 VDC and a maximum output current of 1 A for powering an additional device. This output can be switched on or off in the "System Setting" menu.

Web Server Interface

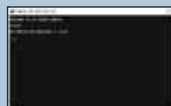
XLN series power supplies with the -GL option (GPIB/LAN) provide a built-in Web Server. This allows users to configure, control or monitor the basic settings of the power supply from a remote computer using a Web browser such as Microsoft® Internet Explorer or Mozilla® Firefox. Connect to the user-defined IP address to view the welcome page (Compatible with Java-enabled browsers).



Interface for controlling voltage, current and output state



Setting Controls page for configuration of protection settings and setup/reset password for the system.



Power supplies

Single output DC power supplies



BK 1621A-1623A-1627A



BK 1715A-1735 A



Capabilities

- LED display (red, green)
- Connect 2 supplies in series or parallel to double voltage or current
- Compact style
- Reliable, durable
- Fully overload protected

Capabilities

- LED display (red, green) with 4 digits
- 10mV and 1mA resolution
- Connect 2 supplies in series or parallel to double voltage or current
- Very low ripple and excellent regulation
- Reliable, durable
- Fully overload protected

Technical Specification	BK 1621A	BK 1623A	BK 1627A	BK 1715A	BK 1735A
Number of channels	1	1	1	1	1
Display	2 LED displays red, green			2 LED displays red, green	
Output voltage	0-18V	0-60V	0-30V	0-60V	0-30V
Output current	0-5A	0-1,5A	0-3A	0-2A	0-3A
Can be connected in series or parallel					
General Specification	LED 3 Digit		LED 3 Digit	LED 3 Digit	LED 4 Digit
Display	Protected against short circuit, overload, overheat, over current and reverse polarity.				
Safety	Independent (single)				
Mode	120 - 230VAC ± 10%, 50/60Hz				
Power supply	205 x 115 x 270 mm	205 x 115 x 270 mm	205 x 115 x 270 mm	158 x 140 x 318 mm	
Dimensions	7,4 Kg	7,4 Kg	7,4 Kg	5,4 Kg	4,7 Kg
Weight	Mains : CAT II Output 60V CAT I				
IEC 1010					

Supplied with : one power cord



BK 1743B
BK 1745A



Capabilities

- 4 digits LED displays
- Fully overload protection
- Very low ripple and excellent regulation

Technical Specification	BK 1743B	BK 1745A
Number of channels	1	1
Display	2 LED displays red, green	2 LED displays red, green
Output voltage	0-35 V	0-35V
Output current	0-6A	0-10A
Ripple and noise	1mVrms. typ.	1mVrms. typ.
Load regulation	0,2%+2mV	0,2%+2mV
General Specification	LED 4 Digits	
Display	Protected against short circuit, overload, overheat, over current and reverse polarity.	
Safety	120-230VAC ± 10%, 50/60Hz	
Power supply	205 x 115 x 275mm	
Dimensions	10,8Kg	14,9 Kg
Weight	Mains : CAT II Output 60V CAT I	
IEC 1010		

Supplied with one power cord

Triple output power supplies

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2010

Capabilities

- Two 4 digit LED displays
- Switchable series / parallel operation
- 10mV and 1mA resolution



BK 1762

2 YEARS
warranty



BK 1760A-1761

2 YEARS
warranty



BK 1672

Capabilities

- Two 4 digit LED displays
- Switchable series / parallel operation
- 10mV and 1mA resolution

Capabilities

- 4 separate LED displays
- Switchable series / parallel operation
- Fully overload protection

Technical Specification

	BK 1760A	BK 1761	BK 1762	BK 1672
Number of channels	3	3		3
Display	2 LED displays green	2 LED displays green	2 LED displays green	4 LED displays red, green
Output voltage	2x0-30V+1x4-6,5V	2x0-35V+1x2-6,5V	2x0-60V+1x4-6,5V	2x0-32 V+1x5V
Output current	2x0-2A+1x5A	2x0-3A+1x5A	2x0-2A+1x4A	2x0-3A+1x3A
Ripple and noise	≤ 1 mVrms.	≤ 1 mVrms.	≤ 1 mVrms.	≤ 0,3 mVrms
Operating modes	Serial, parallel or tracking	Serial, parallel or tracking	Serial, parallel or tracking	Serial, parallel or tracking
General Specification				
Display	LED 4 digit	LED 4 digit	LED 4 digit	LED 3 digit
Safety	Protected against short circuit, overload, overheat, over current and reverse polarity.			
Power supply	120 - 230VAC ± 10%, 50/60Hz	120 - 230VAC ± 10%, 50/60Hz	120 - 230VAC ± 10%, 50/60Hz	120 - 230VAC ± 10%, 50/60Hz
Dimensions	145 x 267 x 381 mm	145 x 267 x 381 mm	170 x 230 x 310 mm	170 x 230 x 310 mm
Weight	9,5 Kg	9,5 Kg	9,5 Kg	5,7 Kg
IEC 1010	Mains : CAT II Output 60V CAT I	Mains : CAT II Output 60V CAT I	Mains : CAT II Output 60V CAT I	Mains : CAT II Output 60V CAT I

Supplied with: one power cord

Triple output power supplies

Power supplies

Single output DC power supplies



BK 1665
BK 1666-BK 1667

Capabilities

- Over voltage & short circuit protection
- Fine setting for voltage and current
- Constant voltage operation
- Constant current operation

Technical Specification

	BK 1550	BK 1665	BK 1666	BK 1667
Number of channels	1	1	1	1
Display	LCD displays	2 LED displays green	2 LED displays green	2 LED displays green
Output voltage	1-36V	1-19V	1-40V	1-60V
Output current	0-3A	0-10A	0-5A	0-3,3A
Ripple and noise	<50mVrms.	<20mVrms.	<20mVrms.	<20mVrms.
Load regulation	±50mV	0,5% + 200 mV	0,5% + 200 mV	0,5% + 200 mV

General Specification

	BK 1550	BK 1665	BK 1666	BK 1667
Display	LCD 3 Digit	LED 3 Digit	LED 3 Digit	LED 3 Digit
Safety	Protected against short circuit, overload, overheat, over current and reverse polarity.			
Power supply	90-265VAC+/-10%, 50/60Hz			
Dimensions	70 x 150 x 250 mm	205 x 115 x 275 mm	205 x 115 x 275 mm	205 x 115 x 275 mm
Weight	2Kg	3Kg	3Kg	3Kg
IEC1010	Mains : CAT II output 60V CAT I	Mains : CAT II output 60V CAT I	Mains : CAT II output 60V CAT I	Mains : CAT II output 60V CAT I

Supplied with one power cord

BK 9110

Capabilities

- Digitally controlled, mixed mode linear/switching DC power supply
- 10 mV/1mA resolution over the full range
- Bright, easy to read display
- Very compact size and light weight
- Low ripple and noise
- High reliability due to OCP, OVP and OTP (over current/voltage/temperature protection)
- Output on/off control
- store and recall 4x100 groups of preset Volt/Amp values
- Intelligent fan control



Bright, easy to read display

The BK9110 automatically recalculates voltage/current limits for each setting. Forming a constant power hyperbolic shaped boundary as illustrated in the diagram below. The BK9110 provides 100W output power in any Volt/Amp combination within the rated voltage (60V) and current (5A) limits. By providing greatly expanded choices of Volt/Amp combinations users can cut down on the numbers of power supplies required and free up valuable bench space.

Technical Specification

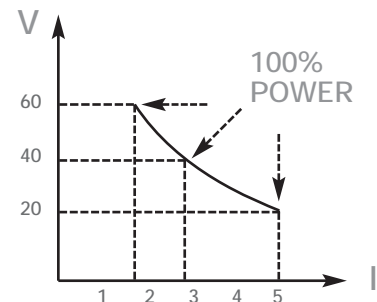
	BK 9110	
	Voltage	Current
Output Ratings	0 - 60V Max power 100 W	0 - 5A
Load regulation	≤ 0,01%+3mV	≤ 0,01%+3mA
Line regulation	≤ 0,01% + 3mV	≤ 0,1% + 2mA
Setting Accuracy	≤ 0,05% + 10mV	≤ 0,2% + 2mA
Display Accuracy	≤ 0,05% + 10mV	≤ 0,1% + 2mA
Ripple	≤ 20mVms	≤ 5mAms

General Specification

Display	LCD
Safety	Protected against short circuit, overload, overheat, over current and reverse polarity.
State Storage memory	100 groups with 4 sets of Volt/Amp memories each
Dimensions	108mm X 175mm X 282mm
Weight	2,65 Kg

Supplied with: power cord, manual

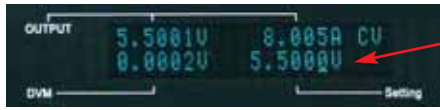
Optional: TL SA (SA test leads), TL 30 (30A test leads), TLPS (power supply test lead kit)



Example:

When setting the voltage to the maximum of 60 V the maximum current value is $100W/60V = 1,66A$. For a 20V setting the maximum current is 5A. Full output of 100W is possible for all Volt/Amp combination that lie on the hyperbolic curve

High power programmable power supply



High resolution display

Encoder knob for quick analog style control



Numeric keys for direct entry of voltage and current values

Output ON/OFF switch

Digital Voltmeter

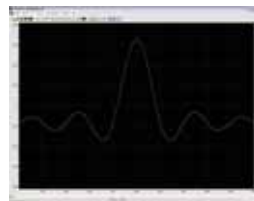
convenient screw terminals

Capabilities

- Excellent display resolution
- Low ripple and low noise due to linear regulation
- Outstanding temperature stability
- Fast transient response time (<120µs)
- SCPI compatible command set, programmable via USB and RS232
- Closed case calibration List mode operation for increased throughput.
- Download and execute command sequences from non-volatile memory
- For bench use or rack mountable
- Very quiet due to intelligent fan speed control, making the supply suitable for bench use
- Over voltage protection

Application Software

The included Application Software supports front panel emulation and allows users to generate simple test sequences without the need to write source code.



Screen shot of test sequence section

Technical Specification

	BK9150	BK9151	BK9152	BK9153
Output Voltage	0 - 5.2 V	0 - 20 V	0 - 30 V	0 - 60 V
Output current	0 - 60 A	0 - 27 A	0 - 18 A	0 - 9 A
Load Regulation ±(%of output+offset)	<0.01% + 0.5 mV <0.1% + 10 mA	<0.01% + 1 mV <0.1% + 5 mA	<0.01% + 1 mV <0.01% + 1 mA	0.01% + 1 mV <0.1% + 2 mA
Line Regulation ±(%of output+offset)	<0.02% + 0.1 mV <0.1% + 1 mA	<0.02% + 1 mV <0.01% + 1 mA	<0.02% + 1 mV <0.01% + 1 mA	<0.02% + 1 mV <0.01% + 0.1 mA
Programming resolution	0.1 mV/1 mA	1 mV/1 mA	1 mV/1 mA	1 mV/0.1 mA
Readback/ Meter resolution	0.1 mV/1 mA	0.1 mV/0.1 mA	0.1 mV/1 mA	0.1 mV/0.1 mA
Front panel Setting resolution	0.1 mV/1 mA	0.5 mV/1 mA	0.5 mV/1 mA	0.5 mV/1 mA
Programming accuracy, 12months (25 °C ± 5°C) ±(%of output+offset)	<0.02%+2 mV <0.1%+30 mA	<0.02%+6 mV <0.1%+15 mA	<0.02%+6 mV <0.1%+15 mA	<0.02%+12 mV <0.05%+10 mA
Readback/ Meter accuracy 12months (25 °C ± 5°C) ±(%of output+offset)	<0.02%+1.5 mV <0.05%+15 mA	<0.02%+3 mV <0.05%+10 mA	<0.02%+3 mV <0.05%+10 mA	<0.02%+6 mV <0.05%+5 mA
Ripple & Noise (20Hz ~20MHz)	≤4 mVp-p 15 mArms	≤4 mVp-p 5 mArms	≤4 mVp-p 5 mArms	≤5 mVp-p 3 mArms
Temperature coefficient, (0 °C~40 °C) ±(% of output+offset)	<0.02%+2 mV <0.1%+30 mA	<0.02%+5 mV <0.1%+15 mA	<0.02%+5 mV <0.1%+15 mA	<0.02%+10 mV <0.05%+5 mA
Readback temperature coefficient, ±(% of output+offset)	<0.02%+2 mV <0.1%+20 mA	<0.02%+5 mV ≤0.05%+10 mA	<0.02%+5 mV ≤0.05%+10 mA	<0.02%+10 mV ≤0.05%+5 mA
Transient Response (for a change from 0 mA to 50% of maximum rated current).	100 µs for output to recover to within 75 mV	120 µs for output to recover to within 75 mV	100 µs for output recover to within 50 mV	to50 µs for output to recover within 50 mV
DVM Accuracy			0~12V range: 0.02%+2mV 0~40V range: 0.02%+3mV	
DVM Resolution			0~12V range: 0.1mV 0~40V range: 1mV	
Milliohm Meter Accuracy			0.1% (for Voltage and Current ≥of full scale) 0.3% (for Voltage and Current ≥3% of full scale)	

General Specification

Display	VFD
Weight	29 kg
Dimensions	429 mm (W) x 88.2 mm (H) x 458.9 mm (D)
Warranty	2 years

Supplied with : power card, RS-232 and USB communication mode, application software installation disk.

Optional accessories : see page 44,45

Visit our web site : www.sefram.fr



DC Electronic loads Overview

Selection Guide

	Power	Operating voltage	Rated current		Page	
Low power DC Electronic load	BK8540	150 W	0.1 - 60 V	30 A		22
	Power	Operating voltage	Rated current	Interfaces	page	
Programmable DC Electronic loads	BK 8500	300 W	0.1 - 120 V	30 A	RS-232, USB (option)	23
	BK 8502	300 W	0.1 - 500 V	15 A	RS-232, USB (option)	23
	BK 8510	600 W	0.1 - 120 V	120 A	RS-232, USB (option)	24
	BK 8512	600 W	0.1 - 500 V	30 A	RS-232, USB (option)	24
	BK 8514	1200 W	0.1 - 120 V	240 A	RS-232, USB (option)	24
	BK 8518	1200 W	0.1 - 60 V	240 A	RS-232, USB (option)	24
	BK 8520	2400 W	0.1 - 120 V	240 A	RS-232, USB (option)	25
	BK 8522	2400 W	0.1 - 500 V	120 A	RS-232, USB (option)	25
	BK 8524	5000 W	0.1 - 60 V	240 A	RS-232, USB (option)	25
	BK 8526	5000 W	0.1 - 500 V	120 A	RS-232, USB (option)	25



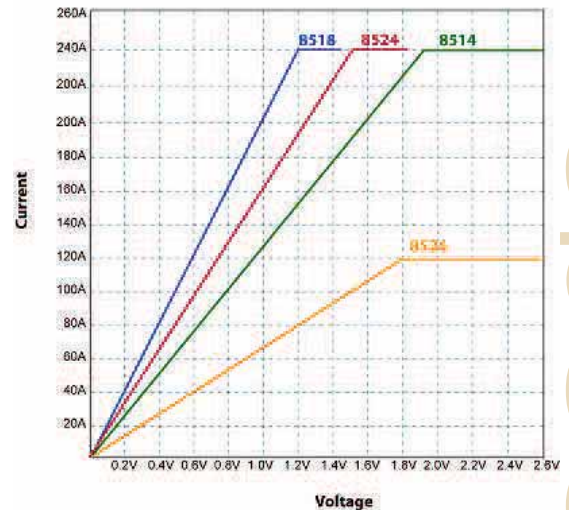
Versatile and Economical DC Electronic loads

The 8500 series Programmable DC Electronic Loads can be used for testing and evaluating a variety of DC power sources. Their wide operating ranges of up to 500 V and 240 A, flexible operating modes and excellent measurement accuracy make the 8500 series well suited for characterizing DC Power supplies, DC-DC Converters, batteries, fuel cells and solar cells. The loads can operate in CC, CV, CR or CP mode while voltage/current or resistance/power values are measured and displayed in real time. Load terminals are isolated and floating. Extensive protection, including over temperature, over power, over voltage, over current and reverse polarity will help protect your valuable prototype. The DC loads are easy to use. All parameters can be set quickly and precisely from the front panel, or programmed via RS232 (included) or USB (optional) interfaces.



Low voltage operation

The 8500 series can operate well below 1V which is important for low voltage application such as fuel cell and solar cell testing. All models can regulate (provide a stable input) down to 0,1V. Model 8518, due to its particularly low input resistance, can operate at full scale current of 240 A at 1.2 V (see image)



Typical minimum operating voltage at full scale current:

BK8500	BK8502	BK8510	BK8512	BK8514	BK8518	BK8520	BK8522	BK8524	BK8526
1.05 V	3 V	1.8 V	3 V	1.92 V	1.2 V	10.8 V	3.6 V	1.56 V	1.8 V

Flexible operating modes

CC, CR, CV and CP mode

In Constant Current (CC) mode, the load will sink a current according to the programmed current value regardless of the input voltage. (CC) mode can be used for load regulation testing of DC power supplies or for characterizing the discharge profile of a battery.

Constant Power (CP) mode simulates a load whose power consumption is independent of the applied voltage.

Constant Power (CP) mode is useful for battery testing and simulating a realistic discharge curve.

In Constant Voltage (CV) mode, the load will attempt to sink enough current to control the source voltage to the programmed value. This mode is suitable for testing battery chargers.

In Constant Resistance (CR) mode, the load will sink a current linearly proportional to the input voltage in accordance with the programmed resistance. Unlike conventional resistors, the load resistance stays constant regardless of the power level.

Transient generator

The 8500 series offers a variable frequency generator which can be used in all operating modes. The DC load will toggle between 2 preset levels at a frequency between 0.1 Hz to 1 kHz, either continuously or controlled by a trigger.

Triggered operation

Triggering is used to allow synchronization of the DC Load's behavior with other events. You can generate a trigger event by front panel keystroke, by applying an external TTL signal to the back panel terminal or by sending a commands over the serial bus. The trigger can be used in pulse mode, transient mode, list mode and works in CC, CR, CV and CP modes.

Remote control and application software

The DC loads can be remotely controlled from any PC with USB or RS232 interface, allowing the user to fully program and monitor all parameters. An RS232 to TTL serial converter cable is included. A USB to TTL adapter cable is available as option.

List Mode

A list of command sequences can be stored in non-volatile memory and executed independently of a computer. Execution in list mode greatly reduces command processing time and computer interaction during product testing. The command sequence can be entered manually from the front panel or downloaded from a PC via RS232 or USB interface.

Application Software

The included Application Software supports front panel emulation of the load and includes a battery test application which provides A*hr rating of a battery and adjustable ending voltage levels (safety voltage). Whether you are designing a device with Nickel-Metal Hydride or Lithium-Ion batteries, the 8500 series have the capabilities to test their characteristics.

150W Compact DC Electronic load



BK 8540



The BK 8540 DC electronic load is a very compact, economically priced instrument that is at home on both the bench and the production floor. Though this is a DC load in a small package, it can reliably test a 5 Volt power supply to 30 Amps and do it continuously. The BK 8540 DC electronic load can operate in CC, CV or CR mode while Voltage/Current or resistance/power values are measured and displayed in real time, making it well suited to test a variety of DC power sources. The BK 8540's performance is comparable to most full size bench DC loads, yet it does the job at half the price and take up half the space on your bench.

Capabilities

- Operates between 0-60 VDC, 1 mA-30A (150w maximum)
- Easy operation
- Bright, easy-to-read display
- Very compact and light weight
- Two current ranges ; 3A (1mA resolution) and 30A (10mA resolution)
- Constant current (CC), constant resistance (CR) and constant voltage (CV) operation
- Over-current and over-voltage protection
- Short mode to simulate shorts
- Save up to 400 instrument settings

Technical Specification

BK 8540

Input rating (0° - 40°C)

DC voltage	0 to 60V
DC current	1mA to 30A
Power	0 to 150W

Constant voltage mode (CV)
Constant current mode (CC)

Range	Accuracy	Resolution
0,1V to 60V	±(0,05% + 0,1%FS)	10mV
0-3A	±(0,1% + 0,1%FS)	1mA
0-30A	±(0,1% + 0,15%FS)	10mA

Constant Resistance mode (CR)

0,1Ω to 10Ω	±(1% + 0,8%FS)	0,001Ω
10Ω to 99Ω	±(1% + 0,8%FS)	0,01Ω
100Ω to 999Ω	±(1% + 0,8%FS)	1Ω
1kΩ to 4kΩ	±(1% + 0,8%FS)	1Ω

Current measurement

0-3A	±(0,1% + 0,1%FS)	1mA
0-30A	±(0,1% + 0,15%FS)	10mA

Voltage measurement

0-10V	±(0,05% + 0,1%FS)	1mV
0-60V	±(0,05% + 0,1%FS)	10mV

Power measurement

0-10W	±(1% + 0,5%FS)	1mW
10-99W	±(1% + 0,5%FS)	10mW
100-150W	±(1% + 0,5%FS)	100mW

*FS = full scale

General Specification

Protection	over-voltage, over-current
Display	LED
Power supply	110V / 230V 47-63Hz
Dimensions	175 x 88 x 282 mm
Weight	2,7kg

Supplied with: power cord, manual

300W Programmable DC Electronic Loads



Capabilities

- Operates from 0-120V and 1mA-30A (BK8500)
- Operates from 0-500V and 1mA-15A (BK8502)
- Easy operation: front panel and remote control
- Constant current (CC), constant voltage (CV), constant resistance (CR) and constant power (CW)
- Fully protected
- Save up to 25 instruments settings
- Bright, easy to read VFD display
- Interfaces: RS-232, USB (option)
- SCPI compatible

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Easy front panel operation :

The numeric keys and rotary knob provide a convenient interface for setting the operating mode and desired current/voltage/resistance levels quickly and precisely. Voltage and current can be set to a maximum resolution of 1 mV and 0.1 mA respectively (model's 8500 and 8502 only). Up to 25 different instrument setups can be stored and recalled from internal memory.

1) High resolution, easy to read display

Displays values and measured values. Current/voltage and power/resistance displays can be toggled.

2) Convenient data entry

Rotary knob for quick analog-style control. Turn to adjust a setting value. Press to toggle measurement display mode.

3) Numeric keypad

Conveniently enter set values directly and access secondary functions.

4) Function key

Activate current, voltage, power, or resistance modes and scroll through menus and options.

5) Front panel load terminals

Connect to device under test.

Technical Specification	BK8500		BK8502	
	Range	Range	Accuracy	Resolution
Input rating (0° - 40°C)	DC voltage	0 to 120V	0 to 500V	
	DC current	1mA to 30A	1mA to 15A	
	Power	300W	300W	
Constant voltage mode (CV)	BK8500 0.1 - 18V	BK8502 0.1 - 18V	±(0,05% + 0,02%FS)	1mV
	0.1V - 120V	0.1 - 500V	±(0,05% + 0,025%FS)	10mV
Constant current mode (CC)	0 - 3A	0 - 3A	±(0,1% + 0,1%FS)	0,1mA
	0 - 30A	0 - 15A	±(0,2% + 0,15%FS)	1mA
Constant Resistance mode (CR)	0.1 - 10 ohms		±(1% + 0,3%FS)	0,001 ohm
	10 - 99 ohms		±(1% + 0,3%FS)	0,01 ohm
	100 - 999 ohms		±(1% + 0,3%FS)	0,1 ohm
	1000 to 4kohms		±(1% + 0,8%FS)	1 ohm
Constant power mode (CW)	0 - 100W		±(1% + 0,1%FS)	1 mW
	100 - 300W		±(1% + 0,1%FS)	100 mW
Current measurement	0 - 3A	0 - 3A	±(0,1% + 0,1%FS)	0,1mA
	0 - 30A	0 - 15A	BK8500: ±(0,2% + 0,15%FS) BK8502: ±(0,2% + 0,3%FS)	1mA
Voltage measurement	0V to 18V		±(0,02% + 0,02%FS)	1mV
	0V to 120V	0V to 500V	±(0,02% + 0,025%FS)	10mV
Battery test	Capacity from 0 to 999Ah and test period from 1 to 60000 s			
*FS = full scale				
General Specification				
Protection	over-voltage, over-current, over-temperature			
Display	LED			
Power supply	110V / 230V 47-63Hz			
Dimensions	215 x 88 x 355 mm			
Weight	5,2kg			

Supplied with: main cord, manual, RS-232 interface (ITE-131) and software PV 8500.
Options: ITE-132 USB connection kit, IT-E151 rack mount kit

600W and 1200W Programmable DC Electronic Loads

**600W/
1200W**



BK8510 / BK8512 / BK8514 / BK8518

Model BK8518 is dedicated to fuel cells and solar cells applications

Capabilities

- Operates from 0-120V and 1mA-120A (BK8510) / 1mA-240A (BK8514)
- Operates from 0-500V and 1mA-30A (BK8512) / 0-60V and 1mA-240A (BK8518)
- Easy operation: front panel and remote control
- Constant current (CC), constant voltage (CV), constant resistance (CR) and constant power (CW)
- Fully protected
- Low minimum operating voltage of < 0.1 V and minimum input resistance of 5 m Ω (model BK8518) allowing the load to sink high current at low voltages, required for fuel and solar cell applications"
- Save up to 25 instruments settings
- Bright, easy to read VFD display
- Interfaces: RS-232, USB (option)
- SCPI compatible

Technical Specification

	BK8510	BK8512	BK8514	BK8518		
Input rating (0° - 40°C)	DC Voltage	0 to 120V	0 to 500V	0 to 120V	0 to 60V	
	DC Current	0 to 120A	0 to 30A	0 to 240A	0 to 240A	
	Power	600W	600W	1200W	1200W	
	Range				Accuracy	Resolution
Constant voltage mode (CV)	0 - 18V				$\pm(0,05\% + 0,02\%FS)$	1mV
	0.1V - 120V	0.1 - 500V	0.1 - 120V	0.1 - 60V	$\pm(0,05\% + 0,025\%FS)$	10mV
Constant current mode (CC)	0 - 12A	0 - 3A	0 - 24A		$\pm(0,1\% + 0,1\%FS)$	1mA
	0 - 120A	0 - 30A	0 - 240A		$\pm(0,2\% + 0,15\%FS)$	10mA
Constant Resistance mode (CR)	0.1 - 10 ohms				$\pm(1\% + 0,3\%FS)$	0,001 ohm
	10 - 99 ohms				$\pm(1\% + 0,3\%FS)$	0,01 ohm
	100 - 999 ohms				$\pm(1\% + 0,3\%FS)$	0,1 ohm
	1000 ohms to 4kohms				$\pm(1\% + 0,8\%FS)$	1 ohm
Constant power mode (CW)	0 - 100W				$\pm(1\% + 0,1\%FS)$	1 mW
	100W - 600W		100W - 1200W		$\pm(1\% + 0,1\%FS)$	100 mW
Current measurement	0 - 12A	0 - 3A	0 - 24A		$\pm(0,1\% + 0,1\%FS)$	1mA
	0 - 120A	0 - 30A	0 - 240A		$\pm(0,2\% + 0,15\%FS)$	10mA
Voltage measurement	0V to 18V				BK8510/14: $\pm(0,02\% + 0,025\%FS)$	1mV
					BK8512/18: $\pm(0,02\% + 0,02\%FS)$	
	0V - 120V	0V - 500V	0V - 120V	0V - 60V	$\pm(0,02\% + 0,025\%FS)$	10mV
Battery test	Capacity from 0 to 999Ah and test period from 1 to 60000 s					

*FS = full scale

General Specification

Display	VFD, 16 characters
Protection	overcurrent, overvoltage, overpower, over temperature
Power supply	115 / 230V, 50/60Hz
Dimensions	88 x 355 x 429 mm
Weight	14Kg

Supplied with: main cord, manual, RS-232 interface (ITE-131) and software PV 8500.
Options: ITE-132 USB connection kit, IT-E151 rack mount kit

Hi-power programmable DC Electronic loads 2400W and 5000W



**2400W/
5000W**

Capabilities

- Operates from 0-120V and 1mA-240A (BK8520)
- Operates from 0-500V and 1mA-120A (BK8522 and 8526) / 0-60V and 1mA-240A (BK8524)
- Easy operation: front panel and remote control
- Constant current (CC), constant voltage (CV), constant resistance (CR) and constant power (CW)
- Fully protected
- Save up to 25 instruments settings
- Bright, easy to read VFD display
- Interfaces: RS-232, USB (option)
- SCPI compatible

BK8520 /BK8522 / BK8524 / BK8526

Technical Specification

	BK8520	BK8522	BK8524	BK8526	
Input rating (0° - 40°C)	DC Voltage	0 to 120V	0 to 500V	0 to 60V	0 to 500V
	DC Current	0 to 240A	0 to 120A	0 to 240A	0 to 120A
	Power	2400W	2400W	5000W	5000W
	Range				Accuracy
	BK8520	BK8522	BK8524	BK8526	Resolution
Constant voltage mode (CV)	0 - 18V				±(0,05% + 0,02%FS)
	0.1V - 120V	0.1 - 500V	0.1 - 60V	0.1 - 500V	±(0,05% + 0,025%FS)
Constant current mode (CC)	0 - 24A	0 - 12A	0 - 24A	0 - 12A	±(0,1% + 0,1%FS)
	0 - 240A	0 - 120A	0 - 240A	0 - 120A	±(0,2% + 0,15%FS)
Constant resistance mode (CR)	0.1 - 10 ohms				±(1% + 0,3%FS)
	10 - 99 ohms				±(1% + 0,3%FS)
	100 - 999 ohms				±(1% + 0,3%FS)
	1000 ohms to 4kohms				±(1% + 0,8%FS)
Constant power mode (CW)	0 - 100W				±(1% + 0,1%FS)
	100W - 600W		100W - 1200W		±(1% + 0,1%FS)
Current measurement	0 - 24A	0 - 12A	0 - 24A	0 - 12A	±(0,1% + 0,1%FS)
	0 - 240A	0 - 120A	0 - 240A	0 - 120A	±(0,2% + 0,15%FS)
Voltage measurement	0V to 18V				BK8522/26: ±(0,02% + 0,02%FS)
					BK8520/24: ±(0,02% + 0,025%FS)
	0V - 120V	0V - 500V	0V - 60V	0V - 500V	±(0,02% + 0,025%FS)
Battery test	Capacity from 0 to 999Ah and test period from 1 to 60000 s				10mV

*FS = full scale

General Specification

Display	VFD, 16 characters
Protection	overcurrent, overvoltage, overpower, over temperature
Power supply	115 / 230V, 50/60Hz
Dimensions	180 x 444 x 539 mm for BK8520/8522 and 357 x 444 x 539 for BK8524/8526
Weight	30Kg for BK8520/8522 - 67kg for BKBK8524/8526

Supplied with: main cord, manual, RS-232 interface (ITE-131) and software PV 8500
Options: ITE-132 USB connection kit

Digital oscilloscopes Overview

Oscilloscopes has been considered to be one of the most widely used instruments in the Electrical Test and Measurement field. With the rapid advancement of technology, oscilloscope market has been shifting from conventional analog technology toward Digital Storage Oscilloscopes (DSO). To satisfy various need of waveform observation and analysis, SEFRAM provides an entire series of DSO.

Selection Guide

	Bandwidth	Display	Channels	Sampling RTS	Memory	FFT	Counter	Go-No-Go (mask)	USB Host	USB device	SD interface	IEEE	page	
Economical compact series	5322DC	25MHz	LCD, TFT	2	250Ms/s	4k	yes	6 digit	-	-	yes	yes	-	28
	5342DC	40MHz	LCD, TFT	2	250Ms/s	4k	yes	6 digit	-	-	yes	yes	-	28
	5362DC	60MHz	LCD, TFT	2	250Ms/s	4k	yes	6 digit	-	-	yes	yes	-	29
	5382DC	100MHz	LCD, TFT	2	250Ms/s	4k	yes	6 digit	-	-	yes	yes	-	29
	5442DC	60MHz	LCD, TFT	2	1Gs/s	1M	yes	6 digit	-	-	yes	yes	-	27
	5462DC	100MHz	LCD, TFT	2	1Gs/s	1M	yes	6 digit	-	-	yes	yes	-	27
	5482DC	150MHz	LCD, TFT	2	1Gs/s	1M	yes	6 digit	-	-	yes	yes	-	27
Bench economical series	BK2530	25MHz	LCD, B&W	2	250Ms/s	4k	yes	6 digit	yes	-	yes	-	-	32
	BK2534	60MHz	LCD, TFT	2	400Ms/s	4k	yes	5 digit	yes	yes	yes	-	-	33
Bench, Hi-performance 2 channels	5062DC	60MHz	LCD, TFT	2	1Gs/s	25k	yes	6 digit	yes	yes	yes	-	option	30
	BK2540	60MHz	LCD, TFT	2	1Gs/s	4k	yes	5 digit	yes	yes	yes	-	-	33
	BK2542	100MHz	LCD, TFT	2	1Gs/s	4k	yes	5 digit	yes	yes	yes	-	-	33
	5160DC	100MHz	LCD, TFT	2	1Gs/s	25k	yes	6 digit	yes	yes	yes	-	option	30
	5260DC	200MHz	LCD, TFT	2	1Gs/s	25k	yes	6 digit	yes	yes	yes	-	option	30
Bench, Hi-performance 4 channels	5064DC	60MHz	LCD, TFT	4	1Gs/s	25k	yes	6 digit	yes	yes	yes	-	option	31
	5164DC	100MHz	LCD, TFT	4	1Gs/s	25k	yes	6 digit	yes	yes	yes	-	option	31
	5264DC	200MHz	LCD, TFT	4	1Gs/s	25k	yes	6 digit	yes	yes	yes	-	option	31



Digital Oscilloscopes

NEW
2010

2 channels compact hi-performance DSO, from 60MHz to 150MHz



Sefram 5482DC

Capabilities

- 2 channels, full bandwidth from 60MHz to 150MHz
- Vertical resolution: 8 bit
- Sampling: 1Gs/s and 25Gs/s in ETS
- Memory: 2Mpoints
- 27 automatic measurements, including arithmetic, FFT and FFT RMS
- 6 digits real time frequency counter
- Coloured TFT LCD
- SD-CARD interface
- USB1.1 & 2.0 interface
- Freewave PC software

Technical Specification	5442DC	5462DC	5482DC
Number of channels	2	2	2
Vertical Mode			
Bandwidth (-3dB)	60MHz	100MHz	150MHz
Resolution	8 bit	8 bit	8 bit
Sensitivity	2mV/div to 5V/div	2mV/div to 5V/div	2mV/div to 5V/div
Rise time	<5.8ns	<3.5ns	<2.3ns
Coupling	AC, DC, GND	AC, DC, GND	AC, DC, GND
Input impedance	1M ohms //15pF	1M ohms //15pF	1M ohms //15pF
Horizontal Mode			
Time base	1ns to 50s /div	1ns to 50s /div	1ns to 50s /div
Display	window, zoom, roll, XY	window, zoom, roll, XY	window, zoom, roll, XY
Acquisition			
Sampling rate	1Gs/s	1Gs/s	1Gs/s
Memory (total)	2Mpoints	2Mpoints	2Mpoints
ETS sampling rate	25Gs/s	25Gs/s	25Gs/s
Mode	single, peak, average	single, peak, average	single, peak, average
Averaging	2, 4, 8, 16, 32, 64, 128, 256	2, 4, 8, 16, 32, 64, 128, 256	2, 4, 8, 16, 32, 64, 128, 256
Trigger			
Mode	Auto, normal, single, TV, pulse, edge	Auto, normal, single, TV, pulse, edge	Auto, normal, single, TV, pulse, edge
Coupling	AC, DC, LF, HF, noise reject	AC, DC, LF, HF, noise reject	AC, DC, LF, HF, noise reject
External Trigger	yes	yes	yes
Functions & measurements			
XY	yes	yes	yes
Automatic measurement	27 measurements, including FFT, FFT RMS, +, -, x	27 measurements, including FFT, FFT RMS, +, -, x	27 measurements, including FFT, FFT RMS, +, -, x
Cursors	dV, dT, 1/dT	dV, dT, 1/dT	dV, dT, 1/dT
Counter	6 digit	6 digit	6 digit
Autoset	yes, selectable	yes, selectable	yes, selectable
Memory	up to 15 setup or curves	up to 15 setup or curves	up to 15 setup or curves
Autocalibration	yes	yes	yes
Interfaces			
USB	yes, USB1.1 & 2.0 (device)	yes, USB1.1 & 2.0 (device)	yes, USB1.1 & 2.0 (device)
SD card (front panel)	yes, for display, setup and files	yes, for display, setup and files	yes, for display, setup and files
General Specification			
Display	LCD, TFT coloured 320x234 dots	LCD, TFT coloured 320x234 dots	LCD, TFT coloured 320x234 dots
Menu	per function, with multilanguage	per function, with multilanguage	per function, with multilanguage
Grid	8x10div	8x10div	8x10div
Power supply	100 - 240V / 48-63Hz (25VA max.)	100 - 240V / 48-63Hz (25VA max.)	100 - 240V / 48-63Hz (25VA max.)
Safety	IEC1010, Cat II -300V	IEC1010, Cat II -300V	IEC1010, Cat II -300V
Dimensions, weight	140x142x310mm - 2,5 Kg	140x142x310mm - 2,5 Kg	140x142x310mm - 2,5 Kg

Supplied with: power cord, user's manual, 1 set of 1/1:10 probes, Freewave software for PC (CD-ROM)

Optional accessories : see page 44,45

Digital Oscilloscopes

Digital Oscilloscopes

2 channels compact DSO, from 25MHz to 100MHz



Sefram 5342DC

40 MHz
250 MS/s
2 CHANNELS

Capabilities

- 2 channels, full bandwidth from 25MHz to 100MHz
- Vertical resolution: 8 bit
- Sampling: 250Mech/s and 25Gech/s in ETS
- Memory: 4K per channel
- 19 automatic measurements, including arithmetic and FFT
- 6 digits real time frequency counter
- Coloured TFT LCD
- SD-CARD interface
- USB1.1 & 2.0 interface
- Freewave PC software

Technical Specification	5322DC	5342DC
Number of channels	2	2
Vertical Mode		
Bandwidth (-3dB)	25MHz	40MHz
Resolution	8 bit	8 bit
Sensitivity	2mV/div to 5V/div	2mV/div to 5V/div
Rise time	<14ns	<8,75ns
Coupling	AC, DC, GND	AC, DC, GND
Input impedance	1M ohms //16pF	1M ohms //16pF
Horizontal Mode		
Time base	1ns to 10s /div	1ns to 10s /div
Display	window, roll, XY	window, roll, XY
Acquisition		
Sampling rate	250Ms/s	250Ms/s
Memory (per channel)	4 kwords	4 kwords
ETS sampling rate	25Gs/s	25Gs/s
Mode	single, peak, average	single, peak, average
Averaging	2, 4, 8, 16, 32, 64, 128, 256	2, 4, 8, 16, 32, 64, 128, 256
Trigger		
Mode	Auto, normal, single, TV, pulse, edge	Auto, normal, single, TV, pulse, edge
Coupling	AC, DC, LF, HF, noise reject	AC, DC, LF, HF, noise reject
External Trigger	yes	yes
Functions & measurements		
XY	yes	yes
Automatic measurement	19 measurements, including FFT	19 measurements, including FFT
Cursors	dV, dT, 1/dT	dV, dT, 1/dT
Counter	6 digit	6 digit
Autoset	yes, selectable	yes, selectable
Memory	up to 15 setup or curves	up to 15 setup or curves
Autocalibration	yes	yes
Interfaces		
USB	yes, USB1.1 & 2.0 (device)	yes, USB1.1 & 2.0 (device)
SD card (front panel)	yes, for display, setup and files	yes, for display, setup and files
General Specification		
Display	LCD, TFT coloured 320x234 dots	LCD, TFT coloured 320x234 dots
Menu	per function	per function
Grid	8x10div	8x10div
Power supply	100 - 240V / 48-63Hz (25VA max.)	100 - 240V / 48-63Hz (25VA max.)
Safety	IEC1010, Cat II -300V	IEC1010, Cat II -300V
Dimensions, weight	140x142x310mm - 2,5 Kg	140x142x310mm - 2,5 Kg

Supplied with: power cord, user's manual, 1 set of 1/1:10 probes, Freewave software for PC (CD-ROM)

Optional accessories : see page 44,45

Digital Oscilloscopes

2 channels compact DSO, from 25MHz to 100MHz



60 MHz
250 Ms/s
2 CHANNELS

Sefram 5362DC

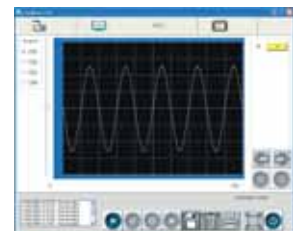
Technical Specification	5362DC	5382DC
Number of channels	2	2
Vertical Mode		
Bandwidth (-3dB)	60MHz	100MHz
Resolution	8 bit	8 bit
Sensitivity	2mV/div to 5V/div	2mV/div to 5V/div
Rise time	<5,8ns	<3,5ns
Coupling	AC, DC, GND	AC, DC, GND
Input impedance	1M ohms //16pF	1M ohms //16pF
Horizontal Mode		
Time base	1ns to 10s /div	1ns to 10s /div
Display	window, roll, XY	window, roll, XY
Acquisition		
Sampling rate	250Ms/s	250Ms/s
Memory (per channel)	4 kwords	4 kwords
ETS sampling rate	25Gs/s	25Gs/s
Mode	single, peak, average	single, peak, average
Averaging	2, 4, 8, 16, 32, 64, 128, 256	2, 4, 8, 16, 32, 64, 128, 256
Trigger		
Mode	Auto, normal, single, TV, pulse, edge	Auto, normal, single, TV, pulse, edge
Coupling	AC, DC, LF, HF, noise reject	AC, DC, LF, HF, noise reject
External Trigger	yes	yes
Functions & measurements		
XY	yes	yes
Automatic measurement	19 measurements, including FFT	19 measurements, including FFT
Cursors	dV, dT, 1/dT	dV, dT, 1/dT
Counter	6 digit	6 digit
Autoset	yes, selectable	yes, selectable
Memory	up to 15 setup or curves	up to 15 setup or curves
Autocalibration	yes	yes
Interfaces		
USB	yes, USB1.1 & 2.0 (device)	yes, USB1.1 & 2.0 (device)
SD card (front panel)	yes, for display, setup and files	yes, for display, setup and files
General Specification		
Display	LCD, TFT coloured 320x234 dots	LCD, TFT coloured 320x234 dots
Menu	per function	per function
Grid	8x10div	8x10div
Power supply	100 - 240V / 48-63Hz (25VA max.)	100 - 240V / 48-63Hz (25VA max.)
Safety	IEC1010, Cat II -300V	IEC1010, Cat II -300V
Dimensions, weight	140x142x310mm - 2,5 Kg	140x142x310mm - 2,5 Kg

Supplied with: power cord, user's manual, 1 set of 1/1:10 probes, freewave software for PC (CD-ROM)

Optional accessories : see page 44,45

Freewave PC software

The PC software (Freewave) is supplied with all 53XX DSO's. This software enables the full screen image transfer from oscilloscope to PC via the USB port in a fast-updating manner, so the user is able to see a nearly real time display on the PC screen. The screen image (.bmp or .jpg) and waveform data (.csv) could be saved into PC for further application. The continuous waveform images (.avi) in a period of time could be recorded for later playback. This video recorder function facilitates the repetitive observation of a saved waveform with continuous variation in a certain period of time.



Digital oscilloscopes

2 channels DSO, from 60MHz to 200MHz



Sefram 5062DC

60 MHz
1GS/s
2 CHANNELS

Capabilities

- 8 bit vertical resolution
- Sampling rate 1Gs/s and 25Gs/s (ETS mode)
- 25K memory per channel
- 27 automatic measurements and Go-No-Go mode
- Colour TFT LCD
- Detailed on screen help
- USB 2.0 (Host) interface and RS-232
- GPIB interface (factory option)



Sefram 5160DC

100 MHz
1GS/s
2 CHANNELS



Sefram 5260DC

200 MHz
1GS/s
2 CHANNELS

Technical Specification	Sefram 5062DC	Sefram 5160DC	Sefram 5260DC
Number of channels	2	2	2
Vertical Mode			
Bandwidth (-3dB)	60MHz	100MHz	200MHz
Resolution	8 bit	8 bit	8 bit
Sensitivity	2mV/div to 5V/div	2mV/div to 5V/div	2mV/div to 5V/div
Rise time	<5,8ns	<3,5ns	<1,75ns
Coupling	AC, DC, GND	AC, DC, GND	AC, DC, GND
Input impedance	1M ohms //16pF	1M ohms //16pF	1M ohms //16pF
Horizontal Mode			
Time base	1ns to 10s /div	1ns to 10s /div	1ns to 10s /div
Display	window, roll, XY	window, roll, XY	window, roll, XY
Acquisition			
Sampling rate	1Gs/s	1Gs/s	1Gs/s
Memory (per channel)	25Kwords	25Kwords	25Kwords
ETS sampling rate	25Gs/s	25Gs/s	25Gs/s
Mode	single, peak, average	single, peak, average	single, peak, average
Trigger			
Mode	Auto, normal, single, TV, delayed event, pulse, edge	Auto, normal, single, TV, delayed event, pulse, edge	Auto, normal, single, TV, delayed event, pulse, edge
Coupling	AC, DC, LF, noise rejection	AC, DC, LF, noise rejection	AC, DC, LF, noise rejection
XY	yes	yes	yes
Automatic measurement	27 measurements, with FFT	27 measurements, with FFT	27 measurements, with FFT
Cursors	dV, dT, 1/dT	dV, dT, 1/dT	dV, dT, 1/dT
Counter	6 digit	6 digit	6 digit
Autoset	yes	yes	yes
Memory	20 setups, 24 curves	20 setups, 24 curves	20 setups, 24 curves
Autocalibration	yes	yes	yes
External Trigger	yes	yes	yes
Help	on screen detailed help	on screen detailed help	on screen detailed help
Interfaces			
USB	USB HOST - 2.0	USB HOST - 2.0	USB HOST - 2.0
RS-232	yes	yes	yes
IEEE-488	option when ordering	option when ordering	option when ordering
General Specification			
Display	TFT LCD coloured 320x234	TFT LCD coloured 320x234	TFT LCD coloured 320x234
Grid	8x10div or 8x12div without menu	8x10div or 8x12div without menu	8x10div or 8x12div without menu
Power supply	100 - 240V / 48-63Hz (65VA max.)	100 - 240V / 48-63Hz (65VA max.)	100 - 240V / 48-63Hz (65VA max.)
Safety	IEC1010, Cat II -300V	IEC1010, Cat II -300V	IEC1010, Cat II -300V
Dimensions, weight	254x142x310mm - 4,3 Kg	254x142x310mm - 4,3 Kg	254x142x310mm - 4,3 Kg

Supplied with: power cord, user manual, Freeware software.

Interface IEEE s/n 5x60 IEEE. Factory option

Optional accessories : see page 44,45

Digital oscilloscopes

4 channels DSO, from 60MHz to 200MHz



Sefram 5064DC

60 MHz
1GS/s
4 CHANNELS

Capabilities

- 8 bit vertical resolution
- Sampling rate 1Gs/s and 25Gs/s (ETS mode)
- 25K memory per channel
- 27 automatic measurements and Go-No-Go mode
- Colour TFT LCD
- Detailed on screen help
- USB 2.0 (Host) interface and RS-232
- GPIB interface (factory option)



Sefram 5164DC

100 MHz
1GS/s
4 CHANNELS



Sefram 5264DC

200 MHz
1GS/s
4 CHANNELS

Technical Specification

	Sefram 5064 DC	Sefram 5164 DC	Sefram 5264 DC
Number of channels	4	4	4
Vertical Mode			
Bandwidth (-3dB)	60MHz	100MHz	200MHz
Resolution	8 bit	8 bit	8 bit
Sensitivity	2mV/div to 5V/div	2mV/div to 5V/div	2mV/div to 5V/div
Rise time	<5,8ns	<3,5ns	<1,75ns
Coupling	AC, DC, GND	AC, DC, GND	AC, DC, GND
Input impedance	1M ohms //16pF	1M ohms //16pF	1M ohms //16pF
Horizontal Mode			
Time base	1ns to 10s /div	1ns to 10s /div	1ns to 10s /div
Display	window, roll, XY	window, roll, XY	window, roll, XY
Acquisition			
Sampling rate	1Gs/s	1Gs/s	1Gs/s
Memory (per channel)	25Kwords	25Kwords	25Kwords
ETS sampling rate	25Gs/s	25Gs/s	25Gs/s
Mode	single, peak, average	single, peak, average	single, peak, average
Trigger			
Mode	Auto, normal, single, TV, delayed, event, pulse, edge	Auto, normal, single, TV, delayed, event, pulse, edge	Auto, normal, single, TV, delayed, event, pulse, edge
Coupling	AC, DC, LF, noise rejection	AC, DC, LF, noise rejection	AC, DC, LF, noise rejection
XY	yes	yes	yes
Automatic measurement	27 measurements, with FFT	27 measurements, with FFT	27 measurements, with FFT
Cursors	dV, dT, 1/dT	dV, dT, 1/dT	dV, dT, 1/dT
Counter	6 digit	6 digit	6 digit
Autoset	yes	yes	yes
Memory	20 setups, 24 curves	20 setups, 24 curves	20 setups, 24 curves
Autocalibration	yes	yes	yes
External Trigger	-	-	-
Help	on screen detailed help	on screen detailed help	on screen detailed help
Interfaces			
USB	USB HOST - 2.0	USB HOST - 2.0	USB HOST - 2.0
RS-232	yes	yes	yes
IEEE-488	option when ordering	option when ordering	option when ordering
General Specification			
Display	TFT LCD coloured 320x234	TFT LCD coloured 320x234	TFT LCD coloured 320x234
Grid	8x10div or 8x12div without menu	8x10div or 8x12div without menu	8x10div or 8x12div without menu
Power supply	100 - 240V / 48-63Hz (65VA max.)	100 - 240V / 48-63Hz (65VA max.)	100 - 240V / 48-63Hz (65VA max.)
Safety	IEC1010, Cat II -300V	IEC1010, Cat II -300V	IEC1010, Cat II -300V
Dimensions, weight	254x142x310mm - 4,3 Kg	254x142x310mm - 4,3 Kg	254x142x310mm - 4,3 Kg

Supplied with: power cord, user manual, firmware software.

Interface IEEE s/n 5x60 IEEE. Factory option

Optional accessories : see page 44,45

Digital oscilloscopes

25MHz Digital Sampling Oscilloscope, 2 channels



BK 2530

25MHz
250Ms/s
2 CHANNELS

Capabilities

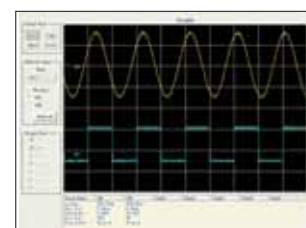
- 25MHz bandwidth, 2 channels
- Vertical resolution: 8 bit
- Sampling rate: 250Ms/s and 50Gs/s in ETS
- Memory: 4K per channel
- 11 automatic measurements
- Autoset
- B&W LCD display
- USB interface
- Automatic calibration

Technical Specification	BK 2530
Number of channels	2
Vertical Mode	
Bandwidth (-3dB)	25MHz
Resolution	8 bit
Sensitivity	2mV/div to 5V/div
Rise time	<14ns
Coupling	AC, DC, GND
Input impedance	1M ohms //13pF
Horizontal Mode	
Time base	2,5ns to 50s /div
Display	window, roll, XY, zoom
Acquisition	
Sampling rate	250Ms/s
Memory (per channel)	4000 samples
ETS sampling rate	50Gs/s
Mode	single, peak, average
Trigger	
Source	CH1, CH2, Line, Ext, Etx/5
Mode	Auto, normal, single, TV (with line selection), pulse, edge
Coupling	AC, DC, LF reject, HF reject
External Trigger	yes, with BNC on front panel
Functions & measurements	
XY	yes
Automatic measurement	11 measurements, with FFT and Go-No-Go mode
Cursors	dV, dT, 1/dT
Counter	6 digit, DC coupling
Autoset	yes
Memory	10 setup, 10 curves and 2 reference curves
Autocalibration	yes
Interfaces	
USB	yes, EasyScope for Windows TM software
General Specification	
Display	LCD, B&W 320x240 dots
Grid	8x10div
Power supply	100 - 240V / 45-440Hz (50VA max.)
Safety	IEC1010, Cat II -300V
Dimensions, weight	290x150x300mm - 4,6 Kg

Supplied with: power cord, user's manual, 1 set of 1/1:10 probes, Easyscope software for PC (CD-ROM)

Optional accessories : see page 44,45

The included Easyscope software provides seamless integration between oscilloscope and PC. Capture and transfer waveforms, screen images, setups and measurement results to a Windows® PC via the USB device port on the back of the instrument. Save waveform data in csv (Microsoft Excel®) for post acquisition analysis.



Digital oscilloscopes

60MHz to 100MHz Digital Sampling Oscilloscopes



BK 2542



A compartment for accessories

Capabilities

- Vertical resolution: 8 bit
- Sampling rate: 1Gs/s (BK2540, BK2542) and 50G/s ETS
- Memory: 4k per channel
- Autoset
- 24 automatic measurements
- Direct print on USB memory stick
- Coloured TFT LCD
- 2 USB interfaces
- Automatic closed case calibration

Technical Specification

	BK2534	BK2540	BK2542
Number of channels	2	2	2
Vertical Mode			
Bandwidth (-3dB)	60MHz	60MHz	100MHz
Resolution	8 bits	8 bits	8 bits
Sensitivity	2mV/div to 5V/div	2mV/div to 5V/div	2mV/div to 5V/div
Rise time	<5,8ns	<5,8ns	<3,5ns
Coupling	AC, DC, GND	AC, DC, GND	AC, DC, GND
Input impedance	1M ohms //19pF	1M ohms //19pF	1M ohms //19pF
Bandwidth limit	yes, 20MHz	yes, 20MHz	yes, 20MHz
Horizontal Mode			
Time base	2,5ns to 50s /div	2,5ns to 50s /div	2,5ns to 50s /div
Display	window, roll, XY, zoom	window, roll, XY, zoom	window, roll, XY, zoom
Acquisition			
Sampling rate	400Ms/s	1Gs/s	1Gs/s
Memory (per channel)	4000 samples, 2500 displayed	4000 samples, 2500 displayed	4000 samples, 2500 displayed
ETS sampling rate	40Gs/s	50Gs/s	50Gs/s
Mode	single, peak, average	single, peak, average	single, peak, average
Trigger			
Source	CH1, CH2, Line, Ext, Etx/5	CH1, CH2, Ligne, Ext, Etx/5	CH1, CH2, Ligne, Ext, Etx/5
Mode	Auto, normal, single, TV (with line selection), pulse, edge	Auto, normal, single, TV (with line selection), pulse, edge	Auto, normal, single, TV (with line selection), pulse, edge
Coupling	AC, DC, LF reject, HF reject	AC, DC, LF reject, HF reject	AC, DC, LF reject, HF reject
External Trigger	yes, with BNC on front panel	yes, with BNC on front panel	yes, with BNC on front panel
Functions & measurements			
Automatic measurement	24 measurements with FFT and Go-No-Go mode Vpp, Vmoy, Veff., Vmax, Vmoy et Veff. period, width, duty cycle, Tm, Td, Freq, période, overshoot, preshoot, delay CH1-CH2, phase	24 measurements with FFT and Go-No-Go mode Vpp, Vmoy, Veff., Vmax, Vmoy et Veff. period, lwidth, duty cycle, Tm, Td, Freq, période, overshoot, preshoot, delay CH1-CH2, phase	24 measurements with FFT and Go-No-Go mode Vpp, Vmoy, Veff., Vmax, Vmoy et Veff. period, width, duty cycle, Tm, Td, Freq, période, overshoot, preshoot, delay CH1-CH2, phase
XY	yes	yes	yes
Cursors	dV, dT, 1/dT	dV, dT, 1/dT	dV, dT, 1/dT
Counter	5 digit, DC coupling	5 digit, DC coupling	5 digit, DC coupling
Autoset	yes	yes	yes
Memory	10 setups, 10 curves and 2 reference curves	10 setups, 10 curves and 2 reference curves	10 setups, 10 curves and 2 reference curves
Autocalibration	yes	yes	yes
Interfaces			
USB	USB Host front panel, USB device rear panel	USB Host front panel, USB device rear panel	USB Host front panel, USB device rear panel
Saved file types	BMP, CSV, STP, WFM	BMP, CSV, STP, WFM	BMP, CSV, STP, WFM
Software	Comsoft software for Windows, with front panel emulator	Comsoft software for Windows, with front panel emulator	Comsoft software for Windows, with front panel emulator
General Specification			
Display	LCD, TFT coloured 320x240 dots, VGA 256 colours (145mm diagonal)	LCD, TFT coloured 320x240 dots, VGA 256 colours (145mm diagonal)	LCD, TFT coloured 320x240 dots, VGA 256 colours (145mm diagonal)
Grid	8x10div (ou 8 x 12 without menu)	8x10div (ou 8 x 12 without menu)	8x10div (ou 8 x 12 without menu)
Plastic housing	with compartment for probes and accessories	with compartment for probes and accessories	with compartment for probes and accessories
Power supply	99 - 242V / 47-440Hz (50VA max.)	99 - 242V / 47-440Hz (50VA max.)	99 - 242V / 47-440Hz (50VA max.)
Safety	IEC1010, Cat II -300V	IEC1010, Cat II -300V	IEC1010, Cat II -300V
Dimensions, weight	269x147x310mm - 3,6 Kg	269x147x310mm - 3,6 Kg	269x147x310mm - 3,6 Kg

Supplied with: power cord, user's manual, 1 set of 1/1:10 probes, Comsoft software for PC (CD-ROM)

Optional accessories : see page 44,45

Bench and hi-resolution handheld multimeters Overview

Selection Guide

Model	Display count	Display type	Best accuracy V DC	AC conversion	VAC bandwidth	Best V DC resolution	Functions	Interface	Power supply	page
7210B	2,000 counts	LCD	±0.5%	standard	500Hz	1mV	Hold	-	Battery/ 230V	36
7211	4,000 counts	LCD	±0.1%	TRMS AC	1000Hz	100µV	Hold, Min, Max, REL, MEM	-	Battery/ 230V	36
7240	40,000 counts	LCD	±0.06%	TRMS AC+DC	100kHz	10µV	Hold, Min, Max, REL, MEM, dB, dBm, %	USB*	230V	36
BK2831E	20,000 counts	VFD	±0.03%	TRMS AC+DC	100kHz	10µV	Min/Max, REL, MEM, dB, dBm, %, Limits	USB	230V	37
BK5491B	50,000 counts	VFD	±0.02%	TRMS AC+DC	100kHz	10µV	Min, Max, REL, MEM, dB, dBm, %, Limits	USB	230V	37
BK5492	120,000 counts	VFD	±0.012%	TRMS AC+DC	100kHz	1µV	Min, Max, REL, MEM, dB, dBm, %, Limits	RS-232	230V	37
BK5492 IEE	120,000 counts	VFD	±0.012%	TRMS AC+DC	100kHz	1µV	Min/Max, REL, MEM, dB dBm, Limits	RS-232 & IEE	230V	37
7351	40,000 counts	LCD	±0.03%	TRMS AC+DC	100kHz	1µV	Min,Max,Avg REL, Hold, Auto-Hold	USB*	Battery	35
7355	100,000 counts	LCD	±0.015%	TRMS AC+DC	100kHz	1µV	Min,Max,Avg REL, Hold, Auto-Hold	USB*	Battery	35

* Opto isolated USB accessory supplied.

BENCH
HANDHELD



Handheld multimeters

Capabilities

- Voltage measurement up to 1000V TRMS AC and 1000V DC
- Basic accuracy: 0,015% (7355) and 0,03% (7351)
- Current measurement up to 10A
- Frequency et capacitance measurement
- Resistance measurement up to 10 Mohms
- Continuity test with buzzer
- Temperature measurement for K type thermocouple
- Duty cycle measurement
- Dual LCD, with bargraph and backlight
- Datalogger (20000 records)
- Functions: dB, dBm, HOLD, Peak Hold, MIN/MAX, Average, REL
- Opto isolated USB interface
- Supplied with PC application software and of accessories
- Safety: 600V CAT IV and 1000V CAT III



NEW
2010

35

Technical Specification

	7351	7355
VDC	4 mV to 1000 V	4 mV to 1000 V
Accuracy*	±(0,03% + 20dgt)	±(0,015% + 20dgt)
VAC	40mV to 1000V in 6 ranges	100mV to 1000V in 5 ranges
Accuracy*	±(0,7% + 50dgt)	±(0,4% + 50dgt)
Bandwidth	40Hz to 100kHz	40Hz to 100kHz
IDC	40mA, 400mA and 10A	10mA, 100mA and 10A
Accuracy*	±(0,2% + 40dgt)	±(0,1% + 40dgt)
IAC Currents	40mA, 400mA and 10A	10mA, 100mA and 10A
Accuracy*	±(0,8% + 80dgt) from 5% to 100% of the range	±(0,7% + 80dgt) from 5% to 100% of the range
Bandwidth	40Hz to 1kHz	40Hz to 1kHz
Peak Hold (VAC and IAC only)	for pulse >1ms: ±(3% +100dgt)	for pulse >1ms: ±(3% +100dgt)
dB	Measure in dB and dBm	Measure in dB and dBm
Frequency	40Hz to 4 MHz	40Hz to 4 MHz
Accuracy*	±(0,002% + 10dgt)	±(0,002% + 10dgt)
Duty cycle	from 20% to 80%	from 20% to 80%
Accuracy*	±(3d/kHz + 1dgt)	±(3d/kHz + 1dgt)
Capacitance	40nF to 40mF in 7 ranges	40nF to 40mF in 7 ranges
Accuracy*	±(0,8% + 20dgt)	±(0,8% + 20dgt)
Resistance	400ohms to 10 Mohms in 6 ranges	100ohms to 10 Mohms in 6 ranges
Accuracy*	±(0,2% + 30dgt)	±(0,025% + 30dgt)
Temperature	-200°C to 1200°C, -328°F to 2192°F	-200°C to 1200°C, -328°F to 2192°F
Diode test	yes, under approx. 0.5mA	yes, under approx. 0.5mA
Accuracy*	±(1,5% + 2dgt)	±(1,5% + 2dgt)
Functions	MIN, MAX, AVG, REL, HOLD, Auto Hold	MIN, MAX, AVG, REL, HOLD, Auto Hold
Datalogger	20.000 records, with ajustable rate	20.000 records, with ajustable rate

General Specification

Display	LCD, with backlight 5 digits, 40.000 counts with bargraph	LCD, with backlight 5 digits, 100.000 counts with bargraph
Measurement rate	3 mes./s	6 mes./s
Memory	1000 measurements	1000 measurements
Safety	600V - CAT IV and 1000V CAT III	600V - CAT IV and 1000V CAT III
Power supply	4 x 1.5V batteries - LR6 AA Autonomy: 100h typical with alkaline batteries	4 x 1.5V batteries - LR6 AA Autonomy: 100h typical with alkaline batteries
Dimensions	95 x 52 x 207mm	95 x 52 x 207mm
Weight	630g, with holster	630g, with holster

* Accuracy values are best accuracy

Visit our web site : www.sefram.fr



Handheld multimeters

Bench multimeters

TRMS AC

TRMS AC+DC



Sefram 7210B



Sefram 7211



Sefram 7240

Capabilities

- Dual power source (batteries or mains)
- Panoramic LCD with backlight
- 2000 counts display
- Frequency meter
- IEC 1010 : 600 V CAT II

Capabilities

- Dual power source (batteries or mains)
- 4000 counts display
- Panoramic LCD with backlight
- True RMS AC
- Min, Max, Hold functions
- Bargraph
- IEC 1010 : 600 V CAT III



Capabilities

- Triple display with backlight and bargraph
- Dual power source (batteries or mains)
- 40000 counts
- True RMS AC+DC
- Frequency and capacitance measurements
- Min, Max, Hold, dB, dBm, REL functions
- RS-232 isolated interface with application software
- IEC 1010 : 600 V CAT III



SEFRAM 7210B, 7211 and 7240 can be powered by batteries or mains. These instruments can be used either for field application or for laboratory measurements. The built-in compartment make the storage of cables and accessories very easy.

Technical Specification	SEFRAM 7210B	SEFRAM 7211	SEFRAM 7240
VDC	200mV to 600V (5 rges)	400mV to 1000V (5 rges)	40mV to 1000V (6 rges)
Accuracy*	±(0,5% + 2d)	±(0,1% + 2d)	±(0,06% + 8d)
VAC	2 V to 600 V (4 rges)	4V to 750 V (4 rges)	400 mV to 1000V (5rges)
Accuracy*	±(1,5% + 5d)	±(0,5% + 5d)	±(0,7% + 5d)
Bandwidth	50Hz - 500Hz	40Hz - 1KHz	40Hz - 100KHz
VAC + DC	-	-	400mV to 750V (5rges)
Accuracy*	-	-	±(0,7% + 5d)
IDC	200µA to 10A (4 rges)	4 mA to 10A (4 rges)	40mA to 10A (4 rges)
Accuracy*	±(1% + 2d)	±(0,4% + 2d)	±(0,2% + 4d)
IAC	200µA to 10A (4 rges)	4 mA to 10A (4 rges)	40 mA to 10A (4 rges)
Resistance	200 Ω to 20MΩ	400 Ω to 40MΩ	400Ω to 40MΩ
Accuracy*	±(0,7% + 3d)	±(0,4% + 2d)	±(0,3% + 2d)
Continuity test	yes	yes	yes
Diode test	yes	yes	yes
Frequency	200Hz to 20MHz (5 rges)	100Hz to 1MHz (5 rges)	400Hz to 4MHz (5 rges)
TRMS	-	TRMS AC	TRMS AC+DC
Capacitance	-	4 nF to 40µF (5 rges)	4 nF to 10mF (5 rges)
Temperature	-	-	-50°C to +1200°C
Memory	-	yes	Yes, 10
Peak-hold	-	yes	yes
Relative mode	-	yes	yes
Other functions	-	Hold	dB, dBm, Min-Max, auto-hold
RS-232 interface	-	-	yes, optoisolated
General Specification			
Bargraph	-	42 segments	80 segments
Display	LCD, 2000 counts	LCD, 4000 counts	LCD, triple display 40 000 counts
Measurement rate	2 mes/s	2 mes/s	2 mes/s
Backlight	yes	yes	yes
IEC 1010	600 V CAT II	600 V CAT III	600V - CAT III
Power supply	Battery / mains	Battery / mains	Battery / mains
Dimensions, weight	218 x 195 x 73 mm, 1,3kg	218 x 195 x 73 mm, 1,3kg	230 x 250 x 95 mm, 1,7Kg

Accuracy values are basic accuracy. For 7240, accuracy is specified in 4000 counts mode. It is necessary to multiply by 10 the specifications for 40000 counts accuracy.

Optional accessories : see page 44,45

NEW
2010

TRMS AC+DC



BK 2831E

NEW
2010

TRMS AC+DC



BK 5491B

TRMS AC+DC



BK 5492

Capabilities

- 20000 counts, dual display
- True RMS AC, AC+DC
- Basic accuracy 0,03% for VDC
- Frequency meter up to 1MHz
- dB, dBm measurements
- USB interface
- IEC1010: 300V CAT II and 1000V CAT I

Capabilities

- 50000 counts, dual display
- True RMS AC, AC+DC
- Basic accuracy 0,02% for VDC
- Frequency meter up to 500kHz
- dBm measurements
- RS-232 interface
- IEC 1010 : 300V CAT II and 1000V CAT I

Capabilities

- Selectable 120000/40000/4000 counts
- Dual display
- True RMS AC, AC+DC
- Selectable measurement rates
- 2 or 4 wires resistance measurements
- IEEE interface (option)
- IEC 1010 : 600 V CAT II

These 3 high resolution, high accuracy benchtop multimeters are designed for all application in education (university, technical trade schools,...), R&D department, maintenance, manufacturing ATE. They all offer high performances at low price.

Technical Specification	BK 2831E	BK 5491B	BK 5492
VDC	200mV to 1000V (5 ranges)	500mV to 1000V (5 ranges)	120mV to 1000V (5 ranges)
Accuracy*	±(0,03% + 4d)	±(0,02% + 4d)	±(0,012% + 5d)
VAC	200mV to 750V (5 ranges)	500mV to 750V (5 ranges)	120mV to 750V (5 ranges)
Accuracy*	±(0,4% + 10d)	±(0,35% + 10d)	±(0,2% + 100d)
Bandwidth	20Hz to 100kHz	20Hz to 100kHz	30Hz to 100kHz
VAC+DC	200mV to 750V (5 ranges)	500mV to 750V (5 ranges)	120mV to 750V (5 ranges)
Accuracy*	±(0,4% + 10d)	±(0,35% + 10d)	±(0,2% + 45d)
IDC	2mA to 20A (5 ranges)	5mA to 20A (5 ranges)	12mA to 12A (4 ranges)
Accuracy*	±(0,08% + 4d)	±(0,05% + 4d)	±(0,05% + 15d)
IAC	2mA to 20A (5 ranges)	5mA to 20A (5 ranges)	12mA to 12A (4 ranges)
Accuracy*	±(0,5% + 60d)	±(0,5% + 40d)	±(0,5% + 100d)
Resistance	200Ω to 20MΩ (6 ranges)	500Ω to 20MΩ (6 ranges)	1,2kΩ to 120MΩ (6 ranges)
Accuracy*	±(0,1% + 15d)	±(0,1% + 4d)	±(0,05% + 8d) in 4 wires
Continuity test	yes, adjustable threshold	yes, adjustable threshold	yes
Diode test	yes	yes	yes
Frequency	5Hz o 1MHz (4 ranges)	5Hz o 1MHz (4 ranges)	5Hz to 1 MHz (4 ranges)
Accuracy*	±(0,01% + 2d)	±(0,01% + 2d)	±(0,005% + 3d)
Functions	dB, dBm, REL, MAX, MIN, %, Limit (COMP)	dB, dBm, REL, MAX, MIN, %, Limit (COMP)	dB, dBm, %, REL, MIN, MAX, HOLD, Limit (COMP)
Interface	USB	USB	RS-232 (GPIO in option)
General Specification			
Display	VFD, 20 000 counts	VFD, 50 000 counts	VFD, 120 000/40 000/4 000 counts
Measurement rate	5, 10 or 25 meas/s	5, 10 or 25 meas/s	2, 10 or 25 meas/s
IEC1010	300V CAT II and 1000V CAT I	300V CAT II and 1000V CAT I	600V CAT II
Power supply	110V / 230V - 50/60Hz	110V / 230V - 50/60Hz	110V / 230V - 50/60Hz
Dimensions, weight	225 x 100 x 355 mm, 2.5kg	225 x 100 x 355 mm, 2.5kg	255 x 105 x 305 mm, 3kg

Accuracy values are basic accuracy.

Optional accessories : see page 44,45

Benchtop multimeters

Spectrum analysers

38



30kHz
3,3GHz



BK 2650A



Capabilities

- Frequency range: 50kHz to 3,3GHz
- Channel and adjacent channel power measurement
- Occupied bandwidth measurement
- Electric field strength measurement (with optional dipole antennas)
- Magnetic field strength measurement (with optional PR 26M)
- Min/Max, Hold, Average and over write mode
- Marker measurement
- Switchable 50 or 75 ohm input impedance
- Peak search
- Auto tuning & Auto range
- Hard copy of display (with optional PT 2650A)
- LCD TFT color screen
- USB interface

BK 2652A

- Specifications are the same as BK2650A
- Tracking generator from 5MHz to 3,3GHz

Technical Specification

BK 2650A and BK 2652A

Frequency		Sweep	
Frequency range	50 KHz to 3,3GHz	Sweep time	
Center frequency		Range	10ms to 30s and auto, frequency span 0 to 2GHz 30ms to 30s and auto, frequency span 3,3GHz
Resolution	20KHz, allows numeric key or rotary wheel	Accuracy	±0,1%+1 dot from 0 to 2GHz ±1,5%+1 dot full span
Accuracy	< +(30+20T)KHz from 200KHz to 10MHz and RWB=30KHz < +(60+300T)KHz from 20MHz to 3,3GHz and RWB=100KHz (T = time base in s)	Trigger mode	Auto
Frequency span		Detection mode	positive peak, negative peak, sample
Range	0Hz (zero span), 200KHz to 2GHz (1-2-5 step) and 3,3GHz (full span)	Trigger source	external, internal
Accuracy	within +-3% +-1 dot	Functions	
Display resolution	Frequency span / 250 (251 dot displayed)	Marker	Normal: displays frequency (7 digit) and level (4 digit) at marker point Delta: displays difference frequency and level between 2 markers
Resolution bandwidth (RBW)	3dB	Peak search	Normal: searches a peak within 10div Zone: searches for a peak within a zone (centre freq. +width)
Range	3KHz to 3MHz (1-3 step) and auto	Calculation	Normal, Max, Min, Average (2 to 256), MAX, Hold
Accuracy	within 20%	Measurement	Channel power, adjacent channel power, occupied bandwidth electrical field strength (option. antenna), magnetic field strength (option. antenna)
Selectivity	1:12 (typical, 3dB:60dB)	Auto tuning	the maximum level spectrum is adjusted to center and reference level Filters (RBW, VBW) and sweep time are adjusted to optimum
Video bandwidth (VBW)	100KHz to 1MHz (1-3 step) and auto	Memory	200 traces and 200 setups
SSB Phase noise	-90dBc/Hz typical (100KHz, RBW= 3KHz, VBW =100Hz, sweep time=s)	General Specification	
Spurious response	less than -60dBc	Interface	USB
Harmonics	less than -45dBc from 100MHz to 3,3GHz	Hard copy	Hardcopy with optional printer
Amplitude		Display	LCD, TFT 640x480mm
Reference level		Power supply	Li-ion battery
Range	+10 to -40dBm , 1dB step	Dimensions, weight	162 x 71 x 265mm - 1,8kg (with battery)
Accuracy	within +0,8dB	TECHNICAL SPECIFICATION (BK2652A ONLY)	
Units	dBm, dBV, dBmV, dBµV, dBµV/m, dBµA/m (dBµV/m, dBµA/m is used in the measuring function)	Frequency range	5MHz to 3,3GHz
Noise	-127dBm (typical) at Fc=1GHz, RBW=3KHz et VBW=100Hz	Output level	-10dBm ± 1dB
Input Impedance	50 ohms	Flatness	± 1,5dB
ROS	< 2.0	ROS	< 2.0
Input attenuator		Output connector	N
Range	0 to 25dB (1dB step) coupled with reference level	Supplied with: user manual, AC adaptor, soft carrying case, accessory pouch, PS software.	
Switching error	+ - 0,6dB	Optional accessories : see page 44,45	
Display	10dB/div or 2dB/div		
Accuracy	within 0,8dB/10dB +1 dot within 0,2dB/2dB + 1 dot within 1,6dB/70dB + 1 dot		
Max input level	+20dBm (carrier), 25V DC		
Input connector	N		

Spectrum analysers

A comprehensive range of accessories

Magnetic field probe



PR 26M

PR26M	
Frequency range	10MHz to 3 GHz
Spacial resolution	~ 0,25mm (object dependent)
Connector	SMA
Dimensions	12 x 135 mm
	2 mm x 1mm for the probe tip
Weight	20g

Coaxial adapter kit



CT 2701

CT2701

Content: 6 universal adaptors, 2 BNC(m), 2 BNC(f), 1 F(m), 1 F(f), 2 N(m), 2 N(f), 1 RCA(m), 1 RCA(f), 1 SMA(m), 1 SMA(f), 2 TNC(m), 2 TNC(f), 2 UHF(m), 2 UHF(f), 1 Mini-UHF(m) and 1 Mini-UHF(f) Supplied in a protective pouch



BK 2658A



CC 265

Coaxial Deluxe connexion kit (50 ohm)
Includes 4 adaptors (2 N and 2 BNC) and a high quality SMA cable.

All kit components feature precision machined interfaces, 50ohm impedance and low VSWR to ensure accurate and repeatable measurements.

The kit is provided in a convenient foamlined case for easy component selection and storage.



Antennas

AK 2650 software for Windows™

Kit includes Windows™ software and USB cable. Software allows user to display spectrum on computer and control the instrument from the computer (BK2650A or BK2658A)

Antenna range

	M401	M402	M403	M404	M405	M406	AN307
Frequency range	0.8 to 1GHz	1.25 to 1.65GHz	1.7 to 2.2GHz	2.25 to 2.65GHz	300 to 500MHz	4.7 to 6.2GHz	3.4 to 3.6 GHz
Antenna gain	>1dB	>1dB	>1dB	>1dB	>1dB	>1dB	> 10dB
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Dimensions	ø 7,5x280mm	ø 7,5x280mm	ø 7,5x210mm	ø 7,5x210mm	ø 7,5x152mm	ø 7,5x280mm	30x520mm
Weight	58g	60g	58g	56g	62g	54g	520g
Reference level setting range	93 to 143 dBV/m	96 to 146 dBV/m	99 to 149 dBV/m	100 to 150 dBV/m	87 to 137 dBV/m	109 to 159 dBV/m	-

spectrum analysers

Spectrum analysers

40



2 YEARS
warranty

50kHz
8,5GHz

NEW
2010

BK 2658A

Capabilities

- Frequency range : 50kHz to 8,5GHz
- Channel and adjacent channel power measurement
- Occupied bandwidth measurement
- Electric field strength measurement (with optional dipole antennas)
- Magnetic field strength measurement (with optional PR 26M)
- Min/Max, Hold, Average and over write mode
- Marker measurement
- Switchable 50 or 75 ohm input impedance
- Peak search
- Auto tuning & Auto range
- Hard copy of display (with optional PT 2650A)
- LCD TFT color screen
- USB interface

BK2658A is lightweight, handheld spectrum analyser designed to analyse the “new wave” of wireless signals, including GPS, 802.11a, 3G, ultra-wideband, WiMAX, W-CDMA, CDMA, GSM, PDC, PHS, Wireless LAN and Bluetooth. It was designed to be high-performance spectrum analyser providing excellent performance and function for many different applications.

Technical Specification

Frequency	
Frequency range	50KHZ to 8,5GHz
Center frequency	
Resolution	20KHz, allows numeric key or rotary wheel
Accuracy	< +(30+20T)KHz from 200KHz to 10MHz and RWB=3KHz < +(60+300T)KHz from 10MHz to 8,5GHz and RWB=100KHz (T = time base in s)
Frequency span	
Range	0Hz (zero span), 200KHz to 5GHz (1-2-5 step) and 8,5GHz (full span)
Accuracy	within 3% to 23°C
Resolution bandwidth (RBW)	3dB
Range	3KHz to 3MHz (1-3 step) and auto
Accuracy	within 20%
Selectivity	1:12 (typical, 3dB:60dB)
Video bandwidth (VBW)	100KHz to 1MHz (1-3 step) and auto
SSB Phase noise	-90dBc/Hz typical (100KHz, RBW= 3KHz, VBW =100Hz, sweep time=0,3s)
Spurious response	less than -60dBc
Harmonics	less than -40dBc from 100MHz to 8GHz
Amplitude	
Reference level	
Range	+10 to -60dBm , 1dB step
Accuracy	within +0,8dB (RBW= 3KHz, VBW:off and 0dB attenuator)
Units	dBm, dBV, dBmV, dBµV, dBµV/m, dBµA/m (dBµV/m, dBµA/m is used in the measuring function)
Noise	-127dBm (typical) at Fc=1GHz, RBW=3KHz et VBW=100Hz/VBW=100Hz
Input Impedance	50 ohms
ROS	< 2.0
Input attenuator	
Range	0 to 25dB (1dB step) coupled with reference level
Switching error	+/-0,6dB
Display	10dB/div or 2dB/div
Accuracy	within 0,8dB/10dB +1 dot within 0,2dB/2dB + 1 dot within 1,6dB/70dB + 1 dot
Max input level	+23dBm (carrier), 25V DC
Input connector	N

BK 2658A

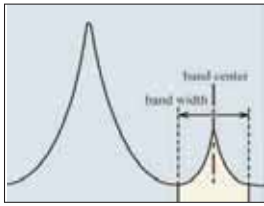
Sweep time	
Range	10ms to 30s and auto, frequency span 0 to 2GHz 30ms to 30s and auto, frequency span 5GHz 0,1s to 30s and auto, frequency span 8,5GHz
Accuracy	±0,1%+1 dot from 0 to 2GHz ±1,5%+1 dot full span
Trigger mode	Auto
Detection mode	positive peak, negative peak, sample
Trigger source	external, Internal
Functions	
Marker	Normal: displays frequency (8 digit) and level (4 digit) at marker point Delta: displays difference frequency and level between 2 markers
Peak search	Normal: searches a peak within 10div Zone: searches for a peak within a zone (center freq. + width)
Calculation	Normal, Max, Min, Average (2 to 256)
Measurements	Channel power, adjacent channel power, occupied bandwidth magnetic field strength (option. antenna), magnetic field strength (option. antenna)
Auto tuning	the maximum level spectrum is adjusted to center and reference level Filters (RBW, VBW) and sweep time are adjusted to optimum
Memory	200 traces and 200 setups

General Specification

Interface	USB
Hard copy	Hardcopy with optional printer
Display	LCD TFT, 640x480
Power supply	Li-ion battery, main adaptor included
Dimensions, weight	162 x 71 x 265mm - 1,8kg (with battery)

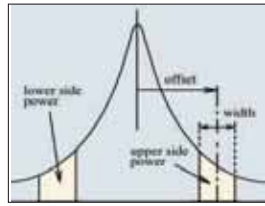
Supplied with: user manual, AC adaptor, soft carrying case, accessory pouch, PS software.

Optional accessories : see page 44,45



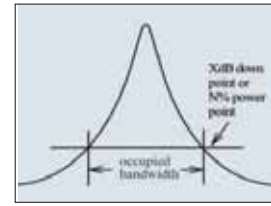
Channel power measurement

Max Hold: At each displayed frequency, the currently-measured value is compared to the previously measured value and the larger one is retained and displayed. This feature is useful for observing a bursted or intermittent signal or for measuring the electric field strength of systems using direct sequence spread spectrum/frequency hopping modulation techniques.



Adjacent channel power

Measure the ratio of power leakage (from the wanted signal) into adjacent channels. Center frequency, adjacent channel bandwidth, and offset between main carrier and adjacent channels can be set. Users can select from any of the following three measurement methods based on the reference carrier definition: total power (of displayed spectrum), peak power (reference level) and in-band power (user specified bandwidth)..

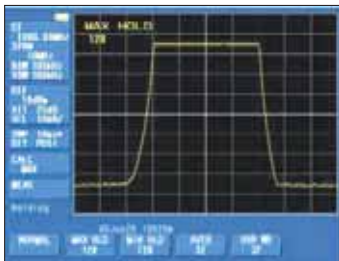


Occupied Bandwidth

This measurement calculates the bandwidth containing the total integrated power occupied in a given signal bandwidth. Two measurement methods are available: The user can specify N% of total power or the X dB downpoint relative to the carrier peak level.

Max and Min Hold

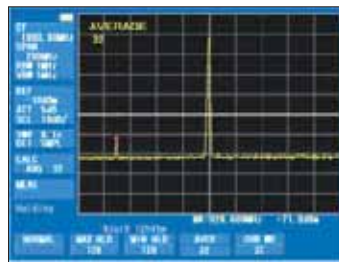
Max Hold: At each displayed frequency, the currently measured value is compared to the previously measured value and the larger one is retained and displayed. This feature is useful for observing a bursted or intermittent signal or for measuring the electric field strength of system using direct sequence spread spectrum/frequency hopping modulation techniques.



Min hold: At each displayed frequency, the currently measured value is compared to the previously measured value and the smaller one is retained and displayed. In both cases, the number of sweeps can be set to 2N, where N is from 1 to 10 or infinite.

Averaging

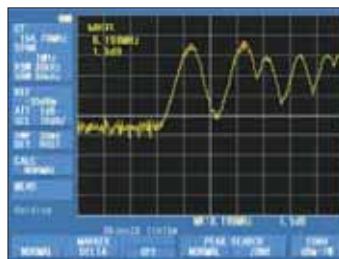
The analyzer continuously sweeps, then calculates and displays the average value over the total number of sweeps. The number of sweeps can be set to 2N, where N is from 1 to 10. Averaging is useful for detecting signals buried in the noise floor because random noise is averaged out.



Marker Function

Two different modes are available for marker measurements:

- Normal marker mode measures the frequency and level of the marked point
- Delta marker mode measures the frequency and level differences between the two markers (see image)

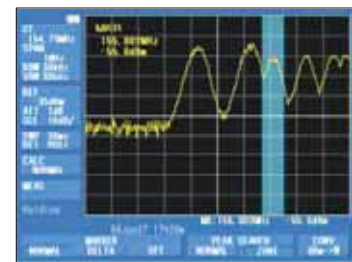


Delta marker measurement

Peak Function

Two different modes are available for peak search:

- Normal peak search mode searches for the highest level on the screen. In this mode, you can also use the NEXT button to locate the marker on the next smaller peak.
- In-zone peak search mode searches for the peak level in the range specified by the center value and width.



The picture shown demonstrates in-zone peak search.

spectrum analysers

ESR/LCR meters

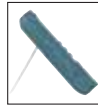
NEW
2010



BK 875B



BK 878B



BK 879B



BK 889B

Technical Specification

	BK 875B	BK 878B	BK 879B	BK 889B
Measurement frequency	120Hz / 1KHz	100Hz-120Hz-1KHz-10KHz	100Hz,120Hz,1KHz,10KHz	100Hz to 200KHz
Ranges	Auto	Auto		
R	40 Ω - 10 MΩ	40 Ω - 10 MΩ	10 Ω - 10 MΩ	from 0 Ω to 500 MΩ
L	400μH - 1000H	40μH - 10000H	1mH - 10000H	0,030μH - 9999H
C	400pF - 20mF	40pF - 20mF	1000pF - 10mF	0,003pF-80mF
Measured parameters	L, C, R, D, Q	L/C/R/Z/D/Q/q/ESR	R, L, C, D, Q	Z, Ls, Lp, Cs, Cp, DCR, D, Q, ESR, DCR
Equivalent circuit	-	-	-	yes
Accuracy (base)	0,50%	0,50%	0,50%	0,50%
Display	LCD	LCD	LCD, backlight	LCD, panoramic
Interface	USB	USB	RS-232	USB
Power supply	9V Battery	9V Battery	9V Battery	110/230V 50/60Hz
Dimensions, weight	188,7 x 91 x 41,1 mm, 360 g	188,7 x 91 x 41,1 mm, 360 g	192 x 90 x 41 mm, 330 g	300 x 220 x 150 mm, 4,5 kg
Other function	Relative mode	Relative mode	Relative mode	600V Multimeter, 2A AC, Diode, test 2 measurement rates

Capacitance meters



BK 810 C



BK 830 B



BK 890 B



BK 881

Technical Specification

	BK 810C	BK 830B	BK 890B	BK 881
Ranges:	200 pF - 20 mF	1000 pF - 10 μF et 100 μF - 100 mF	1000 pF - 10 μF et 100 μF - 50 mF	1000 pF - 10 mF
Measured parameters	C	C	C	ESR / DCR
Accuracy (base)	1%	0,20%	0,20%	-
Display	LCD	LCD	LCD	25 LED
Power supply	9V battery	9V battery	9V battery	9V battery
Dimensions, weight	76 x 171 x 57 mm, 200 g	184 x 87 x 41 mm, 320 g	184 x 87 x 41 mm, 320 g	40 x 100 x 145 mm, 200 g
Other function	-	USB Interface	USB Interface	Includes test clip for SMD Components

Frequency counters

2.4GHz



BK 1823A

3.5GHz



BK 1856D

Capabilities

- Wide Measuring range up to 2,4GHz
- 9 Digit LED display
- Frequency ratio, Time interval, Period measurements
- Trigger function
- High stability time base
- External frequency standard input
- Input attenuator, Low pass and Line filters
- RS-232 Interface

Capabilities

- Wide measuring range up to 3.5GHz
- 9 digit LED display
- Period mode for accurate low frequency measurement
- Totalize mode permits counting of individual events
- Accurate TCXO time base
- Input attenuator and filters
- RS-232 Interface

Technical Specification

	BK 1823A	BK 1856D
Frequency range	0,1Hz to 100MHz 80MHz to 2,4GHz	0,1Hz to 100 MHz 80 MHz to 3 GHz
Accuracy	± time base+1dgt	± time base+1d
Period	0,5µs to 200 000µs	0,285 µs to 200 000µs
Input characteristics		
Sensitivity	<30mV from 0,1Hz to 100MHz (A and B)	< 20mV from 5Hz to 30 MHz < 50 mV for F> 100 MHz
Impedance	1MΩ (A and B)	1 MΩ
Coupling	AC or DC for A and B	AC
Filter	100KHz, -3dB (A and B)	100 KHz, -3dB
Attenuator	yes, x1/x10 (A and B)	yes, x1/x10
Prescaler input		
Sensitivity	<15mV from 80GHz to 2GHz <25mV from 80MHz to 150MHz <20mV from 150MHz to 2GHz <60mV from 2GHz to 2,4GHz	<20mV from 2GHz to 3GHz <30mV from 3GHz to 3,2GHz <50mV up to 3,5GHz.
Impedance	50 Ω	50 Ω
Coupling	AC	AC
Max. level	3V rms	3V rms
Time base		
Type	Quartz - TCO	TCXO
Frequency	10MHz	10 MHz or ext. input
Stability	±1ppm ±1Hz	± 0,1 ppm ± 1 Hz
Temperature drift	< ± 1ppm+10% for 10% change	< ± 0,1ppm for 10% change
Main voltage drift	± 5 ppm from 0° to 50°C	± 10 ppm from 0° to 40°C
Display	9 digit, LED	9 digit, LED
Units	KHz, MHz, µs, gate, overflow	KHz, MHz, µs, gate, overflow
Interface	RS-232	RS-232
Power supply	120/220/240V	120/220/240V or 6 1,5V/AA batteries
Dimensions	90 x 270 x 240 mm	240 x 90 x 270mm
Weight	2,5Kg	2,5 kg

Supplied with : power cord

Optional accessories : see page 44,45

Frequency
Counters

Accessories



GE 8100

700V



GE 8115

1500V

Differential probes

TECHNICAL SPECIFICATION	GE 8100	GE 8115
Bandwidth	30 MHz	30 MHz
V common mode	700 V max	1500 V max
Attenuator	x 20, x 200	X 100, X 1000
Accuracy	± 3 %	± 3 %
Rise time	12 ns	12 ns
Automatic power off	10 min.	10 min.
Power supply	9V battery (autonomy : 20h) 12 V external*	9V battery (autonomy : 16h) 12 V external*
IEC 1010	CAT. III 600 V	CAT. III 1500 V
Dimensions	157 x 60 x 26 mm	157 x 60 x 26 mm
Cable length	50 cm	50 cm

* mains optional adaptor P/N 207195104

Oscilloscopes probes

P/N:	Attn	Input impedance	Bandwidth	Rise time	Vmax.	Compensation	Length
150 MHz							
GE.1511	X10	10 MΩ	12 pF	150 MHz	2.3 ns	300 VAC+DCmax.	10..30 pF 1,20 m
GE.1521	X1/X10	1/10 MΩ	45 pF/12 pF	25/150 MHz	14/2.3 ns	300 VAC+DCmax.	10..30 pF 1,20 m
GE.1502	X1	1 MΩ	65 pF	21 MHz	17 ns	300 VAC+DCmax.	- 2,0 m
GE.1512	X10	10 MΩ	14 pF	135 MHz	2.6 ns	300 VAC+DCmax.	10..30 pF 2,0 m
GE.1522	X1/X10	1/10 MΩ	65 pF/14 pF	17/135 MHz	21/2.6 ns	300 VAC+DCmax.	10..30 pF 2,0 m
250 MHz							
GE.2511	X10	10 MΩ	12 pF	250 MHz	1.4 ns	300 VAC+DCmax.	10..30 pF 1,20 m
GE.2521	X1/X10	1/10 MΩ	45 pF/12 pF	25/250 MHz	14/1.4 ns	300 VAC+DCmax.	10..30 pF 1,20 m
GE.2502	X1	1 MΩ	65 pF	35 MHz	10 ns	300 VAC+DCmax.	- 2,0 m
GE.2512	X10	10 MΩ	14 pF	190 MHz	1.8 ns	300 VAC+DCmax.	10..30 pF 2,0 m
GE.2512	X1/X10	1/10 MΩ	65 pF/14 pF	17/190 MHz	21/1.8 ns	300 VAC+DCmax.	10..30 pF 2,0 m
450 MHz							
GE.4511	X10	10 MΩ	7 pF	450 MHz	0.78 ns	300 VAC+DCmax.	8-15 pF 1,20 m
GE.4512	X10	10 MΩ	8.5 pF	450 MHz	0.78 ns	300 VAC+DCmax.	10-25 pF 1,20 m
GE.4521	X10	10 MΩ	10 pF	430 MHz	0.80 ns	300 VAC+DCmax.	8-15 pF 2,0 m
GE.4521	X10	10 MΩ	11 pF	430 MHz	0.80 ns	300 VAC+DCmax.	10-25 pF 2,0 m
500 MHz							
GE.5011	X10	10 MΩ	8 pF	500 MHz	0.7 ns	600 VAC+DCmax.	8-18pF 1,20 m

For 3m cable length, please contact our sales department
 All models can be delivered with isolated BNC (add SA to P/N) and with readout actuator for 1/10 probes (add RA to P/N)
 Accessories : 109-96008 standard accessory kit (1 screw driver, 1 BNC adaptor, 1 ground lead, 1 test clip, 1 needle)



GE 1521

High voltage probes

P/N:	Attn	Imp.	Input	Bandwidth	Rise time	Comp	Length
2 kV - 200 MHz/ IEC 1010 - 2 kV CAT I/ 1 kV CAT II							
GE.3121	X100	100 MΩ	5.0 pF	200 MHz	1.8 ns	10-30 pF	1,20 m
GE.3231	X100	50 MΩ	4.0 pF	200 MHz	1.8 ns	10-30 pF	1,20 m
GE.3122	X100	100 MΩ	6.0 pF	160 MHz	2.2 ns	10-30 pF	2,0 m
4 kV - 100 MHz/ IEC 1010 - 4 kV CAT I/ 2 kV CAT II							
GE.34211	X100	50 MΩ	5.0 pF	100 MHz	3.5 ns	10-30 pF	1,20 m
30 kV - 3 MHz/ IEC 1010 - 30 kV CAT I							
GE.3830	X1000	500 MΩ	3.0 pF	3 MHz			2,0 m

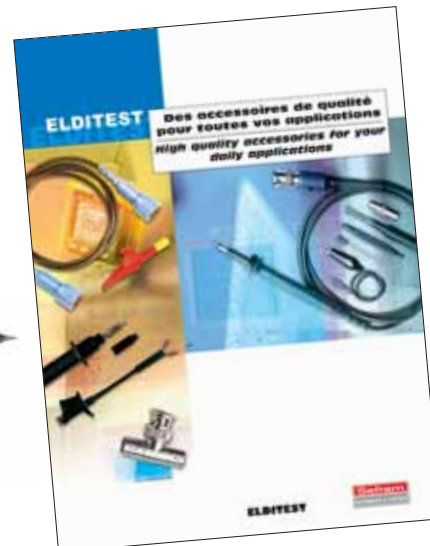
* GE3231 is equipped with 2 HF adjustments to improve flatness of signal
 All models can be delivered with isolated BNC (add SA to P/N) and with readout actuator (add RA to P/N)



GE. 3231

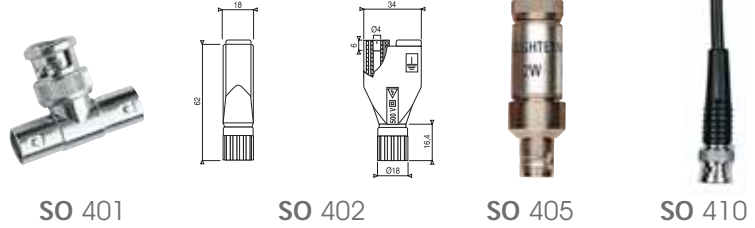


GE. 3830



Cables and adaptors

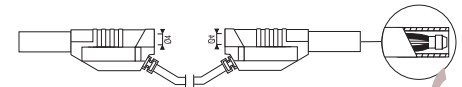
- SI601 IEEE cable
- SO401 BNC male / 2 x BNC female adaptor
- SO402 Isolated BNC male / 2 x banana female adaptor
- SO405 50 ohms, 2W load (BNC)
- SO410 BNC/BNC coaxial cable (1m, 50 ohms, black)



Safety cords

P/N L =	PVC				Silicone		
	0,75 mm2 (12 Amax)	1 mm2 (20 Amax)	1,5 mm2 (25 Amax)	2,5 mm 2 (36 Amax)	0,75 mm2 (12 Amax)	1,5 mm2 (25 Amax)	2,5 mm2 (36 Amax)
0,10 m	2610-I-10-*	2612-I-10-*	2615-I-10-*	2617-I-10-*	2611-I-10-*	2613-I-10-*	2614-I-10-*
0,25 m	2610-I-25-*	2612-I-25-*	2615-I-25-*	2617-I-25-*	2611-I-25-*	2613-I-25-*	2614-I-25-*
0,50 m	2610-I-50-*	2612-I-50-*	2615-I-50-*	2617-I-50-*	2611-I-50-*	2613-I-50-*	2614-I-50-*
1 m	2610-I-100-*	2612-I-100-*	2615-I-100-*	2617-I-100-*	2611-I-100-*	2613-I-100-*	2614-I-100-*
1,5 m	2610-I-150-*	2612-I-150-*	2615-I-150-*	2617-I-150-*	2611-I-150-*	2613-I-150-*	2614-I-150-*
2 m	2610-I-200-*	2612-I-200-*	2615-I-200-*	2617-I-200-*	2611-I-200-*	2613-I-200-*	2614-I-200-*

Nominal voltage: 1000V - Packing: 10 pieces



*Colours
R=red, N=black
V= green, J= yellow
Bl= blue, Bc= white

Safety Test leads

- SA100 Straight fixed banana plug test lead set
- SA101 Right angle banana plug test lead set (4mm, red and black)
- SA105 Patch cord set with straight fixed ban. Plug (1m red and black)
- SA106 Right angle ban. Plug to straight fixed ban. Plug test lead set (1m red and black)
- SA110 Alligator clip set (4mm, red and black)
- SA115 Test probes set (4mm, red and black)
- SA120 Maxigrabbers set (4mm, red and black)



We provide a complete set of test leads, adaptors, cables.
Please contact our sales department for more informations

Temperature accessories

- Sefram 7305 Thermocouple module for multimeter or clamp-on-meter
Ranges: -196°C to 800°C - Output: 1mVDC per °C or °F. Input :
K type thermocouple
Accuracy: ±(0,5%+2°C) - Supplied with a bead probe ST305
- ST301 Immersion probe, -196°C to 800°C
- ST302 Air probe, -196°C to 500°C
- ST303 Surface probe, 0°C to 400°C
- ST304 Piercing probe, -196°C to 800°C
- ST305 Bead probe, general purpose, -40°C to 204°C
- ST306 Thermocouple adaptor for multimeter (banana to K)
- ST309 Bead probe, high temperature, -40°C to 500°C



Sefram 7305

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For assistance and ordering



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