S-Series

SCO 4-Input Port Combiner

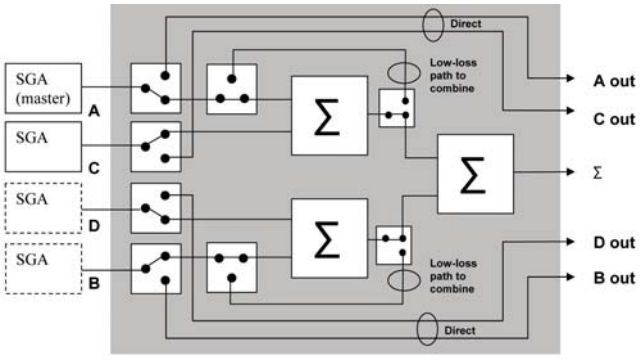
High performance 4-input combiner/switch module to complement the SGA signal generator for all multisource applications.

Features

- Wide band cover:

  - SCO-6 - 1 MHz to 6 GHz

- Plug & Play operation under the control of an SGA simplifies test configuration
- Aerolock™ interlocking mechanism for test system creation
- Combine the outputs of up to four S-Series signal generators to support all multisource applications
- Combine the outputs of two S-Series signal generators via a low-loss combined path for higher output
- Direct low-loss outputs for each signal generator for LO substitution or mixer testing
- Supports many applications including mixer testing, receiver selectivity, intermodulation distortion
- Powered from USB 2.0



SCO block diagram

Combiner Control

When the SCO is connected to an S-Series signal generator (SGA or SGD) via USB port, the SCO's presence is recognized by the SGA/SGD and the configuration menu for the SCO is available in the SGA/SGD. The large 8.5 inch touch-screen LCD on the SGA/SGD displays the SCO combiner information graphically, on one screen and without the need to select configurations from lower level menu structures.

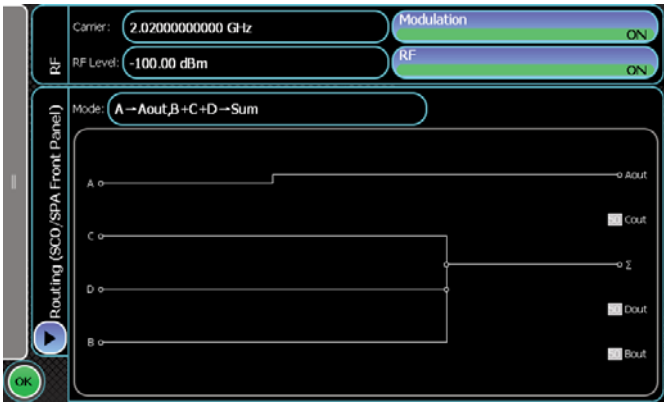
System Loss Correction

By using the RF level offset feature in the SGA/SGD, the system loss values for each path may be entered into the appropriate SGA/SGD such that the path losses are compensated for when setting the output level on the signal generator. Multiple RF level offset tables may be saved and readily recalled so that, for example, one table may be saved for source A direct path and another table saved for source A to ∑ path.

Typical RF level offset table with system loss data

Excellent Intermodulation Performance

To achieve the best possible intermodulation performance, careful attention has been paid to the VSWR of all ports. The use of reactive (hybrid) combiners ensures high isolation between input ports, minimizing the effect of the output of one signal source modulating the output of another signal source.



SGA Screenshot showing combiner setup

Signal Routing Indicator

A group of front panel LEDs give immediate and convenient indication of the combiner signal routing.

Modular Instrument Concept Employing Aerolock™ Interlocking Mechanism

The SCO is designed to work with multiple SGA/SGD signal generators. Aerolock™ is an ingenious, simple and strong interlocking mechanism allowing the SCO to be joined to two SGA/SGD signal generators to create a complete multisource test solution.

Aerolock™ interlocking mechanism

Two SGAs and an SCO Aerolocked together

Multisource Test Applications

The SCO simplifies tests which require multiple sources, particularly for the testing of receivers, amplifiers and mixers.

For receiver testing, sensitivity, selectivity and blocking require at least two sources, sometimes more if additional interferers are required.

Two or three sources are required for third-order intermodulation testing where the performance of the hybrid combiner helps ensure that the performance of the device under test is faithfully verified.

For mixer testing, the low loss direct outputs allow one of the sources to provide the input to the LO port, all while two other sources may be routed through the combiner to provide unwanted and interfering signals at the RF port.

Remote Operation

The SCO is controlled from the SGA/SGD. USB, LAN and GPIB interfaces are all supported by the SGA/SGD using SCPI format commands where possible. Remote desktop and VNC are also supported allowing off-site remote control.

Non-Volatile Memory

The SGA/SGD's memory stores also stores SCO configurations.

Low Cost of Ownership

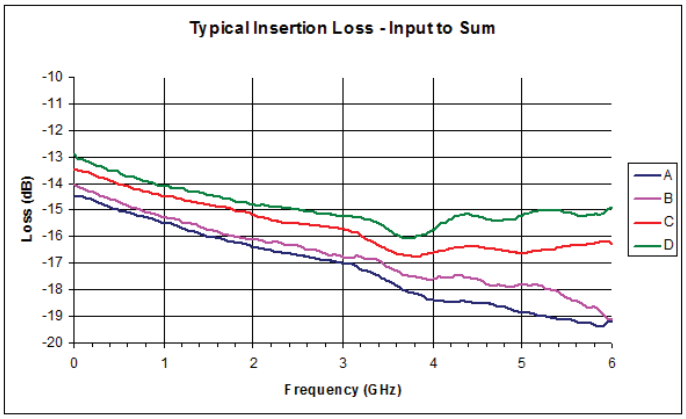
The SCO comes with a standard 2-year warranty and recommended 2-year calibration periodicity. Options to extend the warranty to five years are available.

SPECIFICATIONS

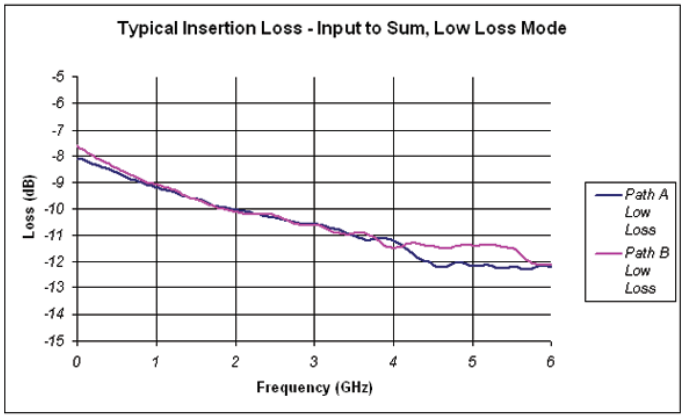
All specifications apply after a warm-up period of 20 minutes.

Frequency Range	
Frequency Range – all paths	*10 MHz to 6 GHz, useable to 1 MHz*

Insertion Loss (typical)		
	10 MHz to 3 GHz	*Above 3 GHz*
A, B, C, D to ∑	*<17 dB*	*<20 dB*
A, B to ∑ via low loss path	*<12 dB*	*<15 dB*
Direct paths (e.g. A - A out)	*<4 dB*	*<5 dB*



Typical graph of insertion loss on input ports – sum



Typical graph of insertion loss on input ports low loss – sum

VSWR (unused ports terminated in 50 ohms) (typical)			
	10 MHz to 3 GHz	*>3 GHz to 5 GHz*	*>5 GHz*
∑	*1.3:1*	*1.5:1*	*1.6:1*
A, B, C, D (inputs and outputs)	*1.6:1*	*1.8:1*	

Path Calibration Data Uncertainty	
10 MHz to 3 GHz	*Above 3 GHz*
±0.2 dB	*±0.4 dB*

Isolation (unused ports terminated in 50 ohms)	
Between inputs A, C or B, D, with ∑ selected	*>25 dB (30 dB typ)*
All other input combinations with ∑ selected	*>40 dB*
Between inputs A, B in low loss path mode, with ∑ selected	*>30 dB*
Between ∑ and direct outputs with ∑ selected	*>50 dB*
Between ∑ and direct outputs with direct paths selected	*>40 dB*

Intermodulation
The following specification applies with two S-Series signal generators providing two tones at 0 dBm on the combiner into a source VSWR of 2:1 or better: -80 dBc

RF Connectors	
Impedance	*50 Ω*
Maximum applied power A, B, C, D inputs	*+24 dBm*
Maximum applied power A, B, C, D outputs	*+24 dBm*
Maximum applied power ∑ output	*+30 dBm*

Environmental	
Rated Range of Use	
Temperature	*0 to 50°C*
Humidity	*Up to 93% at 40°C*
Altitude	*Up to 3050 m*
Conditions of Storage and Transport	
Temperature	*-40 to +71°C*
Humidity	*Up to 95% at 40°C*
Altitude	*Up to 4600 m*
EMC	*EN 61326-1, Emissions Class B, Immunity Table 1 – Performance Criteria B*
Safety	*EN 61010*
Mechanical	*MIL-PRF-28800F Class 3*

Power Requirements	*USB 2.0*

Connectors	
A, B, C, D inputs, outputs and ∑	*50 Ω N-type – see options for front/rear panel configuration*
3 x USB 2.0	*Rear panel* *1 x USB Type B for plug & play connection with S-Series instrument* *2 x USB Type A for redistribution*

General Data	
Recommended Calibration Cycle	*24 months*
Weight	*4.25 kg*
Dimensions - H x W x D	*1U x 444 mm x 490 mm*
Instrument includes side strap handle and front tilt feet. *Instrument includes Aerolock™ interlocking mechanism with modules mounted above or below.*	

ORDERING INFORMATION

SCO-6	10 MHz to 6 GHz 4-Input RF Combiner
Option 001	All RF connectors on front panel
Option 002	All RF connectors on rear panel

Extended Warranty Options

Option 203	3 year warranty
Option 204	4 year warranty
Option 205	5 year warranty

Supplied Accessories

Instruction manual

Aerolock™ locking keys – set of 2 with fixings

USB Type-B to Type-A 1.5 m cable

Optional Accessories

59999/163	Precision coaxial adapter N male to SMA female
43139/849	185 mm N-type cable with calibration data (for short connection between SGA/SGD and SCO)
43139/876	500 mm N-type cable with calibration data (for long connection between SGA/SGD and SCO)

CHINA Beijing
Tel: [+86] (10) 6539 1166
Fax: [+86] (10) 6539 1778

CHINA Shanghai
Tel: [+86] 21 2028 3588
Fax: [+86] 21 2028 3558

CHINA Shenzhen
Tel: [+86] (755) 3301 9358
Fax: [+86] (755) 3301 9356

FINLAND
Tel: [+358] (9) 2709 5541
Fax: [+358] (9) 804 2441

FRANCE
Tel: [+33] 1 60 79 96 00
Fax: [+33] 1 60 77 69 22

GERMANY
Tel: [+49] 89 99641 0
Fax: [+49] 89 99641 160

INDIA
Tel: [+91] 80 [4] 115 4501
Fax: [+91] 80 [4] 115 4502

JAPAN
Tel: [+81] (3) 3500 5591
Fax: [+81] (3) 3500 5592

KOREA
Tel: [+82] (2) 3424 2719
Fax: [+82] (2) 3424 8620

SCANDINAVIA
Tel: [+45] 9614 0045
Fax: [+45] 9614 0047

SINGAPORE
Tel: [+65] 6873 0991
Fax: [+65] 6873 0992

TAIWAN
Tel: [+886] 3 5500 338
Fax: [+886] 3 5502 065

UK Stevenage
Tel: [+44] (0) 1438 742200
Fax: [+44] (0) 1438 727601
Freephone: 0800 282388

USA
Tel: [+1] (316) 522 4981
Fax: [+1] (316) 522 1360
Toll Free: 800 835 2352

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A passion for performance.

www.aeroflex.com

info-test@aeroflex.com

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