

1XN and MXN Benchtop/Rackmount Programmable Switches



SB/SC/SCG Series

The JDS Uniphase SB, SC, and SCG series of fiberoptic switches are programmable benchtop/rack-mount switches that can be controlled using the front panel keys and a numeric pad or via GPIB and serial RS232 interface. The SCG series ganged input switches allow a single switch instrument to replace multiple switch elements while maintaining low loss. In this series of switches, the inputs are ganged together in a particular sequence and are thus able to offer three different modes of operation (D, E, and F configurations).

The SB and SC series switches are available in four basic configurations, namely C, D, E, and F. The C configuration is a single common input model. The D configuration provides simultaneous connection of a bank of input fibers to output fibers. The E configuration allows any input to be connected to any output while other inputs/outputs are aligned to subsequent/adjacent channels. The switch is non-blocking in this mode and other inputs/outputs are aligned. The F configuration enables one of the inputs to be aligned with an output in a blocking sense, with a result in reduction of available output channels. A low-loss MxN blocking switch is the result.

Operation of these switches is based upon JDS Uniphase's proven expanded beam lens technology, which utilizes a precision stepper motor to align optical channels. The use of collimating lenses minimizes insertion loss and improves repeatability and performance. Internal temperature control of the switching mechanism ensures excellent operational stability.

Both single-mode and multimode versions of the SB, SC, and SCG series switches are available. The series features the high level of performance required for multiunit testing in research and development and in manufacturing environments. The compact, portable SB switch and the standard rack-mount enclosure SC and SCG switches are highly suited for applications in telecommunications, manufacturing, and test environments.

JDS Uniphase's SB and SC switches are known in the fiberoptic industry for their low insertion loss and excellent repeatability. In addition to the many standard options available, we also customize switches in this series to meet your specific application need.



Key Features & Benefits

SB and SC Switches

- SB switches can accommodate up to 48 channels*
- SC switches can accommodate up to 180 channels*
- SB and SC series switches offer up to four input channels*
- Low insertion loss, 0.4 dB typical*
- Excellent repeatability, 0.003 dB typical*
- High return loss, > 65 dB typical*
- GPIB and RS232 remote control*
- CE and cCSAus compliant*

SCG Switches

- Offer up to 45 input channels and 90 output channels*
- Mass input reconfiguration possible*
- Low insertion loss, 0.5 dB typical for D configuration*
- High return loss, > 65 dB typical*
- Excellent repeatability, 0.005 dB typical*
- Replaces multiple switch elements with one switch instrument*
- CE and cCSAus compliant*



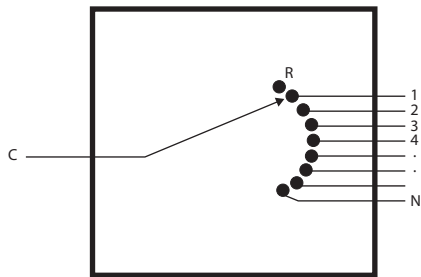
Applications

- Fiberoptic component testing and measurement*
- System testing*
- Research and development*
- Mass reconfiguration of large numbers of inputs/outputs with SCG series (D configuration)*
- Connection of multiple wavelength sources to any one of a number of devices with SCG series (F configuration)*



Insist on performance. We do.

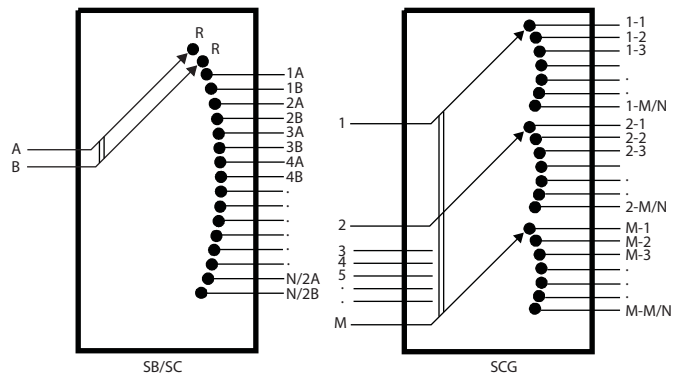
Configurations



C Configuration

(SB and SC)

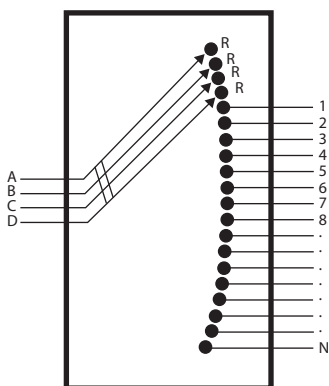
The 1xN configuration allows a single common input to be switched to any of the outputs.



D Configuration

(SB/SC/SCG)

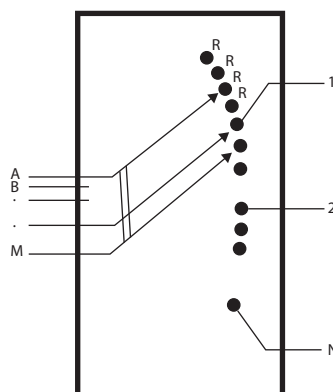
The MxN configuration allows for mass reconfiguration of optical paths. It provides simultaneous connections of a bank of inputs to outputs.



E Configuration

(SB/SC/SCG)

The MxN configuration aligns any input with any output, while other inputs are aligned to adjacent outputs.



F Configuration

(SB/SC/SCG)

The MxN configuration allows any one of a bank of inputs to connect with any output with no other connections occurring.

Technical Specifications

PARAMETER ¹ (SB SWITCHES)	SINGLE COMMON		MULTIPLE COMMON				
	C Configuration		D Configuration		E and F Configurations		
	Typical	Maximum	Typical	Maximum	Typical	Maximum	
Insertion loss							
SM (3 and 4 input models)	0.4 dB	0.7 dB	0.4 dB (0.5 dB)	0.7 dB (1.0 dB)	0.5 dB (0.7 dB)	1.0 dB (1.5 dB)	
MM (3 and 4 input models)	0.4 dB	0.7 dB	0.4 dB (0.5 dB)	0.7 dB (1.0 dB)	0.5 dB (0.7 dB)	1.0 dB (1.5 dB)	
Return loss ²							
SM standard/analog	≥ 65 dB	60/65 dB	≥ 65 dB	60/65 dB ³	≥ 65 dB	60 dB	
MM ⁴ standard/analog	25/35 dB	20/30 dB	25/35 dB ³	20/30 dB ³	> 25 dB	20 dB	
Polarization dependent loss	SM	0.02 dB	0.05 dB	0.02 dB	0.05 dB	0.03 dB	0.07 dB
Insertion loss stability ⁵		± 0.03 dB	± 0.05 dB	± 0.03 dB	± 0.05 dB	± 0.03 dB	± 0.05 dB
Repeatability							
sequential switching		± 0.003 dB	± 0.005 dB	± 0.005 dB	± 0.01 dB	± 0.005 dB	± 0.01 dB
random switching		± 0.01 dB	± 0.025 dB	± 0.02 dB	± 0.04 dB	± 0.02 dB	± 0.04 dB
Crosstalk (maximum)	SM	- 80 dB					
Maximum input power (optical)	300 mW						
Switching time	one channel						
	each additional channel						
	300 ms						
	12 ms						
Power supply	100-240 V, 50-60 Hz						
Power consumption	100 VA maximum						
Control	local and remote via GPIB and serial RS232 interfaces						
Drivers for external switch modules	four open collector drivers with maximum 100 mA sink current						
Dimensions	W x H x D						
	21.2 x 8.9 x 35.5 cm						
with rack-mount kit (optional) ⁶	48.3 x 8.9 x 35.5 cm						
Weight	3.75 kg						
Operation temperature	0 to 55 °C						
Storage temperature	- 40 to 70 °C						
Humidity	maximum 95 % RH from 0 to 55 °C non-condensing						

1. Excluding connectors. All optical measurements taken after temperature has been stabilized for one hour.

2. Return loss specification based on 1 m pigtail length.

3. Analog version available on one and two input SB model switches (C and D configurations).

4. Values shown for 62.5 μm diameter maximum fiber core.

5. Drift of any channel relative to reference channel at ± 3 °C deviation of ambient temperature over a seven-day period.

6. ED000899-A-00 standard rack-mount kit, ED000899-A-01 Japan rack-mount kit. Requires two kits to mount two units side-by-side.

Technical Specifications

PARAMETER ¹ (SC AND SCG SWITCHES)	SINGLE COMMON		MULTIPLE COMMON				
	C Configuration (SC model only)		D Configuration		E and F Configurations		
	Typical	Maximum	Typical	Maximum	Typical	Maximum	
Insertion loss							
SM (SC with 3 & 4 inputs & SCG models)	0.4 dB	0.7 dB	0.4 dB (0.5 dB)	0.7 dB (1.0 dB)	0.5 dB (0.7 dB)	1.0 dB (1.5 dB)	
MM (SC with 3 & 4 inputs & SCG models)	0.4 dB	0.7 dB	0.4 dB (0.5 dB)	0.7 dB (1.0 dB)	0.5 dB (0.7 dB)	1.0 dB (1.5 dB)	
Return loss ²							
SM standard/analog	≥ 65 dB	60/65 dB	≥ 65 dB	60/65 dB ³	≥ 65 dB	60 dB	
MM ⁴ standard/analog	25/35 dB	20/30 dB	25/35 dB ³	20/30 dB ³	> 25 dB	20 dB	
Polarization dependent loss	SM	0.02 dB	0.05 dB	0.02 dB	0.05 dB	0.03 dB	0.07 dB
Insertion loss stability ⁵		± 0.03 dB	± 0.05 dB	± 0.03 dB	± 0.05 dB	± 0.03 dB	± 0.05 dB
Repeatability							
sequential switching	± 0.003 dB	± 0.005 dB	± 0.005 dB	± 0.01 dB	± 0.005 dB	± 0.01 dB	
random switching	± 0.01 dB	± 0.025 dB	± 0.02 dB	± 0.04 dB	± 0.02 dB	± 0.04 dB	
Crosstalk (maximum)	SM	- 80 dB					
Maximum input power (optical)	300 mW						
Switching time							
one channel (SCG model)	300 ms (420 ms)						
each additional channel (SCG model)	12 ms (20 ms)						
Power supply	100-240 V, 50-60 Hz						
Power consumption	100 VA maximum						
Control	local and remote via GPIB and serial RS232 interfaces						
Drivers for external switch modules	four open collector drivers with maximum 100 mA sink current						
Dimensions W x H x D							
single (double height ⁶)	48 x 13 x 37 cm (48 x 26.6 x 37 cm) excluding handles						
Weight	single (double height ⁶)						
single (double height ⁶)	9 kg (14 kg)						
Operation temperature	0 to 55 °C						
Storage temperature	- 40 to 70 °C						
Humidity	maximum 95 % RH from 0 to 55 °C non-condensing						

1. Excluding connectors. All optical measurements taken after temperature has been stabilized for one hour.
2. Return loss specification based on 1 m pigtail length.
3. Analog version available on one and two input SC model switches (C and D configurations).
4. Values shown for 62.5 μm diameter maximum fiber core.
5. Drift of any channel relative to reference channel at ± 3 °C deviation of ambient temperature over a seven-day period.
6. Applies to SC model only.

Technical Specifications

The following table lists the current configurations that are supported for the SC switch. The configurations available for the SB switch are shaded in gray. For information regarding other configurations, contact your JDS Uniphase representative.

SB/SC Switch Configuration

C		D		E			F			
1xN	2xN	3xN	4xN	2xN	3xN	4xN	2xN	3xN	4xN	
4	4	6	8	4	4	4	4	4	4	
6	6	12	16	6	6	6	6	6	6	
8	8	18	24	8	8	8	8	8	8	
12	12	24	32	12	12	12	12	12	10	2U BENCHTOP
16	16	36	40	16	16	16	16	14	12	
20	20	42	64	20	20	20	20	20	16	
26	26	60	80	26	26	26	26	26	20	3U CHASSIS
32	32	72	104	32	32	32	32	32	26	6U CHASSIS
38	38	84	128	38	38	38	38	38	32	
44	44	108	152	44	44	44	44	44	36	
48	52	126	180	52	52	52	52	52	40	
52	60	144		60	60	60	60			
60	68	168		68	68	68	68			
68	76	180		76	76	76	74			
76	84			84	84	84	80			
84	90			90	90	90				
90	100			100	100	100				
100	110			110	110	110				
110	120			120	120	120				
120	140									
130	160									
142	180									
154										
166										
180										

SB switch configurations

The following table lists configurations on the SCG switch. For information regarding other configurations, contact your JDS Uniphase representative.

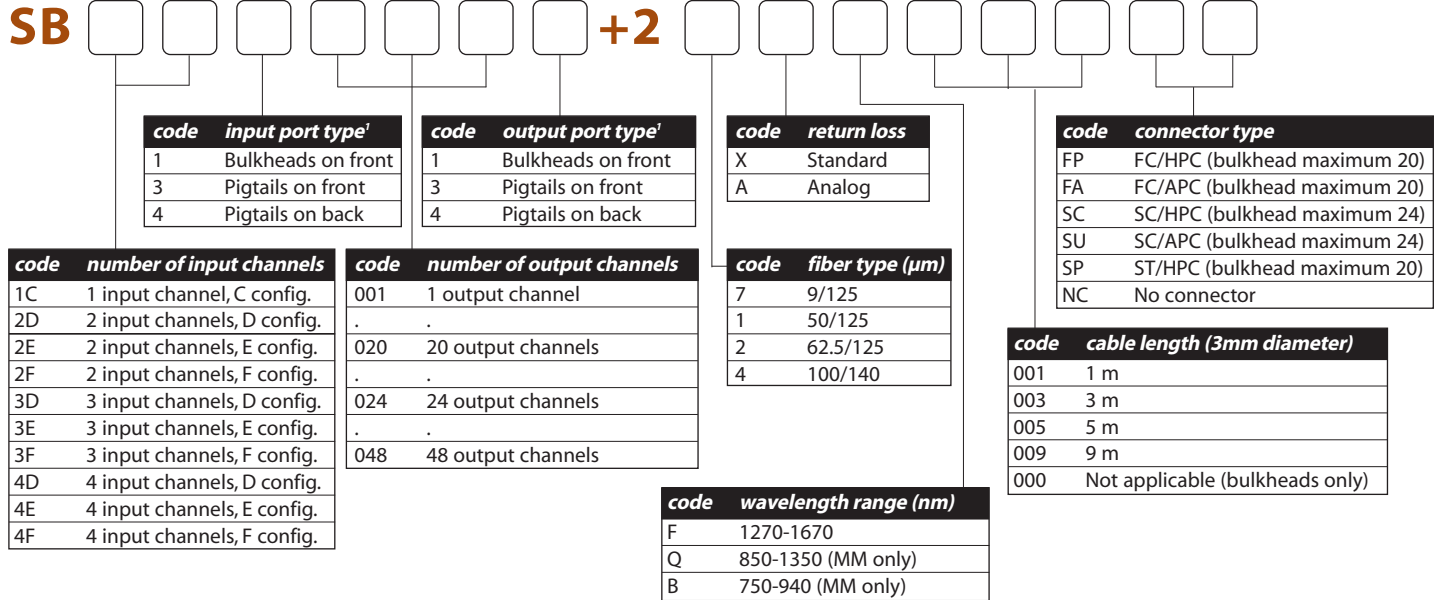
SCG Switch Configuration

D Configuration							E Configuration	F Configuration			
6xN	10xN	16xN	20xN	26xN	34xN	45xN	Up to 45x45, or 6x84	6xN	8xN	11xN	13xN
6	10	16	20	26	34	45	Contact JDSU for testing requirements	6	6	6	6
12	20	32	40	52	68	90		8	8	7	
24	30	48	60	78				10	10		
36	50	64	80					12			
48	70	80						14			
60	90										
72											
90											

- D: Up to 45x90 such that 'number of outputs' [N] is divisible by 'number of inputs' [M]
- E: Up to 45 inputs [M] and up to 84 outputs [N], such that M + N is not more than 90
- F: Up to 13 inputs [M] and up to 14 outputs [N], such that M x (N+1) is not more than 93

Ordering Information

Sample Order: **SB2E10141+27XF000SP**



1. Bulkheads and pigtails can not be mixed in the same panel unless custom ordered.

Ordering Information

Sample Order: SC2D30043+22XB009FP

SC +2

code	input port type ¹
1	Bulkheads on front
2	Bulkheads on back
3	Pigtails on front
4	Pigtails on back

code	output port type ¹
1	Bulkheads on front
2	Bulkheads on back
3	Pigtails on front
4	Pigtails on back

code	return loss
X	Standard
A	Analog

code	cable length (3 mm diameter)
001	1 m
003	3 m
005	5 m
009	9 m
000	Not applicable (bulkheads only)

code	number of input channels
1C	1 input channel, C config.
2D	2 input channels, D config.
2E	2 input channels, E config.
2F	2 input channels, F config.
3D	3 input channels, D config.
3E	3 input channels, E config.
3F	3 input channels, F config.
4D	4 input channels, D config.
4E	4 input channels, E config.
4F	4 input channels, F config.

code	number of output channels ²
001	1 output channel
.	.
084	84 output channels
.	.
180	180 output channels

code	wavelength range (nm)
F	1270-1670
Q	850-1350 (MM only)
B	750-940 (MM only)

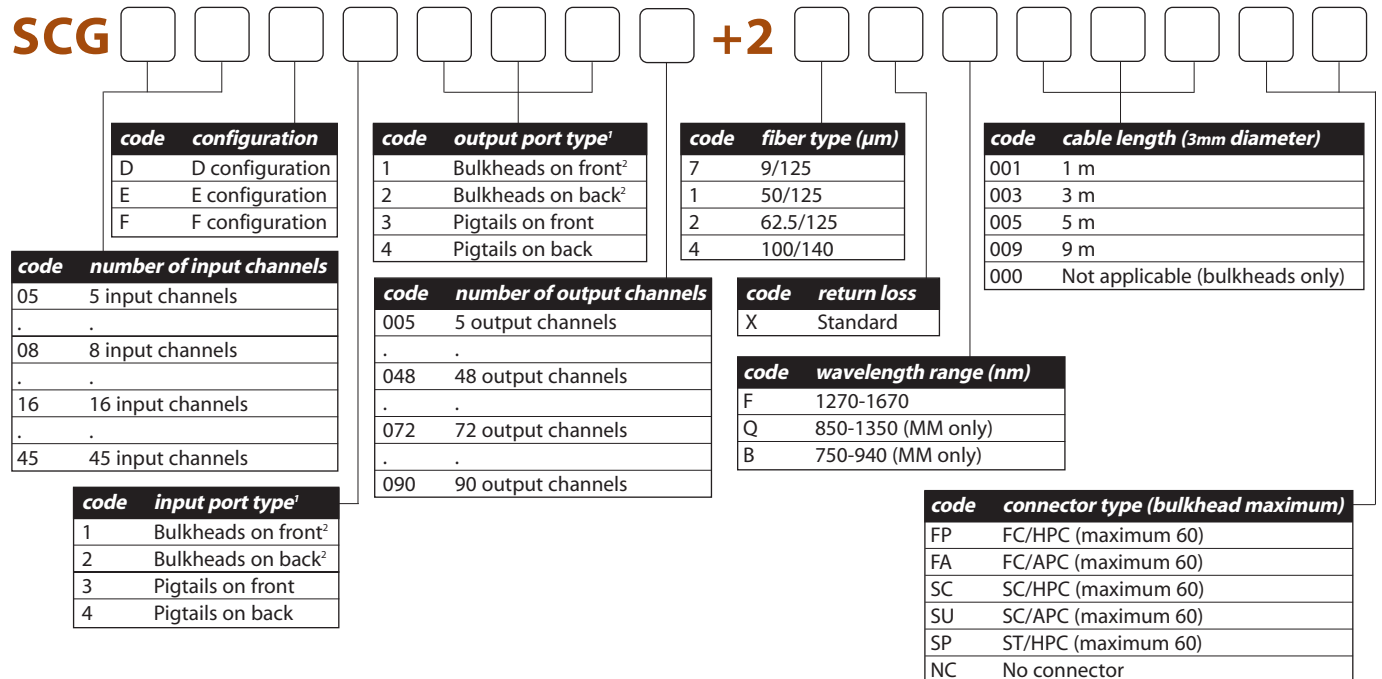
code	fiber type (μm)
7	9/125
1	50/125
2	62.5/125
4	100/140

code	connector type (3u/6u)
FP	FC/HPC (bulkheads maximum 60/120)
FA	FC/APC (bulkheads maximum 60/120)
SC	SC/HPC (bulkheads maximum 60/120)
SU	SC/APC (bulkheads maximum 60/120)
SP	ST/HPC (bulkheads maximum 60/120)
NC	No connector

1. Bulkheads and pigtails can not be mixed in the same panel unless custom ordered.
2. Single height: 84 output channel maximum. Double height: 180 output channel maximum.

Ordering Information

Sample Order: SCG06D20241+27XF000FP



1. The inputs and outputs must exit on opposite sides. (For example, if inputs exit from the front, then the outputs must exit from the rear.)
2. For exact layout of bulkheads and labeling, contact JDS Uniphase.

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Indicate your requirements by selecting one option from each configuration table. Print the corresponding codes in the available boxes to form your part number.

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