SC Switch Control Platform

- SC2000, SCX2000, SCP2000
- SCM Series Modules

Features

The SC switch control platform is designed for a multitude of switching applications in RF systems. Each of the main chassis is equipped with five (5), rear-facing, user-configurable slots. Individual slots or groups of slots can be populated with a variety of SCM series RF switch modules.

The Model SC2000 can be fiber-optically combined with up to seven (7) model SCX2000 expansion units. The model SCX2000 is mechanically identical to the model SC2000, but does not contain a control panel. Instead, control is provided by the connected model SC2000.

For backward compatibility with the legacy model SC1000, the model SCP2000 was created. This model provides identical switch configuration and operation to the legacy model SC1000 and its modifications (M1 – M5).

All of these switch controller systems can be controlled either manually, using the provided color LCD touch display, or remotely, using any of the four provided remote ports (USB, GPIB, RS-232, and Ethernet).

System interlock capability is provided on the Models SC2000 and SCP2000 by sensing switch closures on three independent inputs. Three separate user definable configurations are provided for times when interlock switch closures are not sensed.

A user defined "safe" configuration is also provided for use during signal re-routing in order to assure cold switching of any attached amplifiers and loads. In addition to the three interlock configurations and single "safe" configuration, eight (8) user configurations can be saved and recalled for ease of use in complex systems.

A positive 24 VDC signal along with four (4) open drain outputs, and four (4) digital outputs (TTL) are supplied for applications such as external switch/relay control.

The export classification for this equipment is EAR99.

SC2000

RF switch control platform base unit. Can be controlled manually via front panel touch display or via four (4) provided remote ports. The SC2000 has five (5) user configurable module slots on the rear panel.

SCX2000

RF switch control platform sub unit. The SCX2000 does not have a control panel or remote control ports and therefore must be connected to a Model SC2000 for local or remote control. The SCX2000 has five (5) user configurable module slots on the rear panel.

SCP2000

RF switch control platform base unit configured to imitate a legacy Model SC1000. Can be controlled manually via front panel touch display or via four (4) provided remote ports. The SCP2000 module slots are populated to provide drop-in replacement of the Model SC1000 and any of its associated modifications (M1–M5).

AR RF/Microwave Instrumentation
160 School House Rd
Souderton, PA 18964
215-723-8181

For an applications engineer call:800.933.8181

www.arworld.us

Specifications

Rated Voltage	100 – 240 V AC
Rated Frequency	50 – 60 Hz
Rated Power	100 VA max.

Dimensions	W x H x D	48.26 x 13.34 x 44.77 cm (19.0 x 5.25 x 17.625 in)

Weight	SC2000 (without modules)	approx. 4.1 kg (9 lbs)
	SCX2000 (without modules)	approx. 3.9 kg (8.5 lbs)
	SCP2000 (with modules)	approx. 6.8 kg (15.0 lbs)

Interfaces (front panel)		**SC2000**	**SCX20000**	**SCP20000**	
Display/Control Panel	for manual operation	1	-	1	480 x 272 pixel, resistive touch, LED backlight

Interfaces (rear panel)					
USB	for remote control	1	-	1	Test and Measurement Class; Full Speed (12 Mbps); Type-B Connector
GPIB (IEEE-488)	for remote control	1	-	1	24-pin, Female Connector
RS-232	for remote control	1	-	1	9-pin, Subminiature D, Female Connector
Ethernet	for remote control	1	-	1	TCP/IP, 10 Mbps, RJ-45 Connector
Fiber-Optic Serial	connection of base unit with extension units	1	1	1	Separate Tx & Rx, SMA Connectors, 500 kbps
Interlock Connector		1	1	1	15-pin, Subminiature D, Female Connector
	safety interlocks	3	-	3	Active low, Internal 1k pull-up to +5 VDC
	open drain outputs	4	4	4	800 mA current sinking each*
	digital outputs	4	4	4	TTL
	voltage supply (use with open drain outputs)	1	1	1	+24 VDC, 1.5 A max. (internally fused)
	ground return (use with open drain outputs)	2	2	2	

*Open drains 3 and 4 have internal 10K Ohm pull-ups to 3.3V.

Other		
Export Classification		EAR99

Module Slots		
Number of module slots		5 on rear of unit
Number of control buses for modules		5

Dimensions (W x H x D)		
Single module slot	slot 3	3.68 x 8.84 x 30.23 cm (1.45 x 3.48 x 11.90 in)
Double-width module slot	slots 1, 2, 4, 5	7.42 x 8.84 x 30.23 cm (2.92 x 3.48 x 11.90 in)

Specifications

Module Specifications

Model	Connectors	Frequency Range	Description	Buses	Slots
SCM1S1S2	SMA (f)	DC – 18 GHz	RF switch module 1x SPDT coaxial switch	1	single
SCM1S1K2	K (f)	DC – 40 GHz			
SCM1S1N2	N (f)	DC – 12 GHz			
SCM2S1S2	SMA (f)	DC – 18 GHz	RF switch module 2x SPDT coaxial switch	1	single
SCM2S1K2	K (f)	DC – 40 GHz			
SCM2S1N2	N (f)	DC – 12 GHz			double
SCM4S1S2	SMA (f)	DC – 18 GHz	RF switch module 4x SPDT coaxial switch	1	double
SCM4S1K2	K (f)	DC – 40 GHz			
SCM1S1S4	SMA (f)	DC – 18 GHz	RF switch module 1x SP4T coaxial switch	1	double
SCM1S1K4	K (f)	DC – 40 GHz			
SCM1S1N4	N (f)	DC – 12 GHz			
SCM2S1S4	SMA (f)	DC – 18 GHz	RF switch module 2x SP4T coaxial switch	1	double
SCM2S1K4	K (f)	DC – 40 GHz			
SCM1S1S6	SMA (f)	DC – 18 GHz	RF switch module 1x SP6T coaxial switch	1	double
SCM1S1K6	K (f)	DC – 40 GHz			
SCM1S1N6	N (f)	DC – 12 GHz			
SCM2S1S6	SMA (f)	DC – 18 GHz	RF switch module 2x SP6T coaxial switch	1	double
SCM2S1K6	K (f)	DC – 40 GHz			

RF Switch Module Specifications

Parameter	SCM1S1S2	SCM1S1K2	SCM1S1N2
Switch Type	1x SPDT coaxial switch		
Connector Type	SMA (f)	K (f)	N (f)
Impedance	50 Ω		
Frequency Range	DC – 18 GHz	DC – 40 GHz	DC – 12 GHz
Switching time (nominal)	< 35 ms	< 15 ms	< 50 ms
Number of switching cycles	1 million	1 million	1 million
Current consumption	max. 150 mA (+24 VDC)	max. 200 mA (+24 VDC)	max. 135 mA (+24 VDC)
Dimensions (W x H x D)	3.68 x 11.63 x 30.23 cm (1.45 x 4.58 x 11.90 in)	3.68 x 11.63 x 30.23 cm (1.45 x 4.58 x 11.90 in)	3.68 x 11.63 x 30.23 cm (1.45 x 4.58 x 11.90 in)
Slot position	1, 2, 3, 4, or 5		
Weight	approx. 0.23 kg (0.5 lb)	approx. 0.23 kg (0.5 lb)	approx. 0.41 kg (0.9 lb)

Specifications

RF Switch Module Specifications			
Parameter	SCM2S1S2	SCM2S1K2	SCM2S1N2
Switch Type	2x SPDT coaxial switch		
Connector Type	SMA (f)	K (f)	N (f)
Impedance	50 Ω		
Frequency Range	DC – 18 GHz	DC – 40 GHz	DC – 12 GHz
Switching time (nominal)	< 35 ms	< 15 ms	< 50 ms
Number of switching cycles	1 million	1 million	1 million
Current consumption	max. 150 mA (+24 VDC)	max. 400 mA (+24 VDC)	max. 270 mA (+24 VDC)
Dimensions (W x H x D)	3.68 x 11.63 x 30.23 cm (1.45 x 4.58 x 11.90 in)	3.68 x 11.63 x 30.23 cm (1.45 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)
Slot position	1, 2, 3, 4, or 5		1, 2, 4, or 5
Weight	approx. 0.27 kg (0.6 lb)	approx. 0.27 kg (0.6 lb)	approx. 0.41 kg (0.9 lb)

RF Switch Module Specifications		
Parameter	SCM4S1S2	SCM4S1K2
Switch Type	4x SPDT coaxial switch	
Connector Type	SMA (f)	K (f)
Impedance	50 Ω	
Frequency Range	DC – 18 GHz	DC – 40 GHz
Switching time (nominal)	< 35 ms	< 15 ms
Number of switching cycles	1 million	1 million
Current consumption	max. 150 mA (+24 VDC)	max. 800 mA (+24 VDC)
Dimensions (W x H x D)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)
Slot position	1, 2, 4, or 5	
Weight	approx. 0.41 kg (0.9 lb)	approx. 0.41 kg (0.9 lb)

RF Switch Module Specifications			
Parameter	SCM1S1S4	SCM1S1K4	SCM1S1N4
Switch Type	1x SP4T coaxial switch		
Connector Type	SMA (f)	K (f)	N (f)
Impedance	50 Ω		
Frequency Range	DC – 18 GHz	DC – 40 GHz	DC – 12 GHz
Switching time (nominal)	< 35 ms	< 15 ms	< 50 ms
Number of switching cycles	1 million	1 million	1 million
Current consumption	max. 155 mA (+24 VDC)	max. 130 mA (+24 VDC)	max. 235 mA (+24 VDC)
Dimensions (W x H x D)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)
Slot position	1, 2, 4, or 5		1, 2, 3 , or 4
Weight	approx. 0.36 kg (0.8 lb)	approx. 0.36 kg (0.8 lb)	approx. 0.68 kg (1.5 lb)

Specifications

RF Switch Module Specifications		
Parameter	SCM2S1S4	SCM2S1K4
Switch Type	2x SP4T coaxial switch	
Connector Type	SMA (f)	K (f)
Impedance	50 Ω	
Frequency Range	DC – 18 GHz	DC – 40 GHz
Switching time (nominal)	< 35 ms	< 15 ms
Number of switching cycles	1 million	1 million
Current consumption	max. 310 mA (+24 VDC)	max. 260 mA (+24 VDC)
Dimensions (W x H x D)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)
Slot position	1, 2, 4, or 5	
Weight	approx. 0.54 kg (1.2 lb)	approx. 0.54 kg (1.2 lb)

RF Switch Module Specifications			
Parameter	SCM1S1S6	SCM1S1K6	SCM1S1N6
Switch Type	1x SP6T coaxial switch		
Connector Type	SMA (f)	K (f)	N (f)
Impedance	50 Ω		
Frequency Range	DC – 18 GHz	DC – 40 GHz	DC – 12 GHz
Switching time (nominal)	< 35 ms	< 15 ms	< 50 ms
Number of switching cycles	1 million	1 million	1 million
Current consumption	max. 155 mA (+24 VDC)	max. 130 mA (+24 VDC)	max. 235 mA (+24 VDC)
Dimensions (W x H x D)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)
Slot position	1, 2, 4, or 5		1, 2, 3 , or 4
Weight	approx. 0.36 kg (0.8 lb)	approx. 0.36 kg (0.8 lb)	approx. 0.73 kg (1.6 lb)

RF Switch Module Specifications		
Parameter	SCM2S1S6	SCM2S1K6
Switch Type	2x SP6T coaxial switch	
Connector Type	SMA (f)	K (f)
Impedance	50 Ω	
Frequency Range	DC – 18 GHz	DC – 40 GHz
Switching time (nominal)	< 35 ms	< 15 ms
Number of switching cycles	1 million	1 million
Current consumption	max. 310 mA (+24 VDC)	max. 260 mA (+24 VDC)
Dimensions (W x H x D)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)	7.42 x 11.63 x 30.23 cm (2.92 x 4.58 x 11.90 in)
Slot position	1, 2, 4, or 5	
Weight	approx. 0.54 kg (1.2 lb)	approx. 0.54 kg (1.2 lb)

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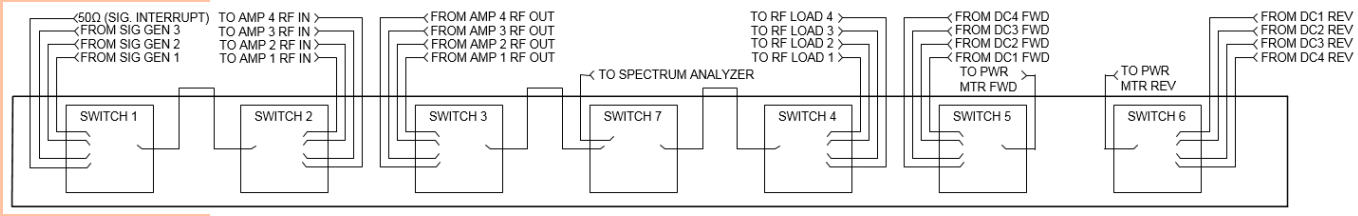
Specifications

RF Switch Power Handling				
Frequency Range	**Notes**	**K**	**SMA**	**N**
DC – 0.1 GHz	VSWR 1.1:1	400 W	450 W	1200 W
DC – 0.5 GHz		200 W	275 W	600 W
0.5 – 1 GHz		150 W	200 W	450 W
1 GHz – 4 GHz		75 W	100 W	250 W
4 GHz – 8 GHz		55 W	75 W	175 W
8 GHz – 12 GHz		45 W	55 W	150 W
12 GHz – 18 GHz		35 W	50 W	-----
18 GHz – 40 GHz		25 W	-----	-----

RF Switch Power Derating Factor	
VSWR	**Derating Factor**
1.5:1	94
2.0:1	88
2.5:1	83
3.0:1	78
3.5:1	73
4.0:1	70

SCP2000 Block Diagram



Model Configurations

SLOT NUMBER	1		2	4	5		3
	SWITCHES INSTALLED						
MODEL NUMBER	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**
SCP2000	SMA	SMA	N	N	SMA		
SCP2000M1	SMA	SMA	N	N	SMA	SMA	N
SCP2000M2	SMA	SMA			SMA		
SCP2000M3	SMA	SMA			SMA	SMA	
SCP2000M4	K	K			K	K	
SCP2000M5	SMA	SMA			SMA	SMA	N

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SCP2000	Controller designed for multi-amplifier/multi-load application where reverse power measurement is not necessary.
SCP2000M1	Controller designed for multi-amplifier/multi-load applications with forward and reverse power measurement and emissions feedback.
SCP2000M2	Controller accommodates forward power measurement and higher power/higher frequency amplifier and load combinations where switching and cable losses need to be minimized.
SCP2000M3	Controller accommodates forward and reverse power measurement and higher power/higher frequency amplifier and load combinations where switching and cable losses need to be minimized.
SCP2000M4	Controller accommodates forward and reverse power measurement and higher power/higher frequency (up to 40 GHz) amplifier and load combinations where switching and cable losses need to be minimized.
SCP2000M5	Controller accommodates forward and reverse power measurement, higher power/higher frequency amplifier and load combinations where switching and cable losses need to be minimized, and emissions feedback.