



raditeq

Data Sheet

# RadiSwitch®

Coaxial Relay Switch Cards

Flexible | High Quality | Extensible





# RadiSwitch®

## Maximum Flexibility in Test Automation

Flexible High Quality Extensible

EMC test systems are complex installations with many test and measurement instruments connected. In order to enable full automated testing, these devices and measuring instruments as well as the connections made between amplifiers, power meters, antennae and EMI receivers should be controlled in an automated manner. To enable switching these signals Raditeq developed the RadiSwitch® plug-in cards that are used in combination with the RadiCentre® modular test system.

### Flexible & Wide range

The RadiSwitch® RF coaxial relay plug-in cards are able to switch RF signals from DC until 50 GHz and with RF power up to 700 Watts directly, or any high RF power indirect using externally controlled switches. RadiSwitch® plug-in cards are available in several versions, with one, two or four SPDT coaxial relays, alternatively one or two SP6T of different type coaxial relays; N-Type, BNC, SMA, 2.92mm (K) and 2.4 (Q). Any combination of plug-in cards is allowed, making this system the most flexible switching systems in the world!

### High quality

The RadiSwitch® plug-in cards use high quality switches with excellent RF characteristics. The insertion loss is specified at typical 0.4 dB and isolation is typically 60 dB. The lifetime (maximum switch cycles) of the internal relays is typically 10.000.000 cycles. This ensures long term usage of your switch system.

### Extensible & Easy to use

RadiSwitch® plug-in cards are designed to fit in the RadiCentre® modular EMC test systems. This system has a backplane that will fit one, two or seven plug-in cards, bringing the maximum capacity of the system to 28 relays in the RadiCentre® 7-slot system. Of course it is possible to build even larger switching systems by combining any number of RadiCentre® systems. The system is "Plug and Play", which means that every board is automatically recognised, initialised and ready for use. The user can configure and control the functionality of every individual plug-in card by means of external software or using the RadiCentre® colour TFT touch screen display.

### Hardware interlock

The first relay of the RadiSwitch® plug-in card (only for SPDT models) can either be used as a standard relay or as a safety interlock relay. When using this relay as a safety interlock, this enables the function to switch OFF the RF input to the amplifier, in order to prevent personnel to be subjected to high radiated RF fields. The RF interlock input can be connected to a switch on the entrance door of the test chamber.

### External switch control

High power RF amplifiers are normally placed in separate test rooms with appropriate cooling facilities. To control these amplifiers the RSW2002E RadiSwitch plug-in card can be connected to an external high power switch system which has an internal power supply to power 12VDC/24VDC/28VDC external (high power) relays.

### Software support

The RadiSwitch® plug-in cards are software controllable. Besides the RadiMation® integral EMC measurement software the system can be controlled by any EMC measurement package using control commands.



# RadiSwitch® Technical Specifications

Performance		All models
Frequency range internal relays and connectors		3 GHz for BNC, 12,4 GHz for N-type, 18 GHz for SMA and 40 GHz for 2,92mm (k) connector 50 GHz for 2.4mm (Q) connector
Power handling capacity, internal relays		See paragraph 'Average power' below
External relays		2 external relays can be driven, max current 0,5A per relay 12V, 24V or 28V supply software selectable.
Models		
RSW1021B		1 coaxial switch SPDT, BNC-type 3 GHz (1 slot)
RSW1021N		1 coaxial switch SPDT, N-type 12.4 GHz (1 slot)
RSW1022S		2 coaxial switches SPDT, SMA 18GHz (1 slot)
RSW1024S		4 coaxial switches SPDT, SMA 18GHz (1 slot)
RSW1061S		1 coaxial switch SP6T, SMA 18GHz (2 slots)
RSW1062S		2 coaxial switches SP6T, SMA 18GHz (2 slots)
RSW1022K		2 coaxial switches SPDT, 2.92mm (k) 40 GHz (1 slot)
RSW1024K		4 coaxial switches SPDT, 2.92mm (k) 40 GHz (1 slot)
RSW1061K		1 coaxial switch SP6T, 2.92mm (k) 40 GHz (2 slots)
RSW1062K		2 coaxial switches SP6T, 2.92mm (k) 40 GHz (2 slots)
RSW1022Q		2 coaxial switches SPDT, 2.4mm (Q) 50 GHz (1 slot)
RSW1024Q		4 coaxial switches SPDT, 2.4mm (Q) 50 GHz (1 slot)
RSW1061Q		1 coaxial switch SP6T, 2.4mm (Q) 50 GHz (2 slots)
RSW1062Q		2 coaxial switches SP6T, 2.4mm (Q) 50 GHz (2 slots)
RSW2002E		2 outputs for SP6T, external relay driver card 12/24/28VDC (1 slot)
Relay Lifetime		
SPDT relays, SMA or 2,92mm (k)		10.000.000 cycles
SP6T relay SMA		5.000.000 cycles
SP6T relay 2,92mm (k) or 2.4mm (Q)		2.000.000 cycles
N-type and BNC relay		1.000.000 cycles

Performance		All models
Temperature range		0° C - 40° C
Relative humidity		10 - 90% (non-condensing)
Power consumption		
Supply voltage		Power supplied through RadiCentre back panel
Power consumption		30 W max
Safety		
Interlock *		
(*RSW1022S/K/Q and RSW1024S/K/Q only)		Each relay of the plug-in card can be used as an interlock safety switch
Warranty		
Warranty		3 years (misuse excluded) <sup>(2)</sup>

## Models B & N - Plug-In cards with BNC and N-type connectors

### Specification BNC, 3.0GHz, SPDT relays

Life time 1.000.000 cycles

Frequency	GHz	0 to 1	1 to 2	2 to 3
VSWR		1,15	1,20	1,25
Insertion loss	dB	0,15	0,20	0,25
Isolation	dB	85	80	75
Average power	W	400	300	240

### Specification N-type, 12.4GHz, SPDT relays

Life time 1.000.000 cycles

Frequency	GHz	0 to 1	1 to 2	2 to 3	3 to 8	8 to 12.4
VSWR		1,15	1,20	1,25	1,35	1,5
Insertion loss	dB	0,15	0,20	0,25	0,35	0,5
Isolation	dB	85	80	75	70	60
Average power	W	700	500	400	250	200

## Model S - Plug-In cards with SMA connectors

### Specification SMA, 18GHz, SPDT relays

Life time 10.000.000 cycles

Frequency	GHz	0 to 3	3 to 8	8 to 12,4	12,4 to 18
VSWR		1,10	1,20	1,20	1,40
Insertion loss	dB	0,15	0,20	0,25	0,35
Isolation	dB	80	75	65	60
Average power	W	240	150	120	100

### Specification SMA, 18GHz, SP6T relays

Life time 5.000.000 cycles

Frequency	GHz	0 to 3	3 to 8	8 to 12,4	12,4 to 18
VSWR		1,20	1,30	1,40	1,50
Insertion loss	dB	0,20	0,30	0,40	0,50
Isolation	dB	80	75	65	60
Average power	W	240	150	120	100

## Model K - Plug-In cards with 2,92mm connectors

Specification k 2.92mm, 40GHz, SPDT relays

Life time 10.000.000 cycles

Frequency	GHz	0 to 6	6 to 12.4	12.4 to 18	18 to 26.5	26.5 to 40
VSWR		1,30	1,40	1,50	1,70	1,9
Insertion loss	dB	0,30	0,40	0,50	0,70	0,8
Isolation	dB	70	60	60	55	50
Average power	W	80	60	50	20	10

Specification k 2.92mm, 40GHz, SP6T relays

Life time 2.000.000 cycles

Frequency	GHz	0 to 6	6 to 12.4	12.4 to 18	18 to 26.5	26.5 to 40
VSWR		1,30	1,40	1,50	1,70	2,2
Insertion loss	dB	0,20	0,40	0,50	0,70	1,1
Isolation	dB	70	60	60	55	50
Average power	W	40	30	25	15	5

## Model Q - Plug-In cards with 2,4mm connectors

Specification Q 2.4mm, 50GHz, SPDT relays

Life time 2.000.000 cycles

Frequency	GHz	0 to 6	6 to 12.4	12.4 to 18	18 to 26.5	26.5 to 40	40 to 50
VSWR		1,30	1,40	1,50	1,70	1,90	1,90
Insertion loss	dB	0,30	0,40	0,50	0,70	0,80	1,10
Isolation	dB	70	60	60	55	50	50
Average power	W	80	60	50	20	10	5

Specification Q 2.4mm, 50GHz, SP6T relays

Life time 2.000.000 cycles

Frequency	GHz	0 to 6	6 to 12.4	12.4 to 18	18 to 26.5	26.5 to 40	40 to 50
VSWR		1,30	1,40	1,50	1,70	1,90	1,90
Insertion loss	dB	0,30	0,40	0,50	0,70	0,80	1,10
Isolation	dB	70	60	60	55	50	50
Average power	W	80	60	50	20	10	5