Outdoor Redundancy Switch 2:1
RSCM-2-OD

The WORK Microwave Redundancy Switch RSCM-2-OD/ID is a solution for a 2:1 redundancy system with indoor controller and Outdoor Switch Box, which includes the coaxial transfer switches. It can be used for Upconverters and Downconverters.

The system can be configured from the front panel or remotely via RS232, RS422/485, or TCP/IP over Ethernet.

The switching system can be set in automatic mode, whereby an automatic switchover to the spare unit is performed upon detection of an alarm generated by the main unit. In addition, a manual switchover to the spare unit and back can be initiated.

Two power supplies and two AC input connectors within the unit guarantee high availability.

The Redundancy Switch RSCM-2-OD/ID is also available with integrated uplink power control (Option UPC).

This picture shows an Outdoor Switch Box of a 2:1 redundant switching system. The Switch Box is connected to the control unit, which is installed indoors. The Outdoor Switch Box includes alarm and status indication via LEDs, manual switchover and easy access to the serial control interfaces of the converter units. The picture below shows a typical 2:1 configuration with converters, built as an outdoor solution.

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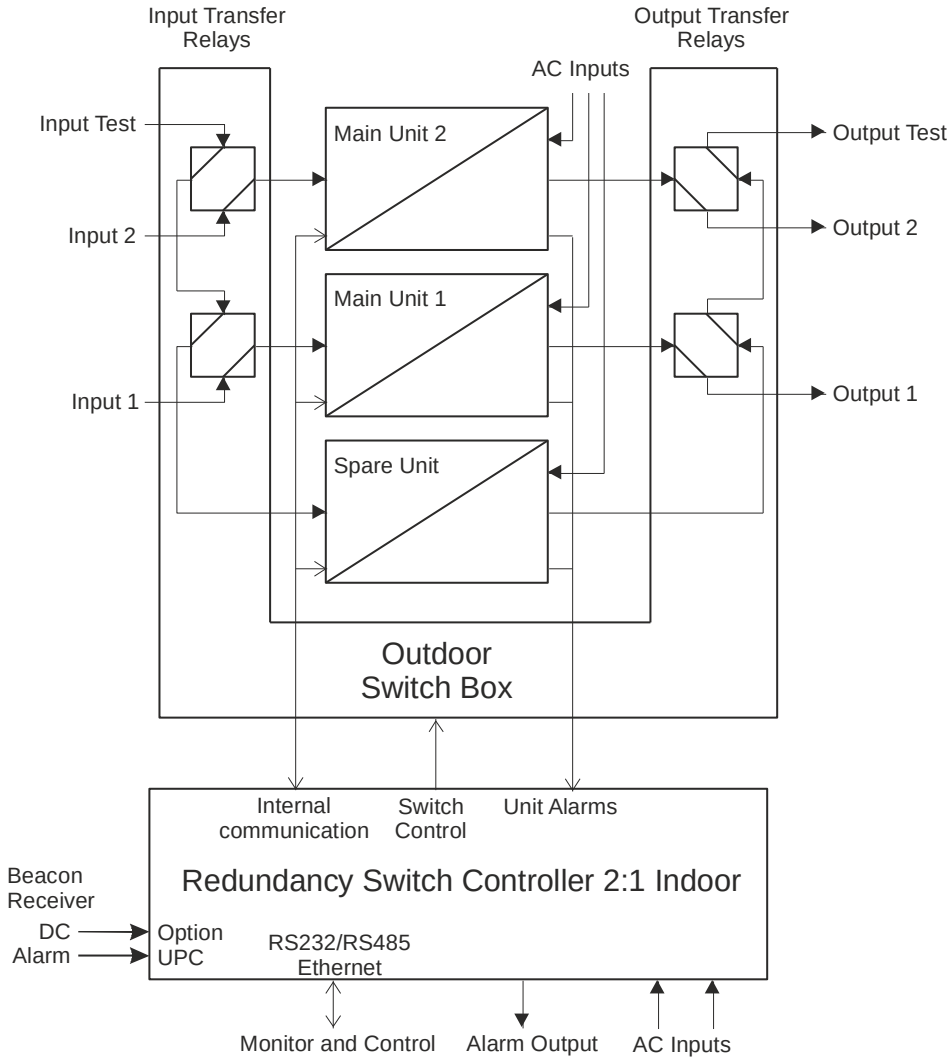

2:1 Redundancy Switch System with Outdoor Switch Box

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Controller RSC Parameters	
Monitoring and Control Interface:	Protocol: SNMP Connection: UDP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45
	Protocol: HTTP (web browser interface) Connection: TCP/IP over Ethernet (10 or 100 Mbps, auto sensing), connector RJ-45
	Protocol: Multipoint Connection: RS232 or RS422/RS485 (configurable), connector DSUB09 female or TCP/IP over Ethernet (10 or 100 Mbit/s, auto sensing), connector RJ-45
User Interface:	LCD (VFD as option), 2 x 40 characters, 4 cursor keys, 2 function keys, Status LED's
Summary Alarm Interface:	Controller alarm out, two potential free contacts (DPDT, connector DSUB09 female)
Interface to Indoor Redundancy Sets: [1)]	Main unit alarm and IF/RF-relay-control (2x connector DSUB15 female)
Interface to Indoor Spare Unit: [1)]	Alarm (connector DSUB15 female)
Communication Interface to Indoor Units: [1)]	RS485 (connector DSUB09 male)
Interface to Outdoor Switch Box: [1)]	Unit alarms, RS485 communication interface to units, IF/RF-relay-control, 24V supply (connector MIL-C-26482: MS 3120 E 16-26 P)
Insertion loss compensation:	For each channel attenuation and equalization [2)] offsets can be set to compensate for influences of cable and relay differences in case of a replacement.
Switching:	Manual or Automatic
Delay from unit alarm occurrence until IF/RF relay switching:	Typical 100 ms, max. 400 ms (depending on connected spare unit)
Uplink Power Control Algorithm (only with Option UPC):	Configurable parameters: • Uplink power control on/off, master and per converter • Maximum gain increase for each converter in reference to clear sky gain • Sampling and update period 0.3 to 5.0 seconds • Ratio between decrease of beacon signal and increase of transmission signal for each converter • Clear sky value of DC beacon receiver signal • Sustain period in seconds (up 3600 s) for which the uplink power control keeps the last gain increase value (in case of deep fade conditions where the beacon receiver can lose lock for some period of time) Monitors for: • DC signal from beacon receiver • Calculated attenuation of beacon signal • Current gain increase of transmission signal for each converter
Beacon Receiver Interface (only with Option UPC):	Differential DC Input: Voltage Range DC-In+: 0 … +12 V related to Ground Voltage Range DC-In-: -12 … +12 V related to Ground DC-In+ - DC-In-: 0 … +12 V Input Impedance: approx. 10 kΩ +5 V Output to shift Input Voltage Range to -5 V … +5 V Beacon Receiver Alarm Input: TTL Input, Pull-Up to 5 V with 1 kΩ, suitable for external relay closure to GND Connector DSUB9 male (on provided special cable where necessary)
Temperature Range:	-30 °C … 60 °C operating, -30 °C … 80 °C storage The LC-Display is operational: -20 °C … 60 °C.
Relative Humidity:	<95% non-condensing
Mains Power Input:	2 x 100 … 240 V AC nominal, 90…264 V AC max, 50…60 Hz, Redundant Power Supply, Hot swap
Mains Power Consumption:	Max: 25 VA / 7 W
Mains Power Input Connector:	2 x IEC C14
Mains Fuse:	2 x 2 x 2.0 A time-lag fuse
Dimension and Weight:	483 x 44 x 270 mm³ or with option L 483 x 44 x 470 mm³ (WxHxD), 1 RU (19") approx. 4 kg

Outdoor Switch Box OSB Parameters	
Interface to Indoor Controller:	Unit alarms, RS485 communication interface to units, IF/RF-relay-control, 24V supply (connector MIL-C-26482: MS 3120 E 16-26 S)
M&C Interfaces to Outdoor Converters:	Connector MIL-C-26482: MS 3120 E 14-19 P, unit alarm, RS485 communication interface, 24V supply
IF Connectors:	Impedance: 50 Ω Connector: N female (standard), SMA female (for Multi-channel converters)
RF Connectors to Outdoor Converters, Test Channel:	Impedance: 50 Ω Connectors: SMA female (50K), K (2.92 mm) female (50Ka)
RF Connectors Main Channel:	Impedance: 50 Ω Connectors: SMA female (50K), K (2.92 mm) female (50Ka) WR28 waveguide (Ka with option WR28)
Local Indicators:	LED's for 24V supplies, unit alarms and relay positions
Local Control Possibilities:	Only with disconnected indoor controller: - RS232 M&C interface to converter units with RS232 to RS485 converter - IF- and RF-relay switching to replace main unit 1, main unit 2 or none
Temperature Range:	-30°C … 60°C operating, -30 °C … 80 °C storage
Relative Humidity:	< 100 %
Dimension and Weight:	300 x 150 x 400 mm³ (WxHxD) approx. 8 kg
Degree of Protection:	IP66 (acc. IEC 60529)

[1)] Use either Indoor or Outdoor connectors

[2)] If supported by converters

Specifications are subject to change

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IF and RF Switch Type Parameters without Cabling							
Relays 50K, 50Ka26, 50Ka40	Impedance:	50 Ω					
	Power handling:	1 W (switching)					
50K, 0 … 18 GHz: **50Ka26, 0 … 26.5 GHz:**	Connector:	SMA female					
	Frequency (GHz):	0 … 1	1 … 4	4 … 8	8 … 12.4	12.4 … 18	18 … 26.5
	V.S.W.R. (max.):	1.1	1.15	1.25	1.35	1.6	1.7
	Insertion loss (dB max.):	0.2	0.2	0.3	0.4	0.6	0.8
	Isolation (dB min.):	85	80	70	65	60	55
50Ka40, 0 … 40GHz:	Connector:	K female					
	Frequency (GHz):	0 … 6	6 … 12.4	12.4 … 18	18 … 26.5	26.5 … 40	
	V.S.W.R. (max.):	1.3	1.4	1.5	1.7	1.9	
	Insertion loss (dB max.):	0.3	0.4	0.5	0.7	0.8	
	Isolation (dB min.):	70	60	60	55	50	

Order Information for Outdoor Redundancy System:

RSCM-[Number of Main Units]-[IF Switch Type]-[RF Switch Type]-[Options]-OD
consists of Indoor Controller RSC2-OD/ID and Outdoor Switch Box
Number of Main Units: 1 to 2

Possible options are:

UPC	Uplink Power Control
VFD	VF Display
L	long housing, depth 470 mm
WR28	RF main channel connectors are WR28

Examples:

RSCM-1-50K50K-50Ka40-OD	1:1 system with two 50 Ω 18 GHz IF and one 50 Ω 40 GHz RF relays for 2-Channel-Converters
RSCM-2-50K-50K-UPC-OD	2:1 system with one 50 Ω 18 GHz IF and one 50 Ω 18 GHz RF relays per main unit and Uplink Power Control

Order Information for Controller:

RSC2-OD/ID-[Options]
Indoor controller for use with Outdoor Switch Box or standard indoor relay panel

Possible options are:

UPC	Uplink Power Control
VFD	VF Display
L	long housing, depth 470 mm

Examples:

RSC2-OD/ID-UPC	2:1 Controller with Uplink Power
RSC2-OD/ID-VFD-L	2:1 Controller with VF Display in long housing

Order Information for Outdoor Switch Box:

OSB-[Number of Main Units]-[IF Switch Type]-[RF Switch Type]-[Options]
Number of Main Units: 1 or 2

Possible options are:

WR28	RF main channel connectors are WR28

Examples for Outdoor Switch Box:

OSB-2-50K-50Ka26	OSB for 2:1 redundancy with one 50 Ω 18 GHz IF and one 50 Ω 26 GHz RF relays per main unit
OSB-1-50K50K-50Ka40-WR28	OSB for 1:1 redundancy with two 50 Ω 18 GHz IF and one 50 Ω 40 GHz RF relays and one WR28 RF connector