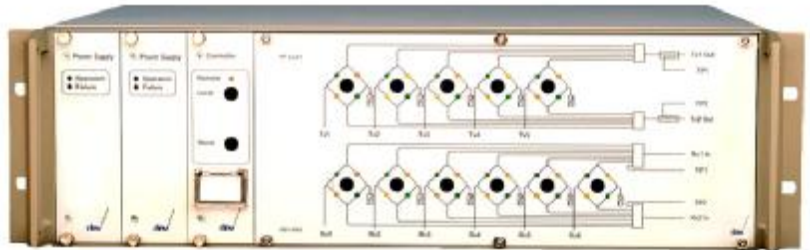


# RF Switching System for Tx and Rx



## DEV 1400

RF Switching Systems from 3 to 18 GHz  
for C-, CX-, X- or Ku-Band

### Features:

- / Modular Architecture: either Receive/Distributing Matrix, Transmit/Combining Matrix or Redundancy Switch
- / Compact housing 3 HU
- / Redundant power supplies with alarming function
- / Meantime to repair: max. 30 minutes due to modularity
- / Ethernet with SNMP

### Application Areas:

- / Satellite Ground Stations
- / Military applications with high flexibility requirements



# DEV 14xx

## RF Switching System for C-, X-, CX or Ku-Band from 3 to 18 GHz

### The Problem

Satellite ground stations need to combine signals to send them via the chosen signal paths through amplifiers to the antenna. For redundancy or flexibility purposes it is necessary to ensure backup for failures in signal transmission.

### DEV Systemtechnik worked out a solution

DEV developed the DEV 1400 Switching System consisting of different plug-in modules depending on the required functionality. The DEV 1400 Switching System is able to work as a Transmit/Combining Matrix from 2:2 to 8:2 as well as a Receive/Distributing Matrix from 2:2 to 2:8. Alternatively, it can work as an RF Redundancy Switch from 2+1 up to 8+1. Different plug-in modules contain the different functionalities. In addition the functionalities can be mixed. The DEV 1400 Switching System connects the up- or downconverters with the desired up- or downlink path.



### The Technical Concept

#### DEV 1400

The DEV 1400 is built for use in satellite ground stations. It switches on the Tx (Transmission) side up to 8 incoming signals to one of two combiners. On the RX (Receiving) side it switches each of the 8 output ports to one of the two incoming signals. The common signal always can be monitored through the test ports.

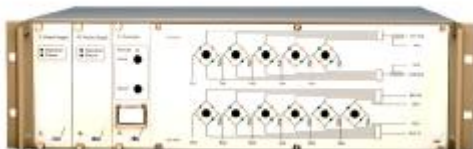
The frequency range depends on the parts used in each individual unit. It is either dedicated for C-, CX, X- or KU-Band so the customer has to define the band in beforehand.

Due to its modular architecture (plug-in modules) different combinations of functionalities are possible:

- Combining an Distributing Matrix
- Combining Matrix and Redundancy Switch
- Distributing Matrix and Redundancy Switch
- Double Redundancy Switch

The unit is delivered with Ethernet control (SNMP) and RS 232.

Front View



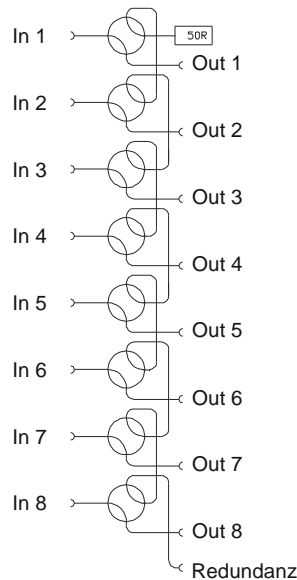
RX Module 2:6





## Examples for application of different plug-in modules:

### DEV 1418 Redundancy Switch 8+1 DC -18 GHz

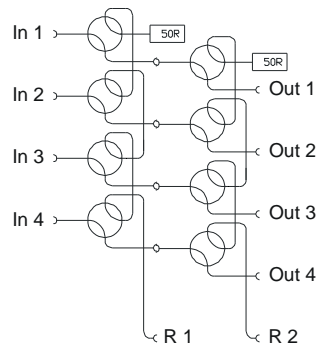


Redundancy Switch to share one set of redundant equipment between 2 and up to 8 standard used signal paths.

The switch is described as input router. To use it as an output router, input and output have to be exchanged.

The 50Ω loads are external so that a ninth path is available for testing purposes.

### DEV 1424 Redundancy Switch 4+2 DC -18 GHz



Redundancy Switch to share two sets of redundant equipment between 2 and up to 4 standard used signal paths.

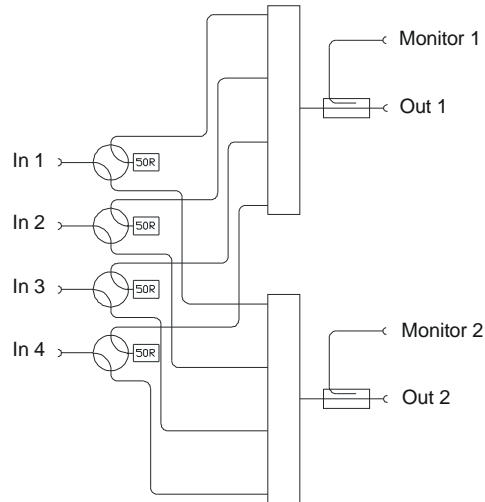
The switch is described as input router. To use it as an output router, input and output have to be exchanged.

The 50Ω load is external so that two more signal paths are available for testing purposes.



## Examples for application of different plug-in modules:

### DEV 1434 Transmit/Combining Matrix 4:2

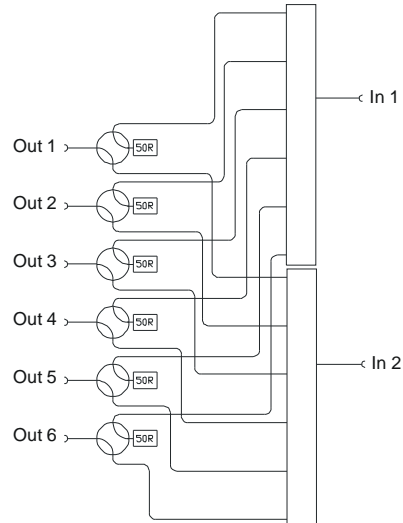


Combining matrix where each input port is either switched to output 1 or output 2. Each input can be switched individually. Both output signals are available at a monitoring port at a 20 dB reduced level to the output.

It is available for the following configurations and frequency band for 2-8 inputs:

- C-Band
- X-Band
- CX Band
- Ku Band

### DEV 1446 Receive/Distributing Matrix



Distributing matrix where each output port is either switched to input 1 or input 2. Each output can be switched individually. Each of the input signals is available at the output level at a monitoring port.

It is available for the following configurations and frequency bands for 2-8 outputs:

- C-Band
- X-Band
- CX Band
- Ku Band



## Technical Data:

### DEV 1400

#### General RF Specifications for all modules:

Connectors: SMA (f)  
Impedance: 50 W  
Input level: < 10 dBm  
Return loss: > 18 dB

**Remote:**  
Remote control:

RS 232 (19200 8 non 1) SIF protocol , Ethernet  
SNMP

Connector:

D-Sub-9(f), RJ 45

#### Alarms:

Two stage alarm signalisation:

Potential free contacts

Alarm connector:

D-Sub-9(m)

Contact load:

60V; 0,3 A

B-Alarm:

One power supply unit does not provide any  
secondary power.

A-Alarm:

Both power supply units do not provide any  
secondary power.

#### Redundant Power Supply:

Redundant power supplies:

100 – 260V AC out of two different phases

Power consumption:

20 VA

#### General Specifications:

Housing:

3 HU, 19" ,420mm depth

Weight:

ca. 8 kg

Environmental conditions:

ETS 300019 Part1-3 Class 3.1

### DEV 141x

Frequency range:

DC –18 GHz

Insertion loss:

< 0,5 dB @ 3 GHz

< 1,0 dB @ 12 GHz

< 1,5 dB @ 18 GHz

Isolation:

> 80 dB @ 3 GHz

> 60 dB @ 18 GHz

Return loss:

> 18 dB

Continuous power:

<50W

Switchable power:

<2W

### DEV 142x

Frequency range:

DC –18 GHz

Insertion loss:

< 1,0 dB @ 3 GHz

< 2,0 dB @ 12 GHz

< 3,0 dB @ 18 GHz

Isolation:

> 80 dB @ 3 GHz

> 60 dB @ 18 GHz

Return loss:

> 18 dB

Continuous power:

<50W

Switched power:

<2W

### Chassis for RF-Switching Systems

### Redundancy Switch 2+1 to 8+1

### Redundancy Switch 2+2 to 4+2



## Technical Data:

### DEV 143x

#### RF Specifications:

Frequency range:  
Insertion loss for the signal path:  
Amplitude frequency response:

Isolation on/off:  
Isolation on/on :  
Continuous power:

#### RF Specifications:

Frequency range:  
Insertion loss for the signal path:  
Amplitude frequency response:

Isolation on/off:  
Isolation on/on:  
Continuous power:

#### RF Specifications:

Frequency range 1:  
Frequency range 2:  
Insertion loss for the signal path:  
Amplitude frequency response:

Isolation on/off:  
Isolation on/on:  
Continuous power:

#### RF Specifications:

Frequency range:  
Insertion loss for the signal path:  
Amplitude frequency response:

Isolation on/off:  
Isolation on/on :  
Continuous power:

### Transmit/Combining Matrix 2:2 to 8:2

#### C-Band Tx

5845...6650 GHz  
<13,5 dB  
0,5 dBss in any 40 MHz interval  
1 dBss in any 500 MHz interval  
>60 dB  
>20 dB  
<33 dBm

#### X-Band Tx

7900 - 8400 GHz  
<13,5 dB  
<0,6 dBss in any 40 MHz interval  
<1,2 dBss in any 500 MHz interval  
>60 dB  
>20 dB  
<33 dBm

#### CX-Band Tx

5845 – 6650 GHz  
7900 - 8400 GHz  
< 15 dB  
<0,6 dBss in any 40 MHz interval  
<1,2 dBss in any 500 MHz interval  
> 60 dB  
> 20 dB  
<33 dBm

#### Ku-Band Tx

13750 - 14500 GHz  
< 15 dB  
<0,6 dBss in any 40 MHz interval  
<1,4 dBss in any 500 MHz interval  
> 60 dB  
> 20 dB  
<33 dBm



## Technical Data:

### DEV 144x

#### RF Specifications:

Frequency range:  
Insertion loss for the signal path:  
Amplitude frequency response

Isolation on/off  
Isolation on/on  
Continuous power:

#### RF Specifications:

Frequency range 1:  
Insertion loss for the signal path:  
Amplitude frequency response

Isolation on/off  
Isolation on/on  
Continuous power:

#### RF Specifications:

Frequency range 1:  
Frequency range 2:  
Insertion loss for the signal path:  
Amplitude frequency response

Isolation on/off  
Isolation on/on  
Continuous power:

#### RF Specifications:

Frequency range:  
Insertion loss for the signal path:  
Amplitude frequency response

Isolation on/off  
Isolation on/on  
Continuous power:

### Receive/Distributing Matrix 2:2 to 2:8

#### C-Band Rx

3400 - 4200 GHz  
< 13,5 dB  
0,5 dBss in any 40 MHz interval  
1 dBss in any 500 MHz interval  
> 60 dB  
> 20 dB  
<33 dBm

#### X-Band Rx

7250 - 7750 GHz  
< 13,5 dB  
<0,6 dBss in any 40 MHz interval  
<1,2 dBss in any 500 MHz interval  
> 60 dB  
> 20 dB  
<33 dBm

#### CX-Band Rx

3400 - 4200 GHz  
7250 - 7750 GHz  
< 15 dB  
<0,6 dBss in any 40 MHz interval  
<1,2 dBss in any 500 MHz interval  
> 60 dB  
> 20 dB  
<33 dBm

#### Ku-Band Rx

10950 - 12750 GHz  
< 15 dB  
<0,6 dBss in any 40 MHz interval  
<1,4 dBss in any 500 MHz interval  
> 60 dB  
> 20 dB  
<33 dBm



## Order Information

DEV 1400	Chassis for RF Switching System
DEV 1412	Redundancy Switch 2+1
DEV 1414	Redundancy Switch 4+1
DEV 1416	Redundancy Switch 6+1
DEV 1418	Redundancy Switch 8+1
DEV 1422	Redundancy Switch 2+2
DEV 1423	Redundancy Switch 3+2
DEV 1424	Redundancy Switch 4+2
DEV 1432/X	Transmit/Combining Matrix 2:2
DEV 1432/C	Transmit/Combining Matrix 2:2
DEV 1432/CX	Transmit/Combining Matrix 2:2
DEV 1432/Ku	Transmit/Combining Matrix 2:2
DEV 1434/X	Transmit/Combining Matrix 4:2
DEV 1434/C	Transmit/Combining Matrix 4:2
DEV 1434/CX	Transmit/Combining Matrix 4:2
DEV 1434/Ku	Transmit/Combining Matrix 4:2
DEV 1436/X	Transmit/Combining Matrix 6:2
DEV 1436/C	Transmit/Combining Matrix 6:2
DEV 1436/CX	Transmit/Combining Matrix 6:2
DEV 1436/Ku	Transmit/Combining Matrix 6:2
DEV 1438/X	Transmit/Combining Matrix 8:2
DEV 1438/C	Transmit/Combining Matrix 8:2
DEV 1438/CX	Transmit/Combining Matrix 8:2
DEV 1438/Ku	Transmit/Combining Matrix 8:2
DEV 1442/X	Receive/Distributing Matrix 2x2
DEV 1442/C	Receive/Distributing Matrix 2x2
DEV 1442/CX	Receive/Distributing Matrix 2x2
DEV 1442/Ku	Receive/Distributing Matrix 2x2
DEV 1444/X	Receive/Distributing Matrix 2x4
DEV 1444/C	Receive/Distributing Matrix 2x4
DEV 1444/CX	Receive/Distributing Matrix 2x4
DEV 1444/Ku	Receive/Distributing Matrix 2x4
DEV 1446/X	Receive/Distributing Matrix 2x6
DEV 1446/C	Receive/Distributing Matrix 2x6
DEV 1446/CX	Receive/Distributing Matrix 2x6
DEV 1446/Ku	Receive/Distributing Matrix 2x6
DEV 1448/X	Receive/Distributing Matrix 2x8
DEV 1448/C	Receive/Distributing Matrix 2x8
DEV 1448/CX	Receive/Distributing Matrix 2x8
DEV 55-0015	Blanking Plate 3HU 32TE

*Technical specifications are subject to change*



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