The Experts in RF Signal Handling

Universal Switch Chassis

Products:

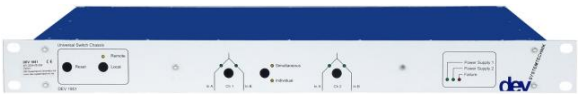
DEV 1951 -	Dual Channel Universal Switch Chassis
DEV 11-0005 -	DPST Switch Card with Monitor Port, CATV-Band
DEV 11-0009 -	DPST Switch Card, DC…2,5 GHz, 50 Ohm, N (f)
DEV 11-0010 -	DPST Sensing Switch Card, L-Band, 75 Ohm
DEV 11-0011 -	DPST Sensing Switch Card, CATV-Band, 75 Ohm
DEV 11-0024 -	DPST Relay Card with Termination, DC…18 GHz
DEV 11-0027 -	DPDT Relay Card, DC…18 GHz, 50 Ohm
DEV 11-0028 -	DPST Switch Card, L-Band, 75 Ohm
DEV 11-0033 -	DPST Relay Card, DC…18 GHz, 50 Ohm
DEV 11-0050 -	DPST Switch Card, DC…2,5 GHz, 50 Ohm, SMA (f)
DEV 11-0057 -	DPDT Switch Card, DC…862 MHz, 75 Ohm
DEV 11-0058 -	DPST Sensing Switch Card, L-Band, 50 Ohm
DEV 14-0001 -	ASI Redundancy Switch Card
DEV 14-0007 -	MEIO Card, Sub-D 25 (f)
DEV 14-0008 -	MEIO Card, 2x Sub-D 9 (f)
DEV 14-0014 -	Ethernet Redundancy Switch Card

Features:

- Chassis can be equipped with one or two equal or different Switching Cards, thus providing high switching Flexibility
- Local Interface and various Remote Interfaces for Control and Surveillance
- Dual Redundant Power Supplies with Status Alarm Output

Application Areas:

- Satellite Ground Stations
- Cable Head End Stations
- Transmission Studios



Front DEV 1951

Rear DEV 1951 equipped with 2x DEV 11-0005

The Situation

Systems integrators need a high flexibility in their switching solutions to match the requirements of the target application. They need to be able to decide at short notice if there is a need e.g. for a redundancy switch with one or with two switching cards or for a switching solution with other functionality.

DEV worked out a Solution

To enable the customer to be as flexible as possible, DEV has developed a modular design principle for a universal switch chassis. The DEV 1951 can be used in a single channel or a dual channel configuration.

With this modularity the customer can decide according to the specific requirements which card is to be applied.

The Technical Concept

The DEV 1951 can be equipped with one or two switching cards which can be operated independently or simultaneously.

If one or two sensing switch cards are installed, the switching can be even performed by the DEV 1951 autonomously.

Aside from the local operation at the instrument, the DEV 1951 can be controlled via the optional Web Interface, enabling a remote access to operational elements of the chassis.

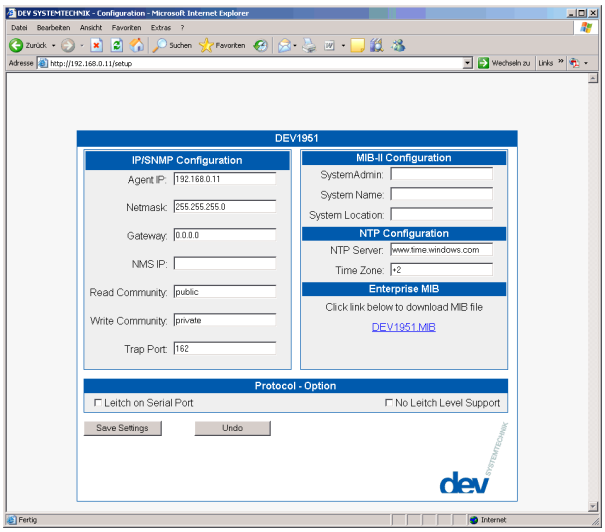
The digital interface of the DEV 1951 provides basic remote switching functionality, e.g. the control via a PLC.

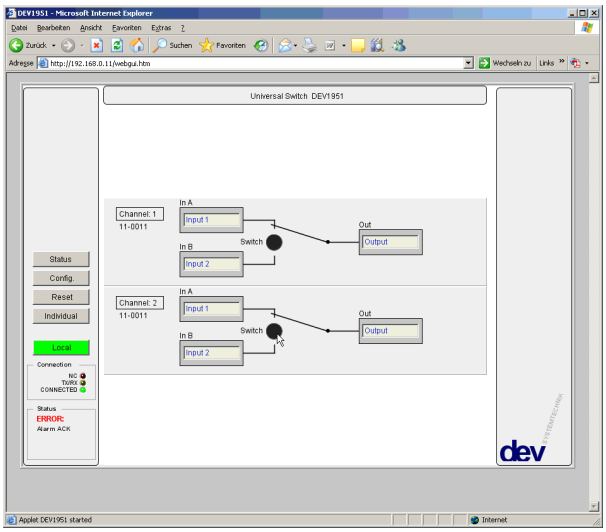
The implementation of remote control protocols as Sandar Prosan, Leitch and SNMP permits surveillance and control of the instrument via external M&C systems.

There is available a variety of different switching cards. Depending on the required application the customer decides which of the cards and card combinations will serve him best. Only the DPST Sensing Switch cards and the MEIO- (Multi Event Input/Output-) cards cannot be mixed with other cards.

A chassis equipped with a single switching card only, can be upgraded at any time with a second card of the same or a different type at the customers' premises and by the customer himself.

The DEV 1951 Web Front End and Web Interface





The DEV 1951 Web Front End

The DEV 1951 Web Front End permits basic surveillance and easy setup possibilities for the unproblematic integration of the instrument within the customer network environment.

As an example the Instrument Configuration page of the DEV 1951 Web Front End is shown.

Within this window it is possible to change the settings of the IP and the SNMP configuration, to define a time server, to download the instruments MIB and even to change protocol options of the instrument. The latter permits for instance, that the protocol supported by the serial interface of the DEV 1951 can be switched between Sandar Prosan protocol and Leitch protocol.

After clicking on the Save Settings button and after confirmation, the instrument will reboot making the new settings effective.

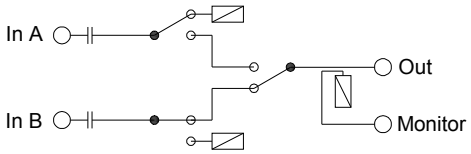
The DEV 1951 Web Interface

The optional Web Interface is a remote extension of the local control of the instrument and enables the simultaneous use of the DEV 1951 from different locations. With up to 7 additional software licenses it is possible to control the instrument in that manner.

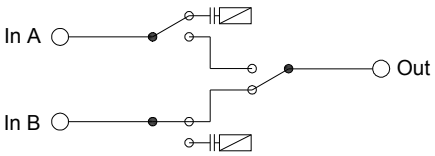
In the middle of the Web Interface there is a symbolic representation of the DEV 1951 regarding its card population and the switching status of the installed cards. If the instrument is in Local Mode, it is possible to perform switching actions by clicking on the corresponding black dots.

On the left side of the Web Interface several buttons are located. Clicking on the Status button will open the Error Log window, which informs about the instrument status and which enables the acknowledgement of pending errors. The Config button permits the assignment of labels for the different switching card ports. And clicking on the green Local button will change the instruments operation mode.

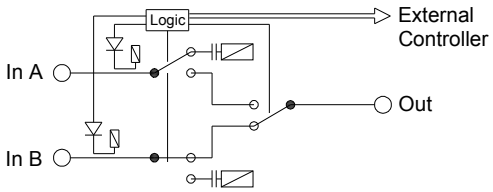
Application of the different Switch Cards



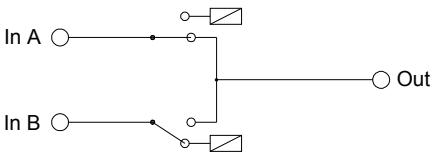
DEV 11-0005
DPST Switch Card
For CATV-Band applications (47…862 MHz) in 75 Ohm with BNC connectors.
The output port can be switched to one of two input ports.
A monitoring output is available for measurement purposes.



DEV 11-0009 and DEV 11-0050
DPST Switch Card
For the frequency range DC…2,5 GHz in 50 Ohm with N connectors (DEV 11-0009) or with SMA connectors (DEV 11-0050).
The common port can be switched to one of two input-/output ports.

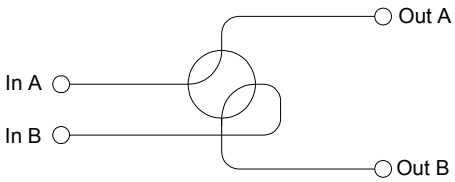


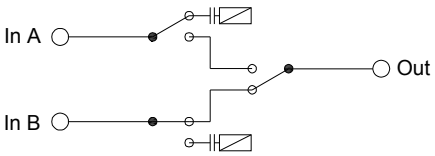
DEV 11-0010, DEV 11-0011 and DEV 11-0058
DPST Sensing Switch Card
For L-Band applications (DC, 950…2150 MHz, DEV 11-0010 (75 Ohm, Precision F) and DEV 11-0058 (50 Ohm, SMA))
or CATV-Band applications (DC, 47…862 MHz, DEV 11-0011(75 Ohm, Precision F)).
Two input ports can be switched to one output port. Both input channels are individually monitored for the user defined RF threshold level. Alarming is provided. The instrument is able to control the switching autonomously. The card is able to pass an external 10 MHz reference signal.



DEV 11-0024
DPST Relay Card
For applications in the frequency range DC…18 GHz in 50 Ohm with SMA connectors.
The output port of the high performance relay card can be switched to one of two input ports.
The port which is not fed to the output is terminated internally.

Application of the different Switch Cards (cont.)



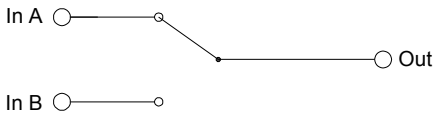


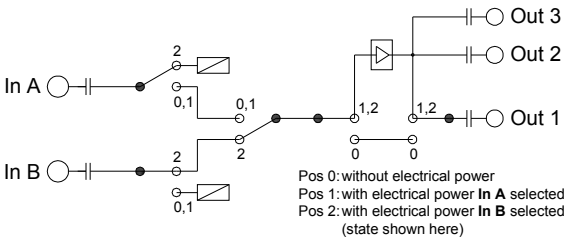
DEV 11-0027 and DEV 11-0057
DPDT Card (Cross-Over Switch)

For applications in the frequency range DC…18 GHz in 50 Ohm with SMA connectors (DEV 11-0027) or DC…862 MHz in 75 Ohm with BNC connectors (DEV 11-0057).
Input A of the card is either connected to Output A or to Output B. In the latter case Input B is connected to Output A otherwise to Output B.

DEV 11-0028
DPST Switch Card

For L-Band applications (DC, 950…2150 MHz) in 75 Ohm with Precision F connectors.
The output port can be switched to one of two input ports. The card is able to pass an external 10 MHz reference signal.





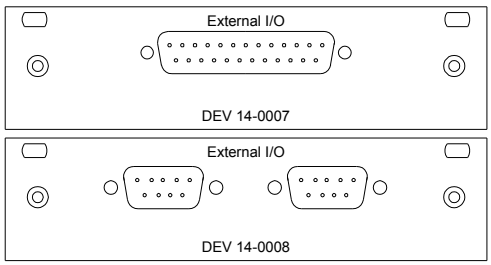
DEV 11-0033
DPST Relay Card

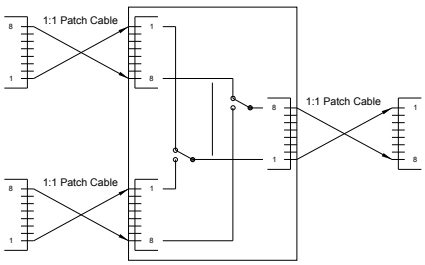
For applications in the frequency range DC…18 GHz in 50 Ohm with SMA connectors.
The output port of the high performance relay card can be switched to one of two input ports.

DEV 14-0001
ASI Redundancy Switch Card

For ASI signal applications in 75 Ohm with BNC connectors.
The card combines a 2:1 input selection and a 1:3 active distribution amplifier for ASI signals. One of two inputs feeds the three parallel outputs.

Application of the different Switch Cards (cont.)





DEV 14-0007 and DEV 14-0008

MEIO Card for Potential Free Contacts

If equipped with MEIO- (Multi Event Input/Output-) Card(s), the DEV 1951 can be used for the remote surveillance and control of DEV instruments which are not equipped with a microcontroller.

The DEV 14-0007 has a female Sub-D 25 connector and the DEV 14-0008 has two female Sub-D 9 connectors.

Each pin of a connector can be defined as a source or a sink, i.e. if the two potential free contacts of a relay are connected to a source pin and a sink pin, the state of the relay can be detected. The free configuration ability of each pin provides flexibility for various applications.

DEV 14-0014

Ethernet Redundancy Switch Card

For Ethernet switching applications.

The card is equipped with three RJ-45 Ethernet connectors, in order to be able to select physically one of two routes.

Technical Data

DEV 1951 Dual Channel Universal Switch Chassis

Capacity	
Number of slots	2
Remote Communication	
Interfaces, connectors	Ethernet, RJ-45 serial interface RS 232 (optional RS 422/RS 485), Sub-D-9 (f) digital interface, Sub-D-9 (f)
Remote control & surveillance, interface	-via (optional) Web Interface, Ethernet; -via Sandar Prosan protocol, serial interface; -via SNMP protocol, Ethernet; -via Leitch protocol, Ethernet/Telnet (2x) & additionally via serial interface instead of Sandar Prosan protocol.
Alarms	
Two stage alarm signalisation for power line failure	Potential free contacts
Alarm connector	Sub-D-9 (m)
Contact load	60 V; 0,3 A
B-Alarm	One power supply unit does not deliver any secondary power.
A-Alarm	Both power supply units do not deliver any secondary power.
Summary Alarm	Via remote interface and via potential free contacts
Redundant Power Supply	
Redundant power supplies	100…240 V AC supplied by two different lines or -36…-60 V DC supplied by two different lines (Option 14)
Power consumption	<40 VA
General Specifications	
Housing	19“ (483 mm), 1 RU (44 mm), 260 mm depth
Weight	~5 kg
Environmental conditions	ETS 300019 Part 1-3 Class 3.1

Technical Data (cont.)

DEV 11-0005 DPST Switch Card with Monitor Port, CATV-Band, 75 Ohm, BNC (f)

RF Specifications

Frequency range	47…862 MHz
Impedance, connectors	75 Ohm, BNC (f)
Damage level	+30 dBm
Return loss selected path	>23 dB @ 70 MHz >18 dB @ 140 MHz >14 dB @ 700 MHz, typical 16 dB
Return loss not selected path	>23 dB @ 70 MHz >18 dB @ 140 MHz >14 dB @ 700 MHz, typical 16 dB
Insertion loss	<2 dB
Isolation on/off	>80 dB @ 140 MHz >55 dB @ 700 MHz
Relay type	failsafe
Switching cycles	10E6

Monitoring Port

Impedance, connector	75 Ohm, BNC (f)
Return loss	>18dB
Insertion loss	= output level - 20±3 dB

DEV 11-0009 DPST Switch Card, DC…2,5 GHz, 50 Ohm, N (f)
DEV 11-0050 DPST Switch Card, DC…2,5 GHz, 50 Ohm, SMA (f)

RF Specifications

Frequency range	DC…2,5 GHz	
Impedance, connectors	50 Ohm, N (f) 50 Ohm, SMA (f)	(DEV 11-0009) (DEV 11-0050)
Damage level	+30 dBm	
Return loss selected path	>14 dB, typical 16 dB	
Return loss not selected path	>14 dB, typical 16 dB	
Insertion loss	<2 dB	
Isolation on/off	>50 dB	
Relay type	latching	
Contact rating	28 V DC, 0,25 A	
Switching cycles	>10E6 >10E5	(no DC) (28 V DC, 0,25 A)

Technical Data (cont.)

DEV 11-0010 DPST Sensing Switch Card, L-Band, 75 Ohm, Precision F (f)
DEV 11-0011 DPST Sensing Switch Card, CATV-Band, 75 Ohm, Precision F (f)
DEV 11-0058 DPST Sensing Switch Card, L-Band, 50 Ohm, SMA (f)

RF Specifications

Frequency range	DC, 47…862 MHz DC, 950…2150 MHz	(DEV 11-0011) (DEV 11-0010, DEV 11-0058)
Impedance, connectors	50 Ohm, SMA (f) 75 Ohm, Precision F (f)	(DEV 11-0058) (DEV 11-0010, DEV 11-0011)
Damage level	+10 dBm +15 dBm	(DEV 11-0011) (DEV 11-0010, DEV 11-0058)
Nominal input level	0 dBm	
Return loss selected path	>14 dB, typical 16 dB	
Return loss not selected path	>14 dB, typical 16 dB	
Insertion loss	<2 dB	
Frequency response	±0,5 dB	
Switching cycles	>10E6	(no DC)

RF Sensing

Adjustable threshold level	-10 dBm > threshold level > -50 dBm -10 dBm > threshold level > -60 dBm	(DEV 11-0010) (DEV 11-0011, DEV 11-0058)
DEV factory setting	-30 dBm	

DEV 11-0024 DPST Relay Card with Termination, DC…18 GHz, 50 Ohm, SMA (f)
DEV 11-0027 DPDT (Cross-Over Switch) Relay Card, DC…18 GHz, 50 Ohm, SMA (f)
DEV 11-0033 DPST Relay Card, DC…18 GHz, 50 Ohm, SMA (f)

RF Specifications

Frequency range	DC…18 GHz	
Impedance, connectors	50 Ohm, SMA (f)	
Input level	<+27 dBm <+30 dBm	(DEV 11-0024) (DEV 11-0027, DEV 11-0033)
Return loss selected path	>14 dB, typical 16 dB	
Return loss not selected path	>14 dB, typical 16 dB	
Insertion loss	<0,5 dB	
Isolation on/off	>60 dB	
Relay type	latching	
Contact rating	28 V DC, 0,25 A	
Switching cycles	>10E6 >10E5	(no DC) (28 V DC, 0,25 A)

Technical Data (cont.)

DEV 11-0028 DPST Switch Card, L-Band, 75 Ohm, Precision F (f)

RF Specifications

Frequency range	DC, 950…2150 MHz	
Impedance, connectors	75 Ohm, Precision F (f)	
Damage level	+15 dBm	
Nominal input level	0 dBm	
Return loss selected path	>14 dB, typical 16 dB	
Return loss not selected path	>14 dB, typical 16 dB	
Insertion loss	<2 dB	
Frequency response	±0,5 dB	
Switching cycles	>10E6	(no DC)

DEV 11-0057 DPDT (Cross-Over) Switch Card, CATV-Band, 75 Ohm, BNC (f)

RF Specifications

Frequency range	DC…862 MHz	
Impedance, connectors	75 Ohm, BNC (f)	
Damage level	+30 dBm	
Return loss	>18 dB >14 dB, typical 16 dB	(In A – Out A, In B – Out B) (In A – Out B, In B – Out A)
Insertion loss	<1 dB	
Isolation	>40 dB	
Relay type	failsafe	
Switching cycles	10E6	

DEV 14-0001 ASI Redundancy Switch Card, 75 Ohm, BNC (f)

Signal type	ASI / 0,8 V
Transmission rate	30…540 MBit/s
Number of inputs	2
Number of outputs	3
Impedance, connectors	75 Ohm, BNC (f)
Input level	100…800 mV
Output level	>600 mV
Isolation on/off	>50 dB
Relay type	failsafe
Switching cycles	10E6

Technical Data (cont.)

DEV 14-0007 MEIO Card for Potential Free Contacts, Sub-D 25 (f)
DEV 14-0008 MEIO Card for Potential Free Contacts, 2x Sub-D 9 (f)

Number of I/O pins	25 2x 9	(DEV 14-0007) (DEV 14-0008)
Connectors	Sub-D 25 (f) 2x Sub-D 9 (f)	(DEV 14-0007) (DEV 14-0008)
Input voltage per sink pin	<14 V DC	
Input current per sink pin	<10 mA	
Output voltage per source pin	12 V DC	
Output current per source pin	<1 mA	

DEV 14-0014 Ethernet Redundancy Switch Card, RJ-45

Transmission rate	<100 MBit/s
Connectors	RJ-45

Order Information

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DEV 11-0010	DPST Sensing Switch Card, L-Band, 75 Ohm, Precision F (f)
DEV 11-0011	DPST Sensing Switch Card, CATV-Band, 75 Ohm, Precision F (f)
DEV 11-0024	DPST Relay Card w/ Termination, DC…18 GHz, 50 Ohm, SMA (f)
DEV 11-0027	DPDT Relay Card, DC…18 GHz, 50 Ohm, SMA (f)
DEV 11-0028	DPST Switch Card, L-Band, 75 Ohm, Precision F (f)
DEV 11-0033	DPST Relay Card, DC…18 GHz, 50 Ohm, SMA (f)
DEV 11-0050	DPST Switch Card, DC…2,5 GHz, 50 Ohm, SMA (f)
DEV 11-0057	DPDT Switch Card, DC…862 MHz, 75 Ohm, BNC (f)
DEV 11-0058	DPST Sensing Switch Card, L-Band, 50 Ohm, SMA (f)
DEV 14-0001	ASI Redundancy Switch Card, 75 Ohm, BNC (f)
DEV 14-0007	MEIO Card for Potential Free Contacts, Sub-D 25 (f)
DEV 14-0008	MEIO Card for Potential Free Contacts, 2x Sub-D 9 (f)
DEV 14-0014	Ethernet Redundancy Switch Card, RJ-45
DEV 57-0017	Blanking Plate (to cover an empty slot)
DEV 33-0001	Web Interface License
Option 14	-36…-60V DC supply voltage
Option 52	RS 422 instead of RS 232
Option 53	RS 485 instead of RS 232

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