The Experts in RF Signal Handling

Minimum Space – Maximum Performance!

Product:

DEV 2180 - L-Band Distribution System

Features:

- Versatile 4 RU Chassis which can be equipped individually
- Various L-Band Distribution Amplifier (DA) Options and Matrix Switch Options are available
- Inputs and Outputs are available in 50 Ohm (DA Options) and 75 Ohm (DA Options and Matrix Switch Options)
- LNB Bias Feeding, Monitoring Output and RF Sensing for each Amplifier Module
- Bias Current Monitoring for DA Options (standard) and Matrix Switch Options (optional) with Alarm Function
- Redundant AC or DC Power Supplies with Status Alarm Output

Application Areas:

- Large Cable Head-Ends
- Large Satellite Ground Stations
- Play Out Centers

*Front DEV 2180 (with 12 Amplifier Modules & 4 * Option 33)*

Rear DEV 2180 (Sample Configuration)

Typical Large Downlink Head-End Challenges

Large cable head-ends need to be capable of receiving L-Band feeds from many satellites.

Typical applications require a large number of L-Band receivers to be fed from a number of satellites, with each satellite providing four L-Band signals.

Some receivers may require only one of the signals from a specific satellite; some can require more flexibility, such as the ability to independently select from up to all four L-Band signals of a specific satellite.

Introducing DEV's Solution

The DEV 2180 is the ideal unit for minimizing space requirement- while providing maximum performance, by using multiple distribution amplifier options or matrix switch options in a compact chassis, tailored to the specific satellite and channel listing requirements.

The Technical Concept

The DEV 2180 L-Band distribution system can be flexibly configured.

Two types of amplifier modules are used for the different applications; all modules provide a monitoring port, bias feeding, and RF Sensing for monitoring the input signal. It is possible to install up to 12 amplifier modules at the front side of the instrument, which feed the splitters and/or matrix switches located at the rear side of the chassis.

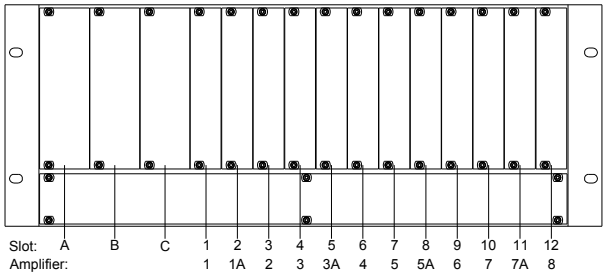
There are available different L-Band distribution amplifier options (1:8, 1:16, in 50 Ohm or in 75 Ohm), which provide LNB bias current monitoring by default.

Alternatively, the chassis can be equipped with various matrix switch options. Each output of a matrix switch can select any of the two or four input signals. The matrix switch options are available with 16, 32, 48, or 64 outputs.

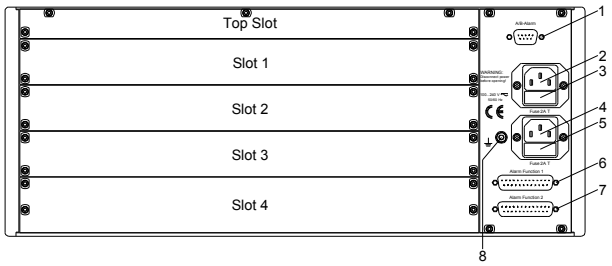
For the matrix switch options, LNB bias current monitoring modules are available as an option.

Due to the modular design of the DEV 2180, it is possible to exchange the modules on the front side, whilst the unit is fitted in the rack, without the need to unplug the cables from the rear side or to remove the unit.

DEV 2180 System Configuration



Front Slot Configuration DEV 2180



Rear Slot Configuration DEV 2180

To configure your DEV 2180 count the front side slots and rear side slots of your desired setup.

Front Side

The instrument is equipped with up to three power supply modules (A)…(C), which are located on the left side. By default, two power supply modules are installed, it is recommended to equip the instrument with a third power supply (Option 18), if eight or more amplifier modules are installed.

Right to the power supply modules, the twelve available slots (1)…(12) for amplifier modules (distribution amplifier modules or matrix amplifier modules) are located, counted and installed from left to right. The naming of the amplifier modules differs, since it is possible to equip an instrument with applied matrix switch options with the optional bias monitoring modules, which require a slot per two matrix amplifier modules. The bias monitoring modules are installed at the amplifier locations, which are named with an “A” appended, i.e. “1A”, “3A”, “5A”, and “7A”. Naturally, this reduces the maximum number of matrix amplifier modules per chassis to eight.

Rear Side

On the right side, the power plugs ((2) & (4)), the alarm connectors ((1), (6) & (7)), and the grounding screw (8) are installed.

Five horizontal slots are available; the Top Slot is reserved for the inputs of the instrument.

Slots 1…4 are intended for the outputs of the instrument, i.e. splitters or matrix switches are installed here. A matrix switch with 16 outputs requires one slot; larger matrix switches need the corresponding number of slots.

Alternatively a slot can be used for the outputs of a distribution amplifier option, up to four 1:8 splitters or two 1:16 splitters can be located within one slot.

Note, that the maximum number of 1:8 splitters is restricted to 12 per chassis, due to the number of available slots at the front side.

The assembly of inputs in the top cover will start from left to right, following the numbering of the front side.

The assembly of outputs starts in Slot 1 with the splitter (or matrix switch) with the maximum number of output ports, down to the splitter (or matrix switch) with the lowest number of output ports.

Technical Data

DEV 2180 L-Band Distribution System – Common Technical Data

RF Specifications

Frequency range	950…2150 MHz

Capacity

Front side	Up to 12 vertical slots
Rear side	Up to 4 horizontal slots plus Top Slot for the inputs

Monitoring Port

Impedance, connector	50 Ohm, SMA (f)
Return loss	>18 dB

RF-Sensing

Adjustable threshold level	0 dBm > threshold level > -45 dBm (distribution amp. modules) -15 dBm > threshold level > -45 dBm (matrix amp. modules) (DEV factory setting: -30 dBm)
Alarm threshold adjustment	Threshold level is adjustable for each amplifier module: • for distribution amplifier modules: using a standard terminal application via the RS 232 interfaces (Sub-D 9 (f) connectors) at the front side of the instrument; • for matrix amplifier modules: using the potentiometers at the front side of the modules.
Alarm indication	via LED and via potential free contacts

Bias

Bias	15+3/-0 V; max. 500 mA (per amplifier module), total max. 1.5 A (per chassis)

Bias Current Monitoring for Distribution Amplifier Modules

Adjustable level setting:	
• Upper alarm level	100…500 mA (DEV factory setting: 350 mA)
• Lower alarm level	0…300 mA (DEV factory setting: 100 mA)
Alarm thresholds adjustment	Upper and lower alarm level is adjustable for each amplifier module using a standard terminal application via RS 232 interface(s) (Sub-D 9 (f) connector(s)) at the front side of the instrument.
Alarm indication	via LED and via potential free contacts

Bias Current Monitoring for Matrix Amplifier Modules (Option 33)

Level setting:	
• Upper alarm level	100…500 mA (DEV default setting: 350 mA)
• Lower alarm level	0…300 mA (DEV default setting: 100 mA)
Alarm indication	via LED and via potential free contacts

Technical Data (cont.)

Redundant Power Supply

Number of power supply module slots, number of power supply modules	3 power supply slots available, equipped with 2 (standard) or 3 (Option 16) power supply modules
Power line redundancy	190…240 V AC supplied by two different lines (standard) or 90…120 V AC supplied by two different lines (Option 18) or -36…-60 V DC supplied by two different lines (Option 14)
Power consumption	<120 VA

Potential Free Contacts

Alarm connectors	2 * Sub-D-25 (m) & 1 * Sub-D-9 (m)
Contact load	60 V; 300 mA

Two Stage Alarm Signalization for Power Line Failure:

B-Alarm	One power supply unit does not deliver any secondary power.
A-Alarm	All power supply units do not deliver any secondary power.

Alarm Signalization for RF Sensing and/or Bias Current and/or secondary power fail:

Amplifier Alarm	(for distribution amplifier modules): RF level below threshold level and/or bias current not within bias current monitoring interval and/or secondary power fail.
RF Sensing Alarm	(for matrix amplifier modules): RF level below threshold level and/or secondary power fail.
Bias Alarm	(for matrix amplifier modules with Option 33): Bias current not within bias current monitoring interval.

General Specifications

Housing	19“ (483 mm), 4 RU (178 mm), ~490 mm depth
Weight	~10 kg
Environmental conditions	ETS 300019 Part 1-3 Class 3.1

Technical Data (cont.)

DEV 2180 L-Band Distribution System – Distribution Amplifier Options

RF Specifications

Number of outputs	8 or 16 per DA option	
Impedance, connectors	50 Ohm, SMA (f) 75 Ohm, Precision F (f)	(for 50 Ohm inputs/outputs) (for 75 Ohm inputs/outputs)
Damage level	+10 dBm @ 50 Ohm / 120 dBµV @ 75 Ohm	
Nominal input level	–10 dBm @ 50 Ohm / 85 dBµV @ 75 Ohm	
Return loss	>14 dB	
Insertion loss	0±3 dB	(for 1:8 and 1:16 DAs)
Frequency response full band	±1.0 dB	(for 1:8 and 1:16 DAs)
Frequency response in any 36 MHz interval	±0.3 dB	(for 1:8 and 1:16 DAs)
Isolation between output ports	>25 dB	
Intermodulation distortion	<-40 dBc @ -10 dBm	
Group delay	<5 ns	
Noise figure	<10 dB	

Unused output ports need to be terminated!

DEV 2180 L-Band Distribution System – Matrix Switch Options

RF Specifications

Number of inputs	2 or 4 per matrix switch option	
Number of outputs	16, 32, 48, or 64 per matrix switch option	
Impedance, connectors	75 Ohm, Precision F (f)	
Damage level	120 dBµV	
Nominal input level	85 dBµV	
Return loss	>14 dB	
Insertion loss	3±3 dB	
Frequency response	±0.6 dB	(in any 36 MHz interval)
Isolation between input ports	>25 dB	
Isolation between output ports	>25 dB	
Intermodulation distortion	<-35 dBc @ 85 dBµV	
IMA_3 output level	<89 dBµV	
IMA_2 output level	<87 dBµV	
Group delay	<5 ns	
Noise figure	<10 dB	

Input Selection

Switch control	14 V, 18 V and 0 Hz, 22 kHz at the output

Unused output ports need to be terminated!

Order Information

DEV 2180 Chassis for L-Band Distribution System

Please select number and type of options to be installed in the chassis from the following table. Please consider the slot requirements on the front side and the rear side of the chassis, feel free to contact DEV Systemtechnik if you need assistance!

Please order Option 18, if the instrument is to be supplied with AC ranging from 90…120 V AC.

Options	Inputs			Outputs			Slot Requirements	
	#	Impedance	Connector	#	Impedance	Connector	Front	Rear
Distribution Amplifier Options								
Option 8/50	1	50 Ohm	SMA (f)	8	50 Ohm	SMA (f)	1	1 / ¼
Option 8/75	1	75 Ohm	F (f)	8	75 Ohm	F (f)	1	1 / ¼
Option 16/50	1	50 Ohm	SMA (f)	16	50 Ohm	SMA (f)	1	1 / ½
Option 16/75	1	75 Ohm	F (f)	16	75 Ohm	F (f)	1	1 / ½
Matrix Switch Options								
Option 2x16/75	2	75 Ohm	F (f)	16	75 Ohm	F (f)	2	1
Option 2x32/75	2	75 Ohm	F (f)	32	75 Ohm	F (f)	2	2
Option 2x48/75	2	75 Ohm	F (f)	48	75 Ohm	F (f)	2	3
Option 2x64/75	2	75 Ohm	F (f)	64	75 Ohm	F (f)	2	4
Option 4x16/75	4	75 Ohm	F (f)	16	75 Ohm	F (f)	4	1
Option 4x32/75	4	75 Ohm	F (f)	32	75 Ohm	F (f)	4	2
Option 4x48/75	4	75 Ohm	F (f)	48	75 Ohm	F (f)	4	3
Option 4x64/75	4	75 Ohm	F (f)	64	75 Ohm	F (f)	4	4
Other Options								
Option 14	Supply voltage -48 V DC instead of AC supply							
Option 16	3rd power supply module, no additional slot requirements, since the 3rd power supply slot is already provided. Option 16 is recommended for instruments with 8 or more amplifier modules.							
Option 18	Supply voltage 90…120 V AC instead of 190…240 V AC							
Option 33	Bias monitoring (to be ordered in combination with matrix amplifier modules only, one Option 33 per two matrix amplifier modules).							

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