

L-Band Combining Matrix ARCHIMEDES



The final product may vary from the above image depending on the options selected.

Products

DEV 1976 mxn Combining Matrix ARCHIMEDES; 850...2450 MHz; 75 Ohm, F (f)
Standard Configurations: 32x22, 32x44, 64x22 or 64x44
Upgradeable Versions available

Features

- Up to 64x44 Combining Matrix in 4 RU
- Various Input and Output Modules
 - 75 Ohm, F (f) or BNC (f), or 50 Ohm, SMA (f) or BNC (f)
 - Optical Inputs
- Variable Gain (MGC or AGC)
- Variable Slope
- RF Sensing
- LNB Powering, switchable 13/18 V and 22 kHz Tone
- Full Color Multi-Touch Display as Local User Interface
- Integrated TV-Receiver
- Integrated Spectrum Analyzer
- Controller Redundancy
- Power Supply Redundancy
- Secure Lock Operation
- SNMP Support
- Easy to use DEV Web Interface
- Signal Recording and Data Backup Feature

Technical Data

DEV 1976/mxn

Combining Matrix ARCHIMEDES

Capacity

Number of	DEV 1976/32x22:	32x22
Inputs (m) x Outputs (n)	DEV 1976/32x44:	32x44
	DEV 1976/64x22:	64x22
	DEV 1976/64x44:	64x44
	(and Field upgradeable Matrices)	

RF Specifications

Frequency Range	850...2450 MHz
Impedance, Connectors	75 Ohm, precision F (f)
Return Loss	typ. 14 dB, min. >12 dB
Damage Level	+25 dBm
Operational Input Level	<-5 dBm
Variable Gain	Input: -5...5 dB Output: -32...31 dB
Flatness	typ. ± 2.0 dB (over entire Band) ± 0.75 dB (in any 36 MHz Interval)
Isolation	Input/Input, Output/Output: typ. 60 dB Input/Output (Crosstalk): typ. 60 dB Off: typ. 60 dB
Intermodulation Distortion ¹	<-40 dBc (two Tones @ -8 dBm)
Group Delay Distortion	<1 ns (in any 36 MHz Interval)
Noise Figure	<37 dB; Input gain: 5 dB
OIP ₃ ¹	>12 dBm
OP1dB	2 dBm
Relay Type	Semiconductor

Remote Communication

Interface (Connector)	Ethernet (RJ-45)
Remote Control & Surveillance (Interface)	• via Web Interface (Ethernet) • via SNMP (Ethernet)

Redundant Power Supply

Supply Voltage	100...240 V AC supplied by two different Lines
Power Consumption	<250 VA

General Specifications

Size	19" (483 mm) Width, 4 RU (178 mm) Height, 631 mm Depth
Weight	~18 kg (32x22), ~20 kg (32x44, 64x22), ~25 kg (64x44)
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E

Note 1: Maximum number of combined inputs is 8

Option 20I Change 4 Input Channels to 50 Ohm, SMA (f)

Option 20O Change 4 Output Channels to 50 Ohm, SMA (f)

Per Option 20, one module with four channels is equipped with 50 Ohm, SMA (f) connectors instead of 75 Ohm, F (f) connectors.

Option 21I Change 4 Input Channels to 75 Ohm, BNC (f)

Option 21O Change 4 Output Channels to 75 Ohm, BNC (f)

Per Option 21, one module with four channels is equipped with 75 Ohm, BNC (f) connectors instead of 75 Ohm, F (f) connectors.

Technical Data (cont.)

- Option 22I** **Change 4 Input Channels to Optical providing LC/APC**
Option 22IHP **Change 4 Input Channels to Optical providing LC/APC (High Input Power)**
Option 24I **Change 4 Input Channels to Optical providing SC/APC**
Option 24IHP **Change 4 Input Channels to Optical providing SC/APC (High Input Power)**

Per Option 22I (24I), one input module with four channels is equipped with optical LC/APC (SC/APC) connectors instead of 75 Ohm, F (f) RF connectors.

Furthermore, optical input modules are available that are capable to handle higher optical input levels, as provided by some optical LNBs. These high power optical input modules are to be ordered via Option 22IHP (with optical LC/APC connectors) and via Option 24IHP (with optical SC/APC connectors)

Optical Specifications

Fiber Type	Single Mode 9/125 µm
Connector Type	Option 22I, Option 22IHP: LC/APC Option 24I, Option 24IHP: SC/APC
Wavelength	1100...1650 nm
Optical Input Level	Option 22I, Option 24I: -22...0 dBm Option 22IHP, Option 24IHP: -22...3 dBm
Damage optical Input Level	+10 dBm

Option 25 Variable Slope (all Channels)

With Option 25, the matrix provides slope control for all paths.

Variable Slope	0...5 dB
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Option 26I Change 4 Input Channels to 50 Ohm, BNC (f)

Option 26O Change 4 Output Channels to 50 Ohm, BNC (f)

Per Option 26, one module with four channels is equipped with 50 Ohm, BNC (f) connectors instead of 75 Ohm, F (f) connectors.

Option 34 LNB Powering (all Channels)

With Option 34 each RF input port of the matrix is capable to deliver LNB power and to select the polarity (vertical (13 V) or horizontal (18 V)) and the band (low band (0 Hz) or high band (22 kHz)) of the LNB.

The matrix is delivered with an additional 1 RU power supply.

As Option 34 is per chassis, a mix of RF Input Modules with and without LNB Powering is not allowed.

A mix of Optical Input Modules and RF-Input Modules with LNB Powering is allowed.

Note that Option 34 cannot be applied in combination with Option 59 (Prepared for ARCHIMEDES Cluster).

LNB Power & Current Monitoring

LNB Power	Max 350 mA per Input
Voltage and Tone Control	13 V, 18 V and 0 Hz, 22 kHz
Adjustable Level Setting:	
• Upper Alarm Level	• max. 330 mA
• Lower Alarm Level	• min. 50 mA

Redundant Power Supply

Supply Voltage	100...240 V AC supplied by two different Lines
Power Consumption	<600 VA

General Specifications

Size	19" (483 mm) Width, 1 RU (44 mm) Height, 380 mm Depth
Weight	~12 kg
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E

Technical Data (cont.)

Option 36 Integrated Spectrum Analyzer

With Option 36, the matrix provides integrated spectrum analyzer functionality either to be operated via Web Interface or via the multi-touch display (Option 54). The matrix chassis provides a dedicated external 50 Ohm, SMA (f) spectrum analyzer input port for connecting any signal to be probed.

For the technical data of the spectrum analyzer, please refer to the separate spec sheet.

Note that Option 36 is available in combination with Option 54 (Multi-Touch Display) only.

Option 38 Secure Lock Operation

With Option 38, the matrix provides the ability of Secure Lock Operation for multiple user operation.

While each user can be configured to operate dedicated inputs and outputs, Secure Lock Operation allows user X to lock a switched path while user Y cannot unlock this path to prevent unwanted service interruptions. An admin user is able to overwrite any path locked by normal users.

Option 39 TV-Receiver

With Option 39, the matrix provides TV view via an integrated TV-Receiver to be operated via the multi-touch display (Option 54). Each matrix input signal can be routed to the TV-Receiver, which is capable to play unprotected content. (Option 54 needs to be ordered separately)

Option 51 Prepared for Redundant Controller

Option 52 Redundant Controller

With Option 52, the matrix is equipped with two controller modules in redundant operation. In case of a malfunction of the main controller, the redundant controller will take over using the same IP settings and the same MAC address. If ordered with Option 51 instead, the matrix is delivered with this functionality prepared, but without the second (redundant) controller module.

Option 54 Multi-Touch Display

With Option 54, the device is equipped at the front side with a 10.1" HD full color multi-touch display.

With this local user interface, all relevant functionalities are available to monitor quickly the status of the matrix, to switch the matrix, to save or to load switching presets, to lock switched paths, to configure the IP address, and to use the integrated TV Receiver to check content.

Option 59 Prepared for ARCHIMEDES Cluster

With applied Option 59 the device is prepared to become a member of an ARCHIMEDES cluster which merges a number of DEV 1976 to a single matrix, providing >64 inputs and/or >44 outputs.

Thus, larger matrix configurations (up to 1024x1024) are possible.

Please contact DEV Systemtechnik to discuss the requirements of your ARCHIMEDES cluster!

In addition, please note that Option 59 cannot be applied in combination with Option 34 (LNB Powering).

Option 87 8 Input Channels less

Option 88 8 Output Channels less

Per Option 87 or Option 88, the matrix is delivered with 8 input channels or 8 output channels less.

Thus, the standard configurations can be equipped with less input or output channels. This provides the flexibility to configure the matrix for the current requirements and to keep the option to upgrade the matrix to an application specific maximum size. The field upgrade can be performed by the customer by ordering the required number of corresponding upgrade kits.

Technical Information Upgrade Products

DEV 19761 Upgrade Kit for 8 Input Channels; 850...2450 MHz; 75 Ohm, F (f)

(A number of) DEV 19761 can be applied for matrices that were ordered with (a number of) Option 87.

If different input channel properties are required, Option 20I, Option 21I, Option 22I, Option 22IHP, Option 24I, Option 24IHP, and Option 26I are provided.

For matrices with applied Option 34, Option 33 needs to be ordered in addition.

DEV 19762 Upgrade Kit for 8 Output Channels; 850...2450 MHz; 75 Ohm, F (f)

(A number of) DEV 19762 can be applied for matrices that were ordered with (a number of) Option 88.

If different output channel properties are required, Option 20O, Option 21O, and Option 26O are provided.

DEV 19765 Expansion Block to 64x64

The DEV 19765 is to be applied once in combination with DEV 19766 and/or DEV 19767 to product configurations with more than 32 input channels and with more than 32 output channels.

DEV 19766 32 Input Channel Expansion to 64 Input Channels; 850...2450 MHz; 75 Ohm, F (f)

The DEV 19766 can be applied once to the following products:

■ DEV 1976/64Ux22

■ DEV 1976/64Ux44

■ The DEV 19765 is required in addition to the DEV 19766.

■ DEV 1976/64Ux44U

■ The DEV 19765 is required in addition to the DEV 19766 if ordered in combination with the DEV 19767.

Naturally, the number of additional inputs can be reduced by ordering the appropriate number of Option 87.

If different input channel properties are required, Option 20I, Option 21I, Option 22I, Option 22IHP, Option 24I, Option 24IHP, and Option 26I are provided.

For matrices with applied Option 34, Option 33 needs to be ordered in addition.

DEV 19767 22 Output Channel Expansion to 44 Output Channels; 850...2450 MHz; 75 Ohm, F (f)

The DEV 19767 can be applied once to the following products:

■ DEV 1976/32x44U

■ DEV 1976/64x44U

■ The DEV 19765 is required in addition to the DEV 19767.

■ DEV 1976/64Ux44U

■ The DEV 19765 is required in addition to the DEV 19767 if ordered in combination with the DEV 19766.

Naturally, the number of additional outputs can be reduced by ordering the appropriate number of Option 88.

If different output channel properties are required, Option 20O, Option 21O, and Option 26O are provided.

Order Information

Products

DEV 1976/32x22	32x22 Combining Matrix ARCHIMEDES; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/32x44U	32x22 Combining Matrix ARCHIMEDES, Field upgradeable up to 32x44; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/64Ux22	32x22 Combining Matrix ARCHIMEDES, Field upgradeable up to 64x22; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/64Ux44U	32x22 Combining Matrix ARCHIMEDES, Field upgradeable up to 64x44; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/32x44	32x44 Combining Matrix ARCHIMEDES; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/64Ux44	32x44 Combining Matrix ARCHIMEDES, Field upgradeable up to 64x44; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/64x22	64x22 Combining Matrix ARCHIMEDES; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/64x44U	64x22 Combining Matrix ARCHIMEDES, Field upgradeable up to 64x44; 850...2450 MHz; 75 Ohm, F (f)
DEV 1976/64x44	64x44 Combining Matrix ARCHIMEDES; 850...2450 MHz; 75 Ohm, F (f)

Options

Option 20I	Change 4 Input Channels to 50 Ohm, SMA (f)
Option 20O	Change 4 Output Channels to 50 Ohm, SMA (f)
Option 21I	Change 4 Input Channels to 75 Ohm, BNC (f)
Option 21O	Change 4 Output Channels to 75 Ohm, BNC (f)
Option 22I	Change 4 Input Channels to Optical providing LC/APC
Option 22IHP	Change 4 Input Channels to Optical providing LC/APC (High Input Power)
Option 24I	Change 4 Input Channels to Optical providing SC/APC
Option 24IHP	Change 4 Input Channels to Optical providing SC/APC (High Input Power)
Option 25	Variable Slope (all Channels)
Option 26I	Change 4 Input Channels to 50 Ohm, BNC (f)
Option 26O	Change 4 Output Channels to 50 Ohm, BNC (f)
Option 34	LNB Powering (all Channels)
Option 36 ¹	Integrated Spectrum Analyzer
Option 38	Secure Lock Operation
Option 39 ¹	TV-Receiver
Option 51	Prepared for Redundant Controller
Option 52	Redundant Controller
Option 54	Multi-Touch Display
Option 59	Prepared for ARCHIMEDES Cluster
Option 87	8 Input Channels less
Option 88	8 Output Channels less

Note 1: In combination with Option 54 only

Order Information Upgrade Products

Upgrade Products

DEV 19761	Upgrade Kit for 8 Input Channels; 850...2450 MHz; 75 Ohm, F (f)
Option 20I	Change 4 Input Channels to 50 Ohm, SMA (f)
Option 21I	Change 4 Input Channels to 75 Ohm, BNC (f)
Option 22I	Change 4 Input Channels to Optical providing LC/APC
Option 22IHP	Change 4 Input Channels to Optical providing LC/APC (High Input Power)
Option 24I	Change 4 Input Channels to Optical providing SC/APC
Option 24IHP	Change 4 Input Channels to Optical providing SC/APC (High Input Power)
Option 26I	Change 4 Input Channels to 50 Ohm, BNC (f)
Option 33	LNB Powering for 8 Inputs (mandatory for products with applied Option 34, and not available for DEV 19761 in combination with Option 22I or Option 24I)
DEV 19762	Upgrade Kit for 8 Output Channels; 850...2450 MHz; 75 Ohm, F (f)
Option 200	Change 4 Output Channels to 50 Ohm, SMA (f)
Option 210	Change 4 Output Channels to 75 Ohm, BNC (f)
Option 260	Change 4 Output Channels to 50 Ohm, BNC (f)
DEV 19765	Expansion Block to 64x64 (to be ordered once in combination with DEV 19766 and/or DEV 19767)
DEV 19766	32 Input Channel Expansion to 64 Input Channels; 850...2450 MHz; 75 Ohm, F (f)
Option 20I	Change 4 Input Channels to 50 Ohm, SMA (f)
Option 21I	Change 4 Input Channels to 75 Ohm, BNC (f)
Option 22I	Change 4 Input Channels to Optical providing LC/APC
Option 22IHP	Change 4 Input Channels to Optical providing LC/APC (High Input Power)
Option 24I	Change 4 Input Channels to Optical providing SC/APC
Option 24IHP	Change 4 Input Channels to Optical providing SC/APC (High Input Power)
Option 26I	Change 4 Input Channels to 50 Ohm, BNC (f)
Option 33	LNB Powering for 8 Inputs (mandatory for products with applied Option 34, and not available for DEV 19766 in combination with Option 22I or Option 24I)
Option 87	8 Input Channels less
DEV 19767	22 Output Channel Expansion to 44 Output Channels; 850...2450 MHz; 75 Ohm, F (f)
Option 200	Change 4 Output Channels to 50 Ohm, SMA (f)
Option 210	Change 4 Output Channels to 75 Ohm, BNC (f)
Option 260	Change 4 Output Channels to 50 Ohm, BNC (f)
Option 88	8 Output Channels less

Size Configuration Examples

1. Initial Size: 24x14 → Target Size: 32x32

- Initial Order: DEV 1976/32x22 with 1* Option 87 and 1* Option 88
- Upgrade Order for Target Size: 1* DEV 19761 (for 32x14) plus 1* DEV 19762 (for 32x22)

2. Initial Size: 16x22 → Target Size: 56x22

- Initial Order: DEV 1976/64Ux22 with 2* Option 87
- Upgrade Order for Target Size: 2* DEV 19761 (for 32x22) plus 1* DEV 19766 with 1* Option 87 (for 56x22)

3. Initial Size: 16x22 → Target Size: 32x36

- Initial Order: DEV 1976/32x44U with 2* Option 87
- Upgrade Order for Target Size: 2* DEV 19761 (for 32x22) plus 1* DEV 19767 with 1* Option 88 (for 32x36)

4. Initial Size: 16x14 → Target Size: 56x44

- Initial Order: DEV 1976/64Ux44U with 2* Option 87 and 1* Option 88
- Upgrade Order for Target Size:
 - a. 2* DEV 19761 (for 32x14)
 - b. 1* DEV 19762 (for 32x22)
 - c. 1* DEV 19766 with 1* Option 87 (for 56x22)
 - d. 1* DEV 19765 and 1* DEV 19767 with 1* Option 88 (for 56x44)

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Rev. 14-Oct-2020

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