User Manual

RT-1000 Multichannel RF-Splitter

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Note

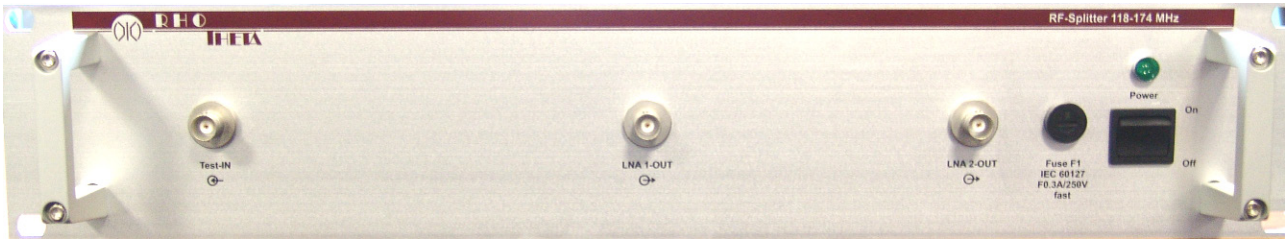
The manufacturer reserves the right to make modifications at any time and without previous information of the here described product.

Content

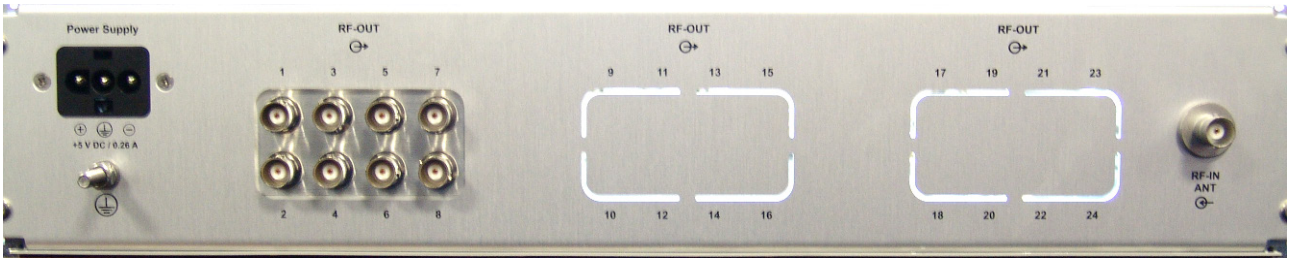
1 General Description

The RF-Splitter distributes the RF-Signal coming from the antenna, lossless, up to 24 receiving channels. The RF-Splitter covers the frequency range of 118,000 -174,000 MHz, thus the RF-Splitter can be used for ATC-Applications, as well as for VTS-Applications. Additionally, the RF-Splitter contains a redundant amplifier and test outputs options to provide the reliability and testability of the RF-Splitter and the DF-System. The extra input TEST-IN at the front of the RF-Splitter gives the opportunity to connect the RF-Generator and to test parts of the system while normal operating without disconnecting the antenna.

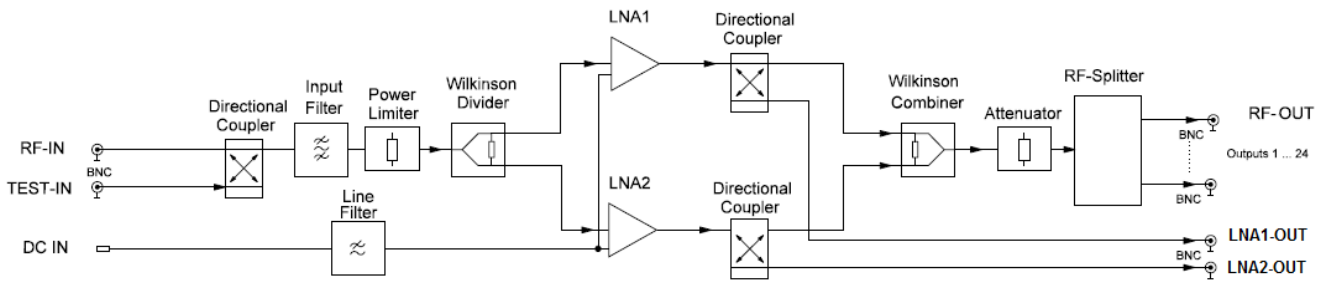
Front View



Rear View



Block Diagram



2 Options

Number of RF-Outputs can be defined by the user
The RF-Splitter filters and distributes the RF-Signal to all DF-Channels installed. Maximum 24 DF-Channels can be connected.

Redundancy (Second Low Noise Amplifier – Double LNA)
As an option, the RF-Splitter can be extended with a second LNA (Low Noise Amplifier) in order to provide the redundancy and consequently increase the reliability of the system. When using a single LNA, the gain between RF-IN and RF-OUT connectors is 3 dB. While both LNA are installed, the gain between RF-IN and RF-OUT is 0 dB.
In case of failure of one amplifier, the gain of the system will be reduced by 3 dB, while the system continues to operate. The failure of the LNA can be detected during the annual maintenance procedure.

Testability of RF-Splitter
Additionally the RF-Splitter can be equipped with a test function for controlling the function of LNAs, which is useful for maintenance issues. Hence, the gain measurement can be done between the TEST-IN and LNAn-OUT connectors.

Options	
Number of RF Outputs:	The number of RF distributed outputs can be defined due to customer requirements as follows: 8 – Outputs 16 – Outputs 24 – Outputs
Option 1	Without redundancy and without test function (Single LNA without any test output)
Option 2	With redundancy and without test function (Single LNA with a test output)
Option 3	Without redundancy and with test function (Double LNA without any test outputs)
Option 4	With redundancy and with test function (Double LNA with test outputs for both LNAs)

3 Technical Characteristics

3.1 Interfaces

Interfaces		
Name	**Parameter**	**Value**
RF-IN ANT	Number	1
	Impedance	50 Ω
	Connector Type	BNC
	VSWR	≤ 1,4 : 1
	Max Input Power	+33 dBm (2 W)
RF-OUT	Number	8, 16 or 24
	Impedance	50 Ω
	Connector Type	BNC
	VSWR	≤ 1,3 : 1
TEST-IN	Number	1
	Impedance	50 Ω
	Connector Type	BNC
	VSWR	≤ 1,2 : 1
	Max Input Power	+44 dBm (25 W)
	In-Couple-Loss	> 20 dB
LNA-OUT	Number	1/ with Redundancy 2
	Impedance	50 Ω
	Connector Type	BNC
	VSWR	≤ 1,2 : 1
	Out-Couple-Loss	> 20 dB
Power Supply	Signals	+5 V_{DC}, GND, PE
	Connector Type	Molex HCS-125
	Voltage	+5 V ±5%
	Current	0,26 A
	Power Consumption	typ. 1 W / max. 1,3 W

3.2 Electrical Characteristics

Electrical Properties		
Parameter	**Condition**	**Data**
Frequency Range	Air and Marine Band	118,000 MHz – 174,000 MHz
Gain	Single LNA (No Redundancy)	
	RF-IN → RF-OUT	-1,5 dB ± 1,5 dB
	RF-IN → LNA1-OUT	3,0 dB ± 1,5 dB
	Double LNA (Redundancy)	
	RF-IN → LNA1-OUT	0 dB ± 1,5 dB
	RF-IN → LNA2-OUT	0 dB ± 1,5 dB
Test Port Gain	Single LNA (No Redundancy)	
	TEST-IN → RF-OUT	-22,0 dB ± 1,5 dB
	TEST-IN → LNA1-OUT	-17,5 dB ± 1,5 dB
	Double LNA (Redundancy)	
	TEST-IN → LNA1-OUT	-21,0 dB ± 1,5 dB
	TEST-IN → LNA2-OUT	-21,0 dB ± 1,5 dB
FM-Band-Suppression	f < 100 MHz	< -6 dBr
UHF-TV-Band-Suppression	f > 190 MHz	< -40 dBr
Decoupling of Outputs	(RF-OUTn and RF OUTm)	> 25 dB
System Input IP3	P_{ref} = -107 dBm IM3 = 77 dB	> +10 dBm
System Noise Figure	118,000 – 174,000 MHz	< 7 dB
Reverse Decoupling	RF-OUTn → RF-IN	> 40 dB

3.3 Environmental Characteristics

Common Data		
Parameter	**Condition**	**Data**
Dimensions	B x H x T	482,6 x 88 x 340 mm (84 TE, 2 HE)
Temperature	Operation	-20 °C … +55 °C
	Storage	-55 °C … +85 °C
Weight		5,9 kg
Line Filter	Standard Version, UL 1283	Schurter 5003.0121.1 DC
Fuse	IEC 60127	F 0,3A / 250V fast

4 Notes