



## Internal Preamplifier (Option R&S ESIB-B2)

for the EMI Test Receivers R&S ESIB26/R&S ESIB40 in the frequency range 7 GHz to 26.5/40 GHz

The internal preamplifier (option R&S ESIB-B2) is used to extend the frequency range of the preamplifier (9 kHz to 7 GHz) integrated as standard in the EMI Test Receivers R&S ESIB26 and R&S ESIB40 in the microwave range up to 26.5 GHz or 40 GHz.

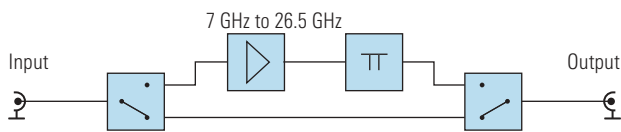
- ◆ System noise figure improved by 18 dB typ.
- ◆ Nominal gain 20 dB
- ◆ Multistage configuration up to 26.5 GHz or 40 GHz
- ◆ Connection irrespective of operating mode: analyzer or receiver

The preamplifier is used to improve the input sensitivity of the receivers by approximately 18 dB so that cable losses and antenna correction values can largely be compensated in the GHz range.

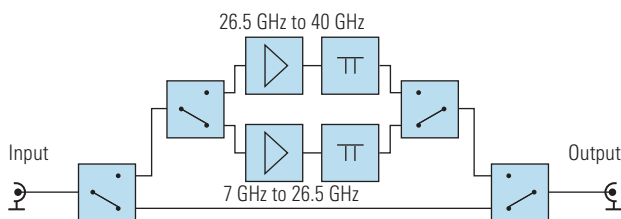


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The Test Receivers R&S ESIB 7/ R&S ESIB 26 and R&S ESIB 40 are equipped with an integrated preamplifier from 9 kHz to 7 GHz as standard. Model 26 of the R&S ESIB-B2 option extends the frequency range of the R&S ESIB 26 from 7 GHz to 26.5 GHz. Model 40 of the R&S ESIB-B2 option provides complete coverage from 7 GHz to 40 GHz for the R&S ESIB 40. The following block diagrams show the configuration of the preamplifier models for 26 GHz and 40 GHz.



**R&S ESIB-B2 model 26 (7 GHz to 26.5 GHz)**



**R&S ESIB-B2 model 40 (7 GHz to 40 GHz)**

## Configuration

The internal preamplifier (option R&S ESIB-B2) is designed so that low-frequency components <7 GHz are suppressed after a diplexer (highpass characteristics) and the preamplifier is inserted before the tracking YIG filter and the input mixer.

The preamplifier can be softkey-activated on the receiver in the analyzer or receiver mode.

Depending on the frequency range, the additional frequency response is automatically taken into account internally in the two models with the preamplifier switched on.

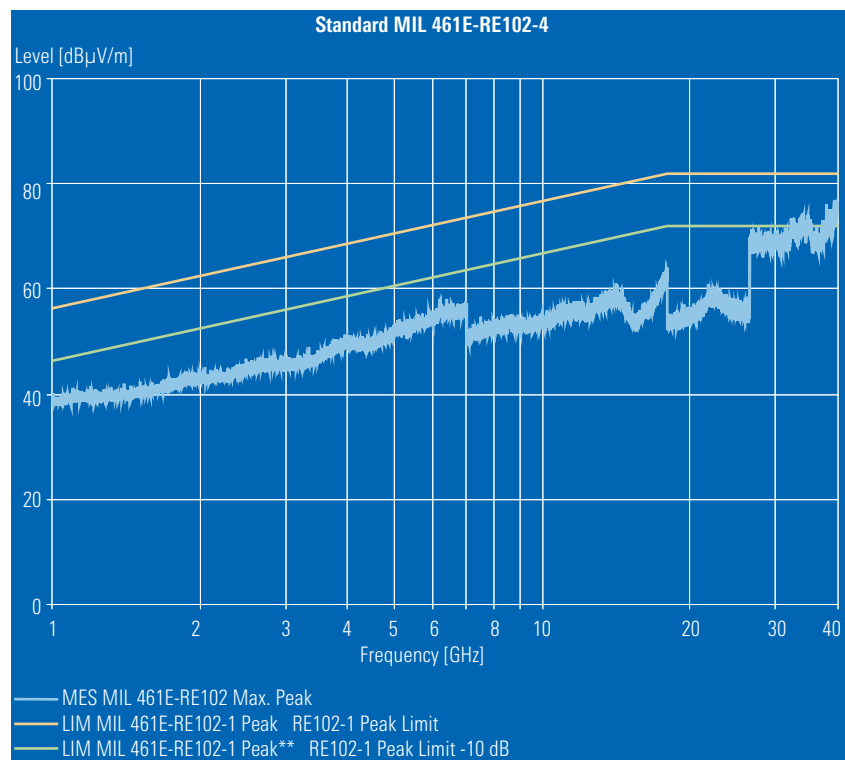
## Installation and calibration

When the R&S ESIB-B2 option is installed, the noise in bypass mode is approx. 2 dB to 3 dB higher than specified in the EMI Test Receivers R&S ESIB data sheet (PD 0757.4576) due to the attenuation of the relays involved and the cabling. Factory installation is recommended since the additional frequency response is taken into account in the factory calibration.

## System sensitivity

The use of the preamplifier considerably improves the noise figure of the input stage in the microwave range. In addition to high cable attenuation values (e.g. +8 dB), which are rapidly attained when field-strength measurements are performed in shielded enclosures with cables of up to 20 m in length, the correction values of the horn antennas used (e.g. 30 dB to 40 dB) can be partially compensated. With the R&S ESIB-B2 option and an additional external amplifier (depending on the antenna and the test specification) fitted directly to the antenna feedpoint, even the most exacting requirements to MIL specifications are fulfilled.

The following example shows the typical displayed average noise level of the R&S ESIB 40 with built-in Preamplifier R&S ESIB-B2 (model 40), recorded with a peak detector, a measurement bandwidth (RBW) of 1 MHz and taking into account the cable attenuation and correction factors of three horn antennas up to 18 GHz, 26 GHz and 40 GHz.



## Specifications

The specifications below describe the additional data valid as of firmware version 4.01 or higher and are supplementary to the EMI Test Receivers R&S ESIB data sheet (PD 0757.4576). Data designated "nominal" applies to design parameters and is not tested.

<b>Displayed noise floor (receiver mode)</b> (AV detector, 0 dB RF attenuation, RBW = 1 MHz, 50 Ω termination)		
	<b>Model 26</b>	<b>Model 40</b>
<b>Preamplifier off</b>		
7 GHz to 18 GHz	<22 dB $\mu$ V	<26 dB $\mu$ V
18 GHz to 26.5 GHz	<25 dB $\mu$ V	<29 dB $\mu$ V
26.5 GHz to 0 GHz	–	<40 dB $\mu$ V
30 GHz to 40 GHz	–	<44 dB $\mu$ V
<b>Preamplifier on</b>		
7 GHz to 18 GHz	<4 dB $\mu$ V	<6 dB $\mu$ V
18 GHz to 26.5 GHz	<6 dB $\mu$ V	<9 dB $\mu$ V
26.5 GHz to 30 GHz	–	<20 dB $\mu$ V
30 GHz to 40 GHz	–	<26 dB $\mu$ V
<b>Displayed noise floor (analyzer mode)</b> (displayed average noise level, 0 dB RF attenuation, RBW = 10 Hz, VBW = 1 Hz, 20 averages, trace average, 50 Ω termination)		
<b>Preamplifier off</b>		
7 GHz to 18 GHz	<–135 dBm	<–131 dBm
18 GHz to 26.5 GHz	<–132 dBm	<–128 dBm
26.5 GHz to 30 GHz	–	<–117 dBm
30 GHz to 40 GHz	–	<–113 dBm
<b>Preamplifier on</b>		
7 GHz to 18 GHz	<–153 dBm	<–151 dBm
18 GHz to 26.5 GHz	<–151 dBm	<–148 dBm
26.5 GHz to 30 GHz	–	<–137 dBm
30 GHz to 40 GHz	–	<–131 dBm
<b>Frequency response (10 dB RF attenuation)</b>		
7 GHz to 18 GHz	$\pm 3$ dB <sup>1)</sup>	$\pm 3$ dB <sup>1)</sup>
18 GHz to 26.5 GHz	$\pm 3.5$ dB <sup>1)</sup>	$\pm 3.5$ dB <sup>1)</sup>
26.5 GHz to 40 GHz		$\pm 4$ dB <sup>1)</sup>

<sup>1)</sup> Error after calling peak function. Additional error of  $\pm 1.5$  dB for sweep time <10 ms/GHz.

## Ordering information

<b>Internal Preamplifier</b> 7 GHz to 26.5 GHz	R&S ESIB-B2	1137.4494.26
<b>Internal Preamplifier</b> 7 GHz to 40 GHz	R&S ESIB-B2	1137.4494.40





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ROHDE&SCHWARZ GmbH & Co. KG · Mühlendorfstraße 15 · 81671 München · Germany · P.O.B. 80 14 69 · 81614 München · Germany · Telephone +49 89 4129-0  
www.rohde-schwarz.com · Customer Support: Tel. +49 1805124242, Fax +49 89 4129-13777, E-mail: CustomerSupport@rohde-schwarz.com