

## VHF Stereo Transposer NU002-DM

Top-quality demodulator/modulator with integrated relay receiver

VHF Stereo Transposer DM is part of the versatile NU002 plug-in system from Rohde&Schwarz. It is a demodulator/modulator (87.5 to 108 MHz, FM) designed to CCIR recommendations. Receive and transmit frequencies can easily be changed without replacing any component.

The *demodulator* contains a synthesizer-controlled mixer and features

excellent selectivity and high S/N ratio. The IF bandwidth can be switched over for minimum harmonic distortion or optimum selectivity.

The *modulator* uses the internal MPX signal to generate a frequency-modulated, level-controlled output signal of high quality. Additionally, an external mono signal can be applied which passes first through a 15-kHz lowpass filter. Transposer model .03 has two

input connectors, one for an external MPX signal and the other for additional information, eg local RDS signals.

The low-noise VCO is synthesizer-controlled. If the input level is too low, a squelch interrupts the operation of the transposer and activates a fault signal which is indicated on the front panel and available at a signalling relay for remote indication.

# Specifications

## Receiving section

<b>Frequency range</b>	87.5 to 108 MHz, synthesizer-controlled oscillator SMA female, 50 Ω, on front panel
RF input	
RF input voltage for 54-dB weighted S/N ratio, to CCIR	<300 μV (typ. 220 μV)
Frequency stability	±2 kHz
Intermediate frequency	10.7 MHz
Interference caused by IF harmonics	not detectable
Oscillator reradiation at receiver input	<2 μV (typ. 1 μV)

### Selectivity characteristics

(ratio of wanted to unwanted signal voltage for 54-dB weighted S/N ratio, via decoder, with deemphasis,  $V_{\text{signal}} = 1 \text{ mV}$ )

Common-channel selectivity		
Unwanted signal not modulated		
Frequency difference 6 to 10 kHz		≥48 dB, typ. 44 dB
Unwanted signal modulated with ±40-kHz deviation, $f_{\text{AF}} = 500 \text{ Hz}$		
Selectivity for frequencies close to carrier		≥63 dB, typ. 60 dB
Unwanted signal modulated ( $f_{\text{mod}} = 500 \text{ Hz}$ , ±75-kHz deviation)		
±100 kHz	IF narrow 60 dB (typ. 57 dB)	IF wide 60 dB (typ. 57 dB)
±200 kHz	10 dB (typ. 6 dB)	12 dB (typ. 8 dB)
±300 kHz	-15 dB (typ. -21 dB)	-3 dB (typ. -9 dB)
±600 kHz	-40 dB (typ. -45 dB)	-40 dB (typ. -45 dB)
Selectivity for frequencies far off from carrier		
±1.2 MHz	-45 dB (typ. -50 dB)	-45 dB (typ. -50 dB)
Image-frequency rejection (measured at MPX connector)		
	-17 dB (typ. -20 dB)	-17 dB (typ. -20 dB)
<b>AF check output (MPX)</b>		
Source impedance	decoupled output on front panel	
Output level (±75-kHz deviation)	±60 Ω 12 dBm, internally adjustable to ±3 dB	

### Linear distortions

(±75-kHz deviation, referred to  $f_{\text{AF}} = 500 \text{ Hz}$ , measured at MPX output)

Frequency response ref. to 500 Hz		
$f_{\text{mod}}$ 40 Hz to 43 kHz	≤±0.1 dB	
45 to 53 kHz	≤±0.3 dB	
61 to 70 kHz	≥-1.2 dB, ≤0 dB	
70 to 75 kHz	≥-2.0 dB, ≤0 dB	
Stereo crosstalk attenuation L ↔ R (without pre- and deemphasis, measured at MPX connector via stereo decoder)		
40 Hz to 15 kHz	IF narrow ≥40 (typ. 42) dB	IF wide ≥44 (typ. 46) dB

### Nonlinear distortions

Harmonic distortion (measured at MPX connector via stereo decoder, with deemphasis)

Deviation ±75 kHz, R or L channel	0.5% (typ. 0.3%)	0.4% (typ. 0.2%)
deviation ±100 kHz	0.7% (typ. 0.5%)	0.6% (typ. 0.4%)

Difference-frequency distortion to IEC268

$f_1/f_2 = 13/14 \text{ kHz}$ , dev. ±75 kHz		
$d_2$	≤0.1%	≤0.1%
$d_3$	≤0.15%	≤0.15%
$f_1/f_2 = 13/14 \text{ kHz}$ , dev. ±100 kHz		
$d_2$	≤0.15%	≤0.15%
$d_3$	≤0.25%	≤0.25%

$f_1/f_2 = 53/54 \text{ kHz}$ , dev. ±75 kHz		
$d_2$	≤0.15%	≤0.15%
$d_3$	≤1.2%	≤1%
$f_1/f_2 = 53/54 \text{ kHz}$ , dev. ±100 kHz		
$d_2$	≤1.5%	≤1.5%
$d_3$	≤2%	≤1.25%
S/N ratio (to DIN 45405, peak measurement via test decoder with deemphasis, referred to ±40-kHz deviation, $f_{\text{mod}} = 500 \text{ Hz}$ )		
RF input voltage	200 μV	unweighted 51 dB (typ. 54 dB)
	1 mV	68 dB (typ. 70 dB)
	2 mV	70 dB (typ. 72 dB)
		weighted 50 dB (typ. 53 dB) 63 dB (typ. 66 dB) 66 dB (typ. 69 dB)

## Transmitting section

<b>Frequency range</b>	87.5 to 108 MHz, internal tuning
Frequency drift after 20 min. warm-up	±1 kHz
Frequency stabilization	by synthesizer

### Linear distortions

(±75-kHz deviation, referred to  $f_{\text{AF}} = 500 \text{ Hz}$ , measured at MPX output)

Frequency response	
$f_{\text{mod}}$ 40 Hz to 43 kHz	≤±0.1 dB
43 to 100 kHz	≤±0.3 dB
Stereo crosstalk attenuation L ↔ R (w/o preemphasis and deemphasis)	
40 Hz to 100 Hz	≥36 dB
100 Hz to 15 kHz	≥45 dB

### Nonlinear distortions

Harmonic distortion (measured at MPX connector via stereo decoder, with deemphasis)

deviation ±75 kHz, R- or L channel	IF narrow 0.3%	IF wide typ. 0.15%
deviation ±100 kHz	0.5%	typ. 0.35%
Difference-frequency distortion to IEC268, $f_1/f_2 = 53/54 \text{ kHz}$ , ±75-kHz deviation		
$d_2$	≤0.1%	≤0.05%
$d_3$	≤0.15%	≤0.1%

### S/N ratio

(to DIN 45405, peak measurement via test decoder, with deemphasis, referred to ±40-kHz deviation,  $f_{\text{mod}} = 500 \text{ Hz}$ )

unweighted	≥71 dB	typ. 74 dB
weighted	≥67 dB	typ. 69 dB
AM S/N ratio referred to 100% AM		
unweighted	≥65 dB	
weighted	≥60 dB	
AM S/N ratio for FM, ±40-kHz deviation, $f_{\text{mod}} = 500 \text{ Hz}$ , referred to 100% AM (unweighted)		
	≥65 dB	

### Class of emission

Output power	F3E (F3) 10 dBm
Setting range	6 to 11 dBm
RF output	SMA female, 50 Ω
Harmonics suppression	≥60 dB
Spurious emission	
IF - $f_c$ < 1 MHz	≥75 dB
IF - $f_c$ > 1 MHz	≥85 dB
Modulation input, selectable internally (receiving section) or externally (in transmit mode only)	
Input impedance MPX	600 Ω/12 kΩ, selectable with jumper
Mono	600 Ω/12 kΩ, selectable with jumper
AF input level for ±75-kHz dev.	12 dBm, internally adjustable to ±3 dB
Modulation frequency range	40 Hz to 75 kHz



## Transposer

### Linear distortions

( $\pm 75$ -kHz deviation, referred to  $f_{AF}=500$  Hz)

Frequency response ref. to 500 Hz

$f_{mod}$ 40 Hz to 43 kHz	$\leq \pm 0.1$ dB	
43 to 53 kHz	$\leq \pm 0.3$ dB	
53 to 70 kHz	$\geq -1.2$ dB, $\leq 0$ dB	
70 to 75 kHz	$\geq -2.0$ dB, $\leq 0$ dB	

Stereo crosstalk attenuation L  $\leftrightarrow$  R

(without pre- and deemphasis, measured via test demodulator and stereo decoder)

40 to 100 Hz	IF narrow $\geq 38$ dB	IF wide $\geq 38$ dB
100 Hz to 15 kHz	$\geq 40$ (typ. 42) dB	$\geq 44$ (typ. 46) dB

### Nonlinear distortions

Harmonic distortion (measured via test demodulator and stereo decoder, with deemphasis)

deviation $\pm 75$ kHz, R or L channel	$\leq 0.3\%$	$\leq 0.3\%$
deviation $\pm 100$ kHz	$\leq 0.5\%$	$\leq 0.4\%$

Difference-frequency distortion to IEC 268

$f_1/f_2 = 13/14$ kHz, dev. $\pm 75$ -kHz	$d_2 \leq 0.1\%$	$d_3 \leq 0.15\%$	$\leq 0.1\%$	$\leq 0.15\%$
$f_1/f_2 = 53/54$ kHz, dev. $\pm 75$ kHz	$d_2 \leq 0.15\%$	$d_3 \leq 1.2\%$	$\leq 0.15\%$	$\leq 1.0\%$

S/N ratio  
(to DIN 45405, peak measurement via test decoder, with deemphasis, referred to  $\pm 40$ -kHz deviation,  $f_{mod}=500$  Hz)  
1-mV RF input voltage

unweighted 67 dB	weighted 62 dB
(typ. 70 dB)	(typ. 64 dB)

### General data

Rated temperature range  
Operating temperature range  
Storage temperature range  
Power supply

0 to +40 °C
-5 to +45 °C
-40 to +70 °C
230 V $-10\%/+15\%$ , 47 to 63 Hz
(15 VA / 10 W)

Dimensions (W x H x D); weight  
with power supply  
without power supply

38 mm x 208 mm x 502 mm; 2.4 kg
38 mm x 208 mm x 377 mm; 1.8 kg



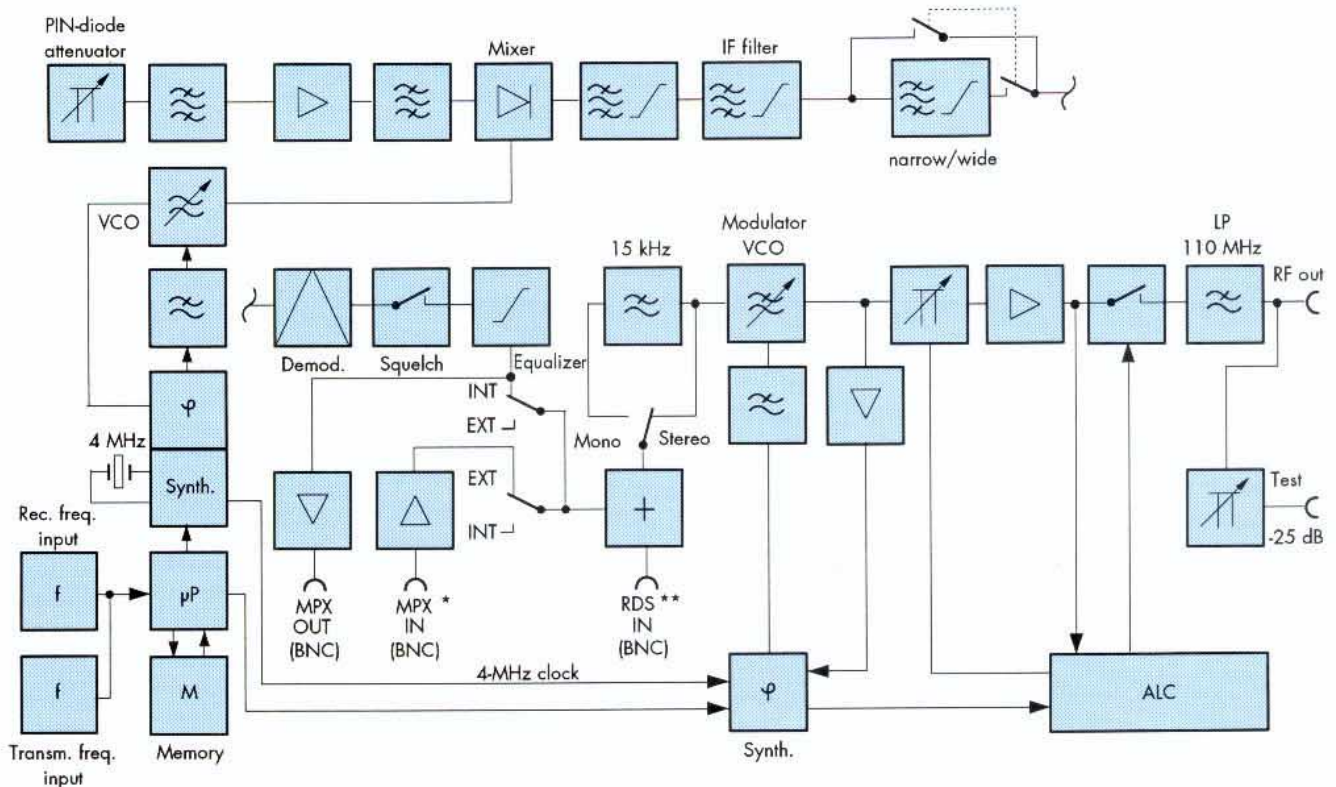
## Ordering information

VHF Stereo Transposer  
with power supply  
without power supply

NU002-DM	2032.6107.02/.03	2032.6159.02/.03
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Power Supply (separate)  
(2 x 400 mA)

NU002-B	2020.3008.02
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\* For model 03 only; with model 02 MPX IN/OUT is a female connector which serves as an output for EXT and as an input for INT

\*\* For model 03 only; for model 02, mono input (Lemo Triax connector)



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