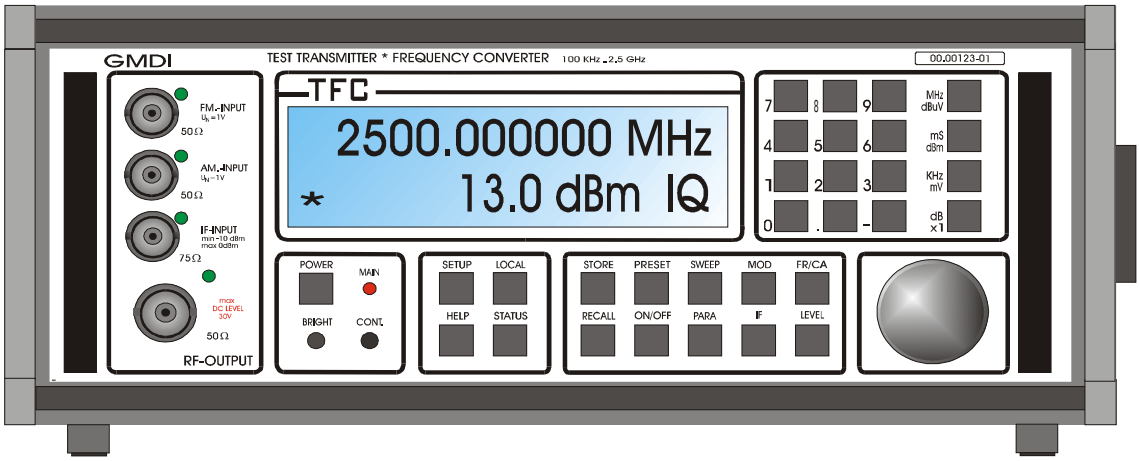
HUBER
SIGNAL PROCESSING

TFC – Test Transmitter and Frequeny Converter

Datasheet

Preliminary V0.3



- Protable, battery and mains powered
- Fast boot time
- Compact dimensions
- High spectral purity
- Continuous frequency sweep
- Continuous level sweep
- IF input for frequency conversion
- Broadband modulation
- Vector modulator
- Options available for retrofit
- High signal-harmonic ratio

Frequency

Range	100 kHz to 2.5 GHz	with Option H 2.5 GHz to 5 GHz
Resolution	1 Hz	
Setting time for RS232 programming (in CW mode)	< 6 ms	

Reference Frequency

(DTCXO)		with Opt. O
Aging	1 ppm / year	< 0.001 ppm / day
Temperature influence (20..50 °C)	< +-1.5 ppm	< 0.1 ppm
Heating-up time		10 min
Range for manual detuning	+-100 ppm	

Output for internal reference

Frequency	10 MHz
Level	1 Vpp in 50 Ω
Source resistance	50 Ω

Input VCXO tuning voltage

Voltage range	-2 to +2 V
Sensitivity	40 ppm / V
Input resistance	40 k Ω

Spectral Purity

Harmonics	at Level 5 dBm	< 45 dBc	
	typically	< 50 dBc	
	at Level 10 dBm	< 40 dBc	
Sub-Harmonics		none	
Non-Harmonics			
	to 2000 MHz	< -55 dBc	
	at 2000 to 2500 MHz	< -42 dBc	
Broadband noise		< -131 dBc	with Option L
SSB Phase noise carrier distance 10 kHz			
	at 1 GHz	< -100 dBc	at 1 GHz < -105dBc
	at 2 GHz	< -100 dBc	at 2 GHz < -105dBc

Frequency Sweep

Span < 20 MHz	
Resolution	100 Hz
Number of Steps	256
Min sweep time	100 ms
Max sweep time	9.9 s
Span > 20 MHz	
continuous	
Min sweep time	10 ms
Max sweep time	9.9 s
Trigger modes	auto, external and manual

Level Sweep

from	-107 dBm (0 dBuV) to 13 dBm (120 dBuV) Stop and Start level programmable
Resolution	0.1 dB
Accuracy	as Level Sweep
Sweep time	1 ms / step

Level

Level adjustment continuous	
Range	-107 dBm (0 dBuV) to +13 dBm (120 dBuV)
Resolution	0.1 dB
Setting Time at RS232 programming	2 ms
Deviation	< 0.8 dB (typical 0.3 dB)
Output impedance	50 Ω (Option 75 Ω)
Reflection loss	> 15 dB to 2 GHz
>13 dB to 2.5GHz	
Max. DC Level	25 V
Max. RF reflection power	23 dBm

Modulation

AM modulation

Internal (Option LF) and External	
Modulation frequency range	DC to 20 MHz
Input	
Input voltage	
For 100% modulation	1 Vp
100% modulation at 7 dBm possible	
to 13 dBm continuous sloping	
Impedance	50 Ω

FM modulation

Internal (Option LF) or external	
Modulaton bandwidth	50 Hz to 10 MHz
Max. Shift	5 MHz

RF bandwidth	200 MHz
Input	
Sensitivity	10 MHz / V

I/Q modulation Option

Internal (Option Q) or external

Modulaton frequency range (B.B)	DC to 80 MHz
3 dB RF bandwidth	200 MHz
Carrier suppresion	< -40 dBc
Broadband noise	< -131 dBc at 100MHz
	< -136 dBc at 2000MHz
Input impedance	50 Ω
Voltage for full conduction	$\sqrt{I^2+Q^2}$ = 0.5V in 50 Ω

Pulse modulation

External

Off Level	-120 dBm
Rise and fall time	20 ns
Input	TTL level

IF Converter

Internal (Option TV) and external

Frequency range	30 MHz to 50 MHz
Level range	-10 dBm +-1 dB
Bandwidth	+-8 MHz
Image frequency rejection for	fT - 2 x fZF fZF=38,9 MHz -55 dB
Intermodulation	IP3 < 55 dBc
Input Impedance	50 Ω

Miscellaneous

BNC Inputs	Ref. Detuning
	Trigger
	IF frequency
	Modulation I, Q, Pulse, AM, FM
BNC Outputs	10 MHZ Ref. Frequency
	Ramp
Remote Control	RS232 and USB
Baud Rate	9.6 kbit / s
Number of Presets	99
Mains voltage	90 V to 240 V, 50 to 60 Hz
Integrated battery	3.5 Ah
DC current drain	1.4 A at 14.2 V
Dimensions (LxHxD)	270 mm x 125 mm x 280 mm
Weight	5 kg

Options

75Ω	Impedance of the RF output 75Ω	
H	Frequency range extension (CW)	
	Frequency	from 2,5 GHz to 5GHz
	Resolution	100 kHz
	Phase noise	at 20 KHz carrier distance
		<-95 dBc
	Level f<4GHz	-17 dBm to 13 dBm
	Level f>4GHz	-17 dBm to 9 dBm
	Resolution	0.1 dB
	Accuracy	+-0.8 dB(typically 0.4dB)
L	Low phase noise (not for Opt. H)	
	at 10 KHz carrier distance	
	at 2 Ghz	<-105 dBc
TV	TV vestigial sideband modulator with FM tone modulators and Sat subcarrier modulator, freqency / channel input	
O	Qrystal Oven	
LF	Modulation LF Generator	10 Hz to 10 MHz