

SigmaCom Broadcast



DDS-30



DDS-30 FM Exciter

Traditional FM Exciters

For many decades, the FM broadcasting industry uses a -rather- abnormal technique to make frequency modulation. A Voltage Controlled Oscillator (VCO) with a Phase Locked Loop (PLL) circuitry is being used to generate an RF carrier at the desired frequency. The audio signal is applied on a varicap diode that affects the VCO frequency and causes deviation respectively to audio variation. The PLL loop filters are modified so, to allow such frequency deviation.

This technique has the following potential problems:

- Phase noise from widen PLL loop filter is inserted into carrier, affecting modulation.
- On the other hand, a tight PLL loop filter will not allow linear modulation.
- The varicap itself is a non-linear component, severely affected by temperature and bias voltage.
- For these reasons, a varicap cannot provide perfect linear or symmetric frequency deviation.
- Analog circuitry can insert distortion and phase variation, affecting mostly the MPX signal.

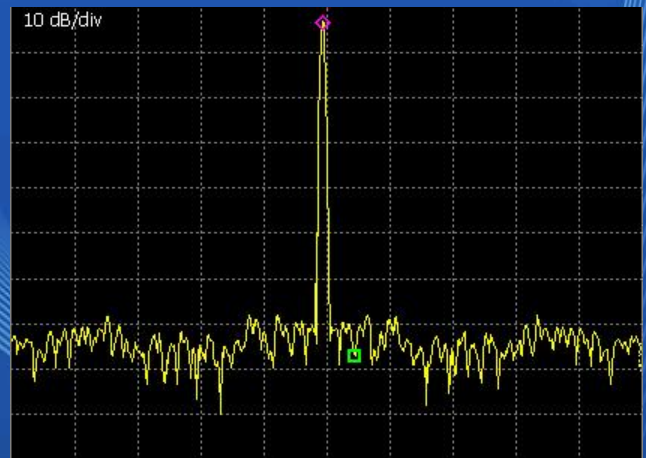
Our technology

- There is no VCO, PLL or varicap diodes involved in carrier generation and modulation.
- The carrier is composed by a Numerical Controlled Oscillator (NCO), with 0.000000888Hz precision.
- A Digital-to-Analog Converter (DAC) at the output of NCO, creates the analog RF carrier on-the-fly.
- A Digital Signal Processor (DSP) receives the audio signal, in analog or digital format.
- The digital audio feed is processed directly, without any D/A conversion like some other "digital" exciters.
- The DSP does all the mathematical calculations for Frequency Modulation, and dictates the NCO appropriately almost 600.000 times per second.
- As a result, we have absolute modulation linearity, no analog noise or distortion, ultimate frequency accuracy.

Get the best, the most perfect modulation you have ever heard! Without VCO, varicaps, PLLs, or any other conventional component that could affect the audio linearity and performance!



PLL + VCO: Noise & spurious within 2 kHz span



DDS-30: Noise & spurious within 2 kHz span

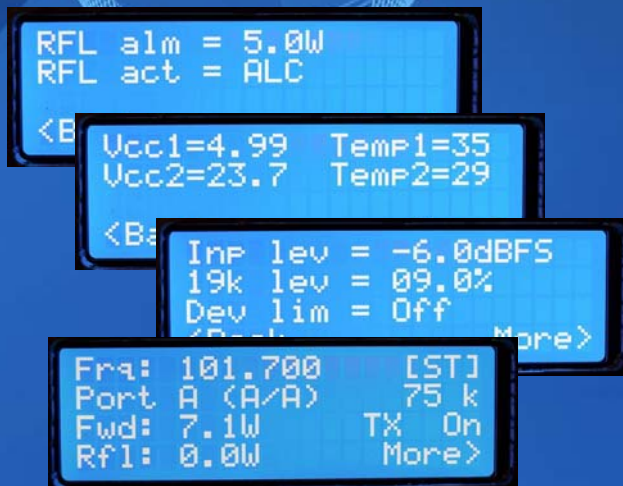
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Key Facts

- Professional, 24-bit audio resolution.
- 1 electrical AES3 interface for L/R audio or D-MPX.
- 1 optical AES3 interface for L/R audio or D-MPX.
- 2 analog electrical interfaces for L/R audio or A-MPX.
- Both analog interfaces are TRUE balanced inputs.
- Digital inputs can accept 32 to 96 kHz sampling rate for L/R audio, 192 kHz for D-MPX, at 16-24 bits resolution.
- The analog inputs are digitized internally, at 96 kHz for L/R audio, 192 kHz for A-MPX, both at 24 bits resolution.
- Internal DSP stereo encoder with ultimate separation.
- Remote control and telemetry via RS232
- 4 user-selectable TX modes of operation: Stereo, Mono, External Baseband, Mute (CW).
- Backup audio source port, auto switchover and / or by external event.
- Accurate and precise adjustment of FM deviation and 19kHz pilot level.
- Configurable VSWR alarm threshold and action (None, Mute RF, ALC).
- Easy and compact User Interface.

- 50W version (OPT-001)
- 1 kHz frequency selection step (OPT-002)
- Internal RDS (OPT-004)*
- Support for digital SFN operation (OPT-008)*
- Support for analog SFN operation (OPT-016)*
- Ethernet interface and web GUI (OPT-032)*

*Available in H2 2013



You define from the LCD menu the desired amount of deviation in kHz - no need for modulation monitors, no worry of violating authority regulations about FM deviation.



DDS-30 FM Exciter

Technical specifications (preliminary)

GENERAL	
Model name	DDS-30
Dimensions	19" 1U chassis
Power supply	230VAC 50Hz, 60W
Operating temp	-20 to +60 Celsius
Output frequency	87.5 to 108.0 MHz
Carrier modulation	Direct Digital Synthesis FM
TX Modes	Mute, Mono, Stereo, External Baseband
Internal stereo encoder	DSP based (32 bit DSP), >70dB separation
19 kHz pilot level	User adjustable, 8.0 to 12.0 %
Deviation level	User adjustable, +/- 20 to 150 kHz
Audio / MPX input level	User adjustable, -25.0 to 0.0 dBFS
Input port selection	User selectable primary / secondary
Port switching	On loss of digital input and/or by external trigger event (GND on pin)
Options	OPT-001: 50W RF output OPT-002: 1 kHz frequency step OPT-004: Internal RDS encoder OPT-008: Digital SFN support OPT-016: Analog SFN support OPT-032: Ethernet interface - web GUI

RF SECTION	
RF output	30W nominal @ 50 Ohm
Frequency stability	+/-2.5 ppm
Carrier generation	NCO + Iout DAC (DDS)
Frequency step	10 kHz (1 kHz optional)
Frequency resolution	0.888 uHz
Output phase noise	-120dBc/Hz @ 1 kHz
SFDR	>-80dBc within channel
RF connector	N female

AUDIO / MPX SECTION	
Input name	Port A
Input type	Digital electrical interface
Connector	XLR-3 female
Impedance	110 Ohm balanced - transformer isolated
Supported formats	AES3, IEC60958, S/PDIF
Maximum data rate	12.288 Mbit/s
Audio sample rate	32 - 192 kHz (96kHz for L/R, 192kHz for D-MPX)
Audio sample resolution	24 bit

Input name	Port B
Input type	Digital optical interface
Connector	F05 female
Supported formats	AES3, IEC60958, S/PDIF
Maximum data rate	12.288 Mbit/s
Audio sample rate	32 - 192 kHz (96kHz for L/R, 192kHz for D-MPX)
Audio sample resolution	24 bit

Input name	Port C
Input type	Analog electrical interface - 2 inputs
Connector	2 x XLR-3 female
Impedance	10 kOhm TRUE balanced
ADC resolution	24 bit
ADC sample rate	96 / 192 kHz (96kHz for L/R, 192kHz for A-MPX)
ADC THD+N	-106dB (0.0005%)
ADC Dynamic range	121 dB (no weighting)
Channel separation	135 dB
Reference input	5.6Vpp for 0 dBFS
Input BW @ 96kHz SR	-0.1dB @ 40 kHz
Input BW @ 192kHz SR	-0.1dB @ 80 kHz



NOTE: These are preliminary technical specifications and might change without notice. Please do not hesitate to contact us for the most updated information at: support@sigmacom.gr