NRG-PLL-PRO7

FM TRANSMITTER

- Operating Instructions
- programming Manual
- Specifications

www.nrgkits.co.nz

NRG-PLL-PRO7

Introduction

NRG transmitters are type approved for LPFM use in New Zealand and carry all required regulatory labels.

The NRG-PLL-PRO 7 has no frequency drift, rock solid power and the ultimate sound quality in one superb package.

This is the NRG PLL PRO 7, Incorporates the unique NRG circuit design, it delivers a stunning 10 watts of RF power to a correctly matched antenna.

The frequency is selected from the front display, no manual tuning adjustments required to change the frequency,

The PLL PRO 7 design uses wide-band power amplifier technology, this eliminates the need for manual tuning to “peak the power”.

This design is so stable that the RF power output will remain constant even at high ambient temperatures, there is no power slump with this transmitter.

Also featured in the PLL PRO 7 design is a “Out Of Lock Power Down” circuit. This will automatically reduce the output power to zero so that frequency to adjacent radio stations will NOT be affected.

A clean startup is also assured every time without any disturbance to other channels. After initial power on the pll will lock within 2 seconds to any frequency in the FM band

After lock is reached there is a further short delay before RF power is enabled then progressively increases over a further 2 seconds to the maximum set power.

The sound quality of the PLL-PRO 7 will match the most expensive exciters.

The audio frequency response is absolutely level and linear from 30Hz to 57KHz to provide only the highest transmitter FM modulation quality, not only this but the pll is dual speed for a fast lock with 2 seconds then switching to a very low loop constant, with no more distortion of low audio frequencies and no more tilt.

If this wasn’t enough the oscillator is immune to RF feedback and hum since it operates on a completely different frequency to the output stages.

This along with the unique NRG design offers excellent phase noise. Your listeners will receive crystal clear sound and an excellent stereo performance.

Optimum sound quality has always been high on our list,

NRG-PLL-PRO7

INSTALLATION AND ACTIVATION

CAUTION:

Before switching the equipment, ensure that all RF Loads, RF cables and connectors are properly connected.
Failure to observe the above caution and also the installation instructions of this amplifier may cause damages to the amplifiers for which the supplier cannot be responsible.

CONNECTIONS AND INSTALLATION

Before installing the equipment, always make sure that the transmitter is not powered. This has the purpose to prevent electrical shocks and damage to the equipment.
Install the transmitter so that there is sufficient air flow in front and the back of the transmitter.

ANTENNA

Connect the transmitting antenna cable using 50 Ohm coaxial cable with an N type male connector fitted
Connect this to the N type female socket located on the rear of the case.
To prevent damage to the amplifiers, it is essential that either the feeder and antenna system or the dummy load have a good in-band return loss.
Failure to observe the above caution and also the installation instructions of this amplifier may cause damages to the amplifiers for which the supplier cannot be responsible

POWER CONNECTION

Connect the power cord supplied to an operating source. Make sure that the power supply source provides the nominal voltage AC supply voltage from 110 VAC to 230 VAC
We suggest the installation of spike suppressors, line conditioners, isolation transformers, UPS or other devices useful to protect the equipment from eventual damages that can be caused by the mains fluctuations or spikes.

MPX AUDIO CONNECTION

Audio mpx input is adjustable on the rear or the transmitter next to the MPX input bnc audio input connector.
You will need a small jewellers type flat headed screwdriver to adjust the trim pot
Do not exceed 2 volts peak to peak of audio input as this may cause damage to the input.
It is very important to set the audio level to comply with the standards of your country of origin.
For New Zealand LPFM you must not exceed AF 75kHz and or 100% modulation.
MPX input only – note, there is NO stereo encoder inside. We recommend using StereoTool to generate a full Stereo/RDS multiplex signal that will also keep your deviation tightly controlled giving you loud crisp sounding audio, keeping your transmitter in compliance with the required standards. Go to www.thimeo.com for more information.

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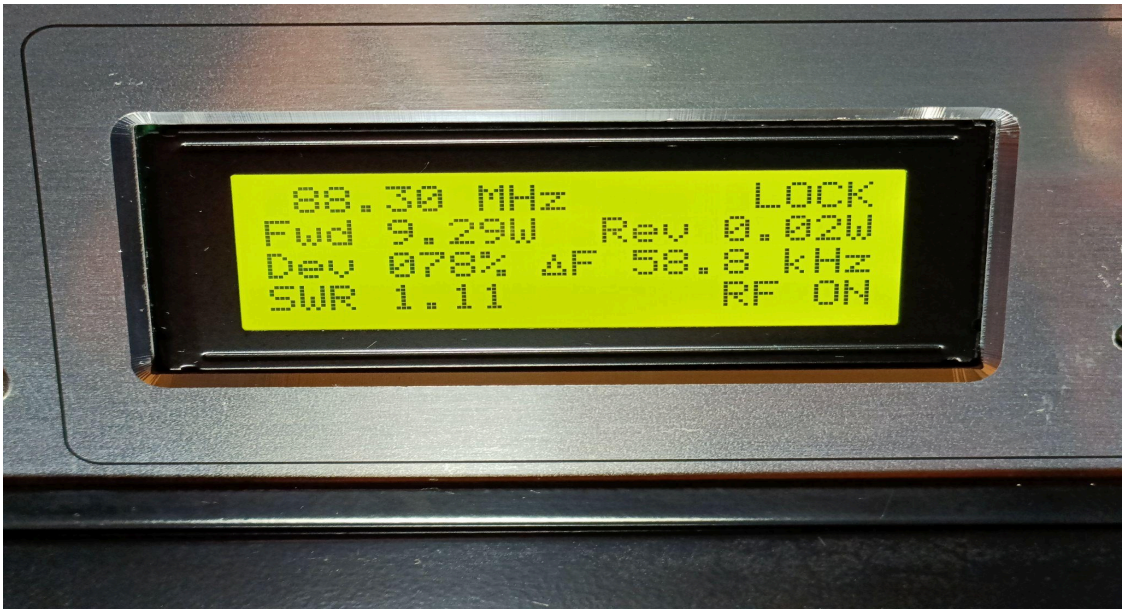
MENU DESCRIPTION AND VISUALIZATION LCD DISPLAY

The following parameters that are visualized on the front panel LCD display are the actual operating parameters of the **NRG PLL PRO 7 Transmitter in operation.**
The default LCD display indicates the output power set by the customer, the transmission frequency in MHz and that it is locked on frequency, the real forward power in Watts and milliwatts the, reflected power in watts and milliwatts, the deviation in percent, the audio frequency AF in kHz, the standing wave ratio SWR, the RF power if on or off,
The adjustable parameters from the programming buttons are RF on or off and frequency adjustment.
Audio mpx input is adjustable on the rear or the transmitter.

Power adjustment is inside the case to comply with New Zealand LPFM Regulations.



LCD Display Operating Screen Abbreviations

Operating frequency	88. 30 MHz	**Lock or Unlock**	LOCK
Power Output	FWD 9.29W	**Reverse Power**	Rev 0.02W
Deviation	Dev 078%	**Audio Frequency**	AF 58.8 khz
SWR	SWR 1. 11	**RF Power on or off**	RF ON

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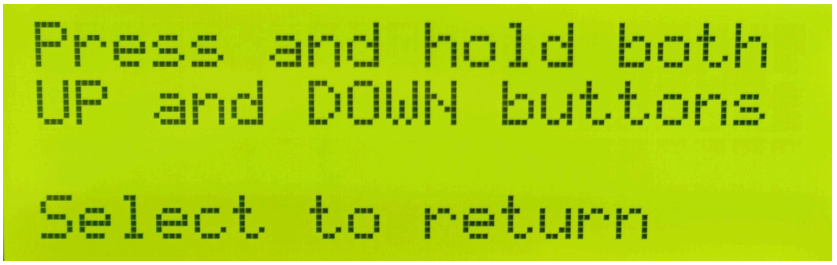
Adjustable Functions and Parameters

Setting Or Changing Frequency Mhz

To adjust and or set the transmit frequency press the enter button on the front panel this is the centre button. Use the up or down arrow buttons to scroll though the menu until you reach set frequency

Step1 Press the enter button.

Step 2 Press and hold the up and down buttons.



Step 3 To adjust the frequency use the up and down buttons to select the desired frequency then press the enter button to save.

Step 4 Then use the up or down buttons to scroll through the menu until you reach (Return To Main Menu) then press the enter button.

RF Mute on/off

This allows the ability for the RF power to be turned on/off leaving all other functions operating.
To turn on or off press the enter button scroll to the **Rf mute option** using the up and down buttons then press enter.
Use the up or down buttons to select RF Mute or RF enabled press the enter button to save.
Use the up or down button until you reach **return to main menu** then press enter.

MPX Audio Input

This has been preset for line level input

Audio mpx input is adjustable on the rear or the transmitter next to the MPX input bnc audio input connector.
You will need a small jewellers type flat headed screwdriver to adjust the trim pot
Do not exceed 2 volts peak to peak of audio input as this may cause damage to the input.

RF Power Adjustment

The Rf power is set to one watt output as default, This is to comply with NZ-LPFM regulations.
The power is adjustable from 1 watt though to 10 watts.
A trim pot is located inside the cabinet on the main controller/transmitter board with the wording (POWER)
Only a qualified radio engineer or technician with experience in radio frequency (RF) technology should adjust the power levels, ensuring the transmitter operates within legal limits and optimal performance.

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Transmitter / Interference Protection

SWR Protection

If the SWR is above 1.8 the transmitter will automatically turn the RF power off and show SWR on the LCD Display
To reset the transmitter (SWR Protection) turn the mains power off, then back on.
Check The Following
Factors that can cause high SWR
Antenna length and tuning.
Antenna placement too close to nearby objects.
Damaged incorrect cables and or connectors.

Out Of Lock Power Down

If out of lock occurs power down the transmitter for 30 seconds then reinstate the power.
If the problem still persists please contact the supplier

Out Of Lock Power Down” Circuit, automatically reduces the output power to zero so that radio stations on adjacent frequencies will not be affected.
A clean startup is assured every time without any disturbance to other channels After initial power on the pll will lock within 2 seconds to any frequency in the FM band, after lock is reached there is a further very short delay before RF power is enabled and progressively increased over a further 2 seconds to the maximum set power.

NRG-PLL-PRO

Specifications

Type: VHF/FM PLL wideband modulation Frequency Coverage 87.5 to 108 MHz in 100KHz steps
Frequency Generation: Ultra low noise VCO operating above 2GHz with output divider to generate target frequency in FM band
Frequency Correction: Dual Speed Phase Locked Loop Synth.
Amplifier stages: 3 stage wideband – No Tune
Frequency Stability: Plus/minus 300Hz (temperature compensated TCXO)
RF power out: adjustable 1-10 watts (Max power + / - 5%)
7 Pole RF Low Pass Filter
PA Efficiency: 80% At 10 Watts Output
PA ruggedness: 20:1 VSWR (withstand at full power)
PA stability: Stable through 20:1 VSWR, all phases
Power down in event of high VSWR
Harmonic Rejection: -65dBc (7 pole LPF)
Spurious: -90dB down on carrier
S/N ratio: -80dB down on line level
MPX input
Audio input: 0.775 V rms for +/- 75 KHz
Audio performance: Less than 0.05% distortion, 30Hz-57KHz
Phase noise better than -115dBc/Hz at 10KHz offset
Polarity protection: Full crowbar fused power input
Power requirement: 230/110 volts AC 0.7A 50/60Hz