



144MHz - 146 MHz to 28MHz - 30MHz  
VHF down converter  
for SDR radios.

*Suitable for analogue radios*

User manual. Rev 01  
(June 2014)

The Heros Tech 144-146MHz to 28-30MHz VHF Down Converter introduced here expands the frequency range of any Software Define Radio (SDR) or analogue shortwave receivers covering 28MHz to 30MHz (10m band) allowing reception of the exciting 144MHz-146MHz band (2m band).

The Converter is connected between the antenna and a SDR or analogue HF radio (called IF receiver). When turned ON the 144MHz-146MHz band is mirrored on 28MHz-30MHz band.

For example, if the IF receiver is tuned on 28.430 MHz, you are receiving the frequency of 144.430 MHz, (allocated segment of frequencies for beacons according to the 2m band plan.) Tuning to 29MHz you are receiving 145MHz and so on.

The Converter allows the reception of all amateur radio services assigned to the 2m band such as SSB, CW, FM, RTTY, FAX transmission modes, internet voice gateway, digital communications, repeaters space communications, ( ISS International Space Station, space-Earth link), amateur satellites and many more stimulating activities.

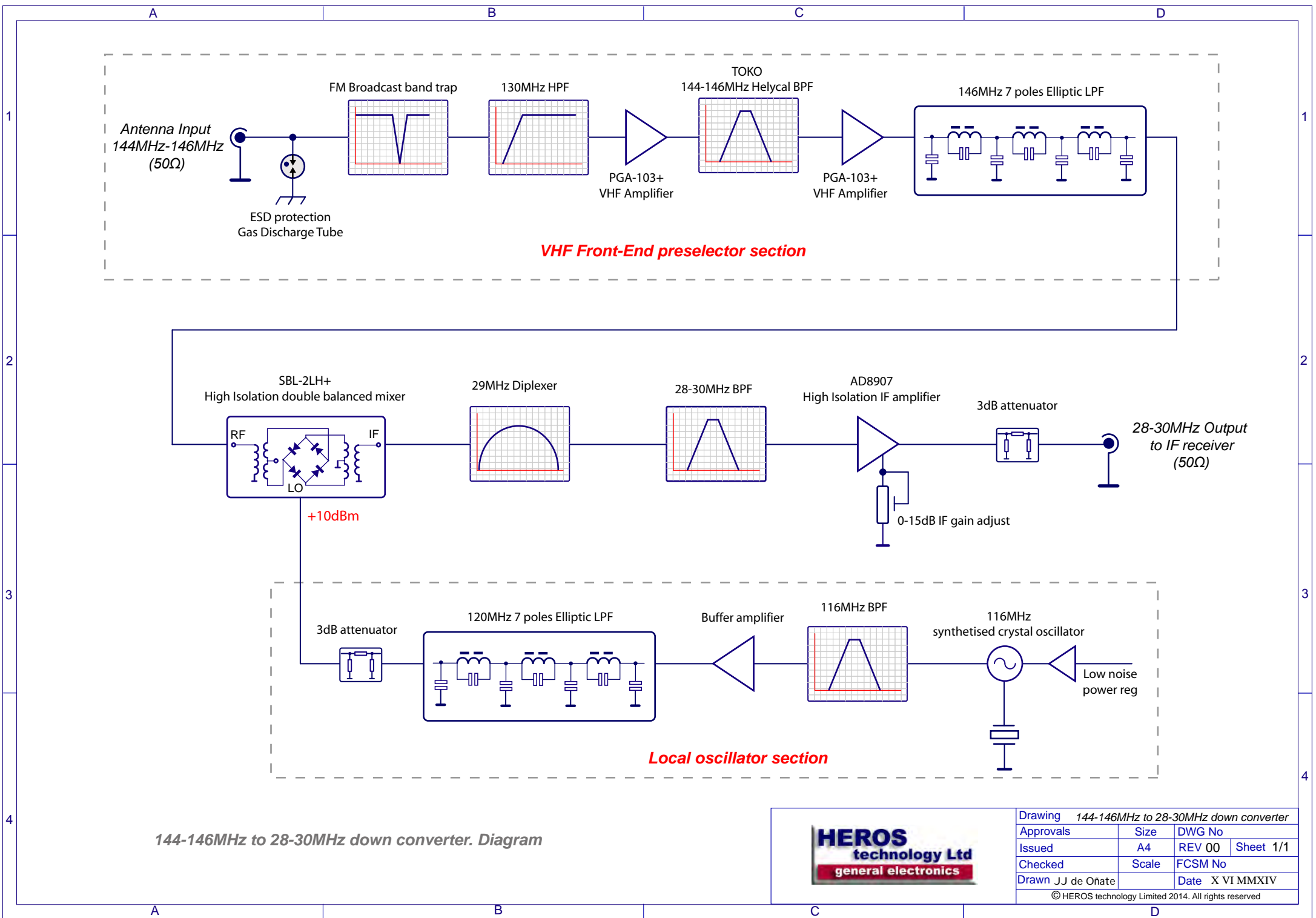
The Heros Tech 144-146MHz to 28-30MHz VHF Down Converter is designed taken in account the wide range of signal variability that are expected to be received. Those conditions demand for very low noise, good front end filtering, high dynamic range performance, excellent IMD characteristics and good IF receiver isolation.

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#### Technical Specifications:

- Converter class: Superheterodyne. Mirrored down.
- Frequency range: 144MHz-146MHz (2m band).
- Gain: 40 dB.
- Noise figure: 0.5dB.
- IP3: > 38dB.
- Input/Output impedance: 50  $\Omega$
- VHF Front-End preselector:
  - Dual helical filter.
  - 146 MHz seven poles Elliptic Low Pass Filter.
  - FM broadcast band rejection filtering.
  - ESD protection.
  - Dual high dynamic range E-PHEMT enhanced technology VHF preamplifier.
- Mixer:
  - High L-R/L-L ports isolation double balanced mixer.
- Crystal oscillator: High stability, very low jitter, 116MHz synthesised crystal oscillator.
- IF receiver output:
  - Frequency: 28MHz-30MHz.
  - 3 sections 28MHz-30MHz Band Pass Filter.
  - 80dB high isolation IF amplifier.
  - 0dB-15dB variable gain range. User regulable.
- Power supply: 12volts/350mA
- Enclosure: Aluminium
- Size: 165mmx80mmx45mm ( 6.5x3.15x1.78in)





144-146MHz to 28-30MHz down converter. Diagram



Drawing 144-146MHz to 28-30MHz down converter			
Approvals	Size	DWG No	
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Front panel



Rear panel

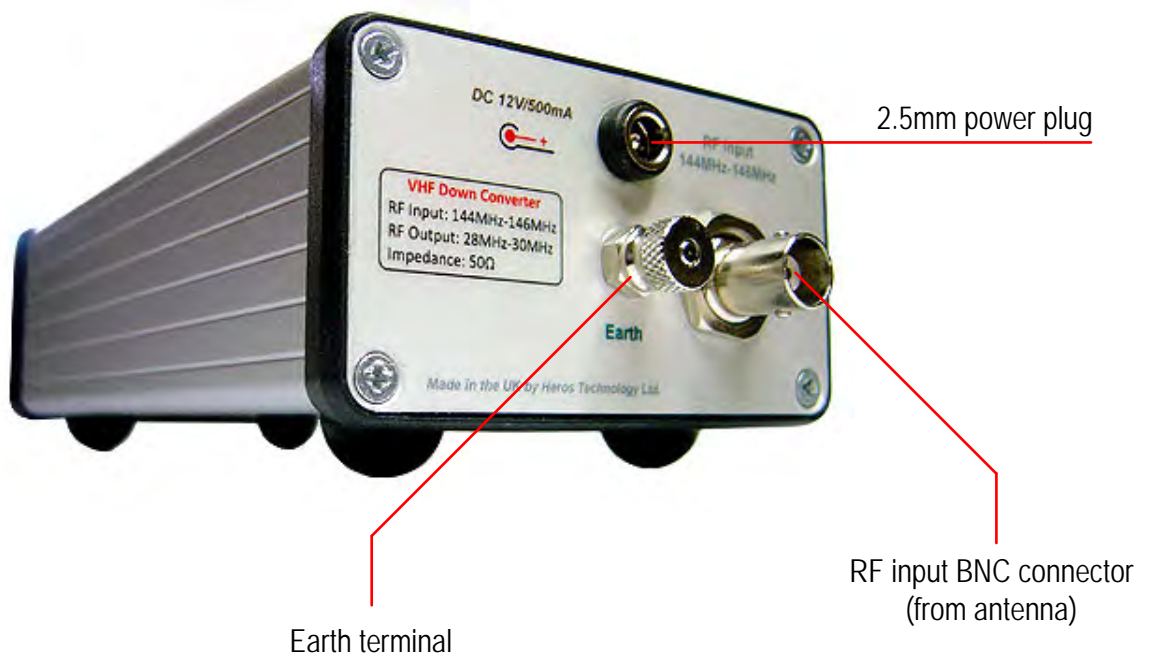
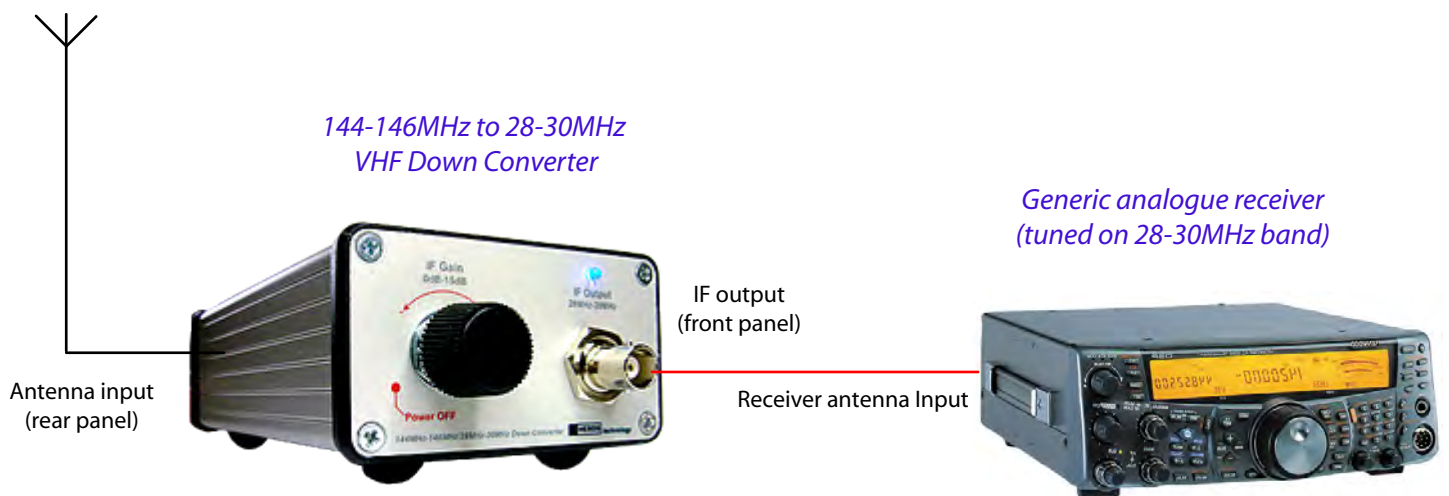
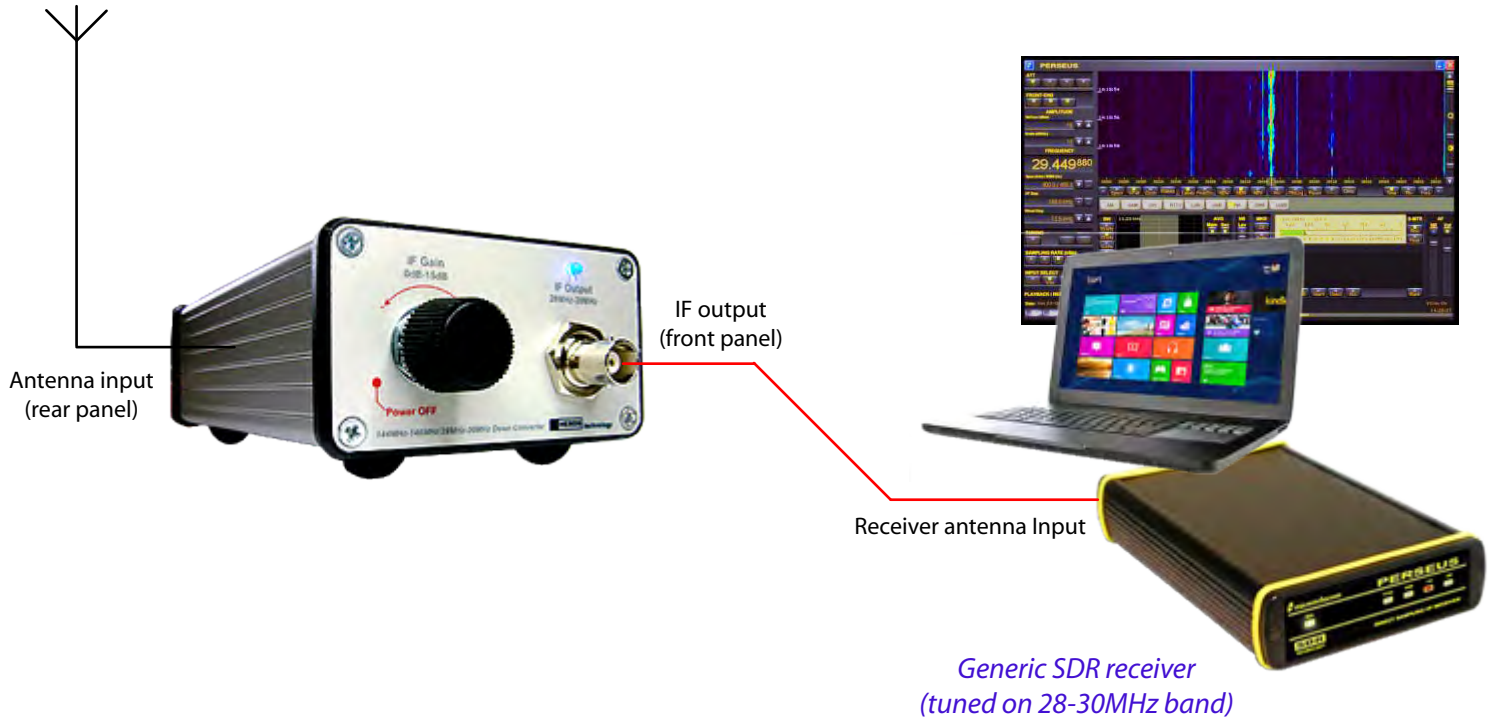
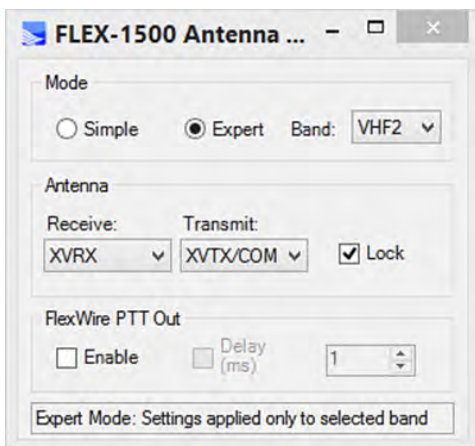


Illustration of connection to generic radios





FlexRadios connection illustration



PowerSDR configuration

XVTR Setup

Enabled	Band Button	UCB Address	Button Text	LO Offset (MHz)	LO Error (kHz)	Begin Freq (MHz)	End Freq (MHz)	RX Gain (dB)	RX Only	Power	XVTR RF TX
<input type="checkbox"/>	0	0	2m	1.0	2.000	3.000000	4.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	1	1	70cm	6.0	7.000	3.000000	3.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	2	Heros	115.0	0.000	144.000000	146.000000	0.0	<input checked="" type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	3	3	3	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	4	4	4	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	5	5	5	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	6	6	6	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	7	7	7	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	8	8	8	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	9	9	9	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	10	10	10	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	11	11	11	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	12	12	12	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	13	13	13	0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	14			0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>
<input type="checkbox"/>	15			0.0	0.000	0.000000	0.000000	0.0	<input type="checkbox"/>	100	<input type="checkbox"/>

Use XVTR PWR for Tune

**NOTES:**

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