

VR-JTL30xx DC/DC Converter Voltage Regulator module

In many cases where a single, high voltage is available like in high power Class-D designs, there are also low voltages required. Normally, people use a small separate power supply for that.

With this series of Voltage Regulator modules we use a professional DC/DC converter range, capable of transferring relative high voltages into regulated lower voltage(s) for low power electronics like preamplifiers, DAC's and digital circuits. So with these modules you only need a single supply now.

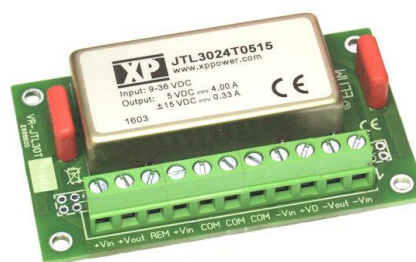
The range of 30W DC/DC converters as we use have a very wide input voltage range and are available as single 3,3V, 5V, 12V and 15V, symmetrical with $\pm 5V$, $\pm 12V$ or $\pm 15V$ and even triples with 3,3V or 5V as well. The professional converter module is metal encapsulated and very small considering what its capable of. These switch mode modules are, unlike many others, doing all required in one on a high quality scale.

While developing our PS-UNxx Power Supply modules we wanted that these would have an option making it possible to get an extra, low voltage regulated output(s) as well. This can only be done by the use of switching DC/DC converter modules. They are available with one up to three regulated secondary voltages. About regardless the input voltage and supply type, you now can have high quality symmetrical supply voltages for analogue electronics and/or voltages for digital circuits as well without extra electronics other than this VR-JTL-30 module connected to a supply. We made them pin-compatible with our linear regulators. All our NEW switched mode Voltage Regulator modules fit on about all our ELTIM Power Supplies while using the versions with a 2x 26 pole header. While using the screw terminal version you can use them anywhere.

- Highlights of this VR-JTL30 Converter/Voltage Regulator module:
 - Tiny 1"x 2" [JTL30 DC/DC converter module](#) with 30W capacity.
 - Professional quality with expected MTBF of 320000 hours.
 - Extremely high efficiency of up to 91%, switching at 330kHz with very low RF-residue.
 - Very wide input voltage ranges of 9 – 36Vdc and 18 – 75Vdc.
 - Supplying input voltage can be single line or symmetrical ($-V + +V = V_{in}$).
 - Input and output circuits galvanic separated, can be overruled by a jumper wire / main PCB track.
 - Output single voltage variants: 3,3V; 5V; 12V; 15V.
 - Outputs symmetrical output variants: $\pm 5V$; $\pm 12V$; $\pm 15V$.
 - Outputs triple output variants: $+3,3/\pm 12V$; $+3,3/\pm 15V$; $+5/\pm 12V$; $+5/\pm 15V$.
 - Secondary overvoltage, over temperature (@115°C) and overload protection @150%.
 - All outputs are regulated independently within 0,2% accuracy and high dynamics.
 - Versions with a straight or angled header connector (3A pins). Fit on all our [PS-Unxx\(S\) Supplies](#).
 - For every output connection 6 pins are used, so $6 \times 3A = 18A$ (over)rated.
 - Pinning is compatible with our linear regulated VR-modules.
 - Versions with a 10A screw terminal and 4x M3 holes for separate module mounting.
 - PCB tracks and header/screw terminal calculated to handle 10A+ per output voltage.
 - Professional FR4 board with dimensions of 75x45x12mm.



Models with 2x 26 pins matching other [ELTIM VR-modules](#)



Models with 11-pole screw terminal and 4x M3 holes

With the triple versions there is a third output available as +VD (for digital, 3,3V or 5V) as in the pictures.

Converter / regulator module

We decided to use professional metal canned XP-Power DC/DC converter /regulator modules due to their long lifespan, high efficiency and capability of handling high input voltages as we need in order to be able to connect them to the quite high voltages of audio power amplifiers as we had in mind.



The ones we use are of a different league mostly used in general electronics and are allowed to use in f.e. industrial equipment, locomotives, etc. The life span (MTBF, Mean Time Between Failures) is **320000 hours** (45 years, 24/7). So, about a human listening lifetime. The efficiency is over **90%**, an unbeaten value.

The irregularly high switching frequency of **330kHz** leaves hardly any residue, and what's left will do no harm, not even in highest classed audio equipment.

If you want it all, this high frequency residue and its harmonics can be filtered out most easy with an LC-filter.

The switching modules we use are capable of transferring quite high DC-voltages as f.e. used in class-D power amplifiers already and transferred into a range of low voltages (see table below) used in preamplifiers, DAC's, DSP's, etc. So with these, you can combine the instant and solid power from a linear (single or symmetrical) power supply AND have clean voltage(s) for the driving electronics in one supply.

Just as we believe is a missing link so far.

Availability and pinning of output voltages

There are two input voltage ranges available: **9-36Vdc** (+Vin<>-Vin), 24V nominal and **18-75Vdc**, 48V nom.

Remote controlled function

Pin 9 (REMOTE) can be left open for normal operation. The unit comes in after 30mS typical.

For remote control, delayed power on, resp. fast power off, connect 9(REM) to 1(-Vin).

Trimming

The single voltage variant can be trimmed 10% by use of a resistor between pin 2 and V1 OR 2 and COM.

Please check the [JTL30 datasheet](#) for details.

Header	26	25	24	23	22	21-	19	18-9				8	7	6	5	4	3	2	1	
	ab	ab	ab	ab	ab	ab	ab	ab				ab	ab	ab	ab	ab	ab	ab	ab	
Screw con.	11	10 (V1)				-	9	8	7	6	5	4	3 (V3)			2 (V2)				1
Module	Input voltage range 9 – 36Vdc, 24V nominal																			
JTL3024S3V3	+Vin	3,3V (7,5A)				n.c.	Remote	+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3024S05	+Vin	5V (6,0A)				n.c.		+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3024S12	+Vin	12V (2,5A)				n.c.		+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3024S15	+Vin	15V (2,0A)				n.c.		+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3024D05	+Vin	+5V (3,0A)				n.c.		+Vin	COM			-Vin	n.c			-5V (3,0A)			-Vin	
JTL3024D12	+Vin	+12V (1,25A)				n.c.		+Vin	COM			-Vin	n.c			-12V (1,25A)			-Vin	
JTL3024D15	+Vin	+15V (1,0A)				n.c.		+Vin	COM			-Vin	n.c			-15V (1,0A)			-Vin	
JTL3024T0312	+Vin	+12V (0,42A)				n.c.		+Vin	COM			-Vin	+3,3V (5,0A)			-12V (0,42A)			-Vin	
JTL3024T0315	+Vin	+15V (0,33A)				n.c.		+Vin	COM			-Vin	+3,3V (5,0A)			-15V (0,33A)			-Vin	
JTL3024T0512	+Vin	+12V (0,42A)				n.c.		+Vin	COM			-Vin	+5V (4,0A)			-12V (0,42A)			-Vin	
JTL3024T0515	+Vin	+15V (0,33A)				n.c.		+Vin	COM			-Vin	+5V (4,0A)			-15V (0,33A)			-Vin	
Module	Input voltage range 18 – 75Vdc, 48V nominal																			
JTL3048S3V3	+Vin	3,3V (7,5A)				n.c.	Remote	+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3048S05	+Vin	5V (6,0A)				n.c.		+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3048S12	+Vin	12V (2,5A)				n.c.		+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3048S15	+Vin	15V (2,0A)				n.c.		+Vin	COM			-Vin	n.c			Trim			-Vin	
JTL3048D05	+Vin	+5V (3,0A)				n.c.		+Vin	COM			-Vin	n.c			-5V (3,0A)			-Vin	
JTL3048D12	+Vin	+12V (1,25A)				n.c.		+Vin	COM			-Vin	n.c			-12V (1,25A)			-Vin	
JTL3048D15	+Vin	+15V (1,0A)				n.c.		+Vin	COM			-Vin	n.c			-15V (1,0A)			-Vin	
JTL3048T0312	+Vin	+12V (0,42A)				n.c.		+Vin	COM			-Vin	+3,3V (5,0A)			-12V (0,42A)			-Vin	
JTL3048T0315	+Vin	+15V (0,33A)				n.c.		+Vin	COM			-Vin	+3,3V (5,0A)			-15V (0,33A)			-Vin	
JTL3048T0512	+Vin	+12V (0,42A)				n.c.		+Vin	COM			-Vin	+5V (4,0A)			-12V (0,42A)			-Vin	
JTL3048T0515	+Vin	+15V (0,33A)				n.c.		+Vin	COM			-Vin	+5V (4,0A)			-15V (0,33A)			-Vin	

Galvanic separation

Without further precautions/actions, the input and output(s) are galvanic separated, see fig. 1 at next page. The input circuit and output circuit(s) are so not connected electrically as with a transformer. Make sure that the difference between in/outputs and case does not exceed 1600Vdc, which will hardly ever happen.

In order to drop the galvanic separation, meaning connecting the grounds of both devices, a link has to be made between the both grounds. We made internal connections on our modules for simple linking:
For symmetrical host supplies: Just connect **GND** of the host to **COM** of our module (Fig 2).
For single, positive voltage host supplies: link **-Vin** (=Host GND) with **COM** of our module (fig 3).
For single, negative voltage host supplies: link **+Vin** (=Host GND) with **COM** of our module (fig 4).

While using a header version of our module, link 1ab (for pos. supplies) or 26ab (neg. supplies) to 8-18ab on the mother PCB as we have done on our power supply modules already.
While using a symmetrical host supply, just connect header COM pins 9-18ab to GND of the host PCB.

[XP-Power JTLxx datasheet](#)

[ELTIM switching voltage converter / regulator modules comparison chart](#)

*These designs are copyrighted by
ELTIM audio BV, Louis Timmers 2019 ©
PE1LTM*

www.eltim.eu

Examples of connecting ELTIM switched mode regulator modules:

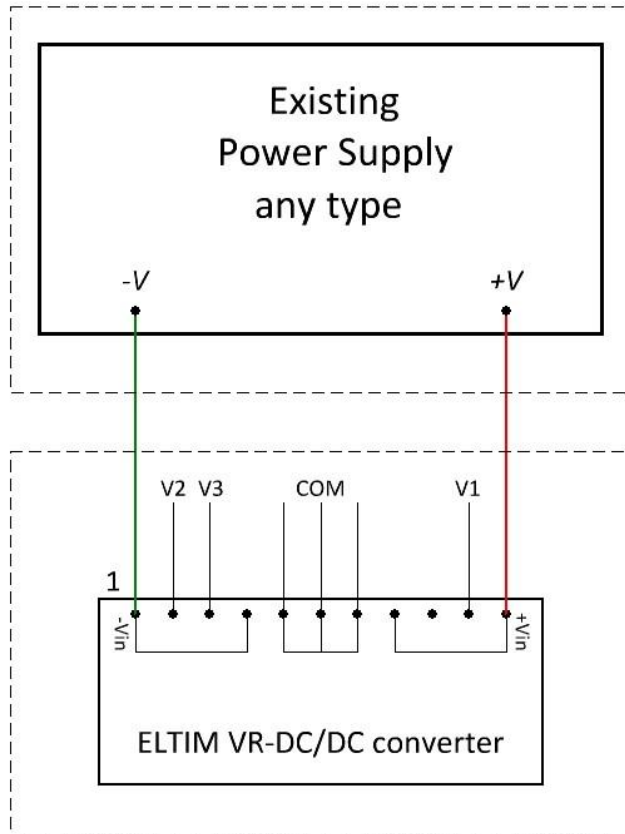


Fig 1: Galvanic separated host / guest supplies

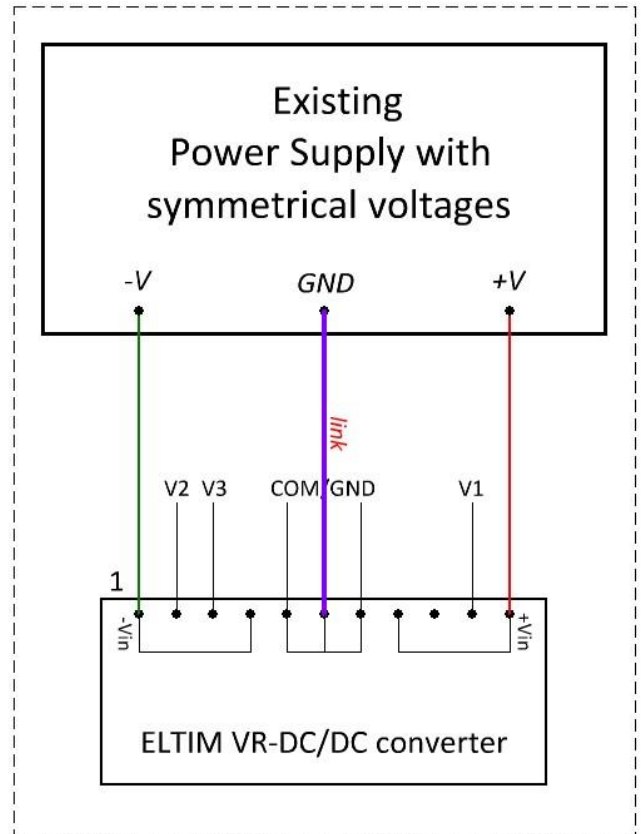


Fig 2: Symmetrical host supply, with common ground

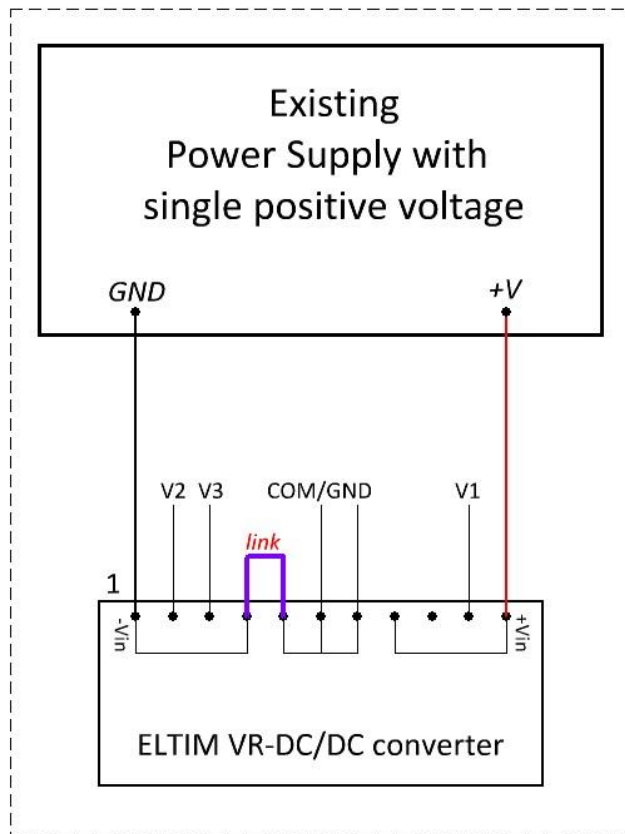


Fig 3: Single positive supply host, with common ground

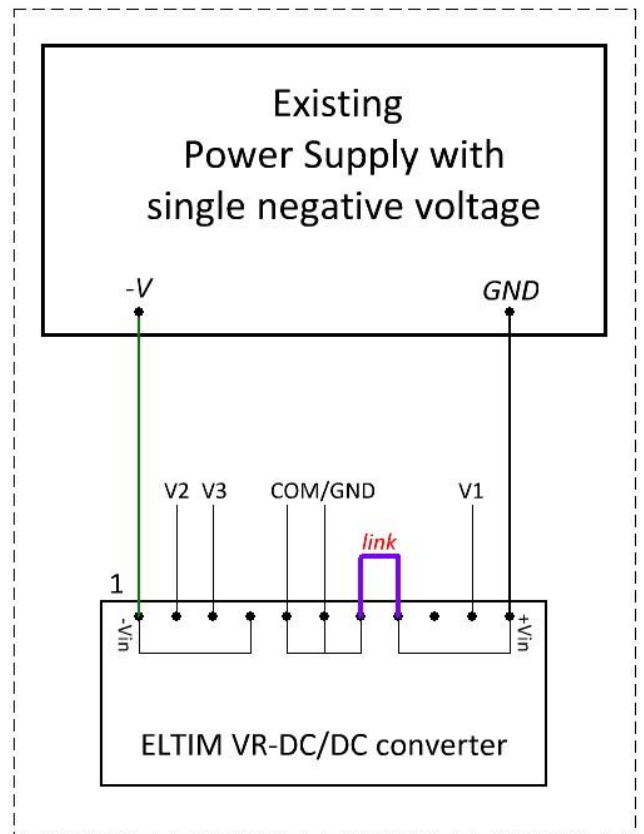


Fig 4: Single negative supply host, with common ground