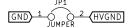


 $\pm 12~V$ power is provided by a DC power brick. $\pm 3.3 V$ and $\pm 5 V$ power are obtained using step-down (buck) regulators.

The control board generates a bipolar square wave up to 240 Vrms (frequency = 100 Hz to 10 kHz) with a boost converter that uses the +12 V source as input. It communicates with the computer over USB/serial and with the HV switching boards over i2c.

It also measures the return current from the device (CUR_SENSE).

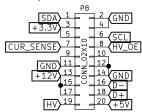
JUMPERS



J1 connects HVGND to GND (note that this should normally be connected)

J2 must be connected to enable HV output

POWER AND COMMUNICATION HEADERS These headers are exposed for testing and for control by a PC or embeded linux system.



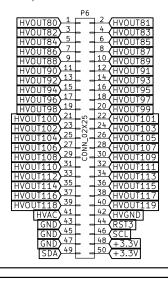


Reset lines for the switching boards can be used for firmware flashing.

HV SWITCHING BOARD EDGE CONNECTORS
Each switching boards consists of an array of 40 solid—state relays controlled over i2c.
Each output is either connected to this HVAC signal or shorted to HVGND.
HVAC is bipolar square wave signal of up to 240 Vrms (frequency = 100 Hz to 10 kHz)

P2
HVOUTO 1 P 2 HVOUT1
HVOUT2 3 4 HVOUT3
$\frac{1}{1}$
$\frac{1}{1}$
HVOUT8 9 10 HVOUT9
HV0UT10 11 12 HV0UT11
HV0UT12 13 14 HV0UT13
HV0UT14 15 16 HV0UT15
HV0UT16) 17 18 HV0UT17
HV0UT18 19 20 HV0UT19
HV0UT20\21 \\ \(\omega\) = 22\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
HVOUT20 21 50 22 HVOUT21 HVOUT23
HV00122 25 3 26 HV00125
HV0UT26) 27 = 28 HV0UT27
HVOUT26 27 2 28 HVOUT27 HVOUT28 29 S 30 HVOUT29
HV0UT30 31 32 HV0UT31
HV0UT32 33 34 HV0UT33
HV0UT34\35 36\HV0UT35
HV0UT36 37 38 HV0UT37
HV0UT38 39 40 HV0UT39
HVAC 41 42 HVGND
IGND) 43 44 (RST1)
GND) 45 46 SCI
GND) 47 48 + 3.3V
SDA) 49 = 50 (+3.3V

	Р4		
HVOUT40 1	-	12	HVOUT41
HVOUT42		4	HVOUT43
HVOUT44		6	HVOUT45
HVOUT46 7		8	HVOUT47
HVOUT48		10	HVOUT49
HVOUT50 11		12	HVOUT51
HVOUT52		14	HVOUT53
HVOUT54		16	HVOUT55
HV0UT56) 17		18	HVOUT57
HVOUT58 19		20	HVOUT59
HV0UT60 21	-2-	22	HVOUT61
HV0UT62 23	02X25	24	HVOUT63
HV0UT64) 25		26	HVOUT65
HVOUT66) 27	ЬĔ-	28	HVOUT67
HV0UT68) 29	ĻŌ-	30	HVOUT69
HVOUT70 31	<u> </u>	32	HVOUT71
HV0UT72 33		34	HVOUT73
HVOUT74 35	- -	36	HVOUT75
HV0UT76 37	<u> </u>	38	HVOUT77
HV0UT78 39		40	HVOUT79
HVAC 41		42	HVGND
GND 43		44	RST2
GND 45	┝ -	46	SCL
CND 47	l	48	1 7 71/



DMF DEVICE CONNECTOR PORTS

These connectors accept high—density discrete cables (Samtec 0.050" pitch Tiger Eye series). The cables connect these outputs to another PCB that interfaces with a DMF device using spring—loaded pogo—pins. Each pin carries a bipolar square wave signal of up to 240 Vrms (frequency = 100 Hz to 10 kHz)

VOLUE (a) 39 [] 40 (UVOLUE (4)

HVOUT40) == -	 70
HV0UT42) 37	HVOUT43
HVOUT44) 35	36 HVOUT45
HVOUT46) 33	HVOUT47
HV0UT48 31	32 HV0UT49
HV0UT50 29	30 HVOUT51
HVOUT52 27	28 HVOUT53
HVOUT54) 25	26 HVOUT55
HV0UT56 23 - 8	HVOUT57
HV0UT58 21 - 8	= 22 (HV0UT59
TIVOLITED 191	HVOUT61
HVOUT62	HVOUT63
HV0UT64\15\-0	HVOUT65
HV0UT66) 13	HVOUT67
HVOUT68	HVOUT69
HVOUT70	HVOUT71
HVOUT72	B HVOUT73
HVOUT74	HVOUT75
HVOUT76 3	HVOUT77
HVOUT78	HVOUT79
P5	

н	HVOUT80	129		40/	HVOUT81
H	HVOLITRO	37		38.	HVOUT83
Н	HVOUT84	(35 L		36	HVOUT85
Н	HVOUT86	〈 33 [34 >	HVOUT87
Н	HV0UT88	31	- 7	32	11.00107
Н		29	- 7	30 >	
Ц	HVOUT90	27		28	HVOUT91
Ц	HV0U192	25		26	HVOUT93
Ц	HVOUT94	23	-₀-	24.	HVOUT95
Ц	HVOUT96	_	_02x20		HVOUT97
П	HVOUT98	21	-8-	22 >	HVOUT99
H١	VOUT100	19	-Z	20 >	HVOUT101
Н١	VOUT102	17	-07	18	HVOUT103
Н١	VOUT104	15		16 2	HVOUT105
H١	VOUT106	13	- 4	14	HVOUT107
H١	VOUT108	11		12 >	HV0UT109
H١	VOLIT110	9	. 4	10 >	HVOLIT111
H١	VOUT112	<u>7</u>		_8_}	HVOUT111
H١	VOUT114	5		6	HVOUT115
H۱	VOUTILIA VOUTILIA	(3		4	HVOUT113
	VOUT118	$\langle 1 \rangle$	- 7	2 >	HVOUT117
П.	1001110	$\overline{}$		\neg	HVOUT119
			P7		

Ryan Fobel

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Size: USLetter	Date: 2016-12-18	Rev: 0.1
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