NW Digital Radio

UDRC-II™ Universal Digital Radio Controller

Features:
- Raspberry Pi HAT Compliant
  - 40 Pin Header
- 12V to 5V 3AMP Voltage Regulator
- TI 3204 DSP Sound Chip
- PTT and COR Interface
- DE-15 Pin Connector
  - Interface to Yaesu DR1-X Repeater
- Mini DIN-6 Connector
  - HF/VHF/UHF Radio Data Port
- Open Source Image Available

Open Source Applications Supported by Others:
- ircddbgateway/Dummyrepeater
- DIREWOLF 1200/9600 AX25
- Fldigi
- ISO Image available for Download

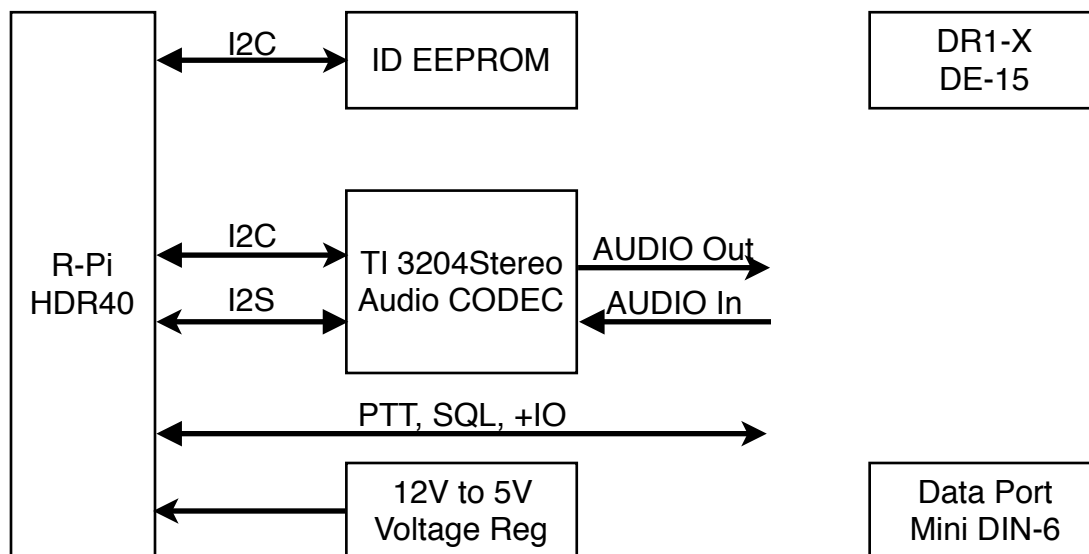Check the website for availability

The UDRC-II™ is a Raspberry Pi HAT containing all of the necessary hardware to directly interface to a radio or repeater.

The UDRC-II™ is compliant with Raspberry Pi HAT Specification and has the ID EEPROM which directly loads the device table for the UDRC on boot up. The Ideal Diode circuit allows the Pi to be powered by either the Micro USB jack or external 12VDC.

Direct Connection to the Yaesu DR1-X Repeater is available with the DE-15 Cable and adds D-STAR Capability to your Fusion Repeater.

Alternatively the Mini DIN-6 Cable can be used to connect to the Data Port on a standard HF/VHF/UHF Radio.
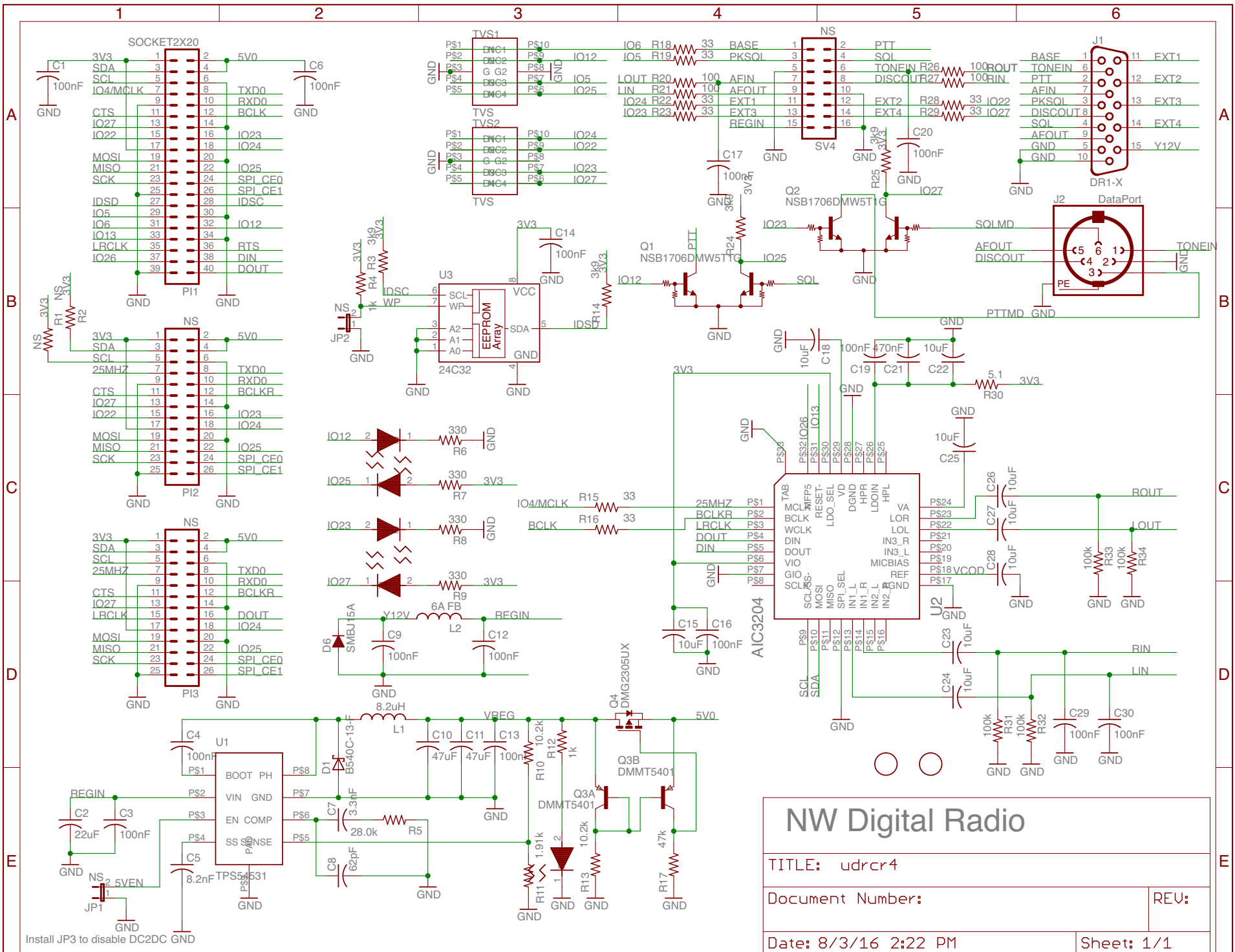
Both ports may be used with a custom cable.

AMBE is a trademark of DVSI, D-STAR is a trademark of Icom Incorporated.
Data Sheet UDRCDS.PDF 5/25/16

HD15F Pinout

UDRC-II	REV 4					
Function	HDR 40	PI	DE15/HDR16	Direction	Level	
BASE	31	IO6	1	Output	3.3V	
PTT	32	IO12	2	Output	OC 12V	
PKSQL	29	IO5	3	Input	OC 12V	May require pull-up resistor
SQLDET	22	IO25	4	Input	3.3V	
GND			5	GND	3.3V	
TONEIN		Line Out Right	6	Output	1.5V p-p	10 uF DC Capacitor
AFIN		Line Out Left	7	Output	1.5V p-p	10 uF DC Capacitor
DISCOUT		Line In 1 Right	8	Input	1.5V p-p	10 uF DC Capacitor
AFOUT		Line In 1 Left	9	Input	1.5V p-p	10 uF DC Capacitor
GND			10	Power		
EXT1	18	IO24	11	Output	3.3V	
EXT2	15	IO22	12	Output	3.3V	
EXT3	16	IO23	13	Output	3.3V	
EXT4	13	IO27	14	Output	3.3V	
12VDC			15	Power		
GND			16	GND		Header Only

Mini DIN-6 Pinout

UDRC-II	REV 4					
Function	HDR 40	PI	MDIN6/F	Direction	Level	
AFIN		Line Out Left	1	Output	1.5V p-p	10 uF DC Capacitor
GND			2	GND		
PTT	16	IO23	3	Output	OC 12V	
DISCOUT		Line In 1 Right	4	Input	1.5V p-p	10 uF DC Capacitor
AFOUT		Line In 1 Left	5	Input	1.5V p-p	10 uF DC Capacitor
SQL	13	IO27	6	Input	OC 12V	May require pull-up resistor

The standard cables supplied with the UDRC-II have all conductors wired straight thru.

If you want to connect to 2 radios you need to modify the cables as described on the wiki.

NW Digital Radio

SOCKET2X20

PI1

	3V3	1	2	5V0	
	SDA	3	4		
	SCL	5	6		
	IO4/MCLK	7	8	TXD0	
		9	10	RXD0	
	CTS	11	12	BCLK	
	IO27	13	14		
	IO22	15	16	IO23	
		17	18	IO24	
	MOSI	19	20		
	MISO	21	22	IO25	
	SCK	23	24	SPI_CE0	
		25	26	SPI_CE1	
	IDSD	27	28	IDSC	
	IO5	29	30		
	IO6	31	32	IO12	
	IO13	33	34		
	LRCLK	35	36	RTS	
	IO26	37	38	DIN	
		39	40	DOUT	

C1 100nF C6 100nF GND

PI2

	3V3	1	2	5V0	
	SDA	3	4		
	SCL	5	6		
	25MHZ	7	8	TXD0	
		9	10	RXD0	
	CTS	11	12	BCLKR	
	IO27	13	14		
	IO22	15	16	IO23	
		17	18	IO24	
	MOSI	19	20		
	MISO	21	22	IO25	
	SCK	23	24	SPI_CE0	
		25	26	SPI_CE1	

PI3

	3V3	1	2	5V0	
	SDA	3	4		
	SCL	5	6		
	25MHZ	7	8	TXD0	
		9	10	RXD0	
	CTS	11	12	BCLKR	
	IO27	13	14		
	LRCLK	15	16	DOUT	
		17	18	IO24	
	MOSI	19	20		
	MISO	21	22	IO25	
	SCK	23	24	SPI_CE0	
		25	26	SPI_CE1	

R1 R2 3V3 NS

JP2 NS R4 1k R3 3V3 3k9

U3 24C32 EEPROM Array
SCL WP VCC A2 A1 A0 SDA GND
IDSC IDSD C14 100nF

R14 3k9 3V3

TVS1 / TVS2 / TVS
P$1 DMIC1, P$2 DMIC2, G G2, DMIC3, DMIC4
IO12 IO5 IO25 IO24 IO22 IO23 IO27

IO6 R18 33 BASE
IO5 R19 33 PKSQL
LOUT R20 100 AFIN
LIN R21 100 AFOUT
IO24 R22 33 EXT1
IO23 R23 33 EXT3
REGIN

SV4 / NS
PTT SQL TONEIN R26 100 ROUT
DISCOUT R27 100 RIN
EXT2 R28 33 IO22
EXT4 R29 33 IO27
C20 100nF

C17 100nF GND R25 3k9

Q2 NSB1706DMW5T1G
Q1 NSB1706DMW5T1G R24 3k9
IO23 IO25 IO12 SQL PTT SQLMD

J1 DR1-X
BASE 1 / TONEIN 6 / 11 EXT1
PTT 2 / AFIN 7 / 12 EXT2
PKSQL 3 / DISCOUT 8 / 13 EXT3
SQL 4 / AFOUT 9 / 14 EXT4
GND 5 / GND 10 / 15 Y12V

J2 DataPort
SQLMD AFOUT DISCOUT TONEIN PTTMD GND
PE

IO12 R6 330 GND
IO25 R7 330 3V3
IO23 R8 330 GND
IO27 R9 330 3V3

IO4/MCLK R15 33 25MHZ
BCLKR R16 33 BCLK

AIC3204 U2
TAB MCLKR RESET WFP5 LDO_SEL VD HPR LDOIN HPL
BCLK WCLK DIN DOUT VIO GIO SCL/SS-
MOSI MISO SPI_SEL IN1_L IN1_R IN2_L IN2_R AGND
VA LOR LOL IN3_R IN3_L MICBIAS REF VCOD
SCL SDA

C15 10uF C16 100nF
C18 10uF C19 100nF C21 470nF C22 10uF R30 5.1 3V3
C25 10uF
C26 10uF C27 10uF C28 10uF ROUT LOUT
C23 10uF C24 10uF RIN LIN
R33 100k R34 100k R31 100k R32 100k
C29 100nF C30 100nF

SMBJ15A Y12V 6A FB
D6 C9 100nF L2 C12 100nF REGIN

U1 TPS54531
BOOT PH VIN GND EN COMP SS SENSE
REGIN
C4 100nF C2 22uF C3 100nF C5 8.2nF
C7 3.3nF R5 28.0k C8 62pF
R11 1.91k

L1 8.2uH VBEG
C10 47uF C11 47uF C13 100nF
R10 10.2k R12 1k
D1 B540C-13-F
Q4 DMG2305UX 5V0
Q3B DMMT5401 Q3A DMMT5401
R13 10.2k R17 47k

JP1 JP3 5VEN

Install JP3 to disable DC2DC

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