# NW Digital Radio

# UDRC™ 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
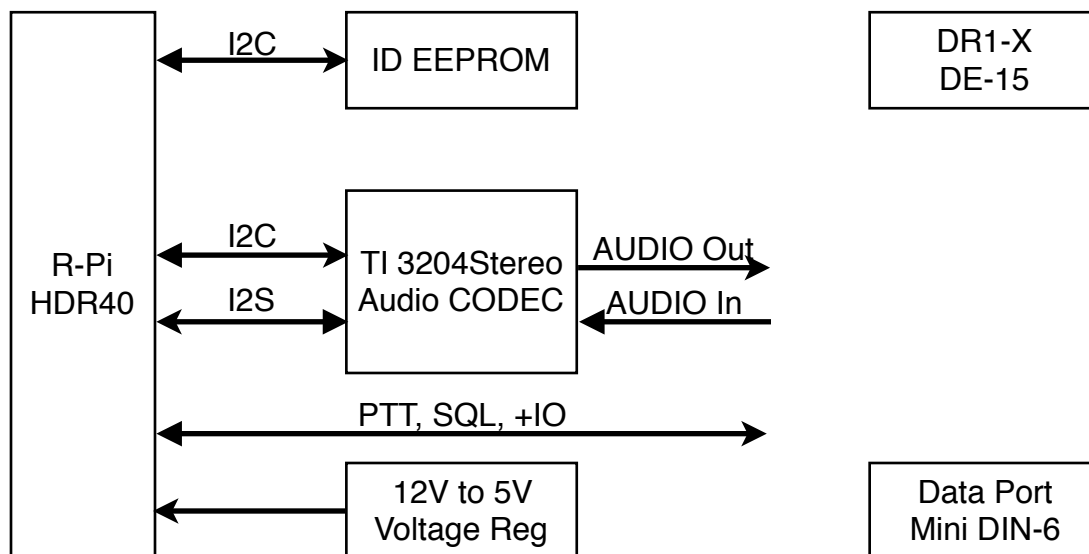- DIREWOLF 1200/9600 AX25
- FL-Digi
- ISO Image available for Download

Check the website for availability

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

The UDRC™ 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.

# Pinout

| UDRC | REV 3 | | | | | |
|---|---|---|---|---|---|---|
| Function | HDR 40 | PI | DE15/HDR16 | 3.3V Only | Mini DIN-6 | |
| BASE | 31 | IO6 | 1 | Output | | |
| PTT | 32 | IO12 | 2 | Output | 3 | Open Collector on DIN-6 |
| PKSQL | 29 | IO5 | 3 | Output | | |
| SQLDET | 22 | IO25 | 4 | Input | 6 | 12 V Tolerant may require Pullup |
| GND | | | 5 | Power | 2 | |
| TONEIN | | Line Out Right | 6 | Output | | 10 uF DC Blocking Cap |
| AFIN | | Line Out Left | 7 | Output | 1 | 10 uF DC Blocking Cap |
| DISCOUT | | Line In 1 Right | 8 | Input | 4 | 10 uF DC Blocking Cap |
| AFOUT | | Line In 1 Left | 9 | Input | 5 | 10 uF DC Blocking Cap |
| GND | | | 10 | Power | | |
| EXT1 | 18 | IO24 | 11 | Output | | |
| EXT2 | 15 | IO22 | 12 | Output | | |
| EXT3 | 16 | IO23 | 13 | Output | | |
| EXT4 | 13 | IO27 | 14 | Output | | |
| 12VDC | | | 15 | Power | | |
| GND | | | 16 | Power | | |

# NW Digital Radio

SOCKET2X20

PI1
PI2
PI3

3V3  SDA  SCL  IO4/MCLK  CTS  IO27  IO22  MOSI  MISO  SCK  IDSD  IO5  IO6  IO13  LRCLK  IO26
5V0  TXD0  RXD0  BCLK  IO23  IO24  IO25  SPI_CE0  SPI_CE1  IDSC  IO12  RTS  DIN  DOUT

C21 100nF  C10 100nF

GND

TVS1  TVS  TVS3  TVS
P$1 DNC1 P$10  P$2 DNC2 P$9  G G2  P$3 DNC3 P$8  P$4 DNC4 P$7  P$5 P$6
IO12  IO5  IO25  IO24  IO22  IO23  IO27

IO6 R9 33 BASE  IO5 R10 33 PKSQL
AFIN  AFOUT
IO24 R11 33 EXT1  IO23 R12 33 EXT3
Y12V
PTT R6 33 IO12  SQL R13 33 IO25  TONEIN  DISCOUT  EXT2 R14 33 IO22  EXT4 R15 33 IO27
J2  GND  R3 3k9  R26

SQL R26 Q2  10k R25  GND  R24 10k  AFOUT  DISCOUT  GND

J1 DR1-X
BASE  TONEIN  PTT  AFIN  PKSQL  DISCOUT  SQL  AFOUT  GND  GND
EXT1  EXT2  EXT3  EXT4  Y12V

J3 DataPort  AFIN  GND  PE  GND  Q1
PTT  R27 10k  GND

3V3 3k9  R18  R16 1k  IDSC  WP  JP1  GND
IC1 EEPROM Array 24C32  SCL  WP  VCC  A2  A1  A0  SDA  GND
3V3 C25 100nF  GND  3k9 R17 3V3  IDSD
GND  GND

is this right?  GND
3V3

IO4/MCLK R21 33 25MHZ  P$1  BCLK R23 33 P$2  LRCLK P$3  DOUT P$4  DIN P$5  VIO P$6  GND P$7  P$8

AIC3204 U1
TAB  MCLK  BCLK  WCLK  DIN  DOUT  VIO  GIO  SCL  MOSI  MISO  SPI_SEL  IN1_L  IN1_R  IN2_L  IN2_R
MFP5  RESET-  LDO_SEL  VD  DGND  HPR  LDOIN  HPL  VA  LOR  LOL  IN3_R  IN3_L  MICBIAS  REF  AGND

GND 10uF C16  100nF C17  470nF C4  10uF C18  5.1 R22 3V3
GND  10uF C15
C9 10uF  C8 10uF  TONEIN  AFIN  C6 10uF VCOD
100k R7  100k R8  GND  GND  GND
C19 10uF  C5 100nF  GND
SCL  SDA
C14 10uF  DISCOUT  C13 10uF  AFOUT
100k R4  100k R5  GND  GND

8.2uH L1  VBEG  Q4 DMG2305UX  5V0
U2 TPS54531  BOOT PH  VIN GND  EN COMP  SS SENSE
C7 100nF  D1 B540C-13-F  C11 47uF  C24 47uF  C20 100n  R1 10.2k
C12 3.3nF  C23 62pF  28.0k R3  1.91k R2
Q3A DMMT5401  Q3B DMMT5401  10k R19  47k R20
Y12V  C1 22uF  C2 100nF  GND  C22 8.2nF  JP3  GND
Install JP3 to disable DC2DC

GND

TITLE: udrcsch
Document Number:
REV:
Date: 5/25/16 11:32 AM
Sheet: 1/1

5/25/16 11:33 AM  f=0.90  /Users/Bryan/Dropbox/NWDR/UDRC/udrcsch.sch (Sheet: 1/1)