WebRadio Module WR1-AD

- Works as **stand-alone audio board or module**. Dimensions: 83 x 57 mm.
- **MP3 and AAC/AAC+/ADTS** (MPEG-4) streams up to 192 kBpS supported. **Stores up to 50 presets**.
- Integrated **DHCP client** (gets IP-address from router automatically) **or fixed IP.**
- Network settings can be set easily.
- High quality **optical S/PDIF out**, line out and headphone connector.
- Best sound experience with dedicated audio decoder VLSI VS1063.
- Presets, settings, volume and equalizer control GUI through webpage hosted by the module.
- **GUI webpage optimized for 640x480 touchscreen panel pc.**
- Most popular browsers are supported: IE, Firefox, Chrome, etc.
- **Presets up/down with user buttons for stand-alone usage.**
- Preset selection and volume control through RS232 command interface for audio module mode.
- Decodes station and artist info where available.
- **No additional software or drivers needed.**
- Optional LCD with station info.
- Fitting housing box blue or black available.

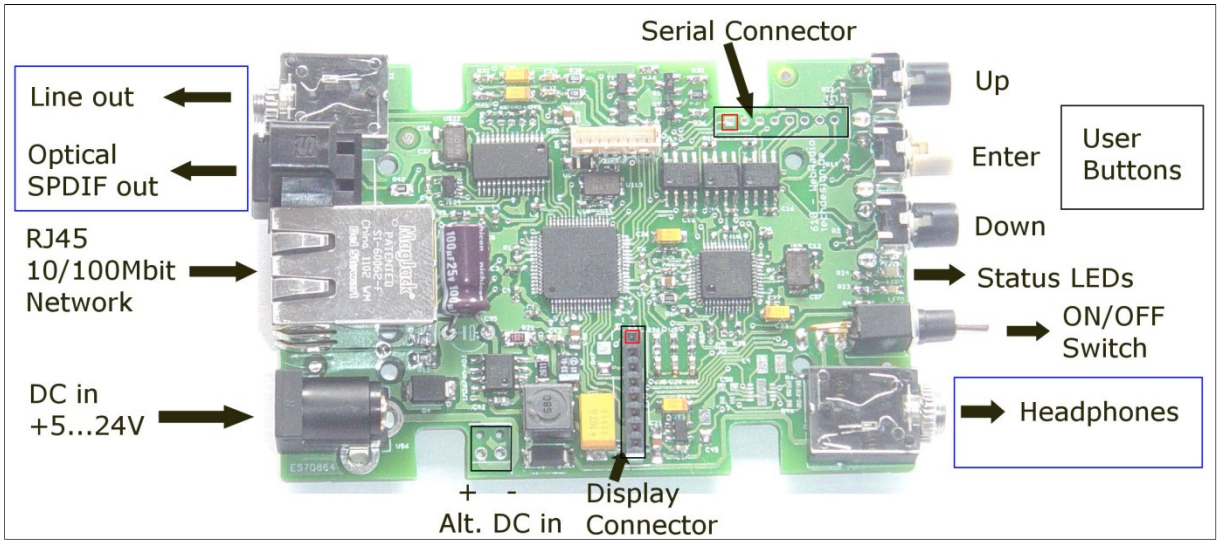

Fig. 1: WebRadio Module WR1-AD: Connection overview.

Line out (audio): 3,5 mm stereo socket for 3,5 mm stereo jack. Analog audio Zero dB line out. Power on delay switching enabled for amplifier protection.

Optical SPDIF out (digital audio): 48 kHz, 16-bit right-justified. Driven from decoded digital audio (I2S) path.

RJ45 10/100Mbit network socket: connect to the internet via router. Gets DHCP address automatically or (under development) can be set to a user predefined static address.

DC in +5…24V: power supply for standard 5mm jack. Supply positive is inner pin, ground is outer.

Alternate DC in: spare connections for power supply. In case you don't use the 5mm jack.

Display connector: optional LCD or OLED module connector. Red square is pin 1. See detailed specs below.

Headphones: can drive up to a 30 ohm load; includes an overcurrent protection. Do not use this output to drive your amplifier (take the line-out instead which is protected.)

ON/OFF switch: user toggle switch. Switches the complete circuit. No power consumption when OFF.

Status LEDs: three LEDs: Orange for boot; Yellow for tuning in; Blinking Green for normal operation.

User Buttons: three user buttons; preset Up/Down and Enter (short press: goto preset 1; long press: goto preset 25)

Serial Connector: External RS232 command connector. See detailed specs below.

Technical Data:

Parameter	Min .	Typ.	Max.	Unit
Module Power consumption	60	80	100	mA @12V DC supply
Analog line out S/N Ratio		94		dB
Optical SPDIF output		48		Ks/S sample rate
Power on to normal operation	2	4	6	Sec.

Table 1: Technical Data.

Module Function Block	Chip or Component
Power supply	LM2674M-ADJ
Ethernet Controller	PIC18F67J60-I/PT
Audio Stream Decoder	VS1063
I2S to SPDIF codec	WM8805
SPDIF Transmitter	GP1FAV31TK0F

Table 2: Chip Data.

Display Connector:

LCD connection for use with the optional WR1_LCD module (84x48 dots):

Pin number	Pin function
1 (red square)	RES
2	D/C
3	CS
4	SDA
5	VDD +3V3
6	SCLK
7	GND
8	CAP/BL (backlight)

Table 3: Display Connector pinout.

Note 1: the WR1-AD retains its full functionality when no display is connected (connector remains open.)

Note 2: The WR1_LCD module is fully wired and functional to directly connect to the display connector.

Serial Connector:

External interface for module control:

Pin number	Pin function
1 (red square)	PIC RS232 RX input
2	PIC RS232 TX input
3	/SS1 (leave open, do not connect)
4	SDI (leave open, do not connect)
5	SCLK (leave open, do not connect)
6	SDO (leave open, do not connect)
7	GND
8	VDD +3V3

Table 4: Serial Connector pinout.

Note 1: The RS232 is at +3V3 level, you'll need a level converter to communicate with a PC COM port.

Note 2: The RS232 speed is 19200 bits per second, protocol 8N1. Use "type" to pass the commands as a text string.

Serial commands:

External commands received through pin 1 (RX) and pin 7 (GND) for module control:

Command string	Command description
p12<enter>	Tune to preset number x. E.g. “p12” tunes to preset 12. Valid for p0..p49
v255<enter>	Set volume. E.g. “v255” sets to max volume . Valid for v0..v255
b10<enter>	Set bass. E.g. “b10” sets to medium bass . Valid for b0..b15
e4<enter>	Set equalizer. E.g. “e4” sets to “best” setting . Valid for e0..e5 ○ e1 for equalizer OFF ○ e2 for “Voice” ○ e3 for “Rock” ○ e4 for “Classic” ○ e5 for “Best”
u	Up: tune to next preset.
d	Down: tune to previous preset.
+	Increase volume with 5 units (min)max scale 0..255)
-	Decrease volume with 5 units.

Table 5: Serial command specifications.

Note 1: After each successful command, the new setting is also stored internally. Last settings for station preset, volume, bass and equalizer are loaded upon module boot.

Web Interface / GUI:

User preset and volume selection.

1. Open your browser (Firefox, Chrome, Internet Explorer, etc)
2. In the address bar: type or paste the NetBIOS name: **webradio** or http://webradio or the IP-address 192.168.0.199

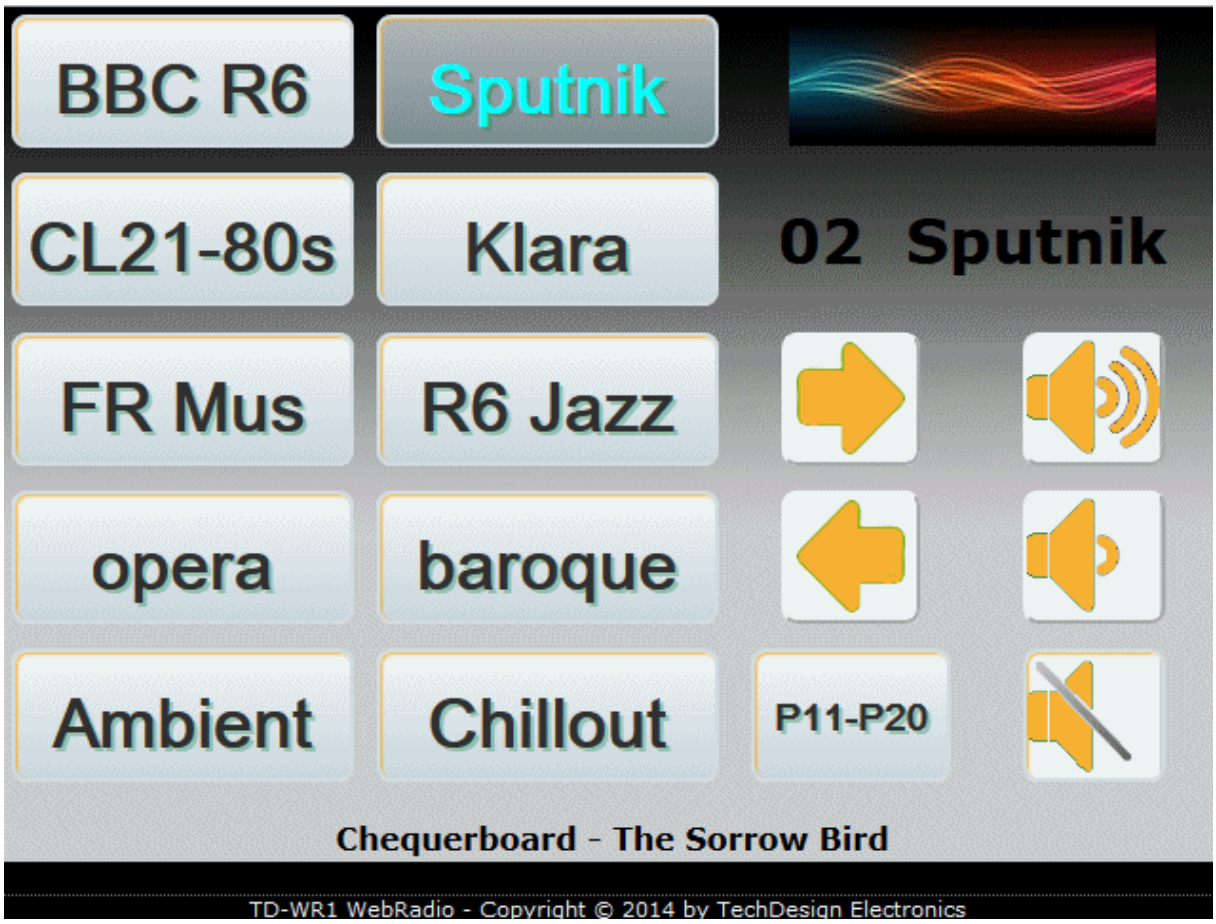

Fig. 2: Webbrowser GUI / Main Interface overview (fullscreen mode).

User browser control for loading/saving presets, user settings, network, etc.

1. Click on the logo (coloured waves) at the top-right.
2. Or, in the address bar: type or paste the NetBIOS name: **webradio/config.htm** or http://webradio/config.htm or the IP-address 192.168.0.199/config.htm

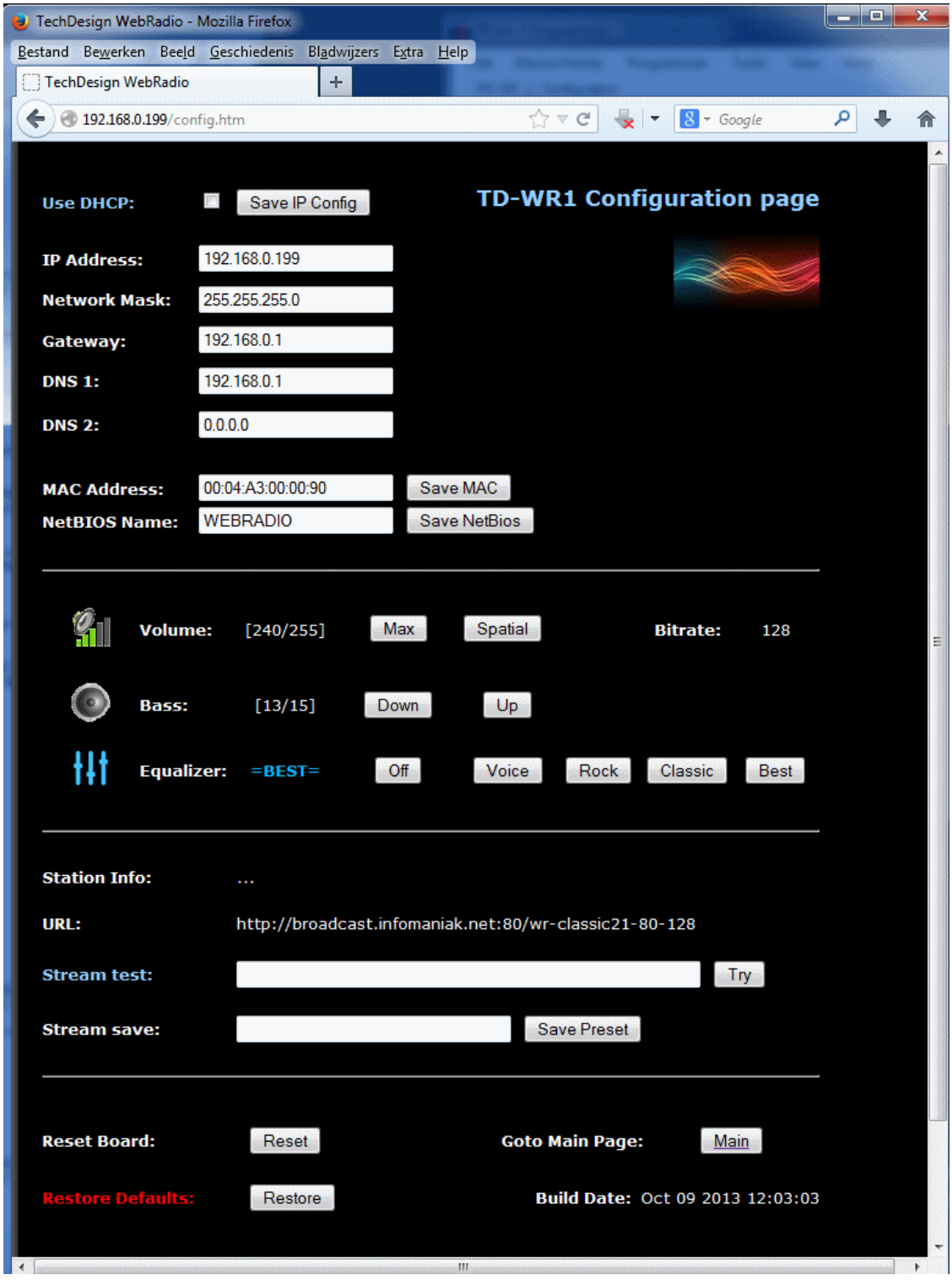

Fig. 3: Webbrowser / Config Interface overview.

How to:

- **Use DHCP** instead of a **static (fixed) IP-address**: check the “Use DHCP” checkbox and press “Save IP Config” then Reset or power cycle the board. Restart of your browser may be needed.
- **Change MAC address**: change the value in the field and press “Save MAC” button. Important: stay within the Microchip MAC range of 00:04:a3:xx:xx:xx for correct operation. Contact us for more info on how to get a globally unique EUI-48 MAC address.

- **Multiple IP-settings change:**

  1. Type the new **MAC-address** and click "Save MAC"
  2. Type the new **NetBios Name** and click "Save MAC"
  3. Type the new **IP-address** and click "Save IP Config"
  4. Click "Reset" near the bottom of the form.
  5. Restart your browser en go to the new IP-address.
  6. When no response; then try with another browser. Emptying your browsers history and cache will help as well.

- **Tune to a new station URL**: paste or type the station URL behind the “Stream test:” label and enter or click the “Try” button.
- **Save a station as a new preset** (or overwrite an existing preset): behind the “Stream save:” label: first write “p” then the desired preset number, add a space, then the preset alias. Finish with the “Save Preset” button or enter. E.g. “p2 Sputnik”

- **Restore to factory defaults**: reset the Network settings to the factory defaults.
  1. Press the “Restore defaults” button or press and hold the fysical User button: Enter during 5 seconds at power up.
  2. The board IP-address is set fixed to 192.168.0.199
  3. Gateway and DNS 1 are set to 192.168.0.1
  4. The MAC address is set to 00:04:A3:00:00:00
  5. The NetBIOS name is set to WEBRADIO
  6. Note: this will not affect the stored stream preset data.

- **Batch configuration of presets**: to configure the preset data quickly.
    1. An online batch text file is used to readout and save the preset data.
    2. Each line of text represents one preset.
    3. Example batch URL: http://www.techdesign.be/projects/610/610_preset_01.txt
    4. To process, copy + paste the Example batch URL in the “stream test” field and click “Try”
    5. You can copy this batch text file and make your own version, then save this somewhere on any available weblocation. Then use this new URL to process your own batch.
    6. If you want to erase all preset data: type “zero-p/” (without the brackets) in the “stream test” field and click “Try”

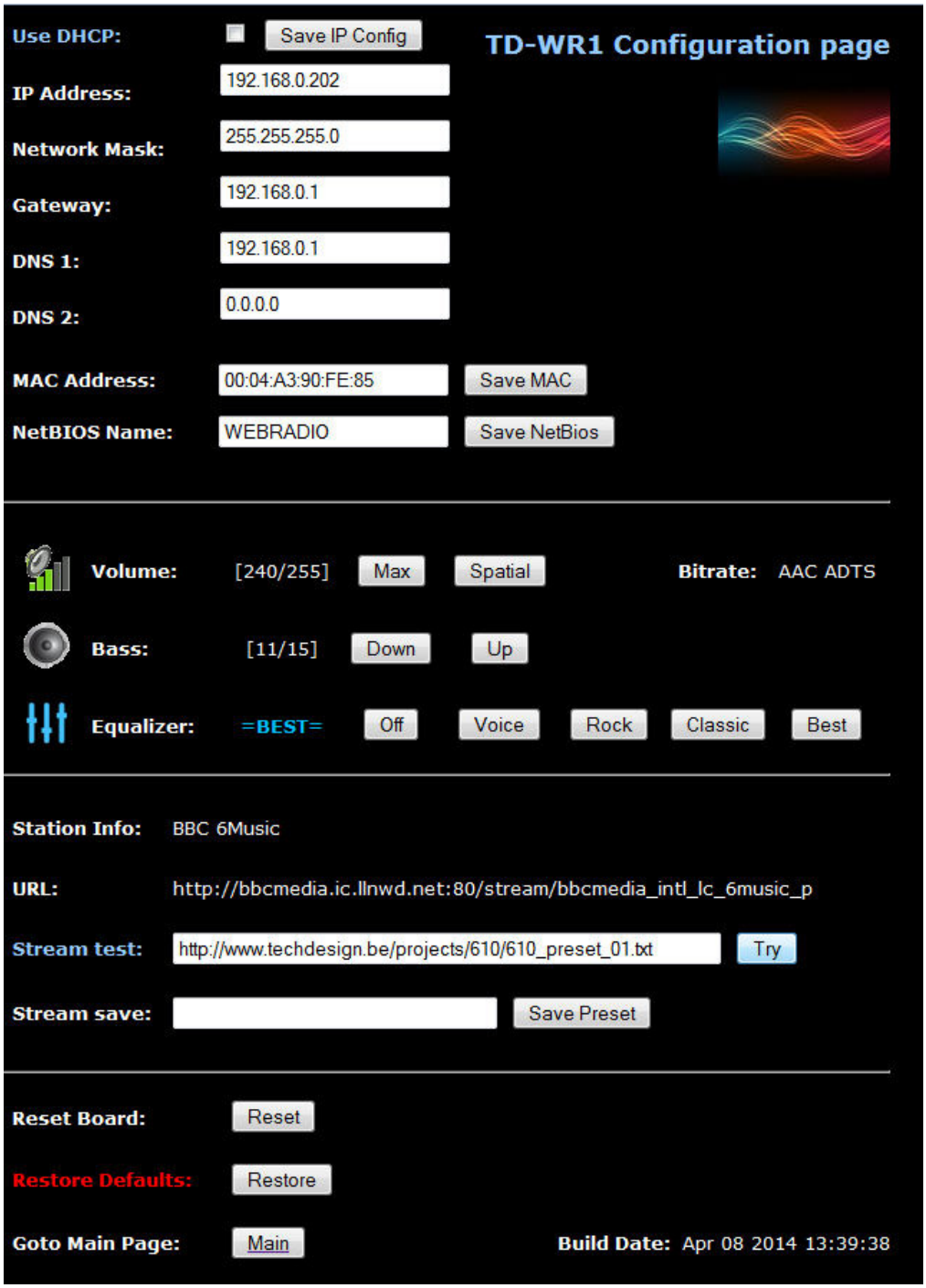

Fig. 4: Batch file URL example.

- **Batch text file details**:
  1. For preset 7 the line looks like this: **p7 "Ambient" mp4.somafm.com:80/ * v-15 e=5 b=0**

  2. p7 --> Preset number: p1 up to p50.
  3. "Ambient" --> Preset alias must be between brackets.
  4. mp4.somafm.com:80/ --> Any standard URL or IP notation is allowed.
  5. * v-15 --> Volume attenuation from max. volume: v-0 up to v-255:
     v-15 is the default setting.
  6. e=5 --> Equalizer setting:
     - e=0: global setting is used
     - e=1: equalizer is OFF
     - e=2: VOICE
     - e=3: ROCK
     - e=4: CLASSIC
     - e=5: BEST
  7. b=0 --> Bass setting: b=0 up to b=15, Equalizer must be OFF (e=1)
     to use Bass setting.

Note 1: the pc or tablet on which you run the interface needs to be in the same network as the WR1-AD module you connect to.

Note 2: station stream URL data can be found on numerous websites, f.e.

- Europe: http://www.listenlive.eu/index.html
- USA: http://www.usliveradio.com/
- Shoutcast: http://www.shoutcast.com/

Mechanical Data:

Module Dimensions: 82,66 x 56,61 x 24 mm.

Weight: 38 grams.

4 mounting holes, diameter: 2,6 mm. Each at X 14,33 and Y 14,31 mm from each corner.

Fitting housing: Hammond Hand Held Instrument 1593L (black or blue.)

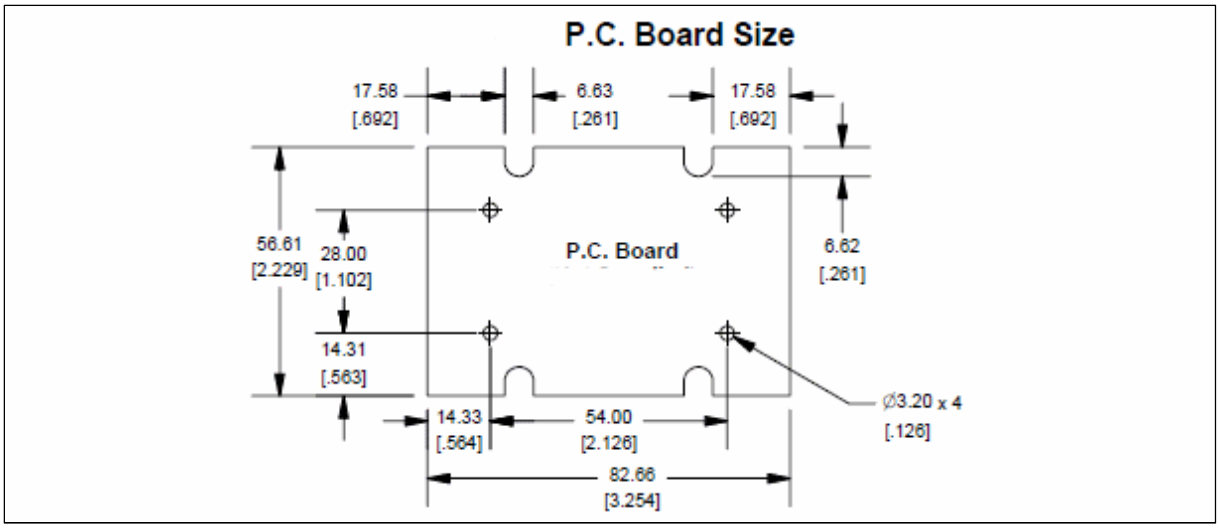

Fig. 5: Module PCB dimension details in mm and [inches]