



ESP Radio

ESP8266 and VS1053 Internet radio

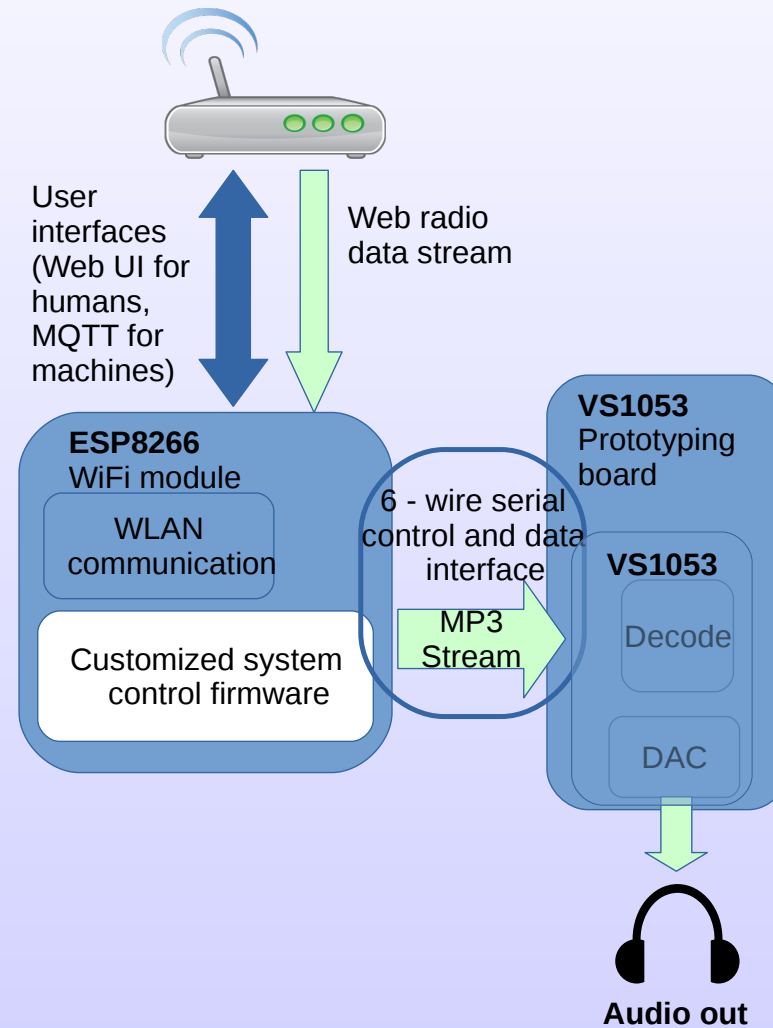
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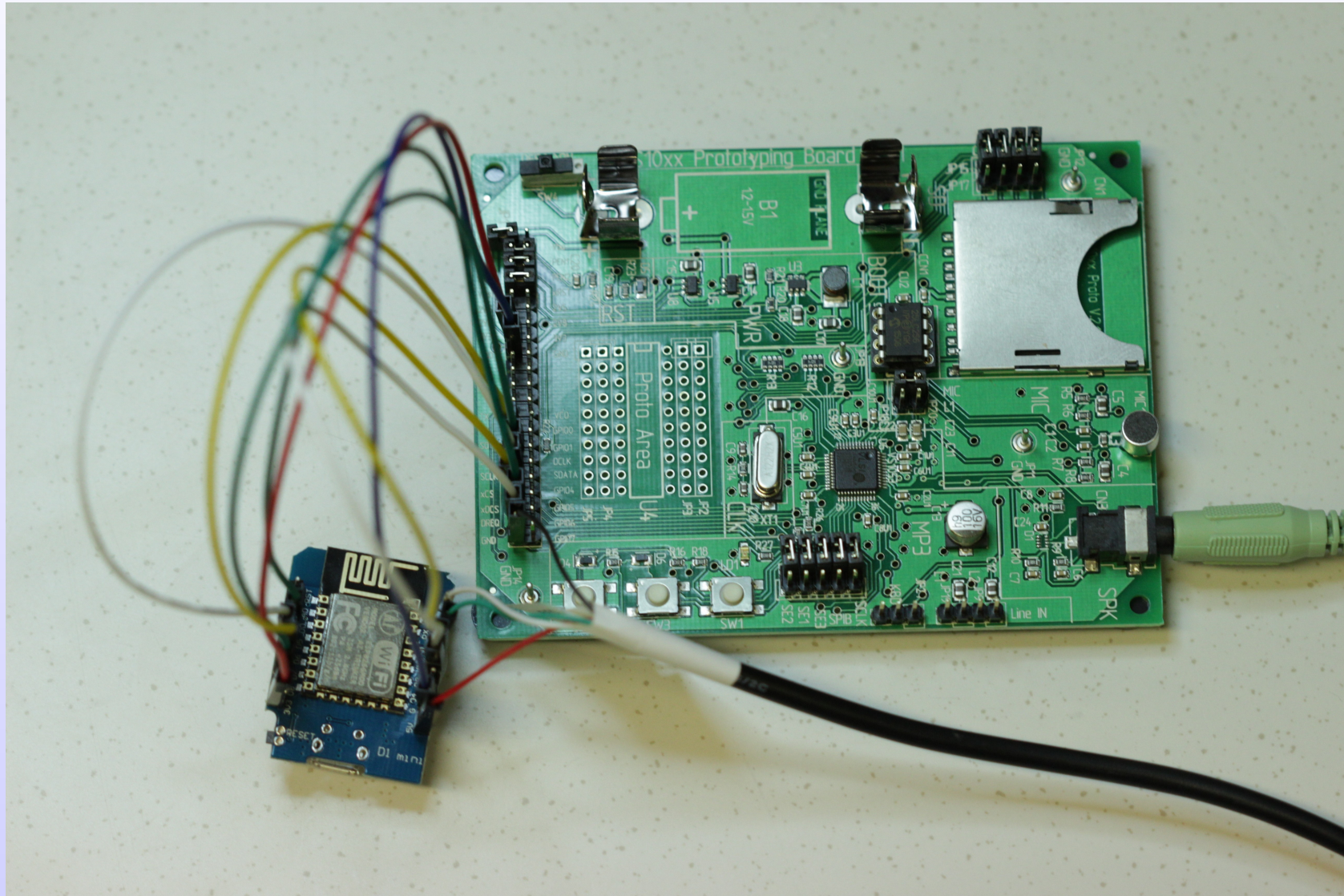
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Block diagram



Demo hardware



Overview of the system



- Project made by Ed Smallenburg
- No software from VLSI Solution
- Operation
 - ESP8266 WiFi-module loads MP3-stream from the Internet
 - VS1053 decodes digital stream to analog audio
 - Digital communication with 6 signals
- Custom software for ESP8266 available
 - <https://github.com/Edzelf/Esp-radio>

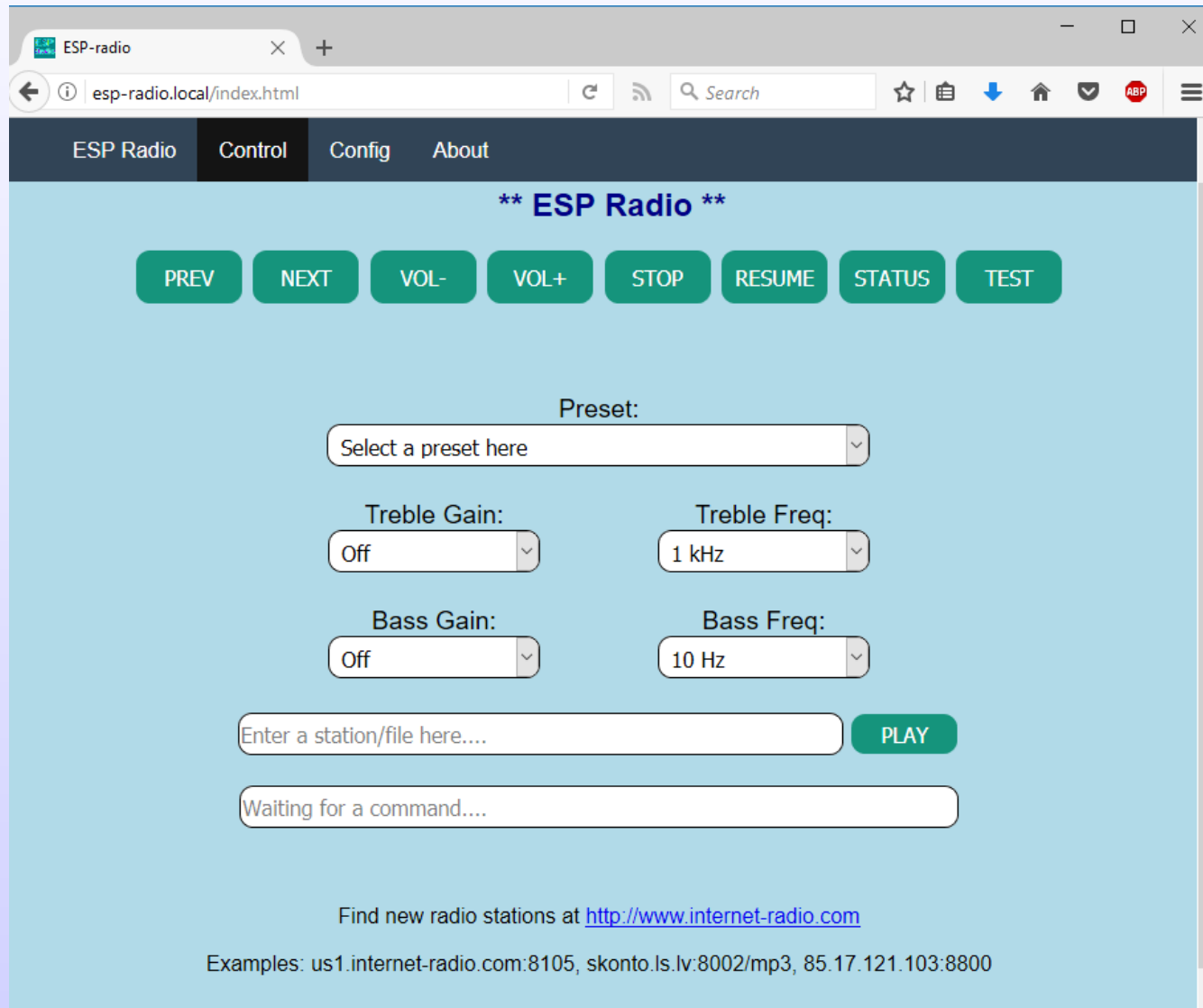
Features of the ESP8266 firmware



- Web radio player
 - Read digital audio stream from web
 - Feed data to VS1053 for decoding
- Web server for human user interface
- MQTT node for Internet of Things
- uDNS: Radio can be accessed from esp-radio.local

- UART cable for power and debug
- 3V3 from ESP8266 board to VS1053 proto board
- Data signaling 6 wires (DREQ, xDCS, xCS, MISO, MOSI, SCK)
 - Low on xCS selects control SPI interface
 - Low on xDCS selects data SPI interface
 - High on DREQ is request for more data to decode
 - MISO, MOSI and SCK are data and clock lines
 - ESP8266 uses H/W SPI interface in communication

User Interface screenshot



The screenshot shows a web browser window with the address bar displaying 'esp-radio.local/index.html'. The page has a dark blue navigation bar with links for 'ESP Radio', 'Control', 'Config', and 'About'. The main content area is light blue and features a title '** ESP Radio **'. Below the title is a row of green buttons: 'PREV', 'NEXT', 'VOL-', 'VOL+', 'STOP', 'RESUME', 'STATUS', and 'TEST'. A 'Preset:' section contains a dropdown menu with the text 'Select a preset here'. Below this are four more dropdown menus: 'Treble Gain:' (set to 'Off'), 'Treble Freq:' (set to '1 kHz'), 'Bass Gain:' (set to 'Off'), and 'Bass Freq:' (set to '10 Hz'). A text input field with the placeholder 'Enter a station/file here....' is followed by a green 'PLAY' button. Below the input field is a status bar showing 'Waiting for a command....'. At the bottom, there is a link to 'http://www.internet-radio.com' and a list of examples: 'us1.internet-radio.com:8105, skonto.ls.lv:8002/mp3, 85.17.121.103:8800'.

ESP-radio

esp-radio.local/index.html

ESP Radio Control Config About

**** ESP Radio ****

PREV NEXT VOL- VOL+ STOP RESUME STATUS TEST

Preset:

Select a preset here

Treble Gain: Treble Freq:

Off 1 kHz

Bass Gain: Bass Freq:

Off 10 Hz

Enter a station/file here.... PLAY

Waiting for a command....

Find new radio stations at <http://www.internet-radio.com>

Examples: us1.internet-radio.com:8105, skonto.ls.lv:8002/mp3, 85.17.121.103:8800

- Original project
 - <https://github.com/Edzelf/Esp-radio/>
- ESP8266 WiFi SoC
 - <http://espressif.com/en/products/hardware/esp8266ex/overview>
- Wemos D1 mini development board
 - https://wiki.wemos.cc/products:d1:d1_mini
- VS1053
 - <http://www.vlsi.fi/en/products/vs1053.html>
- VS1053 prototyping board
 - <http://www.vlsi.fi/en/support/evaluationboards/vs10xxprotoboard.html>