Triangle Embedded Interest Group: Community project update

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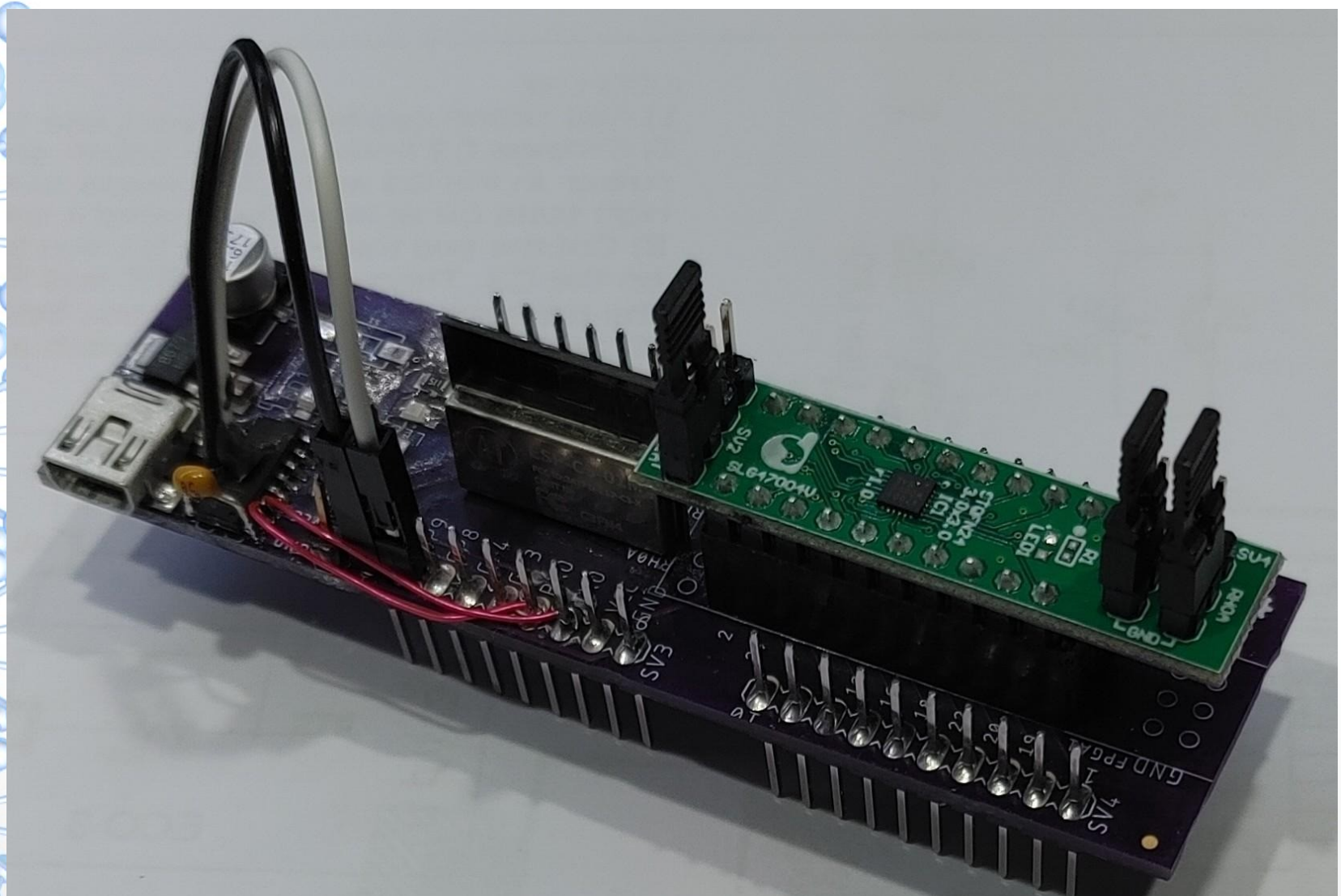
- Version 0.01

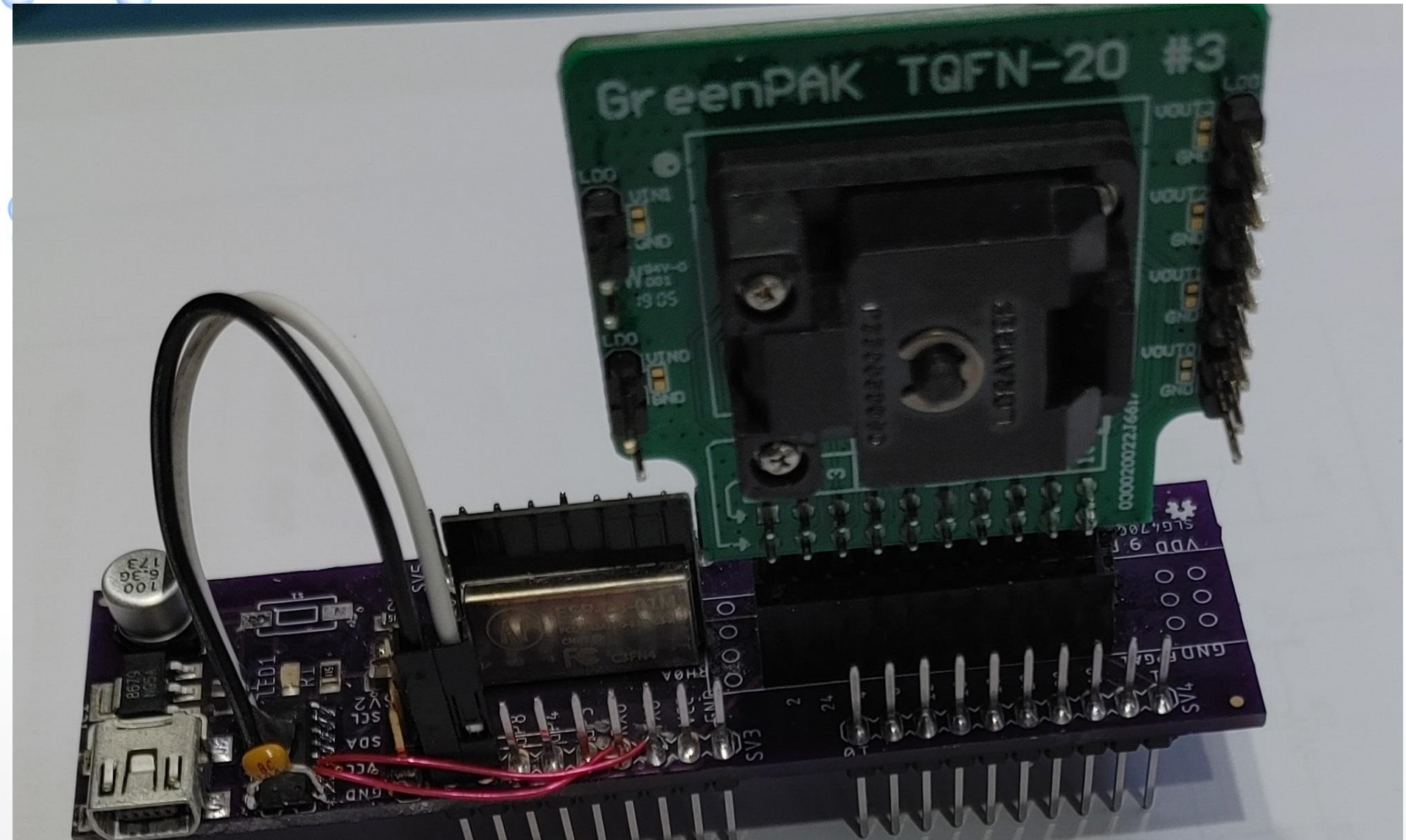
TriEmbed Community Project

- What the project is
  - A development board with a few notable features
    - Combines a popular MPU module (ESP32) with field programmable gate arrays (FPGAs)
      - Dialog mixed signal arrays are the initial target and will be programmed via a web interface using the ESP32
      - FPGAs are pluggable and can run standalone or with the ESP32
    - Expansion/programming via pluggable daughter boards
      - Keeps hard to solder stuff on daughter boards
      - Simple bus systems can support multiple FPGAs bare or as subsystems on daughter boards
  - A collaborative project that can fan out to include many interested parties
    - Working group currently has 26 members
  - Starting simple and cheap: <= $10 total parts cost target
    - Single RISCV core ESP32-C3-M1 module
    - Sockets for one onboard FPGA or the Dialog progamming adapter
    - Next version will have large uncommitted area for custom designs
- Why are we making it?
  - Enable techies to more easily access FPGAs
  - Make them accessible to those who never thought they'd be interested in them

Hardware Status

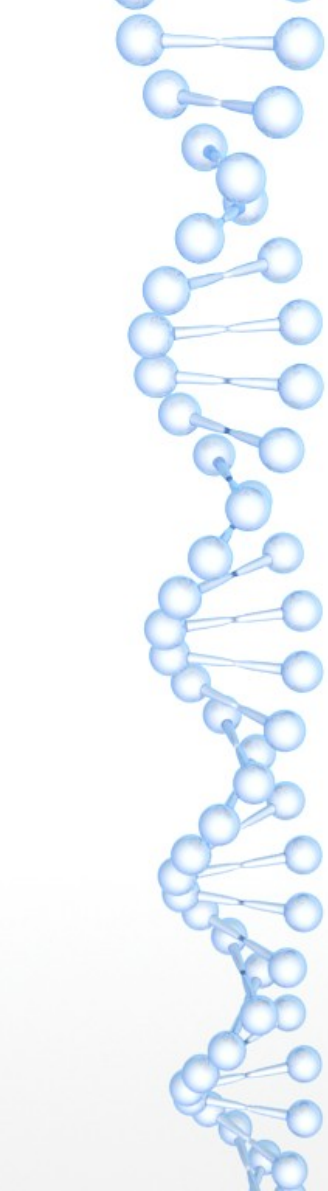
- Three version 0.60 boards distributed
- Version 0.70 board debugged
  - Distribution @ next meeting
- Version 0.8x board design started
  - 10x10cm form factor
  - > 50% area uncommitted


SL617004U
GND
GND FPGA


GreenPAK TQFN-20 #3
LDO
VIN
GND
VOUT
SV3
SV4

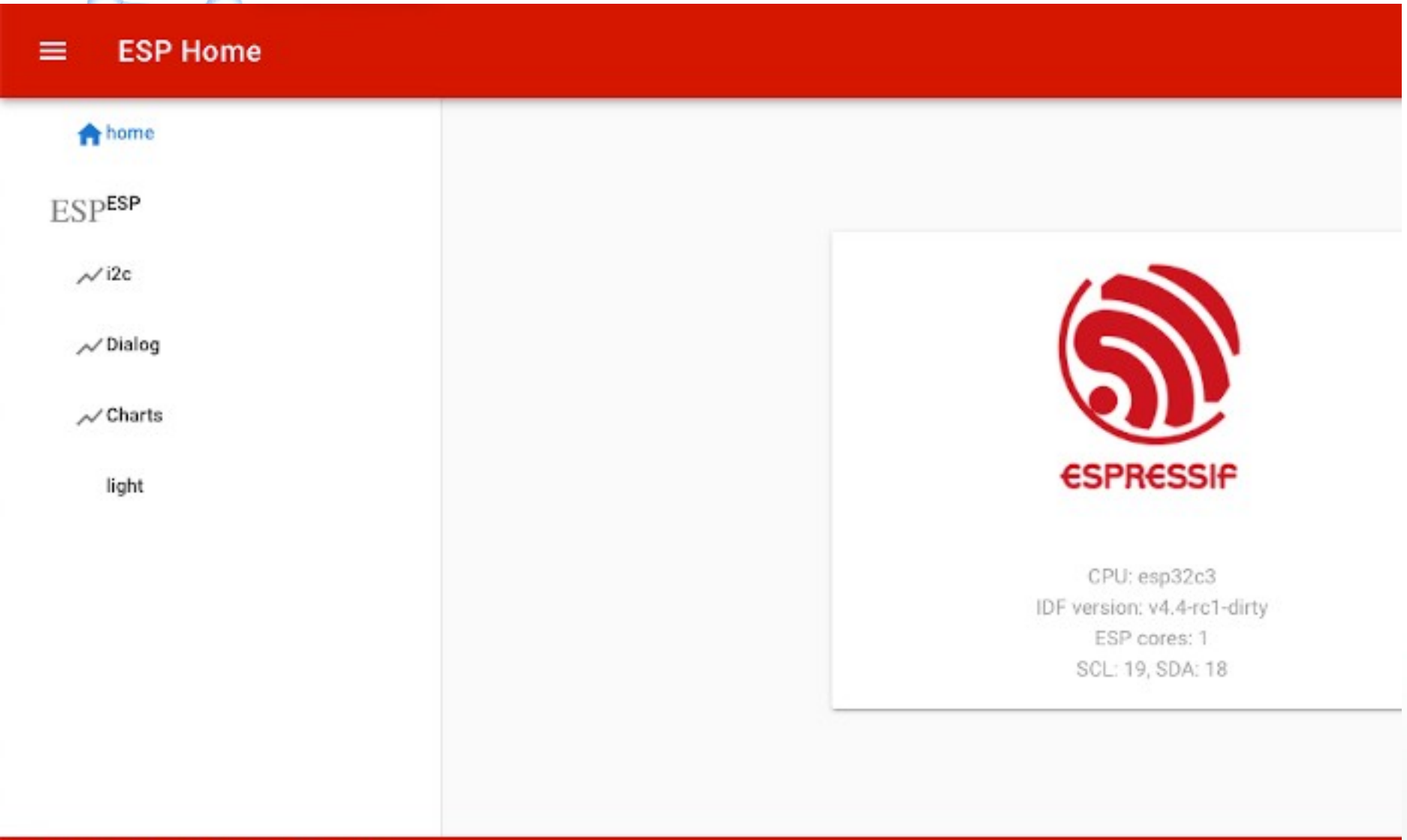
Current BOM for the 0.70 board

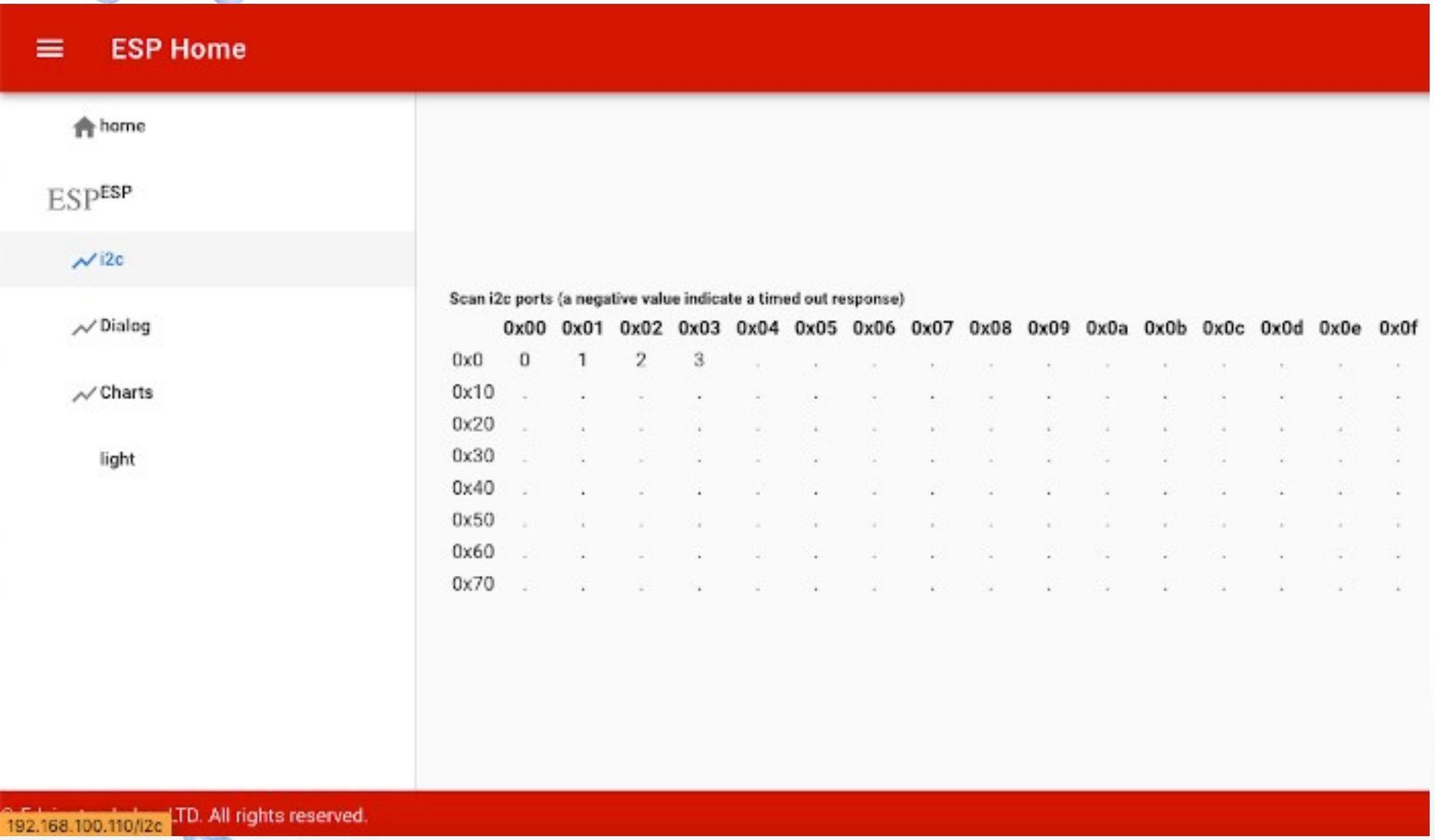
- ESP32-C3-M1 depending on off shore source $2-3
- Dialog SLG47004V-DIP $1.30
- 3.3V regulator (off shore) $.50
- Regulator and decoupling capacitors $.25
- CH340C USB interface chip (off shore) $.50
- PCB from (offshore) $2
- USB socket $.25
- Headers $2.00
- Power and progammable LEDs $.25
- Resistors $.05
- Total: $9.10-10.10
  - Additional sites for



Firmware Status

- Web-based Dialog Programmer




ESP Home
home
ESPESP
i2c
Dialog
Charts
light
Scan i2c ports (a negative value indicate a timed out response)
0x00 0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 0x09 0x0a 0x0b 0x0c 0x0d 0x0e 0x0f
0x0 0 1 2 3
0x10
0x20
0x30
0x40
0x50
0x60
0x70
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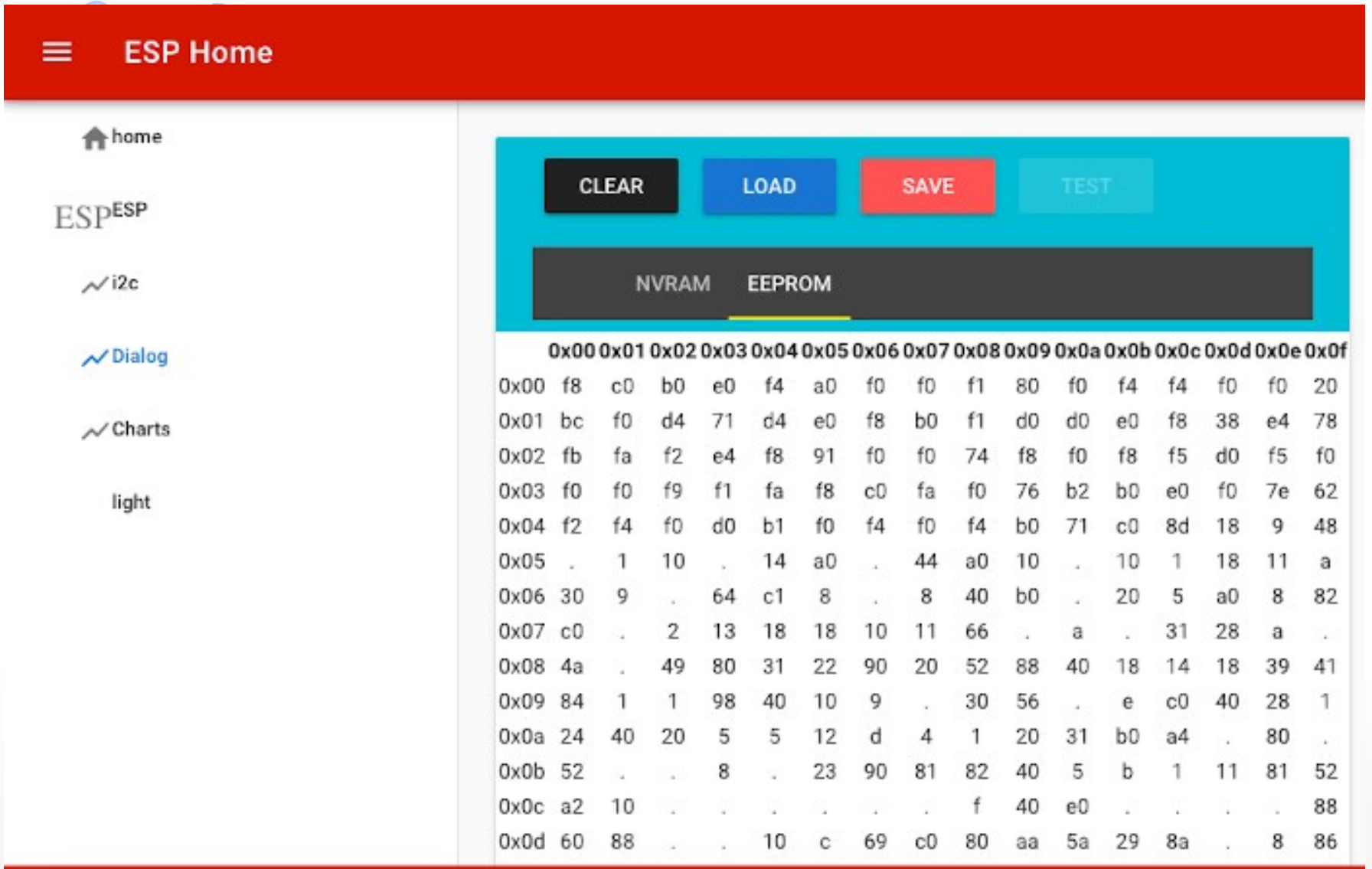
192.168.100.110/i2c


ESP Home
home
ESPESP
i2c
Dialog
Charts
light
CLEAR
LOAD
SAVE
TEST
NVRAM
EEPROM
0x00 0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 0x09 0x0a 0x0b 0x0c 0x0d 0x0e 0x0f
0x00 f8 c0 b0 e0 f4 a0 f0 f0 f1 80 f0 f4 f4 f0 f0 20
0x01 bc f0 d4 71 d4 e0 f8 b0 f1 d0 d0 e0 f8 38 e4 78
0x02 fb fa f2 e4 f8 91 f0 f0 74 f8 f0 f8 f5 d0 f5 f0
0x03 f0 f0 f9 f1 fa f8 c0 fa f0 76 b2 b0 e0 f0 7e 62
0x04 f2 f4 f0 d0 b1 f0 f4 f0 f4 b0 71 c0 8d 18 9 48
0x05 . 1 10 . 14 a0 . 44 a0 10 . 10 1 18 11 a
0x06 30 9 . 64 c1 8 . 8 40 b0 . 20 5 a0 8 82
0x07 c0 . 2 13 18 18 10 11 66 . a . 31 28 a .
0x08 4a . 49 80 31 22 90 20 52 88 40 18 14 18 39 41
0x09 84 1 1 98 40 10 9 . 30 56 . e c0 40 28 1
0x0a 24 40 20 5 5 12 d 4 1 20 31 b0 a4 . 80 .
0x0b 52 . . 8 . 23 90 81 82 40 5 b 1 11 81 52
0x0c a2 10 . . . . . . f 40 e0 88
0x0d 60 88 . . 10 c 69 c0 80 aa 5a 29 8a . 8 86
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Next Steps

- Working group meeting on March 28th @ 7pm
  - Abbey Road Tavern and Grill, 1195 W Chattham St Cary, NC 27513
  - Reminder will go out when it's closer
- Brain storm: What to put on the 0.8x board?

Resources

- Main github repo for project information: https://github.com/TriEmbed/League
- Repo for initial inexpensive dev board “Aardvark”: https://github.com/Triembed/aardvark
- Working group meeting notes
- These slides are here: https://TriEmbed.org/doc/20220314-TriEmbed-Community-Notes.pdf