DPRG RBNV Chat Record – 9/27/2022

Carl Ott
7:41 PM
~7:37pm Ray showed first look at a new sensor- a Radar- FM24-NP100. FM24-NP100 24GHz Microwave Ranging Radar 24G Radar Body Sensor Level Radar demo FMCW
https://www.neweggbusiness.com/Product/Product.aspx?item=9sivccdj3x5136&bri=9b-0jj-03b0-002z9

Carl Ott
7:47 PM
The group came up several questions – e.g. – is the sensor designed only for people? Or can it detect things like a cardboard box, a chain link fence, tree trunk, foliage…

Carl Ott
7:49 PM
Wavelength (λ) for electromagnetic radiation of frequency 24 GHz in Air is 1.246 cm (0.47 inch). So perhaps it may not do so well with a typical chain link or 'sparse' wire fence like a barbed wire fence...

Carl Ott
7:53 PM
~7:50pm - Doug P showed progress with his outdoor rover - lots of parts bolted to a relatively larger base chassis. Which raises concern for I2C wiring on a larger platform

Carl Ott
7:54 PM
Doug P. showed an NXP Semiconductors application note for an AN11075, which showed a method to use standard Cat5 cabling (relying on it's twisted pairs)

Ray Casler
8:05 PM
https://rfbros.com/product/fm24-np100-demo/

Ted Meyers
8:06 PM
Google says: 15 pF/ft

Carl Ott
8:06 PM
Ted - Cool - 15 pF / ft.
What is the I2C capacitance spec limit?

John Gauthier
8:07 PM
400 pF at speeds of up to 400 kbits/sec
https://en.wikipedia.org/wiki/I%C2%B2C

Carl Ott
8:08 PM
Cool - so with careful termination ie. careful transitions from cable to board - seems like a good bet to get 2 or 3 feet with this method - and still have good margin...

Carl Ott
8:10 PM
Group also recommended trying ribbon cable - where data lines and ground or power lines were alternated -> giving a "poor man's shield"

John Gauthier
8:10 PM
"Depending on the wire gauge and insulator material used, most standard ribbon cables and wires have a capacitance in the range of 10 – 50 pF/ft between wires"
https://e2e.ti.com/blogs_/archives/b/precisionhub/posts/how-to-minimize-crosstalk-in-cable-designs#:~:text=Depending%20on%20the%20wire%20gauge,shown%20in%20Figure%201%20below.

Doug P.
8:17 PM
Hobbywing UBEC link: https://www.ebay.com/itm/253714777729

Carl Ott
8:23 PM

~8:21pm - Ray showed updates to his "Tricorder" - a portable display - using the ESP Now protocol to send telemetry from the robot. Big enough to show lots of data, bright enough to see outdoors.

Doug P.
8:27 PM
NXP Application note on I2C: https://www.nxp.com/docs/en/application-note/AN11075.pdf

Paul Bouchier
8:29 PM
Stack exchange discussion of twisting single-ended signals with gnd or vcc: https://electronics.stackexchange.com/questions/624787/is-twisting-a-single-ended-signal-with-its-own-gnd-really-useful

Doug P.
8:40 PM
PCA9605 datasheet: https://www.nxp.com/docs/en/data-sheet/PCA9605.pdf

Carl Ott
8:43 PM
~8:41pm- Ray showed a link with charts showing terminating resistors as a function of bus capacitance https://topitanswers.com/post/is-there-a-correct-resistance-value-for-i2c-pull-up-resistors

Doug P.
8:46 PM
Good discussion on Rpi pulse=stretching issue is in "Raspberry Pi lot in C by Harry Fairhead (p 143-144). If you have Kindle unlimited it is free.

Ponder SomeMore
8:50 PM
https://www.adafruit.com/product/4756

Doug P.
8:50 PM
Here is an interesting demo on twisted pair: https://www.youtube.com/watch?v=P7WfY9P2uNY

Carl Ott
8:53 PM
Karim - thanks for the link to Adafruit LTC4311 I2C Extender / Active Terminator - STEMMA QT / Qwiic -> https://www.adafruit.com/product/4756

Carl Ott
8:57 PM
~8:56pm - John K showed a "Pendulum Bot" https://www.thingiverse.com/thing:5524375

Carl Ott
8:59 PM
Interesting video talking about how to make the inverted pendulum work...

Carl Ott
9:07 PM
John G - if you had something - perhaps jump in after Bob.

John Gauthier
9:07 PM
OK

Carl Ott
9:07 PM
~9:05 pm- asked about using accelerometer to get velocity instead of encoders. But group consensus was that was But group consensus was that was it's a difficult approach to get working.

Carl Ott
9:13 PM
~9:11pm - John G- Raspberry Pi headless control board - as described a little also last week - with 3 LED, two DIP switches and 2 pushbuttons. John recently updated the script that goes with this board - and described what it can do. Also offered to make a batch...

Carl Ott
9:28 PM
~9:20pm - got into a discussion about powering Raspberry Pi 4. Ray showed a supply with 18-gauge wire. Pat gave an interesting reference - that hefty wire didn't start until about 750 MCM - https://www.wireandcableyourway.com/750-mcm-thhn-building-wire
Outside Diameter: 29.36 mm / 1.156 inches Weight: 2.468 lbs. per ft Allowable Ampacity: 400 Amps at 60ºC / 475 Amps at 75ºC / 535 Amps at 90ºC

Doug P.
9:34 PM
Nice links on Rpi 4 cases vs load and heat: https://www.martinrowan.co.uk/2019/09/raspberry-pi-4-cases-temperature-and-cpu-throttling-under-load/
Carl Ott
9:35 PM
~9:34pm - Doug D gave a quick update- working on both an i-robot and his telepresence robot...
Carl Ott
9:39 PM
some background on one of the Dallas Makerspace Battlebots team - I saw this one under construction before COVID hit.... https://battlebots.com/robot/subzero-2020/
Carl Ott
9:40 PM
~9:40pm - Doug P showed a big ground plan under his GPS
Carl Ott
9:44 PM
and is pulling in lots of GPS satellites very well.
Doug P.
9:46 PM
Kickstarter RTK GPS link: https://www.kickstarter.com/projects/sbcshop1/gps-rtk-hat-for-raspberry-pi?ref=ksr_email_backer_project_update_registered_users_discover_project_similar_2
ed mart
9:50 PM
Euro =0.95, British pound 1.065
Pat Caron
9:52 PM
Great conversations tonight! See you next week