

Taa-'at-dvn Chee-ne' Tetlh-tvm Food Forest Solar System

Team Green New Dream (Spring 2021)
ENGR 305

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Mullennix

Please See this Video to Understand
the Solar Series:
(it may be tricky doing 2 poles with
these panels)

HOW TO: Connecting Solar Panels to the Bluetti, EcoFlow Delta
& Any Other Solar Powered Generator:

<https://youtu.be/2vfcxmYMD5g>

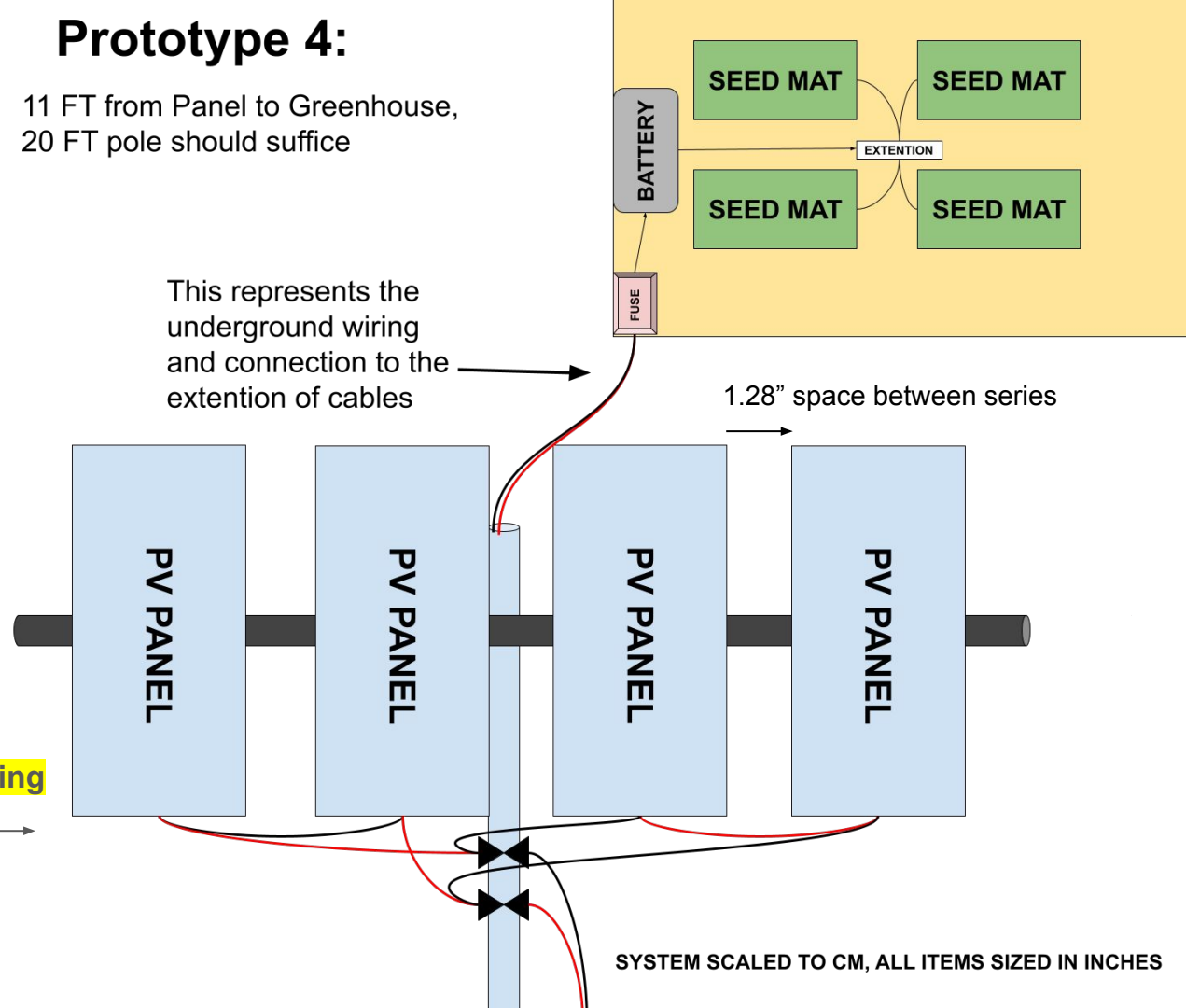
1 Pole Prototype:

- (4) 100w Solar Panels
- (4) Seed Mats
- (1) Ecoflow Generator
- (1) Fuse Breaker
- (4) Solar Mounts
- (1) Extension Cable
- (1) 100ft of Wiring
- (1) Conduit for wiring

Please see video for the correct wiring

Prototype 4:

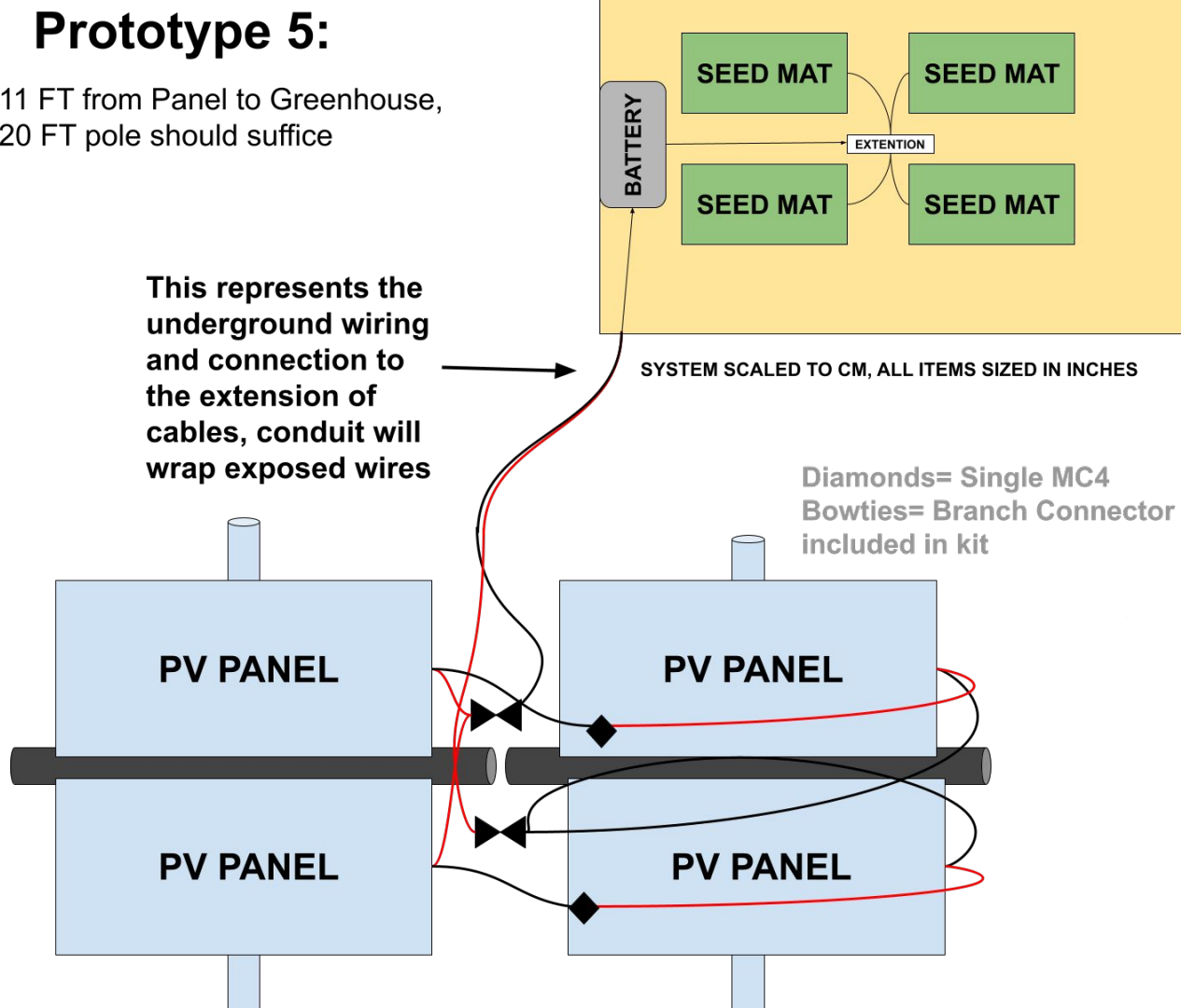
11 FT from Panel to Greenhouse,
20 FT pole should suffice



Prototype with 2 poles (new draft):

Prototype 5:

11 FT from Panel to Greenhouse,
20 FT pole should suffice



VIVOSUN Seedling Heat Mat Digital Thermostat Combo 10"X20.75"

-1 year Warranty

-Uses 15-20 watts each
(10"x 20.75")

-Set and control
temperature between
68-108°F

- \$35 each, 4 mats= \$160



EcoFlow Delta 1800W / 1300wH Solar Generator [Quad Kit] + 4 x 100W 12V Mono Solar Panels

- 1 x EcoFlow Delta 1800W / 1300wH Solar Generator
- 4 x 100W Rigid Solar Panels (12V Monocrystalline) 16lbs
- 1 x XT60 to MC4 Solar Panel Cable (11 ft. long cable)
- 1 x 30 ft 10 AWG MC4 PV Solar Panel Extension Cable
- 1 x Pair of MC4 Branch Connectors
- 1 x AC Standard Wall Charger
- 1 x Carrying Case
- 1 x Car Charger -12V to XT60 cable
- 1 x Free 10,000 Word Solar Generator Setup & Maintenance Guide
- 2-Year Manufacturers Warranty
- Lowest Price Guarantee
- Lifetime Customer Support (Phone, Email or Live Chat)
- FREE Shipping & NO Sales Tax!
- \$1,709.00



Tamarack Solar UNI-PGRM/4P1 > Top of Pole Mount for Four Solar Panels

- Pole Mount for 4 Solar Panels with 1 Vertical Pole
- Pole Diameter: 4"
- Supports: Four 60 Cell or 72 Cell Solar Panels
- The PGRM Series Pole Mount can be used to mount up to 6 solar modules with a frame thickness between 1.18" and 2"
- Install up to 92 square feet of modules on a single 4" Schedule 40 pole and up to 130 square feet of modules on two 4" schedule 40 poles
- Suitable for wind speeds up to 115 MPH
- For high wind locations add an additional vertical pole
- Tilt angle can be adjusted from 0° to 60° and is easily adjusted seasonally
- All sizes can ship by UPS Ground
- Simple one-person installation and adjustment
- 10 year warrenty

Cost: \$426.69

Our total weight on the pole= 90lbs

Pole Diameter: 4"

1 PV Dimension: 47.2" x 21.8" x 1.4"

TOTAL: 188.8" x 87.2" x 1.4"

*****Mount facing South at 30-40 degrees**



Mounting with 2 poles, 2 panels each

Angela's Idea:

Tamarack Solar UNI-TP/02A > Top of Pole Mount for Two 55 Inch Solar Panels

-Universal design, straightforward

- Easy tilt solar panel adjustment ensures optimal alignment in a range of environments, year around
- Heavy-duty, corrosion-resistant aluminum means long-term reliability and value
- Compatible with most commercially available solar panels
- Easy installation and affordable pricing help slash total cost of installation
- Multiple product offerings accommodate a wide range of solar mount application scenarios

\$276 each x 2 + shipping/taxes= \$552

Tamarack Solar UNI-SP/02 > Side of Pole Mount for Two 45 Inch Solar Panels

- **Custom built to size, but non-refundable**
- Easy tilt solar panel adjustment ensures optimal alignment in a range of environments, year around
- Heavy-duty, corrosion-resistant aluminum means long-term reliability and value
- Compatible with most commercially available solar panels
- Easy installation and affordable pricing help slash total cost of installation
- Multiple product offerings accommodate a wide range of solar mount application scenarios

\$155 each x 2 + shipping/taxes= \$310



DEWENWILS Outdoor Digital Power Strip Timer, Outdoor Multi Socket Time Timer, Waterproof 6 Outlet Garden Power Stake, 6ft Extension Cord,Digital Timer for Lights,1800W/15A Heavy Duty

- This connects our seed mats together
- timer to program automatic shut-offs
- waterproof and compact design
- 6 plug outlets
- heavy duty
- \$25.99



Wiring:

50ft conduit, Alex Tech ½ inch split wire black
-\$19.99

Cable Leader 16 AWG Outlet Saver Power
Extension Cord (NEMA 5-15P to NEMA 5-15R)
UL Listed (10 Foot (1 Pack))

-\$10.25

Solar Connectors MC4 Male/Female IP67
Waterproof Solar Panel Cable Connectors (6
Pairs Solar connectors)

-\$8.99



Website and Building

- Sara & Cassidy will be up to build once materials are delivered and gathered!
 - We will set a date for that soon
- The whole process will top to bottom will be documented on the site “**Appropedia**”, so if anyone wanted to replicate it or deeply understand the set up they were looking at, they could!



Site will contain:

- Information and background on Food Forest in general
- Introduction of project and why it was needed for site
- Project Photos: Before, during & after
- Materials used & budget for them
- Safety protocols
- In depth instructions of how to design and construct the system

Poster for Education Purposes

The poster we create will allow anyone who's at the food forest to read about the solar project and understand the different components involved.

We will insert images of the technology onto an image of the greenhouse in order to make it simple to understand.

Each piece of technology will have a description and explanation based on it's own significance to the solar system.

We will laminate these posters so they can be near the set up to allow for a learning experience while also helping educating people who may come into contact with it more often.

Videography

Sophia is working on this, it will show the final build and information about the food forest.

This video will be available through our website and will be another medium you may use to become more familiar with the functions of the solar system while also making it available for the community outreach.

Cost Evaluation (not including pole), **Bring Zip-Ties**

1 Pole:

(1) 50ft Conduit for wiring	\$19.99
(4) 100w Solar Panels and	
(1) Ecoflow Generator kit=	\$1,709.00
(6) MC4 Solar Connectors=	\$8.99
(4) Seed Mats	= \$160
(1) Steel Mount Series	= \$426.69
(1) Extension Cable	= \$10.25
Not Including Pole Cost	= \$2,325.93

2 Poles:

(1) 50ft Conduit for wiring	\$19.99
(4) 100w Solar Panels and	
(1) Ecoflow Generator kit=	\$1,709.00
(6) MC4 Solar Connectors=	\$8.99
(4) Seed Mats	= \$140
(2) Mount Series	= \$552 OR \$310
(1) Extension Cable	= \$10.25
Not Including Pole Cost	= \$2,460.23 or \$2,218.23

Purchase Links:

MC4 Solar Connectors:

https://www.amazon.com/YXGOOD-Connectors-Female-Waterproof-connectors/dp/B08P72QZFN/ref=sr_1_5?dchild=1&gclid=CjwKCAjwmv-DBhAMEiwA7xYrd14TYcD2YIeeGbmBAf1xJAGZzbrqGSJ2oB-VKf74OndnlSPbxfNjCRoCSFYQAvD_BwE&hvadid=410036342777&hvdev=c&hvlocph y=9031574&hvnetw=g&hvqmt=e&hvrnd=6354474055579971296&hvtargid=kwd-15026791559&hydadcr=13709_11419143&keywords=mc4+connector&qid=1619050044&sr=8-5

EcoFlow Delta Quad Kit:

https://shopsolarkits.com/products/ecoflow-delta-1800w-1300wh-quad-kit?currency=USD&utm_medium=cpc&utm_source=google&utm_campaign=Google%20Shopping&c1=GAW&source=prospecting&cr2=original - solar equipment - usa&kw=shopify_US_5094856130700_33978020561036&cr7=c&gclid=Cj0KCQjw9_mDBhCGARIsAN3PaFMXhIkFr2rGc9AYub0gOzStKf6kz-eMU3JV1HIC7ZEZlk7XEW9sKaMaAk74EALw_wcB

ECODirect Solar Mount (4 panels) <https://www.ecodirect.com/ProductDetails.asp?ProductCode=Tamarack%2DUNI%2DPGRM%2D4P1&CartID=1>

16AWG Extension Cord (10ft)

https://www.amazon.com/Cable-Leader-Outlet-Saver-Extension/dp/B075SMD8XB/ref=sr_1_8?crid=2UCKPZCPC47SS&dchild=1&keywords=extension+cable+10+ft&qid=1618456139&s=home-garden&srefix=extension+cable%2Cgarden%2C342&sr=1-8

Weatherproof Powerstrip + Timer

https://www.amazon.com/DEWENWILS-Waterproof-Grounded-Extension-Fountain/dp/B07YBPC5B6/ref=pd_di_sccai_1?pd_rd_w=j09dK&pf_rd_p=c9443270-b914-4430-a90b-72e3e7e784e0&pf_rd_r=2AS5AT80YJ8SBSQ90JYN&pd_rd_r=1b4be891-51c0-493a-a4b4-e659cff2ebcb&pd_rd_wg=Y1GbA&pd_r_d_i=B07YBPC5B6&psc=1

Seed Mats (4) 10" x 20.75"

<https://vivosun.com/collections/heat-mat-kit/products/vivosun-10x20-75-seedling-heat-mat-and-digital-thermostat-combo-set-met-standard>

50 FT Conduit

https://www.amazon.com/Alex-Tech-50ft-Tubing-Conduit/dp/B07TKGJYWS/ref=sr_1_3?dchild=1&keywords=conduit&qid=1618951779&sr=8-3

Purchase Mount Options:

(Angela's) Tamarack Solar UNI-TP/02A > Top of Pole Mount for Two 55 Inch Solar Panels:

<https://www.ecodirect.com/ProductDetails.asp?ProductCode=Tamarack%2DUNI%2DTP%2D02A&CartID=1>

Tamarack Solar UNI-SP/02 > Side of Pole Mount for Two 45 Inch Solar Panels

<https://www.ecodirect.com/ProductDetails.asp?ProductCode=Tamarack%2DUNI%2DSP%2D02&CartID=1>