

GORGON

GPS Organized Observation Network

Vulcan Digital

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Acknowledgements

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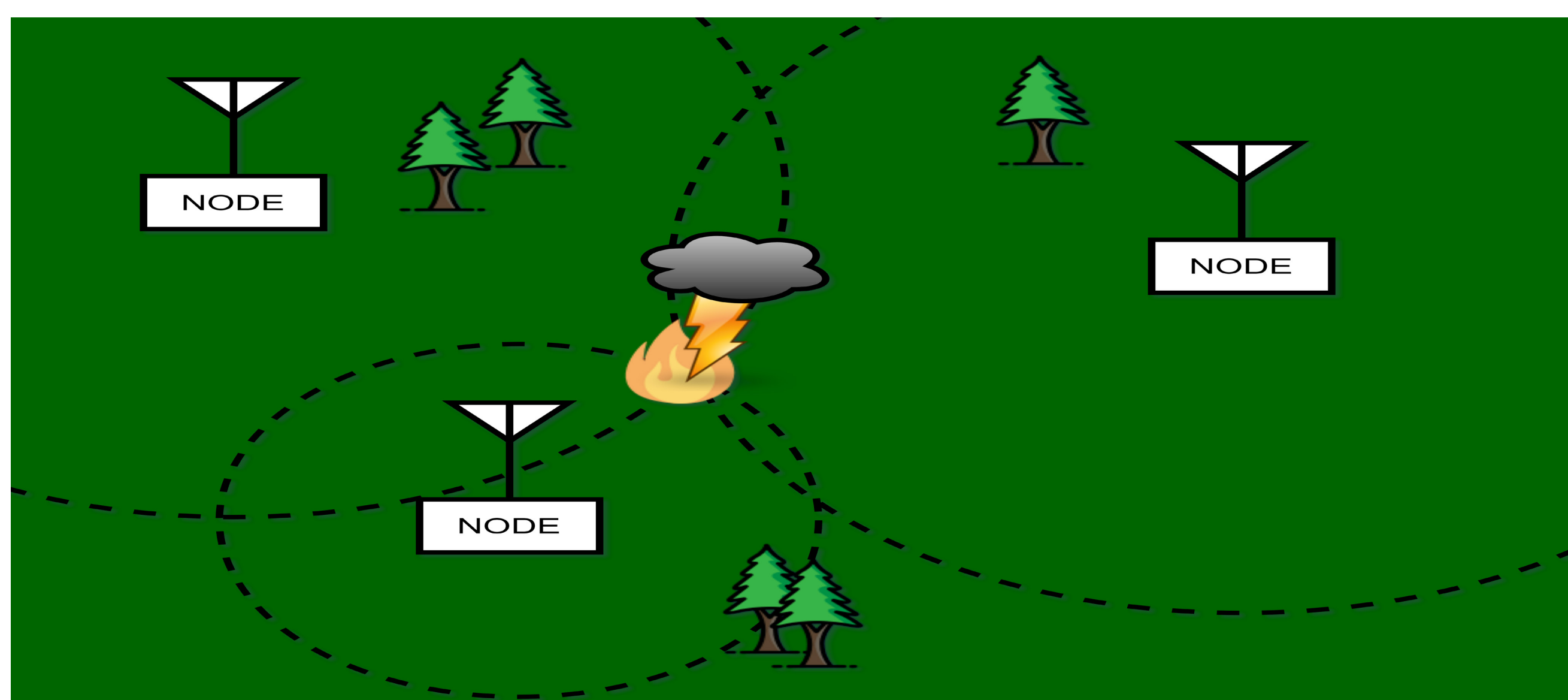
Purpose of Project

- GORGON detects lightning strikes and provides their locations using a system of synchronous sensor nodes.
- Lightning strikes ignite wildfires, destroying resources, threaten public health and safety, and displace many from their homes.
- GORGON provides a way to increase the speed at which first responders can react to ignited wildfires and increases weather data collection capabilities.

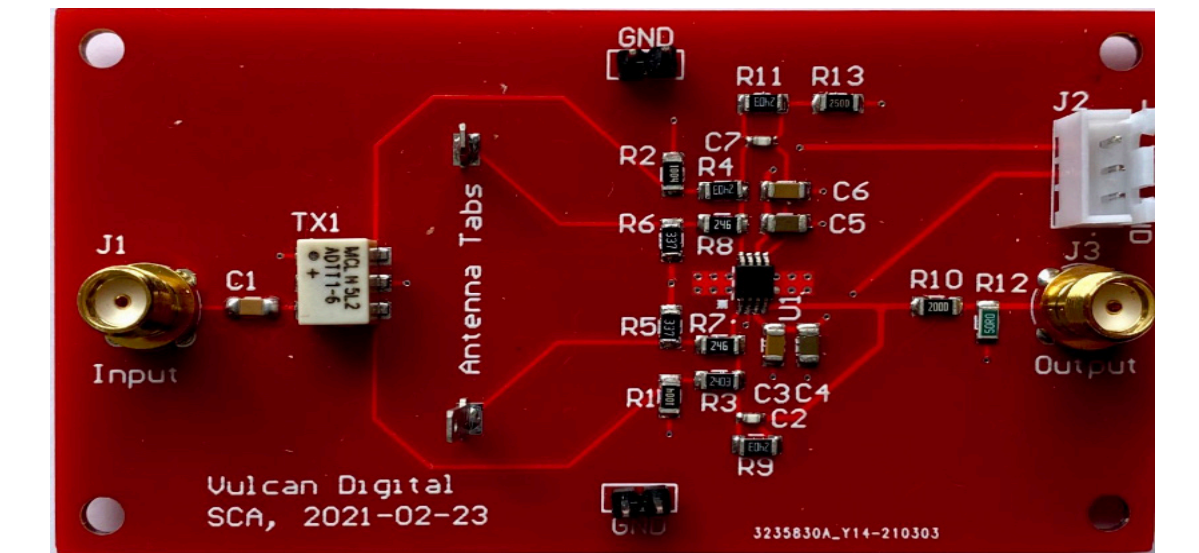
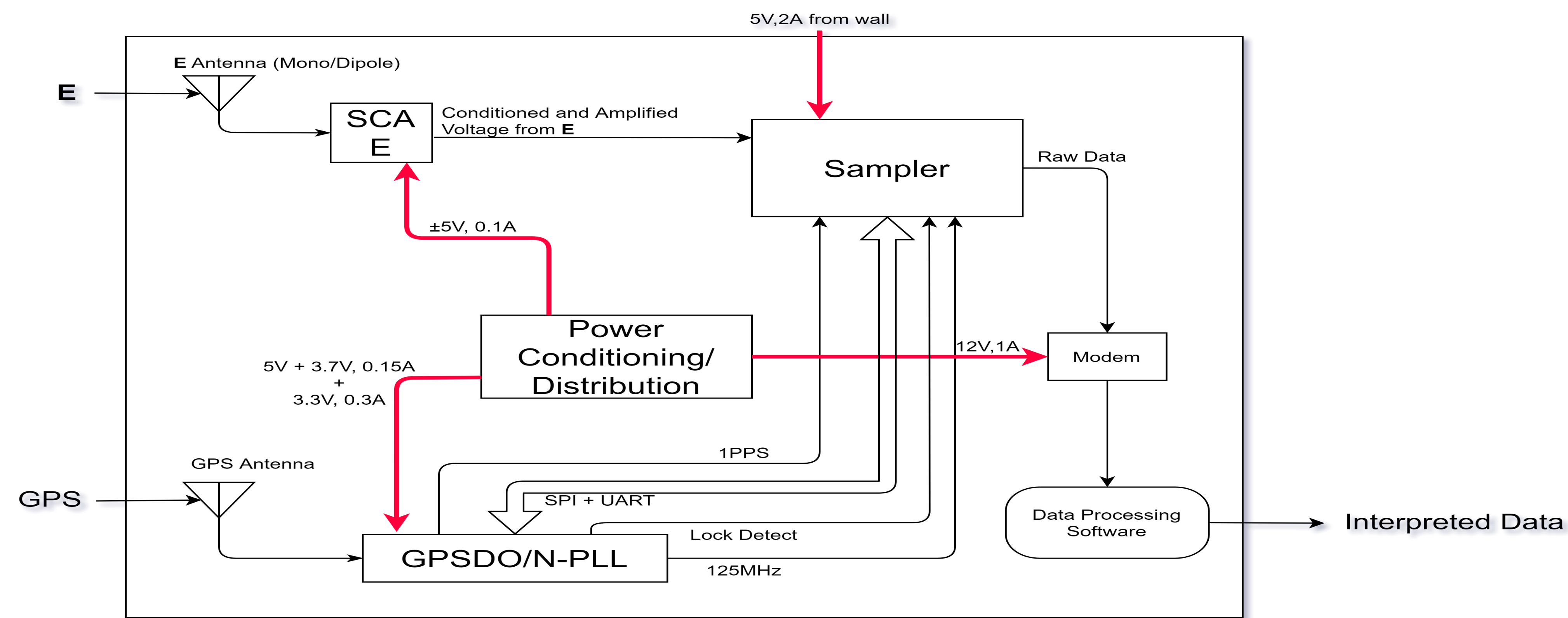
Project Requirements

- Achieve coherent and synchronous sampling on each node via GPSDO (GPS-Disciplined Oscillator) and N-PLL (Integer Phase Locked Loop).
- Sample at a rate of 125MS/s
- High resolution (within tens of meters)
- Low cost (~\$1000/node)
- Filter relevant samples and triangulate location of strike using the data from several nodes

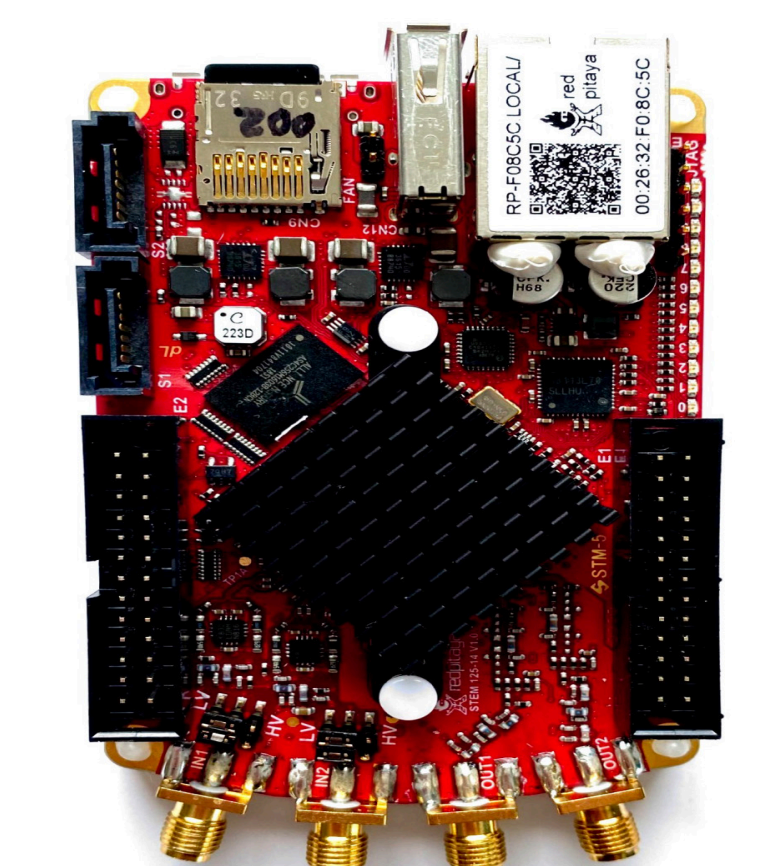
System Overview



System Design



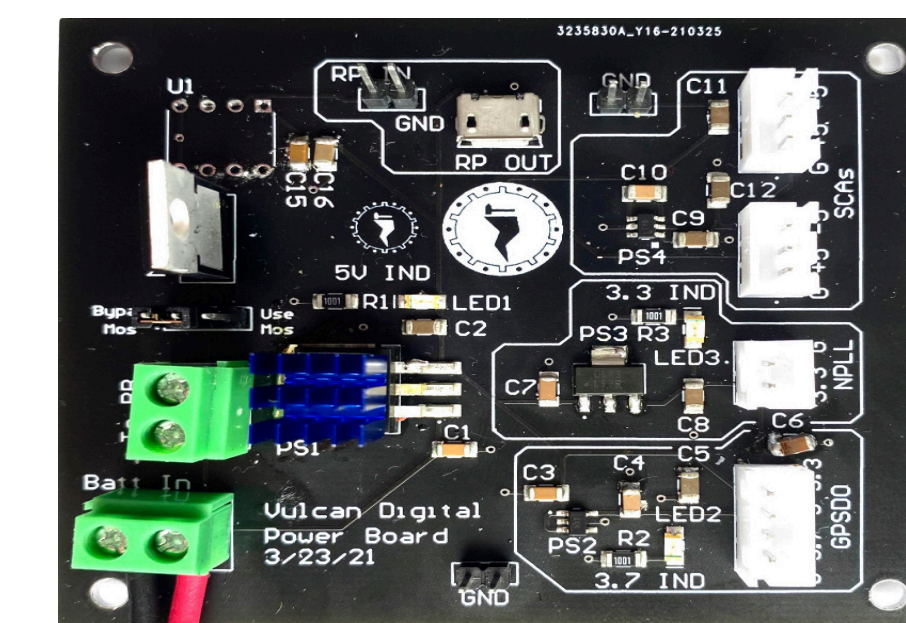
Signal Conditioning Amplifier (SCA)



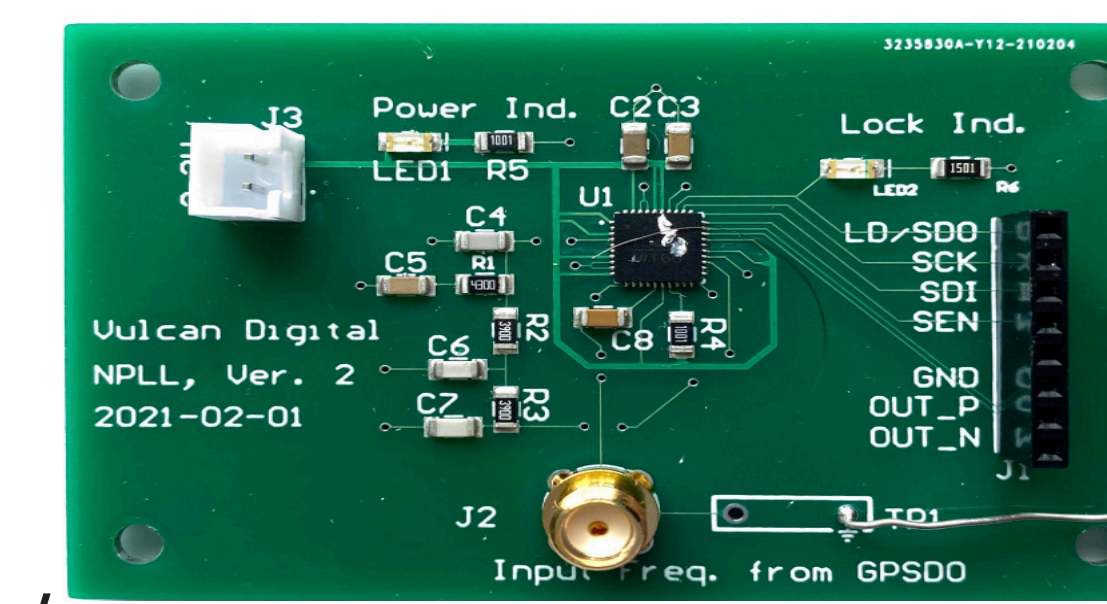
Red Pitaya (Sampler)



Modem



Power Conditioning/Distribution Board



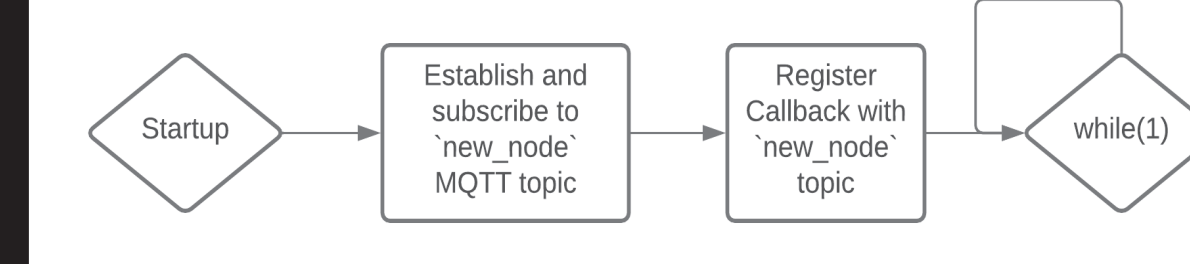
N-PLL Board



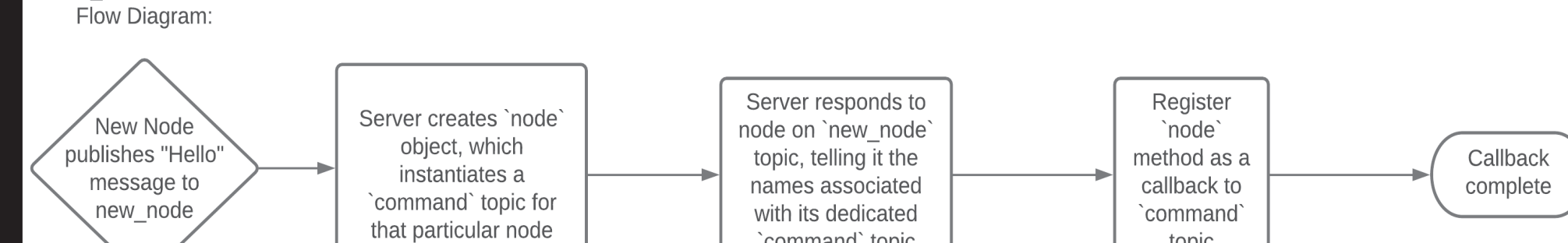
GPSDO Board

System Flow Diagrams

Startup Flow Diagram:



'new_node' Callback Flow Diagram:



Lightning Event Flow Diagram:

