
Cyber-Enabled Wireless Monitoring Systems for the
Protection of Deteriorating National Infrastructure Systems:
Self-Structuring Antennas

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Monarch Antenna, Inc.

NIST Technology Innovation Program
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SC SOLUTIONS



Li, Fischer, Lepech
& Associates



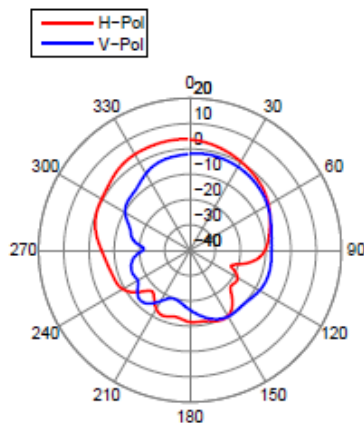
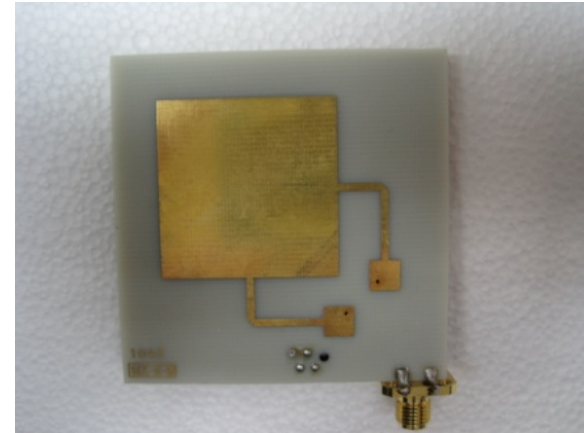
MONARCH
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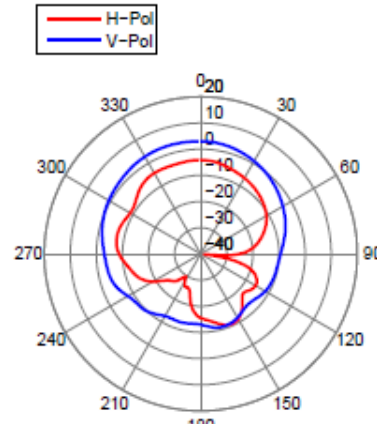
GEN 1C

- **Features:**

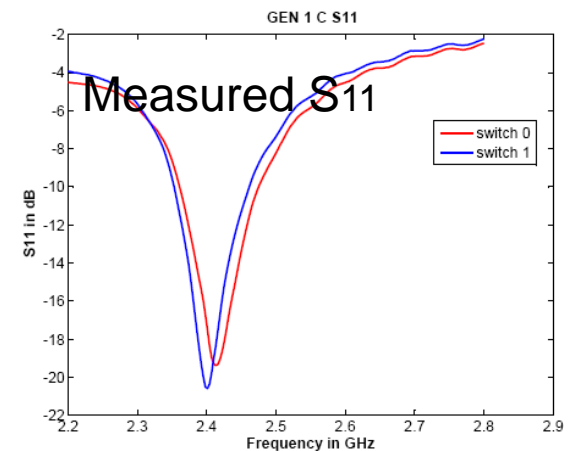
- 2" x 2" Patch Antenna
- Polarization diversity via switching
- 3dBi Gain



Switch State = 0



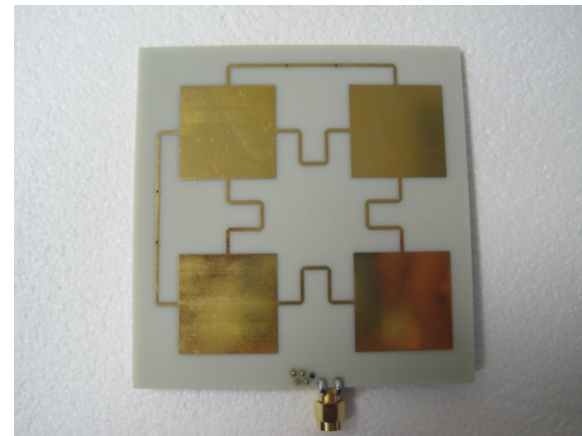
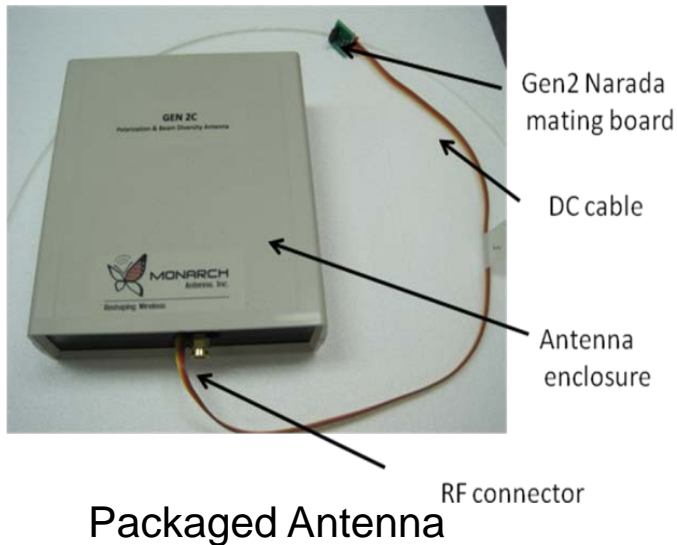
Switch State = 1



GEN 2C

- **Features:**

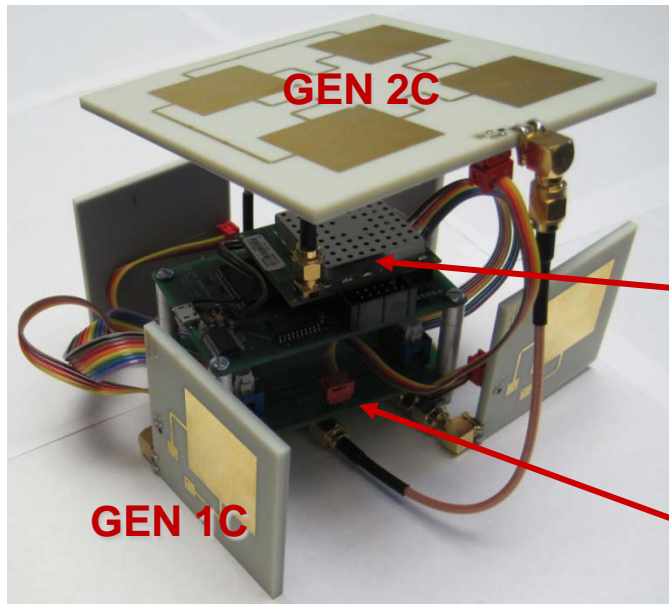
- 3.75" x 3.75" Patch Antenna
- Polarization and beam diversity via switching
- Two polarizations and two beams per polarization
- 2dBi Gain



GEN 1C-Cube

- **GEN 1C-Cube Antenna:**

- True hemi-spherical coverage (solid 180 deg.)
- Polarization and beam diversity
- Cube construction (*One GEN 2C and Four GEN1Cs*)



Radio
(Base Station)

Switching Circuitry
(SP-5T)

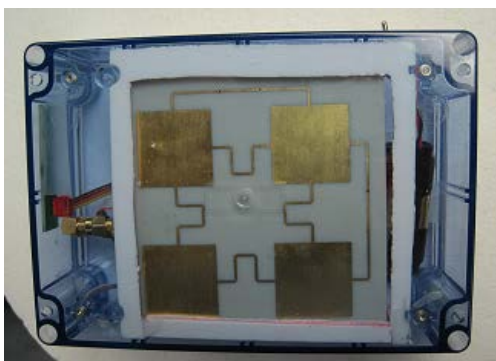


Enclosure

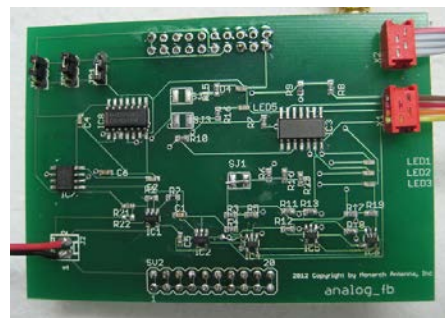
GEN X-Plugin

• Features

- Includes three boards: Antenna Aperture (GEN 2C), Feedback Circuitry and Control Circuitry.
- Contains no embedded software (control logic is implemented in hardware for low power)
- Requires no feedback from the radio (drop in replacement for current passive antennas on the bridges)
- Improves link quality via polarization and pattern diversity
- Operates in the 2.4-2.5GHz band.
- Polarization and Beam Diversity through GEN 2C aperture. Feedback and Control circuits are abstract and could be used to control any switching antenna.
- Priced at \$250/unit at volume of 50. Could be reduced to \$70/unit through redesign



Packaged Product



Control logic is implemented in hardware for low-power consumption

Use of Antennas in Sensor Networks

- GEN 1C-Cube is suitable for use in the Base Station or the Coordinator
- Sensor Nodes are best served by
 - GEN 1/2C or
 - GEN X-Plugin

