# Lifetime Power® Energy Harvesting Development Kit for Wireless Sensors

## P2110-EVAL-01

# Powercast Technology Overview

- Delivers micro-power over distance using common radio waves
  - microwatts(µW) to low milliwatts (mW)

- Green/CleanTech power solution
  - eliminates wires, simplifies installation
  - reduces/eliminates battery replacement
  - provides lifetime power
  - hazardous material shipping & disposal costs reduced or eliminated

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# Why RF Power?

- Wire-free Operation
  - Untethered placement and mobility
  - Operates anywhere in range of a suitable RF power source
  - One-to-many charging

- Reliable
  - Power source is controlled/deterministic
  - Available on demand
  - Minimal effects from weather / time-of-day

- End product differentiation
  - Sealable / waterproof
  - Zero maintenance

# A complete development kit for low-power, battery-free, wireless applications.
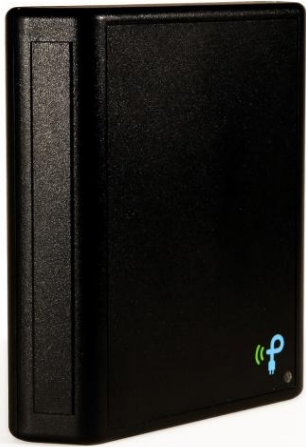
**P2110-EVAL-01**



- Power range of 40-45 feet with included patch antennas
- Pre-loaded, <u>custom</u> firmware for out-of-the-box operation
- Data displayed on a PC with HyperTerminal (or equivalent)

# Kit Components

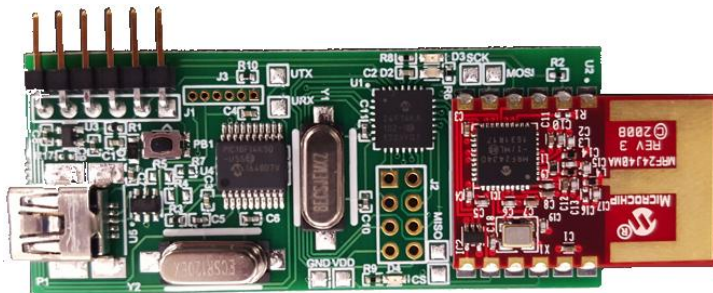**TX91501-3W-ID**
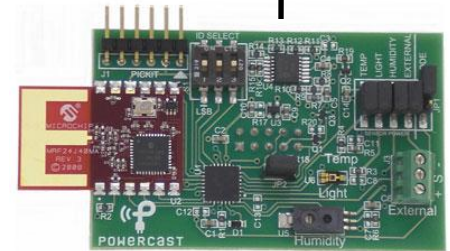915MHz Powercaster™ Transmitter
(FCC Approved)

**PICkit™ 3**
**Programmer**

**P2110-EVB**
P2110 Evaluation Board

**Receiving Antennas**
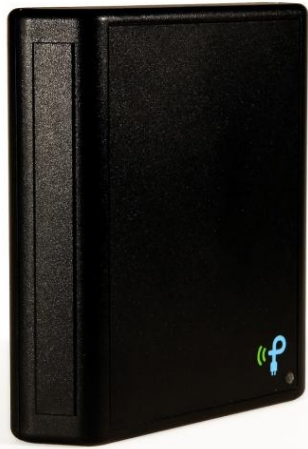Dipole and Patch

**WSN-AP-01**
Access Point

**WSN-EVAL-01**
Wireless Sensor Board

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# Power System



**Transmitter Features:**
- FCC Approved
- 915MHz, 3-watt transmitter
- Transmits power and data
- 8dBi integrated antenna
- Powers multiple receivers

**Receiver Features:**
- P2110 Powerharvester®
- Receives power and data
- Converts RF to DC
- Charge / Power management
- I/O for interface to MCU

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# Wireless Sensor Board



**Features:**

- Node ID selection
- Transmitter ID capture
- RSSI calculation
- Temperature sensor
- Humidity sensor
- Light sensor
- External sensor port
- PIC® MCU
- 2.4GHz / 802.15.4 radio module
- Pre-loaded, <u>custom</u> firmware
- PICkit™ programming header
- Attaches to P2110 evaluation board

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# Access Point



**Features:**

- MCU and wireless development platform
  - PIC® MCU
  - PICtail™ 2.4GHz / 802.15.4 radio module
- Pre-loaded, <u>custom</u> firmware
  - Receives all data packets
  - Configured for up to 8 sensor nodes IDs
  - Maintains time counters for each node
- USB interface for power and data

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# Data Output to PC



Powercast - HyperTerminal

File   Edit   View   Call   Transfer   Help

```
Lifetime Power(R) Energy Harvesting Development Kit for Wireless Sensors
Powercast Corporation
Version 1.0

Packet #    1 | Node   5 | TX ID  009  | Temp   73.8 F | Light    339 lx
Time 00:00:07 | dT 00:07 | RSSI  1.08mW | Humidity -- % | Extrnl     0 mV

Packet #    2 | Node   5 | TX ID  009  | Temp   73.7 F | Light    333 lx
Time 00:00:09 | dT 00:02 | RSSI  1.42mW | Humidity -- % | Extrnl     0 mV

Packet #    3 | Node   5 | TX ID  009  | Temp   73.7 F | Light    322 lx
Time 00:00:10 | dT 00:01 | RSSI  1.37mW | Humidity -- % | Extrnl     0 mV

Packet #    4 | Node   5 | TX ID  009  | Temp   73.9 F | Light    317 lx
Time 00:00:12 | dT 00:02 | RSSI  1.17mW | Humidity -- % | Extrnl     0 mV

Packet #    5 | Node   5 | TX ID  009  | Temp   73.8 F | Light    270 lx
Time 00:00:15 | dT 00:03 | RSSI  0.56mW | Humidity -- % | Extrnl     0 mV
```

Data from Access Point          Data from Wireless Sensor Board

Connected 0:00:24 | Auto detect 19200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

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**Product Listing**

http://www.powercastco.com/products/development-kits/

**Product Support Information**

http://www.powercastco.com/documentation/

**Distributors – online ordering**