

## Extended Range Module

CEL's MeshConnect™ Extended Range module delivers industry-leading range, high performance, and a rich feature set, all at a surprisingly low cost.

The module's +20 dBm output power means extensive range – over two miles - plus more reliable transmission and fewer nodes in your network. It is especially useful for open outdoor applications where the nodes are physically far apart, or for indoor use where the nodes have to connect in a noisy RF environment. The Extended Range Module's outstanding +123.5 dB link budget ensures high quality connections even in such harsh environments.

Applicable to both the original Module and the new Extended Range Module, CEL has complete development kits which include a wide range of software packages that will help you develop your end product quickly. The modules support SNAP™, a software tool that quickly establishes simple mesh networks with minimal development time. Both modules also support SMAC, MAC and the full ZigBee stack where needed.

Data rates up to 1 Mbps help you meet the demands of higher bandwidth networks, while a unique, on-chip voice CODEC opens the door voice transmission applications. A variety of other robust peripherals — battery monitor, temperature sensor, RSSI and AES encryption engines — are all included to help lower total system cost and component count.

The MeshConnect modules are ideal for mesh, point-to-point, and point-to-multipoint networks. Their low current consumption especially in standby mode makes them ideal for battery-powered designs, while their miniature footprint and integrated antenna helps to further reduce system size.

FCC, IC and CE certification eliminates the need for costly, time-consuming certification of your design.

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## MeshConnect™ Extended Range Module for 802.15.4 Applications



### KEY FEATURES

- Extended range: up to 12,000 feet
- Increased receiver sensitivity: - 103.5 dBm; +123.5 dB link budget
- Extended software support:
  - SNAP™ for simple, for rapid development of auto-forming mesh networks
  - SMAC, MAC
  - ZigBee
- High Power out:
  - Up to 100mw (+20dBm)
  - Software configurable for multiple levels of power out
  - Extremely efficient low-power sleep mode
- Mesh, point-to-point, and point-to-multipoint networks
- Small footprint: 25 x 34 mm
- Hi-Speed Network support: 250Kbps, 500 Kbps & 1 Mbps
- Integrated voice CODEC (a-Law,  $\mu$ -Law & ADPCM)
- 16 RF channels
- Inverted-F PCB antenna, plus support for external antennas
- Integrated 8051 MCU functionality:
  - Timers, UARTs(2), SPI Master/Slave, I<sup>2</sup>S
  - 96 KB Flash; 8 KB SRAM
- Based on the MeshConnect IC Platform

### SPECIFICATIONS

Frequency	2405 to 2480 MHz
Operating Voltage	2.1 to 3.3 V
Output Power	+20 dBm
Rx Sensitivity	-103.5 dBm
Power Consumption:	
	Transmit Mode: 200 mA @ +20dBm
	Receive Mode: 38 mA
	Standby Mode: <1.0 $\mu$ A
Operating Temperature	-40°C to +85°C
Regulatory Certification	FCC / IC / CE

### APPLICATIONS

Wide open long range environments  
RF-noisy environments

## CEL MeshConnect™ Product Family

### MeshConnect™ Module

ZICM2410P0-1	Module with integrated PCB antenna
ZICM2410P0-1-SN	Module with integrated PCB antenna and SNAP OS with MAC address
ZICM2410P0-1C	Module with connector for external antenna option
ZICM2410P0-1C-SN	Module with external antenna option and SNAP OS with MAC address

### MeshConnect™ Extended Range Module

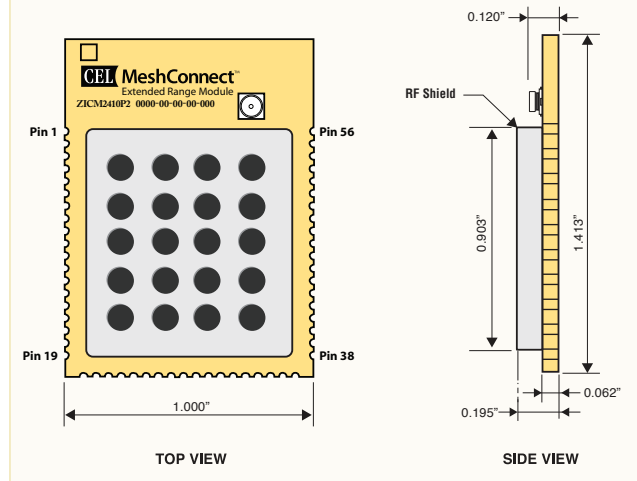
ZICM2410P2-2	Extended Range Module with integrated PCB antenna
ZICM2410P2-2-SN	Extended Range Module with integrated PCB antenna and SNAP OS with MAC address
ZICM2410P2-2C	Extended Range Module with connector for external antenna option
ZICM2410P2-2C-SN	Extended Range Module with external antenna option and SNAP OS with MAC address

### MeshConnect™ System on Chip ICs

ZIC2410QN48	48 pin QFN package
ZIC2410FG72	72 pin VFBGA package

### MODULE DIMENSIONS (inches)

See Data Sheet for Pin Outs, RF and Electrical Specifications.



### MeshConnect™ Development Kits

ZICM2410P0-KIT2-1	Evaluation and Development Kit for both Transceiver ICs and MeshConnect Module
ZICM2410P2-KIT1-1	Evaluation and Development Kit for both Transceiver ICs and Extended Range Module

## CEL MeshConnect / ZigBee Modules / ICs

MODULE / IC ▶	MeshConnect™	MeshConnect™ Extended Range	NEW: MeshConnect™ EM357 Mini	MeshConnect™ EM357	FreeStar Pro	MeshConnect™ IC
<b>RADIO</b>	2405 to 2480 MHz / DSSS / IEEE 802.15.4	2405 to 2480 MHz / DSSS / IEEE 802.15.4	2405 to 2480 MHz / DSSS / IEEE 802.15.4	2405 to 2480 MHz / DSSS / IEEE 802.15.4	2405 to 2480 MHz / DSSS / IEEE 802.15.4	2405 to 2480 MHz / DSSS / IEEE 802.15.4
<b>MCU</b>	MeshConnect™ ZIC2410 (SoC) 8 bit, 8051	MeshConnect™ ZIC2410 (SoC) 8 bit, 8051	Ember™ EM357 32 bit, ARM® Cortex™-M3	Ember™ EM357 32 bit, ARM® Cortex™-M3	Freescale™ MC13224 / MC13226 32 bit, ARM7	MeshConnect™ CEL ZIC2410 8 bit, 8051
<b>Fmax</b>	16 MHz	16 MHz	24 MHz	24 MHz	32 MHz	16 MHz
<b>Memory</b>	96 KB Flash; 8 KB RAM	96 KB Flash; 8 KB RAM	192 KB Flash; 12 KB RAM	192 KB Flash; 12 KB RAM	128 KB Flash	96KB Flash
<b>Inputs/ Outputs</b>	22	20	23	23	46	22 / 24
<b>NETWORK</b>	Mesh, Point-to-Point, Point-to-Multipoint	Mesh, Point-to-Point, Point-to-Multipoint	Mesh, Point-to-Point, Point-to-Multipoint	Mesh, Point-to-Point, Point-to-Multipoint	Mesh, Point-to-Point, Point-to-Multipoint	Mesh, Point-to-Point, Point-to-Multipoint
<b>Software / ZigBee Stack</b>	SNAP®, MAC, S-MAC, ZigBee® (RF4CE)	SNAP®, MAC, S-MAC, ZigBee® (RF4CE)	EmberZNet PRO™ (ZigBee Pro)	EmberZNet PRO™ (ZigBee Pro)	BeeStack™ ZigBee Pro - MC13226 MAC, S-MAC - MC13224	MAC, S-MAC, SNAP® ZigBee® (RF4CE)
<b>PERFORMANCE</b>						
<b>Tx Power Output</b>	+6dBm	+20dBm	SP0 +8 dBm SP2 +20dBm	+20dBm	+20dBm	+8 dBm
<b>Rx Sensitivity</b>	-97dBm	-103dBm	SP0 -100 dBm SP2 -103 dBm	-100dBm	-94dBm	-98 dBm
<b>Range (line of sight)</b>	2,000 ft (609 M)	16,000 ft (4,876 M)	TBD		13,000 ft (3,962 M)	4,000 ft (1,219 M)
<b>Vcc</b>	2.1 - 3.3V	2.1 - 3.3V	2.1 - 3.6V		2.7 - 3.6V	2.0 - 3.6V
<b>Rx Current</b>	35mA	38mA	SP0 30mA SP2 34mA	28mA	30mA	33.2mA
<b>Tx Current @ max dBm</b>	44mA	200mA	SP0 44mA SP2 150mA	170mA	193mA	30.6mA
<b>Sleep Current</b>	⏏ 1.0µA	⏏ 1.0µA	1.0µA		6.0µA	13µA
<b>Dimensions</b>	25 x 36 mm	25 x 36 mm	23.9 x 16.6 mm		25 x 36 mm	25 x 36 mm
<b>PART NO. ▶</b>	ZICM2410P0-1 ZICM2410P0-1C	ZICM2410P2-2 ZICM2410P2-1C	ZICM357SP0-1 ZICM357SP0-1C	ZICM357SP2-1 ZICM357SP2-1C	ZICM357P2-2 ZICM357P2-2C  ZUSNAP357P2-1	ZFSM-201-1 ZFSM-201-1C  ZFSM-201-2 ZFSM-201-2C
<b>EVAL KIT ▶</b>	ZICM2410P0-KIT2-1	ZICM2410P2-KIT1-1	ZICM-EM35X-DEV-KIT-2		ZICM357P2-KIT1-1 ZICM-EM35X-DEV-KIT-1	ZFSM-201-KIT-1
						ZICM2410QN48 ZICM2410FG72
						ZICM2410P0-KIT2-1