



LS RESEARCH LLC

Wireless Product Development

ModFLEX™

Wireless Your Way

ModFLEX™



- Buy Modules or Own Design – **You Decide**
- Common Module Footprints and I/O
- Gateway Platform with Dual Module Support
- Software Application Notes – Develop Your Own Application Code on the Hardware.
- FCC / IC / CE Certified Platforms
- Certification and Manufacturing Packages for Your Own Integrated Design.



SiFLEX01

LS900-SI-01

Available Q1 2010

Features

- Offers Superior Range and Interference Performance
- Software Controlled Automatic Channel Agility
- SiFlex Star Network Protocol – Fast, Simple , Ultra Reliable Wireless Protocol
- Simple Mesh Networking Protocol
- Adjustable Data Rates up 500Kbps
- Low Latency
- AES Encryption for Secure Network
- FCC/IC Certified (*pending*)

Specifications

- Texas Instruments CC430, FHSS Transceiver, CC1191 RF Front end.
- 250mW RF Output Power
- RF Sensitivity up to -100dBm
- 2.7V to 3.6V Operation
- 32K Flash/ 4K RAM/512B Data Flash
- Power Consumption
 - 275mA in Transmit
 - 160mA in Receive
 - 5uA in Standby



ProFLEX01

LS240-ZP-01

Features

- 100mW 2.4 GHz ZigBee / 802.15.4 Transceiver
- Supports ZigBee Pro and Smart Energy Profile
- Very Versatile, Ultra Low Power MSP430 Platform
- Integrated PIFA Antenna
- FCC/IC Certified

Specifications

- TI CC2520 802.15.4 Radio Transceiver
- TI CC2591 RF Front End
- MSP430F5437 Microcontroller
- 100mW RF Output Power
- RF Sensitivity up to -99 dBm
- 2.2V to 3.3V Operation
- 256K Flash / 16K RAM
- Power Consumption
 - 145mA in Transmit
 - 30mA in Receive



WiFLEX03

LS240-WI-03

Coming Soon

Features

- 802.11 b/g/n Module for Embedded Applications
- Integrated Inverted-F Antenna
- Flexible Software Interface
- SPI Host Protocol
- Low Power Consumption
- No External Flash Required for User Application Code
- Hardware Support for IEEE 802.11i, WPA2, WPA and WEP Security
- FCC/IC Certified (*pending*)

Specifications

- Luminary LM3S1918 ARM Cortex M3 Processor
- CSR UniFi Transceiver
- 18 dBm RF Output Power
- RF Sensitivity up to -92 dBm
- 3.0V to 3.6V Operation
- 256K Flash / 64K RAM
- Power Consumption
 - 300mA in Transmit
 - 100mA in Receive

ModFLEX™ Dual Module Gateway

- Advanced Architecture Gateway Platform
- Available as PCB Assembly of Fully Packaged Solution
- Ethernet / USB / RS232 Interface
- Power Over Ethernet
- Battery Back Up
- Supports 2 Module Sockets
 - WiFi to 2.4GHz ZigBee/802.15.4
 - WiFi to 900 MHz ZigBee/802.15.4
 - 2.4GHz ZigBee to 900 MHz ZigBee/802.15.4
 - True Receiver Diversity for ZigBee, WiFi and 900 MHz
- Micro SD Card Slot for Data Logging, Data Storage



Coming Soon

ModFLEX™ Mini Gateway - Ethernet

- Low Cost, Simple Connectivity
- Supports Any LSR Module in The ModFLEX Family
- Ethernet Connectivity
- Micro SD Card Slot
- Fully Packaged Design
- Ergonomic and Compact (4.1"x2.2"x1.6")
- Easy Installation with Mounting Flanges
- Supports Internal or Higher Performance External Antenna
- Standard LSR Software or Customizable
- External Power Supply Support
- Configurable with Embedded Web Server
- LED Status Indicators



ModFLEX™ Mini Gateway - USB

- Low Cost, Simple Connectivity
- Supports Any LSR Module in The ModFLEX Family
- USB Connectivity
- Micro SD Slot
- Fully Packaged Design
- Ergonomic and Compact (4.1"x2.2"x1.6")
- Easy Installation with Mounting Flanges
- Supports Internal or Higher Performance External Antenna
- Standard LSR Software or Customizable
- USB Power or External Power Supply
- Configurable with Embedded Web Server
- LED Status Indicators



Make Versus Buy



Integrated Design:

Benefits:

- Custom, Application Specific.
- Highest Gross Margin.
- Optimized Antenna Performance
- Host Interface, I/Os Custom

Tradeoffs:

- Cost & Time: RF Design
 - Equipment Costs
 - RF Engineering Staff
 - Compliance Know-How
- Certification Fees
- Cost: & Time Software Development

Off the Shelf Module:

Benefits:

- No Design Risk
- Quick Time to Market
- No Certification Fees

Tradeoffs:

- Size
- Unit Cost
- No Flexibility in Design

ModFLEX is the SOLUTION

ModFLEX™ Licensing Options

	Option 1 (manufacture at LSR's CM)	Option 2 (manufacture at own CM)	Option 3 (Integrated Design)
NRE	\$15,000	\$20,000	\$30,000
Royalty	\$0.00	\$0.45	\$0.45

Includes:

- Design Files
- FCC/IC Certification (CE Additional)
- Production Test Plan
- Software



AI Carte Menu

Common Design Modifications and Typical Pricing¹

AI Carte Modifications	Design Costs	FCC Re-Certification	Notes
Antenna Modifications			
Additional External Antennas	\$0	\$5,000	Per Antenna
Antenna Enclosure Optimization / Scan	\$4,000	\$5,000	Per Antenna / Enclosure
Custom Antenna Design	\$2,500 to \$7,500	\$5,000	
Hardware Modificaitons			
Custom PCB Form Factor	\$1,000 to \$4,000	\$5,000 to \$7,500	Design Changes Only
Custom Connector / Interface	\$2,000	\$5,000	Design Changes Only
Add Hardware Component (sensor/LED)	\$2,000	\$5,000	Design Changes Only
Software Modifications			
Additional Host Protocol Commands	\$1,000 to \$5,000	\$0	
Simple Application (i.e. Sensor Control)	\$5,000 to \$20,000	\$0	
Advanced Application Development	\$25,000 to \$50,000	\$0	

1) Budgetary Guideline Only
LS Research LLC Proprietary

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