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

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**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
**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 2.4G Hz ZigBee/802.15.4
  - WiFi to 900 MHz ZigBee/802.15.4
  - 2.4G Hz 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

Coming Soon
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

LS Research LLC Proprietary
## ModFLEX™ Licensing Options

<table>
<thead>
<tr>
<th></th>
<th>Option 1 (manufacture at LSR’s CM)</th>
<th>Option 2 (manufacture at own CM)</th>
<th>Option 3 (Integrated Design)</th>
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<tr>
<td>NRE</td>
<td>$15,000</td>
<td>$20,000</td>
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<td>Royalty</td>
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Includes:
- Design Files
- FCC/IC Certification (CE Additional)
- Production Test Plan
- Software
# Al Carte Menu

## Common Design Modifications and Typical Pricing

<table>
<thead>
<tr>
<th>Al Carte Modifications</th>
<th>Design Costs</th>
<th>FCC Re-Certification</th>
<th>Notes</th>
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<tbody>
<tr>
<td><strong>Antenna Modifications</strong></td>
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<tr>
<td>Additional External Antennas</td>
<td>$0</td>
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<td>Per Antenna</td>
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<tr>
<td>Antenna Enclosure Optimization / Scan</td>
<td>$4,000</td>
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<td>Per Antenna / Enclosure</td>
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<tr>
<td>Custom Antenna Design</td>
<td>$2,500 to $7,500</td>
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<tr>
<td><strong>Hardware Modifications</strong></td>
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<tr>
<td>Custom PCB Form Factor</td>
<td>$1,000 to $4,000</td>
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<td>Design Changes Only</td>
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<td>Custom Connector / Interface</td>
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<tr>
<td>Add Hardware Component (sensor/LED)</td>
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<td>$5,000</td>
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<tr>
<td><strong>Software Modifications</strong></td>
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<tr>
<td>Additional Host Protocol Commands</td>
<td>$1,000 to $5,000</td>
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<td>Simple Application (i.e. Sensor Control)</td>
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<td>Advanced Application Development</td>
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1) Budgetary Guideline Only

LS Research LLC Proprietary
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