Preliminary

muRata
INNOVATOR IN ELECTRONICS

# LG24C

## DNT24/GPRS Cellular Gateway

- **2.4 GHz FHSS DNT24/GPRS Cellular Gateway**
- **Optional 128-Bit AES Encryption**
- **Point-to-point, Point-to-multipoint or Store and Forward Operation**
- **100 mW EIRP 2.4 GHz Transmitter Power**
- **GPRS Class 10 Four-band Cellular Modem**
- **HTTP Posts, SimpleDB, XML and ModBus/TCP Support**

The LG24C is the Murata family's GPRS Cellular Gateway for DNT24 2.4 GHz Frequency Hopping Spread Spectrum (FHSS) based products, including the SN24xx series sensor modems and the ZN-24M RS-485 serial modems. On the 2.4 GHz side, the LG24C's DNT24 radio provides robust wireless communications. On the cellular side, the LG24C utilizes a GPRS four-band modem. In between is the intelligence to allow seamless integration of 2.4 GHz DNT24 based devices into network or Internet cloud based applications. TCP/IP Internet protocol support reduces the effort to tie LG24C networks into existing sensing and monitoring applications. The LG24C gateway shares the same API as the other RFM2M gateway products, letting you pick the wireless technology that best suits your requirements with only a minimum of changes to your application.

### Absolute Maximum Ratings

| Rating | Value | Units |
|---|---|---|
| Power Supply Input Voltage Range | -5 to +30 | V |
| Non-operating Ambient Temperature Range | -40 to +85 | ºC |

### Electrical and Mechanical Specifications

| Specification | Sym | Notes | Minimum | Typical | Maximum | Units |
|---|---|---|---|---|---|---|
| 2.4 GHz Operating Frequency Range | | | 2406 | | 2475 | MHz |
| Spread Spectrum Modulation | | | Frequency Hopping (FHSS) | | | |
| Modulation Type | | | FSK | | | |
| Number of RF Channels | | | 15 or 24 | | | |
| RF Data Transmission Rate | | | | 250 | | kbps |
| Receiver Sensitivity | | | | -100 | | dBm |
| Transmitter EIRP Output Power Options with Supplied 2 dBi Antenna | | | 10 or 100 | | | mW |
| Optimum Antenna Impedance | | | | 50 | | Ω |
| Antenna Connector | | | Reverse SMA Male | | | |
| Access Scheme | | | Ad Hoc TDMA | | | |
| Network Topologies | | | Point-to-Point, Point-to-Multipoint, Store & Forward | | | |
| Network Integrity | | | Heartbeat Transmissions | | | |
| Encryption | | | 128-bit AES | | | |

## Electrical and Mechanical Specifications (continued)

| Specification | Sym | Notes | Minimum | Typical | Maximum | Units |
|---|---|---|---|---|---|---|
| Cellular Modem | | | GPRS | | | |
| GSM Band Support | | | 850/900/1800/1900 | | | MHz |
| RJ-45 Ethernet Port | | | 10/100Base-T, Auto-sensing | | | |
| Ethernet Protocol | | | TCP/IP, UDP, ARP, ICMP, DHCP | | | |
| Internet Protocol | | | ModBus/TCP, HTTP Posts, SimplexDB, XML | | | |
| USB Diagnostic Console Port | | | USB 2.0 | | | |
| Power Supply Input Voltage Range | $V_{CC}$ | | +9 | | +30 | VDC |
| Current Consumption | | | | | 1.5 | A |
| AC Power Supply | | | 110/220 VAC Wall-plug Adaptor with International Plug Set | | | |
| Case Dimensions | | | 7.30 x 4.67 x 1.5 inches (185.4 x 118.6 x 38.1 mm) | | | |
| Mounting | | | Left and Right Flanges, Two Pre-drilled Holes in Each Flange | | | |
| Operating Temperature Range | | | -40 | | +85 | ºC |
| Operating Relative Humidity Range | | 1 | 5 | | 95 | % |

**Notes:**

1. Non-condensing humidity environment.

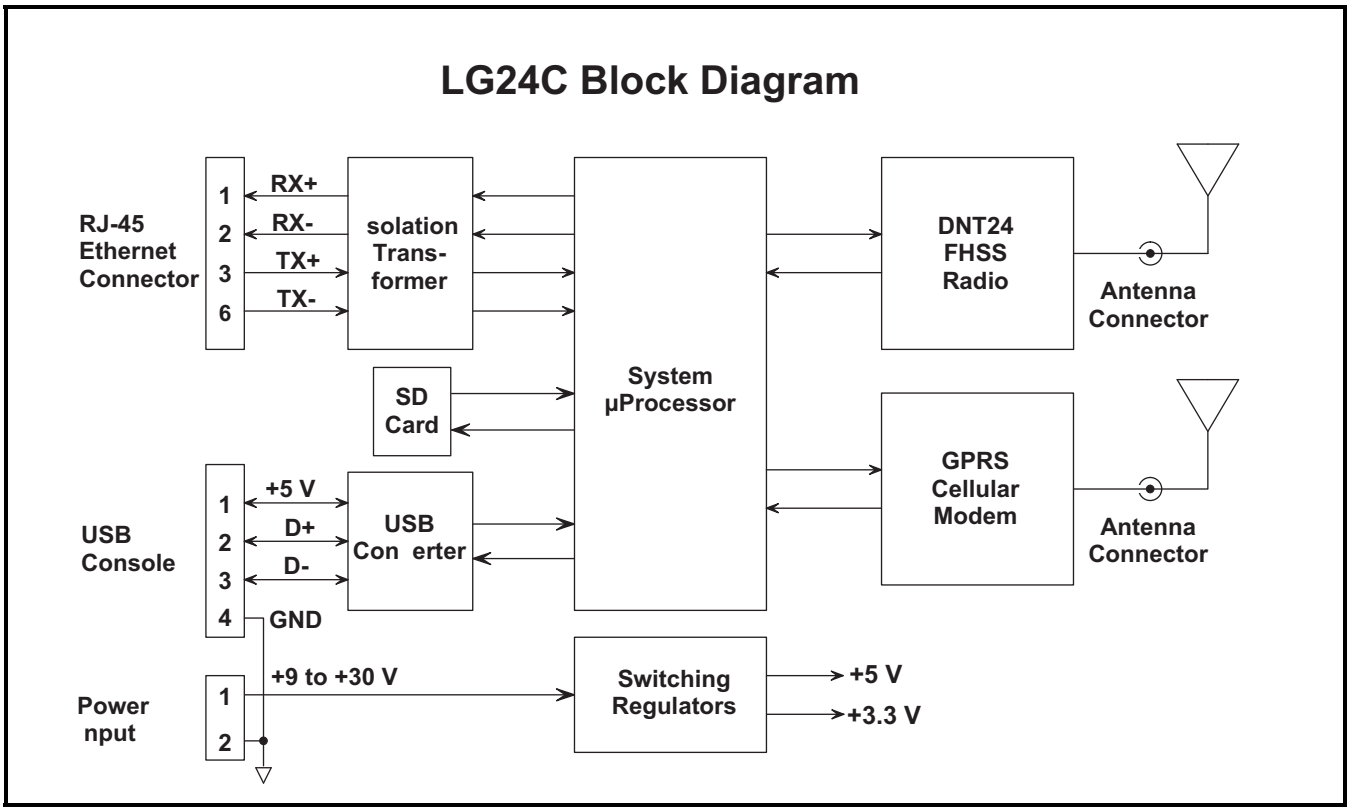


**Figure 1**

**LG24C Operation**

The LG24C is a robust GPRS cellular gateway for RFM's DNT24 Frequency Hopping Spread Spectrum (FHSS) radios. The LG24C's DNT24 radio operates in the 2.4 GHz ISM band, transmitting data at 250 kbps with a power output of 10 or 100 mW EIRP. The GPRS cellular modem provides gateway connectivity in the 800, 900, 1800 and 1900 MHz GSM bands.

The unit is packaged in a rugged aluminum enclosure, and ships with a universal wall-plug power supply a 2 dBi 2.4 GHz dipole antenna, and a four-band GSM dipole antenna. The LG24C is also compatible with RFM's complete line of 2.4 GHz antennas, allowing extended operating range where allowed by local regulations.

The switching regulators used in the LG24C support a wide input voltage range, from +9 to +30 Vdc for operation from battery-backed DC power sources.

LG24C gateways support point-to-point or point-to-multipoint networks, with store & forward range extension capabilities for large site operations.

The four-band GPRS cellular mode provides connectivity through virtually any GSM network, providing seamless integration of DNT24 based remote devices, such as the SN24R420, into network or Internet cloud based applications.

The LG24C includes support for TCP/IP, UDP, ARP, ICMP and DHCP Ethernet protocols, plus ModBus/TCP, HTTP Posts, SimpleDB and XML Internet protocols. This wide array of protocol support greatly reduces the effort to tie LG24C networks into existing sensing and monitoring applications.

ModBus/TCP support allows the LG24C gateway to seamlessly deliver wirelessly collected sensor readings using the ModBus/TCP standard protocol. The LG24C in conjunction with DNT24-based nodes provide a robust wireless data collection network suitable for a wide range of ModBus automation applications.

The LG24C is configured through an Ethernet port using a built-in configuration utility formatted as a web page.

### RJ-45 Ethernet Connector

| Pin | Name | I/O | Description |
|---|---|---|---|
| 1 | TX+ | O | This pin is the Ethernet positive differential output. |
| 2 | TX- | O | This pin is the Ethernet negative differential output. |
| 3 | RX+ | I | This pin is the Ethernet positive differential input. |
| 4 | RESERVED | - | This pin is reserved for future use and should not be connected. |
| 5 | RESERVED | - | This pin is reserved for future use and should not be connected. |
| 6 | RX- | I | This pin is the Ethernet negative differential input. |
| 7 | RESERVED | - | This pin is reserved for future use and should not be connected. |
| 8 | RESERVED | - | This pin is reserved for future use and should not be connected. |

### USB Console Port Connector

| Pin | Name | I/O | Description |
|---|---|---|---|
| 1 | +5 V | I | This pin is the +5 V USB Input |
| 2 | D+ | I/O | This pin is the positive differential I/O port. |
| 3 | D- | I/O | This pin is the negative differential I/O port. |
| 4 | GND | GND | LG24C ground. |

### DC Power Terminal Block

| Pin | Name | I/O | Description |
|---|---|---|---|
| 1 | +PWR | I | Positive power supply input, +9 to +30 V. |
| 2 | GND | - | LG24C ground. |

### LED Indicators

| Pin | Name | I/O | Description |
|---|---|---|---|
| 1 | ACTIVITY | O | Left-most LED on the front of the unit, amber color. Indicates RF communications activity. |
| 2 | LINK | O | Middle LED on the front of the unit, red color. On the base, this LED indicates one or more remotes are linked to it. On a remote, this LED indicates it is linked to the base. |
| 3 | POWER | O | Right-most LED on the front of the unit, green color. Indicates the unit is powered up. |
| 4 | ETH ACT | O | Upper-left LED on the RJ-45 Ethernet connector, green color. Indicates the Ethernet port is linked. |
| 5 | ETH LINK | O | Upper-right LED on the RJ-45 Ethernet connector, amber color. Indicates the Ethernet port communications activity. |

# LG24C Outline Drawing

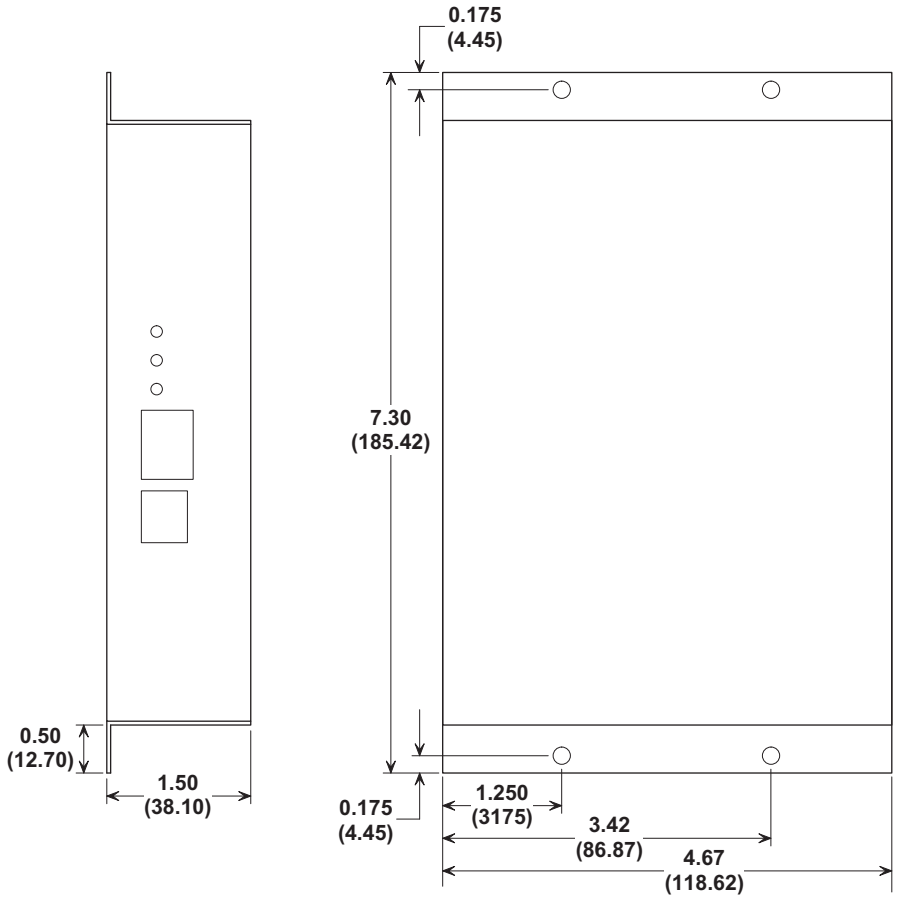


**Figure 2**

## Application Example

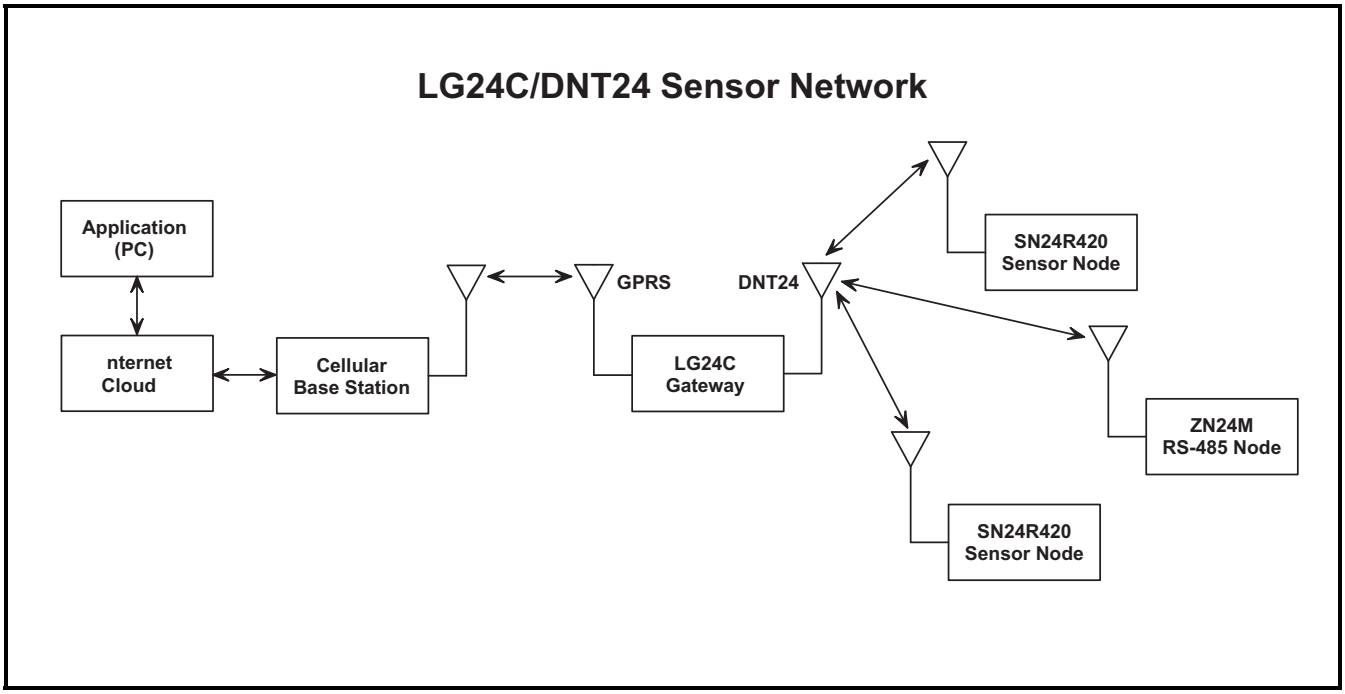


**Figure 3**