General Description

The Terminus Series, GSM864Q, is a GSM/GPRS control terminal that encapsulates everything needed for your wireless M2M capability in a compact enclosure. Quad band design allows for applications to be deployed worldwide.

The Terminus Series breaks through the barriers to M2M connectivity by minimizing investment and reducing total system costs. The Terminus Series contains all circuitry required to operate on the GSM network including SIM card connections and switching power supply. External antenna connection allows system integrator to meet application specific antenna mounting requirements. The GSM864Q allows for stand-alone use via industry standard interconnects or system integration via standard 50-pin 0.1” x 0.1” dual row header, further reducing the need for additional hardware costs. The GSM864Q’s ability to configure 9 GPIO as CMOS input or output makes the Terminus both innovative and cost effective. The ease of application development and optional GPS integration also opens the door for further system cost reduction.

Adaptable and easy to use, the GSM864Q is ideal for use in M2M Telemetry and Telematic applications including fleet and asset management, vending, security, alarm monitoring, e-maintenance and other telemetry applications.

General Features

- Nine User Configurable CMOS GPIO
- One 11-bit ADC Input
- RS-232 AT Command UART Interface
- AT interface selectable between DB9 or 50-pin Header
- Audio Handset Interface
- Input Supply Range: 7-18Vdc (Jump Start and Load Dump Tolerant)
- Power Supply Connection via Standard 2.1mm Barrel Connector or 50-pin Header
- Externally Accessible Replaceable Fuse
- Externally Accessible ON/OFF Control or via 50-pin Header
- Industry Standard SMA connector for GSM Antenna
- Externally Accessible SIM Card Socket
- GSM Status LED
- System Integration 50-Pin Header allows for Terminal-to-PCB Mounting or with Standard Ribbon Cable Connection
- Terminal Mounting via Nut/Bolt Through Enclosure
- Optional 16-Channel GPS Receiver
- Python Versions Available
Features

Product
- Quad Band GSM 850 / 900 / 1800 / 1900 MHz
- Output Power
  - Class 4 (2W) @ 850/900 MHz
  - Class 1 (1W) @ 1800/1900 MHz
- Control via AT commands according to GSM 07.05, 07.07 and proprietary Telit
- Serial Port Multiplexer 7.10
- SIM Access Profile
- TCP/IP stack access via AT Commands
- Power Consumption (typical values)
  - Idle (registered, power saving): <4 mA
  - Dedicated mode (max): 270mA
  - GPRS class 10 (max): 500mA
- Sensitivity:
  - -107 dBm (typ) @ 850/900 MHz
  - -106 dBm (typ) @ 1800/1900 MHz
- Extended Temp range:
  - -30°C to +80°C
  - -30°C to +65°C with GPS

Interfaces
- Data: 9 Position D-sub female
- Power 7 - 18VDC (2.1mm Barrel or 50-pin header)
- Audio 4-wire Handset Interface (RJ9), 4P4C
- 50-pin header (25 x 2, 0.1")
  - User Configurable GPIO
  - UART Interface
  - ADC Input
  - DC Power
- Antenna: 50 OHM (SMA male)
- SIM card reader; 3V interface with SIM detection
- LED Interface indicating connection status
- ITU-T V.24 Serial Link through UART: at CMOS Level Baud rate from 300 to 115.200 bps and Autobauding from 2.400 to 57.600 bps

GPRS Data
- GPRS Class 10
- Mobile station class B
- Coding Scheme 1 to 4
- PBCCH Support

Audio
- Telephony, Emergency
- Half rate, Full rate, Enhanced Full rate and Adaptive Multi Rate voice codecs (HR, FR, EFR, AMR)
- Superior Echo Cancellation & Noise Reduction
- DTMF

SMS
- Point-to-Point mobile originated and mobile terminal SMS
- Concatenated SMS supported
- SMS Cell Broadcast
- Text and PDU mode

Circuit Switched Data Transmission
- Asynchronous Transparent Circuit Switched Data (CSD) up to 14.4 kbps
- Asynchronous Non transparent CSD up to 9.6 kbps
- V.110

Fax
- Group 3, Class 1

GSM Supplementary
- Call Forwarding
- Call Barring
- Call Waiting & Call Hold
- Advice of Charge
- Calling Line Identification Presentation (Clip)
- Calling Line Identification Restriction (CLIR)
- Unstructured Supplementary Services Mobile Originated Data (USSD)
- Closed User Group

Additional Features
- SIM Phonebook
- Fixed Dialing Number (FDN)
- Real Time Clock
- Alarm
- Network LED Support
- IRA Character Set
- Jamming Detection & Report
- Embedded TCP/IP Stack, including TP, IP, UDP, SMTP and FTP protocol
- Optional 16-Channel GPS Receiver
- Python Versions Available
Block Diagram

POWER SUPERVISOR

Vgs
Vcc
Vm

SWITCHING POWER SUPPLY (7 - 18Vdc)

VIN

ON/OFF EXTERNAL

YELLOW LED

SMA (ANT.) CONNECTOR

TELIT GSM MODULE

GPIO (1-9)
RESET
PWRMON

PASSIVE MATCHING

Vmic

4P4C (AUDIO) CONNECTOR

BARREL CONNECTOR

50 - PIN EMBEDDED INTERFACE

50 - PIN EMBEDDED INTERFACE

2.5 - PIN EMBEDDED INTERFACE

GPIO20

SIM CARD SOCKET

GPIO18 / GPS RESET
GPIO19 / GPS WAKEUP

NAVSYNC CW20 GPS MODULE

GREEN LED

MCX (ANT.) CONNECTOR

MUX

(2)

(2)

(1)

RS-232

DB-9 CONNECTOR

Terminus Product Brief GSM864Q  Rev: R00  Date: 02/18/08
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Specifications subject to change without notice
**TECHNICAL SPECIFICATIONS**

**Electrical Specifications**

**GSM Module Specification**
- Quad-band EGSM 850 / 900 / 1800 / 1900 MHz
- Output Power: Class 4 [2W] @ 850 / 900 MHz, Class 1 [1W] @ 1800 / 1900 MHz
- Control via AT commands according to GSM 07.05, 07.07 and proprietary Telit
- Serial Port Multiplexer GSM 7.10
- TCP/IP stack access via AT commands
- Sensitivity: -107 dBm (type.) @ 850 / 900 MHz, -106 dBm (typ.) @ 1800 / 1900 MHz

**GPS Module Specifications**

| GPS Performance |  
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| GPS Channels    | 16              | Frequency       | 1575.42 MHz – L1 C/A Code | TTFF Cold Start @ -135 dBm | 46 seconds | TTFF Warm Start @ -141 dBm | 34 seconds | TTFF Hot Start @ -141 dBm | 5 seconds | Re-acquisition time @ -147 dBm | <3 seconds | Acquisition Sensitivity (fix not available) | TTFF (Hot) with all signals at -138 dBm: 30 s | Acquisition Sensitivity (fix available) (dBm) | -147 dBm | Tracking Sensitivity (dBm) | -150 dBm | Acquisition Sensitivity SBAS satellites (dBm) | -135 dBm | -143 dBm | Acquisition Sensitivity SBAS satellites (dBm) | -135 dBm | -143 dBm | Static Accuracy (without SBAS) | 50% Confidence (CEP) | 1.2 m | 95% Confidence | 3.1 m | Static Accuracy (with SBAS) | 50% Confidence (CEP) | 0.8 m | 95% Confidence | 2.0 m | Maximum Horizontal Speed | 515 m/s | 9 | Maximum Vertical Speed | 15 m/s | 10 | Maximum Altitude | 18 Km | 11 | Maximum Acceleration (g) | 2 g |

Notes:
1. These are RMS values
2. Maximum Sensitivity -147 dBm
3. Simulator Test, all signals at specified power level.
4. Estimated
5. Simulator Test, continuous fix with all signals at specified power level.
6. Simulator Test with signal at specified power level.
7. Open-sky, 24 hrs statistic, active antenna (signal range is between 30 to 49 dB/Hz).
8. Open sky, 24 hrs statistic, active antenna (EGNOS signal used).
9. Limited by International Traffic in Arms Regulation (ITAR)
10. Defined by navigation integrity check
11. Limited by International Traffic in Arms Regulation (ITAR)
## I/O Level Specification

### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIN (DIGITAL INPUTS)</td>
<td>-0.3</td>
<td>-</td>
<td>+3.75V</td>
<td>Volt</td>
<td></td>
</tr>
<tr>
<td>VIN (ANALOG INPUT)</td>
<td>-0.3</td>
<td>-</td>
<td>+3.00V</td>
<td>Volt</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40</td>
<td>-</td>
<td>85</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Supply (+) referenced to Supply(-)</td>
<td>0</td>
<td>-</td>
<td>24</td>
<td>V</td>
<td>1</td>
</tr>
</tbody>
</table>

Operation of the device at these or any other conditions beyond those listed under Recommended Operating Conditions is not implied. Exposure to Absolute Maximum Rating conditions for extended periods of time may affect device reliability.

### Recommended Operating Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-10</td>
<td>-</td>
<td>55</td>
<td>°C</td>
</tr>
<tr>
<td>Supply (+) referenced to Supply (-)</td>
<td>7</td>
<td>-</td>
<td>18V</td>
<td>Volt</td>
</tr>
<tr>
<td>3.165 VDC Output</td>
<td>3</td>
<td>-</td>
<td>3.3V</td>
<td>Volt</td>
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</tbody>
</table>

### Recommended Operating Conditions - Interface levels (2.8V CMOS)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage High - Vih</td>
<td>2.1</td>
<td>-</td>
<td>3.3</td>
<td>Volt</td>
</tr>
<tr>
<td>Input Voltage Low - Vil</td>
<td>0</td>
<td>-</td>
<td>0.5</td>
<td>Volt</td>
</tr>
<tr>
<td>Output Voltage High - Voh</td>
<td>2.2</td>
<td>-</td>
<td>3.0</td>
<td>Volt</td>
</tr>
<tr>
<td>Output Voltage Low - Vol</td>
<td>0</td>
<td>-</td>
<td>0.35</td>
<td>Volt</td>
</tr>
</tbody>
</table>

Typical Current Source/Sink capability = 1mA/1µA

### Recommended Operating Conditions - RESET pin

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage High - Vih_rst</td>
<td>2.0</td>
<td>-</td>
<td>2.2</td>
<td>Volt</td>
</tr>
<tr>
<td>Input Voltage Low - Vil_rst</td>
<td>0</td>
<td>-</td>
<td>0.2</td>
<td>Volt</td>
</tr>
</tbody>
</table>

It is recommended that this input be controlled by an Open Collector/Drain output. Do not use an external pull-up resistor, a pull-up is included internal to the Ternimus.

### Recommended Operating Conditions - ADC1 pin

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>0</td>
<td>-</td>
<td>2</td>
<td>Volt</td>
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<tr>
<td>AD Conversion</td>
<td>-</td>
<td>-</td>
<td>11</td>
<td>Bits</td>
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<tr>
<td>Resolution</td>
<td>1</td>
<td>1</td>
<td>&lt;1</td>
<td>mV</td>
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### Terminus Electrical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Voltage Range</td>
<td>7</td>
<td>-</td>
<td>18</td>
<td>VDC</td>
<td></td>
</tr>
<tr>
<td>Current (idle mode)</td>
<td>22</td>
<td>-</td>
<td>14</td>
<td>mA (typ)</td>
<td>3</td>
</tr>
<tr>
<td>Current (idle mode) with GPS</td>
<td>35</td>
<td>-</td>
<td>20</td>
<td>mA (typ)</td>
<td>3, 4</td>
</tr>
<tr>
<td>Power (max)</td>
<td>11.5</td>
<td>-</td>
<td>Watts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. 7-40V Vin by option. Please contact a sales representative for more information about ordering Ternimus with GPS option.
2. Max current draw of 25mA on the 3.165VDC output.
3. Registered on Network: No Traffic
4. Active antenna not connected.
5. Maximum power during GSM transmission (see Telli GC864 Hardware User Guide, Section 5.1 for more information)

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Specifications subject to change without notice
Mechanical Dimensions

Bottom View

w/ Bottom Cover

Removed

2x Hole
for #6 SHCS

2.400

[66.04]

1.214

[30.84]

3.750

[95.25]

.650

[16.51]

.313

[7.95]

.650

[16.51]
Terminus
GSM Series
GSM864Q
Terminal Modem

Making machines talk.

<table>
<thead>
<tr>
<th>Ordering Information</th>
<th>Description</th>
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<tbody>
<tr>
<td>GSM864Q V1.00</td>
<td>Terminus GPS Terminal</td>
</tr>
<tr>
<td>GSM864Q V2.00</td>
<td>Terminus Non-GPS Terminal</td>
</tr>
<tr>
<td>GSM864QP V1.00</td>
<td>Terminus GPS Terminal w/Python *</td>
</tr>
<tr>
<td>GSM864QP V2.00</td>
<td>Terminus Non-GPS Terminal w/Python *</td>
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</table>

* Note disclaimer: The Python enabled terminals are not PTCRB or carrier certified

<table>
<thead>
<tr>
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<th>Revision Date</th>
<th>Note</th>
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<td>A02</td>
<td>05/16/07</td>
<td>Revisions to Product Features</td>
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<td>A03</td>
<td>06/11/07</td>
<td>Revisions to Footprint/Packaging</td>
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<td>A04</td>
<td>06/25/07</td>
<td>Additional of Mechanical Drawings</td>
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<td>A05</td>
<td>07/19/07</td>
<td>Added Order Information &amp; Python Versions</td>
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<td>A06</td>
<td>08/23/07</td>
<td>Updated Mechanical Drawings</td>
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<td>R00</td>
<td>02/18/08</td>
<td>Updated to Release and Block Diagram</td>
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