INTELLIGENT OFDMA POWER LINE COMMUNICATION MODULE

Overview

The intelligent GridComm Power Line Communication (PLC) module is a complete hardware and software networking solution. In Auto-Routing modes, the software automatically self-adapts to varying conditions on the power lines with the most optimal data routing paths. When powered with a DC12V@300mA power supply, it functions as a full system-level PLC modem. The GridComm GC9802 PLC Module demonstration node, shown in Figure 1, is an example. The PLC module utilizes the industry-leading gridComm GC2200 IC chip: an OFDMA (Orthogonal Frequency Division Multiple Access) Power Line Communication Transceiver.

The PLC module is designed to be used node for use in applications such as Advanced Metering Infrastructure (AMI), Automated Meter Reading (AMR), Smart Lighting Control, Industrial/Home Automation, Alternative Energy and M2M.

Benefits

- Tackles signal variations that are commonly present in power line applications due to signal attenuation, impulsive noise, and changes in line impedance
- Allows selection of carrier frequencies to suit the operating environment
- Scan Frequency tool to scan for best 18 carrier frequencies based on RSSI and Received Success Rate for up to 8 nodes
- Automatically forms a multi-tier network to reach otherwise non-contactable nodes
- Maintains optimal routes between nodes
- Supports UART via a transparent protocol
- Factory set for operation on CENELEC A, B C & D, or FCC/ARIB bands
- Designed to connect directly to DC power lines or AC power lines in Single-Phase and Three-Phase power line system (modifications of coupling capacitor are required for Three-Phase)
- Built-in AFE and Coupling Circuit
- Small form factor, can be easily integrated into a target system
- Noise Indicator tool to detect noise level for selected frequency channels
- Debug tool to test success rate of communication links

Dimensions

The overall dimensions of the PLC module are 66mm L x 45mm W (see Figure 8). There is over-current, over-voltage and electrostatic protection on the PLC module.

Figure 1 - PLC Module Demo Board, GC9802

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Pins Descriptions

The pin locations are shown in Figure 8

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Name</th>
<th>Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N</td>
<td>Power Line</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>Power Line</td>
</tr>
<tr>
<td>3</td>
<td>VCC</td>
<td>12V@300mA Power</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>TxD</td>
<td>UART1 (3.3V TTL)</td>
</tr>
<tr>
<td>6</td>
<td>RxD</td>
<td>UART1 (3.3V TTL)</td>
</tr>
<tr>
<td>7</td>
<td>RS485</td>
<td>RS485 Control</td>
</tr>
</tbody>
</table>

Specifications

- 18 independent channels operating with up to 54 out of 100 pre-configured carrier frequencies between 5 kHz to 500 kHz.
- 3QPSK, 3BPSK, or 1BPSK modulation schemes with up to 18 levels of redundancy
- Raw data rates between 1.22 Kbps to 7.32 Kbps depending on power line conditions
- 32-bit addressing scheme
- Four operation modes: Point-to-Point, Simple Broadcast, Auto-Routing, and Broadcast-Routing
- One Master node supports up to 240 Slave nodes in Auto-Routing and Broadcast-Routing modes
- Options for operation on CENELEC A, CENELEC B, CENELEC C, CENELEC D, FCC or ARIB bands.
- UART input/output with preset COM Port settings: 115200 Baud rate, No Parity Bit, 8 Data Bit and 1 Stop Bit
- Support user packet size of up to maximum of 512 bytes
- Single Power Supply: DC12V @ 300mA with within ±10% tolerance limit and ± 5% maximum permissible ripple
- Normal Power Consumption- Receiving (Rx) Mode: 12V@42mA
- Tx Power Consumption- Maximum up to 12V@210mA
- Rx Sensitivity: -75 dBm
- Distance: Up to 3km-the actual distance depends on power line conditions
- Operating Temperature -40°C to +85°C
- 0.5W Standby Power in listening mode

Contact Information
For more information regarding the GC8802 OFDMA PLC Module including reference design, pricing and ordering please contact:
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