I - Series G.hn Industrial Module (TC430)

G.hn Enabling High Speed Connectivity for IoT

G.hn is opening the door to new opportunities within the Industrial sector, low latency and reliable connectivity are vital to keep Machine - Machine communications and operations running smoothly. Without it, downtime or a degradation of service will be unavaoidable. G.hn acts as essential time-critical and saftey-critical infrastructure, with its robust capabilities allowing for mission critical communications and the ability for the network to self-heal. It allows for fast installation and works seamlessly through existing wiring to provide the low latency connectivity upon which industrial applications rely. G.hn topologies provide the IIoT backbone network for high speed and multi-hop point to multipoint (P2MP) connectivity for up to 250 nodes.

Designed in the UK by MWave, the I - Series G.hn Industrial Module (TC430) is optimised to enable the cost-effective roll-out of G.hn solutions in Industrial environments. The technology offers quick, low cost, seamless deployment without the need for dedicated data cabling or firmware. The module is designed using Maxlinear's latest Wave-2 chipset and ships using tried and tested HN Spirit Firmware (Home Networking) which facilitates P2P (Point to Point) and MESH topology networks.

Out of the box the I - Series G.hn Industrial Module (TC430) is configured for use over power cables typically carrying 24, 32 or 48V DC (or AC). It allows up to 14 nodes to be connected to form a mesh network. This topology and node count will cover many industrial applications. The module has a single 1 Gigabit Ethernet Interface which will satisfy most requirements at an affordable cost. The module also supports RS485 or RS232 serial interfaces that are commonly found in industrial installations such as factory automation and telemetry.
The module is supplied DIN rail mountable in a robust aluminium cast enclosure, and comes with connectors for ease of installation. Status LEDs, Reset and Configuration buttons are recessed to stop accidental use.

Module Block Diagram

G.hn: One Technology, Multiple Connectivity

The illustration below shows the array of network topologies that the G.hn standard can support through firmware and hardware optimisation. The technology offers optimum solutions for most Industrial IoT (IioT/Industry 4.0) connectivity challenges.

Mwave I- Series G.HN Module
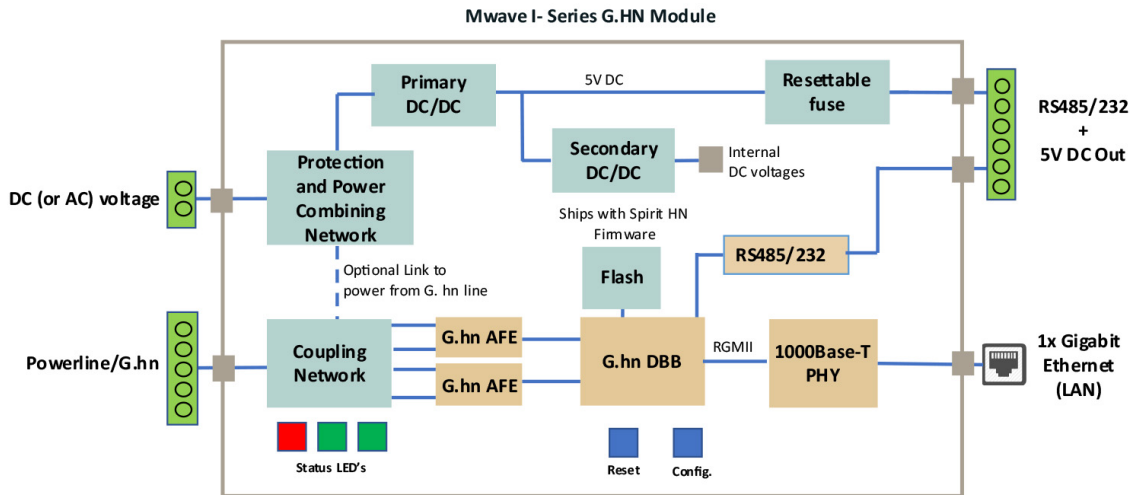
- Self organized
- Up to 1 Gbps throughput
- MIMO or SISO
- 2 or 3 pin Powerline configuration
- Selectable Serial I/F Bridge to G.hn over Powerline

| Segment	Carrier Fiber Extender	Consumer & Carrier Home Networking	Phone-line Carrier Access	Coax Carrier Access & Li-Fi	Industrial & Enterprise IoT
Software	Spirit HN	Spirit HN	Spirit Gigawire/ G.now	Spirit P2MP	Spirit Grid
Network Topology		Full-visibility Mesh	Point-to-Point	Point-to-Multipoint	Large scale Multi-hop network

GigaWire™

Summary of Features

- Plug and Play industrial G.hn network module with intelligent software for Industrial IoT (IioT)

- Uses existing copper wiring infrastructure; typically industrial power cables – up to 48 Vin (DC or AC peak to peak)

- Supports aggregated network data throughput up to 1Gbps (limited by 1Gbps Ethernet PHY)

- Bridges legacy RS485 and RS232 serial interfaces

- Extremely robust in noisy environments with Advanced Powerline Noise Mitigation Techniques

- Security of the network protected with data encryption - AES 128K bit

- Firmware profile supports typicaliIndustrial applications such as factory automation, telemetry, Industrial IoT, video surveillance etc, commercial property lighting and security automation etc.

- Scalable, ideal for point-to-point and supporting networks with multiple nodes

- Quick to install/roll-out; solution can be repurposed

- Cost-effective mass production solution for adoption in industrial applications with DIN rail mount option - custom housings also posssible

- Compact – PCB optimised design

- Long reach - up to 1km, negating the need for repeaters in point-to-point applications

- Can be used as a vehicle for application P.O.C. (Proof of Concept)

- Module is based on Maxlinear Industrial Temperature Range Wave-2 G.hn Transceiver chipset

- HomeGrid forum member with products submitted for Certification

Performance

Dynamic Range

Performance (cont.)

SNR Ch 1 v Attenuation
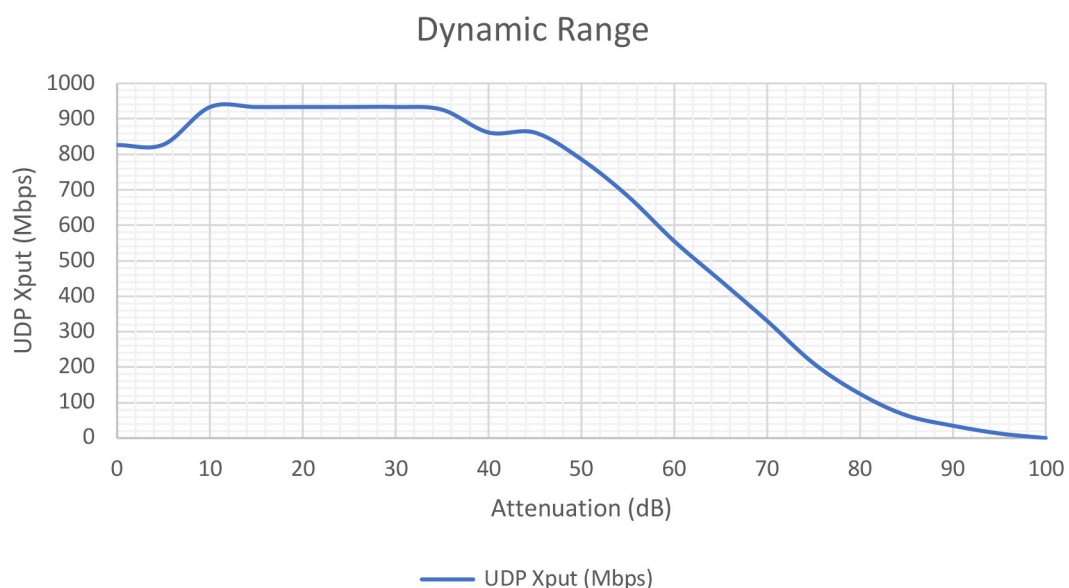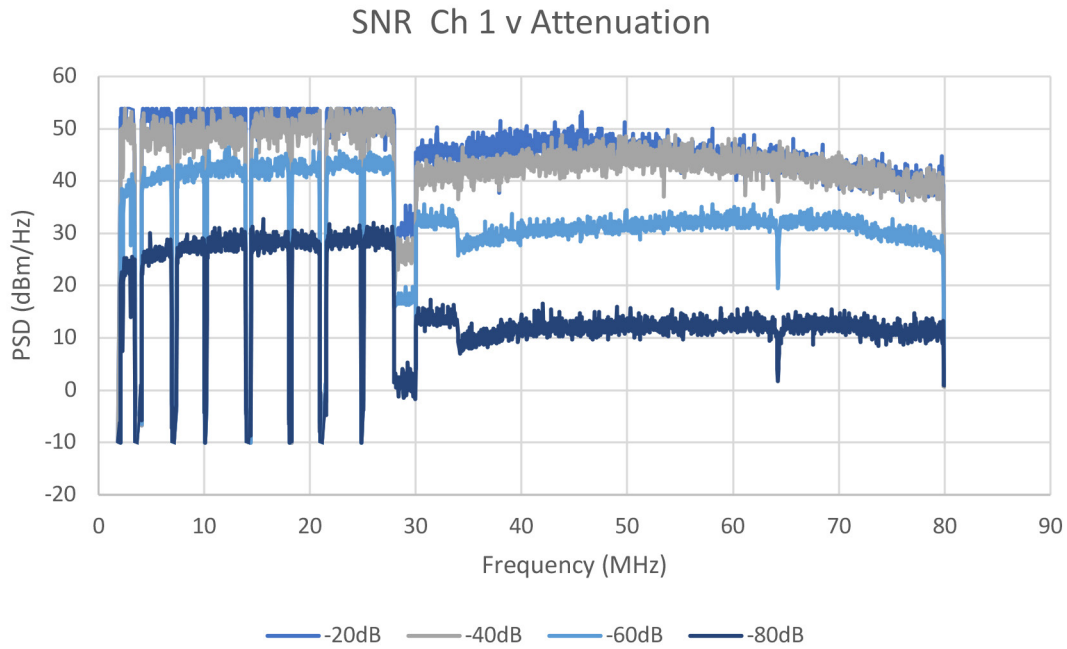
Electrical

Parameter	Value	Maximum Value	Notes
Input Voltage	12-48V DC	60V DC	If AC then maximum voltage is peak-to-peak
Ambient Operating Temp. Range	-40 to +85 degrees Celsius		Ideal maximum ambient operating temp should not exceed 60 degrees Celsius in continuous use
Ethernet	1 x Gigabit Ethernet Phy		1 x RJ45 socket
RS485/232 *	1 x connector 5.08mm pitch screw terminal 6 pin		5V DC (up to 250mA) and Ground also provided on this connector
G.hn	2/3 wire		3 wire operation is standard for Powerline operation
Powerline frequency range	2-100MHz		
Power Consumption	4.7W		@20V DC, 1Gb/s throughput

Mechanical

Parameter	Value	Maximum Value	Notes
Parameter			
Chassis size	98 x 68 x 25mm		Excluding connectors
Chassis weight		350g	TBC
DIN Mount	35mm DIN rail mounting.		Side or rear mounting adapter options
Chassis Material	Die-cast aluminium		

Standards

Parameter	Value	Maximum Value	Notes
ITU-T G.9960			Physical Layer
ITU-T G.9961			Data Link Layer
ITU-T G.9962			Management specification
ITU-T G.9963			MIMO
ITU-T G.9964			Spectral Components

For further information please contact:

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