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Certification Exhibit

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**Manufacturer: Landis+Gyr Technology Inc.
Model: Gridstream Series-5 IWR**

Manual

**Landis+Gyr
Gridstream RF
Series V IWR Radio
Data Sheet**

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Landis+Gyr Gridstream RF Series V IWR Radio Data Sheet



General

The Landis+Gyr Gridstream RF Series V Integrated WanGate Radio (IWR) provides a basis for a powerful RF wireless mesh network for remote data collection and end device monitoring and control. The radio provides full two-way peer-to-peer communication to all devices within the network. The IWR also offers advanced functionality, such as individual message prioritization, additional memory for localized intelligence, and a programming language Device Control Word (DCW) used to provide interface and control to distributed automation equipment.

The IWR has one RS-232 serial port for the LAN Packet Port (LPP) and one RS-232/485 serial port for the Transparent Packet Port (TPP). The LAN Packet Protocol Port is used to communicate to devices that use the Gridstream IWR LAN Packet Protocol, such as a PC with configuration or diagnostic software. The Transparent Packet Port is a general-purpose data port that is used to transport byte-oriented data, such as DNP 3.0, Modbus, or DF1.



NOTE: The mini-USB port is a nonfunctional feature that will be utilized in future releases.



Figure 1. Landis+Gyr Gridstream Series V IWR Radio

IWR Usage

The IWR was engineered specifically for varied needs of residential and commercial applications. It enables access to the RF mesh network using a standard RS-232 connection.

Useful features of the IWR include:

- Simultaneous connections per RS-232 interface by:
 - LPP applications
 - TPP applications

FCC and Industry Canada Compliance

FCC Class B

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult Landis+Gyr or an experienced radio technician for help



WARNING: Changes or modifications to this device not expressly approved by Landis+Gyr could void the user's authority to operate the equipment.

RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 22 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Approved Antenna: Omni-directional antenna, 5.5 dBi gain, 902-928 MHz, antenna impedance is 50 ohms.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Anatel

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

Gridstream Series V IWR Radio Specifications

Table 1. General Series V IWR Specifications

Electrical (General)	
Input Voltage Range	6 - 28 VDC
Input Current (in transmitting mode)	320 mA typical (12 VDC operation)
Input Current (in receiving mode)	38 mA typical (12 VDC operation)
Processor	160kb ROM, 32kb SRAM (Internal)
Internal Memory (DDR)	16 MB
Serial Flash	8 MB
Radio (General)	
Communication Protocol (PHY)	IEEE 802.15.4g (G5i), proprietary Gridstream RF
RF Frequency Range	902-928 MHz
Channel Spacing	200, 400 kHz (G5i) 100, 300, 500 kHz (Gridstream proprietary)
RF Data Rate	50, 150, 200 kbps (G5i) 9.6, 19.2, 38.4, 115.2, 300 kbps (Gridstream proprietary)
Receiver	
Sensitivity (at 10% packet error rate)	-112 dBm (9.6 Kbps) Typical / -101 dBm (115.2 Kbps) Typical, -95 dBm (300 Kbps) typical
Adjacent Channel Rejection	35 dB Typical
Alternate Channel Rejection	50 dB Typical
Transmitter	
Output Power (at Antenna Connector)	21/25/30 dBm (user selectable)
Modulation Type	FSK/GFSK
Out-of-band Spurious Emissions	<-70 dBc