

Sentrius™ MG100

Regulatory Information

v1.4

1 CURRENT REGULATORY CERTIFICATIONS

The Sentrius™ MG100 hosts the Pinnacle 100 module which holds current certifications in the following countries:

Country/Region	Regulatory ID
USA (FCC)	SQG-PINNACLE1
Canada (ISED)	3147A-PINNACLE1
EU	N/A
UK (UKCA)	N/A

The following FCC and ISED regulatory information applies to the Pinnacle 100 module which is hosted by the MG100.

2 CERTIFIED ANTENNAS

Note: Laird Connectivity is the manufacturer for all of the antennas listed below.

Table 1: Pinnacle 100 certified antennas

Model	Part Number	Type	Connector	Peak Gain	
				2400-2500 MHz	
NanoBlue	MAF94045	PCB Dipole	IPEX U.FL	2 dBi	
FlexPIFA	001-0014	Patch	U.FL	2 dBi	
Dipole	001-0001		RP-SMA	2 dBi	

Model	Part Number	Type	Connector	Peak Gain	
				698-875MHz	1710-2500 MHz
Revie Flex	EFF6925A3S-15MHF1	PCB Dipole	IPEX U.FL	1.9 dBi	3.7 dBi
Dipole Blade	DBA6927C1-FSMAM	Dipole	SMA	0.5 dBi	2.2 dBi
Pinnacle™ 100 Bent Metal	110-00665	Bent Metal	N/A	1.3 dBi	2.6 dBi

Model	Man. PN	Type	Conn.	Peak Gain											
				600-698	698-806	806-894	880-960	1350-1580	1550-1610	1690-1880	1850-1990	1910-2180	2300-2700	3300-4200	4900-6000
Revie Flex 600	EFF6060A3 S-10MHF1	PCB Dipole	IPEX U.FL	2.0	2.5	2.7	3.2	3.8	3.8	3.7	2.8	2.9	3.8	4.7	6.9

Model	Man. PN	Type	Conn.	Peak Gain											
				698-824	824-894	880-960	1350-1550	1550-1690	1690-1880	1850-1990	1910-2170	2300-2500	2500-2700	3300-4200	4900-6000
Revie	EFF6989A3	PCB	IPEX												
Flex 700	S-19MHF1	Dipole	U.FL	0.9	1.4	2.7	3.2	4.2	4.1	3.7	3.9	3.7	3.5	3.3	4.5

Note: The OEM is free to choose another vendor’s antenna of like type and equal or lesser gain as an antenna appearing in the table and still maintain compliance. Reference FCC Part 15.204(c)(4) for further information on this topic.

To reduce potential radio interference to other users, the antenna type and gain should be chosen so that the equivalent isotropic radiated power (EIRP) is not more than that permitted for successful communication.

3 FCC REGULATORY

The 453-00010 and the 453-00011 hold full modular approvals. The OEM must follow the regulatory guidelines and warnings listed below to inherit the modem approval.

Part #	Form Factor	BLE TX Pout	BLE Antenna	LTE TX Pout	LTE Antenna
453-00010	M2 Key E	6 dBm	PCB Trace	23 dBm	Bent Metal
453-00011	M2 Key E	6 dBm	U.FL	23 dBm	U.FL

Federal Communication Commission (FCC) Radiation Exposure Statement

This EUT complies with SAR for general population/uncontrolled exposure limits in FCC Part 1.1307, Part. 1310 and FCC KDB 447498 – RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices.

This transceiver must not be co-located or operating in conjunction with any other antenna, transmitter, or external amplifiers. Further testing/evaluation of the end product will be required if the OEM’s device violates any of these requirements.

The Pinnacle™ 100 is fully approved for mobile and portable applications.

OEM Responsibilities

WARNING: The OEM must ensure that FCC labelling requirements are met. This includes a clearly visible label on the outside of the OEM enclosure specifying the appropriate Laird Connectivity FCC identifier for this product.

Contains FCC ID: SQG-PINNACLE1

Thee following FCC part 15.19 statement must also be available on visible on outside of device:

The enclosed 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

Label and text information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. However, the type size for the text is not required to be larger than eight points.

CAUTION: The OEM should have their device which incorporates the Pinnacle™ 100 tested by a qualified test house to verify compliance with FCC Part 15 Subpart B limits for unintentional radiators.

CAUTION: Any changes or modifications not expressly approved by Laird Connectivity could void the user’s authority to operate the equipment.

Federal Communication Commission Interference Statement

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 of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

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 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

Integration Instructions for Host Product Manufacturers

Applicable FCC rules to module – FCC Part 24/27; FCC Part 15.247

Summary of the Specific Operational Use Conditions – The module must be installed in a mobile device. This device is intended only for OEM integrators under the following conditions:

- The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- The transmitter module may not be co-located with any other transmitter or antenna

As long as the two conditions above are met, further transmitter testing is not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example, certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator is responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization. The OEM integrator must be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Limited Module Procedures – Not applicable

Trace Antenna Designs – Not applicable

RF Exposure Considerations – 20-centimeter separation distance and co-located issue shall be met as mentioned in *Summary of the Specific Operational Use Conditions*.

Product manufacturer shall provide the following text in the end-product manual:

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 20 centimeters between the radiator and your body.

Label and Compliance Information

Product manufacturers must provide a physical or e-label with the finished product that states the following:

Contains FCC ID: SQG-PINNACLE1

Information on Test Modes and Additional Testing Requirements

LTE – Simulator is required to link up and set the module to transmit at specific frequency, output power level under operation mode.

BT – Test tool is UwTerminal, version 7.94

Additional Testing – Part 15 Subpart B Disclaimer

The module is only FCC authorized for the specific rule parts listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

4 ISED (CANADA)

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- *This device may not cause interference*
- *(This device must accept any interference, including interference that may cause undesired operation of the device)*

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS (s) exemptés de licence d'Innovation, Sciences et Développement économique Canada. L'opération est soumise aux deux conditions suivantes:

- *Cet appareil ne doit pas causer d'interférences*
- *Cet appareil doit accepter toute interférence, y compris les interférences pouvant provoquer un fonctionnement indésirable de l'appareil*

Radiation Exposure Statement

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following condition:

- The transmitter module may not be co-located with any other transmitter or antenna.

As long as 1 condition above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

- Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 1 condition ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains IC: 3147A-PINNACLE1"

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 3147A-PINNACLE1".

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

This radio transmitter (IC: 3147A-PINNACLE1) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain 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.

Le présent émetteur radio (IC: 3147A-PINNACLE1) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Table 2: Pinnacle 100 certified antennas

Model	Part Number	Type	Connector	Peak Gain	
				2400-2500 MHz	
NanoBlue	MAF94045	PCB Dipole	IPEX U.FL	2 dBi	
FlexPIFA	001-0014	Patch	U.FL	2 dBi	
Dipole	001-0001		RP-SMA	2 dBi	

Model	Part Number	Type	Connector	Peak Gain	
				698-875MHz	1710-2500 MHz
Revie Flex	EFF6925A3S-15MHF1	PCB Dipole	IPEX U.FL	1.9 dBi	3.7 dBi
Dipole Blade	DBA6927C1-FSMAM	Dipole	SMA	0.5 dBi	2.2 dBi
Pinnacle™ 100 Bent Metal	110-00665	Bent Metal	N/A	1.3 dBi	2.6 dBi

Model	Man. PN	Type	Conn.	Peak Gain											
				600-698	698-806	806-894	880-960	1350-1580	1550-1610	1690-1880	1850-1990	1910-2180	2300-2700	3300-4200	4900-6000
Revie Flex 600	EFF6060A3 S-10MHF1	PCB Dipole	IPEX U.FL	2.0	2.5	2.7	3.2	3.8	3.8	3.7	2.8	2.9	3.8	4.7	6.9

Model	Man. PN	Type	Conn.	Peak Gain											
				698-824	824-894	880-960	1350-1550	1550-1690	1690-1880	1850-1990	1910-2170	2300-2500	2500-2700	3300-4200	4900-6000
Revie Flex 700	EFF6989A3 S-19MHF1	PCB Dipole	IPEX U.FL	0.9	1.4	2.7	3.2	4.2	4.1	3.7	3.9	3.7	3.5	3.3	4.5

4.1 ISED ICES-003 Issue 7 Compliance Declaration

This device was originally tested to the requirements of ICES-003 Issue 6, Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement; and evaluated to the updates published in ICES-003, Issue 7, Information Technology Equipment (Including Digital Apparatus). Based on this evaluation, this product continues to observe compliance to the requirements set forth by The Innovation, Science and Economic Development Canada (ISED), and complies with the updates published in ICES-003, Issue 7, Information Technology Equipment (Including Digital Apparatus).

5 UK (UKCA)

Manufacturer:	Laird Connectivity
Product(s):	Sentrius™ MG100
Product Description	Sentrius™ MG100 - Micro-Gateway

Internal Antenna



External Antenna



Notified Body (where applicable)

Name of notify body	Telefication
4 digit notified body number:	0560
Conformity assessment Module	Module B
Reference number of the certificate of notified body	202140374/AA/00

EU Directives: 2014/53/EU – Radio Equipment Directive (RED)


Reference standards used for conformity:

Article Number	Requirement	Reference standard(s)		
3.1a	Low voltage equipment safety	EN 62368-1: 2014+A11:2017		
	RF Exposure	EN 62311:2008		
	Protection requirements with respect to electromagnetic compatibility	EN 50665:2017		
		EN 50385:2017		
	Means of the efficient use of the radio frequency spectrum	EN 301 489-1 V2.2.3 (2019-11)		
		EN 301 489-3 V2.1.1		
		Draft EN 301 489-17 V3.2.2 (2019-12)		
		Draft EN 301 489-52 V1.1.0 (2016-11)		
		EN 55032:2015/AC:2016, Class B		
		EN 61000-3-2:2014, Class A		
		EN 61000-3-3:2013		
	EN 55024:2010/A1:2015			
3.1b	Low voltage equipment safety	EN 300 328 V2.2.2 (2019-07)		
		EN 300 330 V2.1.1.(2017-02)		
		EN 301 908-1 V13.1.1 (2019-11)		
		EN 301 908-13 V11.1.2 (2017-07)		
		EN 62368-1: 2014+A11:2017		
		3.2	RF Exposure	EN 62311:2008
				EN 50665:2017
				EN 50385:2017

Declaration:

We, Laird Connectivity, declare under our sole responsibility that the essential test suites have been carried out and that the above product to which this declaration relates is in conformity with all the applicable requirements outlined above, when used for its intended purpose.

The minimum distance between the user and/or any bystander and the radiating structure of the transmitter is 20 cm.

Place of Issue:	Laird Connectivity W66N220 Commerce Court, Cedarburg, WI 53012 USA tel: +1-262-375-4400 fax: +1-262-364-2649
Date of Issue:	September 9, 2021
Name of Authorized Person:	Brian Petted, Technology Leader
Signature of Authorized Person:	

6 EU REGULATORY

6.1 EU Declarations of Conformity

Manufacturer:	Laird Connectivity
Product(s):	Sentrius™ MG100
Product Description	Sentrius™ MG100 - Micro-Gateway

Internal Antenna



External Antenna



Notified Body (where applicable)

Name of notify body	Telefication
4 digit notified body number:	0560
Conformity assessment Module	Module B
Reference number of the certificate of notified body	202140374/AA/00

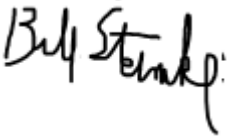
EU Directives: 2014/53/EU – Radio Equipment Directive (RED)

Reference standards used for presumption of conformity:

Article Number	Requirement	Reference standard(s)
3.1a	Low voltage equipment safety RF Exposure	EN 62368-1: 2014+A11:2017
		EN 62311:2008
		EN 50665:2017
		EN 50385:2017
3.1b	Protection requirements with respect to electromagnetic compatibility	EN 301 489-1 V2.2.3 (2019-11)
		EN 301 489-3 V2.1.1
		Draft EN 301 489-17 V3.2.2 (2019-12)
		Draft EN 301 489-52 V1.1.0 (2016-11)
		EN 55032:2015/AC:2016, Class B
		EN 61000-3-2:2014, Class A
3.2	Means of the efficient use of the radio frequency spectrum	EN 300 328 V2.2.2 (2019-07)
		EN 300 330 V2.1.1.(2017-02)
		EN 301 908-1 V13.1.1 (2019-11)
		EN 301 908-13 V11.1.2 (2017-07)
		EN 55024:2010/A1:2015

Declaration:

We, Laird Connectivity, declare under our sole responsibility that the essential radio test suites have been carried out and that the above product to which this declaration relates is in conformity with all the applicable essential requirements of Article 3 of the Radio Equipment Directive 2014/53/EU, when used for its intended purpose.

Place of Issue:	Laird Connectivity W66N220 Commerce Court, Cedarburg, WI 53012 USA tel: +1-262-375-4400 fax: +1-262-364-2649
Date of Issue:	2023/3/17
Name of Authorized Person:	Bill Steinike
Signature of Authorized Person:	

Max. power information:

	Frequency	EIRP Power (Max) – dBm
BT LE	2402~2480 MHz	10

	LTE Band	Conducted Power (Max) – dBm
Cat-M1	LTE B1	22
	LTE B3	23
	LTE B8	22.5
	LTE B20	23
	LTE B28	23.5
NB-IoT	LTE B1	22
	LTE B3	23
	LTE B8	22.5
	LTE B20	23
	LTE B28	23

7 REGULATORY DOMAIN SUPPORT

Domain support but not currently certified for – TBD

8 REVISION HISTORY

Version	Date	Notes	Contributor(s)	Approver
1.0	15 Feb 2021	Initial version	Sue White	Jonathan Kaye
1.1	10 Jun 2021	Added ISED ICES-003 Issue 7 compliance declaration	Sue White	Brian Petted
1.2	09 Sept 2021	Added UKCA regulatory information	Sue White	Brian Petted
1.3	24 Feb 2022	Updated EU and UKCA standards	Dave Drogowski	Jonathan Kaye
1.4	17 Mar 2023	Updated antennas table to remove "Laird Connectivity part number." 001-0001 is a TE part.	Dave Drogowski	Elaine Baxter