

CloudGate



CloudGate User Guide

Expansion Cards Back Slot

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Expansion Cards Back Slot

Expand the functionality

This list may be incomplete. Please check with your point of contact for CloudGate or your distributor.

The CloudGate is an Intelligent M2M gateway from Option which provides LAN to WWAN routing and GPS functionality in a single basic unit. On top of the basic functionality the CloudGate can be tailored to meet your specific requirements by adding additional software and hardware, going from wired and wireless modules to designing your own expansion module, now or when a future need arises. Just make it as simple or full featured as you need it to be.



Front side expansion cards:

See Expansion Cards Front Slot

Back side expansion cards:

-

- WLAN Expansion Card
- WLAN Access Point Card

- WLAN Expansion Card CG2131 (Revision 3)
- Monnit Wireless Sensor Card
- LoRaWAN expansion Card

The equipment is intended for building-in in a restricted access area, the final enclosure will be provided by the host device.

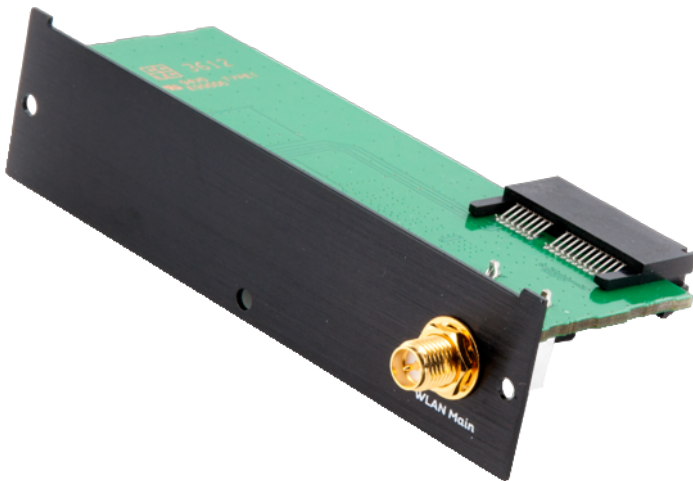
Some of these cards can be used in the front slot with the CG1125 adapter board:

- CG2101, CG2102, CG2131 wlan expansion cards
- CG2118, CG2119, CG2121, CG2123, CG2124, CG2125, CG2132 lora cards

1.1. WLAN Expansion Card (CG2101)

The WLAN Expansion Card (CG2101) features simultaneous client & access point. It supports dual SSID for two simultaneous access points. It has a high level of security including WPA-PSK, WPA2-PSK and mixed WPA/WPA2-PSK.

The card can be inserted at the back side of the CloudGate (it is a so called secondary expansion card).



Features	Description
Number of users	10
Wireless protocols	802.11 b/g/n
Frequency Bands	2.4 GHz
Channels	1-11
Speed	Up to 65Mbps
Guest Network	Yes
Wireless mode	Simultaneous client & access
Channel bandwidth	20 MHz
Security	WPA-PSK, WPA2-PSK, mixed WPA/WPA2-PSK
Antenna connector	RP-female
Operating temp.	-30 to + 70C
Humidity (operational)	5 to 95% RH, non-condensig
Storage temp.	-40 to +85C

RF Specifications:

Note: group re-keying

The WLAN client of the CloudGate connected to a WLAN access point configured with WPA and group re-keying disabled is currently not supported.

RF EXPOSURE WARNING

A minimum distance of 20cm must be maintained between the user's body and the device antenna.

Industry Canada radiation exposure statement

This equipment complies with Industry Canada's RSS-102 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.

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 necessary for successful communication.

This radio transmitter, IC 2734A-CG2101, 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.

- 2.4 GHz band: 3dBi (50□)

WLAN antenna interface

Connector

- The WLAN antenna connector is an RP-female connector. it is labelled "WLAN Main" on the front plate of the expansion card.



- The RF connector on the WLAN antenna should be an RP-SMA male connector



WLAN Antenna

The antenna parameters are as follows:

Frequency range

- 2.4 GHz

The integrator should only choose the frequencies he would like to use.

Performance

- Radiation pattern: Omni-directional
- Efficiency over all used frequencies: > 50%
- Maximum VSWR: < 2.5:1 with 50 Ω reference impedance

Polarization

- Linear

RF EXPOSURE WARNING

To comply with regulatory requirements, please check the maximum allowed antenna gain for your external antenna! The maximum gain is specified for each product in the certification information section of the WLAN Expansion Card.

The following antenna is recommended for the 2.4 GHz band:



Taoglas GW.59.3153

1.11.1.1. Certification information of WLAN Expansion Card

Model: CG2101

This page offers an overview of the country certifications obtained. This expansion card model is approved for use in the countries listed below. For use in other countries, please consult your sales contact.

- Australia
- Canada
- Chile
- Colombia
- European Economic Area (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom)
- Japan
- Mexico
- Peru
- Singapore
- Switzerland
- Turkey
- USA



The WLAN expansion card can be used in Australia and complies with the applicable ACMA regulations.



The WLAN expansion card can be used in Canada and complies with the applicable Industry Canada regulations. The certificate can be downloaded [here](#).

INDUSTRY CANADA REGULATIONS

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.

IC Radiation Exposure Statement

This equipment complies with IC RSS-102 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.

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 necessary for successful communication.

External antennas

This radio transmitter, IC 2734A-CG2101, 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.

- 2.4GHz band: 3dBi (50□)
- 5GHz band: 3dBi (50□)

REGULATIONS INDUSTRIE CANADA

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.

Notification d'exposition aux radiofréquences

Le présent appareil est conforme aux limites d'exposition aux radiofréquences (RF) du CNR-102 pour utilisation par le grand public (environnement non contrôlé). En plus, le produit doit être installé de manière à assurer une distance de séparation de 20 cm minimum entre le corps de l'utilisateur et les antennes.

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.

Antennes externes

Le présent émetteur radio, IC 2734A-CG2101, 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.

- 2.4GHz: 3dBi (50□)
- 5GHz band: 3dBi (50□)

Chile

The WLAN expansion card can be used in Chile and complies with the applicable SUBTEL regulations.



Colombia

The WLAN expansion card can be used in Colombia and complies with the applicable CRC regulations.

European Economic Area

The WLAN expansion card complies with the essential requirements of the R&TTE directive (1999/5/EC) issued by the Commission of the European Union and carries the CE mark. The product can be used in the following countries of the European Economic Area: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. The R&TTE declaration of conformity can be downloaded [here](#).

External antennas

To comply with the CE regulations, maximum antenna gain must not exceed the antenna gain of the Taoglas GW.59.3153 antenna.



The WLAN expansion card complies with the Japanese Radio Law and Telecommunications Business Law.

The WLAN expansion card can only be used in Japan with one of the WLAN antennas listed below.

Taoglass antennas:

- GW.59.3153

Pulse antennas:

- GPSDM700/2500FFS
- GPSDM700/5800GGT
- NMO4E4900B
- NMO5E2400B
- W1027
- W1030
- W1038
- W1043
- RO2408NF (minimum attenuation needed: 1.7dB for 2.4GHz)
- RO2408NM (minimum attenuation needed: 1.9dB for 2.4GHz)
- RO5210NF (minimum attenuation needed: 3.1dB for 5GHz)
- RO5210NM (minimum attenuation needed: 3.2dB for 5GHz)
- SB24003
- SLPT698/2170DMN
- SLPT698/2170NMOHF
- SLPT2400/5900DMN
- SLPT2400/5900NMOHF
- SLPT2400DMN
- SLPT2400NMOHF
- SLPT4900NMOHF
- SLPT4900DMN
- W1028B
- W5001

- W5010
- W5011

NOTE

Some of the antennas listed are high gain antennas and can only be used when additional attenuation is applied. For these antennas the minimum attenuation needed is indicated per frequency band.

WARNING

Operation in the 5GHz frequency band is restricted to indoor use only.



The WLAN expansion card can be used in Mexico and received IFETEL homologation.

IFETEL notificación

La operación de este equipo está sujeta a las siguientes dos condiciones:

- (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y
- (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Antenas desmontables

Este equipo ha sido diseñado para operar con las antenas que enseguida se enlistan y para una ganancia máxima de antena de 3 dB. El uso con este equipo de antenas no incluidas en esta lista o que tengan una ganancia mayor que 3 dB quedan prohibidas. La impedancia requerida de la antena es de 50 ohms.

antena aceptable: Taoglas GW.59.3153



The WLAN expansion card can be used in Peru and complies with the applicable MTC regulations.



The WLAN expansion card has been registered with the Info-communications Development Authority of Singapore under regulation 20(6) of the Telecommunications (Dealers) Regulations (Cap 323, Rg 6) (the "Dealers Regulations") and is approved for sale in Singapore.

The certificate can be found [here](#).



The WLAN expansion card carries the CE mark and can be used in Switzerland.



The WLAN expansion card carries the CE mark and can be used in Turkey.



The WLAN expansion card can be used in the USA and complies with the applicable FCC rule parts.

FCC REGULATIONS

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.

Federal communications commission notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Exposure Information to Radio Frequency Energy

Users concerned with the risk of Radio Frequency exposure may wish to limit the duration of their calls and to position the antenna as far away from the body as is practical.

Modifications

Any changes or modifications made to this device that are not expressly approved by Option could void the user's authority to operate the equipment.

External antennas

The max allowed antenna gain to comply with the RF Exposure and radiated output power requirements is 3 dBi.

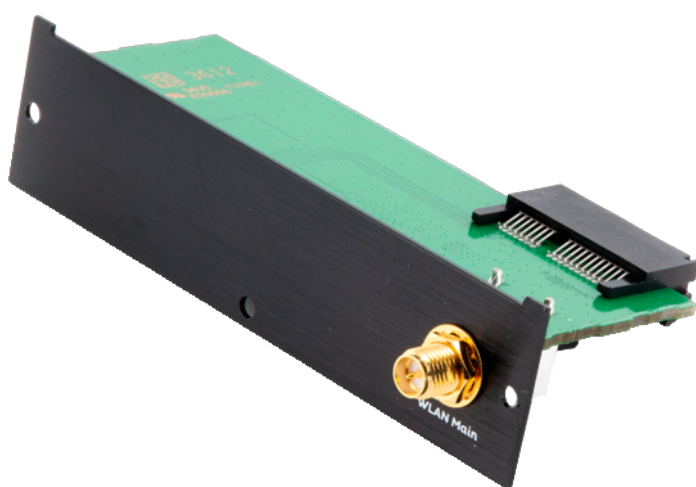
In addition the product shall be installed in a way that a distance of at least 20 cm is maintained between the antennas and the user's body.

1.13.2. WLAN Access Point Card (CG2102)

The WLAN Access Point Card (CG2102) lets up to 32 users connect at once and is therefore ideal to be used in for example trains and buses. This expansion card also supports 5GHz frequency band for reduced interference.

When using the most recent CloudGate SW, this card can also provide WLAN client mode.

The card can be inserted at the back side of the CloudGate (it is a so called secondary expansion card).



Features	Description
Number of users	32
Wireless protocols	802.11 a/b/g/n
Frequency Bands	2.4 GHz & 5 GHz
Channels	1-11, 36-48 and 149-165 - no DSF
Speed	Up to 65Mbps
Guest Network	Yes
Wireless mode	Access point
Channel bandwidth	20 MHz
Security	Mixed WPA/WPA2-PSK
Antenna connector	RP-female
Operating temp.	-30 to + 70C
Humidity (operational)	5 to 95% RH, non-condensig
Storage temp.	-40 to +85C

RF Specifications:

Note: 5 GHz WLAN operation

In order to reduce the potential for harmful interference to co-channel mobile satellite systems, the operation in the 5150-5250MHz band (channels 36 to 48) is restricted to indoor usage only. Outdoor usage in these channels is allowed in the US.

Note: group re-keying

The WLAN client of the CloudGate connected to a WLAN access point configured with WPA and group re-keying disabled is currently not supported.

RF EXPOSURE WARNING

A minimum distance of 20cm must be maintained between the user's body and the device antenna.

Industry Canada radiation exposure statement

This equipment complies with Industry Canada's RSS-102 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.

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 necessary for successful communication.

This radio transmitter, IC 2734A-CG2101, 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.

- 2.4 GHz band: 3dBi (50Ω)
- 5 GHz band: 3dBi (50Ω)

WLAN antenna interface

Connector

- The WLAN antenna connector is an RP-female connector. it is labelled "WLAN Main" on the front plate of the expansion card.



- The RF connector on the WLAN antenna should be an RP-SMA male connector



WLAN antenna

The antenna parameters are as follows:

Frequency range

- 2.4 GHz
- 5 GHz

The integrator should only choose the frequencies he would like to use.

Performance

- Radiation pattern: Omni-directional
- Efficiency over all used frequencies: > 50%
- Maximum VSWR: < 2.5:1 with 50 Ω reference impedance

Polarization

- Linear

RF EXPOSURE WARNING

To comply with regulatory requirements, please check the maximum allowed antenna gain for your external antenna! The maximum gain is specified for each product in the certification information section of the WLAN Access Point Card.

WLAN Antenna

The following antenna is recommended for both 2.4 GHz and 5 GHz bands:



Taoglas GW.59.3153

1.2.1. Certification information of WLAN Access Point card

Model: CG2102

This page offers an overview of the country certifications obtained. This expansion card model is approved for use in the countries listed below. For use in other countries, please consult your sales contact.

- Canada
- European Economic Area (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom)
- Mexico
- Switzerland
- Turkey
- USA

Canada

The WLAN access point card can be used in Canada and complies with the applicable Industry Canada regulations.

Industry Canada regulations

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.

IC Radiation Exposure Statement

This equipment complies with IC RSS-102 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.

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 necessary for successful communication.

External antennas

This radio transmitter, IC 2734A-CG2101, 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.

- 2.4GHz band: 3dBi (50 Ω)
- 5GHz band: 3dBi (50 Ω)

5GHz WLAN operation

Operation in the 5.15 - 5.25 GHz frequency band (channels 36 to 48) is restricted to indoor usage only in order to reduce the potential for harmful interference to co-channel mobile satellite systems.

The maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

REGULATIONS INDUSTRIE CANADA

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.

Notification d'exposition aux radiofréquences

Le présent appareil est conforme aux limites d'exposition aux radiofréquences (RF) du CNR-102 pour utilisation par le grand public (environnement non contrôlé). En plus, le produit doit être installé de manière à assurer une distance de séparation de 20 cm minimum entre le corps de l'utilisateur et les antennes.

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.

Antennes externes

Le présent émetteur radio, IC 2734A-CG2101, 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.

- 2.4GHz: 3dBi (50□)
- 5GHz band: 3dBi (50□)

Opération 5GHz

Les dispositifs fonctionnant dans la bande 5 150-5 250 MHz (canaux 36 à 48) sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux. Le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

European Economic Area

The WLAN Access Point Card complies with the essential requirements of the Radio Equipment Directive (2014/53/EU) issued by the Commission of the European Union and carries the CE mark. The product can be used in the following countries of the European Economic Area: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. The RED EU Declaration of Conformity can be downloaded [here](#).

External antennas

To comply with the CE regulations, maximum antenna gain must not exceed the antenna gain of the Taoglas GW.59.3153 antenna.

Exposure Information to Radio Frequency Energy

This device meets the EU requirements (1999/519/EC) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) on the limitation of exposure of the general public to electromagnetic fields by way of health protection. To comply with the RF exposure requirements, this equipment must be operated in a minimum of 20 cm separation distance to the user.

5GHz WLAN operation

Operation in the 5.15 - 5.25 GHz frequency band (channels 36 to 48) is restricted to indoor usage only in order to reduce the potential for harmful interference to co-channel mobile satellite systems.



The WLAN Access Point card can be used in Mexico and received IFETEL homologation.

IFETEL notificación

La operación de este equipo está sujeta a las siguientes dos condiciones:

- (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y
- (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Antenas desmontables

Este equipo ha sido diseñado para operar con las antenas que enseguida se enlistan y para una ganancia máxima de antena de 3 dB. El uso con este equipo de antenas no incluidas en esta lista o que tengan una ganancia mayor que 3 dB quedan prohibidas. La impedancia requerida de la antena es de 50 ohms.

antena aceptable: Taoglas GW.59.3153

Switzerland

The WLAN Access Point card carries the CE mark and can be used in Switzerland.

Turkey

The WLAN Access Point card carries the CE mark and can be used in Turkey.

USA

The WLAN Access Point card can be used in the USA and complies with the applicable FCC rule parts.

FCC Regulations

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.

Federal communications commission notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Exposure Information to Radio Frequency Energy

Users concerned with the risk of Radio Frequency exposure may wish to limit the duration of their calls and to position the antenna as far away from the body as is practical.

Modifications

Any changes or modifications made to this device that are not expressly approved by Option could void the user's authority to operate the equipment.

External antennas

The max allowed antenna gain to comply with the RF Exposure and radiated output power requirements is 3 dBi.

In addition the product shall be installed in a way that a distance of at least 20 cm is maintained between the antennas and the user's body.

5GHz WLAN operation

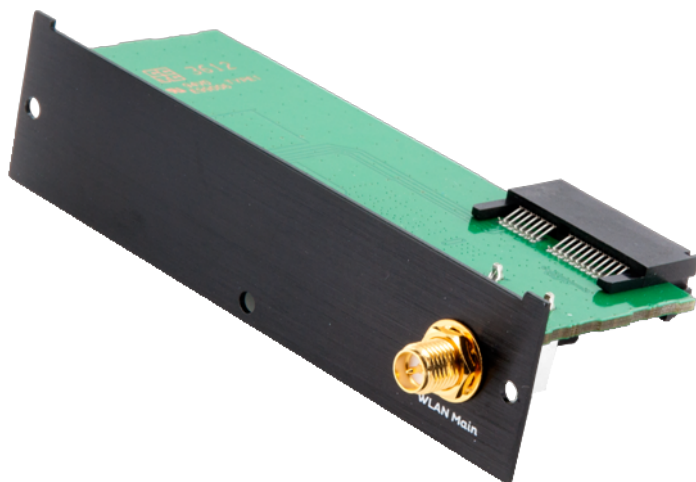
Operation in the 5.15 - 5.25 GHz frequency band (channels 36 to 48) is restricted to indoor usage only in order to reduce the potential for harmful interference to co-channel mobile satellite systems.

The maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

1.3. WLAN Expansion Card (CG2131)

The WLAN Expansion Card (CG2131) features client & access point mode. It is a rear expansion card and is compatible with all devices from CloudGate family which have the rear expansion slot.

It is built around a certified chipset RS9116N-DB00-CC0 from Redpine Signals (CE, FCC and ISED).



Features	Description
Number of users	up to 8 clients (32 from CloudGate firmware 2.92.x onwards)
Wireless protocols	802.11 a/b/g/n
Frequency Bands	2.4 GHz & 5 GHz
Channels	2.4 GHz: 1-11; 5GHz: 20 MHz: 36, 40, 44, 48, 149, 153, 157, 161 40 MHz: 38, 42, 46, 151, 155, 159, 165
Speed	802.11a/g: 54 Mbps; 802.11b: 11Mbps; 802.11n: MCS0 to MCS7
Wireless mode	Client & access point
Channel bandwidth	20 MHz & 40MHz
Security	WPA-PSK, WPA2-PSK
Antenna connector	RP-female
Operating temp.	-30°C to +70°C
Humidity (operational)	5 to 95% RH, non-condensig
Storage temp.	-40°C to +85°C

Features	Description
	CE, FCC/ISED

RF Specifications:

Note: 5 GHz WLAN operation

In order to reduce the potential for harmful interference to co-channel mobile satellite systems, the operation in the 5150 - 5250 MHz band (channels 36 to 48) is restricted to indoor usage only. Outdoor usage in these channels is allowed in the US.

RF EXPOSURE WARNING

A minimum distance of 20 cm must be maintained between the user's body and the device antenna.

Industry Canada radiation exposure statement

This equipment complies with Industry Canada's RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

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 necessary for successful communication.

This radio transmitter, IC 8407A-M7DB6, 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.

2.4 GHz band: 2.37 dBi (50 ohm)

5 GHz band: 2.93 dBi (50 ohm)

WLAN antenna interface

Connector

- The WLAN antenna connector is an RP-female connector. it is labelled "WLAN Main" on the front plate of the expansion card.



- The RF connector on the WLAN antenna should be an RP-SMA male connector



WLAN Antenna

The antenna parameters are as follows:

Frequency range

- 2.4 GHz
- 5 GHz

The integrator should only choose the frequencies he would like to use.

Performance

- Radiation pattern: Omni-directional
- Efficiency over all used frequencies: > 50%
- Maximum VSWR: < 2.5:1 with 50 ohm reference impedance

Polarization

- Linear

RF EXPOSURE WARNING

To comply with regulatory requirements, please check the maximum allowed antenna gain for your external antenna! The maximum gain is specified for each product in the certification information section of the WLAN Expansion Card.

The following antenna is recommended for both bands, 2.4 GHz and 5 GHz:



Taoglas GW.59.3153

Electrical Safety Note

The equipment is supplied by an external ES1 and PS2 circuit: Meaning that the voltage <60 Vdc and power <100 W.

1.3.1. Certification information of WLAN Expansion Card (Rev 3)

Model: CG2131

This page offers an overview of the country certifications obtained. This expansion card model is approved for use in the countries listed below. For use in other countries, please consult your sales contact.

- Canada
- European Economic Area (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden)
- Switzerland
- Turkey
- USA

Canada

The WLAN Expansion Card can be used in Canada and complies with the applicable Industry Canada regulations.

Industry Canada / ISED regulations

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.

IC Radiation Exposure Statement

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

Warning:

- (1) The device for operation in the band 5150 – 5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

(2) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725 - 5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.

(3) The high-power radars are allocated as primary users (i.e. priority users) of the band 5650 - 5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

(4) DFS (Dynamic Frequency Selection) are not available in this product.

(5) This device is not capable of transmitting in the band 5600 - 5650 MHz in Canada.

REGULATIONS INDUSTRIE CANADA

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.

Notification d'exposition aux radiofréquences

Le présent appareil est conforme aux limites d'exposition aux radiofréquences (RF) du CNR-102 pour utilisation par le grand public (environnement non contrôlé). En plus, le produit doit être installé de manière à assurer une distance de séparation de 20 cm minimum entre le corps de l'utilisateur et les antennes.

Avertissement:

(1) Le dispositif fonctionnant dans la bande 5150 - 5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

(2) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant la bande 5725 - 5850 MHz doit se conformer à la limitation P.I.R.E spécifiée pour l'exploitation point à point et non point à point, selon le cas.

(3) Les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bande et 5650 - 5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

(4) La technique d'atténuation DFS (sélection dynamique des fréquences) n'est pas disponible pour ce produit.

(5) Cet appareil ne peut pas émettre dans la bande 5600-5650 MHz au Canada.

European Economic Area



The WLAN Expansion Card complies with the essential requirements of the Radio Equipment Directive (2014/53/EU) issued by the Commission of the European Union and carries the CE mark. The product can be used in the following countries of the European Economic Area: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

The RED EU Declaration of Conformity can be downloaded [here](#).

External antennas

To comply with the CE regulations, maximum antenna gain must not exceed the antenna gain of the Taoglas GW.59.3153 antenna.

Exposure Information to Radio Frequency Energy

This device meets the EU requirements (1999/519/EC) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) on the limitation of exposure of the general public to electromagnetic fields by way of health protection. To comply with the RF exposure requirements, this equipment must be operated in a minimum of 20 cm separation distance to the user.

5GHz WLAN operation

Operation in the 5.15 - 5.25 GHz frequency band (channels 36 to 48) is restricted to indoor usage only in order to reduce the potential for harmful interference to co-channel mobile satellite systems.

Switzerland



The WLAN Expansion Card carries the CE mark and can be used in Switzerland.



The WLAN Expansion Card carries the CE mark and can be used in Turkey.



The WLAN Expansion Card can be used in the USA and complies with the applicable FCC rule parts. Please find the declaration of conformity [here](#).

FCC Regulations

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.

Federal communications commission notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Exposure Information to Radio Frequency Energy

Users concerned with the risk of Radio Frequency exposure may wish to limit the duration of their calls and to position the antenna as far away from the body as is practical.

Modifications

Any changes or modifications made to this device that are not expressly approved by Option could void the user's authority to operate the equipment.

External antennas

The max allowed antenna gain to comply with the RF Exposure and radiated output power requirements is 2.37 dBi (2.4 GHz) and 2.93 dBi (5 GHz).

In addition the product shall be installed in a way that a distance of at least 20 cm is maintained between the antennas and the user's body.

5GHz WLAN operation

Operation in the 5.15 - 5.25 GHz frequency band (channels 36 to 48) is restricted to indoor usage only in order to reduce the potential for harmful interference to co-channel mobile satellite systems.

The maximum antenna gain permitted for devices in the band 5725 - 5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

Monnit® Wireless Sensor Card

The Monnit® expansion card inserts into the back expansion slot of the CloudGate and allows the CloudGate to function as a gateway for wireless Monnit® devices like sensors and relays over the 433MHz, the 868MHz or the 900MHz band. Monnit® Wifi sensors are not supported.

It can be used for sensor data collection in applications such as Smart City, Smart Energy, Smart Home, Smart Building, Retail and other IoT/M2M applications where cost effective wireless sensors are required.

The gateway is controlled and data forwarded to remote systems using Option's LuvitRED graphical device agent. Customers can develop their own applications which use LuvitRED to transmit and receive sensor data to and from the wide range of Cloud services available in the market today.

Alternatively the CloudGate can be used as a gateway between Monnit® sensors and the iMonnit® service.

Models:

Frequency	Monnit® only	Monnit® + WLAN
868MHz	CG2111	CG2103
900MHz	CG2112	CG2104
433MHz	CG2113	CG2105

Specifications:

	Monnit® only	Monnit® + WLAN
Supported frequency bands	900MHz, 868MHz, 433MHz	900MHz, 868MHz
Supported regions	North America, South America, Europe, Middle East, Africa, Asia Pacific, Japan, Australia	North America, South America, Europe, Middle East, Africa, Asia Pacific, Japan, Australia
802.1a/b/g/n	Not included	Included
Simultaneous client and access point mode (10users)	Not included	Included
Failover to Wireless LAN client for WAN connectivity	Not included	Included
Dual SSID broadcast	Not included	Included
Mounting slot	Backslot	Backslot
Storage temperature	-40°C to +70°C	-40°C to +70°C

Operating temperature	-30°C to +70°C	-30°C to +70°C
Humidity operational	5%-95%	5%-95%
Max. amount of sensors	100	100
Range	< 100m	< 100m
Supported sensors	All Monnit® coincell, AA and industrial sensors are supported	All Monnit® co sensors are sup

Certification

Certification information of the Monnit 868MHz card can be found [here](#)

1.4.1. Certification information of Monnit 868MHz card

Model: CG2111

This page offers an overview of the country certifications obtained. This expansion card model is approved for use in the countries listed below. For use in other countries, please consult your sales contact.

- European Economic Area
- Switzerland

European Economic Area



The Monnit 868MHz Card complies with the essential requirements of the Radio Equipment Directive (2014/53/EU) issued by the Commission of the European Union and carries the CE mark. The product can be used in the following countries of the European Economic Area: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. The RED EU Declaration of Conformity can be downloaded [here](#).

External antennas

To comply with the CE regulations, maximum antenna gain shall not exceed 3dBi.

Exposure Information to Radio Frequency Energy

This device meets the EU requirements (1999/519/EC) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) on the limitation of exposure of the general public to electromagnetic fields by way of health protection. To comply with the RF exposure requirements, this equipment must be operated in a minimum of 20 cm separation distance to the user.

Switzerland



The Monnit 868MHz WLAN Access Point card carries the CE mark and can be used in Switzerland.

LoRa Card family



There is an emerging trend of connecting, monitoring and controlling machines and other 'things' in our environment but using wires to do so is often not desirable or even possible. The LoRaWAN expansion card allows the CloudGate gateway to connect to all LoRaWAN wireless sensors.

This card can be inserted at the back expansion slot of the CloudGate.

LoRa expansion cards and supported regions in LuvitRED:

- CG2118: EU868, RU864, IN865
- CG2119: US915, AU915, AS923
- CG2123: EU868, RU864, IN865
- CG2124: US915, AU915, AS923
- CG2125: EU433
- CG2132: EU868, RU864, IN865, US915, AU915, AS923

The CG2132 expansion card uses the new Semtech SX1302 baseband instead of the SX1301. The main advantage of the SX1302 is the reduced power consumption.

All lorawan cards can be inserted in front slot of the CloudGate if an adapter board is used. Using two lora cards simultaneously is not supported however. This can be useful if you need both WLAN and LoRaWAN support.

The LoRaWAN Expansion cards support 8 channels.

Information on how to use the card in LuvitRED can be found here:

<https://cloudgateuniverse.com/docs/lora-gateway>

Datasheet

- LoRaWAN expansion card

Connector

The LoRa antenna connector is an RP-female SMA connector.



LoRaWAN Antenna information

The antenna parameters are as follows:

Frequency range

86x MHz

9xx MHz

The integrators should only choose the frequencies he would like to use.

Performance

Radiation pattern: Omni

Efficiency over all used frequencies: 70%

Maximum VSWR: 2 Maximum

Gain: 1dBi

Nominal impedance: 50 Ohm

Polarization:

Linear

RF EXPOSURE WARNING

To comply with regulatory requirements, please check the maximum allowed antenna gain for your external antenna!

The following antenna is recommended:

PulseLarsen Antennas

Part number W1063 (with RP-SMA male)



FCC regulatory information

Model Name: LoRaWAN 86x/9xx Expansion Card

Model Code: CG2132

FCC ID: NCM-CG2132

Frequency Range: 915 MHz

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.

Modifications

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Federal communication commission notice

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.
- 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.

RF Exposure Requirements

To comply with FCC RF exposure compliance requirements, the device must be installed to provide a separation distance of at least 20 cm from all persons.



Innovation, Science and Economic Development (ISED)

Model Name: LoRaWAN 86x/9xx Expansion Card

Model Code: CG2132

IC ID: 2734A-CG2132

Frequency Range: 915 MHz

ISED Statements

This device complies with Innovation, Science and Economic Development Canada (ISED) license-exempt RSS standard(s). 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.

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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.

Canada Class B statement

This Class B digital apparatus complies with Canadian ICES-003.

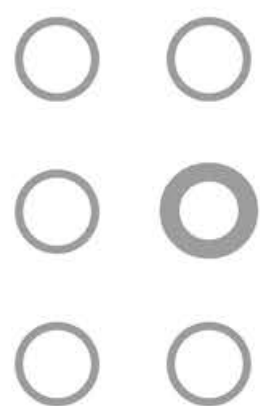
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

RF Exposure Requirements

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 and your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements du Canada établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.



PTION

WIRELESS TECHNOLOGY