Vision Connect Quick Start Guide

NOTE: Please scan the QR Code to access the electronic version of Installation Guide or visit the website: https://www.grainsystems.com/

1-Introduction

The Vision Connect card enables communication between GSI Vision Series grain dryer and the cloud. Supported controller models are GSI Vision Series Grain Dryer. The Vision Connect card connects to the farm's local area network (WLAN) or on LTE cellular network, which must be connected to the internet and allow bidirectional communication through the port 8883. Please make sure that port 8883 is not blocked by your LAN router.

2-Ordering Information

GSIE Part Number	Part number Description
064-11532	FX,VISION CONNECT WIFI
064-11527	FX,VISION CONNECT CELL

3-Notices

• Only properly trained service personnel may perform installation and service procedures. (In other words: electricians, service personnel employed by or active in an organization, business, or service).

• All power sources must be disconnected prior to wiring and installing.

• Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures.

• Warranty is void if the Vision Connect is used in a manner not specified by the manufacturer.

4-Symbols

Symbol	Description
⚠	**WARNING:** Read the following text carefully; it contains important information which, if ignored, may cause the controller to operate improperly.
⚡	High Voltage. Hazard of electrical shock.
⏚	Functional Ground Terminal. Primarily used for functional earth terminals which are generally associated with test and measurement circuits. These terminals are not for safety earthing purposes but provide an earth reference point.

	Protective Earth Ground Terminal. Primarily used for protective earth terminals. These terminals connect to conductive parts of a device for the purpose of safety and is intended to be connected to an external system for protective grounding

5 – Hardware Installation
5-1) Installing the Vision Connect on the Vision control system

Before installation, PLEASE disconnect ALL power to the dryer equipment to minimize risk of shock during installation. The dryer should contain a DISCONNECT handle on the main panel door. Turn this handle counterclockwise will disconnect the power. Verify by turning on the green POWER switch on the switch panel to double check.

5-1-1) Vision Connect Board Installation

1. Uninstall the watchdog parts from Vision Controller.

2. From Installation kit, locate the Vision Connect Card with the metal plate and 4 self-drilling screws. Install the Vision Connect metal plate at old watchdog parts location. Use itself-drilling screws to fasten the Vision Connect metal plate inside Vision Controller.

Note: Install the Vision Connect Card to have the green terminal blocks oriented at the Vision Controller bottom

Ensure to protect electronic circuits against metal chips when drilling metal plate. Take appropriate measures to not create short-circuits in the electronics circuit

5-1-2) Antenna Installation and antenna wiring

1. From Installation kit, locate the magnetic base antenna and the antenna, Remove the black protective cap from the magnetic base antenna. Align and screw clockwise the antenna up to cover completely the thread. The antenna must be tightened against the magnetic base antenna.

Note: The antenna comes with RG58 cable (9 feet (3 meters)) with one SMA connector for connectivity. It is possible to extend the antenna cable by adding another RG58 cable extension and a SMA coupler. Contact GSI Group for part numbers if required.

Note: Do not go over 20 feet for the total distance with the RG58 cable extension

2. The magnetic base antenna contains a magnet to attach itself to the metal body of the dryer without drilling holes. It is recommended to place the antenna as high as possible with a clear line of site between it and the source of your WIFI/Cellular signal. The antenna must point the sky.

3. Route the antenna cable down to the lower control box on the Vision dryer. This cable will need to be installed inside the switch panel. This will require a hole to be drilled into the bottom of this enclosure.

If there is not a hole available, the hole you will drill will need to be large enough to allow the installation of the cable gland. The recommend size is 51/64 inch.

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4. Once the cable gland has been inserted into the hole, the cable gland must be tightened on the enclosure. Fit the antenna cable through the cable gland. Ensure that the antenna cable is enough length to reach the Vision Connect card SMA connector. Tight the cable gland on the antenna cable.

5. Once the cable gland has provided a seal to the enclosure from any external dust and moisture, connect the SMA RG58 antenna cable to the Vision Connect card SMA connector (Look at **Fig. 1** below).
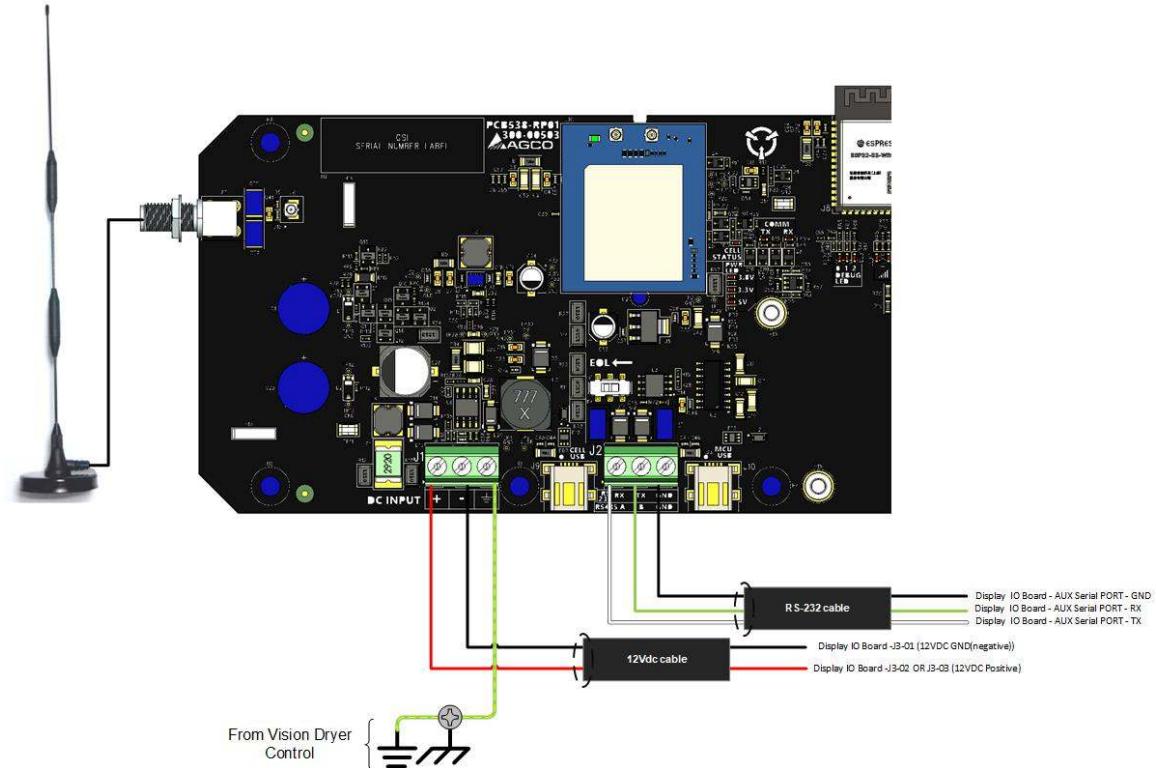
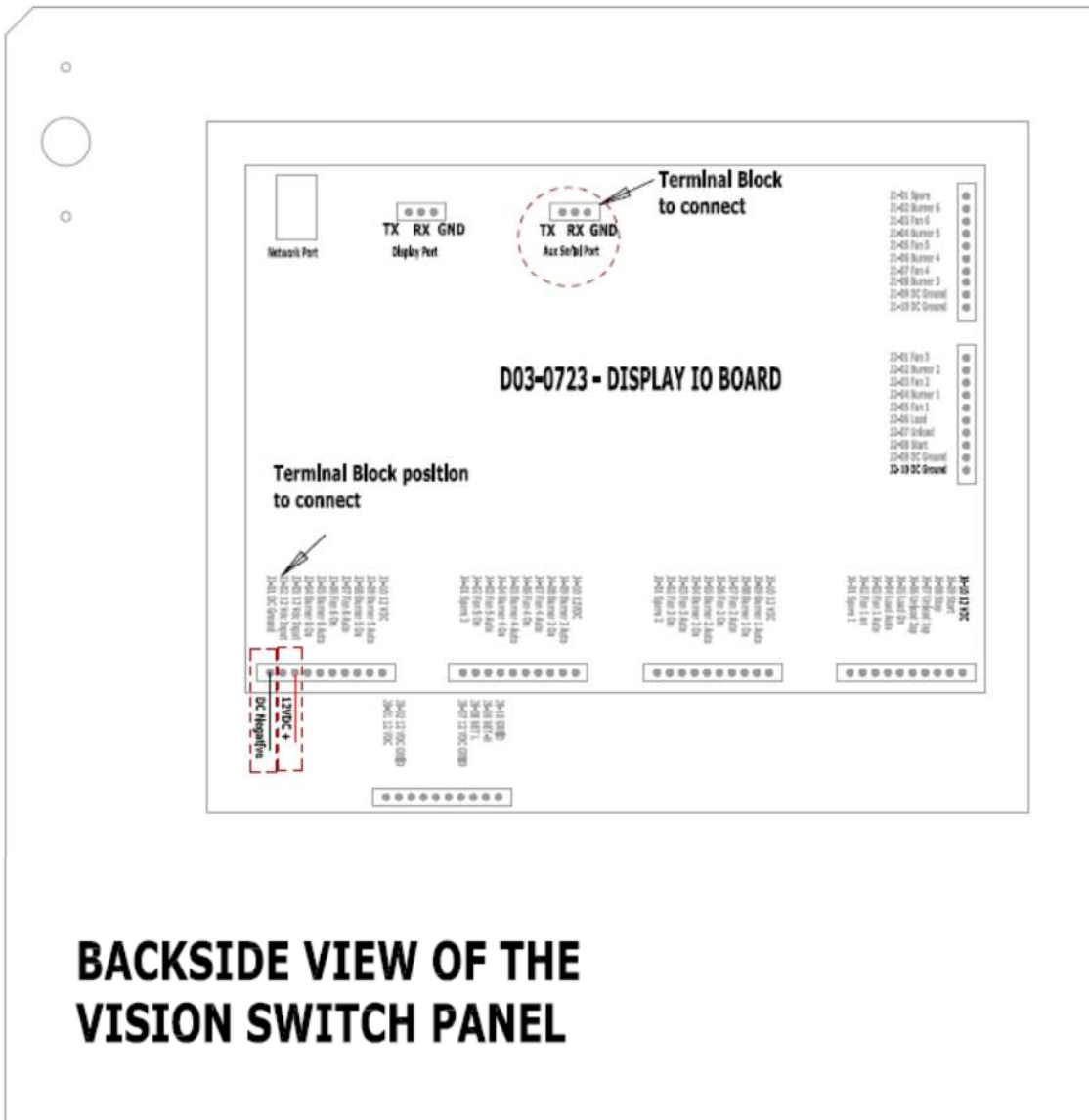
Fig.1 Vision Connect wiring diagram

5-1-3) RS232 and Power cable installation

1. From Installation kit, locate the 3 wires cable with a pre-wired terminal block plug-in on the end. On the circuit board (display IO board) that is mounted on the back of the Vision Controller display on the switch panel door, locate the 3 empty positions terminal block header that will match the 3 positions terminal block plug-in on the end of the cord (Look at **Fig. 2** below). The 3 positions terminal block header is labeled **AUX Serial PORT**. Insert the 3 positions terminal block plug-in into the 3 positions terminal block header. For the other cable end, connect the three wires according to the Vision Connect wiring diagram (Look at **Fig. 1** above)

White wire will be connected to the terminal block **J2-RX** from Vision Connect to **AUX Serial PORT – TX** on the display IO board.
Green wire will be connected to the terminal block **J2-TX** from Vision Connect to **AUX Serial PORT – RX** on the display IO board.
Black wire will be connected to the terminal block **J2-GND** from Vision Connect to **AUX Serial PORT – GND** on the display IO board.

Terminal Block to connect

Network Port

TX RX GND
Display Port

TX RX GND
Aux Serial Port

D03-0723 - DISPLAY IO BOARD

Terminal Block position to connect

DC Negative   12VDC +

BACKSIDE VIEW OF THE VISION SWITCH PANEL

Fig.2 Dashed red circle indicates area to connect AUX Serial Port, Dashed red rectangles indicate area to connect 12VDC wires

2. From Installation kit, locate the 2 wires cable. The RED and BLACK wires will be attached to this circuit board (display IO board) and will provide 12VDC to the Vision Connect Card. Please be aware these wires are polarity sensitive. Use the wiring diagram in **Fig. 1** above how to connect it and use the **Fig. 2 above** for a visual reference to help located and identify the correct terminals being used.

RED wire will be connected to the terminal block **J1- +** from Vision Connect to **J3-02** OU **J3-03** on the display IO board.
Black wire will be connected to the terminal block **J1- -** from Vision Connect to **J3-01** on the display IO board.

5-1-4) Grounding Vision Connect Card

1. On the Vision Connect metal plate, there is a ground lug to connect a wire not provided in the installation kit to the safety ground of the Vision Controller.

Note: The minimum required wire gauge is 14 AWG

5-2) Installing the Wireless network
5-2-1) WIFI network installation

If you do not use WIFI signal Skip this paragraph and then go to the **Cellular network installation paragraph**

1. You will need to determine if the WIFI network is strong enough to reach the dryer controls. This can be achieved by using a smart phone, wireless tablet or laptop in order to locate the WIFI network you want to connect. You may find that the signal is stronger on one side of the dryer and/or up higher on the dryer in order to gain a good line of sight to the WIFI source.

2. If you are unable to locate a WIFI signal OR if you do not have a WIFI setup that is close to the dryer then you will need to improve your WIFI Network or then use the Vision Connect version with a cellular link. Otherwise, if your WIFI signal is strong enough and detectable at the dryer then skip to the paragraph **Configuring the Vision Connect board to connect to your WIFI network.**

5-2-2) Cellular network installation

If you do not use Cellular signal, skip this paragraph, and then go to the **next paragraph**

1. Ensure that a cellular network is available in your area

2. You will need to determine if the Cellular network is strong enough to reach the dryer controls. This can be achieved by using a smart phone or cellular tablet to locate a cellular network.

3. If you can reach a cellular network by using a smart phone or cellular tablet, you should install a Vision Connect Card with a cellular link inside the Vision Dryer controller

6 – First powering-up

1. Once the connections have been made, please double check the wiring before you apply any power to the Vision Connect assembly. This may prevent <u>unnecessary damage</u> from occurring to the Vision Connect Card.

7 – Configuring the Vision Connect card to your WIFI network

For this step, you need a WIFI device and the following information:

- SSID of your Local Area Network. It is the name of your WIFI network when you select it on a mobile phone.
- Password of your Local Area Network.
  Note: It is the password of your WIFI network when you select it on a mobile phone
- Customer's phone number which will be used as contact information for technical support.
- Customer's email address which will be used as contact information for technical support

Procedure:

1. Power up the Controller with the Vision Connect card properly installed.
2. Using a WIFI device (i.e. a mobile phone), connect to the WIFI network having the SSID

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Visionconnect-XXXXXXXXXX, where the number corresponds to the card's MAC address (printed on the bottom of the card).

3. Once connected, you will be asked to enter the SSID and password of your LAN as well as a phone number and an email address which will be used as contact information for technical support.

4. As soon as you submit the WIFI and contact information, the Vision Connect card will automatically reboot and try to connect to the LAN using the new credentials.

NOTE: You will have to repeat the procedure if your WiFi credentials change or if you install your Vision Connect on a different network.

NOTE: You need a password on your router otherwise the application will not allow the use of the network.

7 – Status LEDs and Push Button

The Vision connect card has built-in status LED indicators, a push-button. These are described below.
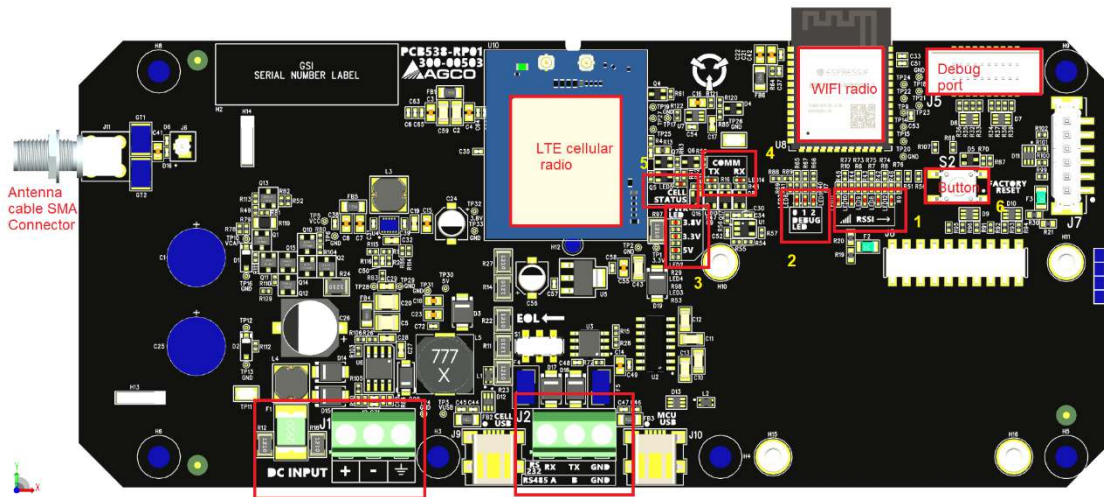
RSSI LEDs (item 1)

Five green LED indicators on the Vision Connect card indicate the power of the Wireless signal.

WIFI Signal Strength	
LED Indicators ON	**RSSI (dBm)**
5	> -30
4	> -50
3	> -65
2	> -75
1	> -80
0	<= -80 (not operational)

Cellular Signal Strength	
LED Indicators ON	**RSSI (dBm)**

5	> -60
4	> -80
3	> -95
2	> -105
1	> -110
0	<= -113 (not operational)

DEBUG LEDs (item 2)

Debug LEDs (labeled DEBUG/DBG 0, 1, 2) represent status of the system, or a part of it.

Status	Name	Description
At boot-up		All the LEDs blink once from LED 0 to 2 (Note: All RSSI LEDs will also blink once in sequence).
WIFI configuration (Captive Portal)		LED 0 and 2 are blinking
Connecting to network		Each LED blinks once in the order 0 to 2, in a loop, until an IP address is obtained.
Normal Operation	Heartbeat	LED 0 is blinking once every second. If LED doesn't blink, the software is not running properly (e.g. stucked, crashed).
Normal Operation	Communication with controller	LED 1 is ON when sending data to the controller and OFF when corresponding response is received.
Normal Operation	MQTT Activity	LED 2 is blinking once when publishing data towards the MQTT server

Power LEDs status (item 3)

Three blue LED indicators on the Vision Connect card indicate the power presence on voltage rails.

RS-232 Communication activity LEDs (item 4)

Two LED indicators on the Vision Connect card indicate communication activities. Green LED is showing data transmission and amber LED is showing data reception.

Cell Status LED (item 5)

A LED indicator on the Vision Connect card indicates the cellular modem is powered on.

PUSH-BUTTON (item 6)

This button allows the user to interact with the Vision Connect card as follows:

Press Duration	Action
Less than 1 second	Nothing
Between 1 and 4 seconds	Resets the card

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More than 5 seconds	Resets to factory settings. **ALL data on the card is lost.**

NOTE: Caution must be taken when manipulating the electronics while power is on.

NOTE: The push-button is operational only when the Vision Connect software is running normally. For example, if the heartbeat LED isn't blinking, you won't be able to reset the card. In that case, you may need to power-cycle the host controller.

Note: When the factory reset is completed, the WIFI credentials (SSID and the password) will be lost. So you need to follow the section 6 to configure a new WIFI network.

8 - Rating

Vision Connect Ratings	
INPUTS:	
Supply Input: 12Vdc +/- 1V, 166mA max	
Operating Temperature	-40 to 40°C (-40 to 104°F)
Storage Temperature in cardboard box	-20 to 50°C (-4 to 122°F)
Environment Type	Outdoor use inside a machine
Pollution Degree	2
Installation Category	2
Altitude	2000 Meters Max. (6561 Ft. Max)
Operating Relative Humidity (maximum)	-40 to 10°C (-40 to 50°F) Non-condensing
	10 to 30°C (50 to 86°F) 95% (± 3 %) Non-condensing
	30 to 40°C (86 to 104°F) 95% (± 3 %) Non-condensing
IP rating (IEC 60529)	0
Nema Rating (Nema 250)	1
Flame Rating (UL94)	5VA V-0
Flame Rating (IEC 60695 or IEC 60707)	FV-0

9 – Telecommunication Information and declaration

The WIFI 2.4GHz radio is identified by these ID in USA and in Canada:

Manufacturer	Model	RF band	FCC ID	IC ID
GSI Electronics	ESP32-S3-WROOM-1U	BLE : 2.402-2.48 GHz	2AFLZSPS3WROOM1U	11880A-ESPS3WROOMU

The Cellular LTE radio is identified by these ID in USA and in Canada:

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Manufacturer	Model	FCC ID	IC ID
Nimberlink (Airgain)	Skywire Global 4G LTE Cat NL-SW-LTE-QBG95	XMR201910BG95M3	10224A-2019BG95M3

Radio Module Inside Vision Connect

The Vision Connect contains a wireless module operating at 2.4GHz and a cellular LTE module: ESP32-S3-WROOM-1U from Expressif System and Skywire Global 4G LTE Cat NL-SW-LTE-QBG95 from Nimberlink. The modules are FCC/IC certified. These statements are valid as long as no other intentional or unintentional radiator components are incorporated into the product, and that there is no change to the module circuitry. The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm (7-7/8 in.) from all persons and must not be co-located or operating in conjunctions with any other antenna or transmitter.

La carte Vision Connect contient un module sans fil opérant à 2.4GHz et un module cellulaire LTE : ESP32-S3-WROOM-1U d'Expressif System et Skywire Global 4G LTE Cat NL-SW-LTE-QBG95 de Nimberlink.

Les modules sont certifiés FCC/IC. Ces déclarations sont valides tant qu'il n'y a pas d'autres émetteurs radio intentionnels ou non intentionnels incorporés dans le produit autre que les modules en présence, et qu'il n'y a pas de changements effectués à la circuiterie des modules en présence. L'antenne utilisée pour le transmetteur doit être installée de façon à fournir une distance de séparation d'au moins 20cm (7-7/8 po) de toutes personnes et ne doit pas être en co-location ou opérée en conjonction avec une autre antenne ou transmetteur.

IMPORTANT:
Radiation Exposure Statement: This equipment complies with IC 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 IC 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.

Antenna

The antenna is provided by GSI Electronics : Abracon: AEACAD460065-S698. Only this antenna could be used on the Vision Connect.

47 CFR Part 15 Regulation Class B Devices
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.

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

FCC Interference Notice
Per FCC 15.19(a)(3) and (a)(4) 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.

ISED Class B Notice

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

(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with the Canadian ICES-003 Class B specifications. CAN ICES-003(B) / NMB-003 (B).

L'émetteur/récepteur exempt de licence et autorisée contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempt de licence et autorisée. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;
(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

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