Decatur electronics

Scout 2

User's Manual

Rev 12/15/2021

This manual intended for use in Canada only

Welcome to Decatur Electronics

Thank you for choosing this Decatur Electronics product — A highly advanced traffic radar unit that will reward your department with years of dependable service. The Scout 2 incorporates high performance and long range, with many leading features. We urge you to study this manual before using the Scout 2 so you can maximize the benefits of this sophisticated radar device. We believe you will be pleasantly surprised by the features and advantages.

If you are as pleased with its performance, as we think you will be, ask your Decatur sales representative about other Decatur products including the Genesis G3 line of radars, and the OnSite line of speed trailers, dollies, and pole signs.

Traffic officers told us exactly what they wanted in a radar device - and we built it!

—The Management and Staff at Decatur Electronics,
The Nation's Oldest Radar Company

About This Manual

This manual contains valuable information to help you set up, use and maintain your radar. Please take a moment to read through it, and keep it handy for future reference.

Note the following symbols in this manual:

Indicates a helpful tip or precaution to note.

Safety Information

All service needs should be referred back to the manufacturer or a factory authorized service centre.

- Opening the Scout 2 automatically voids any warranty still in effect. There are no user serviceable parts inside.
- Do not submerge the Scout 2. If the device should accidently get submerged contact your factory authorized service centre immediately!
- Do not drop the Scout 2 on hard surfaces since damage could occur. Units damaged by dropping or abuse are not covered for warranty repair.

Violation of these guidelines may void the warranty.

Receiving Inspection

- When you receive your radar, inspect all components for damage that might have happened during shipping.
- Notify the shipping company immediately of any damage. Take pictures to document any damage.
- The package should include a USB-C charging cable along with the radar.

Introduction

The Scout 2 is a stationary radar that gives you the option to track vehicles that are approaching, receding, or moving in either direction simultaneously. Directionality dramatically enhances the target selection process. For example, if the radar is set in toward mode (down arrow), it will track only vehicles coming toward the radar and ignore all vehicles moving away from it! On a road with bidirectional traffic, you can choose to make traffic moving in either direction invisible to the radar.

Battery Charging

The Scout 2 is designed to primarily operate off of its internal battery pack and recharges from a ubiquitous type A USB port. For the fastest recharge time, use only the Decatur Electronics recommended USB cable and charger.

When you receive your radar, the batteries will need to be charged for the first time. Additionally, if the radar has been stored for an extended period of time, you will want to recharge the batteries as well. A fully charged radar should run for approximately 1 week between charges given normal use. To charge the batteries follow steps below.

- Connect the power cord to the USB-C receptacle on the bottom of the radar.
- Plug the radar's power cord into your vehicle's USB receptacle or A/C USB adapter.
- Charge Status Indicator.

  Battery charging status can be determined two ways depending if the radar is on or off.

  Radar Off: When plugged into a powered USB port, the Power/Fast button will glow green when charging. When the batteries are fully charged the green LED will go out.

  Radar On: When plugged into a powered USB port, the battery charge icon will change to a charging icon.

  The radar can be left to charge indefinitely. The charging will automatically shut off once the batteries are fully charged.

Operating the radar whiles charging

The radar may be operated while the batteries are recharging. The radar automatically switches from the internal batteries to the power cord for power when the unit is turned on and will also recharge the batteries at the same time.

The batteries are not user serviceable. The batteries are designed to provide more than 70% of their rated capacity after 500 charge/discharge cycles. If you are experiencing short run times between charging, contact your factory authorized service centre for battery replacement.

Scout 2 Controls and Display

Controls

The operation of the Scout 2 is controlled by the three-button key pad and the trigger.

TEST When you press the TEST button, the radar runs a comprehensive self test.

FAST / Power If the radar is off, pressing the FAST/Power button will turn it on. To turn the radar off, press and hold the Fast/Power button until the powering down message is displayed then release.

If the radar is on, a short press of the Fast/Power button will toggle between Strong and Fast modes.

MENU The MENU button lets you view the options you can change. Repeatedly pressing the MENU button advances through the list of features.

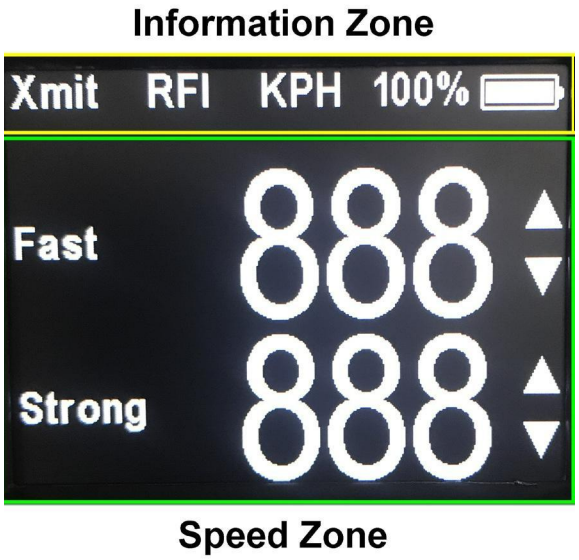
Trigger If you are not in menu mode, pressing the trigger activates the radar transmitter and releasing it stops it. If you are in menu mode, repeatedly pressing the trigger advances through the menu item settings.

➤ **To measure the speeds of target vehicles, pull and hold the trigger. If you want to lock a speed, release the trigger then quickly pull it again (within 1/2 second). As long as you continue to hold the trigger, the radar will continue to track targets and display their speeds. The locked speed clears when you pull the trigger again.**

Radar Display

Display Zones

The Scout 2 uses a black and white display. The display is divided into an upper information zone and a lower speed zone.



Information Zone

The information zone of the display will show :

Hold / Xmit When radar is transmitting it will show **Xmit** otherwise it will show **Hold**.

RFI The radio frequency interference message indicates that excess RFI energy is present. When active, the radar automatically inhibits all speed measurements and no speeds will be displayed. When the RFI condition no longer exists, the radar will resume normal operation.

KPH The radar displays speed in kilometers per hour (**KPH**).

BATTERY LIFE Battery life is shown by the percentage of life left and by a graphical battery icon.

LOW BAT The LOW BAT icon indicates that your battery pack is low on power. The system will not transmit or display any new speeds while LOW BAT appears, and if the system is displaying a locked speed, the speed will remain displayed.

ERROR ERROR shows that the radar has detected an internal hardware error which can affect the proper operation of the radar device. You should turn the radar off and back on. If the problem persists, contact Decatur Electronics at 800-428-4315 or your local factory authorized service centre for assistance.

Speed Zone

In the lower speed zone, the radar will display one or two speed readings and the associated direction of travel.

When operated in Strong mode one speed is shown.

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When operated in Fast mode, two speeds are shown. The upper speed is the Fast speed and the lower one is the Strong speed.

If you lock a speed while in Fast mode, the locked speed replaces the Fast speed.

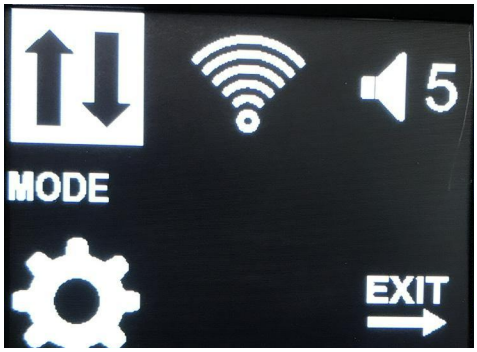
Changing the radar settings

By using the menu feature, you can review and change many of the radar's settings. The radar will remember the settings you last set when it is turned off and will power up with them.

Menus

The most commonly adjusted settings, Direction, Range and Volume are presented graphically. All other settings are found in a secondary menu represented by the gear icon.

To change a setting, repeatedly press the MENU button until the icon representing the setting you want to change appears. Then press the trigger switch to advance through the selections for that setting. When you have made your selection, your new settings will be in effect immediately. If neither MENU or the trigger switch is pressed after 2 seconds, the radar will return to normal operating mode. You may also exit the menu setting by selecting the Exit icon.



Direction

The direction icon lets you select the direction of the target vehicle you want to display. An up/down arrow indicates that you are monitoring vehicles moving both toward and away from the radar.

Range

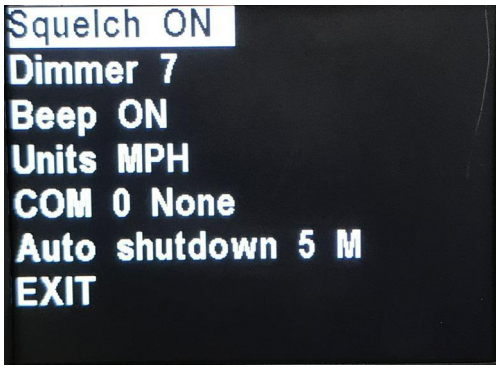
The range icon lets you control the maximum target-acquisition range in 5 steps. The number of wavelets in the icon change based on the range selected. 1 is the lowest, 5 is maximum. You will normally want to start with the maximum range and decrease it until you attain the desired performance level.

Volume

The Volume icon controls the volume level of the Doppler tone. The volume level settings are from 1 to 5. The operator cannot mute audio.

Secondary Menu

The secondary menu (gear icon) allows you to make adjustment to less common settings.



In this menu you will find:

Squelch

The squelch determines the type of Doppler audio you want. When squelch is on, the sound is only the Doppler tone for the displayed target. When squelch is off, you will hear all Doppler tones, including other vehicles, interference and any noise the antenna receives. Normally you operate the radar with the squelch setting to **ON.**

Dimmer

This controls the display brightness. It can be set to AUTO to automatically adjust to ambient lighting or fixed at one of eight preset levels. Level 1 is the dimmest and level 8 is the brightest.

Beep

This option lets the radar to give an audible "beep" to verify every time a key is pressed.

Units

This radar calculates and displays speeds in kilometers-per-hour (**KPH**) only and cannot be changed.

COM (Serial)

This sets the serial communication protocol to one of several options.

Auto shutdown

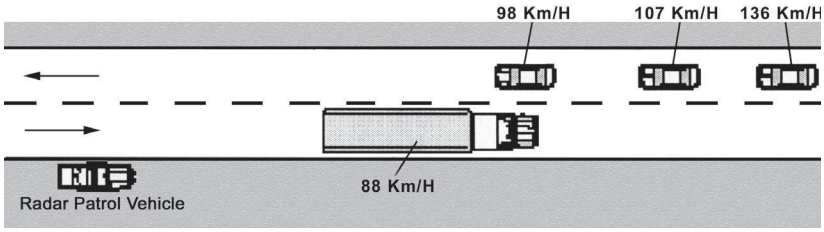
This option is designed to maximize battery life by automatically turning the radar off after a set period of time when the radar has not been used. You can choose between 3 shutdown periods (5 min., 10 min., 15 min.) or disable it by setting it to **OFF.**

RADAR PROCESSING MODES

Directionality

You can change the direction selection to measure the speeds of targets coming toward you, or display only the speeds of targets moving away from you, or both directions at the same time. When you are in bidirectional mode, the radar will display a up or down arrow on the right hand side of the display depending on the direction the target is traveling.

The radar lets you easily select and focus on vehicles approaching or receding from your position. As an example, while in towards mode (down arrow), the radar does not track the truck going away at 88 KPH as pictured, rather displays the car going towards the patrol vehicle at 98 KPH.



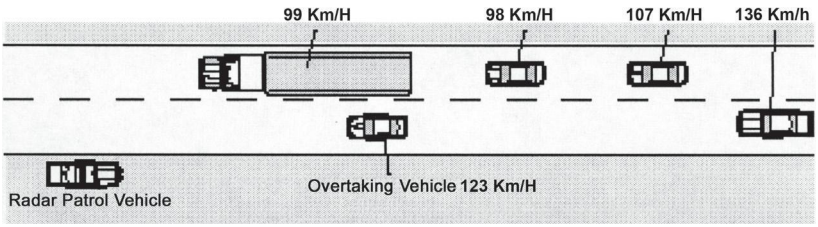
Strongest Signal Mode

All radars track the strongest signal since this is an essential element of tracking history. The radar defaults to the strongest signal-tracking mode and will stay in this mode until you press the FAST button. In Strongest Signal tracking mode, the radar displays the speed of the vehicle with the strongest return signal, which is often the closest vehicle.

Faster Mode

The advanced signal processing algorithms in the Scout 2 simultaneously track multiple vehicles. In FAST mode, the radar displays the speed of the strongest vehicle and a faster vehicle at the same time. To determine which is the faster vehicle, the radar takes the strongest return signal and uses it as a reference level. It then looks at the return signal levels from all other vehicles going faster than the strongest vehicle and compares them to that reference level. It will display the speed of the vehicle that is moving faster than the strongest signal **and** is the next strongest target. In multiple target situations, the next strongest target going faster than the strongest is often closest to the strongest vehicle.

In the example below, the semi going 99 is the strong target and the overtaking vehicle going 123 is the Fast target. The vehicle going 136 is ignored since it is not the next strongest target.



To switch from Strongest Signal target to Faster target, press and release the FAST button. The system will remain in Faster mode until you press the FAST button again or until you lock a speed, which automatically switches the radar back to the Strongest Signal Mode.

In Fast mode, the radar gun locks only the strongest vehicle speed.

Performance Tips

Understanding potential radar interference and what to do when it occurs can greatly increase the radar's performance.

How Radar Works

Determining a vehicle's speed begins with the radar transmitting a beam of microwave energy (radio waves) at a target vehicle. When energy from this beam strikes a vehicle, a small amount of the energy is reflected back to the antenna. The frequency of the reflected energy shifts by an amount proportional to the speed of the target vehicle. This is known as the Doppler effect. The radar device then determines the target vehicle speed from the difference in frequency between the reflected and transmitted signal.

Interference Sources

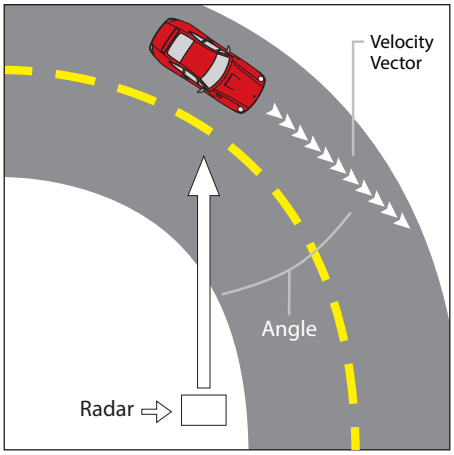
When properly installed and operated, a Doppler radar is extremely accurate and reliable. However, variations in the environment can cause situations and circumstances which can cause spurious (erratic and unusually low or high) speeds to display. Signs that a speed is spurious can include the following characteristics:

- A reading appears when no target vehicle is in the operational range of the antenna.
- A target vehicle entering the operational range overrides the interference signal, causing the display speed to change suddenly to the correct vehicle's speed.
- The Doppler tone is corrupted with noise.
- Speeds are irregular and do not provide a valid traffic history.
- Erroneous speeds appear to track changes with the engine rpm.

Angular Interference (Cosine Error Effect)

The cosine effect causes the system to display a speed which is lower than the actual vehicle speed. This condition occurs when the target vehicle's path is not parallel to the antenna, including conditions such as the vehicle traveling on a curve or hill.

As the angle between the beam of the antenna and the target vehicle increases, the displayed speed decreases. Ideally, an angle of zero (0) degrees is preferable, because the displayed speed is the actual target vehicle speed. However, in all uses of police radar, the radar device is always at a slight angle to the target vehicle to avoid collisions.



An angle between the antenna and the target vehicle causes the cosine effect

The following table shows the effect that an increasing angle has on a displayed speed.

Actual Speed	Horizontal Angle Degrees										
	0°	1°	3°	5°	10°	15°	20°	30°	45°	60°	90°
	Displayed speed:										
50 km/h	50	49	49	49	49	48	46	43	35	25	0
65 km/h	65	64	64	64	64	62	61	56	45	32	0
80 km/h	80	79	79	79	79	77	74	69	56	40	0
90 km/h	90	89	89	89	88	86	84	77	63	45	0
100 km/h	100	99	99	99	98	96	93	86	70	50	0
110 km/h	110	109	109	109	108	106	103	95	77	55	0

Actual and displayed speeds at antenna-to-target angles

Small angles (less than 10°) have little effect on accuracy. As the angle increases, the displayed speed decreases. At 90° the radar reads the speed of the object as zero regardless of it's true speed.

Fan Interference

Fan interference is the most common form of interference that you are likely to experience. It is caused when the radar measures the speed of the vehicle blower fan. Changing the fan speed causes a proportional change in the display speed. To correct this, relocate the radar so it does not display spurious speeds or turn off the blower fan motor.

Electromagnetic Interference (EMI)

Operating electric motors can produce EMI. EMI from power seats or windshield wipers can also produce spurious target speeds. To correct the interference, simply turn off its source.

Feedback Interference

When the radar beam is directed at computer screens, streetlights, and other electronic devices, it can display spurious speeds. To correct the interference, relocate the radar.

Multi-Path Beam Cancellation

If multi-path beam cancellation occurs, the target vehicle speed sporadically blinks and reappears at semi-random intervals. This type of interference occurs when the radar loses track of a target vehicle because the target is reflecting two or more signals, which are interfering with each other. The Scout 2 is immune from multi-path cancellation.

Radio Frequency Interference (RFI)

The system can inadvertently process radio energy as Doppler speeds, including that from police radios, airport radar, microwave transmission towers, CB radio transmitters, and AM/FM transmission towers. For this type of interference to occur, the radar must be operating very close to the radio transmitter.

The Scout 2 radar contain an RFI detection circuit that detects excess radio frequency energy. When stray radio frequency energy reaches an excessive level, the system displays an RFI message and stops processing and displaying speeds. The system resumes normal operation when the RFI condition no longer exists. At that time, any locked speeds will display again.

Scanning

The Scout 2 is designed to be hand-held in a steady position. Moving or "scanning" the antenna past stationary objects can cause the system to detect motion. Obtaining a speed reading from scanning will not happen when you properly use the radar and this considered deliberate misuse of the system.

Vehicle Ignition Interference

The Scout 2 has been designed to operate from their internal battery pack but can be powered from the vehicle's USB receptacle. When connected to the USB receptacle it should be noted that some vehicles exhibit excessive alternator noise at the USB receptacle. In these rare cases, the radar can exhibit erratic readings, especially when the vehicle's electrical system is operated under heavy load. Wiring an accessory USB outlet directly to the battery minimizes the effect. If you are operating off of the radar's internal batteries, then vehicle ignition interference will not be a factor.

If you suspect that there is an interference with your vehicle's electrical system, contact local Decatur Electronics factory authorized service centre for more information.

Testing the Device

Operator-Initiated Self Test

Pressing the TEST button starts a comprehensive system self test, which allows the operator to verify the display and runs a target speed simulation. The self test includes:

Display Test–The display test verifies that the digits and status icons are working correctly and that none of the pixels in the number segments are damaged.

Circuitry Test–The system checks the internal circuitry. If the unit passes all internal checks, the message PASS will be displayed. If an error should occur then FAIL will appear in the display window.

Speed Simulation Test–The radar verifies speed accuracy using synthesized Doppler frequencies corresponding to a series of four simulated speeds: 40, 70, 100, and 130 KPH.

If the device does not display the expected speed, contact your local Decatur Electronics factory authorized service centre at 800.428.4315 to arrange for service.

Mounting Configurations

The radar is designed primarily for hand-held operation. Optionally, you can mount it to a standard camera tripod. Contact your local distributor for the tripod mounting kit.

Care, Cleaning, and Storage

- Avoid spilling food, beverages and other liquids on the radar device.
- When you are not using or transporting the device, store it in its original packaging or approved case.
- To clean the radar device, dust it with a soft clean cloth, which is free of cleaning solutions.

Frequently Asked Questions (FAQ)

Q. My radar will not power up. What should I do?

A. Check to make sure the batteries are charged. If operating off the power cord, then check to make sure that the power cord is properly plugged into the power source. If your radar still does not power up, call your local Decatur Electronics factory authorized service centre at 800.428.4315 or service@decaturelectronics.com.

Q. My radar has poor range. How can I remedy this?

A. Verify that the antenna has no obstructions in front of it. If the radar still has poor range, increase the range level. If you still have this problem, contact Decatur Electronics.

Q. Will my radar work while my vehicle is moving?

A. No, the Scout 2 radar is a stationary only model, so your vehicle should be stationary.

Q. What if I drop my radar?

A. The unit is extremely durable. Simply power up and perform the self test. If the radar doesn't appear to work properly, contact your local Decatur Electronics factory authorized service centre.

Service & Repairs Procedure

If you have questions, concerns or need a quick problem diagnosis, please reach out to your Customer Service Representative:

- Call Decatur Electronics by phoning 800.428.4315 and ask to speak with a Customer Service Representative.
- Explain to the Customer Service Representative the problem you are experiencing.
- Based on the information that you provide, the Customer Service Representative may be able to assist you or you may need to be referred to one of our Service Providers.

If and after a Decatur Service Representative has diagnosed the items, Decatur Electronics will allocate the service Ticket to an Authorized Service Centre.

For in warranty items, the repair will be performed and the items,shipped back to you in a timely manner (if you want the package shipped express or next day air, there will be a charge).

For items not under warranty Decatur Electronics will refer you to an Authorized Service Centre, who will provide you with an estimate for the repair. Decatur Electronics will not assume the repair charges for units that are out of warranty or for service work performed on warranty units when that work is not warranty related.

THREE-YEAR RADAR WARRANTY

Decatur Electronics guarantees the radar to be free from defects in workmanship and material and to operate within specifications for a period of three (3) years. During this period, Decatur Electronics will repair or replace,

at its option, any component (excluding the USB charging cable) found to be defective, without cost to the owner, providing you return the unit to a Decatur authorized warranty service centre. The full warranty on parts and workmanship does not include normal wear and tear, crushing, dropping, fire, impact, immersion, over-tightening of screws or damage from attempted repair or modifications by unauthorized service agents.

THREE-YEAR WARRANTY EXCEPTION

If the unit was purchased under a special buying program (federal and provincial purchase contract, non-standard warranty terms, etc.), then the above warranty may not apply. Please refer to the buying schedule contract for the appropriate warranty terms or contact Decatur Electronics' Customer Service Representative at 800-428-4315 or service@decaturelectronics.com.

Specifications

Antenna Parameters

K-Band	
IACP	Type III
Nominal transmission frequency	24.150 GHz
Nominal horizontal beamwidth	12° H 24° V
Polarization	Linear (Vertical)
Nominal microwave power output	7 mW
Maximum aperture power density	<1 mW/cm2

Environment

Ambient operating temperatures	-30ºC to +60ºC
Maximum humidity	90% relative humidity (non-condensing) at 37°C

Speed Range Parameters

Speed Display Ranges (KPH)	Minimum	Maximum
	20	337

Power Consumption Parameters

Supply voltage range	4.5VDC – 5.5VDC
Battery Low Voltage Trip with antenna ON	6.0 VDC (measured at internal battery)

Current draw when using power cord

All currents are nominal and measured at 5.0 VDC with fully charged batteries, backlight at 8 and speaker volume at 4.

Antenna OFF (Standby)	0.31 amperes
	031 amperes (segment check "888 888")
Antenna ON (Transmit)	0.40 amperes (no targets displayed)

ISED Information

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt 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.

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

Industry Canada Regulatory Information

CAN ICES-3 (A)/NMB-3 (A)

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes:

(1) Cet appareil ne doit pas causer d'interférences.

(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

Attention: Tout changement ou modification non expressément approuvé par la partie responsable de la conformité peut annuler le droit de l'utilisateur de faire fonctionner cet appareil.

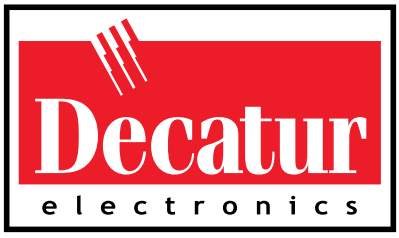
Avis d'Industrie Canada

CAN ICES-3 (A)/NMB-3 (A)

ISED Radiation Exposure Statement

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

Déclaration d'exposition aux radiations Cet équipement est conforme aux limites d'exposition au rayonnement ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et corps.



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