



# Blackbird Ka-Band Transceiver RX3000 Field Installation Manual

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*The Blackbird Ka-Band Transceiver user terminal will be used to provide residential and business users high speed access to the Viasat broadband satellite system. The user terminal consists of an Indoor Unit (IDU) and an Outdoor Unit (ODU).*

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[Ka-Band operation provides access to Viasat's broadband satellite system under the terms & conditions of Viasat's spectrum license\(s\) held with ISED Canada"](#)

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## FEDERAL COMMUNICATION COMMISSION INTERFERENCE STATEMENT

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

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

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

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

### FCC Caution:

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### Radiation Exposure Statement:

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

### Industry Canada Interference Statement

This device complies with ISSED's licence-exempt RSSs. 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' ISSED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

### Radiation Exposure Statement:

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

### Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISSED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

**Brazil Interference Statement:**

This equipment is not intended to protection against harmful interference and cannot cause interference to properly authorized systems. For more information, consult the ANATEL site – [www.anatel.gov.br](http://www.anatel.gov.br)

**Declaração de interferência do Brasil :**

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Para maiores informações, consulte o site da ANATEL – [www.anatel.gov.br](http://www.anatel.gov.br)

**Mexico Interference Statement:**

The operation of this equipment is subject to the following two conditions: 1) it is possible that this equipment or device does not cause harmful interference and 2) this equipment must accept any interference, including that which may cause its unwanted operation.

La operacion de este equipo esta sujeta a las siguientes dos condiciones: 1) es posible que este equipo o dispositivo no cause interferencia perjudicial y 2) este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operacion no deseada.

### ADDITIONAL FEDERAL COMMUNICATION COMMISSION STATEMENT FOR OUTDOOR UNIT (ODU)

This device complies with Part 25 of the FCC Rules. Operation is subject to the limitations and conditions of Viasat's FCC license(s).

In addition to compliance with Part 25 of the FCC rules, this equipment has also 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.

#### **Radiation Exposure Statement:**

The ODU equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. When operating the equipment during the antenna alignment process or at any other time while performing maintenance, take care to avoid placing body parts between the antenna feed and the reflector or in the path of the transmitted signal in front of the antenna.

The ODU equipment is designed with safeguards to disable transmission if blockage is detected, but good practice is to avoid placing anything in the path of the transmitted signal.

## 1 SCOPE/SUMMARY

The Ground Terminal will be used to provide residential and business customers high speed internet access via the ViaSat-3 Broadband Satellite System. The Ground Terminal consists of an Indoor Unit (IDU) and an Outdoor Unit (ODU). The Blackbird Transceiver is a component of the ODU.

This document defines the installation for the Blackbird Transceiver used in the Outdoor Unit (ODU) for the ViaSat-3 (VS3) Satellite Service network. The Blackbird ODU is the RX3000 Model family of VS3 ODU's and includes top-level part numbers of RX3110N-xxx (new production units) or RX3110R-xxx (repaired/refurbished units), where "xxx" can be alpha or numeric characters.

This manual is a job aid intended for field installation technicians.

## 2 OUTDOOR UNIT

The Outdoor Unit (ODU) is located outside the customer's home or facility.

The Ka Antenna receives and transmits the Radio Frequency (RF) signals from and to the satellite, while supporting the connection to the Indoor Unit (IDU) via IFL cable. Figure 1 details the Blackbird Unit and Figure 2 shows the four components of the outdoor unit.

The ODU Operating Environment is as follows:

- Temperature: -40° C to +47° C with a max wind of 4 m/s and a solar radiation of 1120 W/m<sup>2</sup>
- Humidity: 0% to 100%
- Altitude: 4300 m (max)

This model has four main components:

1. Reflector
2. Back Bracket Assembly (Azimuth/Elevation-AZ/EL)
3. Blackbird
  - The reflector boom arm attaches directly to the base of the Blackbird unit and does not require a bracket.
  - The Blackbird is 8.27 in x 5.89 in (21 x 15 cm).
4. Boom Arm
  - The boom allows the Blackbird cables to be threaded inside the arm

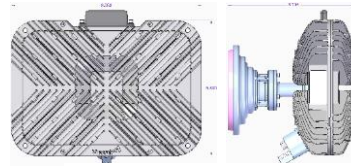


Figure 1: Blackbird Unit



Figure 2: Outdoor Unit Components

Pointing and peaking these models uses a Bluetooth-based Point and Peak Process provided with the Blackbird (TRIA 3). This process uses the Viasat Tech Tools (VTT) mobile app.

### 3 INDOOR UNIT

The Indoor Unit (IDU) is located inside the customer's home or facility.

In total, there cannot be more than 150 feet (45 meters) of coaxial cable (COAX) between the gateway and the TRIA.

The Indoor Unit has three main components:

1. Viasat Network Power Adapter (Figure 3)
2. Viasat WiFi Gateway 3 (Figure 4)
3. Viasat WiFi Gateway 3 Power Supply (Figure 5)



### 3.1 Viasat Network Power Adapter Placement

When placing the Viasat Network Power Adapter (VNA), (Figure 3) ensure the following:

- The power adapter must be placed horizontally on its feet or mounted vertically on a wall.
- No more than 150 feet (45 meters) of COAX cable between the Viasat Network Power Adapter (VNA) and the TRIA.
- The VNA must be within 6 feet (1.8m) of a power outlet.
- Keep the VNA away from heat, liquid, and magnetic interference.
- The VNA must have 1 inch (2.5 cm) of clearance from the front and sides for airflow.



Figure 3: Viasat Network Power Adapter

### 3.2 Viasat Wireless Gateway

When installing the Viasat Wireless Gateway, ensure the following:

- The gateway must be installed vertically on its feet.
- The gateway must have 1 inch (2.5 cm) of clearance around the front and sides of the unit to allow airflow.
- The gateway must be within 5 feet (1.5 meter) of a power outlet.
- The Ethernet cable provided with the gateway needs to be connected to the Viasat Network Power Adapter (VNA).
- Keep the gateway away from heat, liquid and magnetic interference.
- The gateway must have at least 3.75 inches (9.5 cm) of clearance from the back for proper cabling.



Figure 4: Viasat Wireless Gateway

### 3.3 Power Supplies for Viasat WiFi Gateway 3

Figure 5 shows the Power Supply adapters for the Viasat WiFi Gateway 3 for different regions.



Figure 5: Power Supply Adapters per Region

#### 4 CONNECTING THE ODU AND THE IDU

- Once assembled and installed, the ODU will run the COAX cable into the interior of the structure.
- The COAX cable will connect to the VNA.
- An Ethernet cable will connect the VNA WAN port to the WAN port in the Viasat Wireless Gateway 3.
- The VNA must then be plugged into a wall outlet and have its switch turned to ON.
- The Viasat Wireless Gateway 3 will then need to be plugged into a wall outlet.

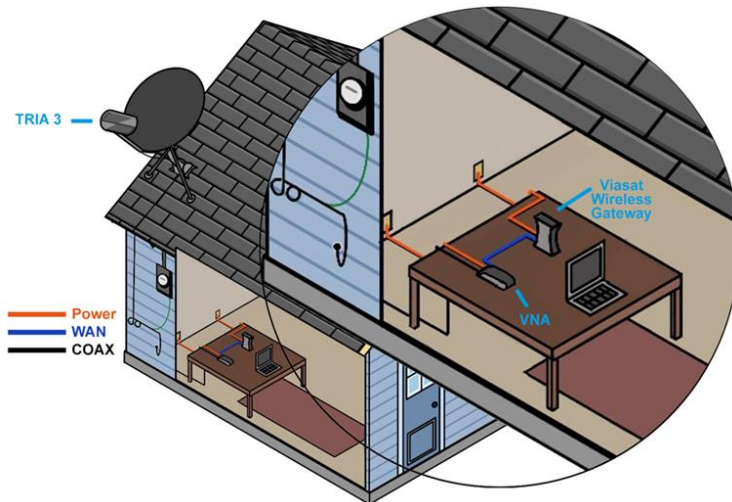


Figure 6: Assembled and Installed ODU and IDU

#### 5 NOTES REGARDING DC POWER

1. Input power to the ODU is between 40 V dc <math>V < 50 V</math> dc with a max current <math>< 2 A</math>.
2. The input power operates at two discrete levels. During startup, a default level of 30 V nominal is used for initial power on.
3. During installation the IDU power will be off, and there will be no DC voltage on the COAX. If the IDU is inadvertently powered on during installation, the lower level 30 V will be maintained as the nominal voltage until the COAX cable is connected to the IDU.
4. The COAX cable will switch to 50 V nominal only after the RG-6 COAX connects the ODU to the IDU, and after the ODU/IDU establish communication.

## 6 ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations	
- C -	COAX.....Coaxial Cable
- D -	DC.....Direct Current
- I -	IDU.....Indoor Unit IFL.....Interfacility Link
- L -	LED.....Light Emitting Diode
- O -	ODU.....Outdoor Unit
- R -	RF.....Radio Frequency
- T -	TRIA.....Transmit Receive Integrated Assembly
- U -	USB.....Universal Serial Bus
- V -	V.....Volts VDC.....Volts of Direct Current VNA.....Viasat Network Power Adapter VS3.....ViaSat-3
- W -	WAN.....Wide Area Network