ICOM INSTRUCTIONS

IRIDIUM REPEATER

RP-SAT1

Thank you for choosing this Icom product.
READ ALL INSTRUCTIONS carefully and completely before using this product.

FEATURES

- Provides indoor satellite communication solution by relaying Iridium® and GNSS signals*
- RF gain level can be adjusted on the front panel

*Make sure you comply with all applicable laws and regulations in your area.

EXPLICIT DEFINITIONS

WORD	DEFINITION
⚠ **WARNING!**	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

Icom is not responsible for the destruction, damage to, or performance of any Icom or non-Icom equipment, if the malfunction is because of:
- Force majeure, including, but not limited to, fires, earthquakes, storms, floods, lightning, other natural disasters, disturbances, riots, war, or radioactive contamination.
- The use of Icom antennas with any equipment that is not manufactured or approved by Icom.

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PRECAUTIONS

⚠ **WARNING HIGH RF VOLTAGE! NEVER** touch an antenna or antenna connector while transmitting. This could cause an electrical shock or burn.

⚠ **WARNING HIGH RF VOLTAGE! NEVER** install the antenna at any place that person easily touch the antenna while transmitting. This could cause an electrical shock or burn.

⚠ **WARNING! NEVER** use other than the specified power adapter. This may result in an electrical shock, cause a fire or damage the repeater.

⚠ **WARNING! NEVER** use non-specified accessories or options. This may result in an electrical shock, cause a fire or damage the repeater.

⚠ **WARNING! NEVER** connect the power adapter to other than the DC jack on the front panel. This may result in an electrical shock, cause a fire or damage the repeater.

⚠ **WARNING! NEVER** disassemble, modify or repair the repeater. This may result in an electrical shock, cause a fire or damage the repeater.

⚠ **WARNING! NEVER** install the repeater in a wet place or outside. This may result in an electrical shock, cause a fire or damage the repeater.

⚠ **WARNING! NEVER** operate or touch the repeater with wet hands. This may result in an electrical shock or damage the repeater.

⚠ **WARNING! NEVER** use the repeater during a thunder and lightening storm. Using it may result in an electrical shock, cause a fire or damage the repeater. Always disconnect the AC adapter before any storm.

⚠ **WARNING!** Immediately disconnect the power adapter if the repeater emits an abnormal odor, sound or smoke. Contact your Icom dealer or distributor for advice.

CAUTION: DO NOT put the repeater in any unstable place (such as on a slanted surface or vibrated place). This may cause injury and/or damage the repeater.

CAUTION: DO NOT install the repeater in a place without air vents. Heat dissipation may be reduced, and this could damage the repeater.

CAUTION: DO NOT place the repeater in direct sunlight. This could damage the repeater.

CAUTION: DO NOT use the repeater in strong magnetic fields or in an area with high static electricity. This could damage the repeater.

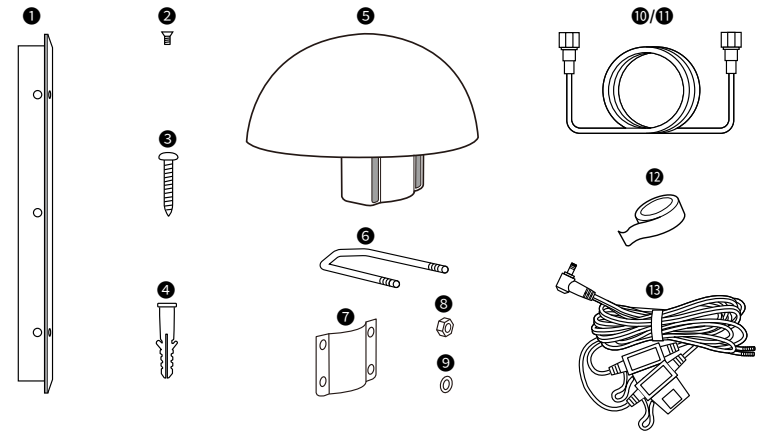
CAUTION: DO NOT use harsh solvents such as benzine or alcohol to clean the repeater, as they can damage the repeater's surfaces. If the repeater becomes dusty or dirty, wipe it clean with a dry, soft cloth.

DO NOT use or leave the repeater outside of the specified temperature range: –30˚C ~ +60˚C (–22˚F ~ +140˚F).

DO NOT place or leave the repeater in excessively dusty environments.

DO NOT use more than two terminals at the same time as it may interfere with the GPS band.

SUPPLIED ACCESSORIES

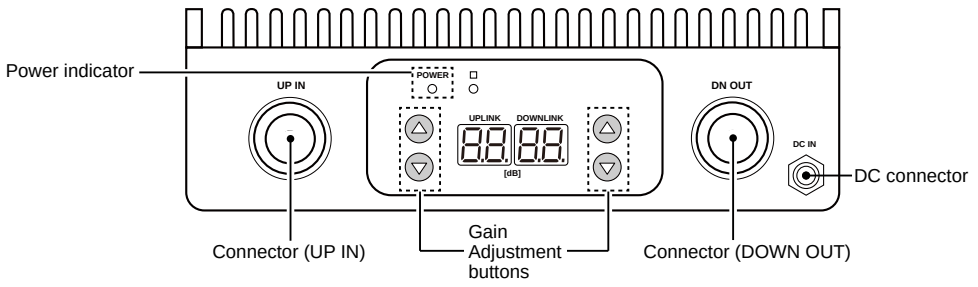


Item	Quantity
❶ Angle bracket	2
❷ Flat head screw (3 × 6 mm)	6
❸ Self-tapping screw (5 × 30 mm)	4
❹ Wall plug	4
❺ Antenna	4
❻ V-bolt	8
❼ Angle	4
❽ Nut	16
❾ Flat washer	16
❿ Coaxial cable (5 m, 16 feet)	2
⓫ Coaxial cable (10 m, 32 feet)	2
⓬ Rubber vulcanizing tape	1
⓭ DC cable	1

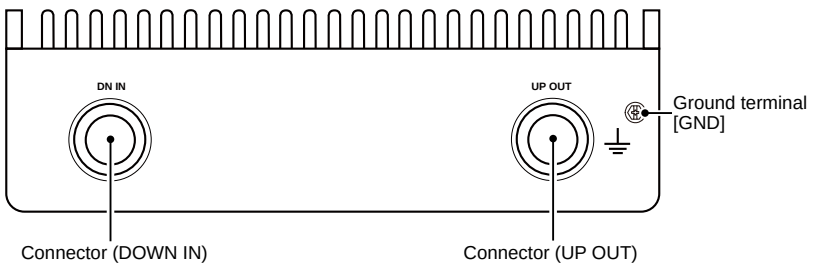
NOTE: Some accessories are not supplied, or the shape is different, depending on the repeater version.

PANEL DESCRIPTION

◇ Front panel

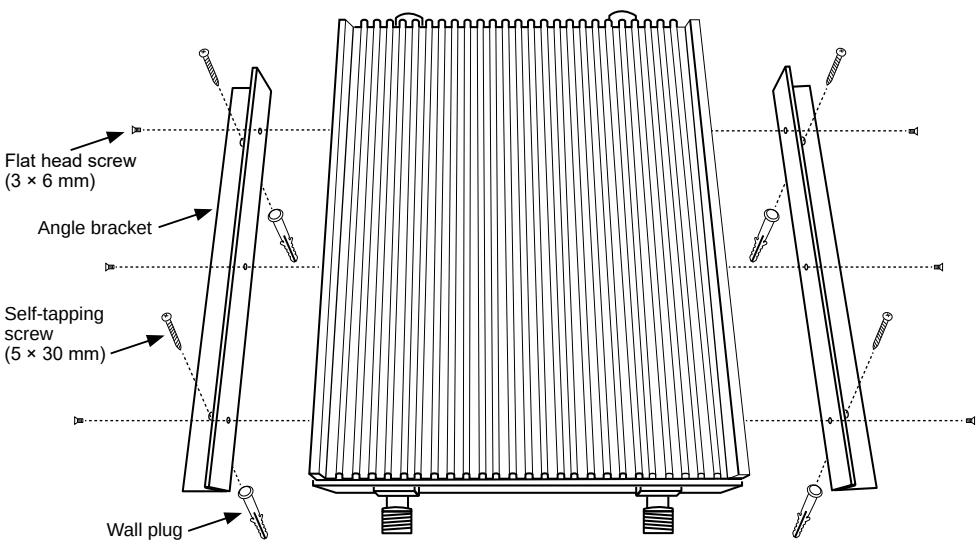


◇ Rear panel



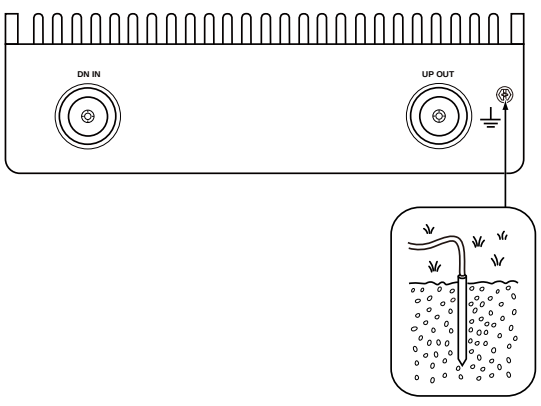
INSTALLING THE MAIN UNIT

Install the main unit on a wall, as shown below.



GROUNDING

To prevent destruction by a lightning strike, ground the repeater using the ground terminal [GND] on the rear panel.
For best results, connect a heavy gauge wire or strap to a long ground rod. Make the distance between the [GND] terminal and ground as short as possible.

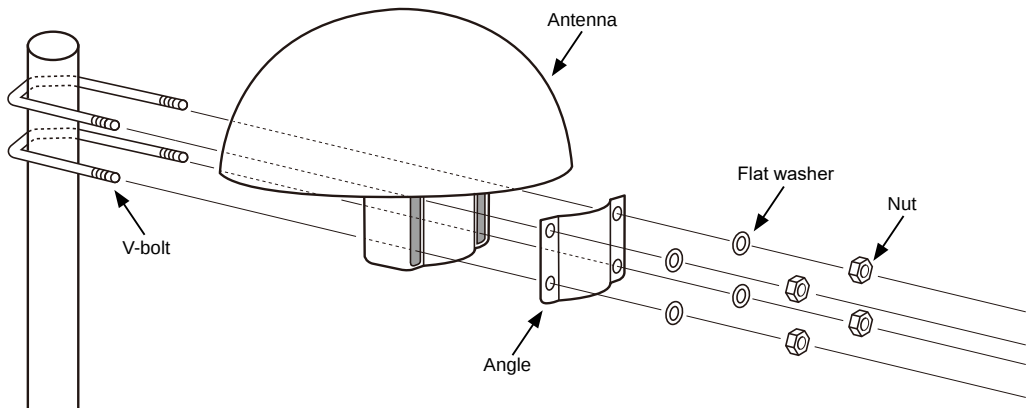


⚠ **WARNING! NEVER** connect the [GND] terminal to a gas or electric pipe, since the connection could cause an explosion or electric shock.

INSTALLING THE ANTENNA

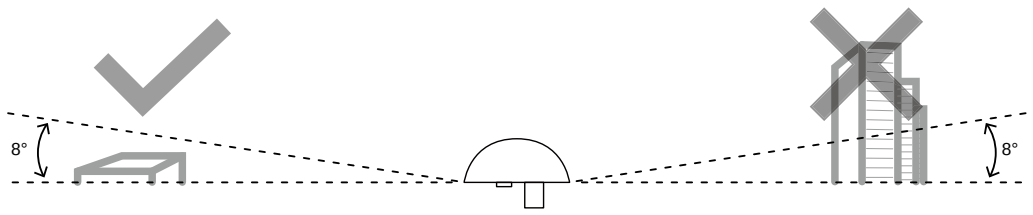
The repeater has 2 outdoor antennas and 2 indoor antennas. Install them on a 32 mm (1.3 inch) diameter pole.
ⓘ Install within the distance that they can be connected to the main unit with the supplied cable.

Installation example:



◇ Installing the outdoor antennas

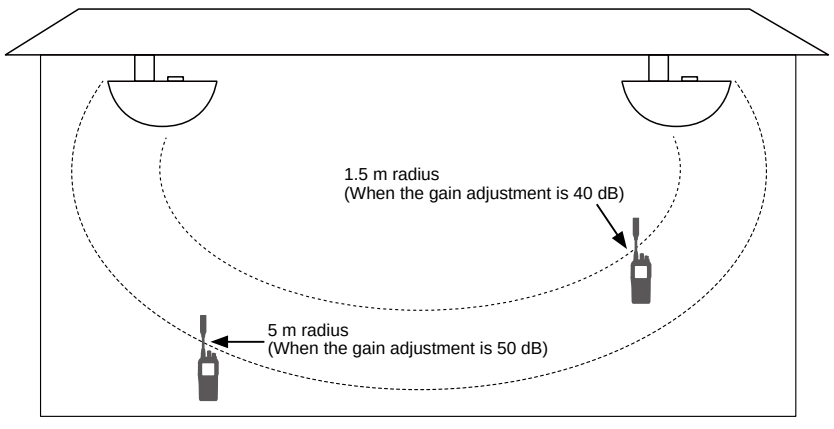
Install the outdoor antennas in a place with a clear view of the sky. Make sure that there are no obstacles, such as buildings or trees, at higher than about 8 degrees around the antenna.
ⓘ The antennas must be at least 5 m (16 feet) apart.
ⓘ Confirm no other antennas are placed within 10 m (32 feet).



◇ Installing the indoor antennas

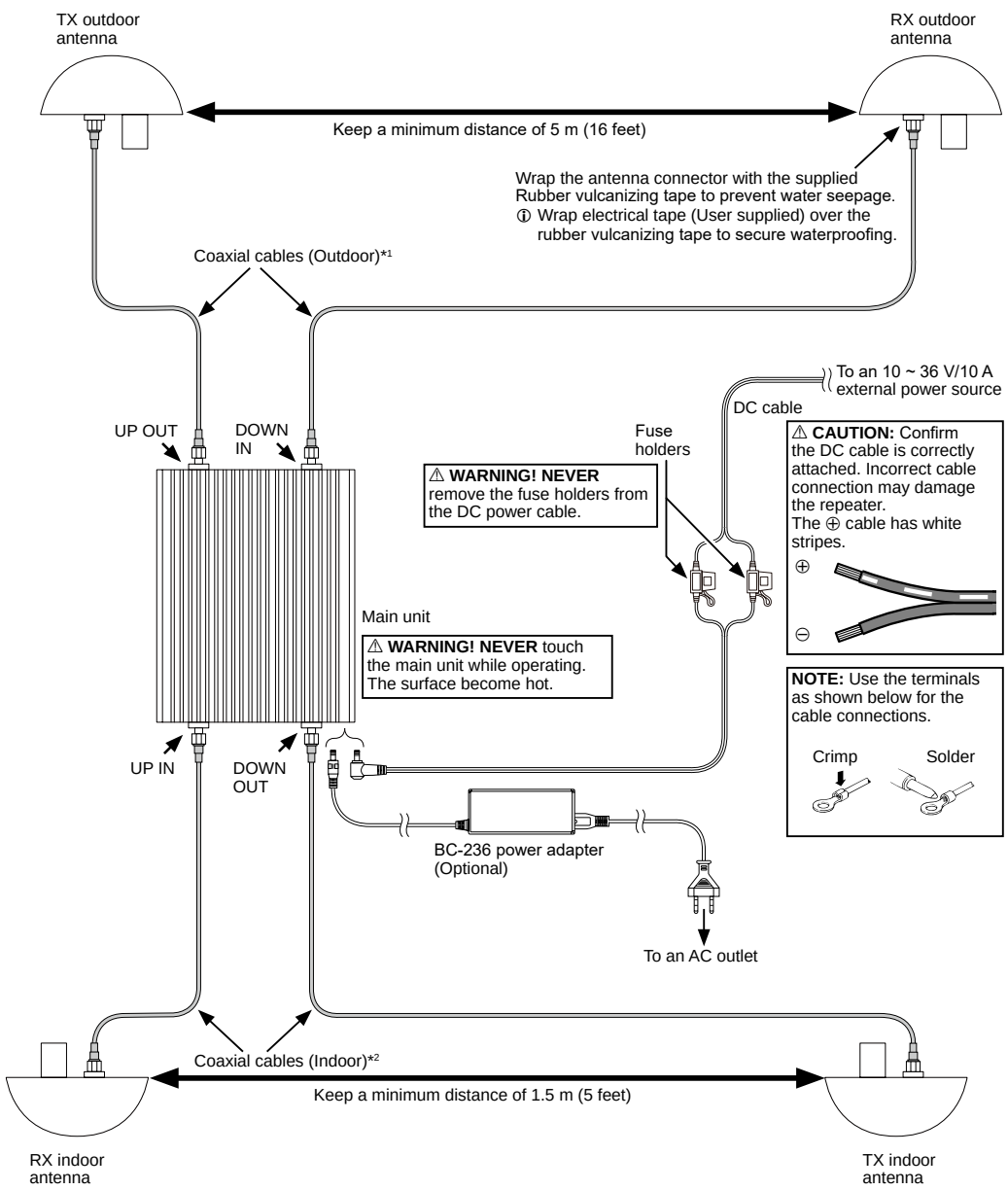
ⓘ The antennas must be at least 1.5 m (5 feet) apart.
ⓘ Confirm no other antennas are placed within 10 m (32 feet).

About the Indoor coverage:



CONNECTION

Connect the main unit, antennas, and power source as shown below.



*1 The cable with attenuation of 5 dB or less.
*2 The cable with attenuation of 3 dB or less.

CHECKING THE SIGNAL LEVEL

Check and adjust the indoor signal level by using your satellite transceiver and the repeater's front panel.

◇ Checking the downlink level

1. Stand about 3 m (10 feet) from an indoor antenna and hold your satellite transceiver.
2. Wait for about 30 to 60 seconds to verify the signal level.
3. Confirm the satellite transceiver displays 4 to 5 bars on its Signal Strength Indicator.
   ⓘ If the signal is lower, adjust the downlink level using the repeater's Gain Adjustment buttons, and then repeat step 1 to 3.
4. Repeat step 1 to 3 at 3 m (10 feet) and 5 m (16 feet) from an indoor antenna.

◇ Checking the uplink level

1. Stand about 5 m (16 feet) from an indoor antenna and hold your satellite transceiver.
2. Wait for about 30 to 60 seconds to verify the signal level.
3. Confirm the satellite transceiver displays 4 to 5 bars on its Signal Strength Indicator.
4. Hold down [PTT] to transmit. Confirm that:
   - The signal level does not decrease while transmitting.
   - The voice call is established.

   ⓘ If the signal level is decreased, adjust the uplink level using the repeater's Gain Adjustment buttons, and then repeat step 1 to 4.

SPECIFICATIONS

◇ General

• Frequency range:	1616 ~ 1626.5 MHz (uplink/downlink) 1575.4 ~ 1605.4 MHz (downlink/GNSS L1 band)
• Antenna impedance:	50 Ω nominal
• Operating temperature range:	–30˚C ~ +60˚C, –22˚F ~ +140˚F
• Power supply voltage:	10 ~ 36 V DC nominal
• Current drain (approximate):	Less than 8.0 A (at relay) Less than 2.5 A (stand-by)
• Dimensions:	265 (W) × 55 (H) × 170 (D) mm, 10.4 (W) × 2.2 (H) × 6.7 (D) inches (Projections not included)
• Weight (approximate):	2.6 kg, 5.7 lb
• Input/Output Connector:	N-J

◇ Uplink

• Total Gain:	40 ~ 50 dB (Adjustable in 1 dB steps)
• Rated output power:	40 dBm
• EVM:	Less than 7%
• Spurious emissions:	Less than –13.0 dBm

◇ Downlink

• Total Gain:	40 ~ 50 dB (Adjustable in 1 dB steps)
• Noise figure:	Less than 3.0 dB
• Spurious emissions:	Less than –13.0 dBm

REPLACING FUSE

If a fuse blows, or the repeater stops functioning, find the source of the problem, repair it, and then replace the damaged fuse with a new rated one.

CAUTION: DO NOT replace the fuse with the DC power cable connected to the power source. Disconnect the cable to prevent electric shock and/ or equipment damage.