



Installation Instruction

The Remote Unit, Extension Unit or Master Unit has to be mounted by professional / special trained installer.

1.1. HIGH POWER EU MECHANICAL INSTALLATION

1.1.1. Health and Safety for mechanical installation

Read and observe chapter 1.3 Health and Safety.

-  1. **Caution:** Risk of injury by the considerable weight of the unit falling. Ensure there is adequate manpower to handle the weight of the system.
-  2. **Caution:** Risk of serious personal injury by equipment falling due to improper installation. The installer must verify that the supporting surface will safely support the combined load of the electronic equipment and all attached hardware and components. The screws and dowels (wall anchors) used should also be appropriate for the structure of the supporting wall.

1.1.2. Property Damage Warnings for Mechanical Installation

- 1. **Attention:** Do not install the unit in a way or at a place where the specifications outlined in the Environmental and Safety Specifications leaflet of the supplier are not met.
- 2. **Attention:** Due to power dissipation, the Remote Unit may reach a very high temperature. Ensure sufficient airflow for ventilation.
- 3. **Notice:** Exceeding the specified load limits may cause the loss of warranty.
- 4. **Notice:** When connecting and mounting the cables (RF, optical, mains, ...) ensure that no water can penetrate into the unit through these cables.
- 5. **Notice:** If any different or additional mounting material is used, ensure that the mounting remains as safe as the mounting designed by the manufacturer. The specifications for stationary use of the Remote Unit must not be exceeded. Ensure that the static and dynamic strengths are adequate for the environmental conditions of the site. The mounting itself must not vibrate, swing or move in any way that might cause damage to the Remote Unit.


Specified torques must be observed for certain mounting procedures according to the following table:


<i>Type</i>	<i>Pins</i>	<i>Hex nuts</i>	<i>Screws</i>
<i>Thread</i>	M 6	M 6	M6
<i>Specified torques</i>	3.3 N-m	3.3 N-m	3.3 N-m

1.2. ELECTRICAL INSTALLATION

1.2.1. Health and Safety for electrical installation

Read and observe chapter 1.3 Health and Safety.

 1. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.**






 2. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current inside the unit in operation. Before opening the unit, disconnect mains power.**

1.2.2. Property Damage Warnings for Electrical Installation


1. **Attention:** It is compulsory to ground (earth) the unit before connecting the power supply. Grounding bolts are provided on the cabinet to connect the ground-bonding cable.
2. **Attention:** If the mains connector of the Remote Unit is not easily accessible, a disconnect device in the mains power circuit must be provided within easy reach.
3. **Attention:** A connection of the mains supply to a power socket requires the power socket to be nearby the Remote Unit.
4. **Attention:** Before connecting or disconnecting the mains connector at the Remote Unit, ensure that mains power supply is disconnected.
5. **Attention:** Make sure that an appropriate circuit breaker acting as a disconnect device (as required by IEC/EN60950-1) and an overcurrent limiting device are connected between mains power and the Remote Unit.
6. **Attention:** Incorrectly wired connections can destroy electrical and electronic components.
7. **Notice:** Although the Remote Unit is internally protected against overvoltage, it is strongly recommended to ground (earth) the antenna cables close to the antenna connectors of the Remote Unit for protection against atmospheric discharge. In areas with strong lightning, it is strongly recommended to install additional lightning protection.
8. **Notice:** To avoid corrosion at the connectors caused by electrochemical processes, the material of the cable connectors must not cause a higher potential difference than 0.6 V (see electrochemical contact series).

9. **Notice:** For unstabilized electric networks, which frequently generate spikes, the use of a voltage limiting device is advised.
10. **Notice:** The unit complies with the surge requirement according to EN 61000-4-5 (fine protection); however, installation of an additional medium (via local supply connection) and/or coarse protection (external surge protection) is recommended depending on the individual application in order to avoid damage caused by overcurrent.
11. **Notice:** Observe the labels on the front panels before connecting or disconnecting any cables.

1.3. HEALTH AND SAFETY

-  1. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current. Obey all general and regional installation and safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.**
-  2. **Danger: Electrical hazard. Danger of death or fatal injury from electrical current inside the unit in operation. Before opening the unit, disconnect mains power.**
-  3. **Caution:** Laser radiation. Risk of eye injury in operation. Do not stare into the beam; do not view it directly or with optical instruments.
-  4. **Caution:** High frequency radiation in operation. Risk of health hazards associated with radiation from the unit's inner conductor of the antenna port(s). Disconnect mains before connecting or replacing antenna cables.
-  5. **Caution:** High frequency radiation in operation. Risk of health hazards associated with radiation from the antenna(s) connected to the unit. Implement prevention measures to avoid the possibility of close proximity to the antenna(s) while in operation.

1.3.1. Property Damage Warnings

1. **Attention:** Due to power dissipation, the Remote Unit may reach a very high temperature. Do not operate this equipment on or close to flammable materials. Use caution when servicing the unit.
2. **Notice:** Although the Remote Unit is internally protected against overvoltage, it is strongly recommended to ground (earth) the antenna cables close to the repeater's antenna connectors for protection against atmospheric discharge.
-  3. **Notice:** ESD precautions must be observed. Before commencing maintenance work, use the available grounding (earthing) system to connect ESD protection measures.
4. **Notice:** Only suitably qualified personnel are allowed to work on this unit and only after becoming familiar with all safety notices, installation, operation and maintenance procedures contained in this manual.
5. **Notice:** Keep operating instructions within easy reach and make them available to all users.
6. **Attention:** Only authorized and trained personnel are allowed to open the unit and get access to the inside.
7. **Notice:** Read and obey all the warning labels attached to the unit. Make sure that all warning labels are kept in a legible condition. Replace any missing or damaged labels.
8. **Notice:** Only license holders for the respective frequency range are allowed to operate this unit.

9. **Notice:** Make sure the repeater settings are correct for the intended use (refer to the manufacturer product information) and regulatory requirements are met. Do not carry out any modifications or fit any spare parts, which are not sold or recommended by the manufacturer.

1.3.2. Compliance

1. **Notice:** For installations which have to comply with European EN50385 exposure compliance requirements, the following Power Density limits/guidelines (mW/cm²) according to ICNIRP are valid:

- 0.2 for frequencies from 10 MHz to 400 MHz
- $F \text{ (MHz)} / 2000$ for frequencies from 400 MHz to 2 GHz
- 1 for frequencies from 2 GHz to 300 GHz

2. **Notice:** For installations, which have to comply with FCC RF exposure requirements, the antenna selection and installation must be completed in a way to ensure compliance with those FCC requirements. Depending on the RF frequency, rated output power, antenna gain, and the loss between the repeater and antenna, the minimum distance D to be maintained between the antenna location and human beings is calculated according to this formula:

$$D_{[cm]} = \sqrt{\frac{P_{[mW]}}{4 * \pi * PD_{[mW/cm^2]}}}$$

where

- P (mW) is the radiated power at the antenna, i.e. the max. rated repeater output power in addition to the antenna gain minus the loss between the repeater and the antenna.
- PD (mW/cm²) is the allowed Power Density limit acc. to 47 CFR 1.1310 (B) for general population / uncontrolled exposures which is
 - $F \text{ (MHz)} / 1500$ for frequencies from 300MHz to 1500MHz
 - 1 for frequencies from 1500MHz to 100,000MHz

RF exposure compliance may need to be addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of 1.1307(b)(3).

3. **Notice:** Installation of this equipment is in full responsibility of the installer, who has also the responsibility, that cables and couplers are calculated into the maximum gain of the antennas, so that this value, which is filed in the FCC Grant and can be requested from the FCC data base, is not exceeded. The industrial boosters are shipped only as a naked booster without any installation devices or antennas as it needs for professional installation.

4. **Note:** Corresponding local particularities and regulations must be observed. For national deviations, please refer to the respective documents included in the manual CD that is delivered with the unit.



5. **Note:** For a Class A digital device or peripheral:

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.

6. **Note:** This unit complies with European standard EN60950.

1.4. EQUIPMENT SYMBOLS USED / COMPLIANCE

Please observe the meanings of the following symbols used in our equipment and the compliance warnings:

Symbol	Compliance	Meaning / Warning
---	FCC	For industrial (Part 20) signal booster: WARNING: This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.
	CE	Alert sign to R&TTE To be sold exclusively to mobile operators or authorized installers – no harmonized frequency bands, operation requires license. Intended use: EU and EFTA countries
		Indicates conformity with the R&TTE directive 1999/5/EC certified by the notified body no. 0700.

Please be aware that each country or governmental body has established its own specific limits for RF exposure, to which the installation of any radiating antenna must conform. When installing your ION-B system, take care to comply to your local regulations and guidelines about RF exposure limits.

Antenna installation must conform to the following guidelines to meet FCC and RSS RF exposure limits, otherwise an environmental evaluation is required.

RSS Canadian standards

To meet RSS Canadian standard the following guidelines have to be taken into account:

- For any situation where multiple carrier signals are present, take care to reduce the single-carrier output rating at least by 3.5dB, especially when the output signal is reradiated and can cause interference with adjacent band users. This power reduction can be achieved by reducing the input power which enters the TFLN input ports, not through an attenuator at the output of the ION-B devices.