

Installation Instruction

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


1.1. MECHANICAL INSTALLATION

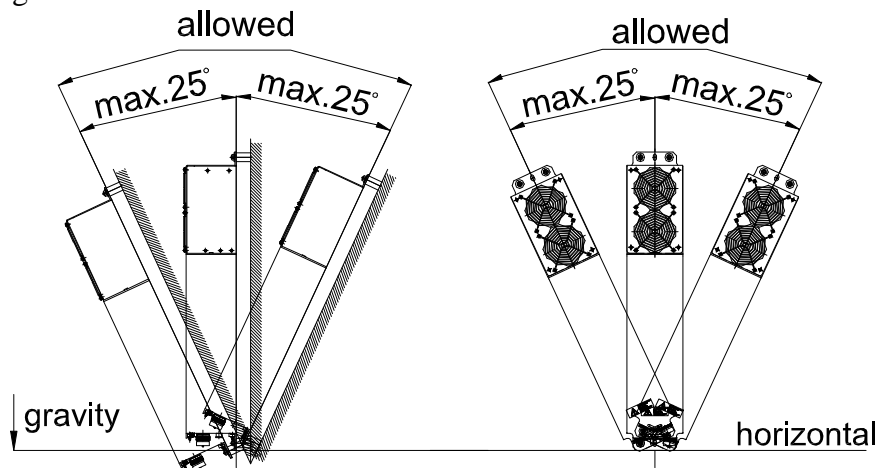
1.1.1. General

Read the health and safety warnings in section 1.3.

1. 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. It is recommended to use the mounting hardware delivered by the supplier only. If different mounting hardware is used, the specifications for stationary use of the Remote Unit must not be exceeded.

Note: Exceeding the specified load limits may cause the loss of warranty!

3.  The unit is considerably heavy. Make sure that a suitable mounting surface is used. Ensure there is adequate manpower to handle the weight of the system.
4. Due to power dissipation, the Remote Unit may reach a very high temperature. Ensure sufficient airflow for ventilation.
5. When connecting and mounting the cables (RF, optical, mains, ...) ensure that no water can penetrate into the unit through these cables.
6. Also observe all additional rules or restrictions regarding mounting that depend on the type of Remote Unit. For details refer to section 7.2.2 *Mechanical Specification*. Install the unit vertically with the fan unit at the top. A maximum tilt angle of 25° from a vertical position must be kept, as in the following illustrations:



7. A spacing of 40 mm (1.58 inch) around the unit is required.
8. To ensure sufficient airflow when mounting the unit in enclosed spaces, two lid openings (one for the air inlet and the other for the air outlet) have to be provided. Do not block these air inlets and outlets when mounting the Remote Unit. The size of each opening must equal at least 12 x 12 cm (144 cm²). Make sure, too, there is no thermal short circuit between the air inlet and air outlet.

If any different or additional mounting material is used, ensure that the mounting remains as safe as the mounting designed by the manufacturer. 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 have to be observed for certain mounting procedures according to the following table:

<i>Type</i>	<i>Tallow-drop screws</i>	<i>Hex nuts</i>	<i>Spacing bolts</i>		<i>PG (plastic)</i>	<i>PG (aluminium)</i>
<i>Thread</i>	M 4	M 8	M 4	M 8	PG 13.5	PG 29
<i>Specified torques</i>	3.3 Nm	27 Nm	2.3 Nm	27 Nm	3.75 Nm	10 Nm

table Fehler! Kein Text mit angegebener Formatvorlage im Dokument.-1 Specified torques

Note: To avoid damage when mounting the unit, always make sure that the M8 washers (DIN9021 or DIN125 depending on the mounting kit) are placed behind and in front of the mounting drillings of the unit.

The mounting procedures for a stand-alone Remote Unit without optional accessories are described and illustrated in the following sections. For further information regarding special mounting procedures including mounting of accessory equipment, please see separate manual.


1.2. ELECTRICAL INSTALLATION

1.2.1. General



Read the health and safety warnings in section 1.3.



1. This unit contains dangerous voltages. Loss of life, severe personal injury, or property damage can be the result if the instructions contained in this manual are not followed.
2. It is compulsory to ground (earth) the unit before connecting the power supply. A grounding bolt is provided on the cabinet to connect the ground-bonding cable.
3. Although the Remote Unit is internally protected against over-voltage, 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 highly recommended to insert additional lightning protection.
4. 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.
5. Before connecting or disconnecting the mains connector at the Remote Unit, ensure that mains power supply is disconnected.
6. 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.
7. A connection of mains supply to a power socket requires the power socket to be nearby the Remote Unit.
8. Incorrectly wired connections can destroy electrical and electronic components.
9. 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).
10. Use an appropriate torque wrench for the coupling torque of N-type connectors (2 N-m / 20 in lb), with 13/16 in opening to tighten the N-type antenna connectors. For example, use torque wrench of item no. 244379 available from the *Andrew e-catalog*. Do NOT use your hands or any other tool (e.g. a pair of pliers)! This might cause damage to the connector and lead to a malfunction of the Remote Unit.
11. For unstabilized electric networks, which frequently generate spikes, the use of a voltage limiting device is advised.
12. The unit complies with the surge requirement according to EN 61000-4-5 (fine protection); however, it is recommended to install an additional medium (via local supply connection) and/or coarse protection (external surge protection), depending on the individual application, in order to avoid damage caused by overcurrent.
13. Observe the labels on the front panels before connecting or disconnecting any cables.

 **Note:** The electrical installation has to be performed in accordance with the safety regulations of the local authorities. Due to safety reasons, the electrical installation must be performed by qualified personnel only. The repeater must not be opened. The maximum antenna height has to be 10 meters above ground.

1.3. HEALTH AND SAFETY WARNINGS

-  1. 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.
2. Read and obey all the warning labels attached to the unit. Make sure that the warning labels are kept in a legible condition and replace any missing or damaged labels.
3. 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.
4. Keep operating instructions within easy reach and make them available to all users.
5. It is the responsibility of the network provider to implement prevention measures to avoid health hazards which may be associated to radiation from the antenna(s) connected to the unit.
-  6. Laser radiation! Do not stare into the beam; do not view it directly or with optical instruments.
7. 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 (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).


8. **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.

9. For installations which have to comply with Europe an 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
10. Make sure, access is restricted to qualified personnel.
11. Only licence holders for the respective frequency range are allowed to operate this unit.
12. Corresponding local particularities and regulations must be observed. For national deviations please refer to the respective documents included in the manual CD delivered.
13. Use this equipment only for the purpose specified by the manufacturer. Do not carry out any modifications or fit any spare parts which are not sold or recommended by the manufacturer. This could cause fires, electric shock or other injuries.
14. Due to power dissipation, the repeater may reach a very high temperature. Do not operate this equipment on or close to flammable materials.
15. Before opening the unit, disconnect mains.
-  16. ESD precautions must be observed! Before commencing maintenance work, use the available grounding system to connect ESD protection measures.
17. This unit complies with European standard EN60950.
18. Make sure the repeater settings are according to the intended use (see also product information of manufacturer) and regulatory requirements are met.
19. Although the repeater is internally protected against overvoltage, it is strongly recommended to earth the antenna cables close to the repeater's antenna connectors for protection against atmospheric discharge.

Equipment Symbols Used

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

Symbol	Compliance	Meaning
	---	Alert sign to R&TTE
CE 0700	Symbol	Indicates conformity with the R&TTE directive 1999/5/EC certified by the notified body no. 0700.