# Important matters

Please read this instruction manual carefully before use.

Please keep this manual, which contains important instructions for the use of TS-R1000.

§ Please consult the dealer about the operation of cluster mode, IP interconnection mode and transit mode.

⚠ Installation Environmental Requirements.

- Only TSITS approved antennas and accessories can be installed.
- Operating Temperature Range

  -30 ° C (- 22 ° F) to+60 ° C (+140 ° F).

  This temperature is the temperature measured in the vicinity of the repeater. For example, if the repeater is installed in a cabinet, the temperature is the temperature measured inside the cabinet.
- Humidity

  The relative humidity shall not exceed 95% at 50 ° C (122 ° F).

⚠ Input Power Requirements.

- The relay station is equipped with a DC power interface and a standard 3-core AC power interface (optional).
- DC power interface, the working range of this device is DC 13.8V ± 10%, and the power supply current is not less than 15A.
- The standard 3-core AC power interface provides a standard 3-core wire to connect the power supply to the AC voltage source. ①
- This equipment must be installed next to an easily accessible AC power source. ①
- The socket must be connected to an AC power supply capable of providing a maximum power of 280 W. ①
- A standard 3-wire grounded receptacle is recommended for connection to AC power. ①

  Note: ① The power supply mode of the AC power socket provided by the equipment is optional, and the built-in switching power supply is required. For details, please consult the dealer

⚠ Site grounding and lightning protection.

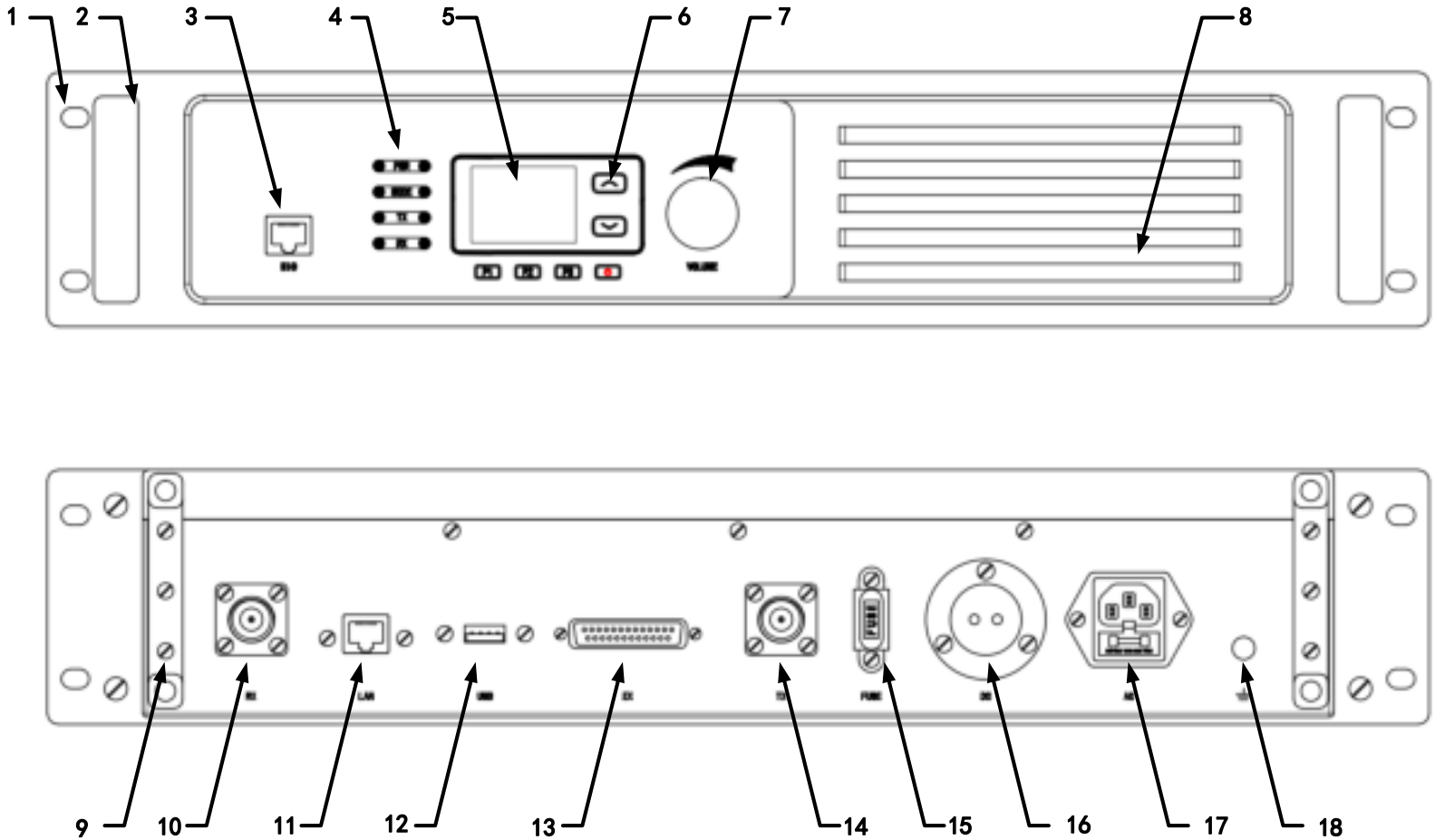
- Proper site grounding and lightning protection are important matters that must be considered. Failure to provide proper lightning protection can cause permanent damage to the intercom equipment.
- Providing adequate lightning protection is essential to ensure a safe and reliable communications site. RF transmitter cables as well as AC and DC must be protected
  Power cords to prevent lightning strikes when lightning enters the site.
- The repeater is equipped with a grounding screw located on the rear of the repeater power module. This screw is used to connect the repeater to field ground.
- Correct RF grounding. This type of grounding involves the grounding of unwanted RF energy. An example of RF grounding is the use of shielding to protect against interference from communications equipment and
  cable for harmful RF energy or to minimize this emission.

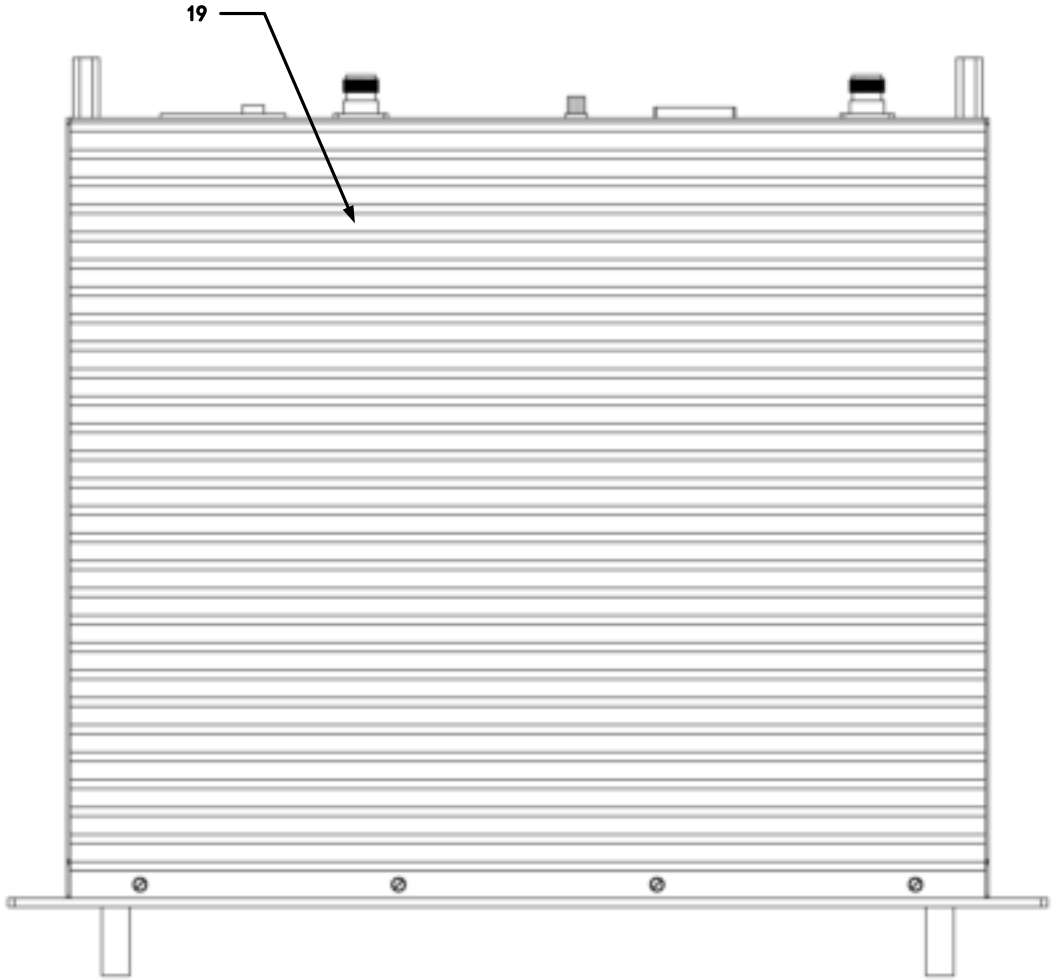
⚠ Do not use the repeater in the following situations.

- Near explosive sites.
- On the airplane.
- Near the gas station.

# Catalog

# Panel Description

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| Serial number | The name of the part | Description |
|---|---|---|
| 1 | Locate mounting holes that | With this position, it can be fixedly mounted in a standard chassis. |
| 2 | Carrying Hand | |
| 3 | the annex interface | 1. Connect the microphone accessories, through the microphone to realize the repeater active call other devices.<br>2. Connect the data cable attachment for repeater data information setting/reading and monitoring. |
| 4 | LED indicator | |
| 5 | digital tube display area | |
| 6 | Pushbutton | |
| 7 | Volume knob | |
| 8 | Horns | |
| 9 | Fixed support feet | |
| 10 | Receiving antenna interface | Type N |
| 11 | Ethernet port | 10-Base-T/100-Base-Tx (RJ45)。 When IP board accessories are selected, this interface is open. |
| 12 | USB interface | Open this interface when IP board accessories are selected |
| 13 | Extended interface | including programming and audio interfaces |
| 14 | Transmitter Antenna Interface | Type N |
| 15 | DC power fuse | When using DC power supply, use this fuse |

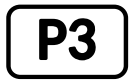
| | | |
|---|---|---|
| 16 | DC power jack | 13.8V |
| 17 | AC power socket | AC-220V |
| 18 | Grounding post | enclosure grounding |
| 19 | Heat sinks | |

# Indicator light

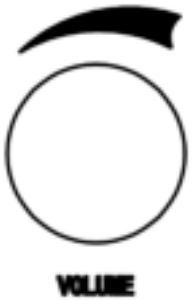
| Serial number | Icons | Name | Description |
|---|---|---|---|
| 1 |  | Power status indicator | 1. The left side is red, the power supply turns on and lights up<br>2. The right side is yellow and goes out when there is a warning |
| 2 |  | Mode indicator | 1. The left side is blue, and the digital mode lights up<br>2. The right side is white, and the analog mode is on |
| 3 |  | Launch Indicator | 1. The left side is red and lights up when transmitting (slot 1 is indicated in TM mode)<br>2. The right side is red and lights up when transmitting (slot 2 is indicated in TM mode) |
| 4 |  | Receiving indicator | 1. The left side is green and lights up when receiving (slot 1 is indicated in TM mode)<br>2. The right side is green and lights up when receiving (slot 2 is indicated in TM mode) |

# Pushbutton

| Serial number | Icons | Description | Serial number | Icons | Description |
|---|---|---|---|---|---|
| 1 |  | Channel switching | 4 |  | Customizing the keys |
| 2 |  | Channel switching | 5 |  | Customizing the keys |

| | | | | | |
|---|---|---|---|---|---|
| 3 |  | Power button | 6 |   | Customizing the keys |

# Volume knob




The volume knob is located on the right side of the panel.

Rotate clockwise to turn up the volume.

Turn counterclockwise to reduce the volume.

**Note: The repeater will only play sound when the listening function is turned on.**

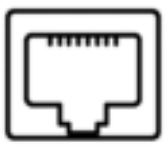
**This function needs to be configured through the configuration interface, please ask your dealer for details.**

# the annex interface

The accessory port is located on the left side of the panel and supports the following functions.

1. Connect the microphone accessories, through the microphone to realize the repeater active call other devices.

2. Connect the data cable attachment for repeater data information setting/reading and monitoring.



Attention: when using the change of interface accessories, you need to choose the fittings in line with our company's standard products.

Use of products that do not comply with our accessories may result in damage to the interface or damage to the equipment

# power on and off

- **Power on:** Connect the repeater to the external power supply, the repeater will turn on automatically; long press the power button in the off state, the repeater will turn on.
- **Shutdown:** In power-on state, long press the power button, the repeater will shutdown.

# Channel selection

- The digital tube displays the current channel number.
- Press the channel switching button or Switching channels.

# Volume adjustment

- Turn the volume knob to turn up the sound clockwise and turn down the time counterclockwise.

**Note:The listening function needs to be turned on**

# Listen mode enable

- This feature is enabled through the configuration software.

# PTT allow call

- This feature is enabled through the configuration software.

# PTT call

- Connect the microphone attachment.
- [PTT Allow Call] enable.
- Press and hold PTT, the red light of the emission indicator lights up, and you can speak at 5-10cm from the microphone.

- Release PTT and the call ends.

# mechanical installation

This section describes the steps of unpacking and mechanical installation of TSITS repeater. The installation method can be changed according to the type of cabinet or rack selected to fix the repeater.

⚠ If the module must be removed from the repeater, be sure to observe proper ESD precautions.

- **unpacking equipment**

  The box contains the following items.

  - TSITS repeater
  - DC power cord (optional DC version)
  - AC power cord (optional AC version)
  - Microphone and microphone holder (optional accessory)
  - Data cable (optional accessory)
  - Operation Manual of TSITS Trunk Station

- **installing the equipment into the cabinet**

  The repeater can be mounted in a rack or cabinet.

⚠ The cabinet and rack provided by the user must be equipped with rails and hole spacing, meet the EIA general 48.3 cm (19 inches) specification, and must meet the following minimum standards:

  - Depth of 41.3 cm (16.25 inches)
  - Width 48.3 cm (19 inches)
  - Height 13.4 cm (5.25 inches)
  - The two mounting rails are 5 cm (2 in.) from the front of the cabinet, with the front mounting holes spaced (2.25 in.) apart (center to center).

For detailed questions about installing equipment in the cabinet provided by the user, please contact TSITS technical support department.

# electrical connections

Electrical connection must be carried out after the mechanical installation of TSITS repeater. The connection includes the following:

  - DC power cord (or AC power cord)
  - Antenna coaxial cable.

- **AC input power connection**

⚠ Do not supply AC power to the repeater at this time. Ensure that the circuit breaker connecting the associated AC outlet is disconnected.

⚠ The AC power supply must be mounted near the equipment and easily accessible.

Each repeater comes with a 3-prong power cord to connect the repeater to 110~240 AC power. Insert the 3-prong plug into the [AC power connector]. If an antenna wire is required, purchase a suitable wire from a qualified electrical parts supplier with a

connector that has been approved by an end-use national safety testing organization.

- DC input power connection

⚠ Do not supply power to the repeater at this time. Ensure that you check that the positive and negative connections of the power cord are correct before supplying power

- grounding connections

The repeater is equipped with a grounding screw, located on the back of the repeater. Connect the field ground cable to the ground screw.

- duplexer selection

The choice of duplexer is very important for the performance of the system. Some systems not used in high RF density locations may use notch (band filter) diplexers. The duplexer must be able to work continuously at least 50 W. For optimum system performance, the insertion loss should be less than 2 dB. If the repeater is used in a high RF density area, it is recommended to use a band-pass band stop duplexer.

- RF antenna connection

Two independent interfaces are used to connect the transmitting and receiving RF antennas. Coaxial cables of receiving and transmitting antennas must be connected to N-type (Tx) and N (Rx) interfaces. In order to use a repeater, there must be sufficient isolation between antennas, or if an antenna is used, the duplexer must have sufficient isolation between Tx and Rx ports.

The insulation requirements of each frequency band are different, as shown in the following table:

| Frequency points | Bandwidth | Isolation |
|---|---|---|
| UHF 1 | 403–470 MHz | 75dB |
| UHF 2 | 450–520 MHz | 85dB |
| UHF 3 | 350–390 MHz | 75dB |
| VHF | 136–174 MHz | 85dB |

- antenna selection

Antenna selection is critical to the performance of the system. An antenna with an impedance of 50 ohms and a capacity of at least 50 watts must be selected. A gain antenna can be used to increase system coverage. Be aware of the limitations when selecting a gain antenna. Some services and areas may have antenna gain or radio management restrictions. A 50-ohm premium transmission line (hardwire) must be used to connect the antenna to the duplexer. The line must be equipped with connectors that match those on the duplexer and antenna.

⚠ It is very important that all antennas be grounded at the point where they are introduced into the building.

⚠ Antenna design is the responsibility of the user. All aspects of antenna design must comply with relevant local regulations.

# post-installation inspection

After completing the mechanical installation and all electrical connections of the TSITS repeater station, power on and check whether the repeater operates normally.

- **energized**

Before powering up the repeater, make sure that all boards are secured in their respective ports on the baseboard and that all RF cables are securely connected.

Turn on the power supply to the repeater power module.

- **Checking for proper functioning**

The operation of the transponder can be checked by the following steps.

  - Observe the display lamp status on the LCD display.
  - Operate walkie-talkie call experiments.

⚠ During operation, some transponder components may become very hot. Turn off all power to the transponder and wait until it has cooled completely before touching it.

# equipment accessories

| Serial number | Project | Quantity |
|---|---|---|
| 1 | Repeater | 1 part |
| 2 | Instruction manual | 1 copy |
| 3 | AC power cord (optional) | 1 root |
| 4 | DC power cord (optional) | 1 root |
| 5 | Hand microphone and mounting bracket (optional accessory) | 1 set |
| 6 | Data cable (optional) | 1 root |

# Cleaning

- Use a clean, dry, lint-free cloth or brush to wipe away dust on the surface of the product and the charging pole piece on a regular basis.
- The buttons, control knobs and housing of this product are very susceptible to soiling. They can be cleaned with a neutral detergent and a non-woven cloth. Do not use chemicals such as detergents, alcohol, sprays, or petroleum-based agents to avoid damage to the surface and housing. After cleaning, make sure the product is thoroughly dry, otherwise do not use it.

**FCC Caution:**

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

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.

Note: 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 or more 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.

- This radio is designed for and classified as “Occupational/Controlled Use Only”, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards; NOT intended for use in an General population/uncontrolled environment
- DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this radio, and the antenna gain shall not exceed 3.5dBi by the manufacturer declared.
- DO NOT transmit for more than 50% of total radio use time, more than 50% of the time can cause RF exposure compliance requirements to be exceeded.
- During operation, the separation distance between user and the antenna shall be at least 89cm, this separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements

During transmissions, your radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.