USER MANUAL FOR THE MAAS KDX-1000 CB BASE ANTENNA

1. PRODUCT DESCRIPTION

The MAAS KDX-1000 is a vertically polarised CB fixed-station antenna made of glass-fibre-reinforced plastic for stationary radio operation in the CB and amateur radio bands. The antenna consists of several screw-together GRP segments and features an integrated matching circuit for feeding via a 50-ohm coaxial cable. The antenna is intended for use with fixed radio installations. It must only be operated in accordance with the applicable legal regulations.

2. TECHNICAL SPECIFICATIONS

Product name: MAAS KDX-1000
Antenna type: Vertical CB base station
antenna Polarisation: Vertical 5/8
Frequency range: approx. 26 to 30 MHz
Gain: 5.15 dBi Max.
power: 500W
Nominal impedance: 50 ohms
Connector: UHF socket / SO-239
Tuning: Via tuning rings on the antenna base Material:
Glass-fibre-reinforced plastic, metal parts Mounting type:
Mast mounting
Weight: 2.85 kg
Length: 5.7 m
Applications: Fixed CB radio operation / 10m amateur radio

Note:
Technical specifications may vary slightly depending on the production batch.

3. SCOPE OF DELIVERY

Before installation, check the contents of the package for completeness and visible damage. The

package usually includes:

- Lower antenna segment with connector and matching
- Middle antenna segment
- Upper antenna segment
- Mast mounting / mast clamp
- Tuning rings
- Installation instructions

If any parts are missing or damaged, do not put the antenna into operation.

4. INTENDED USE

The MAAS KDX-1000 is intended exclusively for fixed radio operation. The antenna must only be used:

- within the permitted frequency range,
- with suitable radio equipment,
- with a coaxial cable fitted in accordance with best practice,
- with proper earthing and equipotential bonding,
- in compliance with applicable laws, standards and safety regulations.

In particular, the following constitutes improper use:

- Operation without suitable earthing when installed outdoors,
- installation near overhead power lines,
- installation on unsuitable or unstable masts,
- Operation with a damaged antenna or damaged coaxial cable,
- Use in potentially explosive atmospheres.

5. IMPORTANT SAFETY INSTRUCTIONS

Read these instructions in full before installing or operating the antenna.

Installing an outdoor antenna can be dangerous. Incorrect installation may result in serious injury, fatal electric shock, fire, damage to the equipment or damage to the building.

5.1 Danger to life from power lines

Never install the antenna near overhead power lines.

Always maintain a safe distance from power lines, roof supports, service cables and other electrical installations.

If in doubt, contact the relevant network operator or a qualified electrician.

Warning:
Even coming into close proximity to or touching a power line with the antenna, the mast or the coaxial cable can be fatal.

Plan the installation so that the antenna can never come into contact with a power line, even if it tips over or falls.

5.2 Working on roofs and masts

Work on roofs, ladders and masts must only be carried out by suitably qualified personnel.

Observe the following rules:

- Never work alone.
- Only work in dry weather.
- Do not work in windy, rainy or snowy conditions, on ice, or when there is a risk of thunderstorms.
- Use suitable ladders and fall protection equipment.
- Only walk on roof surfaces that are strong enough to support your weight.
- Watch out for loose roof tiles and slippery surfaces.
- Wear suitable protective equipment.

If in doubt, engage a specialist contractor.

5.3 Hazards associated with fibreglass material

The antenna is made of glass-fibre-reinforced plastic.

Damaged or aged GRP surfaces may release fine glass fibres. These can cause skin irritation.

Notes:

- Wear work gloves during installation.
- Avoid rubbing against damaged GRP surfaces.
- Do not continue to use damaged antenna parts.
- Do not inhale glass fibre dust.

6. LIGHTNING PROTECTION AND ELECTRICAL INSTALLATION IN GERMANY

An externally mounted antenna can accumulate dangerous voltages during thunderstorms. This applies even without a direct lightning strike.

The following standards are particularly relevant for antenna systems in Germany:

- DIN EN 60728-11 / VDE 0855-1
- DIN EN 62305 / VDE 0185-305
- DIN VDE 0100-540

These instructions do not replace an inspection by a qualified electrician or a specialist lightning protection contractor.

Responsibility for installation in accordance with the standards lies with the operator or the installer.

6.1 Earthing the aerial mast

If installed outdoors, the metal aerial mast must be earthed correctly.

The earthing conductor must be routed along the shortest and straightest possible path to the main earthing busbar or to a suitable earthing system.

The earthing conductor must not be laid in tight loops.

Connections must be permanent, protected against corrosion and mechanically secure.

6.2 Equipotential bonding of the coaxial cable

Where possible, the coaxial cable should be incorporated into the equipotential bonding system before or immediately upon entering the building. A suitable coaxial earth block or surge protector with an earth connection must be used for this purpose.

6.3 Coaxial surge protection

To protect the radio and any connected devices, a suitable coaxial surge arrester is recommended.

The surge arrester should:

- be suitable for 50-ohm radio systems,
- cover the frequency range used,
- be suitable for the transmit power used,
- be installed as close as possible to the building entrance,
- be properly earthed.

A surge arrester is no substitute for earthing or lightning protection.

6.4 Protection range of existing lightning protection systems

If the building has an external lightning protection system, the antenna must only be installed within the permitted protection area or properly integrated into the lightning protection system.

An incorrect connection to a lightning protection system can be dangerous.

Have such installations planned and carried out by a specialist lightning protection contractor.

6.5 What to do during a thunderstorm

In the event of a thunderstorm or risk of a thunderstorm:

- Stop using the radio immediately.
- Switch off the radio.
- Unplug the radio from the mains.
- Disconnect the antenna cable from the radio.
- Lay the antenna cable so that it cannot come into contact with people or equipment.

Warning:
Disconnecting the cable whilst a thunderstorm is already nearby can be dangerous.
Disconnect the system in good time before the thunderstorm.

No lightning protection system offers complete protection against direct lightning strikes.

7. PREPARATION FOR INSTALLATION

Select a suitable installation site.

The installation site should:

- be as unobstructed and elevated as possible,
- be at a sufficient distance from power lines,
- be mechanically stable,
- allow for safe cable routing,
- allow for proper earthing,
- and not be located near highly flammable materials.

Check before installation:

- Are all the antenna parts present?
- Is the antenna undamaged?
- Is the mast stable enough?
- Is a suitable coaxial cable available?
- Have lightning protection and equipotential bonding been planned?
- Is the installation site safely accessible?

8. ASSEMBLY OF THE ANTENNA

1. Lay out all the antenna parts on a clean, level surface.
2. Check the threads and joints for dirt or damage.
3. Carefully screw the antenna segments together.
4. Tighten the segments.
5. Do not use excessive force or unsuitable tools.
6. Ensure that the segments are straight and fully connected.

Note:
Overtightening the threads can damage the antenna.

9. MAST INSTALLATION

The antenna is mounted on a suitable antenna mast.

A sturdy, corrosion-protected steel or aluminium mast is recommended. The

mast must be able to support the antenna securely, even in windy conditions.

Installation instructions:

1. Align the antenna vertically on the mast.
2. Tighten the mast fixings evenly.
3. The antenna must not twist or come loose.
4. Lay the coaxial cable with strain relief.
5. Check all screw connections after installation.

Warning:
Inadequate fastening may cause the antenna or mast to fall in windy conditions.

10. COAXIAL CABLE AND CONNECTORS

Use a high-quality 50-ohm coaxial cable. Suitable cable

types include, for example:

- Maas RG-213/U
- Maas RG-58
- Messi & Paoloni Ultraflex / Hyperflex etc.

The cable should be as short as possible, but laid without any tension. Please

note:

- Do not kink the cable.
- Observe the minimum bend radius.
- Do not crush the cable.
- Seal external connections to make them weatherproof.
- Use UV-resistant cable ties.
- Ensure there are no sharp edges along the cable route.

A drip loop must be provided before the cable enters the building to prevent rainwater from running along the cable into the building.

External plugs must be protected against moisture using suitable self-fusing insulating tape or a weatherproof seal.

11. CONNECTING THE ANTENNA

1. Connect the coaxial cable to the antenna socket.
2. Tighten the connector firmly, but do not overtighten.
3. Seal the external connector to make it weatherproof.
4. Apply strain relief to the coaxial cable on the mast.
5. Route the coaxial cable via the earthing block and equipotential bonding.
6. Only then connect it to the radio.

Caution:
The antenna must not be operated without proper equipotential bonding and earthing if it is mounted outdoors.

12. SWR TUNING

The MAAS KDX-1000 is fitted with tuning rings for adjustment. The antenna is factory-set to 27 MHz. Further adjustment is not usually necessary.

If tuning is required, you will need:

- CB radio
- SWR meter
- short coaxial connection cable
- suitable free frequencies or CB channels
- Alternatively, an SWR analyser

Procedure:

1. Switch off the radio.
2. Connect the SWR meter between the radio and the antenna cable.
3. Switch on the radio.
4. Measure on channel 41 (1) at low power.
5. Measure on channel 40 at low power.
6. Compare the readings.
7. Adjust the tuning rings in small increments.
8. Repeat the measurement.

Setting:

- If the SWR on channel 41 (1) is higher than on channel 40, move the tuning rings downwards.
- If the SWR on channel 40 is higher than on channel 41, move the tuning rings upwards.
- If both values are similarly low, the setting is correct.

Target value:
- An SWR of 2:1 or less is not critical (reflected power approx. 11%)
- An SWR of 1.5:1 or less is generally good.
- An SWR of 1.3:1 or less is very good.

Warning:
Never transmit for prolonged periods with a high SWR (> 2). This may damage the radio.

13. SETTING UP

Before using the radio for the first time, check:

- Is the antenna securely mounted?
- Is the mast sufficiently stable?
- Is the earth connection correctly fitted?
- Is there an equipotential bonding system in place?
- Is the coaxial cable undamaged?
- Is the external connector sealed?
- Has the SWR been checked and adjusted?
- Is the radio properly connected?

Only once the checks have been successfully completed should you operate at normal transmit power.

14. OPERATING INSTRUCTIONS

- Only operate the antenna within the permitted frequency range.
- Observe the legal requirements for CB radio / amateur radio
- Do not exceed the permitted transmission power.
- Avoid transmitting during thunderstorms.
- Check the SWR value regularly.
- Be aware of interference affecting electronic devices in the vicinity.

In the event of interference, check the radio equipment, earthing, coaxial cable and antenna location.

15. MAINTENANCE

The antenna should be inspected at least once a year.

The following should be checked:

- That the antenna is securely fixed
- Condition of the mast
- Condition of the mast clamps
- Condition of the coaxial cable
- Condition of the connectors and seals
- Earthing and equipotential bonding connections
- GRP surface of the antenna
- SWR value

An additional inspection is required following a storm, thunderstorm, icing or heavy wind loads.

Damaged parts must be replaced.

16. TROUBLESHOOTING

Problem: High SWR
Possible causes:
- Incorrect tuning
- Faulty coaxial cable
- Faulty connectors
- Moisture in the connector
- Poor earth or equipotential bonding

Remedial action:
- Readjust the tuning rings
- Check cables and connectors
- Re-seal the connector
- Check the SWR meter and test setup

Problem: Short range
Possible causes:
- Antenna mounted too low
- Obstacles nearby
- Poor-quality coaxial cable
- Incorrect antenna location
- Radio not set up correctly

Action to be taken:
- Check the antenna location
- Mount the antenna higher up and in a more unobstructed position
- Check the coaxial cable
- Check the SWR

Problem: Good reception, poor transmission
Possible causes:
- High SWR
- Faulty connector
- Faulty cable
- Radio unit limited (transmit power) or faulty

Action to be taken:
- Measure the SWR
- Replace the cable
- Check the connector
- Test the radio

Problem: Interference during thunderstorms or due to static electricity
Possible causes:
- Lack of equipotential bonding

- Inadequate earthing
- Lack of surge protection

Action to be taken:
- Have the installation checked by a qualified electrician
- Retrofit equipotential bonding
- Install coaxial surge protection

17. DISASSEMBLY

Before dismantling:

1. Switch off the radio.
2. Unplug the mains lead.
3. Disconnect the antenna cable from the radio.
4. Ensure there is no risk of a thunderstorm.
5. Secure the antenna to prevent it from falling.

Dismantling is carried out in the reverse order to assembly.

Take care to ensure that no parts of the antenna can fall in the direction of power lines.

18. STORAGE

Store the antenna:

- in a dry,
- clean,
- frost-free,
- protected from direct mechanical stress,
- out of reach of children.

GRP parts should not be stored under constant tension or in a bent position.

19. DISPOSAL

The antenna is made of metal, plastic and glass-fibre-reinforced material.

Do not dispose of the antenna with household waste if local regulations require separate disposal.

Please observe local regulations regarding the disposal of composite materials, metals and electronic accessories.

20. DISCLAIMER AND IMPORTANT NOTICE

These instructions contain general installation and safety guidelines.

They do not replace planning, testing or installation by a qualified electrician, an antenna installer or a specialist lightning protection contractor.

The operator is responsible for compliance with all legal, technical and safety-related regulations.

A professional inspection is strongly recommended, particularly for roof-mounted installations, buildings with lightning protection systems, exposed locations or where the earthing situation is unclear.

21. QUICK CHECKLIST BEFORE USE

- Antenna fully installed
- Antenna vertical and securely fastened
- Mast is stable
- Distance from overhead power lines maintained
- Earthing in place
- Equipotential bonding in place
- Coaxial surge protection recommended and installed
- Coaxial cable undamaged
- Connector weatherproofed
- SWR checked
- Radio correctly connected
- No thunderstorm nearby

The system may only be put into operation once all these points have been met.

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