

Safety instructions

Thunderstorms and overloads

The inputs of the ML FX are triple protected against static charge. For coarse protection a fast 60 gas arrester (max. 1kA 8/20µs) is used, followed by a 8KV ESD protector according IEC 61000-4-2 Level 2 / max. 30ns and another 2KV fine protection.

Disclaimer - please note

The integrated overvoltage protection circuit will not protect your equipment from a lightning strike in the event of a direct hit to the house or the vicinity. Irrespective of the loop size, high voltages can be induced which can permanently damage the antenna electronics and/or connected devices. For this reason, liability for these devices is excluded. Other types of damage caused by overloads or by direct HF-exposure (transmitting antennas) are also excluded from the warranty.

In case of absence from home, the potential danger of transmitting (ham radio stations), and thunderstorms etc., can be avoided by disconnecting the antenna cable to avoid any damage.

In the vicinity of strong FM transmitter, please note the following

At the input of the ML FX an FM band-stop filter with extra low-pass is integrated. Thus strong interference can be effectively suppressed by up to 30dB. In the immediate vicinity of very strong transmitters (a distance of a couple of hundred meters) in rare cases the antenna electronics and/or connected receivers can be overloaded. This is possible whenever there is a stronger than -10dBm output level. Weaker signals may be suppressed or phantom signals may be produced.

TECHNICAL DATA

Antenna

Power supply: 5 - 15V DC (max. 40mA)

Connector: BNC / 50 Ohms

Radiator connectors: M5 screws (stainless steel)

Frequency response (-3dB) and nominal gain:

FM band-stop off

1. High Gain: 9kHz - 110MHz & nom. 25dB gain
2. Medium Gain: 9kHz - 150MHz & nom. 20dB gain
3. Low Gain: 9kHz - 180MHz & nom. 15dB gain

FM band-stop on

1. High Gain: 9kHz - 52MHz & nom. 25dB gain
2. Medium Gain: 9kHz - 60MHz & nom. 20dB gain
3. Low Gain: 9kHz - 66MHz & nom. 15dB gain

IP3: typ. +40dBm (@7.00 & 7.20MHz)

IP2: typ. +85dBm (@7.00 & 7.20MHz)

Size / Weight: 98 x 90 x 38mm / 0.12kg

DualPower Inserter CPI1500UNI:

Power supply: max 15VDC/max. 400mA current-limited and protected against polarity reversal

Connectors: 2.1mm DC-power socket (positive inner);

Alternatively via optional USB to DC power plug part no: 00163-1

HF: BNC / 50 Ohms

Size/ eight: 86 x 70 x 29 mm / 0.09 kg

Scope of delivery:

MegaLoop ML FX

Power inserter CPI1500UNI

5m loop made of stainless and saltwater resistant (V4A) PVC-coated steel rope

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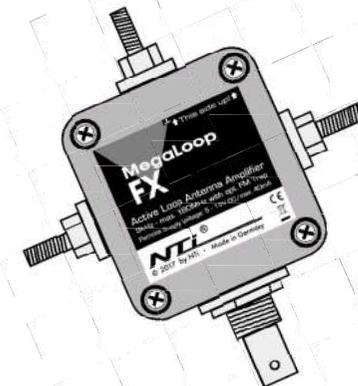
Issue 01/2021

MegaLoop FX

Active Loop Antenna Amplifier 9kHz - max. 180MHz & FM Trap

Operating Manual Version V2.1

CAUTION:
This is strictly a receive-only antenna.
Never connect it to a transmitter. This would
damage your antenna and would also void your
guarantee. Do not place it directly next to a
transmitting antenna.



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A little bit of antenna theory

The ML FX is a premium broadband active loop antenna amplifier with an additional selectable FM band-stop filter.

For maximum flexibility the overall gain is selectable in three stages. In the near field area (distance less than approx. 3 wave lengths), active loop antennas react primarily to the magnetic (H-field) component of the electromagnetic field. Thus the reception of mainly electric (E-field) interference in the near field is strongly suppressed. This effect is especially noticeable in the lower frequency range (VLF/long wave/medium wave and lower shortwave bands) and results in reception with less interference.

Radiation elements

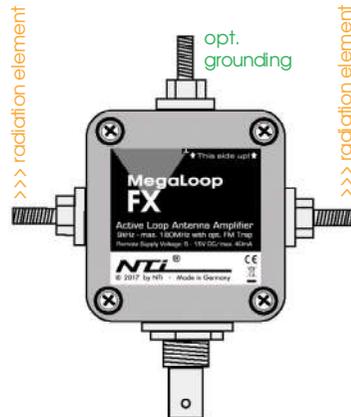
Because of the separation of antenna electronics and antenna radiator, the ML FX offers a flexible solution for connecting different types of radiator elements. The standard version is a loop made of 5m stainless and salt water-resistant (V4A) and PVC-coated high-grade steel rope. Optionally there are also loops of 10m and 15m available.

In principle it is also possible to connect individual radiation elements.

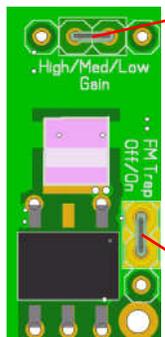
The performance of the antenna depends proportionally on the enclosed area of the loop. The radiator is fixed to the two M5-screw connectors on the side with wing nuts and tooth lock washers.

It is important to install the antenna case with the BNC-connector pointing downwards because there are two small holes to allow condensation to exit.

Optional: You may also attach a grounding wire at the upper connector. The ground is connected internally to the coax outer conductor (ground BNC-jack). You can also ground a loop in the middle.



Selecting amplifier gain: High/Medium/Low & FM Trap



Jumper Gain
High/Medium/Low
High Gain (25dB gain):
For small rigid loops with 40 - 80 cm diameter
Med. Gain (20dB gain):
For loops from 5m to 10m circumference
Low Gain (15dB gain):
For loops greater than 10m circumference
Jumper FM trap (on / off)
For attenuation of nearby strong FM transmitters

For optimum performance according to the attached radiation element the gain is selectable with a jumper. This is necessary to avoid overloading the antenna. To do this, you have to detach the cover of the antenna case (4 stainless steel screws). When you put the cover back on, make sure to tighten the screws sufficiently to make the case waterproof.

Please note: The maximum usable frequency changes accordingly to the selected gain. For more information please refer to the section „Technical Data“

Default: Medium Gain / FM Trap off

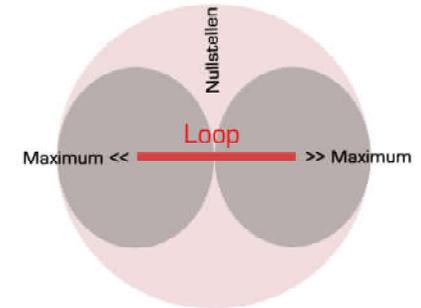
Antenna radiation pattern

Besides two relatively wide reception maxima, the loop antenna has two minima, which are perpendicular to the antenna surface. With increasing frequency, however, these minima become less and less noticeable.

Hint 1:
When installing the antenna in an East-West direction, the minima are towards the poles, whereas the other continents are received relatively unimpeded.

Hint 2:
Interference from a particular direction can be suppressed by exactly adjusting the antenna towards the minima.

Horizontal antenna radiation pattern (typical):



Installation

Basically, an active loop antenna does not have to be installed as high as possible for best performance.

Outdoors, it is sufficient to install the antenna near the ground where it is not exposed to the risk of lightning strikes.

When installed indoors, the antenna will suffer from increased attenuation caused by the type of building (reinforced concrete, electrical wiring etc.).

The antenna should be installed at a place that is permeable to electromagnetic waves, such as windows, lightweight construction walls, attics or on the balcony.

The simplest installation is to suspend the loop as an inverted delta loop (v-shape).

Example of window installation:



Coaxial power inserter

The antenna electronics are powered via the connected coaxial cable of the power inserter. Power is supplied by the power inserter (CP11500UNI) which can be fed by an external power supply. Whenever possible, do not use a switch mode power supply; it is always preferable to use a transformer-based power supply.

Power can also be supplied via USB with the optional USB to DC power plug part no: 00163-1. A self-resetting fuse will limit the power input to 400mA in case of a short circuit.

The power inserter has two LED-status indicators:

Green (PWR): Operating voltage display
Red (!): Short-circuit or overload indicator

Attention:
If the red LED illuminates, disconnect the antenna and power cables from the power inserter and investigate the cause of the short circuit or overload!

