GNSS and LTE Antennas
- please refer to the dedicated datasheet for details -

General hints for antenna installation:

- Use a sufficient ground plane directly under the GNSS antenna if the antenna is not mounted already directly on a grounded surface. The metal ground plane (connected with “earth” of the vessel) shall have not less than 20 cm diameter to prevent any reflection from the bottom side.
- Use only high quality GNSS Antennas from well known manufacturers, with a preferred antenna gain of at least +30dB and good “Out-of-Band” filtering (e.g. if an Inmarsat communication is operated close-by).
- When installing multiple GNSS Antennas, separate them by at least 1 m.
- When installing GNSS Antennas near other transmission antennas, separate them if possible in height by at least 3m, above or below each other.
- If the antenna cable (coax) is longer than about 10 m, use low-loss cable RG-59 (~15 dB / 50 m) for up to 50 m distance instead of RG-58 (~30 dB / 50 m). For length up to 100 m use LMR-400 cable (~8.1 dB / 50 m). This is especially important when using high accurate GNSS (L1,L2, RTK, dual-antenna). Do not bend the cable strongly as it increases the loss and hence leads to significant degradation.
- Only important for highest accurate time measurements: An RG58/59 cable leads to a typical propagation delay of ~40 ns / 10 m – i.e. keep the cable length always as short as possible!

The following pictures show an overview about GNSS antennas iMAR Navigation provides as standard equipment.

- Formfactor: Diameter 3.5” or 2.6” diameter or ARINC743
  (note: the smaller the antenna, typically the lower the performance)
- L1 and L1L2L5 GPS + GLONASS + GALILEO + BEIDOU + SBAS + L-Band
- Screwed, bolt threaded, bulkhead (with seaing) and magnetic foot GNSS Antennas
- LNA, 33-35dB Gain (standard), 40 dB on request
- Central TNC bulkhead with sealing, SMA or MCX connector
- colour gloss white or other on request (lusterless grey, olive crab green, lusterless black)
- For specific additional filtering ask iMAR sales engineers (e.g. to reduce distortions from near-by INMARSAT antennas)

Furthermore nearly all versions of devices are deliverable – ask iMAR sales engineers if the following standard antennas would not match to your requirements.
The following pictures show only type examples. Refer always to the individual drawing related to your specific GNSS antenna!

Left:  Example for threaded antenna with threaded bolts from top
Right: Example for ARINC743 antenna

Left:  Example for magnetic foot mounted antenna with SMA connector
Right: Example for bulkhead mounted antenna

Left:  Magnetic foot mounted L1 GNSS antenna with integrated cable
Right: L1L2 GPS-GLONASS L5 UMTS GSM WLAN antenna for rail vehicles
Antenna with ground plane, with vacuum fixation foot: 
left: GNSS antenna with SMA connector – it is recommended to use a 
bulkhead antenna (central connector downside, e.g. 90° MCX to save 
space); right: LTE antenna

Semi-Chokering-Antenna for GNSS for multipath reduction:

Design rule for L1L2 antenna:
Distance between plates:
Lambda / 4 x cos 45° = 33.6 mm
Difference of radius between each plate:
Lambda / 4 x cos 45° = 33.6 mm
(i.e. linear distance between outer edge of 
neighborhooded plates shall be lambda / 4 
of L1 and shall have a slope of 45°).
Lambda (L1) = 190.5 mm (wavelength).
The plate’s inner diameter shall not be 
smaller than 200 mm (larger than lambda).