iRRR

iMAR's GNSS RTK Reference Receiver Rack
19" Rack dissimilar redundant GNSS Base Station for permanent Installation

iMAR's iRRR is a robust, high performance RTK GNSS Base Station dedicated for stationary installation within a 19" rack. The iRRR's integrated GNSS receiver operates in Fix Position Mode and generates RTCM correction data in comparison to its known position.

The iRRR provides RTCM correction data streams via VHF/UHF radio modem output by integrated field proven SATEL Radio Modems as well as via UART interface. These data, generated by the integrated all-constellation / all-frequencies GNSS receiver, can be forwarded via the integrated NTRIP Caster as well as via an external one.

As a special feature, the iRRR can be equipped with up to three simultaneously operating dissimilar redundant (!) high performance GNSS receivers – it is the leading hardware solution to mitigate well-known impacts from common mode failures (in usual standard setups known from other manufacturers, only one or several identical GNSS receivers are operated and common mode failures in the RTK correction data cannot be detected).
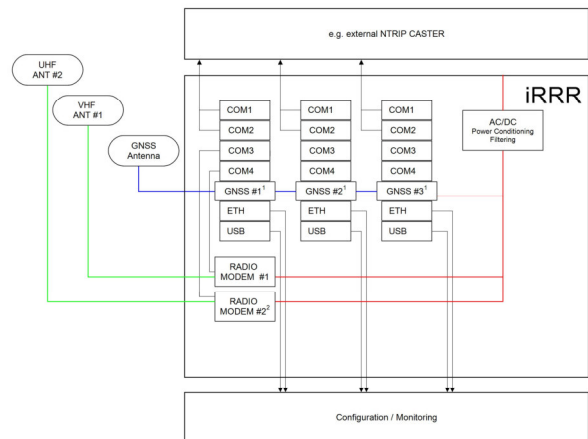
The iRRR's GNSS receivers may be configured and monitored via USB, Ethernet or UART interfaces and thus be integrated easily in exisiting IT infrastructure monitoring concepts of the operator.

- iRRR supports up to three dissimilar redundant high performance and commercial grade GNSS receivers
- iRRR supports LNA Power Supply for GNSS site antenna
- iRRR supports Base Station Position Averaging[1]
- Integrated NTRIP Caster[1]; RTCM 2 output; RTCM 3.1, 3.2, 3.3 output (MSM Messages not via Radio)
- Several SATEL Radio Modems supported (VHF/UHF [up to two evices in parallel within iRRR])
- Provision of initial base station position determination by averaging
- Site support to request frequncy channels via authorities
- Site support to plan and verify coverage
- Rovers can communicate with iRRR Base Station via NTRIP or via SATEL Radio Modems (supported by all iMAR Navigation devices like iNAT, iTraceRT-MVT, iTraceRT etc.)
- On request iMAR supports to request frequncy channels from the authorities
- On request iMAR supports the user to plan and to verify coverage requirements for best performance

The SATEL Radio Modem(s) may be configured via UART serial interface(s).

The known position of the iRRR results either from position averaging or site surveying. Correction data streams are configurable via UART serial interfaces providing physical layer specific data. The iRRR is integrated inside an EMI/EMC protected 19'' rack and powered by 100-240VAC/50-60Hz.

The iRRR is considered a permanent infrastructure installation as used in proving grounds, test areas, ports etc. to provide GNSS correction data within a proximity of about 3…20 km via Radio Modem, while providing correction data streams via NTRIP Caster to cover also larger areas (~30 km with centimeter accuracy and also longer with approx. 1 ppm of distance additional position error).

[1] dissimilar redundant GNSS receiver #2 and GNSS receiver #3 are optional
[2] Radio Modem #2 is optional (dissimilar frequency to Radio Modem #1)

Technical Data of iRRR (excerpt):

Amount of GNSS engines:	up to 3 dissimilar redundant all-frequency / all constellation GNSS receivers (GPS, GALILEO, GLONASS etc.)
Position accuracy:	± 2 cm horizontal, ± 4 cm vertical (+ ~1 ppm of distance between Rover and reference station iRRR)
Time to first fix:	60 s (typical)
Data rate:	usually 1 Hz, up to 20 Hz for position correction data (depending on the physical layer and application)
Interfaces:	Ethernet, UART, Radio Modem up to 19.2 kBd; UHF 430 MHz or VHF 160 MHz (5 W recommended)
Power Supply:	230VAC / 3 Amp. (100…235 V AC, 50/60 Hz)
Communication Network:	UHF/VHF, NTRIP[1]
Environmental Protection:	IP20; CE