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## Hardware development



GNSS reference station layout as introduced in 2007. 19" rack with power supply, switchbox, off the shelf receiver, VPN router, 2 PC's (cold redundant) and Monitor / keyboard tray. Power consumption ca. 60 Watt (monitor off). It is the existing standard.



tinyPC and later tinyPC/2, a versatile low power PC with switching capabilities, can easily be combined with all sorts of GNSS receiver types and met sensors.

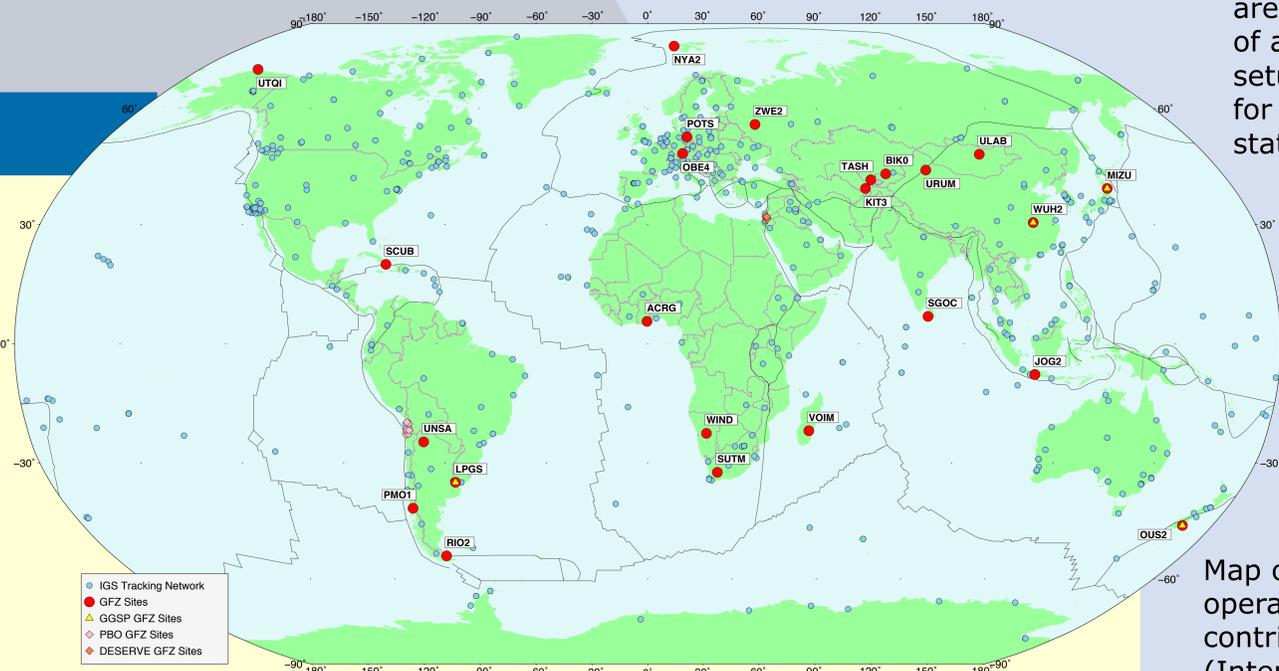


tinyPC/3, the same PC hardware as tinyPC/2, but including a Javad OEM receiver. Low power (5 Watt typ.) with wide temperature range  $-40^{\circ}\text{C} \dots +85^{\circ}\text{C}$ . This setup is recommended for campaign mode installations.



tinyPC/4, using two hot redundant PC modules as in tinyPC/2, this receiver setup combines a high end Javad OEM receiver (Jvad TRE-3), switchboard and a GSM router. Still low power (15 Watt) with extended temperature range  $(-35^{\circ}\text{C} \dots +75^{\circ}\text{C})$ . All modules are easily exchanged by means of a complex motherboard. This setup will be the future standard for the GFZ IGS Reference station network.

## Global Network



Map of the GNSS installations operated by GFZ. Stations contributing data to the IGS (International GNSS Service) are highlighted in it's context to available IGS station worldwide.

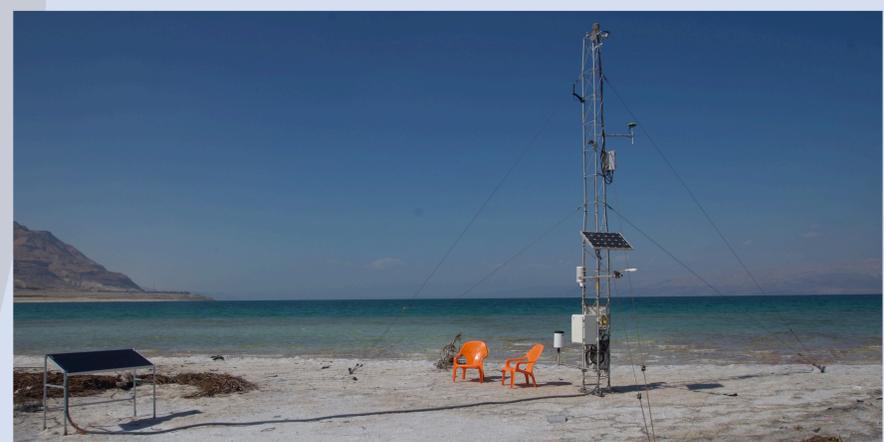
The global GNSS station network operated by GFZ serves since the foundation of the GFZ for investigation of global, scientific questions in different areas, and is an essential part of the scientific infrastructure of the GFZ. For this purpose, generations of hardware setups have been developed to ensure a continuous data logging with real time capabilities. This poster gives an overview of the developments of the last decade. All layouts shown here are driven by the same, linux based, GNSS station software.

## Installation Examples



Permanent installation of a GNSS antenna /met sensor in Ny Ålesund / Spitsbergen. It is a roof top installation with a steel mast, the barrel shape construction acting as a thermal insulation.

The author likes to say thank you to all 'on site' contacts for their support. Even highly automated systems with sophisticated remote control capabilities need *hands on* care from time to time...



Campaign mode installation for GNSS reflectrometry monitoring the water level of the Dead Sea. tinyPC/3 inside a sheltering box (unventilated) with solar panel.