

Mobile Reference Station – Get to Know the New RTK Network Approach

SOKKIA's Mobile Reference Station, the latest RTK infrastructure solution, works with SOKKIA equipment to communicate to any number of mobile receivers in the field.

Working with the Mobile Reference Station

A SOKKIA GSR2700 ISX receiver, acting as the Mobile Reference Station, is positioned on a known point. The Mobile Reference Station then streams satellite corrections to numerous GNSS rovers in the field via GSM mobile and/or CDMA technology. These corrections allow the mobile receiver to calculate its position in real time to create a fixed solution.

The Mobile Reference Station produces more than 5,000 km² of RTK coverage. Because communication is gathered through satellite tracking, rough terrain and other surveying inferences pose no problems for the Mobile Reference Station and its mobile receivers.

Benefits of the Mobile Reference Station

Mobile Reference Station technology doesn't tie down surveyors by requiring that they work in a close proximity to the reference station. This technology ensures superior GSM signal equality and a comprehensive coverage area. It also provides surveyors with a wide range of advantages:

- High-Precision Positioning
- Maximum efficiency and productivity
- Minimal equipment, thus reducing setup and operating costs
- Increased flexibility
- Works with GNSS receivers from all manufacturers
- Create simultaneous connections with multiple Mobile Reference Stations
- User-friendly installation and configuration
- Scalable option, thereby eliminating a large initial investment

Mobile Reference Station in Action

The Mobile Reference Station system, comprised of SOKKIA's GSR2700 RSX reference station and GSR2700 ISX GNSS receiver, enables surveyors to expand to an unlimited number of applications, including

- Geodesic Control
- Conventional Surveying
- Engineering and Construction
- Civil Monitoring and Deformation
- Mapping GIS
- Mining and Machine Control
- Agriculture Precision

Mobile Reference Station Case Study: 3D Engineering, São Paulo, Brazil

RTK Networks first came to São Paulo in August 2007, when the first reference station known as SAOP0 for commercial was installed at the Teodonivel headquarters. Teodonivel is the authorized SOKKIA dealer in São Paulo, and they presented this technology at 8th Annual Meeting of Surveying and Mapping.

A São Paulo surveying company, 3D Engineering, used this reference station to host differential corrections. This process involved the GNSS base reference station (SAOP0) to send information to a GSR2700 ISX receiver acting as a Mobile Reference Station through a *Bluetooth* connection. The GSR2700 ISX receiver operates with a GSM module or a UHF radio.

Today surveyors with 3D Engineering can accomplish many geodesic jobs, such as

- Surveying (horizontal and vertical)
- Industry locations
- Leveling
- City and Country register
- Geo-reference of country real estate

To demonstrate the high-precision and user-friendly abilities of the Mobile Reference Station, employees from both Teodonivel and 3D Engineering used a GSR2700 ISX receiver, SOKKIA GSR NetLink and Mobile Reference Station to verify the network adjustment on a geodesic point in Charqueada, This known point was called SAT-93905. To gather the data, the group used the base Mobile Reference receiver that was located in Teodonivel's headquarters.

As seen in the chart below, the Mobile Reference Station and GSR2700 ISX produced accurate, reliable results, even at a baseline distance of 28 km:

| SAT-93905 Known Coordinates | SOKKIA GSR2700 ISX Coordinates | COMPARATIVE |
|-----------------------------|--------------------------------|---------------------|
| N = 7.507.510,431 | N= 7.507.510,441 | $\Delta N = 1,0$ cm |
| E = 213.278,482 | E = 213.278,459 | $\Delta E = 2,3$ cm |
| h = 576,530 | h = 576, 572 | $\Delta h = 4,2$ cm |

Datum used: SIRGAS 2000

"We have more than 60 hours of connection with the reference station in São Paulo, and we've done 46-km distance from the Reference Station and achieved a survey accuracy of 6 cm. As I become more acquainted with the Mobile Reference Station, I trust this system more and more. The entire connection of equipment, including GNSS receivers, mobile devices and data collector, performed with the total absence of wires and cables. This wireless setup improved equipment handling without a need for external batteries or other peripherals," says Jose Henrique Carvalho of 3D Engineering (www.3d.eng.br).

A video recording of the day can be seen at <http://br.youtube.com/GabrielGPS>.

For further information, please contact the Teodonivel sales team to schedule a demonstration of the Mobile Reference Station system and discover this new alternative for RTK work.

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