

GSR2700 ISX GNSS System by Sokkia

A flexible, scalable, cable-free solution that suits small to large companies.

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SUGGESTED PRICE LIST:
Pricing depends on if the GSR2700 ISX receiver comes equipped with an installed UHF or GSM radio; a GSR2700 ISX rover (UHF) can be purchased for approximately \$14,000.



The Sokkia GSR2700 ISX GNSS solution is advertised as being flexible, efficient, simple to operate and scalable. As a surveyor for more than 20 years, I agree that the ISX delivers on all of these promises.

Ready, Set and Go

One advantage I found with the ISX is that a trip to the field requires very little equipment. To set up the ISX as a rover, I only needed the ISX receiver, a range pole and a data collector with bracket. The cable-free connections of the ISX are simple and quick, and even with an internal UHF radio installed, the entire receiver only weighed 3.9 pounds. Setup can be completed in less than 10 minutes with a typical initialization achieved within seconds.

One of my favorite features of the unit is the audible voice-message function, which makes stakeout mode uncomplicated. The ability to navigate heads-up to a point is a real timesaver. Instead of trying to visually monitor the receiver (or listen for a blip or bleep) as I moved, I was alerted instantly with an “RTK Lost” message. Other announcements include “RTK Fixed,” “Receiver Ready” and “Battery Low.” Spanish-speaking users can easily change the receiver prompts to deliver in Spanish. There are 10 languages available for the ISX receiver.

I found the ISX designed to operate in real-world field conditions. The instrument comes with a well-designed, sturdy carrying case. According to Sokkia, the receiver can withstand water submersion up to 1 meter and a fall of up to 2 meters. The batteries, capable of providing a full-day’s work, are designed to last about 10 hours in RTK mode and 16 hours in static

mode. And no cables are needed to link to the antenna or the data collector.

Fixed and Secure

The GSR2700 ISX can be configured a variety of ways. As a traditional base and rover system with integrated UHF radios, I found the ISX to provide excellent results. Configured this way, I sent an operator into the field to topo approximately 50 acres of open field with well-established fencerow trees.

He collected more than 1,500 data points in a two-day period, including ties to the property corners. Twenty-year survey veteran Tim Fielder said he appreciated the balance and light weight of the rover by the end of the day. “A three-man crew configured with a total station and two rodmen can collect five hundred to six hundred data points in a typical day,” he says. “I estimate that we average a thousand points a day with the ISX and one crew member.”

Fielder said the unit’s internal radios operated very well within the 50-acre site but were more susceptible to losing connection when operated at distances of more than a mile and a half. An optional external radio is available through Sokkia for longer distances.

The ISX has both GPS- and Glonass-tracking capability, which provided consistent satellite coverage in open areas and near the fencerows. With the ability to track both satellite systems simultaneously, the number of satellites available to our crew members was typically between eight and 14. Even in the tree-lined areas, we did not experience any decrease in performance and still maintained a fixed solution.

Look, No Base Station!

The GSR2700 ISX can be purchased with an internal GSM modem or an internal radio. Although the instrument I used was configured with an internal radio for use with a base station, Bluetooth technology allowed me to connect via external cell phone to receive data from the Ohio Department of Transportation’s (ODOT) Virtual Reference Station (VRS) network, which I was given access to for this review. The cell phone ran an easy-to-use Windows-based program called Sokkia GSR NetLink, and again, the Bluetooth technology allowed it to be done completely wireless.



Photo courtesy of Tim Fielder

Crew member Charles Campbell uses a Sokkia GSR2700 ISX system rover to record topo points in Warren County, Ohio.

Being able to operate without a base station has some significant advantages. “When using the VRS network, you don’t have to worry about a base station being stolen or knocked over,” says Charles Campbell, a WYCO Consulting crew member for more than 15 years.

“Connected to the ODOT network, I occupied several Warren County, Ohio, GIS monuments that were three to five miles apart,” he continues. “The occupations were for less than five minutes, and the coordinates obtained were accepted with no post processing. The average difference in grid distance between points as reported by Warren County and as calculated with the ISX was less than 0.03 feet.”

In southwestern Ohio, the field conditions vary from urban to rural, from wide-open fields to wooded areas to urban canyons, and from flat land to rolling hills. Often, in a single day, my schedule can include construction staking for an inner-city school to recovering corners for a 200-acre field. In areas outside the reference network coverage, I could still use the internal UHF radio of the ISX unit. There was no difference in data collection between the traditional and the

VRS configurations of the ISX, so it was very flexible to switch between the two.

Additional Configurations

In areas where no VRS network is available, a user can opt to use the Sokkia GSR2700 RSX Reference Station setup to broadcast to multiple rovers. The RSX Reference Station includes a GNSS receiver, GSR reference station software and a Windows XP-based PC with a built-in Ethernet port for easy connectivity. GNSS data collected at the base is broadcast via the Internet for remote access 24/7. I did not evaluate the RSX but find it to be an important feature of the system.

As Sokkia describes, the GSR2700 ISX, in combination with the GSR2700 RSX, can also be configured to operate as a mobile reference station in areas where extended coverage is required. This configuration enables GNSS data to stream from the GSR2700 ISX over a GPRS connection to the GSR2700 RSX GNSS reference station with a push of a button. Acting as the mainframe, the GSR2700 RSX manages this data and distributes it to an unlimited number of rovers located within the vicinity of each mobile reference station. This solution provides an instant on-the-fly setup with customizable RTK coverage to fit the needs on a project-by-project basis. Sokkia advertises that each mobile reference station produces

more than 5,000 km² of accurate, reliable RTK coverage without having to rely on electrical hookups or Internet access.

For Small and Large

With the multiple configurations available, the Sokkia GSR2700 ISX GNSS system is affordable for a small company like ours, yet it has the capabilities a large organization seeks. The ease of operation and setup as well the accuracy and reliability more than met our expectations.

A smaller company will particularly benefit from the ability to operate the system as a base and rover or to connect to a VRS network. Larger companies will be well served by the opportunities to operate multiple rovers using a fixed or mobile reference station. Additionally, the system’s cable-free, lightweight setup is a labor-saving benefit that all field operators will appreciate. 🌐

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Next month, read how the Sokkia GSR2700 ISX GNSS assisted Korean researchers in studies of environmental warming in Antarctica.