



## **Case Study – GSM2 Comms units**

### **Bentley DSR to Marsh Lane DBS – Level control GSM Comms Link**

#### **Introduction**

Severn Trent Water (STW) were looking for an immediate solution to a constantly troublesome radio link system installed 3 years previously via an approved contractor.

The DSR is a remote site with no mains power available thus the original level and radio equipment was working on a solar panel system. This site is required to transmit 1 x 4-20ma level signal to the Marsh Lane DBS. The output of the radio link at Marsh Lane DBS is used to output the 4-20ma signal and thus control the pumps via a control panel.

The terrain is very straight forward but the area is on the edge of a small village called Mosborough which has several roads linking Sheffield so is a busy route. This led to some of the issues with the existing radio system as when temporary road works were placed anywhere within a 1-mile radius of either end of the transmission path. The temporary traffic lights set up on the roads caused havoc with the signal path of the existing radio link installed rendering the system unusable.

Even when traffic lights were not in the area the radios were susceptible to atmospheric issues of high weather pressure etc. Again, this made the system totally unstable and a complete loss of control.

A subsequent loss of service reservoir supplies was experienced due to these issues on evening which resulted in loss of area supplies for 12 hrs or so.

The local maintenance staff were tasked with obtaining a fast fix solution that could be obtained immediately to ensure reliable level comms could be restored between the two sites.

Hence, due to the success of another fast fix GSM solution used in the district at Edale DSR, the request to obtain a pair of Simranger GSM 2 units via a STW approved supplier was received.

## Design Specification

The system must be able to work off a 12v dc solar supply and take 100 milliamps max.

The system must be able to transmit 1 x Analogue signal (4 to 20mA) and 1 digital output for comms failure.

The units must work from a STW supplied Arkessa SI **Roaming SIM card** and only use less than 30mb of data max per month on each unit.

The radio must transmit every 10 mins or faster updates if required.

If no GSM signal received after 30mins the unit should failsafe and its milliamp output must be driven to 0ma and also drop the 'failsafe' 'comms fail relay' to indicate to telemetry that there is a GSM system comms fail. The 0ma output would force the pump starter panels to start pumps (worst case scenario) done in the sites control panels.

On restoration of GSM Comms the system should auto reset itself back to transmitting the 4-20ma level comms signal and reset the 'comms fail relay' back to healthy thus gaining control of the pumping system.



## Site Survey

The site STW instrument technician confirmed that there was a healthy O2 mobile comms signal of 3G strength on both ends of the site. As this was an immediate solution required this was ample to work the Simranger GSM2 comms units.

## Quotation / Ordering Stage

A quote for an immediate dispatch of a pair of GSM2 units was raised from the Hailey Group (an official STW supplier) via Simranger.

The quote was issued the same day along with a PO to the supplier.

These were programmed up with the outlined parameters required and the pair of units was delivered to the site on the same day as this was an urgent requirement.



## Installation

The Simranger GSM2's were fitted immediately via the STW area instrument technicians. This was simply a matter of removing the redundant radio links and replacing with the Simranger GSM2 units.

Once the units were fitted, in less than 2 hours for both sites, the units powered up, comms was swiftly established.

## Commissioning

Simranger attended site (free of charge) to assist with a smooth and swift commissioning as this was the first time the technicians had fitted this kit.

The units were then commissioned using a forced 4-20ma stepped through the ranges and also for its action on a loss of site comms between the units. All performed perfectly.

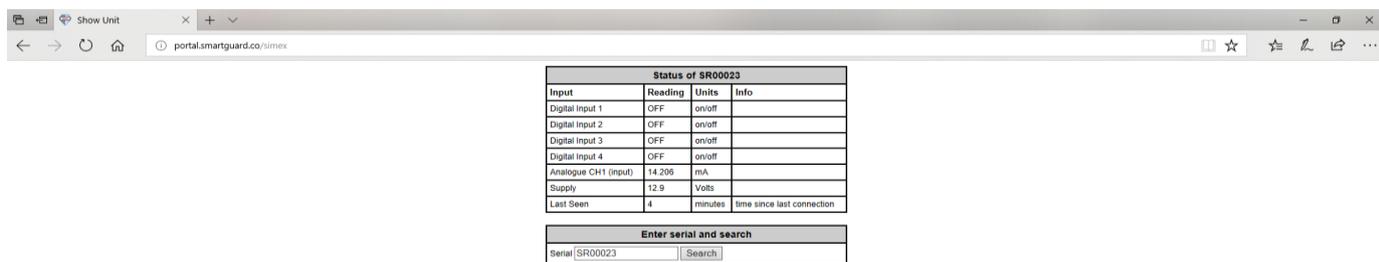
As the end of the day the site was left working and auto pumping was restored on the Marsh Lane DBS.

## Site issue / comms fail alarm experienced

The units worked well for around 48hrs but a comms fail alarm was received at COSC around 04.30 hours in the morning and the STW instrument technicians rang Simranger at 8am to ask for possible assistance as they had not yet had time to get to site.

Simranger simply booted into the simple 'free website / mobile phone app' (shown below) supplied and typed in the serial numbers of the units on both sites to look at the status update on the servers. Note- this is a read only function website/app.

### Free Issue Website/app



Status of SR00023			
Input	Reading	Units	Info
Digital Input 1	OFF	on/off	
Digital Input 2	OFF	on/off	
Digital Input 3	OFF	on/off	
Digital Input 4	OFF	on/off	
Analogue CH1 (input)	14.206	mA	
Supply	12.9	Volts	
Last Seen	4	minutes	time since last connection

Enter serial and search	
Serial: SR00023	<input type="button" value="Search"/>

Very quickly it was determined that the battery voltage at the DSR (solar panel) end of the comms path had last been seen at 10.2v at 04.20 that morning. The Simranger GSM2 units power off below a 10v DC supply to protect the batteries. Thus, this was deemed the most likely cause of the issue...low battery.

It was then enquired from the STW instrument tech as to what size solar panel was the site working from on the original installation.

It became apparent that it was only a 30w solar panel on a 7ahr batt and hence was not large enough to sustain both a 4-20ma level and 100ma drain from the Simranger unit.

A 100w solar panel was recommended by Simranger to be fitted with a 24a/hr batt. This was duly obtained from the STW stores back at base on the same day and both solar panel and battery were fitted that same day by the STW instrument technician.

Immediately repowered the comms system restored level signal between the sites and the pumps began to function again in auto control.

The system has now been in place for over 11 months and has not suffered any other outages or issues in this time.