

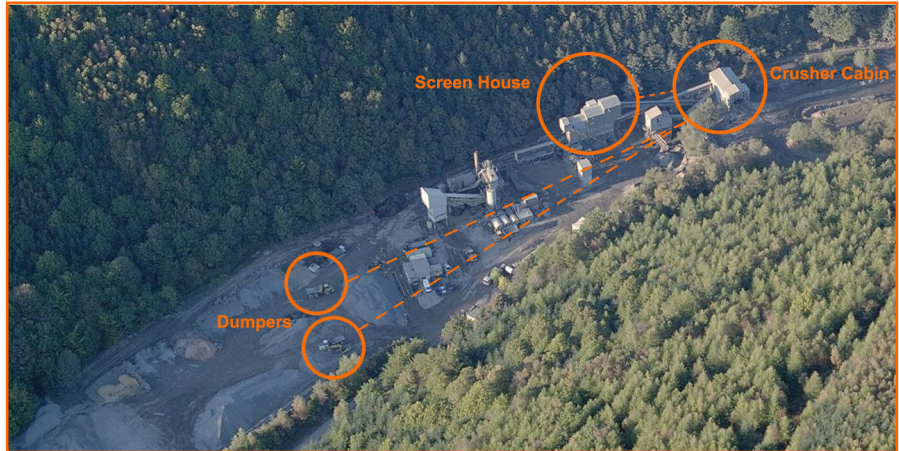


Wireless Level Measurement Application



Innovative radio transmission level system controls the 'ups and downs' of screen house bins

An innovative six point HyLink radio transmission level system, supplied by leading level measuring specialists Hycontrol, is providing crucial operational data on the contents of screen house bins at Lafarge's Hafod quarry in south Wales. Level data from the screen house bins is transmitted simultaneously to the receiver in the crusher control room and to robust portable receiver units in the cabs of the two dumper trucks used to transport screened product around the site.



Owned and operated by Lafarge, the Hafod site (above) produces over 250,000 tonnes of grit stone per annum. Part of this production is used by the on-site bitumen coating plant,

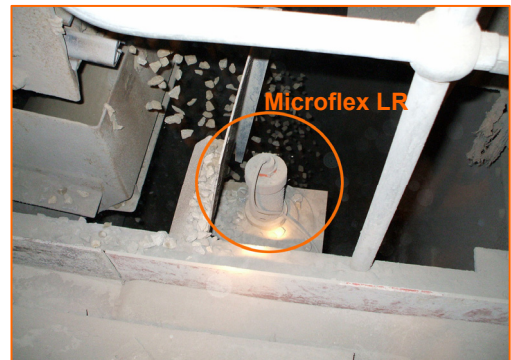
whilst the remainder is processed for sale as coated stone or aggregates. Maintaining optimum levels of material in the screen house bins is vital to ensure efficient and uninterrupted production across the site. If bins become full or run short of product, then various production activities are adversely affected until the situation is remedied. In the harsh operating environment of a busy quarry such as Hafod, providing level measurement on the bins only solves part of the problem: real time data availability and accessibility for relevant personnel also needs to be a crucial part of any system.

Hycontrol's HyLink system, in conjunction with their industry-proven level measuring technologies, provides secure robust transmission of data to critical parts of the operation, removing the need for extensive and vulnerable wiring.



The eight metre high bins contain screened product varying in size from dust up to oversize stone 80 mm in diameter. The four bins containing stone from 10 mm diameter upwards are fitted with Hycontrol's Microflex LR two wire, loop-powered ultrasonic units. These versatile instruments have a proven track record operating on storage bins and silos up to 60 metres high. The Microflex utilizes new lower frequency ultrasonic technology, allowing it to operate successfully in difficult conditions. The unit's proprietary advanced echo extraction system automatically ignores false echoes from falling stone and averages out any uneven level patterns as the bins fill and empty. The unit can be fitted with an optional GSM modem allowing access for remote commissioning and service.

The two bins containing 6 mm stone and dust respectively, are fitted with Hycontrol's VF03 TDR guided wave radar units. These units are unaffected by the high dust levels predominant in these bins and provide excellent long term accuracy over the full measuring range. Changes in pressure, temperature and density also have no affect on performance. These instruments work on the principle of Time Domain Reflectometry, commonly known as TDR, originally developed for checking and locating damage along sub-sea telecommunication cables. The units have replaceable 8 mm diameter stainless steel wires which extend the full length of the bins down through the product. These act as the wave guides for the low-power electromagnetic pulses. The units are fully calibrated prior to installation. All the instruments are powered by the six point radio transmitter unit installed in the screen house. This then retransmits the level readings to the two separate portable receivers fitted in the mobile trucks and the receiver located in the crusher control room. An additional receiver installed





in the bitumen control room provides voltage level outputs for the site's upgraded PLC currently being installed. Using the standard external aerials, the radio system has a minimum working range of 200 metres, increasing to 500 metres with good line of sight. This can be upgraded using higher power aerials.

Percentage level information is displayed simultaneously on the individual HYC3420 LED displays in the custom built panel in the crusher control room and on the mobile cab displays. This dynamic real time data availability across the site means that rapid decisions can be made by operators and drivers to optimise product availability to keep the plant running. If required, the system can be set-

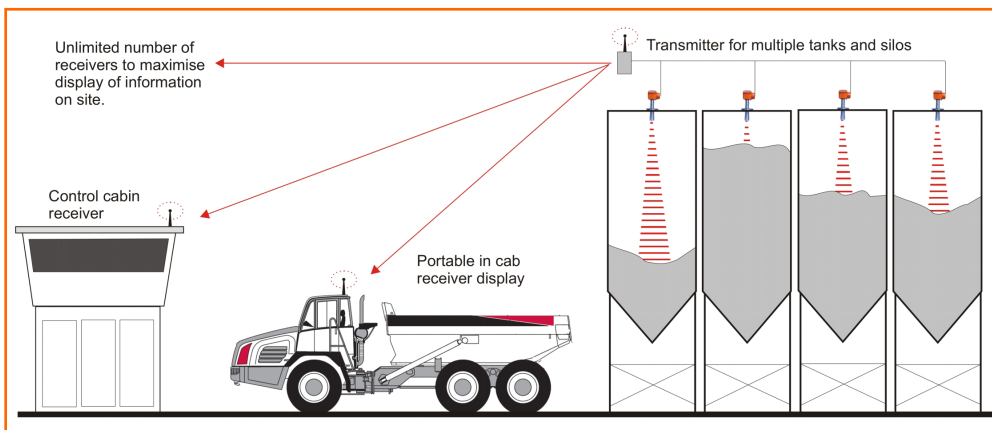
up to display bin contents in tonnes and optional output relays could be used to provide Hi-Lo alarms. A twelve point measuring system is also available for larger installations.

The integration of robust radio transmission technology together with different level measuring technologies, provides a the ideal custom solution for this classic quarry operational problem and Hycontrol's Sales Director Nigel Allen believes it is his company's blend of experience, flexibility and innovation that sets them apart from their competitors. *"We have developed a broad and diverse range of level measuring technologies that allow us to select exactly the right product or products for any particular application. In some installations we may incorporate five or six different technologies depending on specific circumstances. In parallel we have pioneered the development of proven communication technologies that can be integrated to provide the optimum system for such applications. Our in-house panel build and design capability is unrivalled in the industry and this versatility means we can supply complete operational systems that can either be standalone or integrated with customers' control systems and software."*



The portable vehicle level receivers bring a new dimension to level measuring, ensuring real time data can be used to best advantage at busy sites. The units have an integral aerial and can either operate off their built-in rechargeable batteries or the vehicle's standard auxiliary 12 V power supply in the cab. In the Hafod installation the units can display all six bin levels at once in two columns, with the option to view one bin at a time or scan to show all bins in rotation. If level systems are configured to read in tonnes, the cab display can be used to monitor vehicle loading."

Hafod's Quarry Manager Iain Ormrod is delighted with the Hycontrol system and as he concludes: *"The installation of the wireless*



bin level system has made us a more efficient production unit. Prior to this, the stocking dumper driver had to guesstimate when each bin was getting full and this could lead to the bin over filling, contaminating the products in adjacent bins in the process. It could also lead to bins running

empty, forcing the bitumen coating plant to use material from stock. Unfortunately, due to the renowned Welsh weather, this was often soaking wet, thereby increasing our drying costs on top of the cost of moving material twice. An added bonus of knowing the level status of each bin is that the stocking dumper can be used for other tasks when the coating plant is busy, such as moving quarry waste, safe in the knowledge that the in-cab display will indicate when a bin is getting full."

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