



SITRANS LUT400

## License to fill: ultrasonic level control on a tertiary crusher



This is our mission, should we choose to accept.

**The location?** A tertiary crusher at Torr Works, an Aggregate Industries limestone quarry in Somerset, England.

**Our challenge?** Measuring levels in a dusty environment with 100 millimeter (3.9 inch) rocks whizzing by, and – not surprisingly – a lot of noise.

**The solution?** SITRANS LUT400 ultrasonic controller with an Echomax XPS-15 transducer from Siemens.

**The benefits?** Time saving during installation and setup, plus continu-

ally accurate, maintenance-free level measurements.

### Crushed, not stirred

It doesn't take a specially trained secret intelligence agent to diagnose the need for accurate and reliable level measurement in our quarry's tertiary crusher. At Torr Works, we produce six million tons of limestone annually, so materials are always on the move – and moving quickly, too.

Loading shovels haul up to 25 tons (27.6 short tons) of limestone at a time,



With six million tons of limestone moving through our facility each year, Torr Works needs accuracy and reliability in our tertiary crusher level measurement.



We found commissioning the SITRANS LUT400 very easy – with the controller's Quick Start Wizard, the new level measurement system was up and running in record time.

depositing it onto the primary crusher's intake area. This seven-story tall walking crusher breaks rocks into smaller sizes. From here, belt conveyors move materials to one of the tertiary cone crushers, each with a throughput rate of 150 tons per hour (165 STPH).

### Control. Level control.

We use level measurement in the tertiary crusher to control the feed of material into the crusher so that we can correctly maintain the quality (shape and size) of the stones being processed.

With materials on the go, we need to maintain the efficiency of our entire operation, minimizing product waste and preventing time-consuming cleanup if spillage occurs.

Since crushers are a large energy consumer in quarry operations, it is important that they run with the highest possible efficiency. Choke feeding is the most common way of ensuring that a minimum level of rock is maintained in the crusher bowl.

We don't want the crusher bowl ever to run empty, as this is a waste of energy. As well, crushed stone will hit the empty conveyor with greater-than-normal impact and create additional spillage, which could damage the outfeed conveyor belt and result in its increased wear and a reduced lifetime.

If the level ever gets too low, rocks are not crushed to the right size on the first pass. These then need to be recycled to the correct size, resulting in increased energy consumption. The crusher never goes empty, but instead runs efficiently, with the correct level of limestone.

With all of these considerations – plus dust, falling material, and noise levels in excess of 85 decibels – level measurement in this application is a challenge.

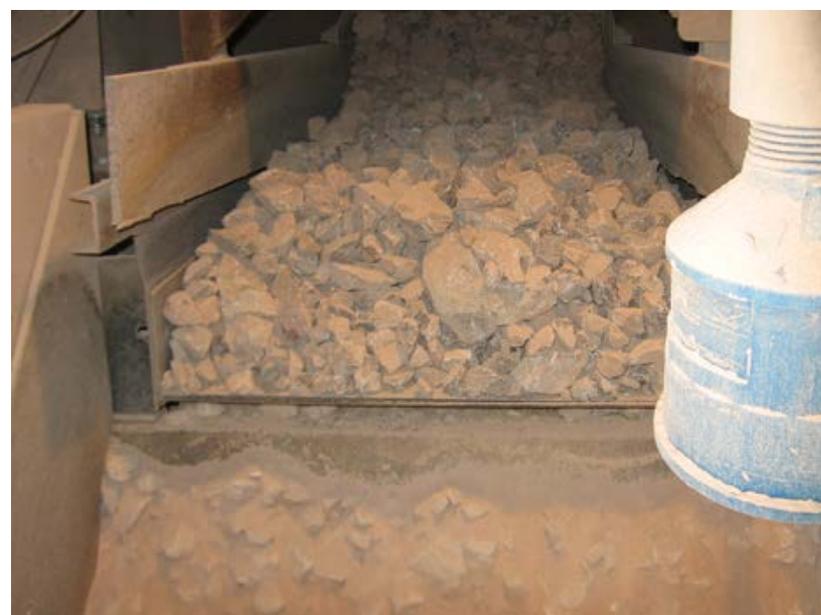
As Gareth Harries, our Electrical Engineering Team Leader, says, "There is not a lot of equipment I have seen that can stand up to the environment we put measurement devices through."

### From Siemens with love

Torr Works has a long history using Siemens equipment, so we chose to install their new SITRANS LUT400 ultrasonic level controller into this process.

We connected the controller to our existing Siemens Echomax transducers on site, which is a real bonus, since it saved us a lot of installation time. Our operators found the device's enclosure easy to connect and mount onto the wall, and they quickly programmed the controller using the Quick Start Wizard.

Says Gareth, "There is plenty of room to wire the device with the removable terminal blocks. Plus, little touches like the 1/4 turn fasteners are helpful so that screws do not drop out and get lost in this environment."



The SITRANS LUT400 controller is compatible with all Siemens Echomax transducers, so operators didn't need to replace our existing transducers.



Installation and setup was simple with the controller's removable terminal blocks for ease of wiring and the convenient 1/4 turn fasteners.

Non-contacting ultrasonic technology works for us in this application, since high vibrations or rocks that could hit the sensor mounted above the crusher bowl are too demanding for measuring devices like radar or laser.

Siemens Echomax transducers, on the other hand, resist the mechanical stress in this environment and the SITRANS LUT400 controller can be mounted separately.

#### **Mission accomplished**

So, what have we gained from ultrasonic level measurement in the tertiary crusher?

Reliable echo profiles that tell us exactly how much limestone is in the crusher bowl, so the crusher runs at the optimal level.

Quick and easy installation plus next-to-no maintenance – since time is money, we have immediately seen cost savings from this controller, as operators can spend their days elsewhere instead of tending to this level system.

Reduction of expenses and waste, fast response time to so that we can control the in-feed speed accordingly, and reliable operation.

In other words? A controller that is competitively priced, does what it is designed to do, is easy to install, and performs without issue or maintenance – a winner in my books.

Mission accomplished.

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*David J. Brown  
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