

HMA

**MEASUREMENT
RESOURCES**

Multi-Scanner System

Measuring your inventory has never been more accurate

MVL



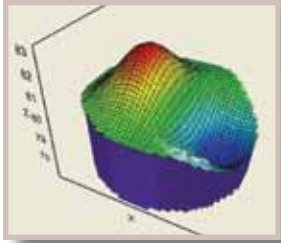
Accurate Volume
Measurement of the
contents inside large
silos, open bins and
warehouses



*Changing the market
from level to volume*



Photograph's property of Brimaster Level Control



Above: top-view of material in silo.
Left: APM software-generated 3D image

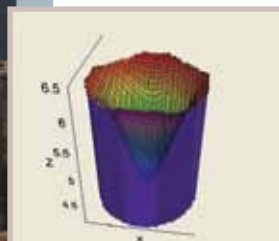
The **APM Multi-Scanner System** is comprised of two or more 3DLevelScanners **Model MVL**, extending APM's innovative volume and level measurement technology to cover very wide silos (with diameters over 15 meters / 50 feet), domes, and other very large open bins, bulk storage rooms, stockpiles and warehouses. This unique system measures practically any kind of solid material, and effectively provides accurate volume measurements critical for inventory and production process control in many industrial applications, including:

- Coal bunkers at power plants
- Large domes storing raw sugar
- Large silos storing corn for ethanol manufacturing
- Large clinkers and other very large silos at cement manufacturing plants
- Large silos storing soy beans for production of seed oil
- Large open bins and warehouse storing animal feed
- Wide warehouses, open bins and domes storing fertilizers (phosphates, potassium, etc.)
- Wide stockpiles of lime stones, copper, iron and other ores
- Large domes for fertilizers in ports
- Wide open bins storing salt
- Very large silos storing various grains

Accurate Volume Measurement

Non-contact, continuous volume measurement with the ability to generate a 3D visualization of the stored material

The **Model MVL** visualization feature provides early warning of build-up loads and bridges that randomly form over time enabling immediate response to maintenance problems.





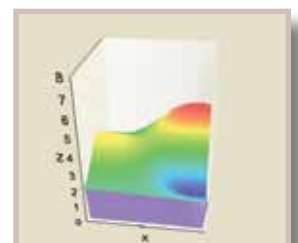
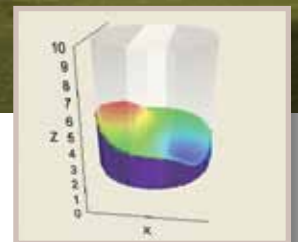
For the first time the finance manager, plant manager and inventory control manager can base their decisions on accurately measured data rather than estimated figures

Inventory report generation

Selection of reports such as: volume, min/max level, min/max distance, weight and historical data logs can be presented

APM software provides real-time data about the product being stored:

- Volume (% , m³, ft³, liters, gallons, bushels)
- Maximum / minimum levels / distances of product
- Weight (metric tons, short US tons, pounds)
- Historic logs of measurements
- Historic 3D image movies
- Vessel Name/ID and contents

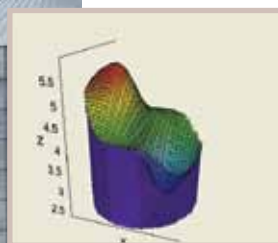
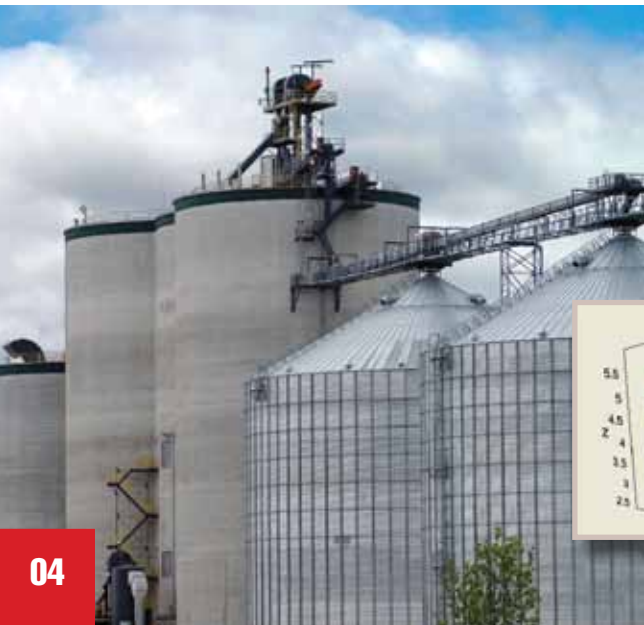


Remote access to the **MVL System** from anywhere in the world is available when the optional **APM 3DLinkPro** unit for wireless communications is attached to the **RS485 bus**

Real-time Inventory Control

Check true inventory status at any time - per silo or per site, per plant with multiple sites

As is the case with all **3DLevelScanner™**, each of the scanners comprising the System employs an array of three antennas to transmit low frequency pulses and to receive echoes of the pulses from the contents of the silo, bin or other container. Using three antennas enables each unit to measure not only the time/distance of each echo but also the direction from which it comes. The device's Digital Signal Processor samples and analyzes the received signals to provide very accurate measurements of the level, volume and mass of the stored contents. A special algorithm combines the data from the scanners in the System and generates a 3D representation of actual allocation of product within the silo or bin or warehouse for display on remote computer screens.



Multi-Scanner System



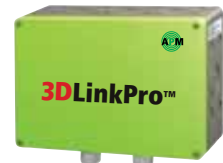
PLC/DCS

The multiple scanner system provides out of each of the 3DLevelScanner MVL devices an analog output which represents (as a default value) the overall volume of contents in the entire silo. Each 3DLevelScanner MVL device can also be configured to provide other outputs such as minimum or maximum levels of the stored contents

4...20mA

RS485

RS485

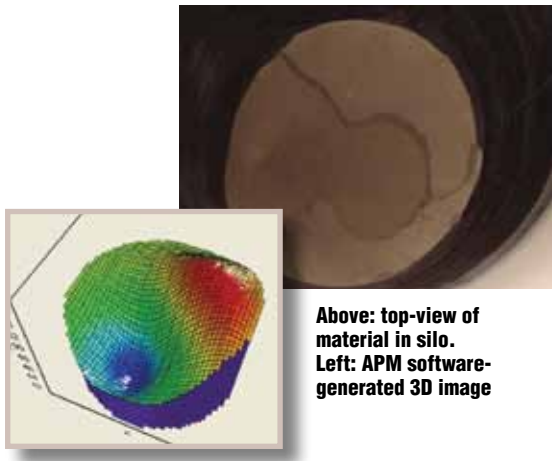


APM Multi-Scanner Controller



APM 3D Vision Software

All MVL units are connected via a daisy chained bus, using the RS485 protocol. This type of connection enables practically unlimited number of units to be linked over the same 2-wire line



Photographs property of BinMaster Level Controls

Above: top-view of material in silo.
Left: APM software-generated 3D image

The MVL system is more than the sum of its components

The **Multi-Scanner Controller** has few major functions that bring synergetic quality to the MVL scanners positioned in the same bin:

- Synchronizing the scanners transmissions so that the scanners do not interfere with each other and do not compromise each other's SNR
- Taking into consideration the entire set of mapping points from all the scanners
- Generating a complete merged visualization of the entire bin
- Updating the 4-20mA output of the scanners to the overall contents percentage

Automatic Material Handling

Accurate and timely inventory monitoring enables ordering material to meet production needs while avoiding costly emergency fills

APM Multi-Scanner Controller Key Technical Specifications:

- 16-30VDC (option to supply with power adaptor)
- 2 x RS232 and 2 x RS232/422/485
- On-board Intel® Atom™ N270 Processor, 1.6GHz
- Dual 1000/100/10 Mbps LAN ports
- 4 x USB2.0/VGA



Multi-Scanner System

Measure what you manage

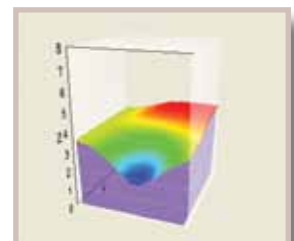
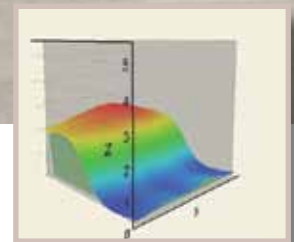
- **ACCURATELY**
- **RELIABLY**
- **SAFELY**

Under the harshest conditions

The Multi-Scanner System helps you learn about the profitability of your process. The system helps the customer understand the cost structure of its end product by determining the volumetric bushels that were continuously used as a part of the manufacturing process

Integration to ERP systems

Interfacing with most material management and control systems



Combined 3D image of material surface received from the two or more MVL 3DLevelScanners

Multi-Scanner System

The Multi-Scanner System is also available for ATEX and FM required applications

System Components:

- APM Multi-Scanner Controller
- Multiple 3DLevelScanners Type MVL (minimum 2 units)
- 3D Vision Software Tool
- 3DLinkPro (Optional for remote wireless access)



Outer unit is coated with build up from dust

Inside the unit is clean and fully operational.

Maintenance free

Proprietary self-cleaning capabilities prevent material from accumulating on the internal workings of the APM device, ensuring long-term reliable performance in harsh dusty conditions

