

Helping You Feed the World

Market Solutions



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Feeding A Hungry World

As the world population grows, farms face additional pressures to produce enough food to keep pace. But as weather patterns shift, farmers are confronting increasingly difficult conditions: Heat waves, droughts, falling yields, rising flood risks and a shrinking amount of arable land.

Meeting these challenges calls for ingenuity and efficiency. This is where VPG Transducers can play a key role as your partner. As a recognized leader in advanced strain gage technology, and a supplier of custom products to a range of industries, VPG Transducers have a proven ability to apply innovative thinking and best practices to today's agricultural needs. Let's work together to improve your operations, and help make sure the world never goes hungry.

Bringing The Best Together

VPG Transducers, the Force Sensors Product Group of Vishay Precision Group, brings together products from several well-known brands.

Celtron

Revere

Tedea-Huntleigh

Sensortronics

Tedea-Huntleigh, Sensortronics, Revere and Celtron are united in a commitment to uncompromising quality, and have been leading suppliers of weighing and force measurement products for decades. Superior load cells and strain gage know-how combine to deliver the most advanced sensor technology available. In addition to standard products, VPG Transducers' extensive experience and proven design capabilities make it possible for the company to supply a wide range of applications and specific products and solutions.

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Harvest Grain Tank Weighing

Accurately Measuring The Yield

With farms covering ever-larger acreage, farmers know it's essential to understand how grain yields vary in different areas of their fields. By analyzing many small sections, they gain valuable feedback, and learn which areas require extra attention to maximize yield.

To aid in this process, VPG Transducers custom-designed a single point load cell for installation around the internal storage tank surface of a harvester. Engineers then developed an innovative software algorithm that allows farmers to communicate with the load cell using the CANbus communication protocol.

The load cells collect force readings created by the grains collected in the storage tank; farmers can use this information to analyze the yield return of the field. As a rule of thumb, a good yield result is identified by a greater force reading in a smaller area over a shorter time span.



VPG Transducers engineers developed a similar system using 4 shear beams of load cells installed under the storage point of the tank.

VPG Transducers also designed a bespoke sensor to measure the impact of grain as it flows into the collection hopper. The impact is directly proportional to the amount of grain collected, making it possible to calculate the yield for each square meter of land.

Combine Harvester Tensioning System

Providing Early Warning and Preventing Expensive Damage

Combine harvesters are expensive, and at harvest time they're in the field 24/7. Any downtime is costly, both for the equipment and for farm operations. Complicating the maintenance challenge is the fact that combines are typically used to harvest many types of grain: wheat, barley, oats, rapeseed, soya; the list goes on.

In dry conditions, these light grains are no problem – but when it's wet or cold, or when the crop is something heavy like corn, the complications multiply. Drums can get jammed. They can take a long time to clear. This can even result in permanent damage.

In the ideal world, you'd be able to anticipate a jam, and prevent it from ever happening. VPG Transducers created a sensor that does exactly that – by sensing the tension on the belt and alerting the operator when it reaches a dangerous level.

The sensor is mounted adjacent to the main drive belt at the side of the combine, and the loading end is attached to a roller. The drive belt connects the driving pulley to a "driven pulley" that operates the main rotating threshing drum. Then, if the torque on the driven pulley starts to increase, the tension in the belt increases – and presses against the load cell.

A PID Controller (Proportional, Integral, Derivative) measures the change, and the rate of change, and either slows down the drive or stops it completely. The result: No drum jamming. The driver has time to clear the potential blockage and quickly get back to work.



Soil Preparation/Spreader

Putting Seeds In Precisely The Right Places

Along with the fertilizer spreader, the planter implement unit is one of the most important tools in modern farming. It enables farmers to deal with a key impact of climate change: unpredictable weather and shorter harvest seasons. With bigger and wider machines, planting and seeding times can be dramatically reduced.

Accurate measurements of soil depth and seed spacing are essential in this process, especially with the larger machines that cover more ground. Knowing the depth margin of the cut from the gauge wheel is crucial; maintaining the right depth not only ensures



the seeds will get the required nutrients, but also that they won't be exposed to unpredictable factors such as weather or birds.

To address this issue, VPG Transducers has designed a force sensor that can be used in this application.



By installing force sensors on several row arms of the planter implement, the machine will be able to accurately measure the force of each arm during the soil preparation process – so seeds can smoothly, and accurately, be placed at just the right depth. Depending on the nature of the output of the sensor, the operator will be able to adjust the depth of the gauge wheel accordingly, or this can be done automatically.

Let us know how a system like this could enhance your equipment – and how VPG Transducers can work together with you to achieve the best solution for your application needs.

Draft Pins Rear Hitch

Keeping An Eye On Critical Pressure Points

To ensure good yields, both tractor and implement tool must work at top efficiency. This involves maintaining a consistent depth in the soil as the plow moves through the field. Hitch sensors – on either the movable upper arm that the implement attaches to, or the pair of lower arms that handle lifting, lowering

and tilting – measure the stress levels. If the plow gets too deep, the stress increases, the operator is alerted and the arm can be raised to the proper depth.

As per today VPG Transducers is the only manufacturer that offers two sizes of draft pins to provide a complete solution. With the system in place, the operator can see the actual force measurement from the draft pin and the risk of overloads, downtime and accidents is greatly reduced.



Fertilizer Spreader

Making Fertilizers and Investments Go Further

It can be difficult to balance rising pressure to limit capital costs with the need to keep market prices low. As fertilizer prices have risen, farmers need equipment that's both cost effective and capable of maximizing yields.

That's why VPG Transducers manufactures custom sensors that provide operators with greater control and accuracy, and eliminate redundancy. Dosing speed can be easily adjusted based on the weight of the fertilizers storage bin and the speed of the tractor. The result is a more efficient way to cover a wider area with a specific amount of fertilizer.



The bin sits on top of a custom shear beam load cell, which is mounted on the chassis of the fertilizer spreader structure.



Image courtesy of Sulky

Strain Gage Installation and Customization Services

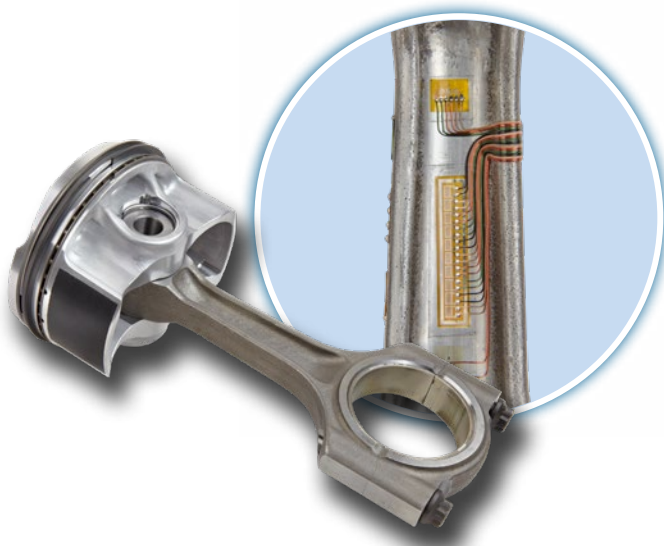
Installing To Your Specifications

VPG Transducers offers a comprehensive strain gage installation service, built on 50 years of proven experience and backed by ISO9001-certified quality. BSSM-qualified technicians handle everything from a single R&D prototype sensor to high volume custom installations – whatever your situation requires. The company also offers rapid turn-around; depending on complexity, many installations can be completed in a single day.

Responding to Your Exact Needs

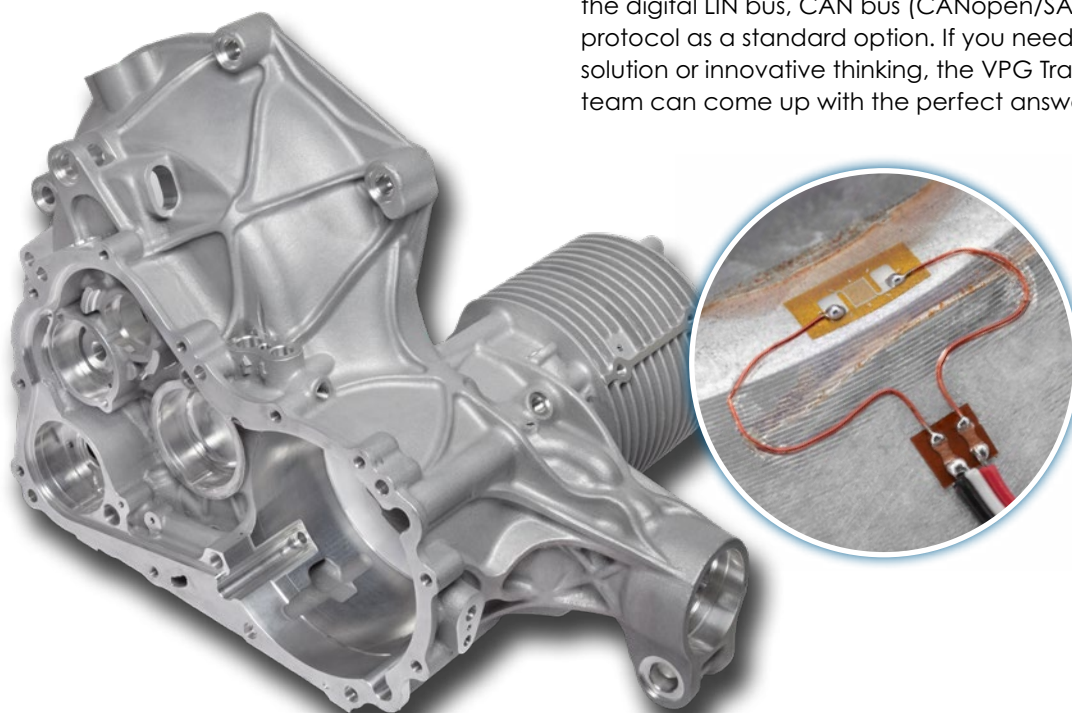
VPG Transducers' comprehensive R&D and Production facilities offer a full range of services that can provide specialized weighing and force measurement solutions. With a customer-focused approach to both specifications and schedules, VPG Transducers can serve as an extension of your own engineering team, and work together with you to create products that meet unique requirements, in whatever shape and capacity your application calls for.

Installations can take place at either VPG Transducers' facilities or on-site at your location, so you have maximum flexibility to complete your project in the



manner that's most efficient and convenient for you. In addition, VPG Transducers can provide a variety of options for protecting installations in harsh environments. With advanced engineering and design capabilities, it can serve as your single-source development and implementation partner.

VPG Transducers' custom sensor solutions are found in applications from tractor load pins and agricultural sensors to vehicle stability systems and specialized force sensors. The company provides a wide variety of analog voltage/current amplifiers, and can embed the digital LIN bus, CAN bus (CANopen/SAE J19319) protocol as a standard option. If you need a new solution or innovative thinking, the VPG Transducers team can come up with the perfect answer.



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PL0453-1708-EN