Measuring device for volume and weight calculation (VGM)

Competence and Trust

WITRON has been designing and implementing warehouse logistics solutions for more than 40 years. During this time, WITRON has successfully realized more than 2,000 projects in different business sectors from trade, E-Commerce, spare parts distribution, and manufacturing. The high number of existing customers (more than 80%) – that means customers that have already realized two or more logistics systems with WITRON – shows the customers’ trust in WITRON. With functional responsibility as general contractor for integrated logistics solutions, we are responsible for the logistics design, software & control, mechanics production, service & maintenance, modernization, through to the entire system operation. We therefore know the needs of our customers very well. We know: one of the major issues for a cost-efficient system operation is accurate master data. To provide our clients a perfect basis, we developed a measuring device for volume and weight calculation called VGM. It registers all required master data with minimum effort:

Fast – Accurate – Efficient – Transparent
Measuring device for volume and weight calculation

Accurate product master data as the basis for cost-efficiency and sustainability

Modern warehouse management and picking systems – regardless of whether conventional or automated – require accurate article master data for an efficient and cost-effective system operation. Accurate master data not only benefits the logistics design of a system (in terms of new construction or expansion). It also helps upstream and downstream logistics processes carried out before picking like route scheduling, dispatch, or an optimal storage space calculation for trailer loading benefit from „clean“ master data. Moreover, master data is also the basis for sustainable logistics: Optimized stacker crane and forklift routes, fewer dispatch trailers through more densely packed load carriers, fewer load carriers based on a precise volume calculation, and of course space savings during construction. The consequence: Significant CO₂ reduction in the logistics area.

Faster – More Accurate – More Efficient – More Transparent

All commercially available measuring systems that are offered on the market so far are based on optical scanning measurement methods. The operator does not know exactly, at which position of the measurement inaccuracies of more than 0.39 inches may occur. The master data determination of products with damaged packaging leads to great measurement inaccuracies. The VGM measures the dimensions of the product by means of pushers that are fixed at linear path sensors. The measurement accuracy of these sensors amounts to 0.001 mm (high reproducibility of the measured values; no drifting of the measured values). The interface of the VGM is compatible and can be integrated seamlessly into all logistics projects – even if these projects have not been realized by WITRON.

The schematic illustration shows the described components in their physical order. The measuring set-up is designed as autonomous workstation. This means that all processes run stationary at this workstation during product registration. The use of an optional battery set plus inverted rectifier unit allows this workstation to be operated as network-independent mobile machinery. In the illustrated design, the camera can be reached via the local network. A connection via USB is also possible.

Components:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Camera</td>
<td>Measurement system for the semi-automatic registration of the length, width, height, and weight. The measuring data registration as well as the provision of the interface to the data registration program will be provided by the corresponding programmable logic controller.</td>
</tr>
<tr>
<td>2. Notebook</td>
<td>Recording of the respective product image</td>
</tr>
<tr>
<td>3. Hand-held scanner</td>
<td>Commercially available notebook with Excel version 2003 or later. The set-up kit including additional OCX objects has to be installed and registered. Excel will provide the platform for the operation of the data registration program.</td>
</tr>
<tr>
<td>4. Hand-held scanner</td>
<td>Registration of the EAN code of the packaging unit (PU) or the piece</td>
</tr>
</tbody>
</table>
Product Registration

The product master data registration is done by means of the VGM which is connected with the registration program via TCP/IP interface. The measuring device is designed for both stationary and mobile operation. The registered product master data as well as the product image taken during the registration process will either be stored decentrally on the workstation computer (notebook) or entered directly into the productive logistics application.

Basic Principle

The measuring device for volume and weight registration is designed as semi-automated evaluation unit for the determination of the basic dimensions (length, width, height), and weight of a single product and is additionally equipped with a camera. It allows the recording of a product image during the registration process.

The heart of the measuring device is the integrated programmable logic controller (PLC). This control is connected with three linear path sensors for the registration of the product length, width, and height as well as weighing cells for the registration of the product weight. The operation of the linear path sensors is done via so-called measuring slides, also called paddles. By manually moving a measuring slide, the measured value of the respective linear path sensor will change at the same time. When activated, the PLC will permanently register the measured basic dimensions of the respective product and provides these measuring data to the data registration device (notebook or logistics application) in form of a data telegram. The camera is not directly connected to the measuring device, but will be activated directly by the data registration device via a separate interface.

Customer Benefits / Advantages at a glance:

- Developed by WITRON experts (general contractor for logistics)
- Can be used in every industry sector
- Exactly tailored to the requirements of the market
- Measurement of all article dimensions - length, width, height, volume, weight, etc. – by means of pushers that are fixed at linear path sensors
- Recording of a product image through integrated camera
- Use of sensors with a measurement accuracy of 0.001 mm
- High reproducibility of the measured values
- No drifting of the measured values
- Export of the determined data into a compatible data format
- Can be used in all logistics projects due to compatible interface, regardless of whether projects have been realized by WITRON
- Can be used as mobile or stationary workstation
Experiences

The **VGM** has successfully proven practical use both nationally and internationally in numerous projects of trade, E-Commerce, and industry. The system has demonstrated high measuring accuracy. The used battery set allows full-time, network-independent operation of at least nine hours. The average number of processed items amounts to 350 per day.

Technical Data

| Description            | SDEG0030  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>External dimensions</td>
<td>L x W x H [mm]: 900 x 700 x 1000</td>
</tr>
<tr>
<td>Controller</td>
<td>Compact PLC for the evaluation of the measuring sensors; interface with defined protocol for the transfer of the measured data to the data registration device</td>
</tr>
<tr>
<td>Input voltage</td>
<td>240V AC / 24V DC</td>
</tr>
<tr>
<td>Interface</td>
<td>Integrated network hub with 2 external RJ45 sockets (Ethernet 10/100 Mbit); connects the data registration device with the controller and the network camera</td>
</tr>
<tr>
<td>Volume registration</td>
<td>3 linear path sensors with slide paddles</td>
</tr>
<tr>
<td>Weight registration</td>
<td>3 weighing cells</td>
</tr>
</tbody>
</table>
| Measuring range        | L x W x H [mm]: Min. 30 x 30 x 80  
|                        | Max. 600 x 400 x 500  |
| Weighing cells [kg]    | Max. 30 |

Optional

- **Battery package**  
  For the power supply independent operation of the measuring device
- **Recording of product image**  
  Network capable or USB capable webcam
- **Mobile workshop vehicle**  
  For the mobile use of the measuring system
- **PC / Notebook**  
  For the operation of the data registration program
- **Microsoft Office**  
  Only in connection with the isolated application (the data registration is based on Excel; the storage of these data is done locally on the registration system)
- **Hand-held scanner**  
  For the product identification

About WITRON:

WITRON Logistik + Informatik GmbH, established in 1971 (headquarters Parkstein, Bavaria, Germany), designs, realizes, and operates customized logistics and material flow systems that generate sustainable competitive advantages for its clients. WITRON has all the decisive key elements of a successful project under one roof: logistics design, information and control technology, mechanics design and production, as well as functional responsibility as general contractor for logistics. The WITRON Corporate Group has 3,100 employees worldwide. WITRON's annual revenue in 2017 amounted to 515 million Euros. Other WITRON branches are located in Rimpar (Germany), Arlington Heights, Illinois (USA), Toronto (Canada), Venray (The Netherlands), Stoke-on-Trent (UK), Madrid (Spain), Strasbourg (France), and Singapore.

WITRON Logistik + Informatik GmbH  
Parkstein  
Phone +49 9602 600-0  
info@witron.de  
www.witron.com

Be innovative • Be committed • Be successful  
www.witron.com