

BELT OPTICAL SCALES



PASSAT
INNOVATIONS

designed to determine the weight and volume of bulk materials transporting by belt conveyors



APPLICATIONS

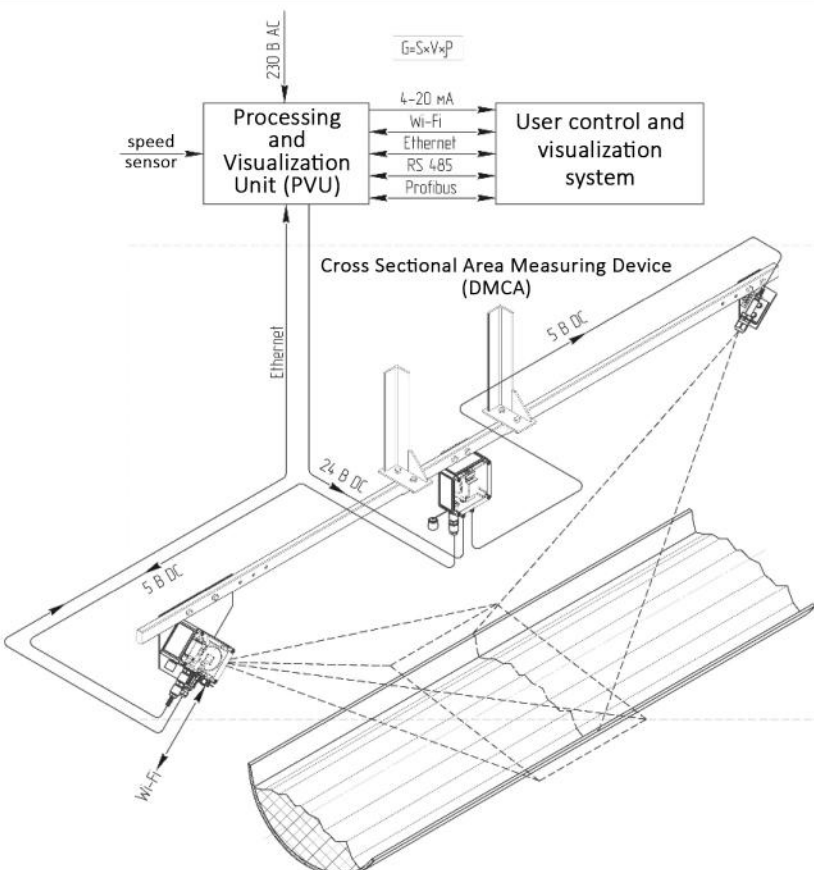
- ▶ chemical and mining industry;
- ▶ enterprises of building industry;
- ▶ enterprises of agricultural and food industry;
- ▶ technological processes of other industries, where continuous measurement of bulk materials weight, consumption and dosing is required.

MAIN ADVANTAGES

- ▶ the absence of mechanical contact with the conveyor moving parts;
- ▶ assembling doesn't demand of interference to the conveyor structure;
- ▶ ability to measure on incline parts;
- ▶ it's enough even limited space for scales mounting at working place;
- ▶ the installation at the conveyors with the belt width from 400 till 2000 mm;
- ▶ ability to control conveyor belt overtail;
- ▶ monitoring the presence of large-sized material on the belt;
- ▶ data transfer via Modbus, Ethernet or Profibus (on the Customer's request);
- ▶ photofixation by event (belt overtail, oversided material and so on).

CONDITIONS OF USE

- ▶ the absence of direct sunlight;
- ▶ relative humidity of the environment – not more than 98% at a temperature of +35°C;
- ▶ atmospheric pressure – from 84.0 to 106.7 kPa;
- ▶ resistance to the impact of sinusoidal vibrations with a frequency of 5-9 Hz (with an amplitude of 0.35 mm);
- ▶ dust content of air up to 800 mg / m³;
- ▶ permissible frequency variations in the supply network – from +10% to +15% of the rated voltage.



STRUCTURAL SCHEME OF BELT OPTICAL SCALES

Belt Optical Scales consist of Cross Sectional Area Measuring Device (DMCA) and Processing and Visualization Unit (PVU).

CROSS SECTIONAL AREA MEASURING DEVICE (DMCA)

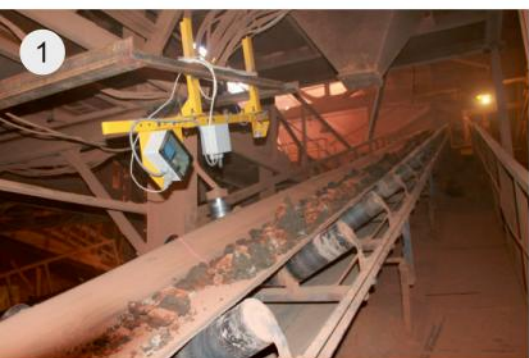
Transporting by conveyor material is brightening by tight laser beam, that contour material, conveyor belt chute and is projecting to the digital video camera matrix. We use laser as a source of light. The video camera is installed in Video Processing Unit of Cross Section Area Measuring Device.

Object shooting and cross section area calculation of transporting material is doing till 15 times per second. Average cross section area per second transfere to Processing Unit for the later processing or to the existing technological object's control system.

The output interface is Ethernet. The protocol is Modbus TCP.

Cross Section Area Measuring Device is implemented on the basis of three units fixed on a special steel beam of rectangular cross-section:

- video processing unit;
- source of laser irradiance;
- power unit.



INSTALLATION EXAMPLES

- 1 - LLC Sokolstroy (Russia), brickworks, charge preparation area
- 2 - SOF 1RU OJSC Belaruskali (Belarus), granulation department, conveyor A1-0406,

PROCESSING AND VISUALIZATION UNIT (PVU)

Processing and Visualization Unit (PVU) receive data from Cross Sectional Area Measuring Device (DMCA), data from the conveyor belt speed sensor or conveyor speed data from the existing automation system and calculates the volume of the transported material.

Based on the entered bulk density, the current weight productivity of the conveyor at the measuring point is calculated. The result can be given in the form of a current signal 4 – 20 mA or in digital form according to the exchange protocol accepted by the customer. In the case of the technological object management system, the calculation of the volume and the current weight productivity can be realized on the existing means of the customer's automated process control system. In this case, there is no need for a processing unit.



MAIN TECHNICAL CHARACTERISTICS

DMCA

- ▶ rated supply voltage - 24 V DC;
- ▶ power consumption no more than 20W;
- ▶ protection grade IP54;
- ▶ weight - no more than 16 kg;
- ▶ ambient temperature - from -10°C to +50°C;
- ▶ limit of permissible relative error (by volume) $\pm 0,7\%$.

PVU:

- ▶ rated supply voltage - 230 V AC;
- ▶ power consumption - no more than 70 VA;
- ▶ protection grade IP65;
- ▶ weight - no more than 8 kg;
- ▶ ambient temperature - from 0°C to +45°C.

The Pliscada software can serve as a tool for visualization and archiving of data coming from the conveyor optical scales, which allows you to analyze the data, as well as generate the necessary reports.



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