dol SENSORS

Technical Note

Design Considerations for Camera-Based Pig Weighing in Finishing Pig Production

This technical note outlines key design and implementation considerations for camera-based pig weighing in finishing pig production. The focus is on measurement method, installation conditions, data delivery and system integration, to support evaluation of automated pig weighing as part of a broader monitoring solution. The iDOL 65 calculates pig weight from 3D camera data based on pig height, width and length, and is specified for pigs in the 7–110 kg range.

Application context

In finishing pig production, growth and performance are often evaluated through manual weighing or indirect indicators. Manual weighing provides only occasional data points and increases labor requirements. A camera-based pig weighing system offers a different approach: continuous estimation of the average weight in the pen without handling the animals. The iDOL 65 captures images every 10 seconds and calculates average weight data using images collected over the last 24 hours, with updated calculations sent every hour.

This makes camera-based weighing relevant in applications where OEMs want to support:

- continuous growth monitoring
- earlier visibility into performance deviations
- evaluation of feed changes
- and integration of weight data with other production data streams

Measurement principle

The iDOL 65 uses a 3D camera to estimate pig weight from body dimensions. It is designed to calculate the average weight in the pen, rather than act as a manual replacement for individual spot weighing. Precision has been tested and verified for piglets and finishing pigs from 7 to 110 kg, with stated weighing accuracy of ±5% MAPE after 24 hours for 7–30 kg pigs and ±3% MAPE after 24 hours for 30–110 kg pigs.

The system provides four primary data outputs every hour:

- average weight in the pen
- standard deviation
- minimum and maximum weight in the pen
- and number of weighings during the last hour and the last 24 hours

Because the average weight is based on approximately 8,600 images captured over the last 24 hours, the system is designed for trend monitoring and representative pen-level insight, rather than single-event measurement.

Installation requirements

System performance depends on correct installation. The camera is intended to be mounted above a feed dispenser in dry feeding systems or above a nipple drinker in wet feeding systems. The floor area covered by the camera must be horizontal, and the camera must have an unobstructed field of view. Minimum ceiling height is 2390 mm, and the recommended mounting position is approximately 2300 mm above the floor and 700 mm from the pen wall / center of the feed dispenser, within stated tolerances. The camera must be mounted stably and horizontally, with vibrations minimized during operation.

For representative section-level averages, dol-sensors recommends using at least 4 cameras distributed over 4 pens, and that at least 10% of the pigs in a section are covered by cameras.

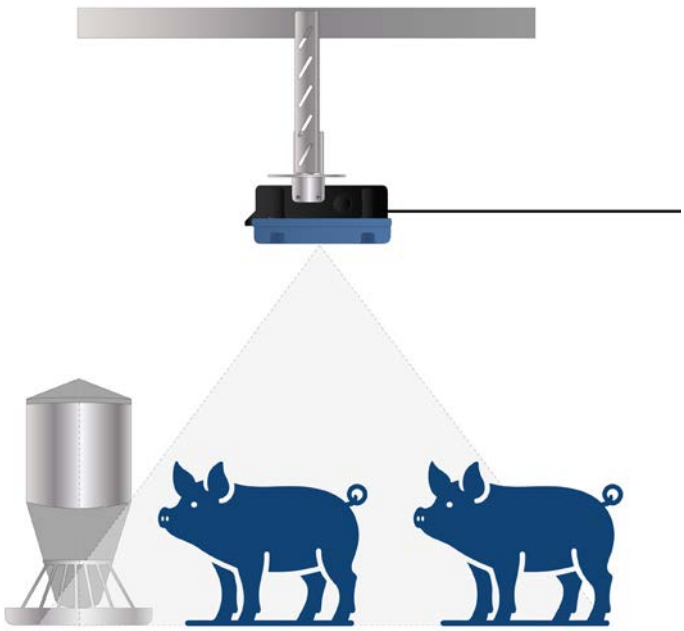
These requirements are important from an OEM perspective because measurement performance is dependent not only on the device itself, but also on:

- mounting geometry
- field of view
- floor conditions
- and absence of obstructions such as pipes, wires or unstable structures

Network and data delivery

The iDOL 65 connects through an internet connection to dol-sensors' Cloud, and data is sent every hour via API directly to the customer's server. The camera can be calibrated through the API, and multiple cameras can be connected serially. Software maintenance and updates are handled centrally while the camera is online.

The iDOL 65 Pig Weighing Camera



The camera is mounted in the ceiling above the pen

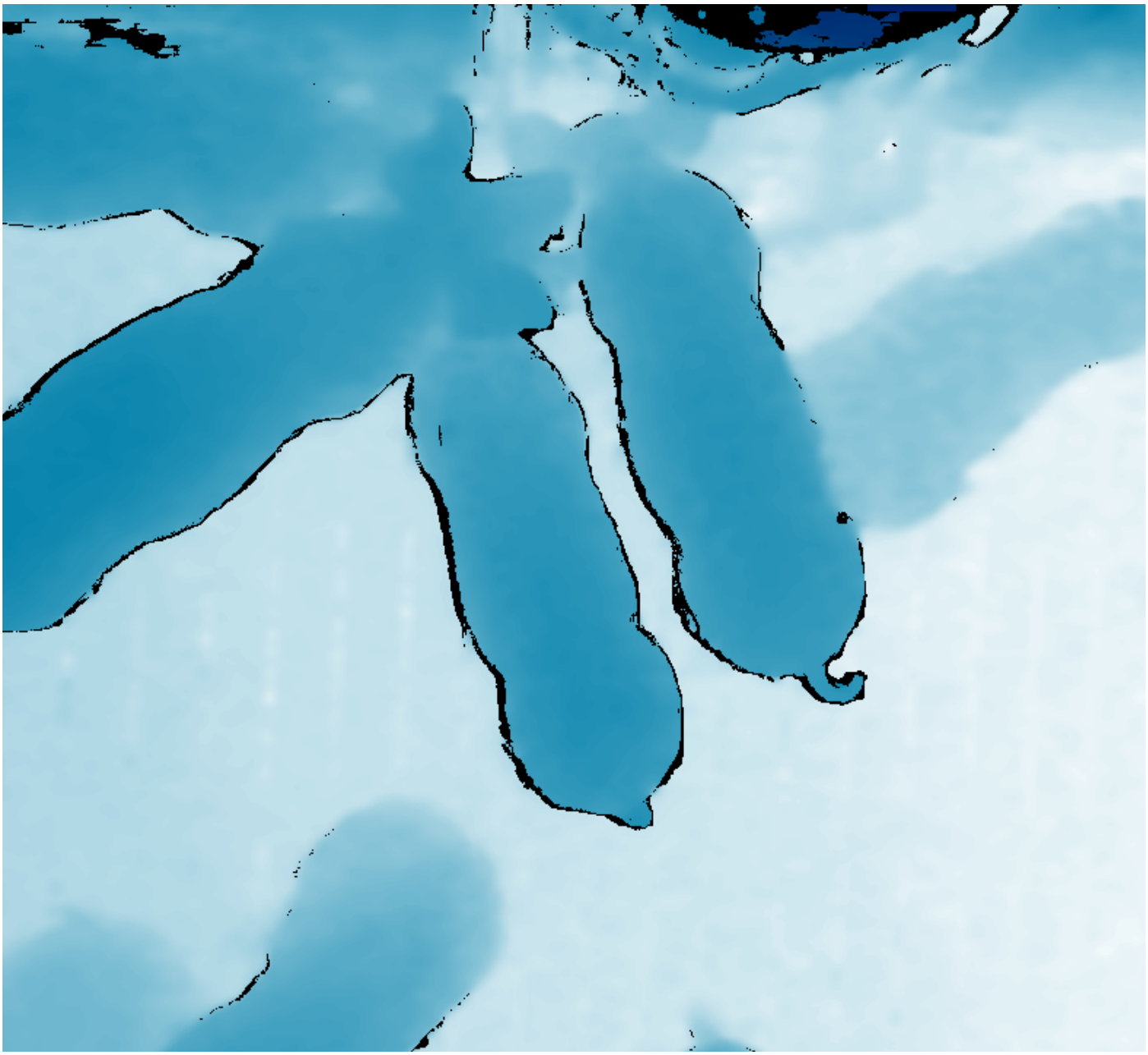
Each device has a unique key and MAC address for API identification, and weighing data is deleted from dol-sensors' Cloud after it has been forwarded to the customer's server.

From an integration perspective, the key technical requirements include:

- 2 x 10/100 BASE-TX RJ45 network interface,
- minimum connection per device of 1 Mbps download / 0.5 Mbps upload,
- minimum LAN speed of 100 Mbps full-duplex,
- CAT5e or better LAN cable,
- and maximum LAN cable length of 100 m.

Operating environment

The device is specified for operation at ambient temperatures from -10°C to +40°C, ambient humidity from 10–90% RH, and IP65 protection. Maximum power consumption is 13 W, and supply voltage is 100–240 VAC, 50/60 Hz.



Example of the images taken by iDOL 65 Pig Weighing Camera

These specifications make the system relevant for barn environments, but as with other vision-based measurement systems, stable operation depends on keeping the optical path clear. As stated in the Technical User Guide the camera must be cleaned at least after each batch, or as needed, because dust and flies can block the field of view and reduce the number of weighings. If the camera position changes during cleaning, recalibration is required.

Data use at system level

The iDOL 65 delivers weight-related data; interpretation and application logic remain at system level. When data has been delivered to the customer's server, it is up to the customer how they want to use it. Typical usage examples include combining weight data with feed consumption, water consumption and climate data, comparing current and historical batches, monitoring the effect of feed changes, and calculating daily weight gain based on successive average pen weights.

This separation is important for OEM integration. The camera provides a structured data stream that can be used as an input into:

- performance monitoring
- alarm logic
- production dashboards
- batch comparison
- and customer-specific analytics

Technical implications for OEM evaluation

For OEMs evaluating camera-based weighing, the main technical questions are not only whether the device can estimate pig weight, but whether it can do so consistently, representatively and in a way that fits into the OEM's existing data architecture.

The available documentation supports several important conclusions:

- the system is intended for continuous, pen-level average weight estimation rather than manual single-animal weighing
- system performance depends on precise and stable mounting conditions
- data is structured for API-based integration into customer-owned systems
- and the device is designed to support broader production monitoring when combined with other data sources

Summary

Camera-based pig weighing can be used as a continuous monitoring input in finishing pig production where OEMs want more frequent and representative growth data without manual weighing. The iDOL 65 is designed to estimate average weight in the pen for pigs from 7 to 110 kg, deliver hourly calculations via API, and operate as part of a broader digital monitoring setup. Correct installation, stable mounting, clear field of view and defined integration logic are central to system performance.