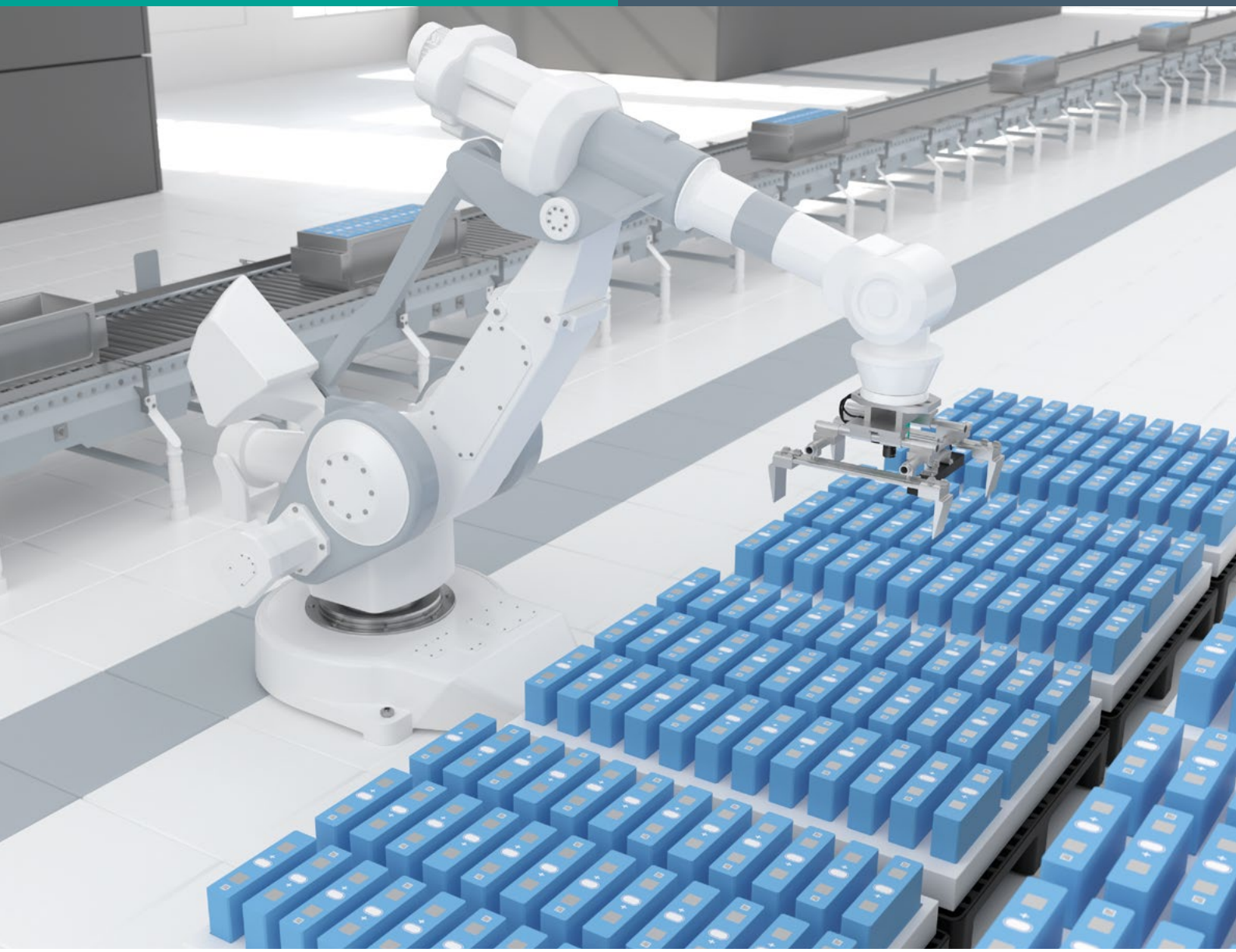
Identification and Positioning Data for Battery-Module Manufacturing

A 2-D Vision Sensor Performs Multiple Tasks with Precise Detection

At a Glance

- Camera-based sensor for reliable detection and versatile use
- A wide range of detection tools for various inspection tasks
- Vision tools that can be combined for feature recognition, completeness checks, code reading, text recognition, and object position checks
- Mechanical focus setting enables flexible positioning of the camera
- Easy integration with programmable data output
- Intelligent system lighting with integrated flash control



The Application

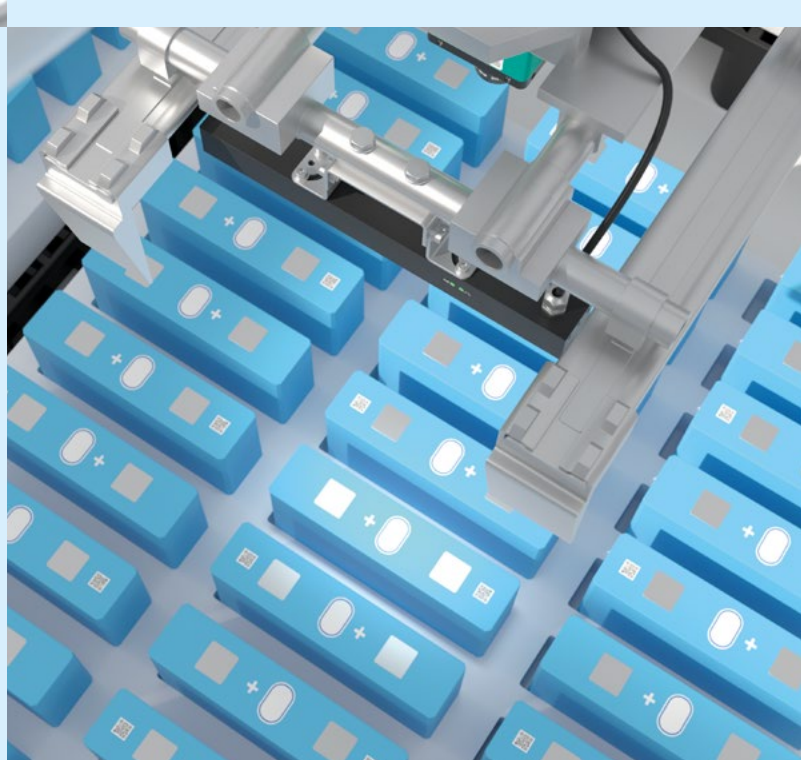
During the manufacturing of battery modules for electric vehicles, several prismatic battery cells are welded together. To do this, the cells must be positioned correctly. In addition, the cathode and anode tabs must be connected in the right sequence to prevent a short circuit. To ensure quality and traceability, each cell and module are uniquely identified. The unconnected cells are arranged on a pallet and sent to the robot, which positions them precisely and feeds them into the welding machine.

The Goal

Before welding, three parameters must be recorded: the battery type (using the Data Matrix code), the alignment of the battery cell based on the polarity symbol, and the x and y positions of the welding tabs. Since the codes are needle-punched onto the surface of the cells, the sensor needs to have a highly discerning reading capacity. Codes and polarity symbols must be reliably detected and assigned. The x/y coordinates of the welding tabs must be precisely recorded and synchronized with the robot coordinate system. The detection should be performed quickly, but the data should also be fully documented.

Identification of the battery cell via the Data Matrix code

Battery cell alignment test



The Solution

With the VOS 2-D universal vision sensor, all tasks can be completed using a single device. In the C-mount version VOS5000, the device can be equipped with a matching lens and combined with external bar lighting. This illuminates the sensing range evenly and an intelligent flash control is integrated. The sensor allows great flexibility during mechanical installation and when connecting data communication.

The Benefits

VOS sensors perform tasks that would otherwise require complex vision systems. Their use reduces both investment costs and integration costs. The same device can be used for different tasks in various applications. This simplifies inventory management and staff training. The system includes a large tool set, in which the solutions for many typical vision tasks are already stored. These tasks include identification, positioning and guidance, detection and alignment, optical measurement, and text recognition (OCR). There are no additional license costs.

Technical Features

- Resolution: up to 2560 × 2048 px
- RS-232 serial interface
- Three inputs and three outputs that can all be freely parameterized
- TCP/IP Ethernet interfaces, PROFINET, EtherNet/IP (other PLCs available on request)

For more information, visit: **pepperl-fuchs.com/px-vos**