

Guided Operator Solutions improve quality and performance in assembly processes

Dublin 19th June 2017

Eliminating human mistakes is one of the main quality challenges facing manufacturing industry today. To overcome this challenge, Mitsubishi Electric has launched a set of Guided Operator Solutions dedicated to preventing mistakes in manual parts picking and assembly tasks. The system is field proven and is already enabling manufacturers from a variety of industries to actively improve their quality processes whilst also reducing their operating costs.

To control picking sequences the system uses a combination of indicator lights, touch sensors, light curtains and door mechanisms that can be applied to parts selection bins. High resolution [HMI screens](#) are used to display assembly instructions and provide operator feedback whilst a full line-up of [controllers](#) provide a scalable solution depending on the application's complexity.

Together these components form a solution that guides assemblers simply and effortlessly through the picking and loading processes of an assembly task. Once installed the system provides a lean strategy in human error prevention, delivering measurable quality and performance improvements for manual assembly operations.

Mitsubishi Electric has already proven the effectiveness of the system by applying it to a manufacturing plant belonging to its sister company, Mitsubishi Electric Air Conditioning Europe, based in Scotland. There,

semi-automated assembly cells are used to manufacture a number of different products. Making several products in one work space meant that there was a high potential for operator mistakes and extensive training was required.

Since the initial install, there has been a significant enhancement in the quality of the picking process and a reduction in training costs, which has increased the competitiveness of the plant. Mitsubishi Electric Air Conditioning Europe has been so satisfied with the initial results that they now plan a roll-out of the solution across the remaining assembly operations.

From an operator point of view [Guided Operator Solutions](#) from Mitsubishi Electric address many of the common issues associated with manual assembly processes. These include making parts easier and faster to locate and replacing paper based instruction manuals with bright, clear display screens that can be updated quickly and easily. Live instructions can also be animated and timed to coincide with the pick sequence. All of which makes the assembly task far easier to complete accurately.

At the heart of the system is Mitsubishi Electric's standard software suite, [iQ Works](#), which enables setup and maintenance functions to be handled through one engineering tool. This provides an intuitive and cost effective method for setup, commissioning and maintaining systems on the plant floor.

Another key benefit of the system is the direct integration with MES applications where new product specifications can be seamlessly sent to production cells and productivity data can be linked directly with resource planning systems. Furthermore, providing detailed production

data to IT systems brings increased transparency and traceability to assembly operations.

Typical deployments for the Guided Operator Solutions include the automotive industry, logistics, packaging, electronics assembly and the life science sector.

Background

Mitsubishi Electric's Guided Operator Solutions are inspired by [Poka Yoke](#) (mistake-proofing) principles that were originally established and formalised in Japan in order to provide a proactive method to improve product quality. Within the manufacturing environment the concept relies on guiding operators through assembly processes using a sequence of signals to direct the operator. This creates an assistive system to help prevent inadvertent mistakes that can creep in unnoticed to assembly processes. As a proactive measure the concept can also significantly speed-up operator actions by removing the need for manual checking and referencing from picking and assembly tasks.

Image Captions:



Picture 1: The new Guided Operator Solutions from Mitsubishi Electric are used to increase quality by eliminating mistakes during manual parts picking process.

[Source: Mitsubishi Electric Europe B.V.]



Picture 2: With Mitsubishi Electric Guided Operator Solutions in place, the automation system guides an operator to the correct parts bin, either by lighting an indicator next to the correct picking location or by opening a door. Picks can also be confirmed manually using a touch switch or light curtain.

[Source: Mitsubishi Electric Europe B.V.]



Picture 3: HMIs replace static assembly instructions with dynamic screen information that can provide live assembly instructions and performance data.

[Source: Mitsubishi Electric Europe B.V.]



Picture 4: Mitsubishi Electric has installed the Guided Operator Solutions at one of its own air conditioning manufacturing plants in Scotland. Since the initial install, there has been a significant

performance improvements in assembly operations and a reduction in training costs.

[Source: Mitsubishi Electric Europe B.V.]



Picture 5: Using advanced control systems also means that manual workstations can be connected to factory wide automation networks and MES systems. This allows greater system transparency and direct access to resource planning systems.

[Source: Mitsubishi Electric Europe B.V.]

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With around 135,000 employees the company recorded consolidated group sales of 38.8 billion US Dollars* in the fiscal year ended March 31, 2016.

Our sales offices, research & development centres and manufacturing plants are located in over 30 countries.

Mitsubishi Electric Europe, Industrial Automation – Irish Branch is located in Dublin, Ireland. It is a part of the European Factory Automation Business Group based in Ratingen, Germany which in turn is part of Mitsubishi Electric Europe B.V., a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan.

The role of Industrial Automation – Irish Branch is to manage sales, service and support across its network of local distributors throughout Ireland

**Exchange rate 113 Yen = 1 US Dollars, last updated 31.3.2016 (Source: Tokyo Foreign Exchange Market)*

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