

Opening the door to increased productivity

Mitsubishi Electric helps door manufacturer triple its throughput

14th December 2022

Renowned door manufacturer Profile Developments has seen a threefold increase in its productivity, thanks to its latest collaboration with Mitsubishi Electric. By working closely together to create an advanced production line, control and precision in key production steps have been enhanced at the facility in Glin, Co. Limerick. The solution is based on multiple FR-E series inverter or variable speed drives (VSDs) and other system-matched components, such as a GOT 2000 series HMI and MELSEC iQ-R PLC.

Profile Developments, the manufacturer of the Palladio Collection of premier composite doors for external applications, has been delivering durable, safe and stylish products to customers in Ireland and the UK for decades. The company's manufacturing site in Glin already had a number of Mitsubishi Electric's automation components installed across the facility ensuring availability and efficiency, including for its door press application line. Therefore, when the company wanted to build a new panel gluing unit to ramp up productivity, the selection of a suitable automation vendor was straightforward.

John Barrett, Site Engineer at Profile Developments, comments: "We have been using Mitsubishi Electric's equipment in our factory for the last 25 years and we have never regretted this choice, as the products are of excellent quality and reliability. This is why, when we decided to undertake this upgrade project, we contacted Mitsubishi Electric Ireland."

Michael Cafferkey, Automation Engineer at Mitsubishi Electric, visited the plant and discussed what new technologies were available, providing an insight into the components that would be best suited to deliver a comprehensive solution that would address Profile Developments needs. In effect, the production of a door involves multiple components that are layered together at separate stages. More precisely, monocoque models from the Palladio Door Collection require the two fiberglass-reinforced door outer skins to be glued, joined and pressed together.

Making an entrance

Similar to the existing setup, the new line was developed along a conveyor, which moves the doors through different stages. The products are sent to a glue machine, an assembling station where the frames are added and a roller press. With each part of the conveyor system powered by a motor, the speed of which has to be controlled by an inverter, a total of 19 drives were required to complete this project. To deliver the high level of accuracy needed for this application, Mitsubishi Electric's FR-E series was selected for the unit.

Michael Cafferkey explains: "It is really important that the movement of the conveyor is controlled accurately so that a door doesn't miss a stage or spends the wrong amount of time in any production process. For example, the duration of the gluing and pressing processes has to be incredibly precise to ensure quality. The FR-E inverter range is ideal to address these exacting needs, as it offers advanced motor performance, precise control and high levels of reliability. It also features a compact design, which can be beneficial when many units have to fit onto a single production line.

To control the 19 VSDs, Profile Developments selected Mitsubishi Electric's iQ-R series PLC, which comes with in-built CC-Link IE Field Basic network protocol as standard, allowing quick and easy communications with all VSDs.

In addition, the controller sends key information to an intuitive and user-friendly GT2510 widescreen HMI to maximise process visibility and accessibility. In effect, it helps operators monitor and interact with the drives, enabling adjustments to their speed when needed, helping to identify anomalies and interpret alarms as well as provide logs of production data.

To ensure compatibility and seamless data transfer, Mitsubishi Electric integrated with an existing third party remote I/O station, leveraging its products' ability to comply with different communications protocols and communicate easily over EtherNet/IP.

Opening the doors to the future

Mitsubishi Electric played a key role in implementing, integrating and assisting in the setup of the new production line, in particular by supporting PLC programming activities.

The entire project was completed without incurring any downtime and, with the new line processing up to 12 doors per hour, Profile Developments has tripled its throughput. In effect, while initially the plant in Glin could only deliver 8 units per hour,

it can now produce 20-24 doors within the same timeframe. Uptime has also improved, as the HMI helps users to be more proactive, in line with smart manufacturing frameworks.

John Barrett adds: “We are extremely happy with the solution delivered and the results obtained. Even more, we are very satisfied with the support received from Mitsubishi Electric, which guided us through all the steps of the project. This is why we value the collaboration with this automation solutions provider and look forward to working together again in the near future to develop more solutions to enhance our production processes.”

Michael Cafferkey concludes: “We highly value long-term relationship with customers, such as Profile Developments, and strive to help them continuously advance and futureproof their operations by leveraging the latest innovations in automation. The new system that has been developed is driving the competitiveness of Profile Developments while also being scalable, ensuring that it can support the future needs and ambitions of the company.”

Image captions:



Image 1: Profile Developments has seen a threefold increase in productivity of its door manufacturing facilities, thanks to its latest collaboration with Mitsubishi Electric.

[Source: Mitsubishi Electric Ireland]



Image 2: After leveraging Mitsubishi Electric's equipment for 25 years, Profile Developments wanted to build a new panel gluing unit partnering with the same vendor to ramp up productivity.

[Source: Mitsubishi Electric Ireland]



Image 3: An intuitive and user-friendly GT2510 widescreen HMI maximises process visibility and accessibility, helping operators monitor and interact with the drives, identify anomalies and interpret alarms as well as provide logs of production data.

[Source: Mitsubishi Electric Ireland]



Image 4: The new door press application line was is run by 19 Mitsubishi Electric's FR-E series VSDs.

[Source: Mitsubishi Electric Ireland]



Image 5: To control the 19 VSDs, Profile Developments selected Mitsubishi Electric's iQ-R series PLC.

[Source: Mitsubishi Electric Ireland]

About Mitsubishi Electric Corporation

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its “Changes for the Better.” The company recorded a revenue of 4,476.7 billion yen (U.S.\$ 36.7 billion*) in the fiscal year ended March 31, 2022. For more information, please visit www.mitsubishielectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥221=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2022.

About Mitsubishi Electric Factory Automation Business Group

Offering a vast range of automation and processing technologies, including controllers, drive products, power distribution and control products, electrical discharge machines, electron beam machines, laser processing machines, computerized numerical controllers, and industrial robots, Mitsubishi Electric helps bring higher productivity – and quality – to the factory floor. In addition, our extensive service networks around the globe provide direct communication and comprehensive support to customers.

Factory Automation Ireland

Mitsubishi Electric Europe B.V. Factory/Industrial Automation- Ireland 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

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About e-F@ctory

e-F@ctory is Mitsubishi Electric's integrated concept to build reliable and flexible manufacturing systems that enable users to achieve many of their high speed, information driven manufacturing aspirations. Through its partner solution activity, the e-F@ctory Alliance, and its work with open network associations such as the CC-Link Partners Association (CLPA), users can build comprehensive solutions based on a wide ranging "best in class" principle.

In summary, e-F@ctory and the e-F@ctory Alliance enable customers to achieve integrated manufacturing but still retain the ability to choose the most optimal suppliers and solutions.

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