MITSUBISHI ELECTRIC
Changes for the Better

Mitsubishi Electric's M2M solution opens up a new world of communications

Machine-to-Machine (M2M) communications holds the key to a new paradigm of industrial automation and production. Jeremy Shinton, Product Manager – Business Solutions & Software for Mitsubishi Electric, explains how.

No matter what sector you operate in, requirements to develop new services, enhance productivity, boost efficiency and solve critical problems are common themes. Across manufacturing sectors, there is also the pressure to build better quality products and to be able to produce those products with greater flexibility, often with unprecedented levels of customisation.

Being able to do this is reliant on two vitally important things: huge quantities of data and the ability to analyse and act on the information that data provides.

In days gone by, the amount of data available was limited. Despite discussions on issues such as remote communications, enterprise connectivity, telemetry and more, the amount of data collected was limited and it tended to remain local. That also placed an emphasis on operators and technicians to be local in order to make operational decisions on the plant floor and it meant that higher level decisions about production were being made more on intuition than on actual requirements – if indeed, they were being made at all.

One of the first drivers for change was the rapid adoption of Ethernet for the backbone of industrial communications, opening up data transfer not just around the plant floor but also between the plant floor and higher level business systems. Then came connectivity to the internet, enabling remote monitoring, diagnostics and even operation. At the same time, new generations of smart devices – sensors, actuators and others – began providing whole new levels of data about status, production efficiency, energy consumption, machine availability and more.

This alone has brought us a new model of integrated operations and flexible production, under the banner of 'manufacturing convergence'. However, the final piece of the puzzle has revealed a much grander picture and this has been driven from the consumer market: it's the GSM revolution.

If we could point to anything that really held back true industrial connectivity over previous decades, then it was surely the cost and difficulty of sending data over long distances. Telematics could only cope with small volumes of data, often only in one direction. Ethernet and internet connectivity revealed how large volumes of data, made available anywhere, could really help to enhance manufacturing operations and now GSM networks are delivering on the promise of high-speed, bi-directional transfer of large volumes of data between

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individual devices, with barely a consideration needed for range, on-time, power, cost or data limits and without any incurred expenditure on network infrastructure or installation.

This is the 'Internet of Things' (IoT), or as it is alternatively referred to, Machine-to-Machine (M2M) communications. Individual devices capture an event and relay that data through a network (wired, wireless or hybrid) to an application (software program) that translates the captured data into meaningful information. It's a game changer in industrial applications, with bandwidth increasing in line with connection times and solutions becoming ever more affordable. It is reckoned that the M2M era will see an estimated 50 billion GSM-connected devices by the end of the decade, driving a new model of connected intelligence. Experts predict that the ability to access, analyse and act upon the increased data that M2M solutions will provide could deliver as much as $100 billion of annual savings thanks to improved material, energy, production and logistics efficiencies. Product quality and yields will improve, operational costs can be controlled more effectively and production can be optimised to best meet ever more demanding customer requirements.

Mitsubishi Electric is at the forefront of this revolution with its M2M platform, delivering affordable, global, end-to-end IP data connectivity in industry sectors such as environmental monitoring, SmartGrid, pipeline monitoring, machine monitoring, mining, water utilities, telecommunication, building and facilities management sectors. The solution is built on the MAPS SCADA software and Mitsubishi FX/L/Q series PLCs, for both control and data acquisition, to and from remote sites. The communication's intelligence lies in the standard PLC function blocks matched to an M2M driver in the MAPS SCADA.

In the solution, the PLC becomes the master of all communications. The Mitsubishi M2M solution does not require a fixed IP or Dynamic NDS middleware. This means you can use this solution on any GPRS/GSM network and not require a static IP from your internet service provider. The only fixed IP required is at the MAPS I/O server. All data can securely be made available on a public APN.

The Mitsubishi M2M solution provides remote communication with the PLC without the presence of an on-site technician. The operator can monitor and control an individual device or group of devices through the MAPS SCADA interface. This solution can also allow a technician to do PLC programming over the air to the M2M device. No need for a technician to go out to site to do a program change.

The intelligent M2M driver in MAPS automatically monitors the connection between the MAPS I/O server and the PLC in the field, without the need to poll or establish a connection to the device. The operator will be notified if the link goes down. The operator will also be notified when the communications link is healthy again. Information on communications is available for any device on the M2M network.

The Mitsubishi M2M solution offers efficient communications with cost-effective data transfer. The PLC can be configured to send data on a time interval, on an alarm event, when the storage buffer limits are reached, or when it is manually polled. Event and alarm data is transmitted to the SCADA simultaneously. Communications can also be set to live mode which will show real time data as the site changes.

Ultimately, M2M communications makes data the definitive management tool, enabling us to implement and operate vastly more sophisticated and complex systems, whilst still maintaining a firm grip of what is happening within those systems. As we drive towards the new manufacturing paradigm of 'Industry 4.0', with smart factories and products that effectively produce themselves, it is M2M that will provide the facilitator, with new device-to-device communication architectures replacing the master/slave network technologies that are currently the mainstay of automation networks. With newly intelligent machines and advanced software analytics, the factories and plants of the future will be able to optimise themselves to increase business performance and drive down costs.

About Mitsubishi Electric

With over 90 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation 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, as well as in products for the energy sector, water and waste water, transportation and building equipment. With around 121.000 employees the company recorded consolidated group sales of 29,5 billion Euro* in the fiscal year ended March 31, 2013. Our sales offices, research & development centres and manufacturing plants are located in over 30 countries.

Mitsubishi Electric Europe, Industrial Automation – UK Branch is located in Hatfield, United Kingdom. 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 – UK Branch is to manage sales, service and support across its network of local branches and distributors throughout United Kingdom.

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