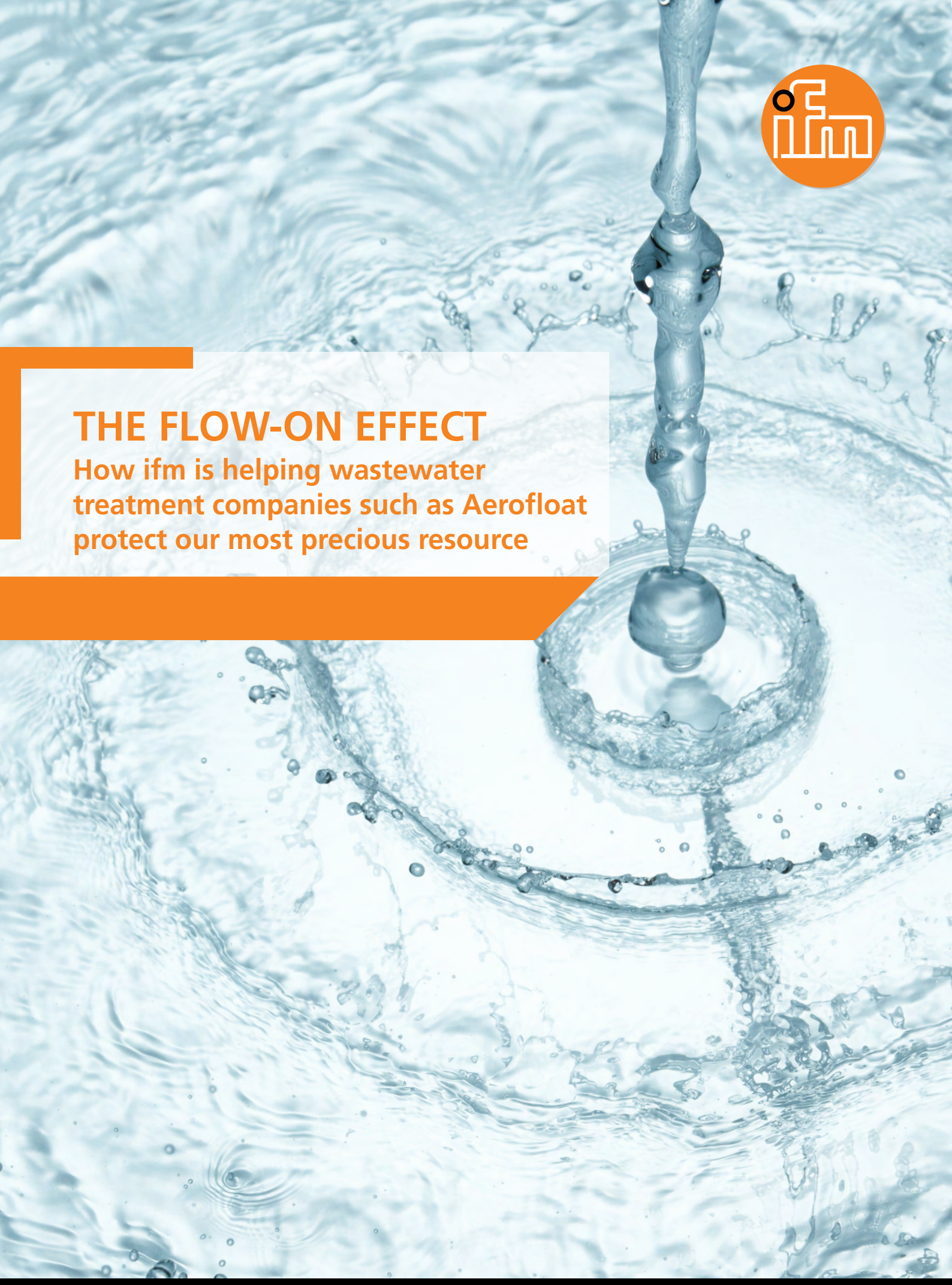


THE FLOW-ON EFFECT

How ifm is helping wastewater treatment companies such as Aerofloat protect our most precious resource

INTRODUCTION

While Australia is blessed with an abundance of natural resources, water is not among them. Already a very dry continent, Australia's water scarcity issues are likely to be exacerbated by changes to weather patterns – caused by climate change – as well as the increased demands of a growing population. This white paper discusses Australia's water challenges and how ifm is working with Australian wastewater treatment companies to streamline their operations through the integration of modern digital sensor technology to collect actionable insights from data.

This paper highlights the partnership between ifm and Australian wastewater treatment specialist, Aerofloat, and how ifm's sensors and easy-to-use IO-Link connectivity solution has saved time and costs for Aerofloat's customers.

A SUNBURNT COUNTRY

As the world's driest inhabited continent, Australia has always faced significant challenges in terms of meeting its water consumption needs. Its average rainfall is roughly 470mm a year – well below the global average – and temperatures in Central Australia can reach over 50 degrees Celsius. Further to that, what rainfall Australia does receive is concentrated along the north and east coasts of the country.[1]

Australia's inherent water scarcity is compounded by the twin challenges of climate change and population growth. Indeed, the Productivity Commission noted in a 2021 report that drought conditions are likely to become more frequent, severe, and prolonged in some regions – owing to climate change – and that reductions in supply should be expected alongside growing demand due to population increase.[2]

In this context, the provision of safe drinking water is a key challenge, and more sophisticated and effective methods of treating water are crucial to meeting the demands of today and tomorrow.

CHALLENGING CONDITIONS

Industry expert Freddie Coertze, who serves as National IoT Business Manager and Digital Strategy Leader for ifm, says that the company's goal is to help maintain Australian water networks and help make them more efficient.

"In Australia, maintaining our water networks is a make-or-break issue," Freddie says. "This is why ifm is committed to working with local companies that are tackling water scarcity issues."

But not all water is created (or recycled) equally, and each state has regulatory frameworks in place that govern how different types of wastewaters are treated, as well as the quality-standards that must be met when transforming wastewater into useable water for different purposes. On-site wastewater management systems must perform effectively and be properly managed to reduce risks to public health and the environment.

Among the criteria that govern the handling of wastewater are the source of wastewater, site constraints, treatment methods, and the quality of effluent needed for proposed end-uses of treated water.[3] Australian states have their own regulatory frameworks that govern the conditions under which permits for the construction, installation, and alteration of wastewater management systems will be granted.[4]

Grant Smith, Senior Applications Engineer at ifm, says that the challenge for wastewater treatment operations is to run plants effectively along the entire cycle – producing a result that is economical, effective, safe, and in line with environmental regulations.

Accounting for these various factors means there is no one-size-fits-all solution.

"At ifm we understand the customer needs and focus on offering scalable solutions that best fit the application," Grant says. "We offer hardware and solutions for water and wastewater treatment plants, and we have a consultative approach because we understand that each application and project is different."

ENTER IO-LINK

Grant says that ifm has supplied various IO-Link Solution wastewater treatment projects – providing hygienic pressure sensors that continuously detect the pressure, temperature, level, and flow in the tanks – connected via IO Link Masters back to a PLC [Programmable Logic Controller]. Integrating IO-Link sensors into wastewater treatment plants allows for greater accumulation of monitoring data and process transparency, from the machine level to ERP [Enterprise Resource Planning] software.

IO-Link is a short distance communications network that connects smart sensors and actuators – components responsible for moving and controlling a mechanism or system – back to an industrial control system, allowing for richer and more transparent monitoring of data, as well as doing away with complex physical wiring processes.

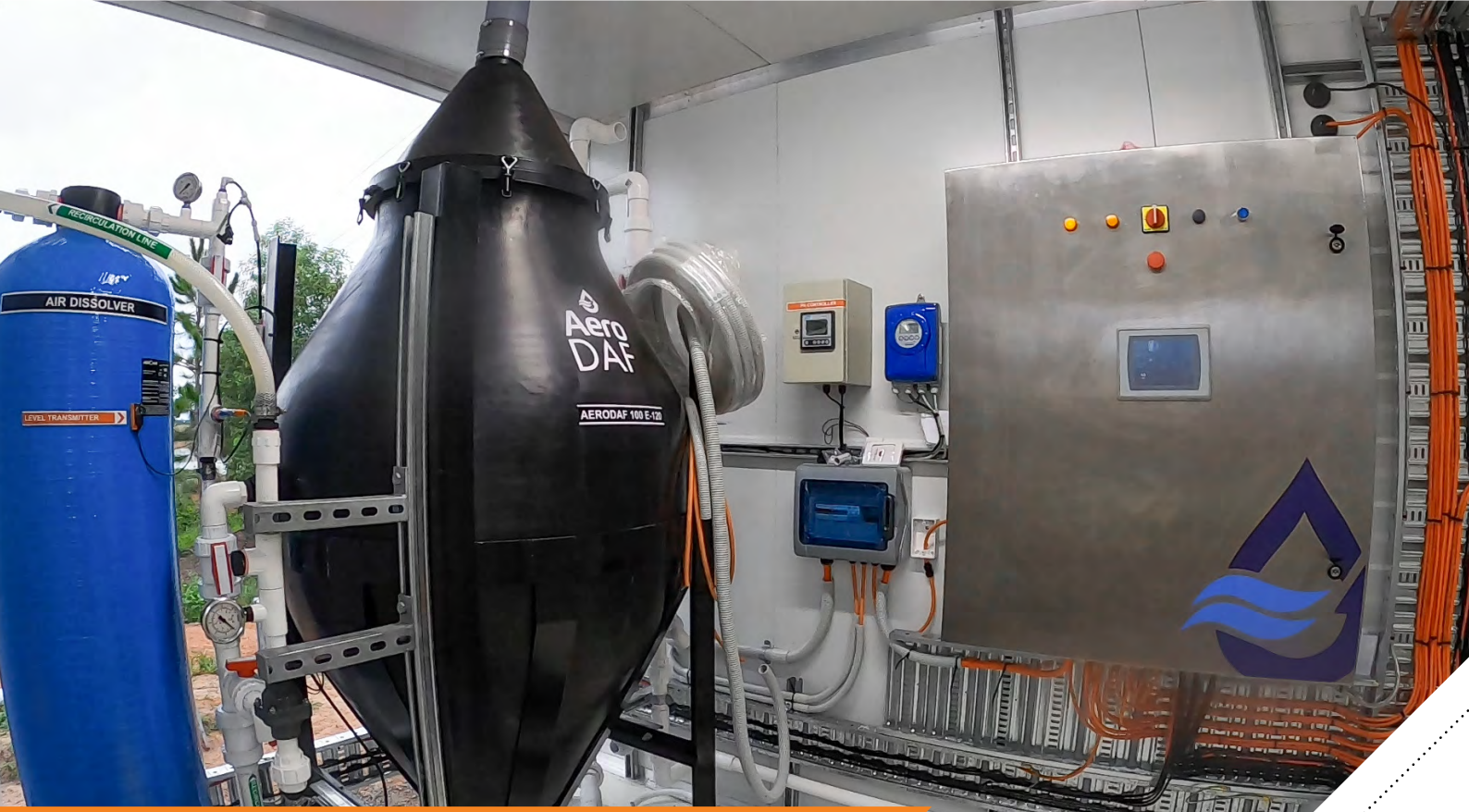
Freddie Coertze notes that in more traditional environments different sensors would each have to be wired back through separate channels, whereas with IO-Link there is just one channel where all the information pertaining to what's going on inside an operation – variables such as pressure, temperature, level, and flow – is gathered in one place. IO-Link allows transition from traditional 4-20mA analogue data collection methods to a more digitalised process that ensures a continuous flow of accurate and lossless data.

"In the past, conversion losses and EMC interference during the analogue signal transmission of the level caused inaccuracies," Freddie says. "The IO-Link utilises purely digital transmission of the measured values, so the exact measured value is now transmitted to the controller — eliminating any risk of signal interruption."

Freddie notes that screened cables and associated grounding are no longer necessary — instead, the data can be transferred instead via industry-standard cables. Furthermore, expensive analogue input cards are no longer needed with the new technology.

"These features save time because you don't need to integrate separate data – there are fewer engineering hours in paying someone to integrate – and also saves on installation costs," he says. "It's almost a plug-in-and-play system: you screw on the cables and you're good to go. That's why it's good for Original Equipment Manufacturers [OEMs] to use ifm's IO-Link system."

Or as Youssef Attallah, NSW Branch Manager at ifm, summarises the advantages: "With IO-Link you get more diagnostics using less wiring."



TAPPING INTO EFFICIENCY: AEROFLOAT CASE STUDY

Youssef points out that ifm has been working with water treatment companies with sensor and control systems for many years, and that its sensors and IO-Link solution is cost-effective for small-to-medium size enterprises.

One such enterprise is Aerofloat, an Australian industrial wastewater treatment specialist that ifm has been working with to help provide affordable, Australian-compliant treatment services to customers.

Youssef says that Aerofloat is an ideal customer for ifm because it provides wastewater treatment solutions across various industries and because – as a homegrown Australian company – it gives new opportunities for ifm products to be utilised in new ways by new companies in an Australia-specific context.

"One day Aerofloat will be installing a solution in a food factory, the next in a winery, the third somewhere else – no two days are the same," Youssef says. "For ifm, as a company with an international footprint, it's great to see our products utilised in new ways for new customers and knowing that ifm and Aerofloat are not only producing business benefits to the end-user, but also contributing to the societal good through more efficient provision of what in Australia is a scarce resource: water."

Michael Anderson, General Manager of Engineering and Operations at Aerofloat, co-founded the company in 2009 with his father and Managing Director, Ray Anderson, and sister Katie Moor, who is the General Manager of Business Operations. Michael says that Ray, a chemical engineer, was doing consulting work when he spotted an opportunity to solve a problem treating grey water on houseboats on the Murray River in South Australia. The three teamed up to address the problem, with their individual skillsets complementing well – Ray's vast experience in the wastewater treatment industry, Katie's chemical engineering background and business acumen, and Michael's passion and adeptness in product design.

"We got to work designing the product, got it certified to Australian standards, commercialised it, and installed about 200 systems," Michael says. "That took roughly three years, and at that point the Environment Protection Authority relaxed its standards for grey water discharge from houseboats on the Murray – and the market we had been solely catering to disappeared."

Michael says that Aerofloat then had to pivot by scaling up the technology it had developed to supply a new product – Aerofloat's Dissolved Air Flotation systems ('AeroDAF') – for industrial wastewater applications.

From working on quite small projects, Aerofloat has grown to doing projects for industrial wastewater plants, breweries, food manufacturers, as well as projects for local and state governments.

"We're committed to innovation and sustainable solutions," Michael adds. "We have a number of patented technologies and we're very R&D focused.

"I'd say our biggest point of differentiation is that we're an end-to-end solution provider in wastewater treatment. Every customer is different, and that's why relationships such as the one we've built with ifm are so important. We've done some reliable wastewater treatment plants exclusively fitted out with ifm instrumentation."

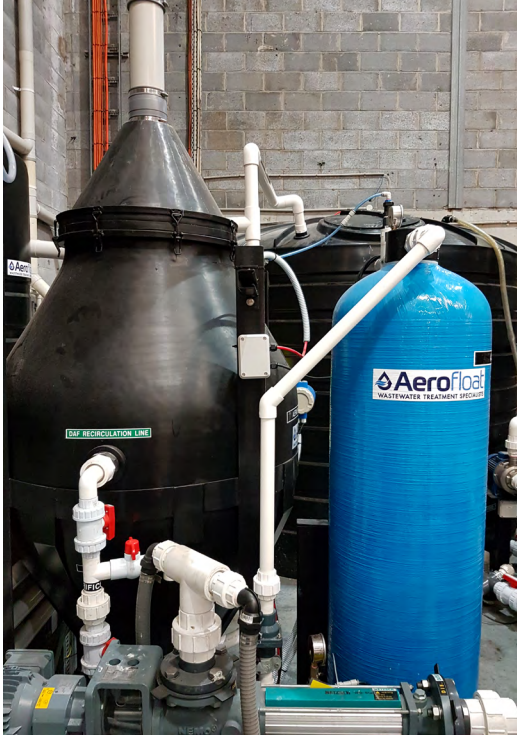
Tim McCann, Operations Manager at Aerofloat, says that the ifm relationship has been key for Aerofloat. "ifm are well known for reliable and high quality products, so having their brand associated with Aerofloat is a great selling point for us," Tim says. "Technologically speaking, ifm's IO-Link technology suits us as a business perfectly because it saves us and our customers on time and wiring costs. We also gain more visibility in terms of data collection than we'd otherwise have with traditional instruments."

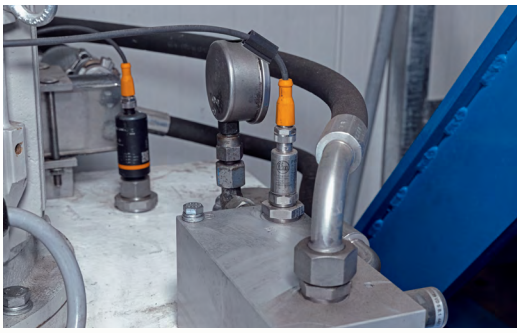
Michael adds that because ifm has so many instruments in their portfolio, there are always new products that can be added to Aerofloat's arsenal in servicing its wastewater plants.

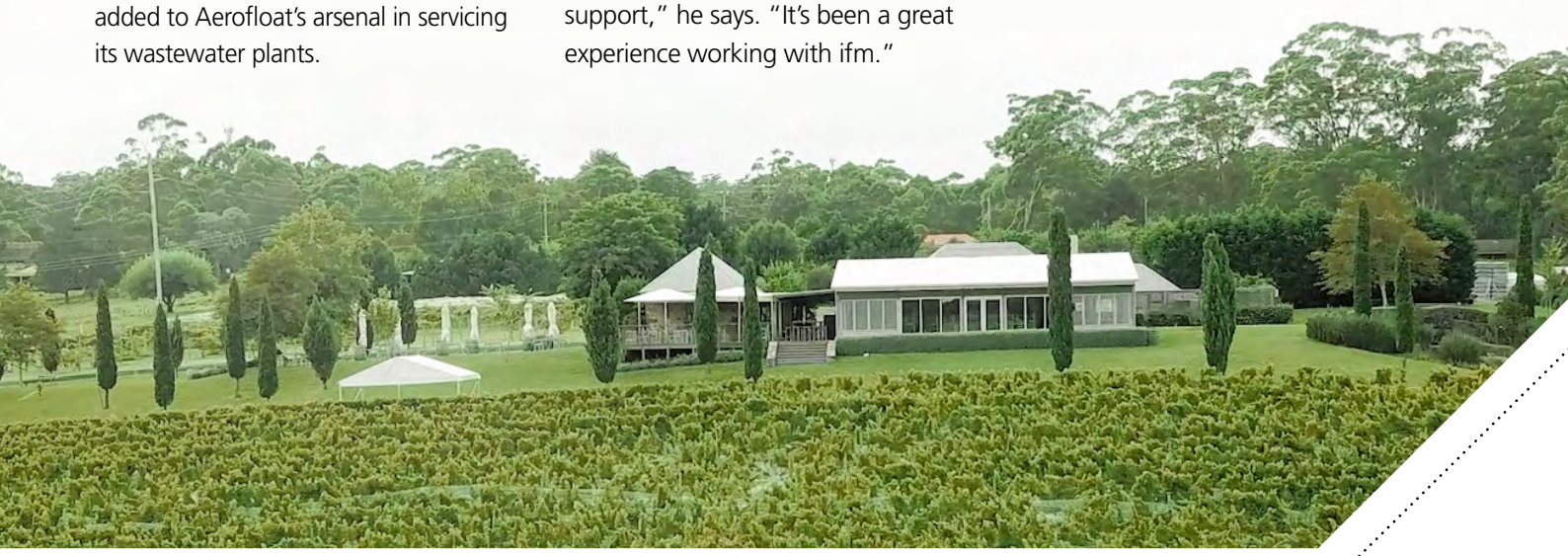
"With IO-Link, if we want to add a new instrument in later, I really like that we don't have to upgrade our control panel," he says. "Where traditionally you would want more PLC inputs and outputs on analogue signalling, we can just get this instrument into one of the field modules – which is fast and straightforward. Having that scalability, flexibility, and ease of add-on functionalities is very important in helping us respond not only to customer demands – but also to potential changes to the regulatory structures that govern our industry."

Tim agrees, stating that the ease of use – as well as the initial and ongoing support Aerofloat has received from ifm – of IO-link has made an immense difference to their business.

"I wish IO-Link was available in all of our other instruments – it's easy so to set up, easy to run, is more cost effective, and we've received great support," he says. "It's been a great experience working with ifm."







SUMMARY

In supplying innovative and always-evolving instruments to assist with wastewater treatment – an industry that will only grow more important given Australia's harsh climate conditions and growing population – ifm plays an indispensable role in collaborating with Australian businesses.

Michael Anderson is justifiably enthusiastic about the Aerofloat-ifm partnership: "We've got a growing and passionate team at Aerofloat dedicated to solving environmental and water issues. We're proud to have such a reliable partner in ifm, who we know will support all the solutions that we're providing."

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