AVNET
Reach Further®

Embedding Success in Your Business

- Part 2: Accelerate Your time to Market and Open New Revenue Streams, Faster.

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If you manufacture devices that need embedded computing, lear how Avnet Integrated can help you Align, Accelerate and Amplify your success.

In this document we cover how to Accelerate your business goals with the best strategies to ensure the success of your embedded project. We can help with development, manufacture, software licensing and distribution to make sure you deliver on your goals in the best possible time and get the best value from every stage of the process.

Why would you want to accelerate your product development?

- The explosion of devices and systems enabled by, and using the Internet of Things (IoT) provides more market opportunities than ever, with IDC expecting to see 80 billion connected 'things' by 2025.*
- Increased competition means that if you can get your product to market first, you can benefit from first mover advantage, and become a market leader in a new marketplace.
- New products present new opportunities that can be relevant for both your existing customers and new customers – helping you to maximise profit in existing relationships as well as open up new revenue streams.
- By working with our teams of specialists in design, product development and licencing, we can help you align your business goals and get through the proof of concept stage more quickly and into production.
- Avnet Integrated offer a number of market-ready modules and building blocks, with re-usable IP that can help you shortcut the production process, allowing you to take advantage of tested technology rather than have to develop everything from new.
- Using these building blocks not only improves your speed to market, it makes your production more efficient and saves costs throughout the process.
- Using the correct Microsoft licence, specifically developed for Embedded and IoT products can help you develop products which are simpler and more flexible to use, more cost effective, more secure and future-proofed. We can also help with the integration of your own software as part of the final product and with other software areas through our network of partners.

*https://www.idc.com/getdoc.jsp?containerId=IDC_P29475, Worldwide Semiannual Internet of Things Spending Guide

Key Considerations for IoT and Embedded Product Development

Today's embedded products are no longer monolithic systems that remain unchanged for years. Now, we see product development happening faster, with demands on embedded and IoT systems that reflect changes in the global technology marketplace.

This means that embedded devices are becoming more complex - which is both an opportunity and a risk. There is a growing pressure on costs and security while expectations of devices in terms of their capabilities and ease of use also continues to rise. This means extra investment in product development to ensure your products and devices can deliver more. It also means when getting those products to market, you need every advantage you can get.

Some considerations of modern embedded and IoT devices are...

1. Higher Expectations for User-Friendly Interfaces
2. More Demands at the Edge
3. Lower Power Requirements
4. Security and Product Updates
5. Smart Features – Machine Learning and AI

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1. Higher Expectations for User-Friendly Interfaces

Everyone is technology user now and wherever technology and people interact; the expectation is for a user experiences that which we are used to as consumers. A clear, rich interface that is easy to use and mirrors our smartphones. Touch screen with high quality displays have meant that even in industrial and rugged environments, user experience should be smooth and simple. These expectations mean an increase in processing requirements and complexity in product development.

2. More Demands at the Edge

Edge computing as a phenomenon has exploded and increasingly, devices at the edge are more intelligent, require more processing power and can do more, than ever before. Previously, the edge was a high risk for security and cyber-attacks and therefore the need for robust security and protection at the edge has also increased. Network connectivity to the edge also remains critical for the smooth exchange of information between the edge and central network and servers.

3. Lower Power Requirements

Many IoT devices such as remote meters and measuring tools are battery powered and may need to function on a single battery for many years. For this reason, product developers have to consider how to reduce the power consumption requirements in these devices or find ways for microprocessors to 'wake up' only for user interaction. Environmental concerns also drive the demand for increased efficiency, which in turn can help to lower ongoing costs.

4. Security and Product Updates

Almost as soon as a new product goes into production, improvements in efficiency, programming, power and control become available. Even though embedded products are designed to have a longer lifespan than most hardware and software, updates will become necessary over to time to increase security, protect from new threats and extend the life of the product. This means designing ‘headroom’ into new products which allow for future updates, secure communication and lifecycle extensions.

5. Smart Features – Machine Learning and AI

A great way to differentiate new products is by building in more `smart' features, or capitalizing on new developments such as machine learning and artificial intelligence (AI). If remote and edge devices can start to predict an error before it happens by reviewing use patterns, it can alert system users of an issue before it becomes critical. Likewise, if machine servicing can be more accurately predicted this saves on expensive person hours in the field and reduces the number of inspections and service visits required.

How Can Avnet Integrated Help You Get To Market Faster? With HARDWARE

Avnet Integrated offer a wealth of experience in product design, development and manufacture and can help advise you on the best components, structure, hardware and software for your embedded or IoT device. We also have a number of pre-built components, with re-usable IP which you can leverage to shorten your production time, make your build process more efficient and help you to develop new revenue streams, faster.

As an original equipment manufacturer (OEM) in our own right, we can provide partly, or completely manufactured solutions. We can supply a range of standard products, or we can work with you to build custom products and solutions. Our in-house expertise in system engineering and our investment in labs, tools and processes means you get the very best solution to deliver applications and devices. Off-the-shelf components, modified components or complete custom solutions can be designed specifically to meet your needs. The benefit of using pre-made or modified components is that they have already been rigorously tested and developed to high standards, meaning you can save time, development cost and manufacturing cost by plugging them straight into your devices.

We can offer main board and slot CPUs, embedded boards and easy to use solutions such as Simple Flex, AI Vision and Direct Connect. Here are some more details on each.

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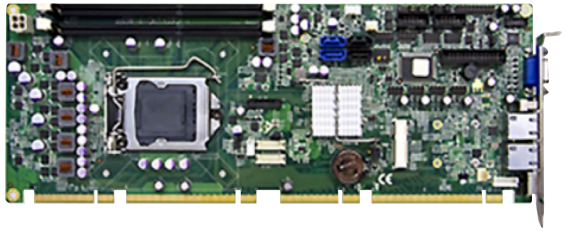
Main Boards and Slot CPUs

At the heart of your embedded or IoT product is your embedded platform. Over many years and thousands of projects we have chosen our partners to provide the best possible solutions. The industrial main boards in our portfolio are available in a wide variety of form factors that can fit your application and purpose.

Slot CPU cards come with a guaranteed availability of up to 5 years, with reliability and quality as standard. We offer a large selection to suit your requirements, whatever they may be.

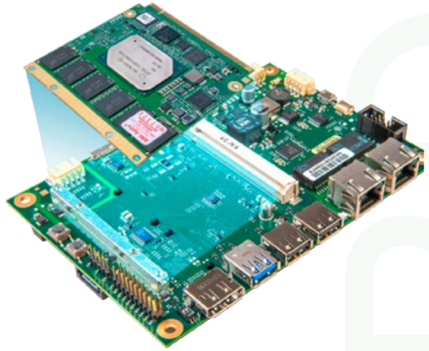


Embedded Boards

Our in-house design and manufacturing team has been leading the industry for over 30 years and have vast experience in designing embedded boards that are complex, high speed and efficient in development and production. Our manufacturing sites in Freiburg and Stutensee, Germany and Malta all have the latest fully automatic manufacturing equipment allowing us to offer best-in-class, high quality at competitive production costs.

We specialize in:

- X86 CPU architecture
- ARM Cortex-Ax architecture
- FPGA/FPGA SOC design
- High speed designs (DDRx DRAM, 10GbE, PCIe, USB 3.0, frontside buses, graphics)
- Simulation (thermal, signal integrity, functional)
- Operating system support (Windows/Windows Embedded / Linux Embedded)
- BIOS and software development



We can offer main board and slot CPUs, embedded boards and easy to use solutions such as Simple Flex, AI Vision and Direct Connect. Continued.

COM – HPC Modules

COM_HPC™ is a new Computer-on-Module standard designed specifically for High Performance Computing. It extends the Computer-on-Module idea to powerful client and server class processors, providing an unmatched infrastructure of high-end interfaces. This supports emerging technologies such as AI, machine vision, edge computing and 5G network infrastructure and is well equipped to support the demands of IoT devices and products that have embedded computing, further into the future than has been previously possible. There are multiple network options and Avnet have worked with semiconductor companies and infrastructure providers to provide flexible solutions and form factors to support high performance CPUs, with customization available to meet your requirements.

SMARC™ Modules

SMARC (Smart Mobility ARChitecture) is a versatile small form factor computer module designed for applications that require low power and costs, but high performance.

Avnet Integrated designs, manufactures and supplies an extensive range of SMARC modules which are available off the shelf and ready for immediate use, or which can be modified or even fully customized to suit your environment or application.

We can offer main board and slot CPUs, embedded boards and easy to use solutions such as Simple Flex, AI Vision and Direct Connect. Continued.

SimpleFlex by Avnet Integrated
A new standard in embedded computing.

SimpleFlex is the intelligent combination of a standard Computer-On-Module (COM) with a standard carrier board. It combines the advantages of Standard SBC and Customer SBC by choosing the COM from a huge portfolio of CPU and memory configuration options.
This is the basis for innovative solutions for HMI systems, complex display systems, IoT gateways, medical devices, gaming systems, transportation and automation systems, and many others.
The ready-to-use platform is cost efficiently adapted with the selected interfaces and assembled in-house on fully automatic production lines.
For the customization, over 30 pre-validated interface combinations are available. This makes SimpleFlex a great solution for series production with large quantities.

Speed time to market

Without sacrificing quality

Without inflating cost

SimpleFlex is the perfect way to build a compute solution that suits your precise needs and move from prototype to mass production in record time – allowing you to reduce development time and cost with no sacrifice on flexibility.

	Standard SBC	Custom SBC	Simple Flex
Low Cost	✓✓✓	✓	✓✓✓
Flexibility	——	✓✓✓	✓✓✓
Time to Market	✓✓✓	———	✓✓✓
Low Development cost/risk	✓✓✓	———	✓✓✓

So, you can see, Avnet Integrated can design, build, develop and supply a whole range of hardware elements to make the production of your embedded or IoT products more efficient, more cost effective, nd faster.

We can offer main board and slot CPUs, embedded boards and easy to use solutions such as Simple Flex, AI Vision and Direct Connect. Continued.

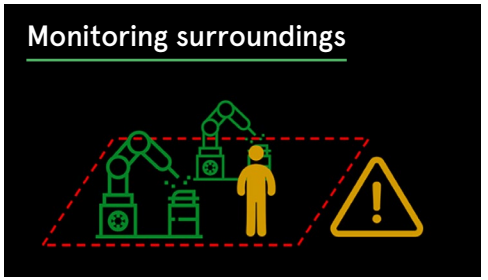
AI Vision

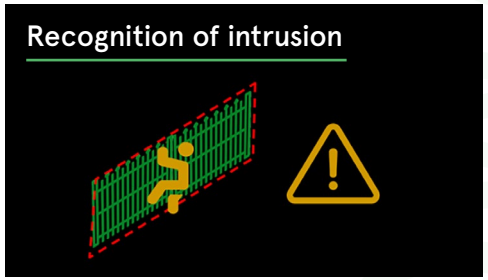
AI Enabled Video Analytics at the Edge

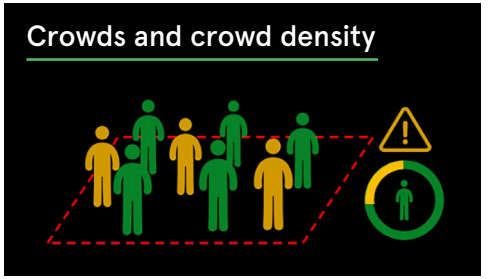
AI Vision is Avnet Integrated's intelligent vision technology platform. It's a ready to use hardware system that includes powerful hardware components and software with optimized AI. It allows any company from system integrator to software developer to evaluate, customize and scale computer vision solutions with artificial intelligence easily and quickly.

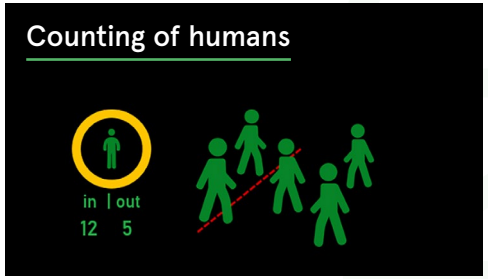
Using smart cameras, edge or cloud-based technology, the platform can detect and identify people and objects and is designed for deep learning, supported by video analytics at the edge. Using built in AI the system can then identify and classify and execute programmed actions.

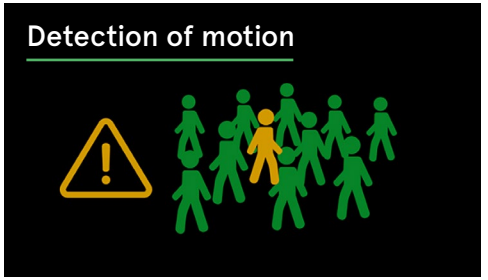
Pre-installed Functionalities include:

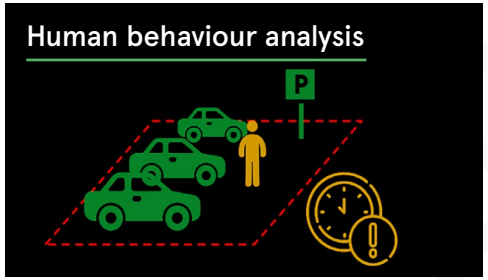












How Can Avnet Integrated Help You Get To Market Faster? With SOFTWARE

Microsoft Licencing for Embedded and IoT devices

Hardware is a key component of embedded computing, and of course, software is the other element which is essential to the success of your devices. Avnet is an authorized Microsoft Embedded license partner and distributor with a team of in-house technical and licence specialists that can assist you with licence management. We can provide Embedded licensing, saving you time and money and licensing for Windows 10 IoT and Server, as well as other Microsoft solutions and embedded channel programs.

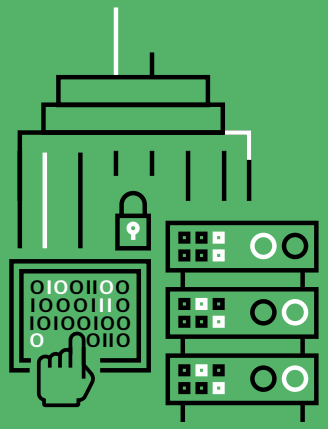
Windows 10 IoT Enterprise has been built specifically for IoT devices in mind, and now you no longer need to buy a different licence product. Both the embedded and core functionality are available in the same SKU, they are just licenced differently.
Windows has an ecosystem of hardware provides from systems to peripherals and natively supports Natural User Interface (NUI) support for Touch, Ink, Cortana, Speech and Vision. Microsoft provides commercialization guidance and tools around testing and manufacturing and is building out a library of repeatable IoT solutions across industries to 'jump start' solution creation.
Microsoft provides tools which enable 'zero-touch' provisioning for installing devices in the field and has management tools which can be used to monitor and update the operating systems and apps. Plus, supported by Azure IoT there are powerful tools to store, manage, analyse and report on even large datasets, quickly.
Choosing the right Microsoft licence and tools is therefore a great way of building competitive advantage into your embedded products and solutions and our expert team can answer in depth technical queries to help ensure you are getting the optimal license setup for your business and ensuring compliance with Microsoft rules.

SOFTWARE

Avnet Direct Connect
Invest in your software

If you develop your own software, Direct Connect from Avnet allows you to concentrate your efforts on developing new applications and improving your customer experience, as well as reducing costs for your business. If you need to supply hardware as part of your solution, or rely on hardware to deliver your application, Direct Connect can allow you to do this.

It's a financial service that offers a low touch option for you to supply solutions complete with hardware direct to your customer – a plug and play model that reduces complexity and allows efficient, supported delivery of your software.



Direct Connect

- **Increase profit margins**
- **Speed time to markets**
- **Reduce support costs**

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Software
Support Services

We offer a range of different software services, provided both in-house and through our subsidiary, Witekio, who help high tech makers build great software. With 5 global offices, Witekio specialize in software for embedded systems and IoT products. You can leverage the team's experience to relaunch or upgrade an existing product or design and architect a new device. We can meet your strategic and operational needs and have specific experience in automotive, handheld, mobile, aeronautics and consumer goods

As well as software customization, we can offer BIOS, firmware, operating software and even training for your in-house software development teams so that they can work easily with our hardware. The sky is the limit and we can support you whatever your software needs.

Want to Find Out How to Get Your IoT Embedded Project to Market Faster?

Our team has years of experience in all aspects of embedded hardware, software, integration, product design, development and deployment and we can put all this experience to use on your project.

You can see a selection of customer case studies, here:
www.avnet.com/wps/portal/integrated/resources/customer-case-studies/

If you want to know more about how Avnet Integrated can help you align, accelerate and amplify the success of your dedicated devices, then let's talk!

Let's talk!

Contact our team on integrated@avnet.com to find out more and discuss how we can help you align, accelerate and amplify your embedded products with your business ambitions.