Steatite

DESIGN AND ENGINEERING CAPABILITIES

TECHNOLOGY FOR EXTREME ENVIRONMENTS

WWW.STEATITE.CO.UK

COMPUTING

BATTERIES

COMMUNICATIONS

ANTENNAS

IMAGING

COMPANY OVERVIEW

Established in 1938, Steatite is a market leader in the design, manufacture and supply of rugged portable and industrial embedded computing, custom battery packs, secure communication systems, antennas and computer imaging products. Our focus is on providing highly reliable technology for use in harsh environments, where failure is not an option.

Custom engineering is at the heart of our business. As a result, dedicated in-house teams support clients by designing, manufacturing, and testing the most advanced range of products and systems tailored to their specific application requirements.

COMPUTERS

Steatite is a designer and manufacturer of industrial embedded computers, specialising in rack-mount systems, fanless PCs, and touchscreen panel PCs.

Designed and built to provide reliable operation in demanding environments, our systems can withstand shock, vibration, dust, moisture and extremes of temperature which would normally cause the rapid failure of conventional computer technology.

Chassis Design and Customisation

Ground Up Design.
Our UK mechanical engineering team can design an enclosure from scratch to suit the Regulatory, Spacial, Enviornmental and EMC requirements of your project. With many years of chassis design experience, and utilising advanced 3D modelling software (Solidworks), you can be confident in fast and accurate delivery of prototypes, along with a low MOQ if required when moving to production.

Existing Chassis Modification
The majority of our own design systems and chassis can be modified to suit your specific requirements, whether you need additional I/O ports, an LCD display, custom interface, removable drive bays or something else entirely, our engineering team will be happy to help.

Branding
To make your system stand out from the crowd, and so it looks like more than just an off-the-shelf computer, we can fully brand our systems with your company colours and logo. Combine with a custom chassis design to create the perfect system just for you.

Custom Mechanical Design

Our mechnical design capbilities are not limited to computer chassis – for example if your solution requires custom mounting hardware or other ancilliary components such as displays then we can provide solutions for these too. If you need a fixed mount, or one that includes adjustment or motion, whether your equipment is vehicle mounted or in an industrial / office environment, we will be able to assist in designing a solution which will perform day in, day out.

Custom Electronic Design

In-house electronic design capability allows Steatite to design and prove custom electronics, providing unique capabilities and custom functionality to your systems. Circuits and PCB's are designed in house using Orcad and Proteus design packages. A wide range of experience in analogue, digital and power electronics gives us the ability to tackle the requirements of almost any design. If custom firmware is required to bring the electronics to life, then this can also be encompassed in-house.

Windows Integration

Custom Image Build
Our software team can fully customise Windows IoT and Windows Embedded operating systems to suit the specific requirements of your project, whether you are looking to 'lock down' certain Windows features to prevent unauthorised use of your system, want to brand Windows so that it does not look like Windows, or want helping configuring advanced features like UWF (Unified Write Filter).

Image Capture & Deployment
To simplify O/S installation and deployment, and to ensure that every system built is identical, we can capture a Windows image from a fully configured system and prepare it for deployment on to future system builds. This can include your software, user accounts and all Windows settings.

Update Management
Once an image has been captured, ensuring that it is properly maintained and updated is vital. We can either automatically apply all available Windows updates during system build, or can inform you periodically of which updates are available so that you can test and approve them before having them added to your image.

Recovery Media Creation
When utilising a Windows IoT or Windows Embedded O/S, you need to consider how that O/S build can be redeployed to systems in the field. Our team can create a bootable USB flash drive that can be used to reimage systems with your Windows build, with drives correctly formatted and partitioned, giving you a way to revert your systems to a factory fresh state.

System Branding

Chassis Colour & Logo
Creating the right first impression and standing out from the crowd can be the difference between winning or losing an order. We understand that as an OEM you may want systems finished in your company colours and branded with your logo, creating a product that is uniquely your own.

Packaging Logo
The ideal accompaniment to a branded chassis is to have it arrive in your own branded packing cartons, further helping to reinforce your company identity.

Labelling
System serial number labels can be customised with your part code, logo, and contact details, plus the serial number itself can follow your specific format.

BIOS Splash
Having a system show your company logo on boot, instead of a generic POST screen, is a great way to ensure that your company name is always in the mind of the user.

Windows Branding
The final piece to the branding puzzle is having Windows branded in your company colours and with your wallpaper. We can also configure Windows so that it loads your application in place of Windows Explorer, meaning the user would not be able to tell they are using a Windows PC.

Total System Design and Build

Full System Design
For more complicated or unusual requirements, we can design an industrial computer from the ground up. Our experienced team has proven design capability in computer systems (fixed and portable), displays, communications systems, battery, and battery management systems. Quite often two or more of these disciplines are combined to produce systems which are a hybrid of the technologies.

Everything from metalwork, plastic moldings, cable looms and electronics can be engineered at Steatite to meet your specific needs. With decades of engineering experience, you can be confident that the design, prototyping, and production process will be efficient, cost effective and fit-for-purpose.

Regulatory Compliance
We have many years of experience in designing, testing, and certifying system to comply with CE, UKCA, FCC, Tempest, Def Stan and MIL-STD standards.

Rack Cabinet Integration
Steatite can take 3rd party hardware, along with our own industrial computers and timing systems, and design and build a fully integrated and tested rack cabinet, ready for deployment into the field.

Demo Systems Available

We have a wide selection of demo systems available for loan that you can use to test with your software and in your specific application before committing to purchase, reducing your risk, and potentially saving money.

3rd Party Hardware Integration

If you have specific I/O cards or custom electronics that need to be integrated with one of our industrial PCs, we can perform the integration in house at Steatite and fully test the end solution using your exact test processes.

Custom System Configuration

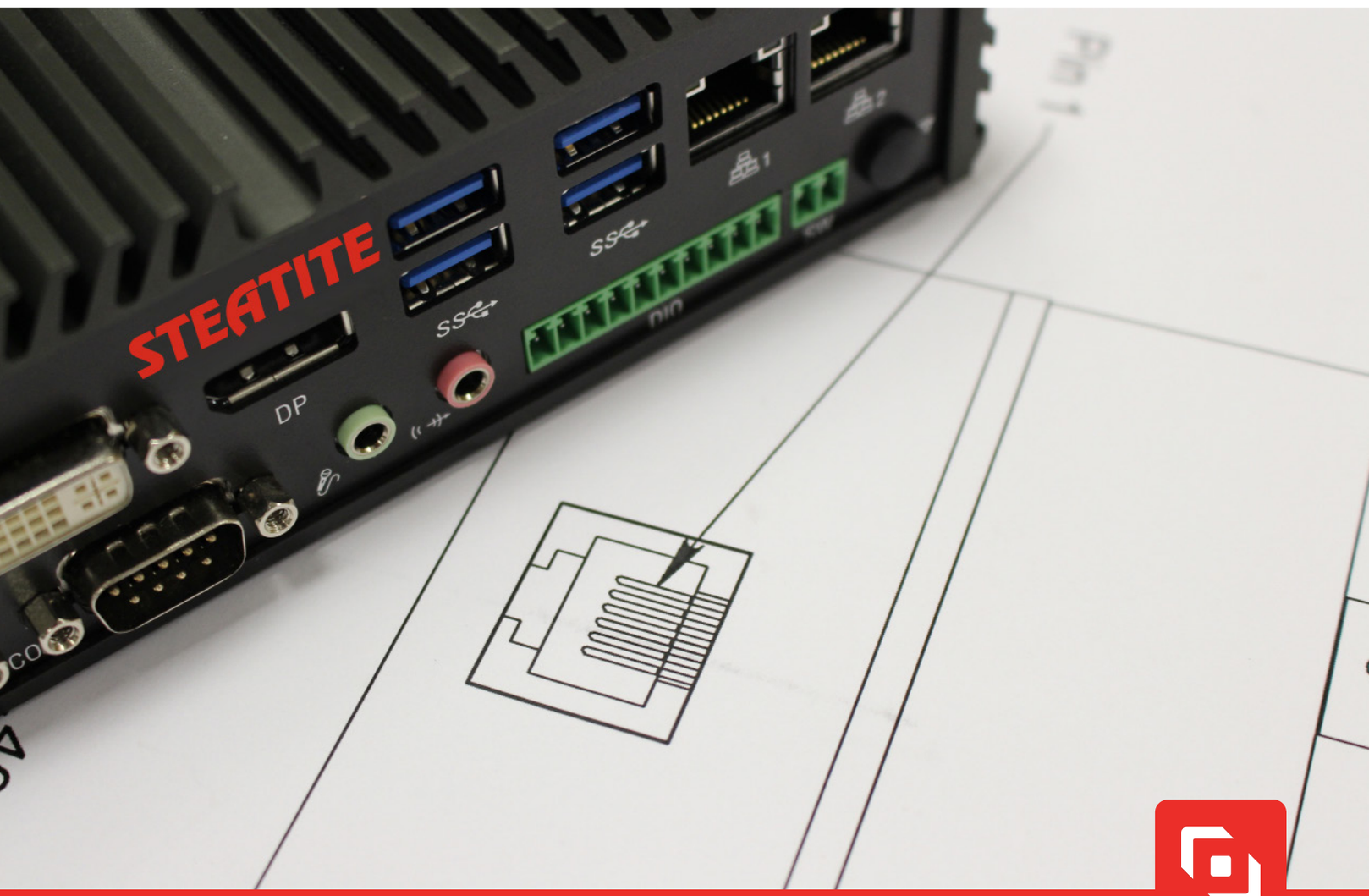
All our systems can be configured to meet your exact requirements, meaning you only pay for the features that you need and don't have to settle for whatever configuration happens to be available. With the option to specify memory, CPU, storage, I/O, expansion, operating system, and more, we can build you the most suitable system for your application.

BIOS Defaults & Branding

Having a BIOS customised with your specific settings 'hard coded' helps to maximise the reliability of your system – no more support calls from customers who have a non-working system because they have taken it upon themselves to 'reset BIOS defaults'. A branded POST screen looks great on boot too.

Windows Image Build & Deployment

A great way to ensure that every system operates in an identical way is to have a customised Windows image created that is pre-configured with your software and settings. This image will then be installed on every system that we deliver, saving time at your end.



Reliability and Consistency

Production Stress Testing
Every industrial PC built at Steatite goes through a thorough stress testing process to ensure any faulty components are identified during build and can be replaced and retested before delivery to you or your customer. Test records are kept for every system we build.

End Of Line Checks
In addition to stress testing, we perform a number of end-of-line checks, including I/O port functionality, wireless connectivity (when present), software and BIOS configuration check, and a physical quality check. A test sheet is completed for each system and is signed off by both the person who built the system and the team leader, ensuring full accountability and traceability.

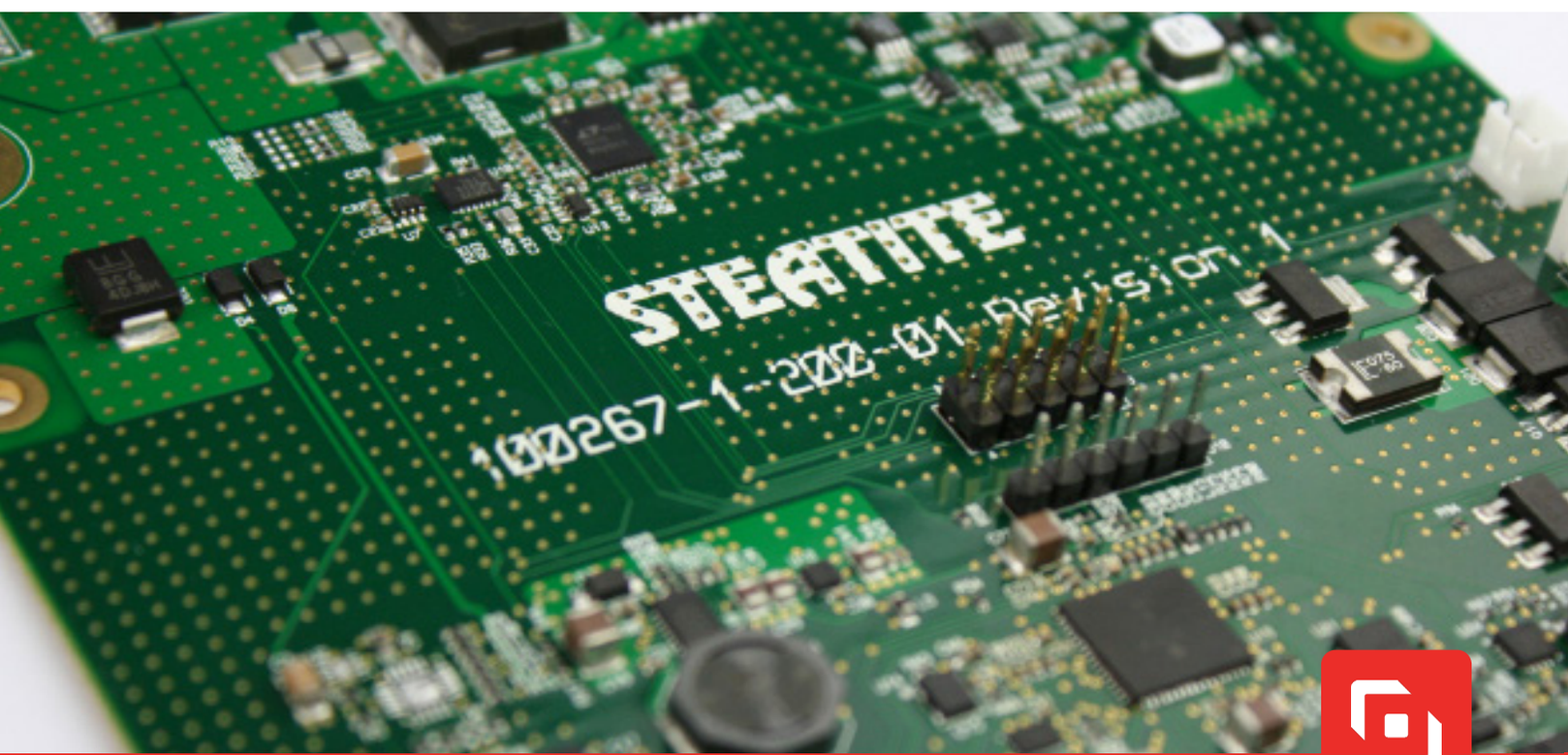
Custom Test Procedures
If you have specific test procedures that need to be performed on a system, we can perform them in-house at Steatite, potentially saving you time and money.

Custom test jigs
Steatite can also design production specific test jigs if required.

Build Documentation
To ensure consistency of every system we build, detailed build instructions are created that describe each step of the assembly process, while highlighting any special build or test requirements that you may have.

Revision Control
Our strict revision control procedures mean that no change can be made to the configuration of your embedded PC without your approval, further ensuring that every system we deliver to you is identical. Steatite utilises a ECN change process.

Lifecycle Management
As and when components are discontinued, we will provide advance notice to allow you to qualify replacement parts in plenty of time, or to place a last-time-buy order, if no alternatives are available.



UK Tech Support

Hardware

If you need help getting your industrial computer to work as required, whether you just need pin-out specs, or something more challenging, our knowledgeable technical support and engineering teams will be happy to help.

Third Party Integration

If you are struggling to get 3rd party hardware or software to work with one of our systems, our experienced support team can help to identify the cause of the problem, and then suggest a solution.

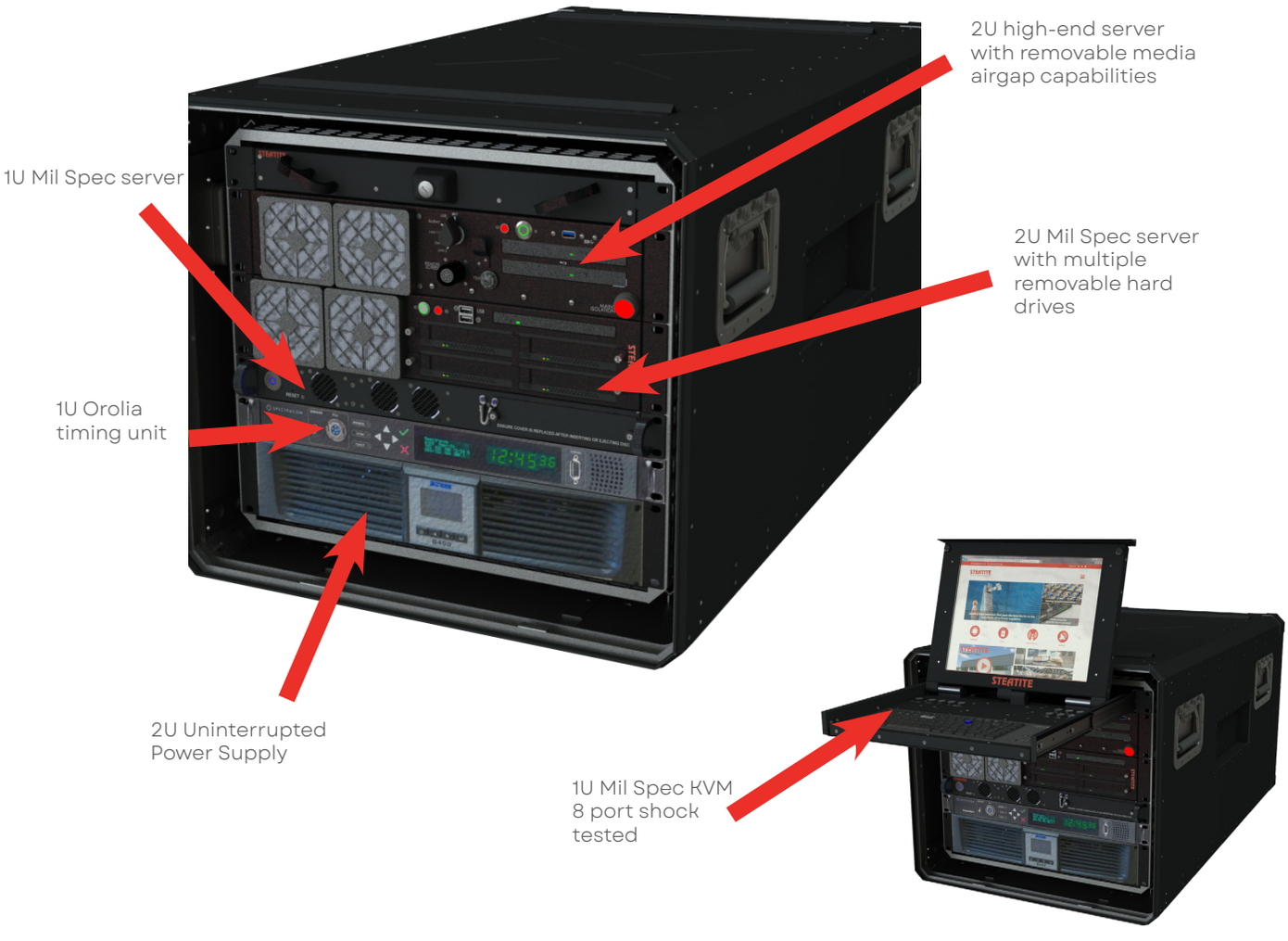
Windows

Our Windows development team can help with Windows configuration, update management and O/S customisation, while also being able to capture an image for deployment or creation of customer-ready recovery media.

UK Repair Centre

In the unlikely event that one of our systems develops a fault, our UK-based support team will be able to quickly investigate the cause of the fault and perform any remedial action.

An example of Steatite Computer Engineering - Rugged Integrated Computer System



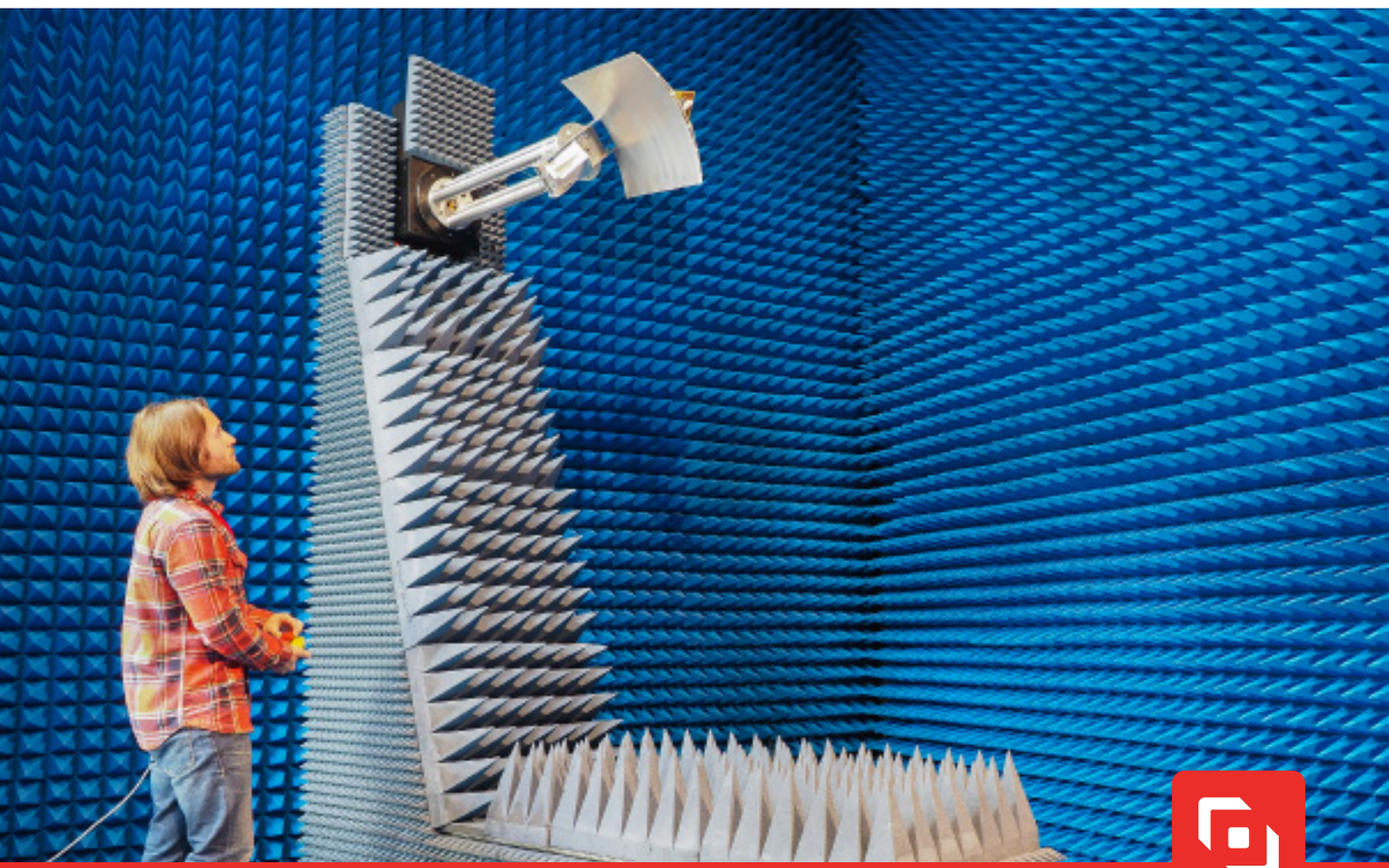
ANTENNAS

Steatite Antennas (formerly Q-par Angus) is a world renowned, UK based custom antenna designer and manufacturer. The company has been at the forefront of microwave antenna development since 1973.

Steatite excels in the research, design and manufacture of specialist, high specification, custom designed antennas. This wealth of expertise also carries into the company's substantial range of commercial-off-the-shelf (COTS) antennas and associated components. Typically engineered to operate in the 30MHz to 60GHz frequency range.

COTS

- Steatite has a catalogue of >1000 antennas of numerous topologies covering the frequency range 30MHz to >60GHz. Directional and omni-directional antennas with single or dual linear and circular polarisations are offered to predefined designs.
- Antenna designs offered include horns, spirals, sinuous, helixes, omni-directional antennas, flat panel arrays and parabolic reflector and feed combinations
- All RF design is undertaken in-house using commercially available CST Microwave Studio software which is complemented by in-house developed tools.
- Key design features are ultrawide bandwidths, high power and non-standard features or attributes including shaped beam patterns, customer specific mounting arrangements or arrays of multiple units.
- Mechanical design including FEA simulation is undertaken using SolidWorks software.



Custom Design

- Custom designs are possible with existing offerings or in response to a new bespoke detailed customer requirement.
- Compliance of the simulated performance to the customer specification will be provided early on in a bespoke antenna development.
- Larger antennas or those containing structural elements are modelled to assess for loading under defined environmental conditions to ensure suitability of the offered design.
- Reports on the structural loading, shock loading or displacements due to vibration can be produced for the customer as part of a development cycle.
- Detailed build instructions are maintained and controlled on our internal systems to ensure consistency of designs.
- It is common to produce repeat orders for our customers with a >10year or >20year gap since previous deliveries; control of design documentation is therefore key to enable provision of potentially qualified antennas.

Bespoke Antenna Positioner Design

- Steatite produces bespoke single and multi-axis positioner systems for antennas and multi-antenna arrays. Integrated solutions that consider the coupling of adjacent antennas, integration of customer front-end electronics, physical alignments of multiple antennas or specific positioner mounts naturally require bespoke rather than off-the-shelf products. Steatite can work with customers to develop specifications, understand specification constraints, and provide bespoke solutions for these applications.
- Steatite specialises in antenna positioning systems for harsh environments including on naval and airborne platforms or in extreme ground-based installations. FEA simulation including for wind loading of large antenna arrays is undertaken along with environmental and EMC testing of systems and sub-systems. Electronic interfaces providing either basic level of commands through to custom high-level movement profiles and custom software can be provided with the positioners.
- Antenna positioners are often provided in radomes for environmental protection whilst posing limited effect on the system RF performance. Radome design is undertaken in-house and construction carried out with third party manufacturers. Radomes can range from simple items to seal a feed on a reflector antenna up to large units that encompass complete multi-antenna positioners.

Custom RF Component Design and System Integration

- Antenna units are often specified and procured as individual components, but many customers have found the benefit of tight integration of front-end components with the antenna units. Steatite can supply adaptations to antennas or bespoke designs that provide integration of front-end electronics close to the antenna port to minimise losses. Steatite can integrate customer provided electronics or can source items for integration with the antenna units including cable looms, limiters, filters, low noise amplifiers (LNAs) or receivers. High power transmitting systems equally benefit from close integration of power amplifiers or magnetron sources along with any ancillary components such as couplers, circulators or loads close to the antenna units.
- In addition to antenna items Steatite can design, fabricate, or source RF componentry including coax-to-waveguide adapters, splitters, OMTs, waveguide components, filters, monopulse comparators or beamforming networks.

In-house Prototype/Low Volume Manufacture

- The Antenna business unit includes in-house fabrication and assembly resourced for prototype or low volume manufacturing of parts. Within the Leominster facility there are the capabilities for CNC and manual milling and turning, sheet metal cutting, bending, and welding, chromate passivation, painting and assembly of batches of 100's off within a clean lab environment.

Management of Outsourced Volume Manufacturing Capabilities

- Management of sub-contractors and third-party assembly houses for medium volume production can be undertaken in-house along with development of assembly/test fixturing and batch test programs for off-site manufacture.

RF and Antenna Pattern Testing

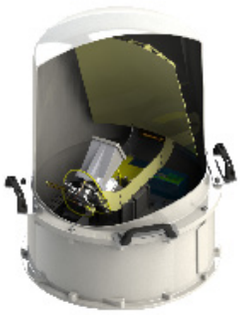
- Steatite operates a near-field measurement range supplied by NSI to fully characterise the beam pattern performance of antennas. The system operates in an anechoic chamber capable of measuring units up to Ø3m within the frequency range 0.1 to 40GHz.
- A crane system is installed to facilitate handling of large or heavy items up to 250kg allowing full multi-antenna arrays to be measured for installed performance.
- Measurement test reports can be issued including information on co-polar and cross-polar patterns at each frequency, 3dB, 6dB and 10dB beamwidths vs frequency, beam squint and polarisation angle vs frequency. In addition, full 3D pattern data can be produced in electronic format for analysis by the customer elsewhere.
- The measurement facility includes the ability to assess field strengths at any range in front of the antenna aperture not just far-field performance. Focused antennas or applications where the field strength is required in the near field can be assessed through measurement to verify simulated performances.
- To ensure performance of all delivered antennas, all units are tested in the lab prior to shipment for port match (VSWR) and port-to-port isolation of dual polar antennas. These results are shipped as standard along with a generic test report for the antenna type. Additional testing can be arranged including amplitude and phase matching across batches or to a gold standard reference.

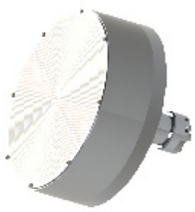
In-house Environmental Testing and Stress Screening (ESS)

- Steatite's antennas are often designed for harsh environments including on airborne, naval, or ground mobile platforms. Even for benign uses, antenna units can often remain in exposed installation sites unattended for many years. Environmental testing is carried out using internal facilities for high/low temperature, shock, vibration, and transit drop to close the loop started with FEA mechanical design. Additional testing is carried out externally for salt spray, solar radiation, blowing sand/dust and rain through third party accredited suppliers. Environmental qualification to military or commercial standards can be discussed with Steatite. Requirements for EMC testing to commercial or military standards for positioner systems can also be arranged where appropriate.
- Environmental stress screening (ESS) can be undertaken on products prior to shipment to precipitate manufacturing failures. ESS test plans appropriate to each delivery can be discussed with Steatite.
- All antenna units are RoHS compliant and can be provided with CE marking or traceability of materials as per BS EN 9102 first article inspection.

Custom Packaging Solutions for International Shipping or Reusable Packages for use in the Field

- Antennas are packaged in a suitable manner for international shipping in single use containers as standard. Re-usable transport packaging can be designed and provided if required to enable easy deployment of items over a number of uses.
- Packaging requirements that dictate item dimensions can be considered during the design process for example split, transportable reflectors in place of single piece units or limitations of sub-system sizes to enable installation through restrictive hatchways or doors.





POWER SOLUTIONS

Our battery business unit, Custom Power, is a leading battery pack manufacturer with over 30 years of experience. We provide power technology solutions for assorted industrial applications. We design, build & supply custom built battery packs and battery related technologies for use in some of the harshest and most demanding environments. Additionally we also produce high volumes of product for many assorted and varied industries including medical, metering, industrial automation, agritech, aerospace, transport (with an emphasis on rail), water, renewables, veterinary, leisure, sport, and others.

Operating from modern facilities in Crewkerne, Somerset, and Fountain Valley, California, we have extensive manufacturing, distribution and office space dedicated solely to battery pack development and assembly. Our growing team of engineers and technicians work to provide a close cooperative approach to integrating the power solution your require into your application.

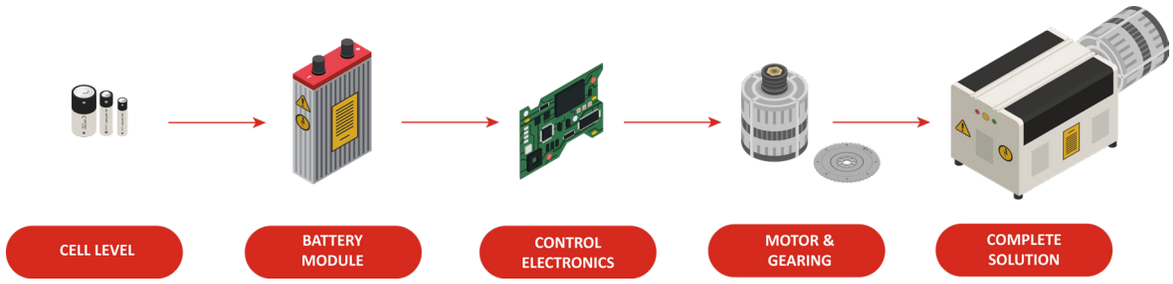
We offer sound technical advice through all aspects of the product life and will guide you through the correct cell and chemistry selection. That will feed into the process of designing a suitable single-use or rechargeable battery pack. As the first prototypes are prepared we will advise and, if needed, manage the necessary approvals to support your application compliance requirements. Finally we advise and assist through the life of your project including second life re-purposing or recycling.

As part of our design approach, we design in-house battery protection circuits, charging circuits and energy remaining fuel gauges. We are comfortable with all standard communication bus technologies, including CAN, 485, MODbus, I2C & SMBus.

Our partnerships with world class cell manufacturers and component suppliers provides us with access to the best technologies available to suit your application. We are not tied to any particular suppliers and will select the right chemistry and format (cylindrical, prismatic or pouch) for your application.

Innovation

We are now developing bespoke power train solutions – incorporating the latest cells, bespoke battery modules, attendant electronics, and electric motors.



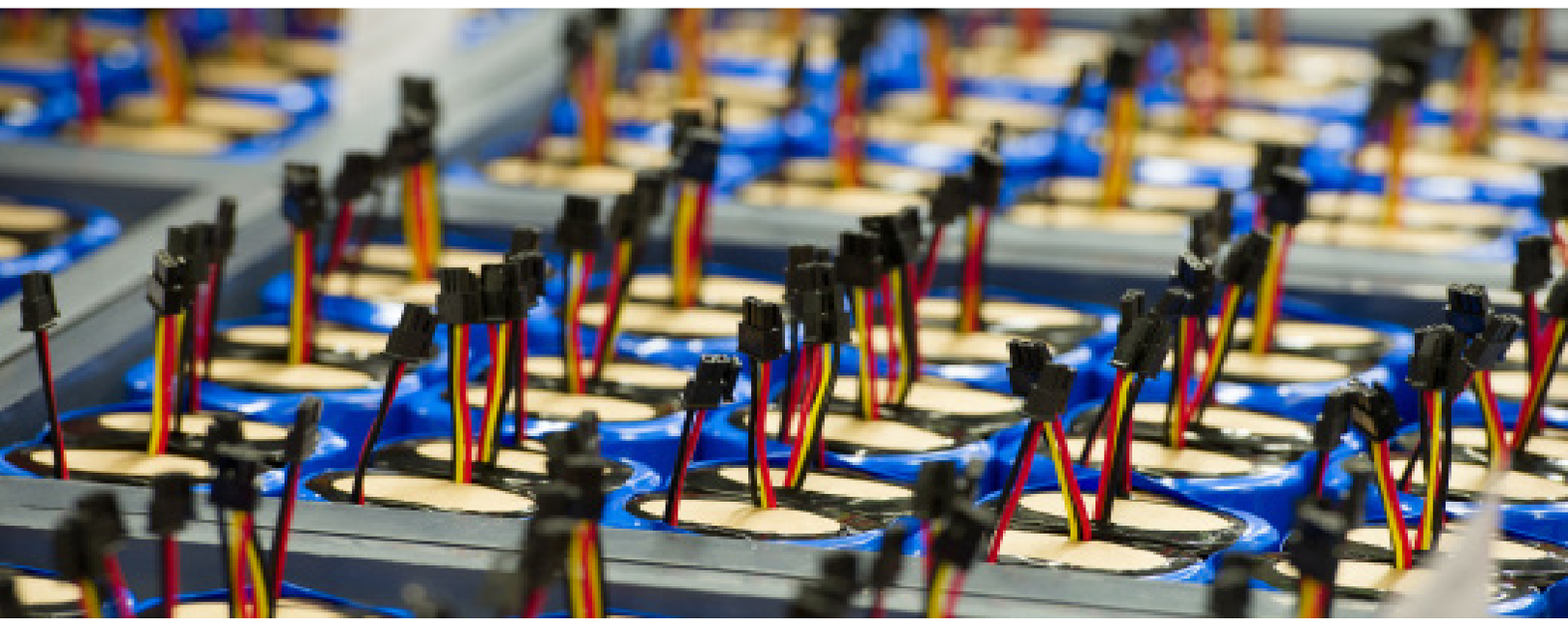
We employ cutting edge manufacturing techniques and equipment, such as our wire bonder for automated welding of highly accurate and reliable connections.

Our internally designed scaleable battery management system allows many batteries to be configured to work as one large power source and be safely managed to ensure reliable and safe integration into your end application. We are a producer of industrial batteries under the Waste Batteries and Accumulators Regulations 2009.

Steatite Ltd produce battery packs using the following chemistry types:

- Lithium-Ion including NMC, NCA, LMO, LCO, LFP/LiFePO4 and LTO
- Lithium Polymer – mainly pouch based cells
- Lithium Primary types including CR, BR, FR, Thionyl/Sulfuryl Chloride & others
- Nickel Metal Hydride
- Nickel Cadmium
- Alkaline
- VRLA

Our customer centric approach to new product design covers the complexity of a seemingly simple product from concept to fullfillment and proves buying in the UK from a trusted supplier with a network of tier 1 Global suppliers makes sense.



COMMUNICATIONS

Development of communications systems based around existing radio systems, specifically Persistent systems MPU5 radios.

Using Steatite's expertise from Computing, Antennas and Batteries engineering teams, we develop bespoke rugged mobile communications systems specific to your requirements, we work with our end customer to configure the system to their specification and will also be present at on-site installation support and training.

Steatite has developed and produced a number of COTS products to meet specific functions with a mobile communications system, such as a range of mounting kits and antenna options.

Steatite Fixed Mount MPU5 Module

Steatite has developed a fixed mount MPU5 module using the Persistent Systems embedded module.

It is designed to work in fixed mounted positions including on vehicles or boats, withstand harsh conditions and offers multiple mounting and antennas options.

Steatite CRiB

The Steatite CRiB is a ruggedised, universal command & control terminal. Designed with portability, reliability and powerful functionality in mind, the CRiB is an all-in-one battle management system (BMS). Complete with Unmanned Systems control capability, voice/data communication, and full motion video (FMV).

With support for both Windows and Android operating systems, the CRiB can independently display both systems across the dual screen configuration. In addition, it has an HDMI output port for a 3rd display or projector if required.

Playing an integral part of any Mobile Ad Hoc Network (MANET), the CRiB provides an instant viewing terminal for full motion video (FMV), situational awareness and other sensor data, all from one convenient HQ management platform.

The built-in router is designed to bridge Beyond Line of Sight (BLOS) to Line of Sight (LOS) networks. This allows distributed enclaves to participate as if locally connected. This provides the CRiB with an instant reach back to the headquarters as well as providing secure access to enterprise services from across the globe.

The CRiB can also be used for Push-to-Talk voice or provide a Video Telephone Conference, allowing for crystal clear communication between multiple talk groups either individually or simultaneously.

Powered by an integrated UPS power system providing up to 4 hours of run time, the CRiB has the capability to maintain continuous operation whilst on the move.

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IMAGING

Steatite's imaging business unit, Active Silicon, is a specialist manufacturer of imaging products and embedded vision systems, providing cameras and camera electronics for image data transmission, frame grabbers for data acquisition and embedded systems for image processing and machine control.

All hardware is designed in-house with manufacturing taking place with trusted partners in both Europe and APAC. Final assembly, inspection and testing is undertaken at the UK Operations Facility to assure quality is maintained at the highest level. Design and development of software drivers, libraries and applications are also carried out in-house in the UK.

Product Groups

Cameras

We offer a range of autofocus-zoom block cameras. AF-Zoom camera features include multiple output options, compact size, global shutter, powerful zoom and our own range of Harrier cost-effective block cameras. Additionally, Active Silicon provides camera interface boards for autofocus-zoom cameras and adapters for host-end acquisition and format conversion.

Frame grabbers

Our skilled technicians enable us to design and manufacture a wide range of acquisition solutions based around leading-edge hardware technology and versatile software toolkits. Our range includes frame grabbers for CoaXPress (including CXP-12 products) and Camera Link in different form-factors; all boards are fully GenICam compliant.

Embedded vision systems

We also produce custom embedded systems, often integrating our leading-edge image acquisition technology. Our systems are designed to meet various safety, quality and medical standards as appropriate. They are designed for long product life – retaining the same fit, form and function for many years.

Customisation of Standard Products and Full Custom Solutions

We offer full custom turnkey solutions, or can tailor an existing product to meet the particular requirements of specific applications. In addition, we provide custom software and firmware for our products and customised hardware based on our technologies. For full-custom systems or boards we will guide through all stages from planning to product design and development, to prototyping and manufacturing.

System / Hardware / FPGA Design Skills and Capabilities

System level design

- Definition of the architecture, the logical and the physical design of the product
- 3D mechanical design

Schematics & PCB design

- Component selection and optimal pin-out
- High-speed, multi-Gbit designs
- HDI-PCB
- DDR3 and DDR4 capabilities

FPGA/VHDL design

- Extensive firmware skills to support complex hardware
- CoaXPress and Camera Link IP cores
- Experts in Xilinx and Lattice

Software Development and Applications

Active Silicon has always provided software support for its many hardware product lines and has extensive experience developing software under Windows, Linux, QNX and macOS. Our skills in software include:

- Kernel drivers for several operating systems: Windows, Linux, QNX, macOS
- Libraries / API design and implementation
- Graphics display: DirectX, OpenGL, CUDA
- GUI application design (Qt, C# / WPF)
- GenICam / GenTL
- Application software for custom embedded systems

Prototyping and Manufacturing

Prototyping

With the help of established local partners, we ensure:

- Fast turn-around on PCB and assembly prototyping
- Fast turn-around on prototyping for mechanical parts
- Scale modelling using CAD data e.g. 3D printing (Rapid Prototyping)

Manufacturing, testing and supply chain management

- Manufacturing of board level parts with established partners, who we have been working with for over ten years and have a proven record of success and quality.
- Inspection of each step and final system assembly in-house at Active Silicon.
- Thorough testing of the final products managed in-house.
- Supply chain management of all components managed by Active Silicon.

Working with the Active Silicon team

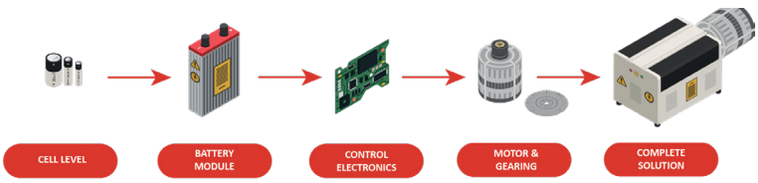
Our engineering team looks forward to finding the best solution for your project. We support:

- Creating a customised system with exactly the right functionality for your requirements.
- Finding the optimal solution for your electronic, electrical and mechanical challenges.
- Providing combined knowledge of qualified experts and leading-edge production processes.
- Quick and economic implementation into your vision system.
- Assuring compliance with ISO-9001:2015, RoHS, REACH and other industry specifications.
- On-going support for the lifetime of the product.

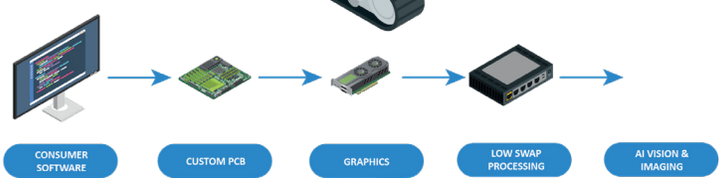
APPLICATION EXAMPLES

Example Solutions for Agritech

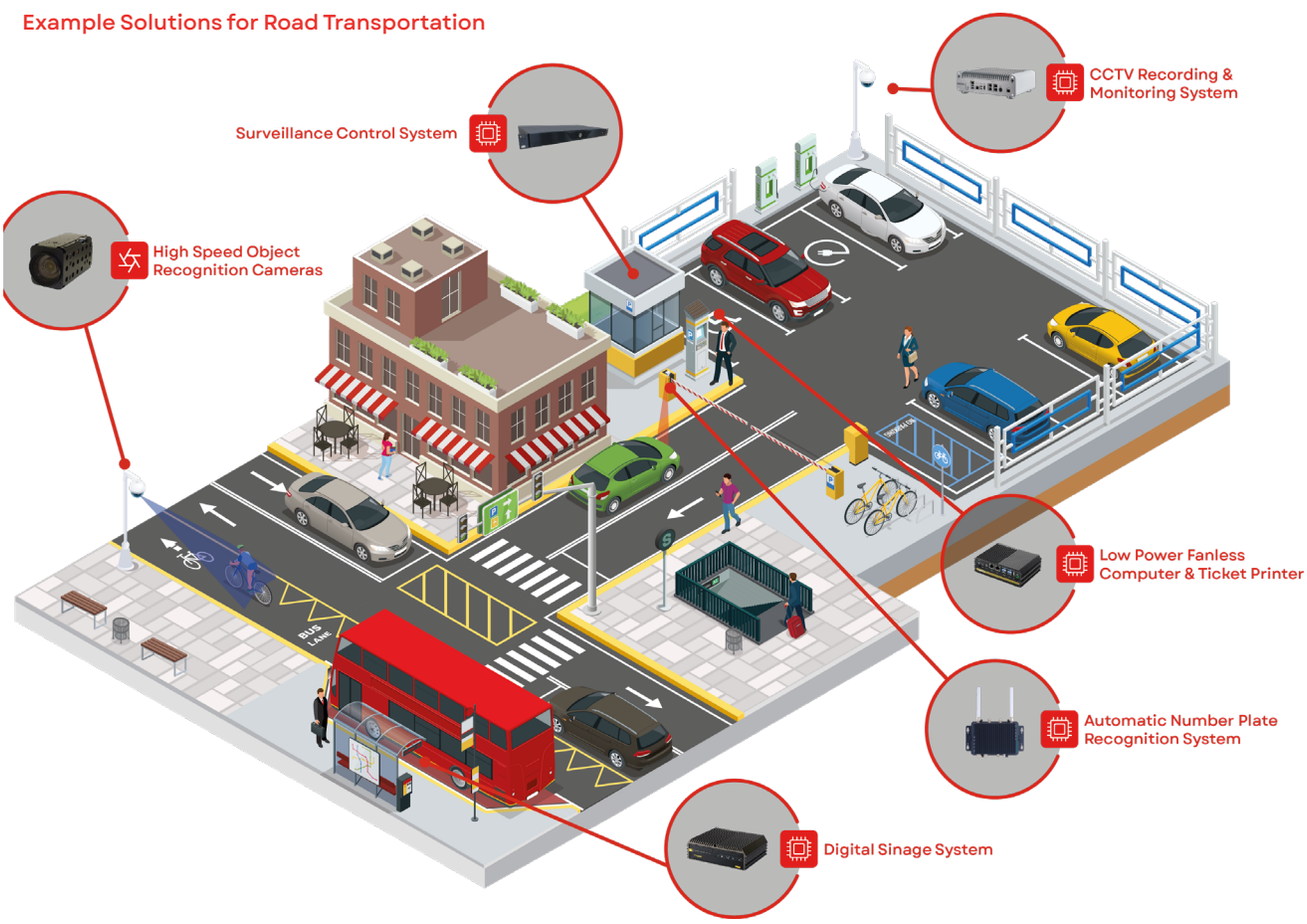
Power train systems and computer imaging solutions



intel. partner Gold IoT Solutions



Example Solutions for Road Transportation



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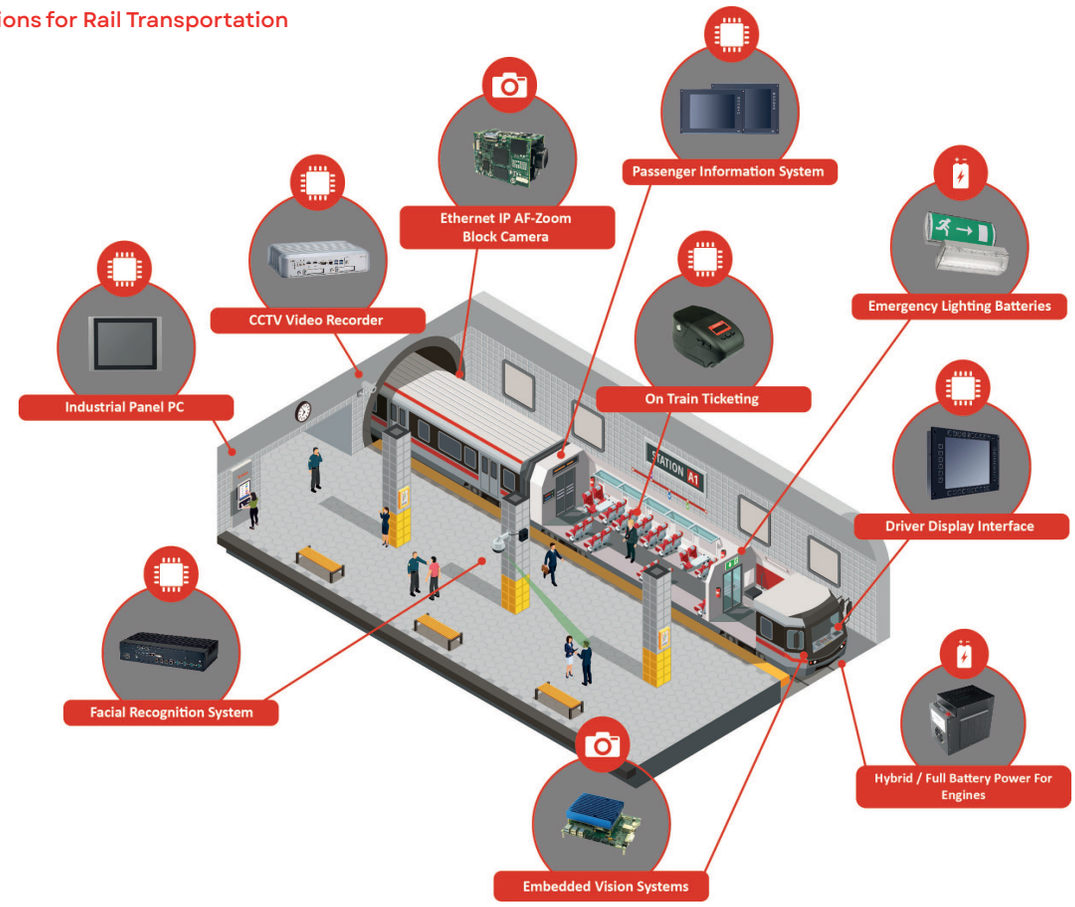
Solutions for Rail Transportation



GET IN TOUCH

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