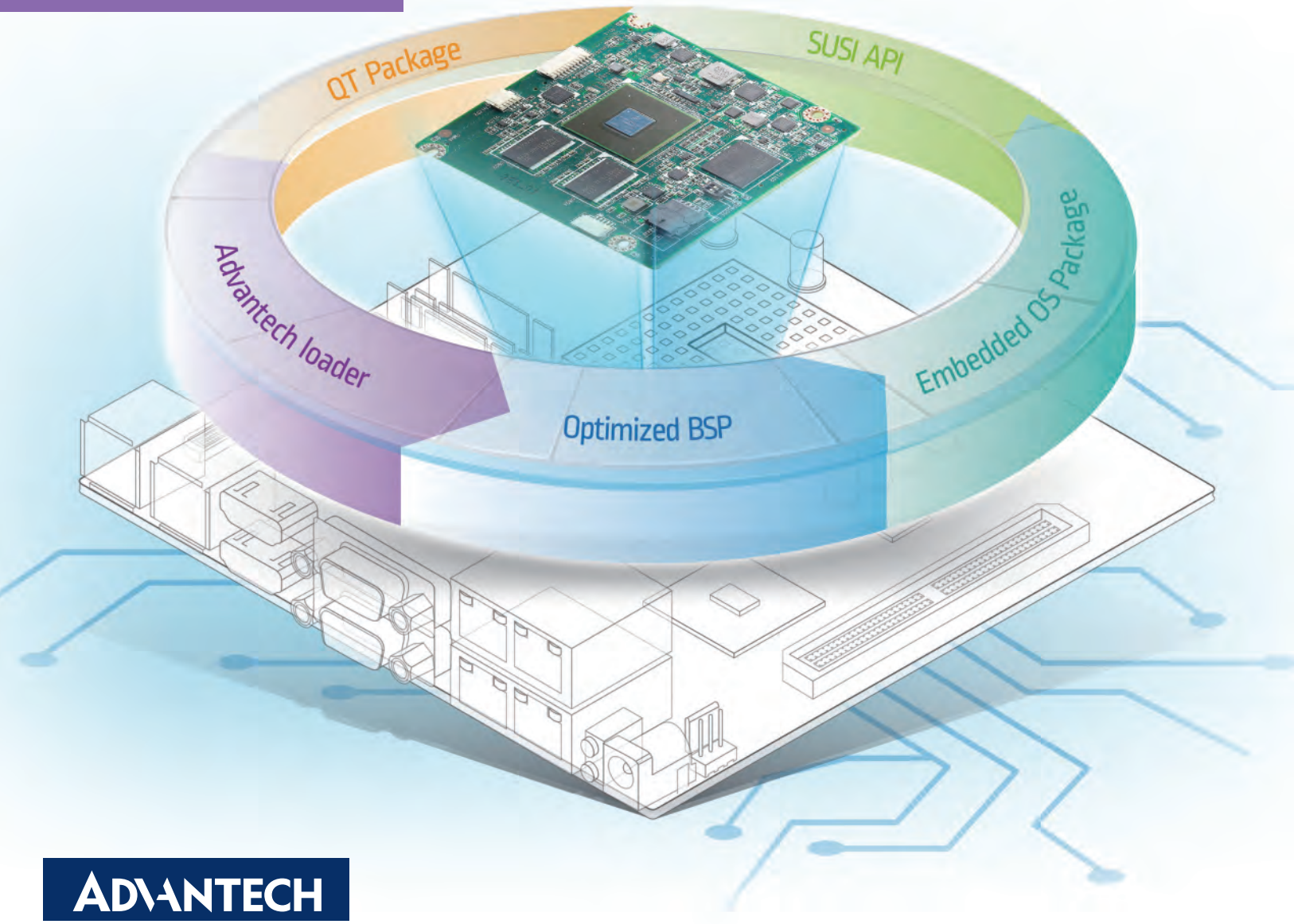
RISC Software Design-in Services

Streamlined Integrated RISC Software and Hardware

- Advantech Loader
- Optimized BSP
- OS Package
- SUSI API
- QT Package
- RISC Computing Selection



ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

About Advantech RISC Computing

In the Intelligent Planet and Smart City era, intelligent computing devices are everywhere, monitoring and controlling the way we interact with the urban environment, its infrastructure, services and utilities. This will represent a huge opportunity for all of us. In particular, intelligent embedded computing solutions, SoC products and smart devices powered by RISC technology which offers a simpler, compact, and low power architecture is best suited for exploring these new opportunities.

Advantech RISC computing platforms provide standardized, ultra compact, yet highly integrated computing solutions that can be utilized on variety of embedded PCs and systems for the smart city. Advantech RISC computing platforms fulfill the requirements of power-optimized mobile devices and performance-optimized applications with a broad offering of Computer-on-Modules, single board and box computer solutions based on the latest ARM technologies. In addition, our professional RISC design-in services help you to rapidly develop their own applications for industrial control, medical and robotic applications, with minimum resources and risk.

With a Full Range of Form Factors

Advantech is a founding member of the SGET consortium which cooperates with multiple embedded platform developers for adopting and promoting SMARC and Qseven standards in the embedded market. Advantech developed a new form factor for ruggedized applications called RTX (RISC Technology eXtended), the standard was announced with a 2.0mm PCB, 4 x B2B strong connectors, 9~24V wide power voltage input, and -40~85°C degree extended operation capabilities. All these features have made RTX the best Computer-on-Module solution for ruggedized applications. Furthermore, Advantech provides a series of application targeted 2.5” and 3.5” Single Board Computers and a UBC Box PC as a ready-to-run solution for application demands in Digital Signage, Automation Control and IoT Gateways. These ready-to-run solutions efficiently shorten the development period and schedules for integration and mass production. With our full range RISC solution offering, and our COM solutions with flexible I/O and fully integrated application targeted board/systems, we are confident that we are providing you with the best products and comprehensive services for developing Smart City applications.

RISC Design-in Services

In the past, ARM based application development was time-consuming and resource-intensive due to lack of technical knowhow, inexperience and an incomplete ecosystem that supports it. Advantech was aware of that and created a brand new service model to enhance product design-in by an experienced service team with abundant technical know-how. We offer comprehensive assistance in software, hardware and integration, which in turn expedites development cycles and boosts your own time-to-market. We're capable of software development, board design, test execution, system integration and trouble-shooting; so customers can benefit from our design-in service and deliver reliable, time-to-market products.

Software
- Middleware/SUSI APIs
- Board Support Package
- Porting Guide
- Customization

Hardware
- Evaluation Kit
- Reference Design
- Design Review
- Trouble Shooting

Integration
- Test Plan/Program
- Function/Reliability Test
- Certification
- Peripherals/Accessories

Production
- Worldwide Delivery
- Global After Services
- Longevity
- Excellent Quality

Reliable Production

Advantech RISC products have 5 to 7 years assured longevity, so customers no longer need to risk having dead stock, material shortages or unexpected cost ups. We are committed to keeping on offer quality products with long period warranty and worldwide technical support. Moreover, we have a strong manufacturing capacity and can provide customization services during production since we are a leader in the industrial market; our attentive after-sales services offer instant help because we believe every product is a long-term commitment and guarantee of our quality and responsibility.

Building Collaborative Partnership

Taking aim at the huge growth in the RISC market, Advantech is building an alliance of strategic IP/silicon, software, and system integrator partners made up of leaders in each of their respective areas of expertise. Together, these partners provide all the essential components for developing, verifying, integrating and building trusted RISC computing solutions to achieve faster time-to-market and help enable intelligent city solutions.

Advantech RISC Software Design-in Services

Simplified RISC Software and Hardware Integration

To simplify the hardware and software integration process and accelerate application development, Advantech offers RISC Design-in Services for all Advantech RISC computing platforms to assist customers with system integration. We've focussed on five major aspects to Advantech RISC Software Design-in Service: Boot Code, Board Support Package (BSP), OS services, API Library and QT package.

Advantech software Design-in Services include:

Seamless RISC Integration Services for Rapid Application Development

With dedicated service team, and complete documentation and reference guide, customers can easily integrate their own application with our hardware platforms. Furthermore, with Advantech's specialized SUSI API software suite, it's easier to implement customized features into our solutions with I/O that can be fully utilized without waste.

Modularized RISC Software Services for Application Differentiation

Modularized RISC Software services can help make your application more portable so that users can easily move their application between different platforms. Our standardized software development package is available in different form factors and helps facilitate your product development process. It's particularly useful for system integration and function verification since our development tool is standardized and verified.

Complete Documentation and Programming Guide for Application Software Development

Advantech provides specialized documents for every single Advantech product. Instead of copying documents from the original SoC vendor and applying them to all products, our product documents are available for specific platforms and operating systems. We provide user manuals, BSP porting guides, sample codes and test related documents specifically for each Advantech product. Clear guidelines for application software development and system integration help you better integrate our products into your application.

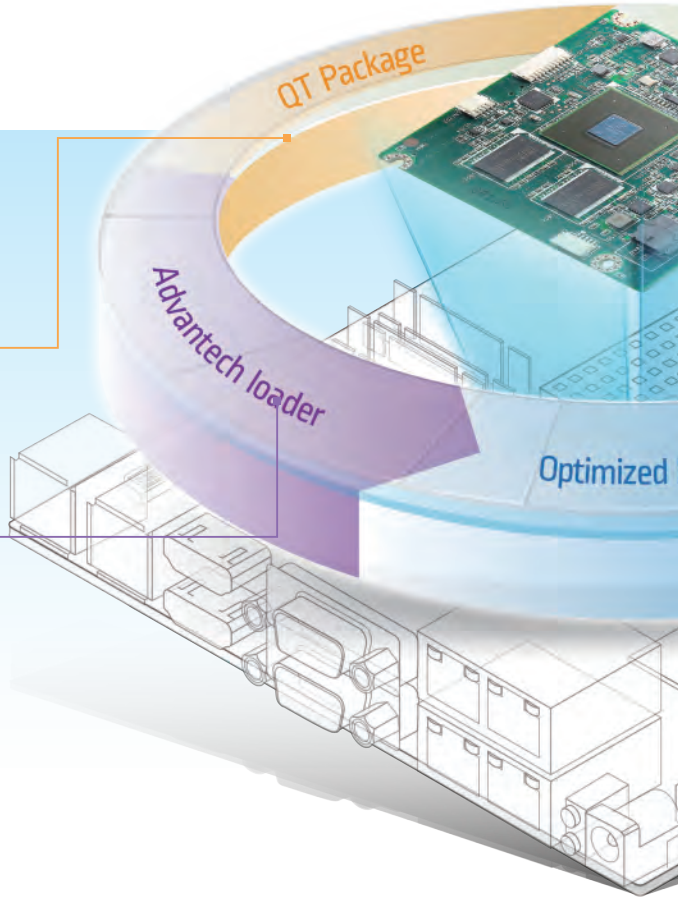
Advantech RISC Software Design-in Services

Embedded QT Package

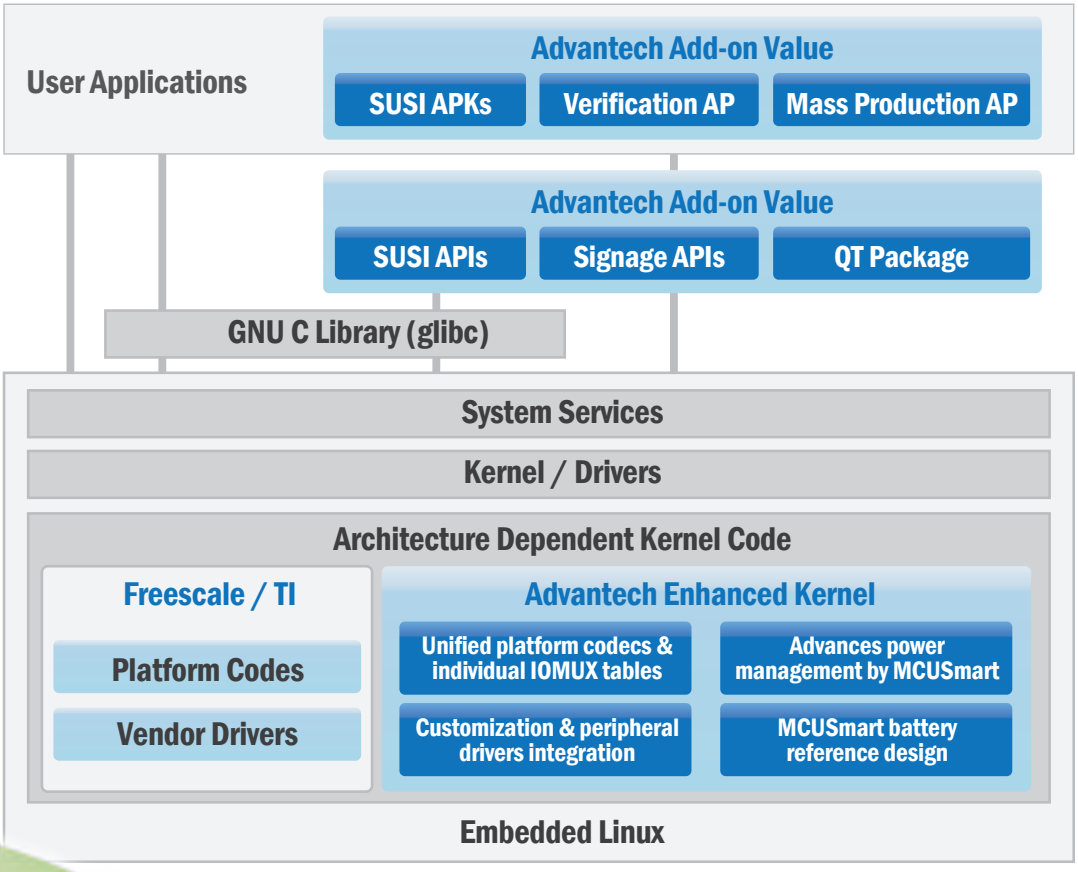
- Standard SOP for quick installation
- Ready-to-use source code
- Enhanced QT AP

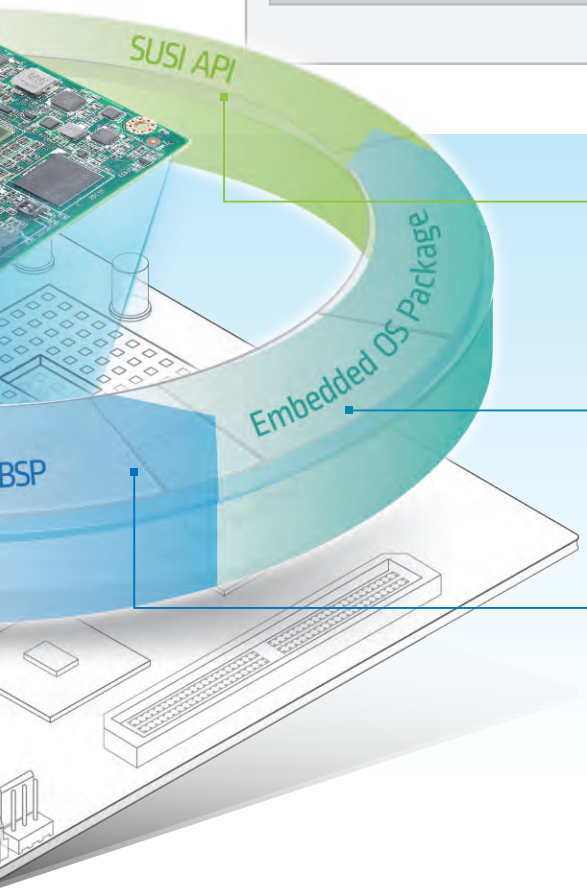
Advantech Loader

- Optimized configuration setting
- Multiple boot selections
- Secure software protection



Advantech RISC Software Architecture





SUSI API for Application Development

- 9 main utilities: H/W monitoring, watchdog timer, I2C control, GPIO control, display power management, brightness control, security, signage API, remote upgrade

Embedded OS Package

- Evaluative OS image
- Optimized kernel, driver and complete SW services
- Documentation and reference material

Optimized BSP

- Optimized BSP package
- Unified BSP folder structure

Advantech Loader

In order to facilitate the development of new applications and to encourage more innovation in the embedded market, Advantech has created a unique, secure and stable boot loader for our ARM-based products. Unlike traditional boot loader structure, Advantech loader offers more add-on value like configuration settings, boot selection and also the capability of integrating more security features and tools for developing more intelligent solutions. Advantech loader is a remarkable creation that redefined the function of a boot loader.

Optimized Configuration Setting

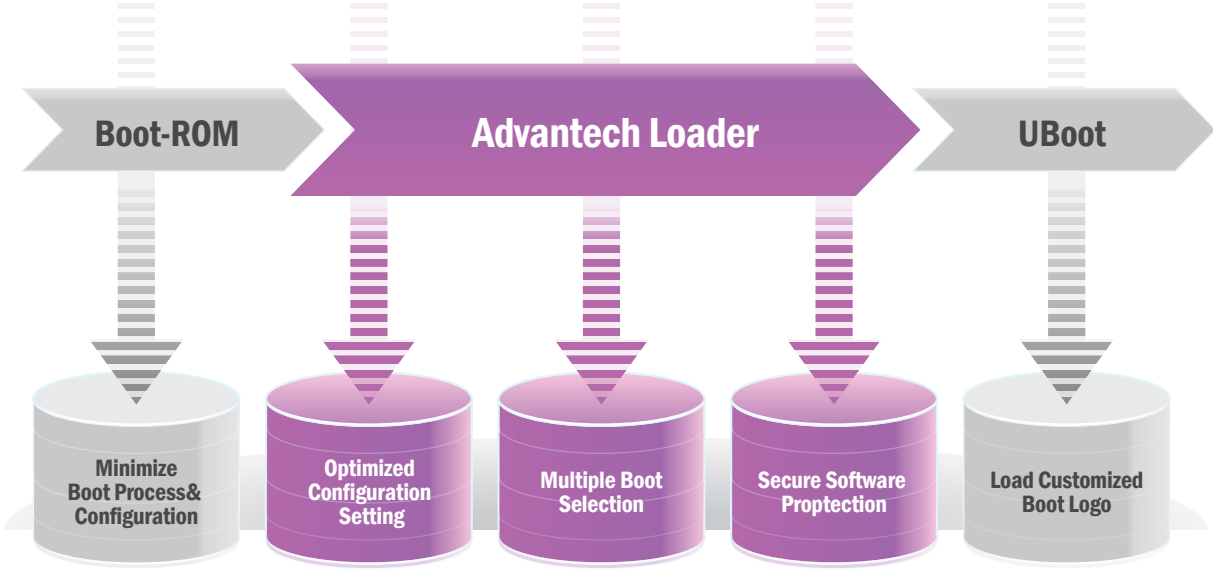
To deliver excellent reliability, performance and compatibility, we provide optimized firmware code for corresponding hardware in all Advantech ARM based products, so customers can just focus on application software development and optimized hardware configuration.

Multiple Booting Selection (From SATA, SD, eMMC)

To enhance flexibility, Advantech offers a pre-installed boot up architecture to automatically search for bootable devices without any boot code modification. The default auto-boot sequence is from SATA drive to SD card to e.MMC, but users can easily configure different devices as primary storage for their applications. Our boot selection architecture can help define system recovery methods and enhance product maintenance.

Secure Software Protection

To protect the software application inside your flash memory from being plagiarized, Advantech boot loader supports customized security features and implements special tools to perform authority checks through password and authority keys. Unlike a traditional boot sequence, Advantech loader can interrupt the boot sequence and run a security tool to check if the user is authorized and the software application is licensed. The tool can block the user from entering the OS if the authorization fails, so that it helps secure the system and its applications. Advantech loader is programmable, customizable and upgradable; it is a unique and critical feature for secure application software development.



Optimized BSP

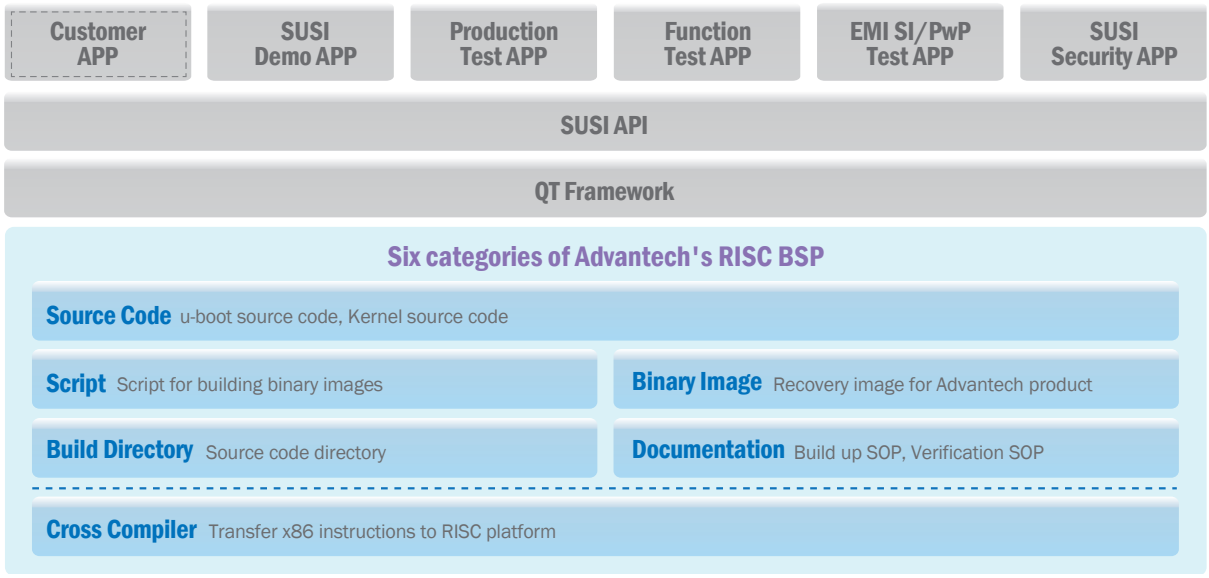
In embedded systems, a Board Support Package (BSP) includes the software code for a device motherboard/system that conforms to a given operating system. It is commonly built with a bootloader that contains the minimal device support to load the operating system and device drivers. A BSP package includes the configurations of the devices on the board, the corresponding source code for the OS and AP, a toolchain and cross compiler for development, a root file system, a build script and other related documents. Advantech products are offered with a corresponding BSP package and related documents. The BSP offerings are for multiple OS platforms and the contents and elements of Advantech BSP are well organized and verified.

Optimized BSP Package

A BSP package includes source code, toolchain, cross compiler, root file system and related documents. Advantech provides scalar BSP package versions from a light version to a complete package with everything included. The light version of our BSP comes with fewer libraries that would be needed in the development phase, this could enhance the efficiency of product development but limit the modification potential of a standard product; a full BSP would offer everything needed in development, however the integration schedule will grow accordingly. Both light and complete version BSPs are standardized so you can select a BSP package based on your project requirements and schedules.

Advantech BSP Features:

- Simple development process
- Well-verified source code
- Stress test utilities for the reliability validation
- Test tool enclosed
- Easy to shift between different platforms
- Binary image for the evaluation



Unified BSP Folder Structure

Following our simple and clear BSP folder structure, you can easily find the utility, source code and document you need when developing your product.

Advantech's BSP offering is standardized, and has been completely verified so engineers can easily test board functions by following instructions in the product manual. However, to be more supportive to those who are not capable of modifying our BSP for whatever reasons, we provide a customization service that provides the following individual features:

- Power-on Logo customization
- GPIO definition customization
- Customized driver integration support

Embedded OS Package

The three mainstream OS: Linux, Android and WinCE are commonly used in the embedded RISC market. Advantech RISC products choose Linux as the default OS with Android, Windows Embedded as alternative OS on demand. As is well known, Linux is the most stable and widely used open source OS in the embedded market. Android is the most popular OS in the consumer market, and WinCE is the most established OS and supports modualized development tools that facilitate AP development and SW/HW integration. To streamline your development process, Advantech offers multiple embedded OS packages and various SW support services to make your development process easier.

Evaluative OS Image

Advantech Linux Services

A complete Linux package is offered from the bottom layer boot loader to a kernel with integrated drivers, AP layer services and libraries. Yocto Linux is our standard offering, with an Ubuntu image available for GUI evaluation.

Advantech WinCE Services

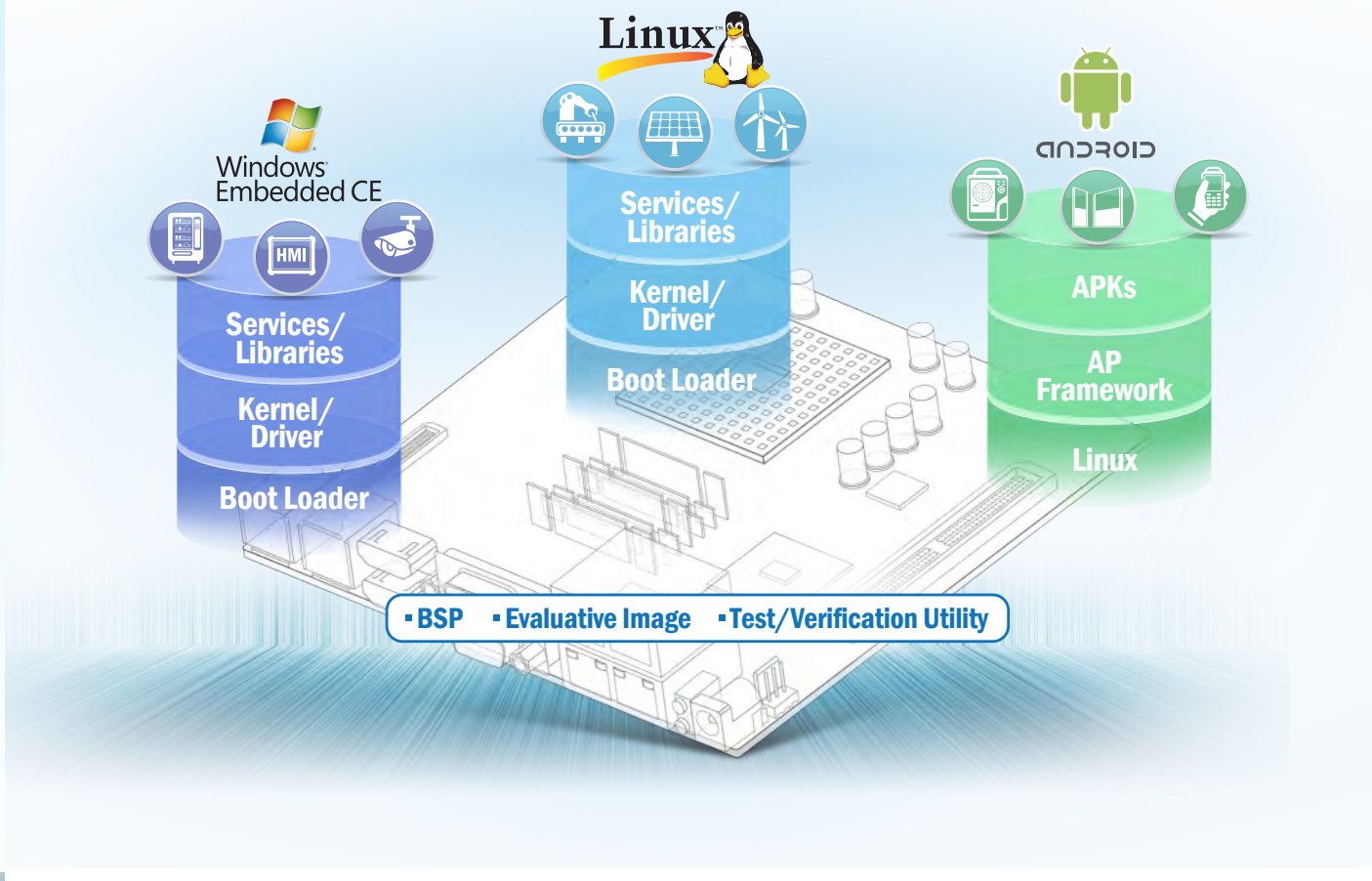
Advantech offers the KITL BSP including WinCE source code, drivers, AP, test tools and libraries. With user documentation and clear instructions, you can easily develop their own WinCE AP and image.

Advantech Android Services

Advantech Android BSP includes Linux kernel, libraries, APK framework and several basic APKs. You can develop customized applications based on the Android image provided, and our support services can efficiently help porting and integrating Apps to the OS.

Advantech OS Package Offering

- BSP
- Evaluative image
- Test/ verification utility



Advantech Embedded OS Features:

Evaluative OS Image including WinCE, Linux and Android

OS Images are integrated with optimized kernel and peripheral drivers so you can quickly start your evaluation.

Source code for Advantech embedded OS are available

Optimized Kernel, Driver and Complete SW Services

Advantech Embedded OS combines optimized kernels, integrated drivers and a few simple applications for quick evaluation. The OS images are well verified and all functions are validated by Advantech test programs. We provide not only Linux, Android and WinCE images for product development, but we provide more added value software support services including driver porting/integration, boot-up logo customization, API development, AP integration and burn-in customized image support. You can rely on our skilled and knowledgeable service team to help you develop your own applications for different Embedded OS platforms.

Documentation and Reference

Advantech RISC products are offered along with corresponding user manuals and design guides, OS, drivers, and AP porting; all with related documents available online. For Advantech computer-on-modules, we offer a software development guide for Linux and Android so that you can quickly start evaluation and AP development. For hardware, related design checklists and referenced guides can help you clearly know how many drivers and APIs should be integrated into the customized system. To learn more about Advantech RISC Embedded OS documentation and reference docs, please visit http://risc.advantech.com

SUSI API for Application Development

Advantech SUSI API incorporates a series of utilities: H/W Monitoring, Watchdog Timer, I2C Control, GPIO Control, Display Power Management, Brightness Control, Security, Signage API, and a Remote Upgrade feature. All SUSI APIs are cross-platform compatible for Android, WinCE and Linux, so you can easily migrate customized features to another OS platform. Advantech SUSI API is also backward compatible, so that you can upgrade and extend more functions of SUSI API in the future.

The Nine SUSI API Functions:

I²C Control
SUSI I2C API allows multiple I2C devices to be configured and controlled though one single control interface.

Remote Control
Allow users to remotely configure settings for management.

Watchdog Timer
Watchdog timer API offers an effective tool to protect the system from crashes.

Brightness Control
Users can adjust the brightness of the screen using this API.

H/W Monitoring
Automatically inspects the system condition and shows real-time data of CPU temperatures and related information.

Remote Upgrade
Allows remote reboot or upgrade of Advantech RISC boards/systems.

GPIO Control
SUSI GPIO API allows users to remotely control GPIO.

Signage API
Advantech SUSI Access for Signage integrates plug-and-play application and signage API for easy integration and quick start.

Security
Hardware Protection API allows users to implement security features for Advantech RISC boards/systems.

Embedded QT Package

QT is a cross-platform application and UI framework for developers using C++ or QML scripting language for JavaScript. It is also an open-source development firmware with many different AP modules. Because it takes a lot of time to get started in the QT environment, Advantech provides a reliable QT solution supporting mainstream Linux dev projects such as Yocto so you can easily integrate QT into your build environment, speed up QT installation and enhance QT usability.

Advantech Embedded QT Package Features:

Standard SOP for Quick Installation

With a standard SOP for installing the Advantech QT package, you can easily integrate the QT development application into your embedded OS and BSP. Advantech also provides guidance with sample code and example Apps. All this helps reduce porting efforts and speed up your product's time-to-market.

Ready-to-use Source Code

By offering Advantech QT package and corresponding source code you can easily integrate all the necessary functions and features into your applications.

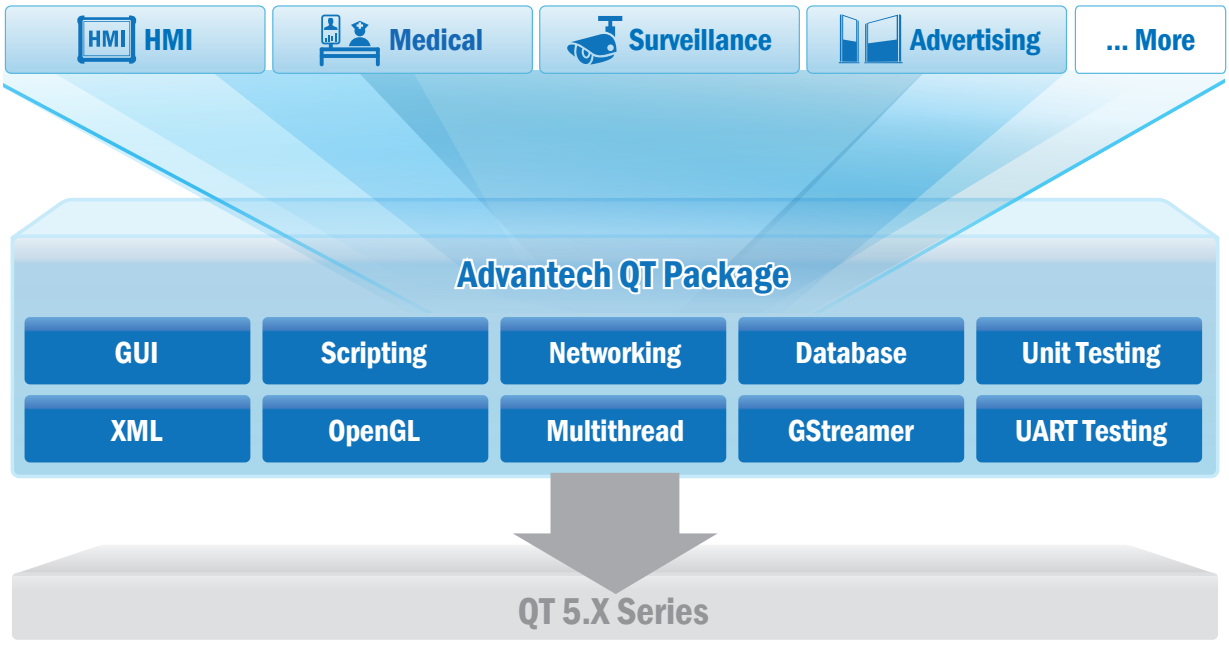
Enhanced QT Modules and APs

Advantech provides a series of QT modules with source code.

- GUI Module
- QT Script Module
- Networking Module
- Database Module
- Unit testing framework
- XML Module
- OpenGL Module
- Multi-threading features

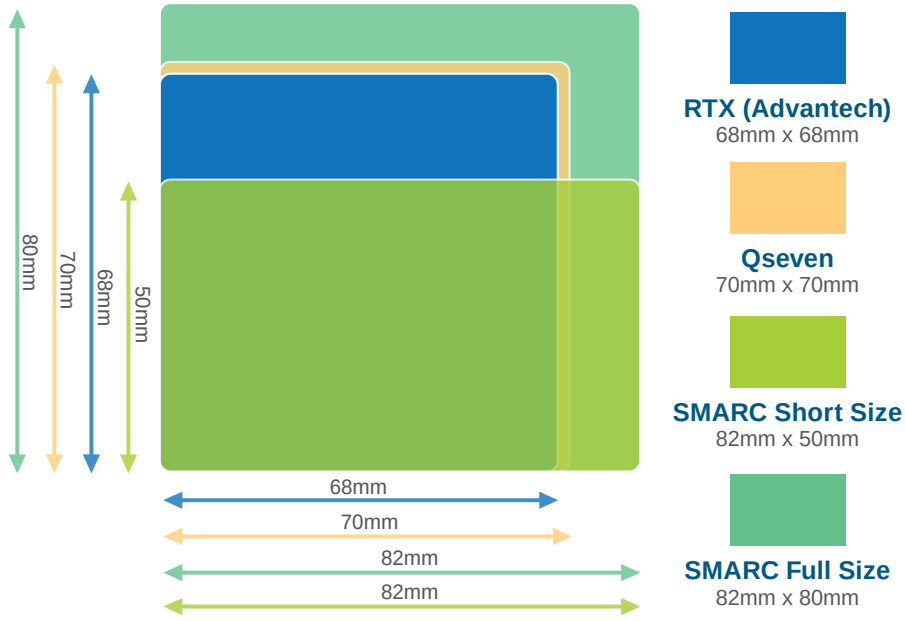
Advantech provides the following QT APPs with source code.

- GStreamer testing
- UART testing



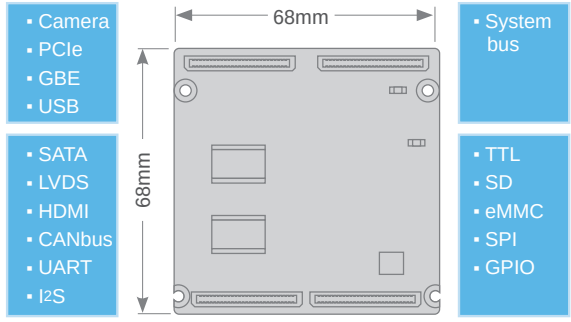
RISC Board Solutions

Advantech offers a range of RISC solutions including RISC Modules, Single Board Computers (SBC) and Box Computers based on ARM processor technologies. Our RISC modules can fulfill different market demands: Standard Qseven RISC modules and SMARC modules for handheld devices and industrial applications, and RTX2.0 modules specially designed for ruggedized applications. In RISC SBC offerings, we optimize our boards with simplified I/O for vertical markets, like RSB boards for signage and industrial control. For RISC box solutions, we designed plug-and-play RISC boxes for specific use in signage and IoT. Advantech brings a new vision of the future of RISC-based devices everywhere.



RTX

Advantech introduced the RTX 2.0 (RISC Technology eXtended) specification which is a RISC standard platform designed for rugged applications. Through its innovative mechanical and electrical design, products designed with RTX 2.0 can perform in complex and challenging environments such as military, logistics, transportation / fleet management, and many other industrial applications.



ROM-3310

- TI Sitara Cortex-A8 AM3352
- Performance Optimized Design
- Ruggedized Applications

ROM-3420

- Freescale ARM Cortex-A9 iMX6
- Highly Reliable Design
- Ruggedized Applications

SMARC

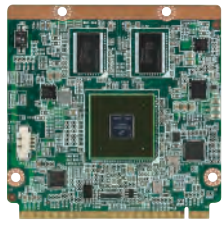
Advantech joined the SGET consortium to contribute to defining the SMARC form factor. The new global standard under the brand name SMARC (Smart Mobility ARCHitecture) is based on ULP-COM, a term which up to now was used for Ultra Low Power Computer-on-Modules.

ROM-5420

- Freescale ARM Cortex-A9 iMX6
- Power Saving Design
- Portable Applications

Qseven

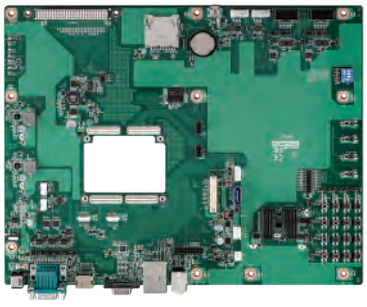
The Qseven concept is an off-the-shelf, multi vendor, Computer-On-Module that integrates all the core components of a common PC. Advantech Qseven modules follow the standardized form factor of 70mm x 70mm and have optimized pinouts.



ROM-7420

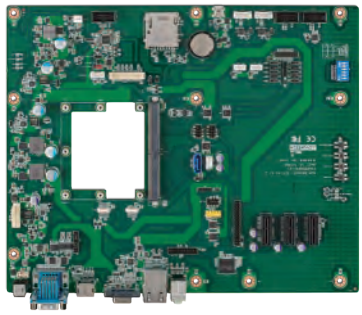
- Freescale ARM Cortex-A9 iMX6
- Function Integrated Design
- Machine Control Applications

Evaluation Boards



ROM-DB3900

- Evaluation Board for RTX 2.0
- ATX form factor
- 19V DC-in



ROM-DB5900

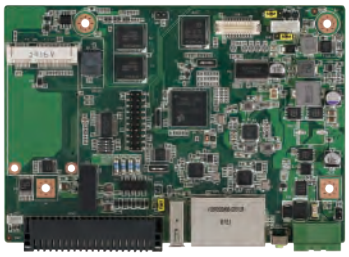
- Evaluation Board for SMARC
- ATX form factor
- 12V DC-in

ROM-DB7500

- Evaluation Board for Qseven
- Mini-ITX form factor
- 12V DC-in

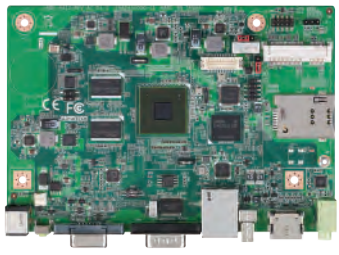
3.5” SBC

In order to facilitate new product development and speed up time-to-market, Advantech released a series of 3.5 inch single board computers for the industrial market. With a highly efficient design and optimized I/O, they are specifically designed for vertical applications such as automation, signage and industrial control. These ARM-based SBCs are power saving, fanless, and Linux OS ready for quick development.



RSB-4220

- TI Sitara AM3352 Cortex A8
- Dual Giga LAN and Wide Voltage Input
- Automation Applications



RSB-4410

- Freescale ARM Cortex-A9 iMX6
- Multi-display Output
- Signage/HMI Applications

RISC System Solutions

The Advantech Box Computer, so called UBC (Ubiquitous Computer) series is designed to meet diverse demands across vertical markets. We offer various RISC-based and x86-based solutions to fulfill different performance requirements and I/O demands. The UBC series is the most optimized, economical and balanced solution offered to the embedded market for vertical applications such as digital signage, visual analysis, automotive, industrial automation, auto-control and monitoring, surveillance and public transportation.

IoT Networking Gateway

Advantech provides a series of IoT gateway solutions based on ARM technology. These IoT gateway systems are compact with plenty of I/O and computing power, and are ideal solutions for sensor gateways, networking gateways and data gateways. Powered by Freescale i.MX6 series processors, they can comfortably handle and organize lots of raw data and turn it into useful information. The high connectivity of GbE/WIFI/3G/GPS helps instant communication with cloud services and other IoT devices.

TAIWAN EXCELLENCE 2013

UBC-200

- Freescale ARM Cortex-A9 iMX6 Dual/Quad 1GHz
- GbE/WIFI/3F/GPS support
- 12/19/24 V DC-in

UBC-220

- Freescale ARM Cortex-A9 i.MX6 Dual Lite 1GHz
- GbE/WIFI/3F/GPS support
- 12V DC-in

Automation Box Computer

Advantech RISC-based automation box computers are equipped with rich I/O for industrial automation applications. With highly stable system performance, low power consumption and fanless design, they are the most reliable solutions for the automation market. They also offer easy integration and multiple mounting methods including wall and VESA mounting. Reserved holes help securely affix cables via fastening rings and fastening rails.

UBC-FA30

- TI Sitara AM3352 Cortex-A8 1GHz
- 4 GPI/O and 6 UART with isolation
- 12/19/24V DC-in

Digital Signage Box Computer

RISC-based digital signage boxes are powered by Freescale ARM® Cortex™-A9 i.MX6 series processors with signage software built-in. Based on the ARM Cortex-A9 processor, Advantech RISC-based signage players deliver high performance and low power consumption with superior multimedia performance. To facilitate system maintenance, they are featured with easy assembly design and friendly software UI for managing digital signage applications.

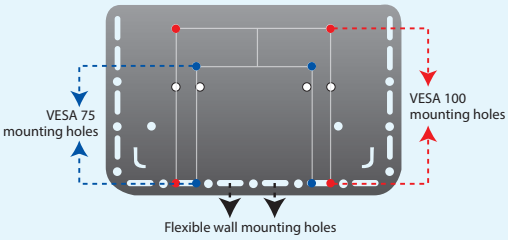
TAIWAN EXCELLENCE 2012

UBC-DS31

- Freescale ARM Cortex-A9 i.MX6 Dual 1GHz
- VGA/HDMI 1920x1080 Dual Display
- Built-in SUSIAccess for Signage and U-Poster Signage Player

UBC-310

- Freescale ARM Cortex-A9 i.MX6 Dual Lite 1GHz
- HDMI 1920x1080 Single Display
- Built-in SUSIAccess for Signage



Easy Installation

- Supports wall mount and VESA 75/100 mount
- Provides flexible wall mounting holes

Easy Maintenance

- Latch lock, no-screw assembly
- Solid, strong cable connection

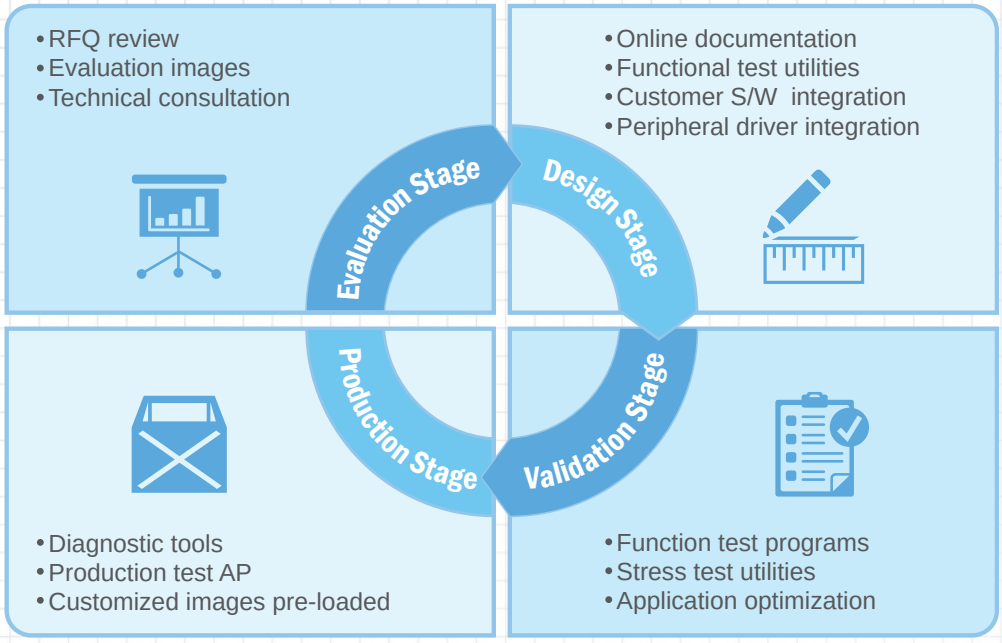
Sufficient Performance

- Full HD playback engine
- Dual independent display (VGA+HDMI) for UBC-DS31
- Ultra low power consumption

Easy Management

- Built-in SUSIAccess for Signage based on Linux QT framework.
- Supports Content Producer and Device Conductor for remote management
- Supports Linux BSP for developing customized signage application software

RISC Software Service Process



Regional Service & Customization Centers

China
Kunshan
86-512-5777-5666

Taiwan
Taipei
886-2-2792-7818

Netherlands
Eindhoven
31-40-267-7000

Poland
Warsaw
48-22-33-23-730

USA
Milpitas, CA
1-408-519-3898

Worldwide Offices

Greater China

China	800-810-0345
Beijing	86-10-6298-4346
Shanghai	86-21-3632-1616
Shenzhen	86-755-8212-4222
Chengdu	86-28-8545-0198
Hong Kong	852-2720-5118
Taiwan	0800-777-111
Neihu	886-2-2792-7818
Xindian	886-2-2218-4567
Taichung	886-4-2329-0371
Kaohsiung	886-7-229-3600

Asia Pacific

Japan	0800-500-1055
Tokyo	81-3-6802-1021
Osaka	81-6-6267-1887
Korea	080-363-9494
Seoul	82-2-3663-9494
Singapore	
Singapore	65-6442-1000
Malaysia	1800-88-1809
Kuala Lumpur	60-3-7725-4188
Penang	60-4-537-9188
Indonesia	
Jakarta	62-21-751-1939
Thailand	
Bangkok	66-2-248-3140
India	1800-425-5071
Pune	91-20-3948-2075
Bangalore	91-80-2545-0206
Australia	1300-308-531
Melbourne	61-3-9797-0100
Sydney	61-2-9476-9300

Europe

Europe	00800-2426-8080
Germany	
Münich	49-89-12599-0
Hilden/ D'dorf	49-2103-97-885-0
France	
Paris	33-1-4119-4666
Italy	
Milano	39-02-9544-961
Benelux & Nordics	
Breda	31-76-5233-100
UK	
Reading	44-0118-929-4540
Poland	
Warsaw	48-22-33-23-740/741
Russia	8-800-555-01-50
Moscow	7-495-644-0364
St. Petersburg	7-812-332-5727

Americas

North America	1-888-576-9668
Cincinnati	1-513-742-8895
Milpitas	1-408-519-3898
Irvine	1-949-420-2500
Mexico	1-800-467-2415
Mexico	52-55-6275-2777
Brazil	0800-770-5355
São Paulo	55-11-5592-5355

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before ordering. This guide is intended for reference purposes only.
All product specifications are subject to change without notice.
No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.
All brand and product names are trademarks or registered trademarks of their respective companies.
© Advantech Co., Ltd. 2014

8600000161