

Arrow Electronics Technical Solutions and Services

A R R O W E L E C T R O N I C S

TECHNICAL SOLUTIONS AND SERVICES



Lighting
Arrow Electronics Lighting Group

Arrow Electronics Lighting Group

We are dedicated to providing LED alternatives to incandescent, halogen and fluorescent lighting. Our direct team specializes in providing a wide range of solutions from components to total solutions containing high brightness light emitting diodes (HB-LEDs). Our extensive line card, unparalleled supply chain management services, design services and experienced technical team can help you with all your solid-state requirements as they evolve and expand.

Design Services and Training

Design Tools

Local Engineering Expertise

Engineering Solutions Center



Arrow Technical Solutions and Services

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Simplifying and Accelerating Your Journey to Market

The journey from concept to production for electronic and computing products is complex, and the shortest route to market is not always clear. As the premier global provider of products, services, and solutions, Arrow can streamline your design process and supply chain to get you to market as quickly and efficiently as possible. Assisting you at each stage of your product's development, Arrow offers unparalleled local engineering expertise and solutions that work across a broad range of applications. Our world-class design services, training, and tools keep your projects on track and accelerate your time-to-market.



Complete Support at Every Point of Your Product's Development

Arrow has the people, products, facilities, and technical expertise in place to serve a broad and diverse customer base, from small design firms to large, global manufacturers.

During the initial design phases, our knowledgeable engineers partner with your engineering team to provide the innovative solutions that best meet your requirements. Getting our field applications engineers (FAEs) engaged early in your design cycle gives your design team insight into which products, solutions, and services are ideal for your specific needs. As your product moves to production, Arrow can provide manufacturing solutions and implement materials planning, inventory management, and fulfillment programs to reduce your costs and inventory liabilities. And our computing solutions centers allow us to complete custom systems integrations and configurations. From concept until your product is delivered to your end customer, Arrow can help you make informed decisions and streamline your processes.

How We Do It

At Arrow, we connect your product design and manufacturing needs with the innovative technologies of more than 600 manufacturers. Our FAEs are experienced engineers trained to bring you the best selection of potential solutions in the shortest time possible, to ensure rapid time-to-market for you. We're able to act as a partner at every critical juncture of your supply chain because we're on top of rapid changes in technology and we're experienced from managing one of the most complex supply chains in the world—our own. We're adept at managing complexity while injecting both speed and specialization throughout your entire journey to market.

We Grow with You

North America prevails as the design capital of the world, and Arrow has the people, products, facilities, and technical expertise in place to serve a broad and diverse customer base. From small design firms to large, global manufacturers, Arrow specializes in serving specific customer groups, including original equipment and contract manufacturers as well as military and aerospace manufacturers. As your product gains market share, Arrow can support your growth from a small manufacturer into a high-volume producer with our broad range of engineering resources, design services, market expertise, and comprehensive supply chain solutions.

Arrow streamlines your processes and speeds your time-to-market with:

- Our vast global network of 260 sales facilities
- Locations in 55 countries and territories
- Distribution warehouses and value-added centers in 21 locations
- Partnerships with more than 600 manufacturers
- Experience from serving more than 140,000 customers
- A total of more than 200 technical support personnel, including:
 - Six dedicated to lighting
 - Nine to power
 - Three to transportation
 - Eighteen Passive, Electro Mechanical, and Connectors (PEMCO) sales managers

Best-in-Class Engineering and Market Support



Local Engineering Expertise

Our highly experienced technical professionals provide unbiased guidance and system-level analysis on your specific applications. Arrow's FAEs typically have at least 10 years of design experience—several have more than 25 years—and their expertise is in the same realm as our customers. Another advantage stems from Arrow's leadership position. You can take advantage of our access to technical resources of leading manufacturers.

Engineering Solutions Center

To simplify your interactions with Arrow, your local FAE acts as a single point of contact and enables you to tap into application specialists familiar with your end market or our Engineering Solutions Center's global network of expertise. We aim to give you a complete answer, regardless of the complexity of your requirements. Our goal is same-day response and first-call effectiveness—we subscribe to execution "on the clock" rather than "on the calendar."



Vertical Market Specialization

Arrow constantly discovers opportunities to expand your business by researching new markets and identifying compelling technologies with potential for growth and synergies. To cultivate these markets, Arrow forges key partnerships with new and existing manufacturers and delivers a complete solution for your needs, expanding well beyond traditional component support.

Markets and Solutions:

- ARM® Embedded Processors
- Custom Logic
- Embedded Computing
- Industrial
- Lighting
- Military/Aerospace
- Power Supplies
- Transportation

Arrow offers a wide range of development tools, seminars, and customized training so you can move forward with the confidence that you've found the best solution for your unique needs. Logistics experience and investment in our infrastructure allow us to deploy resources efficiently, and if your project requires specialized assistance, we can put you in touch with certified third-party test and design resources. All of these Arrow market solutions are supported by our world-class sales team and supply chain management tools.

Our highly experienced technical professionals provide unbiased guidance and system-level analysis on your specific applications.





Solutions and Applications

ARM® Embedded Processors

www.arrownac.com/arm
armsupport@arrow.com

ARM Let us be the one-stop shop for all your ARM solutions. Arrow offers ARM cores that span a broad application space. And we're the *only* approved ARM Training Center in North America. Our FAEs, seasoned professionals with ARM-specific experience, undergo monthly training that prepares them to deliver the latest technical overviews of ARM technologies. With Arrow, you can rest assured you're receiving accurate, up-to-date, and relevant information.

Arrow's tools help move your ARM design quickly from concept to production:

- **Arrowdevtools.com**
Research, compare, and buy ARM development tools.
- **TestdriveSM**
This tool evaluation program allows you to try development tools from key manufacturers for 21 days, free of charge.
- **ARM Solutions Guide**
Simplify your search for ARM solutions with this easy-to-read guide.
- **EmbeddedDeveloper.com**
Select and compare cores and devices by features, performance, or price, and then purchase from Arrow's shopping cart.
- **Arrow Technical Solutions Forum**
This seminar series provides you with real-world solutions to your real-world needs.

Embedded Computing

www.arrownac.com
800-285-7503

Arrow's Embedded Computing capabilities offer customers a broad range of embedded computer solutions that accelerate customer time-to-market through flexible, long-life, standards-based, and easily customizable off-the-shelf products and services. Our strategic partnerships with leading manufacturers such as Intel, Micron, Microsoft, Motorola, NEC Electronics, RadiSys, and Sharp comprise the most comprehensive line card of embedded computing products, which offers solutions ranging from software to hardware designs and services.

Turning to Arrow for embedded computing solutions allows you to focus your resources on the elements of your design that add real value and differentiate you from your competition. Our state-of-the-art Logistics and Value-Add facilities in the United States, Mexico, China, and Eastern Europe support your dynamic global manufacturing requirements and allow you to take advantage of even faster time-to-market capabilities and dramatically reduce operational costs.

Key benefits:

- Global manufacturing reach to your customer base
- Custom product designs
- Verification and testing services
- Board-level solutions in a variety of form factors; flexible in design, peripheral support, smaller packaging, and low power requirements
- Embedded software development and support for Windows embedded operating systems and Linux-based solutions
 - Device driver creation, BSP, image development, OS porting, and application development
- Flat panel integration capabilities
- Custom storage solutions
- Custom power supply design
- Class 1000 clean room



Our CLS group is one of North America's broadest custom logic solutions providers, and offers flexible, risk-reduced, and cost-effective ASIC designs that range from FPGAs, structured ASICs, and standard-cell ASICs to foundry services. Arrow has unparalleled ASIC experience and program management capabilities, and offers the right combination of vendor technology, design services, and intellectual property (IP).

CLS capabilities:

- Design and RTL Netlist creation
- Design verification
- Synthesis
- Physical design and implementation
- Simulation
- Timing closure program management
- ACES partners to augment your engineering capabilities

Competitive Solutions

CLS can help you choose the right solution and save valuable time and resources because we've invested heavily in development tools and hardware—so you don't have to. Boasting more than 23 years of design experience on more than 1,000 ASICs and over \$1 billion in sales, CLS works with you toward your company's goals. Whether your product requires FPGAs, a reduced mask cost with a structured array, or a solution that leverages the extensive IP and low cost of a full standard-cell ASIC, we keep your project moving toward production. CLS has experience working with a broad customer base, from engineering start-ups to military customers. Regardless of your project's complexity, we can provide the optimal custom logic solution.

Unparalleled FPGA and ASIC Engineering Expertise

The dedicated FPGA and ASIC experts on the CLS team average more than 12 years of trenchwork ASIC experience, complementing the knowledge of more than 200 technical support personnel. They offer the full spectrum of services from writing RTL to full test and layout capabilities. Additionally, CLS engineering support extends into the IP space, enabling you to piece together complex SoCs (Systems on a Chip) without having to be "experts at everything." With your business model as a guide, we incorporate flexible technology and engagements to move your design to completion.



Strategic Suppliers

The CLS group has partnered with industry leaders Altera, Atmel, Faraday, and IBM to become one of North America's most comprehensive custom logic solutions providers. Leveraging Arrow's strong relationships with these suppliers, in addition to our exceptional sales, engineering, and logistics solutions, means we can help you get to market quickly with the right product at the lowest possible risk and cost.

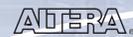
Intellectual property and technology supported by CLS:

- .35 μm , .25 μm , .18 μm , .13 μm , 90 nm, and 65 nm technologies
- Structured array, HardCopy[®], and ASIC technology
- ARM embedded processors and other processors up to 600 MHz
- SRAM, Flash, EEPROM, and high-speed memory interfaces
- USB 1.0 and 2.0, 802.11, 10/100/1000 Ethernet
- PCI Express x1, x4, and x16
- SAS and SATA
- Analog/mixed signal
- DSP cores
- Audio and video IP
- Encryption
- Low power methodology
- High-speed interfaces (SERDES)
- RF

Custom Logic Solutions (CLS)

www.arrowasic.com
cls@arrow.com

CLS accelerates your time to market with unparalleled FPGA and ASIC engineering expertise, competitive solutions, and strategic supplier partnerships.



Industrial

www.arrownac.com
800-349-4960

Arrow focuses on the needs of industrial original equipment manufacturers for the business-to-business and consumer marketplace and has one of the industry's most complete portfolios of products, solutions, and services.



Access some of the world's most knowledgeable technical experts. Arrow's field sales representatives have extensive industry experience. PEMCO sales managers offer comprehensive support to meet your passive, electro mechanical, and connector needs, and power specialists excel in providing solutions tailored to meet your specific power requirements. Our FAEs provide exceptional engineering

Key benefits:

- Abundant inventory, off-the-shelf solutions, and custom services through our value-add facilities support this rapidly expanding market
- Next-day and consolidated shipping, as well as special packing and labeling, enable us to handle more than 30,000 transactions each day

Just a few of the applications supported by Arrow Industrial:

- Motor control
- Sensing
- Power management
- Robotics
- Process controls

support at each point in your design, no matter where you're located. Your local FAE acts as a single point of contact and enables you to tap into the Engineering Solutions Center's global network of expertise. And our regional industrial specialists have industrial-specific backgrounds (an average of 18 years' experience) to address the unique requirements of this market.

- Logistics and value-added services such as vendor managed inventory, materials management programs, more than 70 in-plant stores, consignment programs, integrated supply, and many more services help you achieve greater flexibility and improve responsiveness
- We service numerous market segments, such as factory automation, HVAC, utilities, motor manufacturers, and industrial control

Transportation

arrowtransportation@arrow.com
800-241-3165

The Arrow Electronics Transportation Group consists of technical experts dedicated to serving the needs of transportation original equipment manufacturers through system-level expertise and industry-specific quality and logistics capabilities.

This group offers a broad range of automotive and transportation validated components, supported by in-depth knowledge of application requirements, definition, and component selection. A few of the industry-specific services available through Arrow are FIFO, JIT, TQM, TS-16949, PPAP's, 8-D's, and PFMEA's. Additionally, we're committed to long design and manufacturing life cycles, including EOL, which means we're here to serve your transportation requirements when you need us.

Arrow services a variety of transportation markets:

- Automotive
- Heavy and light trucks
- Buses and coaches
- Farm and agriculture
- Construction
- Trailer and body
- Rail and mass transit
- Marine
- Recreational vehicles

The Arrow Electronics Lighting Group is dedicated to providing HB-LED alternatives to incandescent, halogen, and CCFL lighting. Our focus is to supply a long-life solution that delivers high reliability, lighting efficiency, shock resistance, and vivid color effects at a lower total cost of ownership.

Our comprehensive systems integration capabilities and concept-to-production design services offer the support you need to move your product to completion as efficiently and cost-effectively as possible. In addition, our teams of experienced lighting experts and market specialists offer unmatched expertise in various areas such as transportation, and commercial and architectural lighting, to name a few. Arrow can provide the optimal solution for even the most complicated lighting scenario.



Lighting

lighting.arrow.com
1-888-9LIGHT1

The Arrow Electronics Lighting Group offers:

- Strategically chosen lighting manufacturers and integrators specializing in HB-LEDs, LED drivers (chip sets and ballasts), optics (light pipes and LED lenses), thermal management solutions (heat sinks, metal clad PCBs, and fans), and modules (light engines and assemblies)
- Individual components, complete solutions, and everything in-between
- Solutions for transportation, portable lighting (flashlights), backlighting, LED signs, commercial, and architectural lighting markets
- The only comprehensive lighting-specific website with an HB-LED parametric part search: lighting.arrow.com—research, compare, and purchase HB-LEDs
- InGaN and InGaAlP HB-LEDs from Arrow are RoHS-compliant and feature the latest materials and process technologies
- The Lighting Selector Guide, which helps you select the best solutions for your application by simplifying the search for the right HB-LEDs, drivers, controls, optics, thermal management, modules, and integrated solutions

Arrow/Zeus Electronics is the *only* broadline provider of components and services focused exclusively on serving the needs of the military and aerospace customer base. This group offers the industry's most comprehensive portfolio of both commercial and high-reliability products and services.

Dedicated sales and product specialists and technical design experts can assist you at every point in your project. In a nutshell, we provide an efficient means to manage, and in some cases, outsource your entire supply chain function.

Key differentiators of Arrow/Zeus:

- Unique expertise—our teams are trained to address the military and aerospace market segment with passive, electro-mechanical, and connector products and computing and memory products and services
- Coordination across multi-location sites and programs
- Every facility is certified to ISO 9002 standards
- Optional on-site services that manage day-to-day activities and provide a local subject matter expert
- Demand creation resources and expertise connect technology with your programs
- Supply chain management services meet MIL-SPEC environment requirements
- Diminishing Manufacturing Sources and End of Life products deliver a complete obsolescence management solution

Military/Aerospace

www.arrownac.com
800-52-HIREL

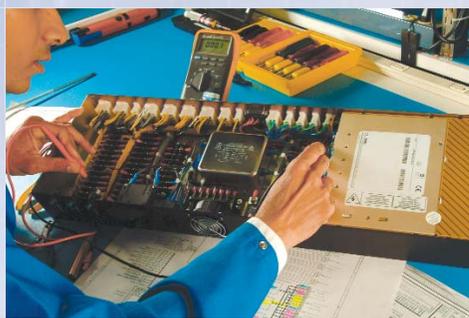


Power Supplies

www.arrownac.com/power_supplies
800-777-2776

Arrow is the leading power supply distributor in North America, and features a team of power specialists who are ready to help you handle any requirement for your power supply—we can help you configure a power system from the ground up.

Our state-of-the-art value-added center in Phoenix, Arizona, is dedicated to meeting your power supply requirements via off-the-shelf or custom power supplies. We can handle any power requirement for your power supply by designing custom cable assemblies, sheet metal enclosures, monitoring circuits, or high-power “hot swap” redundant assemblies to meet your power specification. The center maintains numerous technical and quality certifications, including ISO9001:2000, TL9000, and AS9100.



Comprehensive services:

- Testing, inspection, and burn-in
- Build-to-print
- Custom sheet metal, printed circuit board, and cable assembly design
- Installation of fans, heat sinks, LEDs, mounting hardware, power-entry modules, relays, switches, etc.
- Kitting
- Product testing and documentation
- Project management
- System design and integration
- Technical support

Arrow has partnerships with the industry's leading power supply manufacturers, and connects you with the ideal solution for your particular project. You can choose from a broad range of high-quality products.

Product offering:

- AC/DC low, mid, and high power switching power supplies
- AC/DC modular power supplies
- AC/DC linear power supplies
- AC/DC front-end rectifiers
- DC/DC converters/POL converters
- DC/DC digital programmable converters
- DC/DC chassis mount ruggedized converters
- DC/DC voltage regulator modules (VRM)
- ATCA and MicroTCA power supplies
- LED power supply solutions
- External wall mount and desktop power supplies
- PC power supplies
- Medical power supplies
- Compact PCI power supplies
- UPS
- Batteries

Design Services and Training



Arrow is an approved ARM® embedded processor training center in North America, and gives you access to up-to-date, high-quality technical training from the world's largest and most experienced pool of ARM technology experts. We work around your specific needs and schedule—contact us at any time to schedule training.

Arrow's ARM Training Center offers:

- Information on the latest ARM technologies and how you can benefit from them
- Boiled-down, relevant data communicated by seasoned trainers
- Multi-day classes that dive deep into ARM architectures and development tools
- The opportunity to have classes conducted at any Arrow branch or your location



Arrow Technical Solutions Forum (ATSF) is a seminar series, hosted by Arrow at various locations across North America, which features well-rounded learning modules that provide real-world solutions to your complex engineering design challenges. ATSF is much more interactive than standard device-oriented seminars.



At ATSF, you'll experience:

- Learning modules that integrate technologies from multiple manufacturers and third-party vendors
- Seminars that feature in-depth technical presentations and demonstrations
- Hands-on training designed specifically to reduce your development time and enable you to get to market faster

To learn about seminar topics and locations, visit www.arrow.com/atsf.



See detailed CLS section on page 4.

Our CLS group is one of North America's broadest custom logic solutions providers, and offers flexible, risk-reduced, and cost-effective ASIC designs that range from FPGAs to structured ASICs, to standard-cell ASICs.

Arrow ARM Approved Training Center

www.arrow.com/atc
armsupport@arrow.com

Arrow Technical Solutions Forum (ATSF)

www.arrow.com/atsf

Custom Logic Solutions (CLS)

www.arrow.com
cls@arrow.com



Arrow Consulting Engineering Services (ACES)

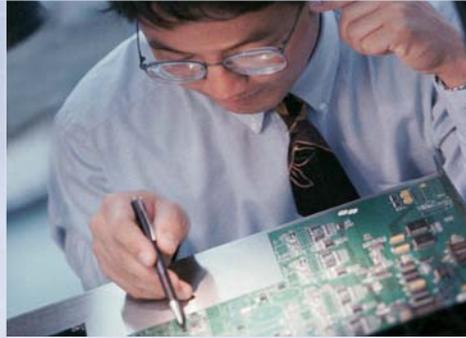
www.arrownac.com/aces
aces@arrow.com | 800-990-1188



ACES provides immediate access to pre-screened, qualified, and certified third-party design services companies. Arrow's network of some of the best engineering design services companies in North America can save you time and money, and allow you to concentrate on your core competency. ACES can support you all the way from specification development to turnkey board design, and simplifies the process through one point of contact.

Manufacturer certifications include:

- Altera® Certified Design Center
- Intel® ICA
- Microsoft® Gold
- Freescale™ Design Alliance Member
- Texas Instruments OMAP™ and DaVinci™



In addition to third-party design services companies, ACES puts you in touch with Arrow's network of FAEs, Arrow Custom Logic Solutions ASIC Engineering teams, Arrow power specialists, and the Embedded Computing Solutions technical team. In fact, you can access the expertise of more than 1,000 engineers.

ACES offers:

- Turnkey board design
- Signal integrity analysis
- Comprehensive ASIC services
- Processor design
- Networking processors
- General μ P
- DSP
- FPGA
- Wireless expertise
- OS/RTOS design and integration
- Device driver development
- Firmware development
- Bus experience
- I/O standards
- Backplane/chassis design
- Custom power supply design
- Compliance testing

Why turn to ACES? You can complement your internal engineering staff and leverage off of existing intellectual property. Globalization is forcing changes in business models, and ACES can help you adapt. Competitive pressure is driving time-to-market, and ACES can accelerate your projects. Let us connect you with the right design solution.

ACES vertical market expertise:

- Consumer electronics
- High brightness LED lighting
- Industrial
- Instrumentation
- Medical
- Military/aerospace
- Networking
- RF/wireless
- Telecom/datacom
- Transportation

Design Tools



Intuitive On Line Development Tool Selection and Purchasing Site

This online development tool selection and purchasing process gives you access to a broad range of development tools and lets you take advantage of leading semiconductor technologies. With arrowdevtools.com, you can narrow your search quickly and intuitively and rest assured you've selected the best development tool for your project.

Arrowdevtools.com enables you to:

- Find optimal development tools at a convenient, "one-stop shop"
- Find tools from more than 60 manufacturers
- Narrow your search through Arrow's proprietary search engine by architecture, silicon manufacturer, product family, tool type, and many more combinations
- Compare tools side by side to determine the best solution
- Purchase online or through Arrow's sales team



The Only online Resource Needed for Identifying, Comparing, and Selecting Embedded Devices and Tools

This is the one website you'll want to bookmark for all your embedded designs. EmbeddedDeveloper is the industry's first one-stop shop for embedded solutions. Easy-to-use comparators and project management tools help you research and choose the optimal devices for your design. At any time, you're only a few clicks away from manufacturers' data sheets or the ability to purchase tools and devices.

Use EmbeddedDeveloper.com to:

- **Easily compare over 1,000 embedded parts parametrically**
Search by core, architecture, and peripheral sets
- **Drill down for specific device information**
Datasheets, manufacturer and third-party development tools, and associated analog devices (power, supervisory, etc.)
- **Order or request a quote on devices or development tools**
- **Resources for new product information**
TECHTEN webcasts, product overviews, special offers, and more



Arrow publishes information-rich selector and solutions guides on specific technologies and markets such as ARM embedded processors, lighting, embedded computing, display, and industrial to help you make informed product decisions for your designs. The easy-to-read format includes manufacturer product briefs that present the key points you need to move forward and find the optimal solution.

Selector Guides contain:

- Features, benefits, and applications of products
- Block diagrams and photos
- A product specifications matrix
- Information on each featured manufacturer
- New product information
- Arrow solutions and services

Arrowdevtools.com

www.arrowdevtools.com

EmbeddedDeveloper

www.embeddeddeveloper.com

Technology Selector Guides

marcom@arrow.com



TestdriveSM Tool Evaluation Program

testdrive@arrow.com



Try tools before you buy them—free of charge for 21 days. Testdrive lets you explore new technology and experience the touch and feel of the latest innovations from leading semiconductor manufacturers with minimal up-front investment.

Highlights of the Testdrive program:

- This program helps you select the best device for your design
- More than 45 manufacturers participate
- Currently, 1,100 tools are available
- All the expertise you need is provided by more than 200 of Arrow's technical support personnel and third-party partners
- New tools are added weekly—300 were added last year

lighting.arrow.com

lighting.arrow.com
1-888-9LIGHT1

The Arrow Electronics Lighting Group is dedicated to providing HB-LED alternatives to traditional lighting. To help you find the best HB-LED lighting solution, we offer the industry's only lighting-specific website with a parametric part search. This is an excellent resource for engineers and designers looking to transition to LED lighting.



Features of lighting.arrow.com:

- Ability to research and compare components from industry-leading manufacturers
- Links to component datasheets and Arrow's shopping cart
- You can request a printed copy or download a version of Arrow's Lighting Selector Guide

ArrowEDGESM

800-777-2776



The Latest Product Introductions from Leading Manufacturers

This program provides valuable exposure to the most innovative technologies in the industry and identifies solutions that can differentiate your company from your competition. ArrowEDGE features manufacturers' newest products and technologies that pertain to your specific application needs.

Unique features of the ArrowEDGE program:

- Technical training at your location by a local Arrow FAE
- Your feedback goes directly back to manufacturers
- All the tools you need to start designing with the featured products
- Practical collateral
 - Product briefs
 - Development tools
 - Pricing
 - CD-ROM with datasheets and application notes

Resource Magazine

www.arrownac.com/resou
resource@arrow.ci



In print and online, this Arrow publication is an excellent source for information on new tools, products, solutions, services, white papers, expert opinions, news, trends, and events.

Stay on top of advances in the electronics industry through:

- Product specifications and block diagrams of the latest technologies
- Special offers, samples, and discounts
- Information geared toward engineers and purchasing and supply chain professionals
- The ability to download datasheets and technical information online

