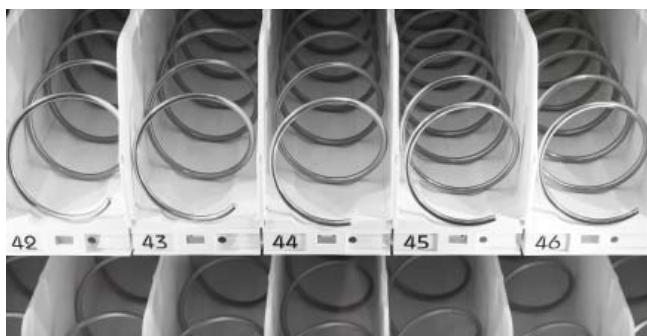


# Vending solutions from Acal BFi

European leader in advanced technology solutions



# About Acal BFi

We are a technology-led provider of customised electronics for industrial applications with design, manufacturing and distribution capabilities.

With our roots firmly founded in design expertise and engineering knowledge we are able to provide our customers with an extensive range of additional custom services along with access to leading-edge technologies. Working closely with world-leading suppliers we act as a technical partner to help solve our customer's design challenges.

We offer a strong and stable partnership to help you develop your products and bring them to market quickly.

## Carefully selected technologies to support our chosen markets

We offer products across 12 specialist technology areas. Customers use our design-led expertise and expert consultation services to find the best technology solutions for their design, prototype and production needs. Each product area has a dedicated team of technical and sales support specialists available to ensure our customers get the best technical advice and pre- and post-sales support.

## Consult. Design. Integrate.

As well as offering off-the-shelf products, we can also provide technical consultation for your design process, provide design and application advice and we can integrate the latest in advanced technologies seamlessly into your design ensuring a cost-effective solution with optimum performance.

## Get in touch

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## Vending solutions contents

Vending solutions overview	page 3
Sensing solutions	page 4
Interconnect solutions	page 5
Power supplies solutions	page 6
Powercords and inlets	page 7
HMI solutions	page 8
Embedded computing solutions	page 9
IoT connectivity solutions	page 10-11
LED and lighting solutions	page 12
PCB-mounted / Environmental solutions	page 13
Locator manufacturing and kiting solutions	page 14
Further information about Acal BFi	page 15
Contact details	page 16



## Advanced technology solutions for vending, coffee and water dispensing

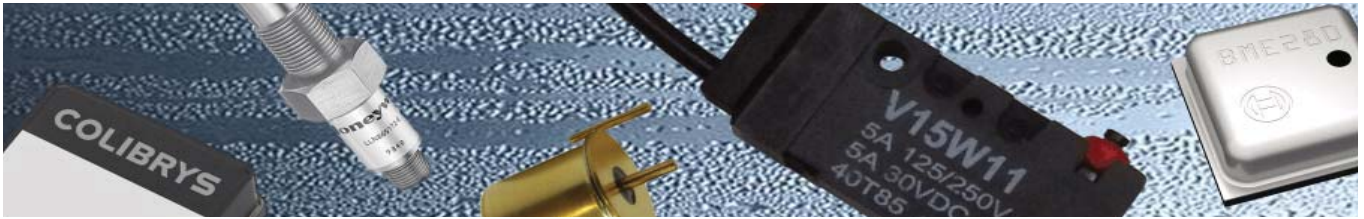
Discover the wide range of advanced technology solutions, electronic components and custom services Acal BFi have to offer designers and manufacturers of vending, dispensing and coffee machines, water boilers and chillers.

### Vending solutions overview

Acal BFi have expertise in developing solutions targeting the vending and dispensing industry, leveraging both our technical expertise and our partnership with best-in-class manufacturers.

Our comprehensive solutions cover both component and system-level devices covering key aspects of technology used in vending including sensors, power supplies, HMI, environmental control products and embedded control systems. Working with key industry players we have a track record of taking standard products and then customising them to meet the specific, individual needs of the customer. Such developments have included custom power supplies and temperature probes.

With our Wireless Technical Competence Centre Acal BFi are in a unique position to bring IoT functionality to your system, whether it's simply advising on the correct components to connect your system to the internet, providing air-time services, or engaging on a complete turn-key design covering hardware design, firmware design and cloud services.



## A wide choice of sensors to support all vending and dispensing functionality

Acal BFi offer a wide range of sensors from world-leading suppliers suitable for use in vending machines, dispensing machines, coffee machines, water boilers and water chillers. Here are some of our most widely used sensors in this market.

### Environmental sensor

Single sensor solution measuring ambient temperature, absolute barometric pressure and humidity for the ultimate in climate control.

### Temperature / humidity sensors

For climate control, liquid temperature measurements and safety cut-outs.

### Flow / liquid level / pressure sensors

For control and protection in liquid dispensing.

### Infrared / IP67 micro switches

For position sensing and security.

### Shock / movement sensors

For security and intrusion protection.

**Amphenol**  
Advanced Sensors

 **BOSCH**

**Honeywell**

 **SAFRAN**  
Colibrys

 **SHIBAURA**

  
**TEWA**

## Technical support when you need it

Work with Acal BFi to create a sensor assembly customised for your needs.

Use our extensive technical support and expertise to help guide you to the most appropriate sensor from our range, and once you've found the correct sensing element, work with our engineers to design the perfect housing, simplifying your production process and improving your ROI.

We have designed custom assemblies for temperature probes, humidity sensors and multi-axis accelerometers.



# Interconnect solutions



## Interconnect solutions to support all vending / dispensing machine functionality

Acal BFi have over 50 years experience with Amphenol, one of the industry's largest connector manufacturers. Our range encompasses connector types and styles suitable for use in vending machines, dispensing machines, coffee machines, water boilers and water chillers. Here are some of our product range.

### Waterproof (IP66+) connectors

Wire-to-wire and wire-to-board solutions where there is a potential for liquid ingress or splashes during cleaning.

### Wire-to-board

Our range includes screw, screwless and crimp options in surface mount and through-hole technologies.

### Miniature board level interconnect

Wide range of board-to-board connectors with different stack heights to suit all applications.

### RF (IoT) connectors

RF connectors suitable for M2M / IoT applications including connectors, pigtail assemblies and converters.

**Amphenol**

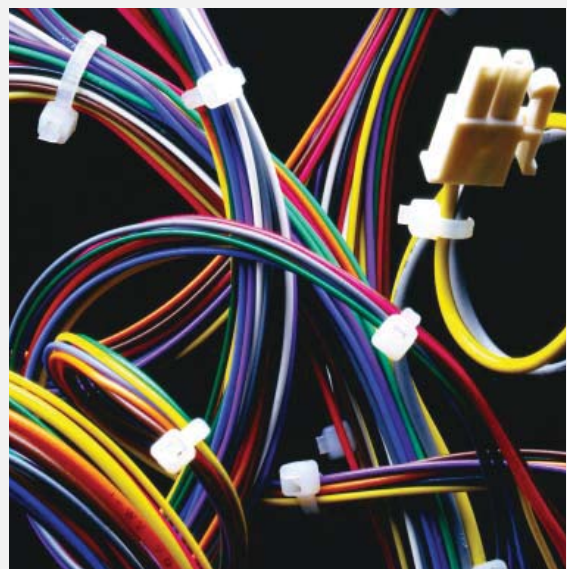


## Cable assemblies and looms made-to-measure

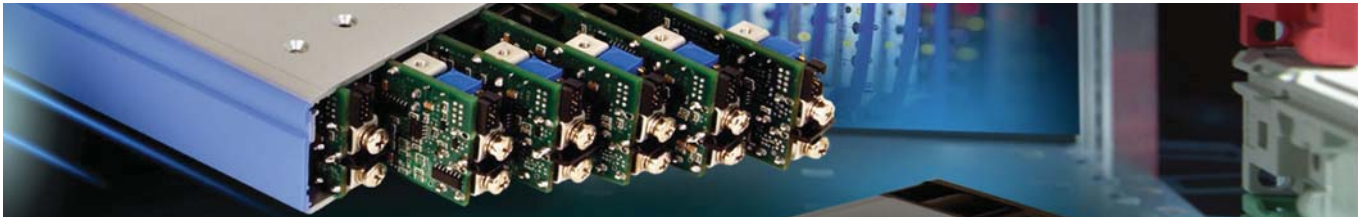
Work with Acal BFi to manufacture your customised cable loom.

Use our experience in connector assembly design and manufacture to improve your ROI. We can produce cable assemblies and looms in accordance with your drawings. Our expertise extends across the whole spectrum, so we can help you whatever your project or application.

- Manufactured to customer specification
- Looms can include switches, relays, fuses etc
- Shielded cable assemblies and harnesses
- Over-moulding
- Custom cables
- Wide range of connectors



# Power supplies solutions



## Off-the-shelf power supplies meet the demand for increased efficiency

Acal BFi offer a wide range of off-the-shelf AC/DC power supplies from leading global manufacturers with an emphasis on high-conversion efficiency and long-term reliability, features which are essential for vending and dispensing applications. Our range includes products meeting the latest level of efficiency requirements.

### Range specifications

#### AC/DC converters

- Power ratings from 5W to 900W
- Universal input (85V to 260V AC)
- Up to five outputs
- Output voltages from 2V to 60V
- Standards compliant

#### DC/DC converters

- Power ratings from 2W to 2kW
- Input voltages from 2V to 50V DC
- Fixed and adjustable output voltages
- Standards compliant

### Supported form-factors

- Open frame
- Closed frame
- DIN mounting
- PCB mounting

acal<sup>bfi</sup>

SynQor

CINCON

SL  
POWER ELECTRONICS

ECOS

RSG  
an acal group company

excelsys

skynet

ICCNEXERGY  
High Power Tech. Inc.

ZIPPY

## Customised power solutions

Acal BFi's power supply design team can create a custom power supply for your needs using off-the-shelf sub-systems tested for compliance in our in-house EMC chamber.

### Key advantages

- Shorter development cycles
- Wide range of power sub-systems
- Standards compliant
- Reduced cost of ownership
- State-of-the-art logistics
- Manufactured in facilities accredited to ISO9001



# Powercords and inlets



## High-quality, globally approved powercords and IEC inlets

Acal BFi have over 25 years experience in the manufacture and supply of internationally approved powercords, IEC extension leads and IEC inlets.

### International powercords

- Power end – support for all countries world-wide
- Equipment end – IEC C5, C7, C13, C15, C19, stripped end
- Standard lengths – 0.5m, 1m, 2m, 2.5m, 3m, 5m, 10m
- Standard colours – black, white, blue, orange, red
- IEC extension leads
- Fully standards compliant for country of destination
- Fully tested
- Next day delivery on stock items

### IEC inlets

- IEC styles C13, C14, C16, C18, C20
- Ratings up to 16A
- Snap-in and screw mounting
- Any combination of switched and/or fused
- Filtered inlets



## Custom powercords to your specific requirements

With extensive manufacturing facilities both in the UK and China, Cabcon, and Acal BFi have a production capacity of over one million units per week.

### Examples of our custom solutions

- Variety of different colours
- Non-standard lead lengths
- Specialised end terminations and lengths
- Custom designed strain reliefs
- Special packaging and handling options
- Logistics, bagging and labelling service





## User interface solutions for vending and dispensing

Acal BFi offer a comprehensive range of HMI solutions for vending and dispensing, from simple vandal-resistant key pads and switches to the latest, stunning, fully customised, backlit, capacitive-touch-based interfaces.

### Stainless steel vandal resistant and piezo switches

- Individual illuminated / non-illuminated push button switches
- Individual piezo / ceramic switches
- Piezo keypads

### Vandal resistant LED indicators

- Variety of colours
- 5V to 24V operating voltages
- Stainless steel housings

### Custom keypads

- Sealing up to IP69K
- Tactile or non-tactile
- Dome, pillow or rim embossing
- Optional illumination
- Capacitive touch



**Honeywell**



**SCHURTER**



## Create visually stunning interfaces

We work with Stadium IGT, a specialist manufacturer in this field, to create stunning touch-activated displays customised to your specific requirements.

These screens can work behind glass up to 8mm thick, so can be used for vandal-resistant applications. Stadium IGT's patented thin film illumination allows designers to add custom layouts to their switch panels, including hidden-until-lit switches, with animation, and with a wide variety of custom shapes.





# Embedded computing solutions



## Embedded computing solutions for vending and dispensing

Acal BFi offer a complete portfolio of embedded products suitable for vending and dispensing solutions. These include embedded PCs in COM and PC104/PC104+ form-factors and the latest range of touch-screen smart panels with resistive touch screens, suitable for integration into vending and dispensing applications.

### Embedded systems pre-loaded with your software

Acal BFi have over 20 years of experience in providing fully configured embedded systems for military, and, more recently, industrial applications.

### Our capabilities

- Design of custom carrier boards
- System integration and test
- Pre-load and test of OS and drivers
- Pre-load and test of application-specific software
- Custom cabling, board to peripherals
- Custom power supplies



## Smart touch computers for OEM integration

ADLINK's STC-1x05 series of industrial panel computers is available in three sizes with 10.4, 12.1 and 15 inch touch-screen displays. These panel PCs leverage the SMARC computer-on-module concept to provide users a range of solutions with proven performance and the flexibility to tailor their systems to meet their specific requirements.

With the SMARC design concept, multiple CPU types are supported and users are able to save on development and redesign costs when they update their systems to support higher processing and graphics-performance requirements.

### Features

- Intel® Atom™ Processor E3845
- 10.4, 12.1, or 15 inch 4:3 TFT-LCD display with 1024 x 768 resolution
- 5-wire resistive or projected capacitive touch with IP65-compliant front bezel



# IoT connectivity solutions

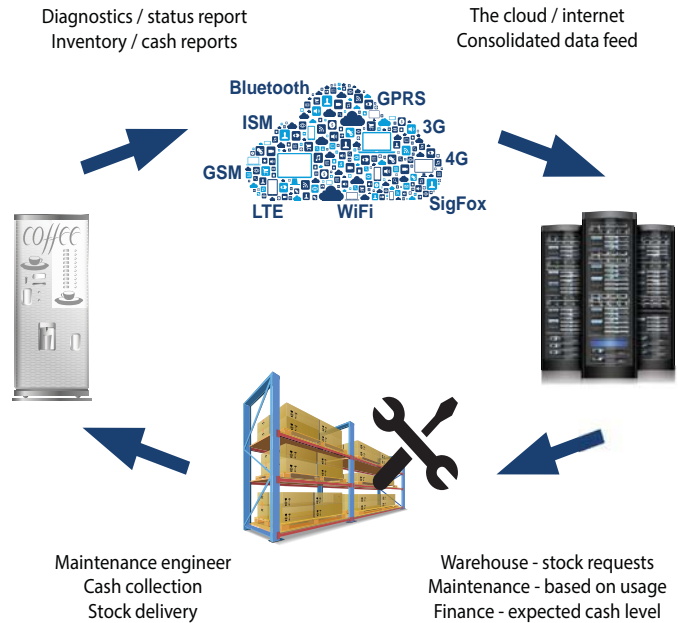


## Improve productivity, reliability and reduce fraud with IoT connectivity

Knowing what's happening with your machines in the field, can bring valuable improvements in customer service and operational efficiency. For machines where cash is used, advanced notice of machine takings can be useful in reducing fraud and assessing the cost-effectiveness of any given site. Connect your machine to the internet and this becomes a very real possibility, and, with our wide range of inter-connectivity solutions, we can work with you to ensure you create the best solution for your needs.

### The power of real-time reporting

- Inventory reporting / stock refill alerts
- Daily cash reports
- Diagnostic reports
- Automatic fault notification



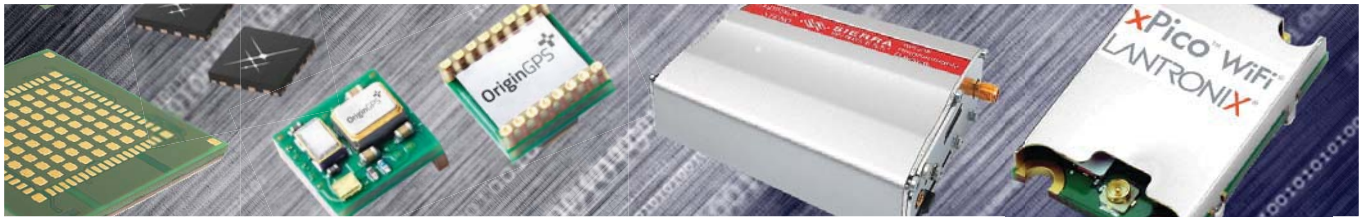
## Supporting the most widely used IoT connection technologies

Acal BFi offer a range of modules and gateways designed to allow you to easily integrate internet connectivity into your system. Our modules are fully standards compliant and can easily be controlled from any microcontroller. Our factory-trained, field-based applications engineers are available to provide in-depth technical support.

### Our technologies

- 2G / GSM / GPRS / EDGE modules
- 3G / 4G – HSPA / CDMA / LTE modules
- 2G / 3G / 4G terminals and routers
- Embedded ethernet (serial-to-ethernet)
- WiFi modules (serial-to-WiFi)
- Bluetooth ISM





## No IoT expertise? No problem – we can help

Acal BFi's European Wireless Technical Competence Centre provides consultancy, concepts and turnkey design of wireless solutions across Europe. One key area of expertise is the development of hardware and firmware solutions to add IoT connectivity to existing designs.

### Tailored, cost-effective service with our in-house expertise

**Specialist design team** – cross-functional team adept at working with propriety ISM, 2G/3G/4G, ZigBee, WiFi and Bluetooth solutions.

**Consultation** – RF design and review services, with suggestions for performance improvement where appropriate.

**System design** – RF hardware, firmware and software design services to add wireless communications to your products.

**Manufacturing** – prototype, first production batch or ongoing manufacture with full program management.

**Cost-effective solutions** – from component selection to overall design, our services are tailored to your needs and in tune with today's commercial challenges.



### Airtime services and cloud-based solutions

- **Adaptive connectivity** – air-time data bundles with conventional or embedded SIMs.
- **Application enablement** – AirVantage® high-performance platform, tools and a development community that will get your service to market faster.
- **Hardware ready** – selection of modules and gateways fully compatible with AirVantage®.
- **Cloud connectors** – AirVantage® is connected to Google's cloud platform, making your IoT data available to all of the services the cloud platform provides.





## Specialist LED lighting solutions

Acal BFi's in-depth knowledge of LEDs and their applications has brought the company to the forefront of the optoelectronics supply industry, allowing our customers to achieve outstanding results both in technical and commercial terms. We work in partnership with customers enabling them to bring products to market in optimum time frames, on budget and to specification.

Our Support Team's comprehensive knowledge of products and applications provides an invaluable service to our customers, enabling them to specify a bespoke solution to suit their budget and end use covering all aspects including drivers, optics and thermal management.

Acal BFi are able to call on a wide variety of in-house services and equipment to support customers as they explore and define their LED light engine requirements. Within our facility, in addition to comprehensive electrical, optical and thermal test equipment, we have an EMC test chamber, allowing our engineers to run pre-compliance testing, so customers know that our solutions will be developed to meet the industry standards.

### Services include

- LED component selection and supply
- Custom LED light engine design
- PCBA design and production
- Thermal management materials
- Driver selection and supply
- Supply of optics for optimum light dispersion



## Discrete LEDs

To complement our specialist lighting solutions Acal BFi also offer a range of discrete LEDs and accessories, suitable for use in vending applications. Our range includes direct mains powered COBs with hues optimised for the food industry, enhancing the appearance of certain foods.

### Our range

- White power lighting LEDs
- White and coloured COBs
- Direct mains powered COBs
- Coloured or colour changing LED lights
- Signal and Indicator LEDs
- Ultraviolet LED illumination
- Lenses and reflectors
- Light shaping diffuser films
- LED drivers
- Thermal management solutions
- Light measurement and test solutions



# PCB-mounted products



## Components for control boards within vending and dispensing

We have a range of components suitable for use in microcontroller-based control systems used in vending and dispensing systems, from semiconductors to sounders and relays.

### Semiconductors

- Power management
- LDOs
- LED drivers
- Op amps

### LED indicators

- Surface mount
- Through hole
- LEDs
- Indicators

### Sounders and buzzers

- Buzzers and transducers
- Piezoceramic speakers
- Piezoceramic amplifiers

### Relays

- Power relays
- Signal relays
- Solid state relays

### Frequency control

- Crystals
- Oscillators
- Real-time clocks

### PCB mount connectors

- Board-to-board connectors
- Screw / screwless connectors
- IDC connectors



## Environmental solutions for vending and dispensing

We offer custom and off-the shelf solutions for heating, passive cooling and temperature regulation to keep the internal environment at a level consistent with best practice to ensure maximum product life and freshness.

### Heating technologies

- Silicone heater mats
- Standard and custom shapes
- Flexible and lightweight
- Precise, even heating
- UL and VDE approvals

### Fan-based cooling technologies

- Shell motors for refrigeration
- Axial and radial fans
- AC blowers
- Full thermal sub-assemblies





## Locator – electronics manufacturing services tailored to your needs

Established for more than 25 years and now operating as part of Acal BFi, Locator provide specialist sub-contract and kitting services. They offer a personalised service for their customers, building long-lasting partnerships based on flexibility and trust.



### The benefits of outsourcing

By using our outsourcing services, companies can speed up production processes and introduce efficiencies which can release valuable resources to be redirected to core expertise and business needs.

The benefits can include financial improvements in cash flow and profitability, including reduced stock levels and administration, as well as an overall improved service to customers.

Our business has developed and grown from the benefits and reliability we offer our customers. We appreciate that outsourcing is a big step for a manufacturer and we work hard at building close relationships based on transparency and flexibility, to be able to effectively integrate into our client's business processes. Over the years we have developed a flexible array of supply chain services that go beyond simply the sourcing and purchasing processes, to encompass kitting, board-level assembly, complete box build, test and project management.

### Our Locator services

#### Component sourcing

- Long lead-time, obsolete and hard to find components
- Global approved sources

#### Production kitting

- Timely delivery of kits to match production schedules
- Reduced inventory, warehousing and administration
- Vendor reduction (one vendor for all electronic components)
- Consistent supply and quality
- Improved cash flow

#### PCB assembly

- Surface mount – single and double sided
- Conventional – flow line and batch build
- Waveflow and hand soldering
- Automated conformal coating to MIL-1-46058C
- Prototype, low, medium and high volume manufacture

#### Test solutions

- Functional testing of PCBAs
- EMC pre-compliance testing

#### Logistic services

- Next day shipments / scheduled orders / just-in-time delivery
- Vendor management and buffer stocks



# Further information about Acal BFi

## Key acquisitions strengthen our technical expertise

To expand our design and manufacturing expertise, our parent company Acal plc have acquired several design and manufacturing companies in the last several years. Products supplied by these manufacturers are a strong part of our offer.

- **Flux** – designer and manufacturer of customised magnetics
- **Foss** – designer and manufacturer of customised fibre optic cabling
- **Noratel** – specialist custom transformer manufacturer
- **RSG** – custom-made power supply specialist
- **Myrra** – designer and manufacturer of power and magnetics
- **MTC** – high-quality ESD shielding, EMC products and services
- **Hectronic** – designer and manufacturer of embedded computers

## International presence

Acal BFi operate in 12 countries throughout Europe. Each country has its own dedicated sales force and technical support teams.

- Belgium
- Denmark
- Finland
- France
- Germany
- Ireland
- Italy
- Norway
- Spain
- Sweden
- The Netherlands
- UK

We also have a presence in China, India, Poland, Slovakia, South Africa, South Korea, Sri Lanka and the USA.

## Areas of expertise

- Communications (RF and wireless)
- Electronics manufacturing services
- Frequency control
- Embedded systems
- LEDs and lighting
- Emech
- Fibre optics
- Power / Magnetics
- EMC / EMI
- Photonics
- Interconnect
- Imaging



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