

2016 / 2017

MANUFACTURING & SERVICES

The Parliamentary Review

A YEAR IN PERSPECTIVE

■ FOREWORDS

The Rt Hon Theresa May MP

The Rt Hon Philip Hammond MP

Terry Scuoler CBE

■ ELECTRONIC MANUFACTURING REPRESENTATIVES

OSRAM

Technical Control Systems

Constant Power Services

Etek Europe

Blakell Europlacer Group

IceMOS Technology

Designed Architectural Lighting

Coldcurve

HEMCO Power & Control Systems

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Foreword

The Rt Hon Theresa May MP

Prime Minister

This year's *Parliamentary Review* follows a significant year in British politics. It was a year in which our economy continued to grow, as the Government followed its balanced plan to keep the public finances under control while investing to build a stronger economy. It was a year in which we began to deliver on the result of the EU referendum by triggering Article 50 and publishing the Repeal Bill, which will allow for a smooth and orderly transition as the UK leaves the EU, maximising certainty for individuals and businesses.

And, of course, it was a year in which the General Election showed that parts of our country remain divided and laid a fresh challenge to all of us involved in politics to resolve our differences, deal with injustices and take, not shirk, the big decisions.

That is why our programme for government for the coming year is about recognising and grasping the opportunities that lie ahead for the United Kingdom as we leave the EU. The referendum vote last year was not just a vote to leave the EU – it was a profound and justified expression that our country often does not work the way it should for millions of ordinary working families. So we need to deliver a Brexit deal that works for all parts of the UK, while continuing to build a stronger, fairer country by strengthening our economy, tackling injustice and promoting opportunity and aspiration.

In the year ahead we will continue to bring down the deficit so that young people do not spend most of their working lives paying for our failure to live within our means. We will take action to build a stronger economy so that we can improve people's living standards and fund the public services on which we all depend. We will continue with our modern Industrial Strategy,

deliver the next phase of high-speed rail, improve our energy infrastructure and support the development of automated vehicles and satellite technology, building a modern economy which creates the high-skill jobs of the future.

At the same time, work needs to be done to build a fairer society – where people can go as far as their talents will take them and no one is held back because of their background. So we will continue to work to ensure every child has the opportunity to attend a good school. We will continue to invest in the NHS and reform mental health legislation, making this a priority. And we will work to address the challenges of social care for our ageing population, bringing forward proposals for consultation to build widespread support.

So this is a Government determined to deliver the best Brexit deal, intent on building a stronger economy and a fairer society, committed to keeping our country safe, enhancing our standing in the wider world, and bringing our United Kingdom closer together. We will continue to put ourselves at the service of millions of ordinary working people for whom we will work every day in the national interest.

“This year's *Parliamentary Review* follows a significant year in British politics”

Foreword

The Rt Hon Philip Hammond MP

Chancellor of the Exchequer



It's been a long road back for the British economy. In 2009 our deficit was at a post-war high, our economy shrank by 4.3% and millions feared for their jobs. Thanks to the hard work of the British people since then, we have reduced the deficit by three-quarters, we have been the second fastest growing G7 economy for the past two years, 2.9 million net new jobs have been created and our employment rate is the highest ever recorded.

By controlling our public spending, backing business and creating the environment for enterprise and investment to thrive, we have got the UK economy back on track.

But now we face new challenges. The deficit is down but debt is still too high. Unemployment is at a 40-year low, but real pay growth is stagnating. And I understand that people are weary of the hard slog of repairing the damage caused by Labour's great recession.

All our progress could be put at risk if we listen to those who say we should abandon the economic plan that has brought us so far, just as we are coming to the final furlong. And it is up to all of us, in business and in Government, across every sector covered by *The Parliamentary Review*, to make the case, all over again, for a market economy, sound money and a system that incentivises enterprise and innovation.

So I will stick to the plan to bring the public finances back to balance, at a pace that supports the economy in the face of short-term challenges, and to make longer-term changes. I will pursue a Brexit outcome that puts jobs and prosperity first. And I will continue with my priority to build a productive and dynamic economy.

It is only by making sustained increases to our productivity that we can deliver the higher wages that will increase living standards and fund the improvement of our public services. That is why I announced the £23 billion of additional investment in infrastructure and innovation at the Autumn Statement last year, and why I launched an overhaul of our technical education system at the Spring Budget.

It is a good start, but there is more to do if we are to close the productivity gap with our competitors, and build a strong economy to provide opportunity, prosperity and the funding for public services that this country needs. I am determined to get on with the job.

This is how we can unlock the full potential of our economy and create an economy that works for everyone.

“We have been the second fastest growing G7 economy for the past two years”



Foreword

Terry Scuoler CBE

Chief Executive of EEF

Manufacturers are clear about their priorities from the Government's Brexit negotiations. Our sector's key concerns are that we retain the tariff-free movement of goods to the EU and, during an appropriate transition period, maintain the economic benefits of access to the Single Market and Customs Union. Thereafter, minimal customs arrangements and a flexible approach to accessing EU labour are essential for our sector to flourish.

We now have just over 12 months before a deal of some kind needs to go before both the EU and UK Parliaments for ratification. In that time, the Government has to sort out the divorce settlement and set out the terms of a new trading relationship with the other 27 countries. With the best political will in the world, success in achieving this satisfactorily and within that tight timescale is highly unlikely. There will come a point when businesses may, in a situation of ongoing uncertainty, decide not just to delay investment but to steer it offshore.

Access to the right skills is a major concern for UK manufacturing as we already struggle with a significant and well-documented domestic skills gap. An early agreement on guarantees for EU citizens would provide much-needed reassurance for all those already resident in the United Kingdom before Brexit, and of course for UK citizens already resident in the EU27.

Manufacturers must also be able to continue to recruit EU workers at all skill levels until the UK labour market is able to support businesses' demand for these workers. We understand that controlling future EU migration is a difficult balancing act, but it is vital government gets this right for the manufacturing sector to survive in a post-Brexit world.

EEF has also called for a reduction in the cost to business of recruiting from outside the EU by abolishing the immigration skills charge along with reversing the recent decision to remove the short-term intra-company transfer route.

In the longer term, we would like to see government spearhead a consistent approach to tackling the UK's longstanding and future skills needs. This must be a key thrust of the new and evolving Industrial Strategy, prioritising science, technology, engineering and mathematics (STEM) education and vocational training.

The Industrial Strategy should also ensure minimal disruption and no additional costs to trade with the EU, which remains a key market for our sector's goods and services. Over eight in ten manufacturers (84%) export to the EU while almost three-quarters (74%) say that a 10% tariff on exports to the EU would have a highly negative impact on their business.

Our regions and localities rightly form a major part of the proposed strategy and the Government's commitment to ongoing investment in broadband and other infrastructure projects, innovation clusters and greater support for small and medium-sized enterprises' (SMEs) supply chains is welcome.

If adequately implemented, these and other initiatives can not only reduce the uncertainty of Brexit, but will set our country on the right path for decades to come.

Return of the Two Party System

The BBC's Andrew Neil gives his take on the state of Parliament following the June 2017 general election.

It was a year in which politicians learned not only of the power of a referendum to overrule the will of Parliament – but of its power to change the party system in which they operate. Nobody saw this coming. But, in retrospect, perhaps we should have, since we had the fallout from the Scottish referendum to guide us.

In the autumn of 2014 the Scots voted 55%-45% to remain part of the United Kingdom. That was supposed to settle the matter of Scottish independence for a generation, until some Scottish Nationalists began regarding a generation as no more than a couple of years. But in post-referendum elections to Holyrood and Westminster, it also recast the Scottish party system.

Remember, Scotland had been one of the first parts of the UK to throw off the British two-party system and replace it with a multi-party choice of SNP, Labour, Tory, Green, Lib Dem and even UKIP. But as the constitutional issue took centre-stage – and remained there even after the referendum – Scottish voters coalesced round a binary choice: for or against independence.

Thus was a new two-party system born of a centre-left Nationalist party (the SNP) and a centre-right Unionist party (the Scottish Tories). The other parties have not been completely obliterated, especially in Holyrood with its peculiar voting system. But by the general election of 2017 Scotland had become a battle between a dominant

Nationalist party and a resurgent Tory party representing the Union. Two-party politics was back north of the border.

So we should have been prepared for something similar when Britain voted 52% to 48% to leave the European Union in the June 2016 referendum. At the time, we remarked on the power of referenda to overrule both the Commons (where MPs were 65% pro-EU) and the Lords (probably 80% pro-EU). What we did not see was how the Brexit referendum would reconfigure English politics just as the Scottish referendum had redrawn Scottish politics.

So we were taken by surprise for a second time. In this year's general election – perhaps the single biggest act of self-harm a sitting government has ever inflicted on itself – almost 85% in England voted either Conservative or Labour. The English had not voted in such numbers for both major parties since 1970, when the post-war two-party system began to wane – and declined in subsequent elections to a point where barely 65% voted Tory or Labour, encouraging some commentators to think the decline terminal.

The referendum, however, reversed the decline. The Brexit vote ended the schism on the Eurosceptic Right as UKIP voters returned to the Tory fold; and those on the Left of the Greens and the Lib Dems flocked to Jeremy Corbyn's more 'Red Flag' Labour offering. So, as in Scotland previously, two-party politics was back with a vengeance in England too.

But without one crucial element. Our historic two-party system regularly produced one-party government for the life of a Parliament. But our new two-party system has produced a hung Parliament with no party having an overall majority. This knife-edge parliamentary arithmetic means the smaller parties may be down – but they are not out.

The Conservatives need an alliance with one small party (Ulster's DUP) to be sure of a majority. Even then, with the Tories and Labour divided over Brexit, no majority on any issue will be certain and on many votes the smaller parties will be pivotal in determining many outcomes.

So politicians return from their summer recess to a great parliamentary paradox: the two-party system has resurrected itself but rather than bringing with it the stability and certainty of the two-party politics of old, almost every major vote in the months ahead will be uncertain and unpredictable – and politics will be peculiarly unstable. Power will rest in Parliament. Government will be able to take nothing for granted. No vote will be in the bag until all the votes are counted. Westminster will have a new lease of life – perhaps even a spring in its step. Our democracy might be all the better for it.



Neil believes two referendums have redrawn the map of British politics.

Review of the Year

Overview



The Rt Hon Greg Clark MP was one of several speakers at the EEF National Conference, addressing the challenges and opportunities that face the UK's manufacturing sector

Brexit, reshoring, better and cheaper technology, competition, digitisation, and how people will work in the future have all converged to make manufacturing examine its place in the British economy more keenly than ever before. That was evident at Engineering Employers' Federation's (EEF)'s National Conference in February where over 850 people swelled to hear from the Rt Hon Greg Clark MP, columnist Martin Wolf, businesswoman Jo Malone and others about the importance of this once neglected sector.

The news, in general, is pretty good.

There is the optimistic view and the more pessimistic view on the future of manufacturing, the pessimism being driven by Brexit fears and a sharp fall in automotive investment this year to £644 million (forecast) from the £2.5 billion it recorded in 2014. Some facts are unambiguous. Productivity

in the UK compared with our peer group in Europe is low, although this baffles many in manufacturing who have invested years on making their processes and people much leaner. In fact, EEF can demonstrate that productivity in the manufacturing sector is higher than in services.

The UK is 'top heavy' in services, with just 10% of gross domestic product (GDP) from manufacturing, although 68% of business research and development (R&D) is in manufacturing. While the 10% proportion is consistent with other G20 countries (Britain is the 9th biggest manufacturing economy), government recognises the need to diversify the economy. Increasing the number of profitable, high-tech manufacturing firms – often with well-paid jobs – is a good way. And with new technology and a more engaged media, the sector is being seen in a new way by a greater number of people and is losing its 'oily factory worker' stigma.

Technology, especially factory automation, is increasingly replacing lower-skilled repetitive jobs, meaning that more of the jobs that remain require engineering skills, soft skills and management and are more enriching and better paid than before.

However, many sectors and businesses still rely heavily on semi-skilled, lower-paid work to assemble and process products such as food and utility goods, and skilled specialist work such as car assembly which, whilst secure, is not highly paid. Brexit has boosted exports by devaluing the pound, however it has increased input costs for many firms which buy raw materials from Europe.

Generally, manufacturing as a sector has had a strong half year. The Markit/CIPS UK manufacturing Purchasing Managers Index (PMI), the widely-accepted barometer of manufacturing health, jumped to 57.3 in April from 54.2 in March – the highest level in three years. Forward to July and industrial output has slipped. But, for industry, the UK is in stable and modestly-growing territory. Other countries are growing faster, though.

‘Everyone is looking at manufacturing. It is essential to take into context that much of the rest of the world is doing much better,’ says Engineering

Employers’ Federation’s (EEF) Chief Economist, Lee Hopley. ‘Global growth forecasts for many countries are ahead of ours.’

In January, the Government launched proposals for ‘a modern industrial strategy to build on Britain’s strengths and tackle its underlying weaknesses to secure a future as a competitive, global nation.’

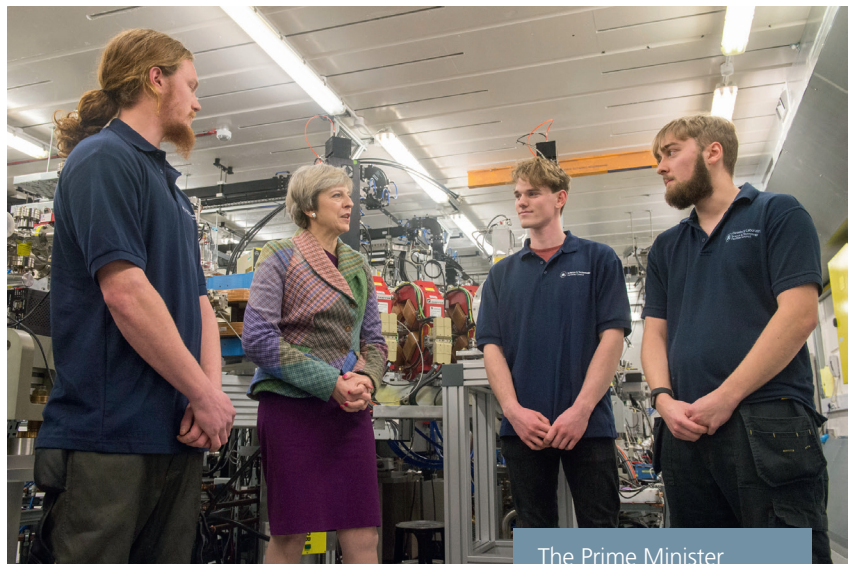
A systemic weakness in the manufacturing base and the economy restrains the levels of exports. Total exports of goods and services in 2016 were circa £550 billion, with manufacturing comprising 45% of this.

Industrial Strategy

The Industrial Strategy, the detail of which is expected to come in the 2017 Autumn Statement, is designed to thread together current government and industry investments across research, industry, skills development, energy and infrastructure. It is also expected to include new ambitious plans in areas such as digitisation, robotics, artificial intelligence and energy storage, and stitch these together into a single, cogent national strategy.

It has 10 pillars, ranging from investing in science, research and innovation to rebalancing growth across the whole country, by providing development funding for big infrastructure upgrades such as the Midlands Rail Hub and Northern Powerhouse Rail.

‘The Industrial Strategy is crucial,’ says Terry Scuoler, Chief Executive Officer of the manufacturers’ organisation, the Engineering Employers’ Federation (EEF). ‘Currently the economy is on an even keel and manufacturing is quite robust. While the sun is shining you fix the roof, and Government has seen we have to do it now,’ he emphasises.



The Prime Minister received a short tour of the facilities at the National Science and Innovation Campus while launching proposals for building a Modern Industrial Strategy

The strategy is full of good things, of which industrialists across the board, from the silver-haired director to the 20-something design engineer, will approve. Few would argue with its top pillar: investing in research and development (R&D) and developing skills.

It says skills shortfalls in some parts of the country contribute to imbalances in productivity in the UK, as shown in a recent Confederation of British Industry (CBI) report, highlighting education and skills as the biggest

determinants of regional variations in productivity. It pushes for more and better technical training.

In the Budget, the Government announced new money to fund the new T-Level qualification for technical education. The Government said it was 'the most ambitious post-16 education reform since the introduction of A-levels.'

Scuoler says of the Industrial Strategy 'Politicians are becoming more aligned with industry and its needs. Catapults are being seen as valuable and effective. They are reaching more SMEs, and while they can never reach them all, the innovation ecosystem that Catapults and Innovate UK represent are helping SMEs, not only big companies.'

Consolidation across the semiconductor industry



SoftBank, a Japanese technology firm, bought the UK's leading company in the area, ARM Holdings, in a multi-billion pound deal

ARM Holdings was Britain's number one domestic semiconductor technology and software design company, until it was bought by Japan's SoftBank for £24.3 billion in July 2016. ARM is symbolic of several powerful companies in the high-tech sector that provide 'solutions' and architectures for others to manufacture processors for these devices.

When the ARM sale was announced, some commentators lamented the loss of another UK champion and the UK's *de facto* best technology firm. But in the deal SoftBank pledged to double ARM's workforce and expand its Cambridge site, demonstrating jobs would be sustained and created in the UK – at the moment it is fulfilling this claim.

Earlier this year, SoftBank made another massive investment in Cambridge technology by leading a \$500 million funding round in virtual reality startup, Improbable. The business develops virtual worlds for use in gaming and real-world simulations, and will use the cash from the Series B funding round to scale up its business.

This was just an *hors d'oeuvres* to the main course. In May, SoftBank launched a £100 billion technology investment fund, the Vision Fund, with money from Saudi Arabia, Abu Dhabi, Apple Inc and more, dwarfing the size of most venture capital funds. The tech sector is acquisitive and seems to be all about creating huge companies.

'ARM is just one example of the massive consolidation happening across the semiconductor industry in the past three years,' says Derek Boyd, Chief Executive Officer of TechWorks, a business organisation representing the UK electronics and semiconductor industry. 'It's a global trend that is best exemplified by the Qualcomm NXP merger – which has still not been approved yet.' In 2015 there was \$103 billion worth of mergers and acquisitions in the sector, in 2016 it reduced to \$55 billion – still a vast figure. Despite this, jobs are being created not culled in this sector.

Scotland is benefiting from the new electronics industry, with several multinationals; Analog Devices, Cirrus Logic (which acquired Wolfson Microelectronics of Edinburgh in 2014), Dialog, Maxim, Cadence, NXP, Plexus and others. 'The big change is that they are no longer doing mass manufacturing in Scotland, they are more concentrated on design and on smaller volume and higher value manufacturing,' says TechWorks' Boyd.

This activity is vibrant despite a skills gap. A skills and recruitment survey of the Scottish technology sector, carried out by Technology Scotland in 2017, found that 70% of participants believed there is a discrepancy between the current university focus and industry requirements. Almost two-thirds of those surveyed also said they were aware of a technology skills gap within their companies.

'There are significant shortages because there are so many specialist positions.

Firmware engineers – where a combination of software and hardware knowledge is required to develop a product – and also Design engineers are in demand and in very short supply,' says Derek Boyd.

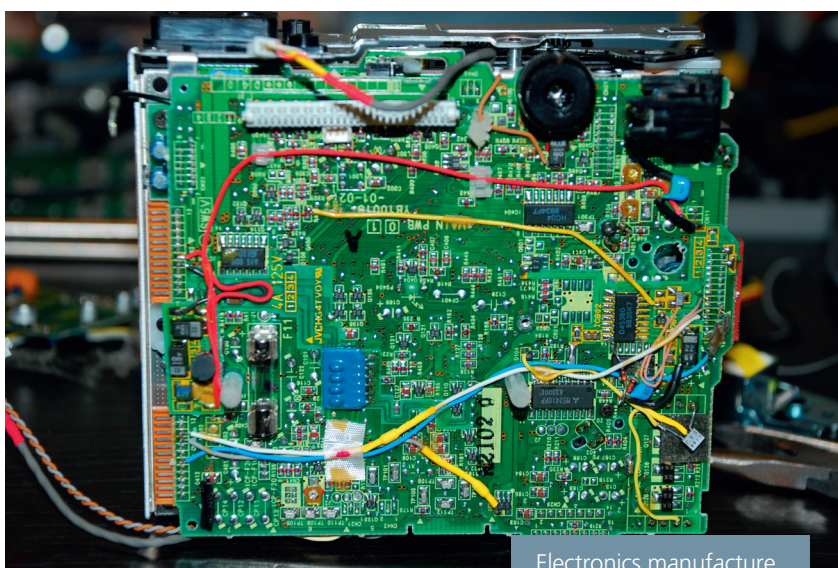
His organisation, with others, set up the UK Electronics Skills Foundation (UKESF). Its main purpose is to give electronics career candidates industrial experience by providing scholarship programmes. The UKESF has changed its strategy this year, targeting teachers more than schoolchildren. 'An example is work with the University of Southampton to give local teachers resources they need to teach A level physics better,' says Boyd.

For end-users, the car is now the focal point of growth in the electronics sector. 'It's well known now that the value of electronics in a car is higher than the value of the structural materials,' says Boyd. 'The UK is among the leaders globally in this technology.'

Contract manufacturing

At an aggregate level the UK electronics manufacturing services (EMS) sector is shrinking, in part due to offshoring of manufacturing from across Western Europe to Central and Eastern Europe.

In the latest edition of the Reed Electronic Research (RER) report on the European EMS market, it estimated that the UK EMS market in 2015 is worth 1,397 million (£1.02 billion at 0.73 conversion). 'We forecast that the 2016 figure will fall to 1.369 million (£999 million), and we estimate that in November 2016 there were 234 companies in the UK engaged either wholly or partly in contract manufacturing services,' says Peter Brent, Consultant Editor at Reed Electronics Review (RER). 'Very approximately, we estimate a total employee base including managers of 10,000 in the UK.'



Electronics manufacture in the UK has been unsettled by some of the knock-on effects of Brexit

RER says many of the circa 230 EMS companies in Britain have historically supplied the aerospace and defence industries, which have cycles of investment and EMS is susceptible to,

for example, defence budgets. The EMS sector also sells to the medical electronics, controls and instrumentation and industrial sectors. The energy and home automation sectors are also becoming more important.

Peter Brent says the Brexit issue hangs over the EMS industry in several ways. 'Companies are more reluctant to commit to new investments when unclear about what the UK will look like in two to five years' time, and companies with facilities in the EU may decide to invest in those locations over the UK,' Brent says. In addition, while the low pound helps exports, it takes time to engineer contracts and overseas customers will want to ensure that cost savings on exchange rates will be sustained over a long period.

Some UK manufacturers in the electronics sector have benefitted from the weak pound, increasing both sales and profits. Globally, the electronics industry is growing, putting pressure on the material manufacturers and pushing out lead-times to many months. This growth and its new challenges in procurement have been

met with a smarter approach to supply chain operation, with many original equipment manufacturers (OEMs) choosing to outsource certain non-core activities rather than buying and manufacturing in-house.

Automation and improvements in technology have also meant that the UK can now compete with lower-cost regions. This consolidation and a heightened appreciation for a more localised supply chain has had a very positive effect for segments of the UK contract manufacturing sector.

'OEM's are now wanting to concentrate their efforts on core activities, generally sales and R&D,' says Daniel Croft, Managing Director of Vanilla Electronics, an end-to-end contract electronics manufacturer in Thetford, Norfolk. 'We have recognised a need for this "one-stop-shop" ethos and shaped our business to cater. Many more OEMs are now using our complete end-to-end service, whereby we manage procurement, stores, manufacturing and even end-customer order fulfilment, therefore offering scalability without increasing their overheads.'

Brexit

The decision to leave the EU will have ramifications for UK manufacturing in the immediate future, and in the long term



Just over a year after our decision to leave the European Union, it is still very difficult to gauge exactly what the consequences will be for the manufacturing industry.

In July, figures reported in *The Financial Times* showed that investment in the UK car industry had fallen to just £322 million in the first half of 2017, projecting £644 million for the year. This is in stark contrast to 2014 when the automotive sector spent a cool £2.5 billion on plant, kit, buildings and training. But commentators, including the Society for Motor Manufacturers and Traders, pointed out that auto sector investment

is cyclical and 2014 levels were at the top of the cycle in an exceptional year.

Jefferson Group, a recruitment agency specialising in manufacturing and engineering, counted 200 separate web news stories from December 2016 to June 2017 that related to 'significant' manufacturing investment; capital expenditure of more than £1 million, or a new research centre, training centre or new manufacturing/distribution park.

While pharma is concerned about the effects of extracting the UK pharmaceutical industry from EU regulation, this did not stop GlaxoSmithKline from investing £275 million in its UK manufacturing facilities, and Novo Nordisk is investing £115 million over the next decade on a diabetes research unit in Oxford (see the Pharmaceutical edition).

When industry as heavily invested in the UK as pharma sees a large geopolitical change, it can be unsettling but it clearly has not stopped business in its

tracks. And some firms have never been busier, including suppliers of machine tools and moulding machines that serve the huge subcontract manufacturing industry where hundreds of big original equipment manufacturers (OEMs) source thousands of parts.

Credit ratings agency Moody's said the UK economy could be tipped into recession if Britain fails to land a deal with the European Union. Others are talking up the list of free trade deals we can negotiate with countries from the US to Japan.

Colin Tirel at ARBURG Ltd, a supplier of injection moulding machines in Leamington Spa, says 'to date, there does not appear to be any negative feeling in the market towards Brexit, quite the opposite with, pleasingly, many instances of work being reshored to the UK. One issue we do see is that of a shortage of technical personnel in the industry. This is something many customers have commented on.'

Investment

It has been striking how many big investments have been made in the manufacturing sector since the start of 2017. The net amount of new investment in the sector this year, offset by closures, liquidations and offshoring, is difficult to quantify, but there seems to have been a far higher than average number of factory investment and expansion stories – as well as training and research centre launches and upgrades – in the first half of 2017 than in previous equivalents periods.

A selection of some bigger and more notable investments in manufacturing in 2017 to date are listed below:

- » In December 2016 Siemens opened its £310 million turbine blade plant in Hull.



A multi-million pound investment deal by Toyota was approved in July

- » Announced in October 2016, Spanish automotive supplier Gestamp Tallent began work in May on a new £126 million plant near Cannock. The investment comprises £70 million in new technology and installation and build costs of £56.3 million.



Costa, the popular café chain, is expanding UK-based production of its coffee

- » In February supercar maker McLaren said it will build its supercar chassis in the Sheffield City region, building a new £50 million factory, creating 200 jobs.
 - » Boeing's first factory in the UK was also announced in February. The multinational aircraft maker will build a £20 million plant to make actuators, which operate aircraft wing flaps, on the 737 and 777 airframes.
 - » In April, Detroit Electric confirmed a \$370 million deal to build electric sports cars and suburban utility vehicles (SUVs) in Leamington. More than 200 new jobs will be created at Detroit Electric's factory in Harrison Way with the launch of the SP:01, a £100,000 sports car to rival the Tesla.
 - » Ready meals manufacturer Charlie Bigham's secured investment to build a new factory in a Somerset quarry that will initially create 100 jobs, with the plan to increase this to 300 in the next few years.
 - » Expanding manufacturing to logistics, in April work began on the second phase of £500 million iPort logistics scheme in Doncaster set to create many jobs. The total area will approach 6 million sq ft. Phase 1 of iPort has already seen 2.34 million sq ft of space let to Amazon, Fellowes, CEVA and Lidl.
 - » In March Costa opens £38 million roaster in Basildon, Essex to quadruple production. It can now roast 45,000 tonnes of coffee a year (or 24 tonnes a day), up from the 11,000 tonnes at its previous Lambeth site. The new site is close to where the raw coffee arrives at Tilbury Docks, saving carbon miles.
- These big announcements were supplemented by hundreds of stories of smaller, but very significant, investments such as Telford-based Proto Labs' €4 million spend on new machinery to service Europe-wide demand for rapid prototypes.

Jobs, pay, work and pensions

Engineering Employers' Federation's (EEF) annual Manufacturing Fact Card shows that pay within the sector continues to outpace services and the whole economy average, being up 1.9% (2015 vs 2014) or 3% compared to 2013. Average pay in the manufacturing sector in 2016/17 is £31,489, in services it is £26,825, and £27,607 is the average for the whole economy.

Unite, Britain's largest manufacturing union, says that employees in the private sector over the last two years have suffered the same downward pressures on pay as experienced by those in public services such as the NHS, where the majority of health staff have seen their pay in real terms eroded by 17% since 2010. Cases such as the recent multi-year pay deal on behalf of over 2,000 workers employed at luxury carmaker Bentley are the exception rather than the norm.

Weak demand in the economy is not helped by below inflation pay deals – or no rise at all – as the Consumer Price Index (CPI) rate of inflation stands at 2.6% (July 2017). Wages are badly lagging behind inflation, Unite says, while Stock Exchange performance, at recent record highs, suggests big companies have the necessary cash reserves.

However, the majority of private sector jobs come from small and medium-sized enterprises (SMEs). The Federation

of Small Businesses says 60% of all private sector employment in the UK is from SMEs and in manufacturing it is thought to be much higher.

The state pension age was due to increase to 68 between 2044 and 2046. Under new proposals that have to be agreed by parliament, this will move forward to between 2037 and 2039. The Government did not include this proposal in its General Election manifesto.

Unite claimed the increase in the retirement age meant that workers would be paying for failed economic policy under the Conservative Government. It says raising the state pension retirement age to 68 between 2037 to 2039 will be detrimental to workers, especially if you have a physically-demanding job or are suffering ill-health, and they called for this proposal to be reversed.

Unite Assistant General Secretary for Manufacturing, Tony Burke, said 'Brexit dominates economic and fiscal policy.

'As a union, we are seeking a 'Jobs First' Brexit where every aspect of the negotiations is set against whether this will create secure and well-paid employment in a country with a strong industrial base. To this end, we are calling on Business Secretary, Greg Clark, to put flesh on the bones of the Government's industrial strategy.'



Unite the union argues that private sector pay for the majority of employees in manufacturing has steadily eroded

The Taylor Review

A big criticism of work conditions in 2016/17 has been the treatment of atypical workers by some employers, typified by workers in the 'gig economy' such as those employed by Deliveroo and Uber.

The Taylor Review of Modern Practices was published on 11 July 2017 and made a number of recommendations to approve the working conditions of atypical workers and those classed as self-employed. 'The report calls for a



The Taylor Review addresses the treatment of atypical workers, following criticisms of the behaviour practised by Deliveroo and Uber

greater degree of consistency between employment law and tax law, and a review of definitions for employment status, including re-naming workers dependent contractors,' says Partner at FBC Manby Bowdler's Julia Fitzsimmons.

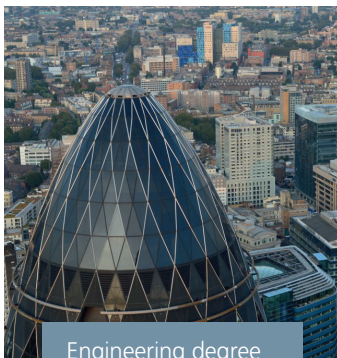
There are currently three categories of individuals: employees who have the

highest level of protection, workers who do not have the full employment protection, and the genuinely self-employed. Those in the worker category would be re-classified as dependent contractors and become eligible for rights such as the National Minimum Wage, paid holiday and access to sick and maternity parental pay.

'It is unclear how many atypical workers are engaged in manufacturing but the report raises the point that the Government would be looking at different rates of National Insurance contributions which apply according to employment status,' Fitzsimmons says.

'This creates a disparity of tax treatment which the report says is neither justified nor sustainable and, therefore, is looking to bring more individuals into the worker or employed bracket in order to increase National Insurance contributions.'

The Apprenticeship Levy



Engineering degree apprenticeships are set to expand as an effective method of closing the skills gap

Government knows Britain needs to increase its technically-trained workforce. The Industrial Strategy green paper says 'We had a record 2.4 million apprenticeship starts in the last parliament, and we are on track to deliver a further 3 million by 2020, with closer links to employers through the new apprenticeship levy.'

Opting for the stick over the carrot approach, the Apprenticeship Levy came into force in April this year. It affects employers with an annual pay bill of £3 million or more who are now required to pay effectively a tax at 0.5% of their pay bill. An apprenticeship allowance of £15,000 offsets the levy. This gives employers an incentive to offer apprenticeships, to both train their staff properly and qualify for the allowance.

While many manufacturing employers understand the logic of the system, the imposition of extra business costs was far from popular. '[Employers] understand a need to build a talent pipeline,' says Engineering Employers' Federation's (EEF), Terry Scuoler. 'They take apprenticeship training seriously; it did not need a levy.'

In Bob Bischof's submission on apprenticeships to London First this year it said 'The Government in England has tried to standardise apprenticeships somewhat following our submission and differentiates now into intermediate (level 1 and 2), advanced (level 3) and higher apprenticeships (level 4–5). The latter, which is the basis for the SEMTA higher apprenticeship for engineering technology in our opinion [German Industry UK and the German British

Forum] goes too far in terms of an apprenticeship, but still lacks educational and commercial content. The intermediate apprenticeship hardly deserves the name. The advanced apprenticeship is the nearest to

European standards. The attainment rates are shockingly low.'

The researchers for London First believe that attainment levels for some apprenticeship courses can be as low as 10%.

Training

The number of, and investment in, manufacturing training centres in the UK has risen in recent years. Engineering Employers' Federation's (EEF) Technology Training Centre in Birmingham is now well established, the Manufacturing Technology Centre and Advanced Manufacturing Research Centres (part of the High Value Manufacturing Catapult) both have apprentice training centres, and Warwick Manufacturing Group is building a similar centre.

All these places are, in the main, fully occupied with a steady flow

of applicants. A consortium of companies led by In-Comm Training and the Marches LEP have put £3 million into the new Marches Centre of Manufacturing and Technology, a training facility for modern skills including 'digital manufacturing' disciplines like engineering simulation and mechatronics training.

The new £21 million Alstom UK train technology centre, recently opened in Widnes and is set to create hundreds of jobs and other sector-specific training centres are popping up with pleasing regularity.



Manufacturing training centres have increased in number

Engineering degrees and degree apprenticeships

According to university admissions body UCAS there has been a drop in undergraduate applications for all degrees from both British and EU students in 2017. The number of applications from overseas students for post-graduate engineering courses has also fallen in the past year. Partly in response to university tuition fees of up to £9,000 per year and sub-optimal application rates, degree apprenticeships are a new and growing route through employment and higher education.

The small number of degree apprenticeships currently being delivered is expected to increase substantially over the next couple of years, says Henriette Fordham at the Higher Education Funding Council for England (HEFCE). Many higher

education providers, including universities, further education colleges and private providers, are developing programmes based upon the increasing number of degree apprenticeship standards. Several institutions have been provided with funding through the Degree Apprenticeship Development Fund to develop new provisions to be delivered from the academic year 2017/18.

'While they do not involve a financial cost for the apprentice, they do involve working in paid employment for the majority of the week and, as a route towards a higher education, qualification they can be challenging,' says HEFCE's Fordham. 'We expect them to complement traditional higher education routes, which will continue



Expansion of degree apprenticeships could help close skills gap

to appeal to potential students, but as employers look to spend their available levy funds on opportunities to develop their existing workforce and recruit

new skilled staff we expect that an increasing number will consider degree apprenticeships as one of a variety of options.'

Digitalisation



GlaxoSmithKline is one of several large organisations to take advantage of advances in digital technology

From BMW's MINI to B&W Speakers, from GlaxoSmithKline to the £2 million contract pharmaceutical manufacturer, from Southampton to Aberdeen, companies are using more digital technology to find business efficiencies.

Sometimes this can be a simple IT upgrade, sometimes it can be a multi-million pound, fully-automated production line. Very gradually, and mainly at large companies, the UK is moving towards an industrial base that will be using cyber physical systems, digital twins and machine learning, where humans intervene very little and machines and products talk to each other, navigating autonomously around the factory and where personalised mass production can be a reality. This process, which has several names including Industry 4.0, 4IR, smart factory and connected factories,

has become an obsession with supporters of manufacturing, business groups and the manufacturing trade press.

As part of the Industrial Strategy, the Government initiated the industrial digitalisation review, or IDR, led by Juergen Maier, Chief Executive Officer of Siemens UK and Ireland. Juergen Maier says 'Our review is about defining how the UK can best adopt radical new technologies that will boost productivity and create new high-tech jobs across manufacturing and industry. We want the end result to be a sector deal for manufacturing that makes a real difference to companies regardless of their size or market.'

'It is not yet too late for the UK to take the global lead in this space, but we are in danger of falling behind if we do not take up the challenge now. So, our aim is to position UK manufacturing and industry at the heart of a new global industrial revolution much like it was over 170 years ago when we [Siemens] first started doing business here.'

By late July the IDR had directly engaged with over 200 companies. The IDR team will now submit the proposal as part of a sector deal by the end of July. This will be negotiated over the summer recess, then – providing Government reaches an agreement – made into policy in the autumn. The details of the IDR are expected within the Industrial Strategy in the Autumn Statement.

OSRAM



Richard Bushnell, Chief
Executive Officer, OSRAM
UK



NOMA Earth
Tubes, Manchester

Founded and Headquartered in Munich, Germany, OSRAM is one of the world's leading lighting manufacturers and has a history dating back more than 100 years. We are focused lighting technology providers in the areas of automotive and specialty lighting, opto semiconductors, luminaires, lighting systems, and solutions. Our product portfolio ranges from high-tech applications using semiconductor-based technologies, such as infrared and lasers, to networked, intelligent lighting solutions for buildings and urban areas.

FACTS ABOUT OSRAM

- » OSRAM has conducted business in the UK since 1908
- » OSRAM has transformed the business to adapt to advances in electronic lighting and sensor technology
- » OSRAM generated almost €3.8 million in revenue during fiscal year 2016

Like many industries, lighting has undergone a recent technological transformation where light sources that were produced using commodities such as metal, chemicals and glass in standardised shapes can now be 1mm square in dimension, produced using silicon and phosphor and can be clustered in many different forms. The light emitting diode (LED) is now the base light source for most lighting products.

The rate of technological change is moving faster than ever before and light sources are not only more energy efficient but can become connected to a network and made 'smart'. With roots deeply embedded in engineering, we have consistently invested in research and development and embraced the opportunities lighting 'digitisation' offers.

Lengthy British heritage

The brand has had a close association with the UK since 1908 with OSRAM producing lamps in Hammersmith, Shaw in Manchester and Wembley for just over 60 years from 1930 to 1991. We continue to employ people in the UK and are



Hammersmith, circa 1910



OSRAM lamp works, lamp assembly, circa 1908

Headquartered just outside London in Slough. We work very closely with UK partners and manufacturers supplying products and services.

The UK represents a significant market for us and we recognise that much of what is supported in design specifications can be manufactured or installed in another country, whether it be automotive sub-assemblies or lighting specification. We are very proud that London hosts the largest number of lighting designers and architects in the world, made up of many globally-recognised names. There are also many lighting and electronics manufacturers in the UK that have been quick to adopt, embrace and install new technology in UK infrastructure enabled by us or with OSRAM inside.

We can literally be found everywhere; if you know where to look. OSRAM manufacture Halogen headlamps, sensors for security cameras, LEDs to backlight your mobile phones and also the camera flash. If your car has a heads-up display – it is probably using high-power LED and infrared technology from us, your wearable fitness band is likely to have sensors manufactured by us inside. If you were one of the few British people to watch the Eurovision song contest – the light show was ours.

Lighting in action

It is often only when you see the spectacular results of innovative lighting that the technology comes to life. In Scotland, the lighting installation at the National Mining Museum animates a new landmark in the Midlothian night skyline as it illuminates the pithead and the gantry. The museum is situated in Newtongrange, nine miles south of Edinburgh, which previously served as Scotland's largest mining village in the 1890s. The challenge of the project was ensuring that the installation would be in strict accordance with all heritage conservation criteria. Innovative LED technology creates the illusion that the pit wheels at the Lady Victoria Colliery are once again turning, making it seem as if the famous gantry is being thronged by miners carrying lamps. The installation provides pre-programmed sequences to give the effect of the two wheels of the pithead turning.

Further south in Manchester, the NOMA Earth Tubes are part of NOMA, an urban regeneration project in North Manchester. Thanks to an innovative lighting installation, the climate towers are not only functional, but also make the landscape more attractive. Each of the three approximately 5.6 metre high towers have a slightly different shape, and have been encased with

“We can literally be found everywhere; if you know where to look. OSRAM manufacture Halogen headlamps, sensors for security cameras, LEDs to backlight your mobile phones and also the camera flash”

“As for Brexit, for me this is simply another dimension of change that will settle over the long term. In the short term, we will need to react to the deal when we know the details ”

a media screen of LED lights, each of which has 5,760 individually controllable light points. For the top of the towers, a disc of LED lighting tube was created to make a round media screen which would fit across the grill without interfering with the air flow of the structure. 10,800 individually addressable light points were installed in total across the three lids. To top things off, each tower was also equipped with a crown light.

In the capital's Golden Mile in West London, rising to 27 storeys, the Tower at Great Western Quarter is one of the tallest buildings in the neighbourhood, offering views across London and the nearby Kew Gardens from the publicly-accessible viewing gallery. The tower, designed by Assael architects, contains prestige apartments and a Novotel hotel on the first 10 floors. It uses several artistic lighting strategies to create an active façade at night, one of

them the 85-metre art light installation that was achieved with the help of LED lighting solutions.

Future developments

I am greatly excited by the new developments coming through. As an example, we recently developed a product that can be attached or embedded in a mobile device to sense the freshness of food – it can also count calories. We also develop photodetectors for eye tracking and sensors for fitness monitoring. Artificial light plays an important role in the lives of people today, even if consciously they do not realise it. Light colour can be controlled during the day to sustain or enhance energy levels or reduce stress.

We are continually finding ways to develop our business in the UK. OSRAM have invested in a couple of UK companies, one of which is developing innovative and flexible forms of lighting products, the other is using web technology to better service lighting installers.

We have a technology incubator up and running in Munich called Fluxunit; we are continuously seeking out new companies with a technical advantage to enhance the existing business.

We have a strong, scaled business with change culture inside it, developing opportunities that come with a strong UK market. As for Brexit, for me this is simply another dimension of change that will settle over the long term. In the short term, we will need to react to the deal when we know the details and reassert our business to perform during the turbulence in between.

We have a global footprint together with significant research and development resource in North America and this, together with innovations developed in Europe will help seed and harness a strong position for OSRAM UK in the future.

National Mining
Museum Scotland
© Black Light Ltd



Technical Control Systems



Pudding Mill
pumping station



Curved Motor Control Centre
(MCC) designed to maximise
space

Technical Control Systems Limited (TCS) is a technology-driven company with leading edge capabilities in fields related to automation and control. The design and manufacture of motor control centres is one of TCS's major activities. The company began modestly, employing four panel wiremen and the factory was 235 sq m.

Today TCS employs 55 people and operates from a factory of over 3400 sq m. Since 2005 we have concentrated on hardware solutions as our core business. This was a direct result of TCS and Cougar Automation Ltd formalising a joint venture for hardware and software solutions, this joint venture is Total Automation & Power (TAP). Today TCS designs all types of low voltage assemblies across most industries.

In-house development

As with our staffing policies, we develop in-house talents and solutions for our clients. With the increased focus from clients for improved designs and compliance with standards, TCS developed our in-house software solution, called Optima, in 2000. This programme remains core to our design approach today.

Optima allows all aspects of the electrical, thermal (detailed design of each compartment for forced or natural cooling) and layout design (including options for future expansion) of an MCC to be completed, all within a single software solution. Total Expenditure (TOTEX) is a concept adopted fairly recently within regulated industries which are heavily dependent on infrastructure assets. TOTEX is the best solution because it has the lowest cost over the whole life of the asset. With the increasing focus on TOTEX from within the UK's water and

FACTS ABOUT TECHNICAL CONTROL SYSTEMS

- » Established in Leeds in 1969
- » Employs 55 people
- » Designs, manufactures and installs control panels throughout the UK and overseas
- » Looking to refocus our efforts with more emphasis on exporting in the next couple of years

“Your partner
for Control &
Automation
Solutions as
*It's all
about you*”

sewage companies, this has proved a valuable support service we offer our clients from initial tendering stage through to final detailed design.

Another example of in-house development is our Integrated Management System (IMS). The development, implementation and daily operation of the IMS was undertaken to establish a formal mechanism to comply with the requirements of ISO 9001 (Quality) ISO 14001 (Environment) and OHSAS 18001 (Health and Safety) and the corresponding need to create and review objectives and targets for the continual improvement of manufacturing and service. The IMS is used by all aspects of the business to identify and comply with all legislative and other requirements as defined and selected by the business.

In 2017 we upgraded our IMS and passed BSI accreditation for ISO 9001 and 14001 to the latest 2015

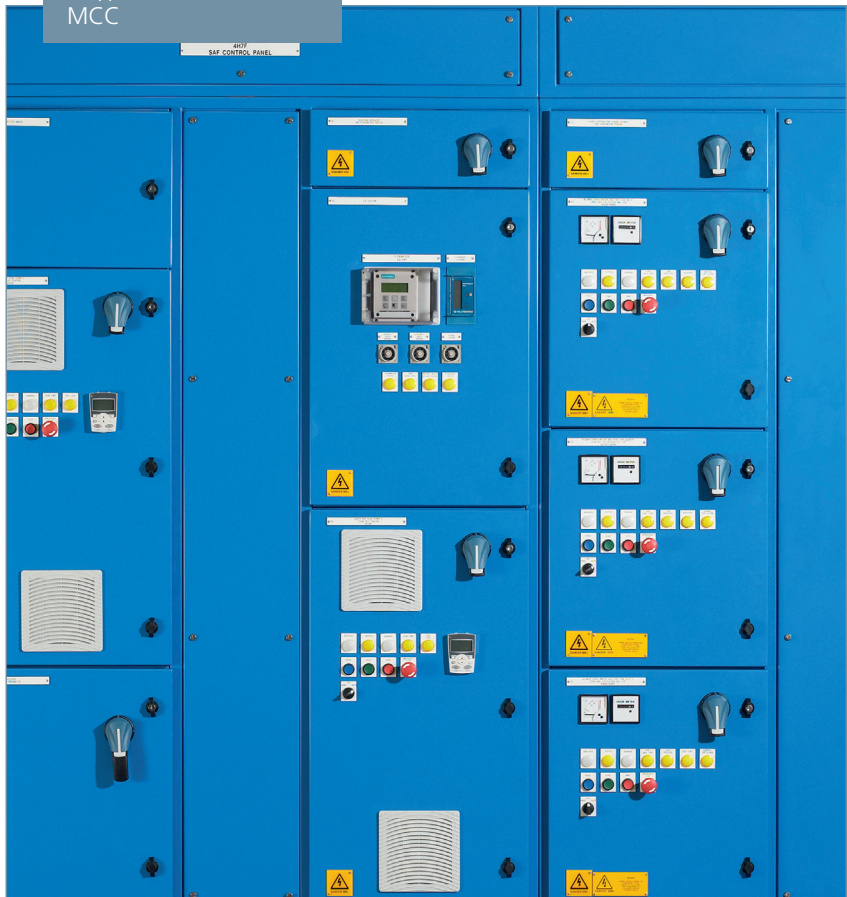
standards. At the same time, the system has been designed to comply with ISO 45001 when fully launched.

Workforce loyalty

TCS staff are loyal, staying with us for many years. In our 48 years of operation we have only employed 205 people, with the average length of service of the current workforce today exceeding 15 years. Our approach to employment is to develop the business to operate in consistent markets and provide long-term employment and opportunities for our staff. We rarely use contractors as we prefer to develop in-house talent.

In 2016 we started an apprentice programme for two young engineers. This is part of a two-year programme, at Leeds City College which operates in all departments. As part of an Engineering Extended Diploma Level 3 scheme students spend one day a week on day release.

A typical UK WaSc small MCC



Electrical Supply Industry Protection Panel





The TCS team

Industries and markets, now and in the future

We have a wide portfolio of projects and solutions across many industries. In our most recent history we have concentrated our successes in the UK water industry and electrical supply industry.

In these fields we have multiple long-term frameworks over longer than a 10 year period and have a reputation as a partner who helps the client and end-user to innovate solutions, rather than a typical supplier.

As we move into the latter half of this decade, we are re-concentrating our efforts to embrace the opportunities offered by the UK civil nuclear industry as well as refocus our exporting efforts around the additional UK government support for SMEs.

Case study – widening our scope to support delivery

» As a partner to our clients, we are happy to take on new opportunities when asked. A recent example of this was for a major WaSc in the North of the UK. Here we had a

time-limited opportunity to assist in providing an enhanced process for the client, to avoid possible litigation against compliance targets.

- » Within six months TCS's scope had increased from an initial basic electrical survey and possible minor electrical modifications. The final scope provided for new Variable speed drive (VSD) starters (630kW), new VSD rated motors, responsibility for size/select/installation of new VSD/Motors, modification of compartments at site, and selection/project management of the motor service provider.
- » Based on the success of the project in terms of cost, timescale and implementation, we are now happy to offer a wider mechanical and electrical portfolio of services for new projects.

The future

TCS has long-term plans to develop sales in the new target industries which will help us expand beyond our current factory capacity of £10 to £11 million per year within the next five years.

“We are focused on delivering quality products and services, providing trust, commitment, and professionalism. We listen, we discuss, we advise and develop”

Constant Power Services



Factory acceptance testing and training available at our head office in Letchworth

FACTS ABOUT CONSTANT POWER SERVICES

- » A wholly owned subsidiary of Riello Elettronica
- » £10 million turnover
- » 45 staff
- » Over 66% have worked for the company for over 10 years
- » 10–20% of staff are undertaking some form of training or gaining a higher qualification
- » Safe Contractor approved
- » ISO 9001, 14001 and 18001
- » Impeccable service level of >95%

Constant Power Services Ltd are a specialist power quality company guaranteeing power to hospitals, schools, financial institutions and corporate buildings. Based in Letchworth, Hertfordshire and Canary Wharf, London, our skills and experience make us a knowledge-based business. The company has achieved consistently great results and in the past 10 years has risen from a £2.5 million lifestyle company to an independent £9.5 million organisation in a highly-competitive market place.

With 30 years of experience in the industry, and being part of Riello Elettronica, Italy – the fourth largest uninterruptable power supply (UPS) manufacturer, and largest independent in the world - we have a knowledge base second to none.

To what do we owe our success? Our team.

It is key to how you differentiate yourself in a highly-competitive market. With manufacturers sourcing the same components from the same countries and suppliers, what can you really do to make your own stand out in the field. Innovative technology, which is at the height of trend now but in months has been copied, or perhaps you provide outstanding award winning customer services, or, as I believe wholeheartedly, the team and colleagues that I work with are the driving force behind the company.

Adding value and support structures to all staff will pay dividends in the end and at Constant Power Services, we pride ourselves on the loyalty of the staff, with 66% of staff having worked for the company for over 10 years.



Project Managers on hand to assist with your bespoke installs

The big question is what makes someone stay?

Do we have massively inflated salaries in the belief that people are fuelled by the desire to earn only money? No.

Do we have lavish parties or gifts for exceptional work? No.

What we do have is a mutual respect for our colleagues and encouragement in all levels of their working life and career. Society and business changes from day to day and keeping our staff informed and educated is not only of benefit to them but to us too.

We provide an extensive internal training programme, run by our excellent technical team and can take an engineer on a journey to become the best in our industry and this also ensures that we are part of The Guild of Master Craftsmen, so skilled are our engineering team.

The training is not limited to one area or function, if a colleague feels that they require training or a course to aid them in their understanding or work then we assist them with this process.

Even today Constant Power Services has 10-20% of staff undertaking some

“To what do we owe our success – our team”

Constant Power Services, part of Riello Elettronica





Our engineers, on a journey to becoming the best

formal higher education and we can be proud that we have aided in colleagues achieving their HNC (Higher National Certificate), ONC (Ordinary National Certificate), project qualifications and degrees in management.

We keep a comprehensive training record for all employees, irrespective of job role or area within the company, everybody has the ability to further their knowledge at Constant Power Services.

Ownership

All staff are responsible for their own decision making and there is no referring up. No one person has ever been disciplined for poor decision-making because they are given the room and the trust to carry out their job. In doing so, they care about the company and they care about how a simple 'yes' or 'no' can affect everyone. It took us a mere 15 months to complete and gain certification for ISO 9001, 14001 and 18001 all without the aid of a third party, this is no mean feat when you consider the standards and the processes which need to be undertaken and to which we had to adhere. The knowledge and commitment from everyone was outstanding.

Moving forward Constant Power Services would like to offer guidance and support to apprentices alongside our existing training programme.

Old school values

Why old? Why date them when in actual fact values are unageing and traverse many social and economic backgrounds.

It has long been our mission/ethos to treat others as we wish to be treated ourselves. This isn't ground breaking stuff but I do believe in today's society this has changed greatly and to keep drawing back to the values and manners that have been passed from generation to generation is very important.

Respect your elders, say 'please' and 'thank you', address people correctly with either Sir and Madam or if you have been fortunate to have been given a first name, repeat it as it is, do not shorten or abbreviate it or over familiarise yourself with someone. All these values are carried out and upheld by my team and we all at Constant Power Services Ltd understand that education is everything.

“No one person has ever been disciplined for poor decision-making because they are given the room and the trust to carry out their job”

Etek Europe



Etek Europe's Technology Centre in Ayrshire



Mike Nelson, Managing Director

Etek Europe is a leading provider of production equipment, consumables and services to the European electronics industry. It was born in 2007 and grew from the vision of Mike Nelson, whose career in the manufacturing industry has spanned more than 30 years. Its growth was supported by financial incentives from the local government and Scottish Enterprise. With its Headquarters in South Ayrshire, Scotland, nestled amongst the Prestwick Aerospace Campus – an established centre of excellence for maintenance, repair and overhaul (MRO), aero structures and design engineering – it is well placed to become the main organisation in its field.

FACTS ABOUT ETEK EUROPE

- » 5,000 installed systems
- » 40+ skilled employees
- » 1,800+ satisfied customers
- » State-of-the-art technology centre

Etek Europe – which has just celebrated its 10th birthday – has grown to become a quality provider of production equipment, consumables, training and services to a diverse range of industries. This includes the aerospace, automotive, defence, medical and electronic manufacturing industries across Europe, the Middle East and Africa.

With a workforce exceeding 40 skilled employees based across the UK, Ireland and Eastern Europe, Etek Europe has continued to build upon its proven successes. It is continually developing strong relationships with its customers and the world's leading equipment suppliers. This ensures that it continues to deliver premium solutions at highly-competitive prices and is able to identify future business opportunities.

With over 1,800 customers and an installation base of 5,000 systems, Etek Europe has one of the largest installation and service teams in Europe. Over time, Etek Europe's team of engineers has developed unrivalled product knowledge

“Etek Europe delivers premium solutions at highly competitive prices”

“Etek Europe’s team of experts offers unrivalled customer support for all equipment and inspection requirements”

and experience in all aspects of planning, supply, installation, testing, commissioning, maintenance and training.

Etek Europe has also invested heavily in developing a Technology Demonstration Centre at their European Headquarters in Scotland. This creates an environment where clients can test and evaluate some of the industry’s most advanced equipment while, at the same time, gain unlimited access to Etek Europe’s team of factory-trained engineers and product specialists. These services include:

Cleaning – Electronic cleaning systems including contamination testing and water treatments. Etek’s dedicated team of service and application engineers helps customers match their cleaning processes with equipment and chemistry to ensure the best results are achieved.

Fume extraction – Offering fume extraction equipment and know-how, including Local Exhaust Ventilation (LEV) testing, spare parts and filters. Etek’s regional service and support team provides comprehensive servicing and LEV testing on all fume extraction equipment.

Imaging – Etek’s Imaging Division offers a range of innovative and cost-effective equipment for Automated Optical Inspection (AOI), Solder Paste Inspection (SPI) and inline or standalone X-ray inspection from world leading X-ray manufacturers. Etek Europe’s team of experts offers unrivalled customer support for all equipment and inspection requirements.

Manufacturing – An extensive manufacturing division offers a range of world-leading, high-performance and cost-effective equipment used in the aerospace, defence, medical and electronics manufacturing industries. This is backed by Etek’s team of factory-trained engineers that provides unmatched 24/7 service and support.

Production equipment – One source to provide all daily consumable requirements from an established company customers can trust. As well as offering value for money, Etek Europe is also committed to bringing customers the best in customer service.

Servicing and support – With a large team of service and applications engineers based throughout the UK, Ireland and Eastern Europe, Etek Europe has a team of equipment and process specialists capable of providing 24/7 rapid-response, frontline support and training to complement your own technical personnel.

Looking to the future

With the manufacturing industry booming, Etek Europe wants to encourage a new generation to get involved.

This industry remains vital to sustaining economic growth and prosperity, national security, and technological innovation. The world is at the beginning of the fourth industrial revolution – dubbed Industry 4.0 –

High speed placement machine, JUKI KE-3020 VAL



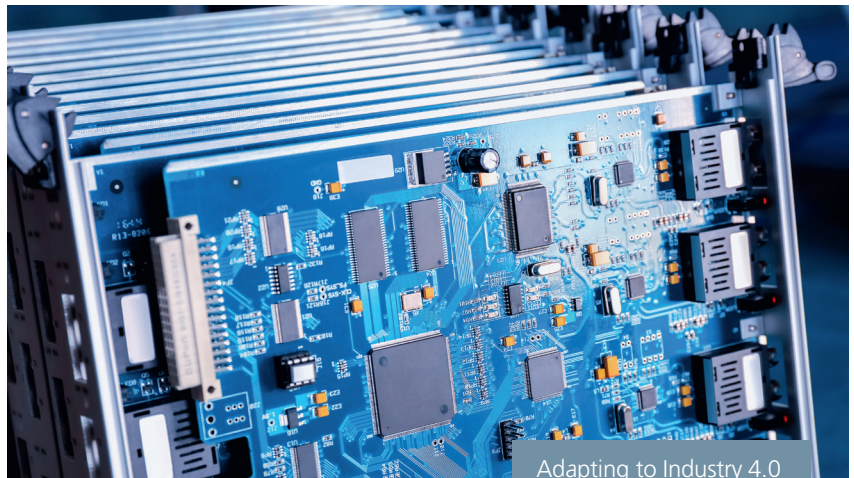
which is characterised by the increasing digitisation and interconnection of products. With this revolution comes the need for a more skilled workforce, and millions of jobs. There is a huge demand to fill these positions already, but not enough trained people to take them on.

The workforce is aging and, along with this, there unfortunately seems to be a stigma attached to the word manufacturing that is causing youngsters to avoid pursuing a career in the industry. To them, it's a world that sounds as though it doesn't have a future.

It's this stigma that Etek Europe wants to eradicate – and they're in a fortunate position where they can train not just engineers, but the next group of great salespeople.

The encouragement starts from a young age – as part of science, technology, engineering, and mathematics (STEM) week, children from local schools visited the Etek Technology Demonstration Centre to take part in workshops. The kids, aged between 9–12 years, were shown around the centre and were able to see different machines working and were taught their uses. The children learned that these machines created the circuit boards that will eventually make their way into their smart phones and tablets. By causing a buzz around the technology, it is hoped that, in the future, these children will not think negatively of the industry but instead will grow to believe it is an exciting business of which to be a part. Indeed, following technological patterns shows that children entering primary school now will be taking on jobs that don't yet exist.

In addition to this, a local Ayrshire company, JB Management, has partnered with Etek Europe to get young people working in the industry. Their Modern Apprenticeship



Adapting to Industry 4.0 will require a highly skilled workforce

programme is open to all ages and is relevant to individuals looking to start their career, and to those seeking work at senior management level. Etek Europe benefits from a skilled and productive workforce and has actually continued to employ some of the apprentices after their contract was due to end. Etek Europe has found that investing in individuals creates a workforce that is enthusiastic and loyal and it is a scheme of which they will continue to make use.

Next steps

By investing in their Technology Demonstration Centre, Etek Europe is preparing for the future and showing the world they know the importance of having product specialists. Etek Europe is continually training and investing in these product specialists – along with all members of staff. The technological revolution is happening now and, while there is a need for the younger generation to learn new skills, Etek Europe knows that it can't be left behind by waiting. By investing in their current members of staff, and partnering with apprenticeship schemes, they're hoping to fill the skills gap that is inevitably on its way.

Manufacturing – and Industry 4.0 – is where the future lies. Etek Europe is ready for it – they just hope the next generation is too.

“We are preparing for the future, and showing the world we know the importance of having product specialists”

Blakell Europlacer Group



Andy Jones, Business Development and UK General Sales Manager



Europlacer's flagship iineo+ SMT System

KEY MILESTONES 2016 FOR BLAKELL EUROPLACER GROUP

- » Largest number of Europlacer machines ever shipped globally
- » Record group sales: organic growth of 18%
- » Sales outside of UK: growth of 40%
- » Best ever Speedprint Stencil Printer results in the USA
- » Sales to Americas up 40%
- » Sales to China up 40%
- » Customer satisfaction excellence award: 99%

It was in the early 1970s that the founder of Blakell, Pat Kellard, began his focus on the electronics' manufacturing world with the development of a light guided assembly machine, which was widely accepted in the industry and was sold globally in very high numbers. As the electronics market evolved over the years and Surface Mount Technology (SMT) grew, Blakell moved into this arena with the acquisition of French SMT equipment manufacturer Europlacer in 1991, thus Blakell Europlacer was born. The products we make have evolved and our ability to respond has increased but what hasn't changed is our ability to listen to our customers, our commitment to innovation or the integrity with which we conduct our business.

With the reduction in through-hole demand and the rise of SMT assembly, the Europlacer platform was perfectly placed to capture the industry's demands. It was Europlacer who pioneered the intelligent feeder – a system that allows the operator to essentially place a device in any location on the machine without fear of making a mistake – a concept which has been developed further by us and emulated by some other manufacturers.

Headquartered in the UK – we have manufacturing both in the UK and in France with sales and service throughout the world. Our direct companies are based in the UK, France, Germany, Italy, Americas and China where we have very strong market share and loyal customers. In other territories, we operate through representatives and we are continually increasing our presence in these markets.

Blakell Europlacer are well known for customer loyalty, this is due, in no small part, to our after-market support – indeed we have won global awards for this for the past four years. A key to the popularity of our equipment is our innovation. We manufacture SMT Pick and Place machines (Europlacer) and Stencil Printers (Speedprint), both featuring options that our competition cannot offer.

Industry recognition

There can be no greater accolade for a company than being judged as the best in a category that features your closest competition. In winning the Frost & Sullivan's 2017 Global Flexible SMT Pick and Place Company of the Year Award we were assessed against some very prestigious names in our industry.

The success was primarily down to innovation of the equipment and the way in which we have looked after our own personnel. Many of our employees have been with the company for twenty years plus and that has been reflected in that award. This is in addition to the same awards received in 2014, 2015 and 2016.

Frost & Sullivan collaborates with clients to leverage visionary innovation

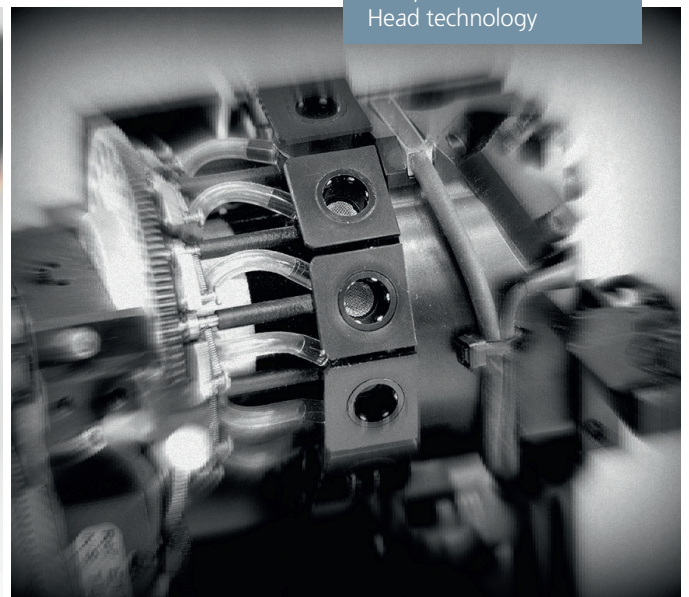
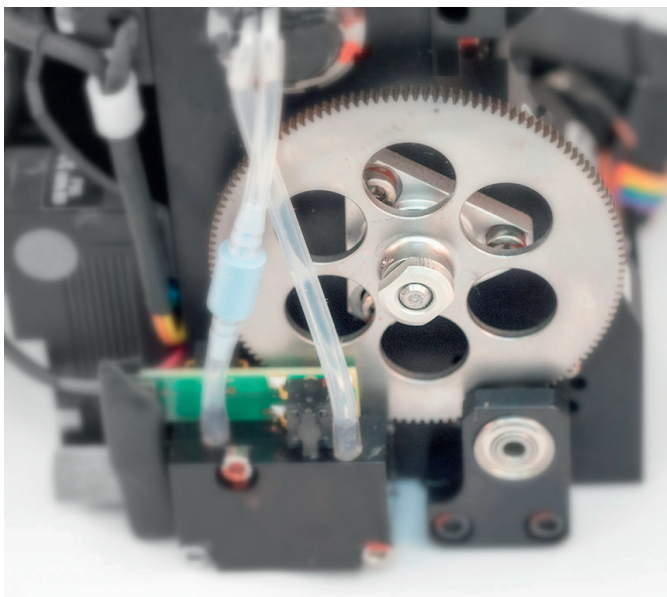
that addresses the global challenges and related growth opportunities that will make or break today's market participants. As part of the decision process, they evaluate equipment suppliers in the Flexible SMT market and rates a series of key performance indicators.

There is then a benchmarking procedure which considers Visionary Innovation and Performance and Customer Impact factors. A decision scorecard rates each supplier score ranging from one (poor) to ten (excellent) and we scored an impressive 9.2 average rating across the two factors, while the nearest competition from within the SMT Flexible market rated 8.5 and 7.8.

We are very proud of the business we have developed over the years which has seen consistent and strong growth year-on-year. This growth has been as a direct result of maintaining our loyal customer base and seeking new opportunities for customers with competitor's equipment where we have grown our global market share in an ever more competitive market.

These results are clearly not an accident and have been preceded by huge efforts from our research and development (R&D), sales and customer service teams as well as the back-office

“The success was primarily down to innovation of the equipment and the way in which we have looked after our own personnel”



Europlacer Placement Head technology

Europlacer in
Rocheserviere, France



members of our strong organisation. We are a forward-thinking and extremely customer-focused business, and these strengths will help us to secure our position and to grow further in the coming years.

Supporting UK manufacturing

It is always a challenge to be a successful manufacturer in the UK; there is a lot of competition and a lot of cost pressure. There is equipment coming from the Far East that is made in much larger volume, and can sell much less expensively than us, so we must major on our key selling points to beat those competitors.

On the Europlacer range of machines, we have managed to keep our market and extend it by having a system that can do the wide range of surface-mount devices on one platform, whereas our competition would need to have two machines to handle what we can do on just one.

Surface-mount technology hasn't changed massively over the last five to ten years, but the marketplace has altered, certainly customers now don't tend to come out and do demonstrations quite so much as they used to, the initial investigations being internet based. We have to be up there with the marketing, and with the products so that we have the right specifications. Though the emphasis

on demonstrations may have reduced, what has become more important (in this age of tripadvisor reviews etc) is reference visits. We pride ourselves on our support and close customer relationships, and actively recommend that prospective clients visit and discuss with our existing users.

Europlacer placement machines are well established in the low/medium and high mix market, which is reflected in our success at Contract Electronics Manufacturers (CEM) and high value Original Equipment Manufacturers (OEM) for example aerospace and medical devices. However, we have identified a requirement for flexibility at the higher volume end of the market and this is something on which we would like to focus going forward.

Facing an ethical future

One of our major plans is to be able to expand our market. The global SMT market is very large, we occupy a small part of that right now, and the target is to try to increase our market share and to get into slightly higher volume markets as well. This growth will be based on the ethical outlook of the senior management of the company. Our Christian ethics trickle down through the company, so we have a very open and honest approach to our customers, and I think that is respected in the industry.

“We have
grown our
global market
share”

IceMOS Technology



Multiple applications in multiple markets



Samuel J Anderson, founder and Chief Executive Officer (CEO)

Born in Northern Ireland, Samuel J Anderson – founder and CEO of IceMOS Technology, developed an idea based on energy conservation and environmental progress into a global company. In the Spring of 2004, IceMOS, a high technology semiconductor manufacturing company, was established in West Belfast.

The vision for the company is to provide sensing products and energy-efficient products that enhance the safety and improve the efficiency of electronic systems. Sensors and Super-Junction Metal Oxide Semiconductor Field Effect Transistors (SJ MOSFETs) are devices used in electronic systems. They're in just about every electronic application. There are dozens in your car, your home and where you work. They're all around you and they do just about everything.

IceMOS designs, manufactures, markets and sells proprietary sensing elements and energy-saving power MOSFET switches to serve our customers in Japan, China, Taiwan, Singapore, Russia, India, USA, Canada and the European Union.

Our factory is located at the top of the Falls Road overlooking the city of Belfast. We employ 70 people, many of them are graduates from Queen's University Belfast (QUB). We're growing and making a contribution to the community in Northern Ireland as part of our social responsibility, providing knowledge-based jobs for today's graduates and many more jobs for future generations to come. We like to think our people are among the best semiconductor manufacturers in the world who come to work each day with a sense of pride and go home to their families each evening with a sense of accomplishment.

» SAM ANDERSON

- » Sam is a highly-accomplished entrepreneur and senior executive with more than 30 years of success within the semiconductor industry
- » Sam's areas of expertise include research and development (R&D), engineering, and business management
- » Sam has served as founder and CEO of IceMOS, since it's inception in 2004, and has lead the organisation to profitability
- » Sam has BSEE University of Ulster; Masters in Applied Physics Queen's University Belfast; Master of Technology Arizona State University

FACTS ABOUT
ICEMOS TECHNOLOGY

- » Headquartered in Arizona with Micro-Electro-Mechanical Systems (MEMS) manufacturing operations in Belfast, Northern Ireland, MOSFET design and development center Tokyo in Japan
- » 71 employees (47 engineering; 17 operations; 4 finance; 2 sales and marketing; 1 corporate and administrative) Majority of employees in belfast factory
- » \$60 million Valuation
- » Strong patent portfolio with 100 patents (80 granted; 6 pending; 14 filed/disclosed)
- » MEMS design and engineering facility in Belfast, Northern Ireland; foundry partnership in Japan for SJ MOSFET
- » The company is well positioned to benefit from many of the trends in cleantech and cloud computing by energy conservation and environmental progress
- » Addressing multiple billion dollar markets
- » Clean energy, sensors, luxury watches, and power management

The markets

Our market selection process is motivated by IceMOS's desire to supply world-class products to businesses with high-end products and steady growth. These firms accept the evolution of high technology and frequent design upgrades to address the continuous need for performance improvements at cost effective prices. The global market for sensing and power management silicon chips is estimated to be US\$7 billion.

The applications

Sensing elements enable sensors that provide an analogue interface between the physical world and digital electronic systems. Sensor elements allow digital electronic systems to 'see', 'hear', 'touch', and 'smell'. They are found in multiple applications such as car airbags, electronic parking brakes, tyre pressure monitoring, infrared sensing for night vision sights, and much more. IceMOS has successfully penetrated the automotive market with products in automotive electronic systems. An example of automotive sensors is shown below.

Power supplies must be more efficient, more compact, and less costly to meet today's increasing demand for energy and environmental conservation. The key technology that delivers the performance required by power supplies is a family of power MOSFET switches

called Super-Junction SJMOSFETS. There are many applications for these including data centres for cloud computing, light emitting diodes (LEDs) for indoor and outdoor lighting, and for satellite communications. Cloud computing Data Centre Servers require power systems with long life capability, high efficiency, small size, and high reliability. Super-Junction SJMOSFETS, are arguably the most critical components in Data Centre power electronic systems. IceMOS Super-Junction products are positioned to be an enabling technology for the reduction of energy consumption.

Currently, cloud computing data servers use 15% of all electricity consumed in the USA.

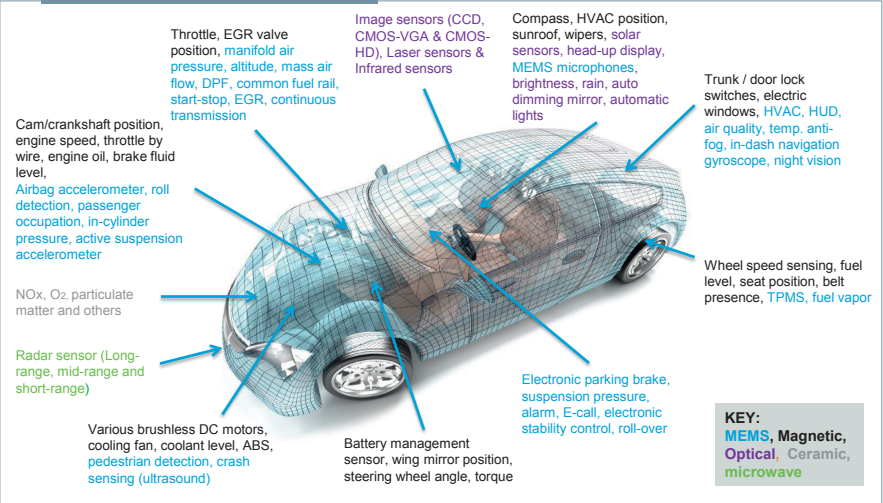
The manufacturing process

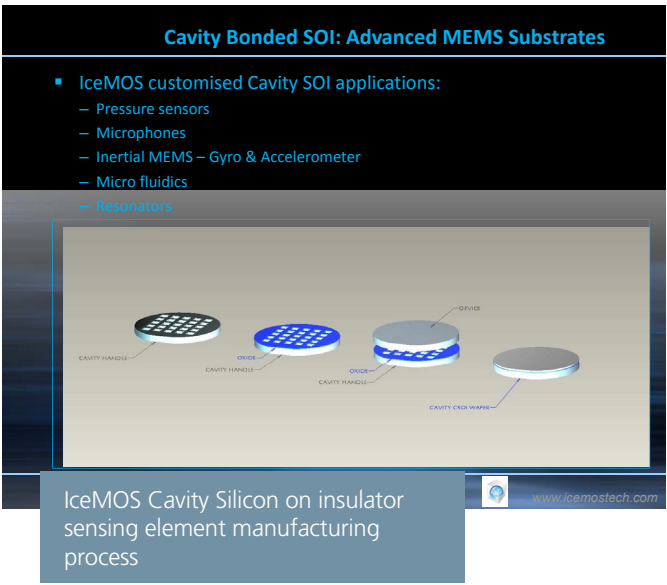
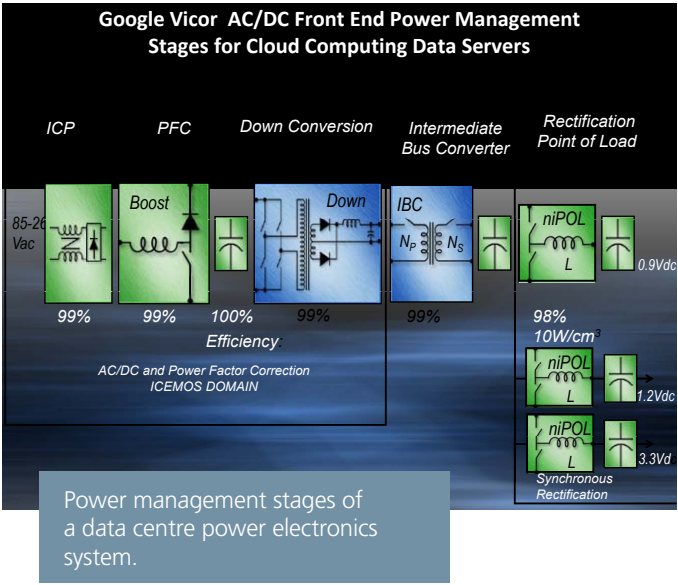
In order to realise the IceMOS vision, control of our own manufacturing is critical. Our silicon chip factory in Belfast has an equipment set that is uniquely suitable for the development and fabrication of sensing products and Super-Junction MOSFETS, allowing IceMOS to position itself in technology and product leadership.

IceMOS matches technology to the application. An example of this is our Cavity Bonded SOI MEMS substrate technology. By using our own optimised manufacturing process, where the product is designed for maximum performance using computer-aided techniques, IceMOS creates a strong manufacturing advantage at competitive prices.

We also use our MEMS technology to manufacture components for high end mechanical watch manufacturers in Switzerland. Companies such as Patek Philippe, Swatch Group, and others need components that are made from silicon rather than steel to allow their watches to keep time accurately over many years without being affected by magnetic interference.

Automotive Sensors cover >100 applications of sensors in cars from safety to body electronics





The sustainable competitive advantage of IceMOS

IceMOS has five sustainable competitive advantages. The first is our portfolio of intellectual property. IceMOS has 70 granted patents plus many more pending.

In the merchant semiconductor business continuous technology development is relentless. The second competitive advantage is our highly accomplished R&D team – the IceMOS Brain Trust. The third, is the rate of technical innovation achieved at IceMOS.

A strong customer-focused manufacturing team working closely with marketing engineers defining products to address customer's business needs are the fourth and fifth competitive advantages respectively.

Quality management systems leveraging global resources

The company has ISO/TS16949 and ISO 9001 manufacturing certifications in support of our manufacturing operations.

IceMOS has leveraged its global resources by creating cross functional teams between our Japanese and Northern Ireland engineers to develop a Design for Manufacturability Quality Management System (DFMQMS).

The attention to detail driven by the Japanese representatives and the creativity of our Belfast-based manufacturing team results in high quality products. This approach applies scientific principles in a disciplined engineering fashion allowing products to be optimised for performance and centred for manufacturability. The DFMQMS approach is key to achieving high yielding cost effective manufacturing platforms.

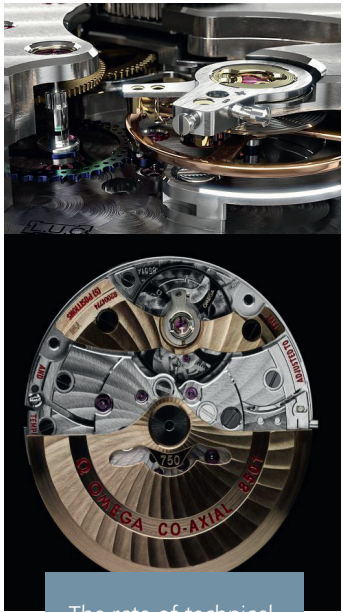
The future

The company is well positioned to benefit from many of the trends in clean and green technologies particularly in automotive and cloud computing applications. Autonomous Vehicles (AV) and electrification of cars will require power, local sensing and continuous information from the cloud always connecting data to the car piloting its journey along the highway.

Autonomous driving will require mobile connectivity equivalent to 50 smart phones in each car.

The merging of mobile and automotive consumer electronics for AV will demand efficient high current power management solutions plus hundreds of sensors per car which presents a huge opportunity for IceMOS.

“Autonomous driving will require mobile connectivity equivalent to 50 smart phones in each car”



The rate of technical innovation is an important IceMOS advantage enabling the development of silicon mechanical components in Swiss luxury watches

Coldcurve



Jonathan Reid, Managing Director



Highland grain drying stores (40,000 tonnes)

FACTS ABOUT COLDCURVE

- » Established in 2003
- » Limited company in 2007
- » Specialists in SCADA, PLC and HMI
- » Specialists in control panel design and manufacturing
- » Based in Moy in the Scottish Highlands
- » Jonathan Reid, Managing Director
- » Board of Directors
 - » Jonathan Reid
 - » Bridget Gibson
 - » Mary Reid
 - » David Walker-Smith

Coldcurve Ltd is a multi-disciplined engineering solutions provider supplying bespoke control systems nationally and internationally. We specialise in custom automation process controllers and electrical system design, creation and installation. Our factory automation systems can range from large scale, multiple remote sites networked to a main control centre, to small applications such as a temperature or valve controller.

Company history

The company was founded by Managing Director, Jonathan Reid, in 2003, when he was only 23 years old. After completing his apprenticeship as an electrician and working for an electrical company for several years in Aberdeenshire, he moved back to his home village of Moy in the Scottish Highlands. Here he set up Coldcurve, initially doing small home rewiring jobs but quite quickly taking on bigger contracts. In 2007, Coldcurve became a limited company with its own board of directors.

The company is still based in Moy and, in the past 10 years, the business has grown and we are happy to take on contracts up to and exceeding £1 million. We are looking at taking on several industrial electricians to complement our engineering design team.

Work and play

Our Headquarters has recently undergone a huge transformation. From working out of the spare bedroom of the Managing Director's home, we now have two fully renovated shipping containers which house our new office space and four other shipping containers that have been turned into workshops and component storage areas.

Coldcurve is a close-knit company, just like the community in which it is based. During lunch we can usually be found sitting around the table, eating together and sharing ideas. Jonathan believes that investing time with his employees is essential to keeping the business strong and moving forward. Having a happy team who can openly communicate with each other increases workflow and production, making work life more enjoyable. Our team also share many interests outside of work. We are keen skiers, snowboarders and bikers and are often out in the hills together.

Clients and continual development

Since the beginning, Coldcurve has never had to go out of its way to find work- it has always been through word of mouth and networking on site. The wide range of contracts mean there is never a dull day in the office and recently the company has worked with the oil, agricultural, medical and renewable industries.

One of our larger clients is Highland Grain Ltd, an agricultural cooperative which dries, conditions and stores malting barley and other crops. It primarily supplies the Scottish whisky distilling industry. Coldcurve was commissioned to replace the existing much-extended control system with an efficient state-of-the-art one.

A new bespoke Movicon SCADA was designed and installed to consolidate the series of plant upgrades and expansions for the grain drying and storage facility which supplies some of Scotland's leading distilleries. The new software provides control and visualisation for product movement, processing and storage, including the integration of biomass boilers and heat recovery systems.

Another large client is Honeyman group. Coldcurve was commissioned to design, construct and install a control system for dry heat ovens which are used in the sterilisation of silicone implants at the Biosil production facility in Cumbernauld. The new electrical control system is also programmed to barcode scan the products when they go in to the oven so there is a documentation trail for each product, printed at the end of each cycle.

Coldcurve controlled the dry heat oven using three phase heating elements and load control through burst firing. By using the burst firing it meant that the oven can be kept at an extremely consistent temperature throughout the entirety of each cycle. This project has been so successful that they are now in the process of commissioning oven number eight.

Coldcurve had also had a crucial role in supporting Scottish and Southern Energy (SSE) deliver a new,

“We are a small business, designing and installing all our own tailored control systems for our clients. Just because we are small, doesn't mean we can't take on big jobs”

Managing Director
Jonathan Reid

Highland Grain using their Coldcurve SCADA



» AUTOMATION PROCESS CONTROLLERS

- » **PLC:** (Programmable Logic Controller)
An industrial Computer Control System continuously monitoring the state of input devices, making decisions from a custom program to control the output devices.
- » **HMI:** (Human Machine Interface)
Touch Screen interface used in manufacturing or process control systems.
- » **SCADA:** (Supervisory Control and Data Acquisition)
An industrial system used to control equipment remotely and monitor, gather and process real time data.



Completed Biosil/Nagor medical sterilisation ovens

“Working within the BSI standards shows that we take our responsibility to our clients and employees seriously”
Managing Director
Jonathan Reid

reliable 24 hour solar and wind generated power system for the Isle of Muck off the West Coast of Scotland. Since 2000, the Isle of Muck had not been connected to the mainland grid. The islanders received lottery funding in order to build a new renewable system for the community.

The new scheme provides a continuous 24 hour electricity supply using clean, sustainable, renewable sources leading to reduced diesel consumption and reduced maintenance. This has been a great benefit to the island and the environment allowing the population to stabilise and grow, safeguarding the community on Muck for years to come.

Our role was to ensure that excess energy produced by the new systems was fairly distributed among the islanders. This was challenging

because they are situated all over the island and the infrastructure is very old. The solution involved radio transmitters located in each building and a PLC controlled schedule of distribution, meaning the duration of excess power required is delivered to individual properties equally on a scheduled basis.

Manufacturing excellence

The company follows strict industry guidelines and best practice, adhering to standards as a member of British Standards Institution (BSI). This is important as it shows that, even though Coldcurve is a small business, it is working within the industry and quality management guidelines to make it an attractive, responsive company to potential clients.

Our company is in the process of developing and certifying our own Quality Management System alongside our Health and Safety Systems and Environmental Management Systems.

What’s next?

Our vision is to continue working to a high standard, being at the forefront of research and development in automation and to continue providing bespoke electrical automation systems to our ever expanding customer base. Plans are also in motion for the manufacture of our own design dry heat oven for the medical industry.

We are working with various industries, local and national, to expand the manufacturing capabilities in the Highlands of Scotland and beyond. These include breweries, sawmills, distilleries and other industries.

We thrive on challenge and are excited about future possibilities.

Designed Architectural Lighting



Al Jazeera at the Shard. One of many floors using DAL luminaires.

Designed Architectural Lighting (DAL) are designers and manufacturers of high-quality luminaires – the lighting industry word for a complete light fitting and its many components – for architectural and major commercial building projects. Founded by the equity shareholders, John Sawyer and Chris Short, DAL is a British company with a highly-experienced team, forming a unique in-house skills base.

The complexity of a lighting product

In recent years luminaire technology has been turned on its head with the introduction of low-energy light emitting diodes (LEDs). The development of these solid-state electronic light sources continues to evolve and improve, resulting in a changing and stimulating marketplace. Many of the fundamental principles of luminaire design – which were established around a traditional point, area or linear light source – have been challenged, requiring a different approach to the design and materials needed to create products that ensure today's expectations of visual comfort, light output and energy efficiency are met.

A single luminaire can take several months to design with several mock-up and prototype stages. It can have more than 30 components and involve in excess of 25 manufacturing processes.

Company history

DAL began trading in 1984, coinciding with the City of London's expansion as it grew to maintain its leading position in the global financial markets. Following the successful completion of Broadgate and through numerous phases of Canary Wharf



The Shard, love it or loathe it, is now one of London's most visited landmarks. In excess of 3,000 DAL luminaires were supplied for this project

FACTS ABOUT DESIGNED ARCHITECTURAL LIGHTING

- » Designers and manufacturers of technical, high spec lighting
- » Established in 1984
- » Major suppliers to commercial architectural, infrastructure and transport projects, art galleries and museums, leisure and retail outlets
- » Primary markets: UK, Europe, Middle East, South East Asia, China
- » 35 direct employees while working with many manufacturing subcontractors, creating 100 more jobs
- » Based in Central London and Essex

“The visual comfort of the occupants is essential”

» KEY PROJECTS INCLUDE

Transportation

- » Chek Lap Kok, International Airport, Hong Kong
- » Dublin Airport
- » Docklands Light Railway, London

Heritage (London)

- » Foreign and Commonwealth Office
- » Hoover Building
- » Savoy Hotel
- » BBC Broadcasting Centre, Portland Place

Art galleries and museums

- » Tate Galleries, London and St Ives
- » Victoria & Albert Museum

Hotel and leisure

- » Burj Al Arab, Dubai
- » Burj Khalifa, Dubai
- » Al Houara, Tangier
- » Sheraton Hotel, Heliopolis, Cairo
- » Aviva Stadium, Dublin

Major commercial developments

- » 20 Fenchurch St, London
- » Principal Place, Broadgate, City of London
- » La Garenne, Paris
- » Samba Bank Tower, Riyadh
- » National Bank of Kuwait, Kuwait City

(1988 to the present), DAL developed a variety of standard range luminaires, opening up opportunities in the hotel, leisure, retail, transport, residential, gallery and museum markets. Equally, the experienced custom/specials division of DAL has maintained a significant business share in many project areas, contributing to the company's overall financial growth.

The market

The establishment of a strong UK market allowed DAL to expand a healthy international business through architect and consultant specification of DAL products, supported by a network of established agents and representatives throughout Europe, the Middle East and South East Asia.

Products

DAL's robust and expanding standard range of luminaires has been supplied for major projects such as The Shard, Oxford Brookes University, Brent Civic Centre and Costa Coffee's current re-branding and new-look, worldwide outlets. Also, DAL are frequently invited to develop and manufacture custom-made lighting products, whether they are replicas of historic light fittings using the latest technology or specialist luminaires for commercial projects. Independence and experience means DAL is free to choose components from many manufacturers, so is able to support the latest in architectural and interior design.

One of the essential skills for the successful design and manufacture of a product is being aware of the needs and financial restraints of the construction and contracting industry. DAL's quick response and flexibility are key factors in high-quality customer service.

Lighting design challenges

When designing a luminaire, there is a bigger picture to consider. Although interior lighting products and solutions are an ever-changing market, the visual needs of the restaurant diner, the art gallery visitor, the office worker or the commuter remain constant. It is not only the amount of illuminance (measured units of light, also known as lux, reaching horizontal and vertical surfaces) needed for people to see the task or objects clearly and move round the building safely that are important, but also their visual comfort and the lit appearance of the space.

Product design challenges

There are many regulations to meet and guidelines to follow, including BS EN12464 (British Standard Euronorm) which specifies the requirements for lighting in most indoor work places and associated areas, addressing both quantity and quality of illumination, together with recommendations for good lighting practice. With this in mind DAL products are developed to meet these constraints with utmost rigour.

Environmental challenges

The luminaire is only one part of the built environment and DAL works closely with one or many disciplines of a design team: the lighting designer, architect, the interior designer or consulting engineer. The developer or owner may also be involved, designing their building to meet a Building Research Establishment Environmental Assessment Methodology (BREEAM) rating. One category is Health and Wellbeing, of which lighting is one important aspect.

Luminaires also have to meet the requirements of the UK Government's Building Regulations on Energy, Part L: Conservation of Fuel and Power. Intended to help manage climate change, it is rigorous in its energy efficiency requirements.



Oxford Brookes University, new teaching and library building. An integrated linear lighting system was developed for this project

DAL luminaires may also be part of an Enhanced Capital Allowance (ECA) scheme. A UK Government initiative, this provides business with enhanced tax relief for investments in equipment that meet its energy-saving standards.

Quality standards

There are many standards and guidelines that must be complied with within the world of luminaire manufacture and lighting specification.

DAL company procedures ensure that consistency of product quality and respect for the environment are maintained by constant monitoring. This is recognised by DAL obtaining Quality Management System ISO 9001 and ISO 14001 accreditation. DAL products are designed and built in the United Kingdom to conform to the requirements of BS EN 60598-1 and IEC 598 (International Electrotechnical Commission). When DAL does not have the appropriate facilities for testing a luminaire, such as the photometric performance (the physical, scientific measurement of the visible light produced by a luminaire), they use fully-accredited test laboratories, such as the British Standards Institute.



The Drum at Brent Civic Centre. More than 2,000 DAL CIVIC downlighters were installed throughout this unique project

The future

DAL's engineering and development departments constantly track the advances in manufacturing materials, lighting design and LED technology. The best optical quality and energy-efficient products are then incorporated in their latest ranges of high-quality, energy-efficient and price-sensitive luminaires. The specification and sales of DAL products continues to be supported by up-to-date, easy to follow, comprehensive literature and a fully interactive web site (www.dal-uk.com).

DAL's continuing ambition is to expand its share in the global market while maintaining a strong UK base. Highlighting this, DAL's current projects include: Palm, Dubai, Battersea Power Station development and Cross Rail, three very complex and ambitious building projects currently under construction.

» DAL'S PRODUCT RANGE

- » High quality downlighters and wall washers for every interior lighting application
- » Linear systems, which can be detailed for exact building requirements
- » Office area luminaires
- » Display spotlights for art galleries and museums.

“Luminaires – the lighting industry word for a complete light fitting with its many components”

HEMCO Power & Control Systems



Karen & Richard Senior, Owners of HEMCO



HEMCO Power & Control Systems has more than 50 years of experience in designing, manufacturing, installing and commissioning bespoke electrical control systems for a wide variety of process control, machinery and manufacturing applications.

FACTS ABOUT HEMCO POWER & CONTROL SYSTEMS

- » Family run business
- » Established in 1963
- » Based just off the M3 in Eastleigh, Hampshire
- » Employs 10 people
- » UK and International clients
- » Annual turnover of £700-£900k.

Our clients include aerospace, aerocomposites, agriculture, automotive, bakeries, contact lens production, continuous metal extrusion, food processing, injection moulding, leisure industry, marine, medical, military training, packaging, petrochemical, pharmaceutical, plastic extrusion, printing, semiconductor manufacture, textile, tooling and tool heating, waste and water management.

We have extensive and transferrable understanding of electrical principles, logic and motion. We specialise in all levels of design and manufacture, from simple control panels to complete integrated control systems from inception to installation, including bespoke software.

What we do and how we do it

It was obvious that we would have to adapt and make significant changes to the way the business was run, in order to survive in this economic climate. Creation of a focussed business plan, action plans and strategy was the way forward. As a result, we have greatly diversified our client base, branching out into more innovative sectors, thus minimising the risk to us if any one industry suffers a downturn. We have made significant changes to our internal procedures by streamlining costs and negotiating better terms with our suppliers, enabling us to maximise our competitiveness and give our clients the best deal. As a result, we have increased turnover and profits. This has meant employing more staff, updating our IT systems, workshop, tools and machinery.

Our internal design process is based on a structured approach, involving compliance with a series of key targets, British and European standards, current legislation, specifications, guidance notes, codes of practice and manuals that cover all design, management and support disciplines. This has been developed and continually improved to capture best practice within the industry, as well as our own valuable practical experience.

We have earned an enviable reputation through our ability to design, engineer and implement technically advanced, cost effective solutions to engineering challenges. We utilise the capability and experience of our qualified, highly skilled and multi-disciplined in-house staff, encouraging initiative and lateral thought at all stages of project design and implementation.

A key aspect of our success is having the facilities, resources, skills and experience to offer both design and manufacturing services on a single site. This provides significant savings in cost and time, whilst ensuring the quality of manufacturing and fabrication work is checked at every stage of production.

Our projects range from small control boxes/enclosures and operator control stations, to the largest multi bay floor standing control systems, to include motor control centres (MCCs) and distribution panels. In-house computerised engraving and printing machinery gives us the flexibility to engrave nameplates, mimic panels and fascias, and to print terminal and component markers.

Our large workshop is very close to the M3 and M27, which gives us good access to other major motorway and road networks. This allows us to conduct regular business with companies across southern England and into the Midlands. We have also completed projects throughout the UK and internationally.

Employees (the HEMCO family)

The most important asset within the company is our staff. Therefore, we have adopted the following approach:

- » Ensuring good employee relations by having regular staff appraisals and an open-door approach to identify opportunities and issues before they become a problem.
- » Providing a structured training programme to encourage career progression.
- » Adopting a rolling programme of apprenticeships to meet future workforce needs.
- » Supporting staff with continuing qualifications and CPD (continuing professional development).
- » Keeping staff up-to-date with regular project, business and staff meetings.

The 'Secret to our success'?

We conduct regular reviews of our business plan, while internal cost audits ensure competitive hourly labour and engineering rates for services etc. We invest in new technologies, tooling, facilities, ISO9001:2015 quality management system and internal procedures. We recruit apprentices from approved local providers, such as the Southampton Engineering Training Association (SETA), and we sponsor them into higher education HNC/HND



Bed Stacking Control System for the NHS in Salisbury

“The most important asset within the company is our staff”



Multi-bay Control System for a new Cable Manufacturing Line



New Touchscreen Lock
& Bridge Controls,
Eastbourne Marina

“We have earned an enviable reputation through our ability to design, engineer and implement technically advanced, cost effective solutions to engineering challenges”

level, to ensure that they have the exact skills we need. Maintaining good relationships with training providers is essential.

Other key policies include:

- » Continuing to keep up-to-date with the latest European and UK safety standards and specific industry regulations.
- » Negotiating cost savings in overheads, utilities, company insurances as well as component parts and assemblies.
- » Forging stronger relationships with existing suppliers and creating partnerships with new suppliers and distributors to obtain the best component discounts and business terms, to ensure maximum competitiveness.
- » Attending international trade shows to further technological knowledge and develop client relations.
- » Attending local business shows and breakfast networking events run by the local chamber of commerce.
- » New client financial procedures and ongoing client credit evaluation and the ability to adjust our proposed payment terms on a project by project basis, to minimise financial risk.
- » Reorganisation of workshop and stock levels etc. to increase efficiency and minimise stock holding.

- » Use of JIT (Just-in-Time) procurement models.

Obstacles

As with many small businesses, we have encountered hurdles. Because of the reluctance of banks to lend money to small businesses, to help finance growth (even with the Enterprise Finance Guarantee scheme), few choices remain for small businesses to raise the required funding. In our case, we were forced down the self-financing route. On top of this, recruitment of engineers has proved difficult. Underinvestment in promoting / encouraging STEM (Science, Technology, Engineering, Maths) subjects in UK students, is causing a skills gap. IT and cyber security is increasingly costly, to ensure suitable levels of data protection. Costs of IT specialists, cloud and secure offsite backups etc. is also rising. Slow broadband speeds and apparent lack of investment in high speed fibre internet access causes progressively more issues in performing offsite data backup and business data sharing / transfer. Finally, large businesses are increasing the pressure on small enterprises to accept extended (60 or even 90 day) payment terms, risking cash flow problems.

Into the future

‘If only we had a crystal ball’ is the dream of every business owner. Without such an aid, we will continue to adapt and change our business model to suit an ever changing market environment. By developing new and strengthening existing relationships with both clients and suppliers, we aim to continue to provide high quality, technologically advanced and bespoke solutions for our clients ever changing requirements into the future.

Prototype Electronics



Our brand new purpose built unit, which we moved into during early 2015



Duane Street, co-founder of Prototype Electronics

Prototype Electronics probably owes its very existence to the exodus of high-volume manufacturing from Britain to the Far East since the 1990s and beyond. Too many existing contract electronics manufacturing (CEMs) companies were simply not adapting enough, or fast enough. They either lacked foresight or suffered from an inability to turn a mass-volume production infrastructure into a more flexible, streamlined model. Two of us who worked in the industry, Duane Street and Wayne Masterman – spotted the growing gap in the marketplace and in 2010, Prototype Electronics Ltd was finally turned into a reality. Focusing on providing a high-quality, fast turnaround printed circuit board (PCB) assembly service, our name soon became synonymous with that level of service.

A bit more about us...

We consider ourselves very lucky to be located in one of the UK's most stunning areas; situated amid the rolling hills of the Piddle valley in Dorset, near Dorchester. From just the two of us nearly seven years ago, the company has expanded and now employs nearly 30 members of staff.

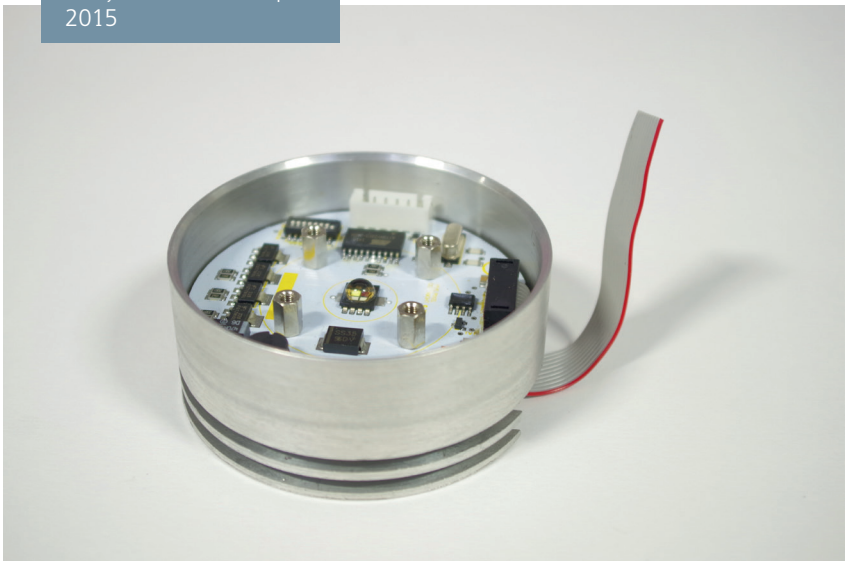
We undertake PCB assemblies for many major industries, ranging from marine, automotive and aviation to military, medical and media. Projects have ranged from Olympic opening and closing shows, to in-cabin lighting for major airliners, to small one-off prototype boards for new designers.

FACTS ABOUT PROTOTYPE ELECTRONICS

- » Supply of high quality PCB assemblies to all industries including aviation, military and automotive
- » Services provided include PCB Assembly, loom and harness assembly, box build
- » Expertise in fast turnaround lower volume but also able to undertake higher volume production builds
- » Tripled turnover in past 2 years
- » The company employs around 30+ people at its base in Dorchester, Dorset
- » Annual turnover is around £2million

“Our company ethos was clear and simple: provide a customer-centric service and focus on retaining this as the company grew”

One of 1,000 units made for the British entry in the World Expo 2015



The start

In the early days, our size became our strength – small, reactive, responsive and price-competitive. However, initially we discovered just how difficult it is to gain a new customer base... Many companies in the electronics manufacturing industry are fiercely loyal to their suppliers. From time to time, however, often when existing suppliers were unable to meet their demands, they'll look for other options. This was our way in. The quality of our service and dedication to our customers won the trust of those who gave us a try. As word of mouth spread in this close-knit industry, we were well and truly up and running!

Our incredible staff

With growth came many challenges and we had to decide which route we were going to take. The top priority was (and remains) acquiring a skilled workforce that understand and buy into our company ethos. We are extremely proud of our staff. Their dedication in delivering high-quality products is firmly behind our success. All of our staff have been hand-picked for their skills and also their attitude towards customer satisfaction. We have a very high retention rate in an industry notorious for high staff turnover.

Financing

Starting in the wake of the 2008 financial and banking crisis meant that financing options were very thin on the ground. We decided to keep to machinery that we knew: not loading the business with the newest £250k+ machines but, over time, acquiring several highly-reliable, yet cost-effective, production lines. These offered us greater flexibility and, crucially, a good return on investment. As we continued to grow so did the need to find larger premises and in early 2015 we took the plunge and moved into a new purpose-built 6,250 sq ft unit.

Keeping on track without missing out on opportunities

It is very easy to get sidetracked and it sometimes takes a lot of discipline to remain on course. For us, it is keeping to our niche: quality, fast-turnaround PCB assembly. We always keep an open mind however, and we soon identified another gap in the market. In 2015 we began to develop a new department within Prototype Electronics: assembling cables and wiring looms for our customers in addition to PCBs. Over two years on and we now have a large factory area and team dedicated to assembling cables. Key to successfully establishing our company as one of the area's premier cable assemblers was hiring highly-skilled and experienced workers.

Learning from mistakes

We have learnt a few useful lessons along the way. Most notable is this one: you always get warning shots across the bow. This could be in the form of a customer return, a sudden unexpected loss of data or maybe a machine breakdown. When you get the first warning, be acutely aware, be ready to act.

Essentially, a weakness in the company has just been exposed. When the second warning hits, act now: this is always the final warning. For example, early on, we only had one reflow oven (used to solder components on PCBs). This broke down at a critical time and we were fortunate to be able to repair it with minimal disruption. However, this made us instantly aware of our vulnerability and we started the process of looking for a second oven. Shortly after we had sourced, purchased and installed our new oven, the first oven broke down again, this time the fault meant it was out of action for nearly a week, not ideal but having the new oven meant minimal disruption. This would not have been the case if we had not reacted when we did. So, whilst we don't always get things right, we always pull out all the stops to immediately make repairs, learn by mistakes and ensure they are never repeated.

Where are we now?

Our company ethos and vision remains as clear today as it was back in early 2010. Offer a first-rate customer service and retain this as the company grows.

Whilst the occasional late night still occurs for Wayne and I, we will never forget the incredible hard slog during our first six months. Walking into our small unit with our knowledge and experience all ready to be put into action, but no customers, looking at each other and saying 'OK, best we get on the phone then!'.

Fast forward to 2017, by the end of the year we will have served over 100 different customers, from small local businesses to large household names and multi-nationals, and we will have nearly tripled our turnover in the past two years alone.



Our typical cabinet build at Prototype Electronics

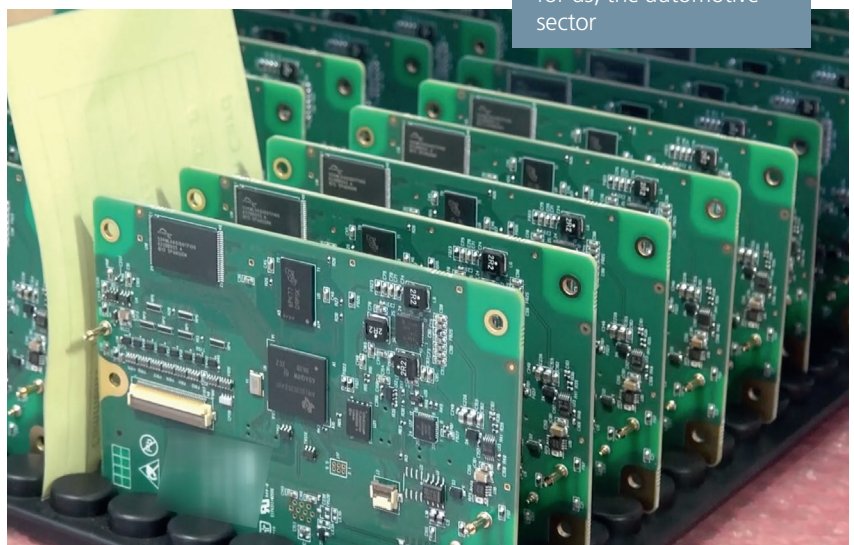
As our growth continues, this has started opening up many doors with lots of exciting new opportunities ahead.

As a result of many low volume prototype PCB assemblies turning into successful products for our customers, we are now able to confidently offer them increased volume production batch runs, whilst maintaining the capacity to continue to work on low volume builds at the same time.

So – after the whirlwind first seven years, we look forward in anticipation and excitement to what the next seven will bring!

“Just wanted to say a massive thanks for the work that you’ve just done for me on the recent assembly, I couldn’t be happier”

PCBs for one of the biggest growth markets for us, the automotive sector



Allectra



Mario Peli, Managing Director,
Allectra Limited



One of the CNC
machines at Allectra's
East Sussex facility

FACTS ABOUT ALLECTRA

- » Founded in 2002 and privately owned
- » Innovative high vacuum and ultra high-vacuum (UHV) components manufacturer
- » Markets include: cryogenics, high technology manufacturing, nuclear fusion, photonics/spectroscopy, semiconductor manufacturing, synchrotron science and surface science
- » Exports to over 30 countries
- » Established reputation for the delivery of complex high-profile projects

Is this a new era of scientific leadership? Allectra was founded 15 years ago by two physicist entrepreneurs to bring a new approach to selling high technology components in the scientific instruments market. During this time the company has gradually increased the volume of its own manufactured products and has successfully taken out several patents. The company has seen strong business growth and the widespread adoption of its proprietary technology across multiple scientific disciplines.

Allectra's customers are mainly makers of advanced scientific machines including CERN and the Neutron and Muon Source at the UK's Rutherford Appleton Laboratory. Allectra's contribution will significantly increase the capacity of the the neutron spectrometer, TOSCA, which is operated by the UK's Science and Technology Facilities Council. The machine is used by both industrial and academic users to explore atomic and molecular motions in materials. Allectra manufactured a flight tube for them, a custom-built component to a very demanding specification.

In synchrotron science, Allectra recently supplied water-cooled masks, scatter guard and cooling circuits for the new 102 Versatile Macromolecular X-tallography in-situ beamline under construction at Diamond Light Source, as well as a new generation of radiation hard switches for ITER the important European fusion experiment.

From the beginning, the company's aim was to develop a range of components including electrical feedthroughs for UHV, and to become a major supplier of these special products for demanding scientific application to customers all over Europe. The demand led Allectra to grow the company. It now employs over 30 people.

Throughout that time, Allectra was experiencing growth in all its sectors and new Allectra-designed products were being adopted as industry standards by European synchrotrons.

Allectra had to find a sustainable model for year-on-year growth of the businesses. The solution was to create an investment strategy based on market change and market intelligence which included opening a dedicated UK facility to bring manufacturing in-house.

Allectra's purpose-built facility in East Sussex, close to Sheffield Park and the famous Bluebell Railway, was designed especially to allow a mix of production and administration functions.

The new facility allowed Allectra to shift from distribution and assembly to developing and manufacturing their own product ranges. Previously, parts were machined by external suppliers, then brought in-house for welding, cleaning and leak-checking processes. By making the move to machining items themselves they now had complete control over the quality of their products. The company could make guarantees to their customers on critical aspects such as delivery time, consistency of components and pricing.

East Sussex County Council supported and encouraged the company to go into manufacturing by awarding a grant to part-fund a computer-controlled manufacturing machine. In return Allectra committed to creating two new full-time jobs which has been successfully achieved.

Allectra's new building was purpose-built in 2013 and designed entirely to their needs and specifications. The layout of the floor very much follows the flow of the manufacturing process and the workplace is clean to the standards required by the industry;

there is a four-stage ultrasonic cleaning plant installed which is UHV compliant.

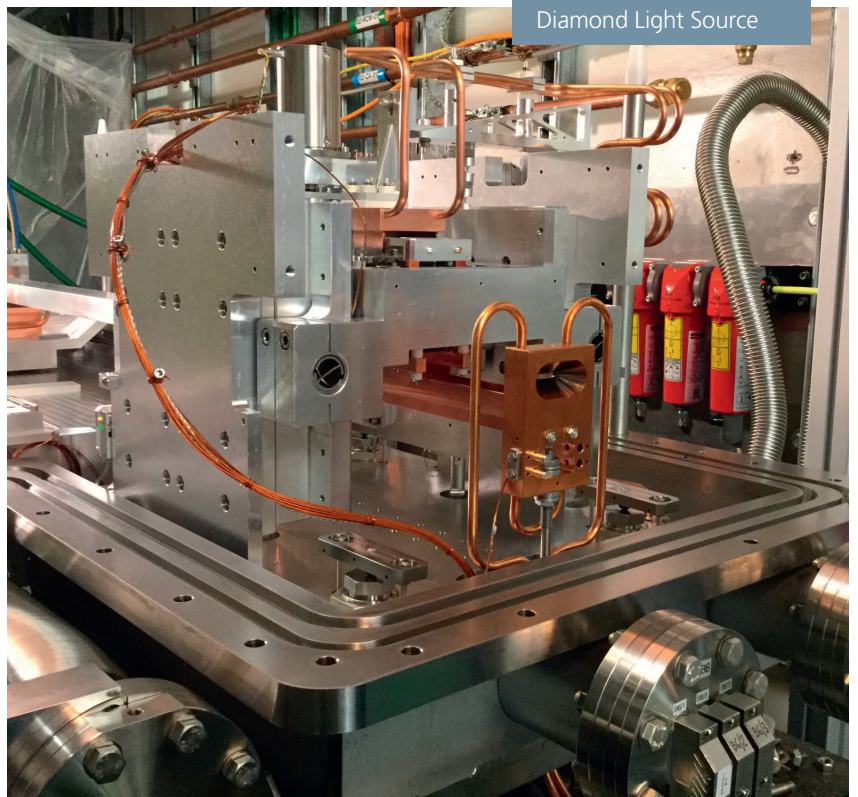
It is crucial to Allectra's business model to have complete control over the quality of their products.

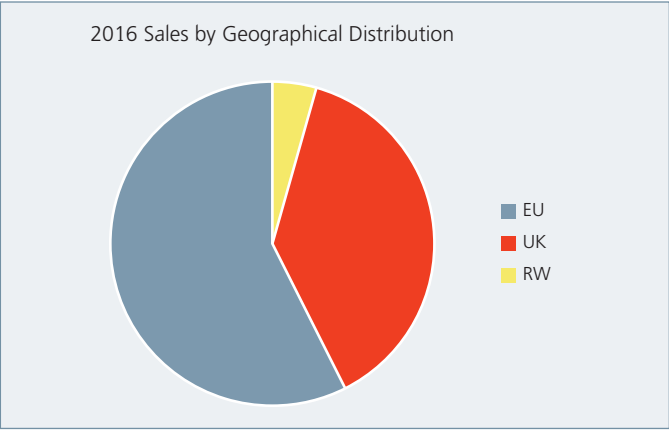
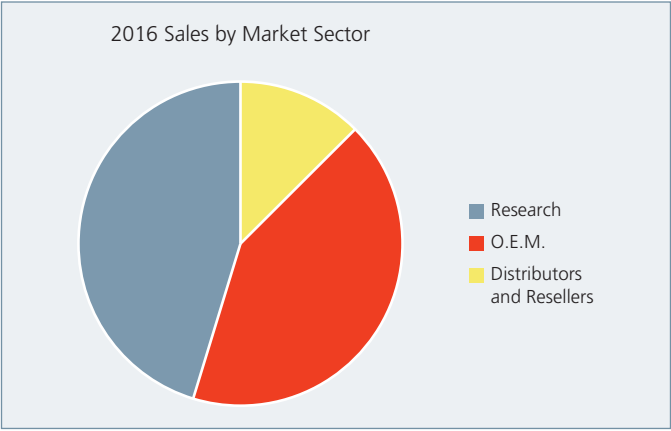
The team have observed that a lot of companies are pushing towards the cheapest possible product and that is not a race in which they want to get involved. They prefer to set their prices in a way which allows for delivery of consistently high-quality components whilst still offering good value for money.

Agility and expertise has also contributed to the company's success as a manufacturer and has been a factor in the growth of sales of custom fabrications in all market sectors. Allectra has a research and development team who collaborate with customers on complex projects when solutions are being developed for the first time. Allectra's experience of product development through the testing and commissioning phase and track record of project successes has built a solid reputation for the company.

“Developing and manufacturing unique products has been a significant business driver and built a solid reputation for Allectra”

Allectra's water-cooled masks (the copper parts) on the double multilayer monochromator at Diamond Light Source





“Our business objectives have been best met by integrating our sales and marketing approach while aligning to one progressive strategy”

Where is Allectra in 2017?

The UK is Allectra’s biggest single market, accounting for about 40% of their turnover. The UK is also a good strategic location as English is seen, almost universally, as the language of physics.

However, because of the diversity and maturity of the European market, Allectra has satellite offices to deal directly with local markets in France and Italy. Furthermore, a German office and two further manufacturing facilities in Germany deal with the German-speaking market and Eastern Europe.

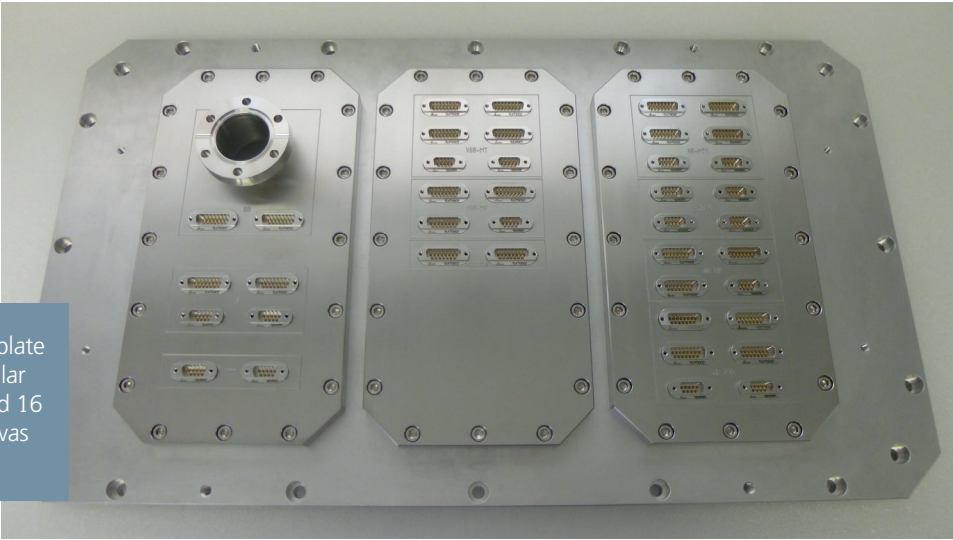
‘We are evolving towards a model which is very customer-centric and aligns our objectives with the scientific community which we are proud to serve,’ comments Mario Peli, Allectra’s Managing Director.

‘Collaborating with our customers on important projects is at the core of the

business and we are prioritising customer experience across all touchpoints.’

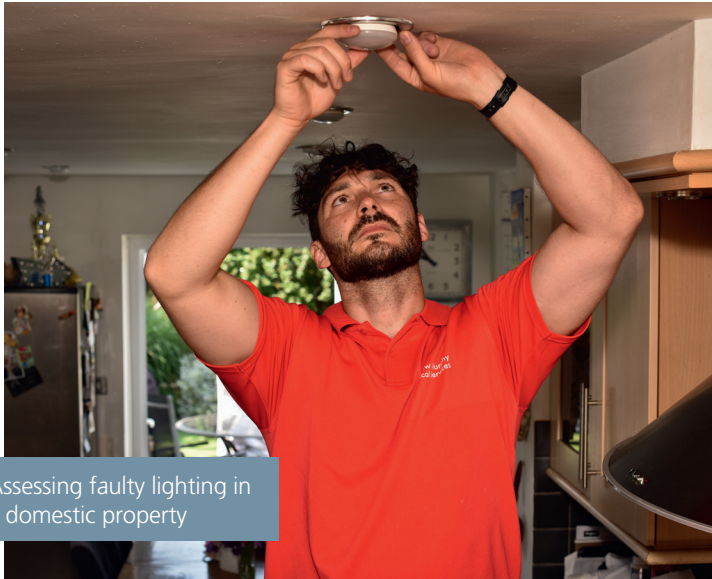
Allectra invested in an in-house marketing department in 2011 to develop a strategic marketing and communications strategy. Today, championing the customer is the main occupation of the marketing team which is busy developing a new e-commerce and technical information portal for the company’s global customer base. Access to scientific and engineering experts via private meetings is limited by geography and the new portal will give the customer a choice either to download drawings and specifications or contact a technical sales office.

In the future Allectra will pursue growth across all its scientific markets, targeting by sector, not by geography.



A custom aluminium rectangular plate with three stainless steel rectangular flanges with 24 Sub-D 15 way and 16 Sub-D 9 way feedthroughs. This was manufactured for CEA in France

Matthew Murphy Electrical Services



Assessing faulty lighting in a domestic property



The red fleet of vans and clear livery make the company instantly recognisable

Matthew Murphy Electrical Services is a family-run business that has become a prominent member of Brighton's business community in just under four years. Providing electrical maintenance and installation services, the company has achieved impressive growth levels in its short lifespan.

Matthew Murphy Electrical Services is a company always looking to operate that bit differently to its competitors. Since being founded in late-2013 by husband and wife Matthew and Samantha Murphy, the family business has achieved a great deal of local recognition throughout Brighton and the South East region across its range of electrical installation services for domestic and consumer customers. Jobs typically vary in scale: ranging from simple tasks such as changing lightbulbs to re-wiring the electrics on a block of seven flats with the added service of 24-hour callouts if required.

Samantha Murphy, Company Director and Business Manager, says that the large rental property market in the city of Brighton and Hove presented a lot of opportunities for the early days of the business. 'We started out working on the electrics for a large Brighton-based letting agent, giving us the solid foundation of regular work,' she explains.

An ambitious approach

'We were quite gung-ho in our approach towards establishing the business but this resulted in rapid growth in a short space of time,' Murphy explains. 'Everyone had an ambitious mentality from the word go.' This approach led to an influx of new business.

FACTS ABOUT MATTHEW MURPHY ELECTRICAL SERVICES

- » Provider of electrical maintenance and installations to domestic and commercial customers
- » Based in Brighton and covers the South East region
- » Founded in 2013 by Matthew and Samantha Murphy
- » Employs 10 staff
- » Holds contracts with RSPCA Brighton, Mishon Mackay, King and Chasemore, Bishop Sullivan and The A&A Group
- » Member of the National Association for Professional Inspectors and Testers (NAPIT)



From left to right, Steven Fisher, Gary Griffiths, Greg Zelent, Emily Finch, Samantha Murphy, Matthew Murphy, Ricky Banks and Duncan Andrews

“We decided to take the initiative by recruiting and training mature apprentices ourselves as Matthew was once afforded this opportunity and long term, the financial cost is a worthwhile investment”

More letting agents around Brighton soon followed, with the profession making up a sizeable share of the company's customer base. An agreement with a prominent local construction firm and an important alliance with charity RSPCA Brighton were also signed. Regular work is also carried out across a diverse commercial customer base comprised of retailers, restaurants, nursing homes and hotels in Brighton and other large East Sussex towns including Eastbourne and Worthing.

High standards

As a certified member of the National Association for Professional Inspectors and Testers (NAPIT), Matthew Murphy Electrical Services has a strict adherence to the highest possible industry standards.

Murphy says that being part of NAPIT and subject to its inspections is a validation of the fact that the company is doing its job properly. These annual inspections by NAPIT cover everything from critical health and safety legislation to operational factors such as ensuring the relevant insurance cover is in place.

Opting for mature apprentices

Growth over the past three and a half years has led to additional people entering the business – rising to 10 staff this year – as the company soon expanded its scope of work. But given the company's high standards in areas of quality and safety, finding the right people to join the company wasn't a straightforward process. Skills shortages around the trade industries are well documented, and Matthew Murphy Electrical Services were not immune from this.

This led to the company adopting the novel approach of targeting skilled apprentices over the age of 24, based on the experiences of Matthew Murphy, who retrained as an electrician aged 25. 'Government funding isn't available for people over the age of 24 retraining as electricians,' Samantha Murphy says. 'We decided to take the initiative by recruiting and training mature apprentices ourselves as Matthew was once afforded this opportunity and long term, the financial cost is a worthwhile investment.'

In sourcing apprentices, Brighton Metropolitan College has proved a useful resource for making

recommendations about Matthew Murphy Electrical Services, which recruits an average of one apprentice annually to undertake a three-year course.

Challenges of growing a small business

Despite the impressive growth levels since its formation, Murphy admits that, like many small businesses, cash flow can occasionally prove problematic for Matthew Murphy Electrical Services. 'Growth costs and cash flow can be a tricky issue,' she says.

'If a customer doesn't pay promptly, and if it falls around the time when outgoings such as taxes, wages, materials and other costs go out of the business, then this can lead to short-term cash flow shortfalls.' However, Murphy says the company has been fortunate that this hasn't been the case with many of its customers, with most outstanding bills paid in a 30-day period.

An effective way of meeting any potential challenges around customer feedback in a digital savvy age has been sought through tapping into social media platforms such as Facebook. The company has run its own page for the past few years and this, according to Murphy, has proved an effective way of both engaging and assisting customer needs.

Looking towards

On the topic of future growth, Murphy singles out working with insurance companies as a specific aim. 'One of our real strengths has been a reputation among customers for being organised, a fact that can be quite rare with trade companies,' Murphy says. 'I see a real benefit for insurance companies drawing on these organisational skills as we can take on work on their behalf and get things done.'

Murphy also pinpoints a further ramp up of its health and safety



Final checks on a 3 Phase commercial consumer unit

accreditations, specifically targeting the well-regarded Contractors Health and Safety Assessment Scheme (CHAS) accreditation, and bringing in a total of six fully-qualified electricians into the company by the end of 2017. Further recognition of the business in the local community is another target, having been the driving force behind the creation of a new Chairs Award by *The Argus* newspaper at its annual Brighton & Hove Business Awards. 'The creation of this award was another feather in our cap,' Murphy says. 'Trade businesses don't network as much as they should, and we aim to go against the grain by getting ourselves out there at every given opportunity.'

“One of our real strengths has been a reputation among customers for being organised, a fact that can be quite rare with trade companies”

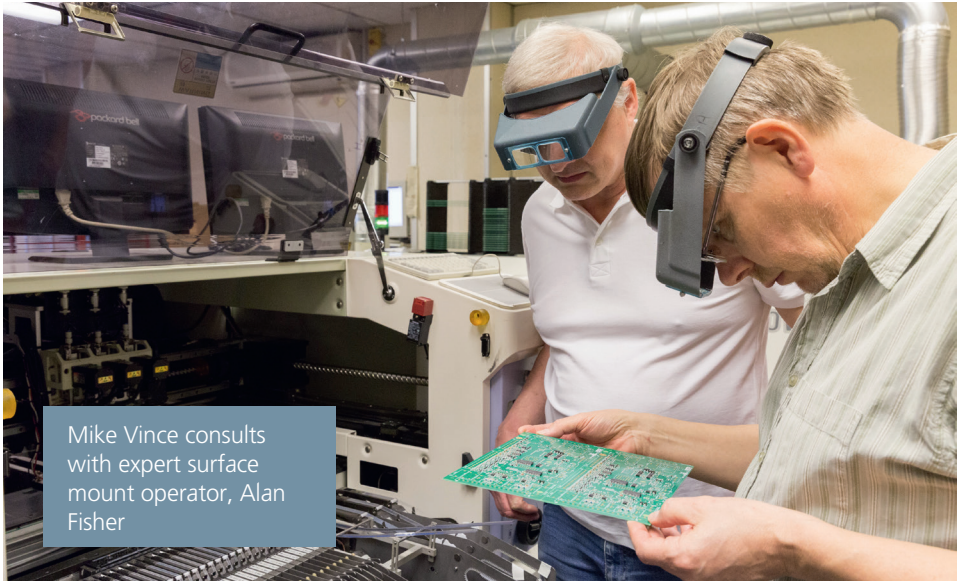
Emily is always on hand to support our customers and staff



Monode



Mike Vince, founder and
Technical Director



Mike Vince consults
with expert surface
mount operator, Alan
Fisher

Monode are specialist designers and manufacturers of electronic circuits and modules to client-defined specifications. With over 35 years of experience, we aim to be an effective and inventive electronics hardware and software partner to organisations seeking expertise and manufacturing services for cutting-edge printed circuit board (PCB) designs.

FACTS ABOUT MONODE

- » Independent electronics design and manufacturing consultancy
- » Founded in 1978
- » Established in Buckingham since 1994
- » 100 years of experience in the senior team

We were established by three electronics engineers, one of whom, Michael Vince, is still the Technical Director and Chief Engineer. We remain, to this day, engineers first and foremost, giving absolute priority to the technical services we provide our clients. Our focus is on our clients, not our profits.

We recognise that each client's needs are different and we provide bespoke solutions to exactly match their specifications. We are a small, lean operation committed to working closely with highly-specialised companies to bring new concepts to market. We believe in the value of having expert engineers oversee every single part of the process. This might not be the most lucrative way of operating but it is essential work. As such, we see ourselves, and other like-minded small companies, as the ball bearings which keep the UK economy moving, enabling and lubricating the technical startups and seed projects which are so essential to the UK's pre-eminence in innovation. As a micro-enterprise our work is usually below the radar but always essential.

Blaze

One of our most notable recent undertakings is the Laserlight project we are working on for Blaze, the innovative cycling technology company. Blaze approached us with their design for a bicycle light to be used by Transport for London as an safety innovation for their Santander London Cycle Hire scheme.

We evaluated Blaze's initial designs, analysing them for productionability, and optimised the manufacturing specification from their designers' prototypes to ensure successful implementation onto 13,000 London bicycles in 2016. We are currently working on the initial production run for the launch of the London Cycle Mark II and we are working with Blaze on their yet-to-be-funded proposal for the Motivate cycles in New York City.

Nortek global HVAC

We pride ourselves on the relationships we build with our clients, and nothing could be more indicative of this than our forty year track record with the Eaton-Williams Group, now Nortek Global HVAC (UK) Ltd, specialists in cutting-edge environmental control products for projects such as the London Eye. Since our founders did their first project for Eaton-Williams in 1978, analysing design faults causing transformer failures on their steam humidifiers, our relationship has gone from strength to strength. Next we developed for them a commercially-successful range of electricity supply Mains Monitors, distributed through RS Components.

Since 2000, we have designed and manufacture their core suite of electronic control and monitoring modules, keeping this work in the UK even after their main manufacturing facility has been moved to Poland. We have stayed with Nortek through decades and several changes in their corporate identity, and we are proud to have been a part of their story.

The issue of government support for small business

The fact that we have stayed close to our engineering roots, rather than prioritising growth and profits, is one of our greatest sources of pride. Unfortunately, it has not been without its difficulties. During the 20th century, most of our work came from the solid

relationships we had built up with established firms in the mechanical engineering sector who needed electronic enhancement or control mechanisms for their systems. Then, around the turn of the millennium, the lure of China meant we were faced with two major problems. Many of our clients were outcompeted by Far East rivals who were able to offer cheaper, off-the-shelf alternatives, while others moved their business away from bespoke British solutions and towards mass-market Chinese products.

Our response was to stay true to our principles, while finding every possible productivity and procurement saving we could. We thus maintained the service and responsiveness on which our reputation was founded, but managed to do so at Chinese prices. We stayed the course but at a severe cost, with profit margins squeezed to the extreme.

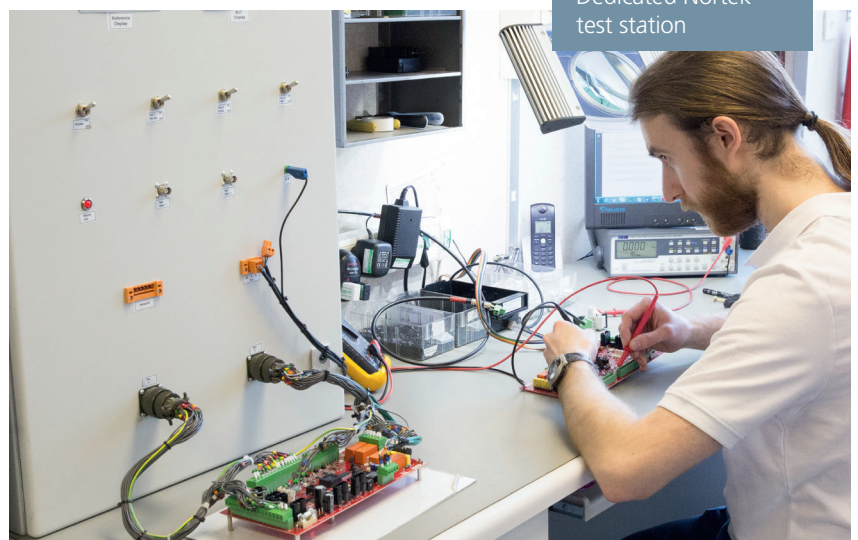
Throughout this process, we felt increasingly cut adrift within the UK economy. Politicians and policy makers seemed to have accepted that manufacturing in the UK was not worth saving. There were, of course, various Government-sponsored advice services but they offered no expertise or advice above a rudimentary level. Below the level of national and global corporations, manufacturing was essentially cut adrift. The small to medium-sized enterprise (SME) manufacturer, in



Blaze's London Bike Light Mk II

“For us a start-up, Monode's kind of flexible support is hard to come by”

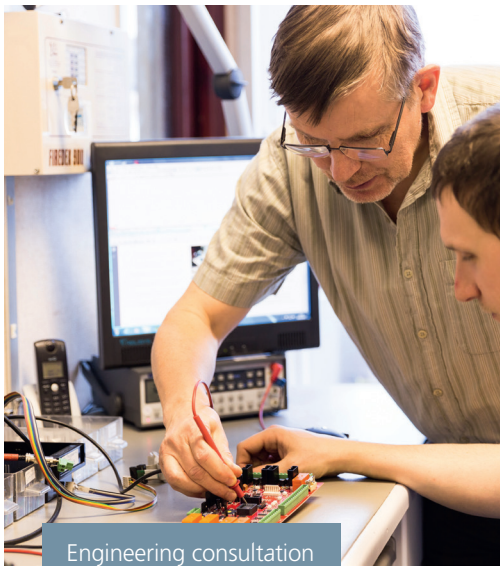
Blaze



Dedicated Nortek test station



Production Manager, Mark Deakin, checks assembly of military battery chargers for export



Engineering consultation over test protocols

particular, was regarded as, at worst, an insignificance and, at best, an archaic oddity. The one truly valuable piece of assistance we received came in 2014 from the Manufacturing Advisory Service. The following year, this service was shut down.

At the same time that engineering and manufacturing had seemingly disappeared over the policy horizon, we have also seen a huge skills shortage among the British workforce. We have been able to find engineering personnel but have struggled greatly to recruit the reliable, committed technicians and assembly workers who are essential to the operation of our business. As a result of changes in our society and the Government's education policy, basic attributes like a high work ethic, a willingness to acquire new skills and an enthusiasm for working hands-on in the engineering sector are perilously difficult to find. This is a national disaster, to which policy makers seem completely blind.

Reshoring

Despite these difficulties, and the modest returns we have accrued by outlasting them, we have survived. The technical environment in which we now find ourselves is radically altered from that of the late 90s. Clients who

tried the off-shore experiment have faced difficulties of their own, not least in regards to the high management overheads involved in sub-contracting projects overseas, and have returned to the domestic market. The slightly higher cost of developing your product with us is more than offset by our hands-on responsiveness and pro-active management. Though we received next to no help during the off-shoring movement, we are doing everything we can to help make reshoring a success.

The future

A further ray of light can be glimpsed in the host of new clients emerging from a growing breed of highly-skilled independent innovators designing high-end niche products. Our current client portfolio includes educational robotics, specialised simulation interfaces and intelligent commercial lighting control systems. Without big company overheads slowing them down, these clients come to us for a de facto in-house production facility. Each project we take on is intimately overseen by our engineers. Our clients are given reassurance by the fact that our engineers are there with the machines every step of the way ensuring the highest possible accuracy and quality.

“Each project is intimately overseen by our engineers ensuring the highest possible accuracy and quality”

A snap election



Prime Minister Theresa May sought to strengthen her position before negotiations with the EU began

On the 19th April 2017, having repeatedly insisted that she had no intention of calling a snap election, Prime Minister Theresa May sprung a complete surprise when she summoned the press to Downing Street to announce she would seek a Commons vote to go to the country on June 8th 2017.

It was all the more dramatic because the first inkling came only when it was announced that the Prime Minister would make an important statement outside Downing Street.

The announcement, made as Parliament returned from its Easter break, had the force of a thunderclap in Westminster. Quite unexpectedly, MPs and parties were plunged into election mode – with no-one in any doubt that the two thirds Commons majority, required to trigger a dissolution, under the Fixed Term Parliaments Act, would be reached.

The immediate effect was to turn what were now the two remaining

Prime Minister's Question Times of the Parliament into *de facto* leader's debates – especially since it was made clear that Theresa May would not take part in the kind of televised debates held in the 2010 and 2015 elections.

On this occasion, her first questioner was the Conservative backbencher, Alberto Costa, who zeroed in on his Party's campaign theme: 'Strong countries need strong economies. Strong countries need strong defences. Strong countries need strong leaders. As the nation prepares to go to the polls, who else in this House, apart from my Right Hon. Friend, can provide the leadership that is needed at this time?'

The Prime Minister did not miss a beat: 'There are three things that a country needs: a strong economy, strong defence and strong, stable leadership. That is what our plans for Brexit and our plans for a stronger Britain will deliver... The Right Hon. Member for Islington North (The Labour Leader, Jeremy Corbyn) would bankrupt our economy and weaken our defences and is simply not fit to lead.'

To Conservative jeers, Mr Corbyn counter-attacked: 'She says that it is about leadership, yet she refuses to defend her record in television debates. It is not hard to see why. The Prime Minister says that we have a stronger economy, yet she cannot explain why people's wages are lower today than they were 10 years ago or why more households are in debt. Six million people are earning less than the living wage, child poverty is up, and pensioner poverty is up.'

The two leaders traded more accusations with Theresa May warning that ordinary working people would face higher taxes and lost jobs under Labour while Mr Corbyn claimed the Prime Minister's priority was 'tax giveaways to the richest corporations while our children's schools are starved of the resources they need to educate our children for the future'.

Brexit emerged as one of the Prime Minister's main campaign themes: 'every vote for the Conservatives will make me stronger when I negotiate for Britain with the European Union. And every vote for the Conservatives will mean we can stick

to our plan for a stronger Britain and take the right long-term decisions for a more secure future for this country.'

The SNP's Westminster Leader, Angus Robertson, raised the headline in the *Daily Mail* which called on the Prime Minister to 'Crush the saboteurs' working against her plans for Brexit. He said that struck a dangerous tone in a democratic state: 'so does the Prime Minister agree that political opponents are not "saboteurs"?'

Later that afternoon, the Commons voted to call an early election, by 522 votes to 13.

The Queen's Speech

What a difference. Theresa May and Jeremy Corbyn's final Commons confrontation before the election had seen the Conservatives limbering up for a triumphal campaign which would culminate in the inevitable smashing of their Labour opponents. When the diminished, battered band of Conservative MPs reassembled, minus their parliamentary majority, for the state opening of Parliament on June 21st, they were chastened and uncertain, while euphoria gripped the occupants of the Labour benches.

When they came to speak in the traditional debate on an address thanking Her Majesty for the Queen's Speech – the new Government's legislative programme – the dynamic between the two main figures had changed completely. Mr Corbyn seemed a far more confident, assertive parliamentary performer, relishing the opportunity to throw back the taunts that had been hurled at him during the campaign.

A Government which had warned that he could only gain power in a 'coalition



The Queen's Speech announced the government's legislative plan for the coming Parliament

of chaos' with the SNP and the Lib Dems had been forced to negotiate for the support of the Northern Ireland Democratic Unionists ... and as the first debate of this new Parliament began, that support had not been secured. Mr Corbyn could not resist the open goal. To triumphant Labour laughter he noted that 'the latest coalition may already be in some chaos'.



Jeremy Corbyn received a boost in support following the election

‘Nothing could emphasise that chaos more than the Queen’s Speech we have just heard: a threadbare legislative programme from a Government who have lost their majority and apparently run out of ideas altogether. This would be a thin legislative programme even if it was for one year, but for two years – two years? There is not enough in it to fill up one year.’

That was a reference to the Government’s decision to declare a two-year Parliamentary Session – a procedural move intended to ensure ministers could push through vital Brexit legislation in time for the exit date in March 2019. Mr Corbyn mocked the Prime Minister for dropping a series of election promises that had not found favour with the voters.

‘It is therefore appropriate to start by welcoming what is not in the speech. First, there is no mention of scrapping the winter fuel allowance for millions of pensioners through means testing. Can the Prime Minister assure us that that Conservative plan has now been withdrawn? Mercifully, neither is there any mention of ditching the triple

lock. Pensioners across Britain will be grateful to know whether the Tory election commitment on that has also been binned.’

Also absent from this slimmed down legislative programme were the Government’s controversial policy on social care (dubbed the ‘dementia tax’ by Labour), plans to cut free school meals, and the promised expansion of grammar schools.

On Brexit, Mr Corbyn stuck to Labour’s careful positioning in favour of a deal with the EU ‘that puts jobs and the economy first’. He called for full access to the single market and a customs arrangement that provided Britain with the ‘exact same benefits’ as now. And in his final flourish he warned the Prime Minister that Labour were now ‘not merely an Opposition; we are a Government in waiting, with a policy programme that enthused and engaged millions of people in this election, many for the first time in their political lives. We are ready to offer real strong and stable leadership in the interests of the many, not the few.’

The Prime Minister attempted to puncture Labour’s mood with a barbed welcome for Mr Corbyn’s return to the Opposition benches – and she reminded him that the Conservatives still had 56 more Commons seats than Labour. She said her policies were aimed at ‘grasping the opportunities for every community in our country to benefit as we leave the European Union; it is about delivering the will of the British people with a Brexit deal that works for all parts of our United Kingdom.’ She said the referendum vote to leave the European Union was ‘a profound and justified expression that our country often does not work the way it should for millions of ordinary families. This Queen’s Speech begins to change that, by putting fairness at the heart of our agenda.’

Grenfell Tower

The fire that destroyed Grenfell Tower, a social housing block in the London Borough of Kensington and Chelsea, seemed to some to crystallise the issues that had driven the 'Corbyn Surge' in the General Election just days earlier.

Accusations about the neglect of social housing tenants, chronic under-investment and official incompetence were flying, even while the pall of smoke still hovered over the capital and the horrific images of the blaze were replayed on TV.

So potent was the symbolism that it became intertwined in the debates on the post-election Queen's Speech - but the Government also committed to keep MPs informed about the aftermath, the efforts to identify casualties in the wreckage of the tower, to re-house and assist those who had lost their homes, and to set up a public inquiry.

So it was that the Communities Secretary, Sajid Javid, came to the Commons on July 3rd to announce £2.5 million had been distributed from the special £5 million fund set up to help the residents. Mr Javid said the public inquiry and the criminal investigation had to be allowed the space to follow the evidence wherever it took them, and everyone should be careful not to prejudice their work. Responding to the Labour MP, David Lammy, who had lost a family friend in the fire, he added that although it was for the judge to determine the scope of the inquiry, he expected it to be 'as broad and wide-ranging as possible'.

Mr Javid also dealt with the key issue of the authorities' inability to say exactly how many people had died: 'There has been much speculation about who was in Grenfell Tower on the night of the fire, and it is vital that we find out.



Tributes for the Grenfell victims came from across the country

The Director of Public Prosecutions has made it clear that there will be no prosecution of tenants ... who may have been illegally sub-letting their property, ... There may have been people living in flats that were illegally sub-let who had no idea about the true status of their tenancy. Their families want to know if they perished in the fire. These are their sons, their daughters, their brothers and their sisters. They need closure, and that is the least that they deserve.'

The Government was also taking urgent action to avoid another tragedy in buildings with architectural cladding similar to that which appeared to have been a factor in the Grenfell fire. Mr Javid said the early findings were disturbing: 'So far, all the samples of cladding tested have failed – that is 181 out of 181. ... the priority now is to make those buildings safe. Where appropriate mitigating measures cannot be implemented quickly, landlords must provide alternative accommodation while the remedial work is carried out.'

The Lib Dem, Jo Swinson, raised suggestions that the fire had been caused by a faulty fridge: 'so will the Government revisit the decision of March last year to dismiss or delay

many of the recommendations of the Lynn Faulds Wood review into product recall, which I commissioned [as a Coalition minister] and in particular look at enforcing the regulations.’ Sajid Javid said the issue was being addressed.

The Communities Secretary clashed with the Labour MP, Andy Slaughter, who attacked the management record of the local council: ‘It is an open secret in West London that the administration

in Kensington and Chelsea could not run a bath. That is why the residents of North Ken have had such a raw deal for so long. So when will the Secretary of State put country before Party and send in the commissioners?’

Mr Javid retorted that Slaughter was a local London MP: ‘he has an opportunity now to put party politics aside and just do the right thing for his constituents. His constituents are watching him.’

Last rites on the Brexit Bill



David Davis, Secretary of State for Exiting the European Union since July 2016

Back in March, when an election seemed a distant prospect, parliament’s main focus was on the European Union (Notification of Withdrawal) Bill. This Bill, which would give Theresa May the authority to begin the UK’s divorce from the European Union, was forced on the Government after a Supreme Court ruling that Parliamentary approval was required to begin the process.

Despite fears that the Bill could be watered down or even reshaped to reverse the Referendum verdict, it passed through the Commons unscathed. All attempts to amend, or add, to its 136 words were voted down. Predictions of a major rebellion of up to 50 Conservative Remainers proved unfounded, and only a handful (notably the arch-Europhile former Chancellor, Ken Clark) defied the party whip.

But when it moved on to the House of Lords, where there is no Government majority and a large concentration of pro-EU peers, the Bill was amended twice. One change guaranteed the rights of EU citizens living in the UK, and the second promised Parliament a ‘meaningful vote’ on the final Brexit deal. That meant the Bill had to return to the Commons because both Houses of Parliament must agree on the final wording of legislation. This is the arcane process known as

‘Parliamentary Ping Pong’, with each house voting on whether to accept or reject changes made by the other.

When the changes were put to MPs, the Brexit Secretary, David Davis, said they should not be accepted. On the issue of EU citizens, he agreed that they made a vital contribution to the UK. But the issue was that the European Union would not begin talks until the UK had begun the formal process of leaving, so their status could not be confirmed. Securing their status, and that of UK citizens living in the EU, was an early priority for the forthcoming negotiations, he said.

He also rejected the second amendment – giving Parliament a vote on the final Brexit deal – as unnecessary, because the Government had already promised a vote. And he was wary of a hidden agenda behind the push for a ‘meaningful vote’, warning: ‘what we cannot have... is any suggestion that the votes in either House will overturn the result of the referendum. That is the key point.’

Mr Davis warned that the amendment ‘effectively, seeks to prohibit the Prime Minister from walking away from negotiations, even if she thinks the European Union is offering her a bad or very bad deal ... The Government will be undertaking these negotiations and must have the freedom to walk away

from a deal that sets out to punish the UK for a decision to leave the EU, as some in Europe have suggested.’

For Labour, the Shadow Brexit Secretary, Sir Keir Starmer, backed both Lords’ amendments. He said protecting EU citizens was a matter of principle – but he was challenged by the senior Labour backbencher, Frank Field, who warned: ‘if we pass this amendment and give those rights to European citizens here, there will be no incentive whatsoever for other European countries to concede those rights to our citizens.’

Sir Kier retorted that the wording asked Ministers to bring forward proposals within three months, and so did not tie anybody’s hands.

Another Labour ex-Minister, Pat McFadden, suggested that, in the event of no deal being agreed, the Government was seeking the authority to default to a trading relationship with the EU, based on the World Trade Organization rules – without a Commons vote. Keir Starmer warned that would be the worst possible outcome, quoting the Confederation of British Industry’s view that ‘the cost of change is simply too high to even consider it’.

The leading Labour leave campaigner, Gisela Stuart, said the Government should make the status of EU citizens in the UK a priority, but she opposed including the issue in the Bill: ‘I shall vote against all the amendments on the simple basis that this Bill has one purpose and one purpose only: to give legal effect to the decision of the people on 23 June ... However, I look to the Secretary of State to give firm assurances that his top and first priority will be the rights of EU citizens.’

One of the Conservatives’ leading backbench Brexiteers, John Baron, said the Commons, in approving the EU referendum in the first place, had made ‘a contract with the British people ... if there is a good deal, we will take it, and if there is not, the Prime Minister has made it very clear that we will not

accept a bad deal, so we move on, and we move out of the EU.’

The Conservative, Anna Soubry, a strong Remain campaigner, said her Party wanted to honour the vote to Leave: ‘now, however, we are talking about the sovereignty of this Parliament and about what would happen in the event that our Prime Minister does not strike a good deal. I trust our Prime Minister ... but let us be under no illusion that if she does not do so, there will be no alternative but WTO tariffs, regulations and rules, and the people in my constituency certainly did not vote for that.’

The debate was held within hours of the announcement by Scotland’s First Minister, Nicola Sturgeon, that she would hold a second referendum on Scottish independence. In the Commons, the former First Minister, Alex Salmond, complained that the Government had broken its promise not to trigger the formal process for leaving the EU until there was an agreed ‘UK approach’ backed by Scotland, and had ignored the SNP compromise proposal to allow Scotland to stay inside the EU Single Market. And he added: ‘there might not be a meaningful vote in this Chamber, but there shall be a meaningful vote in Scotland about protecting our millennium-long history as a European nation.’

When MPs rejected both Lords’ amendments, the Bill was sent back for immediate consideration in the House of Lords, where David Davis came to watch his Junior Minister, Lord Bridges, call on Peers to drop their opposition. And while the Liberal Democrat, Lord Oates, did urge Peers to continue defying the Government, support for the amendment melted away, and the attempt to throw it back to MPs was once more rejected, as was the attempt to keep the ‘meaningful vote’. The final form of the Bill was settled – and it was sent off for the Royal Assent, un-amended.



Parliament, and the general public, remain divided regarding the relationship that the UK should have with EU

Article 50 is triggered



Theresa May meets with European Council President Donald Tusk in Downing Street

The passage of the European Union (Notification of Withdrawal) Act cleared the way for the Prime Minister to act on the Referendum verdict and formally trigger Britain's departure talks with the EU.

She was greeted by cheering Conservative MPs when she announced, on the 29th March, that the process had begun: 'A few minutes ago, in Brussels, the United Kingdom's permanent representative to the EU handed a letter to the President of the European Council on my behalf confirming the Government's decision to invoke Article 50 of the treaty on European Union. The Article 50 process is now under way and, in accordance with the wishes of the British people, the United Kingdom is leaving the European Union.'

She added that she wanted to build a close partnership with the EU: 'We know that we will lose influence over the rules that affect the European economy. We know that UK companies that trade with the EU will have to align with rules agreed by institutions of which we are no longer a part, just as we do in other overseas markets – we accept that. However,

we approach these talks constructively, respectfully and in a spirit of sincere co-operation, for it is in the interests of both the United Kingdom and the European Union that we should use this process to deliver our objectives in a fair and orderly manner. ... We will continue to be reliable partners, willing allies and close friends. We want to continue to buy goods and services from the EU, and sell it ours ... Indeed, in an increasingly unstable world, we must continue to forge the closest possible security co-operation to keep our people safe. We face the same global threats from terrorism and extremism.'

Jeremy Corbyn warned against leaving without a trade agreement: 'the Prime Minister says that no deal is better than a bad deal, but the reality is that no deal is a bad deal. Less than a year ago, the Treasury estimated that leaving the European Union on World Trade Organization terms would lead to a 7.5% fall in our GDP and a £45 billion loss in tax receipts ... It would be a national failure of historic proportions if the Prime Minister came back from Brussels without having secured protection for jobs and living standards, so we will use every parliamentary opportunity to ensure the Government are held to account at every stage of the negotiations.'

He said the debate had now moved on to what a post-Brexit Britain would be like: 'There are Conservatives who want to use Brexit to turn this country into a low-wage tax haven. Labour is determined to invest in a high-skill, high-tech, high-wage future ... Labour will not give this Government a free hand to use Brexit to attack rights and protections and to cut services, or to create a tax dodger's paradise.'

The SNP's then Westminster Leader, Angus Robertson, accused the Prime Minister of breaking her promise that Article 50 would not be triggered without the agreement of the devolved administrations. He noted that Scotland had voted to remain in the EU: 'On this issue, it is not a United Kingdom, and the Prime Minister needs to respect – respect – the differences across the nations of the United Kingdom. If she does not – if she remains intransigent and if she denies Scotland a choice on our future – she will make Scottish independence inevitable.'

The then Lib Dem Leader, Tim Farron, called for a second referendum on the terms of the final deal: 'Today the Prime Minister is not enacting the will of the people; she is at best interpreting that will, and choosing a hard Brexit outside the single market that was never on the ballot paper. This day of all days, the Liberal Democrats will not roll over, as the official Opposition have done ... I am determined to be able to look my children in the eye and say that I did everything to prevent this calamity that the Prime Minister has today chosen ... Surely the Prime Minister will agree with me that the people should have the final say.'

The Westminster Leader of the Northern Ireland DUP, Nigel Dodds, congratulated Theresa May on delivering on the will of the people: 'Is not the fundamental point that this United Kingdom – this Union – is far more important for the political and economic prosperity of all our people than the European Union?'

The veteran Conservative eurosceptic, Sir Bill Cash, hailed what he called an

historic day: 'At the very heart of this letter lies the democratic decision of the referendum of UK voters given to them by a sovereign Act of Parliament by six to one in this House, enabling the British people to regain their birthright to govern themselves for which people fought and died over generations? ... Trade and co-operation, yes; European government, no.'

Another Conservative, Jacob Rees-Mogg, quoted the Elizabethan hero Sir Francis Drake: "There must be a beginning of any great matter, but the continuing unto the end until it be thoroughly finished yields the true glory' ... I wish my Right Hon. Friend good luck and good fortune in her negotiations until she comes to true glory and is welcomed back to this House as a 21st century Gloriana.'

The former Labour Minister, Pat McCadden, was less optimistic: 'There are two kinds of future stemming from the process triggered today. The first is that we spend two years desperately trying to secure the exact same benefits as we have, while gaining control of immigration, which, as Ministers have suggested, may make little difference to the numbers. In which case, people will ask, "What is the point?" Or there is another future where we crash without an agreement, defaulting to WTO rules with all that would mean for industry, agriculture and services. In which case, people will ask, "What is the price?" So which future does she think is the more likely: "what is the point" or "what is the price"?''



Negotiations on leaving the EU are expected to take several years to complete

A terrorist attack on Parliament

On the afternoon of March 22nd, as MPs were engaged in a routine vote of the Pensions Bill, a man drove his car into pedestrians just outside, killing two people and injuring dozens more,

before stabbing to death a police officer who was guarding the gates to the Houses of Parliament, and he was then shot dead himself.



The attack on Westminster was one of several terrorist attacks in the UK during the year

The sitting of the Commons was suspended and MPs were held in their Chamber for several hours, before being escorted away. When they returned the next day, they began with a minute of silence. Then the Speaker opened proceedings by expressing 'our heartfelt condolences to the families and friends of the victims of this outrage. A police officer, PC Keith Palmer, was killed defending us, defending Parliament and defending parliamentary democracy.'

The Prime Minister was heard in silence as she updated MPs: 'Yesterday, an act of terrorism tried to silence our democracy, but today we meet as normal, as generations have done before us and as future generations will continue to do, to deliver a simple message: we are not afraid, and our resolve will never waver in the face of terrorism. We meet here, in the oldest of all Parliaments, because we know that democracy, and the values that it entails, will always prevail.'

She gave an account of the previous day's events and ended by declaring that the best response to terrorism was to act normally: 'As I speak, millions will be boarding trains and

aeroplanes to travel to London and to see for themselves the greatest city on Earth. It is in these actions – millions of acts of normality – that we find the best response to terrorism: a response that denies our enemies their victory, that refuses to let them win, that shows we will never give in; a response driven by that same spirit that drove a husband and father to put himself between us and our attacker, and to pay the ultimate price; a response that says to the men and women who propagate this hate and evil, "You will not defeat us." Mr Speaker, let this be the message from this House and this nation today: our values will prevail.'

The Labour Leader, Jeremy Corbyn, said people should not allow the voices of hatred to divide or cower them – adding that PC Keith Palmer had given his life defending the public and democracy.

Watching impassively in the crowd of MPs standing at the Bar of the House, in the area across the Chamber facing the Speaker's Chair, was the Foreign Office Minister, Tobias Ellwood. He had tried to save PC Palmer's life by giving him mouth-to-mouth resuscitation. Many MPs took a moment to exchange a word with him as they passed or pat him on the arm. And many of those who spoke over the next hour praised his actions.

Tributes and thanks came from all the Party Leaders – the SNP's Westminster Leader, Angus Robertson, the Liberal Democrats, Tim Farron, and the DUP's, Nigel Dodds.

The Conservative MP, James Cleverly, had served with PC Palmer in the army spoke movingly and implored the Prime Minister to 'posthumously recognise his gallantry and sacrifice formally.' Theresa May promised that she would.

President Trump

This year more than most, US politics had a bearing on our own. Not only were many MPs looking across the Atlantic for a trade deal and an enhancement of the 'special relationship', following the decision to leave the EU. But the American people themselves had managed to outdo the British electorate when it came to delivering the most surprising democratic decision of 2016.

As recently as January 2016, a small number of MPs had gathered in Westminster Hall to debate whether or not Donald Trump should be banned from entering the UK altogether. His comments about Muslims, among others, had led to an online petition for him to be considered a 'hate preacher' and therefore banned from British soil. Even those who supported the motion knew there was little chance of such a ban being implemented. But few would have suspected that, just 13 months later, Parliament would be discussing the appropriateness of a state visit from President Donald Trump.

One of the first acts of the new US President was to order a blanket ban on people from a list of Middle Eastern countries travelling to the US. In the Commons, the former Labour Leader, Ed Miliband, and the Conservative, Nadhim Zahawi, joined forces to ask the Speaker for an emergency debate – and it was held that day.

Mr Zahawi, born in Iraq to Kurdish parents, arrived in the UK as a nine-year-old refugee from Saddam Hussein's regime. He is now a British citizen, but because he was born in Iraq, he believed he came under the Trump ban.

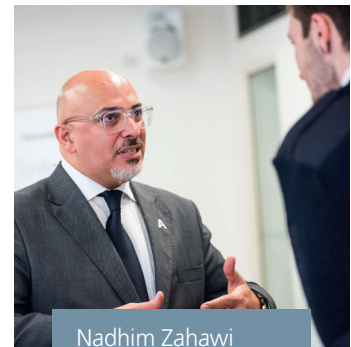
He told MPs his place of birth already meant he had been required to go through an interview at the US embassy, to secure the right to travel to America, under rules imposed by President Obama. But the new restrictions were much tougher.

The US Government has since clarified that people with British passports will not be affected by the ban, whatever the country of their birth, but Mr Zahawi still thought the ban was 'wholly counterproductive'. He described how it was already being used by pro-Islamic State social media accounts as 'clear evidence that the USA is seeking to destroy Islam. They have even called it the "blessed ban"'.

Labour's Yvette Cooper, who chairs the Home Affairs Select Committee, was 'deeply worried' that the Government had already invited the new President to make a state visit to Britain: 'It will look like an endorsement of a ban that is so morally wrong and that we should be standing against.'

The Conservative, Sir Simon Burns, disagreed: 'I think it is absolutely right that the British Government continue the work of the Prime Minister to build bridges with President Trump so that we can, through engagement, seek to persuade him and to minimise or reduce the danger of his more outrageous policies ... I believe that very little would be achieved by cancelling a state visit to which the invitation has already been extended and accepted.'

The emergency debate was on a formal motion that MPs had 'considered' Donald Trump's travel ban, so no call for a policy change was voted on.



Nadhim Zahawi MP strongly criticised the Trump administration's travel ban on certain Muslim countries

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