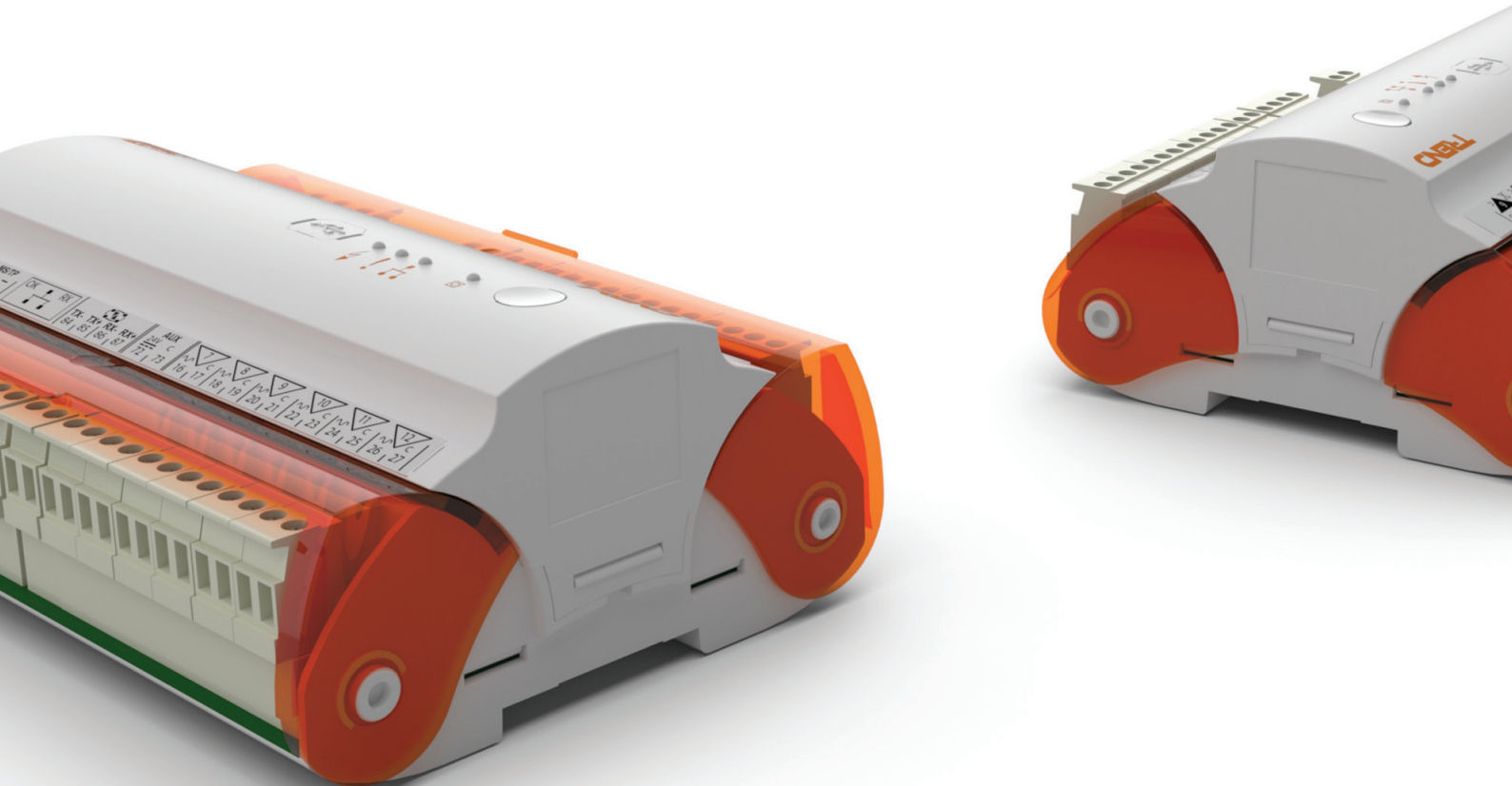


TREND



IQ[®]4 CONTROLLER HARDWARE

Industry Sector:
Client Company:
Design Consultancy:
Submission Date:

Electronic & Electrical Equipment
Trend Control Systems
Ratio Design Associates
June 2015

Ratio

FOR PUBLICATION

2. Executive Summary

IQ4 Controller Hardware

Trend Control Systems are a pioneering UK manufacturing company producing intelligent hardware used to control and monitor the heating, ventilation and air conditioning in commercial buildings throughout the world.

As part of the Honeywell Group of companies and a major international supplier, Trend's technologies, product reliability and customer service is widely respected. The company recognised that their products required a more coherent identity to suitably reflect their class leading technology.

The success criteria for the project can be summarised as:

- **refocus design as a key differentiator within the company**
- **identify, understand & deliver practical user benefits**
- **elevate new products & brand recognition in the BEMS market**
- **improve manufacturing efficiency & reduce part costs**

Results summary:

- **design guides are now referenced across all group companies**
- **unique, functional user benefits & multiple manufacturing savings**
- **distinctive 'Trend' product language consistent across the range**
- **commercial sales forecasts exceeded by 325%**

...never before have customers wished to "preorder" controllers prior to release.

The IQ4 range of new hardware was designed by Ratio and has been developed by Trend engineers from the ground up. The products are now smaller, faster, safer, and more intelligent than ever before.

Whilst initially starting as an industrial design exercise the project has had a much wider impact on the business. A renewed focus on the importance of design throughout the company is now integral to the future business strategy.

This submission illustrates the unique advantages achieved through a collaborative effort between a small creative agency and a global engineering business. The scope, scale and capital expenditure of the IQ4 project dwarfs the 'front end' design input, yet this serves to further demonstrate the importance of research, understanding and simple, intuitive industrial design.

Smaller
Faster
Safer &
Smarter

3. Project Overview

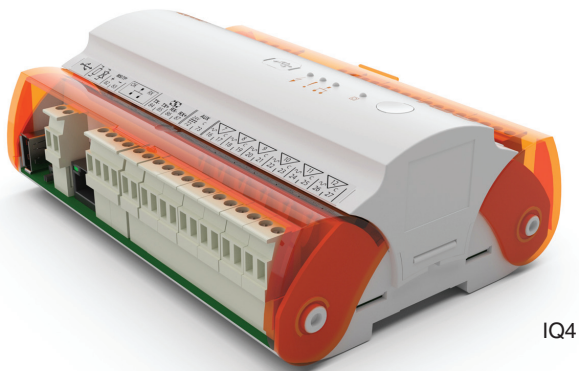
IQ4 Controller Hardware

Outline of project brief.

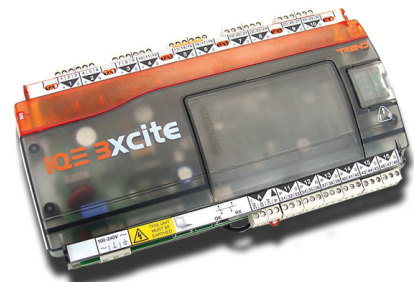
The next generation, IQ4 programme spearheaded an extensive human factors exercise aimed at developing a more holistic, designed approach within the company. A fundamental aspect and keystone to this project was the industrial design of the new control hardware.

The complete IQ4 programme represents a significant development investment for Trend with a £XX expenditure over a five year roadmap. This delivered a series of platform components including software, firmware and hardware from which numerous product variants will realise £XX in revenue in the five year horizon.

Ratio were approached to create the design language for the new product range which would ultimately drive the visual direction and establish a solid foundation for all future product development.



IQ4



IQ3
Predecessor product
prior to re-design

Market overview

Products in the BEMS market (Building & Energy Management Systems), typically follow a utilitarian, industrial aesthetic, where specification choice is predominantly influenced by the manufacturers reputation and product cost. Increasingly design savvy equipment specifiers and more engaged end user clients were evaluating the systems more critically with higher expectations and specific applications in mind.

The once dark, boiler room environment is today a sophisticated, technical hub, where physical space is at a premium and new prominence is given to the equipment. This hardware is trusted to monitor and maintain the correct working environment with a rigorous emphasis made towards minimising energy consumption. Up to 84% of energy consuming equipment can be controlled by the BEMS.

3. Project Overview continued

IQ4 Controller Hardware

With the building sector facing extremely tough economic conditions in 2012 the growth on new construction slowed. However, since launch the products have been applied to retrofit and refurbishment applications driven by the desire to take control of plant and equipment and improve energy savings. Through 2013 the construction sector emerged from recession and in the UK alone the BEMS market is estimated to be worth some £685 million up 4.3% from 2012.

Project launch date December 2009

The ongoing IQ4 development and product rollout spans a ten year programme. The first product was launched in 2012, with June 2015 marking the most significant revenue generating stage due to the release of the first modular elements (IQ4E).

Design budget outline

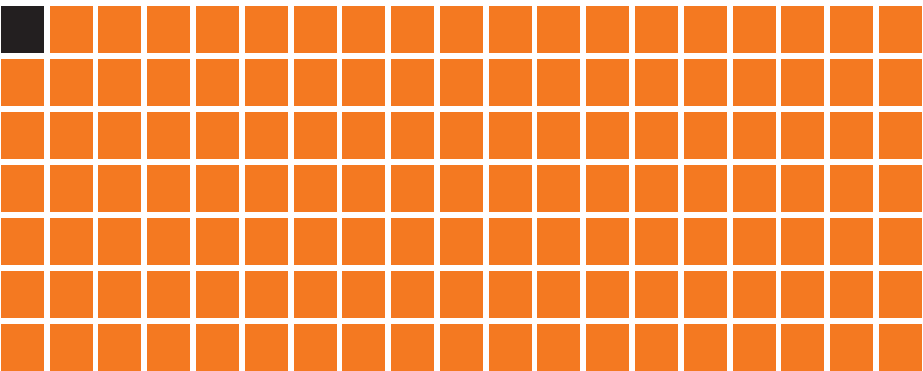
Ratio was specifically tasked with establishing the visual design guidelines and industrial design direction for the IQ4 product range. Based on Ratio invoices, the work completed for the projects outlined in this submission is in the region of £X.

0.76%

Agency cost in relation to overall project investment

Investment with agency

IQ4 programme investment (5yrs)



The scope and extent of the product development and tooling investment for this industrial range of products is extremely difficult to quantify, and to date development is ongoing.

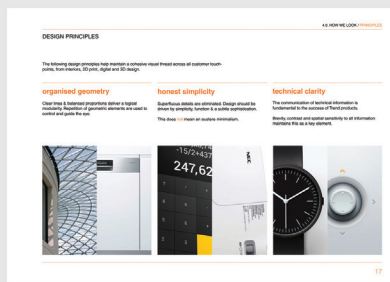
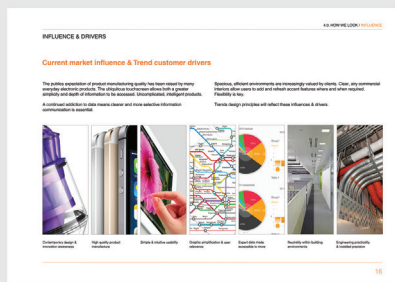
4. Outline of Design solution

IQ4 Controller Hardware

The IQ4 project involved both design direction and industrial design. Below summarises the key outcomes.

Design Guidelines

The core message of a 'trusted intelligence' was established with the creation of a common design language, where the Trend DNA was illustrated. Covering all touchpoints, from print and iconography to interior design specifications the goal was to refocus both the use and importance of design coherently throughout the company.



These extensive internal guidelines maintained a consistency amongst numerous specialist development teams involved across graphics, software, user interface and hardware design.

-40%
Smaller footprint



The New Design Identity & Industrial Design.

Research identified key desirable attributes regarding operational, functional and spatial issues. It was essential that the new product differentiated itself through delivering real user benefits whilst establishing a new look for the next generation of products.

A number of practical, functional features were delivered;

40% smaller for engineers and clients.

Retrofit installations often occur in spatially challenging locations where larger legacy hardware can dominate the space. The smaller footprint of the new modules allow upgrade replacements to be made easily within these situations. Forward facing electrical connections facilitate a closer row proximity of modules to be made, creating additional space savings, allowing for smaller, less expensive control cabinets to be installed.

4. Outline of Design solution continued

IQ4 Controller Hardware



50%
Faster module replacement

Unique, retractable terminal covers improve safety & minimise installation delays

System Modularity benefits

Diagnostic and replacement speed is a critical maintenance factor. Cable free interconnects create a highly efficient installation and maintenance feature where modules can be replaced 50% quicker and more reliably without the disruption to neighbouring hardware.

Commissioning speed & safety improvements.

Due to the time constraints and confined access faced by engineers, a common issue is the removal of terminal covers and accidental damage during installation. This can result in delays to commissioning new systems and an unsightly end result. This insight resulted in one of the IQ4 products most distinctive and unique features. The captive, translucent terminal covers retract out of the way into the body during installation and simply rotate out upon wiring completion, reducing both installation delays and possible penalty costs for the installer.

4. Outline of Design solution continued

IQ4 Controller Hardware

12%

Faster assembly

Manufacturing reliability & product assembly benefits.

The snap together module housings avoid all secondary fixing requirements improving product assembly times by over 12%.

£0

Zero tooling costs
for future variants

The modularity of the design enables the enclosures to be applied to multiple product applications resulting in more rapid deployment and delivery of new product variants at practically zero additional tooling costs.

Effective maintenance & increased brand awareness.

In order to install and maintain IQ4 hardware as efficiently as possible into more confined spaces a small multi-tool was designed and supplied as a promotional 'give-away' item. This also served to build awareness of the Trend brand.



Multi-tool, includes cabinet door key and IQ4 terminal pincers

5. Summary of results

IQ4 Controller Hardware

+150%

Phase 1 / 2012
Revenue projections

+325%

Phase 2 / 2014
Commercial forecasts

£XM

Phase 3 / 2015
Revenue generation
over the next 5 years

As a new product range employing new technologies and changes within the business it is difficult to compare and quantify sales directly to the IQ3 predecessor products. The IQ4 range expansion and sales success is broadly outlined below.

Sales forecasts exceeded.

The first releases of the IQ4 family were specifically designed to offer a complete replacement to an ageing line.

The second iteration of the IQ4 family, a controller with additional input/output points and a variant with additional communications capability exceeded all commercial expectations reaching over 325% of the commercial forecast.

Released in June 2015 the expandable IQ4E controller with accompanying I/O modules represents the most significant revenue generating components of the programme. This will represent some £X million over the coming five years and will complete the entire refresh of the Trend product portfolio.

The Common Design Language Guides have had a very positive response from the dedicated "Honeywell User Experience" team. It covers all the facets required and is used as a guide for other brands in the group.

Higher achieved selling price.

Trend enjoy the enviable market leading position in the UK and is strong in numerous European geographies. IQ4 consequently benefits from higher achieved selling prices than competing products.

It is the new design with its, minimal size, modularity, features and user benefits in combination with the additional wrap around services that has helped Trend to achieve this price point.

5. Summary of results continued

IQ4 Controller Hardware

UK

Manufacturing speed

Reduced carbon footprint

+60%

Social media engagement

The Market

The BEMS market and installer partners are traditionally slow adopters. But not so with IQ4: **never before have customers wished to “pre-order” controllers prior to release but they are making such requests for IQ4E.**

Manufacturing

IQ4 benefits from UK manufacture, quality control and production flexibility which fits entirely with Trend's just-in-time manufacturing model.

Eliminating the international shipping of moulded parts has significantly reduced the IQ4's carbon footprint.

The new product has an enhanced reliability testing through accelerated life testing and selection of industrial grade electronic components.

Increased brand awareness

There has been a huge increase in brand awareness and the amount of PR coverage over the IQ4E with the social media engagement rate up by 60% since the IQ4 launch.

The design exercise and guides continue to extend their influence as Trend incorporate interior refurbishment within their HQ and factory sites to reflect the brand attributes.

Ratio worked with us throughout the entire product portfolio refresh. Having them embedded within our business and working with our customers reaching an understanding of our heritage as well as our future proved invaluable to envisaging and creating the design language for Trend. Ratio were able to deliver a vision where others just talked.

Graeme Rees, Marketing Director, Trend

6. Other influencing factors

IQ4 Controller Hardware

With a project of this scale over such an extended and ongoing timeframe it is very difficult to separate the 'front-end' design input in relation to current sales successes. The design work outlined in this submission (0.76% of the clients project budget), has already had a disproportionate influence throughout the company. The IQ4 range will further strengthen Trends reputation and drive significant global sales over the coming years.

Integral to the project were new digital technologies and interface developments which will have contributed to the projects overall success and rapid adoption rate.

6. Research Resources

Data sources quoted are from internal business data.
www.trendcontrols.com.

BSRIA Work Building Controls Study October 2013

This submission is on behalf of all those involved across the software, engineering and marketing teams at Trend. A straightforward openness and trust fostered a truly collaborative and innovative environment in which the design work proved to be extremely effective.



Design Effectiveness Awards 2016
IQ4 Controller Hardware for Trend Controls

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