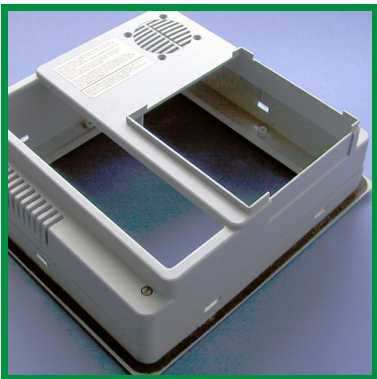
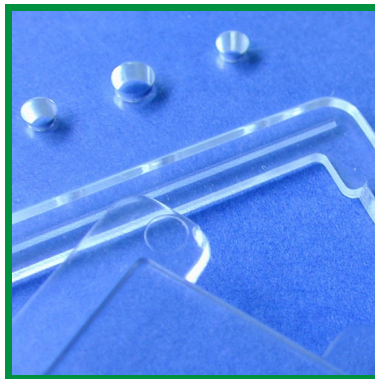


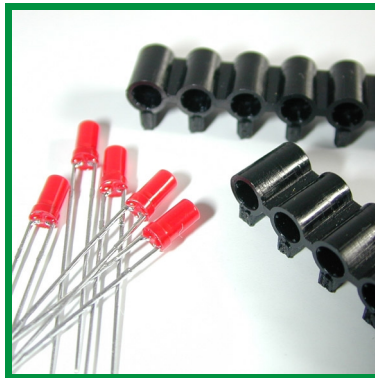
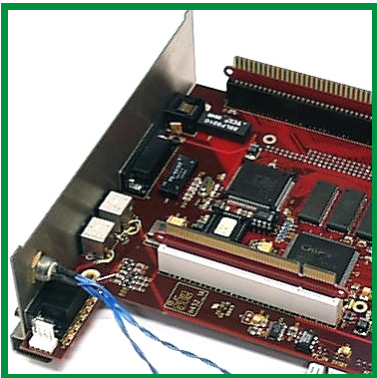
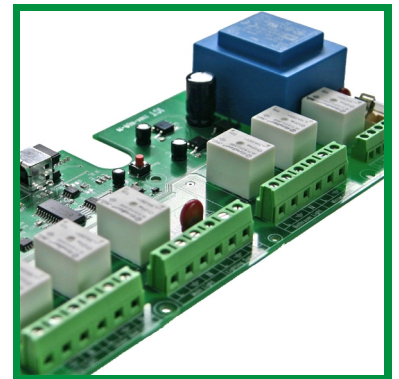
SUB-CONTRACT  
COMPUTER AIDED DESIGN



ELECTRONIC  
DESIGN



PRODUCT DESIGN  
SERVICES



- Industrial Design
- Product Graphics
- Mechanical Engineering
- Concept Visualisation
- Ergonomic Study
- Rapid Prototyping

- Electronics Engineering
- Software
- System Engineering
- Schematic & PCB Layout
- Functional Prototypes
- EMC Analysis

- Project Management
- Reverse Engineering
- 3D Modelling
- Value Engineering
- CAD Draughting
- Production Engineering

Outsourcing Design

If you need to Outsource

If your design departments' work flow peaks and you lack the resources in house you can use 3Minds as a flexible resource to meet the demand.

We can offer design and draughting services for electronic or mechanical designs or any other aspect of new product development.

If you want to Outsource

There are times when you simply do not want to hold up your development program to catch up on time consuming tasks. Perhaps your QA department wants to have old paper drawings converted to electronic format or an assembly manual creating for a legacy product.

3Minds have the manufacturing background to understand and provide you with the solutions.

## Extending Product Life

Reverse Engineering is a service we provide to help improve your product quality. When you have the product you want but don't have control of the manufacturing data, it is possible for 3Minds to reverse engineer one or all of the components.

It is usually possible to regenerate the necessary files from a sample PCB or mechanical component. We can then help source a quality supplier to provide you with a component that will fit into your existing design.

It is important to note however that 3Minds Limited requires that the client confirms in writing their legal right to reproduce an existing design.

## Design Obsolescence

It's a fact that the Electronics Industry is often faced with the problem of design obsolescence and most companies are likely to be affected at some time. In many cases an alternative component will exist, simply requiring vetting by an experienced engineer.

Obsolescence, will generally only affect mature products, and therefore is first faced by your purchasing team. The engineers involved with the initial design will have moved on to something else or may even have left your company.

3Minds can offer an experienced and flexible resource, always able to discuss your problems quickly, enabling you to get on with your normal activities.

## Improve your Margin

It is often the case that product life can be extended and margins increased by reviewing the way in which you currently provide the functionality of your product.

Technology and state of the art manufacturing methods are continuously moving forward. As a result it is likely that if you have a product that is more than a couple of years old it would benefit from fresh design input. It is also likely that you will get a functionality improvement or production benefit at the same time.

Product reviews may be applicable if;

- ▶ Volume is increasing
- ▶ Quality is poor
- ▶ New technologies are available
- ▶ Assembly is labour intensive
- ▶ Margins are slipping
- ▶ New materials are available

## Value Analysis

Value engineering is an analytical exercise which promotes innovative thought. 'How can we make this part for less?' often results in 'How can we improve this part or combine it with these parts and reduce the cost and weight at the same time?' This is the power of design and we have championed a number of value engineering exercises where we have designed injection moulded components to replace expensive machined parts and reproduced PCB's with identical functionality for a lower production cost. There were obvious cost benefits with a return on investment (ROI) within one year, however functional improvements were achieved too! The following are good examples;

- ▶ Machined and fabricated assemblies to Injection Mouldings or Sandcast parts
- ▶ Close tolerance machining to Injection Moulded parts
- ▶ Majority through hole PCB's to Surface Mount PCB's
- ▶ Integrating a number of PCB's into one, taking advantage of component integration and miniaturisation

## Product Illustrations

Technical Illustration is a very effective way of projecting information. Illustrations can be incorporated into technical manuals, operating instructions or used in brochures and in-house product assembly documents.

If you have a requirement to improve your technical documentation, particularly through non-language specific illustrations, then please call 3Minds. Choosing us draws on our product development background and skills in design.

We combine these skills to produce technical illustrations in the form of exploded views and rendered images that clearly define the message you wish to portray. We are familiar with many software packages, to help manipulate and provide you with images you want, including;

- ▶ Solidworks®
- ▶ AutoCAD®
- ▶ CorelDraw®
- ▶ Photoshop®

## Diagrams and Schematics

3Minds can also produce diagrams and schematics for your documentation whether electronic or mechanical using either your CAD data or produced from our own. These can be supplied in most formats including IGES, JPEG and TIFF.

For further information on our CAD capability see the relevant section overleaf.

# Computer Aided Design

## Computer Aided Design

3Minds use CAD throughout the design phase of new product developments and so understand the requirements you may have. We can assist you with electronic CAD work from schematic entry to PCB layout or mechanical CAD work from creating an original three dimensional solid model to the detailing of parts drawings.

## Schematic Entry

Schematic entry is a service we provide to assist you with maintaining your product quality. Without full up-to-date design schematics you will not be able to support or develop your product effectively.

We are fully experienced in schematic capture, providing customers who either have no schematics of current board designs, paper only documents or no longer have any in-house CAD ability.

- ▶ Complete entry from paper schematic
- ▶ Reverse generation from Netlist
- ▶ Schematic component library generation
- ▶ Schematic signal integrity checking

## PCB Layout

At 3Minds Limited we believe that PCB layout process is as important as the actual schematic diagram, particularly with the increasing clock frequencies and strict EMC requirements. For this reason our PCB layout work is performed by engineers who are capable of assessing a design for its optimal physical layout and immediately recognising any potential problems.

These issues are not conveyed by a simple netlist which is often all that is given to a PCB designer and most CAD packages have not provided the tools to steer around the problem. We therefore combine the best aspects of the CAD software with the extensive experience of our engineers to provide you with the best solution.

## Solid Modelling

We have many years of experience using 3D Solid modelling software including industry leading Solidworks® and Autodesk® products.

We provide sub-contract services in CAD modelling to help you maintain and update your manufacturing data. Models can then be converted into detailed drawings, used in technical illustrations or exploded views.

## 2D Draughting

If you have a requirement for drawings of any kind, completed to ISO standards, then we can help.

We are very experienced in 2D CAD design and draughting, dating back to the earliest versions of AutoCAD® and indeed back to the drawing board.

You may have a new drawing to complete or you may want to convert old and dusty paper drawings into digital format, either way we can achieve the result you're looking for and provide it in the format you want.

- ▶ New drawings from sketches
- ▶ New drawings from parts
- ▶ Input of paper only drawings to electronic formats
- ▶ Solid models from paper formats
- ▶ All drawings archived on disk

We have the facility to provide electronic files across the internet, through FTP or on Floppy Disk, CD or ZIP® Disk and printed Paper or Film copies up-to A1 in size.

## Developing your business, by design.

3Minds actively pursues design solutions that reduce costs and time consuming operations for their customers. We strive to combine this with increased functionality and consumer benefits where possible. We offer electronics, industrial and mechanical design services. For further information or for your free quotation please call today on 0845 680 1024 or email [sales@3minds.co.uk](mailto:sales@3minds.co.uk)



3MINDS

Developing  
your  
business,  
by design.



**3Minds Limited.**  
10 Ravensdale Close,  
Walsall,  
West Midlands,  
WS5 3PY. U.K

0845 680 1024  
[sales@3minds.co.uk](mailto:sales@3minds.co.uk)  
[www.3minds.co.uk](http://www.3minds.co.uk)