

30 Years of Microvascular Monitoring

We are proud to highlight that this May marks the start of our 30th financial year in business for Moor Instruments. To celebrate that milestone, alongside other activities (such as our new temporary logo which you may have noticed!) we plan a series of short articles through the year to help document our history, achievements and the products and applications we have helped to create.

In this, the first article in the series, we will focus on our company history and the laser Doppler monitors we have offered from the start. Our grateful thanks goes to those customers who helped track down an example of each from our portfolio enabling us to recently commission a photo shoot, the results of which follow.

Moor Instruments was incorporated by Dr David Boggett (Dave to all). Dave is still chairman at Moor Instruments and takes a very keen interest in our technical innovations and product development.



Dr David Boggett – with a young Pete Jady (Sales and Marketing Manager).

One of the most common questions we are asked is “Why Moor”? The simple answer being that it is an abbreviation of Dave’s property name, “Moorland Ridge” from where the fledgling company took its first steps originally in a shed, moving into the house and out again to an industrial unit in Axminster, where we are now headquartered in somewhat expanded premises.

Dave’s interest in laser Doppler blood flow measurements started way before the birth of Moor as it was a research interest at Oxford Brookes University where Dave headed a small research team. It was there that prototypes were developed which collaborators around the UK felt were as good as anything else commercially available and encouraged him to start manufacturing more seriously. This ultimately resulted in a move away from academic life from Oxford to live in rural East Devon close to the Jurassic Coast.



MBF1 – single channel monitor.

The company’s first laser Doppler monitor was the MBF1 (Moor Blood Flow 1), which did not actually include a laser, an external source was used instead. The unit also had analogue outputs, enabling you to connect to a chart recorder (for those old enough to know what they are!) but also showed some forward thinking as this 30 year old monitor would interface happily with today’s modern A-D data acquisition systems. The MBF1 was a solderer’s delight though – labour intensive in manufacture. As interest developed, it became obvious that more attention should be paid to easing manufacture.



MBF2 – single channel monitor.

To some extent, this was resolved with the MBF2 monitor. The MBF2 was the largest monitor we ever produced, because a Helium Neon tube laser was used internally.



MBF3D – dual channel monitor.

As more staff came on board, work could begin on the MBF3 series which featured a (world first) dual channel design to allow comparisons of blood flow at stimulated and control sites. With the take-off of commercial laser diodes commonly found in CD, DVD players in car and home, we could take advantage of the much more compact laser packages and added heating/cooling circuitry to keep the lasers ultra-stable, (which is still our solution today). The monitor also featured a graphical display, inbuilt data memory and inbuilt colour plotter – again all features that were well ahead of their time. The additional freedom provided by advances in microprocessor design enabled cutting edge design and functionality. The MBF3 was one of the first real commercial successes of the company and really established us as a highly competitive supplier and gave confidence to recruit other staff to boost production, sales and marketing and to develop new systems. It was around this time too that plans were made to launch Moor Instruments properly in the USA, with the formation of Moor Instruments Inc in Delaware (East coast).



DRT4 – dual channel monitor with temperature measurement.

Whilst the basic offering of the MBF3D was strong (and would still compete today!) advances in hardware design meant the DRT4, next generation was inevitable. The DRT4 was based on the MBF3D but featured a wipe clean membrane panel intended more for clinical research and a direct printer interface. We also recognised that skin temperature was an important co-parameter to measure so were the first to produce a combined blood flow/ skin temperature probe.



moorLAB – server with additional satellite channels.

Not wanting to turn our back on the researchers who were interested more in a lower cost, stripped back version of the clinically oriented DRT4 (no graphical screen, no data memory), we followed up with the floLAB/ moorLAB multi channel monitor, enabling up to three channels to be added to the base Server unit. It was around this time we started to get involved with laser Doppler imaging too, funded by the success of the MBF3 and DRT4.



moorVMS-LDF – dual channel module.

We sold DRT4 and moorLAB alongside each other for a number of years before work started again on a direct replacement for both – taking advantage of digital signal processing to create the moorVMS range which we sell currently. Digital signal processing keeps the component count down and fewer parts leads to better reliability (reflected in the 5 year moorVMS-LDF warranty) with lower

production costs (lower sale costs) and makes the system relatively compact.



moorVMS – modules from the moorVMS family.

Over recent years we have focussed on building up the range of modules within the moorVMS range, adding protocol modules to assess the response to heating and pressure cuff inflation.

We also added white light spectroscopy for superficial measurements of blood oxygenation in collaboration with researchers at the University of Remagen (also marking the launch of Moor Instruments GmbH - joining Moor Instruments Inc as a sister company). The most recent addition is moorVMS-NIRS for deeper measurement of oxygen – in the muscle and cerebral tissue for example.



moorVMS-NIRS – dual channel module.

Throughout, we have added options to standardise and automate the more common blood flow provocations, from transdermal drug delivery (MIC1, MIC1-e and MIC2), pressure cuff control (moorVMS-PRES) and tissue heating (SH01, SH02 and moorVMS-HEAT).

Alongside the hardware developments, we have maintained progress with software development to “glue” your choice of modules together according to your precise needs. Find out more at www.moor.co.uk and www.moorclinical.com.

There is no doubt that Moor was founded on blood flow monitoring and together with the other modalities we have offered, contributes significantly to our further growth and product development.

For the next article we will focus on blood flow imaging. If there are any questions about this article, or future articles, please do not hesitate to get in contact 30@moor.co.uk.