rents, because the voltage drop over this stage is low. This requires more components than a simple design, so it is more complicated and more costly. Ready-made lab power supplies with this configuration are therefore distinctly expensive. The authors took this into consideration and gave careful thought to the design. Development started at the Institute for Rectifier Technology and Electrical Drives (ISEA) of the Aachen University of Applied Sciences (RWTH Aachen, Germany), and the design was subsequently refined by Arne Hinz in the electronics lab as a project for the practical part of his studies.

The block diagram in **Figure 1** shows the result. To make things easier for DIY construction, the switching regulator input stage is not designed for

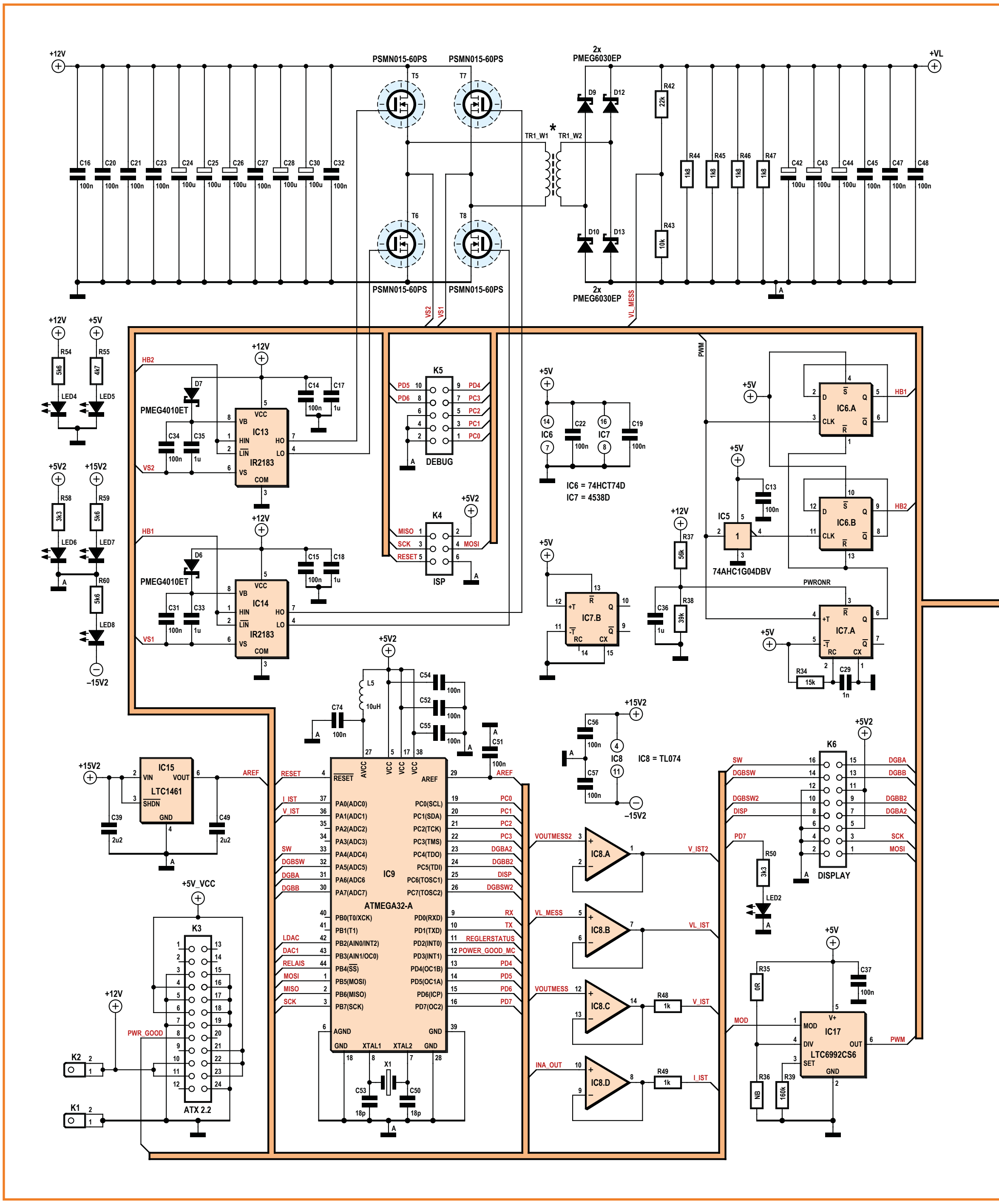

Figure 2.
The schematic of the lab power supply is fairly extensive, even without the display & control section.

direct off-line operation from AC power. Instead, it is designed for low-voltage operation with an input voltage of 12 V DC. This can be provided with sufficient quality and power at low cost by a simple PC power supply, and PC power supplies with capacities from less than 200 W to 1 kW are readily available. Strictly speaking, this means we have a three-stage power supply design. In the top row of the block diagram, from left to right, the first stage is a standard ATX power supply. It feeds the switching regulator in the middle, which acts as a sort of preregulator for the linear output stage to the right. At the bottom middle you see the block for the secondary voltages (±15 V and +5 V on-board supply voltages), and at the the bottom right the display & control module with