

CONCEPTION OF A RACKABLE UNIT FOR POWER SUPPLIES AND ELECTRONIC LOADS CALIBRATION



INTRODUCTION

In order to reduce turn-around time and thus better meet the expectations of its many customers, the laboratory in Zoetermeer (Trescal BeneLux) has developed a unique solution in terms of power supply calibrations. Within one month, an automated bench controlled via an IEEE interface was designed to handle equipment up to 400 A.

METHODS & RESULTS

CONCEPTION

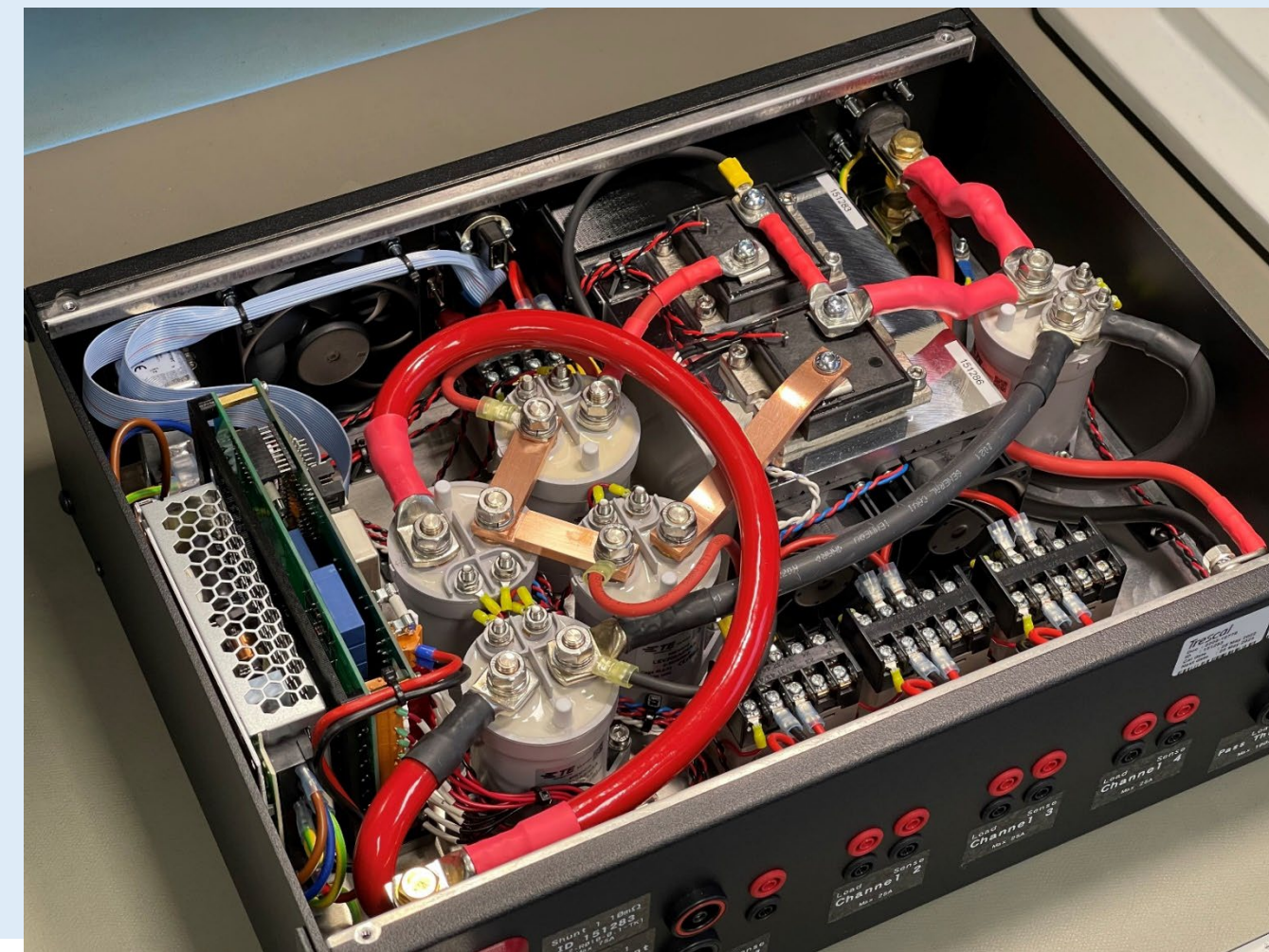
The unit is based on 2 shunts to cover 2 measuring ranges: up to 75 A and 400 A. These elements are the metrological basis of the system. The unit has 4 inputs to support up to quadruple-output power supply or four single-output power supplies simultaneously.

But it also offers the calibration of electronic loads for which a front/rear input has been designed. Finally, in parallel to the first input, an input for larger connectors has been integrated.

The system is capable of automatically switching to the multimeter's rear panel terminal block, especially when the 10 mΩ shunt is required to ensure reliable voltage measurements.

The hardware part is composed of connections between shunts, inputs and various switches, thus minimising the handling by the technician.

From a software point of view, the unit has been designed to be easily fit into the current calibration system through the integration of a USB micro-controller.



IMPLEMENTATION

The test bench consists of :

- A digital multimeter,
- A switch box and its microprocessor,
- Two standard shunts,
- An electronic load,
- An UPS (Uninterruptible Power Supply),
- And all the accessories necessary for this type of calibration.



BENEFITS

The benefits of such a system are numerous and concern each of our fundamentals: our clients, our colleagues and our desire to harmonize processes.

- 1 Customer :**
- Reduction of the Turn-Around-Time,
 - Supported accreditation scope,
 - On-site calibration possible.

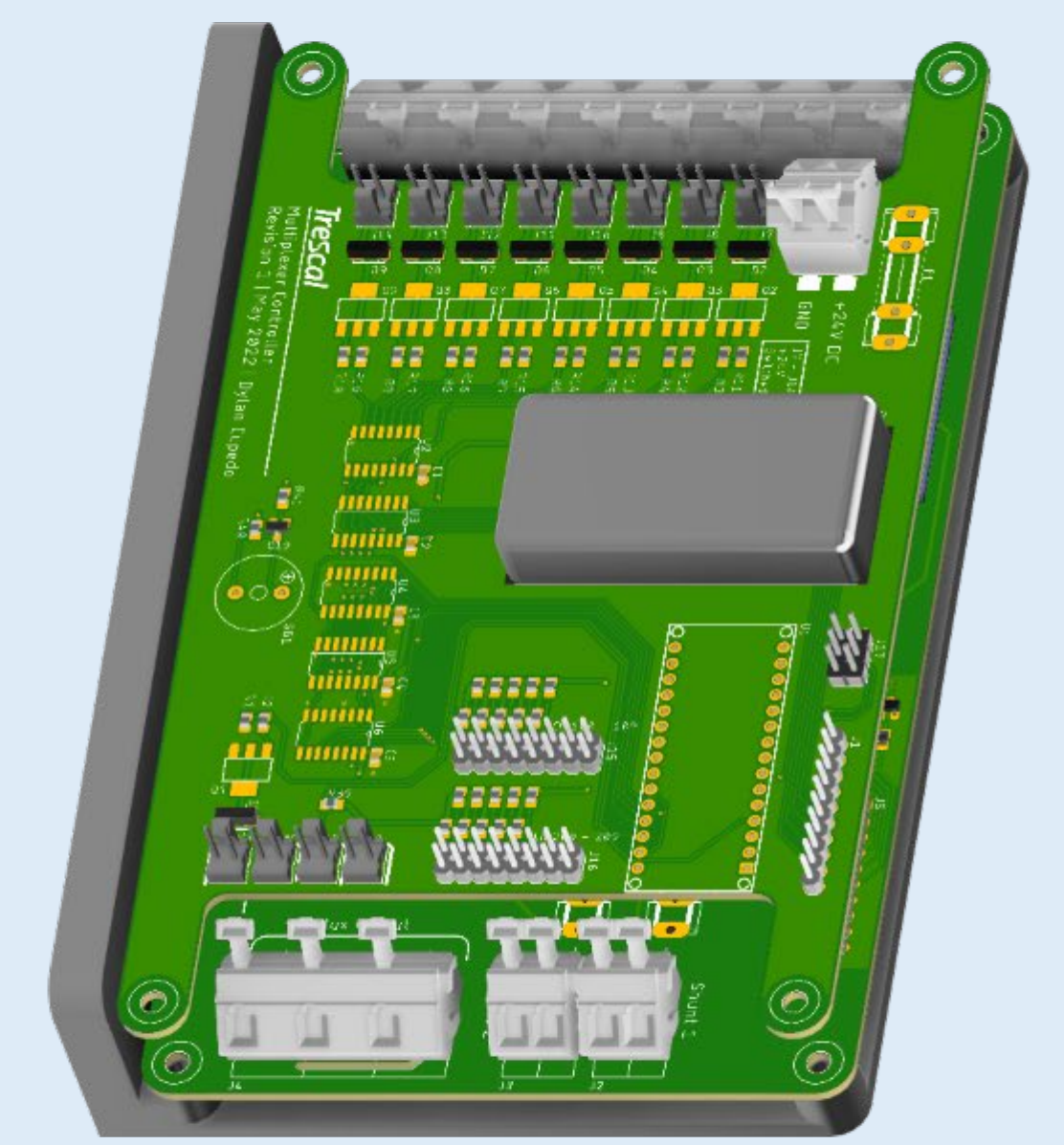
- 2 Technical :**
- More secure system due to less manipulation,
 - Automation,
 - Continuous improvement.

- 3 Harmonization :**
- Already integrated in our measurement software,
 - Modular to meet all requirements,
 - Already reproduced to complement the various existing laboratory benches

PERSPECTIVE

After this first development, there are already many possibilities for improvement of this measuring bench :

- Calibration of Electronic Loads
- Power supplies of more than 1500V (developments in EV Industry)
- Bi-directional Power Supplies
- High accuracy Power Supplies
- Automated Ripple & Low Noise Measurements
- Transient response Measurements



CONCLUSION

In just one month, the design of this unit and its physical integration into a rack has shown that we are able to respond quickly to a growing demand, always taking into account the possibility of future improvements, relying mainly on the skills of our laboratory teams who took care of the modelling, design and implementation of all circuit elements and their software integration.



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