



# High Bandwidth Isolated Transmission of a Measurement

*A cost-optimised solution to interface the controller*

## CONTEXT

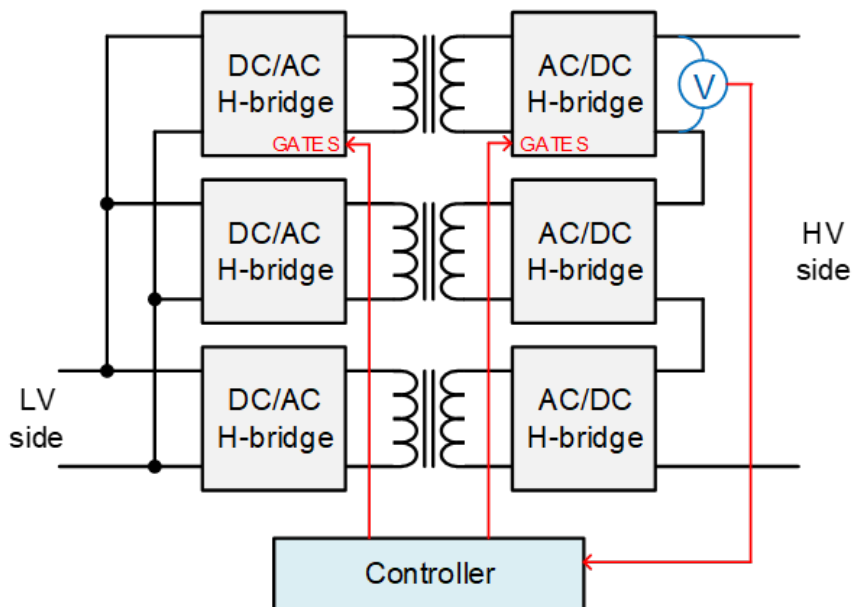
In medium voltage DC to DC conversion, a modular topology for a bidirectional converter is the parallel/series connection of Dual Active Bridge Converters (see figure).

Because of the series connection on the HV side, the voltage of the upper bridge exceeds the typical insulation limit of the voltage and current sensors (LEM-type).

In this context, the controller, which is at ground potential, commands the bridge gates with optical fibres. This is straightforward as the firing orders are digital signals.

But, in order to ensure the balance of voltage and power between the bridges, the output voltages have to be regulated and thus, the controller has to acquire the value of this voltage. As it is an analogue signal, it is not straightforward to send it to the controller.

Moreover, because of the high switching frequency of the bridges, the capacitors are of small value: a high bandwidth for the measurement is then required.



## TECHNOLOGY DESCRIPTION

SuperGrid Institute has developed a method (know-how) to transfer an analog measurement through a low-cost single plastic fiber to a controller equipped with an FPGA.

The developed system avoids micro-controller coding and multiple analog v digital conversions.

## APPLICATION DOMAIN

- MVDC converters with cascaded topology
- Solid State Transformer

## ADVANTAGES

- High bandwidth
- High voltage insulation
- Cost effective

## TRL SCALE



Solution tested and used on a DC/DC converter prototype  
Measured Bandwidth 160kHz, Noise 0.5%, static error: 0.1%

## DELIVERABLES

Know how (Electronic components + FPGA code)