



## Communication Integrated DC-DC Converters for DC Microgrid

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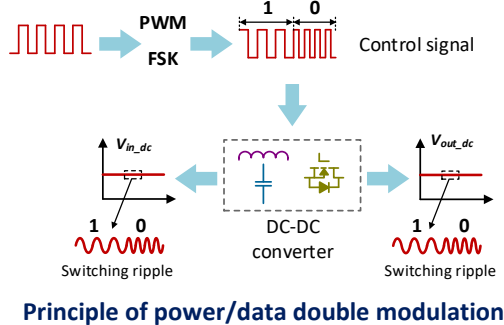
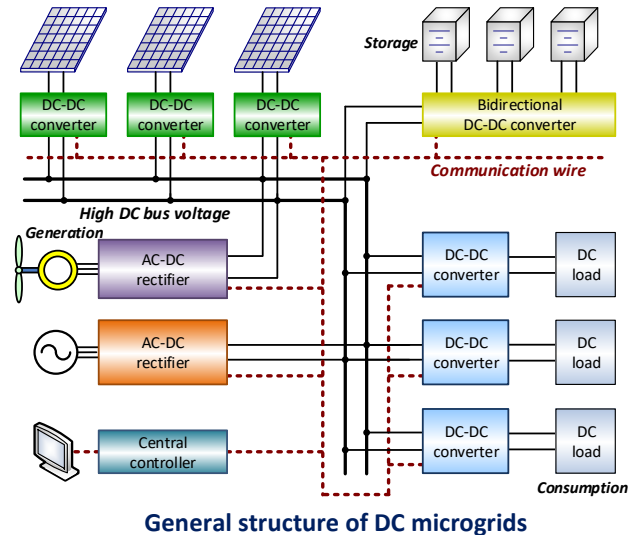
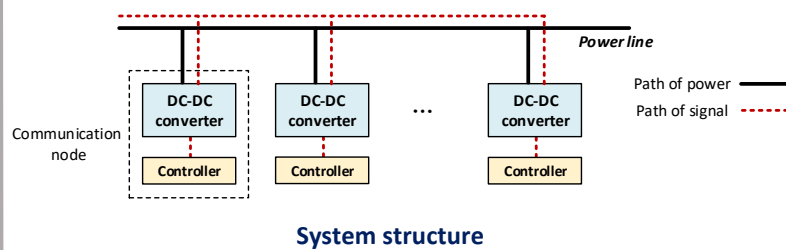
Seconded to Aston University from July 5<sup>th</sup> to September 17<sup>th</sup>, 2017

Host: Dr. Zhengyu Lin

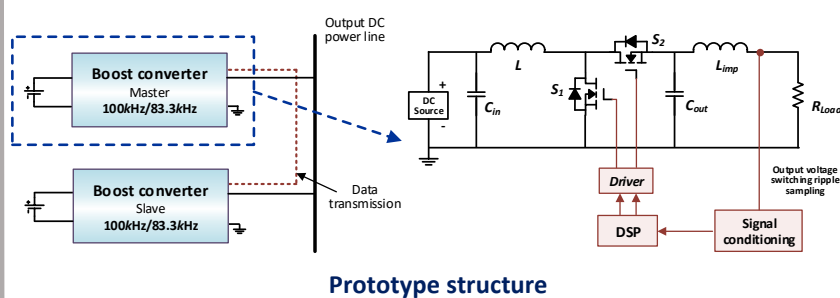
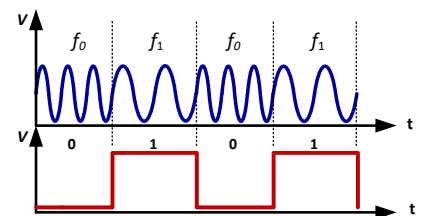


### Research purpose:

- Integrating communication into DC-DC converters for smart energy management in DC microgrid
- Achieving communication based on switching ripples of DC-DC converters without extra signal generation hardware or transmission wires



- DC-DC converters operate in switching mode, thus both input and output DC voltages are superimposed with switching ripples.
- Power pulse width modulation (PWM) and data frequency shift keying (FSK) modulation are employed.
- Data is carried by input/output switching ripples and transmits long input/output power line

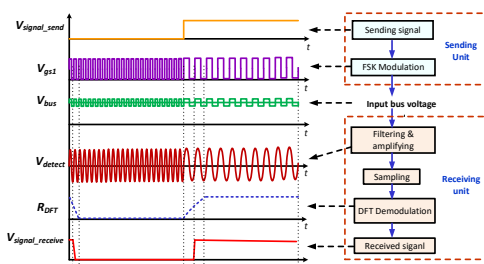


Three boost converters sharing common output power line



Rectifier boost converter

### Diagram of modulation & demodulation process



### Experimental results

