

# German Eol for Power Converters of SFRS



## Adaptive Control Unit (ACU) and DCCT

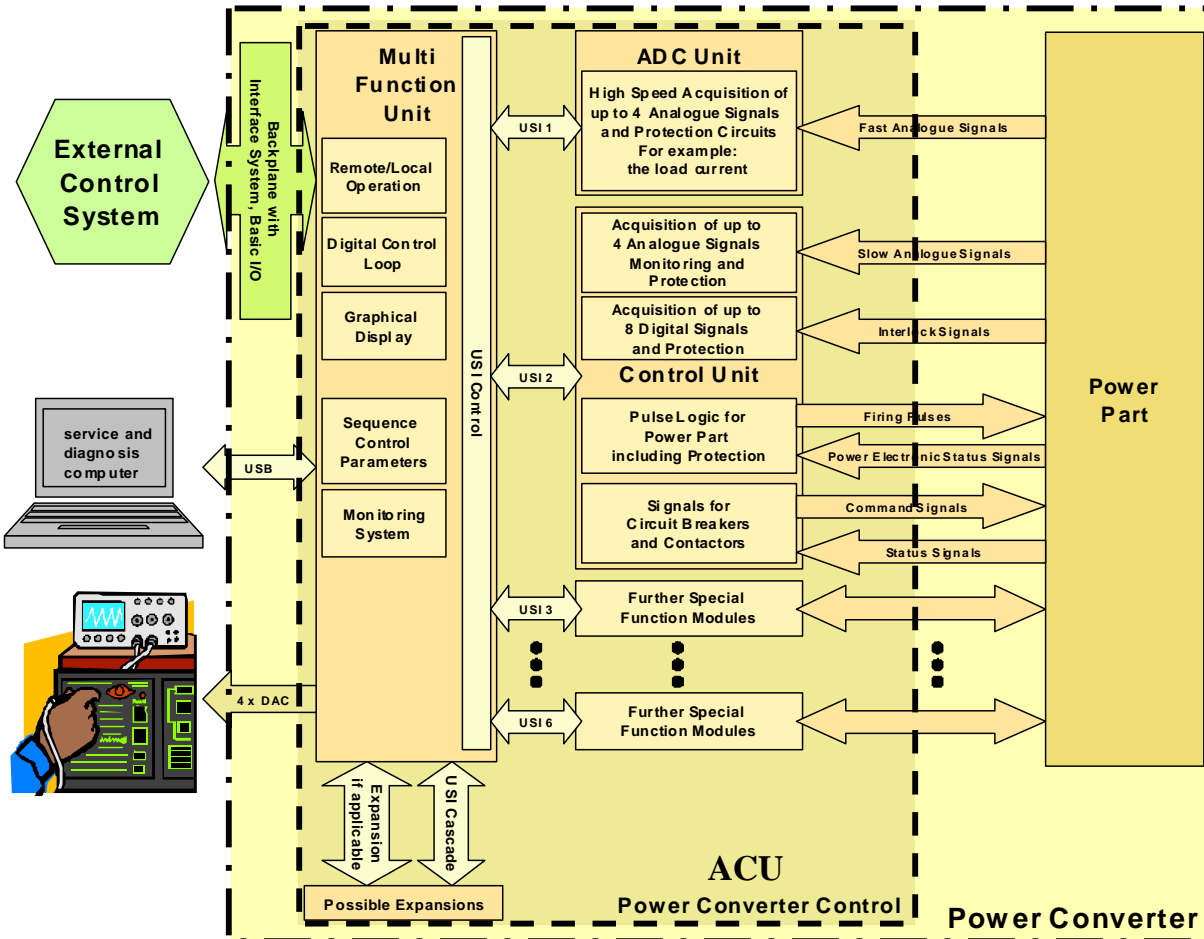
**Because of standardization in FAIR the implementation of a digital control unit is foreseen for all power converters (German In-kind contribution ACU)**

**Because of standardization in FAIR all high precision load current measuring devices in power converters, the DCCTs, are In-kind contributions of Germany.**

**Adaptive Control Unit and DCCT for all SFRS Power Con. 827 k€**

## Adaptive Control Unit and DCCT:

### - Power Converter Control:



In-kind contribution

**Adaptive Control Unit ACU**

- Multifunction unit

- control unit

- [ADC unit]

The digital control algorithm is based on analogue control strategies enhanced by the possibilities of digital signal processing.

All parameters of the control algorithm can be loaded and read by the external control system.

In-kind contribution

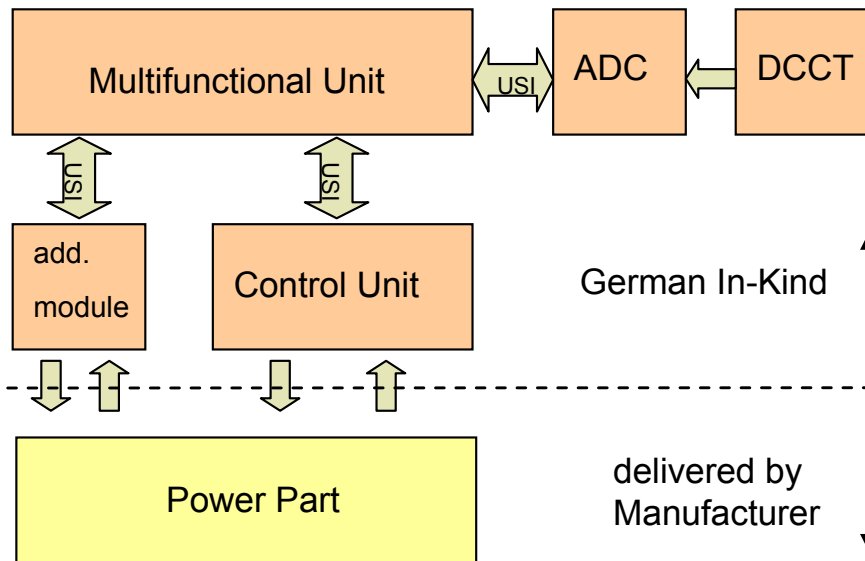
**DCCT (with digital output)**

ACU is second generation of digital control hardware and is used in new Alvarez Power Converters 09/2008

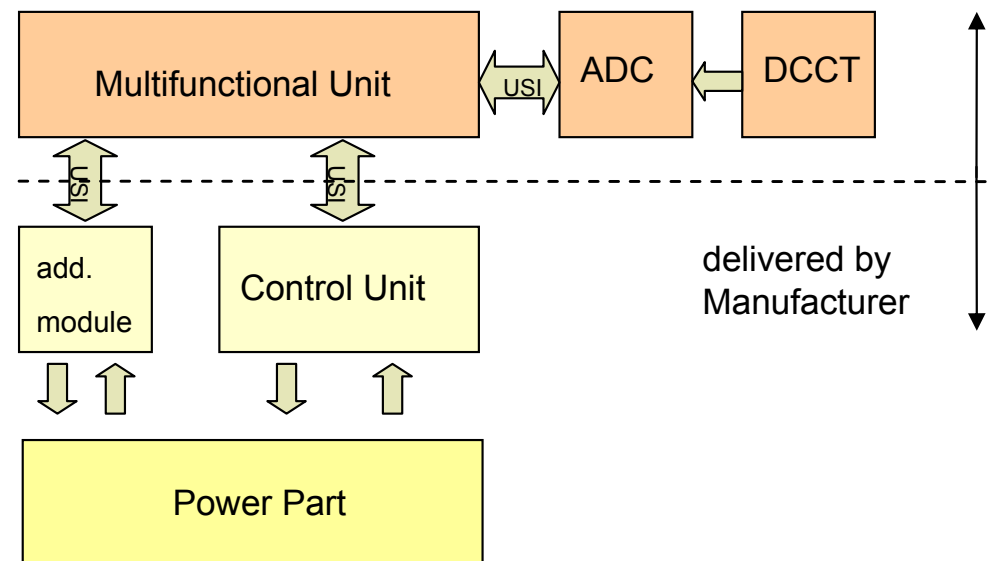
## Adaptive Control Unit and DCCT:

### Use of ACU

*Example 1*



*Example 2*

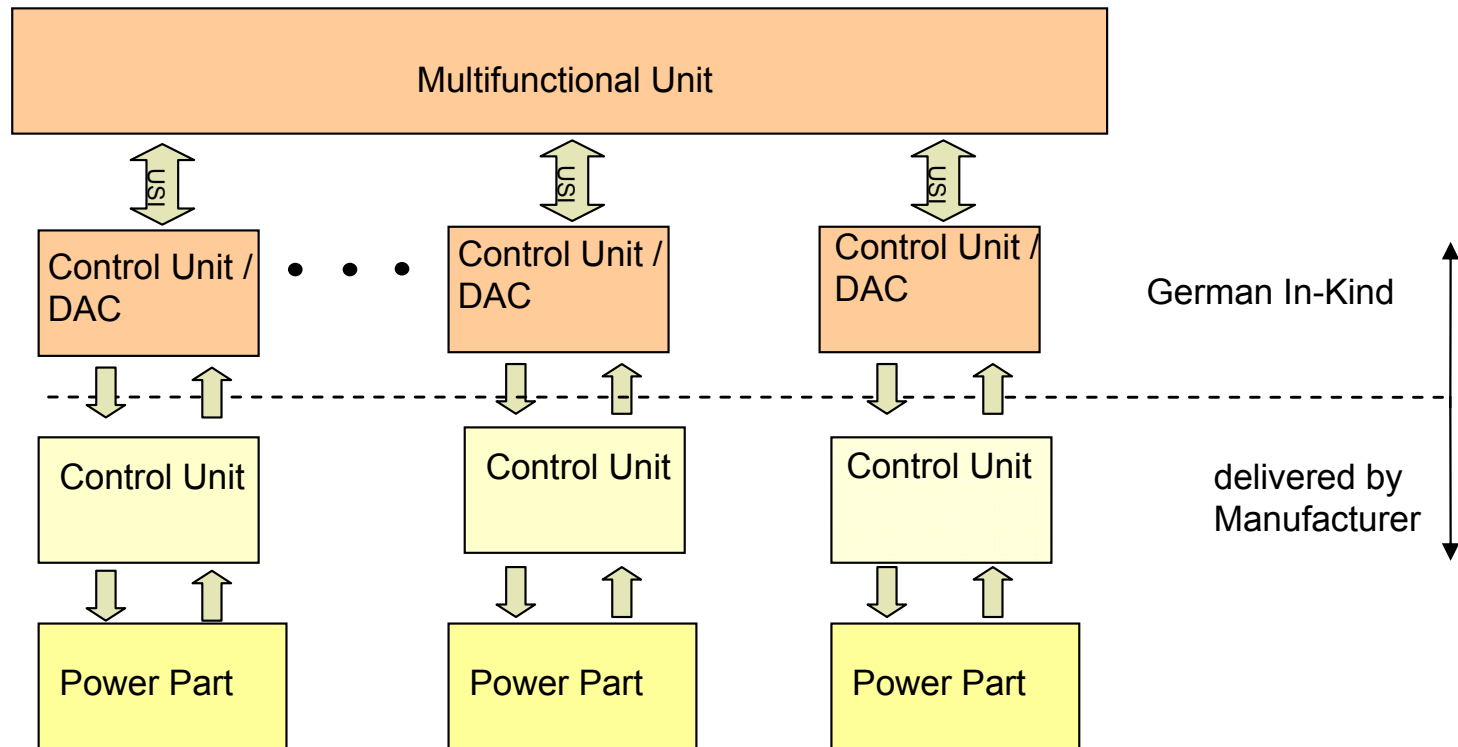


Manufacturer will be responsible for the functionality of the complete system in both cases. In-kind components have to be used like other commercial components on the market.

Adaptive Control Unit and DCCT:

## Use of ACU

Example 3



The analogue current regulation and current measurement is included in the delivery of the Manufacturer. Up to six devices can be supplied by one multifunctional unit.



## **Description on Eol for ACU and DCCT for all power converters of FAIR:**

### **Included in the delivery is :**

- backplane
- multi function unit
- control unit
- ADC board (if necessary)
- DCCT (with digital output)
- graphical user interface
- drivers and interface protocol
- documentation and interface description
- support for integration into the power converter

### **Not included in the delivery is :**

- more than 1 ACU and DCCT for one power converter
- adaption to exotic control strategies
- support for new user development



## **Schedule of EoI for ACU and DCCT:**

- 11/2008**    **First series in operation in Alvarez power converters**
- 08/2009**    **Operational experience during accelerator runs**
- 12/2009**    **Redesign with improvements (if any)**
- 2010**        **Start of series production and delivery**
- 05/2010**    **Documentation available, detailed interface description, drivers**



**Additional FTE for Power Converters in FAIR**

Year	ACU/DCCT	Order management	Sum
2009	2	1	3
2010		0.5	0.5
2011		0.5	0.5
2012		1.0	1.0
2013			
2014			
Total	12	13.5	25.5