German EoI

for

Power Converters of CR

Adaptive Control Unit (ACU) and DCCT

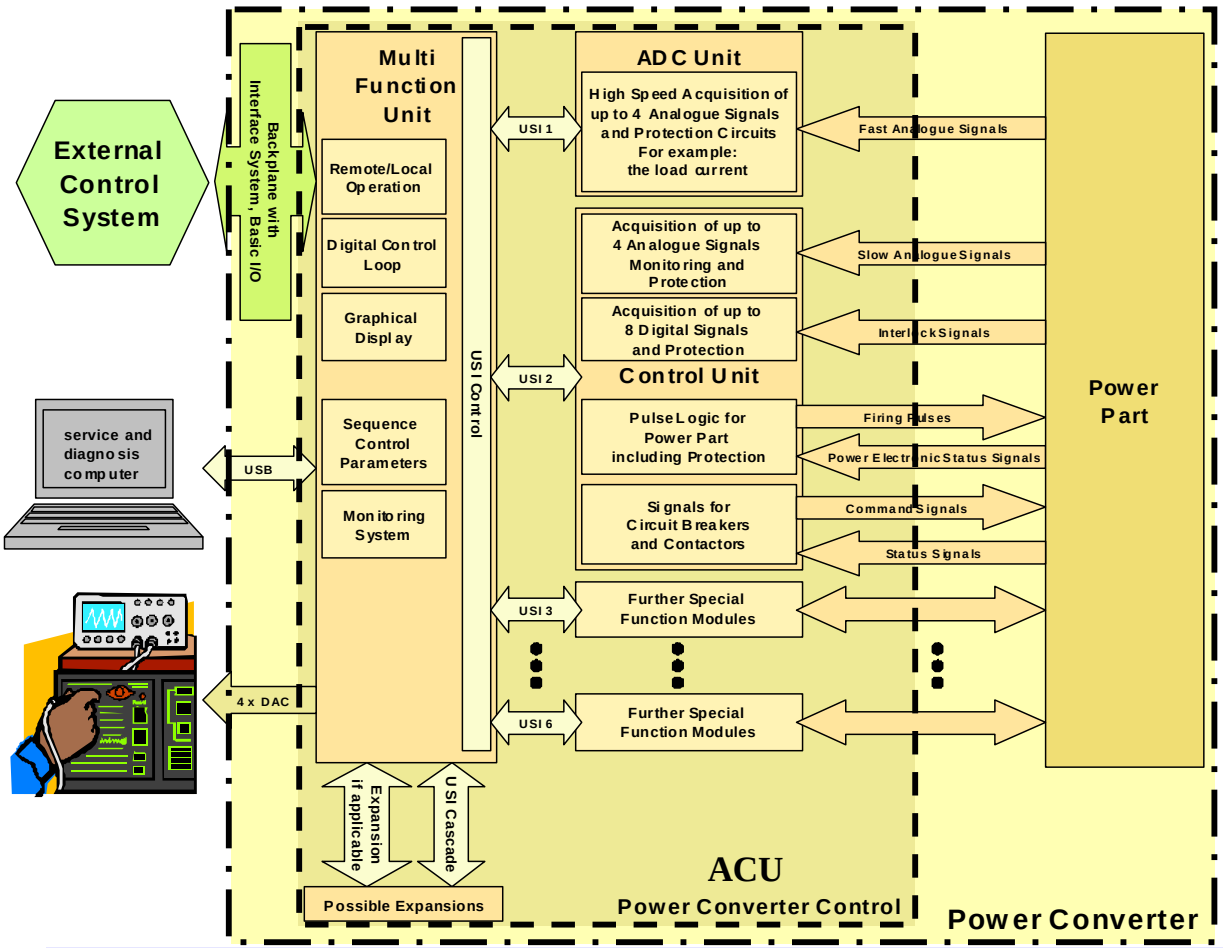
Because of standardization in FAIR the implementation of a digital control unit is foreseen for all power converters (German In-kind contribution ACU)

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 CR Power Converters 366 k€

Adaptive Control Unit and DCCT:

- **Power Converter Control:**



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

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.

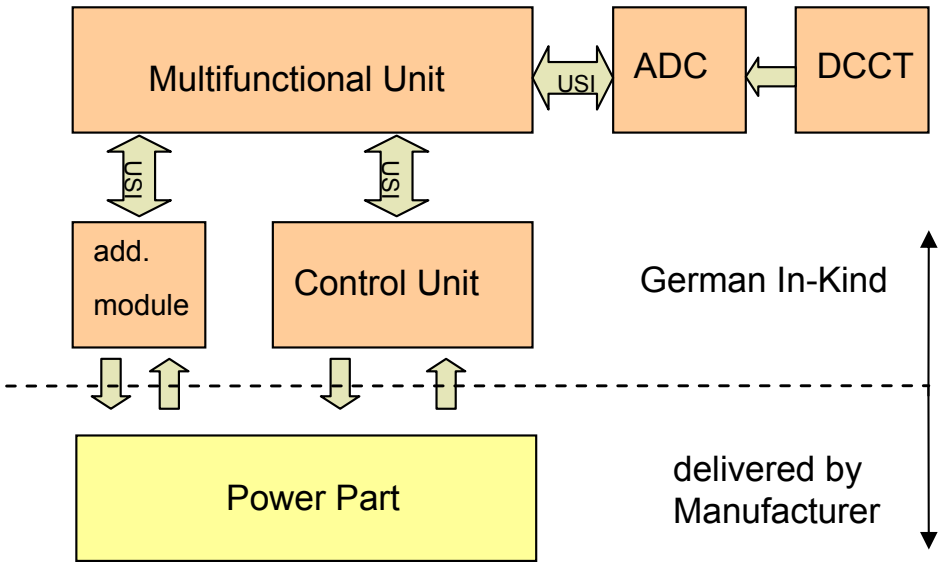
In-kind contribution

DCCT (with digital output)

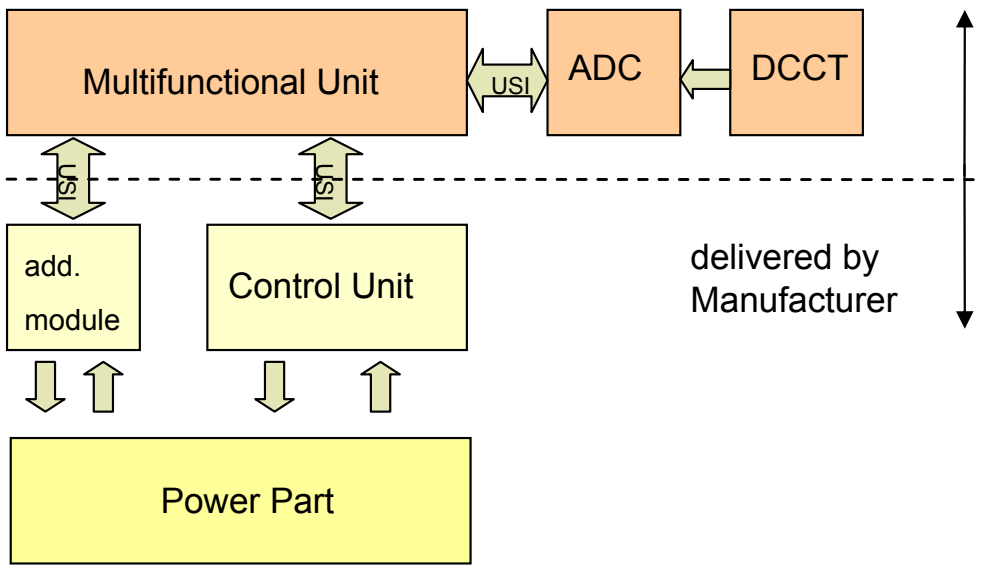
Adaptive Control Unit and DCCT:

Use of ACU

Example 1



Example 2



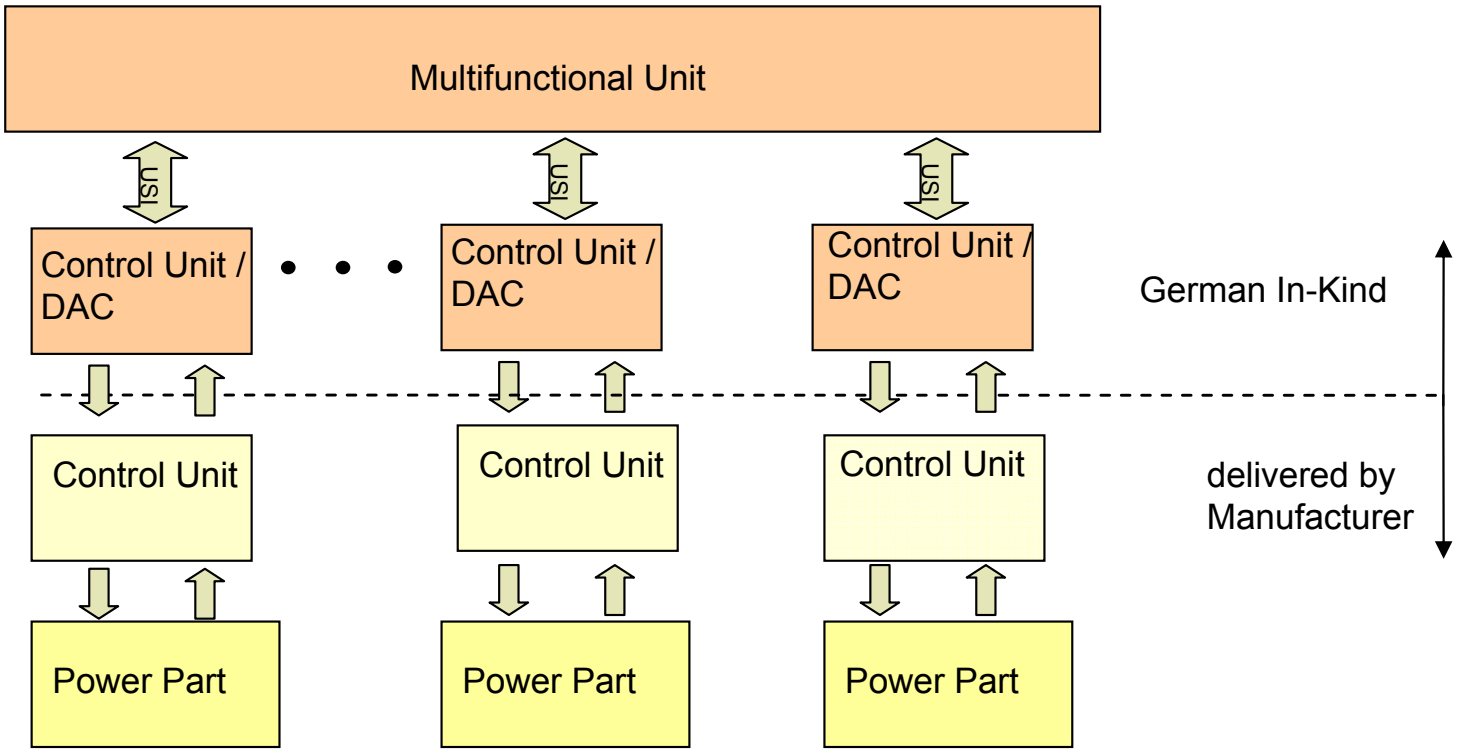
Manufacturer will be responsible for the functionality of the complete system in both cases.

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 EoI 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