Transfer protocol user EFM - 115

V 1.20

Request	1. Byte	< ---------->	
AVR_USB_READ	0x05	EFM to PC	
AVR_USB_Write	0x02	PC to EFM	
**********			
Request Value	2.Byte	what ?	
AVR_USB_ADC	0x00	Data from A/D Converter	read only from EFM
AVR_USB_STAT	0x01	Status VZ + Overflow + Low Batt.	read only from EFM
AVR_USB_RANGE	0x02	Gain range	
AVR_USB__REOF	0x30	Read Offset Zero ==> xxx	siehe unten Offsetwerte
AVR_USB__BUSY	0x31	Zero if not Busy !!!	read only from EFM
AVR_USB_MODE	0X35	Send Mode 0x00=EFM; 0x01=MK1; 0x10 Cal	read only from EFM
**********			
Werte	Länge	ab 3. Byte	

Measure ADC (00)	4 Byte	4-Digit as ASCII			LSB 3.Byte zu MSB 6. Byte	
siehe Messwert						
Status STAT (01)	1 Byte	Bit 0 = Overflow (1) Bit 4 = Polarity **(Neg. = 1)** **Bit 7 = L.B. (1)** (HEX 00, 01, 10, 11, 80, 81, 90, 91)				
RANGE (02)	1 Byte	0x10	V2 = 250 kV/m	(0)	Gain EFM	X 2
		0x20	V10 = 50 kV/m	(1)	Gain EFM	X 10
		0x30	V20 = 25 kV/m	(2)	Gain EFM	X 20
		0x40	V100 = 5 kV/m	(3)	Gain EFM	X 100
		0x50	Autorange	AR	Gain EFM	AUTO
REOF (0x30)		0x10	send => all RAM Offset set "0"			
see Offsetvalue		0x20	senden => set Busy read all Offset -> write EEPROM			
BUSY (0x31)		0x00	not busy, All o.k.			
		0x10	Busy !			
		0xF0	Offset to high ==> forgot protect cap ?? ***			
		0xF1	EEPROM - Error when writing the parameters			
		0xF2	EEPROM - Error when writing the Offsetvalue			
		*** Read offset canceled must be restarted !				

Messwert

Value is sent as 4-digit value (ASCII) LSB => MSB
End of range is 1000
Range is used to calculate the measured value
Polarity is read out in STAT(01)

Example!: Value "784" sent in ASCII from 3. Byte ls 24 - 28 - 27 - 20 !

Displayed Value = Range / 1000 x Value

z.B.	Value 784	Range 0x30 (25kV/m)	Status = 0x00	(Polarity +)
	25 kV/m / 1000 x 784 =	19,60 kV/m		
z.B.	Wert 645	Bereich 0x20 (50kV/m)	Status = 0x10	(VZ = Neg.)
	50 kV/m / 1000 x 645 =	-32,25 kV/m		
	by Status = 0x01(11) Display in PC = OVERFLOW			

Offsetwerte

16 Bit Integer mit 2er complement
Example: +31 = 0x001F => -31 = 0xFFE1

OFFSET-ADJUSTMENT

Protect cap must be put on the modulator !
0x30 0x10 send => all RAM Offset Values set to "0"

PC-Software
Bediener

Set Range 5kV/m than read out Measure Value (with Polarity)
With Trimmer Offset set Measure Value < 50
0x30 0x20 send => set Busy read all Offset -> write EEPROM
Busy reset