STNRG011
Black Box content

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ver 1.1

life.augmented

Introduction

- The “Black Box” is a memory area inside the E2PROM (*) that contains information about the power supply
- It can be accessed by both STNRG011 and external communication board using I2C interface
- It is logical divided into 2 main parts:
  - Factory Data ➔ information written at the end of SMPS manufacturing process that won’t be changed during power supply lifetime
  - Event History ➔ information continuously written by STNRG011 during the operation of the SMPS that provides data about the life of the power supply

(*) Please note that the E2PROM may also contain a patch, so be careful when writing it

Factory data

Sector	Address	EEPROM Content	Note
0	0x0000	Voltage Output 1	SMPS ouput voltages (up to 4)
	0x0001		
	0x0002	Voltage Output 2	
	0x0003		
	0x0004	Voltage Output 3	
	0x0005		
	0x0006	Voltage Output 4	
	0x0007		
	0x0008	Voltage Output PFC	PFC stage output voltage
	0x0009		
	0x000A	Serial Number	20 bytes for S/N or other information
	0x000F		
1	0x0010		
	0x001D		
	0x001E	PFC Voltage	Bulk Voltage
	0x001F	Wattage	SMPS otutput power
2	0x0020	L_param	PFC choke inductance [µH]
	0x0021		
	0x0022	.....	
	0x002F		

- Factory data are written during SMPS manufacturing
- These data are used to identify the SMPS model / bacth / unit ➔ no impact on operation
- Only L_param has another function ➔ it's used by external µC or PC GUI to calculate input power

Event History

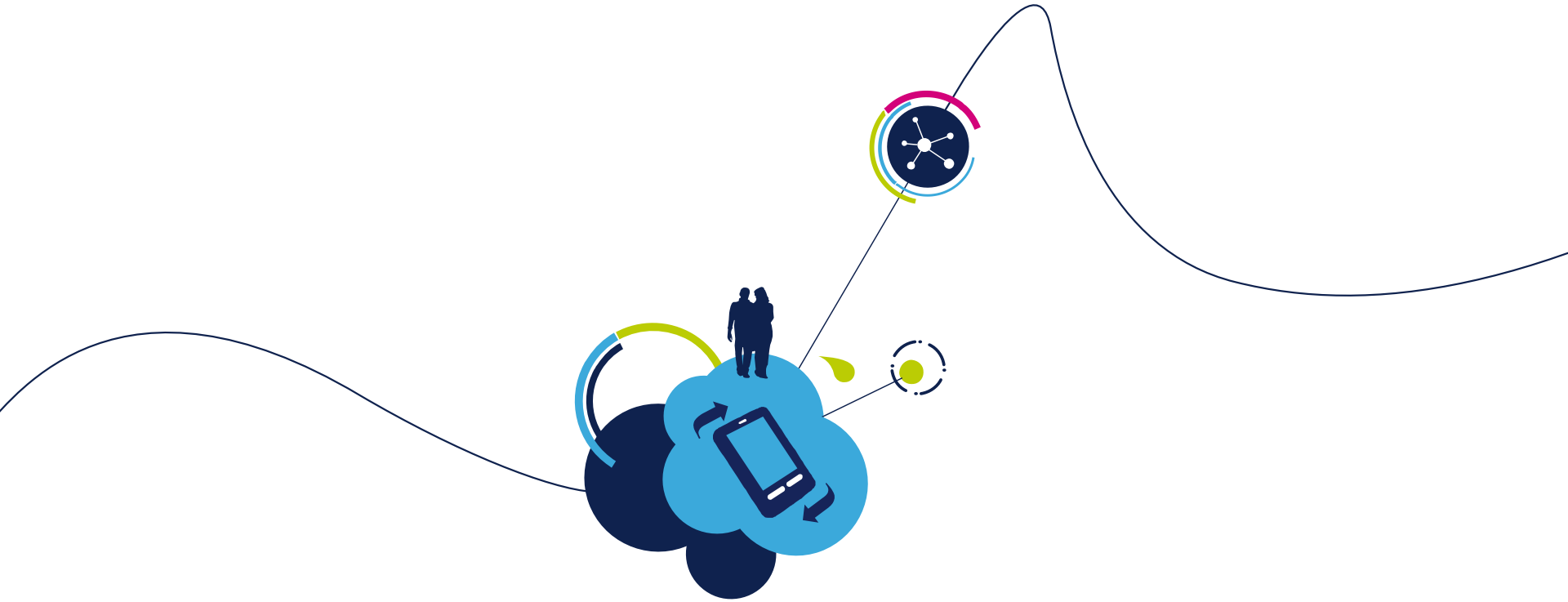
Sector	Address	EEPROM Content	Note
3	0x0030 0x003F	*empty*	
4	0x0040 0x0047	Fault Record	Circular buffer for latest up to 8 faults with index to the position of next available address (*)
	0x0048	Next available position (*)	
	0x0049 0x004C	Running Time	Total SMPS running time outside burst mode (based on input mains half-cycle)
	0x004D 0x004E	On/Off Count	Total SMPS turn-on operation (updated@turn-off)
	0x004F	Error Count	Total number of faults occurred
5-7	0x0050 0x007F	*empty*	

(*) In order to read the last fault go to the previous address

Fault list

FAULT / EVENT	Fault BB tracing Code	Position Byte (*)
FAULT_LLC_OC2	0x01	
FAULT_LLC_OVP	0x02	
FAULT_PFC_OC2	0x03	0xC1
FAULT_PFC_OVP	0x04	
FAULT_LLC_OLP	0x05	
FAULT_LLC_SS_TIMEOUT	0x06	
FAULT_UVLO	0x07	0xC1, 0xC2, 0xC3
FAULT_NO_LLCCS	0x08	0xC2, 0xC3, 0xC4, 0xC5, 0xC6
FAULT_PFC_SS_TIMEOUT	0x09	
FAULT_NO_PFCCS	0x10	0xC1, 0xC2, 0xC4
FAULT_PFC_UVP	0x11	0xC0 + llc_state where "llc_state" is 0x02 = LLC Soft Start 0x04 = LLC Running 0x08 = LLC Burst 0x10 = LLC ACP OTE: if PFC_UVP is caused by missing mains voltage, the bit5 (value 0x20) is set to '1'.
FAULT_SURGE_IN_SOFTSTART	0x12	0xC1, 0xC2, 0xC3, 0xC4
FAULT_NO_PFCFB_0VSS	0x13	0xC1, 0xC2
FAULT_ACP_SOFT	0x14	0xC2, 0xC3, 0xC4, 0xC5
FAULT_ACP_HARD	0x16	0xC1, 0xC2
FAULT_WATCHDOG	0x17	0xC1, 0xC2
FAULT_PATCH_ERROR	0x18	
FAULT_CODE_NO_PFCZCD	0x19	0xC1, 0xC2
FAULT_CODE_NO_LLCFB1	0x20	
FAULT_OTP	0x80	
FAULT_XCAP	0xB1	
FAULT_BROWN_OUT	0xB2	
FAULT_LLC_SD	0xB3	

(*) Some faults have an additional byte for the tracing for debug purpose.



Thank you !