

The MK3 node in the base will act as a DALI/1-10 controller and as the network co-ordinator. Outgoing ZigBee messages will be sent from the SubMaster to the node over a new SPI link and the node will relay any received messages back over the same link. The RTC will be removed from the node to allow the SPI link to be made and the node will indirectly use the RTC on the SubMaster.

The existing SubMaster PCBA will be updated to accommodate the GSM/GPRS/GSM modem and the lux sensors will be moved off onto a daughter board. We also intend to improve the current SIM card connector and add an eSIM to address reliability issues that have been seen in the field.

Finally, a secondary board will be developed that allows us to move the lux sensors off the main PCB and host a USB 802.11 client device. This will also allow the mechanics to be modified to prevent sunlight exposure to the main SubMaster PCBA to increase reliability.

#### 1.4 Specification

Item	Sub-Item	Specification
<b>Temperature</b>	Operational Range	-40 to +75 °C
<b>Power Supply</b>	Voltage Tolerance	230 +6% / -10%
	Standby	typical < 4W
	Energised	typical < 4W
<b>Controller</b>	RF Controller Type	Ember Zigbee Microcontroller
	Main Processor	AT91SAM9G20B-CU
	Protection	Brownout & Watchdog
	RAM	64M
	Flash	256M
<b>Control</b>	Relay	1 pole 16A, latching version
	Control	On and Off with zero crossing switching
	Node Variation	Typically < 1s
	Photosensor	3 Sensors and automatic control
<b>Radio Tx/Rx</b>	Frequency	2405-2480 Mhz
	Modulation	O-QPSK
	Sensitivity	-100dBm
	Output Power	0dBm typically
	Protocol	IEEE 802.15.4 Mesh
	Range	Line-of-sight 200m
	Approvals	ETSI EN 300 328 EMC as per EN 301 489-1 / 17 EN60950
<b>GSM/GPRS</b>	Modem	Gemalto EHS8
	Communications	GPRS / 3G
	Network Security	HTTPS over APN
<b>Antenna</b>	GSM	High performance wideband chip antenna
	ZigBee	1/4w Integral Antenna
	GPS	Patch antenna
<b>Enclosure</b>	IP Rating	IP65
	Socket	
<b>Patents</b>		GB 2372160 B EP 1241924 A2 EP 1249241 A3
<b>Measurement</b>	Voltage	200-260VAC
	Current	0 to 4A
<b>Dimensions</b>	Diameter	145mm
	Height	130mm