DRAFT:

PCBs in STM32 IMS automation system:

#1 of 18

- **Decora Paddle Switch User Control PCB**

  This is the standard “light switch” in the system and takes the form of a standard Decora momentary switch with a pair of RJ45 jacks on the rear. It functions as both an on/off control as well as a dimmer control. A quick press “up” fades up to full brightness over a preset time (default 2 seconds). A longer press “up” gradually fades towards full brightness at a preprogrammed rate until released. Internally, DALI messages are embedded within CAN packets for delivery to Power & Light boxes. A 16 position rotary switch on the rear sets the address of the switch for typical installations. A 2nd switch build option raises total addresses from 16 to 64 or 256.

  - STM32F0 + Address switch(es) for up to 16/64/256 locations
  - a typical Classroom would use 8 units
  - Bus powered
  - 1 two pin JST PH connector for door closed switch input
  - uses standard Decora momentary switch for industrial ruggedness

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- **Decora Lighting Scene Switch User Control PCB**

  Most new classroom designs include a lighting scene switch with settings for All On (50 FC), Whiteboard Presentation, Quiet Time, & A/V Mode.

  This switch provides scene select control and also provides LED indication of selection. The LED brightness follows room brightness and may be RGB.

  - STM32F0 + Address switch(es) for up to 16/64/256 locations
  - a typical Classroom would use 2 units
  - Bus powered
  - 5 pushbuttons with LED indicators (brightness controllable) for scene selection
  - Necessary for LAUSD

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- **Decora Window User Control PCB**

  Manual control for View electrochromic window systems with LED indication of current level. The LED indicator brightness follows room brightness and may be RGB.

  - STM32F0 + Address switch(es) for up to 16/64/256 locations
  - Bus powered
  - 4 pushbuttons with LED indicators (brightness controllable)

#4 of 18

- **Decora Audio Control User Control PCB**

  This control places two rotary controls in a Decora location. Each control includes an LED indicator ring to display current level. indicator brightness follows room brightness and may be RGB.

  - STM32F0 + Address switch(es) for up to 16 locations
  - Bus powered
  - 2 Rotary Encoders with LED level indicators (brightness controllable)

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- **Occupancy Sensor Coupler PCB**

  This PCB sits in a small box behind the wall and connects CANbus to a standard professional grade PIR intrusion detector mounted on the wall surface via a short pluggable cable. An interface for a MEMS microphone allows the sensor to become dual technology, utilizing PIR and passive sonic detection. Gives security system access to automation controls.

  - STM32F0 + Address switch(es) for up to 16/64 locations
  - Bus powered
  - JST-PH 10 conductor cable

- **Daylight Sensor PCB**
  - **- STM32F0 + Address switch(es) for up to 16/64 locations**
  - **- Bus powered**
  - **- 2 Rotary Encoders with LED level indicators (brightness controllable)**

- **LED Driver D.C. PCB**
  - **- STM32F + Address switch(es) for up to 16/64 locations**
  - **- 16 channel, 12 bit brightness PWM + LP Filters + current sink drivers**
  - **- 8 channel, 8 bit Color Temp PWM + CTT current steering circuits**
  - **- 1 connector for Daylight sensor**
  - **- 1 larger connector for standard BOSCH occupancy sensors**
  - **- interface to A.C. PCB**

- LED Driver A.C. PCB
  - - Contains PWM drivers, SSR MOSFETs, A.C. phase ref., inrush limiting uC, Power Supply
  - - Driven by commands from D.C. PCB
  - - Build-option for n SSRs

- **Power Monitor & Light Control Unit PCB**
  - **- Teensy 3.2 with CANbus + Address switch for up to 16 locations**
  - **- Lighting System Management Logic**
  - **- RS485 interface for EKM Metering Omnimeter UL v.4**
  - **- LiFePO4 battery backed clock**
  - **- Optoisolated interface for HVAC/Outdoor Sensor Unit**
  - **- Automation System 24VDC Class 2 Power Inlet**
  - **- Exterior Automation System Component 24VDC Class 2 Power Inlet**

- HVAC Monitor/Outdoor Sensor Unit PCB
  - - Teensy 3.2 with CANbus and Optoisolated serial host interfaces + Address select switch
  - - RS485 interface for Unico HVAC diagnostics + Relay to isolate inverter for firmware updates
  - - Connector for environmental HVAC sensors
  - - Connector for Sky/Weather sensors
  - - DMX or DALI interface for exterior lighting

- HVAC Sensor PCB
  - - PCB with CO2, particulate, temp, and humidity sensors

- Sky Sensor
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- **Building Control Panel / Clock RPi interface PCB**
  - **- MPC2515 + CAN transceiver**

- **View Window System Gateway PCB**
  - **- Teensy 3.6 with CANbus**
  - **- Bus Powered**
  - **- 2nd CAN interface for View Window system**

- **Media Director PCB**
  - **- Teensy 3.2 with CANbus**
  - **- IR control outputs for control of AppleTV & two monitors**
  - **- Async serial link for commanding Audio Processor PCB**
  - **- link to Power Control PCB link to SSRs**

- Media Power Control PCB
  - - isolated simple serial link for commands from Media Director PCB
  - - power control for 8-16 circuits

- HDMI-CEC Adapter PCB
  - isolated simple serial link for commands from Media Director PCB
  - power control for 8-16 circuits

- Audio Interface and Processor PCB
  - Analog Devices Sigma DSP ADAU1467
  - Async serial link for commands from Media Director PCB
  - S/PDIF inputs for ….
  - TDM inputs for 16 microphone system

- Presentation Audio Amplifier PCB
  - Accepts TDM 8 channel digital audio and extracts 2 selected channels
  - Daisy chain topology allows any number of amplifiers to be chained
  - 2 channel, 50W per channel class D audio amp with gain controls

- 2 Audio Amplifier PCB
  - Accepts TDM 8 channel digital audio
  - Analog Devices AD1937 CODEC
  - 7.1 channel, 50W per channel class D audio amp with gain controls