

# Shutter

Application Note 00 Monday, July 19, 2021

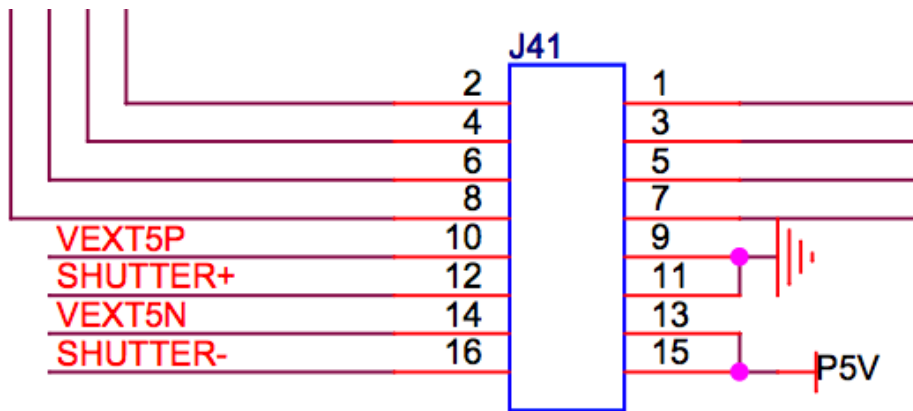
The controller generates an optically isolated digital control signal for controlling a shutter. Power for the shutter can be supplied either by the controller or externally. The selection is made on the J41 header, located next to the RJ45 connector on the front edge of the ARC-420 timing board, where pin 1 is on the lower left corner and pin 2 in the upper left corner:

|           |                       |           |                       |
|-----------|-----------------------|-----------|-----------------------|
| Internal: | pin 3 jumper to pin 5 | External: | pin 1 jumper to pin 3 |
|           | pin 4 jumper to pin 6 |           | pin 2 jumper to pin 4 |

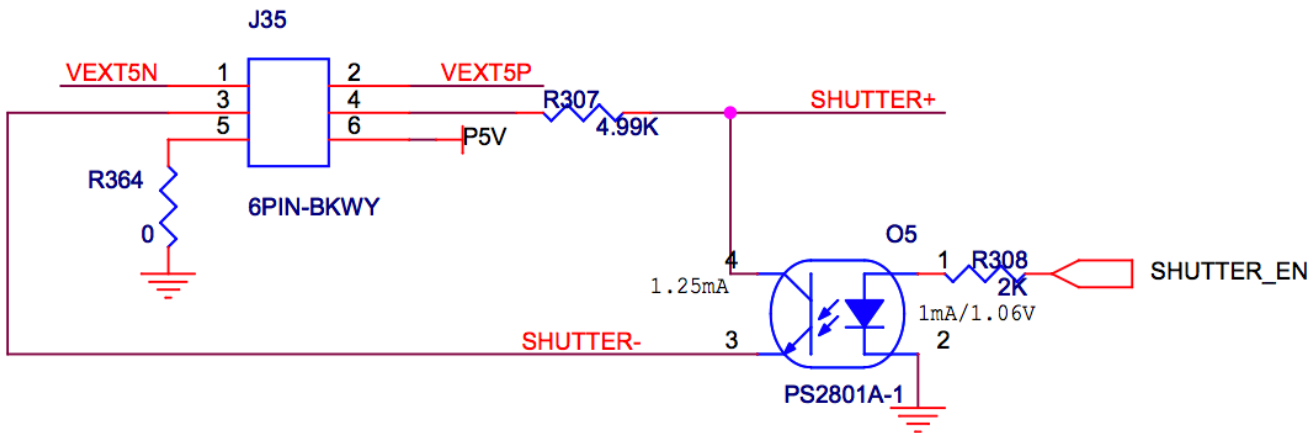
External shutter power is supplied on J41, located to the left of J35. Pins 10 is positive power and pin 14 is ground. The circuit will optically isolate the digital control signal SHUTTER\_EN generated by the micro-controller and output the two shutter control signals SHUTTER+ (J41 pin 12) and SHUTTER- (J41 pin 16). The polarity of the output signals is low true, that is, if SHUTTER\_EN = high then SHUTTER+ = SHUTTER- to open the shutter. These connections are also detailed in the “Pinouts” document.

The shutter can be controlled from G4 by issuing a ‘SHUT’ manual command, with the argument being 1 to open it and 0 to close it. Normally the shutter is controlled in the ARC micro-controller code as part of the exposure sequence with the following commands:

```
Open the shutter:   EMC_WRITE( ARC420_FPGA_CONTROL_REG, 0x40004000 );  
Close the shutter: EMC_WRITE( ARC420_FPGA_CONTROL_REG, 0x40000000 );
```



### HARWIN M80-5401642



For internal power supply, J35 connect pins 3-5, 4-6  
 For external power supply, J35 connect pins 1-3, 2-4  
 J35 has pin 1 in the lower left corner, pin 2 in the upper left corner.

Shutter open = SHUTER+ - SHUTTER- = 0V  
 Shutter closed = SHUTER+ - SHUTTER- = +5V