Launch Box: Arduino Mega Digital IO Block Pinouts

Digital pins 9 and 10 used by timer

**System Arm**, output, L: disarmed, H: armed - **25**

**Igniter Arm (-)**, output, L: disarmed, H: armed - **23**

**Igniter Continuity Test Select**, output, L: panel button, H: Arduino input - **40**

*Note*: This uses a mechanical relay to separate the Arduino sensor from the igniter circuit. It should normally be low, and just put high momentarily while the Arduino checks continuity. It’s very fast, but not instantaneous, so make sure there is a short pause so the relay can catch up. The OS must also prevent the igniter from going off when this channel’s set high, and should display something on the screen like “Wait to Test Continuity,” because the pushbutton won’t work while this is high.

**Igniter Test**, input\_pullup, L:continuity check pass, H: continuity check fail (*see above note*) - **42**

**Pre-arm Monitor**, input, L: arm key switch off, H: arm key switch on - **35**

*Note*: “Pre-armed” means the key switch at the box has been turned, “armed” means this plus the system arm relay has been remotely activated. In pre-arm, the only relays that work are the ones that put solenoids in the closed position. When the OS sees pre-arm goes high, it needs to run a one-time routine that pulses all the close relays (probably in succession to minimize current draw).

**Igniter Disable Monitor**, input, L: igniter disabled, H: igniter enabled – **37**

**Buzzer**, output, L: off, H: on - **6**

*All relay channels should be initialized LOW.*

*Split open/close channels should be pulsed for ~1.5 second to actuate the solenoid.*

**Ch. 1o (Relay 1)**, output, L: off, H: on – *N2O Fill open* - **38**

**Ch. 1c (Relay 2)**, output, L: off, H: on – *N2O Fill close* - **36**

**Ch. 2o (Relay 3)**, output, L: off, H: on – *N2O Vent open* - **34**

**Ch. 2c (Relay 4)**, output, L: off, H: on – *N2O Vent close* - **32**

**Ch. 3o (Relay 5)**, output, L: off, H: on – *Oxygen Fill open* - **30**

**Ch. 3c (Relay 6)**, output, L: off, H: on – *Oxygen Fill close* - **28**

**Ch. 4o (Relay 7)**, output, L: off, H: on – *QD Air open* - **26**

**Ch. 4c (Relay 8)**, output, L: off, H: on – *QD Air close* - **24**

**Ch. 5 (Relay 9)**, output, L: close valve, H: open valve – *AUX* – **22**

**Aux 2(Relay 10)**, output, L: off, H: on - **33**

**Ch. A (Relay A)**, output, L: close valve, H: open – 24V - **31**

**Ch. B (Relay B)**, output, L: close valve, H: open – 24V – **29**

**Igniter Fire,** output, L: off, H: ignite - **44**

*LCD Screen Pins*

**RS - 39, E - 41, DB4 - 45, DB5 - 47, DB6 - 49, DB7 - 51**

*Note:* Use the LiquidCrystal.h library. The constructor is LiquidCrystal(RS, E, DB4, DB5, DB6, DB7) and the display size is 16x2, so initialize with begin(16,2).

*Unused:*

5V-3.3V Logic level converter channels LV3 (**53**), LV4 (**52**)

*Voltage Dividers:*

(x is value from analogRead(), if V < 1.1, it equals 0)

9V curve: V = 0.0097x + 0.4742 - **A7**

12V curve: V = 0.0152x + 0.5152 - **A8**

24V curve: V = 0.0315x + 0.5752 - **A9**