"Smart" Shutter

System Design Requirements - Interface

Power:

May be cycled
- Max "ON" duration = 40 seconds
- Duty cycle = once every 10 minutes

Maintain compatibility with OASIS mooring
12V Nominal
15V Maximum
Minimize current consumption (current unit has a 2A limit and uses 0.5A normally)
- Requires isolation: No

I/O:

Maintain a serial "3-wire" interface
- Optically isolated: No
- Ideally RS232 & RS485 compatible (for DPA compliance)
  - Ideally RS-485 for a bus architecture

Environmental:

Temperature: 0 to 80C
Humidity: 100%
Pressure: 20m depth
Radiation: n/a
EMI: n/a
Vibration: n/a
Shock: n/a

System Design Requirements - Electrical

Software:

1. Use a PIC16F87X processor
   - Provide connection for in-circuit programming/debugging
2. Run at 4 MHz
3. Connect serial RX to interrupt
4. Connect micro PWM output to motor driver
5. Provide status LEDs for power & H-bridge direction
6. Provide a large non-volatile memory for future use

Mechanical:

1. Provide drive for a MicroMo 2224U012SR motor with a 23/1 246:1 gearhead
2. Provide an interface to a MicroMo IE2-16 shaft position encoder
3. Manufactured PCB must remain under 2.875" diameter by 1" high
4. Interface to 2 Micronas HAL114 Hall Sensors for limit detection