Servo/Sensor/Motor Interface Board for NanoCore12DX™ Data Sheet

Description

Designed primarily for robotics and mechatronics applications, this module provides a wide range of features that a user would need to realize these applications using a NanoCore12DX microcontroller module. Support for hobby R/C servos, DC motors, and IR and sonar distance-measuring sensors are the primary features. A generous solderless breadboard section is provided for additional circuits and experiments that the user may wish to design. Both 3V and 5V operation is supported, via the on-board adjustable regulator, and the power source can be wall-powered or battery-powered. For battery-powered applications, a battery voltage monitoring circuit is implemented. Both a microphone and audio transducer are provided to enable interactive applications.

Detailed Feature List:

- Four analog sensor connectors, can be used with IR distance-measuring sensors, accelerometers, etc.
- Six connectors for hobby servos (implemented on Port T of the MCU, to enable PWM control)
- One 9-pin serial port connector for programming and communications
- Two connectors for Devantech SRF04 Analog Ultrasonic Ranger
- Separate 6 Volt regulator for servos (isolates electrical noise and provides increased torque)
- Separate 5 Volt regulator for analog sensors (isolates electrical noise)
- Battery voltage monitoring (up to 20volts)
- Audio transducer
- Microphone so your robot can detect sound
- Dual high-current H-bridges (4A continuous, 6A peak)
- Convenient pluggable terminal blocks for motor and power connections
- Solderless breadboard for customized hardware design
- Same mounting hole locations as NanoCore12 School Board (compatible with most hobby robot bases)
- Requires 32-pin NanoCore module (#NC12D XC32)
- Supplied with schematic and datasheet
Servo/Sensor/Motor Interface Board

- **DC Voltage In (7 to 10V)**
- **5 Volt Regulator**
- **socket for NanoCore12DX module**
- **9-pin RS232 Connector**
- **select Vdd source for breadboard:** default (shown) is Vsharp
- **pluggable terminal blocks**
- **socket strips for access to MCU signals** (pin numbers match NC12DXC32 module)
- **solderless breadboard 60x5-way tie-points**

**voltage regulator for Servos**

**connections for two hobby servo motors**

**SERVO1 (J3)**
- Pin 1 = PT4
- Pin 2 = Vservo
- Pin 3 = Ground

**SERVO2 (J6)**
- Pin 1 = PT5
- Pin 2 = Vservo
- Pin 3 = Ground

**connections for 4 additional hobby servo motors**

**J12: SERVO3 (Pin1 = PT0, Pin2 = Vservo, Pin3 = Gnd)**
**J13: SERVO4 (Pin1 = PT1, Pin2 = Vservo, Pin3 = Gnd)**
**J14: SERVO5 (Pin1 = PT2, Pin2 = Vservos, Pin3 = Gnd)**
**J15: SERVO6 (Pin1 = PT3, Pin2 = Vservos, Pin3 = Gnd)**

**Power LED**
**Reset button**

**mounting holes (8 places)** to mate with most popular robot platforms

**audio transducer (on PM4)**
**connectors for 2 sonars (SRF04)**

**J1**
- Pin1 = Vsharp
- Pin2 = PT7
- Pin3 = PM0
- Pin4 = no connect
- Pin5 = Ground

**J4**
- Pin1 = Vsharp
- Pin2 = PT6
- Pin3 = no connect
- Pin4 = no connect
- Pin5 = Ground

**Connections for 4 Sharp GP2D120 IR sensors** (or other analog sensors)

**J8 = AN02**
- Pin1 = Vsharp
**J9 = AN03**
- Pin2 = Ground
**J10 = AN04**
- Pin3 = AN0x

**J11 = AN05**

*-Note: to use higher voltage motors (e.g. 12V or 24V), remove L1 and L2, and supply Vin to MCU module separately (maximum 12V), via pin 32 on H1 or H2. Then motor voltage may be safely applied via J5.*

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