IRIS
Iris Dynamics Ltd.

IO SmartHub™ Datasheet

Digital and Analog Input and Output

Supports

ORCA-6-LITE

ORCA-6-24V

ORCA-6-48V

ORCA-15-48V

Overview

The Orca IO SmartHub (IOSH) enables control of any Orca Series motor using analog or digital signals. It provides a simple and robust way to directly control the position target or force output from the motor, or to trigger pre-programmed paths that are saved to the motor. The IOSH provides position and force feedback using separate 4-20 mA outputs and provides a digital error and warning signal. It is intended to provide easy and reliable integration with a wide range of IO devices, including simple switches, PLCs and microcontrollers.

Product Highlights

- One 4-20 mA or 0-20 mA input
- Two 4-20 mA or 0-20 mA outputs
- Two 24V (sinking) digital outputs
- Four 24V (sinking) digital inputs
- Galvanic Isolation between PLC and motor
- Configurable input and output context
- 5-30 V supply range
- 2250 Hz sampling rate
- Adjustable Input Range and Sensitivity
- Adjustable Output Range and Sensitivity

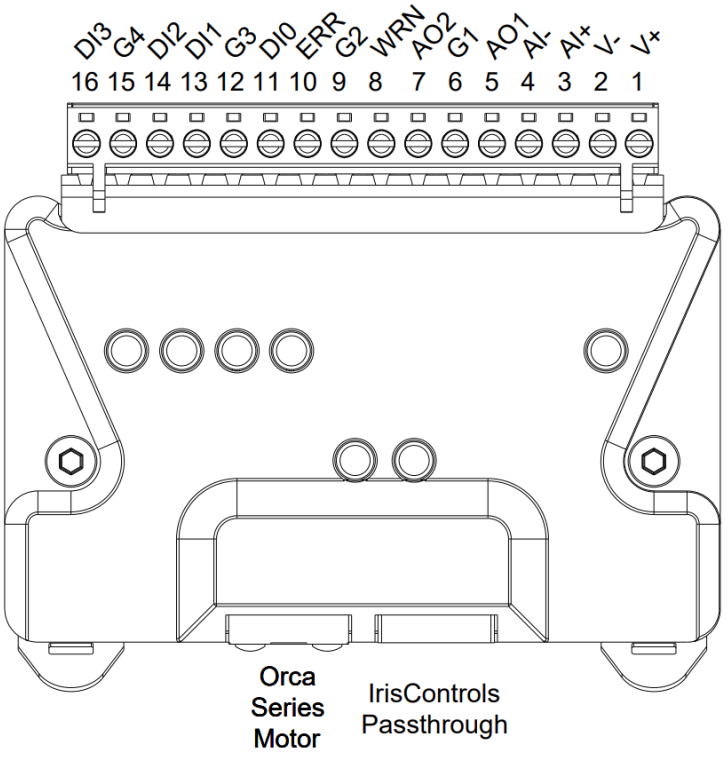

Figure 1 - IO SmartHub Pinout

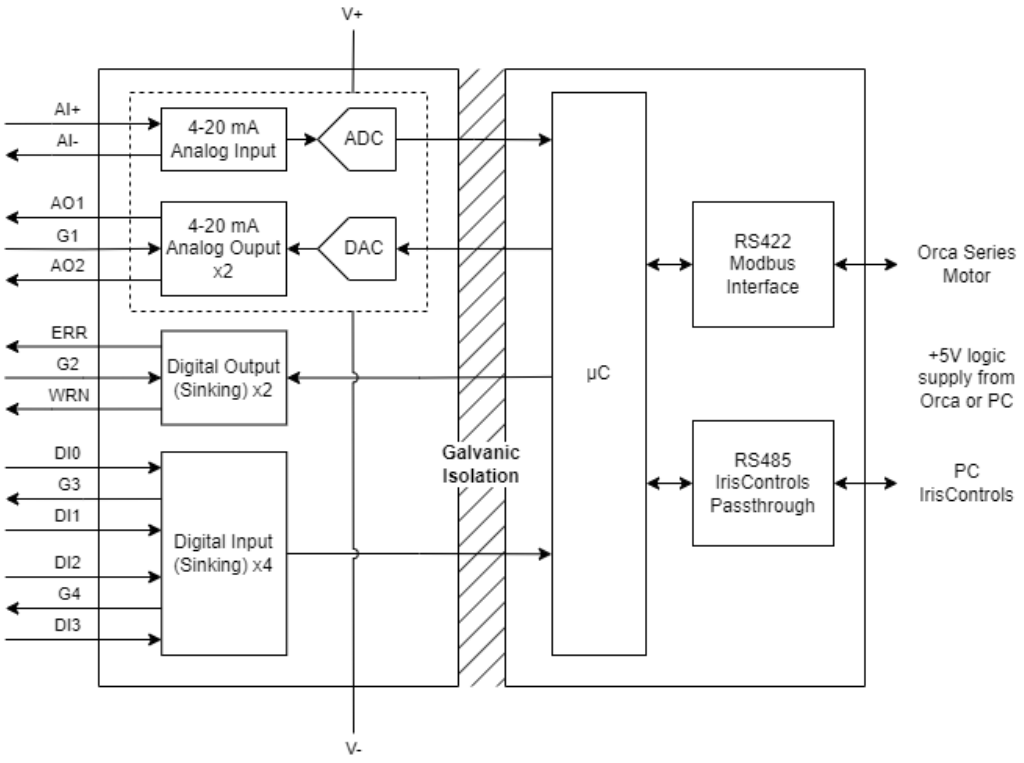

Figure 2 - IO SmartHub System Block Diagram

Pin Descriptions

Pin Number	Pin Name	Function
1	V+	5-30V power supply terminal.
2	V-	0V power supply terminal.
3	AI+	Analog input positive current terminal.
4	AI-	Analog input return current terminal.
5	AO1	Analog output 1 positive current terminal.
6	G1	Common current return terminal for AO1 and AO2 pins.
7	AO2	Analog output 2 positive current terminal.
8	WRN	Warning signal digital output.
9	G2	Common terminal for WRN and ERR pins.
10	ERR	Error signal digital output.
11	DI0	Digital input signal 0.
12	G3	Common terminal for DI0 and DI1 pins.
13	DI1	Digital input signal 1.
14	DI2	Digital input signal 2.
15	G4	Common terminal for DI2 and DI3 pins.
16	DI3 / Enable	Digital input signal 3. Functions as enable signal for all available modes.

Specifications

IO SmartHub

General Specifications

Supply Voltage (PLC Domain)	min	5 V	*Analog circuits require >5V*
	max	30 V	*Exposure to supply voltages exceeding max can cause permanent damage.*
Supply Voltage (Logic Domain)	typ	5 V	*Provided by Orca series motor connection.*
Supply Current (PLC Domain)	max	64 mA	
Supply Current (Logic Domain)	max	38 mA	*Supplied by Orca series motor power supply.*
ESD Protection	IEC 61000-4-2 Level 4		
Operating Temperature	min	-20 °C	
	max	70 °C	
Serial Protocol	RS422		*Half Duplex; 120 Ω termination.*
Message Protocol	Modbus RTU		*For communication with Orca series motors.*
Maximum Baudrate	1 Mbps		
Communication Rate	2.25 kHz		*Rate for digital and analog input updates.*

The standard IOSH product is supplied with a 16-position pluggable screw terminal block, and two removeable clips for mounting on 35mm DIN3 rail (fasteners included). Please contact us at sales@irisdynamics.com if your application requires substitutions for these parts.

Mechanical Specifications

Chassis Specifications

Weight (Device Only)	0.099 kg	*0.22 lbs*
Weight (Standard Assembly)	0.138 kg	*0.3 lbs*
Chassis Fasteners	4 * M3 x 10mm	
Chassis Material	Delrin	
Mounting Fasteners	2 * M4 x 12mm	

Standard Screw Terminal Specifications

Positions	16
Accepted Wire Gauge	12-30 AWG
Wire Strip Length	7 mm
Pitch	5 mm
Screw Torque	0.5-0.6 Nm

Interface Specifications

Interface	Use	Notes
Screw Terminal	PLC / Controller Connection	
RJ45 1	Orca Series Motor Data Connection	*Shielded, TX/RX Lights*
RJ45 2	Orca IrisControls Passthrough	*Provides 5V logic power to both IO SmartHub and Orca*

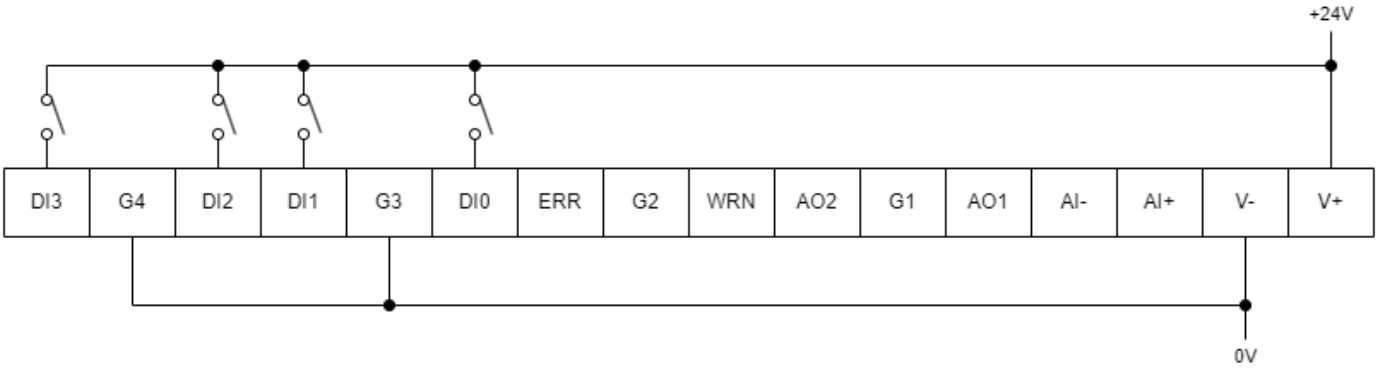

Figure 3 - Digital Input Wiring Diagram

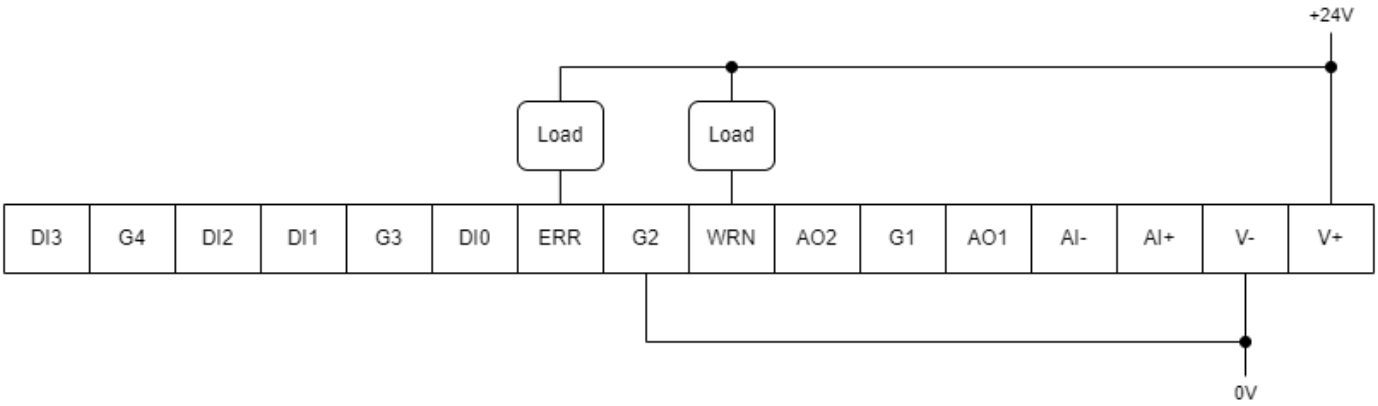

Figure 4 - Digital Output Wiring Diagram

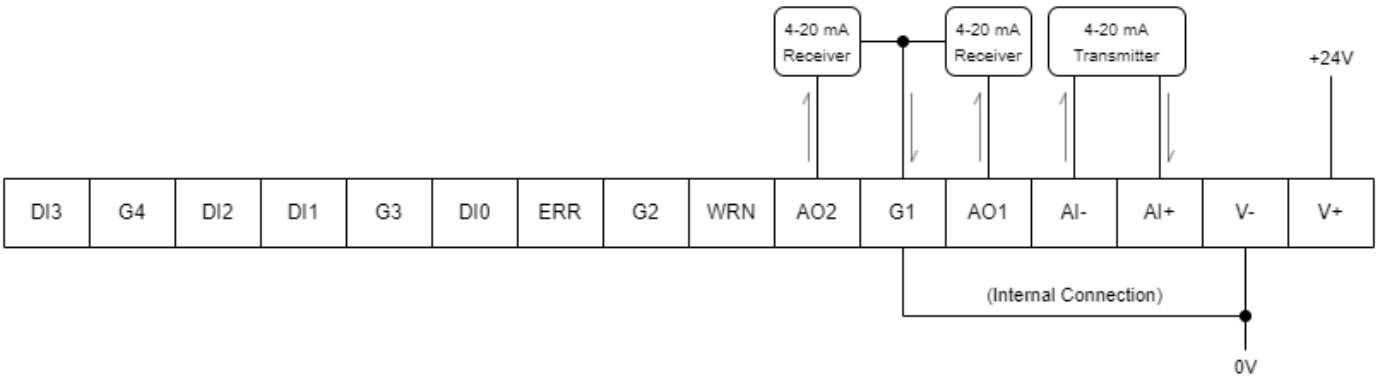

Figure 5 - Analog Input and Output Wiring Diagram

Application Notes

Pneumatic Replacement with Kinematic Control

The IO SmartHub is well suited to integrate Orca Series motors into applications where pneumatic actuators are traditionally used. The IO SmartHub's digital inputs combined with the Orca Series motors kinematic mode of operation can emulate and often surpass pneumatic actuator performance with the exact same control signals. No reprogramming or replacement of active PLC systems should be necessary.

Recommended wiring for this application is shown in Figure 3.

Orca configuration required includes:

- Setting IO SmartHub mode to Kinematic.
- Configure IO SmartHub digital input kinematic triggers.
- Tuning PID position control parameters.
- Setting desired motion profiles for the kinematic controller.

More information on configuring Orca Series motors with IrisControls can be found in the IO SmartHub user manual.

Polishing or Grinding with Analog Force Control

Configuring the IO SmartHub to convert 4-20 mA inputs into force commands provides a simple way to press an object against a polishing or grinding surface with adjustable pressure, independent of position.

Recommended wiring for this application is shown in Figure 5. The analog outputs are optional if the application does not require feedback. Note that the enable input (DI3 / Enable) is required to be high for force output.

Orca configuration required includes:

- Setting IO SmartHub mode to Force.
- Setting desired force output range mapped to the analog input range.

Further Support

For other documents and support, including:

- Orca IO SmartHub User Guide
- Orca IO SmartHub Mechanical Drawings
- Orca Series Reference Manual (RM220115)

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