



HCX – Hand Controller 012-0002 Electrical ICD

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DOCUMENT REVISION HISTORY

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1 Scope

This document describes the electrical interfaces for the Shotover Systems Hand Controller 012-0002.

2 References

Table 1: Applicable Documentation

Reference	Document Number	Description
RD1	002-9480	ICD – HCX HAND CONTROLLER
RD2	011-9029	M2 Gimbal 011-0000-XXX
RD3	011-9033	M2 User Manual – Laser System
RD4	002-9451	OSCAR ICD

3 List of Acronyms

Table 2: List of Acronyms

PoE	Power Over Ethernet
ETH	Ethernet
AWG	American Wire Gauge
ICD	Interface Control Document
LAP	Laser Arming Panel
TBD	To Be Determined
TBR	To Be Released

4 Hand Controller Specifications

Table 3: Hand Controller Specifications

Parameter	Value
Input Power	6.49W (PoE Class 2)
Weight	Controller: 0.65kg (1.4lb) Cradle: 0.20kg (0.64lb)
Storage Temperature Range	-30°C to 75°C
Operating Temperature Range	-15°C to 70°C

5 Hand Controller Interfaces

5.1 Hand Controller External Electrical Interfaces

J1 – External power and comms.

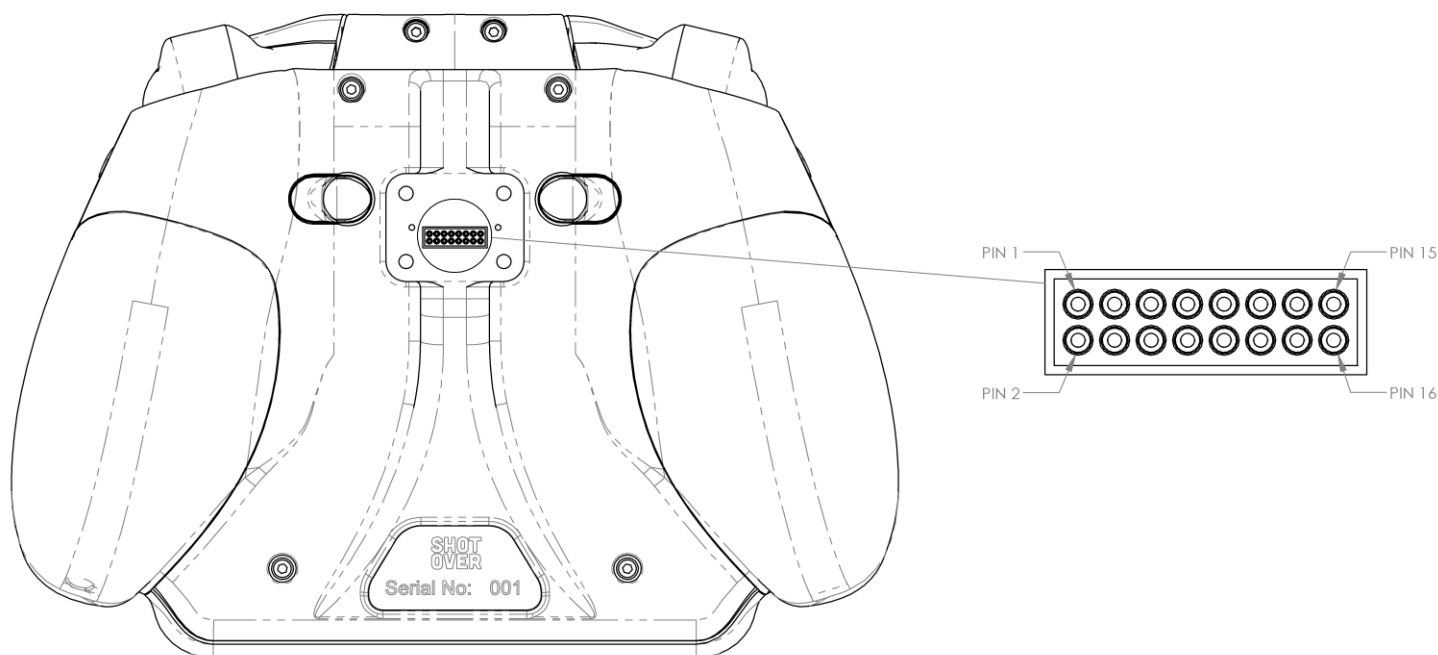


Figure 1: Location of External Connector, Rear View

5.1.1 J1 External Power and Comms

Table 4: External Power and Comms Connector Pin Assignments

Pin	Function	Type	Connection
1	Laser Fire Point	Dry Contact	LAP
2	Laser Fire Illum	Dry Contact	LAP
3	RESERVED 3	Reserved	N/A
4	Laser Fire Source	Dry Contact	LAP
5	RESERVED 2	Reserved	N/A
6	Power Enable	Dry Contact	GIMBAL
7	RESERVED 1	Reserved	N/A
8	Power Ground	Dry Contact	GIMBAL
9	ETH C+	PoE	OSCAR
10	ETH A- (DC+)	PoE	OSCAR
11	ETH C-	PoE	OSCAR
12	ETH A+ (DC+)	PoE	OSCAR
13	ETH D+	PoE	OSCAR
14	ETH B- (DC-)	PoE	OSCAR
15	ETH D-	PoE	OSCAR
16	ETH B+ (DC-)	PoE	OSCAR
SHELL	SHIELD	SHIELD	Platform

Notes:

- For use with SHOTOVER cables only.
- The Hand Controller uses 100Base-T ethernet and does not actively use ETH C and ETH D. These pairs are terminated inside the Hand Controller.

5.1.2 Power Enable

Dry contact between Power Ground and Power Enable pins.
Contact Rating: 300mA 30V.

5.1.3 Power Over Ethernet

The Hand Controller is powered by Active PoE Class 2 (Mode A).

5.1.4 Laser Signals

The laser signals are dry contacts between Laser Fire Source and Laser Fire Point/Illum.

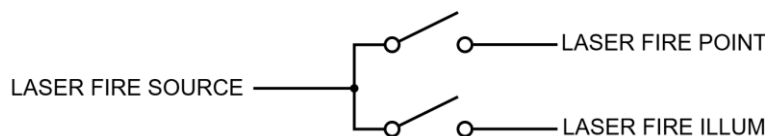


Figure 2: Laser Fire Switch Configuration

Contact Rating: 100mA 35V.

See reference document RD3 for further information regarding the safe use of the M2 laser system

5.1.5 External Cables

External cables are pre-made by SHOTOVER and are available in direct OSCAR connection or bulkhead 2M801 variants.

The Hand Controller connector is reversable and can be configured to exit out of the front or rear of the Hand Controller.

Table 5: OSCAR Connector Cables

Description	Shotover Part Number
Cable - Hand Controller OSCAR 1.5m Straight	012-5565
Cable - Hand Controller OSCAR 3.0m Straight	012-5566
Cable - Hand Controller OSCAR 0.8m Coiled	012-5569

Table 6: Bulkhead Connector Cables

Description	Shotover Part Number
Cable - Hand Controller Bulkhead 1.5m Straight	012-5567
Cable - Hand Controller Bulkhead 3.0m Straight	012-5568
Cable - Hand Controller Bulkhead 0.8m Coiled	012-5570

5.1.5.1 Bulkhead Connector Pinout

Table 7: Bulkhead Connector Pinout

Pin	Function	Type	Connection
1	ETH A- (DC+)	PoE	OSCAR
2	ETH B+ (DC-)	PoE	OSCAR
3	ETH C+	PoE	OSCAR
4	Power Enable	Dry Contact	GIMBAL
5	Fire Point Output	Dry Contact	LAP
6	Fire Illum Output	Dry Contact	LAP
7	ETH A+ (DC+)	PoE	OSCAR
8	ETH D+	PoE	OSCAR
9	ETH B- (DC-)	PoE	OSCAR
10	ETH C-	PoE	OSCAR
11	Power Ground	Dry Contact	GIMBAL
12	Laser Source Input	Dry Contact	LAP
13	ETH D-	PoE	OSCAR
SHELL	SHIELD	SHIELD	Platform

Connector Part Number: 2M801-007-26M8-13PA

6 Appendices

6.1 Appendix One – Mating Connectors

The following parts are available from Shotover.

Table 8: Mating Bulkhead Connectors

Description	Manufacturer	Manufacturer Part Number	Shotover Part Number
RECEPTACLE 2M801 8-13S ELECTROLESS NICKEL, ACCESORY THREAD	AMPHENOL	2M801-010-02M8-13SA	002-63573
RECEPTACLE 2M801 8-13S ELECTROLESS NICKEL, INTEGRAL BACKSHELL	AMPHENOL	2M801-009-02M8-13SA	002-63577

Note: 2M809-002 sockets are included with connectors. Insertion tools are not.

6.2 Appendix Two – Connector Tooling

Table 9: Connector Tooling

Connector	Crimper	DIE/POSITIONE R	Pins/Sockets	Insertion / Removal Tool
2M801-010-02M8-13SA	M22520/2-01	K1461-1	2M809-002 (22-28AWG)	DAK225-22 (Insertion) DRK225-22 (Removal)
2M801-009-02M8-13SA	M22520/2-01	K1461-1	2M809-002 (22-28AWG)	DAK225-22 (Insertion) DRK225-22 (Removal)