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MCA-7724 Motion Axis Router

Introduction

The MCA-7724 Motion Axis Router reroutes the signals from your motion controller into separate connectors that connect to different motion accessories. The router allows you to connect one, two, three, and four axis drives and accessories to a controller.

Features

The MCA-7724 Motion Axis Router has five 68-pin VHDCI connectors: the controller connector, connector A, connector B, connector C, and connector D. Figure 1 shows the five connectors.

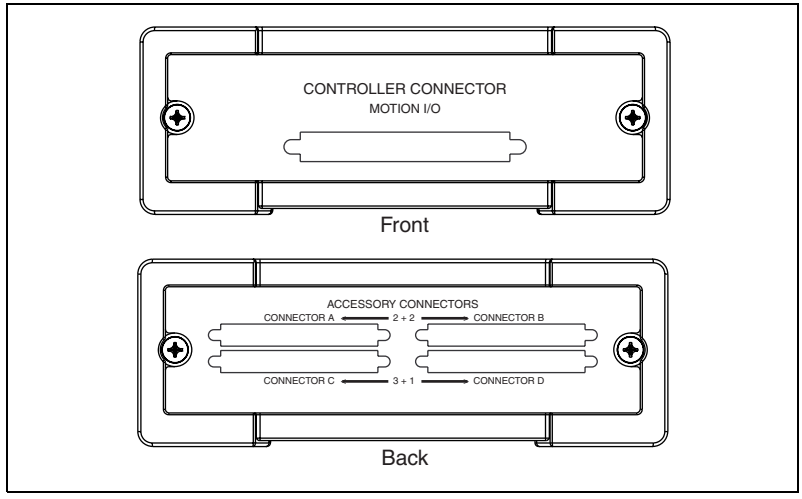


Figure 1. MCA-7724 Motion Axis Router Connectors

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Connectivity Options

The controller connector on the MCA-7724 Motion Axis Router connects to the 68-pin motion I/O connector on your controller. The adapter then reroutes signals from the motion I/O connector to the accessory connectors on the MCA-7724 Motion Axis Router. You can connect motion drives and accessories in a 2 + 2 connectivity option or a 3 + 1 connectivity option. Figures 2 and 3 show the two connectivity options.

Caution Connect motion drives and accessories only to connectors A and B (2 + 2 connectivity option) or to connectors C and D (3 + 1 connectivity option). Failure to connect the motion drives and accessories as shown in Figures 2 and 3 may result in damage to the motion controller, axis router, drive, or accessory.

2 + 2 Connectivity Option

Controller axes 1 and 2 from the controller correspond to axes 1 and 2 on connector A, and controller axes 3 and 4 correspond to axes 1 and 2 on connector B, as shown in Figure 2.

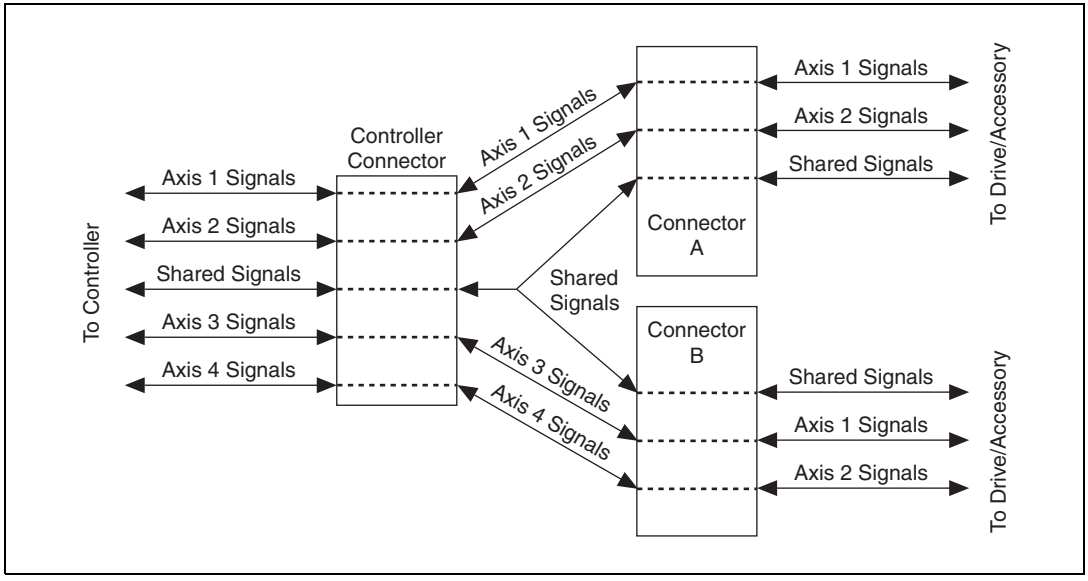


Figure 2. 2 + 2 Connectivity Option

3 + 1 Connectivity Option

Controller axes 1, 2, and 3 correspond to axes 1, 2, and 3 on connector C, and controller axis 4 corresponds to axis 1 on connector D, as shown in Figure 3.

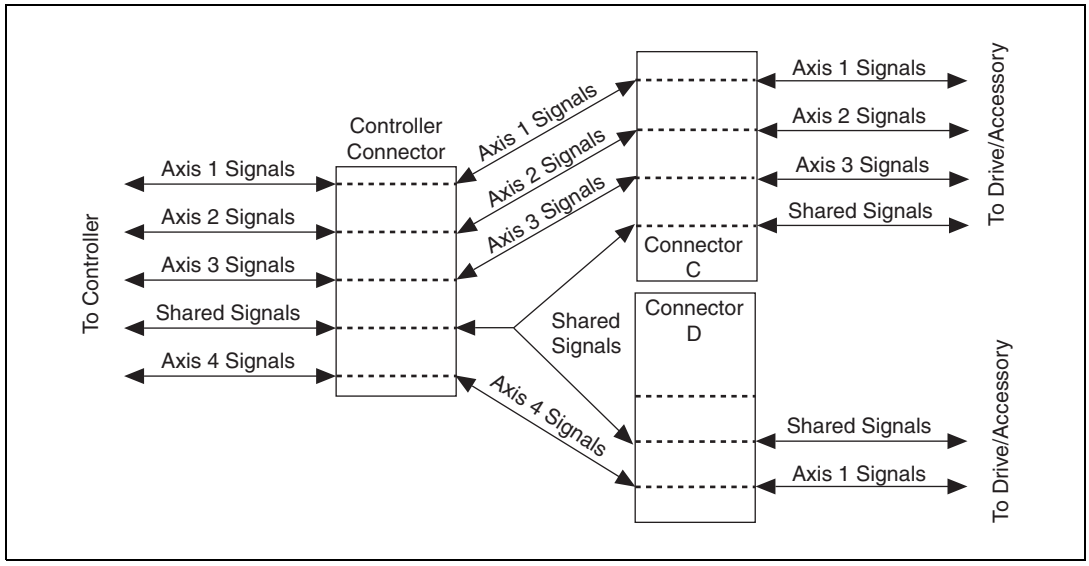


Figure 3. 3 + 1 Connectivity Option

Axis Signals

The per axis and shared signals from the controller are listed below.

Note A line above the signal name indicates that the signal is active-low.

Per Axis Signals from the Controller

Step (CW)
Dir (CCW)
Encoder Phase A
Encoder Phase B
Encoder $\overline{\text{Index}}$
Forward Limit Switch
Reverse Limit Switch
Home Switch
Trigger
$\overline{\text{Breakpoint}}$
$\overline{\text{Inhibit}}$
Analog Output
Analog Input

Shared Signals from the Controller

Host +5V
Digital Ground
Analog Input Ground
Analog Output Ground
Analog Reference (Output)
Shutdown

Note Some signals may not be available on your controller. Please consult your controller user manual for signal connection information.

Caution Shared signals are available at all four accessory connectors. Use caution to avoid double driving input signal shutdown.

Software Configuration

Because of signal rerouting, the axis number on your accessory may not match the programmed axis in your software. With the 2 + 2 connectivity option, the accessory connected to connector B will refer to the axes as axis 1 and axis 2, but will be programmed as axis 3 and axis 4, respectively, in your software. With the 3 + 1 connectivity option, the accessory connected to connector D will refer to the axis as axis 1 but will be programmed as axis 4 in your software.

Connecting Your Adapter

This section provides the pin assignments for each of the MCA-7724 connectors.

Figure 4 shows the pin assignments for the controller connector.

Axis 1 Dir (CCW)	1	35	Axis 1 Step (CW)
Digital Ground	2	36	Axis 1 Encoder Phase A
Digital Ground	3	37	Axis 1 Encoder Phase B
Axis 1 Home Switch	4	38	Axis 1 Encoder $\overline{\text{Index}}$
Trigger 1	5	39	Axis 1 Forward Limit Switch
Axis 1 $\overline{\text{Inhibit}}$	6	40	Axis 1 Reverse Limit Switch
Axis 2 Dir (CCW)	7	41	Axis 2 Step (CW)
Digital Ground	8	42	Axis 2 Encoder Phase A
Digital Ground	9	43	Axis 2 Encoder Phase B
Axis 2 Home Switch	10	44	Axis 2 Encoder $\overline{\text{Index}}$
Trigger 2	11	45	Axis 2 Forward Limit Switch
Axis 2 $\overline{\text{Inhibit}}$	12	46	Axis 2 Reverse Limit Switch
Axis 3 Dir (CCW)	13	47	Axis 3 Step (CW)
Digital Ground	14	48	Axis 3 Encoder Phase A
Digital Ground	15	49	Axis 3 Encoder Phase B
Axis 3 Home Switch	16	50	Axis 3 Encoder $\overline{\text{Index}}$
Trigger 3	17	51	Axis 3 Forward Limit Switch
Axis 3 $\overline{\text{Inhibit}}$	18	52	Axis 3 Reverse Limit Switch
Axis 4 Dir (CCW)	19	53	Axis 4 Step (CW)
Digital Ground	20	54	Axis 4 Encoder Phase A
Digital Ground	21	55	Axis 4 Encoder Phase B
Axis 4 Home Switch	22	56	Axis 4 Encoder $\overline{\text{Index}}$
Trigger 4	23	57	Axis 4 Forward Limit Switch
Axis 4 $\overline{\text{Inhibit}}$	24	58	Axis 4 Reverse Limit Switch
Digital Ground	25	59	Host +5 V
Breakpoint 1	26	60	Breakpoint 2
Breakpoint 3	27	61	Breakpoint 4
Digital Ground	28	62	Shutdown
Analog Output 1	29	63	Analog Output 2
Analog Output 3	30	64	Analog Output 4
Analog Output Ground	31	65	Reserved
Analog Input 1	32	66	Analog Input 2
Analog Input 3	33	67	Analog Input 4
Analog Reference (Output)	34	68	Analog Input Ground

Figure 4. 68-Pin Controller Connector Pin Assignments

Figure 5 shows the pin assignments for connector A.

Axis 1 Dir (CCW)	1	35	Axis 1 Step (CW)
Digital Ground	2	36	Axis 1 Encoder Phase A
Digital Ground	3	37	Axis 1 Encoder Phase B
Axis 1 Home Switch	4	38	Axis 1 Encoder $\overline{\text{Index}}$
Trigger 1	5	39	Axis 1 Forward Limit Switch
Axis 1 $\overline{\text{Inhibit}}$	6	40	Axis 1 Reverse Limit Switch
Axis 2 Dir (CCW)	7	41	Axis 2 Step (CW)
Digital Ground	8	42	Axis 2 Encoder Phase A
Digital Ground	9	43	Axis 2 Encoder Phase B
Axis 2 Home Switch	10	44	Axis 2 Encoder $\overline{\text{Index}}$
Trigger 2	11	45	Axis 2 Forward Limit Switch
Axis 2 $\overline{\text{Inhibit}}$	12	46	Axis 2 Reverse Limit Switch
NC	13	47	NC
Digital Ground	14	48	NC
Digital Ground	15	49	NC
NC	16	50	NC
NC	17	51	NC
NC	18	52	NC
NC	19	53	NC
Digital Ground	20	54	NC
Digital Ground	21	55	NC
NC	22	56	NC
NC	23	57	NC
NC	24	58	NC
Digital Ground	25	59	Host +5 V
Breakpoint 1	26	60	Breakpoint 2
NC	27	61	NC
Digital Ground	28	62	Shutdown
Analog Output 1	29	63	Analog Output 2
NC	30	64	NC
Analog Output Ground	31	65	Reserved
Analog Input 1	32	66	Analog Input 2
NC	33	67	NC
Analog Reference (Output)	34	68	Analog Input Ground

Figure 5. 68-Pin Connector A Pin Assignments

Figure 6 shows the pin assignments for connector B.

Axis 3 Dir (CCW)	1	35	Axis 3 Step (CW)
Digital Ground	2	36	Axis 3 Encoder Phase A
Digital Ground	3	37	Axis 3 Encoder Phase B
Axis 3 Home Switch	4	38	Axis 3 Encoder $\overline{\text{Index}}$
Trigger 3	5	39	Axis 3 Forward Limit Switch
Axis 3 $\overline{\text{Inhibit}}$	6	40	Axis 3 Reverse Limit Switch
Axis 4 Dir (CCW)	7	41	Axis 4 Step (CW)
Digital Ground	8	42	Axis 4 Encoder Phase A
Digital Ground	9	43	Axis 4 Encoder Phase B
Axis 4 Home Switch	10	44	Axis 4 Encoder $\overline{\text{Index}}$
Trigger 4	11	45	Axis 4 Forward Limit Switch
Axis 4 $\overline{\text{Inhibit}}$	12	46	Axis 4 Reverse Limit Switch
NC	13	47	NC
Digital Ground	14	48	NC
Digital Ground	15	49	NC
NC	16	50	NC
NC	17	51	NC
NC	18	52	NC
NC	19	53	NC
Digital Ground	20	54	NC
Digital Ground	21	55	NC
NC	22	56	NC
NC	23	57	NC
NC	24	58	NC
Digital Ground	25	59	Host +5 V
Breakpoint 3	26	60	Breakpoint 4
NC	27	61	NC
Digital Ground	28	62	Shutdown
Analog Output 3	29	63	Analog Output 4
NC	30	64	NC
Analog Output Ground	31	65	Reserved
Analog Input 3	32	66	Analog Input 4
NC	33	67	NC
Analog Reference (Output)	34	68	Analog Input Ground

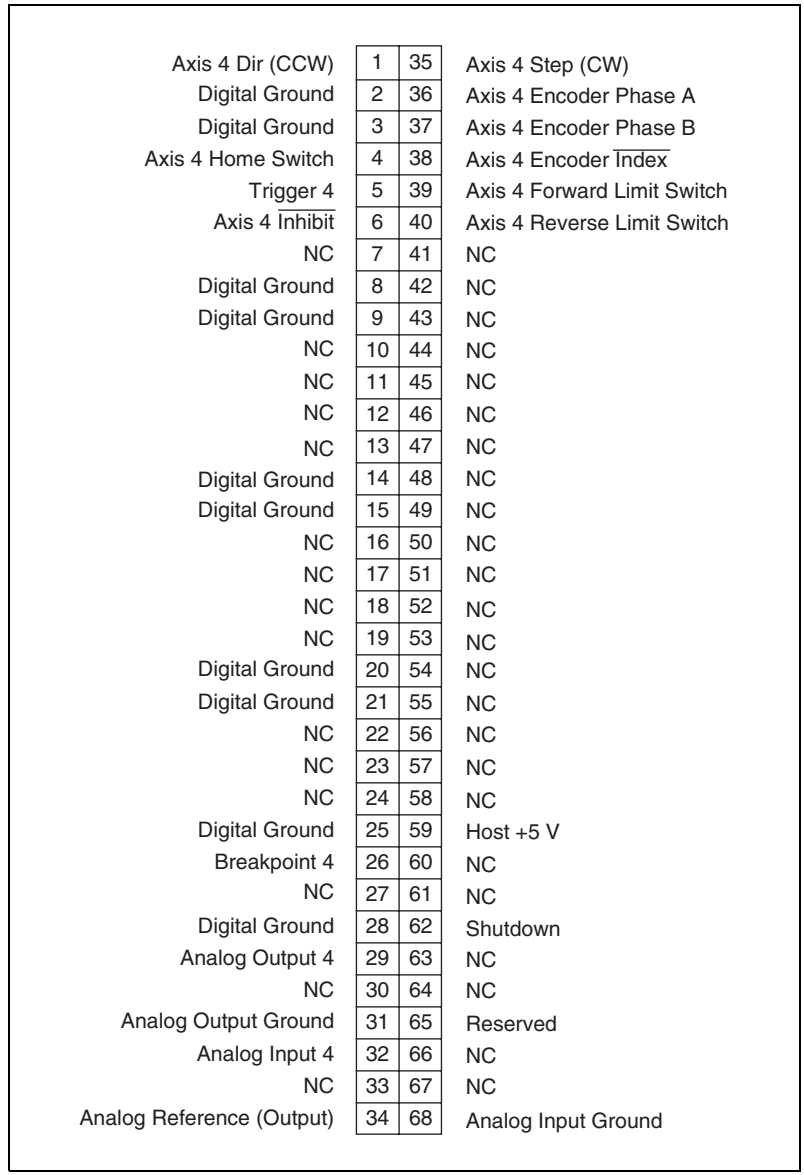
Figure 6. 68-Pin Connector B Pin Assignments

Figure 7 shows the pin assignments for connector C.

Axis 1 Dir (CCW)	1	35	Axis 1 Step (CW)
Digital Ground	2	36	Axis 1 Encoder Phase A
Digital Ground	3	37	Axis 1 Encoder Phase B
Axis 1 Home Switch	4	38	Axis 1 Encoder $\overline{\text{Index}}$
Trigger 1	5	39	Axis 1 Forward Limit Switch
Axis 1 $\overline{\text{Inhibit}}$	6	40	Axis 1 Reverse Limit Switch
Axis 2 Dir (CCW)	7	41	Axis 2 Step (CW)
Digital Ground	8	42	Axis 2 Encoder Phase A
Digital Ground	9	43	Axis 2 Encoder Phase B
Axis 2 Home Switch	10	44	Axis 2 Encoder $\overline{\text{Index}}$
Trigger 2	11	45	Axis 2 Forward Limit Switch
Axis 2 $\overline{\text{Inhibit}}$	12	46	Axis 2 Reverse Limit Switch
Axis 3 Dir (CCW)	13	47	Axis 3 Step (CW)
Digital Ground	14	48	Axis 3 Encoder Phase A
Digital Ground	15	49	Axis 3 Encoder Phase B
Axis 3 Home Switch	16	50	Axis 3 Encoder $\overline{\text{Index}}$
Trigger 3	17	51	Axis 3 Forward Limit Switch
Axis 3 $\overline{\text{Inhibit}}$	18	52	Axis 3 Reverse Limit Switch
NC	19	53	NC
Digital Ground	20	54	NC
Digital Ground	21	55	NC
NC	22	56	NC
NC	23	57	NC
NC	24	58	NC
Digital Ground	25	59	Host +5 V
Breakpoint 1	26	60	Breakpoint 2
Breakpoint 3	27	61	NC
Digital Ground	28	62	Shutdown
Analog Output 1	29	63	Analog Output 2
Analog Output 3	30	64	NC
Analog Output Ground	31	65	Reserved
Analog Input 1	32	66	Analog Input 2
Analog Input 3	33	67	NC
Analog Reference (Output)	34	68	Analog Input Ground

Figure 7. 68-Pin Connector C Pin Assignments

Figure 8 shows the pin assignments for connector D.



Axis 4 Dir (CCW)	1	35	Axis 4 Step (CW)
Digital Ground	2	36	Axis 4 Encoder Phase A
Digital Ground	3	37	Axis 4 Encoder Phase B
Axis 4 Home Switch	4	38	Axis 4 Encoder $\overline{\text{Index}}$
Trigger 4	5	39	Axis 4 Forward Limit Switch
Axis 4 $\overline{\text{Inhibit}}$	6	40	Axis 4 Reverse Limit Switch
NC	7	41	NC
Digital Ground	8	42	NC
Digital Ground	9	43	NC
NC	10	44	NC
NC	11	45	NC
NC	12	46	NC
NC	13	47	NC
Digital Ground	14	48	NC
Digital Ground	15	49	NC
NC	16	50	NC
NC	17	51	NC
NC	18	52	NC
NC	19	53	NC
Digital Ground	20	54	NC
Digital Ground	21	55	NC
NC	22	56	NC
NC	23	57	NC
NC	24	58	NC
Digital Ground	25	59	Host +5 V
Breakpoint 4	26	60	NC
NC	27	61	NC
Digital Ground	28	62	Shutdown
Analog Output 4	29	63	NC
NC	30	64	NC
Analog Output Ground	31	65	Reserved
Analog Input 4	32	66	NC
NC	33	67	NC
Analog Reference (Output)	34	68	Analog Input Ground

Figure 8. 68-Pin Connector D Pin Assignments

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