

HCFA CONTROL RACK CONNECTIONS

SIGNAL	Name	HCFA Rack	PHOENIX Connector	Connection Box	ADAPTER Connector	COMMENTS
AD I/O Motor +	AD-M1	Ts1-1	64-1A	Ts2-1	D25-I-13	
AD I/O Motor -	AD-M2	Ts1-2	64-2A	Ts2-2	D25-I-14	
AD I/O Mot.Shield	AD-M3	Ts1-3	64-3A	Ts2-3	D25-I-15	Connected to Shields-GND
AD I/O Tacho +	AD-T1	Ts1-4	64-4A	Ts2-4	D25-I-16	
AD I/O Tacho -	AD-T2	Ts1-5	64-5A	Ts2-5	D25-I-17	
AD I/O Tacho-Shield	AD-T3	Ts1-6	64-6A	Ts2-6	D25-I-18	Connected to Shields-GND
AD I/O Encoder +Zp	AD-M-Ua0	Ts1-7	108-1	Ts2-7	D25-I-1	
AD I/O Encoder -Zp	AD-M-Ua0*	Ts1-8	108-19	Ts2-8	D25-I-2	
AD I/O Encoder +U1	AD-M-Ua1	Ts1-9	108-37	Ts2-9	D25-I-3	
AD I/O Encoder -U1	AD-M-Ua1*	Ts1-10	108-55	Ts2-10	D25-I-4	
AD I/O Encoder +U2	AD-M-Ua2	Ts1-11	108-73	Ts2-11	D25-I-5	
AD I/O Encoder -U2	AD-M-Ua2*	Ts1-12	108-91	Ts2-12	D25-I-6	
AD I/O Enc. Shield	AD-M-Sh	Ts1-13	108-56	Ts2-13		Connected to Encoder-GND
AD I/O Enc VCC+		Ts1-135		Ts2-14		D25 : pin 8 = Sense +5V
AD I/O Enc VCC-		Ts1-133/134		Ts2-15		D25 : pin 9 = Sense 0V
AD I/O Init. Ref.	AD-REF	Ts1-14	108-38	Ts2-16	D25-I-23	Not connected to MACCON
AD I/O Upper Limit	AD-ULIM	Ts1-15	108-2	Ts2-17	D25-I-19	
AD I/O Lower Limit	AD-LLIM	Ts1-16	108-20	Ts2-18	D25-I-21	
AD Rot. Motor +	AD-R-M1	Ts1-17	64-1B	Ts2-19	D25-II-13	
AD Rot. Motor -	AD-R-M2	Ts1-18	64-2B	Ts2-20	D25-II-14	
AD Rot. Motor Shield	AD-R-M3	Ts1-19	64-3B	Ts2-21	D25-II-15	Connected to Shields-GND
AD Rot. Tacho +	AD-R-T1	Ts1-20	64-4B	Ts2-22	D25-II-16	
AD Rot. Tacho -	AD-R-T2	Ts1-21	64-5B	Ts2-23	D25-II-17	
AD Rot. Tacho Shield	AD-R-T3	Ts1-22	64-6B	Ts2-24	D25-II-18	Connected to Shields-GND
AD Rot. Encoder +Zp	AD-R-Ua0	Ts1-23	108-3	Ts2-25	D25-II-1	
AD Rot. Encoder -Zp	AD-R-Ua0*	Ts1-24	108-21	Ts2-26	D25-II-2	
AD Rot. Encoder +U1	AD-R-Ua1	Ts1-25	108-39	Ts2-27	D25-II-3	
AD Rot. Encoder -U1	AD-R-Ua1*	Ts1-26	108-57	Ts2-28	D25-II-4	
AD Rot. Encoder +U2	AD-R-Ua2	Ts1-27	108-75	Ts2-29	D25-II-5	
AD Rot. Encoder -U2	AD-R-Ua2*	Ts1-28	108-93	Ts2-30	D25-II-6	
AD Rot. Encoder Shield	AD-R-Sh	Ts1-29	108-58	Ts2-31		Connected to Encoder-GND
AD Rot. Enc VCC+		Ts1-135		Ts2-32	D25-II-10	D25 : pin 8 = Sense +5V
AD Rot. Enc VCC-		Ts1-133/134		Ts2-33	D25-II-11	D25 : pin 9 = Sense 0V
Controller GND		Ts1-30	108-105	Ts2-34		See 'Shielding Layout'

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SIGNAL	Name	HCFA Rack	PHOENIX Connector	Connection Box	ADAPTER Connector	COMMENTS
AD Der. Motor +	AD-D-M1	Ts1-31	64-1C	Ts2-35	D25-III-13	
AD Der. Motor -	AD-D-M2	Ts1-32	64-2C	Ts2-36	D25-III-14	
AD Der. Motor Shield	AD-D-M3	Ts1-33	64-3C	Ts2-37	D25-III-15	Connected to Shields-GND
AD Der. Tacho +	AD-D-T1	Ts1-34	64-4C	Ts2-38	D25-III-16	
AD Der. Tacho -	AD-D-T2	Ts1-35	64-5C	Ts2-39	D25-III-17	
AD Der. Tacho Shield	AD-D-T3	Ts1-36	64-6C	Ts2-40	D25-III-18	Connected to Shields-GND
AD Der. Encoder +Zp	AD-D-Ua0	Ts1-37	108-5	Ts2-41	D25-III-1	
AD Der. Encoder -Zp	AD-D-Ua0*	Ts1-38	108-23	Ts2-42	D25-III-2	
AD Der. Encoder +U1	AD-D-Ua1	Ts1-39	108-41	Ts2-43	D25-III-3	
AD Der. Encoder -U1	AD-D-Ua1*	Ts1-40	108-59	Ts2-44	D25-III-4	
AD Der. Encoder +U2	AD-D-Ua2	Ts1-41	108-77	Ts2-45	D25-III-5	
AD Der. Encoder -U2	AD-D-Ua2*	Ts1-42	108-95	Ts2-46	D25-III-6	
AD Der. Encoder Shield	AD-D-Sh	Ts1-43	108-79	Ts2-47		Connected to Encoder-GND
AD Der. Enc VCC+		Ts1-135		Ts2-48	D25-III-10	D25 : pin 8 = Sense +5V
AD Der. Enc VCC-		Ts1-133/134		Ts2-49	D25-III-11	D25 : pin 9 = Sense 0V
Mirror Motor +	Mirr-M1	Ts1-44	64-1D	Ts2-50	D25-IV-13	
Mirror Motor -	Mirr-M2	Ts1-45	64-2D	Ts2-51	D25-IV-14	
Mirror Motor Shield	Mirr-M3	Ts1-46	64-3D	Ts2-52	D25-IV-15	Connected to Shields-GND
Mirror Tacho +	Mirr-T1	Ts1-47	64-4D	Ts2-53	D25-IV-16	
Mirror Tacho -	Mirr-T2	Ts1-48	64-5D	Ts2-54	D25-IV-17	
Mirror Tacho Shield	Mirr-T3	Ts1-49	64-6D	Ts2-55	D25-IV-18	Connected to Shields-GND
Mirror Encoder +Zp	Mirr-Ua0	Ts1-50	108-6	Ts2-56	D25-IV-1	
Mirror Encoder -Zp	Mirr-Ua0*	Ts1-51	108-24	Ts2-57	D25-IV-2	
Mirror Encoder +U1	Mirr-Ua1	Ts1-52	108-42	Ts2-58	D25-IV-3	
Mirror Encoder -U1	Mirr-Ua1*	Ts1-53	108-60	Ts2-59	D25-IV-4	
Mirror Encoder +U2	Mirr-Ua2	Ts1-54	108-78	Ts2-60	D25-IV-5	
Mirror Encoder -U2	Mirr-Ua2*	Ts1-55	108-96	Ts2-61	D25-IV-6	
Mirror Encoder Shield	Mirr-Sh	Ts1-56	108-61	Ts2-62		Connected to Encoder-GND
Mirror Enc VCC+		Ts1-135		Ts2-63	D25-IV-10	D25 : pin 8 = Sense +5V
Mirror Enc VCC-		Ts1-133/134		Ts2-64	D25-IV-11	D25 : pin 9 = Sense 0V
Mirror Init. Ref.	Mirr-REF	Ts1-57	108-43	Ts2-65	D25-IV-23	Not connected to MACCON
Mirror Upper Limit	Mirr.-ULIM	Ts1-58	108-7	Ts2-66	D25-IV-19	
Mirror Lower Limit	Mirr-LLIM	Ts1-59	108-25	Ts2-67	D25-IV-21	
I-Cell Motor +	I-Cell -M1	Ts1-60	64-7A	Ts2-68	D25-V-13	

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I-Cell Motor -	I-Cell -M2	Ts1-61	64-8A	Ts2-69	D25-V-14	
I-Cell Motor Shield	I-Cell -M3	Ts1-62	64-9A	Ts2-70	D25-V-15	Connected to Shields-GND
I-Cell Tacho +	I-Cell -T1	Ts1-63	64-10A	Ts2-71	D25-V-16	
I-Cell Tacho -	I-Cell -T2	Ts1-64	64-11A	Ts2-72	D25-V-17	
I-Cell Tacho Shield	I-Cell -T3	Ts1-65	64-12A	Ts2-73	D25-V-18	Connected to Shields-GND
I-Cell Encoder +Zp	I-Cell -Ua0	Ts1-66	108-9	Ts2-74	D25-V-1	
I-Cell Encoder -Zp	I-Cell -Ua0*	Ts1-67	108-27	Ts2-75	D25-V-2	
I-Cell Encoder +U1	I-Cell -Ua1	Ts1-68	108-45	Ts2-76	D25-V-3	
I-Cell Encoder -U1	I-Cell -Ua1*	Ts1-69	108-63	Ts2-77	D25-V-4	
I-Cell Encoder +U2	I-Cell -Ua2	Ts1-70	108-81	Ts2-78	D25-V-5	
I-Cell Encoder -U2	I-Cell -Ua2*	Ts1-71	108-99	Ts2-79	D25-V-6	
I-Cell Encoder Shield	I-Cell -Sh	Ts1-72	108-64	Ts2-80		Connected to Encoder-GND
I-Cell Enc VCC+		Ts1-135		Ts2-81	D25-V-10	D25 : pin 8 = Sense +5V
I-Cell Enc VCC-		Ts1-133/134		Ts2-82	D25-V-11	D25 : pin 9 = Sense 0V
I-Cell Init. Ref.	I-Cell-REF	Ts1-73	108-46	Ts2-83	D25-V-23	Not connected to MACCON
I-Cell Upper Limit	I-Cell-ULIM	Ts1-74	108-10	Ts2-84	D25-V-19	
I-Cell Lower Limit	I-Cell-LLIM	Ts1-75	108-28	Ts2-85	D25-V-21	
Fiber Motor +	Fiber-M1	Ts1-76	64-7B	Ts2-86	D25-VI-13	
Fiber Motor -	Fiber-M2	Ts1-77	64-8B	Ts2-87	D25-VI-14	
Fiber Motor Shield	Fiber-M3	Ts1-78	64-9B	Ts2-88	D25-VI-15	Connected to Shields-GND
Fiber Tacho +	Fiber-T1	Ts1-79	64-10B	Ts2-89	D25-VI-16	
Fiber Tacho -	Fiber-T2	Ts1-80	64-11B	Ts2-90	D25-VI-17	
Fiber Tacho Shield	Fiber-T3	Ts1-81	64-12B	Ts2-91	D25-VI-18	Connected to Shields-GND
Fiber Encoder +Zp	Fiber-Ua0	Ts1-82	108-12	Ts2-92	D25-VI-1	
Fiber Encoder -Zp	Fiber-Ua0*	Ts1-83	108-30	Ts2-93	D25-VI-2	
Fiber Encoder +U1	Fiber-Ua1	Ts1-84	108-48	Ts2-94	D25-VI-3	
Fiber Encoder -U1	Fiber-Ua1*	Ts1-85	108-66	Ts2-95	D25-VI-4	
Fiber Encoder +U2	Fiber-Ua2	Ts1-86	108-84	Ts2-96	D25-VI-5	
Fiber Encoder -U2	Fiber-Ua2*	Ts1-87	108-102	Ts2-97	D25-VI-6	
Fiber Encoder Shield	Fiber-Sh	Ts1-88	108-67	Ts2-98		Connected to Encoder-GND
Fiber Enc VCC+		Ts1-135		Ts2-99	D25-VI-10	D25 : pin 8 = Sense +5V
Fiber Enc VCC-		Ts1-133/134		Ts2-100	D25-VI-11	D25 : pin 9 = Sense 0V
Fiber Init. Ref.	Fiber-REF	Ts1-89	108-49	Ts2-101	D25-VI-23	Not connected to MACCON
Fiber Upper Limit	Fiber-ULIM	Ts1-90	108-13	Ts2-102	D25-VI-19	

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SIGNAL	Name	HCFA Rack	PHOENIX Connector	Connection Box	ADAPTER Connector	COMMENTS
Fiber Lower Limit	Fiber-LLIM	Ts1-91	108-31	Ts2-103	D25-VI-21	
Controller GND		Ts1-92	108-106	Ts2-104		See 'Shielding Layout'
Dust Motor +	Dust-M1	Ts1-93	64-7C	Ts2-105	D25-VII-13	
Dust Motor -	Dust-M2	Ts1-94	64-8C	Ts2-106	D25-VII-14	
Dust Motor Shield	Dust-M3	Ts1-95	64-9C	Ts2-107	D25-VII-15	Connected to Shields-GND
Dust Tacho +	Dust-T1	Ts1-96	64-10C	Ts2-108	D25-VII-16	
Dust Tacho -	Dust-T2	Ts1-97	64-11C	Ts2-109	D25-VII-17	
Dust Tacho Shield	Dust-T3	Ts1-98	64-12C	Ts2-110	D25-VII-18	Connected to Shields-GND
Dust Init. Ref.	Dust-REF	Ts1-99	108-52	Ts2-111	D25-VII-21	Not connected to MACCON
Dust Upper Limit	Dust-ULIM	Ts1-100	108-16	Ts2-112	D25-VII-19	
Dust Lower Limit	Dust-LLIM	Ts1-101	108-34	Ts2-113	D25-VII-20	
Filter Motor +	Filter-M1	Ts1-102	64-7D	Ts2-114	D25-VII-13	
Filter Motor -	Filter-M2	Ts1-103	64-8D	Ts2-115	D25-VII-14	
Filter Motor Shield	Filter-M3	Ts1-104	64-9D	Ts2-116	D25-VII-15	Connected to Shields-GND
Filter Tacho +	Filter-T1	Ts1-105	64-10D	Ts2-117	D25-VII-16	
Filter Tacho -	Filter-T2	Ts1-106	64-11D	Ts2-118	D25-VII-17	
Filter Tacho Shield	Filter-T3	Ts1-107	64-12D	Ts2-119	D25-VII-18	Connected to Shields-GND
Filter Encoder +Zp	Filter-Ua0	Ts1-108	108-18	Ts2-120	D25-VII-1	
Filter Encoder -Zp	Filter-Ua0*	Ts1-109	108-36	Ts2-121	D25-VII-2	
Filter Encoder +U1	Filter-Ua1	Ts1-110	108-54	Ts2-122	D25-VII-3	
Filter Encoder -U1	Filter-Ua1*	Ts1-111	108-72	Ts2-123	D25-VII-4	
Filter Encoder +U2	Filter-Ua2	Ts1-112	108-90	Ts2-124	D25-VII-5	
Filter Encoder -U2	Filter-Ua2*	Ts1-113	108-108	Ts2-125	D25-VII-6	
Filter Encoder Shield	Filter-Sh	Ts1-114	108-71	Ts2-126		Connected to Encoder-GND
Filter Enc VCC+		Ts1-135		Ts2-127	D25-VII-10	D25 : pin 8 = Sense +5V
Filter Enc VCC-		Ts1-133/134		Ts2-128	D25-VII-11	D25 : pin 9 = Sense 0V
I-CELL Heating +		Ts1-115	108-70	Ts2-129	D15-I-12	From OMEGA controller
I-CELL Heating -		Ts1-116	108-88	Ts2-130	D15-I-4	From OMEGA controller
I-CELL Temp. +		Ts1-117	64-13A	Ts2-131	D15-I-15	From OMEGA controller
I-CELL Temp. -		Ts1-118	64-14A	Ts2-132	D15-I-8	From OMEGA controller
I-CELL Temp. Sense +		Ts1-119	64-13B	Ts2-133	D15-I-14	From OMEGA controller
I-CELL Temp. Sense -		Ts1-120	64-14B	Ts2-134	D15-I-7	From OMEGA controller
I-CELL Temp. Shield		Ts1-121	64-13C	Ts2-135	D15-I-5	See 'Shielding Layout'
Spare		Ts1-122	108-74	Ts2-136		

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SIGNAL	Name	HCFA Rack	PHOENIX Connector	Connection Box	ADAPTER Connector	COMMENTS
Spare		Ts1-123	108-92	Ts2-137		
Spare		Ts1-124	108-97	Ts2-138		
DI/O – ACRO Bit 0		Ts1-125	108-85	Ts2-139		
DI/O – ACRO Bit 1		Ts1-126	108-103	Ts2-140		
DI/O – ACRO Bit 2		Ts1-127	108-14	Ts2-141		
DI/O – ACRO Bit 3		Ts1-128	108-32	Ts2-142		
DI/O – ACRO Bit 4		Ts1-129	108-50	Ts2-143		
DI/O – ACRO Bit 5		Ts1-130	108-68	Ts2-144		
DI/O – ACRO Bit 6		Ts1-131	108-86	Ts2-145		
DI/O – ACRO Bit 7		Ts1-132	108-104	Ts2-146		
Shielding line		Ts1-133	64-15D	Ts2-147		Connected to Shields-GND
Shielding line		Ts1-134	64-15D	Ts2-147		
Signal GND		Ts1-135	64-16D	Ts2-148		
5V - VCC		Ts1-136	64-16C	Ts2-149		
24V		Ts1-137	64-16A	Ts2-150		
12V		Ts1-138	64-16B	Ts2-151		
-12V		Ts1-139	64-15C	Ts2-152		
-24V		Ts1-140	64-15B	Ts2-153		
5V Aux.		Ts1-141	64-15A	Ts2-154		
				Ts2-155		
				Ts2-156		
				Ts2-157		
				Ts2-158		
				Ts2-159		
				Ts2-160		
				Ts2-161		
				Ts2-162		
				Ts2-163		
				Ts2-164		
				Ts2-165		
				Ts2-166		
				Ts2-167		
				Ts2-168		
Shields-GND				Ts2-169		Connected to TS2-147

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SIGNAL	Name	HCFA Rack	PHOENIX Connector	Connection Box	ADAPTER Connector	COMMENTS
Shields-GND				Ts2-170		Connected to TS2-147
Shields-GND				Ts2-171		Connected to TS2-147
Shields-GND				Ts2-172		Connected to TS2-147
Shields-GND				Ts2-173		Connected to TS2-147
Shields-GND				Ts2-174		Connected to TS2-147