

Picomotor Controller

Description

The picomotor controller interfaces a Newport OEM single-axis driver module, model 8703, with the EtherCAT system. It consists of a stand-alone enclosure and an interface adapter for the EtherCAT chassis. The stand-alone enclosure contains one or two single-axis driver modules as well as a relay matrix to control up to 16 axes, or 8 two-axes mirror mounts. The power of the driver module with its switching high-voltage supply can be turned off remotely. A list of picomotors in advanced LIGO can be found at [PicomotorList](#). Maximum cable length and other interesting facts can be found in the [Picomotor FAQ](#).

Specifications

Controlled axes:

- 1 x 16 with one driver module, or
- 2 x 8 with dual driver modules

Connectors:

- 16 RJ-9 jacks, front (Newport wiring)
- 2 25-pin female D-sub, front (parallel to the RJ-9 jacks)

Indicators:

- Axes selection LEDs, front
- Power ON LED, front
- Remote interface active LED, front
- Driver module enable LED, front
- Idle indicator LED, front
- Driver fault LEDs, front
- Drive direction LEDs, front
- Drive active LEDs, front

Remote interface:

- 1 25-pin male D-sub for control lines, rear
- 1 25-pin female D-sub for readbacks, rear
- Dual EtherCAT adapter

Power:

- 24VDC/1A on rear 3-pin power D-sub
- Physical on/off switch with thermal breaker
- Remote on/off

Physical:

- 8"(W) x 12"(D) x 3.5"(H) stand-alone enclosure
- Rack-mountable
- Operating temperature: 10°C - 30°C

Picomotor List

The assignment of serial numbers and frequencies for the advanced LIGO units can be found in [E1200072-v1](#).

Motor	Axes	System	Location	Vac.	Description	Controller			
						ID	Port		
1	2	ISC	ETMX	yes	TransMon, in front of quad detectors	1	1		
2	2						2		
3	2						3		
4	2						4		
5	2			no	WFS centering, green ALS		5		
6	2						6		
7	2						TCS	Beam steering onto Hartmann detector	7
8	2								8
9	2	ISC	ETMY	yes	TransMon, in front of quad detectors	2	1		
10	2						2		
11	2						3		
12	2						4		
13	2			no	WFS centering, green ALS		5		
14	2						6		
15	2						TCS	Beam steering onto Hartmann detector	7
16	2								8
17	2	ISC	HAM1	yes	POB centering	3	1		
18	2						2		
19	2						3		
20	2						4		
21	2		ISCT1	WFS A centering	no		WFS A centering	1	
22	2							2	
23	2		IO	IOT1	no		MC REFL centering	4	3
24	2						WFS A centering		5
25	2	WFS B centering				6			

26	2		HAM2	yes	MC steering	5	1
27	2				QPD centering		2
28	2				ISS centering		3
29	1				HWP rotation		4
30	2	OL	HAM3	no	optical lever steering	3	5
31	2						6
32	2	ISC	HAM3	yes	QPD A centering	3	5
33	2				QPD B centering		6
34	2	IO			Beam steering towards HAM1		7
35	2	OL	HAM4	no	optical lever steering	6	1
36	2		HAM5				2
37	2		BS				3
38	2		FMX				4
39	2		FMY				5
40	2	ISC	HAM6	yes	AS centering	7	1
41	2				OMC QPD A centering		2
42	2				OMC QPD B centering		3
43	2				WFS A centering		4
44	2				WFS B centering		5
45	2	ISCT6			WFS A centering		7
46	2				WFS B centering		8
47	2	TCS	HAM5	no	ITMX beam steering Hartmann sensor	8	1
48	2						2
49	2						3
50	2						4
51	2		5				
52	2		ITMY beam steering Hartmann sensor		6		
53	2		7				
54	2		8				
55	2	BSC1/X-manifold			ITMX CO2 projection	9	1
56	2						2
57	2						3

58	2				4
59	2				5
60	2	BSC3/Y- manifold	ITMY CO2 projection	10	1
61	2				2
62	2				3
63	2				4
64	2				5