ICR Daughter Board

Application note: pinout

The Lumentum Integrated Coherent Receiver can be controlled with several evaluation boards (historically). The (original Neophotonics) motherboard (now discontinued) contains all the generic and low-speed functionality and the daughterboard contains form-factor specific items as well as the high speed lines. It has been replaced by the Pure Photonics **PPEB076** control board, with comparable functionality.

For the daughterboard there are variants for Type I ICR, micro-ICR class 20 and micro-ICR class 40. These boards provide DC and RF routing of the signals. These RF boards have been discontinued and replaced by the Pure Photonics **PPEB086** RF board.

This application note describes the pinout of these products (historical and current).

1. Pinout

Pin	Type I ICR pin	Micro ICR pin class 20	Micro ICR pin class 40	Functionality
1	19	17	17	Peak Indicator YQ
2	20	2	2	For Future Use / Peaking adjust High
3	17	15	15	Output Amplitude Adjust YQ
4	18	16	16	Gain Adjust YQ
5		30	30	VOA2 Adjust Voltage
	16			For Future Use
6		3	3	MGC/AGC Selection
	15			MGC/AGC Selection Y
7		Not used	Not used	
	14			Supply voltage Amplifier YQ
8	13 GND	14 GND	21,14 GND	GND
9	11	8	8	Photodiode Bias Voltage YQ p
10	12	9	Not used	Photodiode Bias Voltage YQ n
11	9	6	7	Photodiode Bias Voltage YI p
12	10	7	Not used	Photodiode Bias Voltage YI n
13		13	13	Supply Voltage Amplifier Y
	7			Supply Voltage Amplifier YI
14	8 GND	14 GND	21,14 GND	GND
15	5	4	4	Monitor Diode Cathode
16	6	5	5	Monitor Diode Anode
17	3	11	11	Gain Adjust YI
18	4	12	12	Output Amplitude Adjust YI
19		1	1	For Future Use
	1			Shutdown Y
20	2	10	10	Peak Indicator YI
21	39	25	25	Peak Indicator XQ
22	40	34	34	For Future Use
23	37	23	23	Output Amplitude Adjust XQ
24	38	24	24	Gain Adjust XQ
25		Not used	Not used	
	35			MC/AGC Selection X
26		31	31	VOA1 Adjust Voltage
	36			For Future Use
27	33 GND	21 GND	21,14 GND	GND
28		Not used	Not used	
	34			Supply-voltage amplifier XQ
29	31	28	Not used	Photodiode Bias Voltage XQ p
30	32	29	29	Photodiode Bias Voltage XQ n
31	29	26	Not used	Photodiode Bias Voltage XI p
32	30	27	27	Photodiode Bias Voltage XI n
33		22	22	Supply Voltage Amplifier X
	27			Supply Voltage Amplifier XI
34	28 GND	21 GND	21,14 GND	GND
35	25	33	33	For Future Use / Peaking adjust Low
36		Not used	Not used	
	26			For Future Use
37	23	19	19	Gain Adjust XI
38	24	20	20	Output Amplitude Adjust XI
39		32	32	Shutdown
	21			Shutdown X
40	22	18	18	Peak Indicator XI

Pin	Micro ICR pin class 40	Micro ICR pin Class 80	Functionality
1	17	8	Peak Indicator YQ
2	2	12	For Future Use / Peaking adjust High
3	15	18	Output Amplitude Adjust YQ
4	16	17	Gain Adjust YQ
5	30	4	VOA2 Adjust Voltage
			For Future Use
6	3	14	MGC/AGC Selection
			MGC/AGC Selection Y
7	Not used		
			Supply voltage Amplifier YQ
8	21,14 GND	20,26 GND	GND
9	8	22	Photodiode Bias Voltage YQ p
10	Not used		Photodiode Bias Voltage YQ n
11	7	21	Photodiode Bias Voltage YI p
12	Not used		Photodiode Bias Voltage YI n
13	13	19	Supply Voltage Amplifier Y
			Supply Voltage Amplifier YI
14	21,14 GND	20,26 GND	GND
15	4	1	Monitor Diode Cathode
16	5	2	Monitor Diode Anode
17	11	15	Gain Adjust YI
18	12	16	Output Amplitude Adjust YI
19	1		For Future Use
			Shutdown Y
20	10	7	Peak Indicator YI
21	25	10	Peak Indicator XQ
22	34	31, 32, 33, 34	For Future Use
23	23	30	Output Amplitude Adjust XQ
24	24	29	Gain Adjust XQ
25	Not used		
			MC/AGC Selection X
26	31	3	VOA1 Adjust Voltage
			For Future Use
27	21,14 GND	20,26 GND	GND
28	Not used		
			Supply-voltage amplifier XQ
29	Not used		Photodiode Bias Voltage XQ p
30	29	24	Photodiode Bias Voltage XQ n
31	Not used		Photodiode Bias Voltage XI p
32	27	23	Photodiode Bias Voltage XI n
33	22	25	Supply Voltage Amplifier X
			Supply Voltage Amplifier XI
34	21,14 GND	20,26 GND	GND
35	33	11	For Future Use / Peaking adjust High
36	Not used	31, 32, 33, 34	
			For Future Use
37	19	27	Gain Adjust XI
38	20	28	Output Amplitude Adjust XI
39	32	13	Shutdown
			Shutdown X
40	18	9	Peak Indicator XI

ICR Pinout

Pinout for Type I ICR (from MSA document)

Pin #	Symbol	Description	Pin #	Symbol	Description
1	SD-Y	Shutdown Y (optional)	40	RFU	Reserved for future use
2	PI-YI	Peak indicator YI	39	PI-XQ	Peak indicator XQ
3	GA-YI	Gain adjust YI	38	GA-XQ	Gain adjust XQ
4	OA-YI	Output amplitude adjust YI	37	OA-XQ	Output amplitude adjust XQ
5	MPD+	Monitor photodiode cathode (optional)	36	RFU	Reserved for future use
6	MPD-	Monitor photodiode anode (optional)	35	MC/AGC-X	MC/AGC selection X (optional)
7	VCC-YI	Supply-voltage amplifier YI	34	VCC-XQ	Supply-voltage amplifier XQ
8	GND	Ground reference	33	GND	Ground reference
9	PD-YI	Photodiode bias voltage YI [1]	32	PD-XQ	Photodiode bias voltage XQ [1]
10	PD-YI	Photodiode bias voltage YI [1]	31	PD-XQ	Photodiode bias voltage XQ [1]
11	PD-YQ	Photodiode bias voltage YQ [1]	30	PD-XI	Photodiode bias voltage XI [1]
12	PD-YQ	Photodiode bias voltage YQ [1]	29	PD-XI	Photodiode bias voltage XI [1]
13	GND	Ground reference	28	GND	Ground reference
14	VCC-YQ	Supply-voltage amplifier YQ	27	VCC-XI	Supply-voltage amplifier XI
15	MC/AGC-Y	MC/AGC selection Y (optional)	26	RFU	Reserved for future use
16	RFU	Reserved for future use	25	RFU	Reserved for future use
17	OA-YQ	Output amplitude adjust YQ	24	OA-XI	Output amplitude adjust XI
18	GA-YQ	Gain adjust YQ	23	GA-XI	Gain adjust XI
19	PI-YQ	Peak indicator YQ	22	PI-XI	Peak indicator XI
20	RFU	Reserved for future use	21	SD-X	Shutdown X (optional)

Pinout for micro-ICR class 20 (from MSA document):

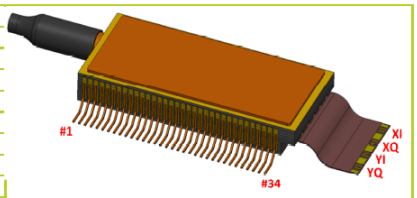
Pin#	Symbol	Description	Pin#	Symbol	Description
1	RFU	Reserved for future use[4]	34	RFU	Reserved for future use[4]
2	RFU	Reserved for future use[4]	33	RFU	Reserved for future use[4]
3	MGC/AGC	MGC/AGC selection (optional)	32	SD	Shutdown (optional)
4	MPD-C	Monitor diode cathode (optional)[3]	31	VOA1	VOA1 Adjust voltage (optional)[2]
5	MPD-A	Monitor diode anode (optional)[3]	30	VOA2	VOA2 Adjust voltage (optional)[2]
6	PD-YI	Photodiode bias voltage YI[1]	29	PD-XQ	Photodiode bias voltage XQ[1]
7	PD-YI	Photodiode bias voltage YI[1]	28	PD-XQ	Photodiode bias voltage XQ[1]
8	PD-YQ	Photodiode bias voltage YQ[1]	27	PD-XI	Photodiode bias voltage XI[1]
9	PD-YQ	Photodiode bias voltage YQ[1]	26	PD-XI	Photodiode bias voltage XI[1]
10	PI-YI	Peak indicator YI	25	PI-XQ	Peak indicator XQ
11	GA-YI	Gain adjust YI	24	GA-XQ	Gain adjust XQ
12	OA-YI	Output amplitude adjust YI	23	OA-XQ	Output amplitude adjust XQ
13	VCC-Y	Supply voltage amplifier Y	22	VCC-X	Supply voltage amplifier X
14	GND	Ground Reference	21	GND	Ground Reference
15	OA-YQ	Output amplitude adjust YQ	20	OA-XI	Output amplitude adjust XI
16	GA-YQ	Gain adjust YQ	19	GA-XI	Gain adjust XI
17	PI-YQ	Peak Indicator YQ	18	PI-XI	Peak Indicator XI

Pinout for micro-ICR class 40 (from datasheet). Main difference with the MSA and with class 20 devices is that the photodiodes for each balanced receiver are connected to the same input (i.e. the photocurrent is the combined photo-current from both photodiodes). MGCAGC and SHDW/OC are reduced to 1 pin.

PIN #	Symbol	Description	PIN #	Symbol	Description
1	n.c.	Not connected (1)	34	n.c.	Not connected (1)
2	ZPKH	Peaking Adjust High	33	ZPKL	Peaking Adjust Low
3	MGC/AGC	MGC/AGC Selection	32	OC	Output Control
4	MPD+	Monitor Photodiode Cathode	31	VOA_CTRL	VOA Control Voltage
5	MPD-	Monitor Photodiode Anode	30	VOA_COM	VOA Common
6	PD-YI	PD Supply Voltage YI	29	PD-XQ	PD Supply Voltage XQ
7	n.c.	Not connected (1)	28	n.c.	Not connected (1)
8	PD-YQ	PD Supply Voltage YQ	27	PD-XI	PD Supply Voltage XI
9	n.c.	Not connected (1)	26	n.c.	Not connected (1)
10	PI-YI	Peak Indicator YI	25	PI-XQ	Peak Indicator XQ
11	GA-YI	Gain Adjust YI	24	GA-XQ	Gain Adjust XQ
12	OA-YI	Output Amplitude Adjust YI	23	OA-XQ	Output Amplitude Adjust XQ
13	VCC-Y	Supply-Voltage Amplifier Y	22	VCC-X	Supply-Voltage Amplifier X
14	GND	Ground Reference	21	GND	Ground Reference
15	OA-YQ	Output Amplitude Adjust YQ	20	OA-XI	Output Amplitude Adjust XI
16	GA-YQ	Gain Adjust YQ	19	GA-XI	Gain Adjust XI
17	PI-YQ	Peak Indicator YQ	18	PI- XI	Peak Indicator XI

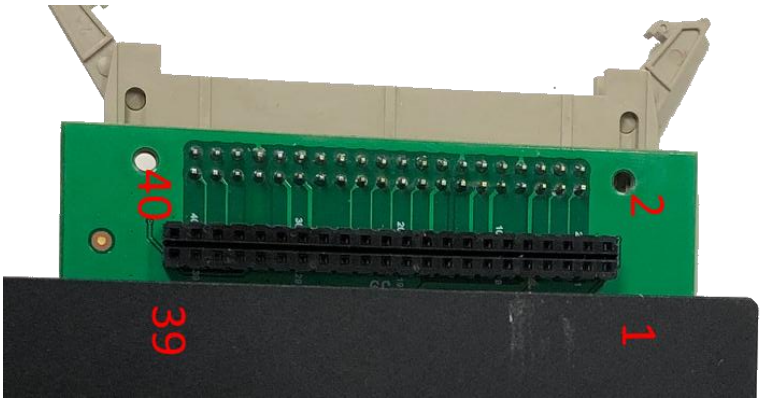
Pinout for class 80

Pin#	Symbol	Description
1	MPD-C	Monitor diode cathode
2	MPD-A	Monitor diode anode
3	VOA	VOA drive voltage
4	VOA-COMM	Common VOA
5	NC	Not connected
6	NC	Not connected
7	PI-YI	Peak indicator YI
8	PI-YQ	Peak Indicator YQ
9	PI-XI	Peak Indicator XI
10	PI-XQ	Peak indicator XQ
11	NC/BWC2	Not connected or Bandwidth control
12	NC/BWC1	Not connected or Bandwidth control
13	SD	Shutdown
14	MGC/AGC	MGC/AGC selection
15	GA-YI	Gain adjust YI
16	OA-YI	Output amplitude adjust YI
17	GA-YQ	Gain adjust YQ
18	OA-YQ	Output amplitude adjust YQ
19	VCC-Y	Supply voltage amplifier Y
20	GND	Ground Reference
21	PD-YI	Photodiode bias voltage YI
22	PD-YQ	Photodiode bias voltage YQ
23	PD-XI	Photodiode bias voltage XI
24	PD-XQ	Photodiode bias voltage XQ
25	VCC-X	Supply voltage amplifier X
26	GND	Ground Reference
27	GA-XI	Gain adjust XI
28	OA-XI	Output amplitude adjust XI
29	GA-XQ	Gain adjust XQ
30	OA-XQ	Output amplitude adjust XQ
31	NC	Not connected
32	NC	Not connected
33	NC	Not connected
34	NC	Not connected

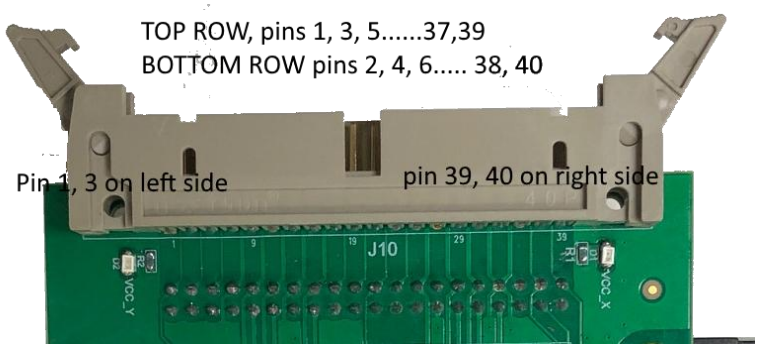


2. Physical configuration

The daughterboards come with a female 40 pin connector at the bottom side. The pinout is indicated below. Typically this connector is pushed onto the motherboard.

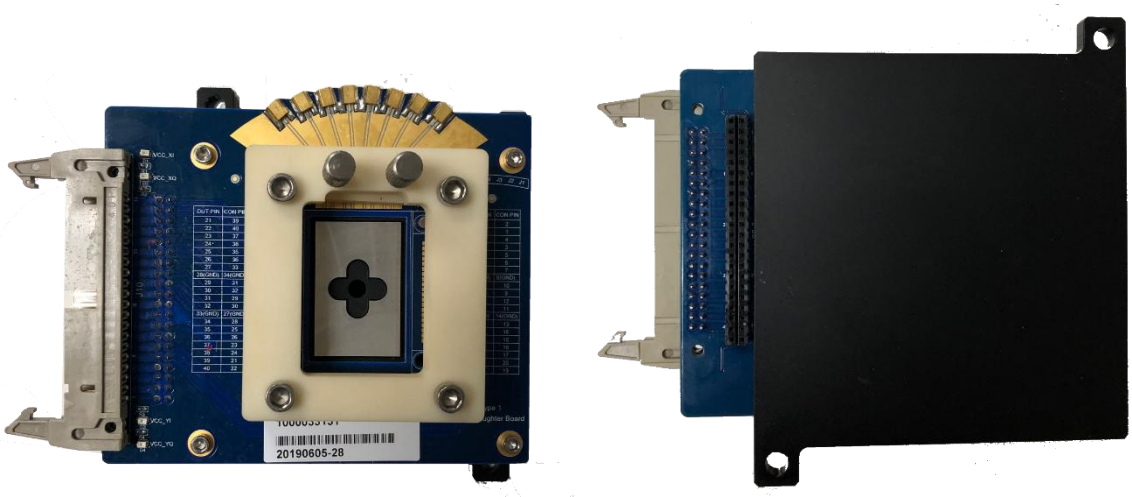


The daughterboard come with a 40 pin latches connector on the side. The pinout is indicated below. A standard IDC cable can be connected to this connector.

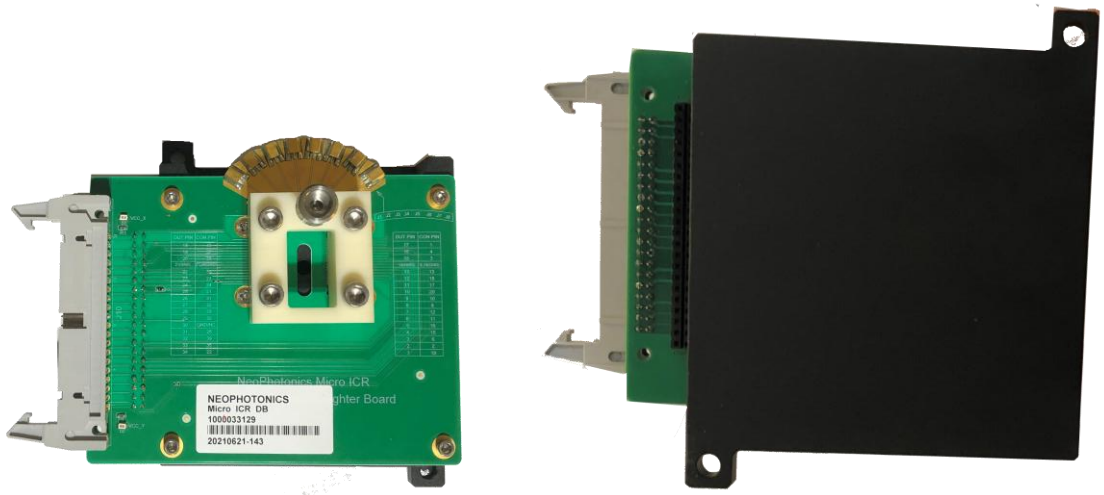


The connectors are standard 0.1” pitch IDC connectors.

Daughterboard for Type I ICR



Daughterboard for micro-ICR class 20



Daughterboard for micro-ICR class 40

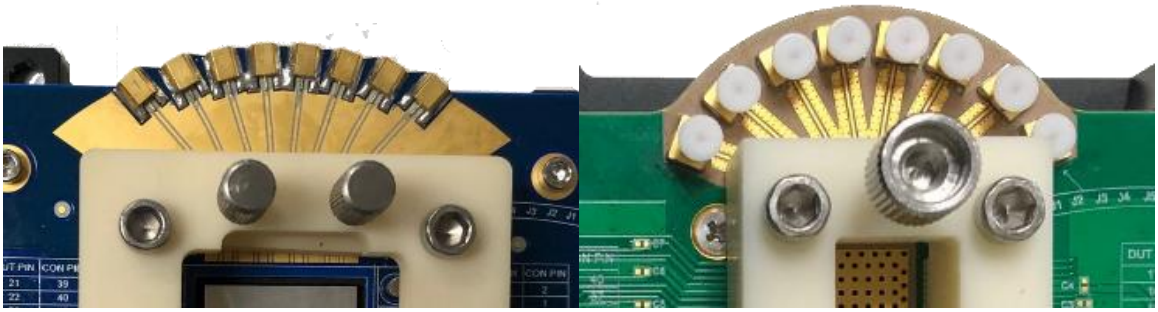
Pinout of the connector on these boards (grayed out pins are not being used for class 40 and class 80 devices):

Pin	Function	Function	Pin
1	Peak YQ	Peaking adjust High	2
3	Output Adjust YQ	Gain YQ	4
5	VOA2	MGCAGC Y	6
7	VAMP YQ	GND	8
9	PD YQ-p	PD YQ-n	10
11	PD YI-p	PD YI-n	12
13	VAMP YI	GND	14
15	PD Cathode	PD Anode	16

17	Gain YI	Output Adjust YI	18
19	Shutdown Y	Peak YI	20
21	Peak XQ	LKPD XQ (pin 34)	22
23	Output Adjust XQ	Gain XQ	24
25	MGCAGC X	VOA1	26
27	GND	VAMP XQ	28
29	PD XQ-p	PD XQ-n	30
31	PD XI-p	PD XI-n	32
33	VAMP XI	GND	34
35	PeakAdjust Low		36
37	Gain XI	Output Adjust XI	38
39	Shutdown X	Peak XI	40

3. RF Connectors

ICR Mounting Board Type	RF Adapters
Type1 ICR	Male GPPO adapters
Type2 ICR	
Micro-ICR Type1 (up to 32 GBaud)	
Micro-ICR Type1 (45 & 64 GBaud)	Female MMPX



ICR and micro-ICR class 20 connectors; micro-ICR class 40 connectors