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```
 21                                  X24C02 WC/ Pin 7
 22                                  X24C02 SCL Pin 6
 23                                  X24C02 SDA Pin 5
 24          3        8   MPDA (+)   Monitor PD Anode (2)
 25          4        9   MPDC (-)   Monitor PD Cathode (2)
 26          1            Case TH    Laser Head Case 10K Thermistor (to GND)

Serial EEPROM X24C02 pins 1,2,3,4 grounded.
```

Notes:

1. Laser diode pins numbered starting at left (next to gap). I don't know if this is standard.
2. There's some question in my scribbled diagram as to which of the pairs (Pins 7,8 or pins 24,25) are correct. An ohmmeter (on diode test) would easily confirm.

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Lightwave Electronics Model 120 Tunable DPSS Laser

The LWE-120 is an ultra-low noise single frequency tunable DPSS laser based on the same NPRO technology as the LWE-125/126 and is its predecessor. (I suggest reading the sections on the LWE-125/126 and LWE-142 first if not familiar with the NPRO concept.) Being strictly IR, these lasers are much simpler than the LWE-142 and similar to the LWE-125/126.

There are 4 models of the LWE-120:

Model	Wavelength	Output Power
120-01	1,064 nm	4 mW
120-02	1,319 nm	2.5 mW
120-03	1,064 nm	40 mW
120-04	1,319 nm	25 mW

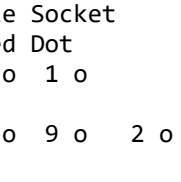
There are also versions with "A" after the model, e.g., 120-4A, that may be slightly higher power.

The LWE-120 system consists of a compact solidly built laser head and separate AC-line powered controller connected with a cable using a 12 pin LEMO as shown in Lightwave Electronics Model 120 Laser System. (Coming soon.) The laser head does not appear to have any electronics beyond some protection for the pump diode - resistor, capacitor, reverse protection silicon diode. (This is unlike the LWE-142 and LWE-125/126 where all the smarts are in the laser head.) The controller box has a keylock Power switch, Attenuate switch, 3 digit and 10 turn knobs for Tuning, and a single turn adjustment for output power.

LWE-120 Laser Head Pinouts

There are only 5 two-pin connectors on th PCB inside the controller whose mating cables go to the laser head via a 12 pin LEMO umbilical. They are cryptically labeled by their color (red, yellow, green, blue, white, along with matching color/black) on the PCB. It appears as though the mapping of the wiring between the colored pairs and LEMO connector depends on the specific model, presumably to prevent damage should an incorrect laser head be plugged in. The mapping from the LEMO to the 120-04 laser head to the optics box is shown below:

LEMO Pin	Optics Box	Function
1	8	LD-
2	NC	
3	3	R1
4	9	
5	11	TEC-
6	10	TEC+
7	7	LD+
8	4	
9	5	R1



```
     10           6                          5 o  4 o
     11           1
     12          NC
```

The 120-03 is probably the same since it is also higher power. For the 120-01/02, LD+ moves from LEMO pin 7 to pin 2; LD- remains the same. I have not confirmed the wiring of any other signals on the 120-02 head but the controller wiring matches that of the 120-01.

R1 may be a temperature sensor thermistor or something else. There should Probing didn't locate any other connections but that's not definitive. And believe or not, there could be errors. There should be a photodiode light sensor somewhere. Some of these lasers are supposed to have a PZT input and that would not show in resistance or diode measurements.

I do not yet have the mapping from the PCB colored pairs to the LEMO for the 120-04/A (or if it is the same), but here it is for the 120-01 determined by testing continuity between the PCB cable connectors and male LEMO on the umbilical. The Clear (pin 8) also is the case ground. It's possible and likely that only the LD+ signal changes as noted above.

LEMO Pin	Wire Color
1	Green/Black
2	Green
3	Blue/Black
4	Blue
5	White/Black
6	White
7	Orange (NC)
8	Clear
9	Red/Black
10	Red
11	Yellow/Black
12	Yellow

Note that on the 120-01, the orange wire which should go to LD+ is not connected - it's cut off inside the controller.

Given how logical the procession is starting with pin 3, I doubt any of those would change. More to come.

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Lightwave Electronics Model 122 IR DPSS Laser

The LWE-122 is an ultra-low noise single frequency DPSS laser based on the same NPRO technology as the LWE-125/126 and is its predecessor. (I suggest reading the sections on the LWE-125/126 and LWE-142 first if not familiar with the NPRO concept.) Being strictly IR, these lasers are much simpler than the LWE-142 and similar to the LWE-125/126. The LWE-122 system consists of a heavy solidly built laser head and separate microprocessor-based AC-line powered controller connected by a DB25 cable as shown in Lightwave Electronics Model 122 Laser System. (This is unlike the LWE-142 and LWE-125/126 where all the smarts are in the laser head.) The controller box has buttons for DISPLAY, SET, and STANDBY, as well as a knob for adjusting parameters. is quite limited. Like the other lasers, the LWE-122 may be controlled via an RS232 port, but with relatively limited functionality. It can switch between STANDBY and OPERATE modes, turn the pump diode on and off, and adjust some parameters. But while things like the pump diode temperature can be changed, the actual temperature cannot be monitored. This is annoying. :) However, for normal operation, setting the laser up via the RS232 port and then using it as a turn-key system should suffice. Like the LWE-142, there are inputs for fast and slow tuning which control the PZT and temperature of the NPRO, respectively.

There were versions of the LWE-122 operating at 1,064 nm (300 or 500 mW and 1,319 nm (150 or 300 mW. Prices in 1992 ranged from $21,750 to $27,750. :) With the introduction of the more compact LWE-125/126 providing similar functionality but requiring only a DC power supply rather than the large controller box, the LWE-122 only had a prodcut lifespan of a few years. (There is a similar control box for the LWE-125/126, but it's optional.) Nonetheless even in 2012, the LWE-122 is still a nice laser. :)

On one version, when power is applied via the keylock switch, there is a 6 second delay while the system initializes, and then it goes into STANDY mode. At this point, the DISPLAY button may be used to cycle among the (limited) options:

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