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Digital Options for Laser Diode Systems

The Digital Control Option allows the operator to precisely calibrate the lasers, store a setting in the unit's memory and retain it for future use. With this added level of control come several benefits. The stability of the system is greatly improved as well as protection of accidental misadjustment as with a manual potentiometer possible is prevented.

Thus the system can more easily maintain compliance with safety regulations. It also eliminates the need to physically handle the system and risk unfortunate misalignment in sensitive installations.

Using this interface the system is not only digitally controllable but the control signals are also TTL compatible.

D-Options replace the mechanical potentiometer between the drive circuit and the laser diode.		
Constant Optical Output Power Control		
D1	TTl compatible (no combination with D2)	This option allows adjustment with 100 positions between minimum and maximum settings. Controller customer supplied
Constant Drive Current Control		
D2	TTl compatible (no combination with D1)	This option allows adjustment with 100 positions between minimum and maximum settings. Controller customer supplied
Temperature Control		
D3	TTl compatible	This option allows adjustment with 100 positions between minimum and maximum settings. Controller customer supplied
High Resolution Constant Optical Output Power Control		
D4	Digital Pot. Module (DPM), fine resolution (no combination with D5/b)	This option allows adjustment with 256 positions between minimum and maximum settings. Connection through PC-Parallel Port
D4b	Digital Pot. Module (DPM), extra fine resolution (no combination with D5/b)	This option allows adjustment with 512 positions between minimum and maximum settings. Connection through PC-Parallel Port
High Resolution Constant Drive Current Control		
D5	Digital Pot. Module (DPM), fine resolution (no combination with D4/b)	This option allows adjustment with 256 positions between minimum and maximum settings. Connection through PC-Parallel Port
D5b	Digital Pot. Module (DPM), extra fine resolution (no combination with D4/b)	This option allows adjustment with 512 positions between minimum and maximum settings. Connection through PC-Parallel Port
High Resolution Temperature Control		
D6	Digital Pot. Module (DPM), fine resolution	This option allows adjustment with 256 positions between minimum and maximum settings. Connection through PC-Parallel Port
D6b	Digital Pot. Module (DPM), extra fine resolution	This option allows adjustment with 512 positions between minimum and maximum settings. Connection through PC-Parallel Port
Control through I/O lines of Micro-Processor PCB on request. Please consult with us for details.		

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Option D1: Constant Optical Output Power Control

The Optical Power Digital Control Option is a digital interface between the laser diode drive circuit and a controller supplied by the customer. Unique in the industry, this interface replaces the standard mechanical potentiometer normally used to adjust the optical power output of the laser diode. The optical power of the system is monitored and adjusted using the current feedback signal from the laser's back-facet monitor diode.

Safety and reliability of the system are enhanced. By eliminating the easy access to the power adjustment, the laser is protected from inadvertent excessive power adjustment and laser diode burnout. Options D1 and D2 are NOT available together.

Option D2: Constant Drive Current Control

The Constant Current Digital Control Option is a digital interface between the laser diode drive circuit and a controller supplied by the customer. It replaces the usual mechanical potentiometer utilized to adjust the drive current of the laser diode.
Options D1 and D2 are NOT available together.

Option D3: Digital Temperature Control

The Thermoelectric Digital Control Option is a digital interface between the Peltier drive circuit and a controller supplied by the customer. It allows the operator to precisely calibrate the operating temperature of the laser, store a setting in the unit's memory and retain it for future use. This interface replaces the standard mechanical potentiometer used to adjust the case temperature of the laser diode. The case temperature of the laser diode is monitored and adjusted using the feedback from a temperature sensor attached to the laser diode housing.

Option D4, D5, D6: High Resolution Digital Control

For some of our systems a Digital Pot Module (DPM) is available, either as an option or as standard equipment. This device is designed as replacement for conventional potentiometers in analog circuits. Each option is capable of 256 or 512 positions between the minimum and maximum settings. This represents an increase of over 5 times the resolution versus the D1, D2, and D3 options. The DPM settings are maintained in non-volatile memory and return to their last programmed position upon power-up.

Digital Potentiometer Controller Software

The Digital Pot Controller software is compatible with all of our digital options. Connection to the PC is through the standard parallel (printer) port. Control of the laser with I/O lines from user provided on board micro-processors can be available on request. The DPMs are selectable at the factory with the following configurations:

- **D4/ D4b Constant Optical Output Power Control**
- **D5/ D5b Constant Drive Current Control**
- **D6/ D6b Digital Temperature Control**