

# **Manual**

**LASOS DPSSL Laser Series**

**Communication Interface  
RS232 / USB**

# 1 General

The controller is equipped with a serial interface. It is intended for servicing and fault analysis. The communication is text based, i.e. all instructions where send as ASCII-code by use of an appropriate terminal program.

## 1.1 Communication via RS232

Connect the RS232 connector of the computer with the interface connector of the controller by use of an appropriate adapter cable. For pin layout refer to the data sheet of the controller.

The following basic settings have to be applied.

Baud rate:	19,200
Data bit:	8
Parity:	none
Stop bit:	1
Hand shake:	none

## 1.2 Communication via USB<sup>1</sup>

Connect the USB connector of the computer with the interface connector of the controller by use of an appropriate adapter cable. For pin layout refer to the data sheet of the controller.

After connecting to the USB connector an additional COM- port is installed. The number of the COM- port has the number that follows the highest number of COM- ports already installed on the computer.

## 1.3 Description of the terms used in this manual

\r	CR (ASCII char 13)
\t	HT (ASCII char 9) (Tabulator)

CRC16   Cyclic redundancy check (16 bit)  
         Complies to CRC-16-XMODEM

ID       Identification [char data type] (a single character, for example an ASCII character)  
         Can be chosen by the user

Err	Error Code
	0 = OK
	1 = Parameter error, not all data sent or invalid data
	2 = Unknown command
	3 = CRC-error, wrong check sum


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<sup>1</sup> Not available with all models, refer to the data sheet of the controller

## 2 Set Commands

### 2.1 Command Structure

All commands were entered without space characters between the terms.

Function	Command	Return string	Remark
Switching the laser On	CRC16 \t ID \t 1020 \r	CRC16 \t ID \t Err \r	Only the diode current is switched, the laser remains in a stand-by
Switching the laser Off	CRC16 \t ID \t 1030 \r	CRC16 \t ID \t Err \r	
Setting the laser output power	CRC16 \t ID \t 2012 \t PWR \r	CRC16 \t ID \t Err \r	 The nominal output power value must not be exceeded, refer to the laser data sheet

PWR Output power in the *Set power* command, decimal number with max. 4 decimal places

### 2.2 Examples for Set Command

(Replace the red terms by the characters described in 1.3)

Laser on using command ID "1"

2060\t1\t1020\r

Laser off using command ID "1"

15165\t1\t1030\r

Setting the laser power to 30 mW using command ID "5"

21279\t5\t2012\t30\r

The response has to be 41630\t5\t0. In any other case the communication was not successful; the command has to be repeated.

## 3 Get Command

### 3.1 Command structure

All commands were entered without space characters between the terms.

Function	Command	Return string
Get the laser status	CRC16 \t ID \t 4000 \r	CRC16 \t ID \t Err \t T1 \t T2 \t I \t P \t N \t OT \t Ipe1 \t Ipe2 \t Q1Q2 \t Q3Q4 \r

## 3.2 Description of the terms

Term	Description	Format
T1	Temperature resonator	Decimal number with 2 decimal places (°C)
T2	Temperature laser diode	Decimal number with 2 decimal places (°C)
I	Current laser diode	Decimal number with 2 decimal places (mA)
P	Output power	Decimal number with 4 decimal places (mW)
N	Optical noise	Decimal number with 4 decimal places (%)
OT	Operation time	Integral number, operating time in minutes
Ipel1	Current TEC 1	Integral number, range of values 0-65532 (current 0 to I <sub>max</sub> )
Ipel2	Current TEC 2	Integral number, range of values 0-65532 (current 0 to I <sub>max</sub> )
Q1Q2	Cooling/Heating TEC 1	Integral number, 1=Cooling, 2=Heating
Q3Q4	Cooling/Heating TEC 2	Integral number, 1=Cooling, 2=Heating



Ipel1 and Ipel2 are a measure of the thermal status. At Ipel1 or Ipel2 equal to 65532 observe risk of overheating.

## 3.3 Example for Get Command

(Replace the red terms by the characters described in 1.3)

Getting the laser status using command ID "1"

41663\t1\t4000\r

## 4 Example for Calculation of CRC16-Code in C++

```

unsigned short Calc_CRC16(char* buffer)
{
    volatile unsigned int i=0,z;
    volatile char j,len=strlen(buffer),k;

    for (j=0;j<len;j++)
    {
        z=(buffer[j]<<8);
        i=i ^ z;
        for (k=0;k<8;k++)
        {
            if ((i & 0x8000)!=0)
            {
                i=(i<<1) ^ 0x1021;
            }
            else
                i<<=1;
        }
    }
    return i;
}

```

The CRC is calculated over the whole command beginning with the command ID, the Tabulator strings but without CR string. Refer to 1.3 for explanation of the terms.