# Integrating a Thorlabs CLD10xx Laser Diode Controller in MATLAB

The recommended way to integrate a Thorlabs CLD Laser Diode Controller (CLD1010LP, CLD1011LP, CLD1015) in MATLAB is to use the SCPI commands which are described in detail in the SCPI Command Reference which you can find in the CLD software section on the website.


The dll driver files are based on these commands as well so you don't lose any functionality. However the integration in MATLAB is much more comfortable.

**Programming in MATLAB:**

1) **Set resource name:**

At first you have to change the resource name in the MATLAB code to the name of your device. The resource name looks like this:

```
USB0::0x1313::<Type-ID>::<Serial Number>::INSTR
```

The type-ID depends on whether the firmware update function is enabled or disabled. This can be done in "Menu" > "System Settings":

- 0x8047 when firmware update is enabled
- 0x804F when firmware update is disabled

The serial number is written on the backside of the CLD driver.

For a CLD1010LP with serial number M00278794 the instrument ID looks e.g. like this:

```
USB0::0x1313::0x804F::M00278794::0::INSTR
```

This step is necessary to make sure that the right device is accessed.

### 2) Sample code for CLD drivers:

This sample code can be copied into MATLAB and can be executed once the resource name is changed correctly.

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```
%   Integrating a CLD10xx Laser Diode Controller in MATLAB using SCPI
commands

%     Specify resource name and vendor of driver
%
%     Resource name is: USB0::0x1313::<type id>::<serial number>::0::INSTR
%     Please change the type ID and the serial number of your device
%
%   Type ID: 0x8047 when firmware update is enabled
%            0x804F when firmware update is disabled
%            (see Menu > System Settings)

cld_addr = 'USB0::0x1313::0x804F::M00278794::0::INSTR';
cld_vendor = 'NI';

%   Open VISA connection and set parameters
global cld;
cld = visa (cld_vendor, cld_addr);
fopen (cld);
set (cld, 'Timeout', 10);
set (cld, 'EOSMode', 'read');

%   Set TEC temperature and enable TEC
temp = 25;
fprintf (cld, ['SOURCE2:TEMPERATURE:SPOINT ', num2str(temp)]);
fprintf (cld, ':OUTPUT2:STATE ON');

%   Check if temperature is stabilized
value = str2double (query (cld, 'SENSE2:TEMPERATURE:DATA?'));
disp('Waiting until temperature is stabilized')
while (abs(temp-value)>0.5)
    value = str2double (query (cld, 'SENSE2:TEMPERATURE:DATA?'));
    disp(['Current TEC temperature: ', num2str(value)]);
    pause(1);
end;

%   Set LD current limit in A
fprintf(cld, 'SOURCE:LIMIT 0.060');
%   Set LD current setpoint in A
fprintf(cld, 'SOURCE:LEVEL 0.050');
%   Switch on LD current
fprintf(cld, 'OUTPUT1:STATE ON');

pause(5);

%   Switch off LD current
```

```
fprintf(cld, 'OUTPUT1:STATE OFF');

%   Close VISA connection
disp ('Close VISA connection.');
fclose (cld);
delete (cld);
disp ('Connection closed successfully.');
```

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This program opens a VISA connection to the CLD driver, sets and enables the TEC control, switches the LD on and off and then closes the VISA connection again.

For further assistance please contact us on: europe@thorlabs.com / +49 (0) 8131-5956-2