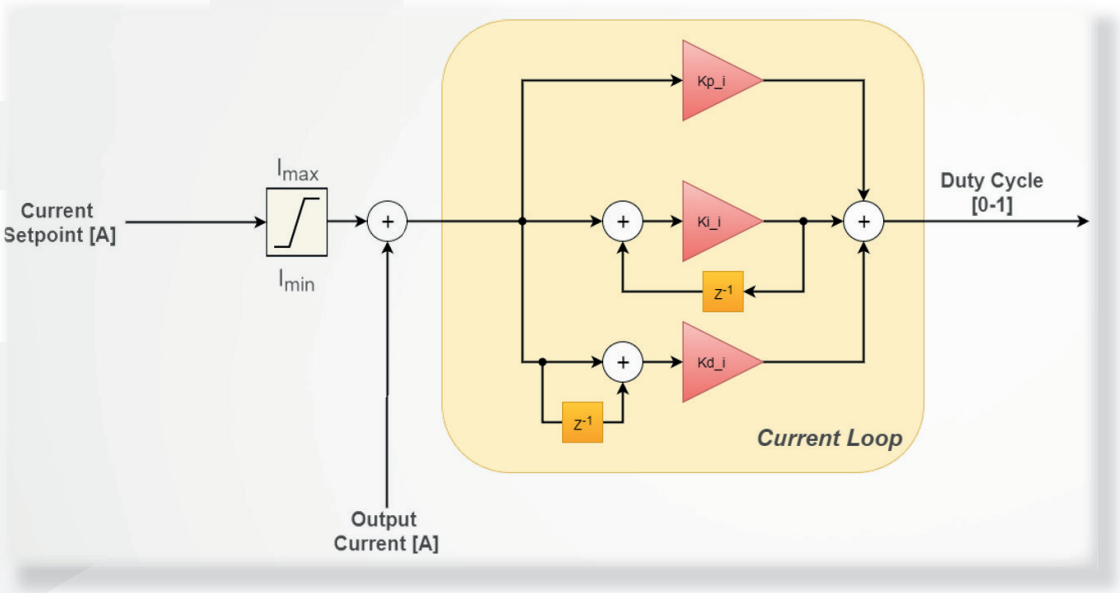
PROCEDURE FOR ADAPTING THE PID PARAMETERS FOR THE Easy-Driver

Pre-Information

THE Easy Driver is a digitaly controlled power supply. This means that an adaptation to any load can be achieved simply by changing the Software PID-Parameters.

Easy-Driver power supply a have control loop that continously controls current. Current Control Loop diagram is hereafter presented:



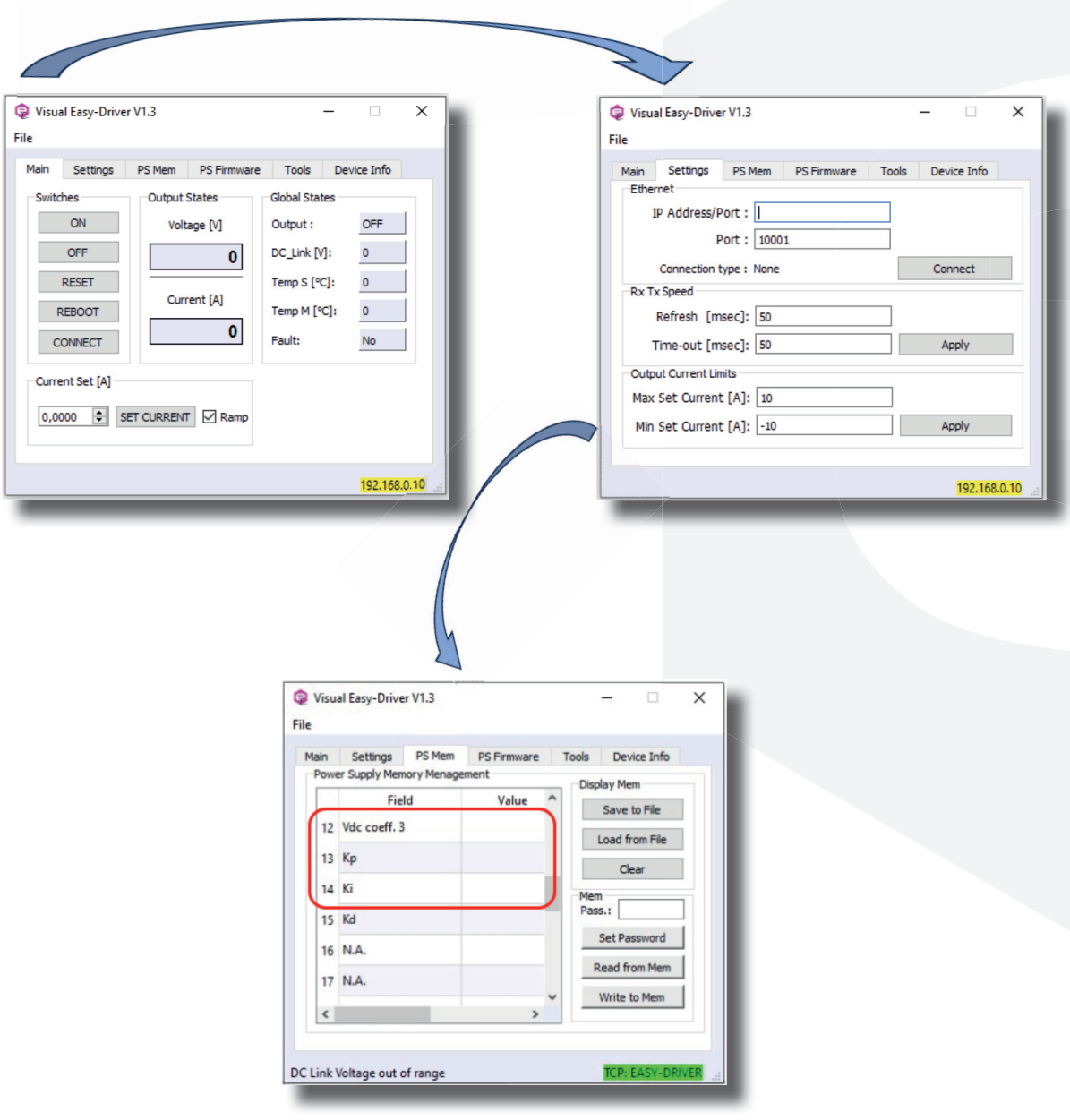
The PID-parameters consist in 3 values, Kp, Ki and Kd, that can be input through the Visual Easy Driver software.

PID PARAMETER ADAPTATION

Current Loop

From the **Visual Easy-Driver** main menu:

- Go to **Settings** menu and enter the power supply's IP address .
- Click on **PS Memory** to access the PID settings.



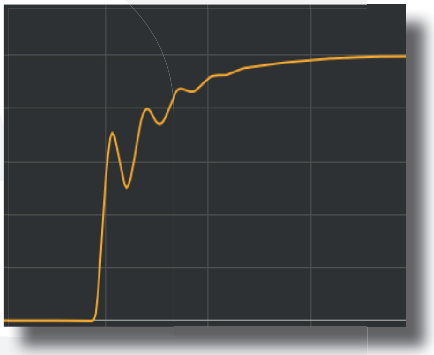
- Press the **Write to Mem** button to save the values to the internal memory.

Target

Target is to adapt PID values for a specific load conncted to the Easy-Driver that is performing in an ideal way: Fast Rise Times, No Overshoot (or small Overshoot), No Oscillations.

UNWANTED STEP RESPONSE:

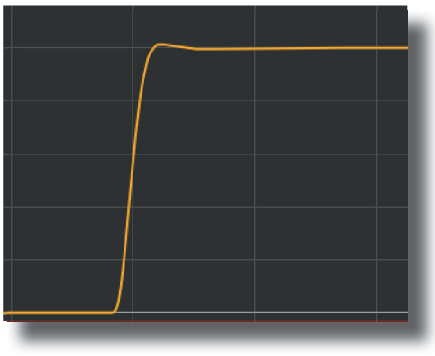
NO



NO

DESIDERABLE STEP RESPONSE:

YES

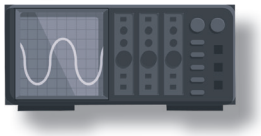


PID PARAMETER ADAPTATION

Setup Devices

Easy-Driver connected to the Load

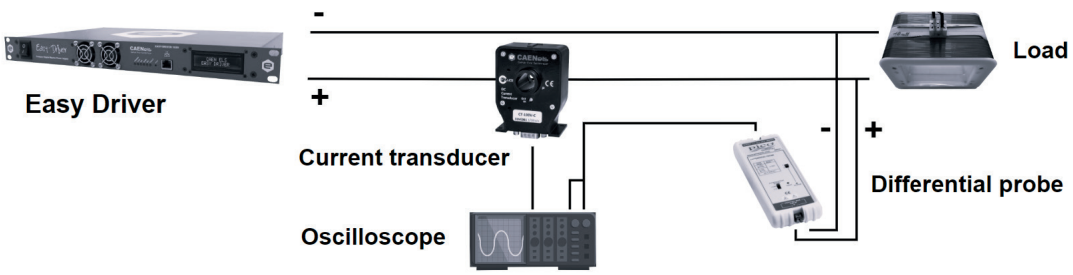
CT-100 – current sensor clamp; for istance and PS12151
(or another setup for measuring current)



Oscilloscope

Differential Probe to measure the output Voltage

Connect the devices as describe in the following diagram:



PID Adaption-Procedure

Due to safety concerns for both the source and the load, caused by potential dangerous high-frequency oscillations, the PID parameters should be set to very low values at the beginning of each adaptation for an unknown load.

To proceed follow these steps:

1. It is recommended to start with these parameters (safe side):

   Kp = Ki = 0.00001 and **Kd = 0**

2. (Kd typically should not to be changed due to its minor influence on the result. Only in very special cases with exeptionally high demands , such as with superconducting magnets, might it be adjust).

3. During PID adaptation procedure, set current to approximately **10%** of the nominal value. (i.e. if the Easy Driver is a 10A - 20 V model set Current and Voltage from 0 to 1A).

ATTENTION: The PID parameters are specific to each power source series. For example, it is not possible to use the same parameters for a Easy Driver 0220A that were determined for the Easy-Driver1020A!

PID PARAMETER ADAPTATION

PID Adaption-Procedure

In the following figures the current is represented in yellow and voltage in red.

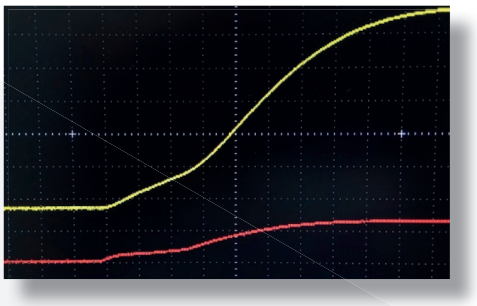


Fig. A

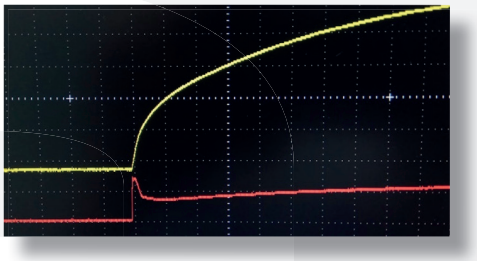


Fig. B

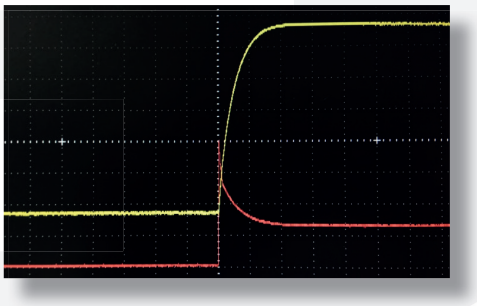


Fig. C

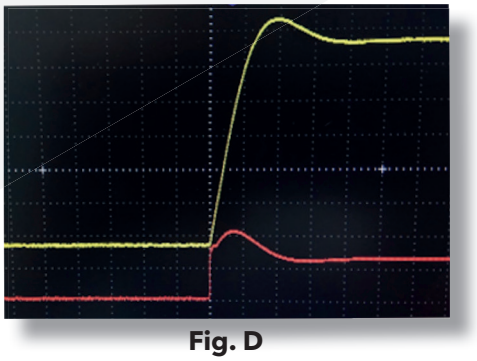
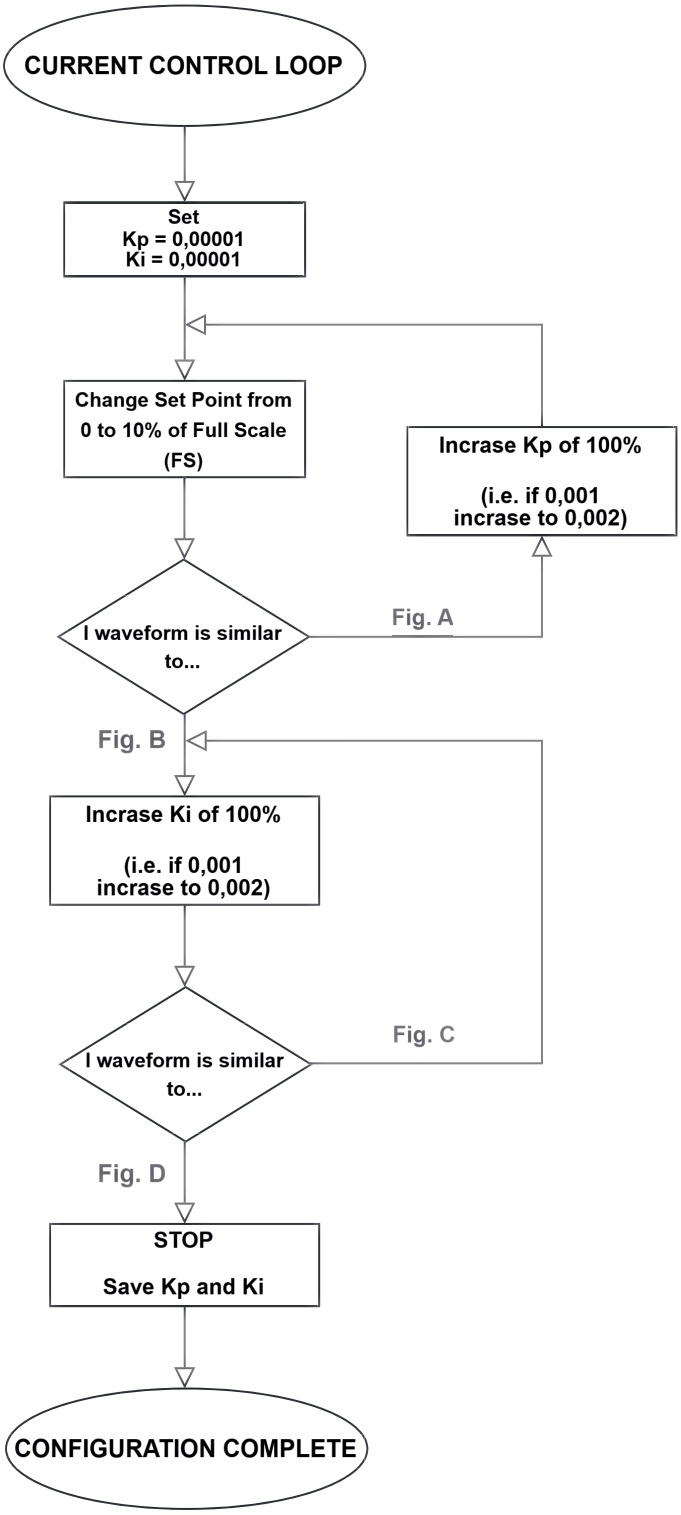


Fig. D



NOTE: In some cases when Fig.D is obtained, a further incrase of Kp may reduce the overshoot.

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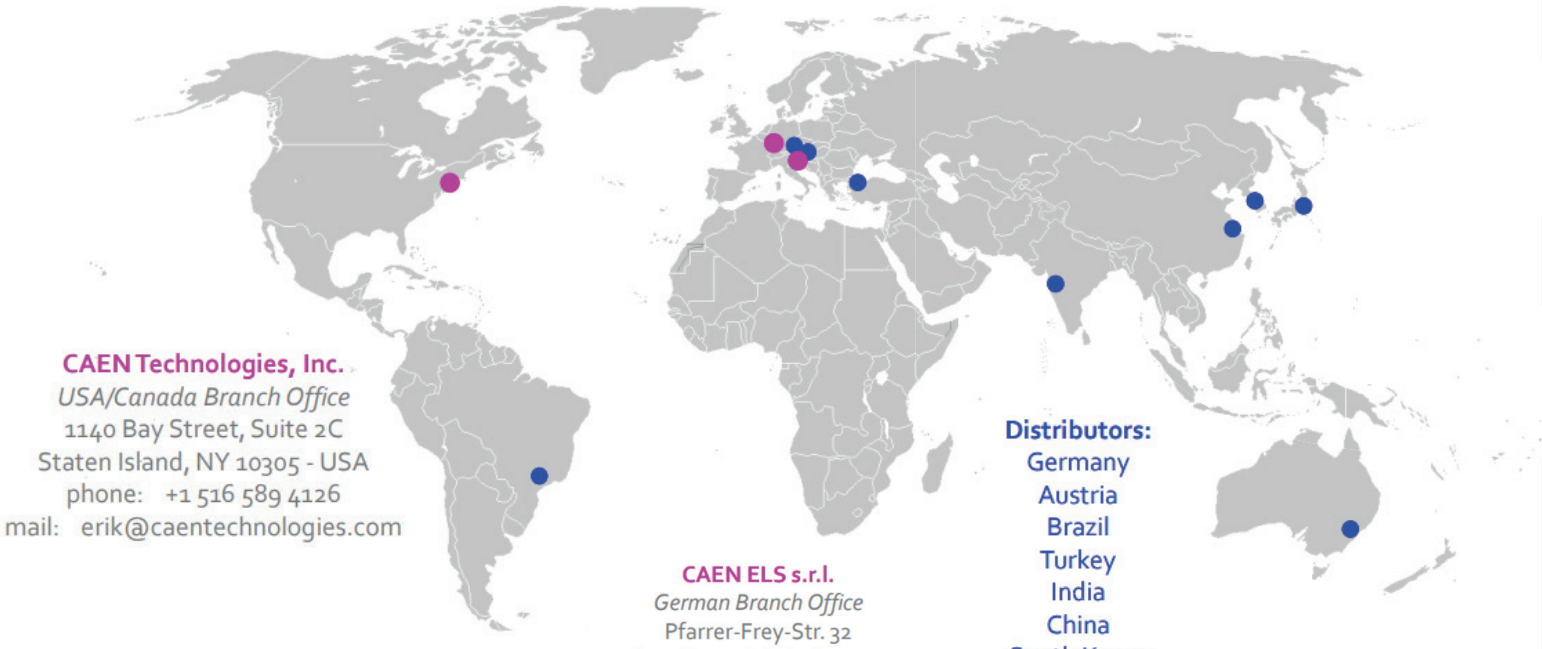

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