*29. September 2014*
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# $Z^+$-Lambda EPICs IOC Server

This EPICs IOC Server is designed to control the voltage and current of the 10 $Z^+$-Lambda power-supplies that power 7 quadrupoles and 2 dipoles. The first power-supply is reserved for a relee function and the other 9 power the magnets. Setting the voltage to 20V of the relee power-supply means a positive sign to voltage and current of the magnets and setting the voltage to 0V means a negative sign.

20V ← POSITIVE
0V ← NEGATIVE

## Records

In EPICs therms records are variables that are visible on the LAN to the clients. To change and view the current and voltage of each $Z^+$-Lambda power-supplies threre are 20 variables defined:

```
shicane:zps:relee:volt
shicane:zps:relee:curr
shicane:zps:2:volt
shicane:zps:2:curr
shicane:zps:3:volt
shicane:zps:3:curr
.
.
.
shicane:zps:10:volt
shicane:zps:10:curr
```

Per definition the values of each power supply are positive float numbers. In addition to these variables there are magnet records defined to represent also the sign:

```
shicane:q1:volt
shicane:q1:curr
shicane:q2:volt
shicane:q2:curr
.
.
.
shicane:q7:volt
shicane:q7:curr

shicane:d1:volt
shicane:d1:curr
shicane:d2:volt
shicane:d2:curr
```

These magnet records are read only variables.

## Starting/stopping the IOC-Server

To start the server go first into the zps directory:

```
cd ~/epcis/ioc/zps
```

and start the server:

```
./zps-ioc.py
```

Every EPICs server needs two ports to communicate with the clients. The Server itself resides in the python file **zps-ioc.py**. Since there can be many ioc-server on the same host, the ports have to be configured via the EPICS_CA_SERVER_PORT and EPICS_CA_REPEATER_PORT variables. This is done in the **zps-ioc.sh** shell script. Configure the ports in the shell script and start it like this:

```
./zps-ioc.sh
```

Stopping the server use CTRL+C key combination. If the server does not react you can open another shell and run the stop script:

```
./zps-ioc-stop.sh
```

### EPICs command line

EPICs provides several command line tools for a quick view and change of single Records. **caget**, **caput** and **camonitor** are sufficient for most puposes. To view the current value of the record shicane:zps:2:volt type:

```
$ caget shicane:zps:2:volt
```

To write a new value 3.14 to the record shicane:zps:2:volt type:

```
$ caput shicane:zps:2:volt 3.14
```

And to monitor this record for changes type:

```
$ monitor shicane:zps:2:volt
```

## Temperature EPICSs-IOC Server

For the temperature monitoring for each magnet threre are record variables defined:

```
shicane:q1:temp
shicane:q2:temp
shicane:q3:temp
shicane:q4:temp
shicane:q5:temp
shicane:q6:temp
shicane:q7:temp
shicane:d1:temp
shicane:d2:temp
```