

Application Note #15

# Charger Starter Interface for PLI Series

(Option PLI16, up from firmware version 4.2.x)

Intelligent chargers often only start the charging process when they detect a suitable energy storage device at their output.

With the optional Charger Starter Interface, the PLI series electronic load simulates a discharged accumulator by applying an appropriate voltage to the load input.



PLI series electronic load and Selectiva series charger from Fronius

## **Safety Instructions**

Read the safety instructions and the user manuals for the electronic load and the respective charger before starting to operate the system!

## **Functional Principle**

The Charger Starter Interface (CSI) can be installed as an option (PLI16) in any PLI load with 60 V or 120 V voltage range. It works in principle like a programmable power supply.

To simulate a discharged accumulator with the electronic load, set the CSI voltage to the voltage expected by the charger when the accumulator is discharged. The activation of the output voltage of the CSI can be coupled with the switching of the load input, so that when the load input is switched on, the output voltage of the CSI is applied to the load input for a certain time.

As soon as the charger supplies current, a previously programmed voltage list can be started in the load, simulating the battery voltage rising.

The measurement data for current and voltage can be recorded and stored in the electronic load and read after charging.



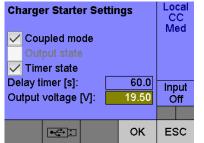
## **Test Procedure**

### **Configure CSI**

In the "Basic settings" menu of the electronic load, select "Charger starter".

Make the following settings in the next dialog "Charger Starter Settings":

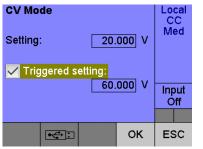
- Output voltage: Set the CSI output voltage to the value of the empty accumulator.
- Timer state, Delay timer: Set the delay time so that the charger starts properly.
- Coupled mode: Activate CSI simultaneously with load
   input



## **Configure Voltage Mode**

In the "Basic Settings" menu, select "Mode" and then "CV". Make the following settings in the "CV Mode" dialog:

- Setting: Set the voltage setting slightly above the CSI voltage.
- Triggered setting: Set triggered setting to maximum value



## Define Charging Curve With Voltage List

Select "List" in the "Function" menu and generate a voltage list according to the respective charge curve.

- List mode: Select Voltage
- Data acquisition: Activate data acquisition

| New List Mode and Length |       |      |   | cal<br>:C<br>ed |  |
|--------------------------|-------|------|---|-----------------|--|
| List length:             |       | 040  |   | ea              |  |
| List mode:               | Volta | ge 🔽 | 2 |                 |  |
| ✓ Data acquisition       |       |      |   |                 |  |
|                          |       |      |   | out<br>)ff      |  |
|                          |       |      |   |                 |  |
| Func:<br>LIST            |       | ок   | E | sc              |  |

Set the first list value identical to the static setting (in our example 20 V). Define all further list steps.

| New List              |          |        | Local     |
|-----------------------|----------|--------|-----------|
| List length:          |          | 40     | CC<br>Med |
| Step:                 |          | 01 💽   | Intera    |
| Level in [V]:         |          | 20.00  |           |
| Ramp time in [s]:     |          | 0.0000 |           |
| Dwell time in [s]:    | 120.0000 |        | Input     |
| Smpl. time ramp [s]:  |          | 1.0000 | Off       |
| Smpl. time dwell [s]: |          | 1.0000 |           |
|                       |          | ок     | ESC       |

#### Start list function by trigger.

| List settings Continuous list exec Iteration count: | Local<br>CC<br>Med |       |
|---|--------------------|-------|
| Trigger controlled                                  |                    | Input |
| ✓ Data acquisition                                  |                    | ΟΠ    |
|   |                    |       |
| Func:   | ок                 | ESC   |

## Höcherl & Hackl The electronic load

### **Configure Trigger**

As soon as the charger supplies current, a trigger is to be initiated that starts the preconfigured voltage list. Select the "Trigger" entry in the "Settings" menu and

make the following settings in the "Trigger" dialog:

- Trigger state: Single
- Trigger source: Current
- Slope: Positive
- Level: Enter current at which it is clearly recognized that the charger has started.

| Trigger             | Local    |        |  |  |  |
|---------------------|----------|--------|--|--|--|
| Trigger state:      | Single   | Med CC |  |  |  |
| Delay time in [s]:  | 0.000    | 10     |  |  |  |
| Hold off time in [s | 0        |        |  |  |  |
|                     |          |        |  |  |  |
| Trigger source:     | Input    |        |  |  |  |
| Slope: Positive     |          | ✓ Off  |  |  |  |
| Level:              | 2.0000 A |        |  |  |  |
| Func:               | OK       | ESC    |  |  |  |

## **Start Test**

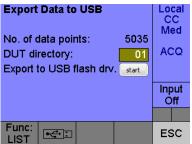
Connect the charger to the load input and switch the load input on.

#### **Read Measurement Data**

After the test, the data recorded during list execution can be transferred to a USB flash drive attached to the USB host socket on the front panel.

Select "Export" from the "Data" menu.

 DUT directory: specify directory on USB memory and start data transfer



## Programming via Data Interface

In addition to local operation, all the functions described can also be programmed via one of the data interfaces.

#### **SCPI Command Sequence:**

CST:VOLT 19.5 CST:OUTP:TIM:DEL 60 CST:OUTP:TIM ON CST:OUTP:COUP ON FUNC:MODE VOLT VOLT 20 VOLT: TRIG MAX LIST:MODE VOLT LIST:VOLT 20,20.2,20.4,20.6,20.8,... LIST:RTIM 0,30,30,120,120,... LIST:DWEL 120,0,0,0,0,... LIST:STIM:RTIM 1,1,1,1,1,... LIST:STIM:DWEL 1,1,1,1,1,... LIST:COUN 1 LIST:ACQ ON LIST:TRIG ON TRIG:SOUR CURR TRIG:LEV:CURR 2 TRIG:SLOP POS INIT INP ON . . . DATA: POIN? DATA:REM? 100 DATA:REM? 100 . . .

## More applications at

PAGE 3 of 3