

# Scienlab Energy Storage Discover

SL1091A



# Table of Contents

- SL1091A-1FP PC Software Energy Storage Discover (ESD) ..... 3
- R-09S-012-A SW Maintenance Contract ESD for 12 Months..... 7
- R-09S-024-A SW Maintenance Contract ESD for 24 Months ..... 7
- R-09S-036-A SW Maintenance Contract ESD for 36 Months..... 7
- ESD Customer training..... 7
- HS0004A-101 ESD Software remote training ..... 7
- HS0004A-100 ESD Software training at customer side..... 8

## SL1091A-1FP PC Software Energy Storage Discover (ESD)

In order to successfully develop and manufacture batteries, it is essential to have an environment for performing comprehensive tests. This necessitates a mature, stable and intuitive test-software allowing users to conduct tests that deliver concrete, stable and reproducible test results.

Energy Storage Discover (ESD) is the software solution for satisfying these complex and comprehensive test procedures. Additionally, the relevance and development of this software is continuously discussed with the respective customers and any subsequent customizations or new requirements are incorporated into the future development cycles.



Figure 1: PC running ESD at test bench

- Central controlling component for all Scienlab energy storage test environments from Keysight
- A single software license per work station
- Several ESD offline versions for the purpose of creating test programs
- Simulation environment for the offline test is available
- Support for Windows O.S. 7 and 10
- Communication with the battery test system via Ethernet
- Continuous enhancements and adaptations for customized client-oriented requirements
- Comprehensive overview, user-friendly operation and easy-to-learn
- Powerful visualization
- Comprehensive management of laboratory components with the help of Lab Discover (optional)
- Easy integration with over-arching (client) control and monitoring software with the help of standardized remote-interface (optional)
- Holistic vehicle emulation from the perspective of battery cell, module and pack levels
- Integration of external components into the test environment and process  
For example, availability of optional “Scienlab Measurement and Control Modules”

## Features – Test programming

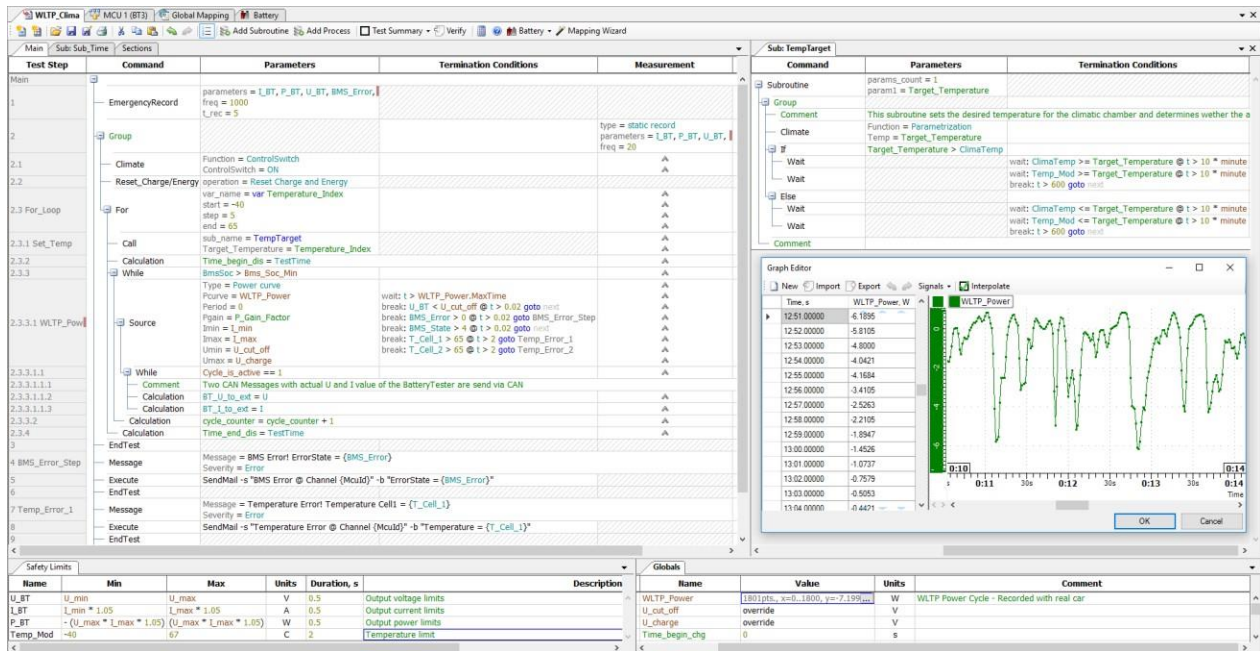


Figure 2: Figure shows intuitive programming in ESD

- User-friendly software that facilitates a shorter learning curve
- Self-explanatory test program solutions that allow one to generate simple as well as complex tests
- Syntax-check and verification options during programming help one to develop test programs faster
- Possibility to maintain structured test processes with the help of sub routines and management of test libraries
- Possibility to create and bind the battery database with “battery-types” and “battery-individuals”
- Possibility to use chronological value tables or simulate a read drive profile (allows for the import of .csv or .txt files)
- Possibility to send mails from ESD while test is running (e.g. mail in case of error)
- Further analysis of sensor values with the help of impedance spectroscopy and cyclical voltammetry (optional)
- Possibility to define parallel processes: independent execution of different actions during a test run (e.g. for controlling the sensor temperature)
- Rest-bus-simulation with BMS simulation tables

## Features – Test execution

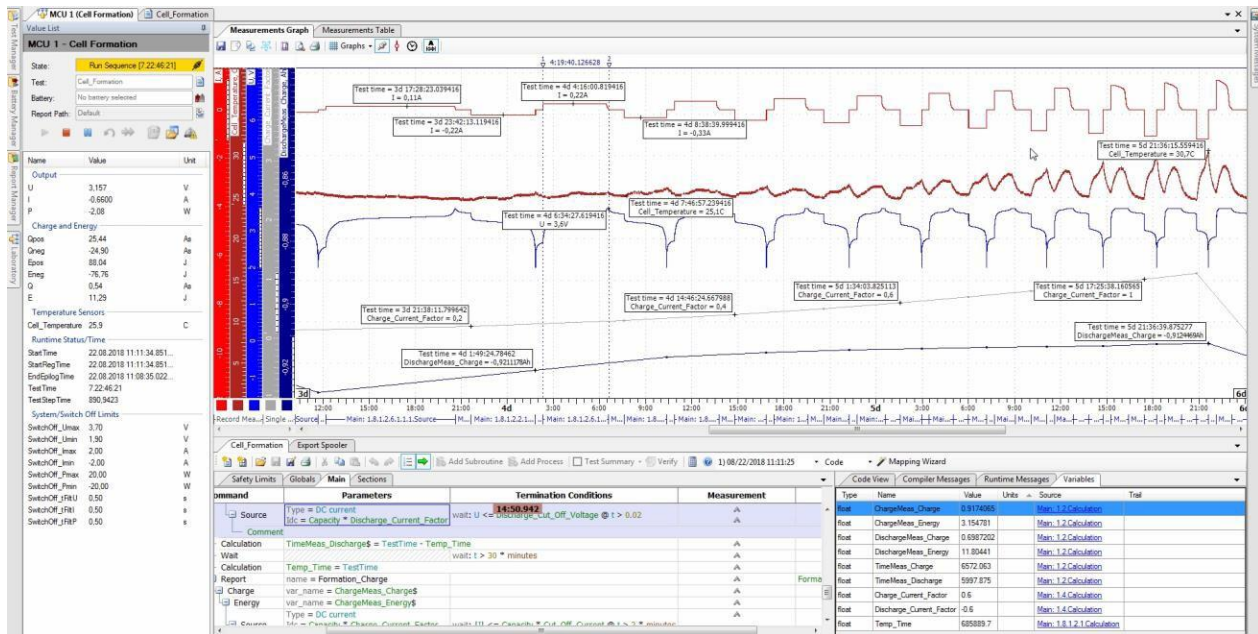


Figure 3: Figure shows the execution of a test in ESD

- Display of the measurement values during run time to capture the values while the test is running
- New parametrization of the test program during run time along with the possibility to incorporate the calculated values and results into the subsequent test procedures
- Monitoring the test environment with a detailed view for each channel
- Control of the test run process through start, stop, pause, and reset functions and to jump into any required test step
- Over-arching control with the help of WCF and XML is possible
- Optionally communicate with the BMS directly during the test run procedure (XCP utility)
- Change the global and battery constant source parameters to run time calculated values, measurements or BMS values advanced through CAN, while the source is active (reaction time = 1ms)
- Comprehensive statistical and arithmetic calculations during test run procedure
- Optional CAN messages in manual mode

## Features – Test analysis

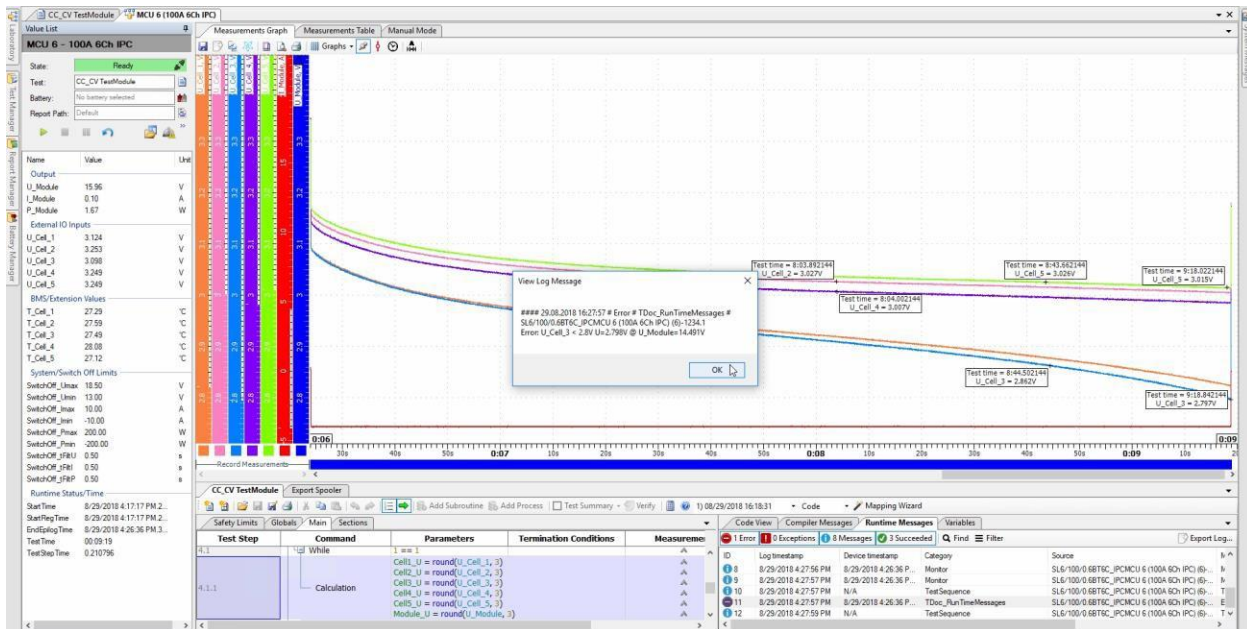


Figure 4: Figure shows easy analysis and visualization of measurement data

- Targeted, relevant and user-friendly analysis software without post process
- Vivid and clear visualization of the measurements using tables and graphs, during the complete tests, to provide fast and easy analysis of large data volumes
- Direct estimation and immediate comparison of several test run procedures in a single graph
- Display and representation of measurements over time or measurements over measurements
- Shared time stamps for carrying out time synchronous measurement analysis
- Record measurements at a constant rate (up to 20KHz) or dynamic record (switch low/high – data rate or delta measurement capture)
- Save measured data as \*.MAT file which can be processed in MATLAB without further conversion
- Generate a test summary with all relevant information and results
- Export selected measurement as “.mdf” (until 4.1), .csv, .txt and as pictures (.jpg, .png etc)
- Optional ESD report viewer for measurement analysis (independent of ESD)

## R-09S-012-A SW Maintenance Contract ESD for 12 Months

For the first six month after initial operational handover, all updates are free of charge. This SW maintenance contract is valid for 12 months. It includes free access to updates for:

- ESD: new releases & patches
- Price per license/system
- Validity: 12 months, follow-up agreement can be renewed during this period

## R-09S-024-A SW Maintenance Contract ESD for 24 Months

Content like item number R-09S-012-A

For the first six month after initial operational handover, all updates are free of charge. This SW maintenance contract is valid for 24 months. It includes free access to updates for:

- ESD: new releases & patches
- Price per license/system
- Validity: 24 months, follow-up agreement can be renewed during this period

## R-09S-036-A SW Maintenance Contract ESD for 36 Months

For the first six month after initial operational handover, all updates are free of charge. This SW maintenance contract is valid for 36 months. It includes free access to updates for:

- ESD: new releases & patches
- Price per license/system
- Validity: 36 months, follow-up agreement can be renewed during this period

## ESD Customer training

### HS0004A-101 ESD Software remote training

For Cell-/Module-/Pack-Test Benches

#### **Participants would be able to**

- program test cases in ESD
- get knowledge of basic functionalities of ESD control software
- select test cases and start tests
- view and analyze measured data online
- analyze measured data after test run
- interpret test cases
- create test reports (diagrammed and textual) and export tests

### Module ESD-Control Software

- introduction in ESD interface (GUI)
- setting up personal workspace
- introduction of main components and workflow
- introduction to command- and control-library and necessary parameters
- setup of sub-routines and function libraries
- usage of system- and interface extensions
- integration of Measurement and Control Modules (MCMs)
- dynamic parametrization of sources and termination criteria
- program test cases to test specifications (test cases will be used in Module Test Bench Control)
- analysis of measured values
- export of measured data
- illustration of measured data in report viewer
- duration: 2 working days

**Requirement:** Internet connection and possibility to set up the WebEx client

### General information

- duration of training: 2 working days
- location: webex conference, individual for each participant
- participants: max. 5
- individual adaption after consulting

## HS0004A-100 ESD Software training at customer side

For Cell-/Module-/Pack-Test Benches

### Participants would be able to

- program test cases in ESD
- get knowledge of basic functionalities of ESD control software
- select test cases and start tests
- view and analyze measured data online
- analyze measured data after test run
- interpret test cases
- create test reports (diagrammed and textual) and export tests

### Module ESD-Control Software

- introduction in ESD interface (GUI)
- setting up personal workspace
- introduction of main components and workflow
- introduction to command- and control-library and necessary parameters
- setup of sub-routines and function libraries
- usage of system- and interface extensions
- integration of Measurement and Control Modules (MCMs)
- dynamic parametrization of sources and termination criteria
- program test cases to test specifications (test cases will be used in Module Test Bench Control)
- analysis of measured values



- export of measured data
  - illustration of measured data in report viewer
  - duration: 2 working days
- Requirement:** seminar room with projector

#### **Module Test Bench Control**

- introduction into test system
  - explanation of hardware and system construction
  - running test cases on real DUT (device under test)
  - duration: 0.5 working days
- Requirement:** Operative Test System

#### **General information**

- duration of training: 2.5 working days
- location: at customers site in seminar room (incl. projector) and at Test System
- incl. seminar documents
- participants: max. 5
- individual adaption after consulting

Learn more at: [www.keysight.com](http://www.keysight.com)

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

