



ZAKŁAD SYSTEMÓW ELEKTRONICZNYCH

ATLAS - SOLLICH

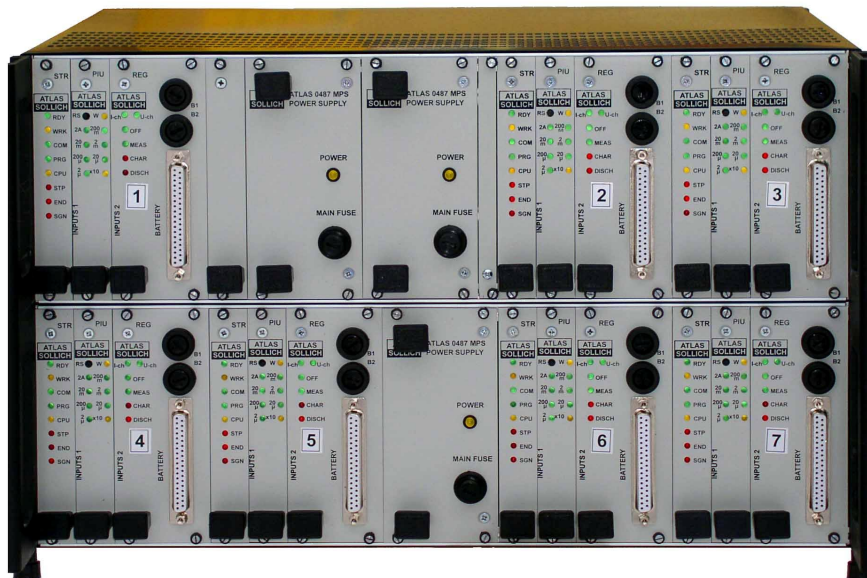
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TECHNICAL INFORMATION

ATLAS 0461

MULTICHANNEL BATTERY INTERFACE

v.7x5V6A



ATLAS 0461 MBI v.7x5V6A

GDĄŃSK 2004

I. INTRODUCTION

ATLAS 0461 MULTICHANNEL BATTERY INTERFACE is complete measuring device designed to testing and measurements half-battery cells, battery cells and battery.

Device is consisted from 1 to 8 independent ICDU units, which realize each own research program. Every unit can operate from 1 to 8 individual cells connected in series.

The instrument is built-in in EURO 6U cover.

Separate POT-GALV units, central adapters and control circuit systems are made as EURO 3U slots.

The instrument's control and regulation is executed by **ABCD&T v.2.1a** software.

II. DEVICE APPLICATION

- Working out a new chemical sources of current,
- The researches of substances and materials applied in production of chemical current sources,
- Testing the elements of cells with use of reference electrodes,
- Researches of half-finished products,
- The study of charging battery methods,
- Testing changes of temperature, pressure, concentration of electrolyte and the others during charging and discharging of cell,
- Testing completed products.

III. FUNCTION OF DEVICE

- Constant current charging with limitation of voltage,
- Constant voltage charging with limitation of current,
- Constant current discharging,
- Creation of any processes sequence of charging, discharging and measurement in time,
- Independent voltage measurement of all cells,
- Cells and battery SEM measurements,
- Measurement of half-battery cells voltage with use of high resistance reference electrodes,

- Temperature measurement at each ICDU unit,
- Measurement of external sensor voltage (e.g. pH, pressure),
- The possibility of finishing any executed charging or discharging process depended on: the time of service, voltage of battery, voltage of cells, current of battery, temperature, external voltage from any sensors, charge, energy, combination of above conditions,
- Reading the results during performing of research program,
- Optical and acoustic signaling the state of device.

Examples of connecting tested object to ATLAS 0461 MBI device.

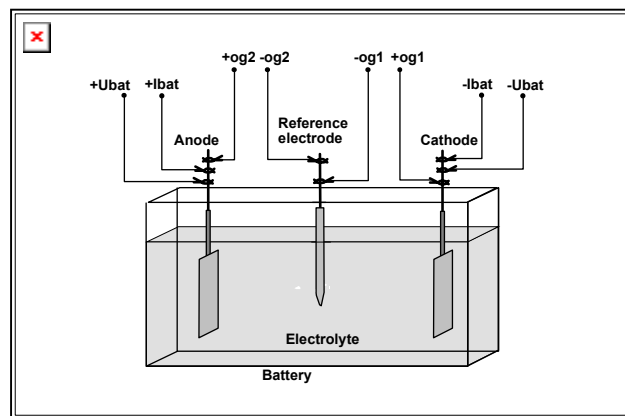


Fig. 1 Connecting cell with reference electrode.

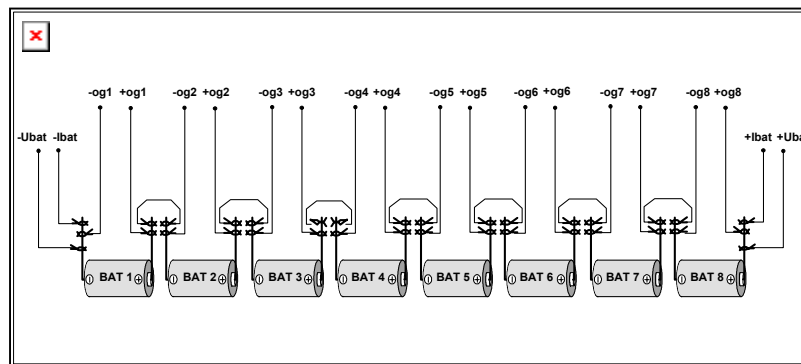


Fig. 2. Connecting 8 cells with measurement and control voltage of every cell.

IV.THE INSTRUMENT STRUCTURE

IV.1 Central adapter

The central adapter consists of 1 slots:

The slots enable the communication between the ICDU slots and the computer. The central adapter enables the selection of ICDU units, voltage and current ranges setting. It also enables to transfere digital data to the computer.

IV.2 Independent Charge-Discharge Unit - ICDU

The ICDU unit consists of:

- the packet of controller responsible for driving, controlling and regulation of adjustments,
- the packet controlling the parameters of charging and discharging battery and measurement of voltages and currents,
- the packet regulating current of charging and discharging battery,
- the measuring adapter allowing to easy connection of tested object to device connectors.

1. One ICDU unit may be used as:

U ch - charging with constant voltage.

I ch - charging and discharging with constant current.

Actually setted function is exposed on the front- board of the unit.

2. There are 4 working modes of the unit possible:

OFF – off mode -entire disconnection of the inputs and
the outputs I+, I-, ogn+, ogn-

MEAS - measure mode - switch on the inputs ogn+, ogn-

CHAR-- charging mode - switch on all of the inputs and outputs.

DISCH - discharging mode - switch on all of the inputs and outputs.

3. Each ICDU unit posses the I/U transducer.

Each ICDU unit has 4 to 6 current measurement ranges:

Lp.	$I_{max} \leq 2A$	$I_{max} > 2A$	$I_{max} > 20A$
1	2 A	2 A x10 = 20 A	200 A
2	200 mA	200 mA x10 = 2 A	20 A
3	20 mA	20 mA x10 =200 mA	
4	2 mA	2 mA x10 = 20 mA	
5	200 μ A		
6	20 μ A		

4. Multiplexer enables to measure the voltage between 8 succeeding cells of the battery:

$$U_{cell1} = (+og1) - (-og1)$$

$$U_{cell2} = (+og2) - (+og2)$$

$$U_{cell3} = (+og3) - (+og3)$$

$$U_{cell4} = (+og4) - (+og4)$$

$$U_{cell5} = (+og5) - (+og5)$$

$$U_{cell6} = (+og6) - (+og6)$$

$$U_{cell7} = (+og7) - (+og7)$$

$$U_{cell8} = (+og8) - (+og8)$$

IV.3 The low- power supplies.

The pulses power supplies powered the ICDU units and control adapter.

IV.4 The EURO cover.

There are 2 pannels installed in the EURO 6U cover:

- higher 3U - contains of power supplies and central adapter and 3 ICDU units
- lower 3U - contains of 4 ICDU units.

V. ATLAS 0461 MBI 7x5V6A TECHNICAL DATA:

Lp.	Parameter		
1.	ATLAS 0461 v.7x5V6A Numer of ICDU	7	
2.	ICDU function		
2.1.	- constant voltage charging, U=const	U-ch	
2.2.	- constant current charging and discharging, I=const	I-ch	
3.	ICDU working mode		
3.1.	-off connections	OFF	
3.2.	- SEM measurement	MEAS	
3.3.	- charging	CHAR	
3.4.	- discharging	DISCH	
4.	Current-voltage parameters of ICDUs		
4.1.	Maximum charge – discharge current:	6	A
4.2.	Maximum voltage of charge:	+ 5	V
4.3.	Minimum voltage of charge:	- 4	V
4.4.	Programming current value, in subranges:	20, 200 2, 20	mA A
4.5.	Resolution current setting, Ibat:	12	bit
4.6.	Current setting error:	< 0,5	%
4.7.	Programming voltage value, in subranges:	2 8	V V
4.8.	Voltage setting error Ubat:	< 0,5	%
4.9.	Current measurement Ibat, in subranges:	20, 200 2, 20	mA A
4.10.	Resolution current measurement Ibat:	12	bit
4.11.	Current measurement error:	< 0,5	%
4.12.	Voltage measurement Ubat, in subranges:	2 8	V V
4.13.	Resolution voltage measurement Ubat:	12	bit
4.14.	Voltage measurement error, Ubat:	< 0,5	%
4.15.	Voltage measurement Ucell, in subranges:	2 6	V V
4.16.	Resolution voltage measurement, Ucell:	12	bit
4.17.	Voltage measurement error, Ucell:	< 0,5	%
4.18.	Voltage measurement inputs bias current:	< 10	nA

5.	General:		
5.1.	Supply	230 +/- 10 % 48 - 60	V Hz
5.2.	Max power consumption	480	VA
5.3.	Fuse	10	A
5.4.	Dimensions W x H x D	450x290x400	mm
5.5	Weight	25	kg

VI. PROGRAM ABCD&T

The ATLAS 0461 MBI works with external computer used to programming it and receiving results of measurements. The service and cooperation of computer and device is realized by ABCD&T (Atlas Battery Charger – Discharger and Tester) software.

Device is connected to computer by serial interface RS232. During the execution of measuring process the computer can be switched off.

In the driving program the following processes of measurements, charging and discharging battery are recorded as next steps. Program is executed from first to the last programmed step. The end of executing of each steps is depended on settings chosen by operator.

Selected fragment of program can be repeated many times by internal loop. When program works the results of measurements are on up to date send to computer and displayed. The results from device or from previous saved files can be displayed on the graph.

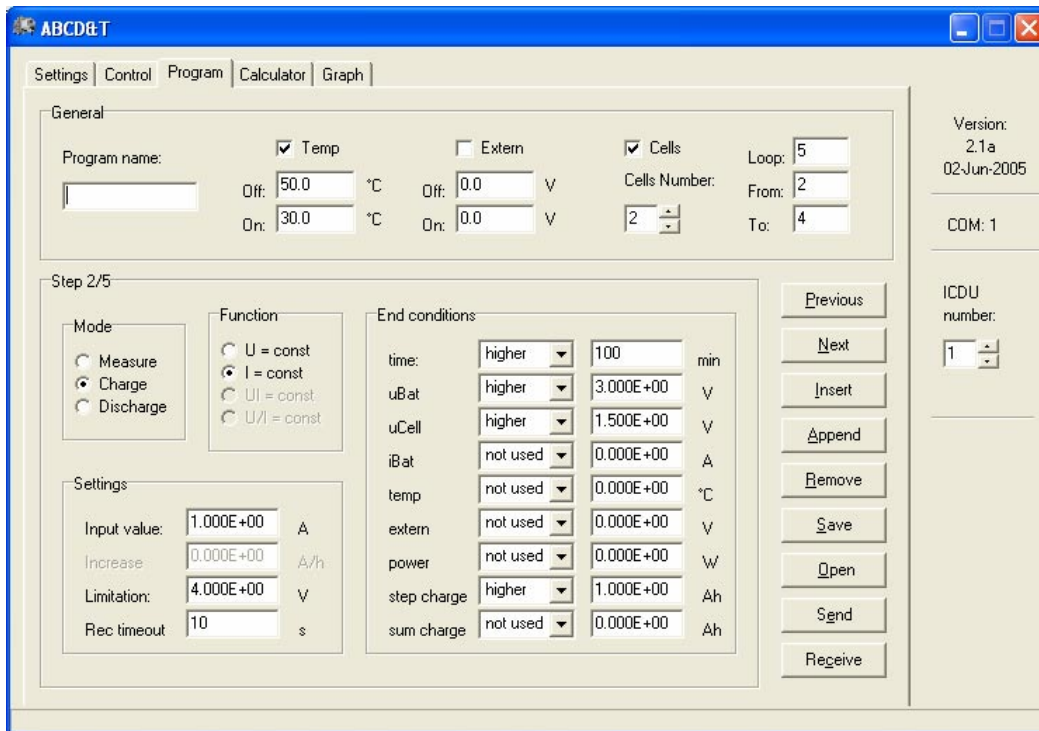


Fig. 3 Creating individual steps of program

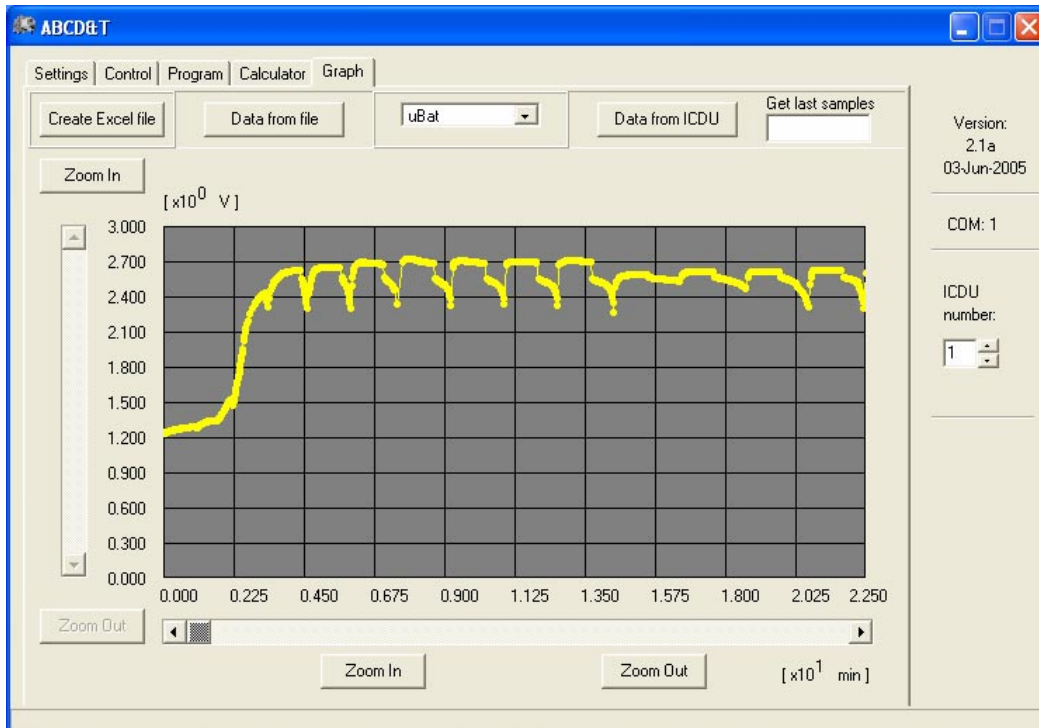


Fig. 4 Visualization of measurement results