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TECHNICAL INFORMATION

# ATLAS 0961

## MULTICHANNEL BATTERY INTERFACE

### v.8x6V200mA



ATLAS 0961 MBI v.8x6V200mA

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## I. INTRODUCTION

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

Device consists of 1 to 8 independent ICDU units, which realise its 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-09 v.1.0** software.

## II. DEVICE APPLICATION

- Developing new chemical sources of current,
- The research of substances and materials applied in production of chemical current sources,
- Testing the elements of cells with use of reference electrodes,
- Research of half-finished products,
- The study of battery charging methods,
- Testing changes of temperature, pressure, concentration of electrolyte and the others parameters during charging and discharging of cells,
- Testing of finished 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 EMF (electromotive force) 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,
- Visual and acoustic signaling of the state of device.

Examples of connecting tested object to ATLAS 0961 MBI device.

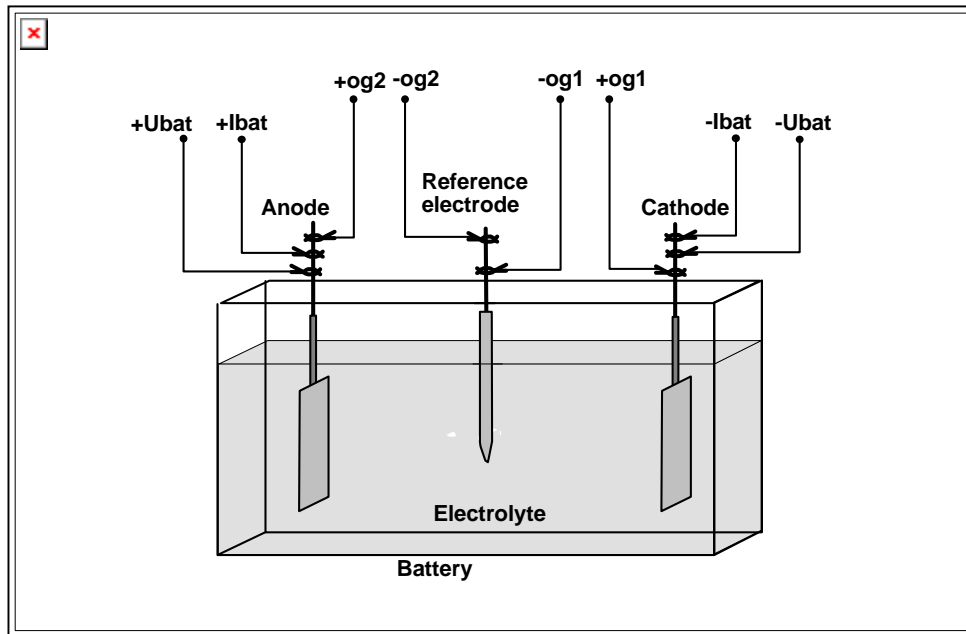


Fig. 1 Connecting cell with reference electrode.

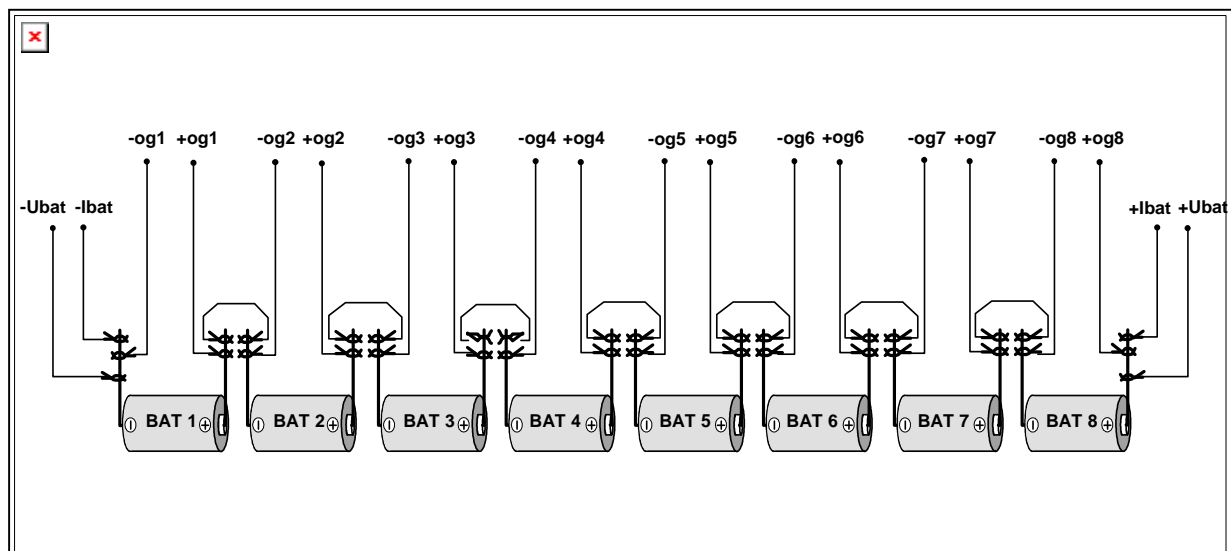


Fig. 2. Connecting 8 cells with measurement and control voltage of every cell.

## IV.THE INSTRUMENT STRUCTURE

### IV.1 Central adapter RS232/485

The central adapter consists of 1 slot:

The slot enables 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 transfer 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 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 is equipped with I/U transducer.

Each ICDU unit has 4 to 8 current measurement ranges:

Lp.	Description	Current range	Unit
1	2e0	2	μA
2	2e1	20	μA
3	2e2	200	μA
4	2e3	2	mA
5	2e4	20	mA
6	2e5	200	mA
7	2e6	2	A
8	2e7	20	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.

### V. ATLAS 0961 MBI 8x6V200mA TECHNICAL DATA:

Lp.	Parameter		
1.	Numer of ICDU	8	
2.	<b>ICDU function</b>		
2.1.	- constant voltage charging, U=const	U-ch	
2.2.	- constant current charging and discharging, I=const	I-ch	
3.	<b>ICDU working mode</b>		
3.1.	-off connections	OFF	

3.2.	- EMF measurement	MEAS	
3.3	- charging	CHAR	
3.4.	- discharging	DISCH	
<b>4.</b>	<b>Current-voltage parameters of ICDUs</b>		
4.1.	Maximum charge – discharge current:	200	mA
4.2.	Maximum voltage of charge:	+ 6	V
4.3.	Minimum voltage of charge:	- 6	V
4.4.	Programming current value, in subranges:	2, 20, 200 2, 20, 200	$\mu$ A mA
4.5.	I <sub>bat</sub> current setting Resolution:	16	bit
4.6.	Current setting error:	< 0,2	%
4.7.	Programming voltage value, in subranges:	6	V
4.8.	U <sub>bat</sub> voltage setting error:	< 0,2	%
4.9.	I <sub>bat</sub> current measurement, in subranges:	2, 20, 200 2, 20, 200	$\mu$ A mA
4.10.	I <sub>bat</sub> current measurement resolution:	24	bit
4.11.	Current measurement error:	< 0,2	%
4.12.	U <sub>bat</sub> Voltage measurement:	6	V
4.13.	Resolution of U <sub>bat</sub> voltage measurement:	24	bit
4.14.	U <sub>bat</sub> voltage measurement error:	< 0,2	%
4.15.	Max number of cells:	8	pcs.
4.16.	U <sub>cell</sub> voltage measurement, in subranges:	6	V
4.17.	U <sub>cell</sub> voltage measurement resolution:	24	bit
4.18.	U <sub>cell</sub> voltage measurement error,,::	<0,2	%
4.19	Voltage measurement inputs bias current:	< 100	pA
<b>5.</b>	<b>General:</b>		
5.1.	Supply	230 +/- 10 % 48 - 60	V Hz
5.2.	Max. power consumption	120	VA
5.3.	Fuse	10	A
5.4.	Dimensions W x H x D	450x150x400	mm
5.5	Weight without cables	9,7	kg

### VI. PROGRAM ABCD&T

The ATLAS 0961 MBI works with external computer used to programming it and receiving results of measurements. The service and cooperation of computer and device is executed by **ABCD&T-09** (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 controlling program, the consequent 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 step depends on settings entered by operator.

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

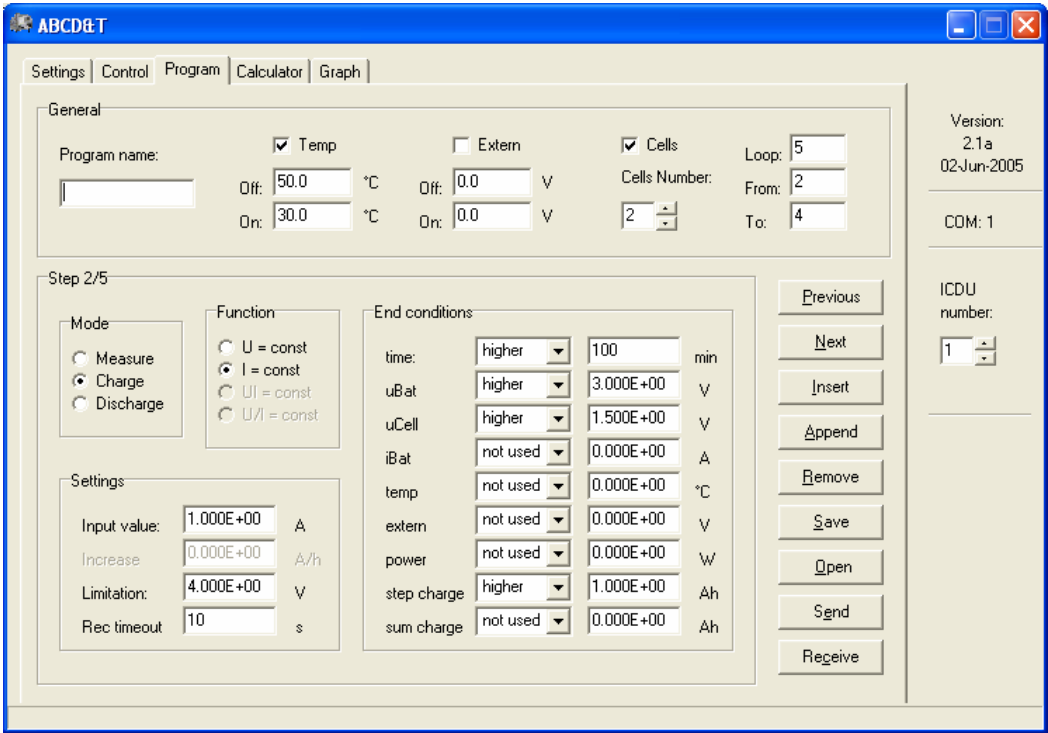


Fig. 3 Creating individual steps of program

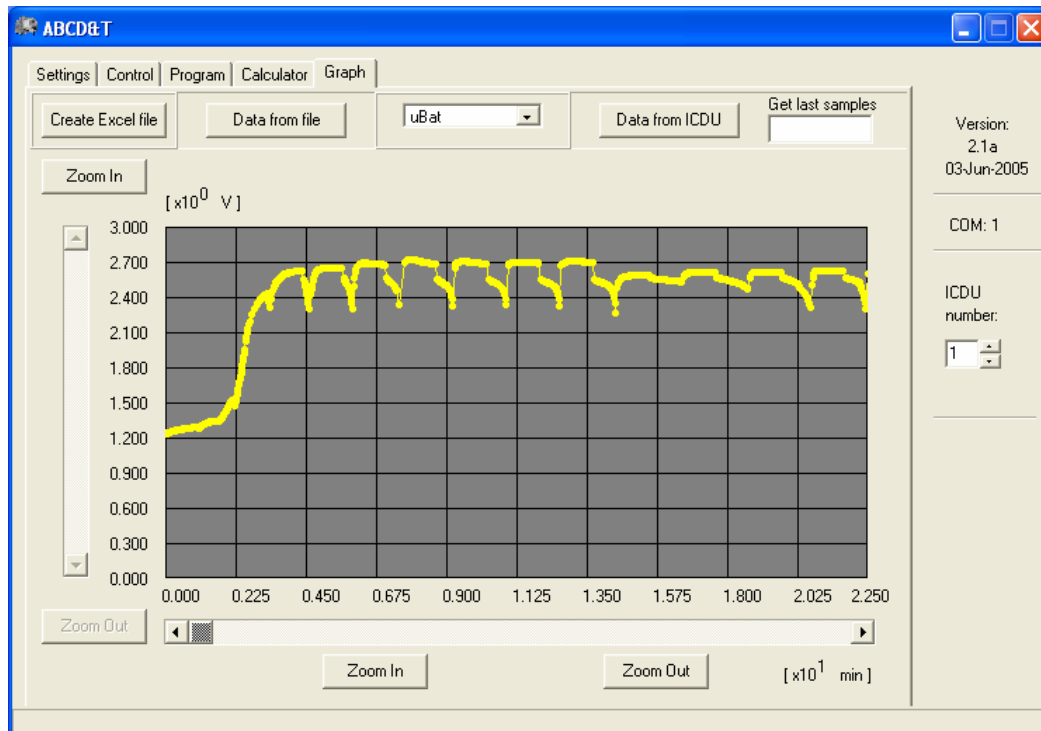


Fig. 4 Visualisation of measurement results