

User's Manual of BATCATWIN Software for BATCAT (BA249 / PV99 / BA24)

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DFV Technologie BATCATWIN Software 14 Jan 2008 Edition

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Introduction

BATCATWIN software associated to the autiomatic battery controler BATCAT allows to verify easily and quickly a battery.

It is possible to verify any battery (CdNi, Pb or other technlogy). The maximum number of cells which can be verified is 249 and depends of the number of rack(s) of the BATCAT.

A BATCAT equipped with 1 rack can verify up to 24 cells A BATCAT equipped with 2 racks can verify up to 49 cells ... A BATCAT equipped with 10 racks can verify up to 249 cells

BATCAT has 6 measurement ranges :

Range 1 : from 0 to 3V Range 2 : from 0 to 6V Range 3 : from 0 to 9V Range 4 : from 0 to 12V Range 5 : from 0 to 15V Range 6 : from 0 to 18V

So it is posible to measure single cells of 2V or groups of cells 12V (builded with 6 cells of 2V).

BATCAT measures in real time each voltage of all cells of the battery. If one of them is bad, it is instantaneously flagged.

In order to perform the test, you have to describe the batteries (record caracteristics into a file). All these files build a "battery database"

Then you have to determine the test you want to perform (program minimum thresholds, duration ...). This is called "TEST". You can create many TEST for the same battery (ANNUAL TEST, TRIMESTEST TEST ...).

When BATTERIES and TESTS are created, you can perform the test of the battery.

During measurements, all the data are shown in real time (Total voltage, cells voltages, temperatures, currents ...)

If an alarms occurs, it is shown instantaneously.

All data are stored in real time on the hard disk if the PC. When the test is terminated, you can analyze the data and make your report. (You can look at your data like on a Video Cassette Recorder).

BATCAT BA249 Overview



Overview of BATCAT BA24



Overview of BA24R





WARNING

For using BATCATWIN software, you are supposed to know how to use Windows (95,98,NT4,XP).

BATCATWIN software is protected against copy by the european laws. It cannot be copied. However a user is authorized to install it on more than one PC in his office (desktop and laptop for example).

BATCATWIN *Multi licence* allow to manage more than one BATCAT BATCATWIN *Single licence* allow to manage only one BATCAT

Minimum configuration to use BATCATWIN

Pentium 133MHz 32Mo Ram 40Mo of free disk Video card 800 x 600 CDROM drive Inkjet or laser printer (colour or Black and white)

Recommended configuration to use BATCATWIN

Pentium II 233MHz 64Mo Ram 100Mo of free disk Video card 1024 x 768 CDROM drive Inkjet or laser printer (colour or Black and white)

Software installation

Insert CDROM into CDROM drive to install software. If AUTORUN mode is configured on your PC, SETUP will run automatically. Otherwise you have to run SETUP.EXE on the CDROM.



Installation of software (Double click on SETUP icon)

Then you have to follow the instructions of the SETUP program.

Note : If you install a new version, you have not to desinstall the old one.



When you launch program the following window is displayed, asking you to enter Key.

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software

The key is writen on the last page of the user manual (Just before the CDROM blister)

Jser name an	d key	
User name		
Software key	<u> </u>	

Notes :

- The key and user name have to be entered with respect of uppercase and lowercase.
- Software key cannot contain letter 'O'.

Batteries file manager

Software uses a file manager like Windows. This allows you to manage easily files. You have not to kown how and where the files are stored to use the software.



Battery manager has a toolbar to simplify the use of the software



When a line is selected in the file manager a preview is displayed on the right part of the window.



If the selected line in the file manager is a measurements file, the curve of the discharge is displayed on the right part of the screen.



When the selected line is a "battery", you can access to the different function using the right button of the mouse.



If you want to erase a file, you have to confirm it :



Beware a deleted file cannot be undeleted ...

If the selected line is a "TEST" you can access to another menu using right button of the mouse.



System setup

When you start the first time the software, you have to enter Setup. You can access to the

setup using · icon or using File/Setup menu.

Following screen is displayed :



Printing example with a custom logo

Page 1 / 2 Dated 19/05/2001 at 10:18:27 BatCatWin Version 1,02 DFV Technologie Battery: 4lbt_Bt Test: 115VTR4 File: c:\mes documents\mesures batcat\4lbt_Bt.rbt\115VTR4.res\115VTR4.esa Electricité de Trance **Battery description** Custom logo printed on each page of the report Batcat type : BA249 Battery :4LBT_BT Battery location :SDM TR4 Battery technology :Blei Group of 1x cells fixed Battery capacity :210 Ah Max load voltage :2,25 V Accuracy : 1,0% Floating voltage :2,20 V Accuracy : 1,0% Inversion voltage :1,60 V Cells cabling Battery #1

Test description

- Current measure : Current clamp 0 to 200 A (0 to 200mV input)
- Start on current greater than 20 A

Alarm Stop

\mathbf{M}		if total voltage of battery #1 is lower than 107,00 V
\mathbf{M}		if absolute threshold is lower than 1,86 V
		if differential threshold is greater than 200 mV
		if differential threshold is lower than 200 mV
		if discharge current is greater than 54 A
		if battery is discharged more than 50 %
		if aux. input is greater than 0
		if total duration is equal to 75 min
Dura	tion c	orrection according to the temperature

0°C to 15°C	:1	Duration = Duration	+	0 min
15°C to 20°C	:1	Duration = Duration	+	3 min
20°C to 25°C	:1	Duration = Duration	+	8 min
25°C to 30°C	:1	Duration = Duration	+	16 min
30°C to 40°C	:1	Duration = Duration	+	28 min
> 40°C	:1	Duration = Duration	+	45 min

Programming

To perform a battery test, it is necessary to create battery and test file . This is done in the file manager.

"Battery" programming

To create a battery choose File/New battery menu or click on the following icon

You can do this also with a right click on the root line of the file manager.

Software ask to enter a battery name. Beware,
name is limited to 8 letters (without space).

File	Battery	Test	Measure
S F	ietup Print		
1	est editin	g	
Ņ	leasurem	ents vi	ewing
١	lew batte	ry	
١	lew test		
1	lew meas	uremen	nt
E	ixit		

ame or the new dat	tery
Name of the ba	ittery file
ОК	Cancel

Then you have to enter nattery caracteristics. Data input is done in the TAB of the following screen. (General programming, cabling, Voltage dropout, comments)

Tab "General programming" :





Tab "voltage dropout" :

On the BATCAT BA249 (equipped with 8.91 version), it is possible to manage voltage dropouts in cable. This occurs when battery is divided in many section connected with a long cable.



Tab "Comment"

You can input comment on each battery using this text editor



<u>Note</u> : It is possible to use Windows keys "CTRL INSER" to copy and "SHIFT INSER" to paste.

To exit, you have only to click on the upper right corner of the window. The software ask you if you want to save modifying.



Note : It is also possible to save programming using File/Save menu



<u>"TEST" programming</u>

To create a new TEST, select the battery line in the file manager, click on the right button of the mouse and select "NEW TEST". You can also use File/New test menu or click on the following icon



Enter Test name :

Name of the test file	Name of the test file		
		Name of the	e test file

File name is limited to 8 letters (without space) for compatibility with MSDOS.

Test programming winddow a many Tabs. Battery tabs (general programming, cabling, voltage dropout, comments) are in read only mode.

This allows to sea the battery programming without modifying it.

₩ BatCatWin DFV Technolo	gie - [Test programming c:\mes do	cuments\mesures_batcat\3lat_Bt.rbt\dfv.res\dfv.esa	
Kar File Window 2			_ 8 ×
Ph			?
General Setup Cabling Voltag	je dropout Comments Voltage Disch	n Current/Aux. channel Duration/T*	
BATCAT type	BA 249		
Battery type	Blei		
Nominal capacity	660 Ah		
Range	x1 : End of scale = 3V		
Cabling	Fixed		
Battery location	SDM TR3		
Maximum land ordered	D DE		
Maximum load voltage	Z.25. V per cel	Accuracy 🚺 🏅	
Floating voltage	Z,Z V percel	Accuracy 1 8	
Inversion voltage	1,6 V per cel		
			16:17:02

Tab "Voltage"



and /or a stop.

If the voltage of one cell is under the programmed threshold, BATCAT can make an alarm and /or a stop.

Beware, you have to enter the interval value of a cell (example 2V for 12V cell composed with 6x2V cell).

Tab "Current/Auxiliary"



Beware, do not program a value too low.

> If this input is used, it can issue an alarm if the current is over the programmed value.

Tab "Duration/Temperature"

When you test a battery, you have to respect the duration. This duration must be corrected as a function of teperature.

Eg : If the test duration is X min at the temperature of Y $^{\circ}$ C, it must be Z min if the temperature is K $^{\circ}$ C.

When programmed duration is reached, BATCAT can issue an alarm and/or a stop. You have to program a stop if you use an automatic charge/discharge control box	BatCatWin DFV Technologie - [Test programming c:\mes documents\mesures batcat\Slat_BLibt\dfv.res\dfv.resa] File Window 2 General Setup Cabling Voltage dropout Comments Voltage Disch Current/Aux. channel Duration/T* Duration Stop Total duration 150 min Marm Duration modifying according to the temperature Temperature between 0° and 15°: Duration = Duration + 0 min Temperature between 15° and 20°: Duration = Duration + 3 min Temperature between 25° and 30°: Duration = Duration + 16 min Temperature between 30° and 40°: Duration = Duration + 45 min Temperature over 40°: Duration = Duration + 45 min	If no stop is programmed, test will continue over the programmed time.Si on ne programme pas d'arrêt, le test se poursuit au delà de la valeur indiquée. At the end of the time, alarm rings allowing you to stop the discharge and measure the behaviour of the hattery during the
BRD91	16:20.05	battery during the charge

The following screen allows to enter the different values (values can be negative).

Duration correction has to be done just before the start of measurements.

You can correct the duration as a function of

- electrolyt temperature
- ambiant temperature
- temperature entered manually.

Make and record measurements

Generality

- <u>Notes</u> : To make measurements, Battery and Test have to be configured (see previous chapter)
 - Before making measurements, verify that PC time and date are up to date.

To make measurements with automatic battery controler BATCAT BA249 or PV 99, you have to do the follow these steps :

- Connect the power plug of the BATCAT
- Connect the voltage measurement cables to the automatic battery controler
- Connect 1 or 2 temperature probe
- Connect current probe to the BATCAT (current clamp or SHUNT adapter AMPLISO)

<u>Nb</u> : Do not forget to connect filtrer FILTHARM (If necessary) and/or dividers (1/2, 1/4 or 1/10)

- Connect automatic discharge/charge control box BRD91 (if necessery)
- Connect BATCAT to the PC using provided RS232 cable. (Beware : do not use another cable, because it is a special cable)
- Switch BATCAT power supply on and verify that "Operating led" id flashing.
- Switch PC power supply on and run BATCATWIN software.

When all is donne, choose a battery, a test in the file manager and create a noew measurements file.



Enter measurements filename (8 letters) Eg : 180301A Software try to communicate with the BACAT controler.

If serial port is not configured properly, the following message is displayed.

📲 Battery: 4L	CB Test:TEST	BAT	Measurements:	dfv 🔀		
	Unable to	Unable to open Com port #3				
Start	Floating	Sta	rt measurements	Alarm Ack		
E Au	Automatic floating		Duration correction			

Verify setup in the file manager screen (Setup menu) and verify that serial port is not used by another program.

Floating measurements

If communication between BATCATWIN software and BATCAT succeed, the program is send to the BATCAT and "floating" measurement is performed.

This first measure allows to verify cabling.

Note : Measurement test is not yet started

👷 Eile Display S	ietup <u>W</u> indow <u>?</u>	👸 🎚 <u>?</u>						⊴
B1:1 0, B1:2 0, B1:3 0, B1:5 0, B1:5 0, B1:6 0, B1:8 0, B1:9 0, B1:10 0, B1:12 0, B1:13 0, B1:14 0, B1:15 0,	S29V B1:22 S28V B1:22 S75V B1:22 659V B1:22 659V B1:22 659V B1:22 754V B1:22 754V B1:22 754V B1:22 754V B1:22 816V B1:32 986V B1:33 996V B1:35 993V B1:36 993V B1:36 993V B1:36 993V B1:36	1,225V 3,2577 3,2577 3,2577 5,007 0,000V 0,000V 0,000V 0,000V 0,000V 0,000V 0,000V 0,000V 0,000V 0,000V	Test TEST B	Start measurement	nta:dfv S Alarm Ack n correction			Display of BACAT type, version and number of rack(s)
B1:17 1, B1:18 1, B1:19 1, B1:20 1, B1:21 1, D1:21 1, Total duration: T time: Remaining time: 35 Discharge %: 0,	0 s Tota 0 s Tota 0 s Tota 0 s Electronic Control Cont	Nolkage: 21,7 V Iblant T1: 999,4°C ctrolyt T1: 999,4°C	Sort t	ay weakest cells	4	1 B1:31 2 B1:30 3 B1:29 4 B1:26 5 B1:28	skest cells 0,0000 0,0000 0,0000 0,0000 0,0000	System time

As soon as floating measurement is performed, monitor window is displayed.

This window allows to monitor automatic battery controler BATCAT (Stop, Start, Alarm Acknoledge).



In case of error, you have to ask for a new floating measurement again.

An automatic floating function can be started. BATCAT do a floating measurement until the seltcion box is deselected. This function can be used to set zero of current clamp.

Before start measurements, you can ask for duration correction as a function of temperature.

Battery:4LCB Test:TE	STBAT Measurements:dfv	×
Stop Floating	Start measurements Alarm A	ck
Automatic floatin		
No correction		
O Duration correction as fo	nction of ambiant T*	If temperature is
C Duration correction as fu	nction of electrolyt T*	18°C, test duration
C Manual correction durat	on 18 °C -> +0 min	will be increased of
Total duration = 25 min		0 minute
	<	
	Standar	rd test duration

Start measurements

When all is all right and you are ready to start, you only have to click on "Start measurements" button

If "Start on discharge current" has been programmed, the following screen is displayed.

Battery: 4L	CB Test: TEST	BAT	Measurements	dfv
	Waiting for dis	charg	je current of 100	JA
Stop	Floating	Sta	rt measurements	Alarm Ack
C Automatic floating		Duration correction		

To start measurements, start the discharge load (create a current greater than the programmed threshold)

This allows you to start current load (charge and discharge) and synchronize measurement with start of discharge.

When measurement is started, screen is refreshed every 10 seconds for the BATCAT BA249 and 6 seconds for the BATCAT PV99.

Screen show in real time state of the battery and display alarms .

If an alarm occurs, you have to acknolege it with "Acknoledge Alarm" Button.

During measurement you can display different screens :

-	Bargraph	Function key F5
-	Total voltage curve	Function key F6
-	Cell voltage curve	Function key F7
-	Temperature curve	Function key F8
-	Discharge current curve	Function key F9
-	Aux channel curve	Function key F10
-	Alarm list	Function key F11
-	Numerical values	Function key F12

You can also access these display using "Display" menu

For more information about display function see chapter "Analyze of recorded data"

Stop measurements

If a STOP has been programmed and maximum duration is reached, systems stops automatically.

If an automatic charge/discharge control box is used, BACAT disconnect discharge load and connect charge load.

If STOP has not been programmed, user has to stop the test manually. STOP button has to be depressed and then STOP has to be confirmed.

To close measurement screen, click in the right upper corner of the screen or use File/Exit menu.

Analyze of recorded data

Generality

Data stored can be analyzed whenever you want. You can look at any time of the test (like using a Video Cassette Recorder)

File is selected in the file manager



Following screen is displayed :



Toolbar description



Display description :



Scrollbar :

Horizontal scrollbar allows to zoom in zoom out and scroll display

Zoom in : Click on right scrollbar (or left) and move right (or left)



Zoom out : Click on right scrollbar (or left) and move left (or right)



Scroll of display : Click on the scrollbar and move left or right.

Battery voltage curves

In order to display discharge curve use "Display/ Total voltage" menu, depress F7 function

h.tt. icon.

key or double click on



Double click to get the bargraph display.

<u>Cells voltage curves</u>

To display cell voltage curve use the "Display/cell voltage" menu, depress F8 function key or double click on the licenter of the licenter of



Temperature curves

To display temperatures curve (ambiant / electrolyt) use "Display/Temperature menu", depress F4 function key or double click on ______i icon.



Current curves

To display current curve, use "Display/Current" menu, depress F5 function key or double click on icon.

Numerical values

To display numerical values, use "Display/numerical" menu, depress F6 function key or double click on **[12]** icon.



weakest on top)

Scales setup

Voltage curves and bargraphs are displayed with the following scales :

Start of scale : inversion voltage (Inversion voltage x nbr of cell for the total discharge curve) End of scale : equalization voltage (Equalization voltage x nbr of cell for the total discharge curve)

Standard scale for temperature curve are :

Begin of scale : 0°C End of scale : 60°C



Scales are stored into a file for each battery

Colors setup

BatCatWin DFV Technologie - [Battery:PMU2 Test:CREIL Measurements:PMUCREIL 05/06/89 10:18:06# _ 🗆 × File Display _ 8 × AR . A B 🖄 🖬 🖉 🔢 🤶 wax load voltage 2.30 2.30 Background ? × colour 2,00 1,819 1,73 ,60 (V - HHH duration: 34 min 30 s Total Voltage: 196,6 V 📕 🛄 💹 Weakest cells 1 B1:6 1,687W 2 B1:12 1,705W 3 B1:7 1,799W 4 B1:1 1,814W 5 B1:13 1,818W T time: 27 min 54 s -Remaining time: 6 min 36 s Discharge %: 34,8% Ambiant T*: 999,4*C Electrolyt T*: 999,4°C -Numeric Total V. Cell(s) V. Bargraph Comments Temperature Alarms B1:21,843 V 08-17-59

Backgroung colour can be choosen using "Setup/Colour" menu

Bargraph colour can also be customized



Bargraph colour can be adjusted in clicking on the colour squares.

📕 📕 📕 W	eakest cells	
1 B1:6	1,687V	
2 B1:12	1,7057	
3 B1:7	1,7990	
4	1 01 477	

New colour is choosen using the following screen :



At any time, actual page can be printed using "File/print current page" menu.



Screen content can also be copied into the clipboard using "File/copy" menu. The copied image can be paste into any windows software (Word for example).



Images are copied into WORD using paste function

Export data to a spreadsheet (EXCEL)

Data can be exported into EXCEL format using "File/copy into speadsheet format" menu or clicking icon.

To get data into EXCEL, use Edit/Paste menu.



Report printing

To print a report click on this icon



or choose File/Print

Data to be printed can be choosen :



One file can be stored for each "TEST".

Start of page used to separate pages Printing X Start of page Battery description Start of page Battery description Battery comments Battery comments Test description Test description Alarm list Alarm list Ambiant & Electrolyt curve Temperature cur Current curve Total voltage of battery #1 Current curve Total voltage of battery #1 Cells curves Weakest cells curves Aux, channel curve << Numerical values Bargraph Measurements comments • Load default Save default Cancel Print Click here to print

You can choose cells if you print cell curves



If weakest cells printing is choosen, nr of cells to be printed can be choosen (nbr of cell in a graph and nbr of graph in a page).



The weakest cells list can be sorted by clicking in this box (the weakest on top)

Statt of page Battery description Battery comments	Start of page Battery description Battery comments
Test description	Test description
Ambiant & Electrolyt curve	Temperature curve
Current curve	Current curve
otal voltage of battery #1	Total voltage of battery #1
Jells Curves BT Lell: 2,3,AV. Veakest cells curves of Battery #1	Liells curves
Jumerical values of Battery #1	Aux, channel curve
	Numerical values
>>> ==================================	Bargraph
	IMeasurements comments

Report example

Page 1 / 1 Dated 20/05/2001 at 12:55:49 BatCatWin Version 1,02 DFV Technologie Battery: PMU2 Test: CREIL Measurements : PMUCREIL 05/06/89 at 10:18:06 File: c:\mes documents\mesures batcat\PMU2.rbt\CREIL.res\PMUCREIL.mbt



Battery description

Batcat type : PV99 Battery :PMU2 Battery location : Battery technology :Blei Group of 6x cells flying Battery capacity :40 Ah Max load voltage :2,30 V Accuracy : 1,0% Floating voltage :2,24 V Accuracy : 1,0% Inversion voltage :1,60 V



Test description

Current measure : None (Average current of 30 A)

Start on current greater than 100 A

Alarm Stop

1		if total voltage of battery #1 is lower than 187,00 V
1		if absolute threshold is lower than 1,73 V
		if differential threshold is greater than 0 mV
		if differential threshold is lower than 0 mV
		if discharge current is greater than 100 A
		if battery is discharged more than 80 %
		if aux. input is greater than 0
		if total duration is equal to 60 min
Dura	tion c	orrection according to the temperature

0°C to 15°C	: Duration = Duration + 0 min
15°C to 20°C	: Duration = Duration + 3 min
20°C to 25°C	: Duration = Duration + 8 min
25°C to 30°C	: Duration = Duration + 16 min
30°C to 40°C	: Duration = Duration + 28 min
> 40°C	: Duration = Duration + 45 min

Page 1 / 1 Dated 20/05/2001 at 12:59:23 BatCatWin Version 1,02 DFV Technologie Battery: PMU2 Test: CREIL Measurements : PMUCREIL 05/06/89 at 10:18:06 File: c:\mes documents\mesures batcat\PMU2.rbt\CREIL.res\PMUCREIL.mbt









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Glossary

<u>Double click</u> : Click two times very quickly

Inversion voltage : Voltage under which the polarity of the battery swap. Do not reach this value otherwise the battery will be damaged.

Floating voltage : Voltage of the battery when connected to the charger.

<u>Max load voltage</u> : Maximum voltage of the battery used in maintenance mode.

<u>Single bloc</u> : Bloc composed of many internal cells. Example : a car battery (12V) is composed with 6 cells of 2V