

## **Impulse charger**

DIP switches and software



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## 1. Introduction

Impulse is a program by which you can:

- Read several data from the Impulse charger
- On-line monitor the charge progress

In order to read out these data or observe the charge process you need to have a PC/Laptop with Impulse program installed and the special interface set supplied with the installation disc.

At first, the little cover at the bottom has to be unscrewed (by use of a Torx-10screw –driver) (see fig.1). (Afterwards the cover has to be mounted again.)



Fig. 1

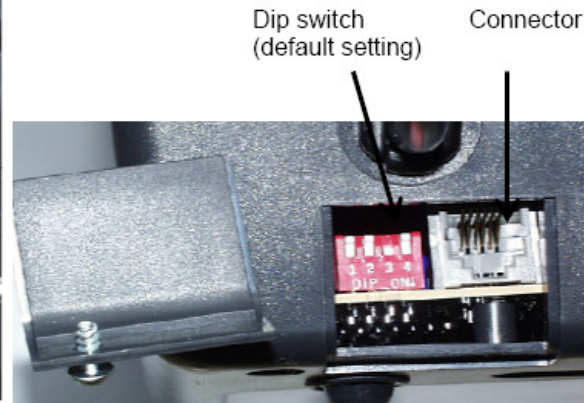


Fig. 2

You can connect the charger to your computer with the “USBTO TTL SERIAL CABLE 1.8m” 4.86.90.03010

Your USB Cable has an electronic interface circuitry inside and therefore the corresponding device driver needs to be installed first. You will find the instructions on your Impulse install CD in the directory '>>USB interface cable driver/Installation steps.doc'. Please follow those steps and connect your cable to a USB socket of your computer. (see fig. 3) The other end of the cable has to be plugged in the connector near the DIP switch (see fig. 2). Next the charger has to be switched on and the Impulse software has to be started in order to read the data from the charger.

## 2. Data read out

### Connection overview



Fig 3

## Data summery

In the impulse, the following data are stored and can be read out:

- Software version
- Number of incomplete and complete charge cycles and number of deep discharges.
- Hours during charge and stand-by
- Number of charged Ah
- Curve selected by DIP-switch
- Battery data (which can be reset, when the battery is replaced):
  - Number of incomplete, complete and total charge cycles
  - Totally charged capacity (so average charged cycle capacity can be computed by dividing by total charge cycles)
  - Number of deep discharges
  - Last cycle charged capacity and cycle time
- Error history: The last 10 failures: failure code, charge state, charge duration, current, voltage, temperature (can be reset)
- Power-ups, stand-by hours, charge hours

*In order to read out these data, you need the following:*

- PC or laptop
- Interface USB to TTL cable (Victron Energy order number 4.86.90.03010)
- Impulse software (Victron Energy order number ?????)

The diagram (fig. 4) shows the data flow and the buttons for reading, saving and printing the data.

## Data flow

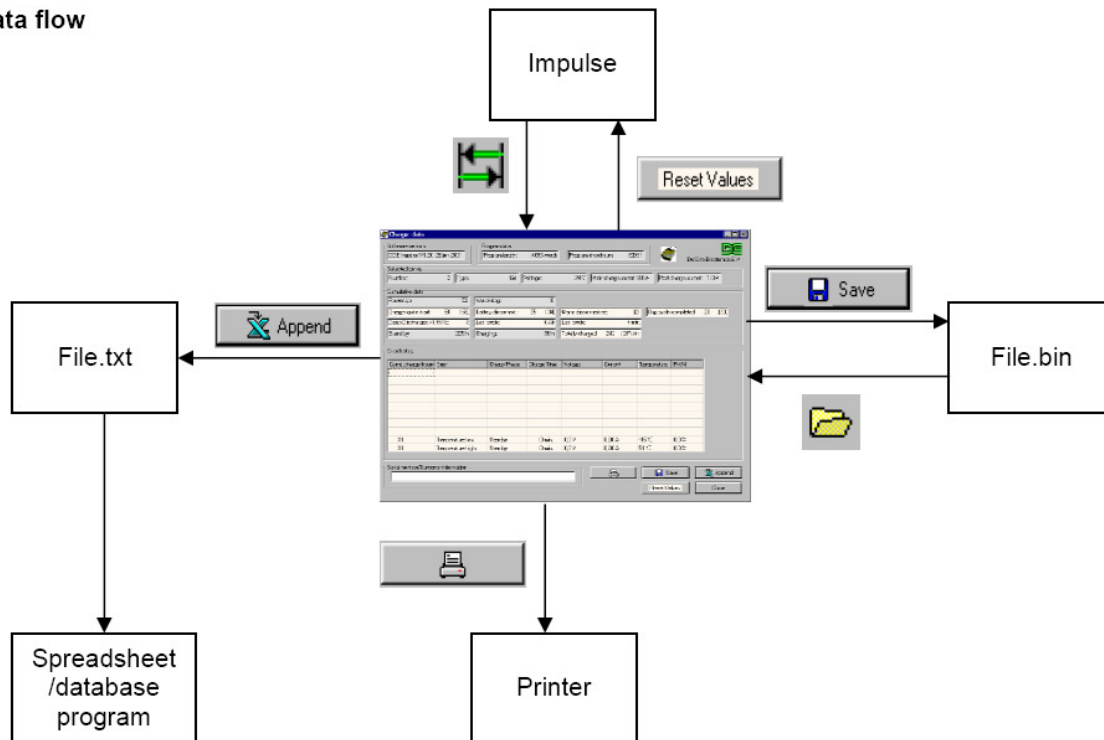


Fig. 4

## Error history

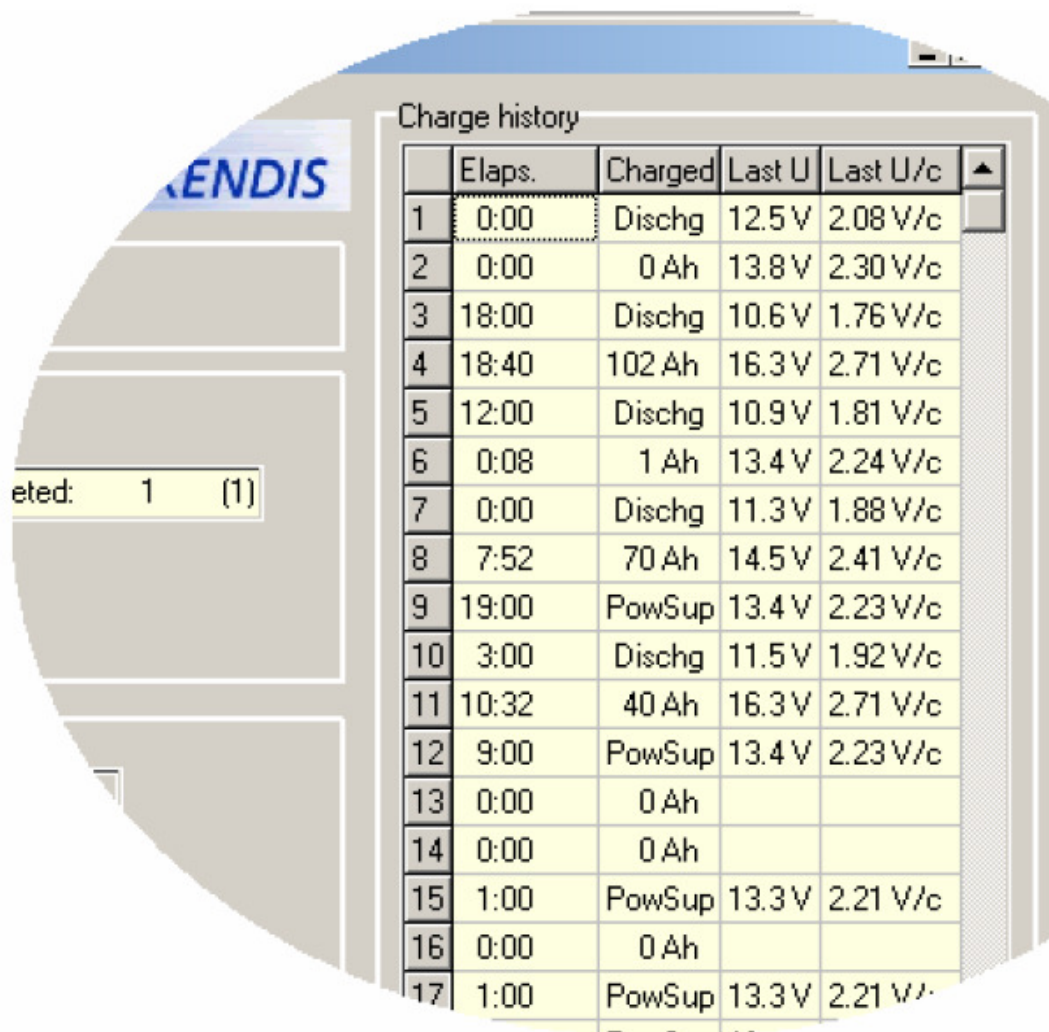
In case of an error, the Impulse stores the error in the error history and both LED's blink a number of times followed by one second rest. This number indicates the failure that has occurred. (See table 1)

Number of times the LED's blink followed by a short rest	Error description in error history	Error description
1	Current offset high	Current offset error. Usually this error is once present (due to factory testing), with "Cumulative charge hours" at 0. Otherwise the charger can be defect.
2	Control loop	Control loop error. The charger can be defect.
3	Control loop I low	Control loop error: current almost 0 A Probably charger defect.
4	Temperature low	Temperature below $-15^{\circ}\text{C}$ or charger defect
5	Temperature high	Internal temperature above $50^{\circ}\text{C}$ .
6	Main charge too long	Main charge longer than 15 hours. Probably battery (cell) defect.
7	Output overcurrent	Output overcurrent or short circuit
8	No curve	No valid battery type selected by DIP-switch.

Table 1

### Charge history

The most significant result of the forty preceding charge events are logged by the charger. (see fig. 5) A long table contains the duration of charge, charged Ah, last battery voltage and last cell voltage on the right of the *Charger data* window.



Charge history

	Elaps.	Charged	Last U	Last U/c	
1	0:00	Dischg	12.5 V	2.08 V/c	
2	0:00	0 Ah	13.8 V	2.30 V/c	
3	18:00	Dischg	10.6 V	1.76 V/c	
4	18:40	102 Ah	16.3 V	2.71 V/c	
5	12:00	Dischg	10.9 V	1.81 V/c	
6	0:08	1 Ah	13.4 V	2.24 V/c	
7	0:00	Dischg	11.3 V	1.88 V/c	
8	7:52	70 Ah	14.5 V	2.41 V/c	
9	19:00	PowSup	13.4 V	2.23 V/c	
10	3:00	Dischg	11.5 V	1.92 V/c	
11	10:32	40 Ah	16.3 V	2.71 V/c	
12	9:00	PowSup	13.4 V	2.23 V/c	
13	0:00	0 Ah			
14	0:00	0 Ah			
15	1:00	PowSup	13.3 V	2.21 V/c	
16	0:00	0 Ah			
17	1:00	PowSup	13.3 V	2.21 V/c	

eted: 1 (1)

Fig. 5

**Charging curve select** [Only for Impulse S6 and S8, V2.1 or higher]

If the charger supports this function a combobox will appear within the *selected curve* frame of the *Charger data* window. However, it becomes enabled only when the user type is set to Advanced user (*Settings* window, *User interface behavior* frame). Rolling it down, the user can choose from the available charging options, supported by the charger. (Note: the meaning and sequence of parameters accord with those of the neighboring fields to the left.)

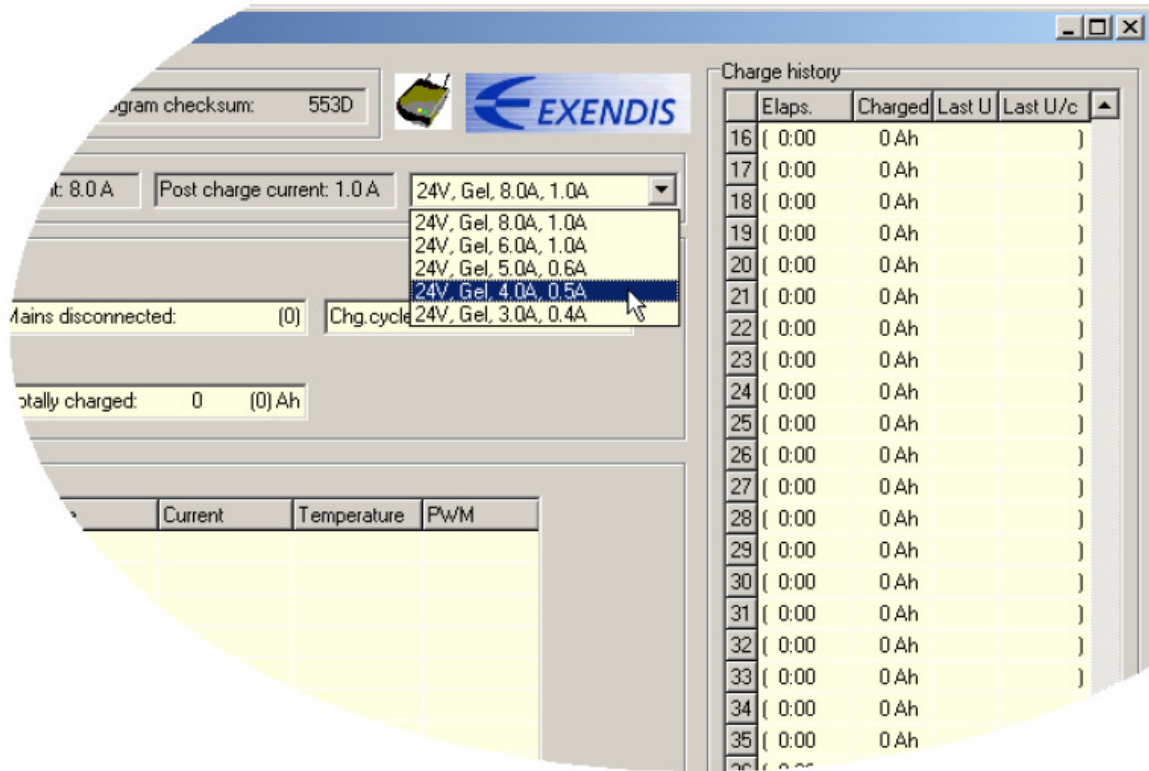


Fig. 6

After selection a conformation box (see fig. 6) will appear to test the intensions of the user, and by OKing the new parameters will be sent to the charger.

In some seconds the field next to the combobox will indicate the new parameters, showing that the operation was successful.

**AVOID ACCIDENTS: Never forget to indicate the present setting on the housing of the device, all user must be aware what the charger is set to!**

### 3. Online monitor charge process

#### Connection overview



Fig. 7  
Online monitor data summery

In the Impulse (firmware version V1.10 and up), the following data are measured and can be monitored (with 0.5 seconds update time):

- Voltage (also cell voltage) (accuracy 0.01V/cell)
- Current (accuracy 7% or better)
- Internal temperature
- PWM control
- Charge phase
- Error
- Charged capacity (1 minute update time)
- Charge progress time

The diagram below (fig. 8) shows the data flow and the buttons for reading and saving the data.

Data flow:

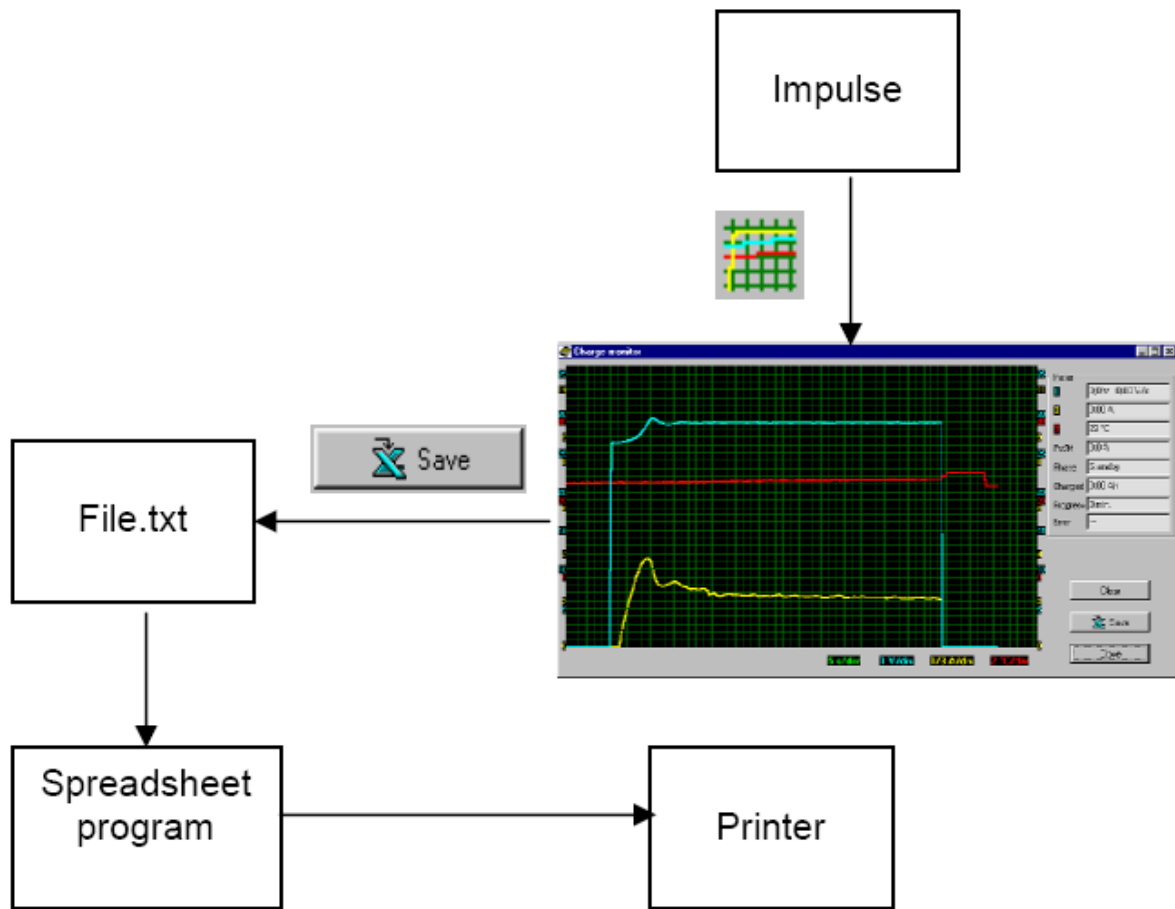


Fig. 8



8			24 V	Yellow Top	90Ah	12A	1.5 A	120Ah	16A	2.0A
9			12.. 24 V	Yellow Top conditioning	90Ah	4A	3.0 A	120Ah	8A	4.0A
10			24 V	M-combi (Impulse 5: 6)	60-90Ah	12A	1.0 A	80-120Ah	16A	1.4A
11			24 V	Droog/ Trocken/ Sèche/ Dry	90Ah	12A		120Ah	16A	
12			12 V	Gel	75-180Ah	12A		100-240Ah	16A	
13			12 V	Nat/ Naß/ Humide/ Wet	75-110Ah	12A	1.8 A	100-150Ah	16A	2.5A
14			12 V	Nat/ Naß/ Humide/ Wet	>120Ah	12A	3.0 A	>160Ah	16A	4.0A
15			12 V	Yellow Top	90Ah	12A	1.5 A	120Ah	16A	2.0A

**AVOID ACCIDENTS: Never forget to indicate the present setting on the housing of the device, all user must be aware what the charger is set to!**



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