T.ALI

DC-DC / AC-DC
Power supply and emergency power supply unit
with or without battery
and
intelligent battery charger
for
NiMH, NiCd, Pb, LiPo and IonLi
batteries

User Guide

Edition 03 of 03/08/10

Thanks for having chosen a **TELEDIF ITALIA** *product*

Please read this manual carefully and keep it handy for any consultation; this will allow to obtain the best performance and to use the features and functions of the T.ALI in the best way.

The power supply system T.ALI is compliant to 2004/108/EEC for electromagnetic compatibility and to 2006/95/EEC for low voltage devices.

Main features of T.ALI:

- ⇒ Three out stabilized Voltages: "Main", "Auxiliary" e "Power voltage failure"
- ⇒ "Auxiliary" Voltage selectable at 12 or 6 Vdc.
- ⇒ "Intelligent" management of battery charge, by controlling Voltage, Current, Time and Temperature,
- ⇒ "Intelligent" battery insertion: the battery is connected to the load only when there is a power failure, thus safeguarding battery life.
- ⇒ Protection circuit to avoid damages to the battery in case of power failure for a long time.
- ⇒ Possibility to connect an internal battery 12V/800mAh (NiMH)
- ⇒ Recharger of NiMH, Pb, NiCd and Lithium (Li-po e Ion-Li) Batteries.
- ⇒ Input and Output lines are protected by auto restart fuses.
- ⇒ "Main" output protected against wrong connections.
- ⇒ Spikes suppressor on power supply input.
- ⇒ Display of the status.
- ⇒ Status available for a remote external device.
- ⇒ Total control of the battery state, local, remote or automatic.
- ⇒ Battery deep discharge and recharge automatic every 3 months or by manual command.
- ⇒ NiMH battery initialization, to obtain the maximum efficiency in the shortest possible time.

TECHNICAL SPECIFICATIONS

Power supply:	12 - 24 Vac or 17 - 34 Vdc
Power supply consumption:	30VA for AC or 25W for DC (ref. Table 1)
"Main" Output Voltage:	12Vdc ± 5%
"Auxiliary"Output Voltage:	12Vdc ± 5% or 6Vdc ± 5%
"Power failure" Output Voltage:	12Vdc ± 5%
Max current from "Main" + "Auxiliary" output, when Mains is on:	800mA
Max current from "Main" + "Auxiliary"+ "Power failure" when operating from Battery:	800mA
Max current from "Power failure" Out:	250mA
Max power consumption with no load:	40mA
Size:	127 (L) x 115 (P) x 40 (H) mm
Weight:	300 g
Working temperature:	+ 5°C to + 50°C
Storage temperature:	- 10°C to + 70°C
Max working and storage humidity:	80%

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QUICK START

Follow the procedure below for a quick installation of T.ALI:

1. Connect the device to be fed to the "Main" voltage output, pins 1(+) and 2(-) of CN2 connector; pay attention to respect the polarity. The device connected should not exceed 800mA consumption.
2. Connect the Battery to the connector CN4, pins 1(+) and 2(-). **Respect the polarity!**
3. Check that the jumpers JP1, A0, A1, B0, B1 are properly set (see page 10)
4. Connect the Input Voltage to the connector CN1, pins 1 and 2 (polarity dont care)
5. If the LED flash Three Times GREEN wait 60 seconds and check on Page 5 and 6 the meaning of the information provided by the LED.

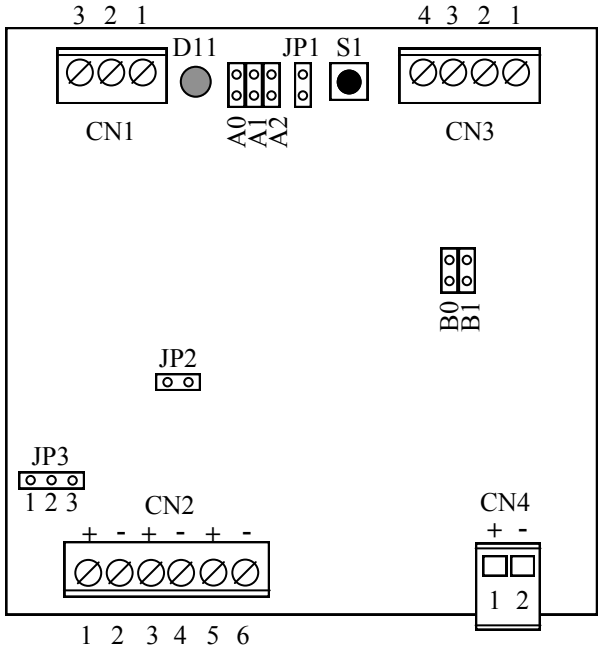
Table 1
Input Voltage and Current

Voltage	Minimum Current	Minimum Power
12Vac	2,5 A	30VA
24Vac	1,25 A	
17Vcc	1,5 A	25W (about)
34Vcc	750 mA	
24Vcc	1 A	

Table 2
***MAX* Current Out (mA)**

"Main"	"Auxiliary"	"No Power Supply"
800	0	0
550	0	250
200	350 (@ 12Vdc)	250
300	500 (@ 12Vdc)	0
250	300 (@ 12Vdc)	250
550	250 (@ 6Vdc)	0
300	250 (@ 6Vdc)	250

A) WIRING DIAGRAM



CN1 Connector
1 - 2 12 to 24 Vac or 18 t 34 Vdc Input (polarity dont care)
3 Ground contact

CN2 Connector
1 - 2 Output Main 12Vdc
3 - 4 Output Auxiliary 12Vdc or 6Vdc
5 - 6 Output No Power Supply 12Vdc / 250mA

CN3 Connector
1 RED LED signal
2 GREEN LED signal
3 Ground (-)
4 Command to start battery control from remote

CN4 Connector
1 BATTERY **(+)** 12Vdc **(BE CAREFUL TO RESPECT THE POLARITY)**
2 BATTERY **(-)**

Other components
D11 Multicolour LED to show the status of the system: green, red, orange
S1 Button to start the manual test procedure, inizialization and battery discharge
JP1 Jumper to select the type of battery (ref. Page 10): Pb/NiCd o NiMh/Li
JP2 e JP3 Jumper to select the value of the Auxiliary voltage (ref. page 7 C.1)
A2 Jumper to set the automatic battery discharge (ref. page 9)
A0,A1,B0,B1 Battery set (ref. Page 10)

B) DISPLAY

The multicolor LED D11 shows system status and faults; the colour has the following general meaning:

1. RED: Error
2. ORANGE: Warning
3. GREEN: Load

B.1) RED LED: ERROR STATE			
No. Of Flashes	**What**	**When**	**How to correct the fault**
Conti-nuous	There is a shortcut The system limit the output current	At least one Output is shortcut or the user device is drai-ning too much cur-rent	a. Disconnect input power b. Disconnect the battery c. Remove the shortcut or reduce the power consumption d. Connect the battery e. Connect input power
9	Battery Error	The battery is out of service	a. Replace the battery
8	Error in JP1 battery jumper	The jumper has been put or removed when the device was working. See page 8, C.4	a. Disconnect input power b. Disconnect the battery c. Set the jumper in the correct position d. Connect the battery e. Connect input power
7	Battery error	The battery is dame-ged	a. Replace the battery
6	Battery error	The battery is not connected	a. Check that the battery is connected
5	Input voltage too High	The input Voltage is above 24Vac or 34 Vdc	a. Disconnect input power b. Check that the input volatge is between 12 and 24Vac or 18 and 34Vdc c. Connect the input power
4	Input voltage too Low	The input Voltage is below 12Vac or 17 Vdc	
3	Temperature too high	The environmental temperature is above 60°C	Change the device location to a cooler place
1	No input voltage The system use the battery	a. Cables discon-nected b. No power from mains	a. Connect the cables b. Check mains

N.B. When main power supply drop, T.ALI automatically switch to the battery mode and start signalling; the LED flash with one RED + 1 to 5 ORANGE. The number of ORANGE flashes indicate the residual battery load (tef. table B2)

B.2) ORANGE LED: WARNING STATE	
N. of Flashes	**Meaning**
5	Battery charge is between 80% and 100%
4	Battery charge is between 60% and 79%
3	Battery charge is between 40% and 59%
2	Battery charge is between 20% and 39%
1	Battery charge is between 1% and 19%

B.3) GREEN LED: BATTRY CHARGE AND BATTERY CONTROL				
N Flashes	**Status**	**When**	**How long**	**Do the following**
8	The system is preforming the battery	When a battery must be preformed or initialized	24 hours	Ref. page 8, C.4.1
6	Slow charge (**SLOW**)	a. After a battery test with low battery and with environmetal temperature out of range b. After a battery test with very low battery c. After a quick charge and with environmental temperature out of the range d. As a final phase in a battery charge cycle	Until battery is fully loaded or until quick charge if Voltage and Temperature are within the ranges	If after ten minutes the system is still in this status or move to GREEN status the installation is completed; if not check the new status and move from there
4	Fast charge (**QUICK**)	a. After a battery test if battery is low and the temperature is in range b. After a low charge with a correct temperature c. After a deep sicharge	Until battery is fully charged	**OK** The system is correctly performing; the installation is completed
3	**TEST** Check if the battery is efficient and reliable	a. Automatic every 24 hours b. Following 1 second push of S1 button c. Following at least 1 sec closing of CN3-3 and CN3-4 pins	One minute for NiMH and NiCd batteries or 5 minutes for Pb or Lithium batteries	Wait the test time, then check the status and act accordingly
2	**DEEP DISCHARGE**	Ref. Page 8 and 9 a. Every 3 month, automatic b. Manual	Depending on battery capacity	It is recommended to check again the system after 24 hours
1	Battery charged. The system check and maintain the efficiency (**TRICKLE**)	When the battery is fully charged	Up to an automatic or a manual action or error condition (RED LED)	**OK** The system is properly working; the installation is completed

C) CUSTOMIZATION

T.ALI is a flexible and intelligent system that can be customized to user requirements.

C.1) "AUXILIARY" OUTPUT

T.ALI Auxiliary Output can be set at 6 or 12Vdc.

To set the output voltage to 6Vdc:

1. Close the jumper JP3 pins 2 and 3 .
2. Close jumper JP2 .

To set the output voltage to 12Vdc:

1. Close the jumper JP3 pins 1 and 2 .
2. Open jumper JP2 .

If the Auxiliary output is set to 6 Vdc, the maximum current is 250 mA. When the output is set to 12 Vdc the maximum current is 800 mA; the maximum current that T.ALI can provide is 800 mA and is the total of the three Output.

C.2) "POWER SUPPLY FAILURE" REPORTING

The "Power Supply failure" Output delivers 12Vdc up to 250mA and is activated only when running on battery; it is therefore useful to connect an emergency lamp.

To use this service simply connect the device to pins 5 and 6 of CN2 connector, respecting the polarity.

Example:

1. By connecting a 12V/3W lamp or LED you get an emergency light that is activated only in case of loss of mains power
2. By connecting an alarm sound device (with power consumption less than 250mA) you can get a sound alarm that is only activated when mains power fails.

C.3) BATTERY CHECK

Battery test is a set of operations that T.ALI performs to check the status of efficency of the battery.

The test procedure is only started with a fully charged battery and with Mains power supply on (GREEN LED with 1 flash). The test can be activated:

1. AUTOMATICALLY: every 24 hours and each time T.ALI is switched on
2. MANUAL LOCALLY: pressing the S1 button until the GREEN LAD flashes 3 times
3. REMOTELY: connecting pins 3 and 4 of CN3 to a remote switch and closing it for at least 1 second.

The control procedure includes:

1. First battery test: check of the battery with a known load (3 GREEN flashes) and if necessary start battery recharge.
2. Second battery test: check of the battery after a full charge. Reporting of the check: 1 GREEN flash means Battery Ok; 7 RED flashes means battery damaged.

C.4) BATTERY

IT-ALI can manage different type of batteries (see Table E page 10) and if used as UPS (Uninterruptible Power Supply), can use a NiMH, 12V / 800mAh battery (that can be positioned inside the plastic case), or a PB battery of minimum 1,3Ah.

The procedure to change the battry is the following:

1. Disconnect the power supply from CN1 pins 1-2
2. Disconnect the battery, connector CN4
3. Set the jumper JP1 based on the type of battery to be used
   - JP1 open: battery NiMH or Litio
   - JP1 closed: battery Pb or NiCd
4. Connect the battery to CN4, **pay attention to respect the polarity**
5. Reconnect the input power supply to CN1

If a new NiMH battery is used for the first time, it is recommended to follow the initialization procedure (ref. C.4.1); if the battery is lead acid (Pb) the procedure is not necessary. The systems supplied equipped with NiMH battery do not require any initialization, since this is part of the factory test.

Danger! The use of NiMH batteries not compliant with the sepcified type can result in malfunction of the device or performance degradation resulting in severe danger to persons or property loss due to acid leak, fire or explosion of the battery.

C.4.1) Special functionalities: Charge, Initialization and Restore of the battery with deep discharge

The following procedures are useful in order to keep the battery at the best efficency and can require, depending upon the conditions and capacity of the battery, up to several hours.

In order to initialize optimally a 12V/800mA NiMH it takes about 45 hours (Lead acid batteries do not require initialization); to restore a battery not used it takes 21 hours; to recharge a battery and avoid memory effect it takes 7 hours.

FUNCTIONS	DESCRIPTION	LED
Intelligent Charge (manual)	Recharge of the battery avoiding memory effect	Green
Battery recovery	Try restore disused batteries	Orange
Inizialization Of the battery	To charge new batteries and reach the maximum efficency in the shortest possible time. This operation is **requested** for NiMH batteries. In case the NiMH 12V/800mA battery has been purchased together with T.ALI from Teledif the battery has been already factory initialized.	Red

How to start these functionalities manually

1. Disconnect the battery
2. Connect the input power
3. Make sure that the jumpers are set correctly according to the type of battery used
4. When the LED start flashing RED, press and hold the button S1
5. Keeping S1 pressed, connect the battery to be charged, recovered or initialized:

⇒ **To Load**, hold S1 pressed until the LED becomes GREEN and start flashing quickly, then release S1. The LED stay GREEN and the system start the intellicent charge process.

⇒ **To Restore**, press and hold S1 until the LED light ORANGE and start flashing quickly. At this point release S1; the LED become GREEN and the system starts the process of Battery Recovery.

⇒ **To Initialize**, press and hold S1 until the LED become RED and start flashing quickly. At this poin release S1: the LED become GREEN and the system start the Initialization process.

Charging, initialization and restoration procedures are suspended when Main Power fails and are automatically restarted when Main Power return.

To cancel a procedure in progress just repeat the procedure from start.

C.4.2) Deep discharge and recharge (automatic periodic function)

The deep discharge of a battery it is useful to ensure a longer life to the batteries and is suggested for Pb and NiMH batteries.

1. Jumper A2 open = the battery is automatically discharged and then recharged every 3 months
2. Jumper A2 closed = the battery is never automatically discharged. The discharge process should be done manually (ref. C 4.1)

Warning: This procedure must be possibly done under strict control because if mains supply fails while the system is performing it the residual battery capacity could be lower than the one requested for the operation of the connected load.

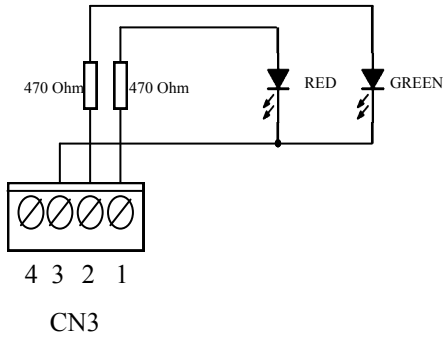
If you want to exclude the automatic discharge make sure the jumper A2 is closed.

C.5) REMOTE SIGNALS (MULTICOLOR LED)

Use the commector CN3 for remote reporting from T.ALI.

Remote reporting can be done in two different ways:

1. TO A DISPLAY: two external LEDs are controlled in the same way of the system Multicolor LED (Orange is indicated by both LED lighting)
   - Connect a resistance of 470 Ohm and a RED LED in series between pins 1 and 3
   - Connect a resistance of 470 Ohm and a GREEN LED in series between pins 2 and 3



2. TO AN INTELLIGENT DEVICE: : two digital signals (0/5Vdc) are sent through pin 1 and 2
   - Connect the ground of the external device to connector CN3, pin 3.
   - Connect pins 1 and 2 of CN3 with the input port of the external device.
   - If T.ALI is operating with a T.gsm system connect pins 3 and 1 (CN3, T.ALI) with pin 1 of CN3 (T.gsm) and pin 8 of CN2 (T.gsm).

D) APPROX CHARGE TIME FOR LEAD ACID BATTERIES

Each Ah (Ampere/hour) corresponds to a charging time of approx 2 hours and half.
The following are indicative charge times for more common Lead Acid (Pb) batteries:

BATTERY CAPACITY (Ah)	CHARGE TIME (hours)
1,3	**4**
2,2	**6**
7,2	**19**

Please note that even different and larger capacity Pb batteries can be connected (minimum is 1.3 Ah) without any system problem. Grater the capacity of the battery and longer is the time required for a full charge.

E) BATTERY CHARGER AND UPS (Uninterruptible Power Supply)

BATTERY TYPE		V	N. of Cells	JUMPERS					Full
Type	DESCRIPTION			NiMH -PB	B1	B0	A1	A0	
Ni-MH	Nickel-Metal hydride	12	10	A	A	A	A	A	Yes
		10,8	9	A	A	A	A	**C**	no
		9,6	8	A	A	A	**C**	A	no
		8,4	7	A	A	A	**C**	**C**	no
		7,2	6	A	A	**C**	A	A	no
		6	5	A	A	**C**	A	**C**	no
		4,8	4	A	A	**C**	**C**	A	no
		3,6	3	A	A	**C**	**C**	**C**	no
		2,4	2	A	**C**	A	A	A	no
		1,2	1	A	**C**	A	A	**C**	no
Li-Ion Li-Po	Lithium-ion Lithium-ion polymer	11,1	3	A	**C**	A	**C**	A	no
		7,4	2	A	**C**	A	**C**	**C**	no
		3,7	1	A	**C**	**C**	A	A	no
		10,8	3	A	**C**	**C**	A	**C**	no
		7,2	2	A	**C**	**C**	**C**	A	no
		3,6	1	A	**C**	**C**	**C**	**C**	no
Pb	Lead Acid	12	10	**C**	A	A	A	A	Yes
		6	5	**C**	A	A	A	**C**	no
Ni-Cd	Nickel Cadmium	12	10	**C**	A	A	**C**	A	Yes
		10,8	9	**C**	A	A	**C**	**C**	no
		9,6	8	**C**	A	**C**	A	A	no
		8,4	7	**C**	A	**C**	A	**C**	no
		7,2	6	**C**	A	**C**	**C**	A	no
		6	5	**C**	A	**C**	**C**	**C**	no
		4,8	4	**C**	**C**	A	A	A	no
		3,6	3	**C**	**C**	A	A	**C**	no
		2,4	2	**C**	**C**	A	**C**	A	no
		1,2	1	**C**	**C**	A	**C**	**C**	no

Full = **yes**: T.ALI can be used as a battery charger and as UPS
Full = **no**: T.ALI can only be used as an intelligent battery charger

C = Jumper closed **A** = Jumper open

N.B.: IMPROPER JUMPER SETTINGS MAY CAUSE OVERHEATING OR EVEN EXPLOSION OF THE BATTERY

DISPOSAL

The device and the batteries must never be disposed of with household refuse. Please obtain appropriate information about the regulations in your community, and dispose of all refuse in accordance with regulations at separate locations provided.Improper disposal of the equipment or parts thereof may cause harmful effects to human health and to the environment.

RoHS

The electronic circuit of this product is designed and manufactured in accordance with the provisions of legislation 2002/CE (RoHS)

COMPLIANCE

Teledif Italia declares that the device meets the directives by the Councilin respect of EMC Directive 2004/108/EC and electrical safety equipment for low voltage Directive 2006/95/EC and its subsequent changes. The conformity of the product is expressed by the "CE" mark.

PRECAUTIONS FOR USE

Before attempting any cleaning or maintenance, disconnect the unit fromthe mains and any other connection. Do not put in contact with liquid and do not use aerosol sprays or solvents for cleaning. Use and / or store the product within temperature and humidity ranges (see page 2). Use only the supply voltages in the ranges listed in this manual.
For any repairs contact your dealer or the service center of Teledif Italia.

WARRANTY

Teledif Italia warrants this product free from manufacturing defects for 2 (two) years from the date of purchase as resulting from the invoice.

During the warranty period the equipment will be replaced or repaired free of charge in the service center of Teledif Italia in Torino.

The cost of transport to and from the service center of Teledif Italia is always charged to the customer.

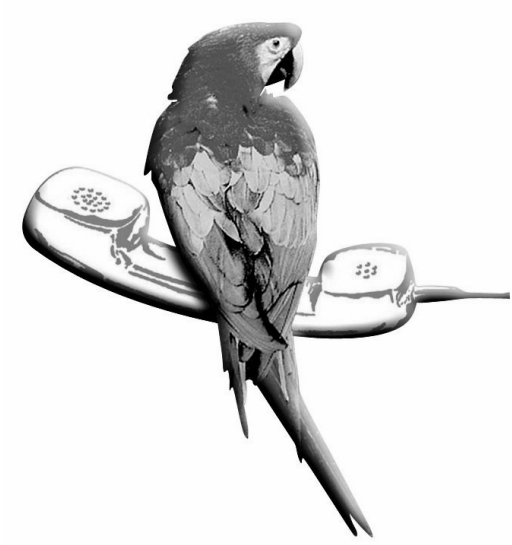
The equipment to be repaired under warranty must be shipped toTeledif Italia in its original packaging and with the copy of the invoice.

Failure to follow the instructions for use, the use of power supply other than indicated, the assembly of non-original parts, repairs by unauthorized third parties, altering or removing the serial number and any tampering, void the warranty.

Nothing will be due to the buyer for inactivity time due to a failure, nor he may claim damages or compensation of expenses for any direct or indirect problem arising from use of this equipment.

For any problem it is advisable to contact the installer or the store where you purchased the unit.

Any dispute will be brought before the courts of Turin, Italy.



working with love is a bond with our customers

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