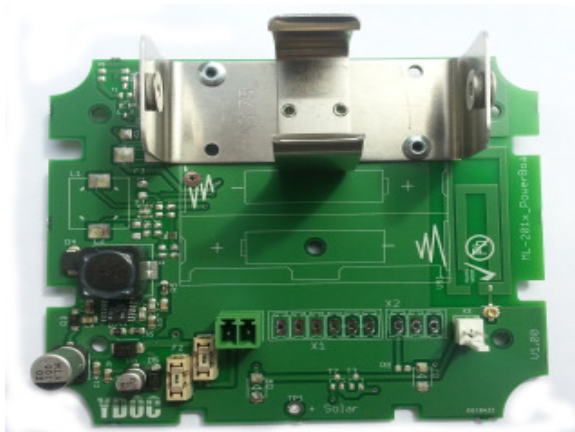


Your Data Our Care

Type ML-2013

Power Board



Title : User guide ML2013 Power Board

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WARNING

THE FOLLOWING OPERATING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID DAMAGE OR MALFUNCTION, DO NOT PERFORM ANY OPERATING OTHER THAN THAT CONTAINED IN THIS MANUAL. ANY OPERATOR SHOULD BE SKILLED WITH A TECHNICAL BACKGROUND BEFORE OPERATING THE DEVICE.

PREFACE

Congratulations!

With your purchase of the ML-2013 Power Board, for use with the type ML-2013 data logger with GPRS Capabilities.

This manual describes the operation and (hardware) installation of the ML-2013 Power Board.

We recommend you to read this manual carefully before installation of the ML-2013.

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1 Product Description

The YDOC ML-2013-PowerBoard is an accessory to supply power the ML-2013 low power datalogger and acts as GPRS antenna.

The PowerBoard is available in several editions:

- PB-LI: As holder for a 3.6V Lithium D-size battery
- PB-DC: As 8..30V DC input with holder for a 3.6V Lithium D-size backup battery
- PB-PV: Solar circuit to charge 3x NiMH AA batteries
- PB-PV+ : As PB-BV, but with power booster to power high power demanding sensors.

The PowerBoard fist the following ML-2013 covers:

- COVER-LI: Blind cover and PB-LI
- COVER-DC: Blind cover and PB-DC
- COVER-PV(+): Cover with integrated 1Wp solar panel and PB-PV(+)
- COVER-TFT-LI: Cover with integrated touch display and PB-LI
- COVER-TFT-DC Cover with integrated touch display and PB-DC

Properties of the ML-2013 Power Board are:

- Input voltage range 8 – 30 Volts DC
- 3.6V Lithium D-size battery holder
- Solar circuit to charge NiMH batteries.
- Power output Booster
- Printed GPRS antenna
- RoHs Compliant
- CE Compliant

1.1 Contents of the package

- ML-2013 Power Board
- Power Cable (between PCB and Data logger)
- Ufl-ufi antenna cable

1.2 Warranty

All YDOC instruments are warranted against defective materials and workmanship. Any questions with respect to the warranty mentioned above should be taken up with your YDOC Distributor.

2 Editions

2.1 PB-LI, Lithium input power edition

It's just a printed GPRS antenna and a mounting plate for a D-size Lithium 3.6V battery. We advise to use a SAFT-LS20H 13000 mAh battery because it can supply peak currents required for GPRS communication.

2.2 PB-DC, 8..30V DC auxiliary input power edition

The power supply is converting the input power source to a, stable and clean, output-source of 3.6 Volts. It is advised that when a user has a very power demanding configuration, to use this power source, to power of the datalogger. A diode is mounted, for isolation of the (lithium battery). I.E. that no current is drawn, accidentally, from the batteries, into the attached power supply. Your ML-2013PowerBoard has the ideal output-voltage for cooperation with the ML-2013 dataloggers.

So:

- 1) When both, (lithium) battery and auxiliary power are connected, the power will be taken from the auxiliary power only, and thus saving the battery.
- 2) When the power board is connected, but NOT powered, the ML-2013 datalogger will still continue to work, and draw it's current from the internal battery. No extra current is wasted into the power supply, by means of the diode.

So to increase the availability of your system it is advised to use both battery and Auxiliary power.

Protection

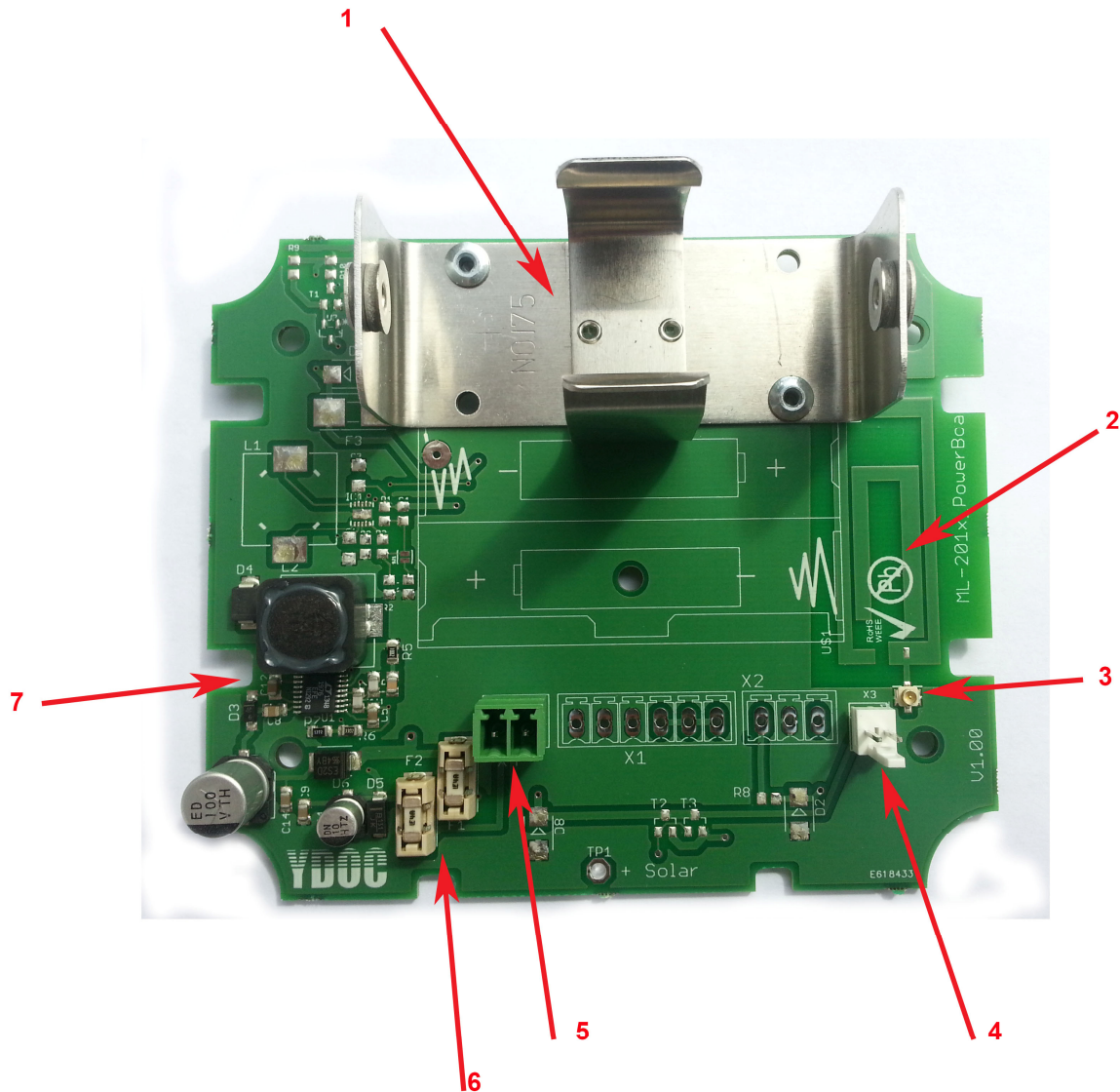
The power board input circuit is equipped with a tranzorp of 30 Volts, this protects the connected datalogger from high input voltages.



Beware of exposing power board to high voltages, as it will damage the fuse. Also, when the polarity of the input-source is wrong, the fuse will blow. But, your connected datalogger is protected in both cases.

Normally the fuse will never blow, during the lifetime of the instrument.

Underneath, a picture is shown of a ML-2013 Power Board with Lithium Battery holder and auxiliary DC input power.



- 1) Battery holder for Lithium Battery (Saft LSH-20)
- 2) Integrated Quad band GPRS antenna
- 3) Antenna Connector
- 4) Power output for powering datalogger (3.6 Volts)
- 5) 8..30 VDC auxiliary power input connector
- 6) Fuses for protection (battery and auxiliary)
- 7) Switched mode Power supply (SMPS)

2.3 PB-PV, Solar power edition

This options enables the use of solar power. It is designed to use with the YDOC solar panel housing.

It has a battery holder for 3 AA type NiMH batteries. These batteries are charged from the solar panel and, due to the dimension of the solar panel, will never be overcharged.



Battery undervolts protection

It has a Battery low protection which triggers when the battery voltage gets below 2.9 Volts. When this happens, the batteries will be disconnected from the output (from the datalogger), so the batteries won't be damaged due to total discharge. There is a hysteresis which prevents the system from "flipping" on and of all the time. The batteries are re-connected to the power output when the battery-voltage gets above the threshold + hysteresis. So, the datalogger will work again.

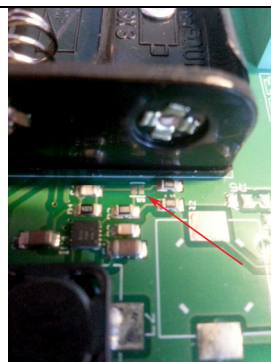
2.4 PB-PV+, Power Booster edition

As PB-PV but wit power booster. This feature is used to "boost" the Sensor Power signal from the datalogger. It is used for powering very high power demanding sensors. It also provides in two, user selectable, output voltages. The system can boost the normal 12 Volts /100mA Sensor Power signal from the datalogger into a high power 12 Volts/400 mA (500 mA peak) or 24 Volts / 170 mA. The user can select his output voltage by using a solder jumper.

By factory default, the output voltage is set to 12 Volts. This high power or "boosted" signal is exactly in sync with the Sensor Power signal of your ML-2013 series Datalogger. The current is drawn directly from the 3 AA type NiMH batteries. This has the advantage that the datalogger itself is NOT loaded at all. The main current flow will be from the Power Board Only.

Output Voltage Configuration

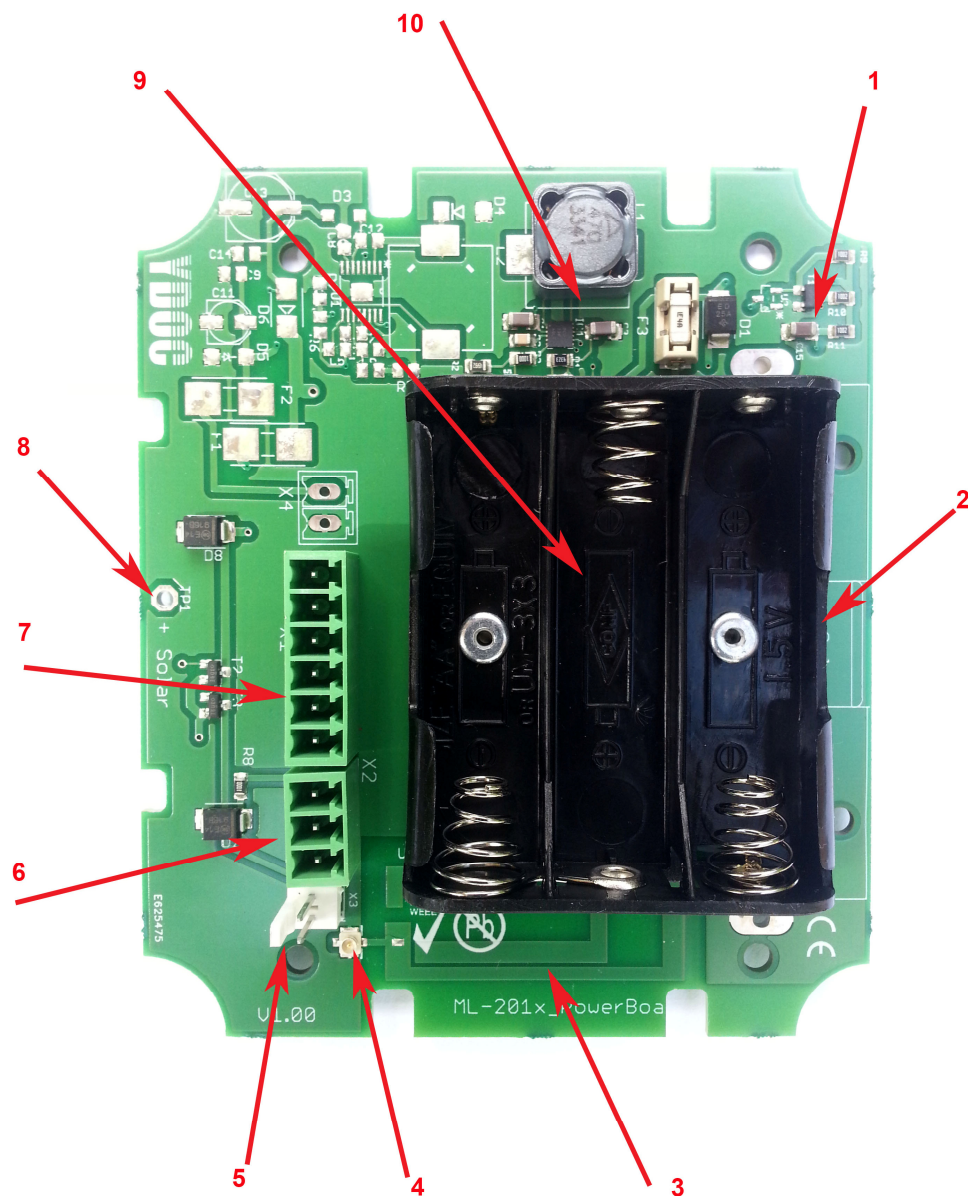
SJ1	Voltage
Open	12 V
Closed	24 V



Beware!

The Power Booster option is only available in combination with the solar / NiMH option. It is NOT possible to use it with the Lithium D cell battery. Simply because this battery is not capable of providing such high currents. The NiMH batteries are the only ones that are suitable for this purpose

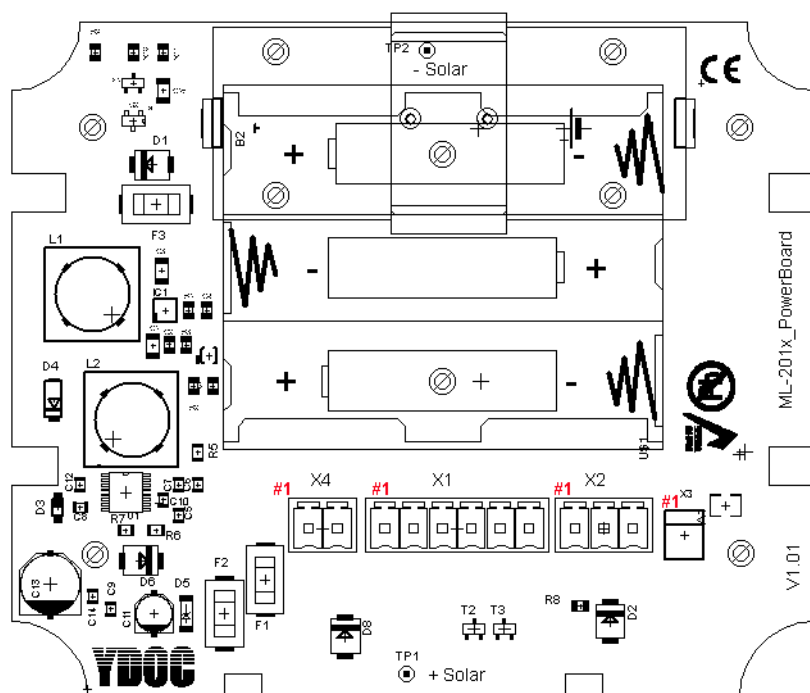
Underneath a picture is shown of the Solar and PowerBoost option. Combined together a very powerful system can be made. i.e. a 24 volts sensor, powered by the sun.



- 1) Battery Low Protection Circuit
- 2) Negative Solar Panel input terminal
- 3) Quad band GPRS antenna
- 4) Antenna Connector
- 5) Power Output connector (to datalogger)
- 6) Sensor Power input Connector
- 7) Power Boost Output Connector
- 8) Positive Solar Panel input terminal
- 9) Battery Holder for 3 AA type NiMH batteries
- 10) Power Booster Circuit

3 Pinconfiguration

Connector	Pin	Function	Description	Value	Comments
X1	1	GND	Sensor Power signal to power 12 Volts or 24 Volts sensors, multiple terminals for connecting multiple wires	0V	
X1	2	GND		0V	
X1	3	GND		0V	
X1	4	Power_Out		12V / 24V	
X1	5	Power_Out		12V / 24V	
X1	6	Power_Out		12V / 24V	
X2	1	Sensor Power Input	Sensor Power input , must be connected to Sensor Power output of datalogger	12 V	
X2	2	GND		0V	
X2	3	N.C.		N.C.	
X3	1	Power Supply +	Power output for powering ML2013 series datalogger	3.6 V	Molex connector
X3	2	Power Supply -		0V	
X4	1	Aux Power Input +	Auxiliary power input	8 .. 30 V	
X4	2	Aux Power Input -		0V	
TP1		Solar Charge input +			Must be soldered
TP2		Solar Charge input -			Must be soldered





USER MANUAL *TYPE ML2013_power board*

Specifications

Power Supply			
Input Range	8 ~ 30 Vdc Solar 5V Lithium 3.6 Volts		
Type of Power	Lithium Battery External DC NiMH battery/Solar Panel		
Power	Output Voltage	Output Current	Output power
	3.6 V	1000 mA	3.6 W
Sensor Power Output			
Protection			
Output Voltage	12 Volts / 24 Volts selectable by solder jumper		
Output Current	400 mA / 170 mA		
Charger Circuit			
Discharge protection	yes, @ 2.9 Volts		
Bypass Diode	yes		
General Enviroment			
Temperature	Operating: -30 ~ + 65 °C; Storage -40 ~ +75 °C		
Humidity	5 ~ 100 % RH		
Electrical			
SMPS	yes		
Switch Frequency	200 kHz		
Quiesent Current	100 uA		
Peak Current	1.8 A		
Max. Input Voltage	30 V		
Min. Input Voltage	5 V		
Connector	Molex 22-27-2021		
Galvanic Isolation	No		
Ripple & Noise	1% pk-pk, 20 MHz bandwidth		
CE Compliant	Yes		
Rohs Compliant	Yes		
Dimensions			
W X D x H	107 mm X 109 mm X 35 mm		
Weight			
Netto Weight	110 Grams		