

V4¹/₂-pwr1

Technical Data

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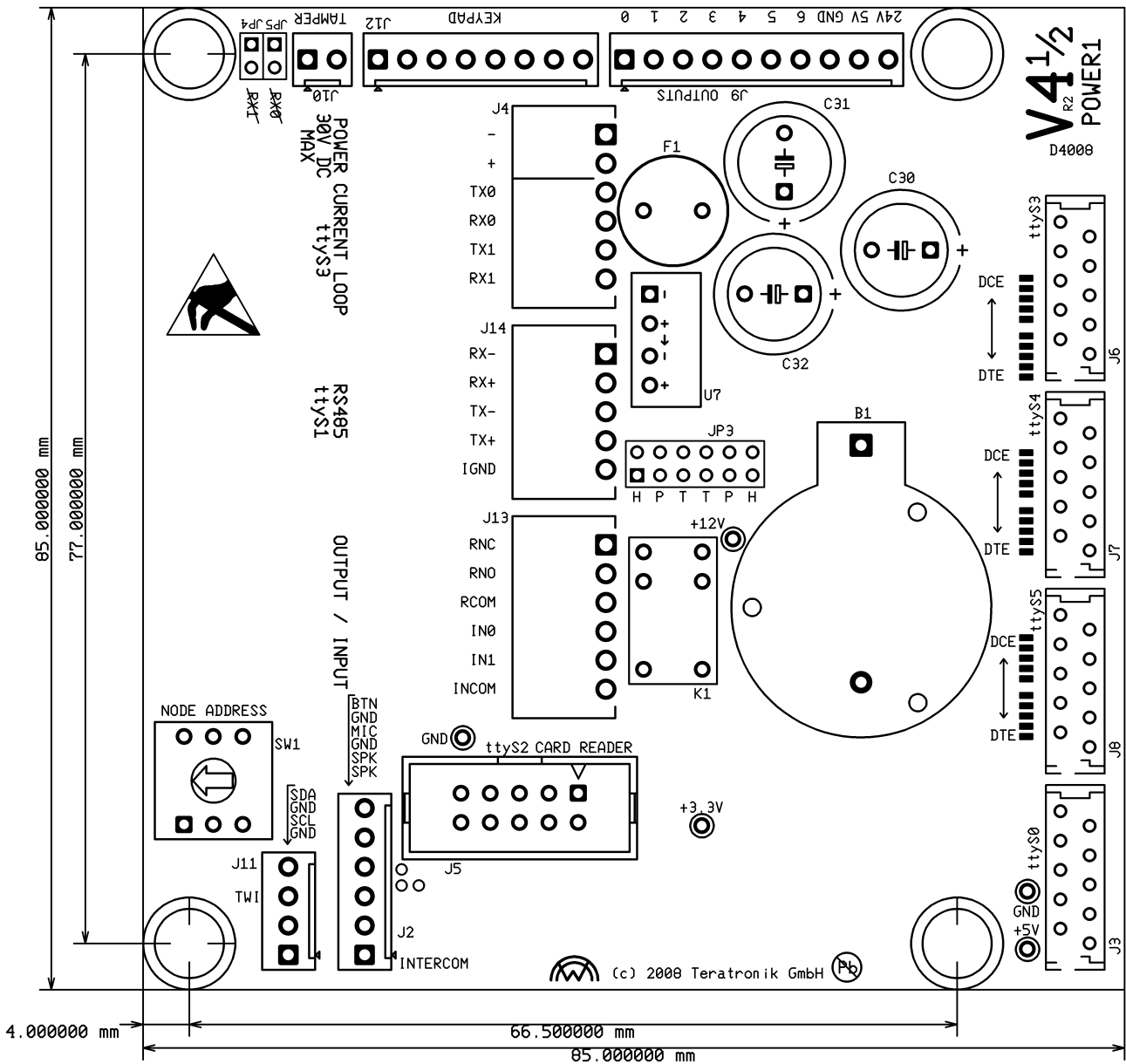
1. Features

V4½-pwr1 is a power board for use with the Teratronik V4½ controller. The board provides these connections:

J1	Stacking connector to the V4½ controller	
J2	Intercom (Speaker, Microphone, Call button)	
J3	RS232 Interface (DBGU debug port)	ttyS0
J4	Power supply and current loop interface	ttyS3
J5	Connector for Leadus V4KF card reader.	ttyS2
J6	RS232 Interface	ttyS3
J7	RS232 Interface	ttyS4
J8	RS232 Interface	ttyS5
J9	Digital outputs (Transistors)	
J10	Tamper switch	
J11	Two-Wire-Interface (I²C compatible)	
J12	4x4 Keyboard matrix	
J13	Relais output and optocoupler inputs.	
J14	RS485 Interface	ttyS1

Board contains built in switching regulators for providing the necessary +5V and +12V voltages.

2. Top view



- B1 - Backup battery for static RAM and clock. (Recommended: CR2032 Lithium button cell)
- F1 - Power input fuse. (T 630mA)

2.1 *J1 - Board-to-board connector to V4½ controller*

Please see V4½ technical data for pinout.

2.2 *J2 - Intercom*

6 pin header .1" pitch.

1	SPK1	Speaker 8Ω 1W
2	SPK2	
3	GND	Electred microphone. Provides 3V microphone power.
4	MIC1	
5	GND	Call button.
6	CALL	

2.3 *J3 - ttyS0 - RS232 interface (DBGU debug port)*

10-pin micromatch connector. Requires AMP/Tyco 215083-10 to connect.

DCE-pinout: When using a straight through cable to a IDC Sub-D9 female connector, this can connect directly into a generic PC serial port.

3	TxD
4	CTS
5	RxD
6	RTS
9	GND
10	May be jumpered to +5V.

2.4 J4 - ttyS3 - Power supply and current-loop interface

6-pin Wago cage-clamp micro header.
Requires Wago cage-clamp micro Nr. 733-106 to connect.

Power supply

1	GND	15V - 30V DC
2	Power supply 24V DC	

Nominal power ist 24V DC, allowed range is 15V - 30V.

Power requirement depends on connected peripherals. Uses about 5W if using a Leadus V4KF card reader and a 3.5" TFT display.

Current-Loop interface

Not recommended for new designs.
This interface (ttyS3) also available as RS232 on J6.

3	CLTXD0	Upstream
4	CLRXD0	To server
5	CLTXD1	Downstream
6	CLRXD1	More terminals

The interface ttyS3 of the CPU receives the data coming into CLRXD0 and sends through CLTXD0.

Also, everything received on CLRXD0 is retransmitted to CLTXD1, while everything coming in by CLRXD1 is passed on to CLTXD0.

This additional signal shaping is always active and works independently from any software.

If nothing is connected to CLRXD0, disable it by closing jumper JP5.
The jumper JP4 disables input CLRXD1, respectively.

2.5 J5 - ttyS2 - Connector for Leadus V4KF card reader.

10-pin header for common IDC connectors.

Required card reader model: Leadus V4KF-01JF-001

Please note: This connector outputs +12V. Connect only a Leadus V4KF-01JF-001 card reader requiring +12V and having a RS232 interface. If something else is connected, both, the connected device and the controller may take damage.

1	RxD
2	TxD
3	CTS
4	RTS
5	
6	+12V
7	GND
8	+12V
9	GND
10	

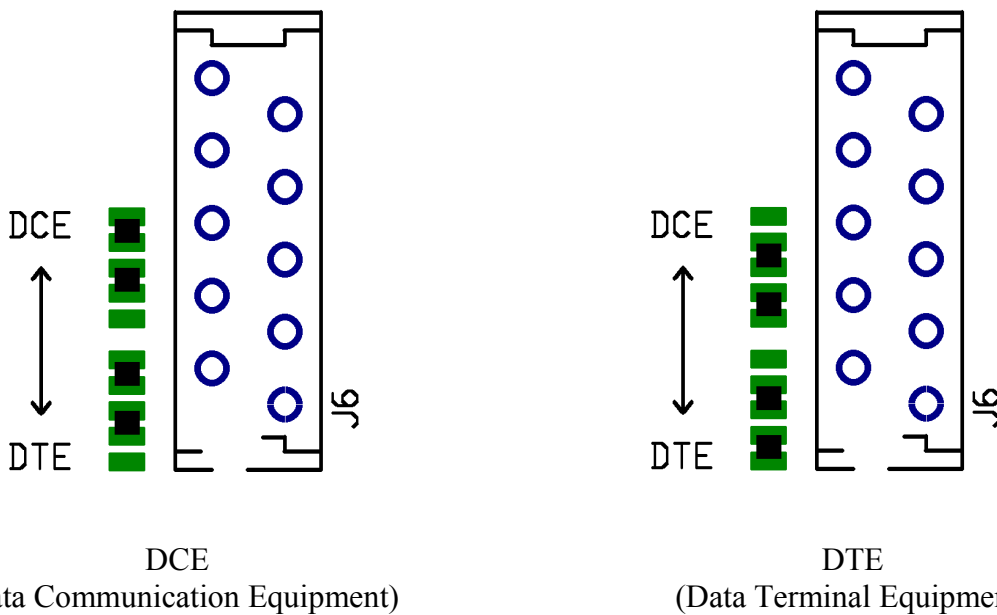
2.6 J6 - ttyS3 - RS232 Interface

10-pin micromatch connector. Requires AMP/Tyco 215083-10 to connect.

This interface (ttyS3) also available as current-loop on J4.

	DCE-pinout	DTE-pinout
3	TxD	RxD
4	CTS	RTS
5	RxD	TxD
6	RTS	CTS
9	GND	
10	Can be jumpered to +5V.	

The connector must be configured to DTE or DCE pinout using the nearby jumpers:



When converting to a 9-pin Sub-D female connector, this can connect directly to a PC.

When converting to a 9-pin Sub-D male connector, this can connect to devices that were meant to be used with a PC.

2.7 *J7 - ttyS4 - RS232 Interface*

Same connector layout as used by ttyS3 at J6.

2.8 *J8 - ttyS5 - RS232 Interface*

Same connector layout as used by ttyS3 at J6.

2.9 J9 - Digital outputs (transistors)

10-pin header .1" pitch.

1	OUT0
2	OUT1
3	OUT2
4	OUT3
5	OUT4
6	OUT5
7	OUT6
8	GND
9	+5V
10	+24V (Fuse-protected voltage from J4)

Outputs OUT0 - OUT6 are driven by a ULN2003 transistor array.

An activated output pulls it's respective pin low through a NPN transistor.

All outputs may be loaded with 100mA continuously. When higher loads are needed, it must be made sure that the ULN2003 cannot overheat. Please see the ULN2003 datasheet.

The outputs include protection diodes for driving inductive loads (e.g. Relay).

It is not allowed to use long wires at this connector. When necessary, provide local coupling relays.

2.10 *J10 - Tamper switch*

2-pin header .1" pitch.

General purpose input, e.g. for use with a tamper or alarm switch. Switch must be closed in secured state.

1	TAMPER
2	GND

2.11 *J11 - Two-Wire-Interface (I²C compatible)*

4-pin header .1" pitch.

I²C compatible interface using 5V TTL signals.

1	+5V
2	SCL
3	GND
4	SDA

2.12 J12 - 4x4 Keyboard matrix

8-pin header .1" pitch.

Connects to a 4x4 matrix keypad. This interface uses 3.3V TTL levels.

1	ROW0	Outputs
2	ROW1	
3	ROW2	
4	ROW3	
5	COL0	Inputs
6	COL1	
7	COL2	
8	COL3	

The Core4 operating systems numbers the matrix as such:

	COL0	COL1	COL2	COL3
ROW0	0	1	2	3
ROW1	4	5	6	7
ROW2	8	9	10	11
ROW3	12	13	14	15

Example: Standard Schurter keypad, Left pin of keypad to pin 1 of J12:

	COL0	COL1	COL2	COL3
ROW0	1	4	7	A
ROW1	2	5	8	0
ROW2	3	6	9	B
ROW3	F	E	D	C

Config list for this keypad:

'1', '4', '7', 'A', '2', '5', '8', '0', '3', '6', '9', 'B', 'F', 'E', 'D', 'C'

2.13 *J13 - Relay output and optocoupler inputs*

6-pin Wago cage-clamp micro header.

Requires Wago cage-clamp micro Nr. 733-106 to connect.

1	NC	Relay (OUT7)
2	NO	
3	Common	
4	In0	Optocouplers
5	In1	
6	Common	

Max load of relay contact on this PCB is 2A/42V.

No contact protection circuit is provided, since this depends on the connected load. It is advised to connect external protection circuits to lengthen the lifetime of the relay contact.

Polarity of optocoupler inputs can be either way. Input will activate within 10V - 24V DC range.

2.14 J14 - ttyS1 - RS485 interface

5-pin Wago cage-clamp micro header.

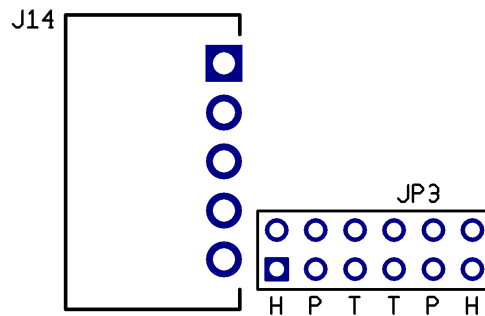
Requires Wago cage-clamp micro Nr. 733-105 to connect.

The RS485 interface is isolated from the rest of the circuit.

1	Rx-
2	Rx+
3	Tx-
4	Tx+
5	GND (isolated)

A RS485 network is always connected in a straight line. Star topology is not allowed. If a star topology is absolutely required, it is necessary to use a RS485 hub.

The jumper array JP3 is used to terminate the network and to provide idle levels.



The network must be terminated once at each end: Exactly twice for each wire-pair. Additionally, a wire-pair needs to be pulled to idle level at one place within the network.

Full duplex (4-wire)	Terminators	Idle-level pullup/down	Both
Half duplex (2-wire)	Terminator	Idle-level pullup/down	Both

The jumpers marked H connect Rx+ to Tx+ and Rx- to Tx- respectively.