How to install the

V1.1 2002-07-03 WG

ELZET 80

PER-EVA900

NET/900H(+) Evaluation Board

ST3 230V~   **ST12** SER1   **ST10** SER0   **ST7** DCF   **ST6** LED   **ST73** An. 3   **ST72** An. 2   **ST71** An. 1   **ST70** An. 0   **J1**

N L
1 2

ST12 pins: +5V RX1 TX1 RTS1*1 CTS1*2 DTR1*3 GND — 1 2 3 4 5 6 7

ST10 pins: +5V RX0 TX0 RTS0*1 CTS0*2 DTR0*3 GND — 1 2 3 4 5 6 7

ST7: +5V In(Ti6) GND — 1 2 3 ... 1 ... 10

ST73: +14V Vref(5V) AN3 AnGND — 1 2 3 4 5
ST72: +14V Vref(5V) AN2 AnGND — 1 2 3 4 5
ST71: +14V Vref(5V) AN1 AnGND — 1 2 3 4 5
ST70: +14V Vref(5V) AN0 +5V AnGND — 1 2 3 4 5

ST8 RC5
+5V GND In(Ti0) — 1 2 3

ST80
2 A1
1 A2
Triac

ST50 Rel50

ST51 Rel51

SER0

SER1

RS485

ST5

ST32

A Bitbus
J21/2
B full duplex
J20 Bitbus / +onTx
RTS polarity

12 12 12 — +24Vi -24Vi +24Vi -24Vi +5V GND
24V/24V 5V
ST90/1 ST4

1 2 3 4 5 — Data B(-) Data A(+) GND*1 RTS B(-) RTS A(+)
RS485
ST20

In.Ti8 In.Ti9 In.TiA In.TiB GND — 1 2 3 4 5
24V in
ST30

In.PD2 In.INT8 In.Ti2 In.Ti4 GND — 1 2 3 4 5
24V in
ST31

+24V in Out.To1 Out.To5 Out.To3 Out.ToA -24V in — 1 2 3 4 5 6
24V out
ST52

Mount NET/900H /900H+

With power off, insert the processor module with pins 1 showing towards the analog inputs ST70..73.

Re-check rapport of Pin 1 module to Pin 1 EVA900. Misplacing the module will destroy the processor module and EVA900 circuitry!

24V i/o supply

The transformer on EVA900 provides 200mA @ 24V for external initiator/switch (inputs) and valve/relay (outputs) supply. The 24V outputs and the internal relays also need 24V to function. Please wire 24V from ST90 or 91 to ST52, observing polarity. You might substitute the internal supply with a stronger external supply wired directly to ST52 - 1(+) and 6(-).

5V supply

is available for small load (250mA max.) external logic on ST4.

Programmer´s port

Please connect a 9p RS232 crossover (null modem) cable from SER0 to your PC´s COM-port for mCAT download and monitor functions. ST10 is available in parallel for hardwired cabinet mount connection using screw terminals. Connect TX with the PC´s RX input and vice versa.

Mains supply

Apply 230V ~ mains voltage to the terminals of ST3. Fix mains cable with a cable tie close to the board. Disconnect from mains when checking the fuse!

If you have 115V supply, you may (after disconnecting from mains) cut BR1 on the solder side of the board below the transformer and then connect BR2 and BR3. Then please mark the transformer top with "115V ~".
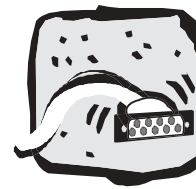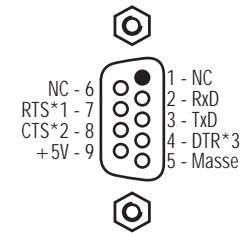
RS232 connectors

Both RS232 connectors are available as D9 and screw terminal ports. See the overview for screw terminal assignments.

ST10, 11: SER0	ST12, 13: SER1
*1) RTS0 (IC3, bit7)	*1) RTS1 (SCLK1)
*2) CTS0 (10K pull-up)	*2) CTS1 (P97/To7+PU)
*3) DTR0 (fixed high)	*3) DTR1 (fixed high)

D9 pinout:
NC - 6, RTS*1 - 7, CTS*2 - 8, +5V - 9
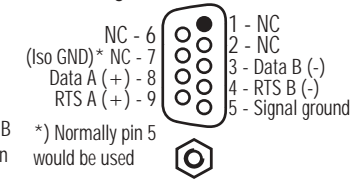1 - NC, 2 - RxD, 3 - TxD, 4 - DTR*3, 5 - Masse

If you need synchronous SPI-like mode on SER1 you might pull IC11 from its socket and access the raw processor pins at the socket as follows: 10 GND, 12 SCLK1, 13 TO7, 14 TxD1 and 15 RxD1. Use short wires only and with care - applying excessive levels of voltage will destroy the processor module.

BITBUS/RS485

The RS485 is taken out to both a screw terminal connector (ST20) and the standard D9 connector. With other half duplex protocols than BITBUS, RTS polarity can be inverted. When full duplex RS485 is needed, the RTS wire pair can be switched setting J21/J22 to B to be the receive port. The data pair then becomes the transmitter only.

ST21 (Plug):
NC - 6
(Iso GND)* NC - 7
Data A (+) - 8
RTS A (+) - 9
1 - NC, 2 - NC, 3 - Data B (-), 4 - RTS B (-), 5 - Signal ground
*) Normally pin 5 would be used

LED-port: ST6

This connector mates the 4-digit 7-Segment displays 7SEG4. LEDCLK and LEDDAT are clock and serial data lines, all others except power are select lines to switch between displays. Set solder joints on 7SEG4 to correspond to LEDCS"0" (default), "1" or "2" - all at the same "bus". See driver sample.

ST6
P0/CLK0 - 10, 9 - /LEDCS2
LEDDAT - 8, 7 - LEDCLK
/DC0 - 6, 5 - /CTS
/LEDCS1 - 4, 3 - /LEDCS0
+5V - 2, 1 - GND

Select area on 7SEG4
BR1 — CS 210

24V digital in: ST30/31

These are 8 optoisolated inputs to be supplied by external 24V. Two of them are supported as counters in mCAT.

24V digital out: ST52

These 4 isolated high-side drivers switch small industrial valves or relays (up to 500mA/each, 0.8A total). Needs 24V!

Analog in: ST70 to 73

The analog inputs allow to supply external sensor conditioning circuitry with a variety of voltages: 14V raw DC, 5V digital supply, 5V reference. Input range is 0..5V to NET/900H(+)'s 10-bit-ADCs. Conversion time is 15µs. **Caution! Analog inputs are raw processor lines. Excessive voltage destroys the NET/900 module!**

DCF77: ST7

Originally intended to read out time standard signals, this low-active input to TI6 (P96) is now open to any application.

Triac: ST80 (J1)

Switches 230V~/1A. J1 must be set to enable the zero crossing detector to trigger NMI. Due to the high priority of this signal, J1 **must not** be set during flash EPROM programming.

PG-Port: ST5

The raw processor pins (caution!) of the pulse generator (stepper motor) port can be connected to external drivers. Use short cables only! No standard software support due to the diversity of motors.

PG13 - 10, 9 - PG12
PG11 - 8, 7 - PG10
PG03 - 6, 5 - PG02
PG01 - 4, 3 - PG00
+5V - 2, 1 - GND
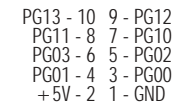
TMux-Inputs: ST32

The pins on this port are 3 inputs to the Ti8 timer that are multiplexed by setting bits D5 and D6 of HCT273 IC3 (Addr. 4000H).

+5V - 10, 9 - GND
TMux2 - 8, 7 - GND
TMux1 - 6, 5 - GND
TMux0 - 4, 3 - GND
+5V - 2, 1 - GND
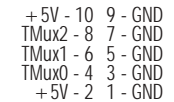
Relays: ST50/51

The 2 changeover relays optoisolated from TO9/PB3 and TO8/PB2 are capable to switch up to mains voltage (250V-/8A). Needs 24V on ST52!

RC5: ST8

This input to Ti0 is used to decode RC5 infrared remote controls. Use the SFH506-36 (obsolete) infrared receiver as input device. When using the new SFH5110-36 instead, please change R6 to 100 Ohms.

Note: **Using EVA900 with NET/900H+ obscures part of the LED's of the 24V-i/o !**

When used with NET/900H or NET/900H+, these can be equipped with an **mCAT** that supports the following i/o of EVA/900 with Express-I/O: 24V inputs (Ti9, TiB as HDMA counters), input Ti6 (DCF77), 24V outputs (To3/To5 PWM), relays, analog inputs, TRIAC (just switched), RC5 receiver. **Not supported** are the stepper port, TMux and LED port. There is, however, a sample task for the 7SEG4 display on the LCD port. Both require access to IC3, HCT273 that can't be read back. So there's need for write coordination! Ti6,7,8 and 9 are free, Ti1 and 5 with possible conflicts (Ti0,4)