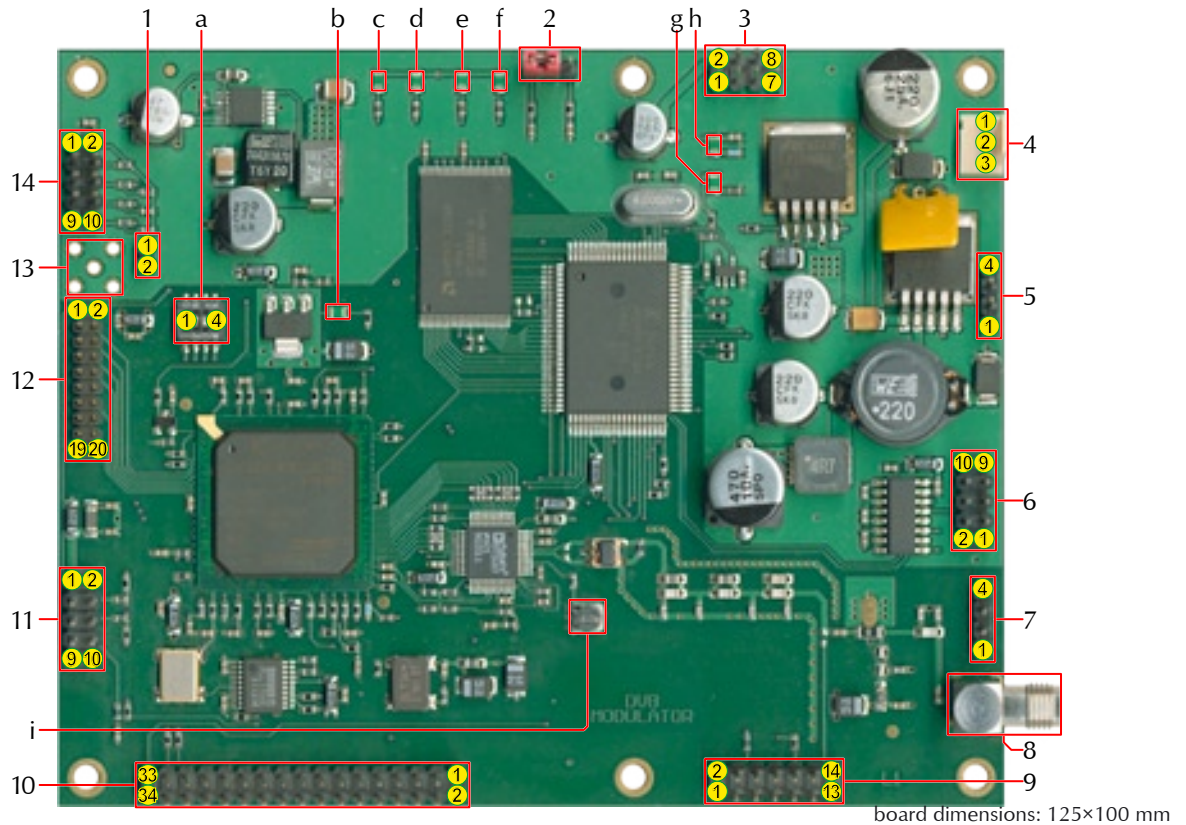


# 1 Connector description



|                   |    |              |   |
|-------------------|----|--------------|---|
| <b>Connectors</b> | 1  | 2pin Header  | Optional battery 3.6 V  |
|                   | 2  | 3pin Jumper  | MCU Prog. Jumper  |
|                   | 3  | 8pin Header  | Power supply for Upconverter                                      |
|                   | 4  | Power Input  | 7 V-24 V=   |
|                   | 5  | 4pin Header  | Optional  |
|                   | 6  | 10pin Header | RS232   |
|                   | 7  | 4pin Header  | Optional serial connector   |
|                   | 8  | SMA          | RF out 3.5-70 MHz, 75-90 dBμV                                     |
|                   | 9  | 14pin Header | Control for Upconverter   |
|                   | 10 | 34pin Header | TS input  |
|                   | 11 | 10pin Header | I <sup>2</sup> C-Bus connector for display and key unit           |
|                   | 12 | 20pin Header | Optional FPGA-Bus   |
|                   | 13 | SMB          | Optional 10 MHz reference from GPS (not mounted in picture above) |
|                   | 14 | 10pin Header | JTAG connector  |

|                          |   |                 |  |
|--------------------------|---|-----------------|--|
| <b>LEDs and controls</b> | a | 4pin DIP switch | mode switch, see pin description part for details                                      |
|                          | b | LED green       | Power ok (2,5 V)   |
|                          | c | LED green       | on   |
|                          | d | LED green       | off  |
|                          | e | LED green       | <b>off</b> :Encoder, <b>on</b> :Ext.Mux+int.TS-Clk., <b>blink</b> :Ext.Mux+ext.TS-Clk. |
|                          | f | LED green       | Loading Firmware (flashes while loading, off after loading => ok)                      |
|                          | g | LED green       | Power ok (3,3 V)   |
|                          | h | LED green       | Power ok (5,0 V)   |
|                          | i | Potentiometer   | IF output level  |

e+f blinking: NIM detected on TS

## 2 Pin description

| <b>1 – Optional battery</b> |         |
|-----------------------------|---------|
| 1                           | GND     |
| 2                           | +3.6 V= |

| <b>2 – Mode jumper</b>   |  |
|--|--|
| Picture shows <b>run</b> -mode, other position is <b>program</b> -mode |  |

| <b>3 – Upconverter power supply</b> |     |   |        |
|-------------------------------------|-----|---|--------|
| 1                                   | GND | 2 | Vin    |
| 3                                   | GND | 4 | Vin    |
| 5                                   | GND | 6 | +5,0 V |
| 7                                   | GND | 8 | +5,0 V |

| <b>4 – Power input</b> |            |
|------------------------|------------|
| 1                      | Vin 7–24 V |
| 2                      | GND        |
| 3                      | GND        |

| <b>5 – Optional</b> |                   |
|---------------------|-------------------|
| 1                   | Port PA0 from MCU |
| 2                   | Port PA1 from MCU |
| 3                   | Port AN0 from MCU |
| 4                   | GND               |

| <b>6 – RS232</b> |               |    |              |
|------------------|---------------|----|--------------|
| 1                | con. with 4+6 | 2  | TxD          |
| 3                | RxD           | 4  | con with 1+6 |
| 5                | GND           | 6  | con with 1+4 |
| 7                | RTS           | 8  | CTS          |
| 9                | not connected | 10 | GND          |

| <b>7 – Optional serical con.</b> |          |
|----------------------------------|----------|
| 1                                | +3.3 V   |
| 2                                | GND      |
| 3                                | RxD FPGA |
| 4                                | TxD FPGA |

| <b>9 – Upconverter control</b> |          |    |             |
|--------------------------------|----------|----|-------------|
| 1                              | PLL Clk  | 2  | PLL Data    |
| 3                              | PLL En2  | 4  | PLL En1     |
| 5                              | PLL Lock | 6  | GND         |
| 7                              | Standby  | 8  | GND         |
| 9                              | PTT      | 10 | 10 MHz Ref. |
| 11                             | GND      | 12 | GND         |
| 13                             | IFout    | 14 | GND         |

| <b>10 – TS for Encoder/Mux</b> |                 |    |                  |
|--------------------------------|-----------------|----|------------------|
| 1                              | +5,0 V          | 2  | +5,0 V           |
| 3                              | +5,0 V          | 4  | +5,0 V           |
| 5                              | SDA             | 6  | not connected    |
| 7                              | SCL             | 8  | xReset           |
| 9                              | GND             | 10 | GND              |
| 11                             | TSCLK B         | 12 | PSYM B           |
| 13                             | not connected   | 14 | DVAL B           |
| 15                             | TS B6           | 16 | TS B7            |
| 17                             | TS B4           | 18 | TS B5            |
| 19                             | TS B2           | 20 | TS B3            |
| 21                             | TS B0           | 22 | TS B1            |
| 23                             | GND             | 24 | GND              |
| 25                             | SD Out (f. E.*) | 26 | PLL THR (f. E.*) |
| 27                             | SDCLK (f. E.*)  | 28 | SD In (f. E.*)   |
| 29                             | GND             | 30 | GND              |
| 31                             | MCLK 27 MHz     | 32 | ASCLK (f. E.*)   |
| 33                             | RST Vid. Codec  | 34 | not connected    |

\*f. E. = for Encoders

| <b>11 – I<sup>2</sup>C for controlpanel</b> |          |    |        |
|---|----------|----|--------|
| 1   | +5,0 V   | 2  | +5,0 V |
| 3   | SDA      | 4  | SDA    |
| 5   | SCL      | 6  | SCL    |
| 7   | Reset-In | 8  | IRQ    |
| 9   | GND      | 10 | GND    |

| <b>12 – optional</b> |        |    |        |
|----------------------|--------|----|--------|
| 1                    | +3,3 V | 2  | CLK 0  |
| 3                    | Bit 1  | 4  | Bit 2  |
| 5                    | Bit 3  | 6  | Bit 4  |
| 7                    | Bit 5  | 8  | Bit 6  |
| 9                    | Bit 7  | 10 | Bit 8  |
| 11                   | Bit 9  | 12 | Bit 10 |
| 13                   | Bit 11 | 14 | Bit 12 |
| 15                   | Bit 13 | 16 | Bit 14 |
| 17                   | Bit 15 | 18 | Bit 16 |
| 19                   | CLK 1  | 20 | GND    |

| <b>14 – JTAG connector</b> |     |    |               |
|----------------------------|-----|----|---------------|
| 1                          | GND | 2  | +3,3 V        |
| 3                          | GND | 4  | TMS           |
| 5                          | GND | 6  | TCK           |
| 7                          | GND | 8  | TDO           |
| 9                          | GND | 10 | TDI           |
| 11                         | GND | 12 | not connected |
| 13                         | GND | 14 | not connected |

| <b>a – Mode switch</b> |                    |                   |
|------------------------|--------------------|-------------------|
|                        | <b>off</b>         | <b>on</b>         |
| 1                      | Encoder            | Ext. TS Input     |
| 2                      | TS-CLK intern      | TS-CLK extern     |
| 3                      | falling clock edge | rising clock edge |
| 4                      | Normal spectrum    | Inverted spectrum |

For Tuner on TS (NIM-Support): 1+2 on

### 3 Specifications

|   |   |
|---|---|
| <b><i>board dimension</i></b>             | 125×100 mm                                |
| <b><i>board weight</i></b>                | <50 g                                     |
| <b><i>Voltage</i></b>                     | 7 V-24 V                                  |
| <b><i>Power consumption</i></b>           | ~5 W                                      |
| <b><i>Modulation methods</i></b>          | QAM16, QAM32, QAM64, QAM128, QAM256       |
| <b><i>Modulation Error Rate (MER)</i></b> | >39 dB                                    |
| <b><i>Symbolrate</i></b>                  | 1000-7000 kSymbols in steps of 1 k        |
| <b><i>IF<sub>out</sub></i></b>            | 80-95 dBμV                                |
| <b><i>IF Frequency</i></b>                | 3.5-70 MHz (in steps of 125 kHz)          |
| <b><i>TS Input</i></b>                    | Clock direction and Clock edge switchable |

#### Corrections:

19.03.2006 *LED c and d*: replaced text from elderly version. *Pinout Header 9*: Text of pins #10 and #14 („10 MHz Ref.“/“GND“) swapped, *Specifications*: completely senseless line removed

20.03.2008 coloured TS connector