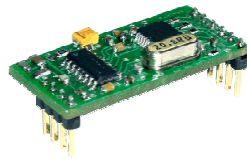


# NETRONIX

## Technical Data Sheet

# UM-DAL

UMDAL-doc-01.03  
In reference to UMDAL-c-01.03



**Contents**

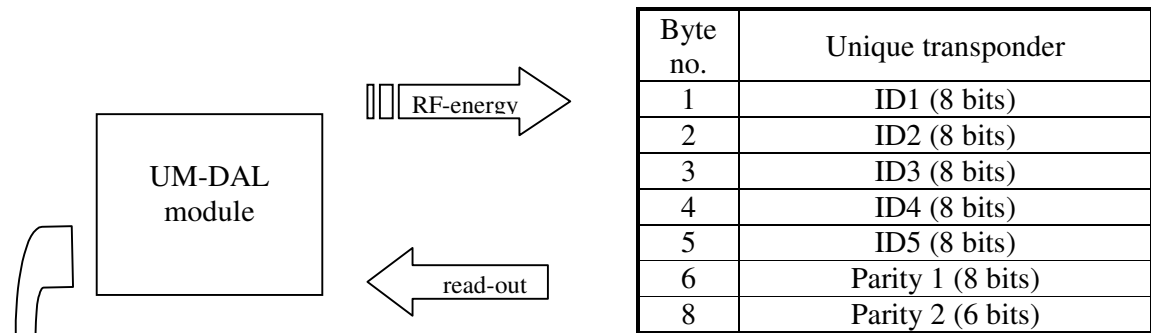
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**Introduction**

UM-DAL module operates on principle of the contact less unique data acquiring from UNIQUE (RFID) transponders. Rea-dout data is transmitted by means of Dallas’a 1-WIRE protocol. It means, that the reader is compatible to the Dallas DS1990 readers.

The principle of module operation:

Applying the transponder to reader – read-out (from transponder) – data transmission (to master unit).



The response received:

Family code	ID	Address	CRC_DAL
01	<b>ID1...ID5</b>	01	XX

The module is equipped with two outputs, which signal successful read-out of the transponder.

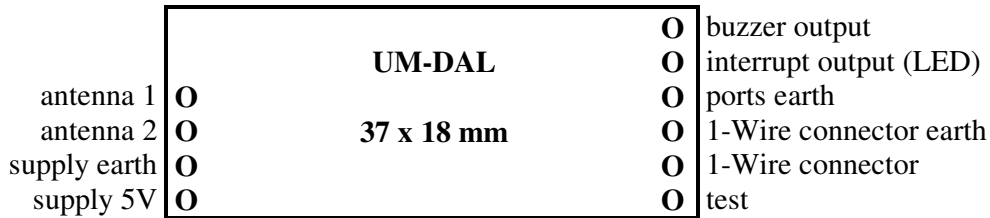
Connect the antenna to UM-DAL module in form of air coil, which will produce electromagnetic field and supply the transponder located in this field.

**Specifications**

- Supply voltage Vdd..... 4.5...5.5 V
- Supply current..... 5...55 mA
- Module rated operating radio frequency..... 125 kHz
- Modulation type of data received from transponder..... Manchester
- Baud rate of data received from transponder..... RF/64 (1953 b/s)
- Antenna..... External 1 mH ±5%
- Output current capacity: Dall and TransponderLed..... 15 mA
- Type of Dall output..... open collector
- Max polarization voltage of Dall output..... Vdd+0.5 V
- Transponder read-out distance..... 8...15 cm depending on antenna
- Maximum read-out frequency..... 2 transponder read-outs/sec
- Transmission parameters to master unit..... Comply with 1-Wire (Dallas) DS1990 specification

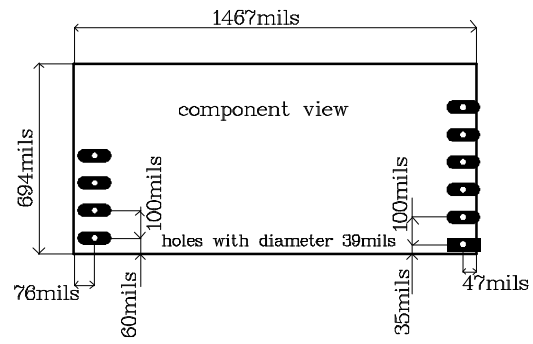
**Pin description**

- antenna1, antenna2 ..... external antenna with inductance of ca 1 mH
- supply earth and supply 5V module supply
- buzzer output..... after successful transponder read-out, the reader activates external buzzer for ca. 100 ms (active H)
- interrupt output..... after successful transponder read-out, the reader sets output in logical one state for ca. 400 ms (interrupt triggering with rise slope)
  
- port earth..... buzzer and interrupt earth
- 1-Wire connector earth..... earth of 1-Wire connector
  
- 1-Wire connector..... after successful transponder read-out module sends data by means of 1-Wire
- test..... for proper module operation, “1-Wire” and “test” connections outside the module should be short together.

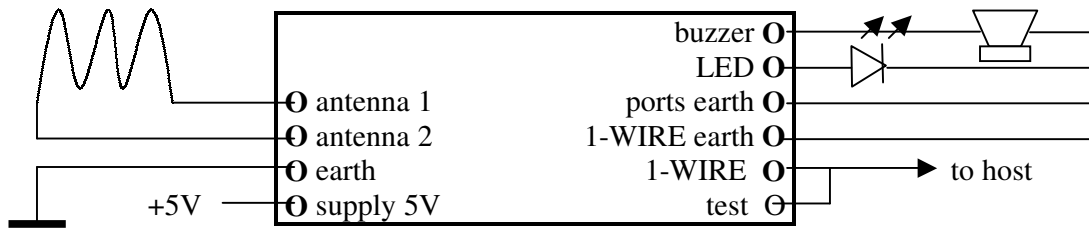


Pin assignment element side view

## PCB Dimensions



## Connections diagram



**Frame format of serial transmission for UM-DAL**

Family code	ID	Address	CRC_DAL
01	<b>ID1...ID5</b>	01	XX

FamilyCode - 0x01 always

**ID1...5 – unique identification number for transponder (5 bytes)**

Address - 0x01 always

CRC\_DAL- control sum data sent

The format complies with 1-WIRE protocol specification of Dallas, for instance DS1990. It means, that UM-DAL reader can be used as replacement of DS1990 chips.

During operation, the reader tries to read transponder cyclically. In case of wrong read-out, the reader does not respond for pulses sent from 1-Wire master. The bus does not see the reader and it is the same situation when the chip is not applied to the chip reader. In case of successful read-out of transponder, UM-DAL begins to send data via 1-WIRE bus.

**CRC value calculation**

CRC\_DAL complies with DS1990 specification. The CRC value is calculated from equation  $x^8+x^5+x^4+1$  with initial value equal to 0x00. This value is calculated in virtue of all the frame bytes except the last one.

Example of calculation of CRC value, written in C language:

```

unsigned char CalcCRCDallas(bank2 unsigned char *SourceAdr)
{
    unsigned char i,k,In,CRC=0;
    for(i=0;i<7;i++)
    {
        In=*SourceAdr;
        for(k=0;k<8;k++)
        {
            if((In^CRC)&1) CRC=((CRC^0x18)>>1)|0x80;
            else CRC=CRC>>1;
            In>>=1;
        }
        SourceAdr++;
    }
    return(CRC);
}

```

Where: \*SourceAdr is flag of the data buffer beginning

**Unique transponder description**

The Unique transponder (EM Microelectronic standard – Marin SA, H4102) comprises 5 bytes with laser written unique ID number. Correctness of read-out data process is protected with parities written in 2 subsequent bytes. It gives 40 bytes of unique ID number. Owing to the UM-DAL reader, the transponder reads the ID number, verifies read-out correctness automatically and next sends this number to master unit via serial interface port.

Byte no.	Unique transponder
1	ID1 (8 bits)
2	ID2 (8 bits)
3	ID3 (8 bits)
4	ID4 (8 bits)
5	ID5 (8 bits)
6	Parity 1 (8 bits)
8	Parity 2 (6 bits)

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