

ADwin-232-2

RS232-Interface

for ***ADwin*** Data Acquisition Boards

Hardware and Software Documentation

Version 1.3

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1. Hardware Features

1.1 Important Information

A link is needed to connect an **ADwin** data acquisition board with the **ADwin-232-2** interface. Please, make sure that no data will be sent by this link to the interface board, before the data acquisition board is booted.

Example: If you would like to connect a measurement device via serial interface of the **ADwin-232-2** interface board with an **ADwin** data acquisition board, boot the **ADwin** board *first* and *then* switch on the measurement device.

1.2 Arrangement of the connectors

ADwin-232-2 is an interface board, consisting of a TRAM printed circuit board and of up to two RS232-TRAM modules. Each of these TRAM modules is a serial interface to the **ADwin** board. Figure 1 shows the arrangement of the link connectors and their numeric labeling on the TRAM board. Moreover you will see the TRAM modules with the 25-pin connectors for the serial interfaces.

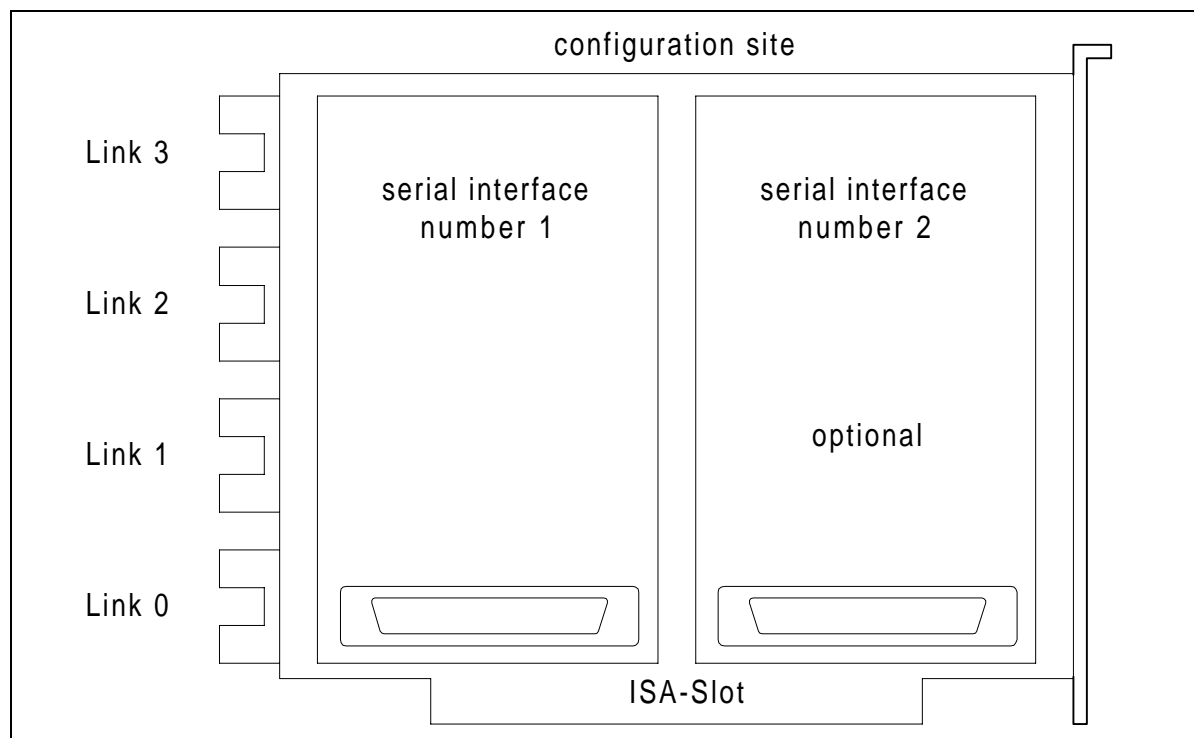


Figure 1: Outline of the **ADwin-232-2** (RS232 interface board)

1.3 Pin Assignment

1.3.1 Link Connector

The following figures show the pin assignment of the link connectors on the TRAM board as well as the pin assignment of the link connectors on the **ADwin** board.

Note: The lines Link-In and Link-Out have been exchanged on the TRAM board so that you can connect the link connectors on the TRAM board and **ADwin** board with the supplied add-on connectors.

Link-Out	1	2	GND
GND	3	4	Link-In
NC	5	6	NC
NC	7	8	Reset-In
+5V	9	10	+5V

Figure 2: Link connector on the TRAM board

Link-In	1	2	GND
GND	3	4	Link-Out
NC	5	6	NC
NC	7	8	Reset-In
+5V	9	10	+5V

Figure 3: Link connector on the **ADwin** board

1.3.2 25-pin D-type connector (RS232 interface)

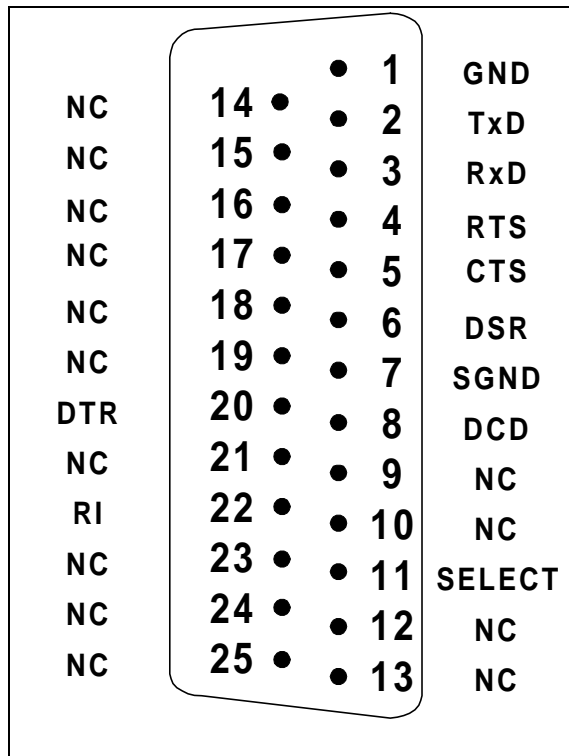


Figure 4: Connector for the serial interface

2. Installation of the RS232 Interface Board

The TRAM module of the RS232 interface board is equipped with CMOS components. Therefore great care is necessary to prevent the board from damages by electro-static discharges (ELD).

The TRAM module is an ISA board, therefore it has to be installed in an ISA slot on the PC. After installation of the RS232 interface board you have to connect it with the **ADwin** board. This is done by using the 10-pin link connectors at the rear of the **ADwin** board and TRAM module and of the supplied add-on connector. The link connectors of the TRAM module can be connected with any link connector of the **ADwin** board. The allocation for the serial inputs is then made by programming in **ADbasic**.

Note: Please do not use the link connectors on the TRAM modules for the connection with the **ADwin** board via the supplied add-on connectors.

The serial interface number 1 of the TRAM module is set to Link 1 and the serial interface number 2 of the TRAM module is set to Link 2 on the TRAM printed circuit board.

3. Configuration of the Interface

3.1 General Information

The TRAM modules have DIP-switches and jumpers, which enable you to set the interface parameters or interface protocols for the handshake mechanism, characteristic for the RS232. This configuration will be explained as follows. Figure 5 illustrates the position of the switches and jumpers on the TRAM module.

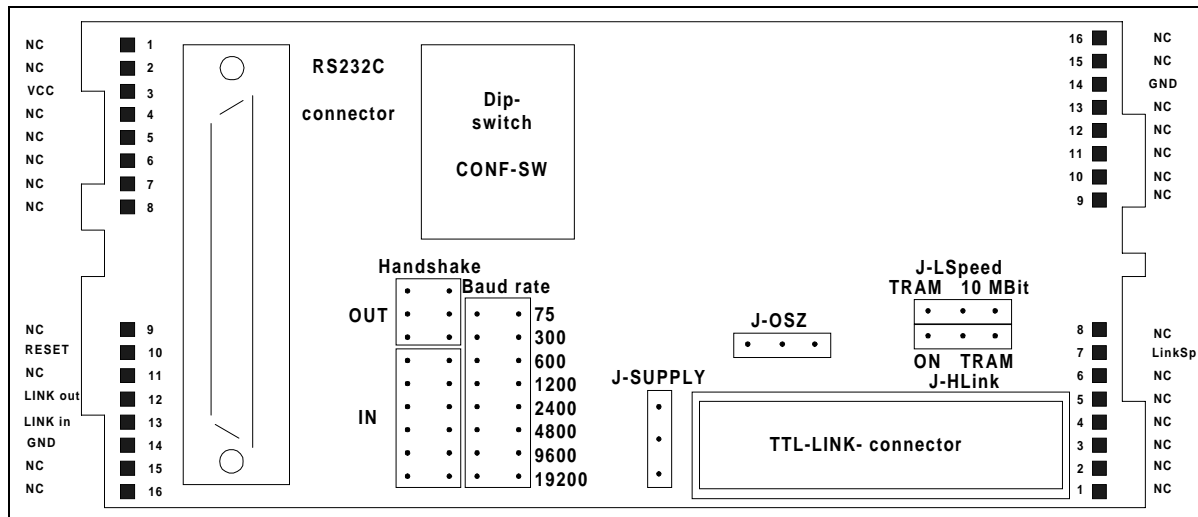


Figure 5: Outline of the TRAM modules

3.2 J-L Speed-Jumper

When using it as TRAM module, this jumper has to be positioned on "TRAM". With this configuration the jumper is no longer responsible for the link speed. Communication with the **ADwin** board occurs at 10MBit/s.

3.3 J-H Link-Jumper

This jumper has to be positioned on "TRAM".

3.4 Configuration DIP-Switch (CONF-SW)

These DIP-switches are necessary for setting parity, character length, stopp bits. The settings of the DIP-switches is shown in Figure 6.

Note: The switches 6-8 have to remain in the predefined position, in order to guarantee the correct function of the TRAM module.

The function of the switches is illustrated in Figure 6.

parity	1	ON	even: SW-1 = Off; odd: SW-1 = ON
character length	2	OFF	8 Bit: SW-2 = OFF and SW-3 = OFF
	3	OFF	7 Bit: SW-2 = ON and SW-3 = OFF
stop bits	4	ON	6 Bit: SW-2 = ON and SW-3 = ON
	5	OFF	2 Bit: SW-4 = OFF; 1 Bit: SW-4 = ON
parity	6	ON	OFF: SW-5 = OFF; ON: SW-5 = ON
free	7	OFF	
RS232	8	OFF	no: SW-7 = OFF and SW-8 = OFF
			yes : SW-7 = ON and SW-8 = ON

Figure 6: DIP-switch (CONF-SW)

3.5 Setting the Baud Rate

The Baud rate can be set between 75 and 19200 Baud. The setting in the figure below shows 9600 Baud.

■	■	J-Baud 8: 75 Baud
■	■	J-Baud 7: 300 Baud
■	■	J-Baud 6: 600 Baud
■	■	J-Baud 5: 1200 Baud
■	■	J-Baud 4: 2400 Baud
■	■	J-Baud 3: 4800 Baud
■	■	J-Baud 2: 9600 Baud
■	■	J-Baud 1: 19200 Baud

Figure 7: Jumpers for setting the Baud rate

3.6 Setting the Handshakes

The jumpers for setting the handshakes are divided into two different groups:

- Jumpers for setting handshakes for outgoing data (handshake outputs) and
- Jumpers for setting handshakes for incoming data.

The upper three pins are used for the handshake outputs, that means, you can define here if the board of the remote station presents a handshake signal or not.

The remaining pins determine if the RS232 interface board waits for signals from the remote station or not.

The settings of the jumpers is illustrated in Figure 8.

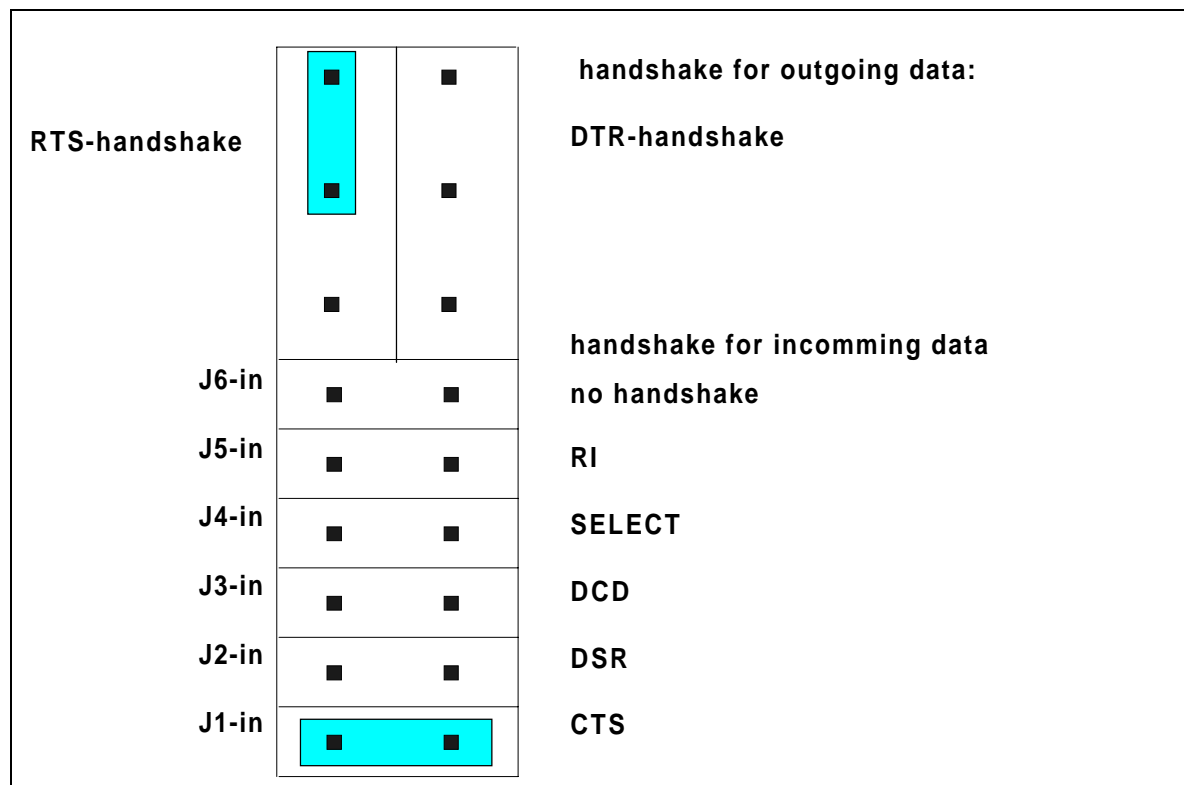


Figure 8: Jumpers for the handshakes

The setting illustrated above is useful for data transfer with „Request To Send / Clear To Send“-handshake. For data transfer without handshake or in the "Xon/Xoff mode, the jumper at J1-in must be removed and relocated at J6-in. These settings have to be similar to those of the remote station.

Basically, a function is active when a jumper is set. At handshake outputs the jumper can connect the lower or the upper pins with each other. This will not influence the operation of the board.

4. Interface Programming with *ADbasic*

The following examples take into consideration that two TRAM modules are used and that they are connected via linkadapter of the TRAM board with Links 1 and 2 of the **ADwin** board.

From **ADbasic** you can access the interface with the commands `LINKIN` and `LINKOUT`. The syntax of these commands is described below.

4.1 Read Data from the serial Interface

Syntax: `LINKIN (channel, value, number)`

- `channel`: Number of the link to which the RS232 interface is connected.
- `value`: Variable or data set to which the read values are saved.
- `number`: Number of bytes to be read.

The following example program illustrates the reading of data:

```
REM Example program which continuously reads the data coming in
REM via serial interface, which is connected to Link 1.
REM If a value has arrived it will be written to parameter 2.
```

```
dim value as integer
```

```
event:
linkin(1, value ,8)           ' receiving data via link 1
```

```
par_2 = value
```

4.2 Outputting Data to the serial Interface

Syntax: `LINKOUT (channel, value, number)`

- `channel`: Number of the link to which the RS232 interface is connected.
- `value`: Variable or data set where the values to be output are located.
- `number`: Number of bytes to be output.

The following example program illustrates the output of data:

```
REM Example program for the output of a value to the RS232 interface
REM via link 2.
REM The value can be predefined in parameter 1.
REM The indicated value will be output once per second.
```

```
event:
```

```
LINKOUT(2, par_1 ,8)         ' sending data via link 2.
```

In order to control the functions, both programs can be started and both interfaces can be connected with each other. If this is done (correct function provided), parameter 1 is continuously transferred to parameter 2.