

AREPOC Ltd.



Multifunction Data Acquisition PC Board AD25HAL



Multifunction DAQ Board

AD25HAL

AREPOC Ltd. Company would like to thank you for purchasing the Multifunction Data Acquisition PC Board AD25HAL. We believe it will meet your expectations.

In case you need any assistance, please do not hesitate to contact us:

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Product No.:

The AD25HAL Analog and Digital I/O Board is specially designed for applications that need a programmable DC current source and precise differential analog inputs. The board is also ideal for high-resolution measurement of the magnetic field using our Hall probes.

System Requirements

The following are the system requirements for installing the card and accompanying DOS software.

- An 80486 computer or higher (Pentium class recommended) with a free ISA slot
- 1 MB of hard disk space for software installation
- 4 MB RAM
- DOS 5.0 or higher operating system
- WIN 95/98/NT/2000 operating system for DLL library (optional)

Unpacking

Electrostatic discharge can damage several components on the board. To avoid such damage in handling the board, take the following precautions:

- Ground yourself via a grounding strap or by holding a grounded object.
- Touch the antistatic package to a metal part of your computer chassis before removing the board from the package.
- Remove the board from the package and inspect the board for loose components or any other sign of damage. Notify AREPOC Ltd., if the board appears damaged in any way. Do not install a damaged board into your computer.
- Never touch the exposed pins of connectors.

Place the board in front of you as you go through the next chapter. This will help you to identify the various components on the board.

Functional Description

The conception of this high performance ISA-bus analog and digital I/O board differs from other data acquisition boards and approaches rather higher accuracy multimeters. Major component of this multifunction plug-in board consists of a single-chip microcomputer, which controls all functions of the board. The board consists of an isolated high resolution integrating AD converter with 8 differential inputs, programmable non-isolated current source and digital inputs/outputs.

Board configuration

The AD25HAL board contains 3 jumpers and one DIP switch to configure the interface and I/O settings. The DIP switch is for setting the base I/O address. Jumper J1 is for the unipolar or bipolar analog inputs selection. Jumpers J2 and J3 are for +15V and -15V output voltage selection.

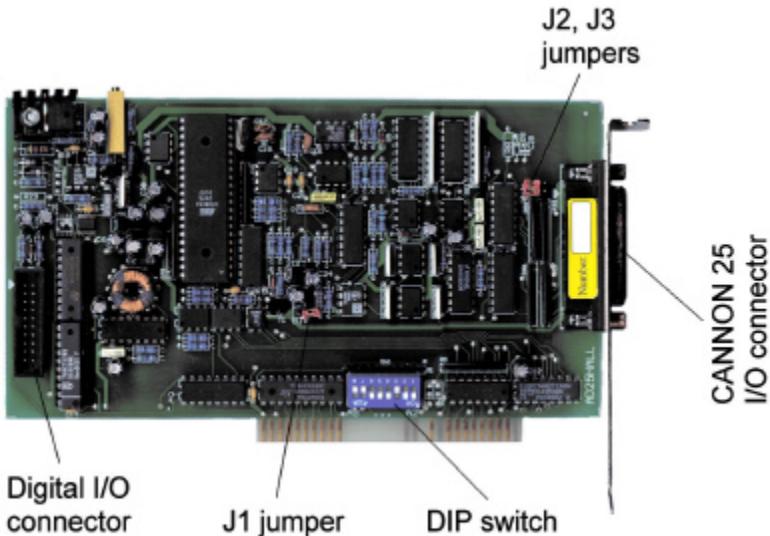


Fig. 1. The DIP switch, J1 - J3 jumpers and connectors locations.

Base I/O Address

The board is configured at the factory to 784 (310h) base I/O address. These settings are suitable for the most of computers. If your PC has other hardware on this base I/O address installed, you will need to change these settings on this hardware or on the AD25HAL board. Each switch of the DIP switch corresponds to one of the address lines A9 through A2. The board occupies 4 consecutive addresses.

Note:

If you have changed the AD25HAL base I/O address, you must make a corresponding change to any software you use with the board. The ON selection on the DIP switch means the log. 0. Base address values 000h trough 0FF are reserved for system use.

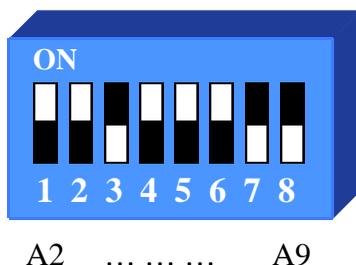


Fig. 2. The DIP switch default settings (hex 310)

Table 1 lists the example of switch settings, the corresponding base I/O address and the base I/O address space for each setting.

| DIP Switch Settings | | | | | | | | Base I/O Address (hex) | Base I/O Address Space Used (hex) |
|---------------------|----------|----------|----------|----------|----------|----------|----------|---------------------------|--------------------------------------|
| A9 | A8 | A7 | A6 | A5 | A4 | A3 | A2 | | |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 220 | 220-224 |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 300 | 300-304 |
| 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 310 (default) | 310-314 |
| 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 320 | 320-324 |

Table 1. Examples of the switch settings

Analog Inputs Settings

The AD25HAL differential analog inputs are configurable for bipolar or unipolar input ranges. Table 2 shows the configuration of the J1 jumper settings.

| Configuration | J1 Jumper Settings |
|-------------------------------------|---------------------------|
| Bipolar ± 5 V (factory setting) | OPEN |
| Unipolar 0 to +10 V | CLOSE |

Table 2. Configuration of the J1 jumper settings

Analog Inputs

The analog inputs have software-programmable gains of 1 to 128 allowing analog input ranges from ± 39 mV to ± 5 V in bipolar mode, respectively from +78 mV to +10 V in unipolar mode. Amplified voltages are multiplexed into an analog-to-digital converter operating on the principle of modified sigma-delta modulation of charge balancing. The **ADM.EXE** software supplied with the board allows selecting of the input range for each channel separately. Table 3 shows actual unipolar and bipolar input ranges.

| Gain | Unipolar Input Range | Bipolar Input Range |
|-------------|-----------------------------|----------------------------|
| 1 | 0 to +10 V | ± 5.0 V |
| 2 | 0 to +5.0 V | ± 2.5 V |
| 4 | 0 to +2.5 V | ± 1.25 V |
| 8 | 0 to +1.25 V | ± 0.62 V |
| 16 | 0 to +0.62 V | ± 0.31 V |
| 32 | 0 to +0.31 V | ± 0.16 V |
| 64 | 0 to +0.16 V | ± 78 mV |
| 128 | 0 to +78 mV | ± 39 mV |

Table 3. Input ranges for unipolar and bipolar mode

Integration time of analog inputs is software-programmable from 5 to 320 ms in four steps with corresponding resolution from 20 to 26 bits. Real resolution is limited by noise of the AD converter. For low gains (1x, 2x and 4x) the noise is limited by the AD converter itself and achievable resolution is approx. 17, 18, 19, 20 bits for integration time 5, 20, 80, 320 ms. Conversion time of each channel for data processing versus effective analog input resolution is shown in Table 4.

| <i>Resolution [bit]</i> | <i>20</i> | <i>22</i> | <i>24</i> | <i>26</i> |
|--------------------------------|------------------|------------------|------------------|------------------|
| Effective resolution [bit] | 17 | 18 | 19 | 20 |
| Integration time [ms] | 5 | 20 | 80 | 320 |
| Conversion time [ms] | 10 | 25 | 85 | 325 |

Table 4. Conversion time versus input resolution

For higher gains the resolution is limited by noise of the input amplifier, which is approx. 400 nV_{p-p} for integration time 320 ms and raises up to approx. 700 nV_{p-p} for 20 ms integration time. Corresponding resolution for gain 128 (range 0 - 78 mV) is 17.5 bits for integration time 320 ms.

Integration principle of conversion and isolation guarantees higher immunity against spurious voltages. In order to obtain total conversion time, 5 to 15 ms must be added (depends on a PC performance) for data processing. To reach high accuracy and stability, the board is equipped with auto-calibration function, which enables to eliminate board's offset and calibrate the range of the converter by means of a highly stable calibration source of 5 V.

Current Source

The AD25HAL board provides a programmable non-isolated unipolar DC current source. The constant output current can be selected from application software environment in the range of 0 to 20 mA (0 – 100 mA respectively) with 14-bit output resolution and 7.8 V compliance voltage.

Analog output of the current source is connected to pin **14** (OUT CURRENT) and pin **1** (PC GND) of the CANNON 25 I/O connector. There is possibility to turn off the current source from application software environment. The cut-off current in the turn-off state is lower than $1 \mu\text{A}$.

Power Connections

Pins **2** (+15V_{out}) and **15** (-15V_{out}) of the I/O connector supply voltage from a PC power supply. These voltages +15V and -15V are lined to the floating ground (AGND pins **3**, **4**, **13** or **25**) and are available for supplying power to external accessories or circuitry. Maximum power rating is 20 mA at 15 V $\pm 10\%$. To enable these voltage outputs close the **J2** (+15V) and/or **J3** (-15V) jumpers.

Note:

Be careful to use ± 15 V_{out} pins. Shorting or grounding pins **2** and/or **15** of the Analog I/O Connector can damage the board or PC motherboard! AREPOC Ltd., is NOT liable for damages resulting from such a connection.

Digital Inputs and Outputs

The AD25HAL provides 8 digital I/O lines TTL/HCT compatible. A strobe signal is provided for latching the digital input/output signals into external circuitry. Programming of the digital outputs: write 8 bits value on the address **bazadr+1**. Digital inputs: read the value from **bazadr+1**. Voltages +5V and +12V are available on the digital connector for supplying power to external accessories or circuitry.

Note:

Be careful to use **PC+5V** and **PC+12V** pins. This voltage circuits are **NOT ISOLATED** from the PC and are connected directly to the ISA bus! Shorting or grounding pins **19** and/or **20** of the Digital I/O Connector can damage the board or PC motherboard! AREPOC Ltd., is NOT liable for damages resulting from such a connection.

Hardware Installation

The AD25HAL multifunction board can be installed in any available ISA 16-bit expansion slot in PC AT computer. After you have correctly set and verified the DIP switch and J1-3 jumpers, you are ready to install the board into your computer. The following are general installation instructions. Consult your PC AT user manual or technical reference manual for specific instructions and warnings.

1. Turn off your computer and all peripheral devices. Unplug the power cord from the wall outlet.
2. Remove the cover from your computer.
3. Find a free 16-bit ISA expansion slot in your system.
4. Remove the metal plate from the slot you have chosen and put the screw aside.
5. Verify and write down the hardware configuration settings. You will need these settings when you configure your software.
6. Ground yourself and discharge any static electricity.
7. Insert the AD25HAL board into the selected 16-bit slot. It may be a tight fit, but **do not force** the board into place.
8. Secure the board to the slot with the screw you removed from the metal plate.
9. Check the installation.
10. Replace the cover of your computer.

The AD25HAL multifunction board is installed. You are now ready to install and configure your software.

Changing the Board Settings

Before changing the hardware settings on your board (J1, J2 and J3 jumper settings or the DIP switch setting) you must to turn off and unplug the computer. Do not forget to write down the DIP switch change in the software *Configuration* menu.

Software Installation (DOS version)

After you have installed your multifunction board hardware, you can begin to install the software. The following files must be copied to your hard drive if you will use our DOS application software:

ADM.EXE - the application software

AD.CFG - configuration file

Should you change the factory-settings of the **hex 310** base address you have to set this option in the ADM software *Configuration* menu, at the first running of the software. Then, save the configuration and close the application. The ADM application is now set up. Once the ADM application has been configured, you can start using your DAQ board.

It is possible to run the AD25HAL board from QuickBasic environment. Copy the Ad25hal.BAS driver and Ad25hal.TXT file to your hard drive. The Ad25hal.bas driver contains also a simple sample application for controlling the DAQ board.

Uninstalling the DOS software - simple delete all installed files.

Software Installation (WINDOWS 95/98 version)

To install the MagDAQ application for Windows 95/98 follow the instruction described in the manual delivered with the software.

If you will write your own application software in C, Delphi, Visual Basic or LabVIEW for Windows 95/98, the following library must be copied to your hard drive:

ad25lib98.dll - the 32 bit Dynamic Link Library (DLL)

Note that the **ad25lib98.dll** library does not operate in Windows NT/2000 operating system.

Software Installation (WINDOWS NT/2000 version)

To install the MagDAQ application for Windows NT/2000 follow the instruction described in the manual delivered with the software.

If you will write your own application software in C, Delphi, Visual Basic or LabVIEW for Windows NT/2000, the following library must be copied to your hard drive:

ad25libNT.dll - the 32 bit Dynamic Link Library must be copied to your application software directory

Driverx.sys – the system driver must be copied to your ...\\System32\\Drivers directory

Drv40.dll – the library must be copied to your application software and/or to the development environment (e.g. LabVIEW) directory.

It is also possible to use the **ad25libNT.dll** library in Windows 95/98 operating system. In this case, the **Driverx.vxd** driver must be copied to your system directory together with the above mentioned **Driverx.sys** and **Drv40.dll** files.

To uninstall the MagDAQ application run the **Uninstall.exe** program from the destination directory and follow the on-screen instructions. Alike it is possible to uninstall the MagDAQ application from "Add or Remove Programs" window. Click on the MagDAQ and follow the on-screen instructions.

Analog I/O Connector

Figure 3 shows the pin assignments for the AD25HAL analog I/O connector. The connector is located on the back panel of the board and is accessible at the rear of the computer. The analog I/O connector is a CANNON 25-pin female connector.

| | | | | |
|---------|----|----|-------------|--------------------------------|
| PC GND | 1 | | | (1 – 14) Current output |
| | | 14 | OUT CURRENT | |
| +15Vout | 2 | | | (2) +15 VDC Source |
| | | 15 | -15Vout | (15) -15 VDC Source |
| AGND | 3 | | | |
| | | 16 | Reserved | |
| AGND | 4 | | | |
| 0 IN Lo | 5 | 17 | 0 IN Hi | (5 – 17) Input channel 0 |
| 1 IN Lo | 6 | 18 | 1 IN Hi | (6 – 18) Input channel 1 |
| 2 IN Lo | 7 | 19 | 2 IN Hi | (7 – 19) Input channel 2 |
| 3 IN Lo | 8 | 20 | 3 IN Hi | (8 – 20) Input channel 3 |
| 4 IN Lo | 9 | 21 | 4 IN Hi | (9 – 21) Input channel 4 |
| 5 IN Lo | 10 | 22 | 5 IN Hi | (10 – 22) Input channel 5 |
| 6 IN Lo | 11 | 23 | 6 IN Hi | (11 – 23) Input channel 6 |
| 7 IN Lo | 12 | 24 | 7 IN Hi | (12 – 24) Input channel 7 |
| AGND | 13 | 25 | AGND | (3, 4, 13, 25) Floating ground |

Fig. 3. Pin assignments of the analog I/O connector

The floating ground (**AGND**) must be connected either to a **Lo** pin or to the **PC GND** pin (recommended to use with Hall probes).

Digital I/O connector

Figure 4 shows the pin assignments for the AD25HAL digital I/O connector. The connector is located on the board and is accessible after removing the cover from your computer. Before connecting or disconnecting to the digital I/O connector you must turn off and unplug the computer.

| | | | |
|--------|----|----|---------|
| IN 0 | 1 | 2 | IN 1 |
| IN 2 | 3 | 4 | IN 3 |
| IN 4 | 5 | 6 | IN 5 |
| IN 6 | 7 | 8 | IN 7 |
| OUT 0 | 9 | 10 | OUT 1 |
| OUT 2 | 11 | 12 | OUT 3 |
| OUT 4 | 13 | 14 | OUT 5 |
| OUT 6 | 15 | 16 | OUT 7 |
| DIGGND | 17 | 18 | DIGGND |
| PC +5V | 19 | 20 | PC +12v |

Fig. 4. Pin assignments of the digital I/O connector

The following specifications apply to the digital I/O lines. Absolute max. voltage input rating 5.0 V with respect to DIGGND.

Digital input specifications (referenced to DIGGND):

- V_{IH} input logic high voltage 2 V min.
- V_{IL} input logic low voltage 0.8 V max.
- I_{IH} input current load, logic high input voltage 20 μ A max.
- I_{IL} input current load, logic low input voltage -20 μ A max.

Digital output specifications (referenced to DIGGND):

- V_{OH} output logic high voltage 2.4 V min.
- V_{OL} output logic low voltage 0.5 V max.
- I_{OH} output source current, logic high 2.6 mA max.
- I_{OL} output sink current, logic low 24 mA max.

Warning:

Maximum ratings are absolute ratings. Connections that exceed any of the maximum ratings of input or output signals on the AD25HAL can damage the AD25HAL board and/or the PC AT. Arepoc is not liable for any damages resulting from incorrect signal connections.

Cabling and Wiring Consideration

Environmental noise can affect the accuracy of measurements made with the AD25HAL if you do not make proper considerations when running signal wires between signal sources and the AD25HAL board. The following recommendations mainly apply to analog input signal routing to the board, although they are applicable for signal routing in general.

Use individually shielded, twisted-pair wires to connect analog input signals to the AD25HAL. With this type of wire, the signals attached to the Channel 0 - 7 inputs are twisted together and then covered with a shield. This shield is then connected at only one point to the signal source ground. This kind of connection is required for signals traveling through areas with large magnetic fields or high electromagnetic interference.

To protect the signal lines from magnetic fields caused by electric motors, welding equipment, breakers or transformers, run the signal lines through special metal conduits.

In making your own cabling, you may decide to shield your cables. The mating connector for the AD25HAL analog I/O is a CANNON 25-position female connector.

High resolution of the AD25HAL board results from the application of auto-calibration method. The analog I/O board AD25HAL can be used in applications where high accuracy, linearity and resolution are required. It can serve as a relatively low cost substitution of 6-decade system multimeters.

Technical Parameters:

Analog Inputs

| | |
|---------------------------------|--|
| Input resolution (programmable) | 20 to 26 bits |
| Nonlinearity (if gain =1) | typ.: 0.0005 % of full scale max.: 0.0008 % |
| Differential nonlinearity | max.: 1 LSB |
| Max. error | 0.005 % of reading 0.01 % of FS |
| Number of analog inputs | 8 differential |
| Input range | 0 - 10 V unipolar or ± 5 V bipolar (jumper selectable) |
| Programmable gain | 1 - 128 (software selectable) |
| Input resistance | > 100 M Ω |
| Input bias current | typical: 10 nA, max.: 50 nA |
| Input overvoltage | ± 20 V continues, powered ± 10 V continues, unpowered |
| Typical noise | < 2 ppm of FS, or < 0.5 μ Vp-p |

Current Source

| | |
|---------------------------|------------------------------------|
| Output current range | 0 - 20 mA (0 - 100 mA optional) DC |
| Output current resolution | 14 bits (12 bits optional) |
| Output current ripple | < 0.0005 % of FS, or < 0.5 μ A |
| Cut-off current | < 1 μ A |
| Max. output voltage | 7.8 V |

Power Connections

| | |
|-------------------------|----------------------------------|
| Floating output voltage | +15 V, -15 V (jumper selectable) |
| Max. power load | 20 mA |

Digital Inputs and Outputs

| | |
|--------------------------|--------------------------|
| 8 digital I/O | TTL/HCT compatible |
| Recommended warm-up time | >15 min |
| Relative humidity | 10% to 90% noncondensing |

Warranty

The AD25HAL multifunction board is warranted against defects in materials and workmanship for a period of one year from the date of shipment, as evidenced by receipts or other documentation. Arepoc will, at its option, repair or replace equipment that proves to be defective during the warranty period. This warranty includes parts and labor. A Return Material Authorization number must be obtained from the factory and clearly marked on the outside of the package before the board will be accepted for warranty work. Arepoc believes that the information in this document is accurate. In the event that technical or typographical errors exist, we reserve the right to make changes to subsequent editions of this document without prior notice to holders of this edition. In no event shall Arepoc be liable for any damages arising out of or related to this document or the information contained in it.

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The AD25HAL comes with functions in Dynamic Link Library (DLL) **ad25lib98.dll** (**ad25libNT.dll** respectively) which can be called from C, Delphi, Visual Basic or LabVIEW under Windows 95/98 (WindowsNT/2000 respectively). The AD25HAL supports two modes of operation: **single conversion** or **periodical measurement**.

In single conversion mode the AD25HAL takes one sample immediately after calling function **Adconv** which returns measured value. An advantage of this mode is a simple programming. Disadvantage: triggering is derived from the PC so timing accuracy can be lower.

In periodical mode measurement sequence is programmed first using procedures **ProgCh**, **ProgEn**, **Timer**, etc. Advantage of this mode is that triggering is controlled by internal clock of the AD25HAL and, therefore, the triggering is more accurate (PC must only read-out result before start of the next conversion). Disadvantage: during periodical measurement the auto-calibration is inaccessible; therefore, this mode is suitable for short-time measurement up to few minutes only.

Description of the DLL library

Both Dynamic Link Libraries the **ad25lib98.dll** and **ad25libNT.dll** offers the following procedures and functions:

function initAD(address:word):integer; stdcall; external 'ad25lib'

Initializes the AD25HAL, address is set by DIP switch on the card, default value is 310H. After successful initialization function returns **1**, otherwise returns **0**. This function must be called first before any other function.

procedure calibration(type, range, resol:integer); stdcall; external 'ad25lib'

This procedure accomplishes auto-calibration of the AD25HAL. Every used range with common resolution must be calibrated before

measurement! Auto-calibration removes drift of the card so it is necessary to call this routine during measurement in interval tens of seconds.

Parameters:

Type - 0 - calibrate only selected range (it is faster)

1 - calibrate all ranges (call only if use more ranges during measurement)

range - 0..7 - select gain 1, 2, 4, 8, 16, 32, 64 or 128

resol - 0..3 - select integrating time 5, 20, 80 or 320 ms

function GetRange(integer); stdcall; external 'ad25lib'

This function returns **1** if the card measures in unipolar mode, **0** in bipolar mode. Mode selects jumper J9 on the board.

function Adconv(resol, range, chan:integer):single; stdcall; external 'ad25lib'

Immediately takes one measurement on selected input.

Parameters:

resol, range - the same as in the procedure **calibration**

chan - 0..7 - number of the measured channel

Returned value is measured voltage in volts.

procedure ProgEn(chan, resol:byte); stdcall; external 'ad25lib'

Sets number of measured channels and resolution in the periodical measurement.

Parameters:

chan - number of measured channels

resol - see procedure **calibration**

procedure ProgCh(chan, range:byte); stdcall; external 'ad25lib'

Sets channel and range for every measured input.

Parameters - see function **Adconv**

procedure Timer(burst:byte; time:word); stdcall; external 'ad25lib'

Sets total measurement period in periodical measurement.

Parameters:

burst - always 1 - 2nd channel is measured immediately after the 1st, 3rd channel after 2nd, etc.

time - total measurement period in ms, max. value is 9000. For proper function **time** must be equal or bigger then the sum of conversion time of all measured channels

procedure StartAD; stdcall; external 'ad25lib'

Starts measurement in periodical mode.

function GetSample(range:byte):single; stdcall; external 'ad25lib'

Read one sample in periodical mode.

Parameters:

range - see procedure **calibration**

function ADfinished:integer; stdcall; external 'ad25lib'

Returns **1** if measurement in periodical mode is finished, otherwise returns **0**.

procedure StopAD; stdcall; external 'ad25lib'

Stops measurement in periodical mode.

procedure DAC(value:word); stdcall; external 'ad25lib'

Sets value of the current from the current source.

Parameters:

value - 0..16000 corresponds to current 0...20 mA i.e. 1 LSB is 0.00125 mA

procedure DigOut(value:byte); stdcall; external 'ad25lib'

Writes value on a digital output.

function DigIn:byte; stdcall; external 'ad25lib'

Reads value from a digital input.

procedure closeAD; stdcall; external 'ad25libNT'

Unload the driver from memory.

function GetCurrentRange:integer;stdcall; external 'ad25lib.dll'

Returns max. current value of the current source (20 or 100) mA.

function GetDACresolution:integer;stdcall; external 'ad25lib.dll'

Returns resolution of the DAC current source converter (12 or 14) bits.

function GetSerialN:integer;stdcall; external 'ad25lib.dll'

Returns serial number of the DAQ board.

Programming Example

Complete programming example in Delphi is in a directory **example**, here is a simple common example which can be adapted to any programming language.

Single conversion example:

```
if initAD($310) = 0 then      //card initialization, address 310H
  begin
    MessageBox(0, 'Unable to connect to AD25HAL', 'Error', MB_OK);
    Exit;
  end;
unip:= GetRange;            //read unip/bip range, unip=1-unipolar
resol:=2;                   //Tint=80 ms; resolution cca 19 bits}
Calibration(0,0,resol);     //Calibration - only range ±5V
u:= ADConv(resol,0,1);     //channel 1, range ±5V
```

Periodical measurement example:

```
if initAD($310) = 0 then    //card initialisation, address 310H
  begin
    MessageBox(0, 'Unable to connect to AD25HAL', 'Error', MB_OK);
    Exit;
  end;
unip:= GetRange;           //read unip/bip range, unip=1 - unipolar
resol:=2;                  //Tint=80 ms; resolution cca 19 bits}
Calibration(1,0,resol);    //Calibration - all ranges
ProgEn(3,resol);           //Measure 3 channels
ProgCh(0,0);               //Input 0, range ±5V
ProgCh(1,2);               //Input 1, range ±1.25V}
ProgCh(2,1);               //Input 2, range ±2.5V}
Timer(1,1000);             //Burst mode, period 1000 ms}
StartAD;
  for i:=1 to 5 do
    begin
      repeat until Adfinished=1; //wait for end of the conversion
      ux[0,i]:=GetSample(0);      //read input 0, range 0
      ux[1,i]:=GetSample(2);     //Input 1, range 2
      ux[2,i]:=GetSample(1);     //Input 2, range 1
    end;
StopAD;
```

Setting current example:

```
DAC(2000);                 //current 2.5 mA (for AD25HAL board with
                           the 20 mA/14 bits current source)
```

Using the LabVIEW™

Procedures and functions of the **ad25lib98.dll** can be called also from the LabVIEW in Windows 95/98 operating system. The calling convention is **stdcall**; a simple example application is in the file **ad25hall.vi** in the directory **exam1w**. Before the first run it is necessary to set proper path to the **ad25lib98.dll**. After loading the **ad25hall.vi** switch to the diagram, right click on every function, select **Configure...** and set proper path to the library.

In Windows NT/2000 operating system must be used the **ad25libNT.dll** library. After loading the **ad25hall.vi** switch to the diagram, right click on every function, select **Configure...** and set the proper path to the **ad25libNT.dll** library.

Note, that **Driverx.sys** must be installed in your ...*System32*\Drivers directory and the **Drv40.dll** must be installed in your LabVIEW directory. The **ad25libNT.dll** library cannot be used without these two files.

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