Make your own software for the PCS500 with the Dynamic Link Library PCS500D.DLL

The PCS500D.DLL is a 32 bit Windows DLL. This document describes all functions and procedures of the DLL that are available for your application programme. Calling the functions and procedures exported by the DLL, you may write custom Windows (98, 2000, Me, XP) applications in Delphi, Visual Basic, C++ Builder or any other 32-bit Windows application development tool that supports calls to a DLL.

A complete overview of the procedures and functions that are exported by the PCS500D.DLL follows. At the end of this document there are listings of example programmes in order to gain an insight as to how to construct your own application programmes. The examples are written in Delphi and Visual Basic. In the listings there are full declarations for the DLL function and procedures.

Note that all the examples in the function and procedure description section are written for Delphi.

Overview of the Procedures and Functions of the PCS500D.DLL

General

`RunOn(Run: Boolean)`	*Set PCS500 Run mode on or off*
`SingleOn(Single: Boolean)`	*Set PCS500 Single mode on or off*
`ShowPCS500(Visible: Boolean);`	*Show or hide the PCS500 user interface*

Setup

`Voltage1(Volts:Longint)`	*Set V/div scale of Ch1*
`Voltage2(Volts:Longint)`	*Set V/div scale of Ch2*
`Time(TpDiv:Longint)`	*Set Time/div scale*
`TrgLevel(TrgLevel:Longint)`	*Set trigger level*
`TrgEdge(Positive_Negative:Longint)`	*Set trigger edge*
`TrgOn(trg_on: Boolean)`	*Set trigger on or off*
`TrgSource(CH1_CH2_Ext:Longint)`	*Set trigger source*
`YPosition1(y_pos:Longint);`	*Set trace Y-position of Ch1*
`YPosition2(y_pos:Longint);`	*Set trace Y-position of Ch2*
`Coupling1(AC_DC_GND:Longint)`	*Set the input coupling of Ch1*
`Coupling2(AC_DC_GND:Longint)`	*Set the input coupling of Ch2*

Data read

```
Use DSOLink.DLL functions
     ReadCh1(Buffer: Pointer)
     ReadCh2(Buffer: Pointer)
```

Note: The PCS500.EXE must be running when the function calls of these DLLs are used.

Procedures and Functions of the PCS500D.DLL

ShowPCS500

Syntax
```
procedure ShowPCS500(Visible: Boolean);
```

Parameter
`Visible`: Boolean true displays the user interface. False hides the user interface.

Description
Displays or hides the PCS500 user interface on the screen.

Example
```
procedure TForm1.ShowPCS500Click(Sender: TObject);
begin
  ShowPCS500(true);
end;

procedure TForm1.HidePCS500Click(Sender: TObject);
begin
   ShowPCS500(false);
end;
```

RunOn

Syntax
```
PROCEDURE RunOn(Run: Boolean);
```

Parameter
`Run`: Boolean true sets the scope to Run mode. False stops Run mode.

Description
Set Run mode on or off.

Example
```
procedure TForm1.RunClick(Sender: TObject);
begin
    RunOn(Run.down);
end;
```

SingleOn

Syntax
```
PROCEDURE SingleOn(Single: Boolean);
```

Parameter
`Single`: Boolean true sets the scope to Single mode. False stops Single mode.

Description
Set Single mode on or off.

Example
```
procedure TForm1.SingleClick(Sender: TObject);
begin
  SingleOn(true);
end;
```

Voltage1, Voltage2

Syntax
```
PROCEDURE Voltage1(Volts:Longint);
PROCEDURE Voltage2(Volts:Longint);
```

Parameter
`Volts`: The index of the V/div range.
0 = 15 V/div
1 = 5 V/div
2 = 1.5 V/div
3 = 0.5 V/div
4 = 0.15 V/div
5 = 50 mV/div
6 = 15 mV/div
7 = 5 mV/div

Description
Set the V/div setting of the PCS500 oscilloscope.

Example
```
procedure TForm1.VoltageRangeClick(Sender: TObject);
begin
  Voltage((sender as TSpeedButton).tag);
end;
```

Time

Syntax
```
PROCEDURE Time(TpDiv:Longint);
```

Parameter
`TpDiv`: The index of the time/div setting rate.
0 = 100 ms/div
1 = 50 ms/div
2 = 20 ms/div
3 = 10 ms/div
4 = 5 ms/div
5 = 2 ms/div
6 = 1 ms/div
7 = 0.5 ms/div
8 = 0.2 ms/div
9 = 0.1 ms/div
10 = 50 us/div
11 = 20 us/div
12 = 10 us/div
13 = 5 us/div

Description
Set the Time/div setting of the PCS500oscilloscope.

Example
```
procedure TForm1.TimeRangeClick(Sender: TObject);
begin
  Time((sender as TSpeedButton).tag);
end;
```

Coupling

Syntax
```
PROCEDURE Coupling(AC_DC_GND:Longint);
```

Parameter
`AC_DC_GND:` The index of the coupling type.
0 = AC
1 = DC
2 = GND

Description
Set the input couplin setting of the PCS500oscilloscope.

Example
```
procedure TForm1.SelectCouplingClick(Sender: TObject);
begin
  Coupling((sender as TSpeedButton).tag);
end;
```

TriggerLevel

Syntax
```
PROCEDURE TriggerLevel(TrgLevel:Longint);
```

Parameter
`TrgLevel:` The triggering level value between 0 and 255.

Description
Set the triggering level of the PCS500oscilloscope in steps of half a division on the screen.

Example
```
procedure TForm1.TrgLevelChange(Sender: TObject);
begin
  TriggerLevel(TrgLevel.position);
end;
```

YPosition1, YPosition2

Syntax
```
PROCEDURE YPosition1(Position.position);
PROCEDURE YPosition2(Position.position);
```

Parameter
`Position:` The Y-position of the trace (ground reference), value between -128 and 127.

Description
Adds an offset to the input signal.

Example
```
procedure TForm1.SetPositionChange(Sender: TObject);
begin
  YPosition(SetPosition.position);
end;
```

TrgOn

Syntax
```
PROCEDURE TrgOn(trg_on: Boolean);
```

Parameter
`trg_on:` Boolean TRUE sets the triggering on and FALSE sets the triggering off.

Description
Set the PCS500trigger on or off.

Example
```
procedure TForm1.TriggerOnClick(Sender: TObject);
begin
  TrgOn(true);
end;

procedure TForm1.TriggerOffClick(Sender: TObject);
begin
  TrgOn(false);
end;
```

TrgEdge

Syntax
```
PROCEDURE TrgEdge(Positive_Negative:Longint)
```

Parameter
`Positive_Negative:` Index of the trigger edge.
0 = Negative
1 = Positive

Description
Set the PCS500trigger edge.

Example
```
procedure TForm1.TriggerEdgeClick(Sender: TObject);
begin
  TrgEdge((sender as TSpeedButton).tag);
end;
```

TrgSource

Syntax
```
PROCEDURE TrgSource(CH1_CH2_Ext:Longint)
```

Parameter
`CH1_CH2_Ext:` Index of the trigger source.
0 = Ch1
1 = Ch2
2 = Ext

Description
Set the PCS500trigger source.

Example
```
procedure TForm1.SpeedButton27Click(Sender: TObject);
```

```
begin
  TrgSource((sender as TSpeedButton).tag);
end;
```

Using the PCS500D.DLL in Delphi

In this application example there are the declarations of the PCS500D.DLL procedures and functions and an example how to use these function calls.

```
unit PCS_Runx;

interface

uses
  Windows, Messages, SysUtils, Classes, Graphics, Controls, Forms, Dialogs,
  StdCtrls, Buttons, ComCtrls;

type
  TForm1 = class(TForm)
    Memo1: TMemo;
    Run: TSpeedButton;
    Single: TButton;
    Show_PCS500: TButton;
    Hide_PCS500: TButton;
    DataRead: TButton;
    GroupBox1: TGroupBox;
    Label11: TLabel;
    Label14: TLabel;
    Label15: TLabel;
    Label17: TLabel;
    LabelCh2: TLabel;
    LabelCh1: TLabel;
    Position_ch1: TTrackBar;
    Position_ch2: TTrackBar;
    Voltage_ch1: TSpeedButton;
    SpeedButton3: TSpeedButton;
    SpeedButton4: TSpeedButton;
    SpeedButton5: TSpeedButton;
    SpeedButton6: TSpeedButton;
    SpeedButton7: TSpeedButton;
    SpeedButton8: TSpeedButton;
    SpeedButton9: TSpeedButton;
    Coupling_ch1: TSpeedButton;
    SpeedButton11: TSpeedButton;
    SpeedButton12: TSpeedButton;
    Voltage_ch2: TSpeedButton;
    SpeedButton15: TSpeedButton;
    SpeedButton16: TSpeedButton;
    SpeedButton17: TSpeedButton;
    SpeedButton18: TSpeedButton;
    SpeedButton19: TSpeedButton;
    SpeedButton20: TSpeedButton;
    SpeedButton21: TSpeedButton;
    Coupling_ch2: TSpeedButton;
    SpeedButton23: TSpeedButton;
    SpeedButton24: TSpeedButton;
    Time_div: TGroupBox;
    Trigger: TGroupBox;
    Label4: TLabel;
    Label42: TLabel;
    Label43: TLabel;
    Label16: TLabel;
    TriggPosition: TTrackBar;
    TriggOn: TSpeedButton;
    TriggOff: TSpeedButton;
    TriggSource: TSpeedButton;
    SpeedButton28: TSpeedButton;
    SpeedButton29: TSpeedButton;
    TriggEdge: TSpeedButton;
    SpeedButton31: TSpeedButton;
    TimeDiv: TSpeedButton;
    SpeedButton33: TSpeedButton;
    SpeedButton34: TSpeedButton;
    SpeedButton35: TSpeedButton;
```

```
    SpeedButton36: TSpeedButton;
    SpeedButton37: TSpeedButton;
    SpeedButton38: TSpeedButton;
    SpeedButton39: TSpeedButton;
    SpeedButton40: TSpeedButton;
    SpeedButton41: TSpeedButton;
    SpeedButton42: TSpeedButton;
    SpeedButton43: TSpeedButton;
    SpeedButton44: TSpeedButton;
    SpeedButton45: TSpeedButton;
    procedure DataReadClick(Sender: TObject);
    procedure RunClick(Sender: TObject);
    procedure SingleClick(Sender: TObject);
    procedure Show_PCS500Click(Sender: TObject);
    procedure Hide_PCS500Click(Sender: TObject);
    procedure Position_ch1Change(Sender: TObject);
    procedure Position_ch2Change(Sender: TObject);
    procedure Voltage1Click(Sender: TObject);
    procedure Coupling_ch1Click(Sender: TObject);
    procedure TriggPositionChange(Sender: TObject);
    procedure TimeDivClick(Sender: TObject);
    procedure TriggOnClick(Sender: TObject);
    procedure TriggOffClick(Sender: TObject);
    procedure TriggSourceClick(Sender: TObject);
    procedure Voltage2Click(Sender: TObject);
    procedure Coupling_ch2Click(Sender: TObject);
    procedure TriggEdgeClick(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }
  end;

var
  Form1: TForm1;
  data1, data2: array[0..5000] of longint;
  s:string;

implementation

{$R *.DFM}
{DLL procedures and functions}
PROCEDURE Voltage1(VpDiv:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE Voltage2(VpDiv:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE Time(TpDiv:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE RunOn(Run: Boolean);stdcall; external 'PCS500D.dll';
PROCEDURE SingleOn(Single: Boolean);stdcall; external 'PCS500D.dll';
PROCEDURE YPosition1(y_pos:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE YPosition2(y_pos:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE TrgOn(trg_on: Boolean);stdcall; external 'PCS500D.dll';
PROCEDURE TrgLevel(TrgLevel:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE TrgSource(CH1_CH2_Ext:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE TrgEdge(Positive_Negative:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE Coupling1(AC_DC_GND:Longint);stdcall; external 'PCS500D.dll';
PROCEDURE Coupling2(AC_DC_GND:Longint);stdcall; external 'PCS500D.dll';
procedure ShowPCS500(Visible: Boolean); stdcall; external 'PCS500D.dll';

procedure ReadCh1(Buffer: Pointer); stdcall; external 'DSOLink.dll';
procedure ReadCh2(Buffer: Pointer); stdcall; external 'DSOLink.dll';

procedure TForm1.DataReadClick(Sender: TObject);
var i: longint;
p:pointer;
begin
  p:= @data1[0];
  ReadCh1(p);
  p:= @data2[0];
  ReadCh2(p);
  memo1.clear;
  memo1.lines.add('Sample rate
[Hz]'+chr(9)+inttostr(data1[0])+chr(9)+inttostr(data2[0]));
  memo1.lines.add('Full scale
[mV]'+chr(9)+inttostr(data1[1])+chr(9)+inttostr(data2[1]));
  memo1.lines.add('GND level
[counts]'+chr(9)+inttostr(data1[2])+chr(9)+inttostr(data2[2]));
  memo1.lines.add('');
  begin
```

```
    for i:=0 to 8 do
    memo1.lines.add('Data
('+inttostr(i)+')'+chr(9)+chr(9)+inttostr(data1[i+3])+chr(9)+inttostr(data2[i+3]));
  end;
end;

procedure TForm1.RunClick(Sender: TObject);
begin
   RunOn(Run.Down)
end;

procedure TForm1.SingleClick(Sender: TObject);
begin
  SingleOn(true);
end;

procedure TForm1.Show_PCS500Click(Sender: TObject);
begin
  ShowPCS500(true);
end;

procedure TForm1.Hide_PCS500Click(Sender: TObject);
begin
   ShowPCS500(false);
end;

procedure TForm1.Position_ch1Change(Sender: TObject);
begin
  YPosition1(Position_ch1.position);
end;

procedure TForm1.Position_ch2Change(Sender: TObject);
begin
  YPosition2(Position_ch2.position);
end;

procedure TForm1.Voltage1Click(Sender: TObject);
begin
  Voltage1((sender as TSpeedButton).tag);
end;

procedure TForm1.Voltage2Click(Sender: TObject);
begin
  Voltage2((sender as TSpeedButton).tag);
end;

procedure TForm1.Coupling_ch1Click(Sender: TObject);
begin
  Coupling1((sender as TSpeedButton).tag);
end;

procedure TForm1.Coupling_ch2Click(Sender: TObject);
begin
  Coupling2((sender as TSpeedButton).tag);
end;

procedure TForm1.TriggPositionChange(Sender: TObject);
begin
  TrgLevel(TriggPosition.position);
end;

procedure TForm1.TimeDivClick(Sender: TObject);
begin
  Time((sender as TSpeedButton).tag);
end;

procedure TForm1.TriggOnClick(Sender: TObject);
begin
  TrgOn(true);
end;

procedure TForm1.TriggOffClick(Sender: TObject);
begin
  TrgOn(false);
end;

procedure TForm1.TriggSourceClick(Sender: TObject);
```

```
begin
  TrgSource((sender as TSpeedButton).tag);
end;

procedure TForm1.TriggEdgeClick(Sender: TObject);
begin
  TrgEdge((sender as TSpeedButton).tag);
end;

end.
```

Using the PC500D.DLL in Visual Basic

In this application example there are the declarations of the PCS500D.DLL procedures and functions and an example how to use these function calls.

Note: Make sure that the file PCS500D.DLL is copied to the Windows' SYSTEM32 folder:

```
Option Explicit
Dim DataBuffer1(0 To 5000) As Long
Dim DataBuffer2(0 To 5000) As Long
Private Declare Sub ReadCh1 Lib "DSOLink.dll " (Buffer As Long)
Private Declare Sub ReadCh2 Lib "DSOLink.dll " (Buffer As Long)
Private Declare Sub Voltage1 Lib "PCS500D.dll" (ByVal Volts As Long)
Private Declare Sub Voltage2 Lib "PCS500D.dll" (ByVal Volts As Long)
Private Declare Sub Time Lib "PCS500D.dll" (ByVal Rate As Long)
Private Declare Sub RunOn Lib "PCS500D.dll" (ByVal Run_On As Long)
Private Declare Sub SingleOn Lib "PCS500D.dll" (ByVal Single_On As Long)
Private Declare Sub YPosition1 Lib "PCS500D.dll" (ByVal y_pos As Long)
Private Declare Sub YPosition2 Lib "PCS500D.dll" (ByVal y_pos As Long)
Private Declare Sub TrgOn Lib "PCS500D.dll" (ByVal trg_On As Long)
Private Declare Sub TrgLevel Lib "PCS500D.dll" (ByVal TrgLevel As Long)
Private Declare Sub TrgSource Lib "PCS500D.dll" (ByVal TrgLevel As Long)
Private Declare Sub TrgEdge Lib "PCS500D.dll" (ByVal Positive_Negative As Long)
Private Declare Sub Coupling1 Lib "PCS500D.dll" (ByVal AC_DC_GND As Long)
Private Declare Sub Coupling2 Lib "PCS500D.dll" (ByVal AC_DC_GND As Long)
Private Declare Sub ShowPCS500 Lib "PCS500D.dll" (ByVal Visible As Long)

Private Sub Check1_Click()
    RunOn Check1.Value
End Sub

Private Sub Command10_Click()
    ShowPCS500 1
End Sub

Private Sub Command11_Click()
    ShowPCS500 0
End Sub

Private Sub Command13_Click()
    SingleOn 1
End Sub

Private Sub Command9_Click()
    Dim i As Long
    List1.Clear
    ReadCh1 DataBuffer1(0)
    ReadCh2 DataBuffer2(0)
    List1.AddItem "Sample rate [Hz]" + Chr(9) + Str(DataBuffer1(0)) + Chr(9) +
Str(DataBuffer2(0))
    List1.AddItem "Full scale [mV]" + Chr(9) + Str(DataBuffer1(1)) + Chr(9) +
Str(DataBuffer2(1))
    List1.AddItem "GND level [counts]" + Chr(9) + Str(DataBuffer1(2)) + Chr(9) +
Str(DataBuffer2(2))
    List1.AddItem ""
    For i = 0 To 8
      List1.AddItem "Data(" + Str(i) + ")" + Chr(9) + Chr(9) + Str(DataBuffer1(i + 3))
+ Chr(9) + Str(DataBuffer2(i + 3))
    Next
End Sub

Private Sub Option1_Click(Index As Integer)
    Voltage1 Index
```

```
End Sub

Private Sub Option2_Click(Index As Integer)
    Voltage2 Index
End Sub

Private Sub Option3_Click(Index As Integer)
    Coupling1 Index
End Sub

Private Sub Option4_Click(Index As Integer)
    Coupling2 Index
End Sub

Private Sub Option5_Click(Index As Integer)
    Time Index
End Sub

Private Sub Option6_Click(Index As Integer)
    TrgOn Index
End Sub

Private Sub Option7_Click(Index As Integer)
  TrgSource Index
End Sub

Private Sub Option8_Click(Index As Integer)
    TrgEdge Index
End Sub

Private Sub VScroll1_Change()
    YPosition1 VScroll1.Value
End Sub

Private Sub VScroll2_Change()
    YPosition2 VScroll2.Value
End Sub

Private Sub VScroll3_Change()
    TrgLevel VScroll3.Value
End Sub
```