PCscanIV

Setup File Format Description (.xsu)

Internal Document

Introduction

This document describes the PCscanIV setup file format (.xsu files).

Document conventions

In several places in this document you will see channels that have been coded into a DWORD (4 Byte datatype). When you come across this occurrence it is important to know how this DWORD contains the MG, MM and Channel. The format of this DWORD is shown below:

1	2	3	4
Channel 1 Byte	**MM** 1 Byte	**MG** 1 Byte	**Not Used**

Most of the values for the elements in the file match the Sony documentation for these elements so for example the Data Bits element in the file will be either 0x00 (24 Bit) or 0x01 (16 bit). The elements that do not correspond to Sony documentation will be described as part of the element.

File Overview

This file format is a versioned file format and the current version of this format is shown below.

Current Version of this File Format = 1.21

The file itself contains numerous settings to do with the setup of the hardware as well as settings regarding the PCscan IV software. An outline of what can be found in the file format is shown below with more detailed descriptions to follow.

File Identifier
File Version
Global Settings
Replay Channels
Hardware Settings
Channel Groups
Last User Layout
Current User Layout
DSP Windows

File identifier and Version

To identify this file as a PCscan IV setup file there is a string identifier at the beginning of the file. The first 15 bytes of the setup file should contain the characters "PCSCANSETUPFILE".

Following this identifier you should find the file version that you are trying to read in. The current latest file version for PCscan IV setup files is 1.21.

1	2	3	4	5	6	7	8
P	**C**	**S**	**C**	**A**	**N**	**S**	**E**
T	**U**	**P**	**F**	**I**	**L**	**E**	**Version** 4 Byte Float
Version (continued)							

Global Settings

After the file identifier and version you will find a host of global settings regarding all aspects of the software and the hardware.

1	2	3	4	5	6	7	8
Frequency Type 2 Byte Short		**Data Bits** 2 Byte Short		**Trigger Start Condition** 2 Byte Short		**Trigger Count** 2 Byte Short	
Trigger Start Time 8 Byte Floating Point							
Trigger Interval Time 4 Byte Long				**Trigger Duration Type** 2 Byte Short		**Trigger Duration Length** 4 Byte Long	
Trigger Duration Length (continued)		**Interval to Trigger** 2 Byte Short		**Panel Lock** 4 Byte BOOL TRUE if panel locked, FALSE if not (Version 1.01+)			
Fan Mode 2 Byte Short (Version 1.01+)		**ILink Speed** 2 Byte Short		**Length of Home Directory String** 2 Byte Short		**Home Directory** String	
Home Directory (continued) This is the home directory from the options dialog. Number of characters is based on previous short of length (10 characters in this illustration but must use length)							
Date Format 2 Byte Short (Version 1.10+)		**Noise Floor** 4 Byte Float				**FFT Power** 2 Byte Short	
FFT Window 2 Byte Short		**FFT Overlap** 2 Byte Short		**Octave Fraction** 2 Byte Short		**Cumulative Average Method** 2 Byte Short (Version 1.05+)	

<table>
<tr><td colspan="2">Cumulative Exponent N
4 Byte Float
(Version 1.05+)</td><td colspan="2">Cumulative Decay Time
4 Byte Float
(Version 1.05+)</td></tr>
<tr><td>Max Cumulative Processes
2 Byte Short
(Version 1.04+)</td><td colspan="2">Record Time Data
4 Byte BOOL
(Version 1.19+)</td><td>Record Frequency Data
4 Byte BOOL
(Version 1.19+)</td></tr>
<tr><td>Record Frequency Data
(continued)</td><td colspan="2">Record Start Key
4 Byte UINT
(Version 1.04+)</td><td>Record Stop Key
4 Byte UINT
(Version 1.04+)</td></tr>
<tr><td>Record Stop Key
(continued)</td><td colspan="2">Key Bounce Time
4 Byte DWORD
(Version 1.04+)</td><td>Data Naming
2 Byte Short
(Version 1.04+)</td></tr>
<tr><td colspan="2">Auto Range Time
4 Byte Float
(Version 1.06+)</td><td colspan="2">Save Matrix
4 Byte BOOL
(Version 1.07+)</td></tr>
<tr><td colspan="2">Current Channel Group ID
4 Byte DWORD
(Version 1.06+)</td><td colspan="2">Number of Channel Groups
4 Byte DWORD
(Version 1.06+)</td></tr>
<tr><td>Time Freeze Mode
2 Byte Short</td><td>Time Scroll Back
2 Byte Short</td><td colspan="2">Enable Microphone
4 Byte BOOL
(Version 1.13+)</td></tr>
<tr><td colspan="2">Lock Front Panel
4 Byte BOOL
(Version 1.17+)</td><td colspan="2">Phase In Degrees
4 Byte BOOL
(Version 1.20+)</td></tr>
</table>

Replay Channels

After the global settings you will find a section describing the replay channels from the replay screen in PCscan IV. Firstly you will find a header containing the replay file name along with how many replay channels are going to be found and some other settings.

Replay Header

Length of Replay File Name 2 Byte Short (Version 1.15+)	**Replay File Name** Number of characters is based on previous short of length (6 characters in this illustration but must use length) (Version 1.15+)
Replay Mic Data 4 Byte BOOL (Version 1.15+)	**Replay Event** 4 Byte long (Version 1.15+)
Replay Taper 4 Byte long (Version 1.16+)	**Replay Channels** 2 Byte Short (Version 1.15+)

After this header there are N channel blocks where N is the number of replay channels described in the header. The table below describes one replay channel section.

Replay Channel

1	2	3	4	5	6	7	8
AOut Channel 4 Byte DWORD MG, MM, Channel coded into DWORD (Version 1.15+)				**XMX Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD (Version 1.15+)			
Output Level 2 Byte Short (Version 1.15+)		**Output Range** 2 Byte Short (Version 1.15+)		**Output Rate** 2 Byte Short (Version 1.15+)			

Hardware Settings

After the replay channels you will find a section describing the hardware settings for all possible MGs, MMs and Channels. This is by far the biggest section within the setup file. You will find settings for 8 MGs each containing 6 MMs each having 4 channels within this section. These are in the format:

MG1, MM1, CH1
MG1, MM1, CH2
MG1, MM1, CH3
MG1, MM1, CH4
MG1, MM2, CH1
MG1, MM2, CH2
.
.
MG8, MM6, CH4

Each MG firstly contains settings to do with itself followed by an array of 6 MMs with the settings for each one. Each MM along with the settings for itself contains an array of 4 Channels with the settings for each one.

Measurement Group

1	2	3	4	5	6	7	8
Measurement Group 2 Byte Short		**Length of Group Name** 2 Byte Short		**Group Name** Number of characters is based on previous short of length (4 characters in this illustration but must use length)			
Length of Group Description 2 Byte Short		**Group Description** Number of characters is based on previous short of length (6 characters in this illustration but must use length)					
Logical ID 2 Byte Short		**Frequency Type** 2 Byte Short		**Data Bits** 2 Byte Short		**Trigger Logic** 2 Byte Short (Version 1.08+)	
Trigger Member 2 Byte Short (Version 1.11+)		**Trigger Module Logic** 2 Byte Short (Version 1.11+)		**Trigger Channel Logic** 2 Byte Short (Version 1.11+)		**Trigger Type** 2 Byte Short (Version 1.11+)	

Trigger Level 2 Byte Short (Version 1.11+)	**Trigger Slope** 2 Byte Short (Version 1.11+)	**Length of Storage Terminal Name** 2 Byte Short	**Storage Terminal Name** Number of characters is based on previous short of length (2 characters in this illustration but must use length)
Length of Storage Terminal Description 2 Byte Short	**Storage Terminal Description** Number of characters is based on previous short of length (6 characters in this illustration but must use length)		

Measurement Module

1	2	3	4	5	6	7	8
Measurement Group 2 Byte Short		**Measurement Module** 2 Byte Short		**Enable** 4 Byte BOOL (Version 1.03+)			
Length of Module Name 2 Byte Short		**Module Name** Number of characters is based on previous short of length (6 characters in this illustration but must use length)					
Length of Module Description 2 Byte Short		**Module Description** Number of characters is based on previous short of length (6 characters in this illustration but must use length)					
Module Type 2 Byte Short		**Sampling Frequency** 2 Byte Short		**Analog Input Format** 2 Byte Short		**High Pass Filter Type** 2 Byte Short	
Filter Type 2 Byte Short		**Filter Value** 2 Byte Short		**Pol Voltage** 2 Byte Short (Version 1.06+)		**Pulse/FV High Spread Frequency** 2 Byte Short	
Pulse/FV Low Spread Frequency 2 Byte Short		**Pulse/FV Interval Time** 2 Byte Short		**Pulse/FV Pulse Divide** 2 Byte Short		**Pulse/FV Average Count** 2 Byte Short	
Pulse/FV Chatter Suppression 2 Byte Short		**Pulse/FV Step Less** 2 Byte Short		**Pulse/FV Dynamic Forecast** 2 Byte Short		**EtoE Source** 4 Byte DWORD MG, MM, Channel coded into DWORD (Version 1.06+)	
EtoE Source (continued)		**Pulse/FV Mode** 2 Byte Short (Version 1.13+)		**Pulse/FV Channel Count** 2 Byte Short (Version 1.13+)		**Pulse/FV Timer Res** 2 Byte Short (Version 1.13+)	

Pulse/FV Max RPM 2 Byte Short (Version 1.14+)	**Pulse/FV Min RPM** 2 Byte Short (Version 1.14+)	**Pulse/FV Pulse Per Rev** 2 Byte Short (Version 1.14+)	**Generator Type** 2 Byte Short (Version 1.21+)
Generator Sweep Type 2 Byte Short (Version 1.21+)	**Generator Burst Type** 2 Byte Short (Version 1.21+)	**Generator Burst Length** 4 Byte DWORD (Version 1.21+)	
Generator Burst Period 4 Byte DWORD (Version 1.21+)			

Channel

1	2	3	4	5	6	7	8
Measurement Group 2 Byte Short		**Measurement Module** 2 Byte Short		**Channel** 2 Byte Short		**Length of Channel Name** 2 Byte Short	
Channel Name Number of characters is based on previous short of length (8 characters in this illustration but must use length)							
Length of Channel Description 2 Byte Short		**Channel Description** Number of characters is based on previous short of length (6 characters in this illustration but must use length)					
Length of Transducer Type 2 Byte Short (Version 1.02+)		**Transducer Type** Number of characters is based on previous short of length (6 characters in this illustration but must use length) (Version 1.02+)					
Group 4 Byte DWORD (Version 1.06+)				**Direction** 2 Byte Short		**Position** 4 Byte long	
Position (continued)		**Cal Slope** 4 Byte Float				**Cal Offset** 4 Byte Float	
Cal Offset (continued)		**Reference** 4 Byte Float				**Length of Units** 2 Byte Short	
Channel Units Number of characters is based on previous short of length (8 characters in this illustration but must use length)							
Record 4 Byte BOOL				**Input Mode** 2 Byte Short		**AutoRange Enable** 4 Byte BOOL (Version 1.06+)	

AutoRange Enable (continued)	**Range** 2 Byte Short	**AutoRange Headroom** 2 Byte Short (Version 1.06+)	**AutoOffset Enable** 4 Byte BOOL (Version 1.06+)
AutoOffset Enable (continued)	**Offset** 2 Byte Short	**Coupling** 2 Byte Short	**Pol Voltage** 2 Byte Short
Trigger Logic 2 Byte Short	**Trigger Type** 2 Byte Short	**Trigger Level** 2 Byte Short	**Trigger Slope** 2 Byte Short
Trigger Member 2 Byte Short	**TEDS Type** 2 Byte Short	**TEDS Serial Number** 4 Byte DWORD	
TEDS Sensitivity 4 Byte Float		**Length of Cal Date** 2 Byte Short	**Cal Date** Number of characters is based on previous short of length (2 characters in this illustration but must use length)
Length of TEDS Model 2 Byte Short (Version 1.09+)	**TEDS Model** Number of characters is based on previous short of length (6 characters in this illustration but must use length) (Version 1.09+)		
TEDS Use For Cal 4 Byte BOOL (Version 1.09+)		**Process Flags** 4 Byte DWORD	
Cal EU1 4 Byte Float		**Cal Volts1** 4 Byte Float	
Cal EU2 4 Byte Float		**Cal Volts2** 4 Byte Float	

Cal Frequency 4 Byte Float		**Cal Level** 4 Byte Float	
Cal Stability 4 Byte Float		**PulseFV Pulse Type** 4 Byte Float (Version 1.13+)	
PulseFV Threshold 4 Byte Float (Version 1.13+)		**Generator Amplitude** 2 Byte Short (Version 1.21+)	**Generator Phase** 4 Byte Long (Version 1.21+)
Generator Phase (continued)	**Generator Offset** 2 Byte Short (Version 1.21+)	**Generator Start Frequency** 4 Byte Float (Version 1.21+)	
Generator Stop Frequency 4 Byte Float (Version 1.21+)		**Generator M Sequence** 2 Byte Short (Version 1.21+)	**Generator Tap ID** 4 Byte Long (Version 1.21+)
Generator Tap ID (continued)	**Generator Random Type** 2 Byte Short (Version 1.21+)	**Generator Output Range** 2 Byte Short (Version 1.21+)	**Generator Fade Setting** 2 Byte Short (Version 1.21+)

Channel Groups

Following the hardware settings section you will find information describing the channel groups which are used within the setup screen to group channels together. You will find N channel group sections in the file where N is the Number of Channel Groups from the global settings section.

Channel Group

1	2	3	4	5	6	7	8
Channel Group ID 4 Byte DWORD Unique identifier for the group (Version 1.06+)				**Length of Channel Group Name** 2 Byte Short (Version 1.06+)		**Channel Group Name** Number of characters is based on previous short of length (2 characters in this illustration but must use length)	

User Layouts

Following the channel groups section you will find information describing the user layouts. You will find two user layout sections, the first being the last user layout and the second being the current user layout.

User Layout

The user layout section of the file format is a little more complicated with a host of different settings describing the setup of mainly the acquire, time and frequency screens inside PCscanIV.

Firstly inside this structure you will find the three dimensional array containing the MM that is displayed in the acquire view for each MG, Page and Slot. There are 8 MGs, 6 pages and 4 slots. The displayed MM is stored as a 2 byte short and can be found in all versions of the file. You will find 192 shorts from this point in the form:

MG1, Page1, Slot1 1
MG1, Page1, Slot2 2
MG1, Page1, Slot3 3
MG1, Page1, Slot4 4
MG1, Page2, Slot1 5
MG1, Page2, Slot1 6
.
.
MG8, Page6, Slot4 192

Following the displayed MG for the acquire view you will find the frozen status of each slot on the acquire view and the frequency graph in the form:

1	2	3	4	5	6	7	8
Acquire View Slot 1 Frozen State 4 Byte BOOL				**Acquire View Slot 2 Frozen State** 4 Byte BOOL			
Acquire View Slot 3 Frozen State 4 Byte BOOL				**Acquire View Slot 4 Frozen State** 4 Byte BOOL			
Acquire View Frequency Graph Frozen State 4 Byte BOOL							

Now follows the trace setup information for the frequency graph in the acquire view. This is a three dimensional array containing the trace color and trace channel that is displayed in the frequency graph on the acquire view for each MG and Trace. There are 8 MGs and 4 traces. You will find 32 blocks like the one below describing these settings for each MG and Trace.

1	2	3	4	5	6	7	8
Acquire View Frequency Graph Trace Color 4 Byte DWORD				**Acquire View Frequency Graph Trace Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			

MG1, Trace1 1
MG1, Trace2 2
MG1, Trace3 3
MG1, Trace4 4
MG2, Trace1 5
MG2, Trace2 6
.
.
MG8, Trace4 32

Now follows the setup information for the time view within PCscan IV in the form:

1	2	3	4	5	6	7	8
Time View Frozen State 4 Byte BOOL				**Time View Graph 1 Volts** 4 Byte BOOL TRUE for Volts, FALSE for EU			
Time View Graph 1 Full Screen 4 Byte BOOL				**Time View Graph 1 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			
Time View Graph 1 Trace Color 4 Byte DWORD				**Time View Graph 1 Solid Cursor Pos** 4 Byte DWORD			
Time View Graph 1 Dotted Cursor Pos 4 Byte DWORD				**Time View Graph 2 Volts** 4 Byte BOOL TRUE for Volts, FALSE for EU			
Time View Graph 2 Full Screen 4 Byte BOOL				**Time View Graph 2 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			
Time View Graph 2 Trace Color 4 Byte DWORD				**Time View Graph 2 Solid Cursor Pos** 4 Byte DWORD			
Time View Graph 2 Dotted Cursor Pos 4 Byte DWORD				**Time View Graph 3 Volts** 4 Byte BOOL TRUE for Volts, FALSE for EU			
Time View Graph 3 Full Screen 4 Byte BOOL				**Time View Graph 3 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			
Time View Graph 3 Trace Color 4 Byte DWORD				**Time View Graph 3 Solid Cursor Pos** 4 Byte DWORD			
Time View Graph 3Dotted Cursor Pos 4 Byte DWORD				**Time View Graph 4 Volts** 4 Byte BOOL TRUE for Volts, FALSE for EU			

Time View Graph 4 Full Screen 4 Byte BOOL	**Time View Graph 4 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD
Time View Graph 4 Trace Color 4 Byte DWORD	**Time View Graph 4 Solid Cursor Pos** 4 Byte DWORD
Time View Graph 4 Dotted Cursor Pos 4 Byte DWORD	**Time View Duration** 4 Byte Float

Now follows the setup information for the frequency view within PCscan IV in the form:

1	2	3	4	5	6	7	8
Frequency View Mode 4 Byte BOOL TRUE for FFT mode, FALSE for OCTAVE mode.				**Frequency View Trace 1 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			
Frequency View Trace 1 Datatype 4 Byte DWORD				**Frequency View Trace 1 Color** 4 Byte DWORD			
Frequency View Trace 1 Axis 4 Byte BOOL				**Frequency View Trace 2 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			
Frequency View Trace 2 Datatype 4 Byte DWORD				**Frequency View Trace 2 Color** 4 Byte DWORD			
Frequency View Trace 2 Axis 4 Byte BOOL				**Frequency View Trace 3 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD			
Frequency View Trace 3 Datatype 4 Byte DWORD				**Frequency View Trace 3 Color** 4 Byte DWORD			

Frequency View Trace 3 Axis 4 Byte BOOL	**Frequency View Trace 4 Channel** 4 Byte DWORD MG, MM, Channel coded into DWORD
Frequency View Trace 4 Datatype 4 Byte DWORD	**Frequency View Trace 4 Color** 4 Byte DWORD
Frequency View Trace 4 Axis 4 Byte BOOL	**Frequency View Solid Cursor Pos** 4 Byte DWORD
Frequency View Dotted Cursor Pos 4 Byte DWORD	

DSP Windows

Following the two user layouts you will find information describing the DSP windows from the Pro screens within PCscan IV. You will find 8 DSP Window sections describing each DSP window.

DSP Window

1	2	3	4	5	6	7	8
Window Number 2 Byte Short 1-8 (Version 1.12+)		**Window Name Length** 2 Byte Short (Version 1.12+)		**Window Name** Number of characters is based on previous short of length (4 characters in this illustration but must use length)			
Window Description Length 2 Byte Short (Version 1.12+)		**Window Description** Number of characters is based on previous short of length (6 characters in this illustration but must use length)					
DSP Datatype 2 Byte Short 0=None 1=Time 2=MagFFT 3=PSD 4=PS 5=Oct 6=CPSD 7=TransH1 8=TranH2 9=TransH3 10=Coherence 11=AutoCor 12=CrossCor 13=Complex 14=Cepstrum (Version 1.12+)		**Graph Type** 2 Byte Short 0=None 1=Time 2=FFT 3=Split 4=Oct (Version 1.12+)		**Selected Channels** 2 Byte Short (Version 1.12+)		**Selected Channel 1** 4 Byte DWORD (Version 1.12+)	
Selected Channel 1 (continued)		**Selected Channel 2** 4 Byte DWORD (Version 1.12+)				**Selected Channel 3** 4 Byte DWORD (Version 1.12+)	

Selected Channel 3 (continued)	**Selected Channel 4** 4 Byte DWORD (Version 1.12+)	**Selected Channel 5** 4 Byte DWORD (Version 1.12+)
Selected Channel 5 (continued)	**Selected Channel 6** 4 Byte DWORD (Version 1.12+)	**Selected Channel 7** 4 Byte DWORD (Version 1.12+)
Selected Channel 7 (continued)	**Selected Channel 8** 4 Byte DWORD (Version 1.12+)	**Selected Ref Channel** 4 Byte DWORD (Version 1.12+)
Selected Ref Channel (continued)	**Window Color** 4 Byte DWORD (Version 1.12+)	**Visible** 4 Byte BOOL (Version 1.18+)
Visible (continued)	**Frozen** 4 Byte BOOL (Version 1.18+)	**Left Percent** 8 Byte double Window Position (Version 1.18+)
Left Percent (continued)		**Top Percent** 8 Byte double Window Position (Version 1.18+)
Top Percent (continued)		**Right Percent** 8 Byte double Window Position (Version 1.18+)
Right Percent (continued)		**Bottom Percent** 8 Byte double Window Position (Version 1.18+)

Bottom Percent (continued)			**Display Bay 1** 4 Byte BOOL (Version 1.18+)
Display Bay 1 (continued)	**Display Color 1** 4 Byte DWORD (Version 1.18+)		**Display Bay 2** 4 Byte BOOL (Version 1.18+)
Display Bay 2 (continued)	**Display Color 3** 4 Byte DWORD (Version 1.18+)		**Display Bay 4** 4 Byte BOOL (Version 1.18+)
Display Bay 4 (continued)	**Display Color 5** 4 Byte DWORD (Version 1.18+)		**Display Bay 6** 4 Byte BOOL (Version 1.18+)
Display Bay 6 (continued)	**Display Color 7** 4 Byte DWORD (Version 1.18+)		**Display Bay 8** 4 Byte BOOL (Version 1.18+)
Display Bay 8 (continued)	**Time Display Hours** 2 Byte Short (Version 1.18+)	**Time Display Minutes** 2 Byte Short (Version 1.18+)	**Time Display Seconds** 4 Byte Short (Version 1.18+)
Time Display Seconds (continued)	**Split Display Top Percent** 2 Byte Short (Version 1.18+)	**Split Display Bottom Percent** 2 Byte Short (Version 1.18+)	**Split Display Swap Data** 4 Byte BOOL (Version 1.18+)
Split Display Swap Data (continued)	**Split Display 1 Y-Axis Autoscale** 4 Byte BOOL (Version 1.18+)		**Split Display 1 Y-Axis Max** 4 Byte Float (Version 1.18+)
Split Display 1 Y-Axis Max (continued)	**Split Display 1 Y-Axis Min** 4 Byte Float (Version 1.18+)		**Split Display 2 Y-Axis Autoscale** 4 Byte BOOL (Version 1.18+)

Split Display 2 Y-Axis Autoscale (continued)	**Split Display 2 Y-Axis Max** 4 Byte Float (Version 1.18+)		**Split Display 2 Y-Axis Min** 4 Byte Float (Version 1.18+)
Split Display 2 Y-Axis Min (continued)			