

CompuScope Configuration Settings using INI files

The INI files in the CompuScope C/C# SDK are used to set up the acquisition, channel, trigger and transfer settings for a CompuScope system or systems. INI files are in the Windows INI format and consist of lists of setting variable assignments called keys. Keys are arranged in groups, whose titles must be between square brackets ([]). Each key must be under the correct group heading in order to operate correctly. For instance, the “Sample Rate” key must be under the “Acquisition” group heading. Keys under different group headings may have the same name.

An example of an INI file is shown below:

```
[Acquisition]
Mode=Dual
SampleRate=200000000
Depth=8192
SegmentSize=8192
SegmentCount=1
TriggerDelay=0
TriggerTimeOut=1000000
TimeStampMode=Free
TimeStampClock=Fixed

[Channel1]
Range=2000
Coupling=DC
Impedance=1000000

[Channel2]
Range=2000
Coupling=DC
Impedance=1000000

[Trigger1]
Condition=Rising
Level=0
Source=A

[Application]
StartPosition=0
TransferLength=8192
SaveFileName=Acquire
SaveFileFormat=TYPE_FLOAT
```

There are functions provided within the CompuScope C/C# SDK that read the settings from the INI file and pass these settings to the CompuScope drivers. Note that it is not necessary to use the INI files, although the sample programs do use them. All the configuration settings can be set up manually by using the SDK structures and API calls.

Any superfluous groups (for example, groups for a channel or trigger number that is not available) or superfluous keys will be ignored. Any necessary groups or keys that are not present in the INI file will be given default values. Invalid key settings will cause an error in the sample programs. Key names are always one word in length with no spaces. Names of keys or their assigned values are not case sensitive.

Below are descriptions of all the available INI file groups and keys. Note that any keys that your application does not require need not be in the INI file. If absent, a required key value is set to a reasonable default value.

[Acquisition]

This group sets all the CompuScope system's acquisition parameters.

Mode

Mode sets the operating mode of the CompuScope system. Valid values are:

Dual	sets the mode to dual channel
D	sets the mode to dual channel
Single	sets the mode to single channel
S	sets the mode to single channel
Quad	sets the mode to quad channel (for CS3200 and CS3200C only)
Q	sets the mode to quad channel (for CS3200 and CS3200C only)
Octal	sets the mode to octal channel (for CS82XX and CS83XX only)
O	sets the mode to octal channel (CS82XX and CS83XX only)
8-bit	sets the mode to 8-bit (for CS3200 and CS3200C only)
16-bit	sets the mode to 16-bit (for CS3200 and CS3200C only)
32-bit	sets the mode to 32-bit (for CS3200 and CS3200C only)

In some cases, special modes can be set by Boolean ORing a special value with the mode. In these cases you must use a number to represent the mode, where:

1	means single channel (or 8-bit mode)
2	means dual channel (or 16-bit mode)
4	means quad channel (or 32-bit mode)
8	means octal channel

The special option would be ORed with the mode number. For example, to enable the reference clock input (on CompuScope models that have this functionality), the mode must be ORed with 0x400 (1024 decimal). For instance, 0x402, would enable the reference clock input in Dual Channel Mode.

SampleRate

SampleRate sets the sampling rate of the CompuScope system. The value is in Hertz. Check your CompuScope hardware manual for the available sample rates for your board(s). The default value depends on the CompuScope model.

Depth

Depth sets the post-trigger depth of the CompuScope system. The value is in samples. The default value is 4096 samples.

SegmentSize

SegmentSize sets the size of the segment to capture. A segment is the sum of the pre- and post-trigger samples that are to be acquired.

TriggerDelay

TriggerDelay sets the trigger delay of the CompuScope system, which is the number of samples to acquire between the occurrence of the trigger event and the actual logging of the trigger event. A non-zero value is useful for signals whose region of interest occurs long after the trigger event. Not all CompuScope models support Trigger Delay. The default value is 0.

SegmentCount

SegmentCount is the number of segments (or records) to acquire in a Multiple Record acquisition. For non-Multiple Record (Single Record) acquisitions, SegmentCount must be set to 1. The default value is 1.

TriggerTimeOut

TriggerTimeOut sets the trigger timeout of the CompuScope system. The value is in 100 nanosecond units of time (e.g. a value of 10000000 gives a trigger timeout 1 second). The trigger timeout is the amount of time the driver will wait for a trigger event to occur before forcing a trigger event. A value of -1 will cause the driver to wait indefinitely for a trigger. The default value is -1.

TriggerHoldOff

TriggerHoldOff sets the time, in number of samples, during which trigger events will be ignored after the CompuScope system begins capturing and awaiting a trigger event. The function is useful for ensuring the accumulation of a specified amount of pre-trigger data that is equal to the TriggerHoldOff value. The default value is 0.

ExtClk

ExtClk is a flag to turn on or off external clocking functionality, assuming that the CompuScope hardware has external clock functionality available. A value of 1 enables external clocking and a value of 0 disables it. If external clocking is activated, then the SampleRate key must be set to the external clocking frequency. The default value is 0.

TimeStampMode

The time-stamping counter may be reset upon the start of each acquisition or left free running.

Free means do not reset the counter upon the start of each acquisition

Reset means reset the counter upon the start of each acquisition

TimeStampClock

The time-stamping counter may operate using for a source a fixed on-board oscillator that is independent of the sample rate. Alternately, the counter source may be derived from the sampling clock. Specifically, the source will be equal to the sampling clock frequency divided by an integer value.

Fixed means use the fixed on-board oscillator as the counter source

Sample means use frequency derived from the sampling clock as the counter source

[Channel1]

The Channel1 group sets the configuration settings for channel 1 of the CompuScope system. Similar groups, (i.e. Channel2, Channel3 etc.) are to set the other channels on the CompuScope system.

Range

Range sets the full scale input range for the channel. The values must be in millivolts. For example, 2000 millivolts sets the input range to +/- 1 volt. Check your CompuScope hardware manual for the available input ranges for your CompuScope model. The default value is 2000 if the model supports it. Otherwise, the default is system-dependent.

Coupling

Coupling sets the input coupling for the channel. Available values are AC or DC. Alternatively, driver constants can be used, which are 1 for DC and 2 for AC. Consult your CompuScope hardware manual to check which values are available for your CompuScope model. The default is DC, unless the CompuScope system only supports AC coupling.

Impedance

Impedance sets the channel's terminating input impedance. Available values are 50 for 50 Ohms and 1000000 for 1 MOhm. Consult your CompuScope hardware manual to check which values are available for your CompuScope model. The default is 1000000, unless the CompuScope system only supports 50 Ohms.

DiffInput

DiffInput is a flag that turns differential input coupling on or off (if this functionality is available on your CompuScope model). A value of 1 activates differential input coupling and a value of 0 enables single-ended input coupling. Consult your CompuScope hardware manual to check which values are available for your CompuScope model. The default is 0.

DirectADC

DirectADC is a flag that turns on or off Direct-to-ADC input coupling (if it is available for your system). A value of 1 enables Direct-to-ADC input coupling and a value of 0 disables it. Consult your CompuScope hardware manual to check which values are available for your CompuScope model. The default is 0.

Filter

Some CompuScope models are equipped with selectable low-pass filters. Set Filter to 1 in order to activate the low-pass filter for the current channel. Use 0 to deactivate it.

DcOffset

DcOffset sets the value for channel's DC Offset in millivolts. The minimum and maximum values are dependent on the current input range. For example, on the 2000 mV input range, the maximum value is 1000 and the minimum is -1000. The default value is 0.

[Trigger1]

The Trigger1 group sets the configuration settings for trigger engine number 1 of the CompuScope system. Similar groups (i.e. Trigger2, Trigger3, etc.) are used to set up the other trigger engines of the CompuScope system, if available.

Condition

Condition sets the condition on which the system will trigger. Current valid values are:

Rising	system will trigger on a positive slope.
R	system will trigger on a positive slope.
Positive	system will trigger on a positive slope.
P	system will trigger on a positive slope.
1	system will trigger on a positive slope.
Falling	system will trigger on a negative slope.
F	system will trigger on a negative slope.
Negative	system will trigger on a negative slope.
N	system will trigger on a negative slope.
0	system will trigger on a negative slope.

The default value is Rising.

Level

Level sets the trigger level as a percentage of the input range of the trigger source (half the full scale input range). For example, in the 2000 mV range at 0 DC offset, 50 would be positive 50 % of 1 Volt, or 500 millivolts. The default value is 0.

Source

Source sets the trigger source. Valid values are:

External	trigger from the external trigger input
Disable	disable trigger input and issue a software trigger as soon as possible

In some special cases, a numerical value must be Boolean ORed in with the trigger source. In this case, a trigger source constant must be used so that it may be ORed with the value. The trigger source constants are:

1	Channel 1
2	Channel 2
3	Channel 3
4	Channel 4
5	Channel 5
6	Channel 6
7	Channel 7
8	Channel 8
-1	External
0	Disable

Coupling

Coupling is the value of the input coupling for the external trigger input. If external trigger is not being used, this value is unnecessary and is ignored. Valid values are AC and DC. Alternatively, the driver constants may be used, which are 1 for DC and 2 for AC. Consult your CompuScope hardware manual to check which values are available for your CompuScope model. The default is DC, unless a system only supports AC.

Range

Range sets the input range for the external trigger input, if the external trigger is being used. If external

trigger is not being used, this value is unnecessary and is ignored. The values are given in millivolts for the full scale input range of the external trigger input. For example, 10000 millivolts represents the +/- 5 Volt external trigger input range. Check your CompuScope hardware manual for the available external trigger ranges for your CompuScope model. The default is 10000 if the CompuScope hardware supports it. Otherwise the default is system-dependent.

Impedance

Impedance sets the terminating impedance of the external trigger input. If external trigger is not being used, this value is unnecessary and is ignored. Available values are 50 for 50 Ohms and 1000000 for 1 MOhm. Consult your CompuScope hardware manual to check values which are valid for your CompuScope model. The default is 1000000, unless the CompuScope system only supports 50 Ohms.

Relation

Relation specifies the Boolean relation of the trigger engine to the rest of the trigger circuitry. Currently, only Boolean OR is supported, whose value is 0. The default value is 0.

[Application]

The Application group sets the data transfer parameters, as well as file format settings.

StartPosition

StartPosition is the address from which to start transferring the acquired data from on-board CompuScope memory to the application. The address is specified relative to the trigger address, so that a value of 0 will start transfer at the trigger address. Negative values will transfer pre-trigger data and positive values will start transfer data acquired after the trigger event. The default value is 0. The user must ensure that the start value is set properly so that invalid data are not transferred.

TransferLength

TransferLength sets the number of samples to transfer, starting from StartPosition. The default value is 4096. The user must ensure that the TransferLength is not too large so that invalid data are not transferred.

SegmentStart

SegmentStart sets the number of the first segment (record) to transfer after a Multiple Record acquisition. The default is 1, for the first segment. If Multiple Record is not being used, this setting is ignored and is unnecessary.

SegmentCount

SegmentCount is the number of segments (records) to transfer after a multiple record transfer. The default is 5. The user must ensure that SegmentCount does not exceed the number of acquired segments so that invalid data are not transferred.

PageSize

PageSize may be used for extremely large transfers. Rather than transferring all the data at one time, GageDeepAcquisition.c may be used to transfer the data in chunks with a size of PageSize.

SaveFileName

SaveFileName is the base file name for the files saved in each of the sample programs. The channel number is appended to the base filename. If the acquisition was a Multiple Record mode, the record number is also appended to the file name. For example, a single record dual-channel capture would save channel 1's data to GAGE_FILE_1.DAT and channel 2's data to GAGE_FILE_2.dat.

SaveFileFormat

SaveFileFormat determines how the sample programs save ASCII output data files. All data files are saved as a single-column ASCII file, where each entry denotes a single sample point.

The available values for SaveFileFormat are:

TYPE_FLOAT	saves the files as voltages in floating-point format
TYPE_DEC	saves the files as raw ADC data in decimal format
TYPE_HEX	saves the files as raw ADC data in hexadecimal format (0x1234)

The default is TYPE_DEC.