elaman
GERMAN SECURITY SOLUTIONS

GOVERNMENTAL SECURITY SOLUTIONS

Advanced Video Audio Recorder

Model 5605

(Manual)

Table of Contents

1. Caution

1.1 Important Safety Rules

NEVER OPEN THIS DEVICE. All maintenance, enhancement, or repair operations must be performed exclusively at our factory. Moreover, the device must be protected against rain and moisture in order to avoid damage to its electronic components.

- The device works at a voltage of 5 Volts
- Use only the power supply unit supplied with the TSE 5605.
- Connecting the device to a power supply source, other than that specified, can lead to destruction of the device
- Should humidity or any foreign material enter the device, disconnect it immediately from the electric power supply. Do not attempt to repair the device yourself. Call your Distributor to arrange for qualified assistance
- Should the device not be used for extended periods, disconnect it from the electric power supply in addition to simply switching it off. To avoid the loss of data, always switch the device off first and then disconnect it from the electric power supply.

Warnings are provided throughout this Manual to prevent damage to equipment or loss of data. Note these particular warnings:

Chapter 4:
Battery

Chapter 4:
Compact Flash Formatting - The formatting operation will delete all of the data on the CF. It is impossible to recover the data once it is deleted.

WARNING
Unauthorized alteration, modification or sale, and/or the improper use of, any TSE 5605 is unlawful and strictly forbidden.

2. Copyright Protection

Video recordings, movies, and/or TV broadcasts may be protected by or subject to copyright law. The recording of such materials may be illegal, or may require the authorization of the copyright holder. (This protection holds true, in particular, for materials recorded from Cable TV stations.)

3. Introduction to the TSE 5605

3.1 Overview of the TSE 5605 DVR

Thank you for purchasing the TSE 5605 Solid State Digital Audio/Video Recorder from us. The TSE 5605 has been specifically designed for Law enforcement applications in which a concealable, high quality recorder is required. The TSE 5605 is light and compact, making it easy to hide on an agent's body, in an automobile, in a wall or ceiling, or in virtually any other small space. It is housed in a rugged aluminum anodized case in order to withstand even the most difficult conditions in the field.

3.2 Highlights

- Extremely Small - Superior Quality via MJPG compression - Removable Compact Flash that in seconds can easily be swapped in the field with a spare when memory is full - Twin Stereo Microphone - Recording Start/Stop Switch - Low-Battery signal with LED or vibration feedback - Compact Flash configuration via PC interface - NTSC/PAL Format	- Color and B/White recording mode - Time Lapse Frequencies: 25,12,6,3,1 - Hi-Fi Quality Stereo Audio Recording - No Moving Parts, No Noise - 5V/200 mAh power supply for camera - Comment Time/Date stamping with OSD (On-Screen Demand) functionality - Confidence Indicator - RS-232 Control

3.3 The TSE 5605 DVR Features

- Hardigg Case IM2050
- TSE 5605 Digital Video Recorder
- 5-Volt Power Supply
- 15-Pin MIL Connector for Input Cable
- Remote Record Switch, Video, Audio, Left and Right Channels with two external Knowles microphones
- 9 Pin MIL Connector with cables
- Input for 5-Volt Power Supply, Video output, Left and Right channel Audio Output
- 9 Pin connector for RS232 connection via PC
- CD-ROM with the Manager Software version 1.0 and User Guide

4. System Basics

4.1 Power and Batteries

The TSE 5605 unit features a built-in 1300 mAh Lithium-Ion rechargeable battery.

4.2 Charging The Unit

To recharge the built-in Lithium-Ion battery, simply connect the unit to the included Power Supply. Connect the 3.5 Male DC-Plug on the TSE 5605 to the Female DC-Plug on the Power Supply and plug the Power Supply into the wall outlet. Switch the unit **ON**. Make sure that the switch on the unit is in the **ON** position (see Fig. 1).
This connection will begin to recharge the unit automatically. It normally takes two hours to fully charge the battery.
The unit comes with a Universal Auto-Switching AC/DC Power Supply with an input range of 110-240 volts AC and an output voltage of 5 volts DC.

4.3 Displaying The Battery Charge

Please note that can be recharged with or without the Compact Flash (CF) card in its slot.
If the CF card is not in its slot while charging the TSE 5605, there will not be any visual indication (LED) - See Fig. 5.
If the CF card is in its slot while charging the unit, the LED indicators may or may not provide a visual indication depending on the circumstances.
The settings pertaining to the Battery-Charge Status LEDs may have either been enabled or disabled in the software contained on the TSE 5605 CF card.
If the "LED Status" functionality is set to Inactive, no visual indication will be provided when charging the battery. In this case, after plugging the 9-Pin Mil connector into the unit and connecting the Power Supply, the internal batteries will begin to charge; at the end of the charging period the LEDs will still be off.

Recommended Procedure:
During the recharge cycle, a red LED will be a permanently lit (see Fig. 4). After the battery is fully charged, the LED will remain on, but the color will change to green (see Fig. 3).
During operation, i.e. when the unit is powered by internal batteries, the Battery LED will be off at all times (see Fig. 2). Using the Manager program, it is possible to set up a warning light when the residual battery power is almost exhausted. This system was devised to ensure both low power consumption and fewer lights visible on the outside surface of the unit. If so desired, you can enable a Low-Battery signal from the internal vibration device (Vibra Motor).
For additional information on LED Status, please refer to the Confidence Indicator Section.

LED	Description	Mode
Static Red	Battery Charging	External Supply Providing 5 V
Static Green	Battery Charged	External Supply Providing 5 V
LED Light Off	Battery Operation	Unit Powered By Internal Battery
Flashing Red	Low Battery	Unit Powered By Internal Battery

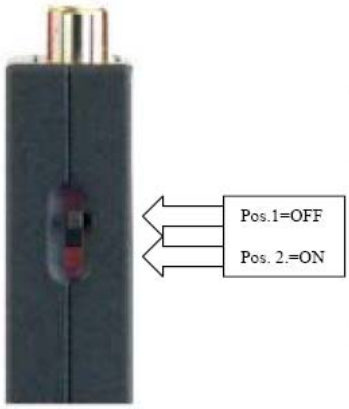


Fig. 1

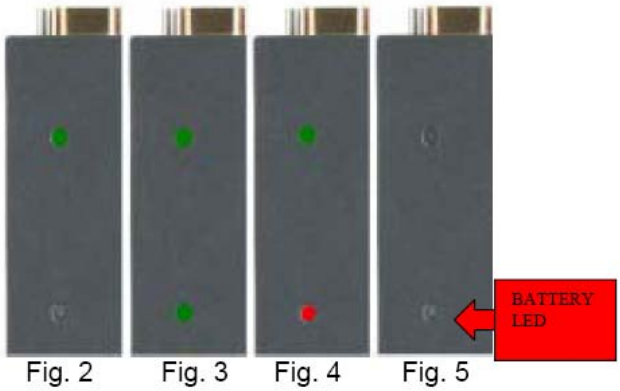


Fig. 2 Fig. 3 Fig. 4 Fig. 5

When the battery is discharged, the TSE 5605 performs three steps:
1. Stops recording and closes current video clip.
2. Internal circuitry goes on stand-by in Sleep Mode.
3. The Battery circuitry is deactivated.

4.4 Battery Technical Data

Charge time for 1300 mAh Li-Ion Cell: 2 hours from completely discharged to fully charged
Pre-charge period. When the battery is completely dead, it requires a 20 minute pre-charge before the unit will power on.

4.5 Cables and Connections

The unit Microminiature Twist-Pin Connectors offer uncompromising performance in a miniature package.
This connector is suitable for applications requiring reduced size and weight, these MIL-DTL-83513, BS9523F0002 and BS9524F0013 approved connectors are used in missile systems, avionics, battlefield gear, and in other demanding Military and Law Enforcement applications.

4.6 Connector Specification

Shell - Aluminum Alloy 6061 or Stainless Steel

Insulation - Liquid Crystal Polymer (LCP)
Interface Seal - Flourosilicone Rubber, Blue
Pin Contact - Beryllium Copper Gold over Nickel Plating

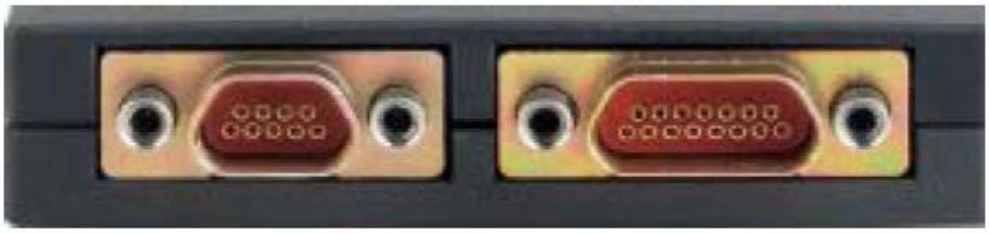
Socket Contact - Copper Alloy Gold over Nickel Plating
Hardware - Stainless Steel

Encapsulant - Epoxy Resin

Operating Temperature - from - 55° to +150° C.
Shock, Vibration 50 g., 20g.
Mating Force: (10 Ounces) X (# of Contacts)

4.7 Microminiature D-Type Connectors

The unit includes two 9-Pin and 15-Pin connectors



The following is a complete list of system functionality

15 Microminiature Connector	
1	Input: Tens 5-volt external power supply and battery charger
2	Output: Tens 5-volt power supply for Camera and external small accessories
3	Input: Digital remote in
4	Input: Audio line & microphone level Left
5	Input: Audio line & right microphone level
6	Output: Tens 1.8 volts for microphone power supply
7	Input: Video 1 Vpp 75 Ohm
8	Digital Input: Power on - off
9	Digital Output: Remote out
10	Digital Output: External LED

9 Microminiature Connector	
1	Input: Tens 5-volt external power supply and battery charger
2	Input: RX serial RS232
3	Output: Audio line level Right
4	Output: Audio line level Left
5	Output: Video 1 Vpp 75 ohm
6	Output: 3.3 volts for supplying small external
7	accessories
	Output: TX serial RS232

4.8 Standard Connections

15 Microminiature Connector	
1	Input: Video 1 Vpp 75 Ohms
2	Input: Audio line & microphone level left
3	Input: Audio line & right microphone level
4	Output: Tens 1.8 Volts for microphone power supply
5	Input: Digital remote in

9 Microminiature Connector	
1	Input: Tens 5-volt external power supply and battery charger
2	Input: RX serial RS232
3	Output: Audio line level right
4	Output: Audio line level left
5	Output: Video 1 Vpp 75 ohm
6	Output: TX serial RS232

4.9 Connecting Cables

The Microminiature 15-pin D-type connector terminals are mapped as follows:

RCA Yellow Female	Video Input
Microphone Level Left	Audio Input Left with Knowels Microphone powered @ 1.8 V
Microphone Level Right	Audio Input Right with Knowels Microphone powered @ 1.8 V
Small anodized element with switch	Two-Position Switch - Record/Stop

The Microminiature 9-Pin D-Type connector terminals are mapped as follows:

RCA Yellow Female	Output Video
RCA Red Female	Output Audio Line Left
RCA White Female	Output Audio Line Right
D-DUB 9 PIN Connector	RS-232 and PC Connection
3.5 mm. DC Plug	Input: Tens 5 volts for external power supply and battery charger

4.10 Connecting Audio-Video Cables

Proceed as follows to attach connectors to the TSE 5605.
During operation, attach the D-SUB Microminiature 15-Pin connector to the TSE 5605

Tighten the screws

Next connect the video camera to the yellow RCA female plug.

When connecting the TSE 5605 to a PC or External Monitor, attach the D-SUB Microminiature 9-Pin connectors to the unit.

Tighten the screws

Next attach the male Audio/Video connectors to the monitor. Make sure that the connectors are attached properly.
Warning: The TSE 5605 was designed not to have any intermediate connectors between the video camera and the 15-Pin video input connector. The best solution is to have only one cable from the TSE 5605 directly to the camera, without any intermediate connectors. However, an RCA connector was added to the standard 15-Pin cable for enhanced flexibility. The same applies to powering the video camera; there is no 5-volt power cable, however it would be useful to power the video camera directly from the TSE 5605 to avoid additional bulky battery packs.

4.11 Compact Flash

The TSE 5605 uses a SanDisk Extreme III Series, Type I, Compact Flash memory card.
After careful testing, Compact Flash and SanDisk accessories were chosen as the best solution in terms of functionality and compatibility with the Windows XP Operating System.

We guarantee correct system operation exclusively with the Extreme III Compact Flash and card readers compatible with the Extreme III series.

The TSE 5605 CF card is removable.
As of the writing of this manual, the following Compact Flash formats are acceptable:
EXTREME III: 8GB, 12GB, 16GB.

For further information on CF card maximum capacity and on cards capable of operating at extended temperature ranges, please contact us.

5. TSE 5605 Manager - Introduction (PC Configuration Utility)

5.1 Philosophy

The TSE 5605 Manager offers a very user-friendly, Windows-based interface with options that can be used to set up the unit.
All functions have been included.

TSE 5605 Manager Functionality Table

Video Setup Audio Setup On Screen Display Confidence Indicator Recoding Setup	Remarks Serial Link Save As Compact Flash

The TSE 5605's philosophy is to make it possible to program every Compact Flash card to be used through the Manager interface.
The idea is for all settings to reside on each CF card.
This means that you can program each CF card with different settings.

Therefore, you can have a CF card that has been set up only to record video at 12 frames per second, and another card set up only to record line audio with a sampling frequency of 48,000 Hz, and so on.
By inserting the CF card into the unit's slot and turning the System on, all settings stored on the CF card will be activated.
This means that you can prepare various kinds of CF cards ahead of time, in the laboratory, and choose the correct card for the given situation before going out to the operational location. Keeping in mind that time is an important factor in certain operational situations we felt this solution was the most appropriate.

5.2 Minimum System Requirements

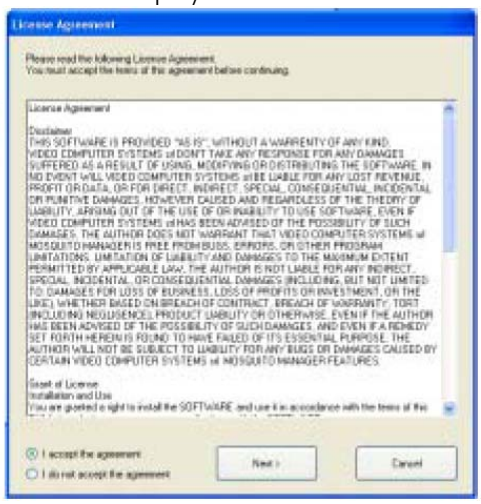
The Manager is a software interface compatible with Windows XP Service Pack 2

1. Pentium 2.000 Mhz or greater with 64 MB RAM (128 recommended).
2. One USB 2.0 compatible port
3. Operating System: Windows XP Professional/Home with service Pack 2
4. Latest Version of Direct X
5. Latest version of Windows Media Player

5.3 How to install The Manager 1.0

To install the Manager, insert the CD-ROM in the CD-ROM drive of your PC, and then click on <Start><Run><Browse>. Select the CD-ROM drive, then click on the file called "manager.EXE" and follow the instructions displayed.

Step1



Step2

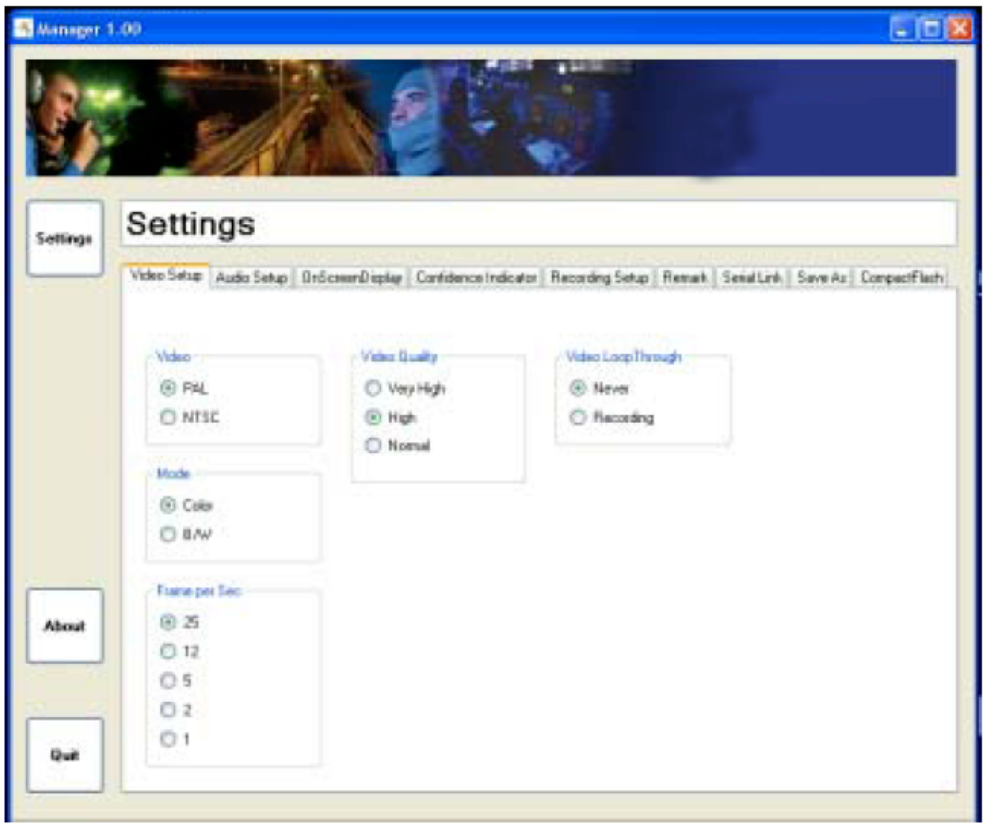
5.4 How to program a Compact Flash

Using a new Removable Compact Flash Card
After installing the Manager software on your computer, connect the SanDisk Compact Flash reader to your PC by means of the USB or FireWire Port.

Insert the CF card into the reader. Make sure that you insert the CF card correctly without damaging it.
Windows XP will automatically recognize the peripheral device connected to the USB port.
Check the icon on the lower right hand side of the desktop to see if the peripheral was recognized correctly.
The TSE 5605 will only operate with a CF card formatted with a FAT 32 (File Allocation Table) file system.
Open the Manager and continue setting up the CF card.

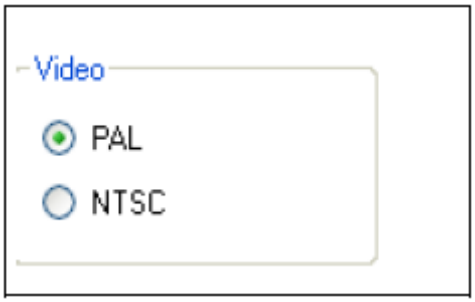
6. The TSE 5605 Manager Settings

6.1 Video Setup



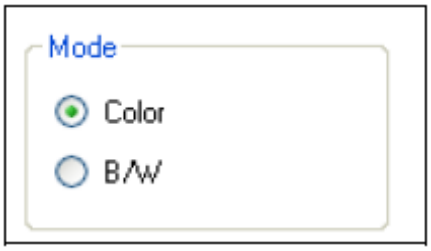
You can select all the video settings in the Video Setup interface.

Video Format
The TSE 5605 can operate either in PAL or NTSC mode.
To select the format, enable one of the two choices as illustrated below:

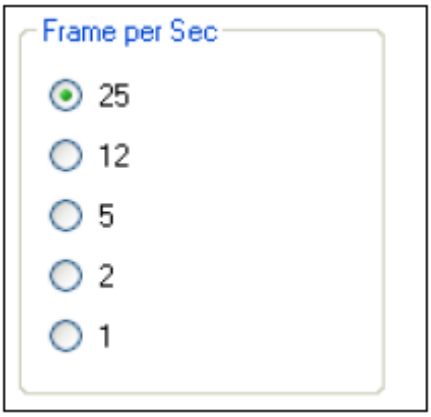


The TSE 5605 will generate FAT-32 MJPEG Video files.

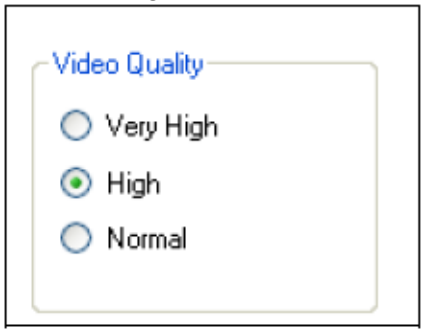
Mode
In the Mode frame, it is possible to choose the quality level of the recorded images and whether they should be in Color or B&W.



Frames Per Second
The TSE 5605 allows for variable frame rate operation. This means that users can select 25/30 frames per second for smoother video. However, in order to save space on the CF card, users can decide to decrease the number of frames per sec. to 12, 5, 2, and 1 for PAL or to 15, 7, 3, and 1 for NTSC.



Video Quality
This is where you can set up the TSE 5605's Video Compression Quality.
Selecting Very High produces video of the highest quality. Please remember that progressively higher Video Quality involves progressively shorter recording times available on the CF card. In any case, High and Normal video quality both provide excellent definition; we advise you to test the three Video Quality settings to determine the best compromise based on your own needs.
The TSE 5605 encodes all Video in the MJPEG format, FAT 32 file system.
The maximum possible size for a file on a FAT 32 volume is 4 GB minus 1 Byte (2^{32}–1 bytes). The TSE 5605 splits the video files into different sizes. If you set the Video Quality to Very High, at 25 fps, the TSE 5605 will create files each about 1.95 MB. On the other hand, if you set the frame rate to 5 fps, the files will measure about 630 MB. This means that, in the case of a 2-hour recording session, there will be multiple files that contain your Audio/Video recordings.
Inside these variable-length files you will find 30 minutes of uninterrupted recording.
All Events recorded on the CF cards will have .AVI extensions.
The Video Signal Resolution is 352 x 288 CIF (*Common Intermediate Format*)

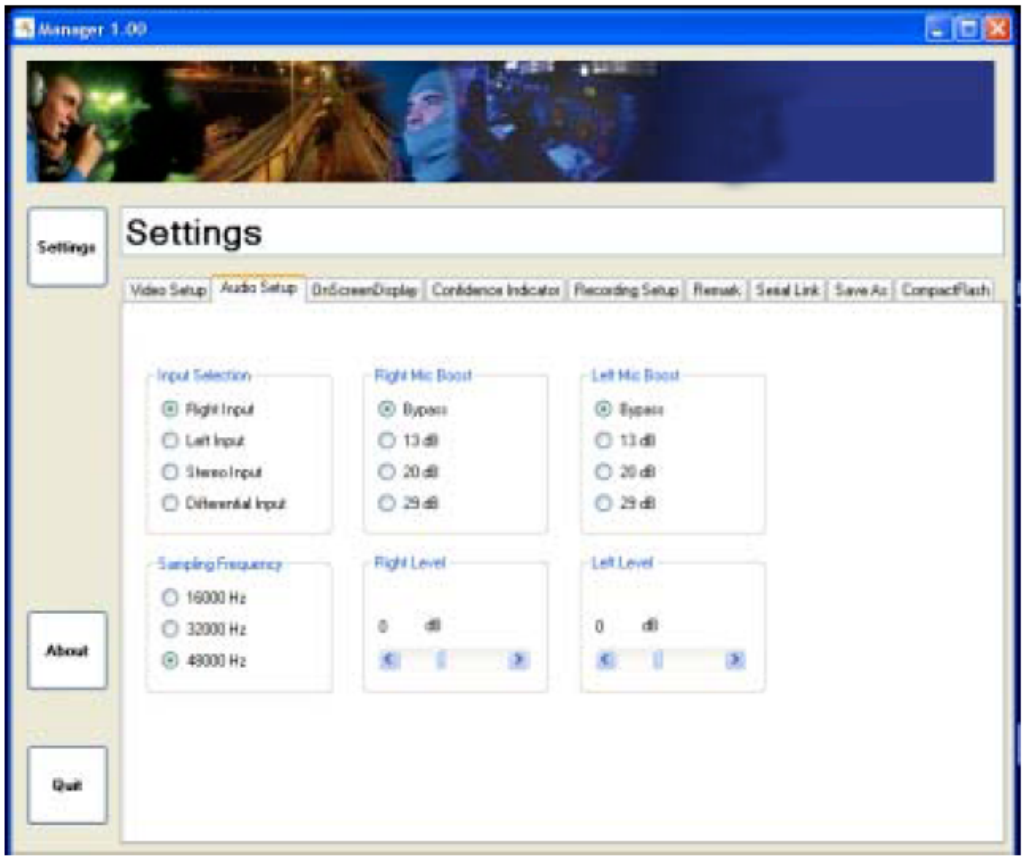


Video Loop Through
This function allows you to enable or disable Video Loop Through during a recording session. If set to "never" there is a noticeable increase in internal battery life since the unit turns off all power to the Video Output connector.
Enabling the "recording" functionality also enables image viewing during the recording session.
Power consumption with Video Loop Through enabled is 250 mAh
Power consumption with Video Loop Through disabled is 180 mAh

Video Camera Appendix
CMOS
Basically, there are two types of cameras. CMOS ***(C****omplementary* ***M****etal* ***O****xide* ***S****emiconductor)* cameras are the least expensive to manufacture because of the relative simplicity of their sensor pick-ups. The measurement of image quality largely depends on the resolution of the camera. Resolution is measured in horizontal TV lines. There are just over 600 lines of horizontal resolution on a PAL television. The higher the resolution of the camera (more horizontal lines) the more well-defined the final image will appear. CMOS cameras tend to be slightly smaller then CCD cameras.

CCD
The other type of camera is a CCD camera ***(C****harge* ***C****oupled* ***D****evice)*. CCD cameras have much more complicated circuitry to produce a sharper image and a more realistic reproduction of colors. The best CCD "bullet-style" cameras available at the moment can display up to 480 lines in PAL, which is a nice sharp clear image; in reality, any camera of this size displaying upwards of 420 lines will give you good picture quality. CCD "bullet" cameras allow more light to the sensor with bigger internal lenses which makes the final image comparable to a mid-range camcorder.

6.2 Audio Setup



Input Selection
The TSE 5605 encodes all audio into uncompressed PCM format.
In the Input Selection Frame, use Right Input or Left Input if you are using only one monophonic channel. Select Stereo Input if you have installed area microphones for both channels. Stereo Recordings of speech are often much easier to understand than mono recordings. This improvement is because we hear in stereo and are used to discerning audio in noisy environments. Stereo recordings, however, require twice as much space for storage.

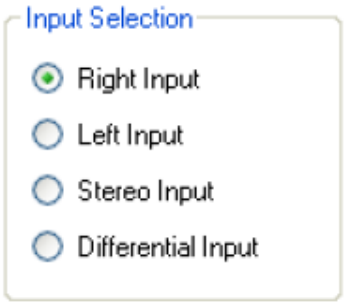


Fig. 1

Differential Audio Input is useful when you need to use very long cables and want to reduce the ensuring noise that could possibly affect the audio signal.
The supplied cable is not compatible with Differential Audio Input. Please let us know if you need a custom cable.
The TSE 5605 uses Knowles EK 3031 microphones.
The unit has an output connector for powering microphones @ 1.8 Vdc.

Right and Left Mic Boost
The TSE 5605 has a built-in audio amplifier that allows you to increase or decrease the Audio Input Signal of either the right or the left channel.

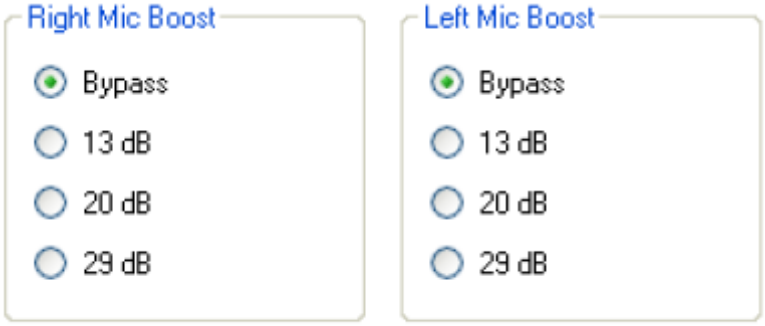


Fig. 2

Sampling Frequency
The TSE 5605 is able to sample Audio at three different frequencies. Increasing this frequency enables recording of a lot more high-frequency data, however it also involves using up a lot more space on the CF card. The higher the frequency, the higher the fidelity of the sound.

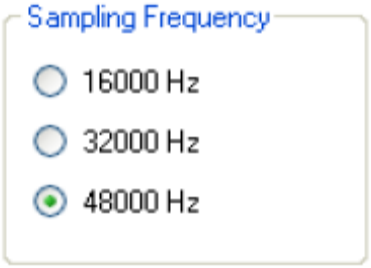
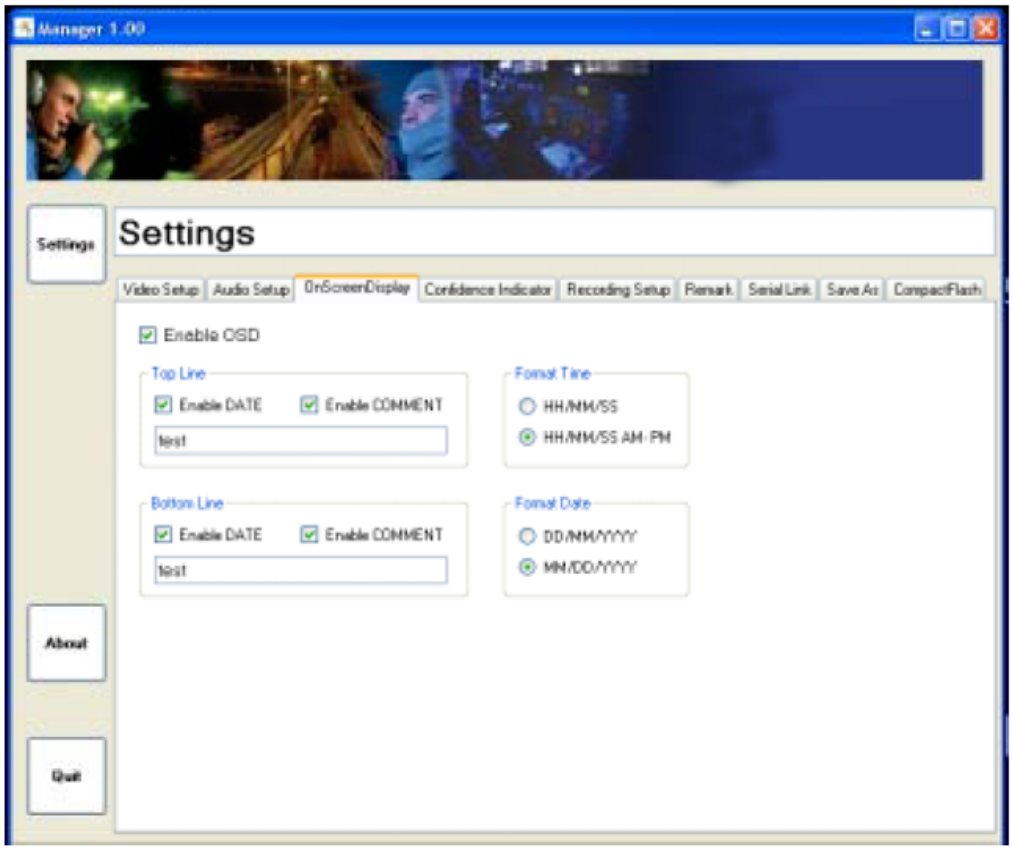


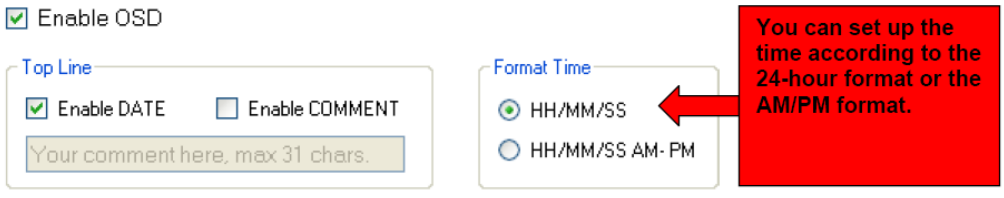
Fig. 3

Level
The next two Sections are used to further boost or decrease the input signal level of either the right or the left channel.
We recommend boosting the signal by at least 8.5 dB when using ambient microphones.

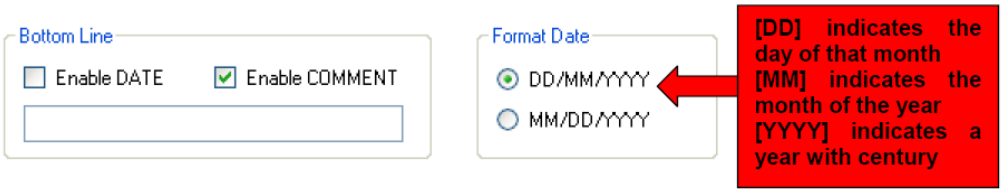
6.3 On Screen Display Setup



Enabling this function makes it possible to write text on top of the video data. This data can be written either in the Top Line or in the Bottom Line.



Enabling comments makes it possible to insert text either in the Top Line or in the Bottom Line up to a maximum of 31 characters.



6.4 Confidence Indicator

With the TSE 5605 it is possible to enable warnings in case of system errors or warnings while recording audio or video. These can be either visual warnings or acoustic warnings.
The Visual warnings are provided by the two LEDs placed on top of the box. Acoustic warnings, on the other hand, are provided by an internal Vibration Motor.

The TSE 5605 can operate with or without confidence indicators based on the individual requirements of your job.

Visual warnings – Enable LEDs
Enabling LEDs turns on visual warnings

1. During the recording phase
2. In case of errors while recording. For example, no video signal, noisy video signal, different input format (a CF card set to PAL with a camera set to NTSC).
3. When recharging the battery, the LED will also provide a warning when the battery is fully charged.
4. In case of battery malfunction, the LED will provide a visual error warning.

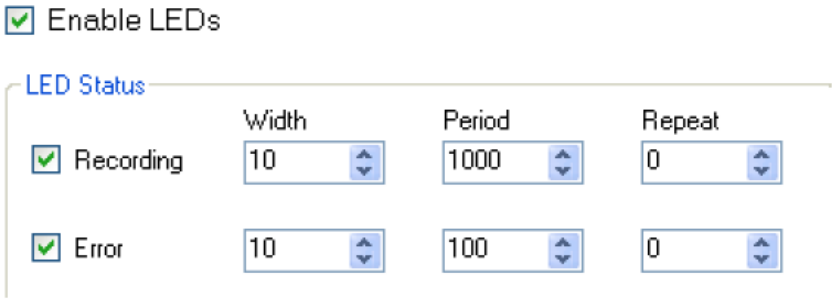
As far as the Battery Status LED is concerned, please refer to Chapter 4.

If the Recording Status LED is enabled with default setting, the following situations will be possible:

LED	Description
Static Green	The system is in Stand-By mode and ready for recording
Flashing Red Recording	The LED will flash repeatedly. If the interval (Period) is set to 1000 (1 sec.) the LED will flash Green once every second while it is recording (i.e. the flashing interval is 1 second and the flashing rate is 1 times x 1 second).
Flashing Red Error	The LED will flash repeatedly. If the interval (Period) is set to 100 (1/1000 sec.) the LED will flash Red 10 times every second (approx.) while it is recording (i.e. the flashing interval is 1/10 second and the flashing rate is 10 times x second, approx.).

6.4 Confidence Indicator

All the settings in the LED Status frame can be changed based on individual requirements.
Width - Width of the LED signal
Period - Rate at which the LEDs will flash. The value is in 1/1000 of a second.
Therefore 1000 = 1 second
Repeat - Number of iterations of the visual warning.



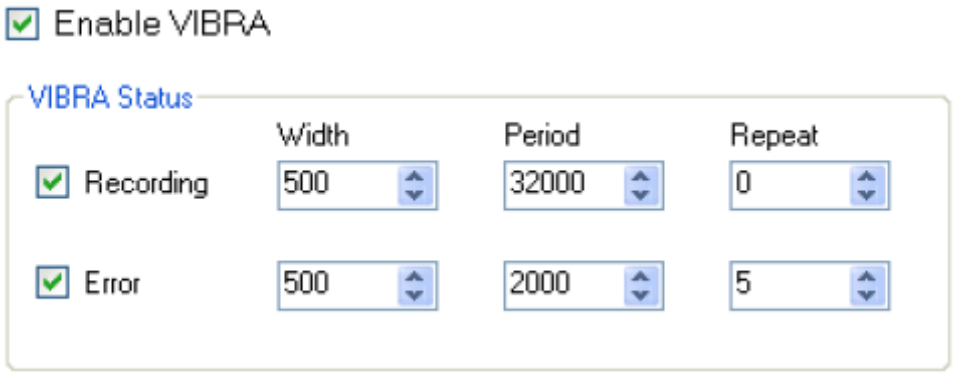
Acoustic Warnings – Enable Vibration
The TSE 5605 contains a built-in Vibration Motor
Enabling the Vibration Motor produces acoustic signals:

1. During the recording phase
2. In case of errors while recording. For example, no video signal, noisy video signal, different input format (a CF card set to PAL with a camera set to NTSC).
3. In case of battery malfunction, the Vibra Motor will provide an acoustic error warning.

All the settings in the Vibra Status frame can be changed based on individual requirements.

Width: Intensity of the Vibra Motor signal
Period: Duration of the Vibra Motor signal. The value is in 1/1000 of a second. Thus 32,000 = 32 seconds
Repeat: Number of iterations of the Vibra Motor

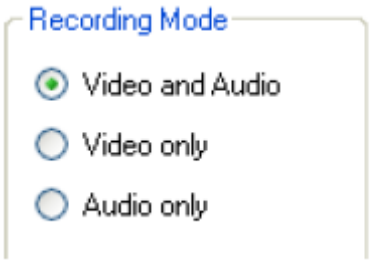
Example: If we set up a Width of 500, a Period of 32,000, and a Repeat of 0 in the Recording box, when recording is activated using the Switch, the TSE 5605's Vibra Motor will turn on for ½ a second (500 Width) and will repeat every 32 seconds (Period = 32,000).



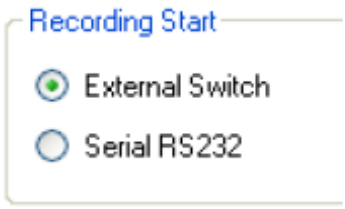
6.5 Recording Setup

The Recording Setup interface offers two choices.
1. Recording Mode.

It is possible to set up the TSE 5605's Compact Flash card as desired. Therefore, as mentioned previously, you can set up different CF cards with different parameters – one for Video + Audio, another only for recording Video, and a third only for recording Audio.

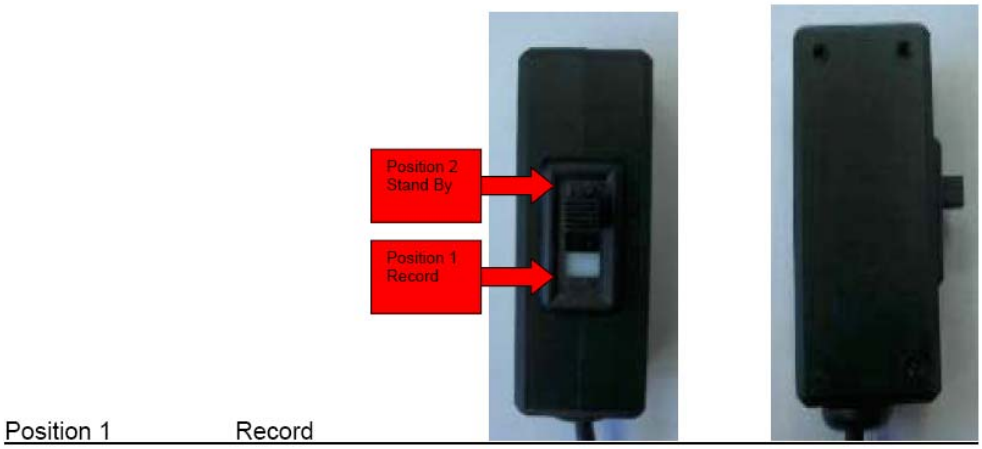


2. Recording Start
With the TSE 5605, you can Start Recording in two different ways.
By means of the RS232 input/output or by means of an External Switch.



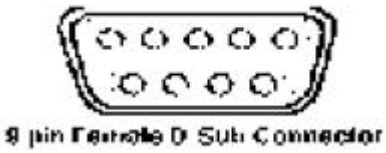
Switch
The TSE 5605 is provided with a Switch to Start and Stop recording.
The Switch is located on one of the cables leading to the 15-Pin Connector

Position	Description
Position 2	Stop



Serial RS-232

When the Serial Protocol box is enabled, TSE 5605 will be able to use serial controls. The unit has a wire terminating on D-SUB9 on the 9-Pin MIL connector.



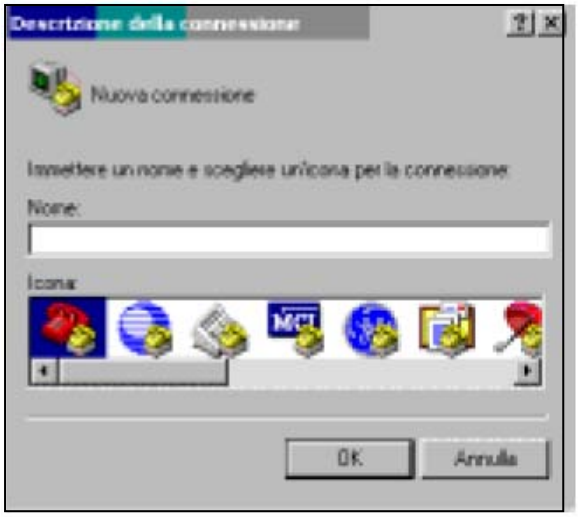
Besides the Serial connection (see Serial Link in Section 6.7) for setting up the date and time of the TSE 5605's Serial Number Recognition, this connection is used to remote control the unit (Rx-Tx).
To control remotely via your PC, it is necessary to connect the female D-SUB 9 Pin to the PC. New PCs are often not equipped with this type of connector.
If that is the case, it is necessary to use an "RS-232 to USB" converter which can be found in most computer stores.
If your PC does not have a D-SUB9 port available, first connect the RS-232/USB converter to the USB port of your PC.
Wait until Windows XP has recognized the peripheral. Then connect the TSE 5605's D-SUB9-Pin female connector to the D-SUB9 male connector on the RS-232/USB adapter.
The RS-232 protocol makes it possible to remotely control the unit at a speed of 115200 bps (bits per second).

Creating a Hyper Terminal Connection

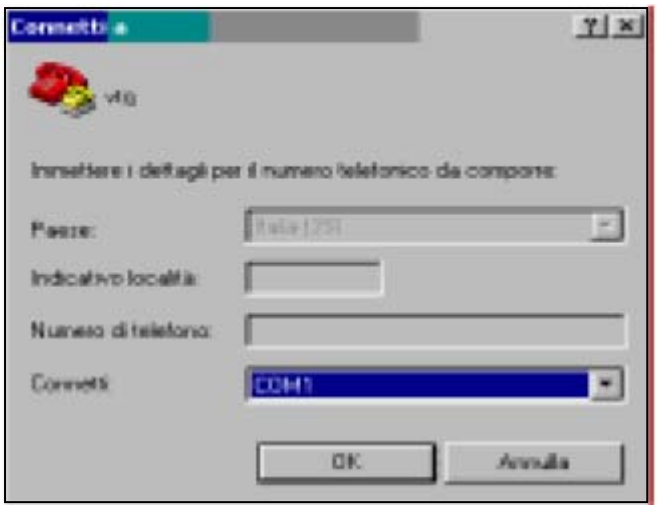
To issue a command, it is necessary to create a new Hyper Terminal connection.
To create a Hyper Terminal connection, go to START/PROGRAMS/ACCESSORIES/ COMMUNICATIONS.
Click on Hyper Terminal.

Step 1.

Type a name for the New Connection: For example, TSE 5605

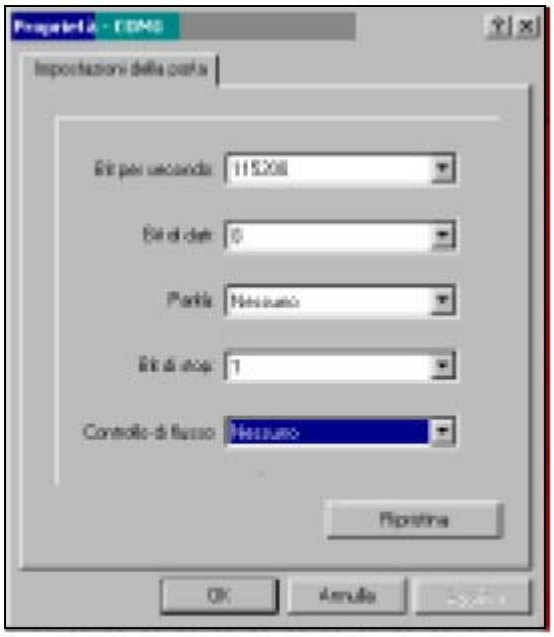


Step 2
Input the Com Port number. To clarify this step, please read the Serial Link paragraph in section 6.7.



Step 3
Set up the Communication Parameters

Bits per Sec. 115200
Data Bits: 8
Parity: None
Stop Bit: 1
Hand Shake: None



Creating a Hyper Terminal Connection

Now you have a new Connection.
Start the new connection, turn on the unit, and press Enter in the Hyper Terminal Menu.
Simple Serial Protocol:

$RECORD + Enter, starts recording
$STOP__ + Enter, stops recording

The commands are 8 characters long including Enter
To stop recording you can also proceed as follows:
$STOP + Enter. Please remember that there should always be a total of 8 characters including Enter.
Example: To record, write $RECORD and push Enter (total 8 characters).

The unit will respond:

A, command recognized
N, command not recognized
E, error
B, occupied
O, no error

The RS-232 functionality is incompatible with stacking

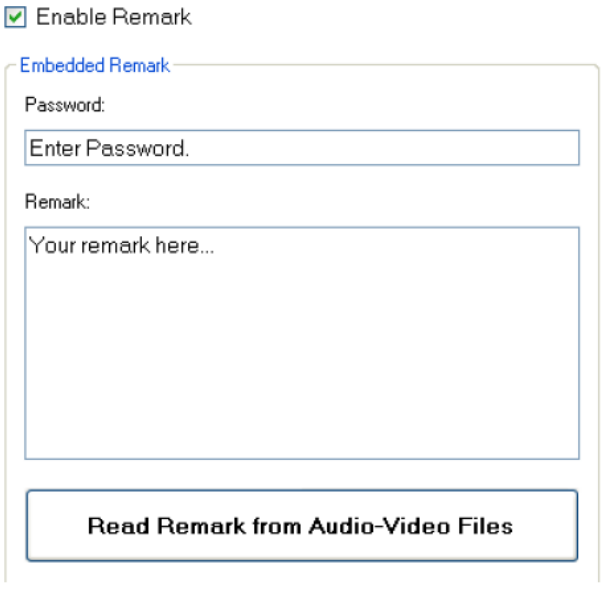
Stacking
Stacking requires additional hardware not included with the TSE 5605.
When Stacking is enabled, if you have a Stacking Box, it is possible to control anywhere from 2 to 12 units in sequence.
A Stacking Box includes 12 15-Pin connectors that, along with the cables provided, make it possible to connect the various units. One side of the Stacking Box has input connectors for the signals coming from the various units.
It is possible to input the following items to a Stacking Box: Power Input, Audio-Video Input, Switch ON-OFF Input. These signals will then be passed on by the Stacking Box to the individual units in the Loop.

In other words, the first unit starts recording. When the CF card on the first unit is full, the Stacking Box shuts down the first unit and starts recording with the second unit, and so on, until the twelfth unit. At the end of the twelfth CF card, the Stacking Box automatically goes back to the first unit to start a new recording cycle.

The Stacking Box is an additional feature provided separately. Please call us or your local reseller for additional information.

6.6 Remarks

When you enable the Remarks functionality, the Manager will write a 250-character Comment in each frame you are recording. If you set up a Password, only the Administrator will be able to open the comments file.
Proceed as follows: Add a comment and a password. Set up the CF card with all parameters. After recording, place the Compact Flash card in the USB reader. Open the Manager and click on "Read Remarks from Audio Video Files"
The system will ask you for the password, after which comments will be available for reading.
This functionality is quite useful when backing-up files to a server for later retrieval. Remarks can include Location, Operator, and any other useful data. In addition, since remarks are written to each frame, you can be sure that the data has not been tampered with.



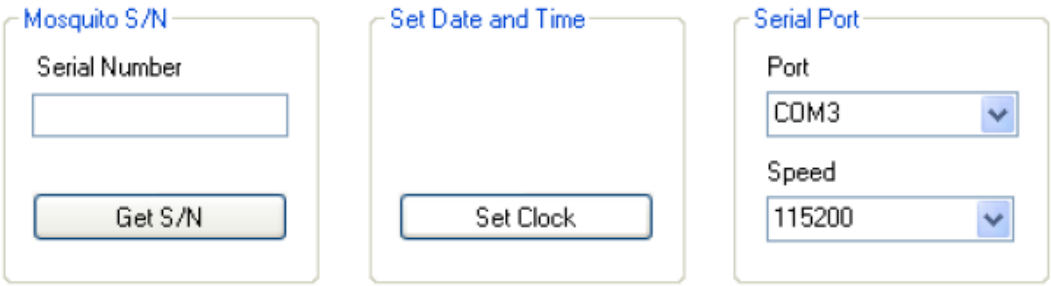
6.7 Serial Link

The TSE 5605 is able to interface with a PC through a DB 9-Pin connector
The DB 9-Pin connector is located on the TSE 5605's 9-PIN connector.
If you do not already have an RS-232 interface on your PC, you can connect the DB 9-Pin connector to an RS232/USB converter, available at most computer stores. To communicate with the unit, connect the DB 9-Pin connector to the PC.

Turn on the unit and wait until the USB interface has been recognized by your PC. Start the Manager, set up the COM Port (first try with one COM Port, and if it does not work, try with another one in the COM Port frame).

To make sure that the COM Port is working, click in the Serial Number section "Get S/N". If the COM Port is the correct one, the Manager will display your TSE 5605's Serial Number.

At this point in time it will be possible to set up the date and time (please refer to the On-Screen Display Section).



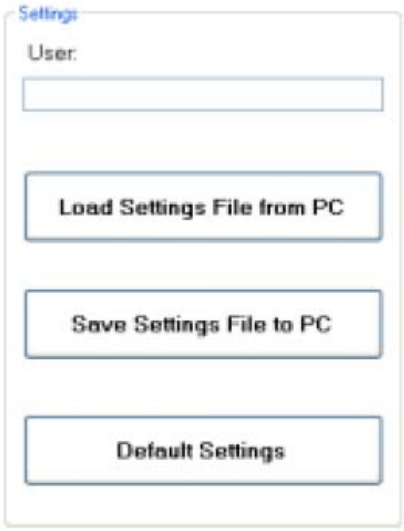
When the "Set Clock" button is clicked from the Configuration windows, the TSE 5605 internal Clock will be set to the same time and date of the PC's internal Clock. Before configuring the unit, be sure that the PC's internal Clock is accurate. There are many programs available for synchronizing the PC's clock with special time servers on the Internet. One such program is About Time, which can be found at:

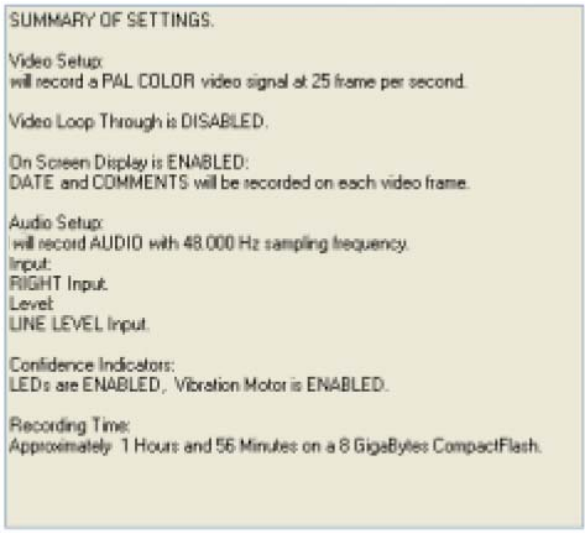
http://www.arachnoid.com/abouttime/index.html

About Time will automatically connect to NIST (the National Institute of Standards and Technology) via the Internet and synchronize the PC.s clock with NIST's atomic clock.

6.8 Save as

The Save As configuration window tells us that we have reached the end of our Setup work.





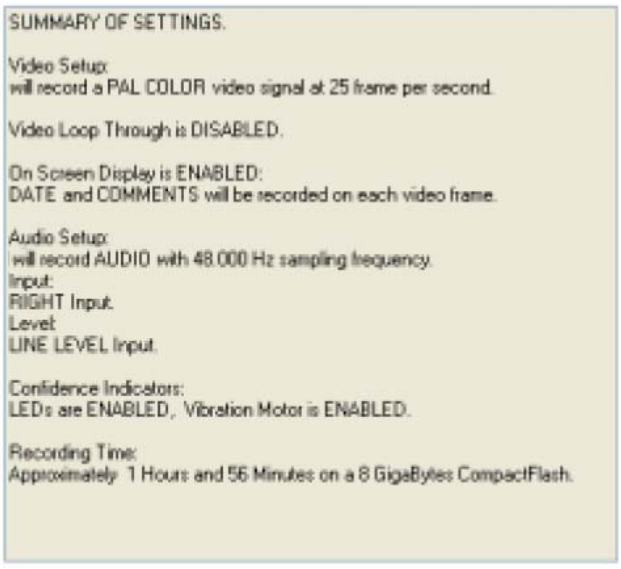
Here is where you will need to input the name of the User who has entered the settings.

This way, in the future, you will be able to find out who entered these settings.
The **Save Settings File to PC** option makes it possible to save your settings within your PC together with the User's name.

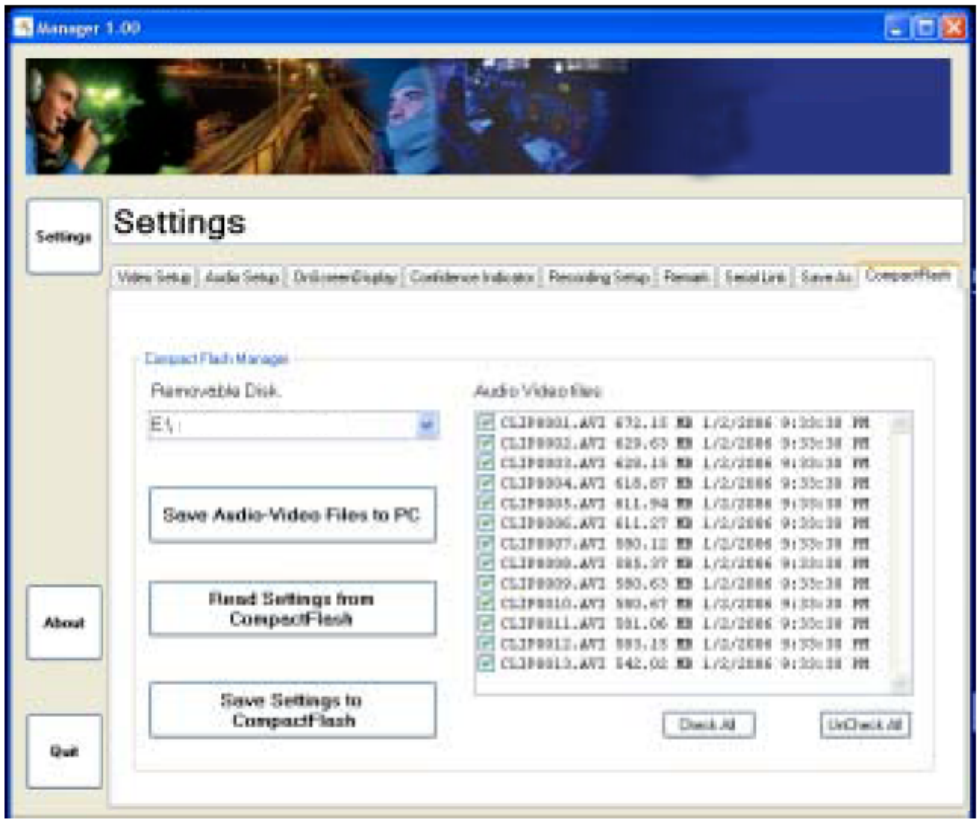
Later on, it will always be possible to search for and load the saved parameters using the functionality "Load Setting File from PC"

Clicking on "Default Settings" all parameters will be reset to factory defaults.

The TSE 5605 Manager allows you to display all the parameters that you have entered, plus the available recording time on the CF card, on the right side of the Configuration Window. It is important to remember that these figures are more-or-less precise since they depend on the video camera definition and the complexity of the images to be recorded. It is always best to test your own video cameras to validate the figures reported by the Manager.

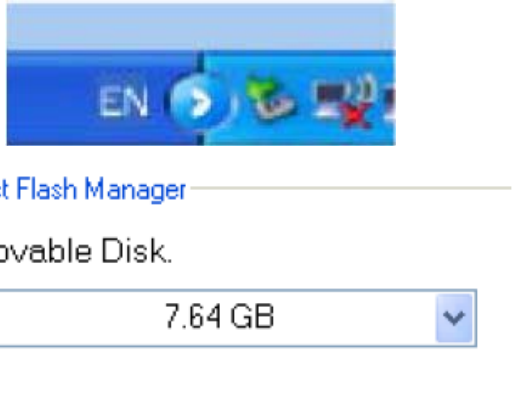


6.9 Compact Flash



The Compact Flash interface handles the CF cards.
The main purpose of this interface is to format and set up CF cards.
In order to format the CF card, you must make sure that the SanDisk USB Reader, that was enabled for reading the Extreme III Compact Flash cards, is connected to the PC's USB port.

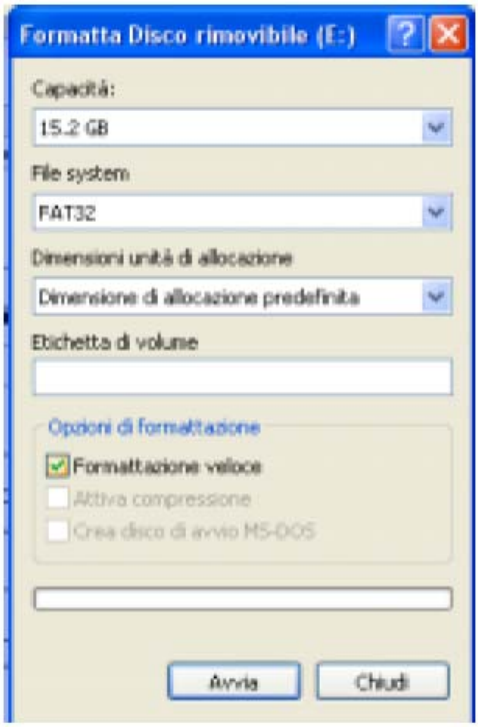
If the Windows symbol is present on your Desktop, you should be able to check the Compact Flash capacity in the Removable Disk window.



To set up a CF card, you need to click on the "Save Settings to Compact Flash" button.

MS Windows will ask you if you are sure, after which the formatting interface will be displayed.

Using a new Removable Compact Flash Card
As mentioned previously, the TSE 5605 uses ScanDisk Extreme III Compact Flash cards.
CF cards should be formatted using the FAT 32 file system.
You must name your Volume "TSE 5605".



Formatting can also be done using the Quick Format function.
Once formatting has started, you need to wait for Windows to finish. When the message "Formatting complete" appears, click on OK.

Click on "close" in the "Formatting Removable Disk" window.

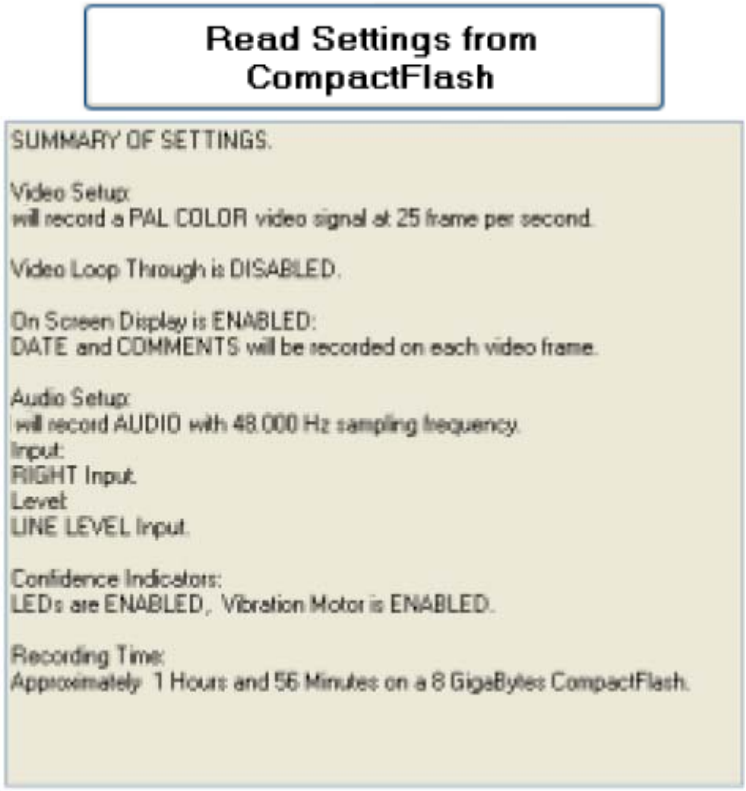
Wait a few seconds for the settings to be transferred to the Compact Flash card.
To be safe, it is a good idea to check if the settings file has really been transferred to the CF card. Go to My Computer and see if the unit Volume has indeed been created. Open the unit Volume and make sure that the two files called "index" and "settings" are present.

Your Compact Flash card is not ready for use.

Please make sure to insert the CF card in the unit correctly. Make sure that the female side of the CF card is inserted in the slot. The part of the Compact Flash card containing graphics should face the side of the box that houses the LEDs.
To remove the Compact Flash card from the unit, turn it around to the side with the notch. The grooved edge of the Compact Flash card has been designed to make it easy to remove. The notch on the box was designed for nails, not for fingers. Pressing your nail against the groove of the CF card makes it very easy to extract the card itself.
Only insert and remove a CF card if the unit has been turned off.
Once you have finished using the TSE 5605 for recording, you can place the Compact Flash card in the USB reader connected to your PC.
After opening the Manager one more time, it will be possible to display the recordings as files in the CF card interface by selecting and deselecting the desired recordings and saving them to your PC. This is a useful way to back-up your work.

The Read Settings function is important when, having set up different Compact Flash cards, you need to look at the settings.

With the CF card inserted in the USB Reader, and clicking on this function, the Manager acquires and displays a summary of the Settings in the Save As window.



Playing Back Recordings On Your PC.
Once you have finished recording and inserted the Compact Flash card in the USB Reader slot, Windows will ask to open the files. Choose to open the files as a Folder.

The TSE 5605 encodes the Video and Audio data based on the FAT 32 file system and creates .AVI files.
The files generated by the unit do not need to be transferred to a PC for reading.
Play back can be done directly from the Compact Flash card. Playing back recordings directly (Direct Play) makes it possible to avoid transcoding proprietary formats to PC-compatible formats, so that the Audio/Video quality is completely unaltered.
Direct Play also makes it possible to view recordings on your PC and an external TV monitor at the same time, provided you connected it to your PC.s video output.

Remember to set up Video Output as a Clone of your Main Monitor in your Video Card's Properties settings.
Another important consideration is Direct DVD Burning. The unit's recordings are truly ready to be burned to DVD: Several DVD Players are already compatible with the format generated by the TSE 5605. We recommend finding a DVD player that is compatible with the Windows Media Player format.
The .AVI FAT 32 format is universally compatible.
The .AVI FAT 32 format is a file that can be up to 4 GB in size.

The TSE 5605 generates files that vary from 1.95 Mb up to 650 Mb in size (this is the largest size with the various quality levels) and a constant duration of 30 minutes. Audio-Video synchronization, when cutting from one file to the next, was designed with the utmost precision.

Playing Back Recordings On Your PC.

The lightness of the data ensures optimal management when using Windows-based forensic analysis software.

Windows Media Player can be used to playback recordings, but make sure that Media Player does display your recordings correctly. In case of incorrect visualization during Playback, please open Windows Media Player and change the default settings.
Every PC is a world unto itself, therefore, every PC should be managed independently.
Besides Windows Media Player, there are a number of other Audio-Video Players on the market. If you are dissatisfied with Windows Media Player try installing a different player. **Always create a Restore Point before installing new software.**

For expert users
If you are not satisfied with the quality of playback using Windows Media Player (and we too have reservations) please remember that it is always possible to install a Codec such as "PIC Video" or others available over the Internet to improve the playback quality of MJPEG recordings in WMP.
Always create a Restore Point before installing new software.
The same applies to your PC.s Video Output. Filters can be enabled or disabled within your Graphics Card settings to improve the quality of your PC's Video Output.

The TSE 5605 is an Open System and will be integrated by optional additional Professional Software for expert users.

Additional integrations, including hardware, are in the planning to satisfy different user needs.

9. Technical Specifications

Input Connector: 15 Pin High-Reliability Mil Specification Connector
Analog Video Input Composite PAL and NTSC standards, Level 1.0 Vp-p 75 ohms
Pixel Resolution: 720X576 pixel (PAL), 720X486 Pixels (NTSC) High Quality: 9-Bit Video ADC
Sampling rate: 27 MHz S/N Ratio 50 dB

General Purpose Digital Input
General Purpose Digital Output
Digital Output for LEDS or other Confidence indicators
External power on-off for longer stand- by time
External Power Input (max 5.5 Volts)
Power Output 5 volt max 200 mA
Microphone bias voltage output 1.8 volt.
Analog Audio Stereo input microphone and line Level Software Selectable.
Line Level max 1 volt RMS 12 KOhm input impedance.
Resolution 16 bits. 32000, 44100 and 48000 Hz sampling rate.

Output Connector 9 Pin high reliability Mil Specification Connector
Analog Video Output Composite PAL and NTSC standards
Level 1.0 Vp-p 75 ohms
High Quality 10-bit Video Dacs
Integral non linearity < 1 LSB at 10 bits
80 db video SNR
External Power Input max 5.5 volts
RS232 serial connection max 115200 baud, TTL level
Analog Stereo Audio Output, line Level
Power output 3.3 volt max 100 mA.

Video Compression
MJPEG codec for superior image quality
Real Time Compression or Decompression at 720X288 @ 25 frames/sec. -PAL
720X240 @30 frames/sec. -NTSC
Visually loss-less compression at 5 :1 on natural images
Compression ratio variable down to 5:1
Field rate variable from 25 frames/sec
To 1 frames/sec. PAL standard, 30 frames/sec to 1 frame/sec for NTSC

Mechanical size and operating Condition
Anodized Aluminum case 6061
54 mm width, 12 mm height, 94 mm depth (with connector),
100 grams weight including batteries.
Operating Temperature 0° C to + 70° C
Storage .20° C to +85° C
Relative humidity 5% to 95% (MAX)
Shock 200 - G
Vibration 15-G

Power Input:
Internal Lithium Ion Battery @ 1300 mAh with battery Charger.
External Power Input for simultaneous operation
and battery charging (max 5.5 volts).

Storage:
Compact Flash type 1, San Disk Extreme III
Capacity 4,8,12, 16 GB

Consumption:
Quality: High
45 mAh in stand by mode @ 5 Volt
180 mAh in recording mode w/out video output @ 5 Volt
Battery Autonomy: approx. 3 hours

Storage Capability
Recording Time Audio+Video from 240 min (high quality mode) to 200 hours (time lapse mode at 1 field/sec.) with a compact flash of 16 GB.

This device is RoHS compliant