

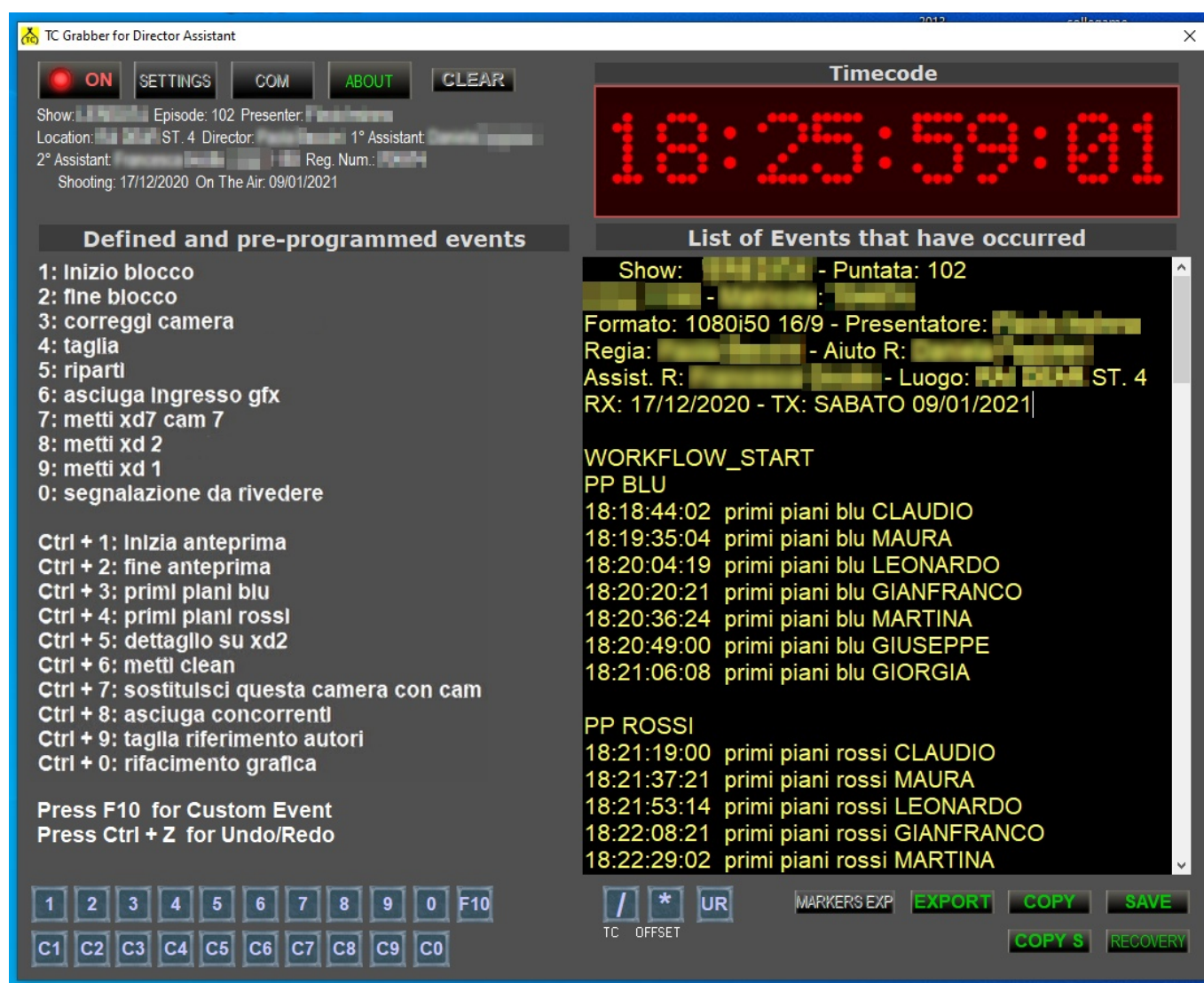
# TC Grabber FDA, a software for Movie or TV Production

## What can you do with TC Grabber for Director Assistant:

**TC Grabber FDA**, or even **Timecode Grabber** is a software for capturing timecode that can be used, in the context of production, to improve the workflow in all contexts that subsequently involve post production processes.

Usually the assistant collaborators of the director, during the shooting of the events, use to write down the timecode in pen on a notebook, completing it with information suitable for the good packaging of the audiovisual product which, thanks to the activities carried out by these professionals, is corrected for time errors of form and content, precisely following the documentation created during the shooting.

The next stage of editing, always performed using specific software defined as software for non-linear editing, completes the work by creating the edition so that it is as correct as possible.



**TC Grabber FDA** it is part of two fundamental phases of the Production with re-edition process.

In the first phase, the software will help the capture assistant with a semi-automatic assisted procedure, which will significantly speed up the process of annotating the edition information which, in most cases, will be limited to pressing the pre-programmed keys, with the possibility of always adding further information to the captured event.

The second phase completes the work, helping to create a professional paper, which can be printed or kept as an electronic document to be attached as a processing sheet for the final edition.

**TC Grabber FDA** possibilities do not stop at using only a suitable tool to draw up a clear and readable document but also make available an export function that will produce a file enabled to be interpreted by the most popular software for non-linear editing.

In fact, exporting the Markers produces, directly on the timeline of the non-linear editing software, not only the points marked with the timecode, where it is necessary to intervene, but also all the suggested and necessary annotations, filled in with **TC Grabber FDA**.

In practice, those who perform non-linear editing will be able to abandon the paper sheet and read directly what is necessary by moving the mouse on the same timeline.

**TC Grabber FDA** assumes a new way of working, in the process of filming that requires post-production, improving efficiency and removing the possibility of errors, with a relief from work for the assistant director, who will be able to focus more on the contents and events, avoiding looking away for too long during annotations.

## Installation of TC Grabber For Director Assistant

**TC Grabber FDA** is compatible with any version of Windows.

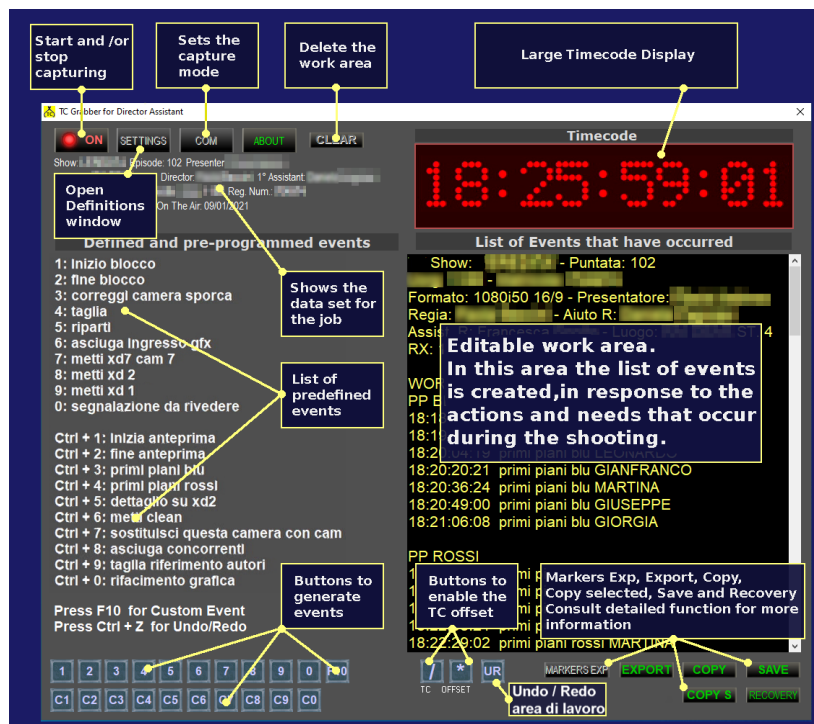
To install, simply click on the **TCGrabberFDASetup.exe** file and follow the wizard, generally leaving the options presented by the program, for the installation destination, as they are shown.

In any case, you can choose to change the destination during the installation process.

**TC Grabber FDA** in order to work with synchronized timecode, generated by the machines used during recording, or by a special device, needs to be configured by choosing a timecode capture interface.

For technical details, refer to the final paragraph, dedicated to the preparation of the hardware.

## Description of the operating interface of TC Grabber For Director Assistant



**TC Grabber FDA** has an interface equipped with a large display for reading the timecode. The work area, with a black background and clearly legible yellow characters for the text, fills up automatically and instantly by pressing the event generator keys, located at the bottom left.

The events, with their specific declarations, can be predefined through the definition window which can be called up with the **Settings** button.

The generation of pre-programmed events (21 in all) can be managed faster and more conveniently, simply by pressing the keys on the computer numeric keypad (0 - 9, ctrl + 0 - 9 and F10).

The export functions allow to obtain a professional document but also Markers to be exported for the timeline of the software dedicated to editing.

## Program settings and events predefined by the user

SETTINGS

To access the settings window it is necessary to enter the predefined events and the Production data concerning the job.

Pressing the **Settings** button opens the window to enter the data necessary for the edition.

Event called by keyboard number	Event called by Ctrl + keyboard number
1 Inizio blocco	1 inizia anteprima
2 fine blocco	2 fine anteprima
3 correggi camera sporca	3 primi piani blu
4 taglia	4 primi piani rossi
5 riparti	5 dettaglio su xd2
6 asciuga ingresso gfx	6 metti clean
7 metti xd7 cam 7	7 sostituisci questa cam con cam
8 metti xd2 conduttore	8 asciuga concorrenti
9 metti xd1	9 taglia riferimento autori
0 segnalazione da ricevere	0 rifacimento grafica

Timecode Offset 1: 00:00:05:00 Timecode Offset 2: 00:00:07:00

**PRODUCTION DATA**

Show title: Code: Reg. Number: Prod. location: ST. 4 Episode: 102 Presented by: Picture format: 1080i50 16/9 Directed by: 1° Assistant: 2° Assistant: Day Shooting: 17/12/2020 TX Date: 09/01/2021 Confirm

On the **Event List and production data** window fill in a list of the necessary events, using the 20 available fields, to generate the corresponding predefined events that will be associated with the corresponding keys, to be used quickly in the recovery phase.

Timecode offset grouping allows you to change the offset of timecode 1 (pre-set to 5 seconds) and the offset of timecode 2 (pre-set to 7 seconds) at any time.

The timecode offset is a function that can be used in the capture phase by pressing the buttons to remove the corresponding time in the live capture phase.

For example, by enabling the / key (one press to enable and another to disable), during the capture, we will instantly remove 5 seconds from the time calculated according to the following scheme:

Pressing the Timecode offset 1 button, set for 5 seconds, produces the following example of result: Reading on the display 00: 01: 10: 00 - timecode captured 00: 01: 05: 00. That is, the captured timecode is 5 seconds earlier than that read on the display.

Pressing the Timecode offset 2 button, set for 7 seconds, produces the following result example: Reading on display 00: 01: 10: 00 - timecode captured 00: 01: 03: 00. That is, the captured timecode is 7 seconds earlier than that read on the display. these functions can be used to compensate for the operator's reaction time to events.

The **PRODUCTION DATA** grouping collects all the information concerning the recovery or the data that will subsequently be reported on the edition document in order to identify it with precision.

It is advisable to fill in these fields carefully, to obtain a professional and precise result of the edition document.

**TC Grabber FDA** also draws on this information to archive and propose the name of the file relating to the work carried out.


The fields that can be entered are the following:


Show/Movie Title:	Name of the show / Production in progress
Reg. Number:	Reference to production codes
Prod. location:	Place of Shooting / Production
Episode:	Episode number
Presented by:	Presenter / Host of the episode
Picture format:	Format for the image adopted
Directed by:	Director
1° e 2° Assistant	1st assistant collaborator and 2nd assistant director
Day Shooting:	Day of Production / Shooting.
TX Date:	Scheduled day for the broadcast / transmission of the program.

## How to best use TC Grabber For Director Assistant - operating methods

**TC Grabber FDA** will be immediately available after having configured and prepared it, with the data relating to the transmission, as indicated above. To make it work correctly, with timecode, you will also have to use the correct hardware interface, necessary for time synchronization.

**For the hardware configuration, refer to the last section of this guide.**

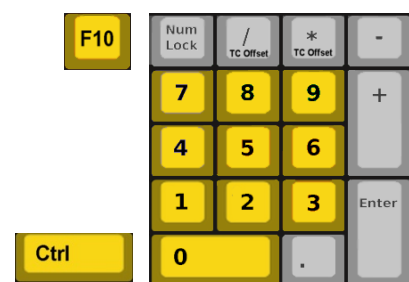
To start **TC Grabber FDA** press the button  on the top left.

If the application is well configured, for the hardware part, the power button will switch to the active state  and the timecode will start to advance.

From now on the interface is ready for capturing events quickly and accurately.

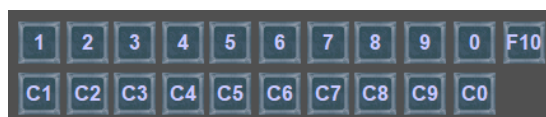
With **TC Grabber FDA** it will be possible to forget the timecode reading operation, the use of the notebook and the pen because the software will write for you, simply by pressing the event keys.

This is an assisted automatic procedure that will significantly speed up the data acquisition procedures, for the program edition, with the possibility of canceling any errors or inaccuracies, should they occur, simply by acting with the keyboard and mouse, on the editable area that it behaves like any writing program.



(the yellow buttons are the active ones)

OR  
( mouse )



1 - 0 are equivalent to the numeric keypad 1 - 0  
C1 - C0 are equivalent to the numeric keypad  
Ctrl + number.

Each press of the event keys on the window, which also correspond to the keys on the numeric keypad (as shown in the figure above), instantly generates the pre-programmed event in the editable area.

The F10 key (21st pre-programmed event) is the event called custom; pressing this key generates an event characterized by the presence of only the timecode to which, without further typing spaces or sending, simply add the desired expression by typing it on the keyboard.

This feature is valid for all events, even those that have a pre-programmed expression.

In fact, even for pre-programmed events, the user will not have to worry about typing spaces or going to a new line, but only pressing the event and possibly adding a comment.

The software will do the work by itself, event after event.



The automation ensures remarkable compilation speed and correct formatting if you also want to use the **Markers Export** function.

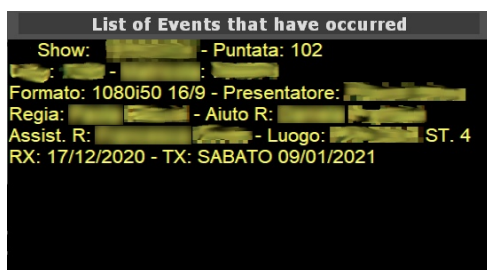
If you need to write numbers, to correct the timecode or to add further expressions, after the generation of an event, you can use the numbers on the main keyboard since those on the numeric keypad are dedicated to the exclusive generation of events .



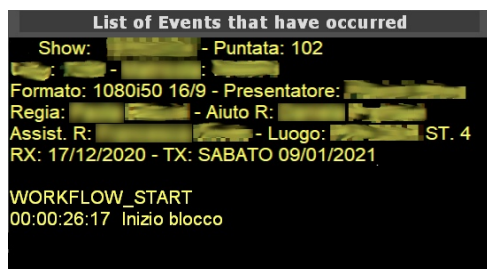
## Deepening: Description of the process and Editable Area



Below is a typical simulation, for the best use of the software.

Suppose you start the program by pressing the OFF / ON button  

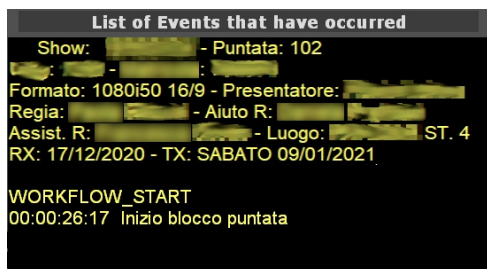


All the information relating to the Program / Production are shown instantly.



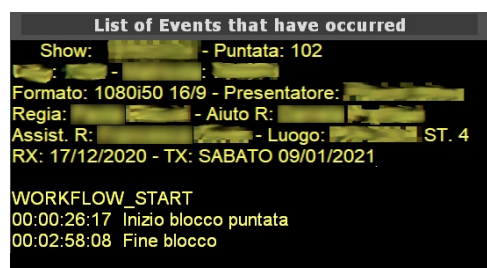
Pressing the Event 1 key,   on the keyboard, or on the application window, will write the current timecode and complete it with the predefined Block Start event previously inserted in the settings window.



The cursor prepares itself for any additional typing, with space already included.

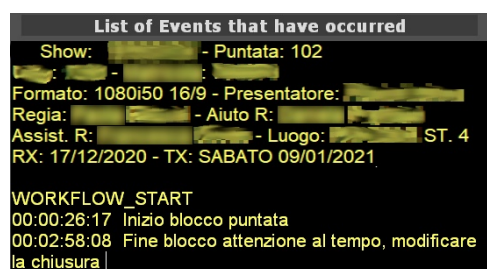


In this way, to add the accessory information (*puntata*), is enough, without pressing any other key, to type directly the term or phrase necessary to close the event that occurred at that moment.

It is not necessary to type Enter or Return.





When a new Event is pressed, as shown in this example, the one corresponding to key 2   , a new case (**Fine blocco**) will be generated complete with timecode.



At the new event (**Fine blocco**) can be added more without pressing the space bar and / or the enter key, as illustrated here with the sentence (**attenzione al tempo, modificare la chiusura**).

The user, not taking care of the spaces and of going to head, will notice a greater speed in the procedure.

The software also makes available the Custom Event   option which will position, on the next line, the only timecode which we could follow any expression typed on the keyboard.

Also in this case, the operator will not have to worry about inserting spaces between the marked timecode and the rest of the sentence, just as he will not have to type the enter at the end of the typing to go to line.

These operations are handled automatically and save time by ensuring correct formatting.


## Export options and actions available to create the Program Edition Document and Markers management




**TC Grabber FDA** provides some commands that allow you to export the work performed, in different ways, to offer the user the possibility to prefer the most appropriate

or desired method.

The available functions are listed below.

**Copy**  button: This button copies all the text present, at that moment in the work area, on the clipboard memory and makes it available to be pasted on any available word processor.

In this way the editor of the Edition sheet can prefer the environment to create the document, with a simple copy and paste.

**Copy S**  button: (Copy Selected) copies only the selected text, with the mouse and makes it available to be pasted on any word processor.

## EXPORT button and integrated Editor for the Edition document

**TC Grabber FDA** has an integrated Editor, for the compilation of the Edition document, created specifically to speed up the editing work.

Pressing the EXPORT button will automatically start the **TCGExport** utility (Timecode Grabber Export) and will export all the **TC Grabber FDA** content present on the worksheet in a very short time.

The document will show, for the most part, already made and it will be necessary to make only a few changes.

**TCGExport** offers all the useful tools for edit, correct and add what it is necessary to carry out the Edition of the episode.

Using the built-in editor is very intuitive, for this it will be enough just to explore, between the options presented, including menus and bars tools, to find what you need.

### **TCGExport offers the following tools:**

Menus and toolbars to choose size, color, font type, bold, italic, underline, strikethrough and to perform cut, copy and paste actions.

Formatting of paragraphs and creation of bulleted lists.

Highlighter with color choice and color inverter.

Zoom and magnification function.

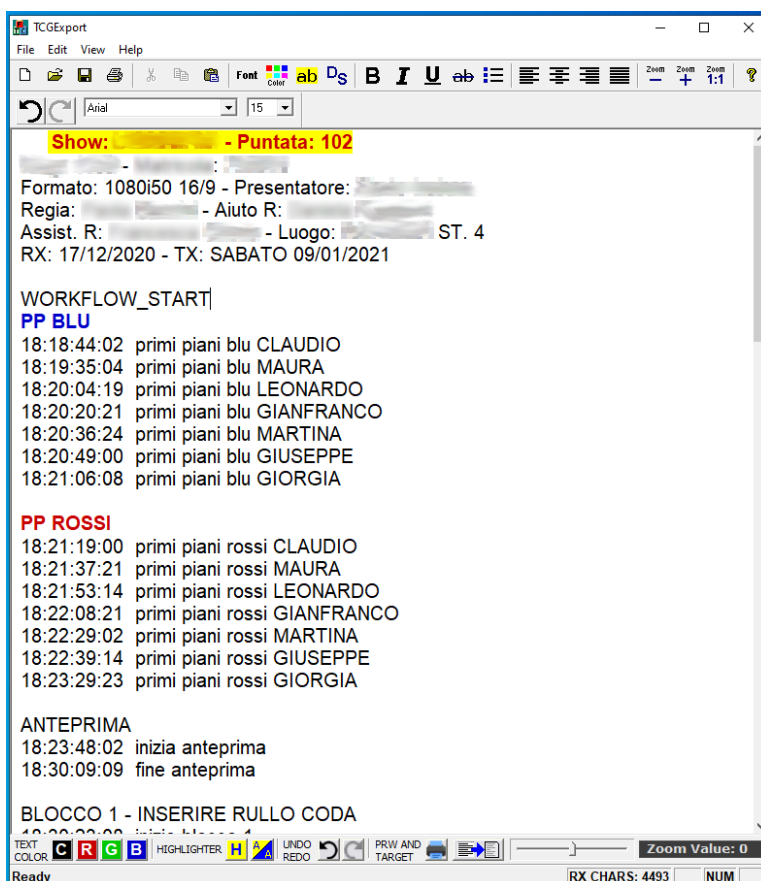
Print and print preview, even on printer

virtual pdf, (available on Windows 10).

Pop-up menu, operated with the right mouse button, to call up the most useful functions.

The format for saving files is the rich text format (\*.rtf) which can be read by all text editors.

**TC Grabber FDA** it shortens Edition times because it starts and fills automatically (Export button), it is practical, simple and essential.



## Export of Markers linked to events, **MARKERS EXP** button



An edition sheet, drawn up using a computer tool, is certainly more orderly, legible and professional than what can be done with the traditional method, with the use of a notebook and a pen.

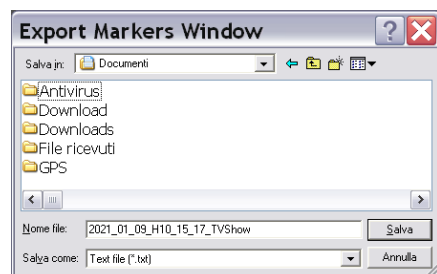
Now let's imagine that we can have the product Edition document, directly on the software timeline, which we use for non-linear editing, with all the indications reported exactly as in the document, placed precisely on the timecode timeline.

Some programs for non-linear editing provide for the possibility of superimposing the above indications on the screen, so that the operator can read the assembly information directly on the preview monitor of the using software.

The (Markers Export) **MARKERS EXP** button generates a \*.csv and / or \*.txt compatible file that can be attached to the machining and imported by the software used for non-linear editing. This possibility generates some advantages among which we can identify the most important ones:

- 1) **ERRORS:** The possibility of intervention errors, due to oversights, in the sequential reading of the Edition document, is cleared as all the relevant points, which require correction, are clearly present on the timeline of the non-linear editing software.
- 2) **SPEED:** The assembly process, which involves shortening and adjustments of the audio / video sequences, is easier and faster as all the information is constantly in front of the operator's eyes.

Pressing the **MARKERS EXP** button displays a window for saving the file, with the option to choose the format in the **save as** drop-down control.



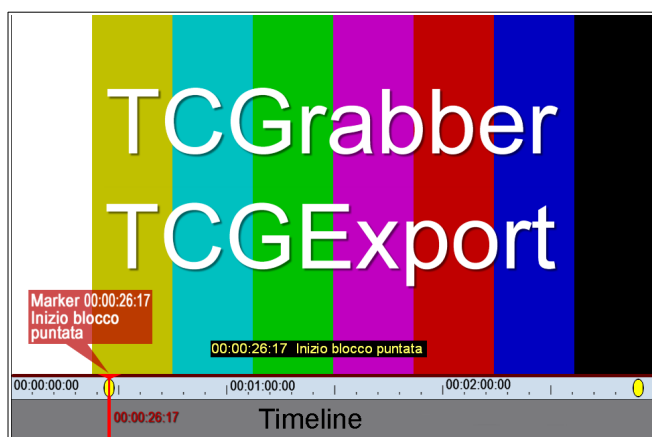
Export Markers Window has a default file name, structured as follows:

YYYY\_MM\_DD\_HHH\_MM\_SS\_EpisodeName  
(Year\_Month\_Day\_hours\_Minutes\_Seconds\_TransmissionEpisodeName)

Of course it will be possible to change the name at will.

After saving the file we will have all the captured Markers available, to edit the program directly on the timeline of the editing software.

To give an example if we have generated a Markers Export, from **TC Grabber FDA**, which contains a **WORKFLOW\_START** Event with **TC 00:00:26:17**, called **Inizio blocco puntata**, uploading the file to the linear editing software used for editing, we will have on the timeline, by scrolling the cursor on the point concerned, the following result:



If you over the cursor, on the point concerned with TC 00:00:26:17, puts the text, of the operation to be performed, on the monitor of the editing software, exactly as reproduced on the Edition document.

All the markers related to each event will be present on the timeline.

Clicking on any marker makes the machining content visible for that time value.

In practice, the Edition document is incorporated into the assembly process.

## The Recovery system

**RECOVERY** Recovery is a function that allows you to recover, at any time and for any reason, a job that may have ended accidentally or stopped due to an error in the computer running **TC Grabber FDA**.

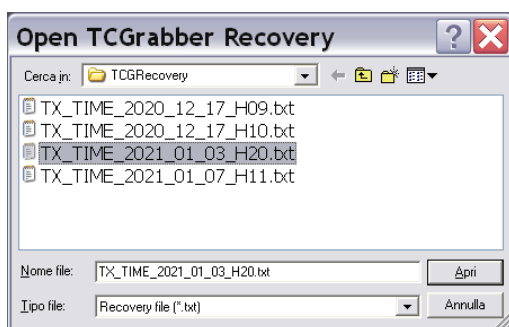
**TC Grabber FDA** software It contains a separate thread that takes care of storing in a file, contained in a folder with path /Users/UserName/Desktop/TCGRecovery all the captured events, up to the last key that was pressed.

It doesn't matter if the program is closed; you can restart the application and resume work exactly where we came from and continue as if nothing had happened.

If we accidentally close the application, proceed as follows:

1. Restart **TC Grabber FDA**

2. Push button **RECOVERY** to show the window below



Select the file corresponding to the year, month, day and hour of interest (usually it is the most recent file that was created with the last event generated).

Press Open, to restore all the work in the editable area.

**Note:** The names of the files created are chosen every hour even if they are always updated to the last event generated.

This option avoids creating a large number of files for each working day.

Occasionally it may be convenient to delete unnecessary files in the TCGRecovery folder. **Important! Enable Recovery Folder for this function.**

3. Restart the timecode by pressing the button **ON** in order to return the program to the previous condition.

4. Resume the capture activity by pressing the key related to the desired event.

## Other options and formatting information

**SAVE** button **SAVE**: Copies all the content in the editable area and saves it on a common text file.

### Information about the editable area for text formatting

**WORKFLOW\_START**  
**00:00:26:17 Inizio blocco puntata** We can give an example on the formatting of the text to provide indications if you want to insert an event in a totally manual way, that is a timecode followed by an event.

The figure above shows an event **00:00:26:17 Inizio blocco puntata** which could be followed by another event but without using a preprogrammed key.

In this case, observe the following rules:

The already existing text is "00:00:26:17(spacebar spacebar)Inizio blocco puntata(spacebar)"

to get a new line, completely manually, type

**(Enter)(timecode)(spacebar spacebar)(note or comment)(spacebar)!** be careful to respect the format TC NN:NN:NN:NN and that the value is greater than the previous TC.

Caution to the enter key which must be pressed only one time and at the beginning, without being used again if the comment goes beyond the right border.

In this case, the sentence continues below automatically, without the need for a new line (for the software, in fact, enter is used to close an event associated with the timecode which is followed by another).



# Technical information for the use of general timecode

## Timecode capture via standard RS422

The current version of **TC Grabber FDA** for Director Assistant it extracts the Timecode from the feedback of any device, equipped with an RS422 port, according to the specifications contained in the 9-Pin Protocol, developed by Sony.

Many modern recorders, including those based on hard drives and solid state drives, can emulate this protocol which has become, over time, a de facto standard.

Let us briefly remind you that from the electrical point of view, to establish communication, this protocol uses the standard RS422 interface, usually connected via 9-pin DE-9 D connectors, set with the following parameters preset by the software:

Baud 38, 8 bit data, odd parity and 1 stop bit.

Soon it is expected to be able to add the possibility of also using Timecode, conveyed via audio (LTC), with decoding operated by the computer sound card and also via ethernet network, using the PTP system (Precision Time Protocol).

The latter options are under development and testing and will be released in the future.

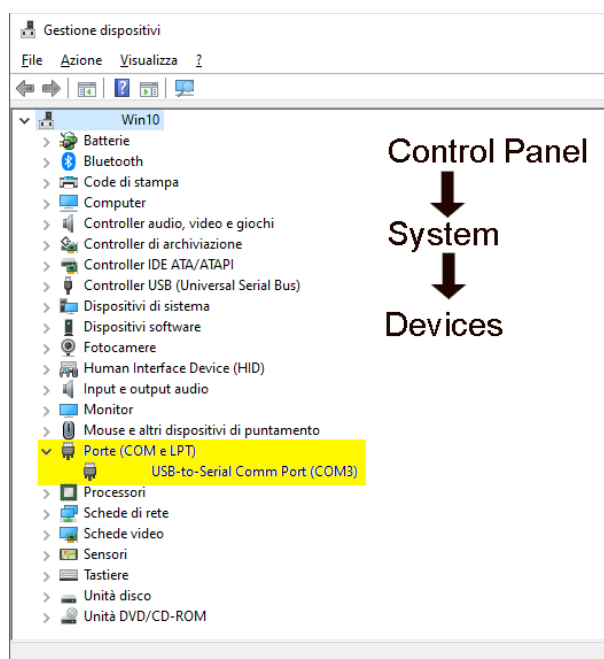
Below is explained how to take the Timecode, through the reliable system based on RS422.


The personal computer on which it is installed **TC Grabber FDA**, it must be equipped with an RS422 serial port or alternatively also with a simple external USB - RS422 adapter, easily available on the market.

Before proceeding with the software configuration, it is necessary to check that the serial port is available and working; above all it is advisable to read the number assigned to the device by the operating system.

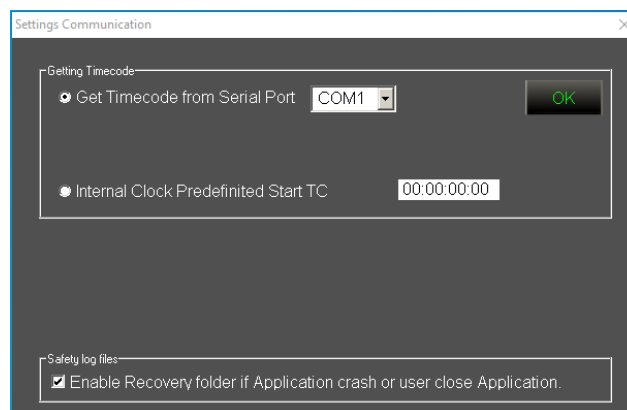
To check the serial interface open the **Control Panel** and select **System**.


Choose **Device management** and on the list of peripherals read the COM number.



As soon as verified the Serial Comm Port start **TC Grabber FDA** and press button  .

In the window **Settings Communication** select Get Timecode from Serial Port and set the COM to use.



This window also contains the Enable Recovery Folder function which must be enabled if you want to use the feature  .

## RS422 wiring diagrams

In this first scheme **TC Grabber FDA** it is connected to capture timecode from a single recorder affected by LTC or VITC.

**TC Grabber FDA** it works as a slave, as only pins 2 and 7 are connected, which only affect the receiver of the RS422 port and it is not he who sends the CURRENT TIME SENSE.

Operation is guaranteed by the presence of the Controller, which can be a remote control device, or a video mixer equipped with control for RS422 recorders or even an advanced controller equipped with different protocols.

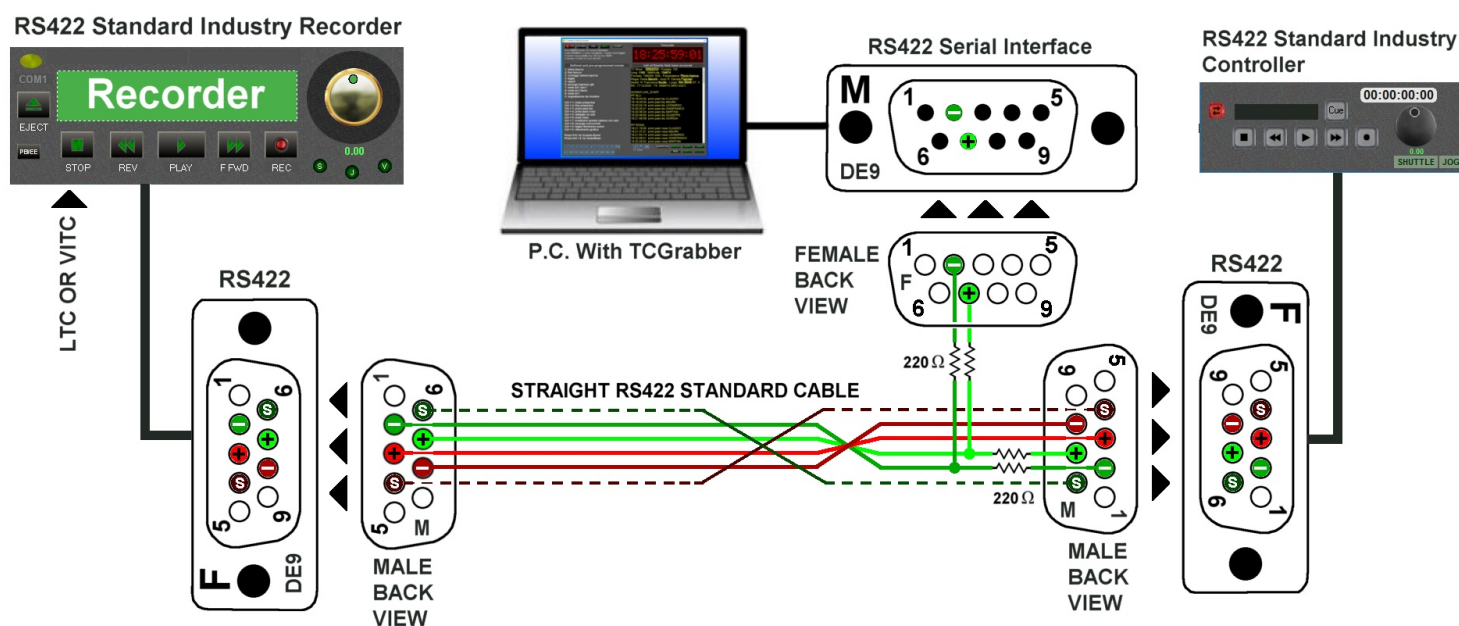
In fact, in this type of configuration, the Controller cyclically sends a request to the recorder to obtain the Timecode value, through transmission, through pins 3 and 8 of the CURRENT TIME SENSE instruction, which is followed by the STATUS SENSE response.

The Controller also receives the requested information via the  $220\Omega$  resistors, exactly as **TC Grabber FDA**, and synchronize the timecode on the display.

It is very important to know that if the recorder does not receive a CURRENT TIME SENSE request from the controller, it cannot respond with the Timecode value.

All controllers send this type of request because, in order to function correctly, they must continuously know the timecode.

### CONNECTION DIAGRAM FOR A RECORDER AND A CONTROLLER



Pin	Signal	Controller or PC	Device
1	Frame Ground	Frame Ground	Frame Ground
2	Receive A -	Transmit A -	Transmit A -
3	Transmit B +	Receive B +	Receive B +
4	Transmit Common	Receive Common	Receive Common
5			
6	Receive Common	Transmit Common	Transmit Common
7	Receive B +	Transmit B +	Transmit B +
8	Transmit A -	Receive A -	Receive A -
9	Frame Ground	Frame Ground	Frame Ground

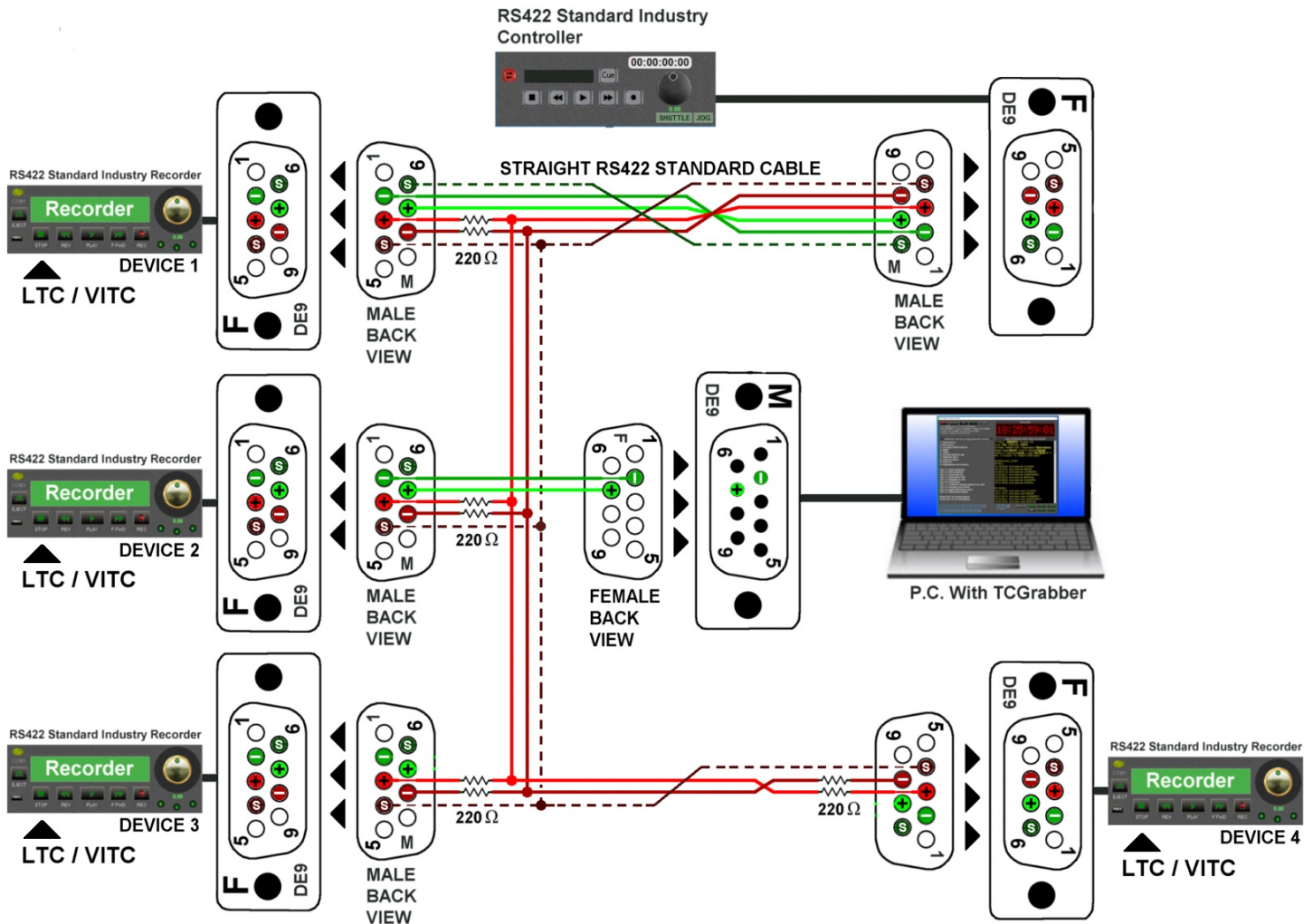
The figure on the side describes the signals involving the RS422 interface.

Recall that the RS422 interface works with two pairs of conductors (One TX 3-8 and the other RX 2-7).

The conductors drawn with a dashed line represent the possible shield of the pairs (pin 4 for the pair 3-8 and pin 6 for the pair 2-7) (shielded pairs).

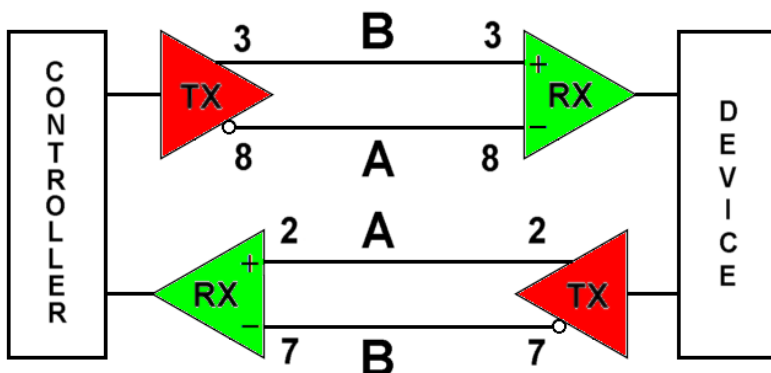
These conductors, i.e. those connected on pins 4 and 6, are not mandatory and may not be wired, especially if you operate with distances less than 40 meters.

## CONNECTION DIAGRAM FOR FOUR RECORDERS AND ONE CONTROLLER



Also in this case, since there is a remote control controller, the software transmission pins will not be wired **TC Grabber FDA** (pin 3-8) since the controller already sends the sequence of bytes CURRENT TIME SENSE.

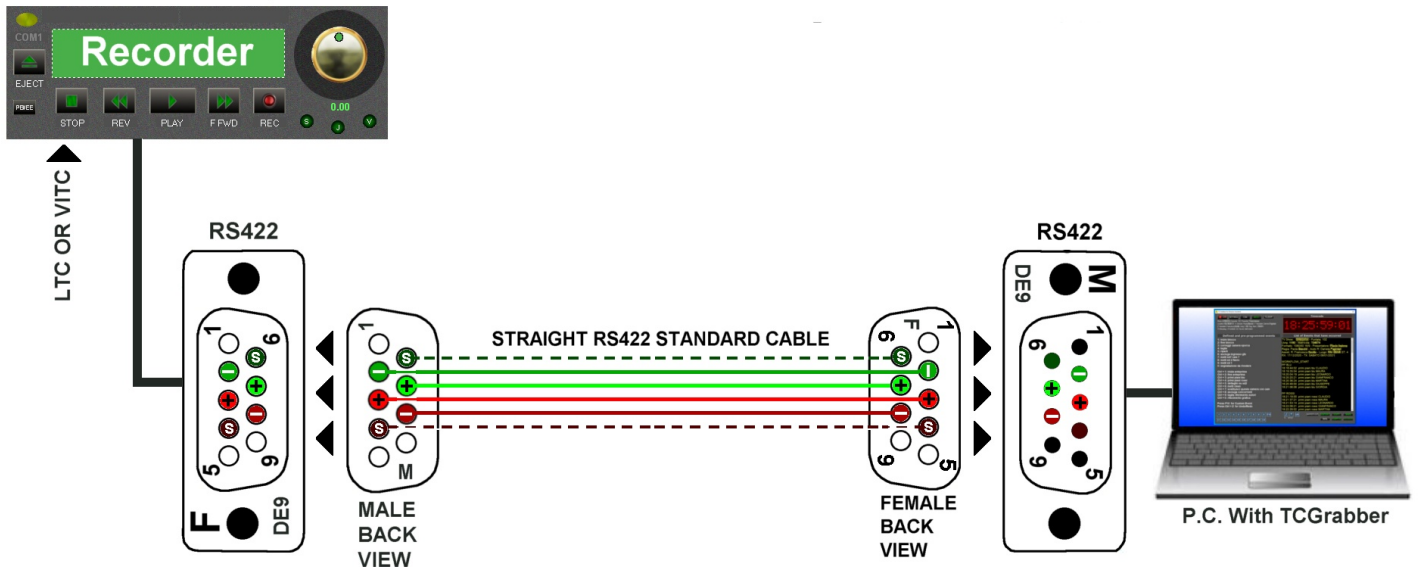
This scheme can also be used to control multiple recorders with a single serial port. It is not recommended to exceed a maximum of 8 recorders using this method.



Principle diagram of RS422 with differential line drivers and receivers. The differential voltage, on balanced lines, is typically between + 5 and - 5 V. Maximum range, using twisted pairs, equipped with good quality shielding, can guarantee distances of up to 800 m.

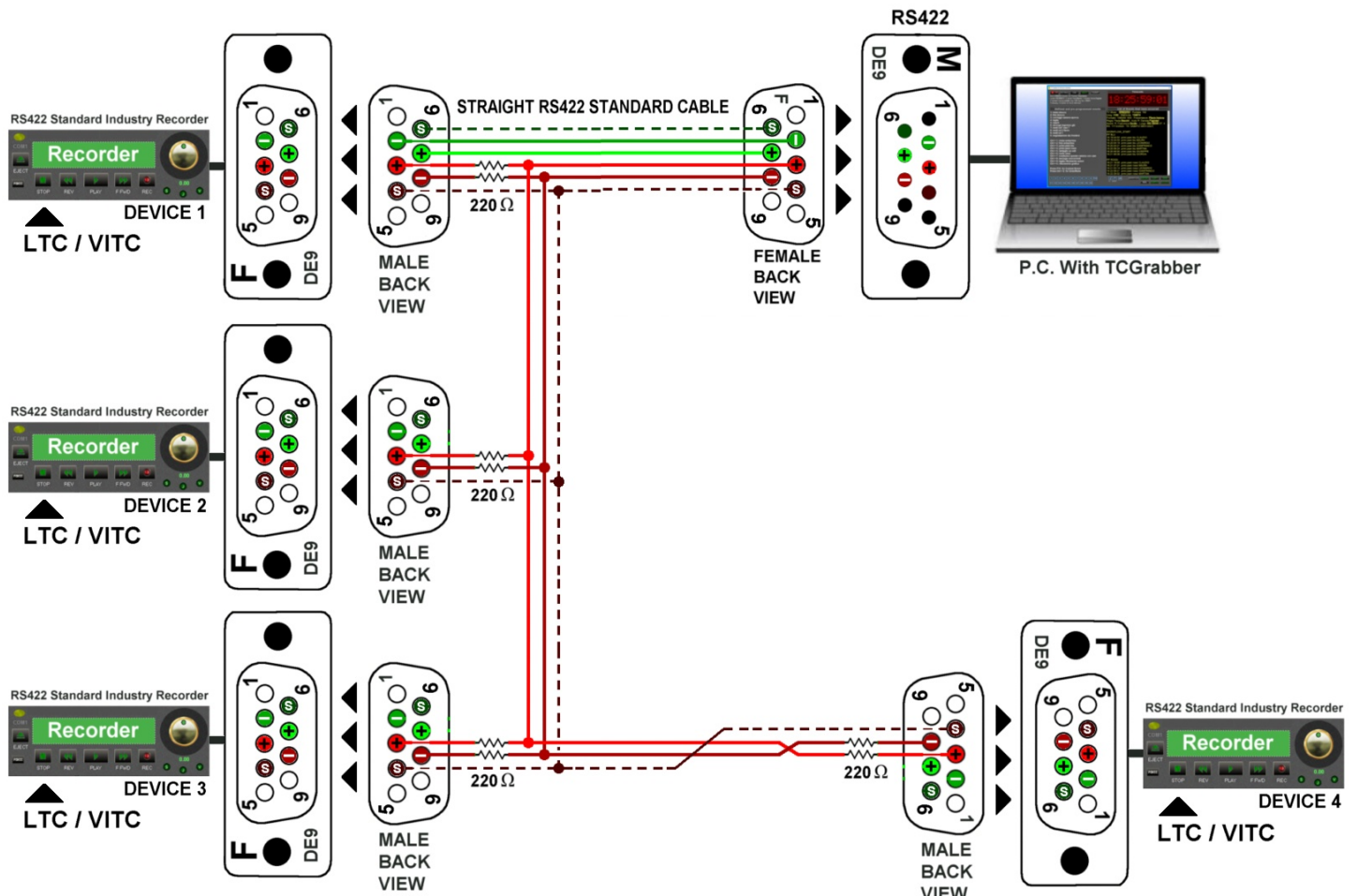
## WIRING DIAGRAM FOR A RECORDER WITHOUT CONTROLLER

RS422 Standard Industry Recorder



In these diagrams is **TC Grabber FDA** to send the sequence of bytes CURRENT TIME SENSE to obtain the reading of the Timecode. This instruction is always present on pins 3-8 of the comm port, when **TC Grabber FDA** is running and the button **ON** is active (master configuration).

## CONNECTION DIAGRAM FOR FOUR RECORDERS WITHOUT CONTROLLER



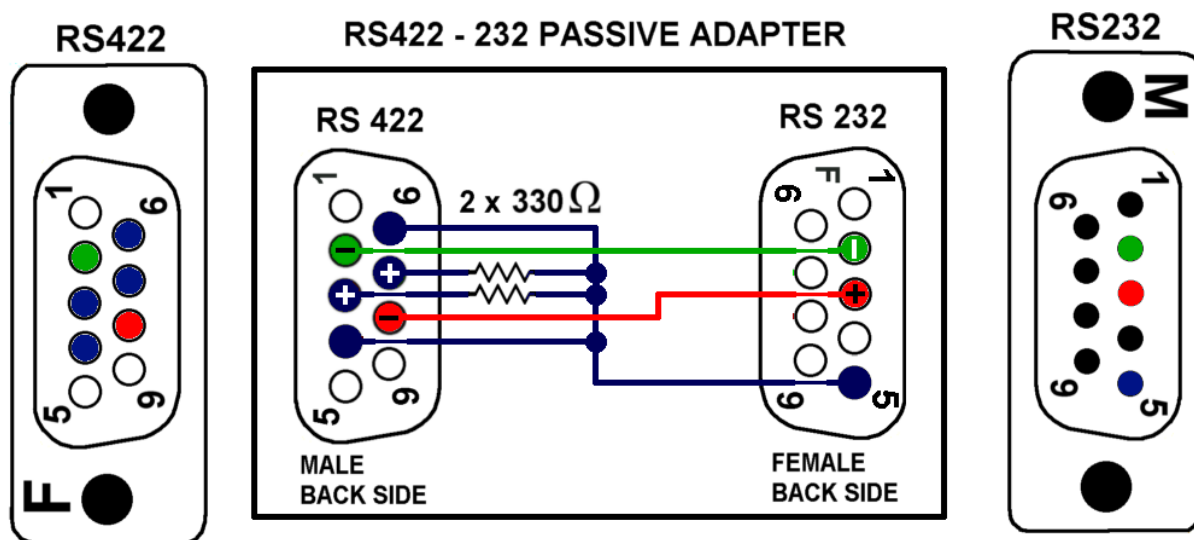


## PASSIVE RS 232 - RS 422 ADAPTER

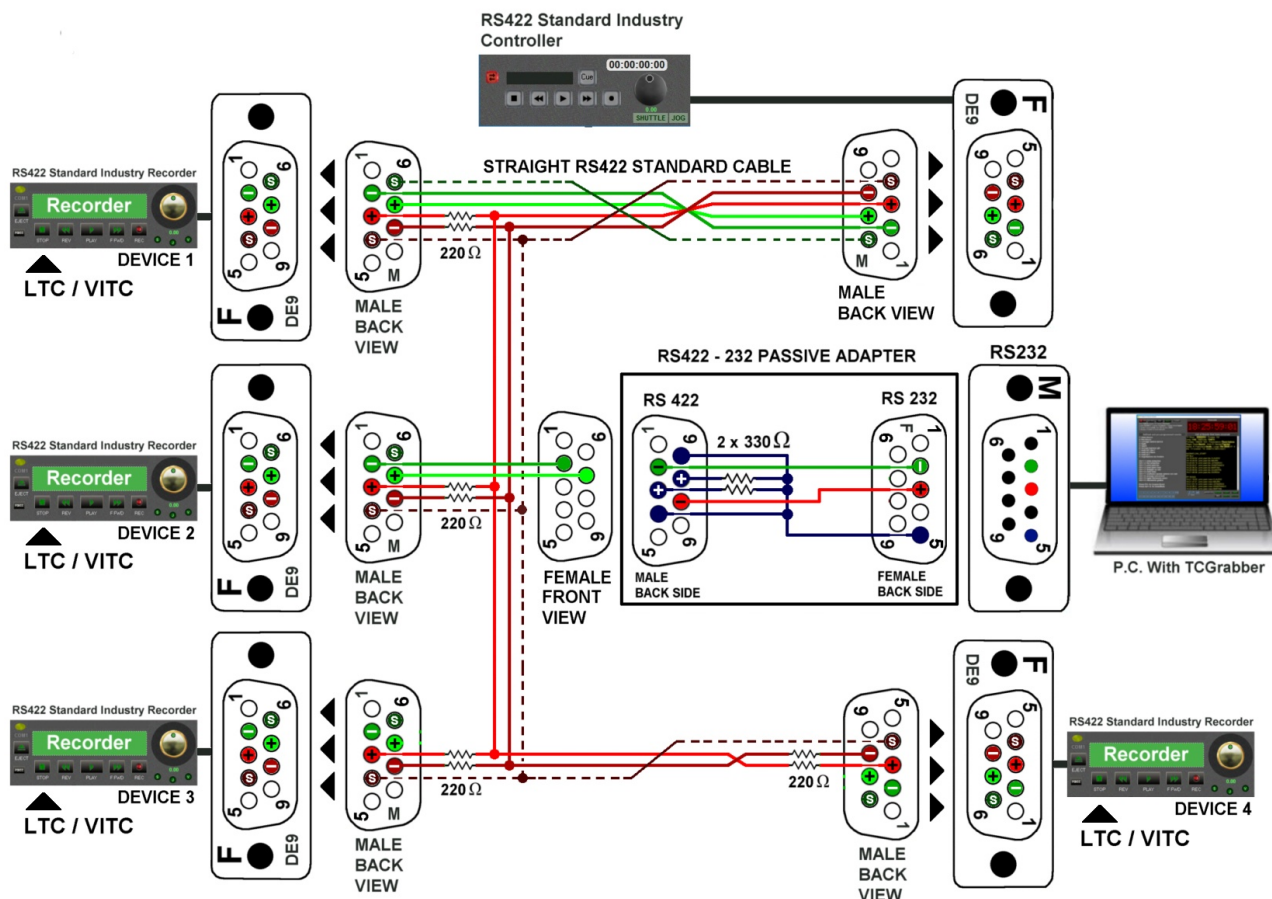
Although it is preferable to use an RS422 serial interface, to connect a remote control system it is possible, for short distances, to use the more common RS232 interface through the passive adapter described in the diagram below.

This solution can be used for distances not exceeding 25 - 30 meters, to connect the computer with **TC Grabber FDA** installed.

Caution: The adapter must always be installed near the computer where **TC Grabber FDA** is installed.



## ADAPTER USED WITH FOUR RECORDERS AND ONE CONTROLLER



## Timecode capture via NTP Server

From version 1.3 the Timecode synchronization can also be carried out by sending requests for the exact time to an NTP (Network Time Protocol) Server that can be present in a local LAN network or come from an external Server, among the many available on the world wide web.

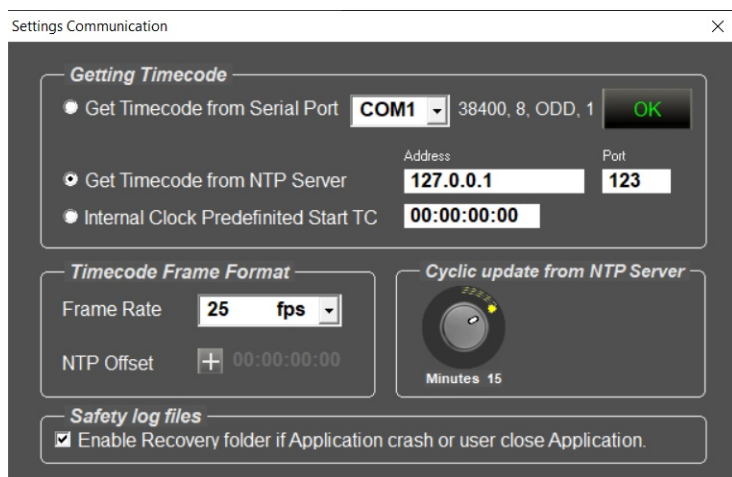
Select "**Get Timecode from NTP Server**" and enter, in the Address field, the IP address of the pointed Server and the required port, for NTP, is usually 123.

Alternatively, in the address field, you can also enter an address in literary form (such as: servername.com) to obtain synchronization, cause work by DNS support.

In the world there are many NTP Servers and doing a search it is possible to find many.

Synchronization, via NTP, is very simple and fast and does not require any additional wiring.

Just be connected to the internet or be connected to a local Server with NTP.



In the Settings Communication window, in addition to defining the address for the Server, it is possible to define a positive or negative offset in Hours, Minutes, Seconds and Frames, via NTP Offset.

The added possibility of using a time offset allows you to align the software for those mixed configurations where, in a shooting situation, different synchronization systems, such as LTC and NTP, can coexist, for example, which affect the registration.

A knob control in the "**Cyclic update from NTP Server**" area allows you to set how often TCGrabber FDA sends a time update request to the Server, which can be adjusted in the interval between 0 and 90 minutes.