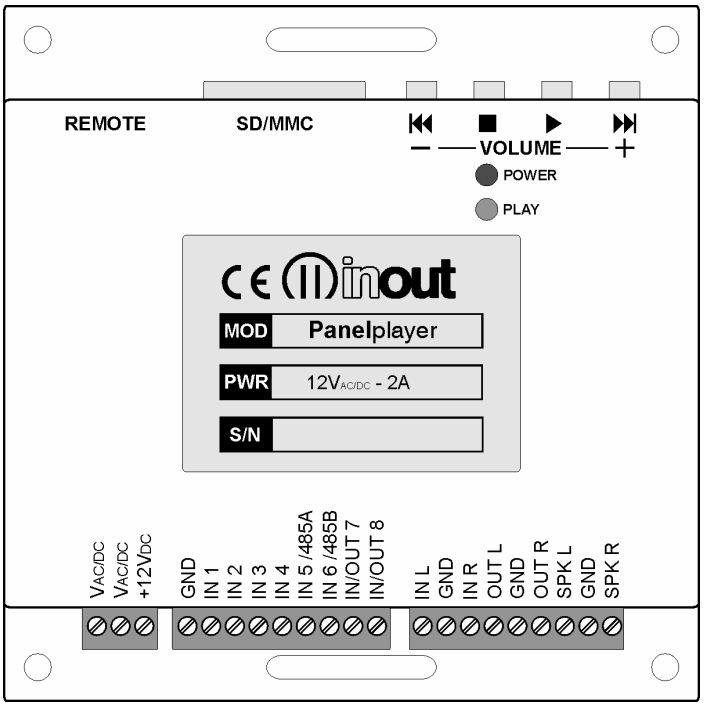
USER MANUAL



Version 1.1

Panelplayer

Warranty

Panelplayer has a 24 month warranty on the electronic parts, running from the date of purchase. The warranty will not be valid in case of tampering with the device or in case personnel not authorised by the manufacturer or by the authorised dealer should carry out work on it.
N.B. responsibility of the purchaser: in case of operation under warranty, the device must be packaged so as to prevent damage during transport and shipped to the manufacturer together with all the accessories.

Warranty rules

1. In order to exercise his warranty rights, the purchaser must enclose with the device a copy of evidence of purchase duly stamped by the dealer (bill/invoice).

2. The warranty lasts for 24 months for the electronic parts. The warranty is granted at the point of sale or else directly requested from the manufacturer.

3. The warranty only covers damage to the product which makes it work badly.

4. Work under warranty will only mean repairing or replacing, free of charge, any parts acknowledged to be defective during manufacture or in their material, including labour costs.

5. The warranty does not apply to damage caused by negligence or failure to comply with the instructions, or damage caused by unauthorised people, with a special reference to the outside parts.

6. Also, the warranty does not apply to damage caused to the device by connection to unsuitable power sources.

7. The warranty does not cover parts subject to wear after use, or the container if the material is not defective.

8. The warranty does not include transport costs, which will be paid for by the purchaser in relation to the manner and time of transport.

9. The warranty will run out after 24 months have elapsed. In this case, service will be provided charging for the parts replaced, labour costs and transport according to the current rates.

10. Any dispute will be settled exclusively before the Court of Law of Venice.

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1 Introduction

1.1 What is Panelplayer?

Panelplayer is a sophisticated amplified player of audio MP3 with a solid state memory, designed to manage sequences of audio messages, musical items, commercial communications and all kinds of audio MP3 files in a rapid, effective and interactive way.
Coupled with switches, touch-sensors or infrared movement sensors, it permits one to create info-interactive areas, didactic and museum routes, information totems for trade fairs and expositions, musical shows and interactive points for commercial promotions.

1.2 What is Mp3?

Mp3 is an acronym for Mpeg-1 layer 3. This is an audio compression standard which eliminates sounds which the human ear cannot hear via a psycho-acoustic algorithm. The purpose of this compression is to reduce the space taken up by an audio file while still ensuring excellent quality. The greater the compression, the less the audio quality. The right compromise, which guarantees a quality comparable to that of a Compact Disc, is 128 Kbps (thousands of bits per second) which represents the most widely used manner, and reduces the size of an uncompressed file by 10 times.

1.3 Encoder

Software which compresses a CD audio or wave file in MP3. There are many programmes of this kind, and it is virtually impossible to say which is the best. Here is an internet site where you can download freeware software suitable for various operating systems: ***www.mp3server.4t.com***

1.4 Decoder

Software which decompresses an MP3 audio file in order to send it to a digital-analog converter and reconstruct the original audio signal.

1.5 Player

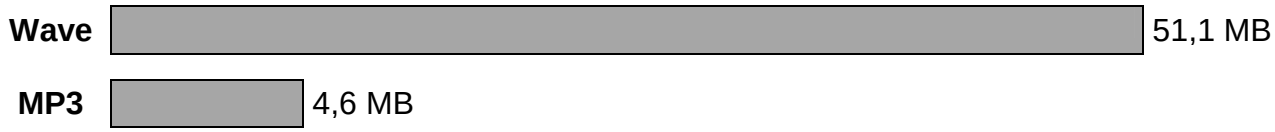
Hardware and software system able to read MP3 audio files. Panelplayer is able to carry out this function.

1.6 Wave

High quality audio format (extension .wav), compatible with the tracks of normal music CD's. If one uses a wave file in format 44.1 KHz/sec. at 16 bit in stereo, one will get exactly the same quality as a music CD, but the size of the file is about 10Mb per minute.

1.7 Audio compression in various formats.

The following graphic shows the space taken up by an uncompressed audio file of about 5 minutes (.wav) and compressed in MP3 at 128Kbps (MP3).



2 Installation

2.1 Content of the kit Panelplayer

- n°1 Panelplayer device;
- n°1 Panelplayer user manual;
- n°1 flash memory.

2.2 Notices

1. Panelplayer has been designed and made to work only with the following mains power supply: 12÷15VAC, 12÷24VDC.
2. The device must be serviced only by qualified staff.
3. Do not put objects inside the device through the openings, in order to prevent the risk of fire or shock.
4. Disconnect the device from the power socket before cleaning. Clean the device using a soft, dry cloth. Do not use liquids or spray which can contain flammable substances.

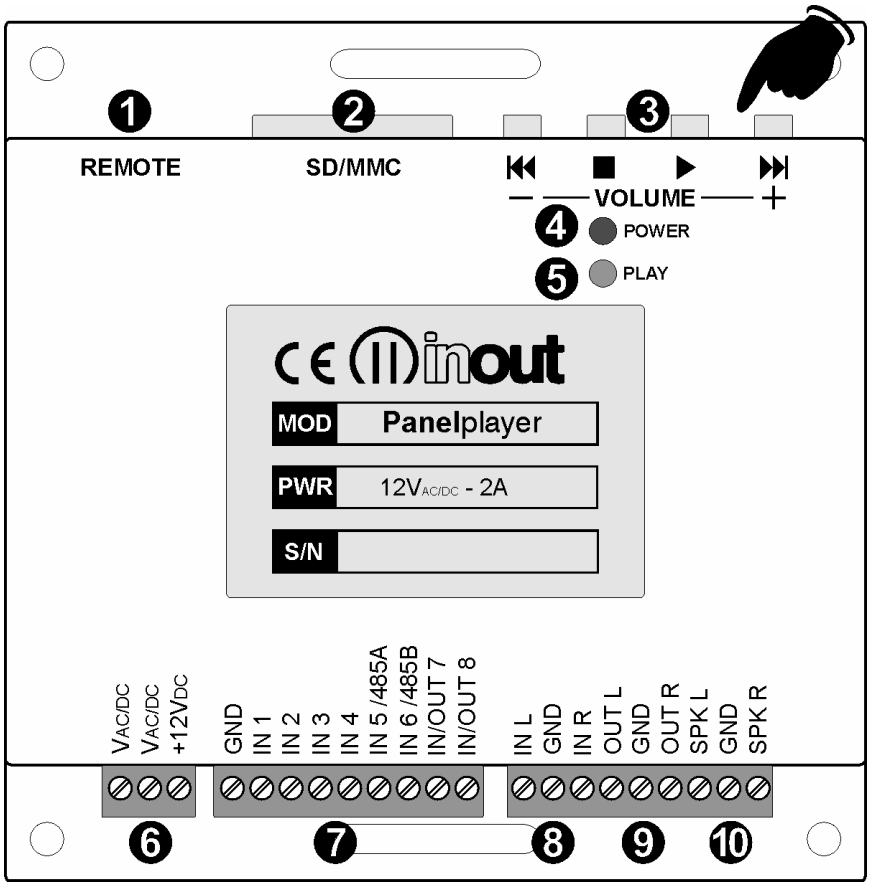
3 Description and connections

3.1 Command description

1 -	Connector for outside connection of the memory and command buttons.
2 -	Flash memory introduction slot for Secure Digital or MultiMedia Card.
3 -	Command keys: ⏮ = (brief pressure) precedent MP3 file / (prolonged pressure) reduce output volume ■ = STOP ⏵ = PLAY ⏭ = (brief pressure) next MP3 file / (prolonged pressure) increase output volume
4 -	Red LED: lit = device is live.
5 -	Green LED: lit = MP3 file playing; blinking = Panelplayer in pause/STOP.

IMPORTANT:

- volume control with the keys is active only during the playing of the MP3 file.
- pressing STOP during play, Panelplayer remains in pause excluding all the logical inputs until reactivation with the PLAY key. This condition is indicated by the blinking green LED.



3.2 Connection description

6 -	**VAC/DC**	Input feed 12÷15VAC or 12÷24VDC.
6 -	**+12VDC**	Auxiliary + 12Vdc voltage, available for input activation or outside feed sensors. MAX. 100mA.
7 -	**GND**	Ground for input activation using outside contacts; auxiliary ground voltage.
7 -	**IN1**	Multi-function input for activating 1.mp3 file or 1.m3u playlist (direct or bit 0 in binary combination).
7 -	**IN2**	Multi-function input for activating 2.mp3 file or 2.m3u playlist (direct or bit 1 in binary combination).
7 -	**IN3**	Multi-function input for activating 4.mp3 file or 3.m3u playlist (direct or bit 2 in binary combination).
7 -	**IN4**	Multi-function input for activating 8.mp3 file or 4.m3u playlist (direct or bit 3 in binary combination).
7 -	**IN5/485A**	Multi-function input for activating 16.mp3 file or 5.m3u playlist (direct or bit 4 in binary combination). Configurable for serial RS485 communication (see chap. 9).
7 -	**IN6/485B**	Multi-function input for activating 32.mp3 file or 6.m3u playlist (direct or bit 5 in binary combination). Configurable for serial RS485 communication (see chap. 9).
7 -	**IN/OUT7**	Multi-function input/output for activating 64.mp3 file or 7.m3u playlist (direct or bit 6 in binary combination).
7 -	**IN/OUT8**	Multi-function input/output for activating 128.mp3 file (direct or bit 7 in binary combination). Configurable for outside applications. 0=standby 1=in play (+12V). Permits two Panelplayers to be connected in cascade for the synchronised management of the musical bases and commercials and spots in a scheduled time frame (connection Vlink, par. 8.1).
8 -	**IN L**	Pre-amplified audio input L channel, for outside music sources (SAT, DAB, CDE, etc.) with Mixer function.
8 -	**GND**	Ground signal of pre-amplified audio input.
8 -	**IN R**	Pre-amplified audio input R channel, for outside music sources (SAT, DAB, CD, etc.) with Mixer function.
9 -	**OUT L**	Pre-amplified audio output L channel.
9 -	**GND**	Ground signal of pre-amplified audio output.
9 -	**OUT R**	Pre-amplified audio output R channel.
10 -	**SPK L**	Amplified 20W audio output for speaker, L channel.
10 -	**GND**	Ground signal of amplified audio output.
10 -	**SPK R**	Amplified 20W audio output for speaker, R channel.

3.3 Power supply

Panelplayer may operate with the following voltage power supplies: 12÷15VAC, 12÷24VDC.
It is recommended to use the mains adaptor furnished with the device. The red POWER LED lights up when it is turned on with active feed.

3.4 Logical inputs

Panelplayer has six/eight multi-function logical inputs to control the playing of the playlists or direct calling up of individual audio files.
The pins are:

1- GND
2- IN 1
3- IN 2
4- IN 3
5- IN 4
6- IN 5
7- IN 6
8- IN 7
9- IN 8

In order to activate the playing of a file, connect the desired GND input (or the desired inputs when one is operating in binary logic).

3.5 IN/OUT 8 - input/output Vlink

Programmable input/output to connect two Panelplayers in cascade, for synchronised management of musical playlists with commercials at scheduled introduction without interruptions.
Vlink: 0 = standby
1 = in play (+12V).

3.6 Serial RS485 connection

Panelplayer can be connected through serial gate, to a RS485 bus that can be controlled by a system master or by a computer. To enable the RS485 gate (pin IN5/485A and IN6/485B), raise the cover of the device and move the relative jumpers (see para. 9.1).

3.7 Pre-amplified audio input

Pre-amplified STEREO L+R audio input for outside music source (SAT, DAB, CD, etc.) with Mixer function to mix a music source with scheduled commercials; extractable terminal strip.

3.8 Pre-amplified audio output

Pre-amplified STEREO L+R audio output on extractable terminal strip.

3.9 Amplified audio output

Amplified STEREO 20W+20W audio output on extractable terminal strip.
Connect the outside 4/8Ω speakers to the **SPK L/GND** and **SPK R/GND** terminal strip**.**
Important! Use a speaker with equal or greater power to that supplied to the amplifier within Panelplayer.
It is recommended to cable the device far from power cables; the two cables that connect the speaker with Panelplayer could be a potential source of interference.

4 Configuration file

4.1 What is the configuration file?

Panelplayer is a very versatile device which can be adapted to the needs of the application in which it is used. Different applications may require adjustment of volume, tone, loudness, special parameters of communication or timing. The text file, called 'configuration file' and stored in the main directory of the flash memory, together with the audio files, makes it possible to programme the various parameters of Panelplayer.
This file must be assigned the name *config.txt* (this extension has been used so it can be modified by any text editor, including those for portable PocketPC terminals).

4.2 Content of the configuration file

Each line of the configuration file consists of:

- Mnemonic code of the parameter to be set. It always consists of four **CAPITAL** alphanumeric characters, and must always be at the beginning of the line. No more than one parameter is permitted on the same line.
- Separating character. **'='**. This **MUST** be inserted just after the mnemonic code, without any spacing or tabulation character.
- The relevant numerical parameter expressed as a **decimal**, to be inserted directly after the separation character, without any spacing or tabulation character.

Example:

```
LMP3=14
LOUT=14
LLIN=14
LLI2=5
LLOU=10
LTRE=10
LBAS=10
MOMD=0
```

4.3 How it is managed by Panelplayer

At the time the device is turned on, or when the flash memory is inserted, Panelplayer will start to read the main directory of the memory; once it has found the file *config.txt*, it interprets the parameters inserted in each line, memorising them permanently in its internal memory, of a non volatile kind. The parameters therefore stay in memory even after the device has been turned off. This is why it is not indispensable for the configuration file to be always present in the flash memory: once all the parameters have been acquired, this file can also be deleted.
NOTE: If it is necessary to configure various Panelplayers with the same parameters, one can prepare a single flash memory with the appropriate *config.txt* file, alternately insert this memory on all the modules to be configured, then insert the memory with the audio files only.

4.4 Preparing the file

To create the file, one can use an ordinary text editor (like Windows Notebook). The file must be saved as a pure text file (**.txt**). Should other programmes be used (e.g. Microsoft Word) one must be careful to save the document as **"text only"**: otherwise, control characters would be inserted which would make it impossible for Panelplayer to interpret this file.

4.5 Memorising the files in the flash memory

The configuration file and all the MP3 audio files can be memorised in the flash memory via a special USB reader/writer for PC.

4.6 Audio adjustment parameters

Panelplayer allows for the following audio adjustments:

- Independent adjustments of the MP3 file level, INL/INR music source input and general amplified/pre-amplified output.
- Adjustment of loudness level.
- Separate adjustment of high and low levels.
- Adjusting the level of the musical background while delivering the spots.
- Activation/deactivation audio amplifier muting in output.

The following tables show the relation between the value set in the configuration file and the actual value of the audio parameter.

Mnemonic	*Description*
LMP3	MP3 decoder output level (value between 0 and 20 in decimal).
LOUT	Level audio output LINE OUTPUT (value between 0 and 20 in decimal).
LLIN	Input level LINE INPUT (value between 0 and 20 in decimal).
LLI2	Background level LINE INPUT (value between 0 and 20 in decimal).
LLOU	Loudness level (value between 0 and 20 in decimal).
LTRE	High tone level (value between 0 and 20 in decimal).
LBAS	Low tone level (value between 0 and 20 in decimal).
MOMD	Mode output muting deactivation (0=OFF/1=ON).

LMP3 (MP3 decoder output level)

Value	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Level	OFF	2%	5%	9%	14%	20%	26%	33%	40%	48%	56%	66%	77%	88%	100% 0dB	112%	128%	144%	161%	178%	200% +6dB

LOUT (general output amplified/pre-amplified level)

Value	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Level	OFF	-55 dB	-35 dB	-28 dB	-23 dB	-20 dB	-17 dB	-14 dB	-12 dB	-10 dB	-8 dB	-6 dB	-4 dB	-2 dB	0 dB	+2 dB	+4 dB	+6 dB	+8 dB	+10 dB	+12 dB

LLIN (input level INL/INR)

Value	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Level	OFF	-55 dB	-35 dB	-28 dB	-23 dB	-20 dB	-17 dB	-14 dB	-12 dB	-10 dB	-8 dB	-6 dB	-4 dB	-2 dB	0 dB	+2 dB	+4 dB	+6 dB	+8 dB	+10 dB	+12 dB

LLI2 (input level INL/INR of the background during the playing of the MP3 file)

Value	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Level	OFF	-55 dB	-35 dB	-28 dB	-23 dB	-20 dB	-17 dB	-14 dB	-12 dB	-10 dB	-8 dB	-6 dB	-4 dB	-2 dB	0 dB	+2 dB	+4 dB	+6 dB	+8 dB	+10 dB	+12 dB

LLOU (loudness level)

Value	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Level	0 dB	+0,5 dB	+ 1 dB	+1,5 dB	+ 2 dB	+2,5 dB	+ 3 dB	+ 4 dB	+ 5 dB	+ 6 dB	+ 7 dB	+ 8 dB	+ 9 dB	+ 10 dB	+11 dB	+ 12 dB	+ 13 dB	+ 14 dB	+ 15 dB	+ 16 dB	+ 17 dB

LTRE (high tone level)																				
Value	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***	***18***	***19***	***20***
Level	-12 dB	-10 dB	-8 dB	-7 dB	-6 dB	-5 dB	-4 dB	-3 dB	-2 dB	-1 dB	0 dB	+ 1 dB	+ 2 dB	+ 3 dB	+ 4 dB	+ 5 dB	+6 dB	+7 dB	+8 dB	+10 dB	+12 dB

LBAS (low tone level)																				
Value	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***	***18***	***19***	***20***
Level	-12 dB	-10 dB	-8 dB	-7 dB	-6 dB	-5 dB	-4 dB	-3 dB	-2 dB	-1 dB	0 dB	+ 1 dB	+ 2 dB	+ 3 dB	+ 4 dB	+ 5 dB	+6 dB	+7 dB	+8 dB	+10 dB	+12 dB

MOMD (Mode Output Muting Disable)	
MOMD	1 = Muting deactivated (amplifier power always active). 0 = Muting active. The power amplifier is active only during the playing of the MP3 files.

4.7 Timing and switchover parameters

One can set the fade-off time, the reaction time of the automatic output volume and the advance time for starting the spot before the end of the piece of music.

Example:
```
TFOU=15
TFIN=15
TAVC=3
TADU=15
```

Mnemonic	***Description of timing parameter***
TFOU	Setting the Fade-Out time in 1/10 of one second (value between 1 and 30 in decimal).
TFIN	Setting the Fade-In time in 1/10 of one second (value between 1 and 30 in decimal).
TAVC	Setting the reaction time of the automatic output volume control.
TADU	Setting the advance Play time of the spot in 1/10 of one second between Panelplayers in cascade (value between 0 and 20 in decimal).

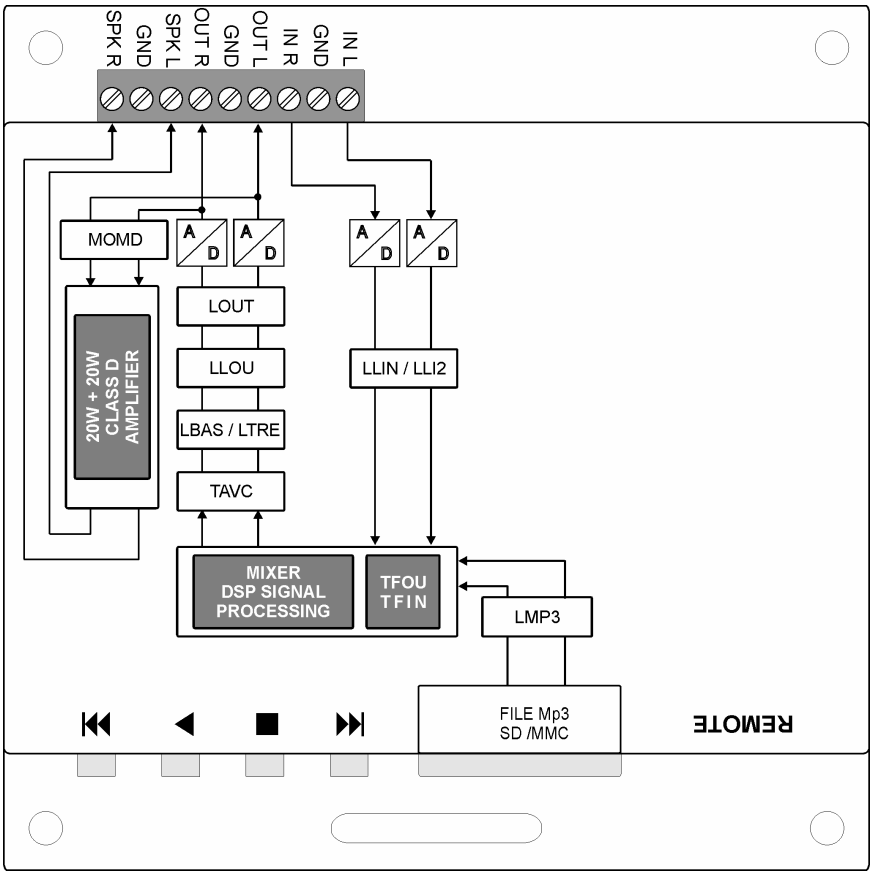
TFOU (fade OUT): setting the fading time of the INL/INR before playing the MP3 file (*spot*).													
Value	***1***	***2....4***	***5***	***6....9***	***10***	***11...14***	***15***	***16...19***	***20***	***21...24***	***25***	***26...29***	***30***
Time	1/10 second		½ second		1 second		1,5 seconds		2 seconds		2,5 seconds		3 seconds

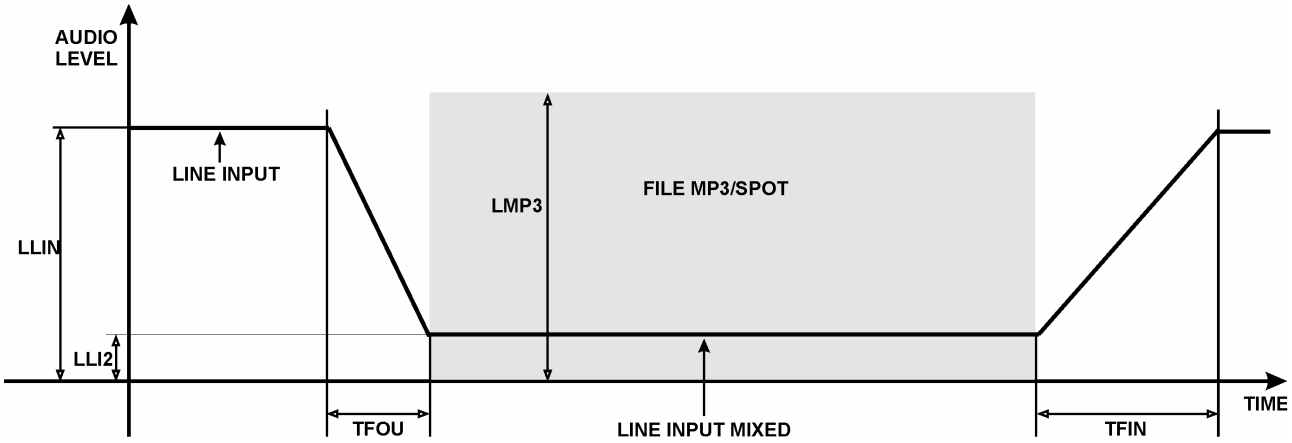
TFIN (fade IN): setting the fading time of the INR/INL after playing the MP3 file (*spot*).													
Value	***1***	***2....4***	***5***	***6....9***	***10***	***11...14***	***15***	***16...19***	***20***	***21...24***	***25***	***26...29***	***30***
Time	1/10 second		½ second		1 second		1,5 seconds		2 seconds		2,5 seconds		3 seconds

TAVC: Setting the reaction time of the automatic output volume control.					
Value	***0***	***1***	***2***	***3***	***4***
Time	OFF	2/10 second	2 seconds	4 seconds	8 seconds

TADU: Setting the advance Play time of the spot in 1/10 second between Panelplayers in cascade.													
Value	***1***	***2....4***	***5***	***6....9***	***10***	***11...14***	***15***	***16...19***	***20***	***21...24***	***25***	***26...29***	***30***
Time	1/10 second		½ second		1 second		1,5 seconds		2 seconds		2,5 seconds		3 seconds

4.8 Diagram of the operating parameters





4.9 Input management parameters

The playing of the files takes place by activating the available logical inputs, the activation modes are set through the IMOD, TPCM MICP and MIRS parameters inserted in the configuration files.

Example:
```
IMOD=0
TPCM=10
MICP=1
MIRS=0
```

Mnemonic	*Description of timing parameter*
IMOD	Setting the mode of input active high or active low.
TPCM	Setting the persistence time of the input command (time to wait before Panelplayer is able to interpret the input command) expressed in decimals of milliseconds (value between 0 and 255 in decimal).
MICP	Setting **M**ode **I**nput **C**ontinuous **P**lay
MIRS	Setting **M**ode **I**nput **R**e**S**tart

IMOD (Input management mode)	
IMOD	0= active-low input mode; the functioning of the input is connected to the ground/GND of the device. 1= active-high input mode; the functioning of the input is applied with a positive voltage between 5 and 12Vdc.

TPCM (Time persistence input command mode)		
TPCM	0 =no delay 1 =10mSeconds 2 =20mSeconds	100= 1 second 200= 2 seconds 250= 2,5 seconds

MICP (Mode Input Continuous Play)	
MICP	0=having terminated the playing of the codified file, requested from the input code, Panelplayer goes in standby. 1=the requested codified file is continuously played until the relevant input code is inserted.

MIRS (Mode input Restart)	
MIRS	0=repeated activation or deactivating of the same input code does not influence the playing of the relevant file. Only the activation of a different code can block the playing underway and activate the playing of the new requested file. 1=in the moment in which an input code is enabled the playing of the of the relevant file from its beginning takes place, even if it is already in play.

4.10 Infrared movement sensor management parameters

IMPORTANT: the following parameters are enabled exclusively for the IN1 input.

Example:
```
PYDT=1
PYDL=10
TAPL=0
RSPL=3
```

Mnemonic	*Description*
PYDT	Activation IR sensor (0=OFF/1=ON).
PYDL	Delay time between two activations of the IR sensor (value between 0 and 240 in decimal).
TAPL	Setting of the AUTOPLAY time for playing of a message when the IR sensor is not activated (value between 0 and 240 in decimal).
RSPL	Delay time of the Play message from the activation of the IR sensor (value between 0 and 20 in decimal).

PYDT (activation infrared movement sensor)	
PYDT	1 = IR sensor activated 0 = sensor deactivated

PYDL (pause between two activations of the IR sensor)

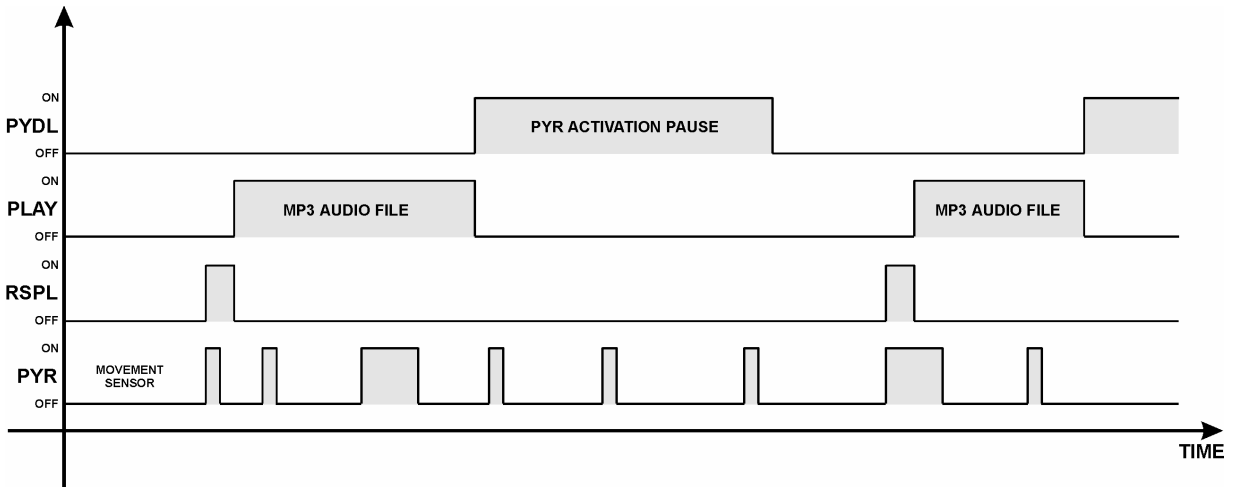
Value	*0*	*1*	*2*	*3*	*4*	*5*	*10*	*20*	*30*	*60*	*120*	*180*	*240*
Time	IR	1 second	2 seconds	3 seconds	4 seconds	5 seconds	10 seconds	20 seconds	30 seconds	1 minute	2 minutes	3 minutes	4 minutes

TAPL (setting AUTOPLAY time for playing files when the IR sensor is not activated)

Value	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*12*	*18*	*30*	*60*	*180*	*240*
Time	Not managed	10 seconds	20 seconds	30 seconds	40 seconds	50 seconds	1 minute	2 minutes	3 minutes	5 minutes	10 minutes	30 minutes	40 minutes

RSPL (delay time of the Play message from the activation of the IR sensor)

Value	*1*	*2....4*	*5*	*6....9*	*10*	*11...14*	*15*	*16...19*	*20*	*21...24*	*25*	*26...49*	*50*
Time	1/10 second		½ second		1 second		1,5 seconds		2 seconds		2,5 seconds		5 seconds



5 Scheduled operation

5.1 Introduction to timed operation

When the flash memory is inserted, Panelplayer will analyse its contents and – depending on the files which are present – will automatically set the mode of operation.
In the presence of the PALIN.TXT file, Panelplayer plays the sequence of communiqués in a cyclical emission (one hour cycles) called PALIMPSEST which are contained in the same PALIN.TXT file.

5.2 The palimpsest file – palin.txt

With Panelplayer one can draw up a sequence or list of communiqués to be played according to pre-set intervals. This list is a simple text file (*palin.txt*) which contains the indication in minutes (00:00÷00:59) and the names of the MP3 files to be played.
There are a few simple rules on how to set the palimpsest; first of all, you must set the time.

Es: **00:10**

N.B. *It is very important to start a new line of text with this, and to separate the hours from the minutes using the character (:)*

On the same line, you must then introduce the names of the MP3 audio files (*max. 8 characters*). You can choose among various kinds of introduction:

1. separating character [Tab] between one spot and the next:

   E.g.: **00:10 spot01 spot02 spot03**

2. comma (,) between one spot and the next:

   E.g.: **00:10,spot01,spot02,spot03**

3. semicolon (;) between one spot and the next:

   E.g.: **00:10;spot01;spot02;spot03**

Once the insertion has been completed, the file will appear as in the following example:

00:00	Spot04	Spot07			
00:05	Spot09	Spot17			
00:10	Spot11	Spot02			
00:15	Spot01	Spot08	Spot03	Spot06	Spot05
00:20	Spot12	Spot03			
00:25	Spot16	Spot17			
00:30	Spot09	Spot10			
00:35	Spot05	Spot11	Spot12	Spot13	Spot14
00:40	Spot02	Spot11			
00:45	Spot04	Spot07			
00:50	Spot02	Spot11			
00:55	Spot09	Spot11			

Example of palin.txt file with cyclical emission at intervals of 5 minutes of commercial spots

An example of the reading and functioning of a timetable bar is provided below:

00:05	**Spot05**	**Spot11**	**Spot12**	**Spot13**	**Spot14**
00:11	**Spot01**	**Spot07**	**Spot03**		

In this case, Panelplayer remains in standby for 5 minutes from the moment it is turned on; at the 5th minute Panelplayer fades out the input audio signal in order to play the 00:05 bar, composed of 5 files/spots.
Once the bar has finished, Panelplayer brings the input audio signal to its precedent value and remains in standby until reaching the 11th minute, fading in the input audio to play the 00:10 bar, composed of 3 files/spots.

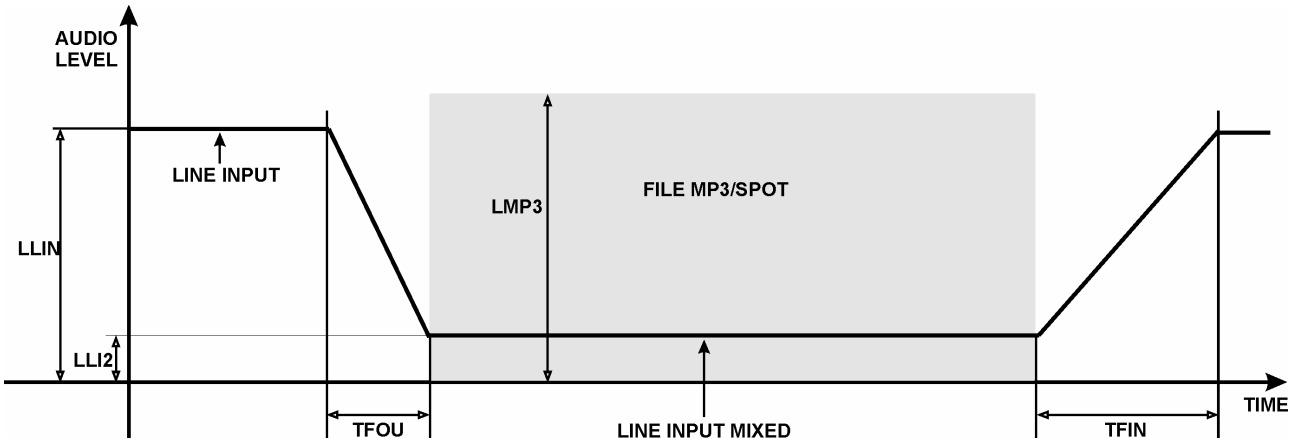
⚠ **IMPORTANT!** Using the pre-amplified audio input, verify the setting of the LLIN, LLI2 and MOMD parameters inserted in the configuration files *(par. 4.6).*

Programming limits:

Max. programming permitted……	1 hour (cyclic)	from 00:00 to 00:59
Max. quantity of hour bars……	60 bars	
Max. quantity of commercials per bar……...	8 spots/file	
Max. quantity of commercials per palimpsest……	500 spots/file	

5.3 MIXER function

Panelplayer has an audio input for connection to outside music sources, with a mixer function to mix this source with the files played by flash memory (see par. 8.3). At the time scheduled for delivering the advertising bar, Panelplayer fades out the input audio signal from the level **LLIN** to the level **LLI2**, according to a programmed fade **TFOU**. Then the MP3 file of the bar with level LMP3 is played, mixed with the outside audio source, present in the background with level **LLI2**.
Once the whole hour bar has been finished, Panelplayer brings the input audio signal back to the level **LLIN** according to a programmed fade **TFIN**.



5.4 AVC function – automatic control of the output volume

Panelplayer has an automatic control of the output volume (parameter **TAVC**, par. 4.7) which allows you to normalise the level of the audio contributions: signal from LINE IN (radio, CD, other Panelplayer).
This allows you to make less evident any differences of levels among the various MP3 files being played.

6 Playlist operation

6.1 Introduction to playlist mode operation

When the flash memory is introduced, Panelplayer analyses its content on the base of the presence of the relevant files, and automatically sets the following operation mode:

1. *FILE PLAYLIST:TXT:* audio player with pieces in sequence according to the list present in the files.
2. *FILE 1.M3U, 2.M3U, 3.M3U, 4.M3U, 5.M3U, 6.M3U, 7.M3U:* audio player of the sequence contained in the files depending on the logical input activated:
   1.m3u = IN 1 2.m3u = IN 2 3.m3u = IN 3 4.m3u = IN 4
   5.m3u = IN 5 6.m3u = IN 6 7.m3u = IN 7

During play the four command buttons REW, STOP, PLAY and FWD are activated.

6.2 What is a playlist file?

Panelplayer is able to follow a sequence or list of music pieces; this play list is a simple text file called *playlist.txt* which can be inserted in the main directory of the same memory containing the audio files (this extension is used so it can be modified via a handy PocketPC portable terminal).
Follow a few, easy rules to set the sequence:

Example with numbers:	1 3 7 9 5 01 005	Example with names:	intro part 1 part 2 monologu music part 3 finale

⚠ IMPORTANT:

- **Rename the MP3 audio files with numbers or names with max. 8 characters.**
- **Do not write in the extension (*.mp3)**
- **Max. 500 pieces per playlist**

Fit the memory into its seat and wait for Panelplayer to read the playlist in order to check the list of pieces contained.
At the end of the reading operation, if the names of the pieces have been fitted in correctly, Panelplayer will automatically start to play the musical items in the programmed sequence or it will await the activation of a logical input.

6.3 Playlist activation by logical inputs - MPLL (Mode PLayList) parameter

The seven available playlists, activated by the logical inputs, can be played with different modes, depending upon the varying needs.
To choose these different manners of operation, you must work directly on the configuration parameter **MPLL** (**M**ode **PL**ay**L**ist) inserted in the file *config.txt*.
When the flash memory is put in, Panelplayer, depending on the configuration of the parameter MPLL in the file *config.txt,* will switch over to the relevant manner of operation.

⚠ IMPORTANT:	• **the names of the 7 playlists are fixed** • **the loading times of the Playlists may last even tens of seconds, in the meantime, Panelplayer is not able to play.**

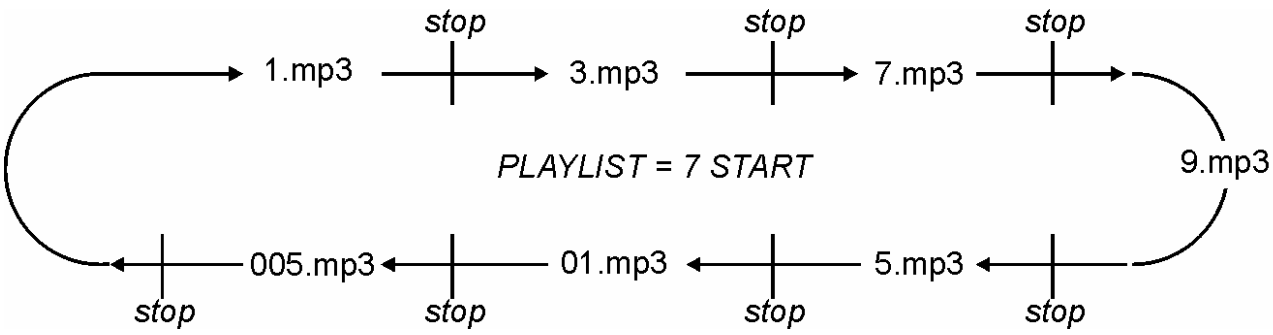
6.4 MPLL=10: Stop & Play Priority playlist

Operating mode:

- Activated the input, the relative item in the Playlist is played: at the end of it, Panelplayer goes in standby, awaiting a further activation. Activating the input once again or if the activation remains, the successive file is played.
- Repeated activations or deactivations of the same input or of other inputs does not influence the playing of the file.
- The position of the last item played is stored in memory, in order to start out again always by the next one in case of restart.
- The playlist is activated in loop, as long as the activation of the relative logical input remains activated.

INPUT		RELATIVE PLAYLIST
none	=	Standby
IN 1	=	1.m3u Playlist 1.m3u
IN 2	=	2.m3u Playlist 2.m3u
IN 3	=	3.m3u Playlist 3.m3u
IN 4	=	4.m3u Playlist 4.m3u
IN 5	=	5.m3u Playlist 5.m3u
IN 6	=	6.m3u Playlist 6.m3u
IN 7	=	7.m3u Playlist 7.m3u
IN 8	=	VLINK function

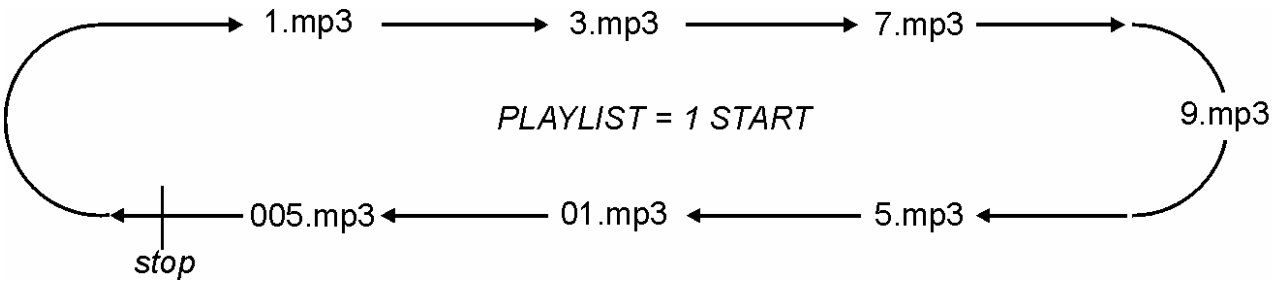
N.B. If several inputs are activated, the playlist relevant to the lowest input is activated. For example, if IN4 and IN5 are active, the playlist 4.m3u is played.



6.5 MPLL=11: Priority playlist

Operating mode:

- Activated the input, the relative item in the Playlist is played: at the end of it, Panelplayer goes in standby, awaiting a further activation.
- Repeated activations or disabling of the same input or of other inputs does not influence the playing of the file.
- The playlist is activated in loop, as long as the activation of the relative logical input remains activated.



6.6 MPLL=12: Stop & Play Standard playlist

Operating mode as MPLL=10 except:

- Repeated activations or deactivations of the same logical input does not influence the playing of the file; only the activation of a different input blocks the playing underway and activates the relative playlist.

6.7 MPLL=13: Standard playlist

Operating mode as MPLL=11 except:

- Repeated activations or deactivations of the same logical input does not influence the playing of the file; only the activation of a different input blocks the playing underway and activates the relative playlist.

6.8 MPLL=14: Stop & Play Restart playlist

Operating mode as MPLL=10 except:

- From the moment that the same logical input is reactivated, the restart of the file is commanded, even if it is playing. The activation of a different input blocks the playing underway and activates the relative playlist.

6.9 MPLL=15 : Restart playlist

Operating mode as MPLL=11 except:

- From the moment that the same logical input is reactivated, the restart of the file is commanded, even if it is playing. The activation of a different input blocks the playing underway and activates the relative playlist.

7 Operation with logical inputs

7.1 Introduction to the logical input operation mode

Panelplayer can also play individual (message) audio files with direct selection from eight inputs (par. 3.4). Panelplayer enters this working mode if there are no PALIN.TXT and PLAYLIST.TXT files present.
Activation is carried out directly or in binary combination, up to a maximum of 255 files, using the inputs IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8.
For the manner of connection, see the paragraph 3.4.
Activating the inputs in binary combination, one can launch the playing of a maximum of 255 messages, naming the audio files as shown on the table 1.
The play modes are set through the IMOD, TPCM, MICP and MIRS parameters inserted in the configuration files *(par. 4.7).*

7.2 Binary input command codes

Activating the inputs in binary combination, one can launch the playing of a maximum of 255 messages, naming the audio files as shown on the following table.

INPUT									RELEVANT FILES / MESSAGES	
1	2	3	4	5	6	7	8		File.mp3	Reference
O	O	O	O	O	O	O	O	=	Standby	
1	O	O	O	O	O	O	O	=	1.mp3	individual activation input IN 1
O	1	O	O	O	O	O	O	=	2.mp3	individual activation input IN 1
1	1	O	O	O	O	O	O	=	3.mp3	binary combination inputs IN 1 + IN 2
O	O	1	O	O	O	O	O	=	4.mp3	individual activation input IN 3
1	O	1	O	O	O	O	O	=	5.mp3	binary combination inputs IN 1 + IN 3
O	1	1	O	O	O	O	O	=	6.mp3	binary combination inputs IN 2 + IN 3
1	1	1	O	O	O	O	O	=	7.mp3	binary combination inputs IN 1 + IN 2 + IN 3
O	O	O	1	O	O	O	O	=	8.mp3	individual activation input IN 4
1	O	O	1	O	O	O	O	=	9.mp3	binary combination inputs IN 1 + IN 4
O	1	O	1	O	O	O	O	=	10.mp3	binary combination inputs IN 2 + IN 4
1	1	O	1	O	O	O	O	=	11.mp3	binary combination inputs IN 1 + IN 2 + IN 4
O	O	1	1	O	O	O	O	=	12.mp3	binary combination inputs IN 3 + IN 4
1	O	1	1	O	O	O	O	=	13.mp3	binary combination inputs IN 1 + IN 3 + IN 4
O	1	1	1	O	O	O	O	=	14.mp3	binary combination inputs IN 2 + IN 3 + IN 4
1	1	1	1	O	O	O	O	=	15.mp3	binary combination inputs IN 1 + IN 2 + IN 3 + IN 4
O	O	O	O	1	O	O	O	=	16.mp3	individual activation input IN 5
1	O	O	O	1	O	O	O	=	17.mp3	
O	1	O	O	1	O	O	O	=	18.mp3	
1	1	O	O	1	O	O	O	=	19.mp3	
O	O	1	O	1	O	O	O	=	20.mp3	
1	O	1	O	1	O	O	O	=	21.mp3	
O	1	1	O	1	O	O	O	=	22.mp3	
1	1	1	O	1	O	O	O	=	23.mp3	
O	O	O	1	1	O	O	O	=	24.mp3	
1	O	O	1	1	O	O	O	=	25.mp3	

INPUT									RELEVANT FILES/MESSAGES	
1	2	3	4	5	6	7	8		File.mp3	Reference
0	1	0	1	1	0	0	0	=	26.mp3	
1	1	0	1	1	0	0	0	=	27.mp3	
0	0	1	1	1	0	0	0	=	28.mp3	
1	0	1	1	1	0	0	0	=	29.mp3	
0	1	1	1	1	0	0	0	=	30.mp3	
1	1	1	1	1	0	0	0	=	31.mp3	
0	0	0	0	0	1	0	0	=	32.mp3	individual activation input IN 6
1	0	0	0	0	1	0	0	=	33.mp3	
0	1	0	0	0	1	0	0	=	34.mp3	
1	1	0	0	0	1	0	0	=	35.mp3	
0	0	1	0	0	1	0	0	=	36.mp3	
1	0	1	0	0	1	0	0	=	37.mp3	
0	1	1	0	0	1	0	0	=	38.mp3	
1	1	1	0	0	1	0	0	=	39.mp3	
0	0	0	1	0	1	0	0	=	40.mp3	
1	0	0	1	0	1	0	0	=	41.mp3	
0	1	0	1	0	1	0	0	=	42.mp3	
1	1	0	1	0	1	0	0	=	43.mp3	
0	0	1	1	0	1	0	0	=	44.mp3	
1	0	1	1	0	1	0	0	=	45.mp3	
0	1	1	1	0	1	0	0	=	46.mp3	
1	1	1	1	0	1	0	0	=	47.mp3	
0	0	0	0	1	1	0	0	=	48.mp3	
1	0	0	0	1	1	0	0	=	49.mp3	
0	1	0	0	1	1	0	0	=	50.mp3	
1	1	0	0	1	1	0	0	=	51.mp3	
0	0	1	0	1	1	0	0	=	52.mp3	
1	0	1	0	1	1	0	0	=	53.mp3	
0	1	1	0	1	1	0	0	=	54.mp3	
1	1	1	0	1	1	0	0	=	55.mp3	
0	0	0	1	1	1	0	0	=	56.mp3	
1	0	0	1	1	1	0	0	=	57.mp3	
0	1	0	1	1	1	0	0	=	58.mp3	
1	1	0	1	1	1	0	0	=	59.mp3	
0	0	1	1	1	1	0	0	=	60.mp3	
1	0	1	1	1	1	0	0	=	61.mp3	
0	1	1	1	1	1	0	0	=	62.mp3	
1	1	1	1	1	1	0	0	=	63.mp3	
0	0	0	0	0	0	1	0	=	64.mp3	individual activation input IN 7
1	0	0	0	0	0	1	0	=	65.mp3	
0	1	0	0	0	0	1	0	=	66.mp3	
1	1	0	0	0	0	1	0	=	67.mp3	
0	0	1	0	0	0	1	0	=	68.mp3	
1	0	1	0	0	0	1	0	=	69.mp3	
0	1	1	0	0	0	1	0	=	70.mp3	
1	1	1	0	0	0	1	0	=	71.mp3	

INPUT									RELEVANT FILES / MESSAGGES	
1	2	3	4	5	6	7	8		File.mp3	Reference
0	0	0	1	0	0	1	0	=	72.mp3	
1	0	0	1	0	0	1	0	=	73.mp3	
0	1	0	1	0	0	1	0	=	74.mp3	
1	1	0	1	0	0	1	0	=	75.mp3	
0	0	1	1	0	0	1	0	=	76.mp3	
1	0	1	1	0	0	1	0	=	77.mp3	
0	1	1	1	0	0	1	0	=	78.mp3	
1	1	1	1	0	0	1	0	=	79.mp3	
0	0	0	0	1	0	1	0	=	80.mp3	
1	0	0	0	1	0	1	0	=	81.mp3	
0	1	0	0	1	0	1	0	=	82.mp3	
1	1	0	0	1	0	1	0	=	83.mp3	
0	0	1	0	1	0	1	0	=	84.mp3	
1	0	1	0	1	0	1	0	=	85.mp3	
0	1	1	0	1	0	1	0	=	86.mp3	
1	1	1	0	1	0	1	0	=	87.mp3	
0	0	0	1	1	0	1	0	=	88.mp3	
1	0	0	1	1	0	1	0	=	89.mp3	
0	1	0	1	1	0	1	0	=	90.mp3	
1	1	0	1	1	0	1	0	=	91.mp3	
0	0	1	1	1	0	1	0	=	92.mp3	
1	0	1	1	1	0	1	0	=	93.mp3	
0	1	1	1	1	0	1	0	=	94.mp3	
1	1	1	1	1	0	1	0	=	95.mp3	
0	0	0	0	0	1	1	0	=	96.mp3	
1	0	0	0	0	1	1	0	=	97.mp3	
0	1	0	0	0	1	1	0	=	98.mp3	
1	1	0	0	0	1	1	0	=	99.mp3	
0	0	1	0	0	1	1	0	=	100.mp3	
1	0	1	0	0	1	1	0	=	101.mp3	
0	1	1	0	0	1	1	0	=	102.mp3	
1	1	1	0	0	1	1	0	=	103.mp3	
0	0	0	1	0	1	1	0	=	104.mp3	
1	0	0	1	0	1	1	0	=	105.mp3	
0	1	0	1	0	1	1	0	=	106.mp3	
1	1	0	1	0	1	1	0	=	107.mp3	
0	0	1	1	0	1	1	0	=	108.mp3	
1	0	1	1	0	1	1	0	=	109.mp3	
0	1	1	1	0	1	1	0	=	110.mp3	
1	1	1	1	0	1	1	0	=	111.mp3	
0	0	0	0	1	1	1	0	=	112.mp3	
1	0	0	0	1	1	1	0	=	113.mp3	
0	1	0	0	1	1	1	0	=	114.mp3	
1	1	0	0	1	1	1	0	=	115.mp3	
0	0	1	0	1	1	1	0	=	116.mp3	
1	0	1	0	1	1	1	0	=	117.mp3	

INPUT									RELEVANT FILES / MESSAGGES	
1	2	3	4	5	6	7	8		File.mp3	Reference
0	1	1	0	1	1	1	0	=	118.mp3	
1	1	1	0	1	1	1	0	=	119.mp3	
0	0	0	1	1	1	1	0	=	120.mp3	
1	0	0	1	1	1	1	0	=	121.mp3	
0	1	0	1	1	1	1	0	=	122.mp3	
1	1	0	1	1	1	1	0	=	123.mp3	
0	0	1	1	1	1	1	0	=	124.mp3	
1	0	1	1	1	1	1	0	=	125.mp3	
0	1	1	1	1	1	1	0	=	126.mp3	
1	1	1	1	1	1	1	0	=	127.mp3	
0	0	0	0	0	0	0	1	=	128.mp3	individual activation input IN 8
1	0	0	0	0	0	0	1	=	129.mp3	
0	1	0	0	0	0	0	1	=	130.mp3	
1	1	0	0	0	0	0	1	=	131.mp3	
0	0	1	0	0	0	0	1	=	132.mp3	
1	0	1	0	0	0	0	1	=	133.mp3	
0	1	1	0	0	0	0	1	=	134.mp3	
1	1	1	0	0	0	0	1	=	135.mp3	
0	0	0	1	0	0	0	1	=	136.mp3	
1	0	0	1	0	0	0	1	=	137.mp3	
0	1	0	1	0	0	0	1	=	138.mp3	
1	1	0	1	0	0	0	1	=	139.mp3	
0	0	1	1	0	0	0	1	=	140.mp3	
1	0	1	1	0	0	0	1	=	141.mp3	
0	1	1	1	0	0	0	1	=	142.mp3	
1	1	1	1	0	0	0	1	=	143.mp3	
0	0	0	0	1	0	0	1	=	144.mp3	
1	0	0	0	1	0	0	1	=	145.mp3	
0	1	0	0	1	0	0	1	=	146.mp3	
1	1	0	0	1	0	0	1	=	147.mp3	
0	0	1	0	1	0	0	1	=	148.mp3	
1	0	1	0	1	0	0	1	=	149.mp3	
0	1	1	0	1	0	0	1	=	150.mp3	
1	1	1	0	1	0	0	1	=	151.mp3	
0	0	0	1	1	0	0	1	=	152.mp3	
1	0	0	1	1	0	0	1	=	153.mp3	
0	1	0	1	1	0	0	1	=	154.mp3	
1	1	0	1	1	0	0	1	=	155.mp3	
0	0	1	1	1	0	0	1	=	156.mp3	
1	0	1	1	1	0	0	1	=	157.mp3	
0	1	1	1	1	0	0	1	=	158.mp3	
1	1	1	1	1	0	0	1	=	159.mp3	
0	0	0	0	0	1	0	1	=	160.mp3	
1	0	0	0	0	1	0	1	=	161.mp3	
0	1	0	0	0	1	0	1	=	162.mp3	
1	1	0	0	0	1	0	1	=	163.mp3	

INPUT									RELEVANT FILES / MESSAGGES	
1	2	3	4	5	6	7	8		File.mp3	Reference
0	0	1	0	0	1	0	1	=	164.mp3	
1	0	1	0	0	1	0	1	=	165.mp3	
0	1	1	0	0	1	0	1	=	166.mp3	
1	1	1	0	0	1	0	1	=	167.mp3	
0	0	0	1	0	1	0	1	=	168.mp3	
1	0	0	1	0	1	0	1	=	169.mp3	
0	1	0	1	0	1	0	1	=	170.mp3	
1	1	0	1	0	1	0	1	=	171.mp3	
0	0	1	1	0	1	0	1	=	172.mp3	
1	0	1	1	0	1	0	1	=	173.mp3	
0	1	1	1	0	1	0	1	=	174.mp3	
1	1	1	1	0	1	0	1	=	175.mp3	
0	0	0	0	1	1	0	1	=	176.mp3	
1	0	0	0	1	1	0	1	=	177.mp3	
0	1	0	0	1	1	0	1	=	178.mp3	
1	1	0	0	1	1	0	1	=	179.mp3	
0	0	1	0	1	1	0	1	=	180.mp3	
1	0	1	0	1	1	0	1	=	181.mp3	
0	1	1	0	1	1	0	1	=	182.mp3	
1	1	1	0	1	1	0	1	=	183.mp3	
0	0	0	1	1	1	0	1	=	184.mp3	
1	0	0	1	1	1	0	1	=	185.mp3	
0	1	0	1	1	1	0	1	=	186.mp3	
1	1	0	1	1	1	0	1	=	187.mp3	
0	0	1	1	1	1	0	1	=	188.mp3	
1	0	1	1	1	1	0	1	=	189.mp3	
0	1	1	1	1	1	0	1	=	190.mp3	
1	1	1	1	1	1	0	1	=	191.mp3	
0	0	0	0	0	0	1	1	=	192.mp3	
1	0	0	0	0	0	1	1	=	193.mp3	
0	1	0	0	0	0	1	1	=	194.mp3	
1	1	0	0	0	0	1	1	=	195.mp3	
0	0	1	0	0	0	1	1	=	196.mp3	
1	0	1	0	0	0	1	1	=	197.mp3	
0	1	1	0	0	0	1	1	=	198.mp3	
1	1	1	0	0	0	1	1	=	199.mp3	
0	0	0	1	0	0	1	1	=	200.mp3	
1	0	0	1	0	0	1	1	=	201.mp3	
0	1	0	1	0	0	1	1	=	202.mp3	
1	1	0	1	0	0	1	1	=	203.mp3	
0	0	1	1	0	0	1	1	=	204.mp3	
1	0	1	1	0	0	1	1	=	205.mp3	
0	1	1	1	0	0	1	1	=	206.mp3	
1	1	1	1	0	0	1	1	=	207.mp3	
0	0	0	0	1	0	1	1	=	208.mp3	
1	0	0	0	1	0	1	1	=	209.mp3	

INPUT									RELEVANT FILES / MESSAGGES	
1	2	3	4	5	6	7	8		File.mp3	Reference
0	1	0	0	1	0	1	1	=	210.mp3	
1	1	0	0	1	0	1	1	=	211.mp3	
0	0	1	0	1	0	1	1	=	212.mp3	
1	0	1	0	1	0	1	1	=	213.mp3	
0	1	1	0	1	0	1	1	=	214.mp3	
1	1	1	0	1	0	1	1	=	215.mp3	
0	0	0	1	1	0	1	1	=	216.mp3	
1	0	0	1	1	0	1	1	=	217.mp3	
0	1	0	1	1	0	1	1	=	218.mp3	
1	1	0	1	1	0	1	1	=	219.mp3	
0	0	1	1	1	0	1	1	=	220.mp3	
1	0	1	1	1	0	1	1	=	221.mp3	
0	1	1	1	1	0	1	1	=	222.mp3	
1	1	1	1	1	0	1	1	=	223.mp3	
0	0	0	0	0	1	1	1	=	224.mp3	
1	0	0	0	0	1	1	1	=	225.mp3	
0	1	0	0	0	1	1	1	=	226.mp3	
1	1	0	0	0	1	1	1	=	227.mp3	
0	0	1	0	0	1	1	1	=	228.mp3	
1	0	1	0	0	1	1	1	=	229.mp3	
0	1	1	0	0	1	1	1	=	230.mp3	
1	1	1	0	0	1	1	1	=	231.mp3	
0	0	0	1	0	1	1	1	=	232.mp3	
1	0	0	1	0	1	1	1	=	233.mp3	
0	1	0	1	0	1	1	1	=	234.mp3	
1	1	0	1	0	1	1	1	=	235.mp3	
0	0	1	1	0	1	1	1	=	236.mp3	
1	0	1	1	0	1	1	1	=	237.mp3	
0	1	1	1	0	1	1	1	=	238.mp3	
1	1	1	1	0	1	1	1	=	239.mp3	
0	0	0	0	1	1	1	1	=	240.mp3	
1	0	0	0	1	1	1	1	=	241.mp3	
0	1	0	0	1	1	1	1	=	242.mp3	
1	1	0	0	1	1	1	1	=	243.mp3	
0	0	1	0	1	1	1	1	=	244.mp3	
1	0	1	0	1	1	1	1	=	245.mp3	
0	1	1	0	1	1	1	1	=	246.mp3	
1	1	1	0	1	1	1	1	=	247.mp3	
0	0	0	1	1	1	1	1	=	248.mp3	
1	0	0	1	1	1	1	1	=	249.mp3	
0	1	0	1	1	1	1	1	=	250.mp3	
1	1	0	1	1	1	1	1	=	251.mp3	
0	0	1	1	1	1	1	1	=	252.mp3	
1	0	1	1	1	1	1	1	=	253.mp3	
0	1	1	1	1	1	1	1	=	254.mp3	
1	1	1	1	1	1	1	1	=	255.mp3	

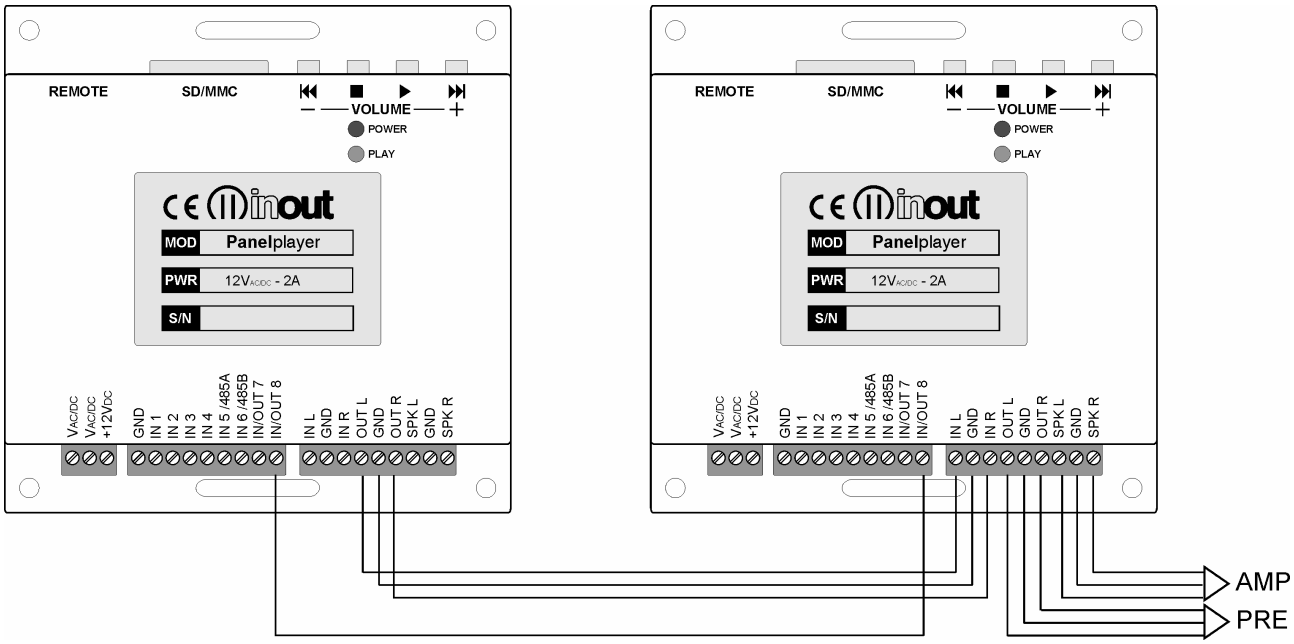
8 SPECIAL FUNCTIONS

8.1 Connection of two Panelplayers with different programming

Connecting two Panelplayers in cascade via Vlink connection and the audio inputs/outputs (see figure), one can recreate the typical operating mode of a commercial radio station.
One Panelplayer must be programmed to run in playlist mode, playing the musical items (PLAYLISTS.TXT), the other programmed to run according to schedule (PALIN.TXT) plays the commercial spots.

Panelplayer with playlist

Panelplayer with palimpsest



When an hour bar is to be played, the schedule-programmed Panelplayer waits for consent for the end of the item from playlist-programmed Panelplayer (which goes into standby), before starting to issue the commercials. Once the playing of the hour bar is over, the playlist-programmed Panelplayer will start to play the following item.

8.2 Amplifier connection to 40W bridge

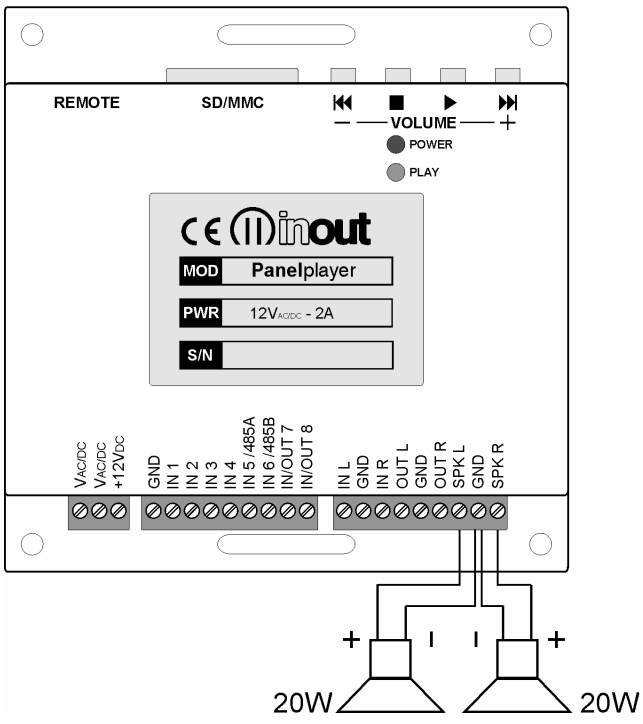
Panelplayer has the capability of commuting the stereo output of the amplifier in a 40W mono bridge configuration, to pilot a single diffuser with greater power.
To enable this operational mode, in addition to having a different connection to the output clams, it is necessary to set the following configuration parameters in the config.txt file:

```
OMON=1
INVR=1
```

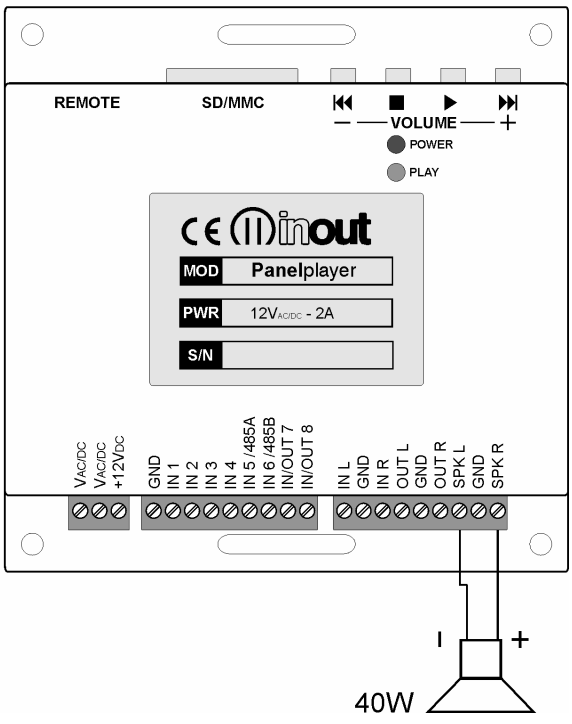
OMON STEREO / MONO audio output switch	
OMON	0= STEREO audio output 1= MONO audio output

INVR Inverted R channel audio output switch	
INVR	0= R channel not inverted (STEREO) 1= Inverted R channel (MONO/BRIDGE configuration)

Panelplayer 20W + 20W STEREO



Panelplayer 40W MONO



9 Serial RS485 communication

9.1 RS485 communication

Panelplayer can be connected to an RS485 communication bus through a serial port, which is controlled from a master system or by a computer.
Due to interference from outside the serial line, one may find anomalous behaviour from part of the master system which could cause possible damage to Panelplayer. To avoid this mishap one must take the following precautions:

1. Do not let the serial cables transit in the same conduits as power cables or cables with elevated voltage. Maintain a safety distance of at least 10 cm. between these cables.
2. Connect serial cable screen to the ground the on one of the two sides (do not connect the screen from both sides); in addition, the ground connection of the screen must not be made in the same point in which piloted circuits of elevated tension are connected.
3. Cut the voltage of the entire system before beginning the wiring of the serial lines: even dispersed or parasite currents could damage the modules.

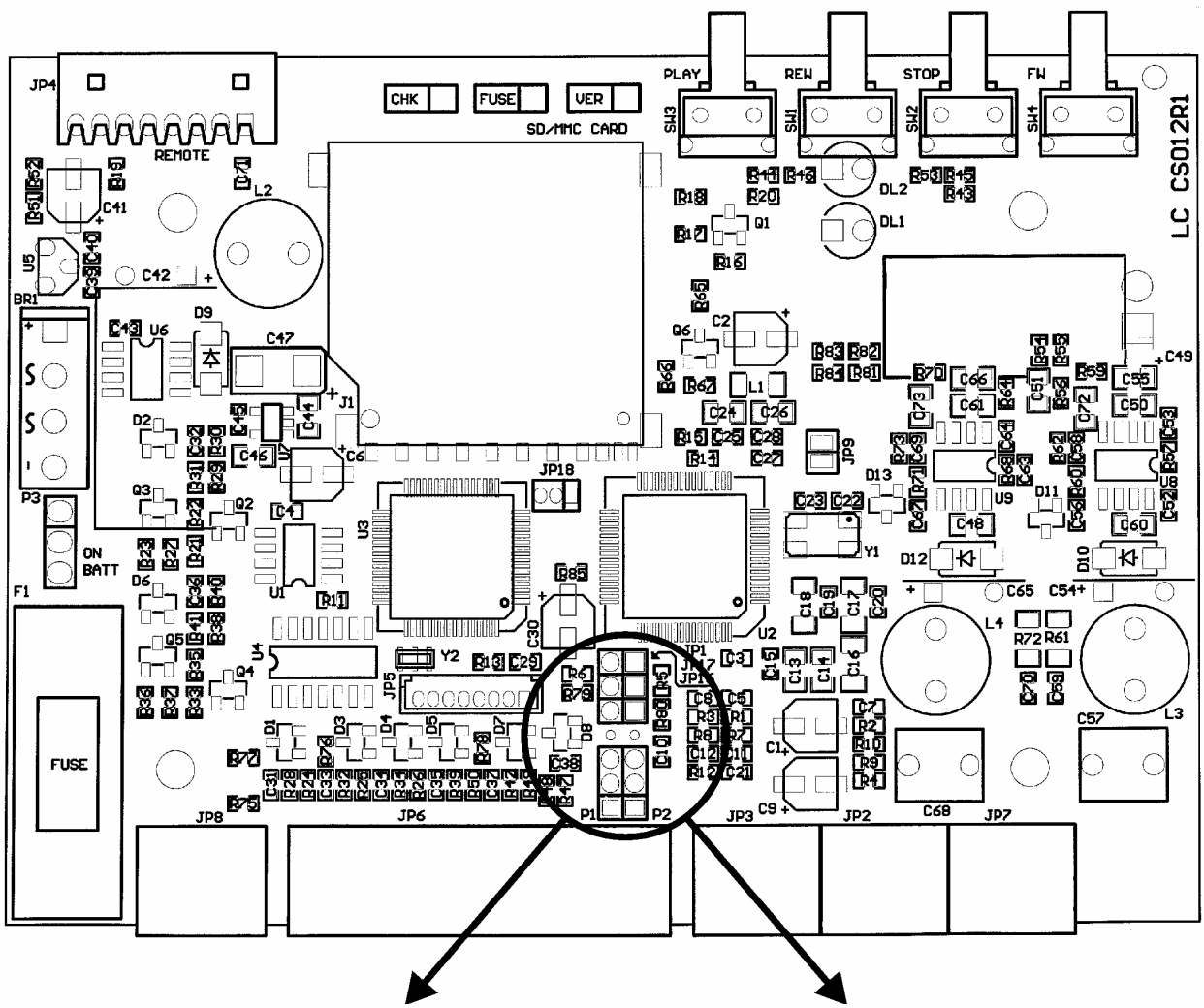
Panelplayer withstands serial communication in 4 different modes with the RS485 electrical standard. This type of serial multipoint communication consents the connection in bus of up to 32 devices, with a maximum distance of 50 metres.
The Panelplayer devices connected to the RS485 bus can not autonomously begin communication, but they can only respond to a specific request (command) from the master station (usually a PLC or a computer).
The RS485 connection parameters (speed, parity, check-sum, etc.) are set via the configuration file *config.txt*. (par. 9.2).

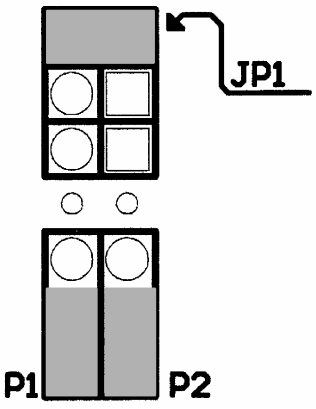
⚠ IMPORTANT!

- The internal electronics of Panelplayer are not galvanically insulated from the RS485 line; in case of short circuit or discharge to ground, it is possible to damage not only the Panelplayer, but even the master system to which it is connected!
- For the RS485 connection, one must remember to ignore the transmission echo from the master that is returning through the serial line.

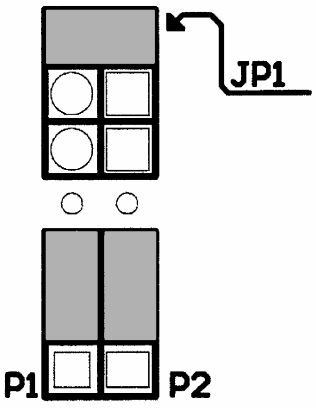
⚠ IMPORTANT!

- To enable the serial port through the IN5/485A and IN6/485B pins, raise the cover of the device and move the **P1** and **P2** jumpers of the diagram as indicated in the following figure.
- With the RS485 connection one must supply termination resistors on both extremes of the line, to avoid the generation of stationary waves and to define the impedance of the lines even in absence of transmission. Panelplayer already has within itself a termination resistor, enabled through a **JP1** bridge jumper; to deactivate such resistance it is sufficient to raise the cover of the device and remove the **JP1** jumper indicated in the figure.





Position **P1** and **P2** jumpers**:** IN5 and IN6 inputs with logical operation. *(Default)*



Position **P1** and **P2** jumpers**:** IN5 and IN 6 inputs enabled to the operation as RS485 serial port. To move the bridges, raise the cover of the device and move the jumpers of the board as indicated in the figure.

9.2 Serial port communication parameters (config.txt)

The parameters of the RS485 serial port (length of the packs, parity, speed, etc.) are set via the configuration file *config.txt*.
These parameters must coincide with those of the outside device with which Panelplayer is to communicate.

⚠**IMPORTANT**: To make the modification of these parameters effective, it is necessary to restart Panelplayer after having introduced the flash memory with the file *config.txt.*

⚠**IMPORTANT**: **notes for the Master system**
Conditions in which a transmission sequence is initialised.
The Panelplayer transmission sequence is initialised under the following conditions:

- When Panelplayer is turned on.
- When the data communication has been normally completed.
- When the timeout time for receiving a pack has expired.

The following table lists the values of the parameters needed to connect Panelplayer to a Master system coordinating it (protocol, speed, timings, etc.).

Mnemonic	***Description***
CMAD	Address Panelplayer in the 485 bus (ADD) (Value between 0 and 31 in decimal). IMPORTANT! This address **MUST** be univocal, two devices with the same address can not co-exist on the same bus.
CMCK	Enabling introduction of the Checksum: 0=Checksum deactivated 1=Checksum activated
CMCL	Enabling introduction of end-of-pack characters CR and LF (hexadecimal values OD and 0A) 0=No CR and LF 1=Insertion of CR and LF activated
CMBR	Baud rate (communication speed in bits per second) 0=1200 bps 1=2400 bps 2=4800 bps 3=9600 bps
CMPR	Parity Bits: 0=no parity 1=odd parity 2=even parity
CMSB	Number of Stop Bits 1=1 StopBit 2=2 stopBits
CMDB	Number of data bits 7=7 bits per datum 8=8 bits per datum
CMDR	Minimum delay between end of reception of the pack and delivery of the reply. (Value expressed in tenths of msec between 0 and 15 in decimal) 0=Minimum delay of about 4msec 1=Minimum delay of 10msec 2=Minimum delay of 20msec

Message waiting time (CMDR)
This is the delay time of the reply message, required by some computers to switch over between the state of transmission and the state of reception.
The awaiting time determines the minimum delay before the Panelplayer sends data in reply to the message received from the Master. Set this time at a value different from **0** only if the specifications of the Master demand it, since the delay determines an extension of the time needed to complete the command.

9.3 " Framing" error on the master

When commercial RS-485 interfaces are used on the master, a Framing error may take place if nothing is being transmitted on the serial line.
In order to avoid this mishap, it is indispensable that the system master ignores all the data until it has received one of the **STX**, **ACK** or **NAK** characters coming from a Panelplayer.

9.4 NAK reply by Panelplayer

The reply with the character **NAK** is sent from Panelplayer to the master when any kind of error is detected in the message received.

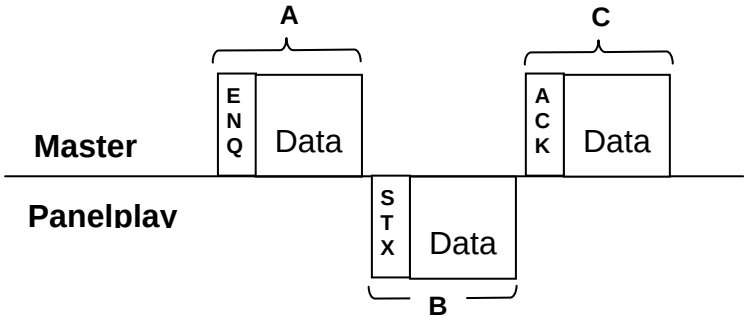
9.5 Transmitting a command by master

When you send a command from the master to Panelplayer using one of the dedicated protocols, make sure you send it with a delay of at least 10mS starting from the moment the last command received by Panelplayer has been completely performed.

⚠ **IMPORTANT**: when one is using the RS485 bus (only on a duplex cable) remember to bear in mind or to ignore the echo of the command that is sent from the master (with RS485 an echo is always present).

9.6 How to read the figures of the dedicated protocols

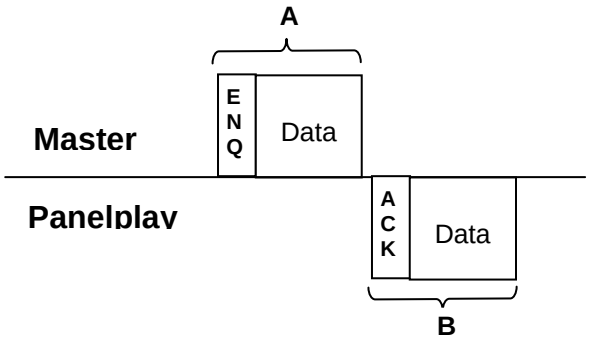
When the master reads the data from Panelplayer.
(Panelplayer > Master)



a) The data areas **A** and **C** indicate the transmission of data from the master to Panelplayer.
b) The data area **B** indicates the transmission of data from Panelplayer to the master.
c) The programme of the Master is structured so as to manage the data in the manner shown on the figure from left to right. Therefore, the data management sequence is **A**, **B**, **C**.
Example : In area **A,** the character **ENQ** (05_H) is transmitted, followed by all the other data indicated as " **Data**" in the figure to the right of the character **ENQ**.

9.7 When the Master delivers a command to Panelplayer

(Master > Panelplayer)

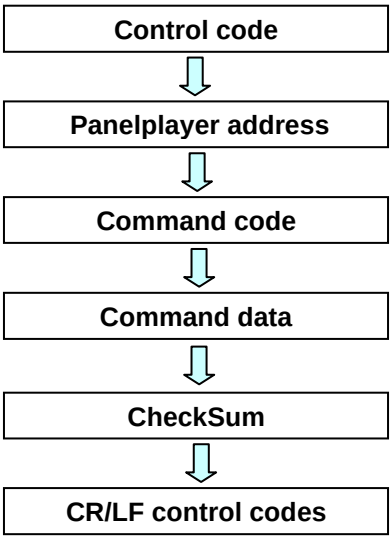


a) The data area **A** indicates the transmission of data from the master to Panelplayer.
b) The data area **B** indicates the transmission of data from Panelplayer to the master.
c) The programme of the master is structured so as to manage the data in the manner shown on the figure from left to right. Therefore, the data management sequence is **A**, **B**.
Example : In area **A,** the character **ENQ** (05_H) is transmitted, followed by all the other data indicated as " **Data**" in the figure to the right of the character **ENQ.**

9.8 Basic format of the dedicated protocols

Panelplayer manages up to four dedicated protocols.
The definition of which of these four protocols must be used by the serial connection, is set in the configuration file *config.txt.* (par. 9.2).
The difference among these four formats is due to the presence or absence of CheckSum and/or of the characters **CR** (**C**arriage **R**eturn, character **$0D_H$**) and **LF** (**L**ine **F**eed, character **$0A_H$**).

9.9 Basic set-up of the data transmission



⚠ **IMPORTANT**: the introduction of **CheckSum** at the end of the block of data and characters of **CR** + **LF** is defined in the configuration file (par. 9.2).

9.10 Control codes

The control codes are characters (they belong to the first 32 ASCII characters and cannot be printed out) which define the kind of information contained in the pack following them.
The control codes used are those which appear on the following table.
Panelplayer initialises the transmission sequence when it receives the character **ENQ.**

Mnemonic	Code	Description
STX	**02H**	Start TeXt. Beginning of transmission of reply pack.
ETX	**03H**	End TeXt. End of reply pack.
ENQ	**05H**	EnQuiry. Beginning of pack addressed to Panelplayer (or # for RS485).
ACK	**06H**	ACKnowledge. Beginning of reply pack: all OK!
LF	**0AH**	Line Feed. End of line code.
CR	**0DH**	Carriage Return.
NAK	**15H**	Not AcKnowledge. Beginning of pack with error code.

N.B. The codes are expressed in hexadecimal.

9.11 Address (ADD)

The address is a number that allows the system Master to establish communication with one of the various modules connected to the same serial line.
The value of this address is defined in Panelplayer through a configuration file *config.txt* (par. 9.2).

⚠ **IMPORTANT**: when setting the address it is necessary to be careful to not define more than one module with the same number, otherwise the communication becomes confused and irregular and the data exchanged will no longer make sense.
The address can assume any value between **00H and 1FH**.
The address is expressed in ASCII characters and consist of **2** characters.

9.12 Command (CMD)

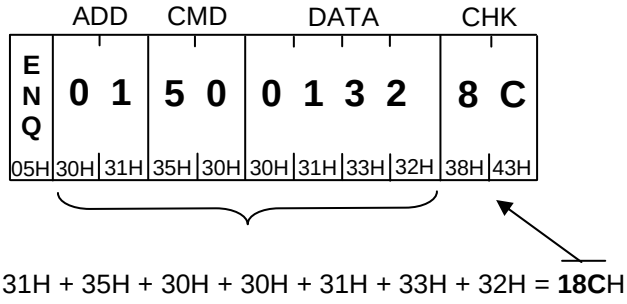
This is used to define the operation to be carried out (for example PLAY, reading the state or setting of the volume). The commands are defined in ASCII characters and consist of **2** characters.
In the following sections of this chapter, we provide the list of commands and every detail about each command.

9.13 CheckSum (CHK)

The CheckSum makes sure that the packs are complete and not corrupted during their transmission by any noise induced on the line.
The CheckSum is calculated summing the hexadecimal value of the ASCII characters contained in the data area defined for the CheckSum. The two least significant characters (in hexadecimal) of the sum represent the CheckSum which is introduced into the two dedicated ASCII characters at the end of the pack (before any CR and LF characters).
Note ! The sum of the value in decimal of the ASCII codes, converted into hexadecimal, must give the same result. Introduction and management of the CheckSum is established by the CMCK parameter of the configuration file.

- If **CMCK=1** has been set, CheckSum will be calculated automatically and added to the term of the reply pack (the one beginning **'STX'**) when this is delivered. When a pack is received, Panelplayer calculates the new CheckSum and compares it with the one contained in the pack itself; if it agrees, Panelplayer goes on to perform the command, otherwise it delivers an error pack (pack beginning with **'NAK'**).

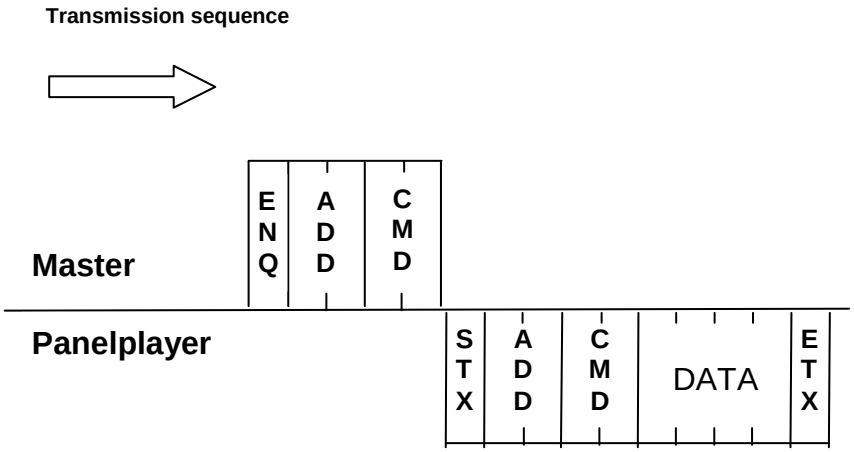
- If **CMCK=0** has been set, CheckSum will not be delivered in transmission and will not be compared (also because it is missing in the data) in the received messages. The following figure shows an example of calculation of CheckSum in a command pack delivered by the master.



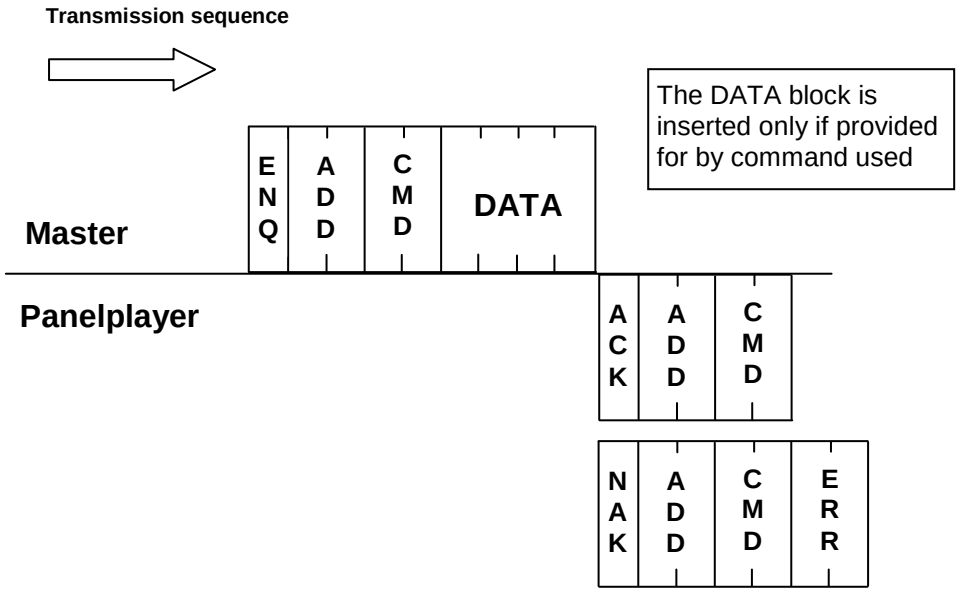
30H + 31H + 35H + 30H + 30H + 31H + 33H + 32H = **18C**H

9.14 Basic protocol

Reading the data of the Panelplayer from the master

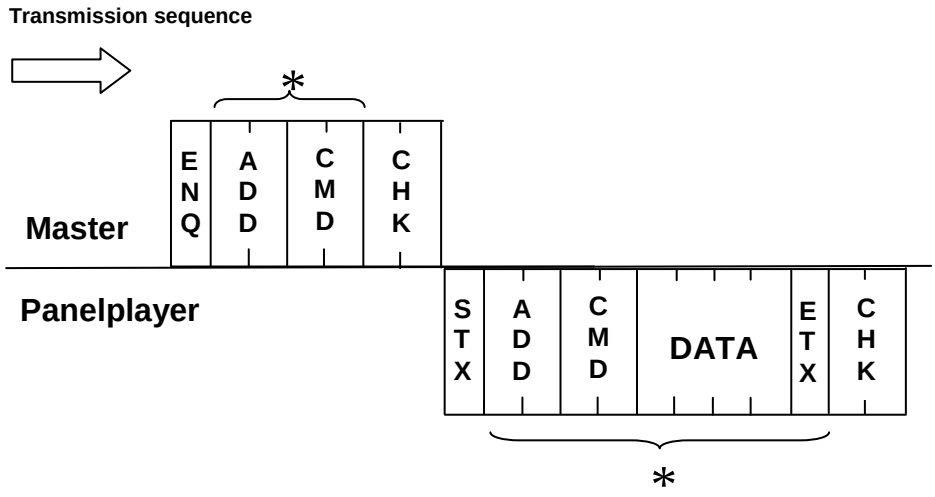


Command transmission from master to Panelplayer

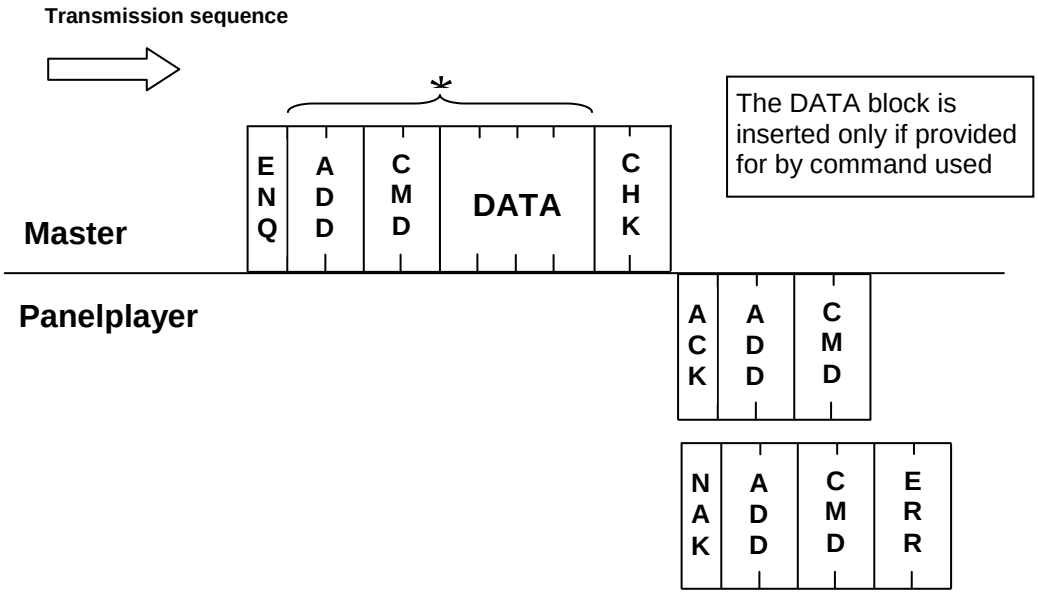


9.15 Basic protocol with CheckSum

Reading the data of the Panelplayer from the master



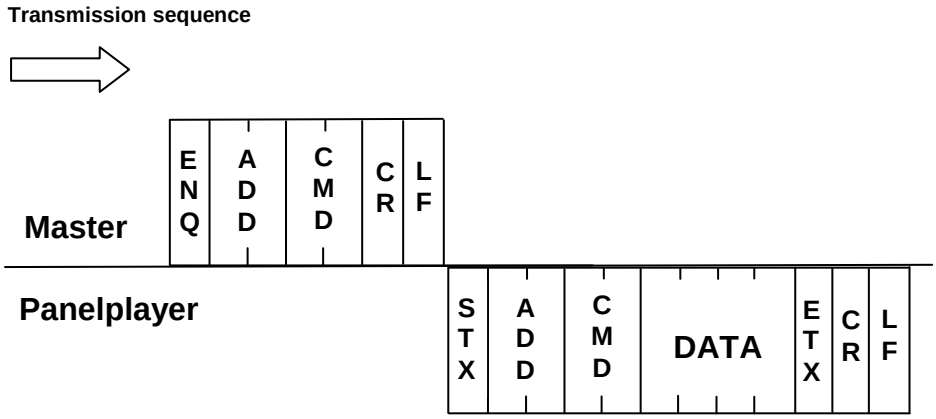
Command transmission from master to Panelplayer



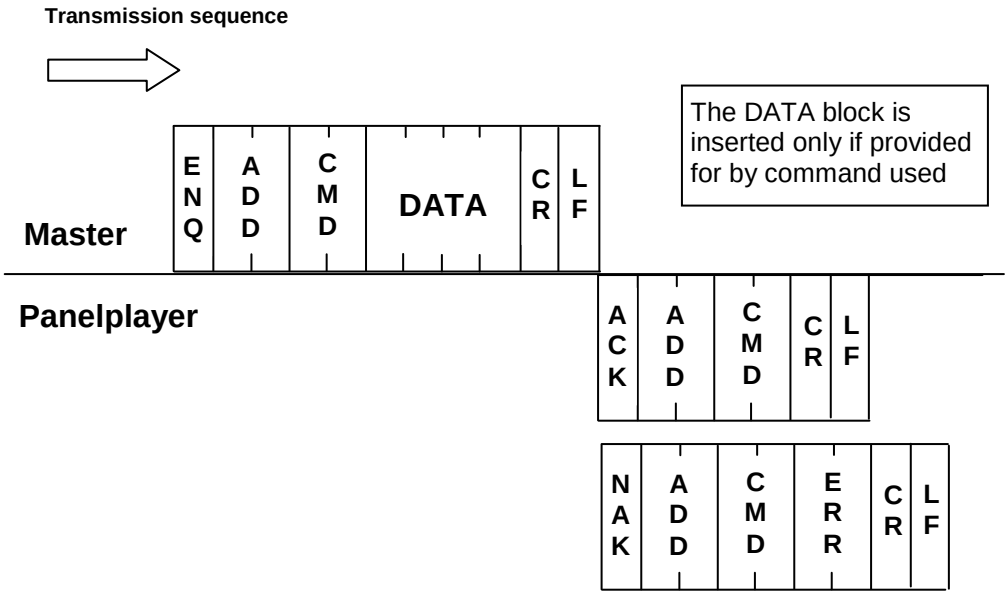
* 1. The CheckSum is introduced if the configuration parameter CMCK=1.
2. The CheckSum is calculated summing all the characters marked by an asterisk.

9.16 Basic protocol with CR and LF

Reading the data of the Panelplayer from the master

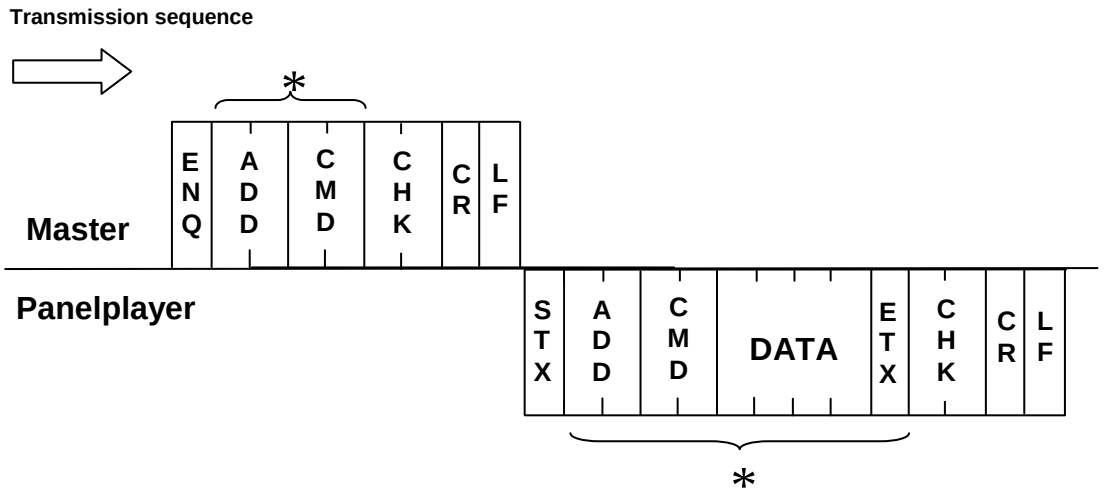


Command transmission from master to Panelplayer

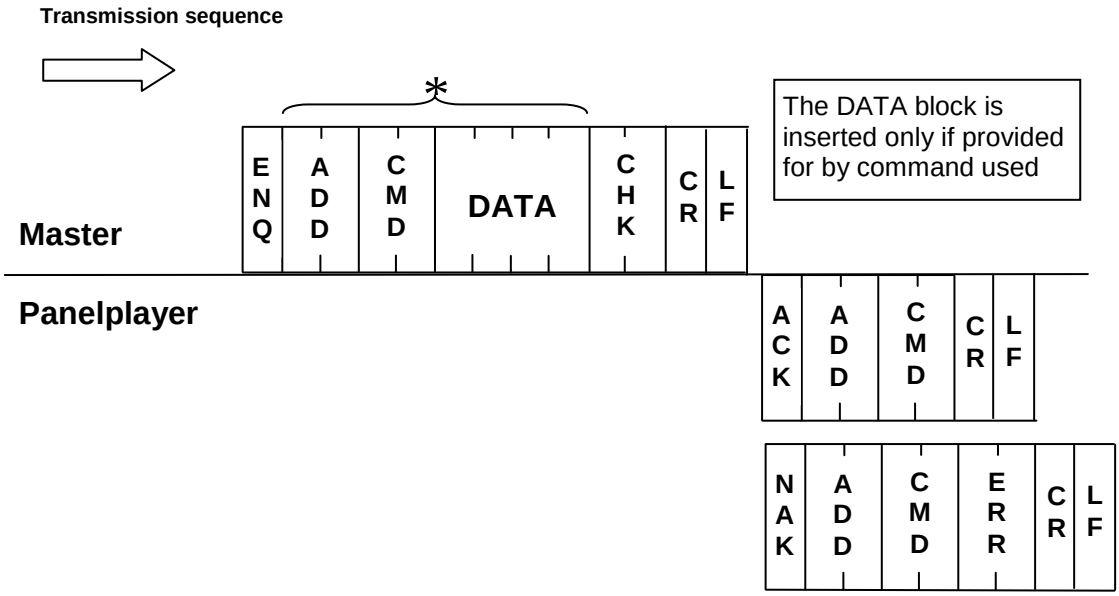


9.17 Basic protocol with CheckSum, CR and LF

Reading the data of the Panelplayer from the master



Command transmission from master to Panelplayer



* 1. The CheckSum is introduced if the configuration parameter CMCK=1.
2. The CheckSum is calculated summing all the characters marked by an asterisk.

9.18 List of commands and operating fields

This table provides the list, with the relevant comments, of all the commands managed by Panelplayer.

Description	CMD	Command data	Reply data
STATUS request	**30**	None	*a b c d* a = State of the player: S = Stop P = Play b = (reserved) c = (reserved) d = (reserved)
STOP	**31**	None	None
PLAY First	**32**	None	None
PLAY Next	**33**	None	None
PLAY Prior	**34**	None	None
PLAY File	**50**	Name of file without extension (4 characters only)	None
PLAY File 2 (automatic STOP before PLAY)	**51**	Name of file without extension (4 characters only)	None
SET Volume	**52**	Level in hexadecimal (0..14H)	None
SET Treble	**53**	Level in hexadecimal (0..14H)	None
SET Bass	**54**	Level in hexadecimal (0..14H)	None
SET Loudness	**55**	Level in hexadecimal (0..14H)	None
Version of firmware	**35**	None	P = Panelplayer x = version xx = Release Version
State of inputs	**37**	None	*a b c d e f g h* a = IN/OUT 7 b = IN/OUT 8 c = IN 6 d = IN 5 e = IN 4 f = IN 3 g = IN 2 h = IN 1
Flash memory size	**38**	None	Size of the flash (MAX. 4 characters)
Title of item being played	**39**	None	Title of the item (MAX. 12 characters)

9.19 Error codes

The following table lists all the error codes which Panelplayer delivers together with the **NAK** pack if problems are found.

Code	Description
10H	Failure to convert command code (CMD). It could contain characters which are outside the representation of a hexadecimal value. The permitted values are: ‘a’ .. ‘f’ ‘A’ …. ‘F’ ‘0’….’9’.
11H	Failure to convert the value contained in ‘DATA’ into a number. It could contain characters which are outside the representation of a hexadecimal value. The permitted values are: ‘a’ .. ‘f’ ‘A’ …. ‘F’ ‘0’….’9’.
12H	Failure to convert the CheckSum (CHK). It could contain characters which are outside the representation of a hexadecimal value. The permitted values are: ‘a’ .. ‘f’ ‘A’ …. ‘F’ ‘0’….’9’.
13H	CheckSum wrong.
14H	Reserved error.
20H	Wrong value in the parameter of the command SET_Volume. It could be more than the maximum permitted value.
21H	Wrong value in the parameter of the command SET_Treble. It could be more than the maximum permitted value.
22H	Wrong value in the parameter of the command SET_Bass. It could be more than the maximum permitted value.
23H	Wrong value in the parameter of the command SET_Loudness. It could be more than the maximum permitted value.
30H	The command PLAY cannot be processed because the flash memory is missing.
31H	The command PLAY (excluding PLAY File 2) cannot be processed because Panelplayer is already playing. To solve the problem, first send the command STOP, or else use the command PLAY_File_2 which automatically stops any file being played.
32H	The file requested via the command PLAY_File or PLAY_File_2 has not been found. The four characters inserted as an argument for these commands must correspond exactly to the name of the file you intend to play, except for the extension. E.g.: the command ENQ + 00501234 requires the playing of the file 1234.mp3 on Panelplayer with address 00.
33H	Failure to play the requested file. The file could be corrupt.

10 SPECIFICATIONS

10.1 Technical features

Power supply ……: 12÷15VAC or 12÷24VAC.

Consumption in Standby …… : 1 W

Protection …….. : inside fuse, 4A delayed.

Capacity of extractable memory : SD/MMC from 32MB to 1GB.

Input absorption…….. : 5 mA

Formats accepted ……: MPEG1 layer 3 (file MP3 from 64 to 160 Kbps)

Response in frequency …….. : 20 ~ 20.000 Hz (±3dB)

Signal/noise ratio ……... : > 90dB.

Harmonic distortion …….... : < 0,1%

Output power……: 20+20W (24V / 4 Ω) THD= 0,04%

Audio controls ……..… : - General output volume control
- Control of input volume and background level with mixer function
- Separate control of low and high tones
- Loudness level control
- Automatic fade control of input volume in play.
- Automatic fade control of output volume in play.

Control keys ……..…….: 4 buttons REW, PLAY, STOP, FWD and menu functions.

Classification…….. : IP 30 on the basis of liquid and dust penetration.

Size…….. :102x102x19mm.

10.2 Maintenance and conservation

See par. 2.2.

10.3 Disposal

To safeguard the environment, the device and its accessories must be disposed of according to legal requirements, in properly equipped places or as special waste.
If you do not know the legal requirements, please contact the dealer or the manufacturer.

Manufactured by: inout Noventa di Piave (VE) - ITALY

CE

Product compliant with the safeguard regulations 73/23/EEC, 89/336/EEC and 93/68/EEC about electromagnetic safety and compatibility.