



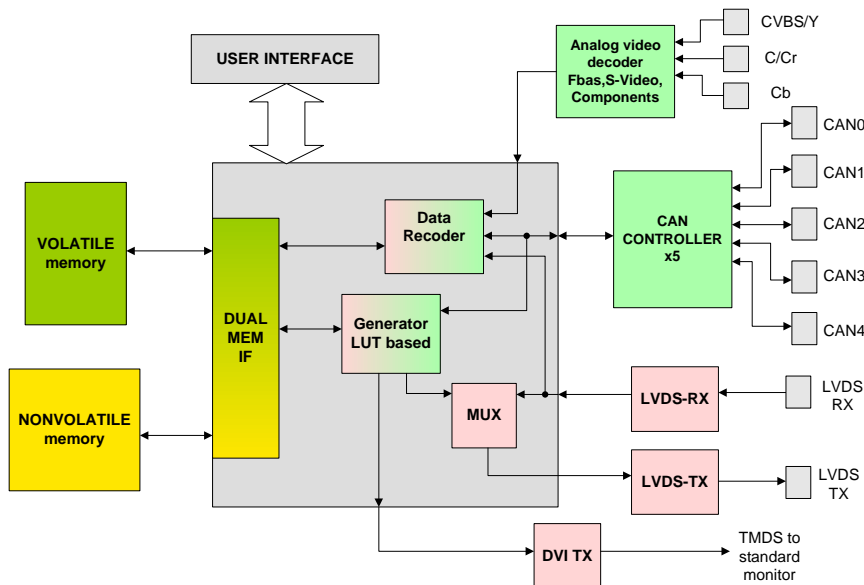
System Manual

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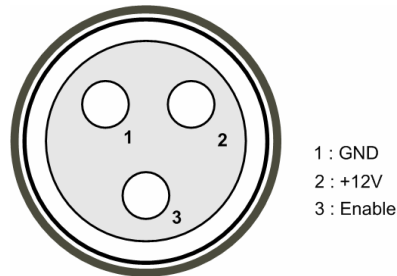
2 System overview

PROTON-VGRAB is a mixed-signal data logger/generator able to record and playback a single channel of 1Gbps LVDS signal raw data merged together with 5 CAN channels independently configured and a gray scale analog video channel. Next Figure sketches the architecture of the system.



2.1 Power Supply

The system is powered with a nominal voltage of 12v DC in the range between 9 and 36 volts with a maximum power consumption of 20Watts. The three pin round connector on the housing gets the power supply for the system with the following pin assignment:

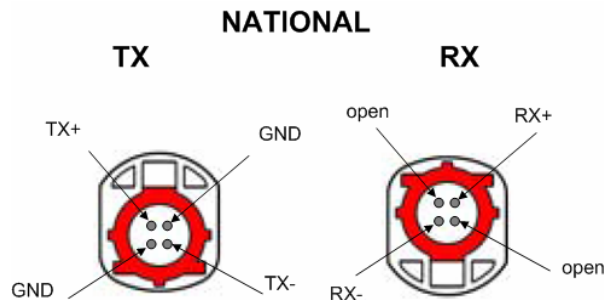


The pin 3 is the power supply enable signal. Connecting this pin to ground disables the power supply. It can be used for remote power supply control. For remote control the main power switch must be in ON position.

2.2 LVDS channel

The LVDS interface in PROTON-VGRAB is based on the 2 wire LVDS National Semiconductors FPDLink-II DS90UR241/DS90UR124 chip set. Configuration of LVDS transceivers is user programmable included a digital control of the pre-emphasis current on the transmitter.

Next figure shows the pin assignment on LVDS Rosenberger connectors.



The programmable control signals of the DS90UR241/DS90UR124 chip set are enumerated in the following table (for more details refer to its corresponding datasheet).

DS90UR241		DS90UR124	
<i>Signals</i>	<i>Mode</i>	<i>Signals</i>	<i>Mode</i>
TPWDNB	write	BISTM	write
TRFB	write	BISTEN	write
RAOFF	write	RAOFF	write
DEN	write	REN	write
Preemph.	write	SLEW	write
		RRFB	write
		PTOSEL	write
		RPWDNB	write
		PASS	read
		LOCK	read

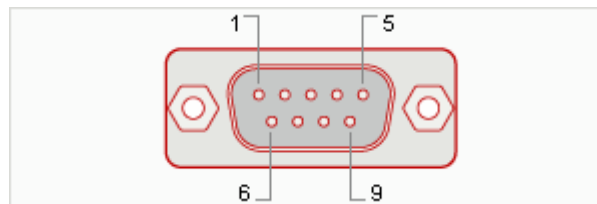
2.3 CAN BUS

Five different CAN bus channels can be independently configured with different baud rates.

Channel	Baud Rates	Remarks
CAN0	20Kbit,25Kbit,40Kbit,50Kbit,62.5Kbit100kbit,125Kbit,250Kbit,500Kbit,800Kbit,1Mbit	High Speed transceiver
CAN1	20Kbit,25Kbit,40Kbit,50Kbit,62.5Kbit100kbit,125Kbit,250Kbit,500Kbit,800Kbit,1Mbit	High Speed transceiver
CAN2	20Kbit,25Kbit,40Kbit,50Kbit,62.5Kbit100kbit,125Kbit,250Kbit,500Kbit,800Kbit,1Mbit	High Speed transceiver
CAN3	20Kbit,25Kbit,40Kbit,50Kbit,62.5Kbit100kbit,125Kbit	Low Speed transceiver
CAN4	20Kbit,25Kbit,40Kbit,50Kbit,62.5Kbit100kbit,125Kbit	Low Speed transceiver

The CAN bus DSub-9 connectors pin assignment is enumerated in the following table:

Pin	Signal	Pin	Signal
1	Not populated	2	CANL
3	GND	4	Not populated
5	Not populated	6	GND
7	CANH	8	Not populated
9	Not populated	--	--



2.3.1 CAN BUS signals and trigger

Eleven different CAN bus signals can be defined using logic masks and ten of them translated into graphical symbols via eleven independent CAN bus signal decoders. The first ten CAN signals highlight an ICON in the DVI output screen of the system, the eleventh CAN signal triggers the recording process when the system is in ARMED state.

The definition of a CAN signal is done using logical masks as listed in the following table:

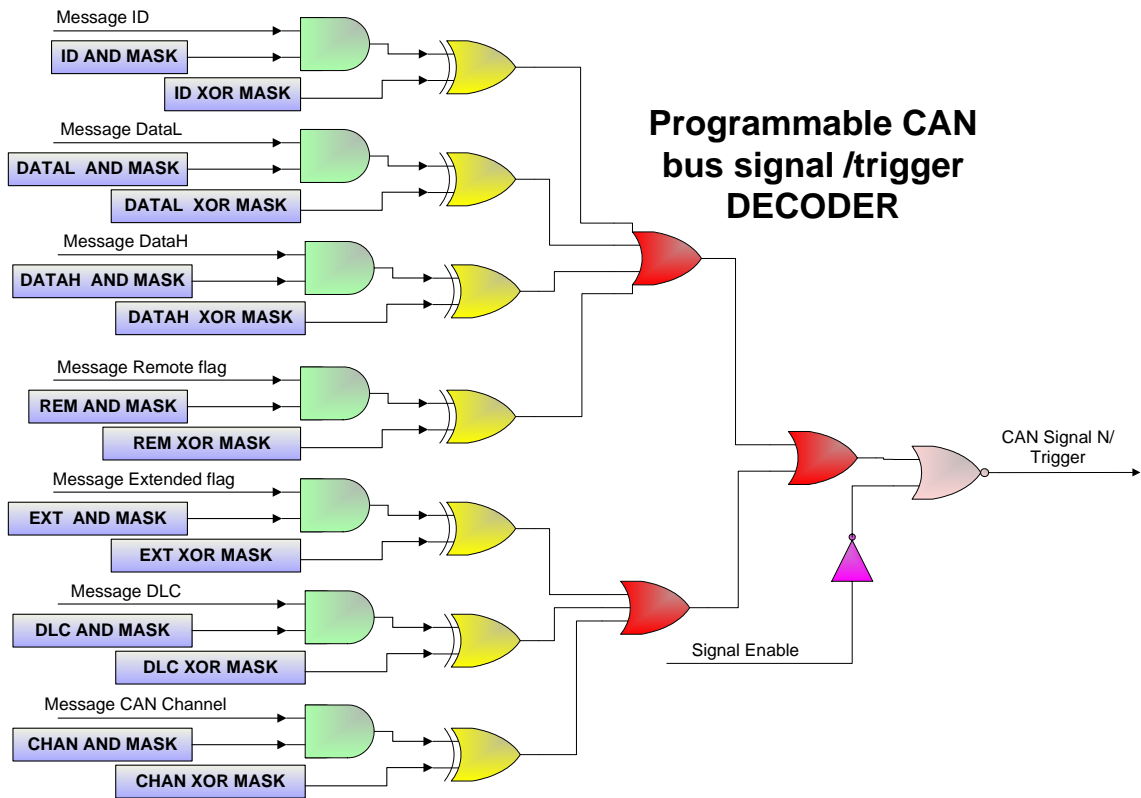
Baud rates/values	description
CAN bus signal enable	Enable CAN signal display
CAN message ID XOR + AND masks	Logic masks to CAN ID
CAN Data High XOR + AND masks	Logic masks to CAN DataH
CAN Data Low XOR + AND masks	Logic masks to CAN DataL
CAN channel XOR + AND masks	Logic masks to CAN Channel
CAN message extended flag XOR + AND masks	Logic masks to CAN EXT
CAN message remote flag XOR + AND masks	Logic masks to CAN REM
CAN message DLC XOR + AND masks	Logic masks to CAN DLC

Upon CAN bus message event, on both recording and playing states a CAN bus message chunk is generated with the structure below.

CAN BUS message chunk

SOFKEY	CAN ID	Channel	Time Stamp	MES ID	REM	EXT	DLC	DATA FIELD (8 bytes)
----------	--------	---------	------------	--------	-----	-----	-----	----------------------

From this chunk of data, the fields, MES ID, Channel, REM, EXT, DLC and DATA are sent to the CAN bus signal decoder array. In the CAN bus signal decoder array there are 11 decoders with identical structure. Next figure shows the structure of a single CAN bus signal decoder found in PROTON-VGRAB. The output of the decoder is a one-bit signal.



Next tables show some examples on how set up the mask register for the CAN bus signal decoder on PROTON-VGRAB:

ID = 0x00000012 , DATA= 0x45 0x34 0x00 0x12 0x44 0x55 0x66 0x34, REM=Don't care, EXT= Don't care DLC = 8 CHAN= 3							
	ID	DATAL	DATAH	REM	EXT	DLC	CHAN
AND MASK	0xFFFFFFFF	0xFFFFFFFF	0xFFFFFFFF	0x0	0x0	0xF	0x7
XOR MASK	0x00000012	0x12003445	0x34665544	0x1	0x1	0x8	0x3

Every CAN message on channel 4							
	ID	DATAL	DATAH	REM	EXT	DLC	CHAN
AND MASK	0x00000000	0x00000000	0x00000000	0x0	0x0	0x0	0x7
XOR MASK	0x00000001	0x00000001	0x00000001	0x1	0x1	0x1	0x4

ID(15 downto 12)=0xA, rest :don't care, DATA(0)=1, DATA(13)=0, DATA(45)=1, rest, don't care REM=Don't care, EXT= 1 DLC = don't care CHAN= don't care							
	ID	DATAL	DATAH	REM	EXT	DLC	CHAN
AND MASK	0x0000F000	0x00002001	0x00002000	0x0	0x1	0x0	0x0
XOR MASK	0x0000A000	0x00000001	0x00002000	0x1	0x1	0x1	0x1

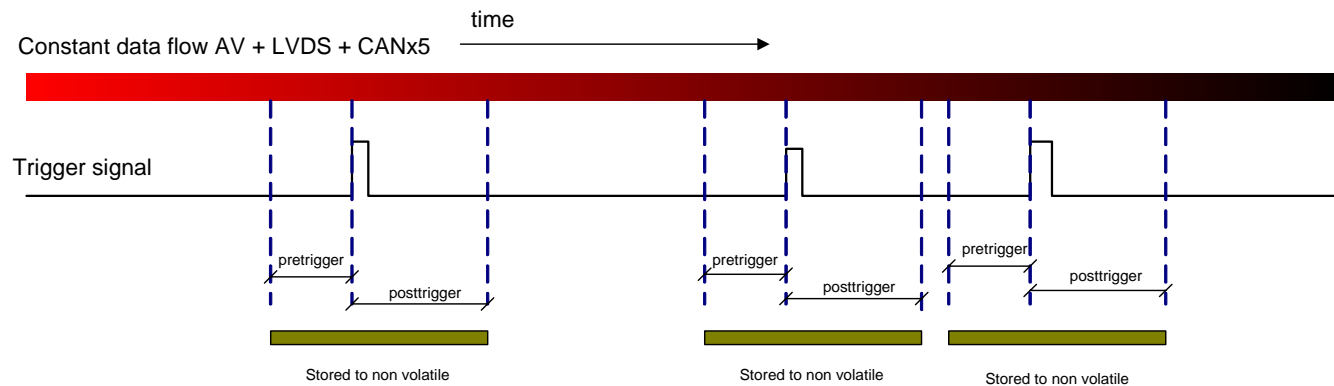
2.4 Analog video

An analog video decoder accepts analog video coded in composite (CVBS), separate video (S-video, Y/C) or components (YCrCb) format, delivering to the logger engine of the system luminance and chrominance in 4:2:2 format with 8 bits per pixel (8bits for luminance and 8bits form chrominance). In the present version of PROTON-VGRAB, only the luminance is processed and can be recorded. The resolution of the logged video is fixed to 575 lines per frame and 720 pixels per line, 25 frames per second.

Analog VIDEO			
Input	Logged	Resolution	frame rate
CVBS, Y/C, YCrCb	Gray scale with 8 bits per pixel	720x575	25fps

2.5 Logger

The recorder functionality has been designed for applications where a sporadic part of a constant data flow is targeted for logging. The system provides a ring buffer of 900 MB of volatile memory and a high bandwidth non-volatile memory device of 320 GB.

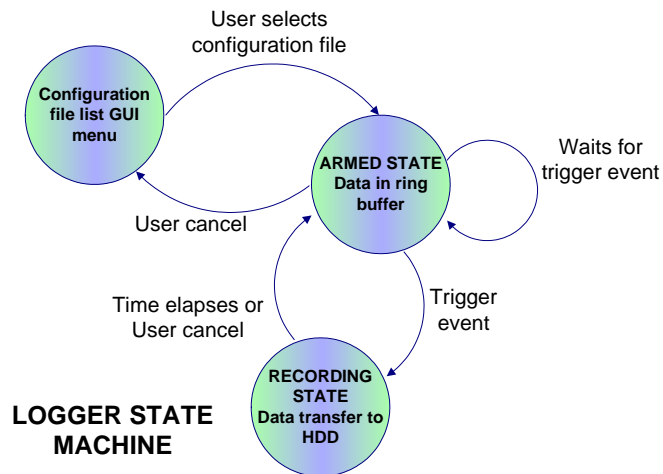


A configuration file stored in system non-volatile memory must be selected prior starting a recording session. The system provides 8 different configuration files which can be programmed by the user and a ninth configuration file which corresponds to the configuration assigned to the last opened file used in player mode (`lastopen_playfile.cfg` and `config0-7.cfg`). The configuration files contain the following parameters:

PROTON-VGRAB Configuration file content			
Channel / parameter	enable	Baud rates/values	description
LVDS	ON/OFF	N/A	LVDS is routed from RX to TX.
Analog video	ON/OFF	N/A	Gray scale Analog video
CAN 0	ON/OFF	20K,25K, 40K, 50K, 62K5, 100K, 125K,250K, 500K and 1000k	HIGH speed transceiver
CAN 1	ON/OFF	20K,25K, 40K, 50K, 62K5, 100K, 125K,250K, 500K and 1000k	HIGH speed transceiver
CAN 2	ON/OFF	20K,25K, 40K, 50K, 62K5, 100K, 125K,250K, 500K and 1000k	HIGH speed transceiver
CAN 3	ON/OFF	20K,25K, 40K, 50K, 62K5, 100K, 125K	LOW speed transceiver
CAN 4	ON/OFF	20K,25K, 40K, 50K, 62K5, 100K, 125K	LOW speed transceiver
Pre-Trigger length	N/A	up to 900Mbytes/input bandwidth	steps of 100 ms
Post-Trigger length	N/A	up to 300GB/input bandwidth	steps of 100 ms
GUI trigger	ON/OFF	N/A	USB trigger enable
CAN Signal 0 to 9	ON/OFF	CAN bus signal decoding based on logic masks	Enable CAN signal display
	N/A	CAN message ID XOR + AND masks	Logic masks to CAN ID
	N/A	CAN Data High XOR + AND masks	Logic masks to CAN DataH
	N/A	CAN Data Low XOR + AND masks	Logic masks to CAN DataL
	N/A	CAN channel XOR + AND masks	Logic masks to CAN Channel
	N/A	CAN message extended flag XOR + AND masks	Logic masks to CAN EXT
	N/A	CAN message remote flag XOR + AND masks	Logic masks to CAN REM
	N/A	CAN message DLC XOR + AND masks	Logic masks to CAN DLC
Trigger Conf.	N/A	ICON used on player window (DVI output)	ICON highlighted if signal found
	ON/OFF	User interface trigger button	Enables GUI trigger
	ON/OFF	CAN bus trigger decoding based on logic masks	Enable CAN bus trigger
	N/A	CAN message ID XOR + AND masks	Logic masks to CAN ID
	N/A	CAN Data High XOR + AND masks	Logic masks to CAN DataH
	N/A	CAN Data Low XOR + AND masks	Logic masks to CAN DataL
	N/A	CAN channel XOR + AND masks	Logic masks to CAN Channel
	N/A	CAN message extended flag XOR + AND masks	Logic masks to CAN EXT
	N/A	CAN message remote flag XOR + AND masks	Logic masks to CAN REM
	N/A	CAN message DLC XOR + AND masks	Logic masks to CAN DLC

In recording mode and after selecting a configuration file, PROTON-VGRAB may run two different states:

- **ARMED state.** The system stores the data from the selected input sources in a volatile ring buffer waiting for a trigger event. Stays in this state until the user exits or a trigger event occurs.
- **RECORDING state.** A trigger event makes the system jump into recording state in which the pre-trigger buffer is stored in non-volatile memory followed by the pos-trigger length selected by the user. Upon completion or user cancel, the system returns into ARMED state waiting for trigger.

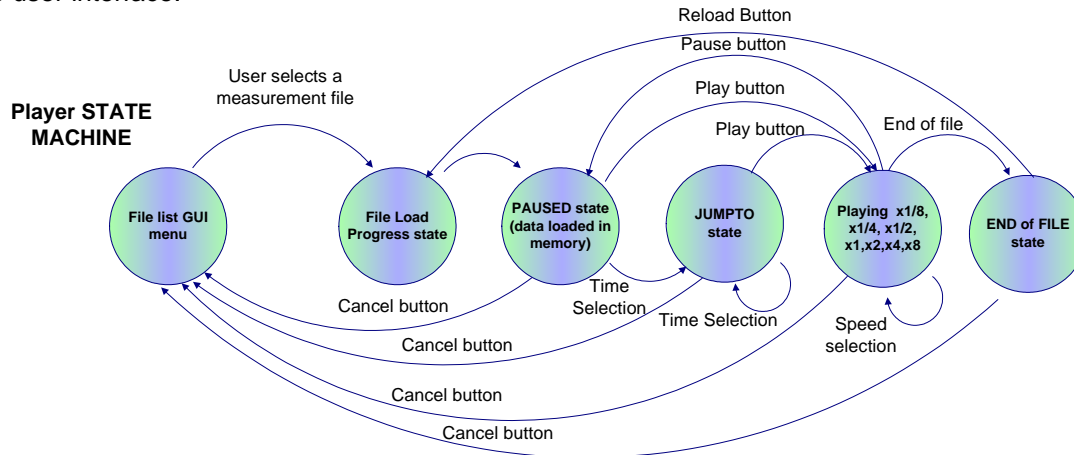


The system provides two types of the trigger signals:

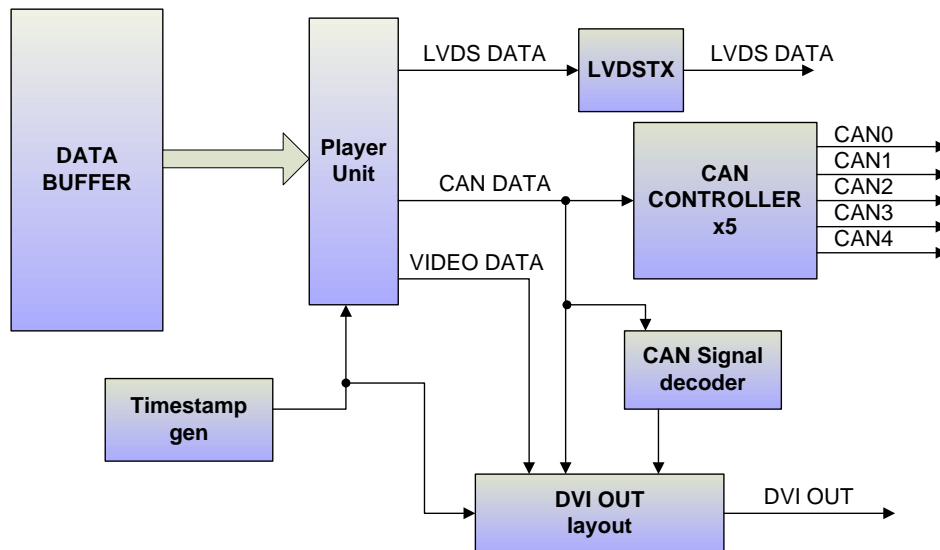
- CAN bus trigger. Signal decoded using the logic operators in the selected configuration file.
- GUI trigger. Push buttons integrated in the system housing and left click of a standard USB mouse connected to the USB host port of PROTON-VGRAB.

2.6 Player

The files recorded during a measurement session can be played back by the system reproducing exact conditions on CAN bus, LVDS and video channels. Next figure shows the player mode system states controlled by the user interface.



The player data flow is sketched in the following figure.



The configuration used to record the selected file for playing is stored together with the channel data in the file. In player mode and during the data load state, the system reads from the measurement file the channel configuration and buffer setup used during recording, and reconfigures the IO channels accordingly. The setup read from the file to be played is automatically saved in `lastopen_playfile.cfg` configuration file.

If the measurement file contains LVDS data, the data will be output on the LVDS TX channel regenerating the original transmit clock on the LVDS channel with an accuracy of at least 1.25% for clock signal with frequency values in the range from 42MHz to 10 MHz.

The CAN bus data present in the measurement file will be sent on its corresponding CAN channel keeping the same time relationship between messages as recorded with an accuracy of 10us.


During playing state, if the measurement file contains analog video data, it will be output on the DVI interface within a 1280x1024 pixels frame in which the CAN bus messages will be displayed in a table with five different columns (one for every channel) and 6 rows; showing time stamp, the number of CAN messages on every channel occurred so far, data field of the CAN message (implicit DLC), the ID, and the remote and extended flags. Together with the CAN bus messages and analog video data, the DVI output contains a graphical representation of every CAN signal included in the configuration file in a shape of a monochrome ICON that will be highlighted if a signal is detected in the CAN data stream. Every CAN bus signal has an independent counter for a given measurement file. The DVI output layout containing all this information shall look as follows.






	CAN 0 [500kbit]	CAN 1 [500kbit]	CAN 2 [500kbit]	CAN 3 [100kbit]	CAN 4 [100kbit]
■ EXT	1	1	1	0	0
■ REM	0	0	0	0	0
■ ID	0000CAC0	0000CAC0	0000CAC0	00000000	00000000
■ DATA	9724300097243000	9724300097243000	9724300097243000		
■ TIME (us)	0000000173967C97	0000000173967CC1	0000000173967CEC	0000000000000000	0000000000000000
■ COUNT	000033A7	000033A7	000033A7	00000000	00000000






■ SIG0 00000009	■ SIG1 00000006
■ SIG2 00000006	■ SIG3 00000009
■ SIG4 00000009	■ SIG5 00000009
■ SIG6 00000009	■ SIG7 00000006
■ SIG8 00000006	■ SIG9 00000009

■ TIME STAMP 000000017209B604

■ TRG 00000001



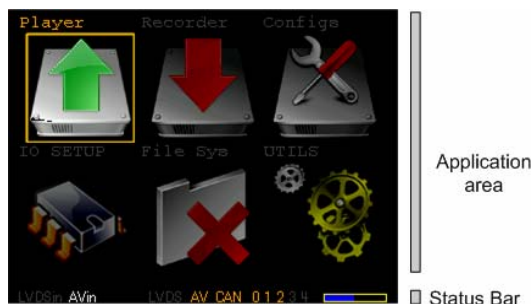






3 User interface

The user interface elements of the system are:

- *320x240 RGB LCD*. User interface application display.
- *Two rotary encoders*. Navigation control through the user interface application. Trigger event generation.
- *USB mouse*. Trigger event generation.
- *DVI out*. Displays analog video and CAN bus information (CAN messages and CAN signal icons).

The embedded GUI screen is divided in two different areas, the application area and the status bar. The application area is where the system menus are displayed in a dynamic way, i.e. windows and menus are replaced driving the rotary encoders of the system.









The status bar is the lower part of the screen. It has always 5 visible fields no matter which part of the graphical embedded application is selected (except in video preview mode) or a menu is displayed. The status bar is always visible and contains the following fields:

- **LVDSin**. This field keeps track of the **lock** output pin of the National semiconductor LVDS receiver DS90UR124. When a stable LVDS data stream is received on PROTON-VGRAB over NATIONAL video channel this status field will be highlighted.
- **AVin**. This field keeps track of the analog video input activity. Whenever the video decoder detects a stable analog video at its input this status field will be highlighted.
- **LVDS**. This field shows if the LVDS channel is enabled for logging/playing in the selected configuration file. If enabled this field is highlighted.
- **AV**. Shows if the Analog video channel is enabled for logging/playing in the selected configuration file. If enabled this field is highlighted.
- **CAN 0 1 2 3 4**. This field shows which CAN channels are enabled for logging/playing in the selected configuration file. If a channel is enabled the corresponding number will be highlighted.
- **Disk bar**. This field shows the remaining capacity of the hard disk of the system.

4 Menu Items and submenus

6 different submenus are available from the top level.

-  PLAYER. Selects and plays measurement files.
-  RECORDER. Data recorder functionality menu. Records data using a given configuration file.
-  CONFIGS. Configuration file edition.
-  IO-SETUP. Allows configuring system IO and previewing the analog video in the embedded LCD.
-  FILE SYSTEM. Allows erasing unwanted measurement files.
-  VGRAB-UTILS. Different subprograms.



PLAYER

Enter/exit the PLAYER submenu.



Rotate left button until PLAYER icon is selected.



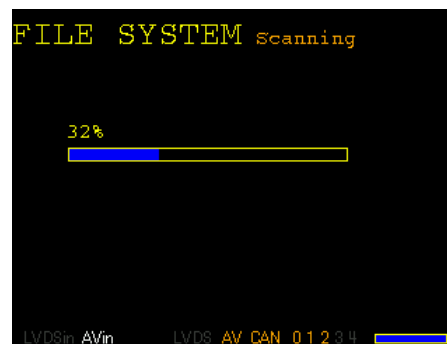
Press left button to enter the file selection window. Hard disk scanning will take place.



Rotate left button until **Exit** is highlighted in cyan colour.



Press left button to exit the file selection window and come back to main menu.





PLAYER

Select a file to play.



Rotate left button to select the file to play, selected file is marked in CYAN colour.



Press left button to enter the play mode. The following actions are executed:



Configuration of CAN bus and LVDS interfaces with the same setup the data was recorded.



Load measurement data to memory.

```
PLAY Measurement Files
(6/166) Selected

Exit
2014/01/01 02:27:24 : 320MB
2014/01/01 02:15:48 : 320MB
2014/01/01 02:04:08 : 320MB
2014/01/01 01:52:24 : 320MB
2014/01/01 01:40:40 : 320MB
2014/01/01 01:29:00 : 320MB
2014/01/01 01:17:24 : 320MB
2014/01/01 01:05:40 : 320MB
2014/01/01 00:54:00 : 320MB
2014/01/01 00:41:48 : 320MB

LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



```
PLAY Loading
Selected 2014/01/01 01:29:00

Loaded 60.0% of 320MB

LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



```
PLAY [Paused]
Selected 2014/01/01 01:29:00

CANCEL PLAY

PRES: 000Hr:57min:29sec:361ms
STRT: 000Hr:57min:29sec:361ms
STOP: 000Hr:57min:55sec:506ms

LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



PLAYER

Play a measurement.



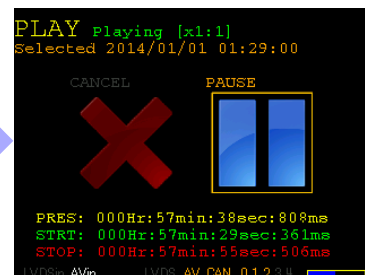
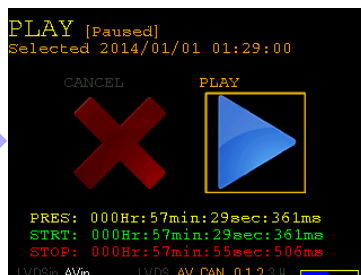
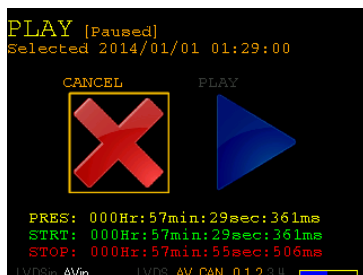
Rotate left button to select the PLAY icon.



Press left button to play.



When PRES time reaches STOP time or the end of file is reached, the system stays in end of file state.

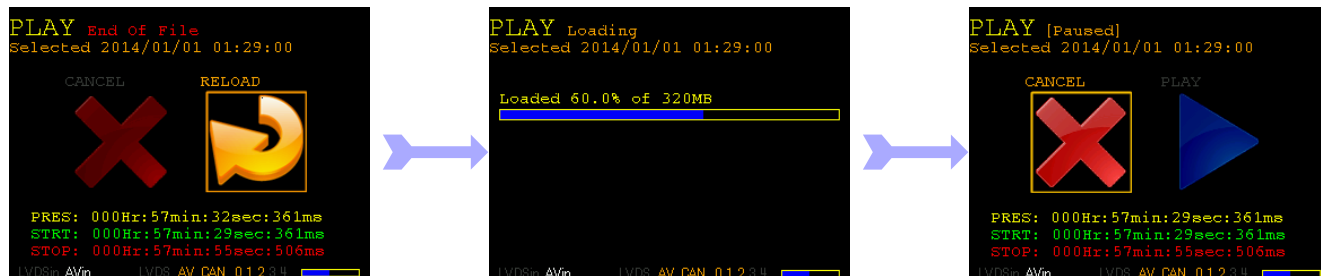




PLAYER

Reload a file.

- ☐ PRES time has reached STOP time or the end of file is reached, the system stays in end of file state.
- ☐ Select RELOAD icon and pres left button to reload the data to memory, or press CANCEL to return to file list.




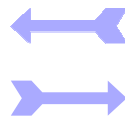
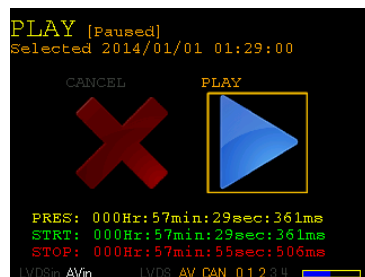


PLAYER

Pause / Play.

 In Paused state, select PLAY icon and press left button to play.

 In PLAYING state, press left button over the PAUSE icon to halt.





PLAYER

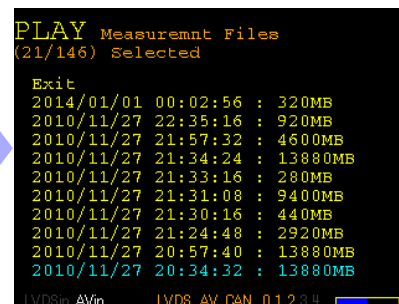
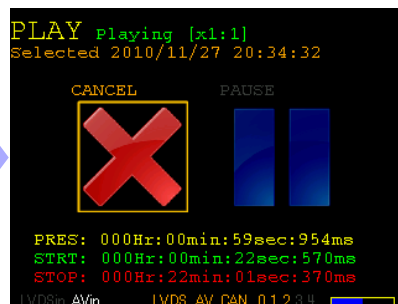
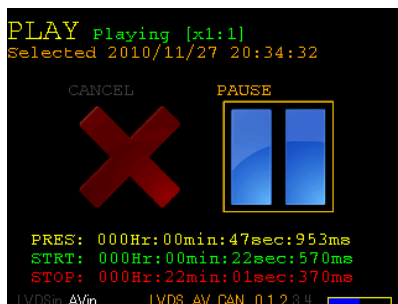
Cancel/Exit play file.



Rotate left button to select CANCEL icon.



Press left button exit and come back to the play list.



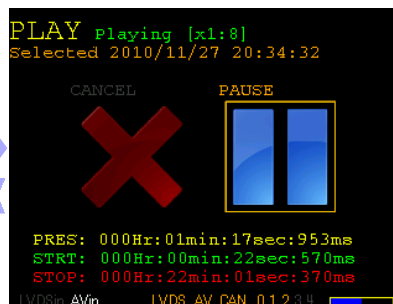
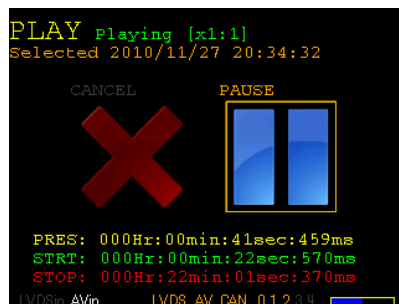


PLAYER

Player speed x1/8, x1/4, x1/2, x1, x2, x4, x8



During PLAYING state, rotate right button to change playing speed.





PLAYER

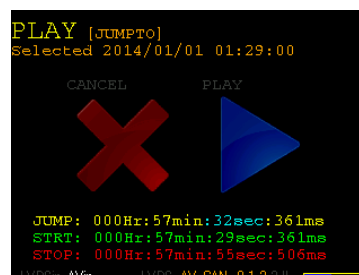
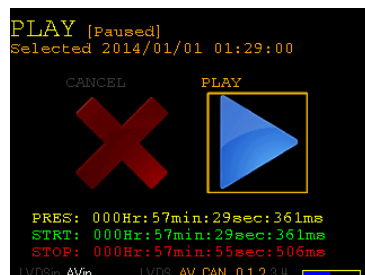
JUMPTO playing



In PAUSED state, rotate the left button until system enters JUMPTO state in which minutes, seconds or milliseconds can be selected (marked in CYAN colour).



In JUMPTO state, rotate the right button to set the time where the player shall stop. When minutes are selected, the system jumps in steps of 1 minute. If seconds it will do in steps of 1 second; and if milliseconds is selected it will do in steps of 10 milliseconds.







RECORDER

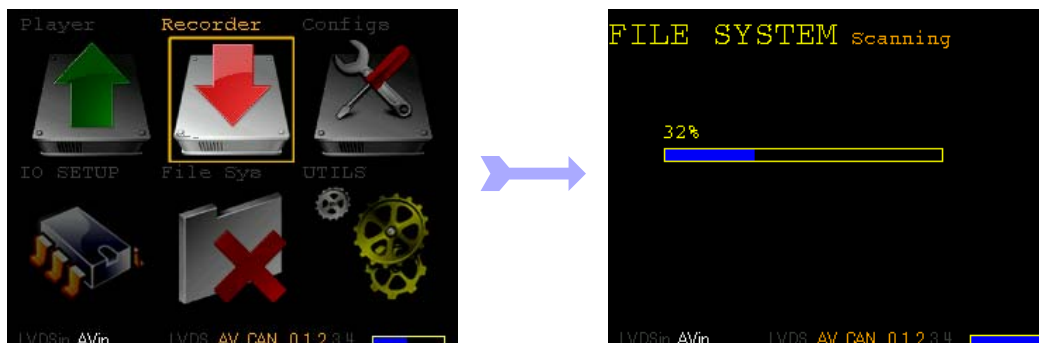
Enter/Exit RECORDER submenu

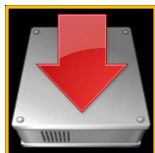
 Rotate left button until RECORDER icon is selected.

 Press left button to enter the recorder configuration file selection window. Hard disk scanning will take place.

 Rotate left button until **Exit** is highlighted in cyan colour.

 Press left button to exit the file selection window and come back to main menu.





RECORDER

Enter ARMED state.



Rotate left button to select the configuration file to be used during recording, selected file is marked in CYAN colour.



Press left button to enter ARMED mode. The following actions are executed:



Configuration of CAN bus and LVDS interfaces with the user selected configuration file.



Initialization of recording buffers, setup of pre-trigger and post-trigger parameters.

```

RECORD Config selection
(5/9) Selected

Exit
lastopen_playfile.cfg
config0.cfg
config1.cfg
config2.cfg
config3.cfg
config4.cfg
config5.cfg
config6.cfg
config7.cfg
..
LVDSin AVin LVDS AV CAN 0 1 2 3 4
    
```



```

RECORD Config selection
(5/9) Selected

Exit
lastopen_playfile.cfg
config0.cfg
config1.cfg
config2.cfg
config3.cfg Loading...
config4.cfg
config5.cfg
config6.cfg
config7.cfg
..
LVDSin AVin LVDS AV CAN 0 1 2 3 4
    
```

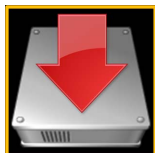


```

ARMED Waiting for trigger
Selected config3.cfg

CANCEL TRIGGER
X [Lightning Bolt Icon]

000Hr:00min:03sec:800ms
---Hr:--min:--sec:--ms
LVDSin AVin LVDS AV CAN 0 1 2 3 4
    
```



RECORDER

Start recording.



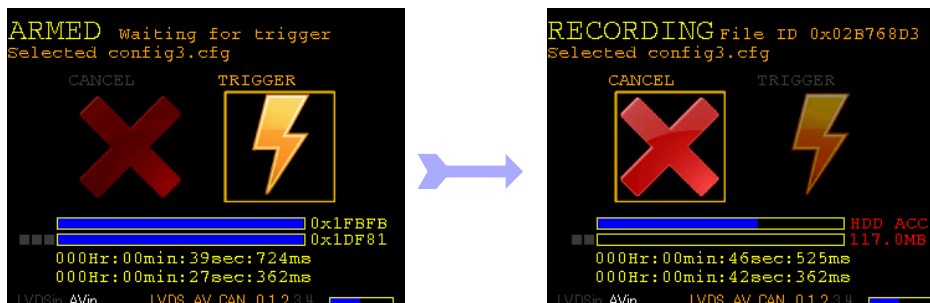
In ARMED state, wait until pre-trigger time is over. Not mandatory.

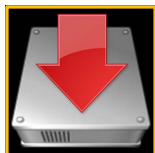


A trigger event (GUI, USB or CAN trigger) will cause to enter RECORDING state where the data is written in nonvolatile memory.



When recording time is over or user presses CANCEL button the system returns to ARMED state.





RECORDER

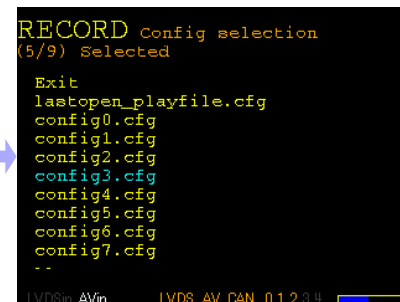
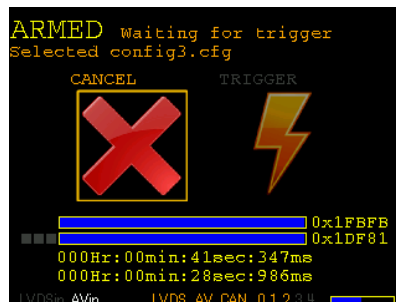
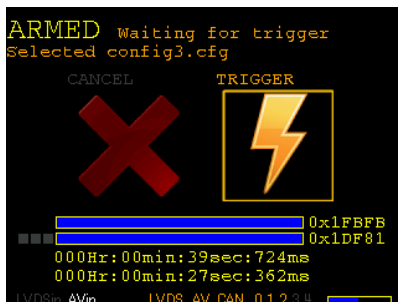
Exit ARMED state.

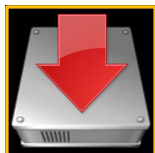


Rotate left or right button quickly at least 6 encoder positions. The CANCEL icon will be highlighted during 2 seconds.



When CANCEL icon is highlighted, press left or right button to exit ARMED mode.





RECORDER

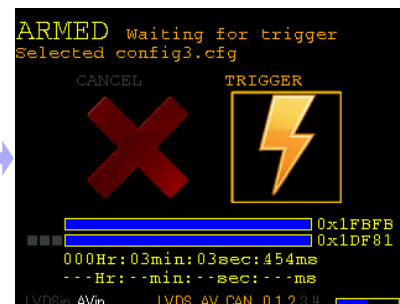
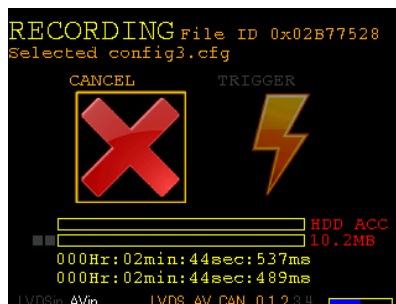
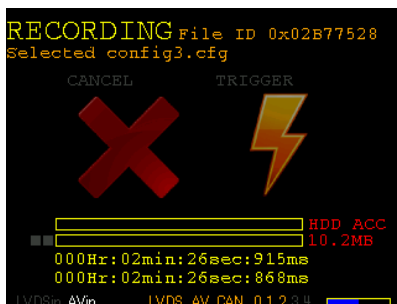
Exit RECORDING state.



Rotate left or right button quickly at least 6 encoder positions. The CANCEL icon will be highlighted during 2 seconds. The system will deselect the CANCEL icon if no other action takes place.



When CANCEL icon is highlighted, press left or right button to exit RECORDING state. The system will return to ARMED mode with TRIGGER icon selected (ready for recording) if no other action takes place.





CONFIGS

Enter/Exit CONFIGS submenu



From main menu rotate left button until CONFIGS icon is selected.



Press left button to enter the configuration file selection window.



From CONFIG File List Menu rotate left button until Exit is selected (marked in CYAN).



Press left button to exit and come back to main menu.





CONFIGS

Select a configuration file for edition.



Rotate left button to select the configuration file to be edited, selected file is marked in CYAN colour.



Press left button to enter the configuration file edit menu.

```
CONFIG FILES View Mode
(4/9) Selected
Exit
lastopen_playfile.cfg
config0.cfg
config1.cfg
config2.cfg
config3.cfg
config4.cfg
config5.cfg
config6.cfg
config7.cfg
--
LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



```
CONFIG FILES Edit mode
(4/9) config2.cfg
CANCEL SAVE
LVDS [*]
ANALOG VIDEO [*]
CAN0 [*] 500Kbit
CAN1 [*] 500Kbit
CAN2 [*] 500Kbit
CAN3 [ ] 100Kbit
CAN4 [ ] 100Kbit
Pre-Trigger 49600ms
Post-Trigger 3801900ms
Next Page >>
LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



CONFIGS

Edit a configuration file (channel selection).



Rotate left button to select the parameter to edit.



Press left button to enable/disable a channel for recording. Enabled channels will be marked with a star.



Rotate right button to select a baud rate for a selected CAN channel.



Rotate right button to configure pre-trigger and pos-trigger.

```
CONFIG FILES Edit mode
(4/9) config2.cfg
CANCEL  SAVE
LVDS    [*]
ANALOG VIDEO [*]
CAN0    [*] 500Kbit
CAN1    [*] 500Kbit
CAN2    [*] 500Kbit
CAN3    [ ] 100Kbit
CAN4    [ ] 100Kbit
Pre-Trigger 49600ms
Post-Trigger 3801900ms
Next Page >>
LVDSin AVin LVDS AV CAN 01234
```



CONFIGS

Edit a configuration file (Page Navigation).



Rotate left button to select **Next Page** or **Previous Page**.



Press left button to jump to Next or previous page (depending on selection).



Alternatively rotate right button to jump between pages.

```
CONFIG FILES Edit mode
(4/9) config2.cfg
CANCEL  SAVE
LVDS    [*]
ANALOG VIDEO [*]
CAN0    [*] 500Kbit
CAN1    [*] 500Kbit
CAN2    [*] 500Kbit
CAN3    [ ] 100Kbit
CAN4    [ ] 100Kbit
Pre-Trigger 49600ms
Post-Trigger 3801900ms
Next Page >>
LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



CONFIGS

Edit a configuration file (CAN signal edition).



Rotate left button to select a mask field or the enable flag.



If Enable field is selected press left button to enable/disable the selected signal.



If a mask field is selected rotate right button to change the mask value.

```

CONFIG FILES Edit mode
(4/9) config2.cfg
CANCEL  SAVE      SIGNAL0 SETUP
Enable  [*]
ID      AND MASK   XOR MASK
DATA H  00000000   00000123
DATA L  00000000   00<A>00000
CHAN    0          0
EXTENDED 0        0
REMOTE  0          0
DLC     0          0
ICON    smoke.png
<< Previous Page      Next Page >>
LVDS0: AVin          LVDS AV CAN 0.1234
    
```



```

CONFIG FILES Edit mode
(4/9) config2.cfg
CANCEL  SAVE      SIGNAL2 SETUP
Enable  [*]
ID      AND MASK   XOR MASK
DATA H  00000000   00000000
DATA L  00000000   00000000
CHAN    0          0
EXTENDED 1        <1>
REMOTE  0          0
DLC     0          0
ICON    woman.png
<< Previous Page      Next Page >>
LVDS0: AVin          LVDS AV CAN 0.1234
    
```



CONFIGS

Edit a configuration file (Trigger edition).



Rotate left button to select a mask field or enable flags.



If Enable fields are selected press left button to enable/disable the selected trigger.



If a mask field is selected rotate right button to change the mask value.

```

CONFIG FILES Edit mode
(4/9) config2.cfg

CANCEL  SAVE      TRIGGER SETUP
Enable USB Trigger [*]
Enable UI CAN BUS Trigger [*]
ID      AND MASK   XOR MASK
DATA H  FFFFFFFF   FFFFFFFF
DATA L  FFFFFFFF   FFFFFFFF
CHAN    7          0
EXTENDED 0         0
REMOTE   0         0
DLC      F         8
<< Previous Page
LVDSin AVin LVDS AV CAN 0 1 2 3 4
    
```




CONFIGS

Save configuration file and exit.



Rotate left button until SAVE is highlighted (marked on CYAN colour).



Press left button to save the configuration file into nonvolatile memory and exit.

```
CONFIG FILES Edit mode
(4/9) config2.cfg
CANCEL  SAVE  TRIGGER SETUP
Enable USB Trigger [*]
Enable UI CAN BUS Trigger [*]
AND MASK XOR MASK
ID 00000000 00000000
DATA H FFFFFFFF FFFFFFFF
DATA L FFFFFFFF FFFFFFFF
CHAN ? 0
EXTENDED 0 0
REMOTE 0 0
DLC F 8
<< Previous Page
LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



```
CONFIG FILES View Mode
(4/9) Selected
Exit
lastopen_playfile.cfg
config0.cfg
config1.cfg
config2.cfg
config3.cfg
config4.cfg
config5.cfg
config6.cfg
config7.cfg
--
LVDSin AVin LVDS AV CAN 0 1 2 3 4
```



CONFIGS

Cancel configuration file edit mode.



Rotate left button until CANCEL is highlighted (marked on CYAN colour).



Press left button to exit configuration file edit mode, changes will be lost.

```

CONFIG FILES Edit mode
(4/9) config2.cfg
  CANCEL  SAVE      SIGNAL4 SETUP
  Enable  [*]
  ID      00000000   00000000
  DATA H 00000000   00000000
  DATA L 00000000   00000000
  CHAN    0          0
  EXTENDED 0         0
  REMOTE   0         0
  DLC      F         4
  ICON     petrol.png
  << Previous Page      Next Page >>
LVDSin AVin  LVDS AV CAN 01234
    
```



```


CONFIG FILES View Mode
(4/9) Selected
  Exit
  lastopen_playfile.cfg
  config0.cfg
  config1.cfg
  config2.cfg
  config3.cfg
  config4.cfg
  config5.cfg
  config6.cfg
  config7.cfg
  ..
LVDSin AVin  LVDS AV CAN 01234
    
```



IO-SETUP

Enter/Exit IO-SETUP submenu

 Rotate left button until IO-SETUP icon is selected.

 Press left button to enter the menu.

 From IO-SETUP options list Menu rotate left button until Exit is selected (marked in CYAN).

 Press left button to exit and come back to main menu.





IO-SETUP

Select menu



Rotate left button to select the IO to edit/visualize.



Press left button to enter the selected option.

SetUp IO

Exit
LVDS TX DS90UR241
LVDS RX DS90UR124
Analog Video Preview

LVDSin AVin LVDS AV CAN 0 1 2 3 4



SetUp IO

Exit
LVDS TX DS90UR241
LVDS RX DS90UR124
Analog Video Preview

LVDSin AVin LVDS AV CAN 0 1 2 3 4



IO-SETUP

Edit LVDS RX/TX parameters



Rotate left button to select the LVDS chip parameters. The selected parameter will be marked on CYAN.



Rotate right button to modify the selected LVDS chip parameter.

Specific information on LVDS chip setup can be found on its corresponding data sheet at www.national.com.

```

NSC-TX DS90UR241-SetUp
Exit
TPWDNB [ 1 ]
TRFB [ 0 ]
RAOFF [ 0 ]
DEN [ 1 ]
Preemph. [ 1 ]
Preemph. [16.00Kohm]
LVDSin AVin LVDS AV CAN 0 1 2 3 4

```

```

NSC-RX DS90UR124-SetUp
Exit
BISTM [ 0 ]
BISTEN [ 0 ]
RAOFF [ 0 ]
REN [ 1 ]
SLEW [ 1 ]
RRFB [ 0 ]
PTOSEL [ 1 ]
RPWDNB [ 1 ]
PASS 0
LOCK 0
LVDSin AVin LVDS AV CAN 0 1 2 3 4


```



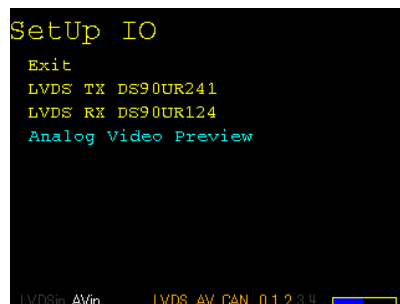
IO-SETUP

Analog video Preview

 Rotate left button to select Analog video Preview option.

 Press left button to enter Analog video preview mode.

 Press left button to exit Analog video preview mode.







FILE SYSTEM

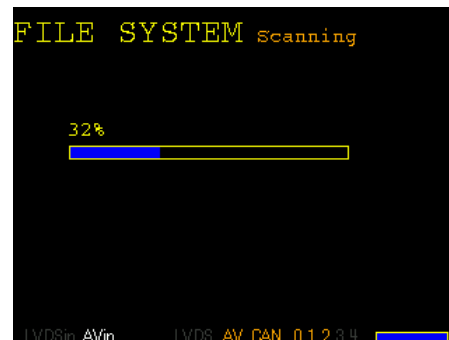
Enter/Exit FILE SYSTEM submenu

 Rotate left button until FILE SYSTEM icon is selected.

 Press left button to enter the menu. Hard disk scanning will take place building a file list.

 From File List Menu rotate left button until Exit is selected (marked in CYAN in upper right corner).

 Press left button to exit and come back to main menu.





FILE SYSTEM

Erase measurement files

1. Rotate left button until the **SELECT** string is displayed in CYAN colour on TOP right corner of the screen.
2. Rotate right button until desired file is selected. A selected file is marked in CYAN colour.
3. Press left button to select the file. A X will appear on the right showing that the file is marked for deletion.
4. Rotate right button until the **ERASE** string is displayed in CYAN colour on TOP right corner of the screen.
5. Press left button to erase the files. The window will show a progress bar exiting upon completion.

```

FILES Measurement      SELECT
(33/174) Selected
52% Disk Usage
2010/11/27 21:34:24 : 13879 MB -
2010/11/27 21:33:16 : 280 MB -
2010/11/27 21:31:08 : 9400 MB -
2010/11/27 21:30:16 : 440 MB -
2010/11/27 21:24:48 : 2920 MB -
2010/11/27 20:57:40 : 13880 MB -
2010/11/27 20:34:32 : 13880 MB -
2010/11/27 20:23:40 : 11120 MB -
2010/11/27 20:22:16 : 600 MB -
2010/11/27 20:19:24 : 320 MB -
LVDS AVn LVDS AV PAN 0.12
    
```



```

FILES Measurement      ERASE
(41/174) Selected
52% Disk Usage
2010/11/27 20:22:16 : 600 MB -
2010/11/27 20:19:24 : 320 MB X
2010/11/27 20:19:00 : 600 MB X
2010/11/27 20:18:24 : 320 MB X
2010/11/27 20:17:08 : 240 MB X
2010/11/27 20:16:24 : 480 MB X
2010/11/27 20:14:16 : 3560 MB X
2010/11/27 20:13:32 : 480 MB X
2010/11/27 20:12:24 : 680 MB X
2010/11/27 20:12:16 : 3000 MB -
LVDS AVn LVDS AV PAN 0.12
    
```







```

FILE SYSTEM Erasing
File 2 of 8
FILE_C2B744C0 86%
LVDS AVn LVDS AV PAN 0.12
    
```




FILE SYSTEM

Erase all measurement files


-  Rotate left button until the `SELECT ALL` string is displayed in CYAN colour on TOP right corner of the screen.
-  Press left button to select all files. A X will appear on the right showing that the files are marked for deletion.
-  Rotate right button until the `ERASE` string is displayed in CYAN colour on TOP right corner of the screen.
-  Press left button to erase the files. The window will show a progress bar exiting upon completion.



UTILS

Enter/Exit UTILS submenu

 Rotate left button until UTILS icon is selected.

 Press left button to enter the menu.

 From UTILS select Menu rotate left button until Exit is selected (marked in CYAN).

 Press left button to exit and come back to main menu.





UTILS

Built-in-self-test



From UTILS Select menu Rotate left button until **Built in self tests** option is selected (marked in CYAN).



Press left button to enter the menu.



Rotate left button to select the Test routine to execute.



Press left button to select the test routine.



Rotate left button to select Execute n times.



Rotate right button to select number of loops the routines will be executed.



Press left button to start executing the test. A window will show the number of errors and a progress bar. Upon completion the system will remain showing the test results (number of errors).



Press left button to exit the window.



UTILS

Built-in-self-test

```
UTILS Test
(3/4) Enabled
Exit
SDRAM BANK 1  [*]
SDRAM BANK 2  [*]
DDR HDD DEV   [*]
DDR HDD HOST  [ ]
Execute 0008 times

LVDSin AVin    LVDS AV CAN 0 1 2 3 4
```



```
TEST executing
0x00000000 Errors
SDRAM BANK1 OK
SDRAM BANK2 OK
4 Check 8732 of 15000...
HDD HOST DISABLED

LVDSin AVin    LVDS AV CAN 0 1 2 3 4
```



UTILS

Trigger Test



From UTILS Select menu Rotate left button until **trigger test** option is selected (marked in CYAN).



Press left button to enter the configuration file select menu.



Rotate left button to select a configuration file.



Press left button to enter the trigger event counter window.

```

TRIGGER TEST   Config Sel.
(3/9) Selected

Exit
lastopen_playfile.cfg
config0.cfg
config1.cfg
config2.cfg
config3.cfg
config4.cfg
config5.cfg
config6.cfg
config7.cfg
..
    
```



```

TRIGGER TEST   Config Sel.
(3/9) Selected

Exit
lastopen_playfile.cfg
config0.cfg
config1.cfg Loading...
config2.cfg
config3.cfg
config4.cfg
config5.cfg
config6.cfg
config7.cfg
..
    
```



```

TEST           Waiting for trigger
config1.cfg

TRIGGER       
Exit
Reset counters
CAN Trig. cnt : 0
USB Trig. cnt : 18
    
```



UTILS

Trigger Test

System waits for a trigger event on CAN bus (according to selected configuration) and USB. Every trigger signal will increment a counter. The trigger icon will be highlighted on a trigger event.



The trigger test functionality has been designed to show if a trigger is recognized, mainly to check if the proper configuration has been selected. Long reaction times or exact counting of trigger events are not accurate in this mode.





UTILS

Trigger Test Exit



Rotate left button until **Exit** string is selected.



Press left button to return to UTILS list select menu.

5 Specifications

	POWER			
	Min	Typ	Max	Units
Power Supply	9	12	36	V (dc)
E/A Isolation	--	1500	--	V (dc)
Consumption	12	18	20	W
Remote OFF	--	6	--	mA
Remote OFF	0	--	1.2	V (dc)
Remote ON	3.0	Open	12	V (dc)

	PHYSICAL			
	Min	Typ	Max	Units
Temperature	0	25	35	°C
Weight	--	1800	--	g
Height	--	87	--	mm
Width	--	180	--	mm
Length	--	190	--	mm

IO Specs

	Analog video	
	Value	Units
Input impedance	75	ohm (dc)
Input coupling	AC	N/A
Dynamic range	2	Vpp
Input format	S-Video,CVBS, Components	N/A
Color coding (input)	NTSC,PAL,SECAM	N/A
Digital format	720x575, 8 bits per pixel (gray scale), 25fps (PAL)	N/A

LVDS (National Semiconductors FPD link-II)		
	Value	Units
RX device	DS90UR124Q	N/A
TX device	DS90UR241QG	N/A
RX/TX Bandwidth	5~43MHz, 24bits (1Gb/s MAX)	N/A
TX clock generator	5-43	MHz
TX clock generator resolution	100	kHz
Logger format	24 bits per pixel clock (raw data)	N/A
TX Pre-emphasis step	100	Ohm
TX Pre-emphasis range	6-16	kOhm

DVI-OUT		
	Value	Units
Type	DVI-D (Single Link)	N/A
Resolution	1280x1024	pixels
Frame rate	56	fps

CAN BUS (Channels 0,1,2 High Speed)		
	Value	Units
Configurable baudrates	20,25,40,50,62.5,100,125,250,500,800,1000	kbit
Transceiver	TJA1050TD	N/A
Termination	120	Ohm

CAN BUS (Channels 3,4 Low Speed)		
	Value	Units
Configurable baudrates	20,25,40,50,62.5,100,125	kbit
Transceiver	TJA1055T	N/A
Termination	Open	Ohm

USB Trigger		
	Value	Units
USB host	USB 1.1	N/A
Trigger generator	USB mouse low speed	N/A

LOGGER Specs

	Memory resources	
	Value	Units
Non Volatile Memory	320	GB
Volatile Memory	900	MB
Pre-trigger Analog video + CAN	~85	sec.
Pre-trigger Analog video + CAN + LVDS (22MHz)	~11	sec.