

Crystal Vision

Playback

HD/SD instant replay devices

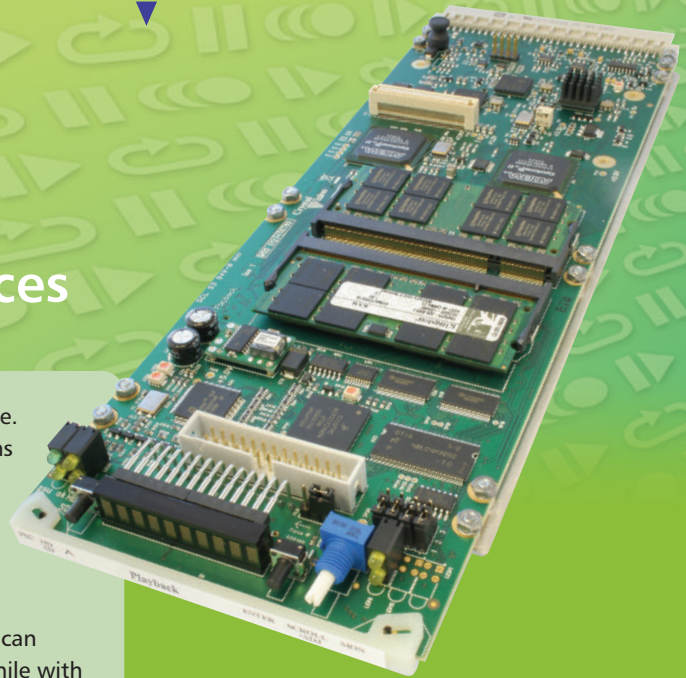
Playback makes replay technology affordable for the first time. This unique product has been designed for sports applications and can replay HD or SD video at a significantly lower price than the hard drive alternatives. Playback is part of the Picturestore product range – Crystal Vision’s area of speciality based on solid-state fast reading and writing picture storage.

Playback features a 4 GB video store and with HD video it can replay the last 30 seconds in 50Hz/25 seconds in 59.94Hz, while with SD video it can replay the last 155 seconds in 50Hz/150 seconds in 59.94Hz. Playback 8G has an 8 GB video store and can replay the last 60 seconds in 50Hz/50 seconds in 59.94Hz (HD video), or the last 310 seconds in 50Hz/300 seconds in 59.94Hz (SD video).

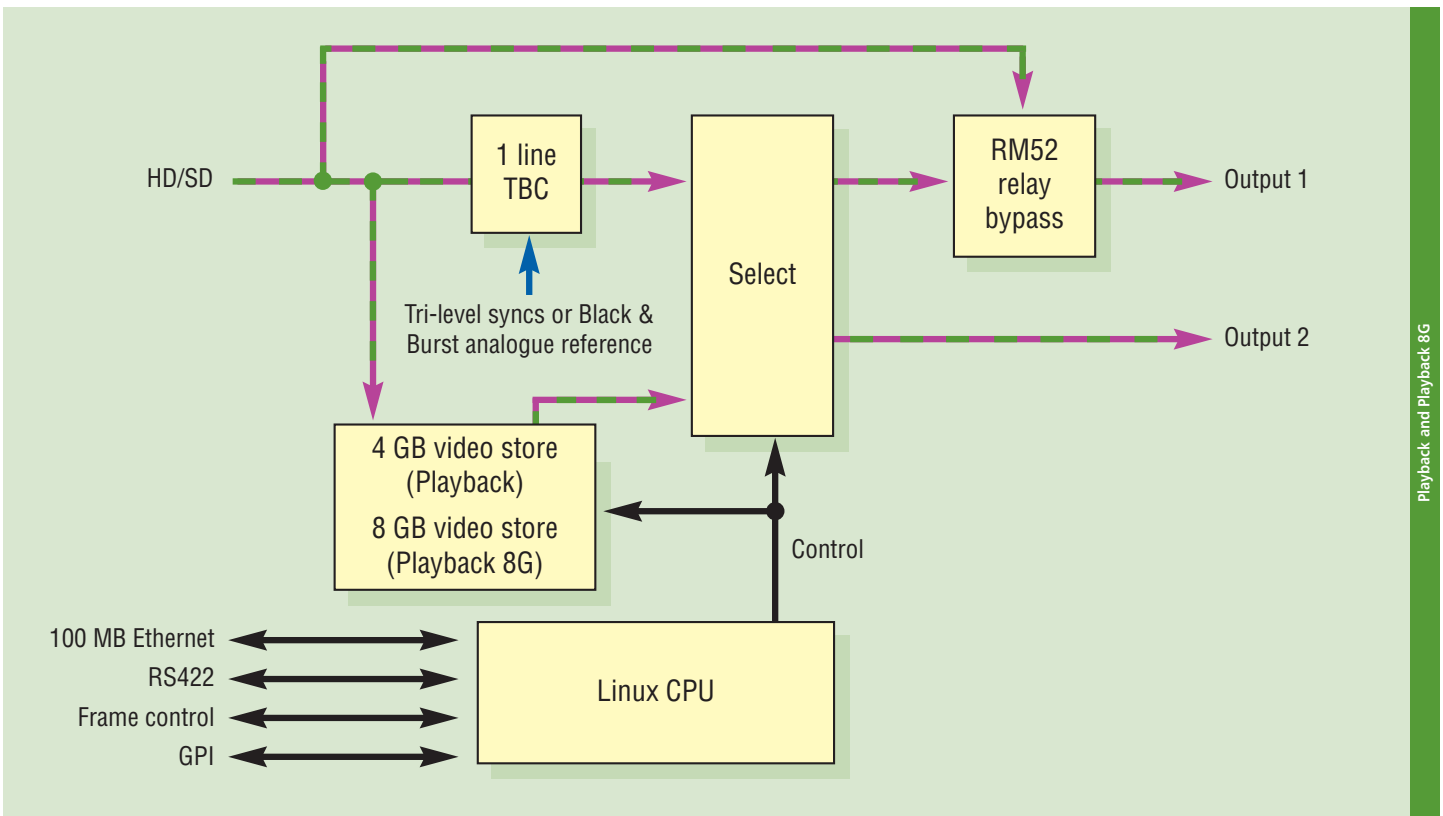
Playback features industry standard software protocols to allow it to be controlled from any third party hardware or software. A dedicated RJ45 connector on the RM52 frame rear module makes RS422 control by Sony or VDCP protocol easy. Playback will continuously record (and overwrite) until something of interest happens at which point the operator will press Stop. The last 30 or 60 seconds of recorded HD video is then available for replay, with flexible playback options available. Pressing Rewind jumps to the start of the recorded video while pressing Play plays from the current frame at normal speed. Other commands allow you to jog forwards and backwards by a number of frames, or to move forwards or backwards through the video at a variable rate. You can send the timecode of the current frame or even jump to a specified timecode using the Cue command. When they have finished reviewing the footage, the operator presses Record again which overwrites the stored video.

Recording the live output of a camera, Playback allows you to have a sporting shot from lots of different angles – simply by putting one on every camera. You can use it either as the main replay device, or in conjunction with hard disk solutions to provide extra channels of action replay and thereby cover all the cameras at an event.

Playback fits in Crystal Vision’s standard frames allowing easy integration with any interface or keying product from the range. With 12 boards in 2U, Playback’s small size makes it ideal for those applications where space really matters, such as in an Outside Broadcast vehicle. The output can be locked to an HD or SD analogue reference, while Playback also includes relay bypass protection of the input in the event of power failure or board malfunction or removal.



- ▶ Affordable instant replay device, available in two versions
- ▶ Ideal for replaying sports action
- ▶ Works with HD or SD
- ▶ 4 GB (Playback) or 8 GB (Playback 8G) video store
- ▶ Playback can replay last 30 seconds of HD video or last 155 seconds of SD video
- ▶ Playback 8G can replay last 60 seconds of HD video or last 310 seconds of SD video
- ▶ Industry standard software protocols (including Sony and VDCP) allow control by third party hardware and software
- ▶ Playback commands include Record, Stop, Rewind, Play, Fast Fwd, Jog forwards and backwards, Var/Shuttle forwards and backwards and Cue
- ▶ Multiple boards can be controlled together or independently
- ▶ Output can be locked to HD or SD analogue reference
- ▶ Relay bypass protection of input
- ▶ Space-saving: 100mm x 266mm module allows 12 Playback in 2U (24 in 4U, six in 1U and two in desk top box)



SPECIFICATION

MECHANICAL

Standard Crystal Vision modules 266mm x 100mm
Weight: 200g
Power consumption: 12 Watts

VIDEO STORE

4 GB (Playback) or 8 GB (Playback 8G) multi-port video store
Playback: With HD video can replay last 30 seconds in 50Hz and 25 seconds in 59.94Hz; with SD video can replay last 155 seconds in 50Hz and 150 seconds in 59.94Hz
Playback 8G: With HD video can replay last 60 seconds in 50Hz and 50 seconds in 59.94Hz; with SD video can replay last 310 seconds in 50Hz and 300 seconds in 59.94Hz

VIDEO INPUTS

One HD or SD input
270Mbit or 1.485Gbit serial compliant to EBU 3267-E, SMPTE 259M and SMPTE 292M
HD cable equalisation up to 140m with Belden 1494 or equivalent (approx. 100m with Belden 8281). SD cable equalisation >250m Belden 8281 or equivalent
Input return loss: -15dB for 50MHz to 1.5GHz
Auto 50/59.94Hz and video format selection

ANALOGUE REFERENCE

The output can be locked to an SD Black & Burst or HD tri-level syncs analogue reference

VIDEO OUTPUTS

One main HD or SD output using RM52 frame rear module.
Second output is set to be a relocked input loop-through.
Relay bypass protection of the input
Serial output: 270Mbit or 1.485Gbit serial compliant to EBU 3267-E, SMPTE 259M and SMPTE 292M. Output follows the input format

DELAY THROUGH BOARD

The input has a one-line TBC to align the input signal timing
SD delay: 6.5us min - one line plus 6.5us max
HD delay: 1.7us min - one line plus 1.7us max
Output timing can be from either an analogue reference or the input, with a user offset

GPI INPUTS

Four GPI inputs
Active: pull to ground, pulled up to +5V through 10 kohm
GPI inputs are shared with the second serial port (link selection)

GPI OUTPUTS

One GPI output
Other GPI output connection is used to control the bypass relay
Electrically: Open collector transistors 48V, 270 ohm current limit resistors. Pulled up to +5V through 6800 ohm

LED INDICATION OF:

Power supplies okay
Main input present
SD/HD input

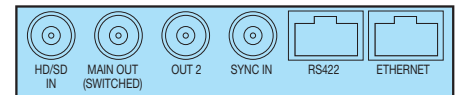
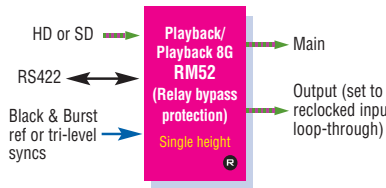
PLAYBACK COMMANDS

ACK/NAK: no user interest, controls the conversation between controller and board
Stop: freezes on current frame, stops recording or playback. Unit outputs undelayed live video with a marker to tell the user they are not recording
Play: plays at normal speed forward from the current frame
Rec: stops playback and starts recording video input, overwriting the contents of the store. The output is clean undelayed video
Fast fwd: jumps to end of recording and stops
Rewind: jumps to start of recording and stops
Jog fwd: steps forward by a number of frames, given by a parameter in the command, and freezes there

Var fwd: moves steadily forward at a variable rate, given by a parameter in the command
Shuttle Fwd: moves steadily forward at a variable rate, given by a parameter in the command
Jog reverse: steps backward by a number of frames, given by a parameter in the command, and freezes there
Var reverse: moves steadily backward at a variable rate, given by a parameter in the command
Shuttle reverse: moves steadily backward at a variable rate, given by a parameter in the command
Cue: Jumps to a specified timecode
Current time sense: sends the timecode of the current frame (based on start of recording = 00:00:00:00)
Status sense: sends back the status data

REMOTE CONTROL

RS422/485
Port 1: 19200, 8 bits, 1 stop no parity
Port 2: 38400, 8 bits, 1 stop odd parity
Basic control from frame active panel and remote panel
Statesman allows basic control from any PC on a network
Playback runs the uLinux operating system
Second serial port (link select instead of GPI inputs) allows connection to control panels and automation systems
Industry standard software protocols including Sony and VDCP help it to work with third party hardware and software
RM52 frame rear module includes dedicated RJ45 connector for RS422 control



RM52 used with Playback and Playback 8G

ORDERING INFORMATION

Playback	HD/SD instant replay device with 4 GB video store
Playback 8G	HD/SD instant replay device with 8 GB video store
Indigo 4	4U frame with passive front panel for up to 24 Crystal Vision modules
Indigo 4SE	4U frame with passive front panel fitted with Statesman CPU for up to 24 Crystal Vision modules
Indigo 2	2U frame with passive front panel for up to 12 Crystal Vision modules
Indigo 2AE	2U frame with active front panel for up to 12 Crystal Vision modules
Indigo 2SE	2U frame with passive front panel fitted with Statesman CPU for up to 12 Crystal Vision modules
Indigo 1	1U frame with passive front panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1-DP
Indigo 1AE	1U frame with active front panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1AE-DP
Indigo 1SE	1U frame with passive front panel fitted with Statesman CPU for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1SE-DP
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTAE	Desk top box with active front panel for up to two Crystal Vision modules
Indigo DTSE	Desk top box with passive front panel fitted with Statesman CPU for up to two Crystal Vision modules
RM52	Single slot frame rear module. Allows maximum number of boards in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box). Provides relay bypass protection of the input. Gives access to one HD/SD input, an HD/SD analogue reference input, one HD/SD output and a second output set to be a relocked input loop-through
REMIND	19" remote control panel
REMIND-E	19" Ethernet remote control panel
Statesman	PC Control System

Performance and features are subject to change. Figures given are typical measured values. PLAYBACK-P0709