



## Ruggedised, Waterproof HD Cameras and Microphones

### Introduction

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Livewire Digital Ltd. has designed a range of HD cameras for use in extreme sporting events, on vehicles or for deployment outside in adverse weather conditions. The cameras are available with a range of features, including Pan Tilt Zoom, Day/Night operation, HD Delay line and Roll Compensation.

All the cameras have been designed with extreme environments in mind; fully waterproof, the enclosures and mechanics have been engineered in machined plastics and hard anodised aluminium.

No compromise on the optics, with a flat sapphire optical window and integrated HD wide-angle lens, a key requirement to covering the action. Lightweight and low power, the cameras offer HD video for the next generation of extreme sporting events.

### Camera Modules

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The Livewire HD cameras housings and electronics are designed to accommodate camera modules such as the SONY FCB-H10 along with a wide-angle lens designed specifically for HD. These modules can be configured to support a range of HD standards that are fully supported 'end to end' by the electronics.

### Day / Night Operation

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Sometimes the action takes place at night or under very low light conditions. To address this Livewire has designed the day/night HD camera and custom IR flood assembly. The unit is fully compatible with the other cameras and associated infrastructure. The Day/Night camera is IP controlled and has an optional 'HD delay line' function to capture those dramatic events that have just taken place.

### Infrastructure

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Cameras often need to be placed in locations that are remote from the A/V recording equipment, often in hostile locations and in some cases for short periods of time that do not warrant high installation costs. This poses a number of technical challenges; the cameras must be powered, deliver high quality HD video and be remotely controlled. These requirements are often addressed separately, with special power supplies, custom connectors and complicated structured cabling.

Livewire have designed the range of HD cameras to be powered, controlled and deliver high quality video using two CAT5 STP cables over distances in excess of 50m.

Each camera has a built in power supply that can accept an input voltage of 18-36 Volts and de-couples the electronics from noisy widely fluctuating supplies. 10/100Bt Ethernet connectivity provides a highly flexible control interface and the latest generation of active drivers deliver high quality HD video to the control board in the Livewire Video Control System.

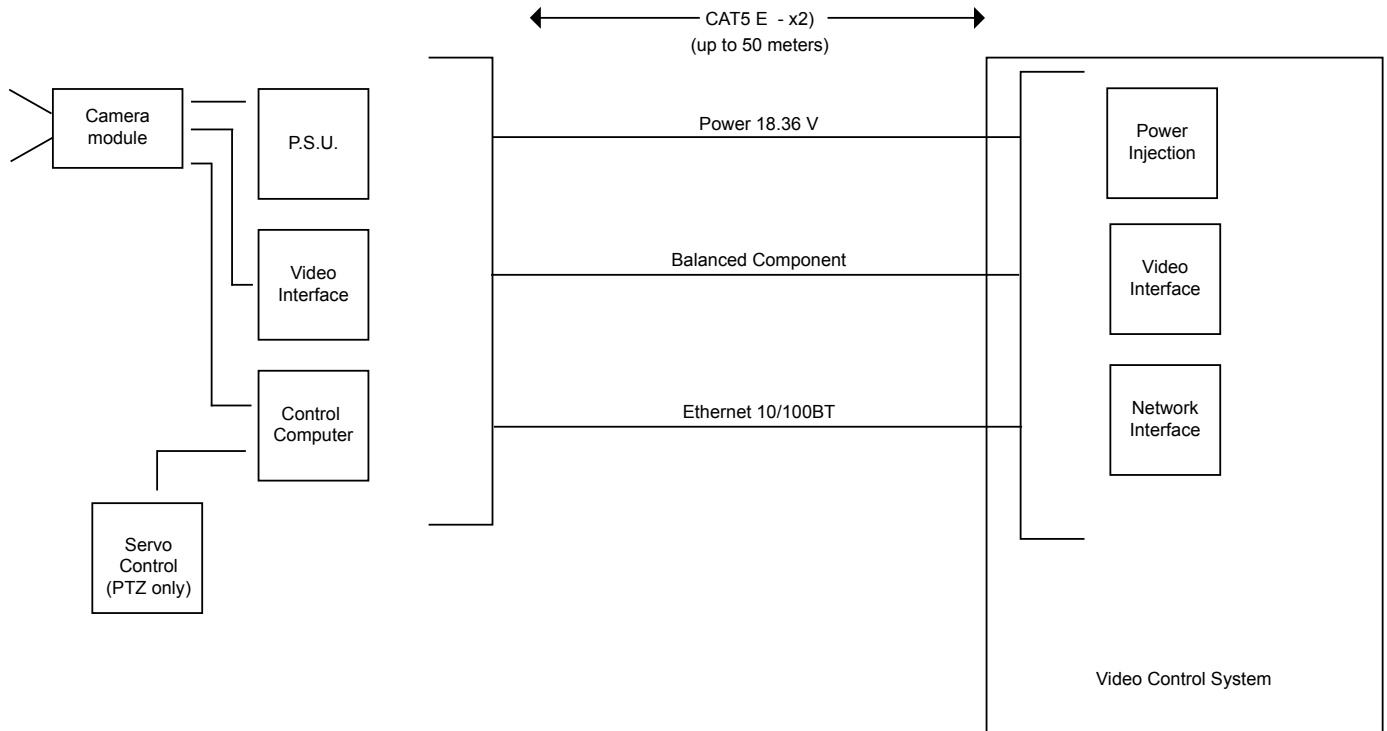
### HD delay Line

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The HD delay line can cache two minutes of historic HD video in a cyclic memory buffer. When triggered the camera can record the memory buffer and the subsequent 6 minutes of live video to a file in Flash that can then be retrieved over the cameras IP connection. The trigger can be a simple button press, telemetry data or remote command issued over IP.

The HD delay line can support two audio channels in conjunction with the HD video and two balanced audio channels can be delivered to the Day/Night camera over the CAT5 infrastructure.

## Camera Control Schematic



### Ethernet and IP control

The range of cameras are controlled over IP, with each camera using 'Bonjour' to advertise their feature set on the network. Livewire have adopted IP as it offers such a high degree of flexibility. Cameras can be controlled locally or remotely over the Internet or private networks and may be readily integrated into custom systems. Optional VISCA support allows the use of industry standard equipment to control a system.

### Video Control System

The Livewire Video Control System, (VCS), presents Ethernet, manages power injection and offers support for switching between 6 remote HD cameras and 2 local unbalanced component sources. A single supply of 18-36V powers the complete system.

### Pan, Tilt, Zoom

The Livewire HD PTZ camera incorporates the HD wide-angle lens and a flat sapphire glass optical window. As with the other cameras, the PTZ is interconnected over two CAT5 STP cables that provide, power, Ethernet and deliver video. The pan and tilt servos are managed by the cameras management computer under IP control, they feature fixed positions, staged sequences and a parking position. On power up they will automatically return to the position they were in before they were parked.

### Microphones

Most applications require audio as well as HD video and this presents similar challenges when managing extreme environments. To complement the range of HD cameras, Livewire has designed a waterproof microphone with integrated pre-amp, 'wind jammer' and a capsule suspension that offers 20dB of isolation from structural borne vibration.