Shadow Telecine

High performance
Solid State
Digital Film Imaging Technology
## Table of contents

- Introduction
- Simplicity
- New Scanner Design
- All Digital Platform
- The Film Look
- Graphical Control Panel
- Film Handling
- Main Features
- Six Sector Color Processor
- Cost of ownership
- Summary
The Film Transfer market is evolving rapidly. There are a host of new DTV formats required for the North American Market and a growing trend towards data scanning as opposed to video transfer for high end compositing work. Most content today will see some form of downstream compression, so quiet, stable images are still of paramount importance. With the demand growing there is a requirement for a reliable, cost effective solution to address these applications.

The Shadow Telecine uses the signal processing concept of the Spirit DataCine and leverages technology and feature of this flagship product. This is combined with a CCD scanner which fulfills the requirements for both economical as well as picture fidelity. The result is a very high performance product all the features required for today’s digital application but at a greatly reduced cost.

Unlike other Telecine solutions available in this class, the Shadow Telecine is not a re-manufactured older analog Telecine, nor an update kit to an existing machine. While these solutions may fit the budgets of many facilities, they are clearly compromises designed to try and make older, obsolete Vacuum tube (CRT) technology perform to today’s demanding digital standards. The Shadow Telecine is one hundred percent a digital machine, using latest state of the art technology and was designed by our Emmy award winning Spirit DataCine design team. It is manufactured alongside the Spirit DataCine in our factory in Weiterstadt / Germany. For an investment similar to the purchase of upgrade kit or re-manufactured machine, a complete Shadow Telecine system is available that offers new, state of the art technology with the best performance in this class of machine. Further, like all of our new products, it carries a full warranty and guarantee and is backed up by our extensive world wide product support and service team.
The Shadow Telecine is one hundred percent a digital machine, using latest state of the art technology and was designed by our Emmy award winning Spirit DataCine design team. It is manufactured alongside the Spirit DataCine in our factory in Weiterstadt / Germany.

**Simplicity**

The Shadow Telecine is a CCD based machine with all the advantages that CCD technology has to offer, providing very high performance without complexity. Unlike Vacuum tube (CRT) technology there is no need to provide a host of complex defect masking, enhancement and correction circuitry to compensate for the poor performance of the Vacuum tube. Simplicity also results in repeatability, reliability offering high utilization and a very low cost of ownership.
New Scanner Design

The heart of the Shadow Telecine is a totally new custom designed scanner. Using the latest advancements in correlated double sampling technology combined with new custom built CCDs, this new scanner delivers incredible performance.

The Shadow Telecine uses a new custom-built optical system by Carl Zeiss, Jena in Germany and the illumination system is an innovative combination of a cost effective Halogen light source, optical fiber transmission system and pre-gate filters to allow precise optical reproduction of any 16 or 35mm film format. Light is transmitted from the illumination system to the lens gate using a Kaleidoscope and a fiber bundle. It then passes directly into the film skid plate, where a second Kaleidoscope is used to re-shape the light and provide diffuse illumination onto the film plane — a simple, yet highly effective design. Diffuse illumination is vital for the natural, artifact-free optical reduction of the effects of dirt and scratches. Vacuum Tube (CRT) light sources use collimated light which actually accentuates the blemishes resulting from dirt and scratches, usually necessitating multiple passes through a film cleaner and hours of electronic dust busting in Post.

The Shadow Telecine also provides the possibility for the user to adjust the illumination level (or exposure) relative to the density of the film with precise optical matching for the type of film being used. This process, again very simple, is close to the natural photographic process of optical film printing and therefore delivers more filmic, natural results to the user.
Features

- Fiber Light Guide - aperture conversion
- Film Gate, Skid Plate
- Projection optics
- Beam Splitter, Red, Green, Blue
- 3 CCD Line Sensors
- Integrator for light diffusion
The demands of today’s market, applications and working environment require reliability, repeatability and high utilization from any new product. These can only be achieved with well-designed all-digital products. Any analog processing adds noise and the potential for drift.

Many Telecine products claim to be “Digital” but only a very small portion of them are in fact truly Digital. A large proportion of the system within these machines is still analog, with heavy reliance on the analog Vacuum tube (CRT) as a light source. This by nature is a great source of drift and variation in the film transfer process requiring complex correction systems designed to mask and recover performance over time. The Shadow Telecine uses the latest solid state CCD technology and immediately after the light has been converted into an electrical signal it is digitized directly in the scanner assembly. There is no risk of noise contamination and the signals are totally free from any analog drift and the full dynamic range of the film has been digitally preserved.

Using the “all digital” approach to the design of the machine not only guarantees performance over time but also totally eliminates the need for routine alignment. There are no “pots to tweak” and “things to fiddle with” on the Shadow Telecine to ensure peak performance. Simply press an auto alignment button once a day and the machine will be digitally aligned and calibrated to ensure optimum performance at all times. The system also constantly monitors itself while in use, and if a fault condition should ever arise it is reported on the graphical control panel for quick problem diagnosis. All these attributes ensure the machine can always be maintained at peak utilization, generating revenue whenever possible. After all, the last time we checked, film transfer was a business designed to make money. It is not a hobby or a place for expensive, cute, analog tinker toys anymore.

The Shadow Telecine draws upon much of the established and proven technology from its big brother, the popular Spirit DataCine, and the same signal processing concepts is used in both machines. This tried and trusted technology with a track record for reliability and performance provides the user with the confidences needed for any new purchase. Many of the operational features loved on the Spirit DataCine are now provided on the Shadow Telecine, including many that were never available on the Shadow’s predecessor the Quadra.
A lot of subjective comments and industry speculation is made about what the “film look” is and what it should be. It is true, a Digital CCD machine looks different from a Vacuum tube (CRT) machine. The transformation in the market over the last three years with the almost runaway adoption and success of the Spirit DataCine into all high-end facilities has demonstrated that this “new look” may be different, but is very desirable. Lush, crisp noise-free images, pure accurate spectral color reproduction, even focus and shading distribution with filmic soft clipping and endless dynamics via unique exposure control describes the CCD Telecine. It is reliable, very fast to use and predictable, delivering great results day in, day out, all of the time.
Application

Much more than just a local control panel, the GCP is an innovative and flexible way to control the Thomson range of film imaging products: Spirit DataCine, Shadow Telecine and Specter Virtual DataCine as well as Scream and SteadiScan.

While in creative telecine applications a third-party controller is essential, there are a number of situations which do not need those advanced features. In these circumstances it makes sense to release the expensive Telecine controller and colour processor hardware for other work and use a more simple local control panel.

The GCP is revolutionary in telecine design in that it provides full access to all of the internal functionality of the Spirit DataCine, Specter Virtual DataCine or Shadow Telecine, including the internal primary and 6-sector color processing as well as Scream and SteadiScan. This is done via a simple but powerful graphical user interface. A carefully designed combination of a large colour TFT touch screen, soft key controls and digital potentiometers give both flexibility and speed of use. For test and alignment, the GCP gives the engineer access to all functions of the system, without the need to use a third party controller. Colorists can also use it to explore the capabilities of the system, with junior staff learning the fundamentals of telecine control.

It could even provide all the control you need for some dailies and long form work. Because the GCP is software based and driven through on-screen menus and soft keys, it can easily adapt as new facilities and features are added to the host system - Spirit DataCine, Specter Virtual DataCine or Shadow Telecine - and will continue to develop as new products are added to the Thomson Digital Film Applications portfolio.

Physically, it is a direct replacement for the original functional control panel, or it can be desk mounted or rack mounted depending on the application.

An upgrade programme is available for users of the functional control panel who wish to use the new GCP.
specification

• microprocessor-based architecture
• TFT colour display with touch screen
• 6 assignable digital potentiometers
  • 1 trackball
• 37 assignable hard keys
• internal power supply
• no fan required
• same footprint as FCP
• trade-in upgrade programme for FCP
• simple 19" rack mount included
  optional table mount with swivel frame available
  optional 19" rack mount with swivel frame available
Film Handling

Film is a most precious commodity. Careful design and perfection of manufacture is imperative in the transport system, if the objectives of safe handling of the film and avoiding even the slightest risk of damage are to be achieved. The Shadow Telecine uses servo systems proven in the well regarded Spirit DataCine, employing the very smooth continuous-motion capstan drive system. The capstan drive removes the risk of damage even if there is a failure, since it is not necessary to either “pull” or “push” the film as with mechanical sprockets or pins located in the film sprocket holes. Any failure on that type of mechanical drive system all too readily results in film breakage or shredding, very in opposite to the solution provided in Shadow TeleCine and Spirit DataCine, which are famous for its superb film handling.

Even if film is laced on the Shadow Telecine incorrectly by an inexperienced operator, with for example loose tension and spooling direction set incorrectly, the Shadow Telecine will gently try to tension the transport, detect a problem and release tension before damage can occur. Under normal operation the film core diameter can be preset into the digital servo and, when in fast shuttle or even play the machine will stop on the film head or tail automatically, avoiding the film run off at high speed. The Shadow Telecine ensures the minimum required tension of the film, which is automatically changed between 16 and 35mm film formats, so helping to prevent damage and abrasion and also provides consistent, firm packing of the film.
Main Features

There are many new features available on the Shadow Telecine, which are not self-evident in this class of product. Key features include:

- High performance Zeiss Optical systems for 16/S16mm and ACA35/S35mm film formats
- Image X,Y Zoom, X,Y linearity and 360 degree image rotation
- Optical matching for all film types (Print, IP, Neg, Primetime)
- Negative matching controls
- Built in resolution independent digital Primary and Secondary color correction
- Diffuse illumination (for optical removal of blemishes due to dirt and scratches)
- Optical diffusion filters provided for effects
- Built in PTR (Particle Transfers Rollers)
- Built in universal Keycode mounting system
- Precision capstan-drive digital servo control system
- 2 to 57 fps variable speed, forward and reverse
- Stereo optical (35mm) and mono 16mm optical and magnetic audio
- Remotely adjustable mechanical focus
- Data output delivering standard RGB DPX files.
- Single wire Cheapernet interface to third party control systems.

Multi-standard video outputs (Analog and Digital):

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>525i / 60Hz</td>
<td>4:2:2 or 4:4:4 or 8:4:4</td>
</tr>
<tr>
<td>625i / 50Hz</td>
<td>4:2:2 or 4:4:4 or 8:4:4</td>
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<td>4:2:2 or 4:4:4</td>
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</tr>
<tr>
<td>1080P / 25PsF (50Hz)</td>
<td>4:2:2 or 4:4:4</td>
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</tbody>
</table>
Application

Thomson film scanning solutions are provided with a standard primary Color corrector (RGB) which offers extensive range and latitude combined with precise digital control. This correction is real-time and resolution-independent (up to 2K) so correction for any output format is supported, even data, with transparent switching between formats. There are applications where the basic primary functionality needs to be enhanced with basic secondary color control.

This option is a cost-effective solution designed to be used either alone with a controller or to enhance the features offered by third party color correctors that are today available on the market. Dailies, best light transfers and the growing adoption of downstream disk-based color correction systems means a high quality basic grade is required before the finishing touches are applied later in the process. Just like the Primary color correction system, the secondary color corrector is also real-time, resolution independent and working with the full film color space and at full film resolution-independent.
Operational control is provided via the popular controllers from DaVinci and Pandora. We also support full control from our graphical control panels supplied with the DataCine and Shadow Telecine products. No additional cables are required, all control functions are embedded within the existing IMCS Cheapernet control interface that is used on these products.

The design and implementation is 100% digital integrating perfectly within our high-speed digital signal processing architecture, it employs up to 16-bit quantization and operates in real time at up to 2K resolutions.

Most important, when in unity mode complete transparency is afforded through the system.
Cost of ownership

There are various factors that influence the expense of owning a Telecine system. Aside from the obvious capital cost of the initial purchase other expenditures can be a huge drain on revenues.

Influencing factors:

- Initial investment in technology
- Expected "useful" life of machine (depreciation)
- Provided manufacturer warranty
- Cost of consumable parts
- Downtime (utilization)

The Shadow Telecine is offered at a very attractive purchase price. It is a brand new design using state of the art all-digital technology, most of which has been proven in the Spirit DataCine. Based upon its features and options, it can address all of today’s new demands in terms of format support and delivers unrivaled quality for a machine in this class. Other solutions offered in this class are re-worked older analog machines or complex update kits.

The Shadow Telecine is a brand new product; the machine carries a full Philips warranty and is supported by our worldwide service centers.

The Shadow Telecine has practically no cost associated with consumable parts. It uses an extremely low cost Halogen lamp that is simple and fast to exchange and requires no alignment once installed. Compared to the cost and associated downtime when dealing with Vacuum tube (CRT) machines the cost for the Shadow Telecine is totally insignificant.

Downtime is a serious consideration. Lost operational hours represent hours lost from billable revenue and upset clients. Repeatability, reliability and ease of service are essential in today’s economic environment. Many Telecines can run two or three shifts a day so utilization has to be high for return on investment. The removal of any routine engineering adjustment, built in diagnostics, the all-digital solid state design, combined with the fast, inexpensive exchange of consumables on the Shadow Telecine make it a very high utilization machine.
Summary

The Shadow Telecine is a machine built to provide the perfect balance between cost, image quality, feature sets and utilization for today’s markets and applications.

The Shadow Telecine uses state of the art CCD Technology which has been proven on the Spirit DataCine to produce a clean desirable artistic film look and recognized by most of today’s top film producers and directors across all market segments. It is the perfect compliment to the high end Spirit DataCine machine in most film transfer applications.
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