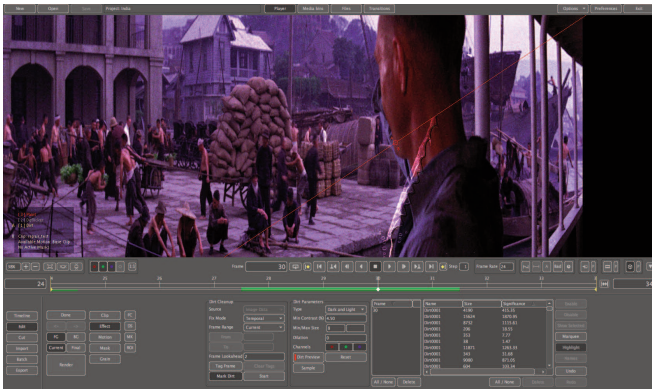


## PFClean and the DI Workflow

The introduction of digital technology to filmmaking is nothing new. Digital tools have been steadily replacing analogue and optical ones for the last two decades. In many cases the methodologies and workflows employed have changed little. The adoption of the Digital Intermediate (DI) process is once again redefining workflow and fundamentally changing the production process and the creative opportunities it provides.

*"Setting up an automated scratch removal and dust busting DI pipeline can be pretty tricky. Throughout the project The Pixel Farm were always ready to help with issues from planning to implementation. They understand our workflows and infrastructure, together we were able to come up with a solution that is right for us." Mark Smith Information Systems Engineer, CFX Delux London*

The PFClean DI workflow allows image data to be captured and used by several processes at the same time to perform any number of tasks, from editing to grading and effects. A true non-linear collaborative workflow can be established allowing creative discussions to be made throughout the production process with far less impact on production economics and timescale than is the case in many current pipelines. In short you can work faster and work smarter.



PFClean supports Linux, Mac OS X Intel and Windows as software only or as a complete Turn-key System. Optional PFClean Film Restoration Pack is available for both software only and systems. Annual support contracts and on-site training can be provided on request.

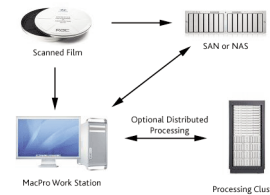
[www.thepixelfarm.co.uk](http://www.thepixelfarm.co.uk)

## You Can't Beat The System

PFClean Systems are complete software and hardware appliances designed to work out of the box as either a network attached or standalone device. Available as the 'Video System', ideal for both SD and HD or a 'Film System' for demanding 2K and 4K environments. Both are built around 64-bit Linux and feature fully hardware accelerated tools. Systems provide a cost effective solution with all the power you need. Optional Video IO adds to the operational flexibility.

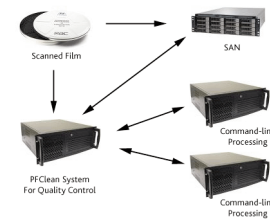
### Typical SD and HD Workflow

PFClean software can be used on a network attached work station or with direct attached storage. Distributed batch processing can be added at any time providing unlimited processing power.



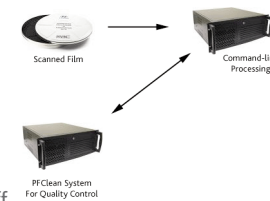
### Typical 2K and 4K Workflow

The PFClean Systems have been designed to maximise throughput on HD, 2K and 4K DI and restoration projects. Additional distributed processing can be added using command-line processing nodes. These can be driven by either PFFarmer or a third party cueing system.



### Typical Automatic post scan clean-up

PFClean can be set up to automatically clean-up plates as they are scanned. The command-line software provides access to the entire PFClean toolset and can process pre-build effects stacks. IR defect maps are fully supported and greatly speed up processing. A GUI version of PFClean can be used to quality control clips before sign off.



A few of the places that PFClean: *Technicolor, Deluxe, Mollinare, Cineimage, Cineric, Ollin Studios, ARRI, DigiCinema, Graal, The Criterion Collection, Galaxy Studios, UPP, Das Werk, FilmLab Mumbai, Pixion, Listo, Buf, Amazing Studios.....*



# PFClean™

## The pre-grade tool for DI and Restoration

Available on all major platforms, PFClean is a fast, flexible and resolution independent automatic image clean up system designed for use with moving image data prior to the VFX and DI process as well as restoration of archived film and video. Built on The Pixel Farm's extensive research in the areas of image analysis technologies, PFClean features a comprehensive set of non-destructive, hardware accelerated tools to clean up and restore images.

*"It has a very quick learning curve, provided us with the toolset we required within a clear user interface and most importantly allowed us to deliver clean scans within time and on budget, it can seamlessly fit in to any digital workflow. We weren't just buying a piece of software, we were buying into a solution and creating a working partnership. The Pixel Farm themselves have been very helpful and supportive, providing guidance and feedback as and when we needed."* Steve Boag Managing Director of Cineimage London

### So Just What is PFClean?

Working as a fully automatic, hybrid or manual system, the PFClean user is able to define frames and the type of anomalies to be fixed in a completely non-destructive and non-linear environment. Image sequences can be processed immediately or committed to the Pixel Farm's tightly integrated cross platform batch processing system. Support is provided for multiple resolutions within the same project or timeline.

All fixes, whether applied automatically or manually, are executed via a per frame metadata map - right down to individual dust specks or paint strokes.

These are then stored as meta data for later modification if required. This



provides total control over any image modification and effectively provides the user with an unlimited number of non-sequential 'undos'. The data is maintained throughout the clean up process with full remastering functionality providing format conversion and multi-resolution exports.



### Comprehensive DI and Restoration Toolset

PFClean has all the tools required to enable the post production and finishing workflow from scanners, archive footage and digital film cameras, including:

- Automatic Dirt, Dust and Scratch removal including defect (IR) map support
- A real-time floating point Paint system including clone and dust-busting brushes
- Image stabilisation including frame rebuilding
- Rotoscope tools to assist paint and motion analysis
- De-flicker
- Global de-noise/sharpen/blur
- Comprehensive Noise/Grain management
- Full float pipeline with HDR support
- Media remastering and Format conversion
- Automatic removal of static dirt
- Tracking Manager
- Rig/Wire removal
- Scripting UI via 'PFClean Automations'
- Project and Media Management

The additional tools within the **Film Restoration Pack** are designed to extend PFClean's core functionality, addressing the problems found when dealing with very damaged film or restoration projects. The tools fit seamlessly into the PFClean environment and take full advantage of the benefits of the PFClean non destructive workflow. The optional additional tools include:

- Tear repair
- Frame repair
- Automatic RGB channel alignment
- Colour balance
- Colour correction
- De Fog
- Colour grade transfer
- De-warp

## Get more bang for your buck

### Fast Non-linear Workflow

A non-linear workflow allows the user to go back at any stage and edit the sequence without the need for multiple renders. By making use of metadata, every action, automatic or manual, is recorded and made available for editing in a fully non-destructive environment. Both the application interface and toolset are optimised to provide an efficient and effective working environment, making PFClean by far the fastest way to get images from the scanner into the DI pipeline.

*Production Director at Ollin Studios, Charlie Iturriago explains, "The PFClean team receive the movie rolls of 1000ft to the computer and remove scratches and dust, cleaning the film frame by frame, in a fast and automated process. Then the final frames go to output servers for deliveries and archival. So, the entire movie is QC'd with PFClean in 2k for a completely clean delivery."*

### Plays Well With Others...

PFClean integrates with existing pipelines and thus enables any pre-grade treatment of footage, while allowing other systems to continue working with the images. For example integration with FilmLight's BaseLight allows footage to be graded in Baselight while simultaneously being restored in PFClean. Our DPX workflow includes the ability to display header info and pass clean DPX header data down stream to other applications. All progressive and interlaced video formats are fully supported, while ingest and layoff are handled through an optional SD/HD 4.4.4 video IO available in the Video and Film Systems. Support is also provided for ASC CDL's for grade transfers.

### While You Were Sleeping...

The GUI can be used to review clips and assess what parameters the batch processing system will require to complete the job. A batch script can then be left to run as files are released from the scanner and made available to the GUI so fully automating the clean-up process. If required, the batch applied fixes can be adjusted, modified or rejected in near real-time using the metadata tags created for each fix. The addition of extra information such as IR data from the scanner, where available, will greatly increase the possibility of fixing any errors with little or no user interaction.

The fully 64-bit application architecture is built around highly optimised and efficient motion analysis algorithms. Hardware accelerated tools provide an amazing speed boost in the Turnkey Systems making them ideal for those needing large throughput at higher resolutions.

# One damaged reel fixed pays for PFClean