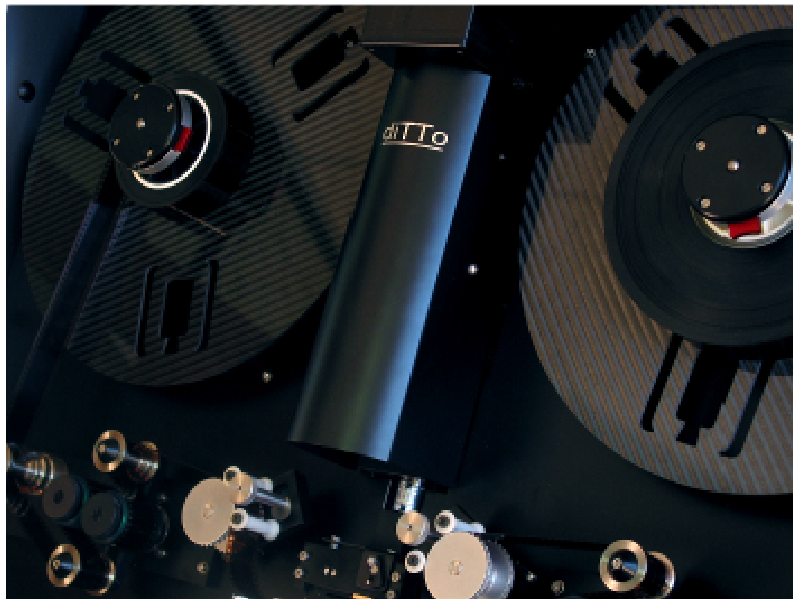




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diTTo



User Guide

Issue 3.0

Provisional

While every effort has been made to ensure that the contents of this document are accurate Cintel International equipment is under constant review to bring about improvements in design, and a unit may differ in detail from that described.

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Declarations of Compliance

CE Declaration of Conformity

Compliance To Be Advised

FCC Part 15 Class A Declaration of Conformity

Compliance To Be Advised

Information for Users on Disposal of Old Equipment

European Union]



Attention

This symbol is only valid in the European Union

This symbol indicates that the electrical and electronic equipment should not be disposed of as general household waste at its end-of-life. Instead, the product should be handed over to the appliance collection point for the recycling of electrical and electronic equipment for proper treatment, recovery and recycling in accordance with your national legislation.

By disposing of this product correctly, you will help to conserve natural resources and will help prevent potential negative effects on the environment and human health which could otherwise be caused by inappropriate waste handling of this product. For more information about collection point and recycling of this product, please contact your local municipal office, your household waste disposal service or Cintel International, or your agent of Cintel International.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

(Business Users)

If you wish to dispose of this product, please contact service@cintel.co.uk to obtain information about returning the product.

[Other Countries outside the European Union]

If you wish to dispose of this product, please do so in accordance with applicable national legislation or other rules in your country for the treatment of old electrical and electronic equipment.



Warning

Electrical supplies in excess of 50 (fifty) volts are potentially hazardous or lethal; supplies of up to 264V exist within the diTTo Scanner. THE SCANNER MUST ONLY BE OPERATED WITH ALL COVERS IN PLACE; covers must only be removed by qualified service personnel for maintenance purposes.



The scanner is designed so that it CANNOT be operated remotely with the film transport door open; safety interlock switches force the scanner into a STOP condition when the door is opened. Do NOT in any way over-ride, modify or alter the operation of these switches; these switches are fitted for safety purposes and can only be over-ridden by a qualified engineer equipped with the correct service tool. In the event of an interlock being overridden the operator waives ALL liability.



Ensure that film tension is switched OFF (Film on film path is slack) BEFORE touching any part of the film transport mechanism.

Introduction



diTTo data Scanner

diTTo is a high quality, high speed digital film scanner designed for all data scanning applications including film mastering, digital intermediate, special effects, archiving and restoration.

diTTo uses cutting edge technology in a unique, space saving 'desktop' design and is designed as a 'plug and play' device.

diTTo is uniquely designed to be a user-friendly film scanner that does not require highly trained operational and maintenance personnel. The scanner has an inbuilt PC and 1.2TBytes of local RAID storage.

diTTo has an intuitive Windows-based Graphical User Interface (GUI) which provides simple, automatic, film calibration, clip management and all the features expected from a professional data film scanner.

diTTo scans 35mm and S35mm 4-perf film to Super2K and 4K data files *(Catalogue Number DT2005200)*

diTTo can be upgraded with the following options:

35mm and S35mm 3-perf Operation	<i>(Catalogue Number DT2005230)</i>
Dust and Scratch Concealment	<i>(Catalogue Number DT2005220)</i>
35mm Keycode Reader	<i>(Catalogue Number DT2005240)</i>
35mm PRINT 4-perf Gate	<i>(Catalogue Number DT2005250)</i>
16mm and S16mm Gate	<i>(Catalogue Number DT2005260)</i>
Kodak Display Manager Option	<i>(Catalogue Number DT2007270)</i>



diTTo includes Kodak Colour Science
(see appendix 5 page 37)

Installation

System set-up

Ensure the ac mains supply has been fully disconnected prior to removing any cover plates. This task must be performed only by suitably qualified personnel.

Connections to the scanner are via an EMC gland plate located at rear of the scanner. Remove the 4 screws (4 x M3) that hold the small adjustable aperture plate, Fig 1(A), feed through the appropriate cable to the diTTo internal PC. Further access can be gained by removal of the side vent plates (6 x M6).

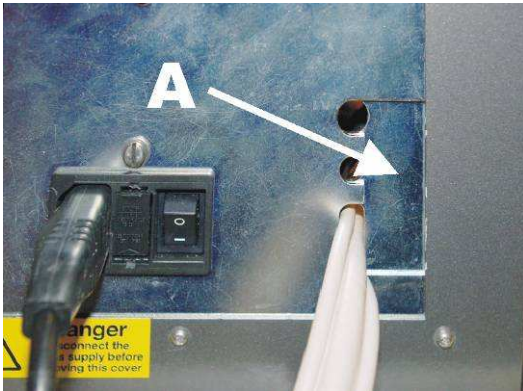


Fig 1 EMC Gland

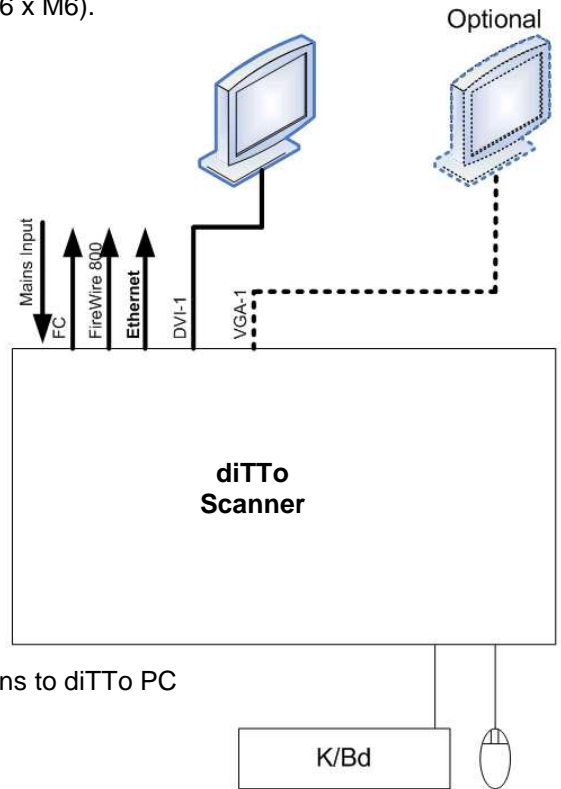


Fig 2 External Connections to diTTo PC



Fig 3 Internal connectors of diTTo PC

The scanner is connected to the scanner GUI monitor, keyboard and mouse via a KVM extension lead (supplied). See Fig 2. All network connections are made directly to the internal PC panel. See Fig 3

Once all cables are connected refit the rear aperture plate and the side panel to maintain EMC compliance.

Network set-up

Consult your local network administrator before connection to any 3rd Party network.

Standard Windows TCPIP file transfer can be performed by changing the Host PC to be on a compatible workgroup and IP address. If the network is running DHCP then manually changing the Host PC workgroup is all that is required. This is performed by accessing **Control panel > System Properties > Computer Name**.

If manual IP setting is required changes can be made by accessing:

Control panel > Network connections >(Select network component)>Properties>*Make selection)

IP / Subnet mask can be verified via DOS shell >ipconfig

The following connections at the internal PC are available (See Fig 3):

Fibre HBA (Host Bus Adaptor) 2Gb Fibre Dual Channel, LC-LC
FireWire 800
USB 2.0
Ethernet 10bT/100bT/1Gb auto-switching

Virus Protection

Due to the inherent background processing overhead imposed by any virus protection software this product is delivered with none fitted. It is strongly recommended that NO background operational software is loaded as this WILL impede the operational speed of this scanner. Access to external gateways is strongly advised against i.e. Internet / Mail servers etc.

Operation

Power up

Note: There are no user serviceable parts contained within this scanner. Only suitably qualified personnel are allowed to operate it with any protective covers removed.

The Mains switch is located at rear Left Hand corner as part of the mains inlet unit. See Fig 1

The GUI Monitor power cord is separate to the main scanner. The main scanner includes the internal Host PC.

The Host PC will boot and then display the familiar Windows XP.

Note: The internal RAID fans will initially run at high speed until the PC takes over temperature control of fan speed.

At login, select the **diTTo** user Icon and input password "diTTo"

The scanner desktop will now appear. Double clicking the **diTTo** icon will launch the Scanner GUI application. The diTTo GUI is Windows-based and designed to be easily navigated.

For details of the diTTo transport and film lacing please refer to the Film Transport section of this manual. (Page 22)

GUI Application

The Graphical User Interface application consists of a Main page where all of the required Scanning, Recording and viewing controls are located as well as a number of additional **Tools** and **Settings**.

Main page

The Main page gives the user full control over diTTo.

Menus

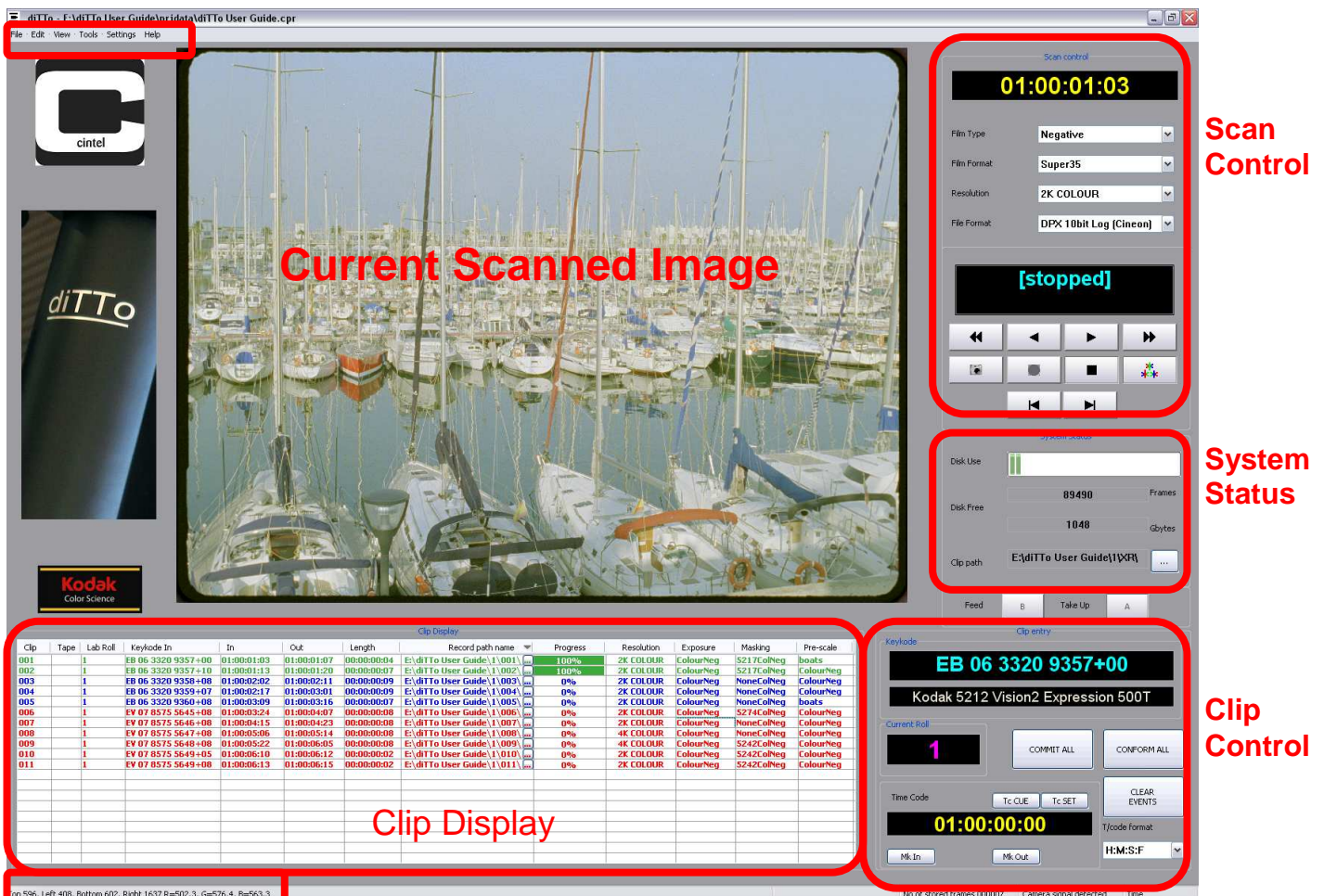


Fig 4 Main GUI Window

Picker Tool Information

Scan Controls

Current timecode location of film on transport

The user can select the following configurations (*dependent upon which options are fitted*):

Film Type - Negative, Inter-Negative, Inter-Positive, Print, B/W Negative, B/W Print

Film Format- Super 35mm, Academy 35mm, 3 Perf 35mm, S16mm

Resolution - 2K Colour, 2K Mono, 4K Colour, 4K Mono. See Appendix 2 for details of settings related to film type.

File Format - DPX 10bit LOG (Cineon), DPX 10bit Linear (Cineon)

Current status of transport

Transport controls using familiar symbols: **Play Forward**, **Play Reverse**, **Stop**, **Fast Forward**, **Fast Reverse**, **Single Frame Forward**, **Single Frame Reverse**, **Continuous Crash Record** (only available in Play Forward mode).

Crash Record (Single Frame)



and LED illumination ON/OFF



controls.

System Status

This shows the amount of local RAID free Disk Space in terms of **GBytes**, **Frames**, as well as a visual indicator (The space is dependent on the Resolution value set in Scan control window.)
A **Browse** control for setting a manual (crash recording) destination is included.

A or **B** wind settings for the **Feed** and **Take Up** Reels. Only available in Unloaded mode (see **Lacing Film** Page 21)

Clip Entry

Clips can be created by using the **Mk In** and **Mk Out** buttons. Uses (Transport Time code as reference)
diTTo control includes Edit Decision List (EDL) management. See Clip Management below.

Keycode displays the current frame Keycode (if the optional reader is fitted)

Timecode window. Allows keyboard entry of timecode for diTTo to be cued to, or for setting the main diTTo timecode.
(This window is NOT used for editing EDL lists).

T/code format menu provides a choice of global timecode type. **H:M:S:F**, **Foot:Frames**, **Frames**

Current Tape. The appropriate alpha-numeric entry must match that of the clip list Lab-Roll or Tape, to allow a conformed recording.

TC CUE will cause diTTo to transport the film to the timecode entered in Clip Entry Timecode window.

TC SET will set diTTo's counter to the timecode entered in Clip Entry Timecode window

COMMIT ALL will activate all changes made to the EDL list shown in the Clip Display.

CONFORM ALL will cause diTTo to perform all committed scans created in the EDL and shown in the Clip Display.

CLEAR EVENTS will clear all clips from the Clip Display List. (An option will displayed to delete recorded files as well)

Clip Display

This window shows Clip listings as edit decision lists (EDL). The listing includes:

Clip number

Tape, an alpha-numeric value

Lab-Roll, an alpha-numeric value

In Point of clip

Keycode, if available. If no Keycode reader is fitted, only imported ALE list Keycodes will appear.

Out Point of clip

Length of clip

Progress, a percentage of the recording of each clip

Record Path Name, the folder location of recorded images from each clip

Resolution, selectable for each clip. (2K Colour, 2K Mono, 4K Colour, 4K Mono).

Exposure, selectable from a list of created exposures.

Masking, selectable from a list of created mask settings.

Pre-scale, selectable from a list of created pre-scale settings.

Clip Management

Clips can be created by several methods

Manual clip generation.

Entering **In** and **Out** points using the diTTo GUI, while transporting the film to the required clip starts and ends will create clips. As soon as an **In** point is created the list will show a clip. Once an **Out** point is entered the clip list will calculate the length. (If the optional **Keycode** reader is fitted and the film has valid **Keycode** the **In** point entry will also create a **Keycode** value). The **Tape/Reel number** will be that entered in the Clip Entry box and the **Record path** will be that determined in the Project Wizard. (See **New Project** creation. Page 12).

New Clips can also be created manually by double clicking an empty clip line and filling in the details.

EDL and ALE Import to create clips

Edl's and ALE files can be imported by selecting **File** then **Import EDL** or **Import ALE**. Before the file is imported, certain parameters such as frame rate (**24fps, 25fps or 30fps**) will need to be confirmed in the **New Project** or **Settings > Project Time code** menu.

The imported list will appear in the **Clip Display** window.

C	Tape	Lab Roll	In	Keycode	Out	Length	Progress	Record path name	Resolution	Exposure	Masking
1	001	cintel	01:02:03:07	EL 03 9721 4858+06	01:02:07:07	0100	0%	E:\swinny proj\001\001\...	2K COLOUR	Exposure Colo...	Masking
2	001	cintel	01:01:49:18	EL 03 9721 4837+03	01:01:53:02	0084	0%	E:\swinny proj\001\002\...	2K COLOUR	Exposure Colo...	Masking
3	001	cintel	01:04:52:08	EQ 06 6621 9636+07	01:04:55:14	0081	0%	E:\swinny proj\001\003\...	2K COLOUR	Exposure Colo...	Masking
4	001	cintel	01:05:19:15	EQ 06 6621 9679+01	01:05:23:03	0088	0%	E:\swinny proj\001\004\...	2K COLOUR	Exposure Colo...	Masking
5	001	cintel	01:06:24:09	EB 06 3320 9365+08	01:06:29:17	0133	0%	E:\swinny proj\001\005\...	2K COLOUR	Exposure Colo...	Masking
6	001	cintel	01:07:26:00	EB 06 3320 9462+13	01:07:28:17	0067	0%	E:\swinny proj\001\006\...	2K COLOUR	Exposure Colo...	Masking
7	001	cintel	01:07:42:21	EB 06 3320 9489+02	01:07:45:21	0075	0%	E:\swinny proj\001\007\...	2K COLOUR	Exposure Colo...	Masking
8	001	cintel	01:03:54:14	EM 28 9402 9445+05	01:03:59:09	0120	0%	E:\swinny proj\001\008\...	2K COLOUR	Exposure Colo...	Masking
9	001	cintel	01:03:25:24	EM 28 9402 9400+10	01:03:29:24	0100	0%	E:\swinny proj\001\009\...	2K COLOUR	Exposure Colo...	Masking
10	001	cintel	01:00:55:18	EL 03 9721 4752+06	01:00:58:18	0075	0%	E:\swinny proj\001\010\...	2K COLOUR	Exposure Colo...	Masking

Fig 5. Clip Display Window; all events uncommitted.

Clip Editing

The following parameters within each clip can be edited prior to recording: **IN** and **OUT** points, **Length**, **Record Path Filename**, **Resolution**, **Exposure**, **Masking** and **Pre-scale**.

Clip **In** and **Out** points can be edited by pointing the mouse at the relevant box containing the timecode, a left click will highlight all the clips parameters, a 2nd left click will highlight the appropriate box; a new value can now be entered. (Ensure to enter in the correct format by including “:”) Invalid numbers will be rejected with a warning notice.

Clip	Tape	Lab Roll	In	Keycode	Out
1	001		01:02:03:07	?? 00 0000 0000+00	01:02:07:07
2	001		01:01:49:18	?? 00 0000 0000+00	01:01:53:02
3	001		01:04:52:08	0000 0000+00	01:04:55:14
4	001		01:05:19:15	0000 0000+00	01:05:23:03
5	001		01:06:24:09	0000 0000+00	01:06:29:17
6	001		01:07:26:00	0000 0000+00	01:07:28:17
7	001		01:07:42:21	0000 0000+00	01:07:45:21
8	001		01:03:54:14	0000 0000+00	01:03:59:09
9	001		01:03:25:24	0000 0000+00	01:03:29:24
10	001		01:00:55:18	0000 0000+00	01:00:58:18

Fig 6. Clip Display Window; event options.

A right click on an individual clip will give you the option to **Cue to Start**, **Cue to End**, **Commit**, **Conform** or **Delete**.

A Left Click on the box to the right of **Record Path Name** will allow new selection of destination for scanned clip.

Record path name	Resc
C:\demo\P1\001\001\...	2K CO
C:\demo\P1\001\002\...	2K CO
C:\demo\P1\001\003\...	2K CO
C:\demo\P1\001\004\...	2K CO
C:\demo\P1\001\005\...	2K CO
C:\demo\P1\001\006\...	2K CO
C:\demo\P1\001\007\...	2K CO
C:\demo\P1\001\008\...	2K CO
C:\demo\P1\001\009\...	2K CO
C:\demo\P1\001\010\...	2K CO

Fig 7. Record Path selection.

Record path name	Resolution	Exposure
C:\demo\P1\001\001\...	2K COLOUR	Exposure
C:\demo\P1\001\002\...	2K COLOUR	Exposure
C:\demo\P1\001\003\...	2K COLOUR	Exposure
C:\demo\P1\001\004\...	2K COLOUR	Exposure
C:\demo\P1\001\005\...	2K MONO	2K COLOUR
C:\demo\P1\001\006\...	4K COLOUR	Exposure
C:\demo\P1\001\007\...	4K MONO	Exposure
C:\demo\P1\001\008\...		Exposure
C:\demo\P1\001\009\...	2K COLOUR	Exposure

Fig 8 Resolution selection

Resolution	Exposure	Masking
2K COLOUR	Exposure Colour 1	Masking
2K COLOUR	Exposure Colour 1	Masking
2K COLOUR	Exposure Colour 1	Masking
2K COLOUR	Exposure Colour 1	Masking
2K COLOUR	Exposure Colour 1	Masking
2K COLOUR	Exposure Colour 2	Masking
2K COLOUR	Exposure Colour 3	Masking
2K COLOUR	Exposure Colour 4	Masking
2K COLOUR	Exposure Colour 1	Masking
2K COLOUR	Exposure Colour 1	Masking

Fig 9 Exposure selection

Resolution	Exposure	Masking
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1
COLOUR	Exposure Colo...	Masking Colour 1

Fig 10 Masking selection

Masking	Pre-scale
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...
Masking Colour 1	Prescale Colour...

Fig 11 Pre-scale selection

A Left Click on the box to the right of **Film Type**, **Resolution**, **Exposure** and **Pre-scale** will allow new selections of parameters of scanned clips. Changing the **Resolution**, for example, will allow exactly the same clips to be scanned at 2K and then on a subsequent conform at 4K

Clip	Tape	Lab ...	In	Keycode	Out	Len...	Progress	Record path name	Resolution
1	001		01:02:03:07	?? 00 0000 0000+00	01:02:07:07	0100	0%	C:\demo\P1\001\001\...	2K COLOUR
2	001		01:01:49:17	?? 00 0000 0000+00	01:01:53:02	0085	0%	C:\demo\P1\001\002\...	2K COLOUR
3	001		01:04:52:08	?? 00 0000 0000+00	01:04:55:14	0081	0%	C:\demo\P1\001\003\...	2K COLOUR
4	001		01:05:18:15	?? 00 0000 0000+00	01:05:23:03	0113	0%	C:\demo\P1\001\004\...	2K COLOUR
5	001		01:06:24:09	?? 00 0000 0000+00	01:06:29:17	0133	0%	C:\demo\P1\001\005\...	2K COLOUR
6	001		01:07:26:01	?? 00 0000 0000+00	01:07:28:17	0066	0%	C:\demo\P1\001\006\...	2K COLOUR
7	001		01:07:42:21	?? 00 0000 0000+00	01:07:45:21	0075	0%	C:\demo\P1\001\007\...	2K COLOUR
8	001		01:03:54:14	?? 00 0000 0000+00	01:03:59:09	0120	0%	C:\demo\P1\001\008\...	2K COLOUR
9	001		01:03:25:24	?? 00 0000 0000+00	01:03:29:24	0100	0%	C:\demo\P1\001\009\...	2K COLOUR
10	001		01:00:55:18	?? 00 0000 0000+00	01:00:58:18	0075	0%	C:\demo\P1\001\010\...	2K COLOUR

Fig 12 Clip Display Window; Some clips committed

Colour Indication of Clip Display

- A Red clip indicates that the clip has just been imported, created or modified. As such it is not committed to scanning.
- A Blue clip indicates that it has been committed for scanning. (Modifying a Blue Clip will un-commit it.)
- A Green clip indicates that the clip has been completely scanned

When editing or modification of the Clip List is complete the entire list can be Committed to recording using the **Commit ALL** button or clips can be individually committed using the right click pull down menu on the clip list (See Fig 6). The text will change from Red to Blue at this point.

Clip	Tape	Lab Roll	In	Keycode	Out	Length	Progress	Record path name	Resolution
1	001		01:02:03:07	?? 00 0000 0000+00	01:02:07:07	0100	0%	C:\demo\P1\001\001\...	2K COLOUR
2	001		01:01:49:17	?? 00 0000 0000+00	01:01:53:02	0085	0%	C:\demo\P1\001\002\...	2K COLOUR
3	001		01:04:52:08	?? 00 0000 0000+00	01:04:55:14	0081	0%	C:\demo\P1\001\003\...	2K COLOUR
4	001		01:05:18:15	?? 00 0000 0000+00	01:05:23:03	0113	0%	C:\demo\P1\001\004\...	2K COLOUR
5	001		01:06:24:09	?? 00 0000 0000+00	01:06:29:17	0133	0%	C:\demo\P1\001\005\...	2K COLOUR
6	001		01:07:26:01	?? 00 0000 0000+00	01:07:28:17	0066	0%	C:\demo\P1\001\006\...	2K COLOUR
7	001		01:07:42:21	?? 00 0000 0000+00	01:07:45:21	0075	0%	C:\demo\P1\001\007\...	2K COLOUR
8	001		01:03:54:14	?? 00 0000 0000+00	01:03:59:09	0120	0%	C:\demo\P1\001\008\...	2K COLOUR
9	001		01:03:25:24	?? 00 0000 0000+00	01:03:29:24	0100	0%	C:\demo\P1\001\009\...	2K COLOUR
10	001		01:00:55:18	?? 00 0000 0000+00	01:00:58:18	0075	0%	C:\demo\P1\001\010\...	2K COLOUR

Fig 13 Clip Display Window; All clips committed

When committed, The clips can be conformed (Scanned) using **Conform All** or **Conform** individual clips by a right click of the mouse and select Conform from the pull down individual clips menu. diTTo will automatically scan the appropriate sections of the film to the Recorded path name in the clip list.

The **Progress** window will display the percentage of each clip recorded.

Conform in progress:

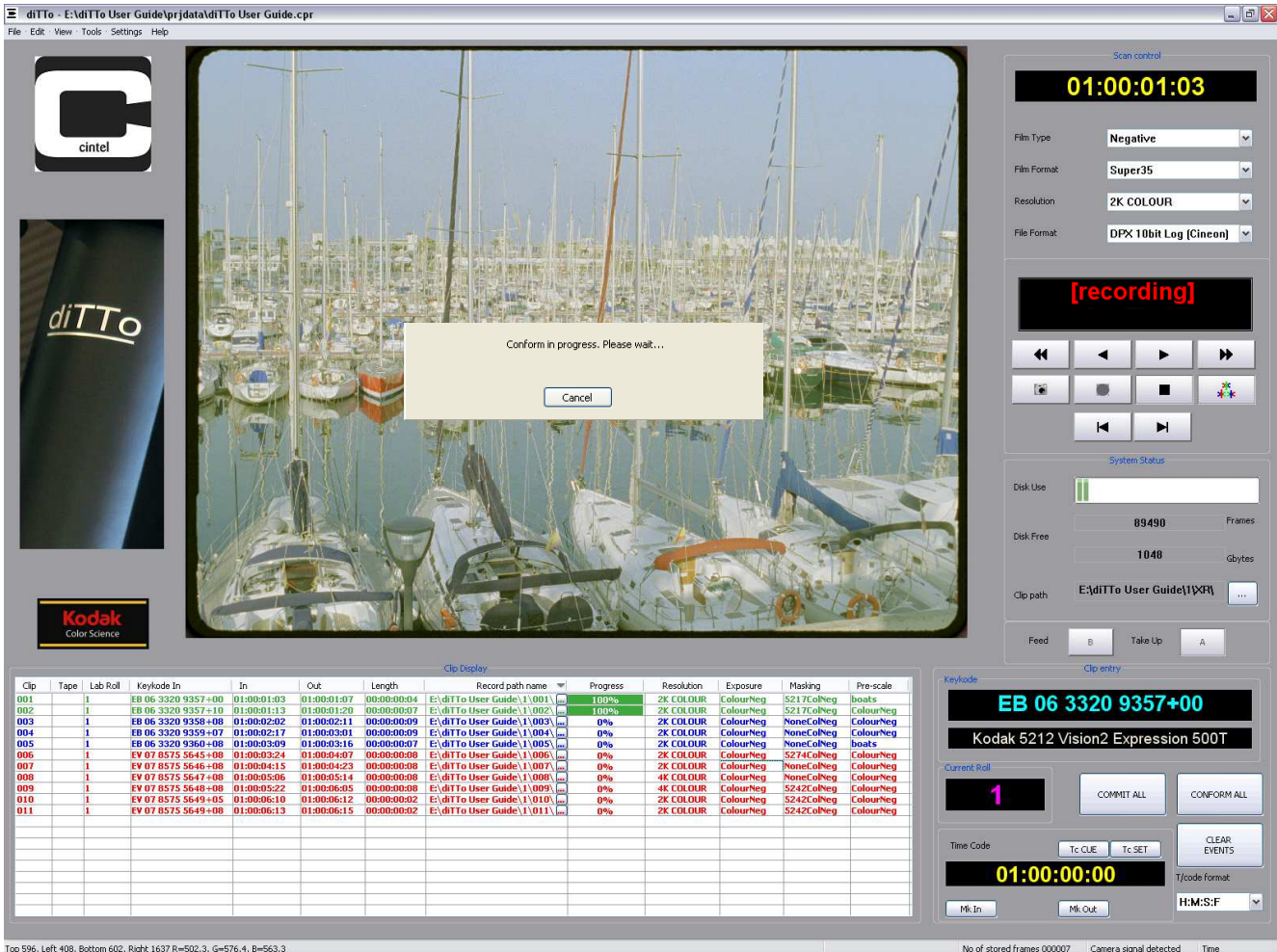


Fig 14 Conform (Recording in progress)

When the recording is complete, a Right click on the clip will give you the option to **Delete** or **Play** the clip using the Playback viewer (see page 14) If **Delete** is chosen, the option to also delete the files will be offered

If **Play** is chosen, the **Playback Viewer** will appear showing the first frame of the clip. (See Tools: Playback page 14)

The **Playback Viewer** can be called up from the tools menu at any time, except when diTTo is conforming. (See Tools selection Page 14)

A note about editing a conformed and recorded Clip.

Once a clip has been conformed and recorded it appears in green on the Clip List. If a clip that has been recorded is further edited it will become Red awaiting a **Commit** or **Conform** command. Note that in order not to overwrite the recorded image files from a previous conform, it will be necessary to select or enter a new **Record path name** prior to committing the clip.

File Menu

This menu is accessed to create **New Projects**, **Open and Save Projects** and **Import EDL and ALE** files. At this time it is not possible to Export EDL or ALE files. However **Clip Lists** created with **EDL or ALE** files and subsequently modified within the diTTo GUI will be saved as part of the Project.



Fig 15 File Pull down menu

File: New Project

The **Project Settings** allows set up of all parameters that may be required for each project.

General includes the **Project Name** and Folder **location** for the main project, the recorded clips and any EDL files associated with the project. The default paths used will depend on the default selection set in **Settings: Site: General** (See page 19)

DMIN Aim is also set here. (See **DMIN** calibration for an explanation. Page 17)

Timecode rates must be set here to match any EDL timecode rates, else a mismatch in timecodes in the clip list relative to the Film clips will occur.

EDL Heads and Tails can be set here. The settings will cause extra frames to be recorded at the head and tail of each clip.

Default **Film Types** and **Resolutions** are also set here.

The Dust/Scratch Concealment Option **D/SCO** can be selected here (see page 19) if enabled. If D/SCO is enabled, then a 'Defect Map' can be enabled into the DPX file by selecting **DPX Scratch data**.

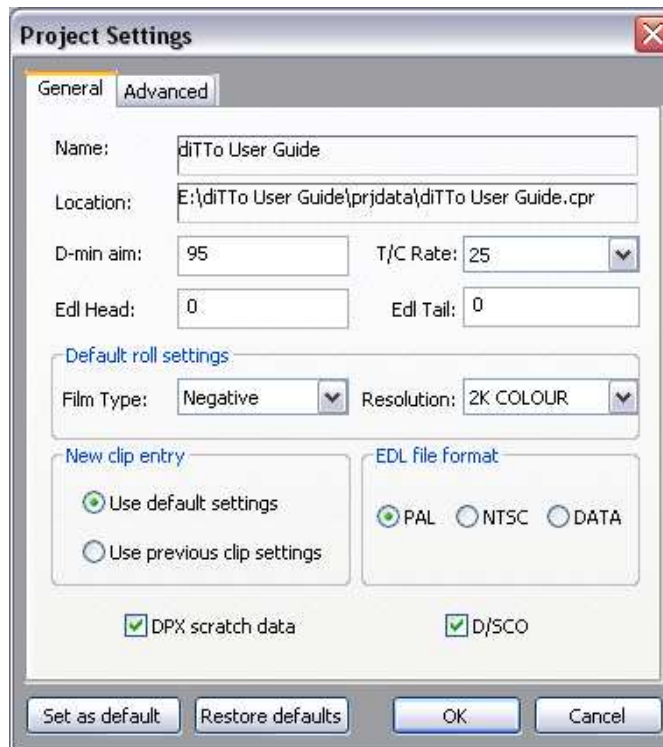


Fig 16(a) New Project Window General



Fig 16(b) New Project Window **Advanced**

Advanced Settings shows the default location of **Exposure, Masking and Pre-Scale** setting, these can be changed to copy a set of parameter from different previous projects if required.

Set as default. This will set file folder location from which to extract the **Exposure, Masking and Pre-scale** settings for use with the current project.

Restore Defaults. This will reset locations to extract the **Exposure, Masking and Pre-scale** settings to those supplied by Cintel International with this software.

View Menu.

This menu provides selection of ways to view both the **Main diTTo GUI and the Playback Viewer GUI**. It only sets the image display within each GUI.

Fit to Window is the default. In this mode the image, regardless of scanned resolution, will all be fitted within the window. This allows the whole frame to be observed



Fig 17 View Pull down menu

No Scaling. This mode provides a pixel to pixel match between the scanned image and the display device. This mode offers a more detailed view of the scanned image. However the user must move the image within the frame to see the whole image.

View Options

This window allows the user to set specific Width and Height **Scaling** of the Record and Playback windows either by Pixel number or by percentage. Lock Aspect ratio will cause the Width or Height to automatically track its value when only one parameter is adjusted. These settings have no effect on the recorded image.

Range specifies how many of the most significant bits (MSB) are not to be viewed. This is included as the GUI display can only show, at best, 8 bits. By limiting the MSBs the GUI display can resolve the lesser bits as a check that no lowlight clipping or other artefacts are present on the recorded image. This settings has no effect on the recorded image.

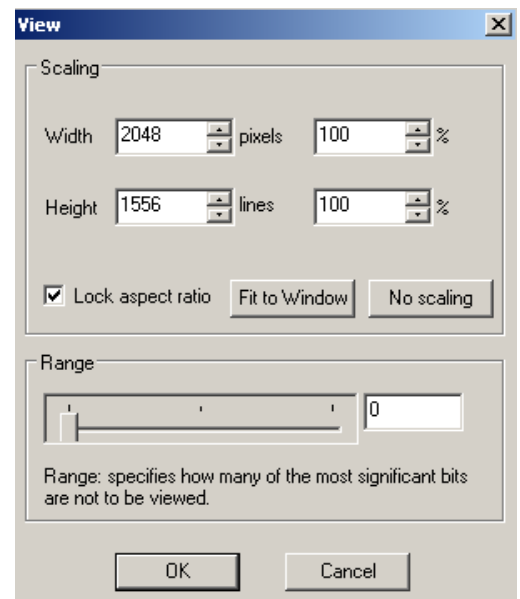


Fig 18 View Scaling Window

Tools Menu

The tools pulldown menu allows selection of : **Playback** Viewer

Additional Image control functions

- Prescale**
- Masking**
- Exposure**
- D/SCO Control (If option is fitted)**

System Calibration: **Auto Shading**
 Image Calibration: **Dmin Calibration**



Fig 19 Tools Pull down menu

Tools : Playback

This **Playback Viewer** is also directly available via **Play** from the recorded **Clip Display** selection



Fig 20 Playback Window

The viewer allows near real-time playback of 2K files. The files to be viewed are accessed by the **Clip** or **DPX** buttons. A familiar Windows browser will appear. If the viewer has been called up from the **Clip Display** the clip will be loaded automatically.




The viewer gives extensive information on the file being viewed:

Keycode	(if the information has been stored in the File Header)
Timecode	(if the information has been stored in the File Header)
Frames Per Second	(original recorded speed)
Frame Number	(the viewed frame number within the sequence)
Display resolution	(Defined by the View mode selected from the menu)
Source Resolution	(the original scan resolution)
File Format	(LOG/LIN DPX etc.)

Selecting **Histogram** will enable an RGB Histogram Monitoring Tool. The histogram is NOT updated live.

Playback can be controlled using familiar symbols – **Play Forward, Play Reverse, Stop, Fast Forward, Fast Reverse, Single Frame Forward, Single Frame Reverse.**

Playback modes can be selected as

- Single Play**  **(Forward or Reverse)**
- Forward or Reverse**  **Playback runs in two Directions**
- A continuous loop mode**  **of either the above operations**

Tools: Pre-Scale Control

Warning.

Adjustments of the Pre-scale will invalidate the settings of **DMIN** and will not comply with Cineon DPX standards. Resetting **DMIN** will NOT return Pre-scale values to a default.

The **Pre-Scale** control provides the ability to individually adjust the 'contrast' of the Red Green and Blue signals.

Multiple settings can be made and each setting can be named by **Add to list**

Named Pre-scale settings are saved with the current project.

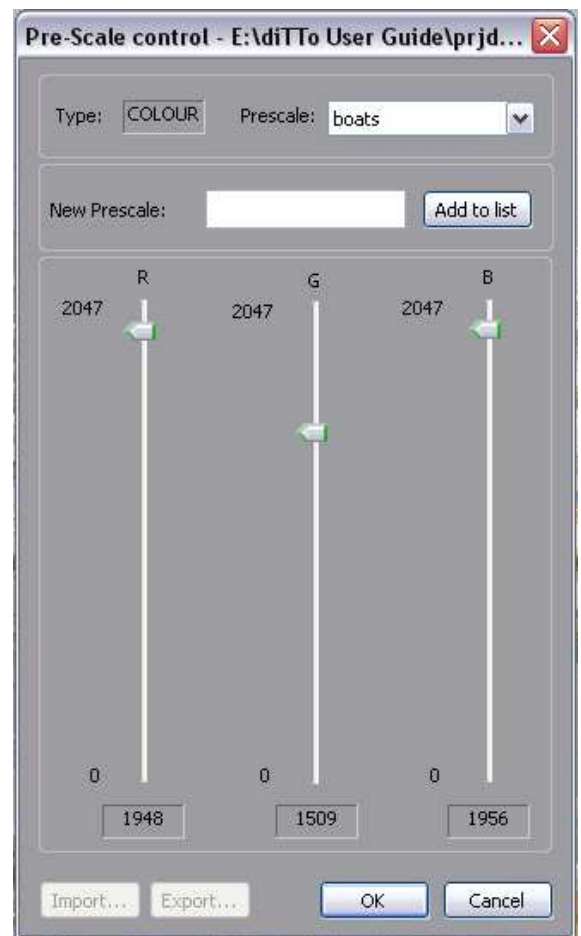


Fig 21 Pre-scale Control Window

Tools: Masking Control. (See also Appendix 4)

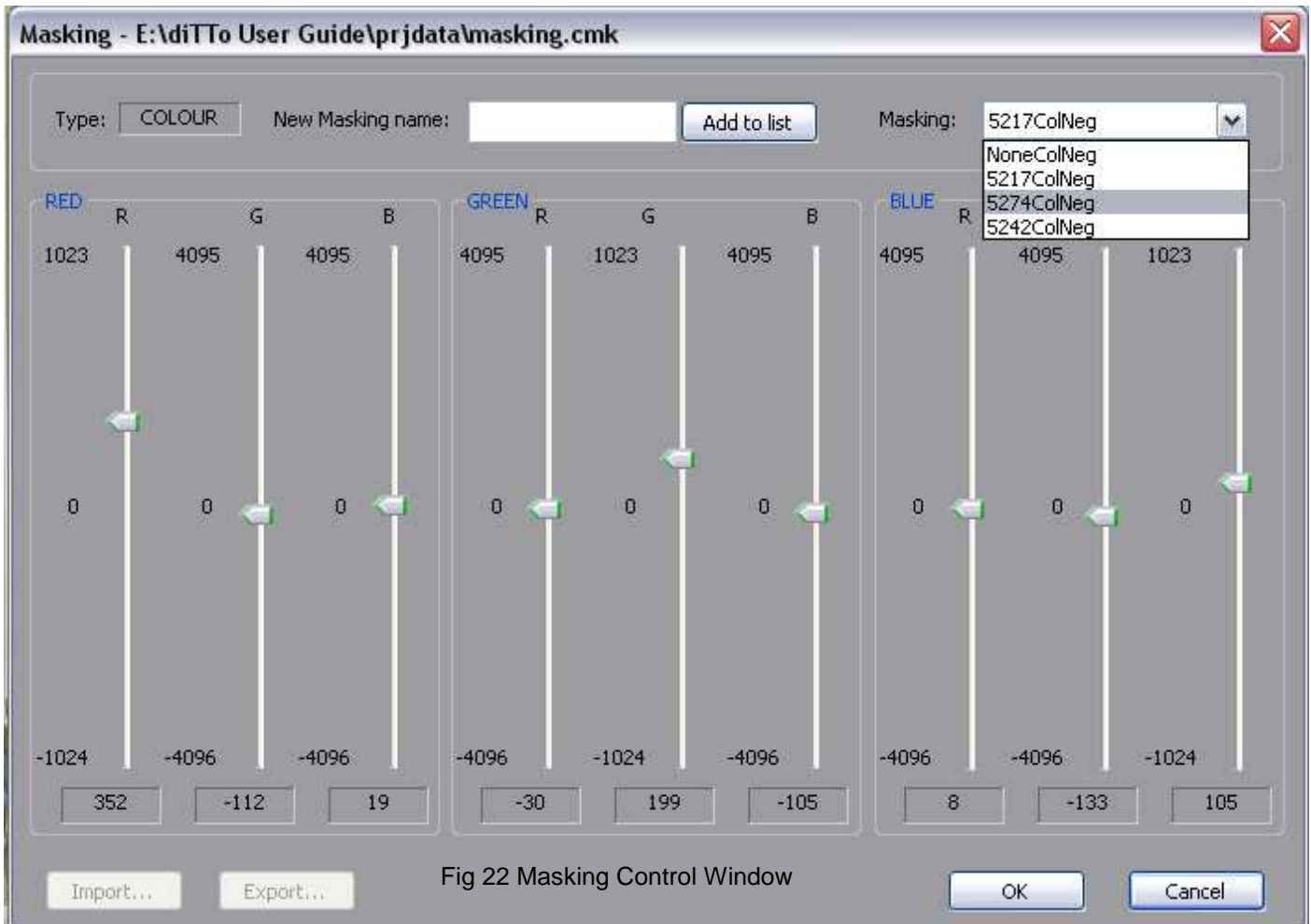


Fig 22 Masking Control Window

Warning.

Adjustments of the **Masking** may invalidate the settings of **DMIN** and may not comply with Cineon DPX standards. Resetting **DMIN** will NOT return Masking values to a default. But may offer a valid DPX file.

When **Masking** is adjusted to correct for film taking characteristics colorimetry and a subsequent **DMIN** calibration is performed the resulting Cineon values will be correct. If masking is used for other aesthetic adjustments to the image the resulting Cineon DPX values may not be correct. (See Appendix 4)

Multiple **Masking** settings can be made and each setting can be named by **Add to list**.

Named **Masking** settings are saved with the current project.

Kodak base stock settings are stored as part of the **Kodak Calibration** process of each new diTTo leaving Cintel (see appendix 5 Page 37).

The **5217** film stock setting covers the Vision2 and Vision3 family of negative films.

The **5274** film stock setting covers the Vision family of negative films.

The **5242** film stock setting covers the intermediate film.

Tools: Exposure Control

Warning.

Adjustments of the **Exposure** will invalidate the settings Of **DMIN** and may not comply with Cineon DPX standards. Be careful with this adjustment, it is very easy to cause the scan to cut-off (clip) some of the image detail in the highlights or lowlights
Resetting **DMIN** will return **Exposure** values to a default.

The **Exposure** control provides the ability to individually adjust the 'setting' of the Red Green and Blue signals. The adjustment varies the light exposure time of the Red, Green and Blue illumination and can therefore make a minor change the scan time.

Multiple settings can be made and each setting can be named by **Add to list**

Named **Exposure** settings are saved with the current project

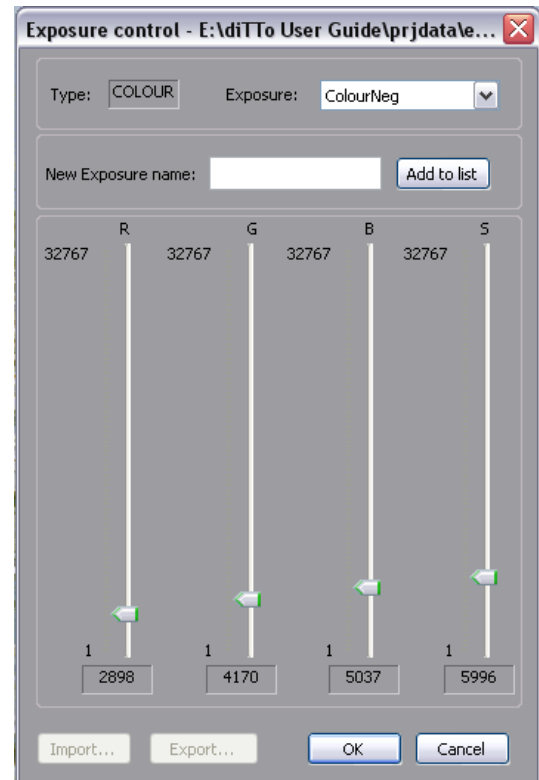


Fig 23 Exposure Control Window

Tools: Auto Shading Correction

Automatic shading compensation caters for any optical variations (RGB) and calibrates the camera cell white and black balances. It is customary to perform a shading align weekly only after verification of a clean optical path. (See maintenance section Page 26).

1. **Perform only with an open gate.** Unload servo and remove film. Ensure gate is in loaded position. (See page 21)
2. Select **Auto Shading Correction**
3. Follow the on-screen prompts (Note: operation takes approximately 5 Minutes)
4. The resultant Shading file is saved by default on the local C Drive and is automatically applied to all future scans.

Tools: DMIN Calibration (Minimum Density setting)

DMIN calibration gives automatic exposure balance to level 95 (~1% level) of the Cineon transfer function. This target level can be set to an alternate value in New Project Wizard (Page 12) or Project Settings (Page 31). See Appendix 1 for more details about DPX files and levels.

1. Load required film and transport to required clip
2. Select **DMIN Calibration** and follow the on screen prompts
The scanner will automatically rack the film until the framing bar is visible and then select a portion of the framing bar to use as the DMIN. The scanner will ask for confirmation at this point.
3. If the area automatically selected has some picture information visible or a better area is available, Use the mouse to drag a sample window over a new desired area. (Verification of minimum levels can be seen in the Pixel Picker)
Select OK and wait until the calibration is complete.
Progress can be viewed on the pixel picker feedback at the bottom of the GUI by observing the RGB levels moving towards a level of 95 or other level if set differently in the **Project Settings**. Note that the values may not display as exactly 95 as the picker averages the pick area values including any dust etc. However the DMIN Calibrator ignores any values greater than the lowest and will therefore ignore dust etc. The film is now automatically calibrated to Cineon DMIN specification.

Fig 24 Pixel Picker Feedback at bottom of GUI

Top 1537, Left 2012, Bottom 1537, Right 2012 R = 0078, G = 0068, B = 0076 [Density R 0.1560, G 0.1360, B 0.1

Picker location and size

Average value

Average density

Tools: D/SCO Control (If Option is fitted)

This tool provides control over the degree of scratch and dust removal of the D/SCO option. While observing a scanned scratched or dusty image on the main GUI, adjust the slide bar till the scratch/dust is minimised. This should be very close to the '0' position.

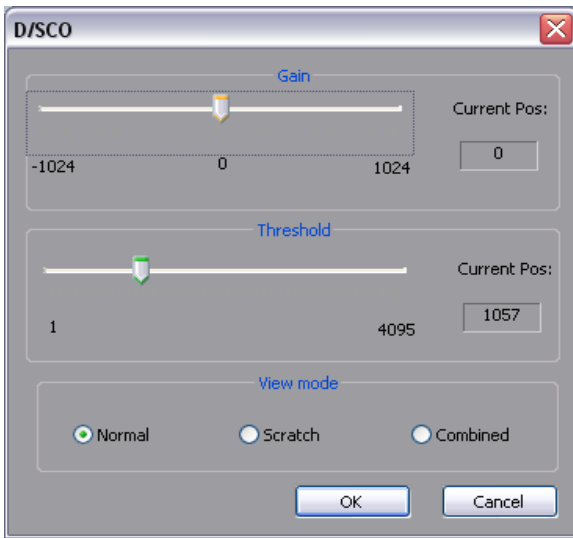


Fig 27 D/SCO Control Window



Fig 28



Fig 29

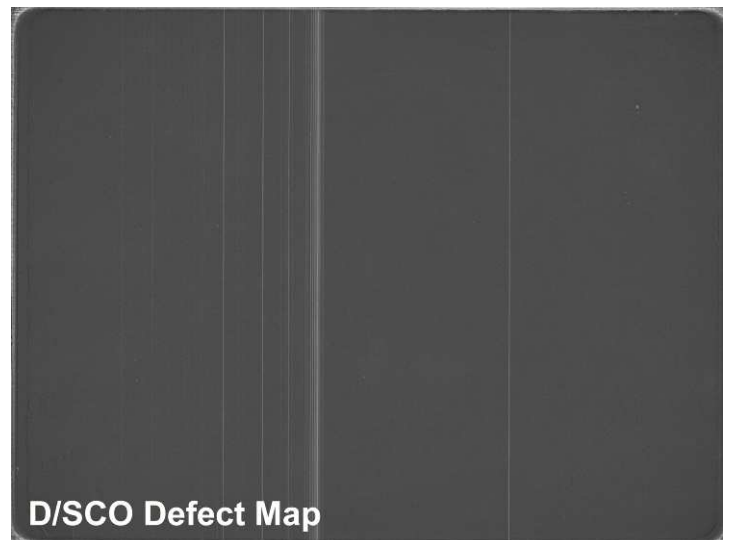


Fig 30

D/SCO can also output a "defect Map" of Dust and Scratches in the Alpha channel; of a DPX file. This is useful where downstream software packages can work on the DPX images at a later stage to provide fast image "clean up". This can be viewed with the **Scratch** setting and the level adjusted with **Threshold**.

The defect map can be viewed at the same time as the scanned image using **Combined**.

Fig 31



Settings: Engineering is Password protected and for Cintel Engineering use only.

Settings: Site: General

This Window allows various **Conforming** options to be set: Conforming from **Timecode** or **Keycode** can be set and **Automatic DMIN** calibration can be used when KeyCode Conforming, either on each **Event** or on each **Roll**. This will allow a cut negative reel of different film stocks to be scanned correctly and automatically.

3 colour Mono files can be selected. This will allow a 4.1MB DPX file size rather than a 12.5MB file size. (See Appendix 2 page 35).

Detail Enhancement provides 3 levels of image filtering giving Low, Normal and High enhancement.

The **Default Project** location can also be set.

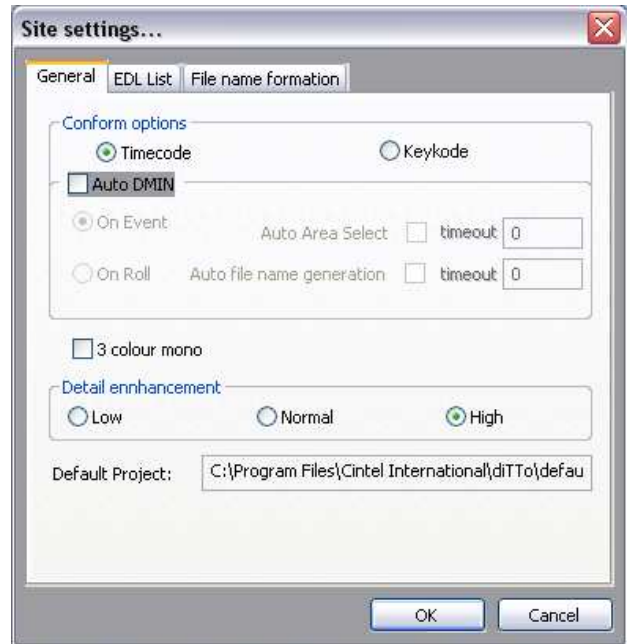


Fig 32 Site Settings **General**

Settings: Site: EDL List

This Window allows the format of the EDL list to be set. Any Designation can be set in any order from the following list:

- Clip**
- Tape**
- Lab Roll**
- Cinema Roll**
- Keycode**
- Keycode Out**
- In**
- Out**
- Length**
- Record Path Name**
- Progress**
- Resolution**
- Film Type**
- Exposure**
- Masking**
- Pre-scale**

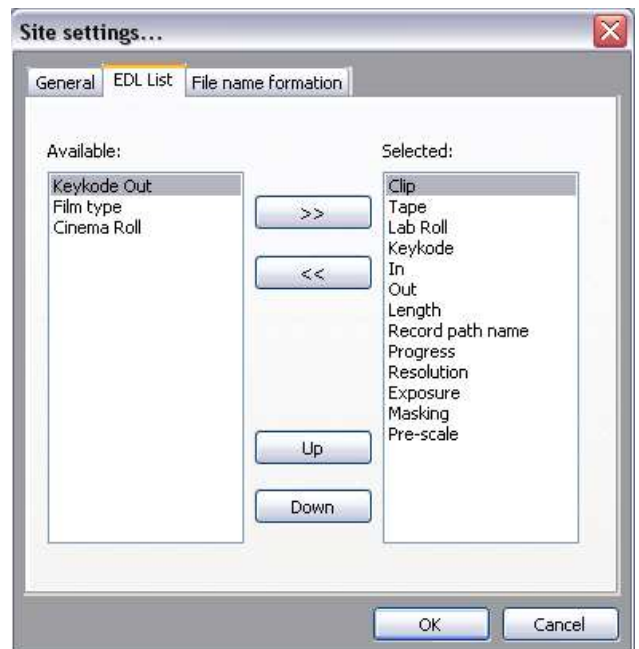


Fig 33 Site Settings **EDL**

Settings: Site: File Name

This menu allows the **File name** to be customised to the users desired formation. The formation can be set in any order from the following list:

- Drive
- Project
- LabRoll
- CinemaRoll
- Tape
- Clip No.
- Custom*
- Timecode
- Frame
- File No.

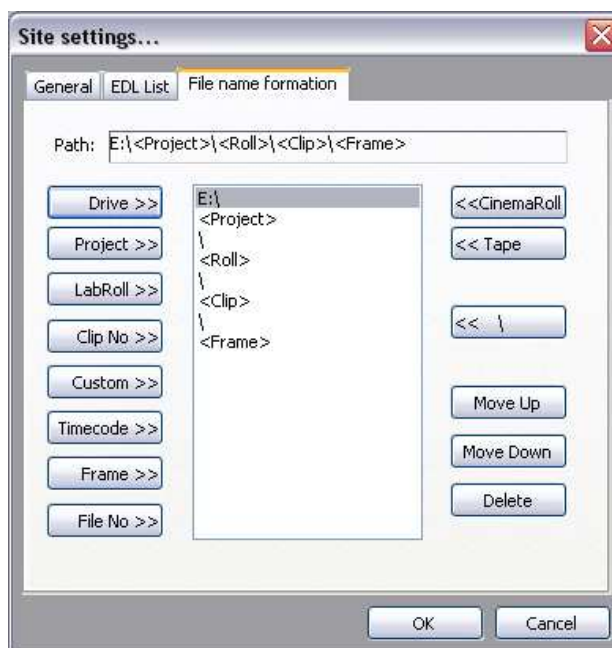


Fig 34 Site Settings **File Name formation**

Description of Film Transport

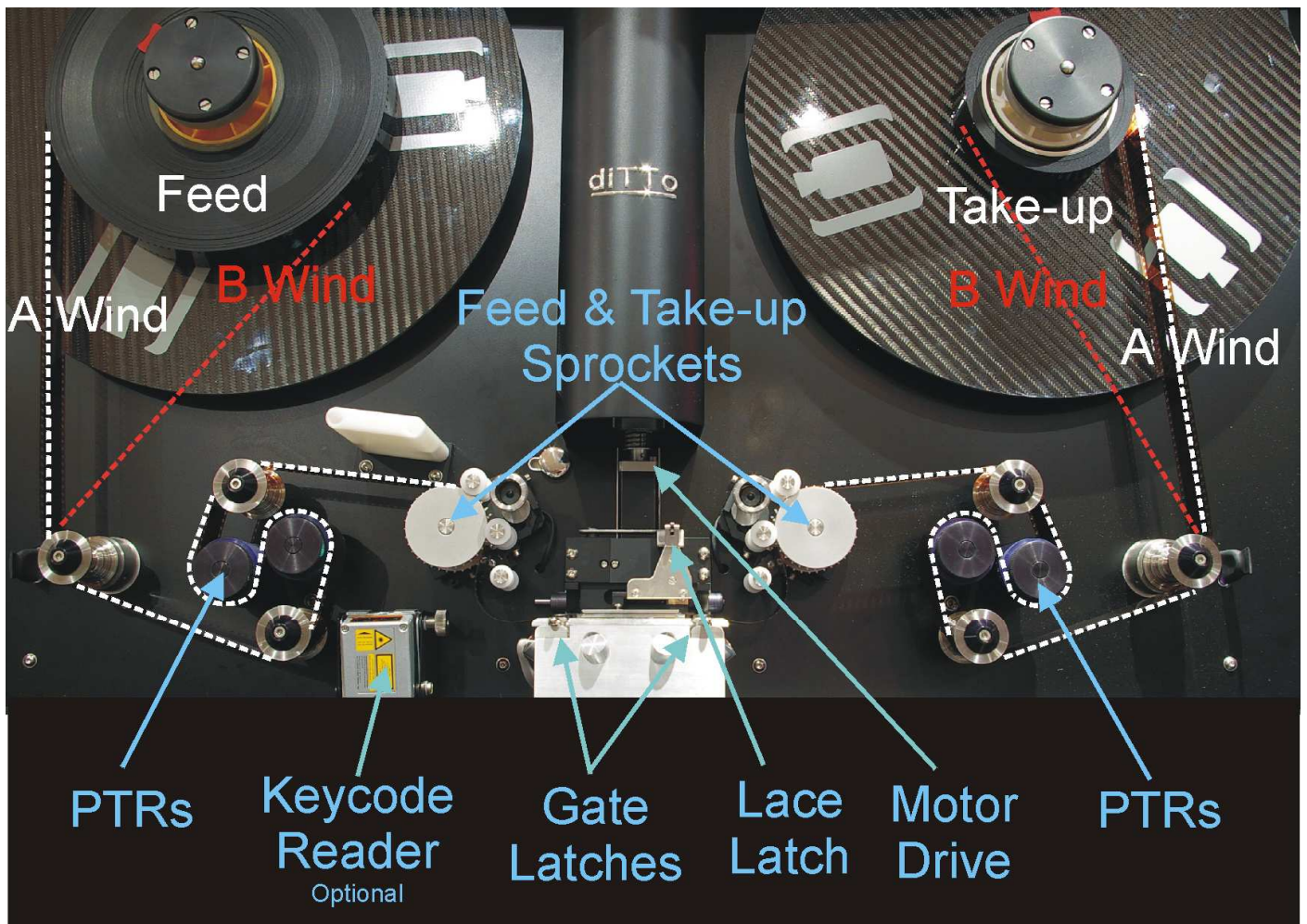


Fig 35 Transport

The Film Transport (Fig 35) comprises continuous rotation feed & take-up back plates that can accept 2000ft of 35mm film. The film is fed to an intermittent clapper type register pin gate by continuously rotating sprockets, with free loops formed either side of the clapper gate. This mechanism minimises any transport tension on the film by avoiding tensioned intermittent motion. The transport includes PTR cleaning rollers, a keycode reader, means to select A/B wind of the back-plates and a removal gate mechanism.

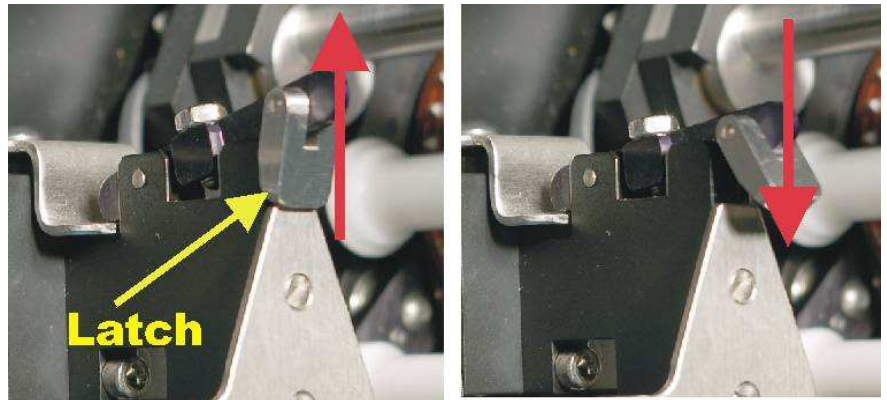
Transport Safety Interlock

When the diTTo door is open remote control from the GUI is inhibited. Local controls remain active. This interlock should only be overridden, when necessary, by qualified service personnel. On no account should diTTo be operated with the interlock overridden due to the possible danger from the rotating mechanisms.

Lacing film

Always scan the film with Emulsion up (towards camera lens). *Focus will be compromised if film is laced emulsion down.*

Ensure gate is in "Lace position" as shown in Fig 36. The Latch will push in to keep the gate in lace mode.



Lace Position

Fig 36

Loaded Position

1. Lace Film left to right missing the feed and take up sprockets and run the film straight from the Feed Compliance arm to the Take Up compliance arm via the PTR (Particle Transfer Roller) rollers to the take up film core. Lace as A or B wind depending on the wind direction of the supplied film rolls. (See Fig 34).

A or B status is set on the GUI (see page 7). Wind sufficient film onto the take-up film core to ensure a tight wrap.

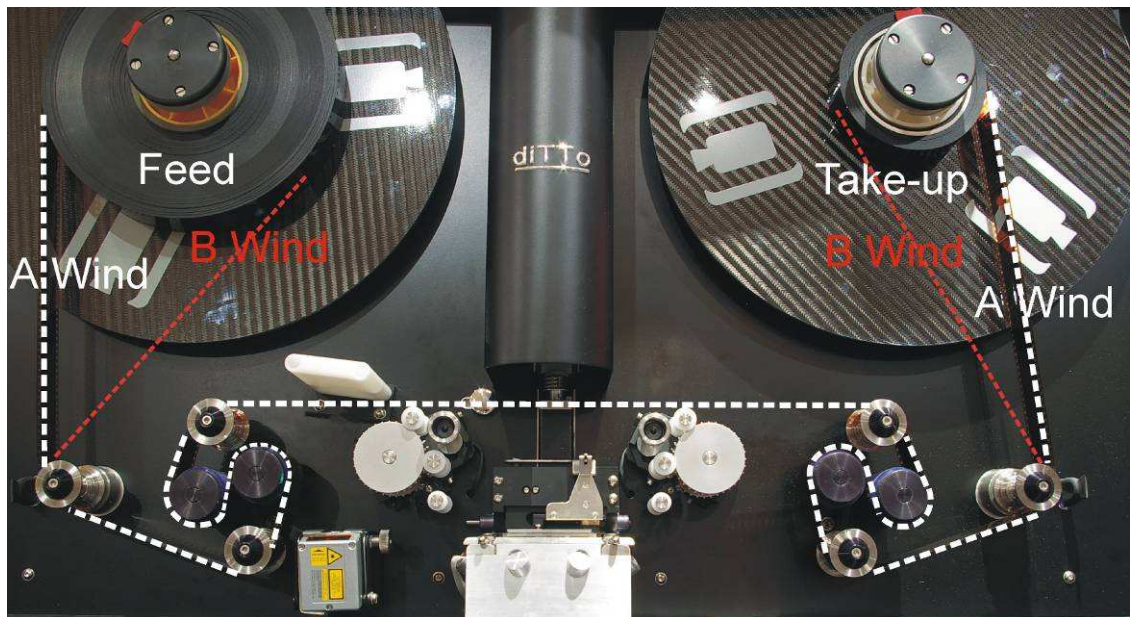


Fig. 37 Initial lacing path

2. Lace Take Up Sprocket. Rotate hold down clamp to lift hold down rollers away from the sprocket as shown in Fig 38. Wrap film around sprocket as indicated, ensuring film perforations engage with sprocket teeth. When correctly wrapped rotate hold down clamp to lower rollers onto film.
3. Lace film temporarily through gate, leaving sufficient loop for film motion.. The loop lengths should be set so they are just touching the skid plate area of the gate. (See Fig 37/38)

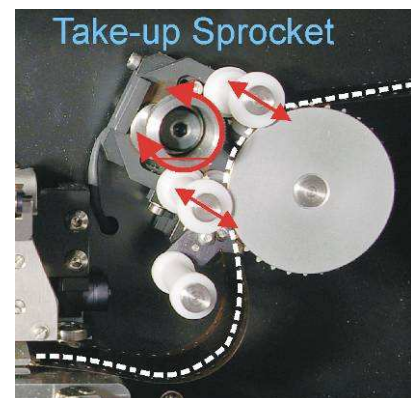


Fig 38 Sprocket lacing path

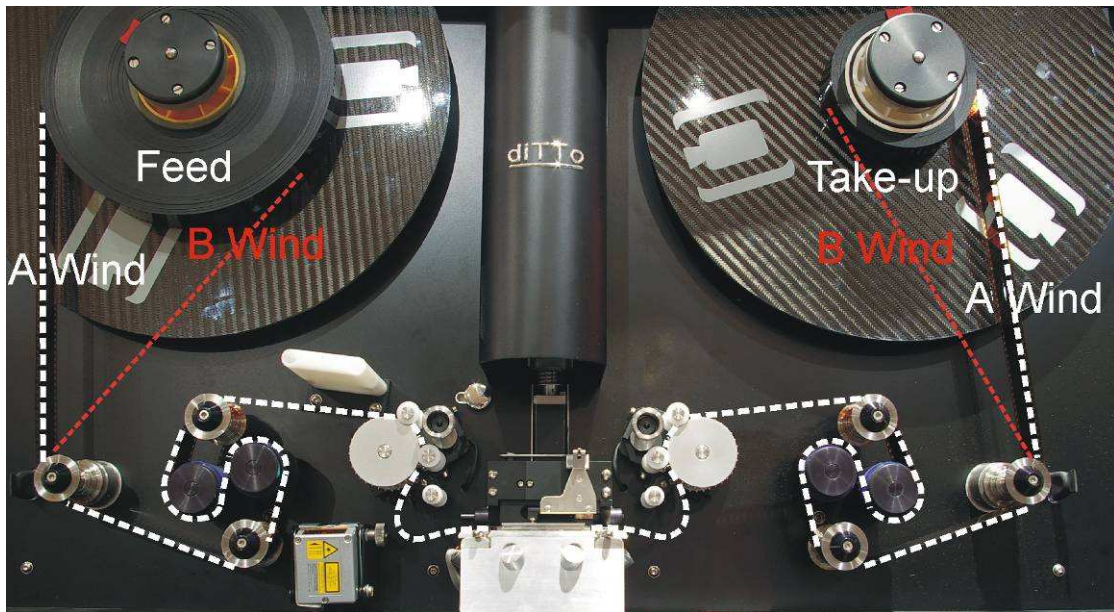


Fig 39 Final lacing path

4. Lace Feed sprocket. In a similar way to the take-up sprocket (See Fig 42)
5. Centre the film loop between the sprockets and align the film frame bar in the centre of the aperture plate just to the right of the shuttle pins (as in Fig 40/41 below) Release the gate lace latch (Fig 36) gently lowering the shuttle pins into the film's perforations. Lightly rock the film to verify that the pins are fully located in the film perforation. (See Gate Lacing below for more details)

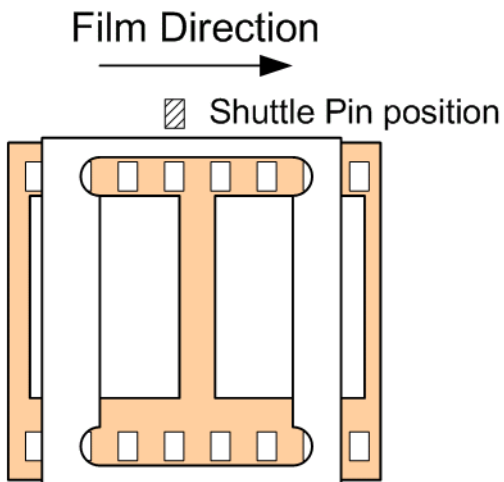


Fig 40 Shuttle pin position

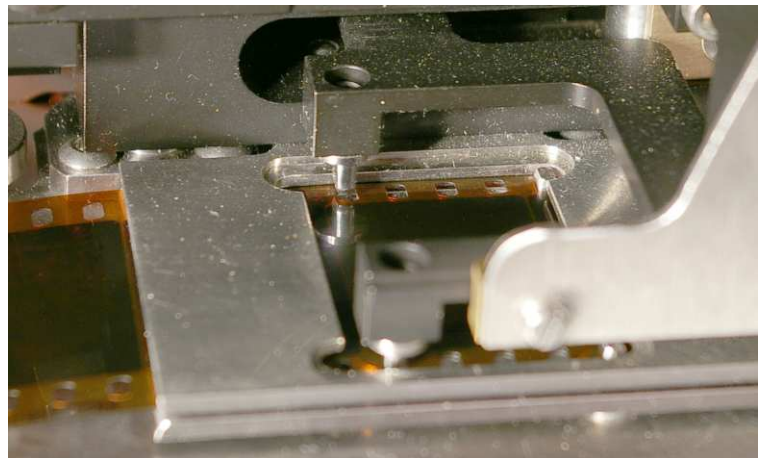


Fig 41 Shuttle pins over film

3-perf Gate Option

The 35mm 3-perf gate (*Catalogue Number DT2005230*) will allow correct transfer of both 35mm and S35mm 3 - perforation Negative film.

First select **3perf 35** in the **Film Format** menu

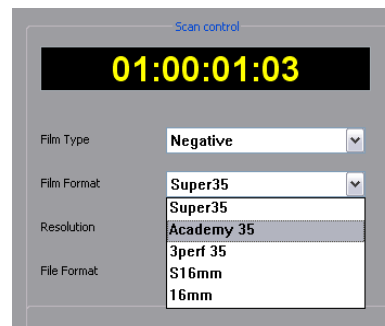


Fig 42 Film Format Selection

Move the **Cam selection switch** into the LEFT position

Fit the 3-perf gate and lace the film (see page 22)

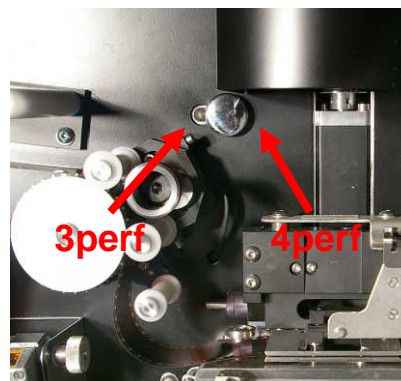


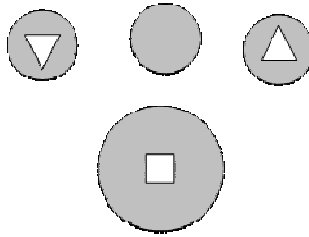
Fig 43 Cam Selection Switch

S16mm Film Gate (option)



LOCAL CONTROLS



The Local Control buttons are arranged like this:



Some of them have dual functions depending on whether you are in 'Loaded' or 'Unloaded' mode;



LOAD

Loading the film is a 2 stage process. Press and hold LOAD then confirm with either  or  (see 'Load transport tension' below)



STOP / Unload

The Stop button, when already 'stopped' further depression of this button "unloads" the transport tension.

When diTTo is in Un-Loaded mode;



Pins DOWN.

. Lowers gate stripper plate down, pins film on fixed register pins then parks gate shuttle at extreme LH side.



Pins UP.

Raises stripper plate up, gate shuttle is parked at LH side of centre permitting lacing of film

When diTTo is in Loaded mode;



Forward (FWD)



A single press will cause the transport to advance 1 frame, a continuous press will advance frames until released.



Reverse (REV)

A single press will cause the transport to reverse 1 frame, a continuous press will reverse frames until released.

Gate Lacing

1. Make sure the transport is in 'Unloaded' mode by depressing the Stop/Unload button.
2. Raise the gate stripper plate up off the fixed register pins by pressing . *Sometimes you need to slightly rotate the motor drive to free up the plate. See Fig 41 and 43*
3. Lift the shuttle pins up and latch it in the upper position. See fig 36
4. Lace the film between the plate top and bottom.
5. Have the frame bar positioned in the middle of the gate aperture. Make sure the fixed register pins are lined up with the film perforations. The shuttle pin should line up with the perforation just to the left of the framing bar. You may need a little physical adjustment by sliding the shuttle pins side to side until over the perforations by rotating the motor drive (Fig 43) until the plate and shuttle pins are at the correct point in the cycle.
6. Unclip the shuttle pin latch and lower the pins carefully down and into the film perforation. See Fig 36 & 41
7. Press  to lower the plate down onto the pins. The Transport should then automatically frame the film and bring the image into focus.
8. Do not operate the transport with the lacing latch (Fig 36) in the up position as this could damage some film perforations

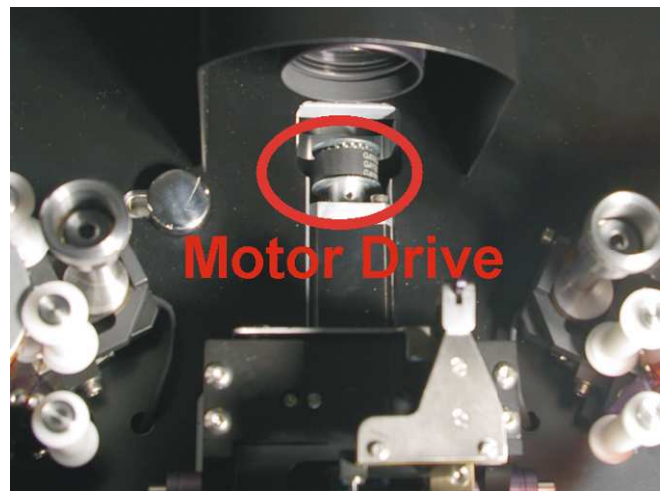





Fig 45 Location of Motor Drive

Load Transport Tension

Make sure the film is correctly laced through all rollers and sprockets then take up any excess film onto the reels

1. Make sure film is not slack and load transport by pressing and holding 
2. If everything is OK with the film path, and the wind direction (A or B) is correct on both Feed and Start-up reels, press either  or  to confirm the LOAD.

The Transport is now fully tensioned and ready for operation. This can be checked by pressing the Inch **FWD** or **REV** buttons to verify correct transportation.

35mm Keycode Reader (Optional)

For safety information about this option refer to Appendix 3

diTTo can be supplied fitted with a Keycode reader, mounted to the left of the film gate. The reader can be adjusted to accommodate keycode on either side of the film.

To adjust, refer to Fig 44.

1. Loosen the locking screw.
 2. Move the keycode reader in or out as required. It is best to run the transport with film containing the appropriate keycode position while adjusting the position to ensure correct readings are being obtained, by looking at the keycode box on the GUI.
 3. Tighten the locking screw.
- For Original Camera Negative (OCN). Position A
 - For Interpositive (IP) keycode. Position A
 - For OCN keycode printed on IP. position B**
 - For OCN Keycode printed via an IP to an Internegative. Position A

** This is only available if the lab has printed the OCN keycode correctly on the Interpositive.

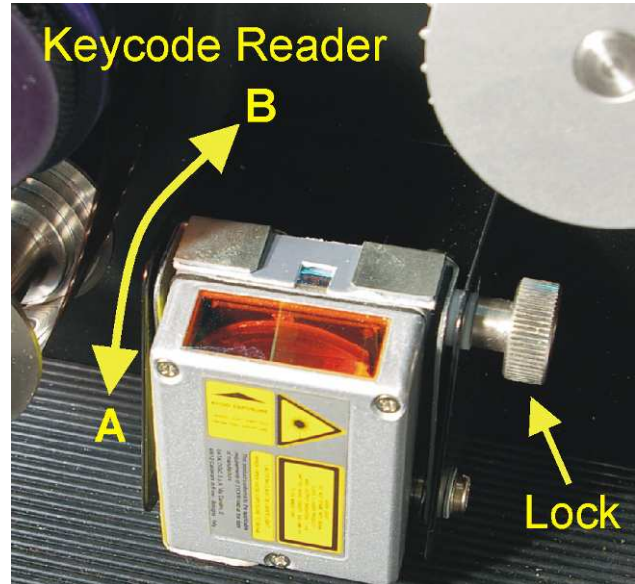


Fig 46 Optional Keycode Reader

Maintenance

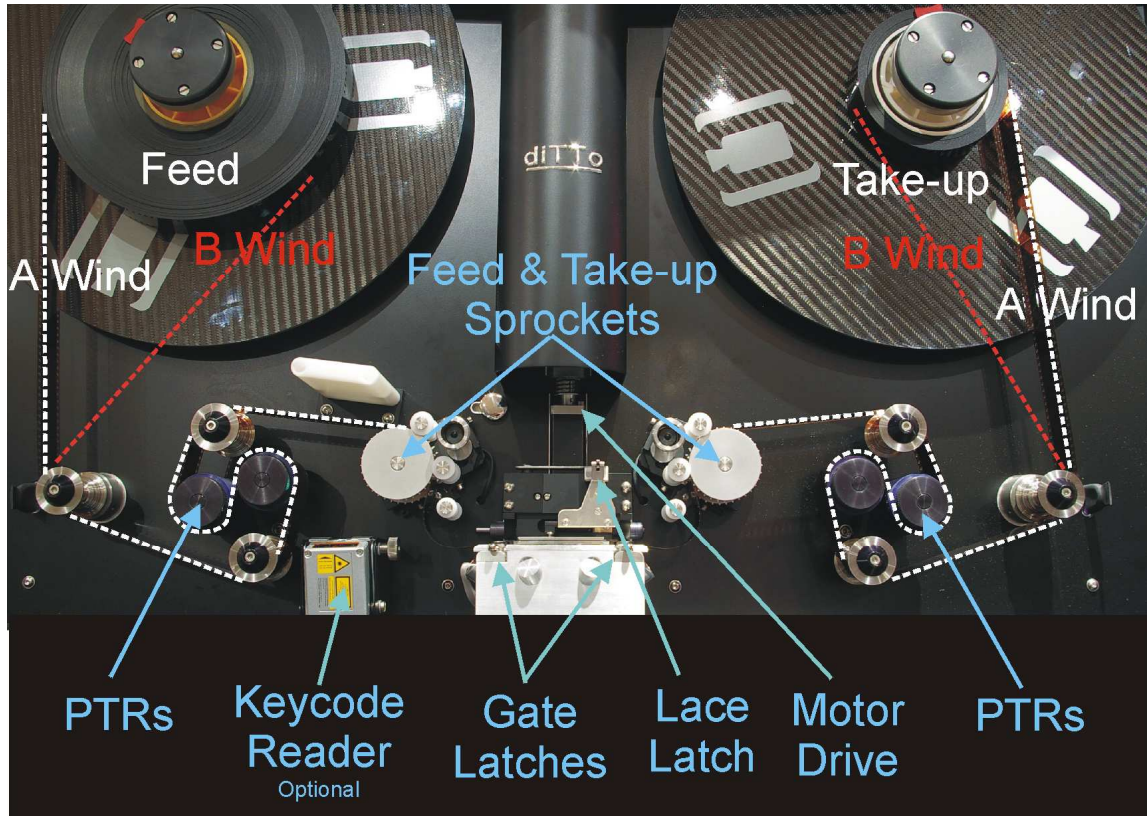


Fig 47 Transport

Like any professional film scanner, diTTo should be kept in an appropriate environment (see page 30) and should be regularly cleaned.

Film Gate Removal

The film gate can be removed, if necessary, by undoing the 2 fixing latches and carefully lifting the mechanism out. Clean as necessary (see below). Refitting the gate may require pressing of the Pins Up/Pins Down buttons to seat properly. (See page 26) Secure the gate with the fixing latches.

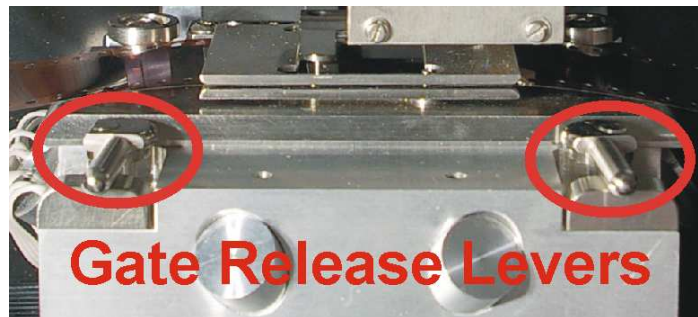


Fig 48 Location of Gate levers

Transport (Film Path Rollers and Gate)

The film transport path should be checked before every job and cleaned if necessary. Check that there is no physical damage on any of the transport path areas. Also check that there is no build-up of dirt or dust. Any accumulated deposits should be removed using a lint-free cloth.

Check that the gate shuttle mechanism is free and that the shafts are clean. If necessary, clean well and apply a very small quantity of fine oil via a lint-free cloth, removing any surplus.

Camera and illumination Lenses

The camera lens should be checked before every job and cleaned if necessary. The lens should be gently dusted using Optical quality wipes. Access to the illumination lens can be made when the film gate is removed.

Caution: All Cintel lenses are coated to improve their performance, this coating is very easily scratched, and therefore great care must be taken to avoid damage.

Particle Transfer Rollers (PTR's)

The PTR's should be cleaned before each job using a damp cloth. Every week the rollers should be removed and cleaned thoroughly with soapy water. Wash PTR's in cold water with a mild detergent, at a ratio of 2-4 drops per litre of water. Use slightly more detergent if the water is "hard". The manufacturer recommends Palmolive detergent.

Do not use dishwasher detergent.

Do not use hot water as it can cause PTR's to become very sticky and cause excessive adhesion and potential damage to the film. Do not use packaging or other adhesive type tapes to clean a PTR after it has been washed! Such tapes will transfer some of adhesives to the PTR and cause excessive adhesion of the film to the PTR, resulting in damage to the film.

Simply wash the PTR's and allow them to dry thoroughly before re installation. If cleaned properly, PTR's should roll off one another when placed together. PTR's that stick together without falling off must be re washed in cold water and (Palmolive) detergent.

Before replacing the rollers a small amount of grease should occasionally be applied to the roller shafts. Failure to do this can result in the rollers binding to the shafts which can lead to damage to the compliance arm assembly. On no account allow any grease to contact the PTR cleaning surface

PTR's will remove dust, dirt and lint from film for a period of 3-4 months of constant use if cleaned properly and regularly. All PTR's are anti-static.

Replacements can be ordered from spares@cintel.co.uk The Cintel part number is **661115**

Specification

Network Connections

RJ45 - Gigabit Ethernet connection
USB 2.0
Firewire 400
Dual Fibre Channel HBA (LC style Connectors)

Environment

diTTo should be installed in a dust free environment.
Temperature range 18°C to 25°C
Relative Humidity 55% to 65%

Power

Mains supply 90v – 265v 47/63Hz Auto sensing
Consumption 2kW Maximum 1kW Nominal

Dimensions

Width 1087mm
Height 785mm Closed 1352mm Open
Depth 820mm
Weight 178kg

Transport System

Over 2000ft per roll capacity
S35mm/35mm Pin Registration
S16mm/16mm Pin Registration (optional)

Light Source

RGB Light Emitting Diode (LED) Illumination
Diffusing Sphere for Dust and Scratch reduction
D/SCO Controllable Dust Scratch Concealment (optional)

Scanning System

3K Area Array CCD camera
Over-sampled "super" 2K at 4.5 frames per second
4K at 3 frames per second
Auto "D-MIN" Calibration
Fast (12fps) B&W mode

Frequently Asked Questions (FAQ's)**Q. Do we have to record to the Local RAID?**

A. *No, the choice is yours. The internal RAID will store over an hour of 2K files but is designed primarily as a buffer. It is anticipated that most users will record directly to a Network via Gigabit Ethernet, for example.*

Q. What is Intelligent Network Transfer?

A. *There are times when a Network is extremely busy with 'traffic'. In these instances, the interface (Gigabit Ethernet, for example) may not be able to sustain the bandwidth required for diTTo's high speed scanning. In these instances, diTTo will slow down its scanning rate to match the available bandwidth. Even when bandwidth temporarily becomes zero, diTTo will only pause while the condition exists, and will recommence scanning as bandwidth again becomes available. This means that scanning will not stop but will continue at the most efficient rate without user intervention.*

Support details

The Cintel Customer Support Department can be contacted on service@cintel.co.uk and service@cintelinc.com

Cintel International Ltd.	(UK)	Tel: +44 (0) 1920 463939
Cintel Inc.	(USA)	Tel: +1 (661) 294 2310
Cintel Asia Pacific	(Hong Kong)	Tel: +852 2887 8727

In all communication, it will help if the diTTo Serial Number and Software Version are known. The Serial Number will be found on the rear upper right panel of diTTo and the Software Version will be found in **Help: About diTTo**



Fig 48 About diTTo Window

For any replacement parts, please contact spares@cintel.co.uk

Software Updates

diTTo software upgrades will be supplied on CD or DVD or may be sent via email. Installation of Upgrades is via Windows install shield and is largely automatic.

diTTo and diTTo options Licenses are issued for life on purchased items.

Where diTTo or a diTTo option is under trial or supplied by Cintel International on a restricted basis Temporary licenses may be issued

Renewal of Temporary License

diTTo Software Options can be licensed for 7, 28 or 56 days. Licenses will be sent via email.

As a license nears its end of life a warning will be displayed on the GUI six to seven days prior to the end of licenses life advising that a new license should be obtained from Cintel International.

If a new license is not obtained by the end of life of the license the following will happen.

If a scan is in operation at license expiry the scan will complete all conformed clips in the current listing as long as diTTo is not disturbed..

At completion of any scan or if no scan is in progress the LED Illumination will be disabled until a new license is obtained.

FUSES**Mains Inlet**

F1	240V	6.3A (T) 20mm
	110V	10A (T) 20mm

LED Machine Status Information**Circuit Board LED's**

Summary of Circuit Board LED functions and status feedback.

TK1058-B3

LED1	Red	+5V = OK
LED2	Red	+24Fan = OK
LED3	Red	+12V = OK
LED4	Red	-12V = OK
LED5	Red	+24V = OK
LED6	Red	-24V = OK
LED702	Red / Orange	NOT Used

M102750-AA1

LED1	Red	R&D test only
LED2	Red	R&D test only
LED3	Red	R&D test only
LED4	Orange	Xilinx Done = OK
LED5	Red	R&D test only
LED6	Red	R&D test only

TK1048-A2

Interlock PCB changes state.

LED1	Red	Lite = Door "CLOSED"
		Un-Lite =Door "OPEN"

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Appendix 1 DPX file format and Metadata

www.cineon.com gives detailed information of the Cineon film data specification.
www.cinesite.com has extensive information on Digital Picture eXchange (DPX) file formats.

Appendix 2 Resolution vs File size selection and quick reference chart

Resolution vs File size

File size depend on both the scan resolution and colour or B/W selection.

For Colour Film settings

Resolution	2K Colour	12.5MB	RGB	Full colour Image
	4K Colour	50MB	RGB	Full colour image
	2K Mono	4.1MB	1 channel	Matrixed RGB to monochrome
	4K Mono.	16.6MB	1 channel	Matrixed RGB to monochrome

For B/W Film settings

Resolution	2K Colour	12.5MB	RGB	Colour scan, may show colour tint
	4K Colour	50 MB	RGB	Colour scan, may show colour tint
	2K Mono	4.1MB	1 channel	Monochrome
	4K Mono.	16.6MB	1 channel	Monochrome

Note: All files are DPX compliant. In some instances OEM software may not decode 1 channel monochrome files correctly.

Approximate File sizes for Colour DPX 10 bit LOG data scans

	Frame	Second	Minute	Hour
Standard Definition (720 x 576)	1.6MB	38.4MB	2.25GB	135GB
1K data (1024 x 768)	3.2MB	76.8MB	4.5GB	270GB
High Definition (1920 x 1080)	8.2MB	197MB	11.53GB	692GB
2K data (2048 x 1556)	12.5MB	300MB	17.6GB	1.03TB
4K data (4096 x 3112)	50MB	1.2GB	70.3GB	4.1TB

Appendix 3 Safety information relating to Keycode reader. (DATALOGIC USS Scanner)

SAFTEY PRECAUTIONS and FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
 (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radiocommunications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct this interference at his own expense. 851000173 (Rev C)

The following information is provided to comply with the rules imposed by international authorities.

STANDARD LASER SAFETY REGULATIONS

This scanner conforms to the applicable requirements of both CDRH 21 CFR 1040 and EN60825-1 at the date of manufacture.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in exposure to hazardous visible laser light.

The laser light is visible to the human eye and is emitted from the window indicated at figure A in the relative installation manual and the orange window shown in Fig 41 page 25 in this manual.

This product utilises a low-power laser diode. Although staring directly at the laser beam momentarily causes no known biological damage, avoid staring at the beam as one would with any very strong light source, such as the sun. Avoid that the laser beam hits the eye of an observer, even through reflective surfaces such as mirrors etc.

Laser warning and classification labels are placed on the product and reproduced in the installation manual.

Label contents: LASER LIGHT
 DO NOT STARE INTO BEAM
 CLASS 2 LASER PRODUCT
 MAX. OUTPUT RADIATION;
 EMITTED RADIATION;
 TO EN60825-1 (200

Appendix 4 Masking

The term masking, as used in film scanning devices, has a different meaning to that used in the film production and post production industry. Masking in the context of film scanning is NOT a means of keying certain parts of an image for special effects or image compilation.

The **Masking** control provides the ability to individually adjust the 'masking' of the Red Green and Blue signals by adding or subtracting Red, Green and Blue information. Masking is used to match colorimetric balances due to the variations in the taking characteristics of colour film stock. Masking should generally be used only to compensate for such variations. It should not be used as a means of general colour correction.

Appendix 5

Kodak Color Science

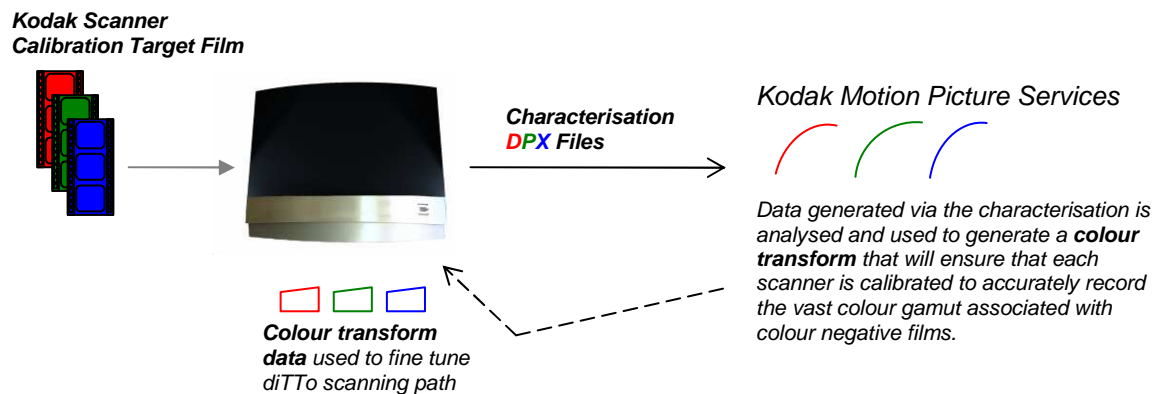


Cintel and Kodak have joined forces to improve Motion Picture Film Scanning by incorporating Kodak Color Science into the diTTo data scanner. These improvements fall into three areas –

- **Scanner Calibration**
- **Display Management**
- **Workflow Enhancement**

Scanner Calibration:

Every diTTo scanner will be factory calibrated using Kodak's Scanner Calibration Target Film and Kodak Motion Picture Services (KMPS). The target film is scanned on diTTo during the final phase of the System Test cycle and the resulting files sent to KMPS. These files are then analysed to produce Colour transform data which is used back at the Cintel Test department to fine-tune the diTTo scanning path.



This factory calibration 'loop' will provide complete piece of mind regarding motion picture scanning. Any doubts regarding the accuracy of the scanner optical path and image reproduction are eliminated.

These calibrations provide pre-set masking values for the three Kodak base stocks.

The **5217** film stock setting covers the Vision2 and Vision3 family of negative films.

The **5274** film stock setting covers the Vision family of negative films.

The **5242** film stock setting covers the intermediate film.

Display Management:

diTTo will optionally include the Kodak Display Manager (KDM) system to emulate the look of motion picture film in the 'Playback Viewer'.

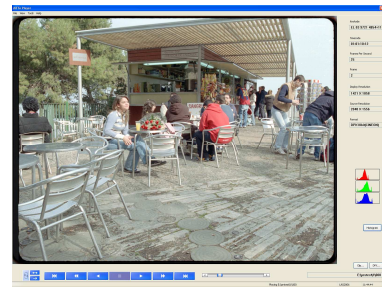
The KDM option includes a monitor calibration probe which ensures that the diTTo GUI monitor is accurately displaying the image content.

Utilising patented film emulation technology, this custom version of KDM will allow diTTo customers to pre-visualize what their scanned film will look like when Printed by invoking different Look Up Tables (LUT's).



The monitor calibration probe (supplied with the diTTo KDM option) is used to sample, analyse and adjust the diTTo GUI monitor characteristics to ensure accurate image playback

See www.kodak.com/US/en/motion/products for more information



diTTo Playback Viewer



KDM LUT applied

Workflow Enhancement

The D/SCO Dust/Scratch Concealment Option fixes approximately 95% of all surface damage 'live' during the scanning process. Any remaining surface damage can be flagged to a downstream process by a 'defect map' stored with each frame of image data.



Typical 'Defect Map'

The DPX file format can carry this information either in the Alpha channel or in the second element and can be used by downstream software systems such as 'PF Clean' from the Pixel Farm, The Foundry's 'Forge', MTI's 'Correct' and 'Revival' from daVinci.

Cintel has incorporated Kodak intellectual property associated the use of the 'Defect Map' by end user customers so that no additional costs are involved and no annual license fee required.

