

LAND IMAGEPro SDS

USER GUIDE

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 LAND IMAGEPro SDS Software



Health and Safety Information



Read all of the instructions in this booklet - including all the **WARNINGS** and **CAUTIONS** - **before** using this product. If there is any instruction which you do not understand, **DO NOT USE THE PRODUCT**.

Safety Signs



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or personal injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to the user or users, or result in damage to the product or to property.

NOTE

Indicates a potentially hazardous situation which, if not avoided, could result in damage or loss of data.

Signs and Symbols used on equipment and Documentation



Caution, risk of electric shock.



Caution, attention to possibility of risk of damage to the product, process or surroundings. Refer to instruction manual.



Caution, hot surface.



Protective Conductor Terminal.



Observe precautions for handling electrostatic discharge sensitive devices.

Equipment Operation

Use of this instrument in a manner not specified by AMETEK Land may be hazardous. Read **and understand** the user documentation supplied **before** installing and operating the equipment.

The safety of any system incorporating this equipment is the responsibility of the assembler.

Protective Clothing, Face and Eye Protection

It is possible that this equipment is to be installed on, or near to, machinery or equipment operating at high temperatures and high pressures. Suitable protective clothing, along with face and eye protection must be worn. Refer to the health and safety guidelines for the machinery/equipment before installing this product. If in doubt, contact AMETEK Land.

Electrical Power Supply

Before working on the electrical connections, all of the electrical power lines to the equipment must be isolated. All the electrical cables and signal cables must be connected exactly as indicated in these operating instructions. If in doubt, contact AMETEK Land.

Storage

The instrument should be stored in its packaging, in a dry sheltered area.

The maximum storage temperature is 10°C (18°F) higher than the maximum operating temperature.

The minimum storage temperature is 10°C (18°F) lower than the minimum operating temperature.

Refer to the Technical Specification for details of the operating temperature limits.

Unpacking

Check all packages for external signs of damage. Check the contents against the packing note.

Lifting Instructions

Where items are too heavy to be lifted manually, use suitably rated lifting equipment. Refer to the Technical Specification for weights. All lifting should be carried out in accordance with local and national regulations.

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Return of Damaged Goods

IMPORTANT If any item has been damaged in transit, this should be reported to the carrier and to the supplier immediately. Damage caused in transit is the responsibility of the carrier not the supplier.

DO NOT RETURN a damaged instrument to the sender as the carrier will not then consider a claim. Save the packing with the damaged article for inspection by the carrier.

Return of Goods for Repair

If you need to return goods for repair please contact our Customer Service Department for details of the correct returns procedure.

Any item returned to AMETEK Land should be adequately packaged to prevent damage during transit.

You must include a written report of the problem together with your own name and contact information, address, telephone number, email address etc.

Design and Manufacturing Standards

The Quality Management System of Land Instruments International is approved to BS EN ISO 9001 for the design, manufacture and on-site servicing of combustion, environmental monitoring and non-contact temperature measuring instrumentation.

Registered ISO 9001 Management System approvals apply in the USA.

UK Calibration Laboratory: UKAS 0034.

USA Calibration Laboratory: ANAB Accredited ISO/IEC 17025.

National Accreditation Board for Testing and Calibration Laboratories approvals apply in India.

Operation of radio transmitters, telephones or other electrical/electronic devices in close proximity to the equipment while the enclosure doors of the instrument or its peripherals are open, may cause interference and possible failure where the radiated emissions exceed the EMC directive.

The protection provided by this product may be invalidated if alterations or additions are made to the structural, electrical, mechanical, pneumatic, software or firmware components of this system. Such changes may also invalidate the standard terms of warranty.

Copyright

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1

INTRODUCTION

This User Guide gives you information on how to use the LAND IMAGEPro SDS Software.

1.1 General Introduction

IMAGEPro SDS software operates in a Windows 10 environment and this guide therefore assumes that the user is familiar with Windows® operating systems. The operations detailed within this User Guide must be carried out by suitably trained personnel, capable of carefully following any guidelines given.

1.2 About IMAGEPro SDS Software

The Slag Detection System software - IMAGEPro SDS is a Windows-based image processing application providing display and analysis of thermal images from the AMETEK Land FTI-E and MIR-640 thermal imaging cameras.

The system provides automatic detection of the presence of slag in a liquid steel stream and generates alarms.



2

HARDWARE AND SOFTWARE REQUIREMENTS

To use the LAND IMAGEPro SDS software the following minimum computer specification is required:

Processor:	Intel i5 2.5 GHz
Memory:	8 GB
Graphics Card:	512 MB or greater
Network:	Additional Gigabit Ethernet Card
Software:	Microsoft Windows 10
Min Screen Resolution:	1280 x 1024 pixels
Minimum Specification:	.NET Framework 4.6.2

3

INSTALLATION

The LAND IMAGEPro SDS software is available for download from the AMETEK LAND Web site at the following address:

<https://www.ametek-land.com/software-downloads>

3.1 Database Selection

During installation of IMAGEPro SDS, you will be asked which database to use to record data.

There are two database systems supported by IMAGEPro SDS:

SQLite

This is the default option and uses a file on disk to store logged data. An SQLite database requires no further administration or specialist knowledge but does not have any enterprise-level features and may have performance implications when logging large amounts of data over an extended period of time.

MS SQL Server

This is an enterprise-grade database engine with full support for advanced features such as data mirroring, redundancy and high performance with large amounts of data.

An SQL Server licence must be purchased separately and the database system must be installed and working correctly before installing IMAGEPro SDS.

SQL Server databases usually require an administrator or database engineer to configure and manage.

IMAGEPro SDS supports SQL Server 2012 and later versions.

SQL Server Express editions are supported in accordance with the licence limitations.

3.2 Licensing

IMAGEPro SDS can be used in trial mode for the first 30 days, after which the application must be licensed or it will shutdown. Please contact your AMETEK Land sales representative to purchase a licence. They will provide you with a Purchase Code. Licences are only valid for a single machine. Multiple licences can be purchased at the same time with a single Purchase Code.

To enter a Purchase Code and activate your software:

- 1) Select **Help > Licence Manager** from the menu and press the **Activate Licence** button (or press the **Activate Now** button on startup if your licence has already expired).

- 2) Enter the Purchase Code provided into the text box provided. A valid purchase code will result in a green tick beside the code and allow you to chose between Manual Activation or Online Activation.

Manual Activation

- 1) Copy the Request Key Code to your clipboard or save to disk using the buttons provided on the right of the window. This code should be emailed to your AMETEK Land sales contact. They will respond with your Licence Code.
- 2) Paste the Licence Code into the box provided or import it from a file by using the buttons on the right of the window. The licence will be read and a green tick displayed if it is valid. Press the **Close** button to activate your application.

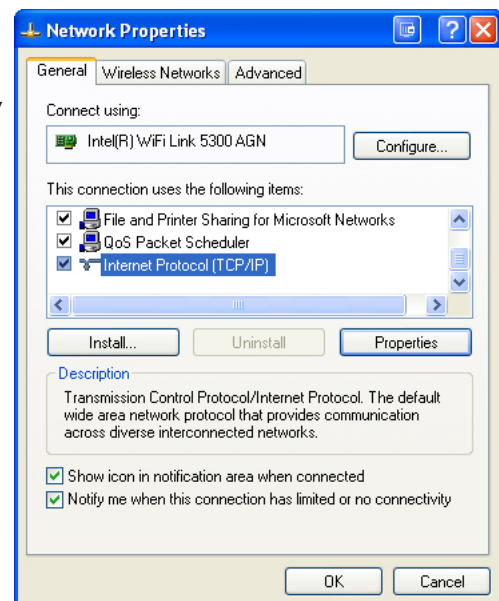
Online Activation

A working Internet connection is required for Online Activation. Press the Activate button to activate your licence.

3.3 Network Adapter Settings

In order for your PC to be able to communicate with the required Camera, you need to specify the correct Network Adapter Settings.

- 1) From your computer's **Start** menu, open the **Control Panel** and select the **Network Connections** option (or similar, depending on your version of Microsoft Windows).
- 2) Right-click on the required Network name and select the **Properties** option.
- 3) Select the **Internet Protocol** option and click on **Properties**.
- 4) Select the **Use the following IP address** option and enter the values:
 IP address: **10 . 1 . 10 . 150 ***
 Subnet mask: **255 . 255 . 0 . 0**
***Note:** For NIR and NIR-B cameras (but NOT NIR-B 2K), the IP address must be set to:
169 . 162 . 10 . 150
- 5) Click on **OK** to save these settings.



3.4 Connecting to your Infrared Cameras

You can connect up to 16 thermal imaging cameras to the Computer running the LAND IMAGEPro SDS Software.

For detailed installation information, refer to the User Guide supplied with your camera and the Installation Guides supplied with any Mounting Accessories included in your measurement system.

- 1) Download the IMAGEPro SDS software from the web address:
<https://www.ametek-land.com/software-downloads>

- 2) Run the program **IMAGEProSDSSetup.exe**.

If you have configured your network adapter settings correctly, as described in Section 3.1, the software will automatically detect and connect to the FTI-E and /or MIR-640 thermal imaging cameras in your network.

The devices detected will be displayed in a list similar to that shown in Fig. 3-1.

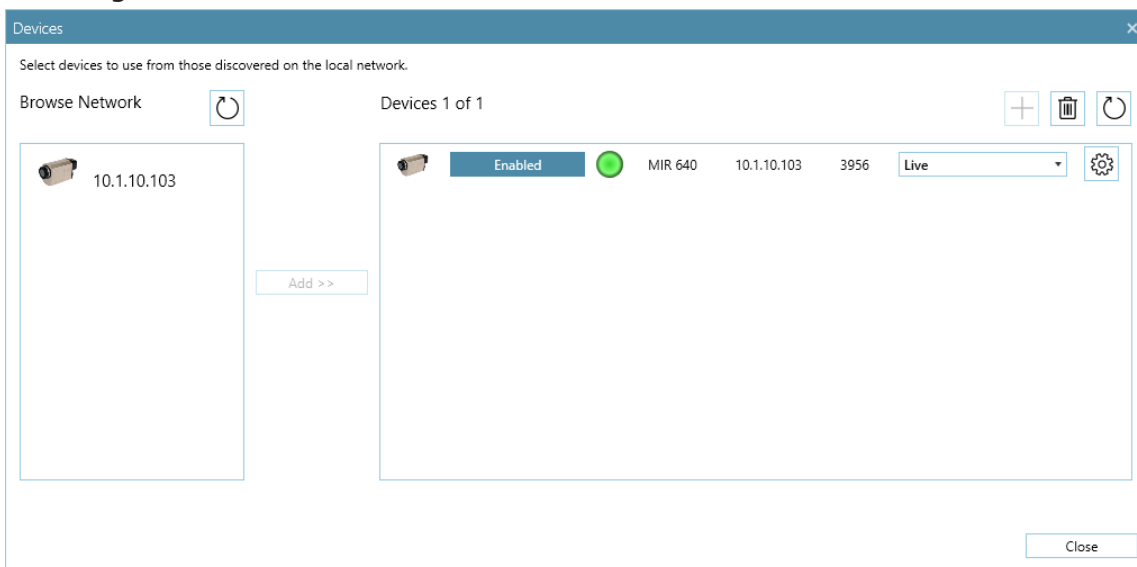


Fig 3-1 Initial Devices list

If you subsequently need to add cameras to your system, you can do so via the **Configuration** menu, as outlined in Section 3.4.1 below.

Additionally, you can use the **Setup Wizard**, which will guide you through the complete installation process, as outlined in Section 3.4.2.

3.4.1 Adding cameras via the Configuration menu

- 1) Open the **Configuration** menu and select the **Devices** option.

When the **Devices** window shown in Fig. 3-1 is first opened, the software will automatically browse the network for available devices.

The **Browse Network** list will show the MAC address and IP Address of each device detected on the network. In some circumstances, firewall rules may also stop the software discovering other device types. In this case the device must be connected manually. Press the **+** icon in the top of the **Browse Devices** window. Select the type of camera you are trying to connect and the IP address of the camera and press OK. The connection status will turn green if a connection was established successfully.

- 2) The **Devices** list allows you to select and configure the required device. In the Devices list, you can configure the following:
 - The device IP Address. **Note:** this is the IP Address used by the software to connect to a device on the network.
 - Set the Device operation mode as Live.
- 3) After configuring your device, press **OK** to add it.
The current status of the device connection will be shown as follows:
 - Green = Connected
 - Red = Disconnected
 - Grey = Disabled
 - Amber = Connecting

3.5 User Accounts

Following installation of the IMAGEPro SDS Software, you can subsequently access the User Management screen via the **Configuration > Users** menu option.

To use the default passwords, simply click on **Next**. Alternatively, to create a new password, see **Changing Passwords** below.

There are three user levels available in IMAGEPro SDS: Guest, Supervisor and Administrator.

- **Guest** – a guest user can only view the system display, they cannot interact with the system or shutdown the application. There is no password required to switch to a guest user.
- **Supervisor** – a supervisor can change display settings, arrange or resize windows, manage data logging and exporting and shutdown the application. A password is required to switch to Supervisor user. The default password is **Super** (case-sensitive).
- **Administrator** – an administrator has full system rights. They have the same abilities as a Supervisor with the additional ability to add and remove instruments and change instrument settings. A password is required to switch to Administrator user. The default password is **Admin** (case-sensitive).

Current User

The current logged in user is displayed in the application title bar after the application name.

Changing User

- 1) Press the **Change User** button on the menu bar to change to a different user.
- 2) Enter the password of the user and press OK to change to that user.

Changing Passwords

You can set up user account password details for both the **Administrator** and **Supervisor** accounts in the IMAGEPro SDS Software.

You must be logged in as an **Administrator** to change passwords.

All user passwords are encrypted and stored on the local machine. There is no way for AMETEK Land to read or retrieve a user's password if it is forgotten but it is possible to reset the passwords to default

Enter the current Administrator password.


- 1) If you want to change a password, enter it in the **New Password** field.
- 2) Enter the exact same (case-sensitive) password in the **Confirm Password** field.
- 3) When you have changed the password details as required, click on **Next**.

The **Setup Wizard Complete** screen will be displayed.

Clicking on **Finish** will open the IMAGEPro SDS software with the views you configured in the Setup Wizard displayed.

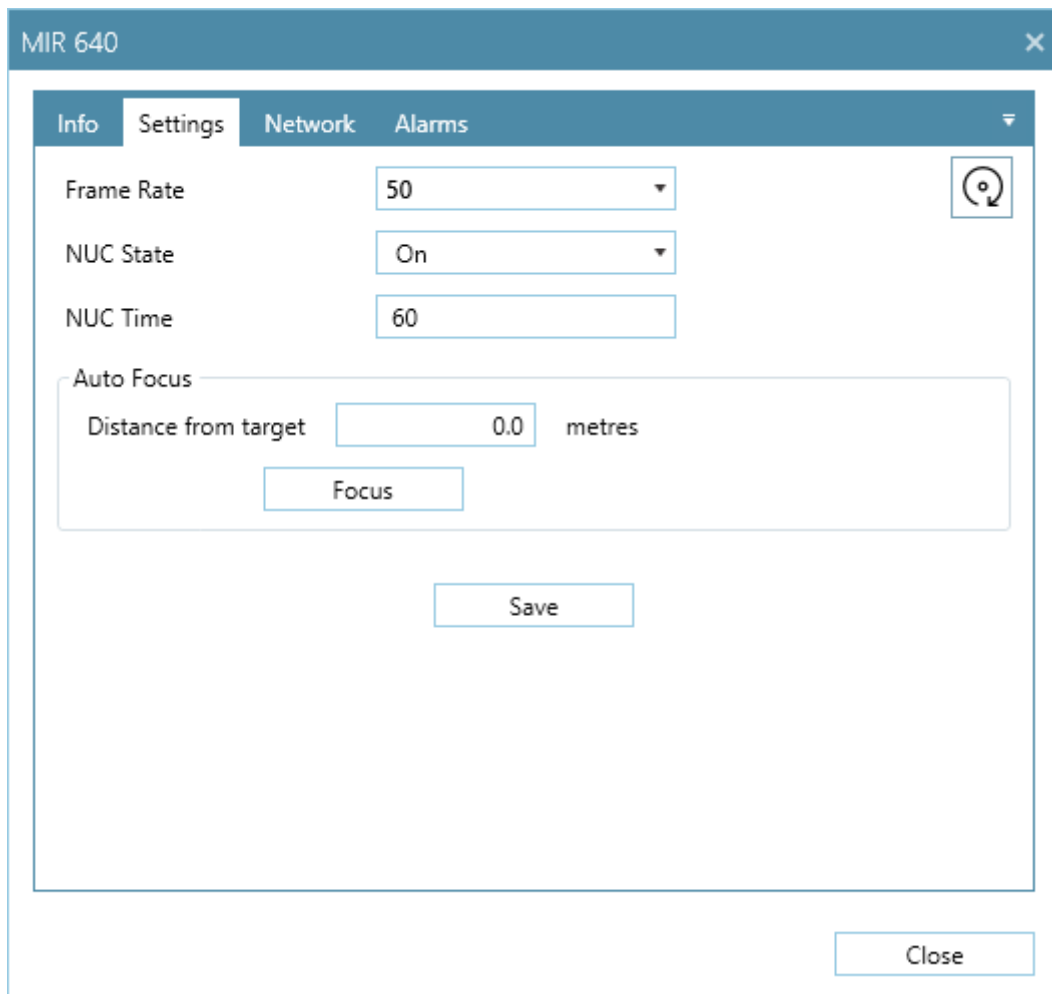
You can access the Setup Wizard at any time via the **Configuration** menu in the IMAGEPro SDS software.

3.6 Camera Settings

- 1) To view and change Camera Settings, open the **Configuration** menu and select the **Devices** option.
- 2) Click on the Settings button for the camera 

The Camera Settings screen will be displayed as shown in Fig. 3-2.

The **Info** tab Shows status information about the camera such as the camera type, the firmware version, the calibration date, temperature ranges and the captured frame rate.



MIR 640

Info Settings Network Alarms

Frame Rate 50

NUC State On

NUC Time 60

Auto Focus

Distance from target 0.0 metres

Focus

Save

Close

Fig 3-2 Camera Settings



The **Settings** tab contains the following user-configurable options.

Setting	Option
Frame Rate	The camera frame rate. Refer to your Camera User Guide for available frame rates
NUC State	The Non Uniform Correction status: Off - uses the NUC settings of the connected camera On - NUC performed at the time frequency specified in the NUC Time field (see below) Inhibit - NUC is not enabled
NUC Time	The frequency (in seconds) at which a NUC is performed when the NUC State is set to On (see above)
Auto Focus	MIR 640 only. Enter the distance of the camera from the target in metres and press the Focus button. The camera will adjust its focus to the correct value for this distance. Fine tuning of the focus can be made on the main screen

3.6.3 Network

Setting	Option
IP Mode	Static IP - sets the IP Address of the camera to the IP Address value entered below DHCP - Enables IP addresses to be assigned automatically by the network on which the camera is installed. DHCP allows a computer to join an IP-based network without having a pre-configured IP address. DHCP is a protocol that assigns unique IP addresses to devices, then releases and renews these addresses as devices leave and re-join the network
IP Address	If using Static IP (see above), use this field to enter the required IP Address for the camera
Subnet Mask	The Subnet Mask of the camera
Port	Read only. The network port of the camera

3.6.4 Alarms

Setting	Option
Ambient Alarm	
High Alarm	Sets the high ambient temperature alarm value
High Warning	Sets the high ambient temperature warning alarm value
Low Warning	Sets the low ambient temperature warning alarm value
Low Alarm	Sets the low ambient temperature alarm value

3.7 Slag Detection Settings

To access the Slag Detection Settings options...

The Settings are displayed over five tabs:

- **Slag Detection**
- **Slag Tracking**
- **Custom Data**
- **Slag Display**
- **System**

3.7.1 Slag Detection

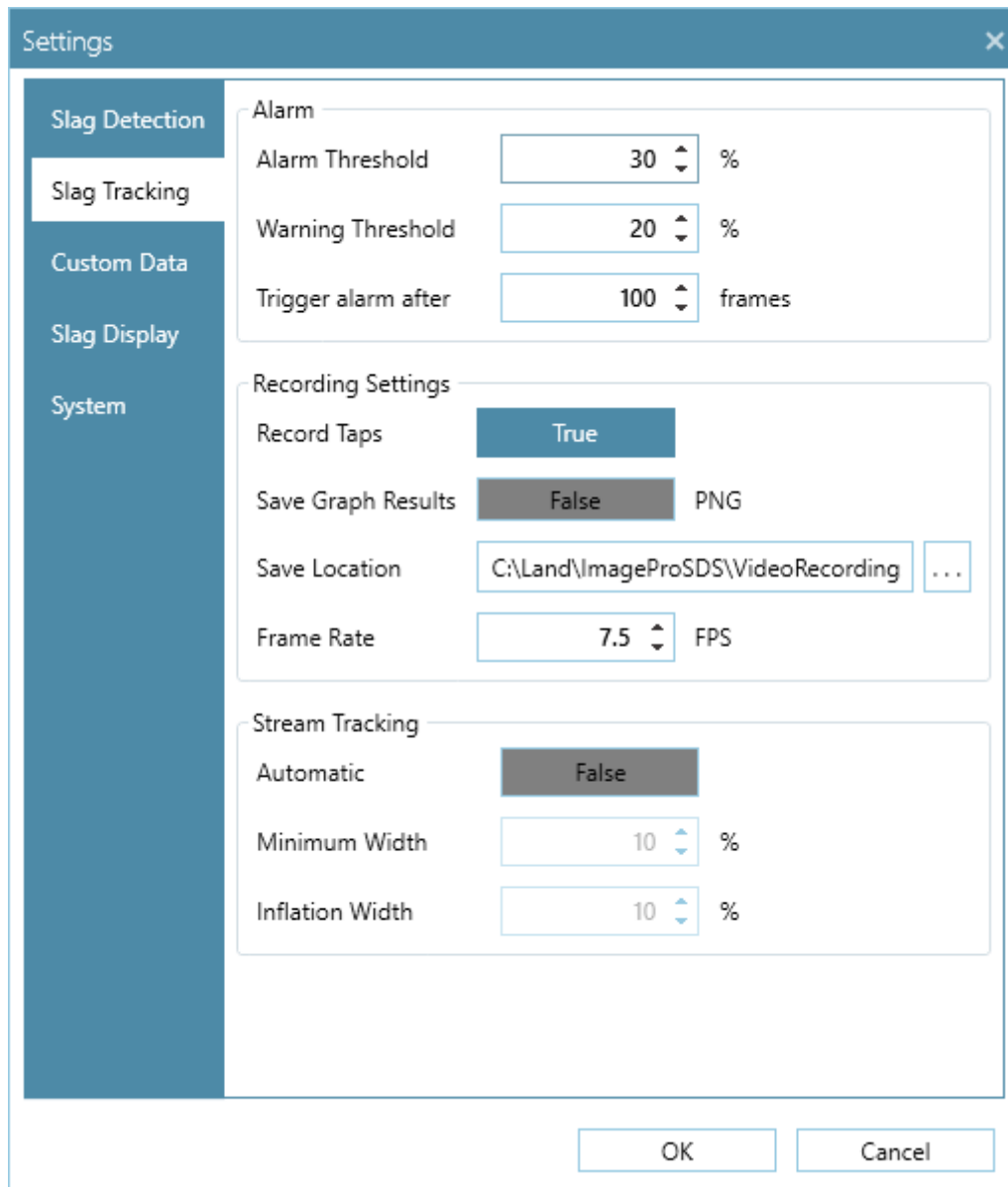
The screenshot shows the 'Settings' dialog box with the 'Slag Detection' tab selected. The dialog has a blue header bar with the title 'Settings' and a close button. On the left is a vertical sidebar with five tabs: 'Slag Detection' (selected), 'Slag Tracking', 'Custom Data', 'Slag Display', and 'System'. The main content area is divided into three sections. The first section, 'Detect Type', has a dropdown menu showing 'Slag' in a red box. The second section, 'Temperature Thresholds', contains three rows: 'Threshold Type' with a dropdown set to 'Calculated', 'Tap Temperature' with a spinner set to '1,600' and a unit 'C', 'Steel Temperature' with a spinner set to '858' and a unit 'C', and 'Slag Temperature' with a spinner set to '1,307' and a unit 'C'. The third section, 'Tap Detection', contains 'Trigger Level' with a spinner set to '1,000' and a unit 'pixels', 'Activate after' with a spinner set to '10' and a unit 'frames', a radio button for 'Detect end of tap', and a selected radio button for 'End tap after' with a time spinner set to '0:03:00' and a power icon. At the bottom right are 'OK' and 'Cancel' buttons.

Section	Parameter	Value	Unit
Detect Type	Detect Type	Slag	
	Threshold Type	Calculated	
Temperature Thresholds	Tap Temperature	1,600	C
	Steel Temperature	858	C
	Slag Temperature	1,307	C
Tap Detection	Trigger Level	1,000	pixels
	Activate after	10	frames
	<input type="radio"/> Detect end of tap		
	<input checked="" type="radio"/> End tap after	0:03:00	

Fig. 3-3 Slag Detection Settings



Setting	Options	Notes
Detect Type		
Detect Type	Slag Steel	Determines whether the system will alarm on the detection of slag or steel.
Temperature Thresholds		
Threshold Type	Calculated Manual	When set to Calculated, then the appropriate steel and slag temperatures will be calculated from the temperature used to tap the steel. When set to Manual, the values for steel and slag temperatures can be entered manually.
Tap Temperature		The temperature at which tapping takes place
Steel Temperature		In Manual mode, you can enter the Steel temperature in this field
Slag Temperature		In Manual mode, you can enter the Slag temperature in this field
Tap Detection		
Trigger Level		The number of pixels above the Tap Temperature threshold which must be present for tap detection to begin
Activate after		The number of consecutive frames at Trigger Level which must be present before tap detection to begin
Detect end of tap		The tap is defined as ended when the number of hot pixels falls below the Trigger Level for the number of consecutive frames set
End tap after	Time	The tap is defined as ended after the specified time period, regardless of the tap signal from the camera



Settings

Slag Detection

Slag Tracking

Custom Data

Slag Display

System

Alarm

Alarm Threshold %

Warning Threshold %

Trigger alarm after frames

Recording Settings

Record Taps ☒ True

Save Graph Results ☐ False PNG

Save Location ...

Frame Rate FPS

Stream Tracking

Automatic ☐ False

Minimum Width %

Inflation Width %

OK Cancel

Fig. 3-6 Slag Tracking Settings

Setting	Options	Notes
Alarm		
Alarm Threshold		The percentage of slag or steel (depending on detection mode set) that must be detected before triggering an alarm.
Warning Threshold		The percentage of slag or steel (depending on detection mode set) that must be detected before triggering a warning.
Trigger alarm after		The number of frames to wait when the detection percentage is above the threshold before triggering the alarm or warning.



Setting	Options	Notes
Recording Settings		
Record taps	True/False	Selects whether or not tap recording is enabled
Save Graph Results	True/False	Selects whether or not to save a PNG image of the graph results at the end of every tap.
Save Location		Select the folder on your system in which to store the tap recordings
Frame Rate		Select the required frame rate for recording. Higher frame rates require more disk space
Stream Tracking		
Automatic	True/False	Selects whether or not Automatic tap tracking is enabled
Minimum Width	5 to 50%	The minimum stream width, set as a percentage of the image width, must be set to prevent the software trying to track on too small a stream
Inflation Width	0 to 100%	If required, the tracking area can be inflated by a percentage of the stream width to ensure the full stream width is captured

	Name	Value
1.	User Label 1	Example 1
2.	User Label 2	2
3.	User Label 3	3.4
4.	User Label 4	Example 4
5.	User Label 5	5

Fig. 3-7 Custom Data Settings

The Custom Data screen allows user values to be displayed on the main screen. Enter the Name of a user value for it appear on the Slag Detection screen.

The Value column allows you to enter a default value for the data. Data can be updated manually for a tap on the Slag Detection screen or it can be updated by external input through the Communications system.

See **Communications** for how to map a tag to data.

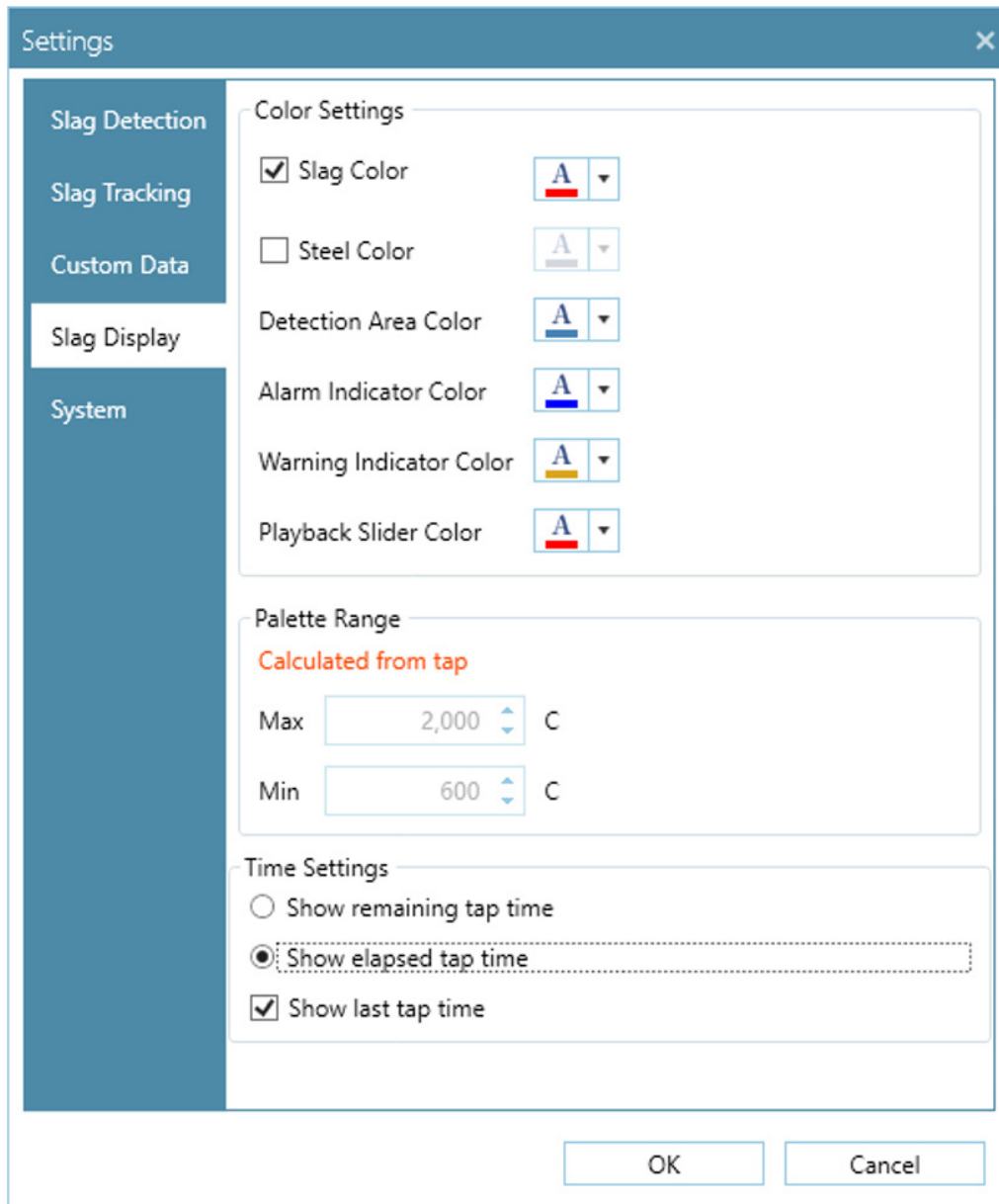


Fig. 3-8 Slag Display Settings

The Slag Display settings contains the following options:

- **Color Settings** - allows you to set the colours for the main components of the display.
- **Palette Range** - allows you to set the maximum and minimum temperature limits of the selected palette. If the temperature thresholds are set to **Calculated**, then the Palette Range will be 'Calculated from tap'.
- **Time Settings** - allow you to select whether to show remaining or elapsed tap time, and also whether or not to show the last (i.e. most recent) tap time.

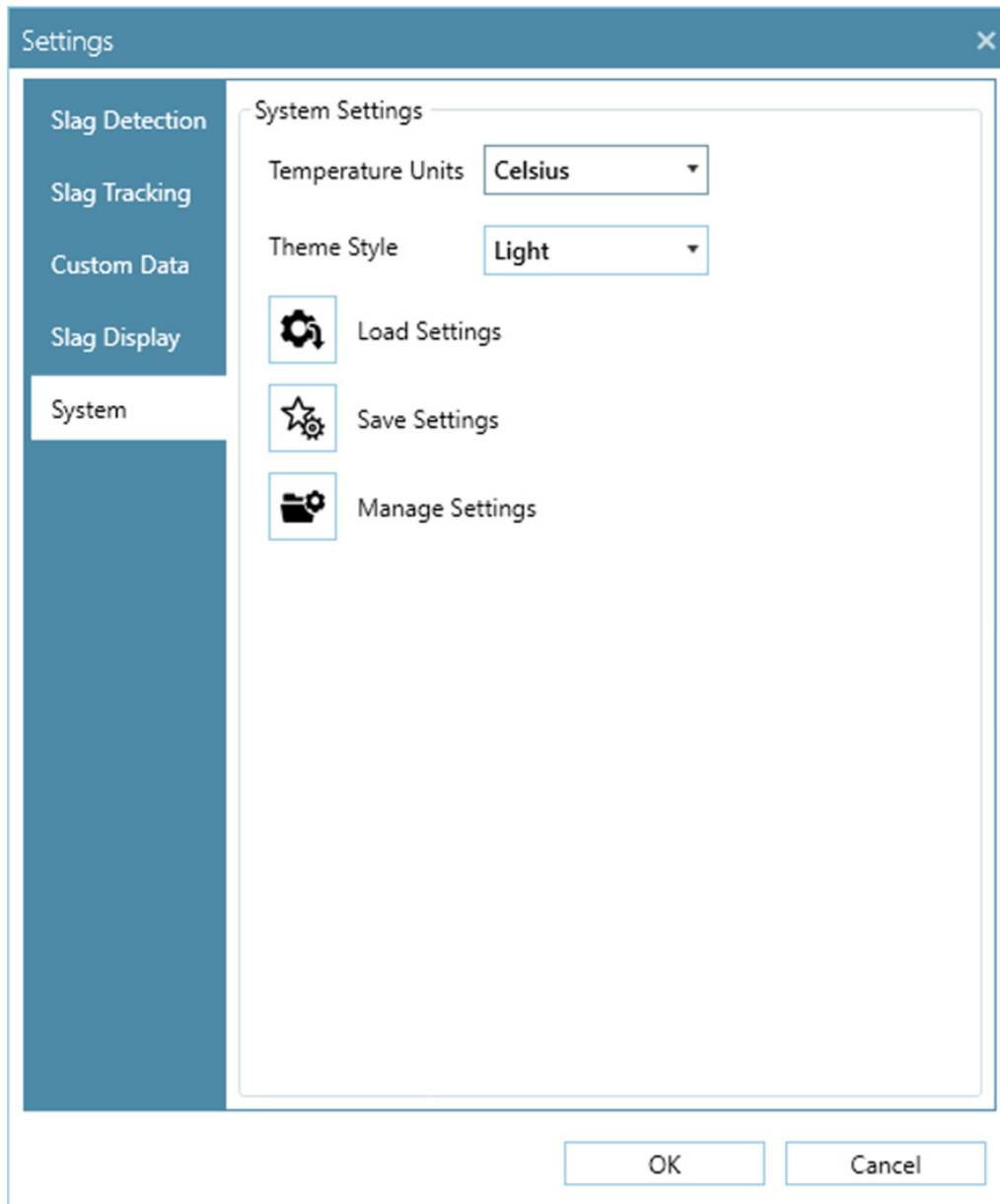
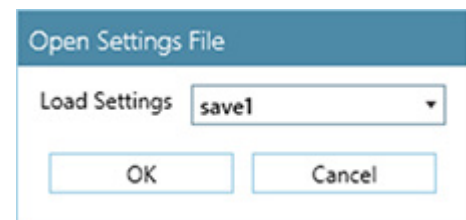


Fig. 3-9 System Settings

The System Settings contains the following options:

- **Temperature Units** - allows you to specify the units used to display tap temperatures.
- **Theme Style** - this can be set to either Light or Dark.
- **Load Settings** - allows you to load a previously saved set of settings from the database. Click on the button to open the databases settings list and select the required file from the drop-down list. Click **OK** to confirm.





- **Save Settings** - allows you to save the current settings to the database.


You can either **Create new settings** by entering a filename in the text input box, or **Replace existing settings** by selecting the file to overwrite from the drop-down list.

Click on **OK** to confirm.

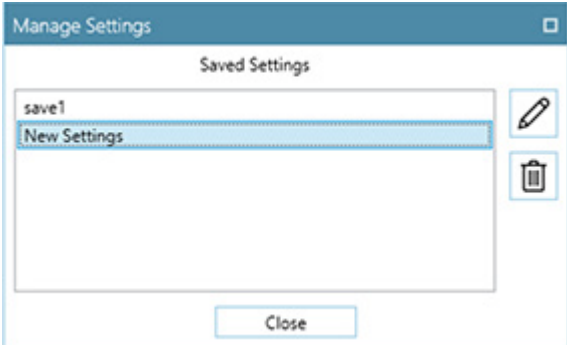
- **Manage Settings** - this option allows you to either rename or delete previously saved settings files in the database.

To rename a file, select it from the list and press 

To delete a file, select it from the list and press 



The 'Save Settings File' dialog box has a blue header. It contains two radio buttons: 'Create new settings' (selected) and 'Replace existing settings'. To the right of the first radio button is a text input field containing 'New Settings'. To the right of the second radio button is a drop-down menu showing 'save1'. At the bottom are 'OK' and 'Cancel' buttons.



The 'Manage Settings' dialog box has a blue header and a list titled 'Saved Settings'. The list contains two items: 'save1' and 'New Settings', with 'New Settings' selected. To the right of the list are two icons: a pencil (rename) and a trash can (delete). At the bottom is a 'Close' button.

4

USING THE SOFTWARE

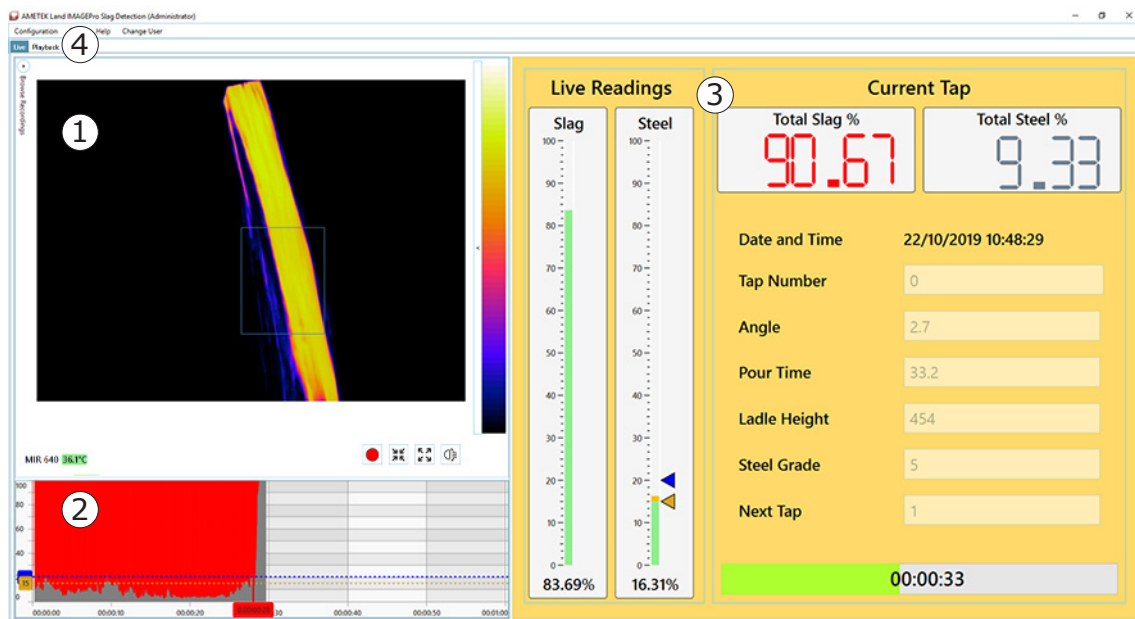


Fig. 4-1 Typical LAND IMAGEPro SDS Interface

The LAND IMAGEPro SDS Software provides an easy to use interface which allows you to view the thermal imaging data captured by your LAND Thermal Imaging Cameras.

A typical LAND IMAGEPro SDS Interface is shown in Fig. 4-1.

Note: There are minor differences in the visual appearance of the interface, depending upon the operating system installed.

4.1 About the LAND IMAGEPro SDS Interface

Refer to Fig. 4-1. The default LAND IMAGEPro SDS interface has the following features:

- ① **Live Image:** Shows the live image feed. Allows you to change the detection area (if manual detection is enabled). You can change the palette, focus the camera in and out, NUC the camera.
You can also start or stop recording manually - this will trigger a start or stop tap event and is a manual override for the automatic detection
The camera ambient temperature and alarm are also shown.

- ② **Slag/Steel Tap Graph:** Shows the slag and steel values recorded at each point during the tap. The colours of the graph are configurable from settings. Move the mouse cursor along the graph to see the results at a specific point in time.
- ③ **Slag Detection Display:** Live Readings shows the current Slag and Steel percentage values detected in the stream. Markers on the graph show the warning and alarm levels.
 The colour of the graph will change when the warning or alarm level is hit. When the warning level is triggered, the background of this screen turns amber. When the alarm level is triggered, the background of this screen turns red.
 Current Tap shows the overall calculated percentages of slag and steel over the course of the tap pour. The date and time, tap number and any user values selected are displayed here.
 The bottom of the screen shows the time of the current tap. If the tap time is set to a fixed value then the progress through the current tap is shown.
- ④ **Playback Controls:** Select the **Playback** tab to open the Playback view. See Fig. 4-2.

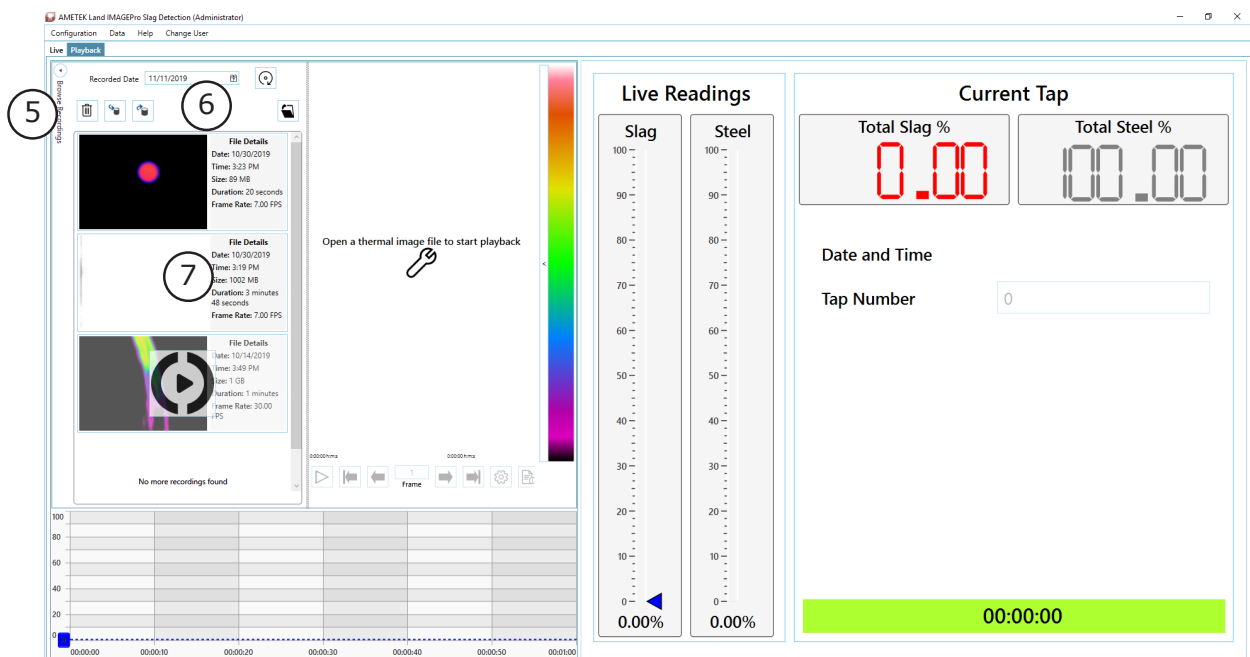





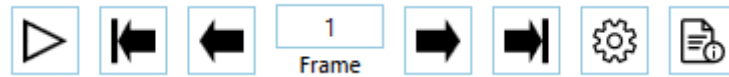


Fig. 4-2 IMAGEPro SDS Playback view

- ⑤ **Browse Recordings:** Shows previous recordings. Select a recording and press the **Play** button to open it.
- ⑥ **Recording File Controls:**

 Import Recording	 Refresh Recording
 Export Recording	 Open File from Disk
 Delete Recording	
- ⑦ **File Information:** Shows the settings that were used to record the file.

4.2 Playback Controls











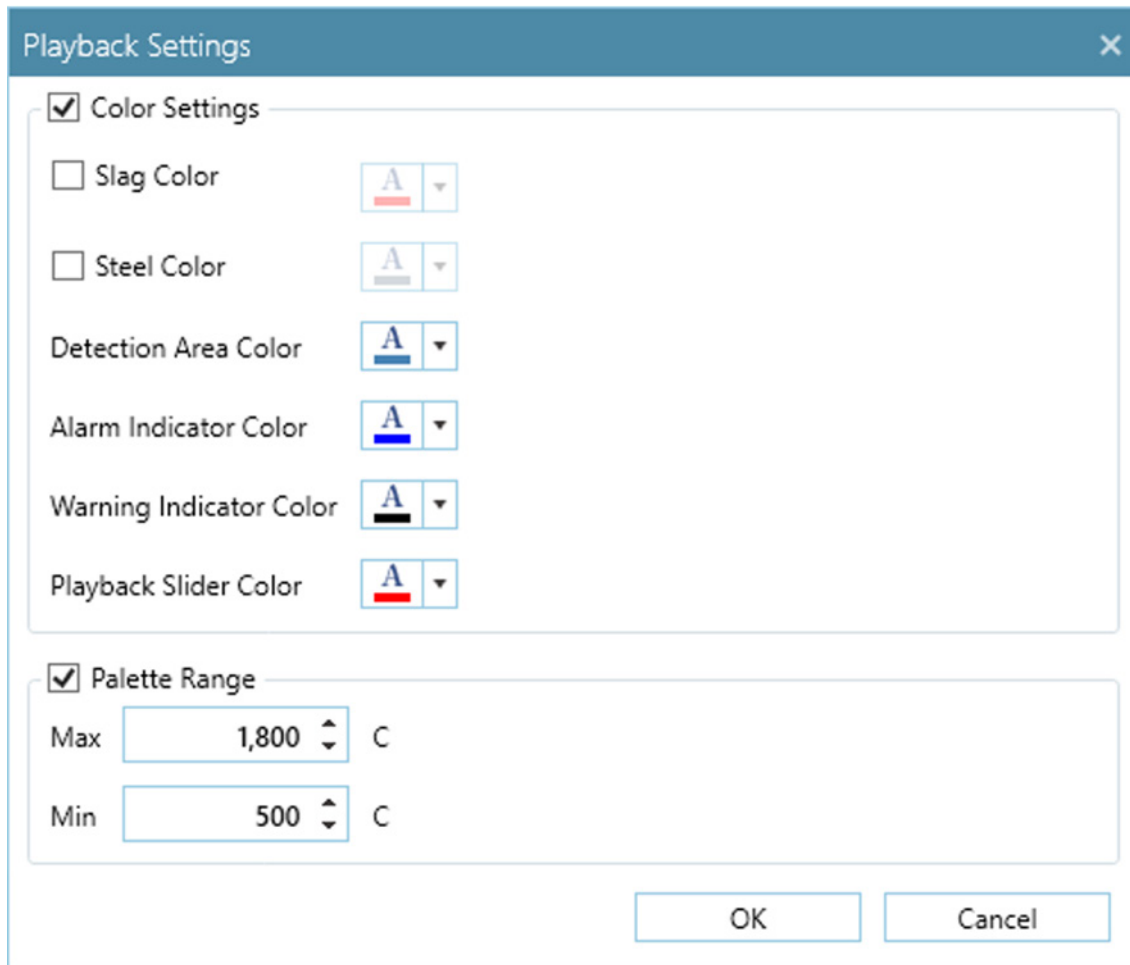
Control	Description
	Play. Starts playing the selected file(s). When a file is playing this button is replaced by the Pause button.
	Pause. Pauses the current playback. This button reverts to a Play button when a playback is paused.
	Playback Settings. Opens the Playback Settings window. See Section 4.3
	First Frame. Selects the first frame of the current file.
	Previous. Selects the previous frame of the current file.
	Current Frame. Displays the current frame number.
	Next. Selects the next frame of the current file.
	Last Frame. Selects the last frame of the current file.


Fig. 4-2 Playback Controls


4.3 Playback Settings





Playback Settings


☒ Color Settings


☐ Slag Color 

☐ Steel Color 

Detection Area Color 

Alarm Indicator Color 

Warning Indicator Color 

Playback Slider Color 

☒ Palette Range

Max C

Min C

OK Cancel

Fig. 4-3 Playback Settings

The Playback Settings options allow you to change the display colours and palette range of the current display view.

5

COMMUNICATIONS

Data Pairs

Available Data Sources

Full Text Search

Drag a column header and drop it here to group by that column

Device Name	Data Field	Pairing
NIR	AmbientAlarmConfiguration	
NIR	AmbientHighAlarm	Modbus - 1
NIR	AmbientHighWarning	Modbus - 2
NIR	AmbientLowAlarm	
NIR	AmbientLowWarning	
NIR	AnalogInputConfiguration	
NIR	AnalogOutputConfiguration	
NIR	BackgroundTemperature	
NIR	BackgroundTemperatureMode	
NIR	BarrelDistortion	
NIR	CalibrationData	

Available Inputs/Outputs

Modules

- Modbus
 - Outputs
 - 1 - NIR_AmbientHighAlarm
 - 2 - NIR_AmbientHighWarning
 - Use new register
 - Inputs
 - Use new register

Add new pairing

Data Source: Min Value: Max Value: Type: Unit: IO Connection:

Register:

Existing pairings

Data Source	Min Value	Max Value	IO Connection
NIR_AmbientHighAlarm	False	True	Modbus - 1
NIR_AmbientHighWarning	False	True	Modbus - 2

OK Cancel

Fig. 5-1 Typical Data Pairs window

5.1 Modbus TCP

Modbus TCP is a standardised protocol built on top of TCP and is widely used for data communications.

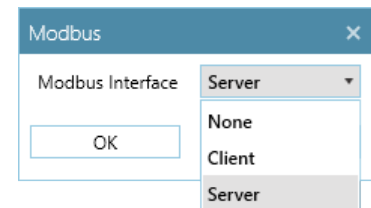
For more information please visit <http://www.modbus.org/>

5.1.1 Client/Server


The Modbus specification requires one device to be a client and the other to be a server in order to establish communication between the two. Under most circumstances, IMAGEPro SDS would act as the **Server** in this arrangement, but in some cases it may be required to behave as a client. This setting can be changed in **Configuration > Communications > Modbus**.

When selecting **Client** mode, you will be asked to enter the remote IP address of the Modbus Server you want to connect to.

All Modbus communication will take place on port **502**.



5.1.2 Data Pairing

- 1) To configure data for input or output via Modbus, first open the Data Pairs window (**Configuration > Communications > Data Pairs**).
Refer to Fig. 5-1 (opposite).
- 2) First select the IMAGEPro SDS data that you wish to input or output. If the data source is read only then only output options will be available.
- 3) Once the data source is selected, select a Modbus register to map the data pair to and press the  button to register the pairing.

5.2 I/O Management

5.2.1 Supported I/O Modules

The IO modules supported by IO Manager are listed below:

- MOXA ioLogik E1214 - 6 relay outputs / 6 digital inputs
- MOXA ioLogik E1240 - 8 analogue inputs (0 to 10 V or 4 to 20 mA via hardware links)
- MOXA ioLogik E1241 - 4 analogue outputs (0 to 10 V or 4 to 20 mA via software configuration)
- Beckhoff CX9001 IO Processor with the following IO modules:
 - EL3112 - 2 Analogue Inputs (0 to 20 mA or 4 to 20 mA via software configuration)
 - EL4014 - 4 Analogue Outputs (0 to 20 mA or 4 to 20 mA via software configuration)
 - EL1004 - 4 Digital Inputs
 - EL2624 - 4 Relay Outputs

NOTE

IMAGEPro SDS software will work with either the Beckhoff CX9001 or the CX8090 IO Processors. In this User Guide, all references to CX9001 apply additionally to the CX8090.

A total of 16 modules, comprising any combination of the above modules can be added. **Note:** A Beckhoff CX9001 is equivalent to 8 modules.

For more information on the MOXA ioLogik modules, refer to the user documentation supplied with each MOXA unit.

5.2.2 Adding I/O Modules

- 1) From the **Configuration** menu, select **Communication** then **I/O Modules**.

Any modules detected on your system will be displayed on the left hand column of the **I/O Modules** screen, as shown in Fig. 5-2.

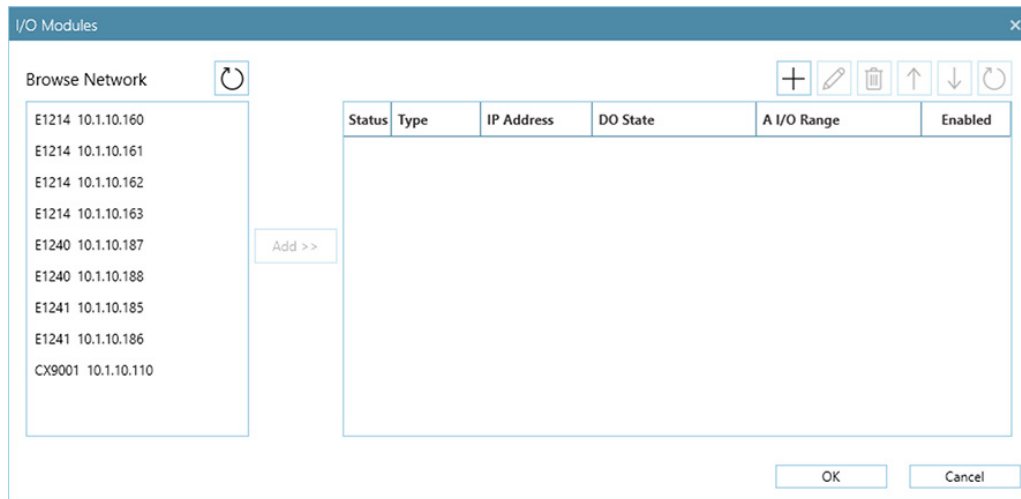


Fig. 5-2 Adding I/O Modules

- 2) To add an individual module, click on the required module in the list then click the **Add** button to add it.
- 3) You can change the order of the modules in the list, for example, to reflect the order in which your modules are fitted on a DIN rail. Click on a module and use the **Move Up** or **Move Down** buttons to arrange the modules in the required order.

The **Remove** button allows you to select a module and delete it from the list. Multiple modules can be selected for removal.

If a module you require is not listed, you can use the **Add New...** button to enter the details of the required module.

- 4) When you have listed all the required modules, click on **OK**.

The I/O Modules screen now display a list of the modules connected, as shown in Fig. 5-3.

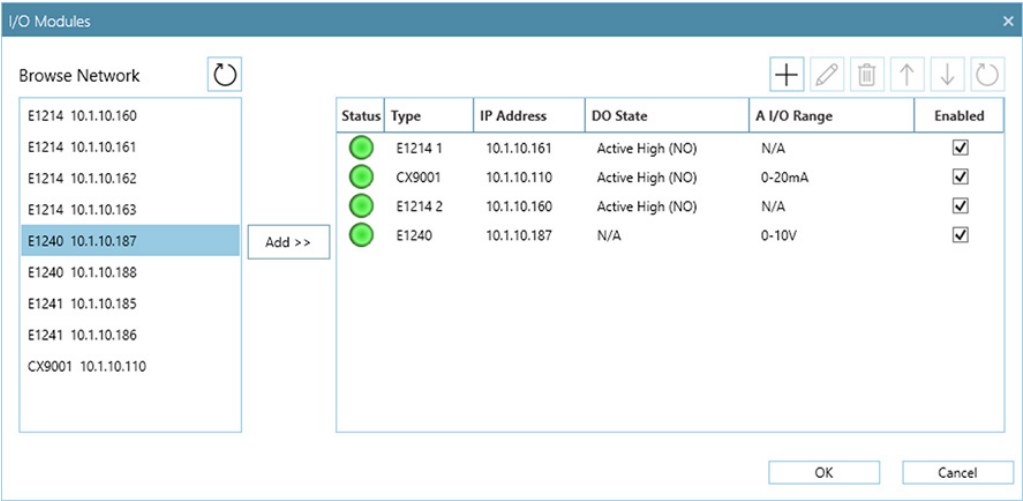


Fig. 5-3 List of added I/O Modules

5.2.3 Configuring your Pairs

When you have configured your Modules, you can then assign a data source in your temperature measurement system to an input or output of a module. This is called 'configuring pairs'.

- 1) Click on the **Configure Pairs** button.
The Configure Pairs screen displays a list of **Available Data Sources** and a list of **Available Inputs/Outputs**, as shown in Fig. 5-4.
For a typical system, it is useful to have outputs monitoring the Data Server Communications and a Watchdog Timer. The Watchdog Timer is a signal which is transmitted at a user-defined interval to check that the system is functioning correctly. The loss of the Watchdog Timer could indicate a problem with the system.

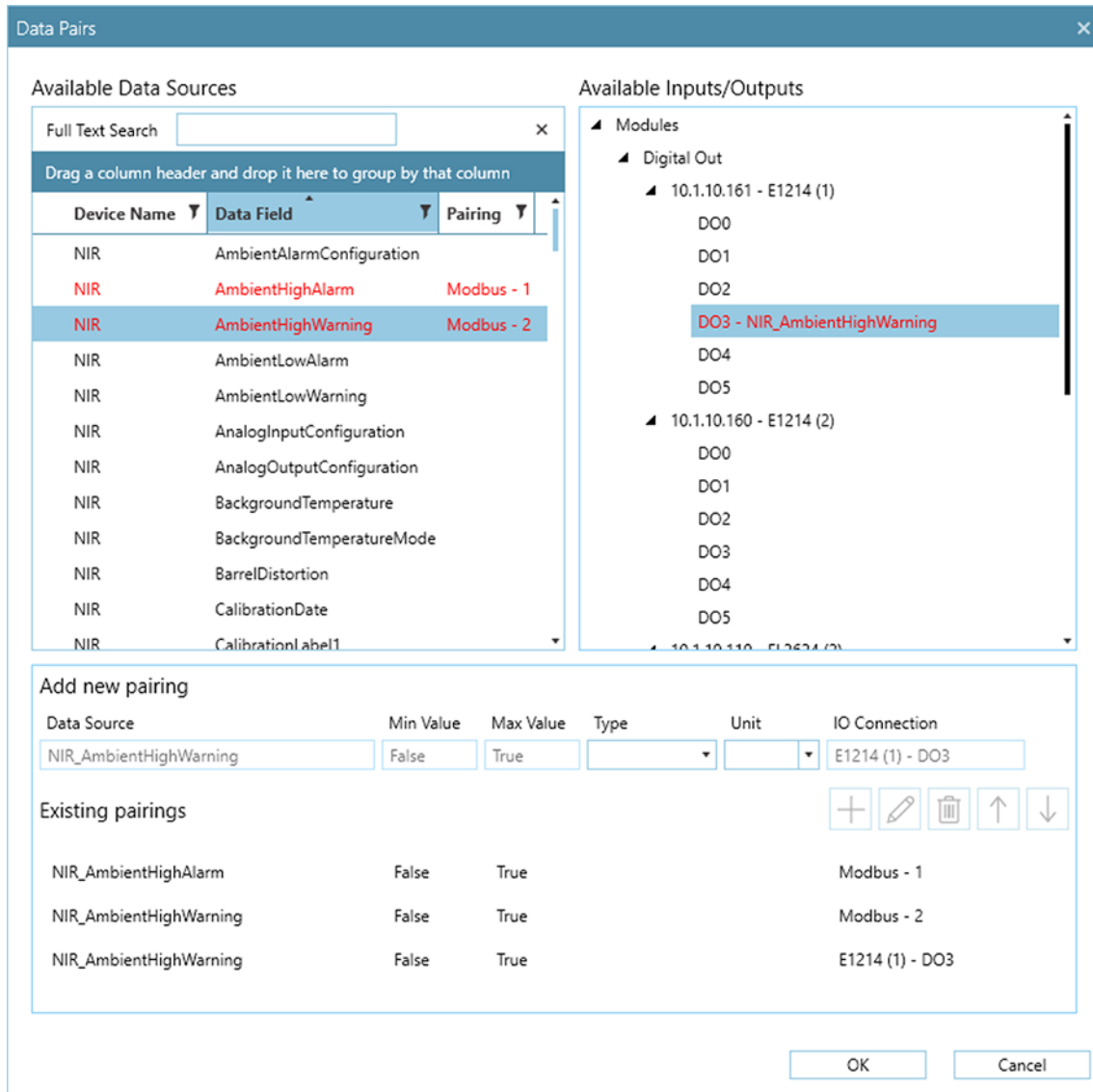


Fig. 5-4 Configuring Pairs

- 2) In the list of Available Data Sources, click to highlight the **Watchdog Timer** option.
The list of Available Inputs/Outputs is expanded to show the corresponding available Digital Outputs that can be paired to the highlighted data source.
- 3) Click on the required output to highlight it e.g. **E1214-1 DO 0**.
The details of the **New Pairing** will be displayed.
- 4) Check that this pairing is correct, then press the **Add Pair** button.
The new pairing is added to the **Existing Pairings** list.
- 5) Repeat steps 2 to 4 to create a pairing for the **Data Server Comms Loss** option on output **E1214-1 DO 1**.
- 6) When you have configured the above pairings, click **OK**.



5.2.4 IOModules View

The **IOModules** screen shows a graphical representation of the connected modules, as shown in Fig. 5-5.

If a Beckhoff CX9001 IO Processor is configured, then the IOModules screen will show a graphical representation of the CX9001 including all of the attached sub-modules.

The CX9001 can be configured to operate with more than one 'Partner', so it is possible that not all of the IO fitted to the CX9001 is available to IMAGEPro SDS.

The IO available to IMAGEPro SDS is shown with its respective Pin number.

IO which is not available to IMAGEPro SDS is shown with an 'x' instead of an IO Pin number.

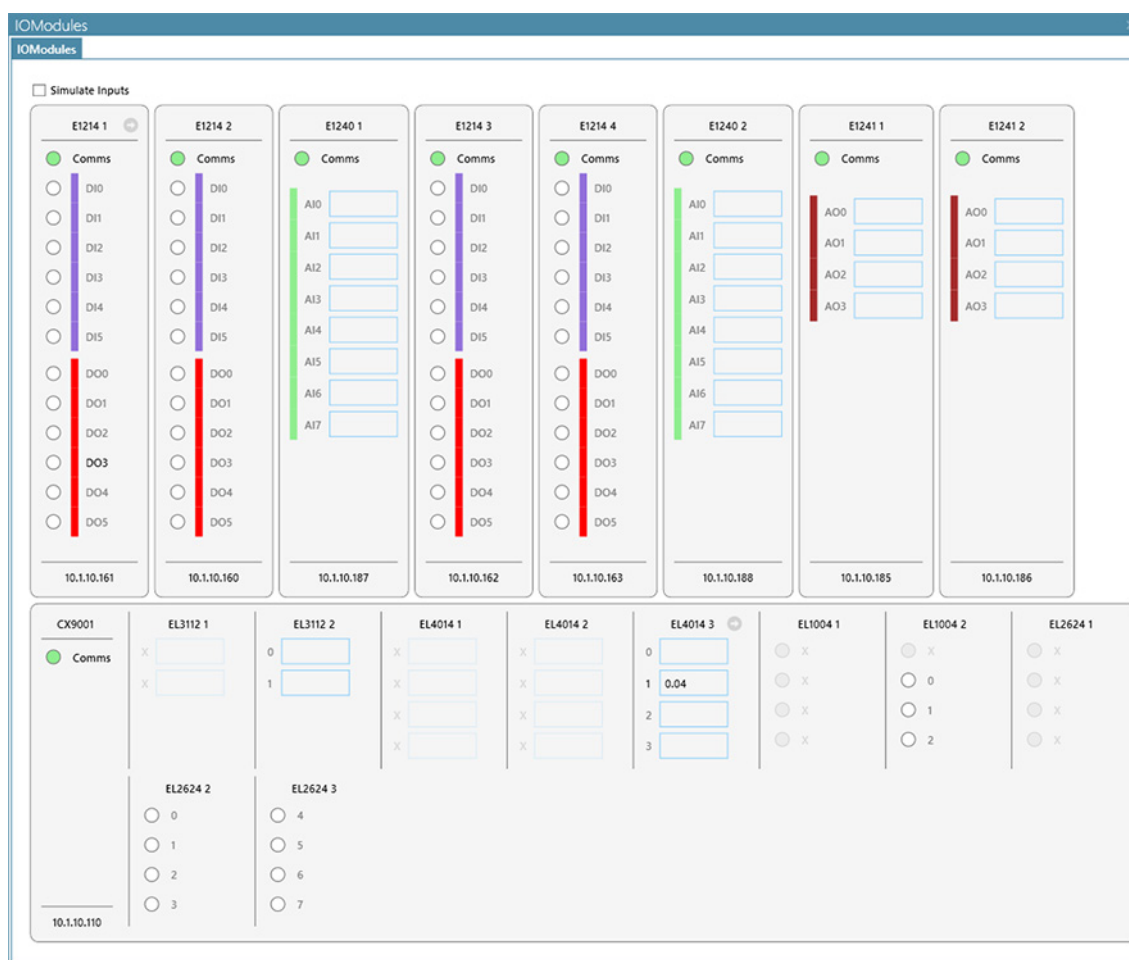


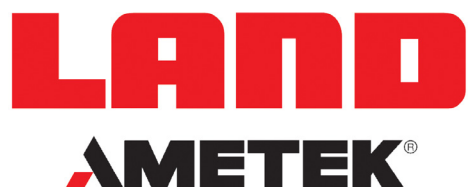
Fig. 5-5 IOModules screen



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