



User Manual



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1. SAFETY AND REGULATORY INFORMATION

Before using this product, the customer shall read and understand all the instructions and warnings. e2v technologies does not accept responsibility for damage or injury resulting from failure to follow the instructions provided.

WARNINGS:

- The Argus[®] Mi-TIC Thermal Imaging Camera Systems are despatched from e2v technologies in a safe condition. Any unauthorised modifications may compromise safety and invalidate the warranty.
- The Argus[®] Mi-TIC Thermal Imaging Camera System is not certified as intrinsically safe and therefore must not be operated in potentially flammable or explosive atmospheres.
- The Argus[®] Mi-TIC Thermal Imaging Camera System is an aid to fire and rescue operations in smoke and darkness. It is not intended to provide a safety function or as a replacement for established safety procedures.
- All users should familiarise themselves with the correct operation, functionality and features of the camera before use.
- The Argus[®] Mi-TIC camera can only be serviced by authorised personnel.
- Use only the mains power supply or vehicle power leads supplied by e2v.
- There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- Where the camera is used at an ambient temperature greater than +40°C suitable protective gloves shall be worn to hold the camera, these should have a temperature rating at least 20°C above the ambient temperature
- **Neglecting the above may result in injury or death.**

CAUTIONS:

- Never point the camera at a source of extreme temperature, e.g. the sun, as this can damage the detector.
- e2v technologies recommends that the Argus[®] Mi-TIC camera is stored in the supplied package or an alternative case supplied by e2v technologies.
- Failure to respond to the warning symbols that appear on the display may result in damage to the camera and the electronics.
- All matters arising, which relate to the safety of this product, should be reported immediately in writing, giving full details, to the Product Safety Officer at e2v technologies.
- e2v technologies recommends that the Argus[®] Mi-TIC camera is stored in either the supplied charging unit or an alternative case supplied by e2v technologies.

ENVIRONMENTAL AND DISPOSAL INFORMATION:

- e2v technologies declares that the Argus[®] Mi-TIC Thermal Imaging Camera System complies with EC directive 2011/65/EU (the RoHS Directive) restricting the use of certain hazardous materials in electrical and electronic equipment.
- The Argus[®] Mi-TIC Thermal Imaging Camera System is classified as Electronic and Electrical Equipment according to directives 2002/96/EC & 2012/19/EU (the WEEE Directives) and should be segregated from domestic waste for disposal.
- This product does not contain toxic or hazardous substances or elements over the maximum permitted concentration values. Refer to the customer information stored on the camera for more information.
本产品不含有毒、有害物质或元素超过最大允许浓度值。请参阅客户信息存储在相机的更多信息



FCC COMPLIANCE INFORMATION (US)

When using the Argus[®] Mi-TIC camera or charging the Argus[®] Mi-TIC camera and battery in the Charger (charge mode), these modes have been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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 radio communications.

When downloading data from the Argus[®] Mi-TIC camera / Charger (data download mode), this mode 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 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 radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.



See the product label
for EU and other
regulatory information

2. INTRODUCTION

The Argus[®] Mi-TIC is the latest generation of the Argus[®] Thermal Imaging Camera (TIC) from e2v technologies. With over 30 years experience in fire-fighters' thermal imaging, e2v technologies continues to produce high quality, affordable systems designed for fire and heat detection for use with civilian, industrial and military rescue services.

The Argus[®] Mi-TIC has been designed with digital imaging technology for a sharper picture and uses the highly successful Amorphous Silicon (ASi) Microbolometer Detector that is in use by many of the world's fire brigades.

Every Argus[®] Mi-TIC is supplied with a unique dual use desktop / in-truck charger station which securely retains and charges both the thermal imager and a spare battery. The charger stations can be daisy-chained together up to a maximum of six units.

The Argus[®] Mi-TIC is a simple, small, lightweight but robust, self-contained camera system, which has fully automatic operation; no control or adjustment is required in use. Through proper use, the user will be able to:

- See through dense smoke and in darkness.
- Detect and display the relative temperatures of objects within the scene.
- Locate the seat and spread of the fire.
- Move swiftly in search and rescue of casualties.
- Have the ability to see in zero visibility conditions.
- Significantly improve safety and mobility.
- Monitor temperatures for preventive maintenance and condition monitoring of equipment.

The Argus[®] Mi-TIC is designed to withstand the high temperatures, knocks and driving spray often encountered in the fire-fighting environment and has many features that can be customised by the end user. These features include:

- Direct Temperature Measurement.
- Toggle between application specific colour modes (Fire or Overhaul/Search).
- Ambient Temperature Measurement.
- Customisable Start-up Screen.
- x2 Zoom (also x4 Zoom on 320 sensor models).
- Time and Date.
- Configurable function buttons
- User Replaceable Germanium window.
- Optional: Image and video capture/playback with embedded storage of up to 1000 images and 4 hours of video.

**The following versions are subject to export controls.
An export licence will be required if exported outside the EU.
MI-nn0-x**

**The following versions are exempt from export controls.
MI-nn9-x**

nn = 16 (160 Sensor) or 32 (320 sensor); x = 1 (1 button) or 3 (3 button)

3. OPERATION AND USE

3.1 System Configuration (Camera Rear)



- 1. 2.7" LCD Display
- 2. Function button 1 (Zoom*)
- 3. Function button 2 (Application Mode*)
- 4. Battery
- *default settings
- 5. Lanyard Loops
- 6. Display Bumper
- 7. ON/OFF Button
- 8. Docking latch
- 9. Docking connector

3.2 System Configuration (Camera Front)



- 1. Replaceable Germanium Window
- 2. Window Release Latch

3.3 System Configuration (Accessories)



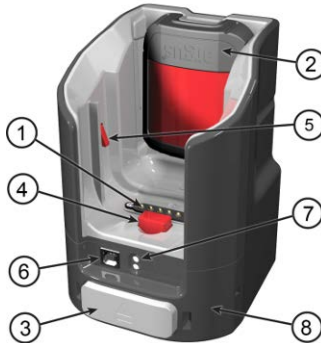
1. M3 x 8 screws
2. MIL-STD-1913 (Picatinny) rail
3. M4 x 30 shoulder screws
4. Double lanyard loop
5. Pocket Clip

6. Sun/smoke shroud*



* purchased separately

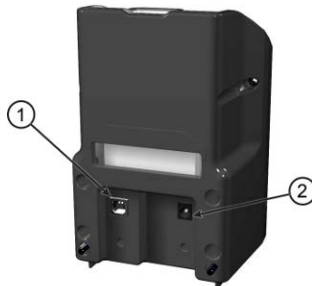
3.4 System Configuration (Charger Front)



- | | |
|--|----------------------------|
| 1. Docking bay 1 (camera with battery) | 5. Camera lock mechanism |
| 2. Docking bay 2 (spare battery) | 6. USB port (front) |
| 3. Camera release button | 7. Charging status LEDs |
| 4. Camera eject mechanism | 8. Front cover (removable) |

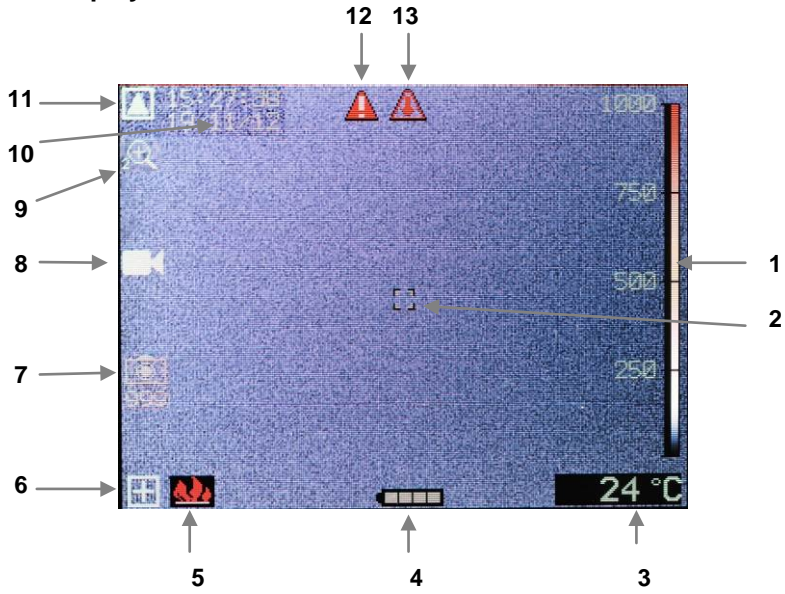
Up to six chargers can be connected in a “daisychain” configuration. Connections should be made via the green power connectors located underneath the removable front cover. The “daisychain” power circuit contains a replaceable 10A fuse. This is also located underneath the removable front cover.

3.5 System Configuration (Charger Rear)



1. USB port (rear)
2. Power connector

3.6 Display



- 1. Colour reference bar
- 2. Spot Temperature Target
- 3. Spot Temperature Value
- 4. Battery Bar
- 5. Application mode indicator
- 6. Operational Format Indicator
- 7. Image Capture*
- 8. Video Capture*
- 9. Zoom indicator
- 10. Time and Date
- 11. Low Sensitivity Mode Indicator
- 12. General System Failure Warning
- 13. Over Temperature Warning

* optional features

3.7 Getting Started

The packing case contains the following items (see Quick Start Guide):

- Camera with lanyard loops
- Charger Station
- Quick Start Guide
- Two rechargeable battery packs
- USB Lead
- Retractable lanyard
- Power Supply Kit:
 - Mains power supply
 - Set of interchangeable plugs
 - Vehicle power lead (12V)
- Pocket Clip
- Picatinny rail accessory with mounting screws
- Universal Mounting Plate for Charger with screws

Basic Operation

- Turn the camera on with a short press of the green button.
- After about one second a start-up image will appear on the screen. (This image may be changed – see section 4.5). After a few more seconds the display will show the thermal image.
- The time and date will be displayed for a further five seconds.
- While the camera is in operation, it will recalibrate to maintain its performance and image quality. During recalibration an internal shutter closes and image will briefly freeze while the internal electronics optimises the performance of the sensor. This occurs more frequently when first turned on, then the calibration interval increases as the internal temperature of the camera stabilises.
- To turn the camera off, press and hold the green button for two seconds until the camera turns off.

3.8 Camera Features

3.8.1 Application Modes

The Argus Mi-TIC has two application modes:

- FIRE



A white-hot grey scale, expanded to cover the dynamic range of the scene. Yellow colourisation is added above 150 °C and red colourisation is introduced above 600°C. The colour reference bar is marked with temperatures.

- SEARCH or OVERHAUL



A white-hot grey scale, expanded to cover the dynamic range of the scene. Red colourisation is added to the hottest part of the scene regardless of absolute temperature. Where there is no significantly warmer area, no red shows.

The camera starts up in Fire mode*. On 3-button cameras, to toggle between the application modes, press the function button assigned to application mode toggle. By default this is the centre function button. See section 4 for how to configure the function buttons.

*Except the camera type MI-160-S which starts up in search mode.

3.8.2 Direct Temperature Measurement



The camera allows the operator to view the average temperature of the centre spot of the scene (defined by the target markings). The temperature reading is displayed in the bottom right-hand corner of the display. This system is intended to give the operator the ability to detect possible hazards such as hot gas bottles or tanks, heat signatures of people or objects, and to compare temperatures.

The temperature measurements feature can be changed between degrees Celsius or degrees Fahrenheit by using the PC Configuration Tool software (see section 4).

Notes:

- The camera can measure scene temperatures between 0 and +1000 °C (32 and +1832 °F).
- The object being measured must fully fill the target marks to get a good reading.
- If the temperature is higher than the maximum, the display will show “+++” in red.
- If the temperature is lower than the minimum, the display will show ‘---’.

- Different types of materials have different infrared emission characteristics. This will affect the accuracy of the temperature reading. Variations can also be caused by the distance from the object. This temperature measurement must be regarded as an indication and not a guaranteed reading.

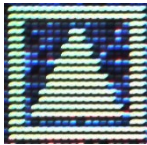
3.8.3 Tri-Mode Sensitivity

The Argus[®] Mi-TIC has three levels of sensitivity: High, Low and Extended Low. These levels provide the user with a thermal image over the widest possible temperature range. The Argus[®] Mi-TIC will switch to the optimum level of sensitivity automatically and will indicate when it is in the lowest sensitivity modes by displaying a green coloured solid triangle symbol at the top left of the display.

- High Sensitivity Mode

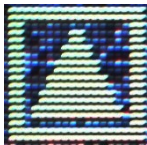
The Argus[®] Mi-TIC will operate in High Sensitivity mode under normal operating conditions. The image that is produced is clearer and will show more detail. The temperature range for this mode is between $-40\text{ }^{\circ}\text{C}$ and $150\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ and $302\text{ }^{\circ}\text{F}$).

- Low Sensitivity Mode



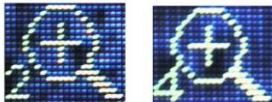
The Argus[®] Mi-TIC will automatically switch to Low Sensitivity mode when higher temperatures have been detected. It is indicated by a green triangle symbol. The image that is produced loses some clarity, but will still show detail. The temperature range for this mode is up to $400\text{ }^{\circ}\text{C}$ ($750\text{ }^{\circ}\text{F}$).

- Extended Low Sensitivity Mode



If the scene has extreme temperatures, the camera will automatically switch to Extended Low Sensitivity mode, again indicated by a green triangle symbol. There will be further loss of clarity and increased noise, but will still show detail even in cooler areas. The temperature range for this mode is up to $1000\text{ }^{\circ}\text{C}$ ($1832\text{ }^{\circ}\text{F}$).

3.8.4 Zoom



A short press on the left-hand function button operates the zoom function. The zoom symbol will appear to the left of the display and is indicated by the magnifying glass icon on the screen.

The temperature measurement sample window is also expanded to suit.

Note: x4 zoom is only provided on 320 camera types.

3.8.5 Time and Date

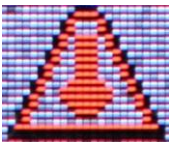


On start-up the time and date are displayed at the top of the screen for 5 seconds. The date and time and format can be adjusted using the software configuration tool (see section 4).

3.9 Display Warning Graphics

The Argus[®] Mi-TIC is equipped with an advanced microprocessor based control and user warning system. In addition to controlling the automatic operation of the camera to ensure the best possible picture at all times, the control system provides graphics on the display to alert the user to certain conditions as follows:

3.9.1 Over-temperature Warning



The internal temperature of the camera is above the correct operating range. The camera must be turned off to cool down and prevent permanent damage.

If the user ignores this warning and continues to operate the camera in very high temperatures, the warning symbol will flash.

When the flashing temperature warning is present, the camera is very close to its absolute operating limit and the image will start to degrade considerably. The user must remove the unit from the high ambient temperature at this time; failure to comply may result in permanent damage to the unit. Failure to act upon this level of warning may result in serious damage to the system and may invalidate the warranty.

3.9.2 General System Failure Warning

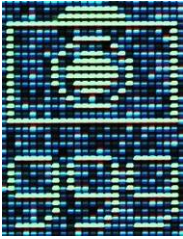


The control system has detected an internal camera fault. Turn the camera off for five minutes and turn back on again. If the warning symbol is still present, or the symptoms return, contact your e2v representative.

Failure to act upon this level of warning may result in serious damage to the system and may invalidate the warranty.

3.10 Camera Features (optional)

3.10.1 Image Capture



Up to 1,000 images can be captured. Images are stored in the camera embedded storage. These images can then be viewed or deleted using the camera or by downloading on to a PC (see section 5).

To capture an image, press the function button assigned to image capture (see section 6.6 for function button set-up).

The image capture symbol appears for a short time on the left hand side of the LCD display. The number of the images remaining will be indicated on the display.

Images stored on the memory card can be viewed on the display by using the image playback mode (see section 3.9.3).

Images are stored on the camera in compressed **.jpg** format.

3.10.2 Video Capture



Videos are stored in the camera's embedded storage in Motion JPEG format in a **.avi** file. The files have a maximum length of 10 minutes to simplify transfer to a computer. The camera will automatically start a new file every 10 minutes.

Video stored on the memory card can be viewed on the display by using the image playback mode (see section 3.9.3).

Video files can be copied to a computer using the USB lead. 10 minutes of video typically generates a 100 MB file.

3.11 Operating Notes

- **Interpreting The Image – Relative Temperatures**

The image displayed is simply a black and white picture of the infrared energy entering the lens. The camera displays relative temperature differences between individual objects and their surroundings irrespective of overall ambient temperature.

The camera is set up to display objects at various shades between black for cooler items and white for hotter bodies, e.g. in a room at 20 °C a cold drink would appear black whilst a hot radiator would appear white. However, in a room at 250 °C, it is possible that the same hot radiator may appear darker than, for example, burning materials. Depending upon the application mode selected, the image may be coloured according to actual temperature (Fire mode) or relative temperature (Search mode).

- **Identification of Fire and Hotspots**

The camera will represent zones of very high temperature as white or red within the picture. When sufficient heat has been detected, e.g. a large area of fire, the camera will automatically enter low sensitivity mode. This will extend the dynamic range of the camera and allow the image of surrounding objects to remain clearly visible.

- **Hidden Fires**

It is possible that fires may be burning or smouldering behind doors, in ducting or in wall or floor cavities. In such circumstances, the operator should look for areas that appear whiter when compared with the surroundings. Search mode particularly useful in this situation as it would colour the hottest areas red.

For example, a fire behind a door will cause the door to appear whiter against the background. Similarly, a white area on an otherwise dark wall could indicate an area of fire behind the masonry.

- **Search for Persons and Objects**

The camera is not restricted to locating fires. In many cases, the fire-fighter will be using the camera to search for casualties, to seek out dangerous items such as fuel tanks or gas cylinders and also as an aid to navigation through unknown premises.

- **Image Clarity**

The sharpness and clarity of the image provided is related to the temperature of the scene and objects in view. A cold room provides little infrared energy and less detail is detected than in a warm environment where objects give off significant energy. In general, the warmer the scene, the more thermal contrast and hence the greater detail in the picture.

- **Heat Layers in Closed Spaces**

In a major fire, a layer of hot gases may build up in the upper region of the closed space. Attempting to use the camera in this hot layer will cause the image to become featureless. By bringing the camera down beneath this layer, the unit is able to provide the fire-fighter with a clearer picture of the scene ahead.

- **Windows and Polished Surfaces**

Glass is not transparent to long wavelength infrared energy and it is not possible for the operator to use the camera to look through a window. A white window would indicate that the window itself is relatively warm and may be being heated by a fire behind it. Just as we see reflections in glass under normal circumstances, it is possible that the camera can detect infrared reflections in glass, mirrors and polished or painted surfaces. Care must be taken to ensure that the image seen is not simply a reflection. Experience will give the operator added confidence.

- **Control of Water Streams/Jets**

When viewed through the camera, water streams from hose reels will appear black against the background scene. The control and direction of a water flow can be monitored by viewing its flow and effect on the fire through the camera. It may be necessary, if employing a water wall, to drop the wall momentarily to view the effects of the extinguishing stream.

- **Smoke Types**

The camera will provide vision through all types of smoke and steam.

- **Lens Cleaning During Operation**

The camera lens, like the BA visor, may become obscured during use. The lens may be cleaned with a glove or cloth if necessary.

4 BATTERIES AND CHARGING

The Argus® Mi-TIC camera is supplied with two Argus® Mi-TIC Lithium Phosphate Rechargeable Battery Packs (ARG_MI_BLPS) designed to power the camera for over 2 hours from a full charge. Batteries must be fully charged before first use.

The optional high capacity battery (ARG_MI_BLPL) gives over 5 hours use from a single charge.

4.1 Indications on Charger



No power applied or no battery fitted



Charging



Battery fully charged.



Battery too warm/cold for charging or other fault

4.2 Battery Life Indicator

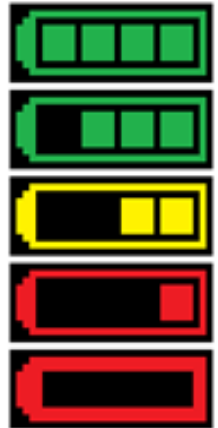
With a new, fully charged battery, the battery indicator will show full with a solid green bar.

The battery indicator represents the normal run time of the battery, 2 hours for the standard battery (ARG_MI_BLPS) and 5 hours for the optional large battery (ARG_MI_BLPL).

When the battery symbol turns orange, there is approximately half of the battery life remaining.

When the battery symbol turns red, there is approximately a quarter of battery life remaining.

When the battery symbol starts to flash, the time remaining will typically be 10-15 minutes.



5. CONNECTING THE CAMERA TO A PC

The camera has 4GB of embedded storage. This is used for:

- Changing the start-up image
- Storing images (optional)
- Storing videos (optional)
- Storing camera diagnostic information
- Updating the camera software
- Storing a copy of the Configuration Tool Software (see section 6)
- Storing a copy of the manual

5.1 Changing the Start-Up Image

A custom start-up image can be loaded into the camera as follows.

1. Generate an image file on a computer in the following format:

Name:	Splash.bmp
Size:	320x240 pixels
Format:	24 Bit Bitmap

2. Turn the camera on.
3. Connect the camera to the computer using the USB lead.
4. The computer should recognise the memory card as a 'Mass Storage Device' and open a file explorer window.
5. Copy the image file from the computer to the top level 'ARGUS TIC' directory.
6. Close the window.
7. On Windows computers it is recommended to select 'Safely Remove Hardware' before disconnecting the camera.
8. Remove the USB lead from the computer and camera.
9. Turn the camera off and back on. The camera will read the new image file when it turns on.
10. Wait until the status message clears.
11. Turn the camera off and back on again. This time the new splash screen image will appear at start-up.

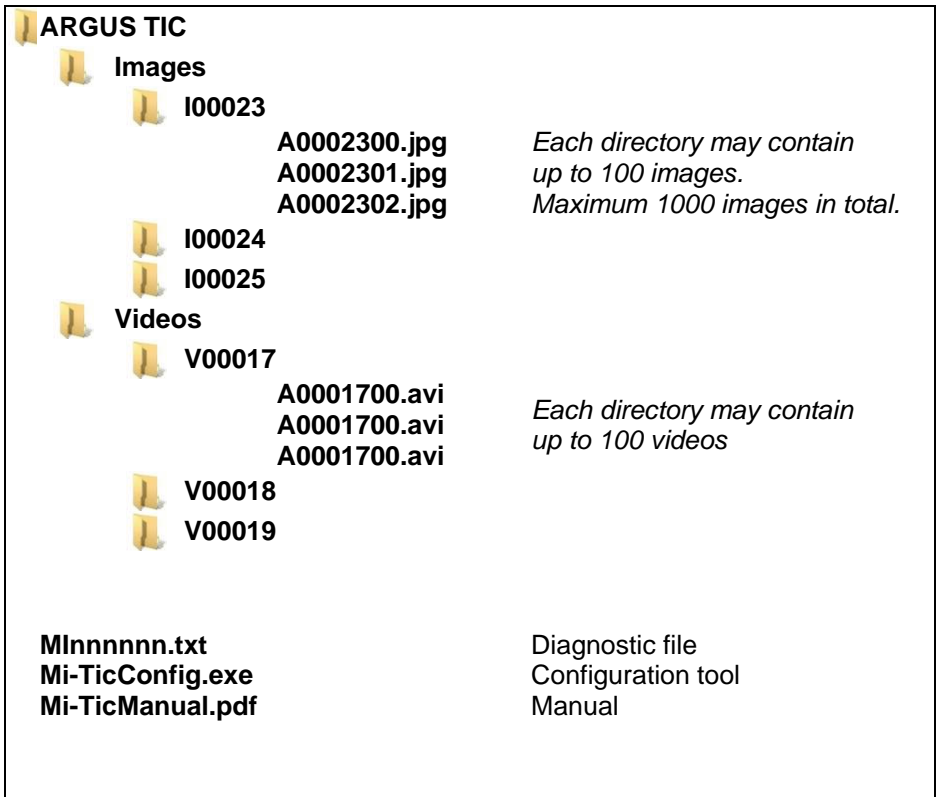
Keep a copy of the image file on your computer. The camera will rename the image file on the memory card after it has been successfully loaded into the camera.

5.2 How to Copy the Memory Card Contents to a PC

Images and videos can be copied to a PC as follows:

1. Turn the camera on.
2. Connect the camera to the computer using the USB lead.
3. The computer should recognise the memory card as a 'Mass Storage Device'. If an explorer window does not open automatically, select 'My Computer' to locate the memory card.
4. Files can be copied from this window to directories on the computer.
5. Close the window.
6. Remove the USB lead from the computer and camera.

Directory Structure of Camera memory



5.3 Diagnostic File

The diagnostic file can be found in the top level 'ARGUS TIC' directory on the memory card. The name of the file is:

MInnnnnn.txt

(nnnnnn is the camera serial number)

The diagnostic file contains information about the camera which may be useful to e2v in diagnosing any camera faults. e2v may ask you to copy this file from the memory card to a computer and send it by email to e2v for fault finding.

6. CONFIGURATION SOFTWARE

The Argus[®] Mi-TIC Configuration Tool is supplied on the camera's embedded storage.

The Configuration Tool runs on a PC with Windows XP / Vista / Win7. This allows the user to perform the following tasks:

- Set the temperature units to either °C or °F.
- Set the time and date format and synchronise the time and date with the PC
- Enable "black box" video recording *
- Customise the operation of the camera's function buttons.

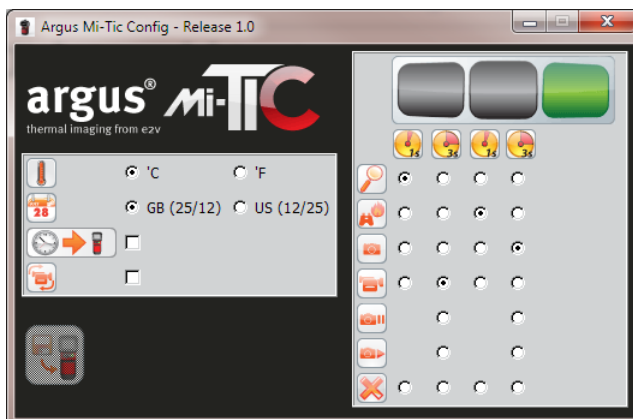
6.1 Running the Configuration Tool

To run the software, connect the Argus[®] Mi-TIC to your computer using the Argus[®] Mi-TIC Charger Station and the supplied USB cable. The camera is recognised as a removable disk.

Navigate to the removable disk and open it.

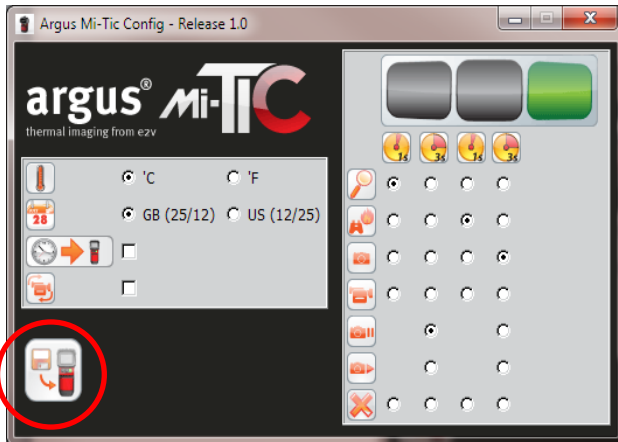
Note: If the camera is not recognised as a removable disk, check that the camera is connected to the PC and correctly docked in the charger station and switch the camera off and back on again.

Run 'Mi-TicConfig.exe'



6.2 Setting the temperature units

Select either C or F, then click the 'Save Changes' button circled in red below. Eject the camera from the charger dock. Do not switch the camera off and back on again. The new settings will be enabled.



6.3 Setting the time and date format

Select either GB or US, then click the 'Save Changes' button. Eject the camera from the charger dock. Do not switch the camera off and back on again. The new settings will be enabled.

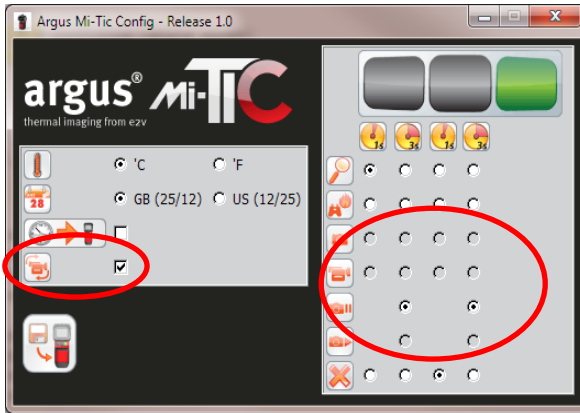
6.4 Synchronising the time and date with the PC

Check the synchronise time and date box, then click the 'Save Changes' button. Eject the camera from the charger dock. Do not switch the camera off and back on again. The new settings will be enabled.

6.5 “Black Box” Video Recording*

Check the “Black Box Video Recording” box, then click the ‘Save Changes’ button . Eject the camera from the charger dock. Do not switch the camera off and back on again. The new settings will be enabled.

Note: When “Black box” video recording is enabled, image capture, video record and image playback functions are disabled.



6.6 Camera function button set-up

The following camera functions can be assigned to either of the two function buttons. Functions can be activated by either a short press (less than one second), or a long press (three seconds).

- Zoom
- Application Mode (Fire or Search/Overhaul)
- Image Capture*
- Video Record*
- Image Freeze*
- Image Replay*

To assign functions to buttons, select the desired combinations and then click the ‘Save Changes’ button . Eject the camera from the charger dock. Do not switch the camera off and back on again. The new settings will be enabled.

* These functions are not available as standard. The additional image and video options can be obtained by upgrading your camera with the 'image & video upgrade' token (ARG_MI_IV).

7. CLEANING, MAINTENANCE AND REPLACEABLE PARTS

7.1 Cleaning

After use and prior to stowing, the camera should be cleaned. This is best carried out using a cloth soaked with warm soapy water. **Solvents should not be used. If in doubt, contact your supplier.**

7.2 Maintenance

No routine maintenance is required for the camera. If it is not in regular use, it should be switched on for a period of ten minutes every month to check correct operation.

7.3 Replaceable Parts

The following items may be replaced by the user:

Item	Description
USB Lead	USB cable with Type B connector (2 metres)
Vehicle Charger Lead Fuse	250 V 2 A Fast Acting Fuse, UL Certified. 1.25 x 0.25 inch (32 x 6 mm). Do not use any other fuse type or rating.

The following items are available as spares and accessories from e2v:

Part No.	Description
ARG_MI_BLPS	Mi-TIC Rechargeable Battery Standard (2.5 hours)
ARG_MI_BLPL	Mi-TIC Rechargeable Battery Pack Large (5 hours)
ARG_MI_CS	Mi-TIC Charger Station
ARG_MI_PSU	Mi-TIC Power Supply
ARG_MI_SS	Mi-TIC Sunshroud
ARG_MI_RL	Mi-TIC Retractable Lanyard
ARG_MI_LL	Mi-TIC Double Lanyard Loop
ARG_MI_RW	Mi-TIC Replacement Window
ARG_MI_RAIL	Mi-TIC Picatinny Rail
ARG_MI_PCLIP	Mi-TIC Pocket Clip
ARG_MI_DB	Mi-TIC Display Bumper
ARG_MI_LED	Streamlight LED Light
ARG_MI_LASER	Streamlight LED Light and Laser
ARG_MI_USB	Mi-TIC USB Lead

THERE ARE NO OTHER USER SERVICEABLE PARTS. If any damage beyond these parts occurs, return the camera to e2v technologies or an authorised repair centre. Any attempt at repair by unauthorised personnel may cause serious damage and will invalidate the warranty.

8.WARRANTY TERMS

8.1 Express Warranty

e2v technologies ("e2v") warrants that this product is free from mechanical defects or faulty workmanship for two (2) years from the date of shipment, with the exception that the warranty period for the battery charger is one (1) year and for the rechargeable battery pack is twelve (12) months from that date, provided it is maintained and used in accordance with e2v's instructions and/or recommendations.

This warranty does not apply to expendable or consumable parts whose normal life expectancy is less than one (1) year. Replacement parts and repairs are warranted for ninety (90) days from the date of shipment.

e2v shall be released from all obligations under this warranty in the event that persons other than its own or authorised service personnel make repairs or modifications, or if the warranty claim results from misuse of the product. No agent, employee or representative of e2v may bind e2v to any affirmation, representation or modification of this warranty concerning the goods sold under this contract.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. e2v SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

8.2 Exclusive Remedy

It is expressly agreed that the Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of e2v, or for any other cause of action, shall be the repair and/or replacement, at e2v's option, of any equipment or parts thereof, that after examination by e2v are proven to be defective. Replacement equipment and/or parts will be provided at no cost to the purchaser, F.O.B. e2v's plant. Failure of e2v to successfully repair any non-conforming product shall not cause the remedy established hereby to fail of its essential purpose.

8.3 Exclusion of Consequential Damages

PURCHASER SPECIFICALLY UNDERSTANDS AND AGREES THAT UNDER NO CIRCUMSTANCES WILL e2v BE LIABLE TO PURCHASER FOR ECONOMIC, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES OF ANY KIND WHATSOEVER INCLUDING, BUT NOT LIMITED TO, LOSS OF ANTICIPATED PROFITS AND ANY OTHER LOSS CAUSED BY REASON OF THE NON-OPERATION OF THE GOODS. THIS EXCLUSION IS APPLICABLE TO CLAIMS FOR BREACH OF WARRANTY, TORTUOUS CONDUCT OR ANY OTHER CAUSE OF ACTION AGAINST e2v.