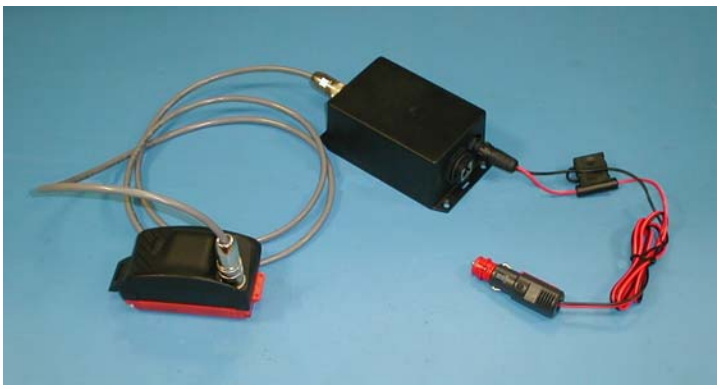
USER GUIDE FOR ARGUS®4 VIDEO ACCESSORIES



THERMAL IMAGING VIDEO ACCESSORIES

SAFETY NOTES

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®4 Video Accessories are despatched from e2v technologies in a safe condition. Any unauthorised modifications may compromise safety and invalidate the warranty.
- The Argus®4 Video Accessories are not certified as intrinsically safe and therefore must not be operated in potentially flammable or explosive atmospheres.
- All users must be trained in the correct operation, functionality and features of the Argus®4 before use.
- The Argus®4 Video Accessories can only be serviced by authorised personnel. There are no end-user serviceable parts except those described in the maintenance section of this manual.
- The Argus®4 LRT receiver contains a Lithium Ion battery. Do not allow the receiver to become heated above 80°C or subjected to extreme impact.
- Neglecting the above may result in injury or death.

LIMITATION OF USE:

The Argus®4 Video Accessories are not certified for automotive use in immunity-related functions. It **MUST NOT** be used for the control of a vehicle, a vehicular safety system or in a way that may disturb the driver, data bus or statutory devices fitted to a vehicle.

All matters arising, which relate to the safety of this product, should be reported immediately in writing, giving full details, to the Quality Engineering Manager at e2v technologies.

RADIO COMPLIANCE

Before using any transmitter accessory read the notes in sections 14, 15 & 16 appropriate to the product and country of use.

It is the users' responsibility to ensure that the frequency and power of operation are permitted in their locale.

Failure to do so may result in illegal radio operation and prosecution.

ENVIRONMENTAL

e2v technologies declares that the Argus®4 Video Accessories comply with EC directive 2002/95/EC (the RoHS Directive) restricting the use of certain hazardous materials in electrical and electronic equipment.

The Argus®4 Video Accessories are classified as Electronic and Electrical Equipment according to directive 2002/96/EC (the WEEE Directive) and should be segregated from domestic waste for disposal. Contact your local e2v sales office for disposal instructions.

The P7030TX, P7030VC and P7030DTX contain a NiMH battery.
Do not crush or dispose of in fire.

The DRX and DRRS products contain a Li-Ion battery.
Do not crush or dispose of in fire.

China RoHS: This product does not contain toxic or hazardous substances or elements over the maximum permitted concentration values. Refer to the Argus®4 Thermal Image Camera customer information CD for more information.
本产品不含有毒、有害物质或其浓度在允许范围内。详细信息请查阅随附的用户信息光盘

USER GUIDE FOR THE ARGUS®4 VIDEO ACCESSORIES

This document explains to the user how to operate the Argus®4 External Video Accessories and applications for their use.

Contents

SECTION 1 – General Overview

The main applications for the Argus®4 video accessories are in remote command overview, training, evidence gathering and investigation. The user is offered a number of different solutions for viewing the camera images at a distance and for recording video from the camera. The user can choose between a fully configured system and the option to use the camera with existing equipment or to build a more complex system.

The main departure from existing systems is that the camera has an output is in a computer-friendly format for the digital age allowing the use with standard networking equipment directly to a computer, providing files ready for use without the need for conversion.

Additionally, analogue output is present on many camera variants allowing use with existing standard video equipment through the analogue accessories.

The LRT accessories offer a very high performance video link that is also secure and can be interfaced with systems in use in command vehicles for other video cameras

SECTION 2 - Argus®4 Transmitter and Battery Pack P7030TX

This accessory allows an Argus® 4 camera to transmit video over Wi-Fi to a suitable receiver and to be viewed on a computer connected to it. This is incorporated in a battery pack that provides power for both transmitter and camera.

The Transmitter and battery pack consists of the following items:

Transmitter and Battery Pack	DAS761760AA
Software CD	DAS762581AA
User Guide (this booklet)	DAS762156AA

Connection to the camera is by replacing the standard battery with the unit supplied. There are no user serviceable parts inside.

INSTRUCTIONS FOR USE

The transmitter battery pack contains a standard battery and may be charged with the standard camera charger accessories, the mains charger supplied with the camera (P7030BC+CS) and the vehicle charger (P7030TBC). It also contains circuitry to give the same camera display of the battery state as a standard battery, although run time is reduced when transmitting, giving a typical 3 hours in ambient temperatures.

When the battery reaches low, as shown below, the transmitter is automatically turned off to ensure that final runtime beyond the low battery warning is maintained.

To maintain the accuracy of the battery charge indicator, e2v recommends that batteries be occasionally fully discharged in a camera before charging.

Note: P7030-LITE does not have the transmission facility.

A transmitter battery cannot be charged attached to the camera in the vehicle storage mount.

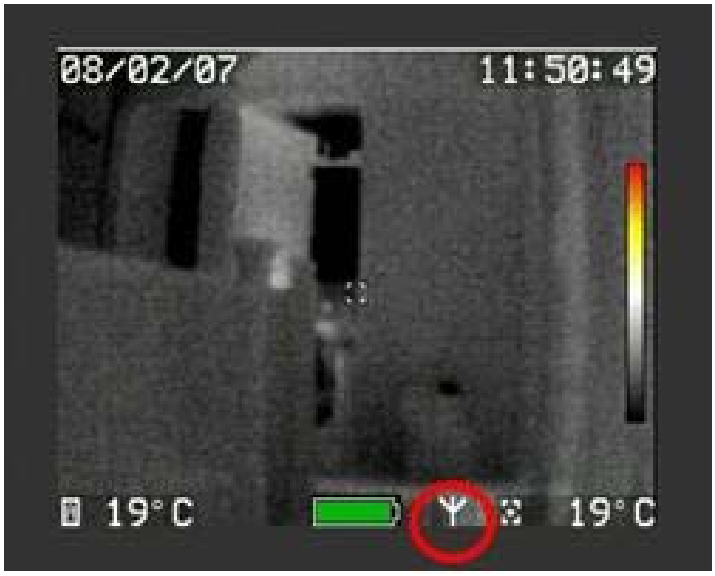
Fit the transmitter unit to the camera as shown below and click into place.

Switch on the camera with the red button as normal and a picture will be seen on the display.

To commence transmitting video, a long push on the right-hand button is required.

When the camera is sending video the 'transmit' icon is shown on the camera, circled in red on the image opposite.

A further long push will turn the transmission off. Transmission also ceases when the battery is nearly empty to extend the final few minutes of run time.



When the video output is being sent out, any suitable device can connect and view the video. The default stream address for the video source is rtsp://10.133.1.20:554/tic04

The IP address of the stream can be changed if required for an advanced installation as described in the advanced section of this guide.

The default setting for the camera is that it is not sending output video as this conserves power when in normal battery powered use. It is possible to set the camera to always turn on with output video working by using the customer software or to control this remotely, see FAQ 1

Note: It is recommended that before each BA team enters the fire, the camera be fitted with a fully charged rechargeable battery.

Disposal of batteries should be in line with local procedures and they should be segregated from domestic waste. Alternatively, the batteries may be returned to e2v technologies for safe disposal.

The battery pack will self-discharge at approximately 2% per day. Battery packs that have been stored off-charge for two weeks will run a camera for at least two hours. It is recommended that the rechargeable batteries are placed into storage fully charged and are routinely recharged so as to be ready for use and to maintain performance. Shelf life is maximised by storage between 10 °C and 25 °C (50 °F and 77 °F). Battery packs that become fully exhausted in storage may suffer irreversible damage.

SECTION 3 - Argus®4 Receiver Station P7030RRS

This accessory allows reception and viewing of an Argus®4 camera transmitting video over Wi-Fi.

The Receiver Station accessory consists of the following items:

- Wireless network adaptor DAS762153AA
- Portable Computer DAS762155AA
- Software CD DAS762581AA
- User Guide (this booklet) DAS762156AA
- User Guides, warranties and software for the Computer and Access Point

The receiver station consists of a wireless network adaptor and a tablet computer connected by USB. A 1.5 m USB lead is supplied with the network adaptor to allow the adaptor to be placed in a more suitable receiving location.

The tablet computer is loaded with appropriate software and is set up to work with a camera in standard configuration. The tablet may be used with a stylus to replace the need for a keyboard and allow the user to have a gloved hand.

Note that the exact equipment supplied may vary from these pictures due to product evolution in the IT market.

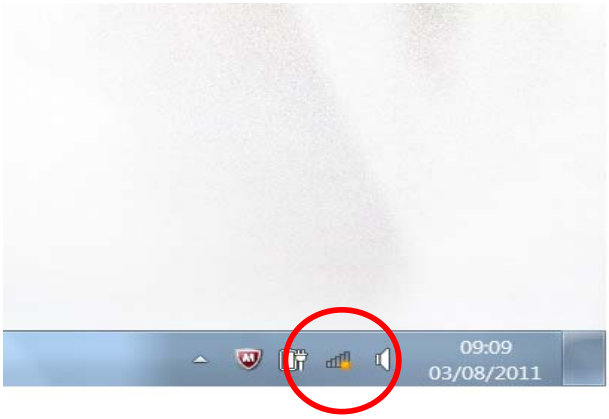
INSTALLATION

Secure the wireless network adaptor in a suitable position. If it is to be used as a walk-about hand-held, this will generally be to the computer or computer binder. For a fixed installation, the location should be considered carefully to obtain the best reception. For example, in a vehicle, it would be better on the windscreen or dashboard away from the metal bodywork. If required, USB extension cables can be obtained from many retail outlets.

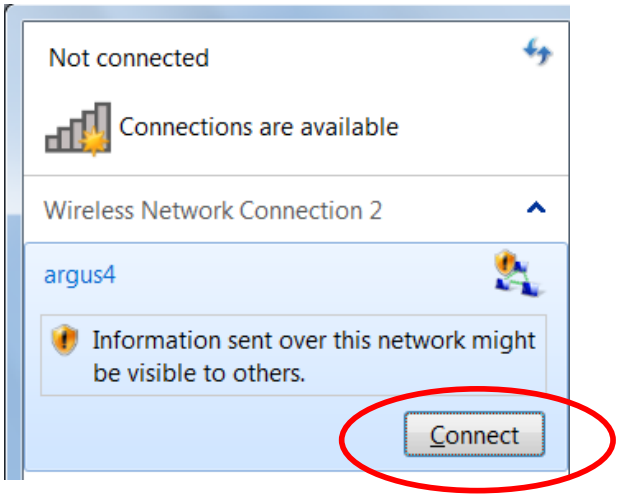
Raise the antenna and connect the USB lead to the tablet computer.

INSTRUCTIONS FOR USE

- Switch on the computer and ensure that the camera is transmitting.
- Click on the '**Internet Icon'** next to the volume button at the bottom right of the screen.



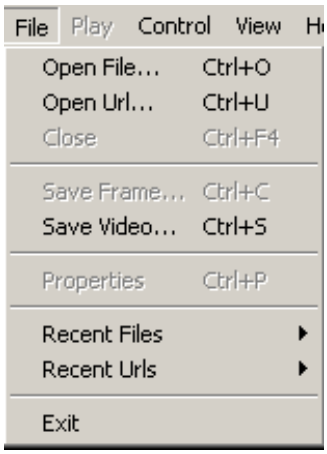
- Click on the '**argus4'** connection in the pop up menu. Then Click '**Connect**'.



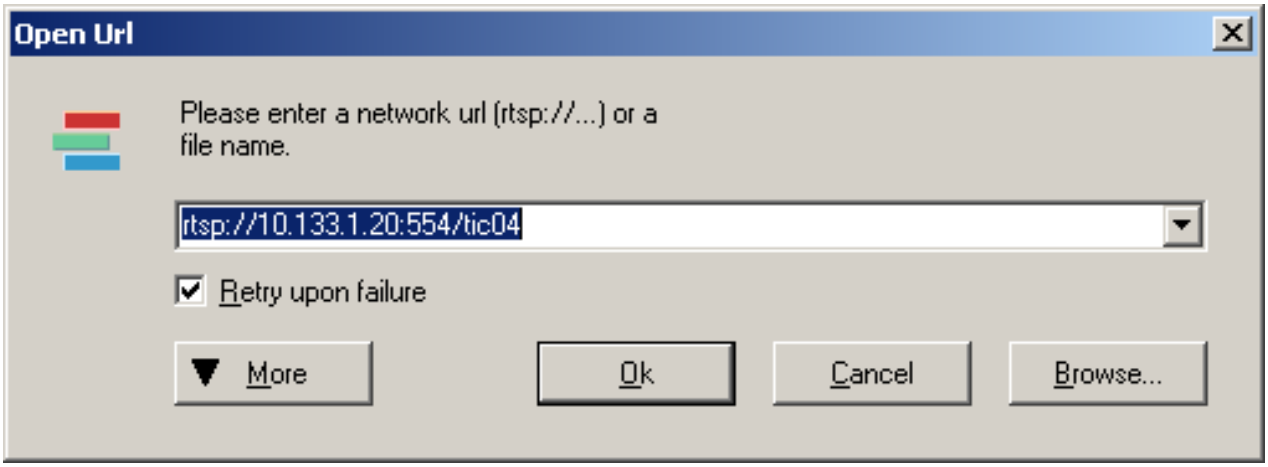
- Double-click on the '**Ateme Player Icon**' to open Ateme player.

- Select '**File**'.

- Select '**Open URL…**'



- Ensure the '**Retry Upon Failure**' box is ticked. Then select '**Ok**'.



SECTION 4 - Argus®4 Receiver Kit P7030RKT

The Argus®4 receiver kit is a USB wireless network adaptor that allows the transmitted video from the camera to be viewed on a PC/Laptop/Tablet. The receiver kit is supplied with:

- Wireless network adaptor and 1.5 m USB lead
- Installation CD for the adaptor
- Software CD containing video player DAS762581AA
- User Guide (this booklet) DAS762156AA
- Manufacturer's user guide and warranty

This accessory allows the receiving of the Argus®4 thermal image transmitted over Wi-Fi. The user must have a suitable computer in order to view camera output. This product is offered to be compatible with the instructions and guidance given for the other video accessories and the model selected has been tested with the camera to ensure that the expected range performance is obtained.

Note that the exact equipment supplied may vary from these pictures due to product evolution in the IT market.

INSTALLATION

These instructions show how to set up a simple camera to computer link. For more complex arrangements, see section 9 and the FAQ.

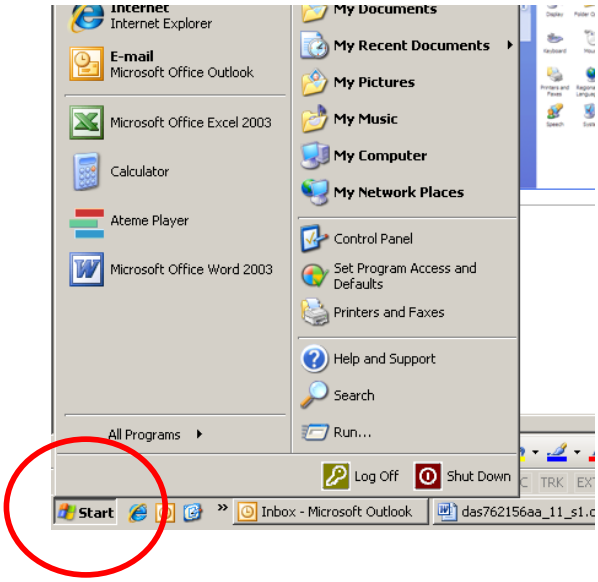
It is recommended that the system be set up on a desk and some familiarity is gained before making a permanent installation and using operationally.

The first step is to install the network adaptor on the PC/laptop/tablet PC and configure the resultant connection set up to work in ad-hoc mode. For computers using Windows XP (SP2+), Vista and Windows 7 operating systems, wireless networking is supported directly and this is the recommended route and is shown below.

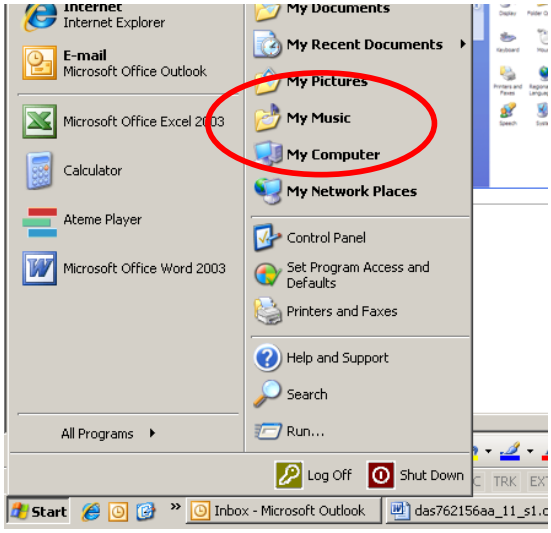
The installation procedure may require administration rights on the computer used, depending upon the individual policies applied to it.

Turn on the computer and insert the CD provided.

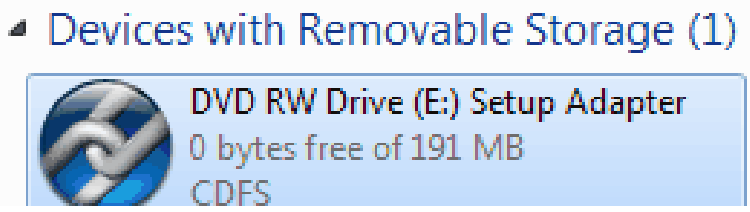
Go to the '**start**' menu on the computer.



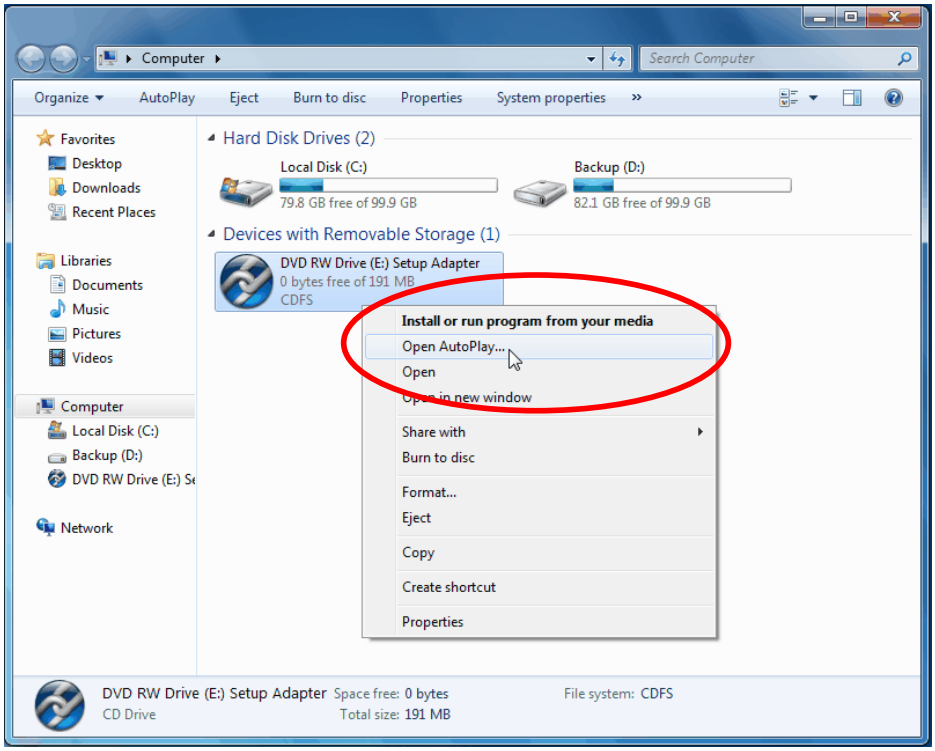
Go to '**My Computer'**



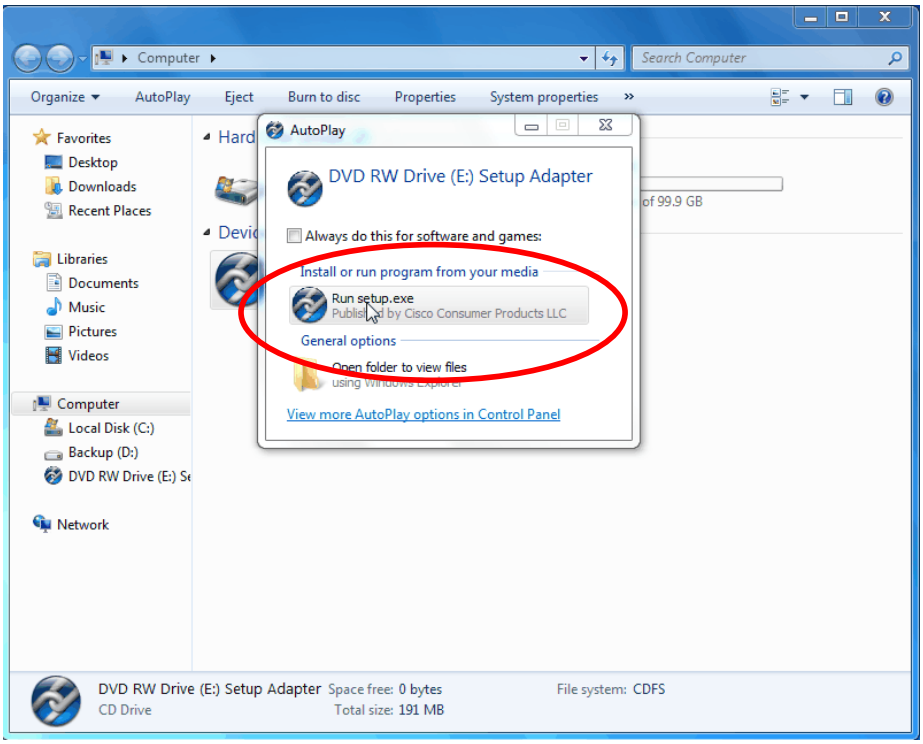
Right click on '**DVD RW Drive (E:) Setup Adapter**'



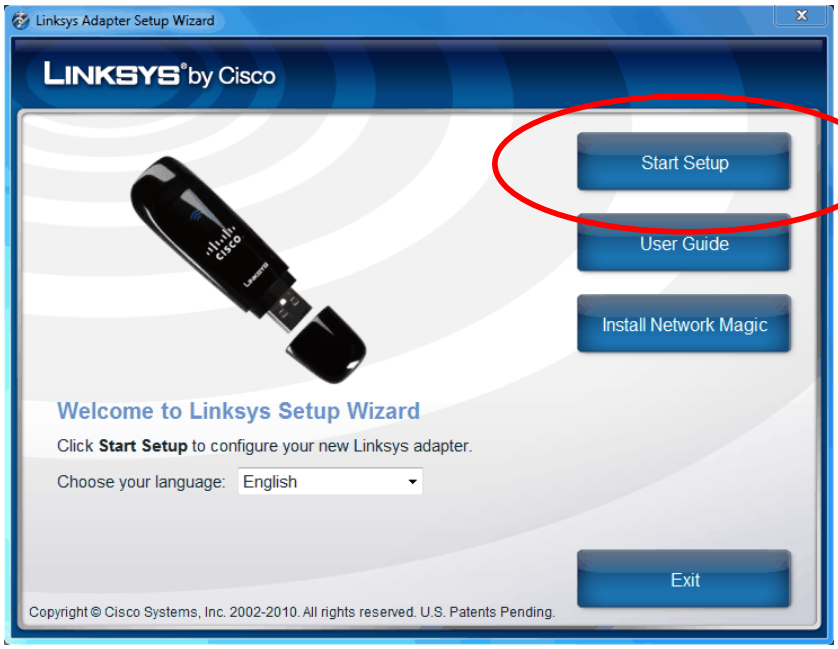
Select '**Open AutoPlay…**'



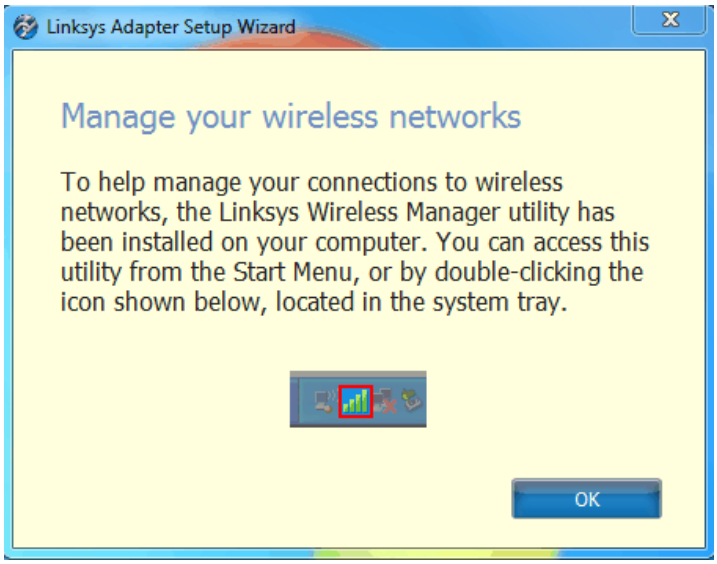
Select '**Run setup.exe**'



This menu will appear. Select '**Start Setup**'. And then continue to follow the on-screen guidance until set-up is completed.



This icon will appear when setup is completed.



The computer network settings now need to be adjusted.

Open the ‘Network connections’ of the computer either from:

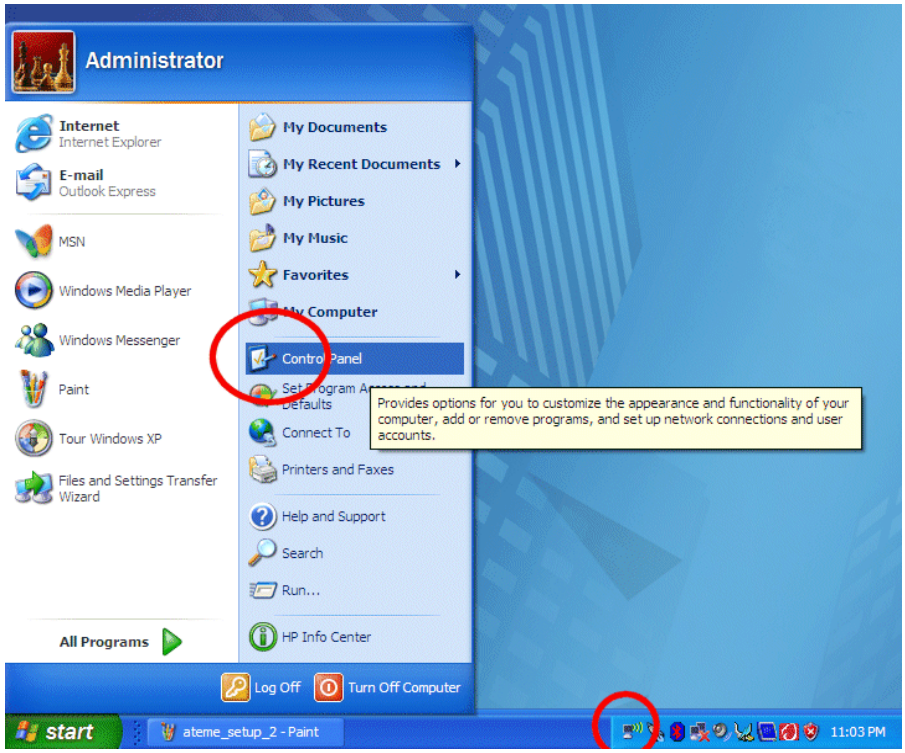
The system tray icon

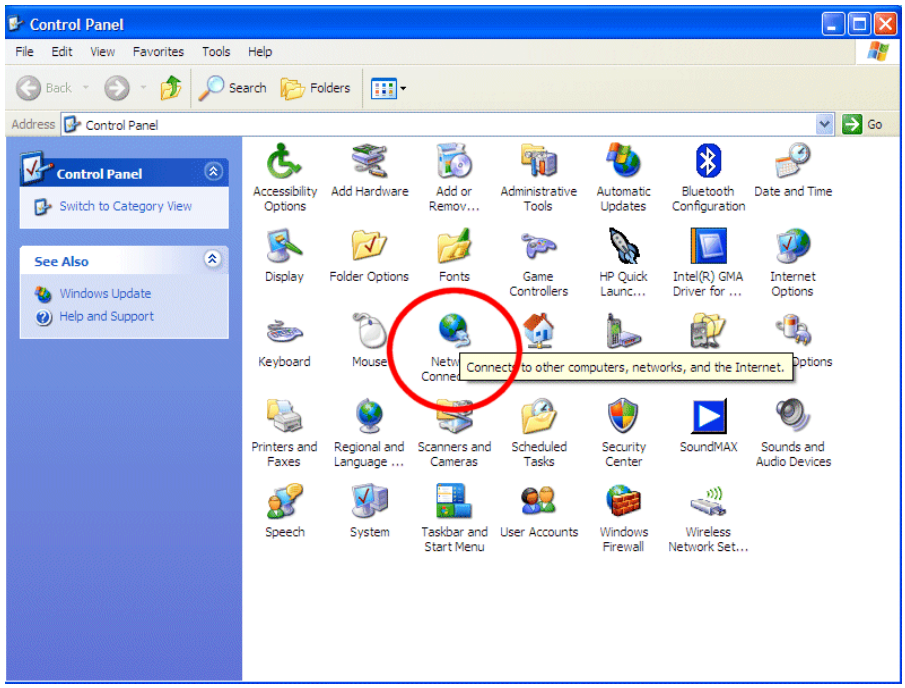
Or

Start/Control Panel/Network Connections

Or

Start/Settings/Network Connections

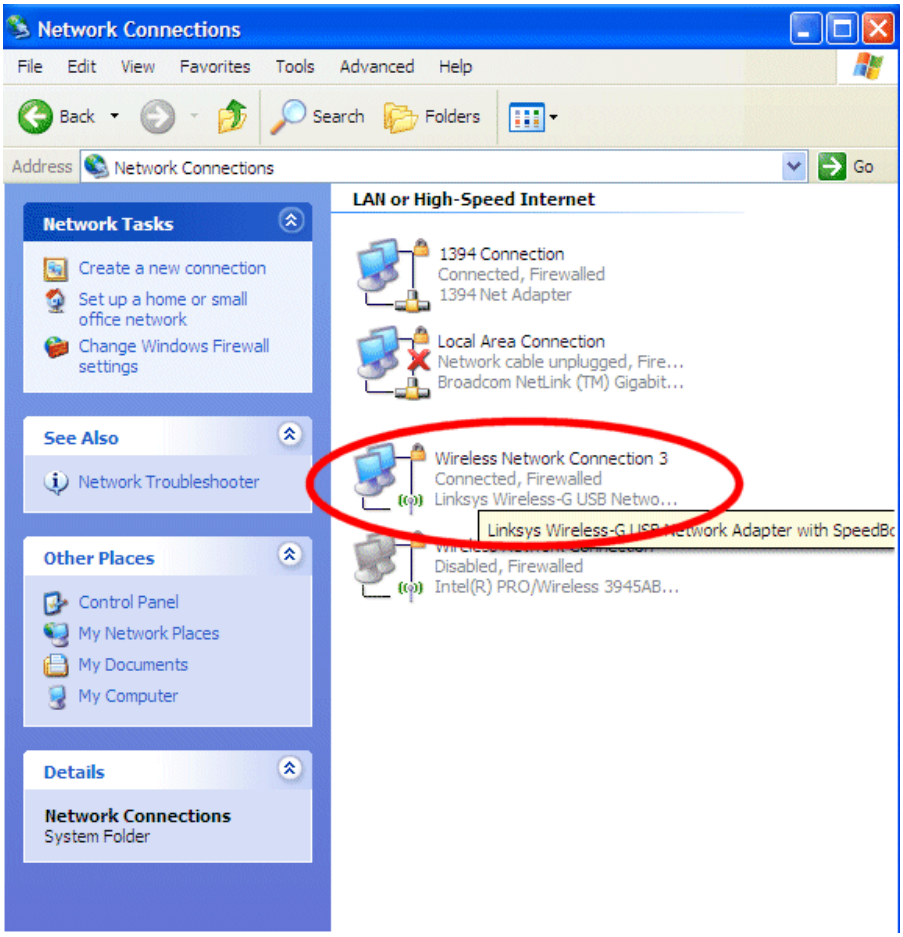




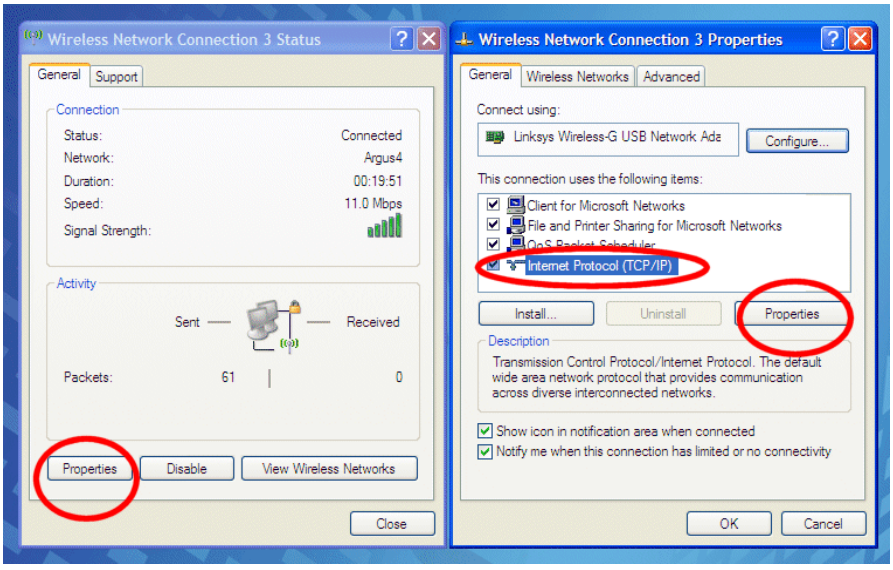
Pick the new wireless connection.

Which other connections are present will depend upon the computer specification.

In the example shown opposite, there is a firewall port, a wired network socket and also an internal wireless network port.



Select properties and the TCP/IP properties.



On the General tab click on “Use the following IP Address”.

To ensure that a simple system will avoid address clashes, generate the computer address using the method below.

Use the transmitter serial number as the last two numbers in the address.

e.g. for transmitter serial number 20.017, use 10.133.20.17 as the computer address.

Enter the IP address selected for the computer in the IP address boxes, 10.133.20.17 in this example.

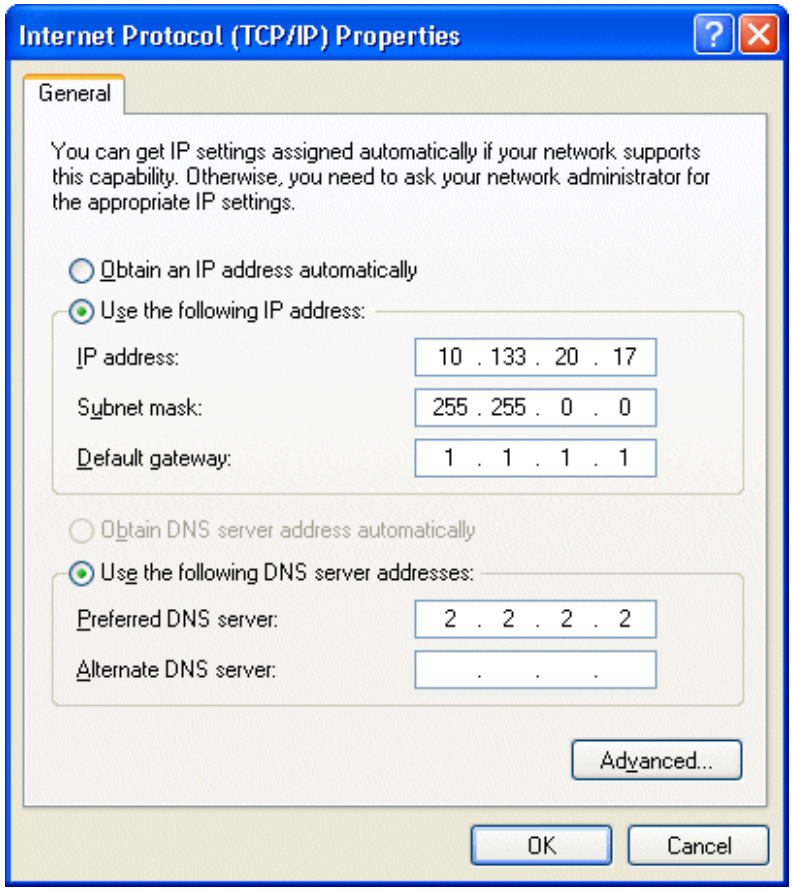
Click in the Subnet mask box and enter 255.255.0.0.

Enter 1.1.1.1 as the Default gateway and enter 2.2.2.2 as the preferred DNS server. These are dummy values for this simple connection.

The window should now be populated as shown opposite.

Then click OK, followed by OK again.

See FAQ 23 for more detail on the IP address structure.



Secure the wireless network adaptor in a suitable position for day-to-day use. If it is to be used as a walk-about hand-held, this will generally be to the computer, while for a fixed installation the location should be considered carefully to obtain the best reception. For example, in a vehicle, it would be better on the windscreen or dashboard away from the metal bodywork. If required, USB extension cables can be obtained from many retail outlets.

This completes the Receiver Kit installation.

A suitable player should be installed at this point if it is not already on the chosen PC/laptop. The Ateme Player supplied on the CD is recommended and the configuration of this player is covered in section 8.

INSTRUCTIONS FOR USE

Day-to-day operation is now similar to the receiver station described in section 2.

USE WITH ACCESS POINT SOFTWARE

As noted above when used with Win2000, and optionally with newer operating systems, the wireless adaptor can be run using the manufacturers' own software. Operation is essentially similar in that the camera transmitter is detected in a survey screen and a connection is then made to it.

The installation will be described in the documentation included with the access point.

An example of using Linksys software with a Linksys access point is shown below.

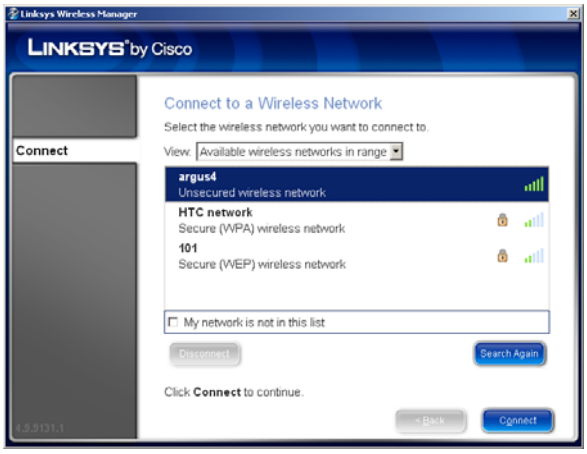
In some cases manufacturer software has been noted as more likely to attempt connection to similar devices on a different network. It is therefore recommended to use the built-in Windows software if possible.

Run the survey to see the available networks either from a shortcut provided by the software or from a system tray icon.

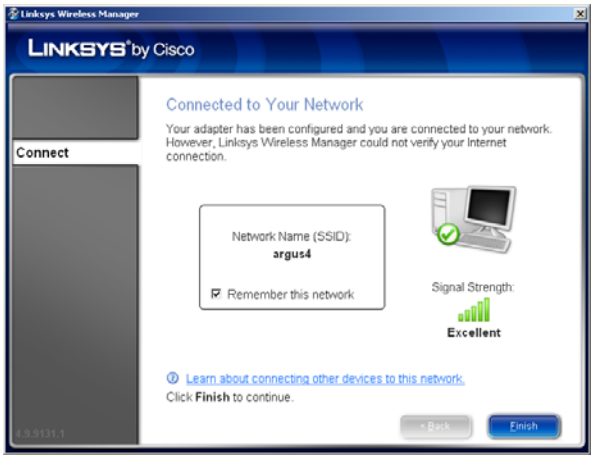
In the screen shown opposite argus4 is shown as one of the networks available.

Select the Argus4 network and press connect.

The wireless network adaptor will now connect to the Argus4 network and camera video is now available to the player.



Once connected, the following screen will appear showing connection information.



SECTION 5 - Argus®4 External Power and Video Adaptor P7030EPVA

This accessory allows an Argus®4 camera to be powered from an external DC power source and for the video from it to be viewed on a computer over a wired network connection, or on a video monitor using a BNC lead.

The External Power & Video Adaptor consists of the following items:

EPVA Battery Replacement Unit	DAS761758AA
EPVA Cable	DAS762180AA
EPVA Junction Box	DAS762179AA
Software CD	DAS762581AA
User Guide (this booklet)	DAS762156AA

Description

The battery replacement unit plugs into the camera in place of the normal battery is connected to the junction box via a rugged cable. The junction box has standard power and network connections allowing the user connections to be placed in a more convenient location.

Power input range is 10 – 30 V, allowing use directly from both 12 V and 24 V vehicle supplies. The connector supplied is a centre-positive vehicle accessory plug of the ‘cigarette lighter’ type. Power may also be obtained from batteries or a suitable mains powered DC supply by feeding 10 to 30V into the unit via this lead. The camera will turn on whenever power is applied; the camera power switch does not need to be used.

A 1.7 m (5 foot) length of rugged cable is provided to connect to between the camera and the junction box.

The analogue video output socket is on the Battery Replacement Unit and is a 75 Ω BNC connector. Analogue video will only be available when coupled to a suitably equipped camera, it is not present as standard on all cameras.

INSTALLATION

The EPVA requires a DC power source of between 10 and 30 V DC. A vehicle accessory plug is provided (cigarette lighter), or this may be removed for direct connections to be made. Do not connect directly to a mains voltage supply. The supply should be capable of supplying up to 10 W (1 A at 10 V or 300 mA at 30 V). Reverse polarity protection is provided in the EPVA. The circuit protection against reverse polarity and vehicle transients is inside the junction box and direct connection from the cable or into the Battery Replacement Unit should not be attempted.

Note the limitation of use on page 2. The EPVA **must not** be used as a driver vision device for example.

Analogue video will only be available when coupled to a suitably equipped camera, it is not present as standard on all cameras.
Models P7030, P7030-LITE, P7009, P7130, P7225/D and P7250/D do not have analogue video output capability.

Model P7030-LITE does not have any video output facility.

If in doubt please contact your distributor or e2v for advice on use with the cameras that you own.

Mount a camera as required. A standard tripod thread is fitted in the base of an Argus® 4 for this purpose. There is also a mounting bracket accessory available as P7030MB.

Connection to the camera is by fitting the Battery Replacement Unit in place of the standard battery on the camera. Use the 1.7 m lead to place the junction box in a more convenient or protected location.

The junction box network connector is a Woodhead RJ-Lnxx rugged industrial network socket allowing the use of industrial or standard network leads. The socket has been wired with a network crossover inside the unit. A standard network lead will allow connection directly to a computer, while most routers will automatically sense polarity and still connect correctly. Full contact area sealing is only maintained with the use of the matching RJ-Lnxx plug.

Where the EPVA is used solely to power a camera or for analogue output, the sealing cap should be secured in place on the network socket.

The analogue video output is direct from the Battery Replacement Unit and should use a 75 Ω cable suitable for the location (e.g. high temperature or low smoke).

A computer is required to receive digital video and the configuration options for this are covered in section 9. It is recommended that a computer with a second network device is used for connection to cameras, either as a point-to-point or small router based network, separate to other corporate and internet connectivity.

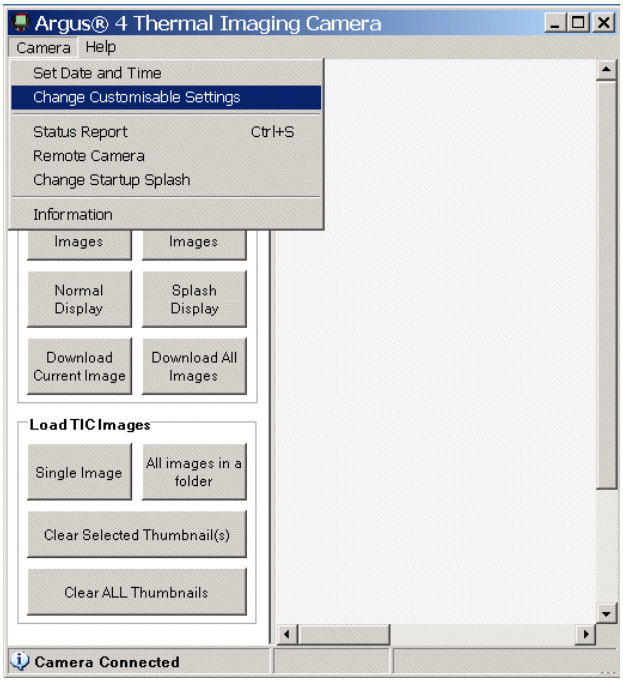
Analogue video is in NTSC 60 Hz format and can be displayed on a standard video monitor or through most modern TV sets by using video inputs. The connector on a television or video recorder is usually an RCA phono socket and coloured yellow and labelled ‘AV in’ or similar. The camera does not connect directly to the antenna socket.

Both the Junction Box and Battery Replacement Unit are sealed. There are no user serviceable parts inside.

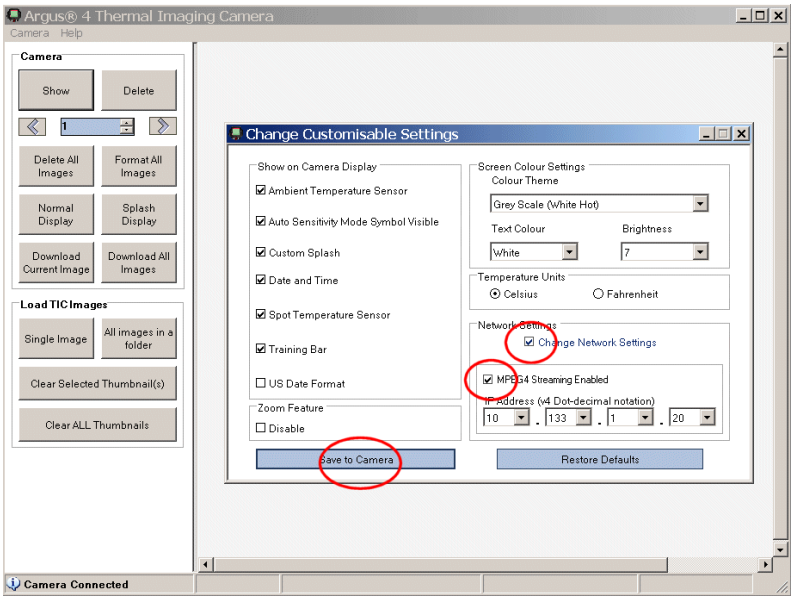
The default setting is for the camera not to send output video when turned on in order to conserve power when in normal battery powered use. It may be found more convenient to set the camera always to turn on with output video sending through setting this mode with the customer software. With the automatic switch on this will give a fully automatic camera feed from just switching the power to the EPVA.

Warning
This is a Class A product. In a domestic or office environment this product may cause radio interference in which case the user may be required to take adequate measures.

To change the camera so that it sends output video from switch-on, connect the camera to a PC that has the customer software installed on it using the USB lead supplied with the camera. Run the software and select Camera – change customisable settings.



Tick the box 'Change Network Settings' and tick the box 'MPEG4 Streaming Enabled'. Click 'Save to Camera'.



INSTRUCTIONS FOR USE

Powering a Camera

Fit the battery substitute unit to the camera as shown below and click into place. Plug the cable into to the junction box and camera.

Plug the DC power lead into a suitable outlet, and switch on if necessary. The camera will now turn on and a picture will be seen on the display. The camera is controlled by the power applied to it; the power switch does not control the camera when it is being powered externally.

Sending Video from a Camera

Video output from the camera must be started either by a long push on the right-hand button or remotely via the customer software. Alternatively, the camera may be set always to turn on with output video sending as described in FAQ 1. When the camera is sending video the 'transmit' icon is shown on the camera, circled in red on the image.

SECTION 6 – Analogue Output Battery Pack P7030AVBP

This accessory allows a suitable Argus® 4 camera to provide an analogue video output signal over a BNC lead to a suitable display device. This is incorporated in a battery pack that provides power for the camera. Connection to the camera is by replacing the standard battery with the unit supplied. There are no user serviceable parts inside.

Analogue video will only be available when coupled to a suitably equipped camera, it is not present as standard on all cameras.

Models P7030, P7030-LITE, P7009, P7130, P7225/D and P7250/D do not have analogue video output capability.

Model P7030-LITE does not have any video output facility.

If in doubt please contact your distributor or e2v for advice on use with the cameras that you own.

INSTRUCTIONS FOR USE

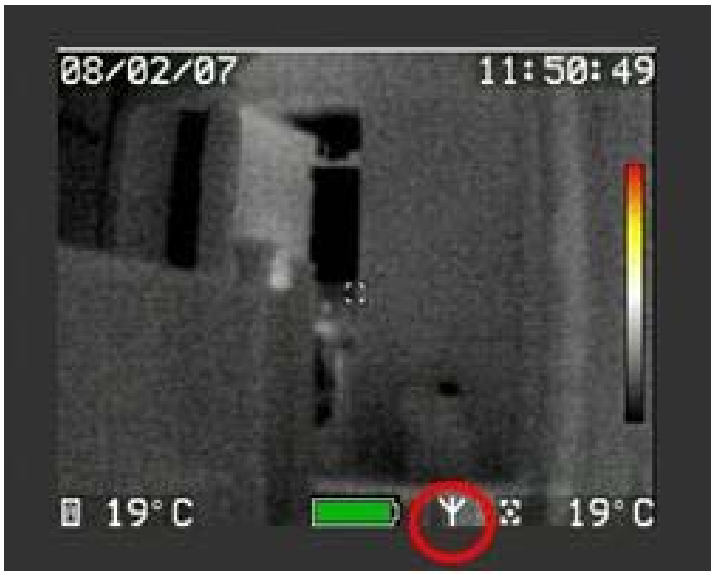
The Analogue Output Battery Pack is similar to a standard battery, and should be charged with the standard camera charger accessories; the mains charger supplied with the camera (P7030BC+CS) or the vehicle charger (P7030TBC). The battery bar display gives the same camera display of the battery state as a standard battery, although run time is slightly reduced when sending video.

When the battery reaches low, as shown below, the video output is automatically turned off to ensure that final runtime beyond the low battery warning is maintained.

To maintain the accuracy of the battery charge indicator, e2v recommends that batteries be occasionally fully discharged in a camera before charging.

Connection to the camera is by fitting the Analogue output Battery Pack in place of the standard battery on the camera.

Video output from the camera must be started either by a long push on the right-hand button or remotely via the customer software. Alternatively, the camera may be set always to turn on with output video sending as described in FAQ 1. When the camera is sending video the 'transmit' icon is shown on the camera, circled in red on the image.



The analogue video signal is in NTSC 60Hz format. This may be displayed on a video monitor or, by using video inputs, on a television or via a video recorder, or into a computer using a TV card. The connector on such devices is usually an RCA phono socket and coloured yellow and labelled 'AV in' or similar. The camera does not connect to the antenna socket.

Note: It is recommended that before each BA team enters the fire, the camera be fitted with a fully charged rechargeable battery.

Disposal of batteries should be in line with local procedures and they should be segregated from domestic waste.

The battery pack will self-discharge at approximately 2% per day. Battery packs that have been stored off-charge for two weeks will run a camera for at least two hours. It is recommended that the rechargeable batteries are placed into storage fully charged and are routinely recharged so as to be ready for use and to maintain performance. Shelf life is maximised by storage between 10 °C and 25 °C (50 °F and 77 °F). Battery packs that become fully exhausted in storage may suffer irreversible damage.

SECTION 7 – Video Capture Battery Pack P7030VC

This accessory allows recording of video from any Argus®4 camera, and the downloading of it to a PC for viewing later. This is incorporated in a battery pack that provides power for the recording device and the camera.

The P7030VC Video Capture Battery Pack consists of the following items:

Video Capture Battery pack	DAS766270AA
Software CD	DAS762581AA
User Guide (this booklet)	DAS762156AA

Connection to the camera is by replacing the standard battery with the unit supplied. There are no user serviceable parts inside.

INSTRUCTIONS FOR USE

The video capture battery pack contains a standard battery and may be charged with the standard camera charger accessories, the mains charger supplied with the camera (P7030BC+CS) and the vehicle charger (P7030TBC). It also contains circuitry to give the same camera display of the battery state as a standard battery, although run time is reduced, giving a typical 3 hours in ambient temperatures whether recording or not.

When the battery reaches low, as shown below, the recording is automatically stopped to ensure that final runtime beyond the low battery warning is maintained and the file is saved correctly.

To maintain the accuracy of the battery charge indicator, e2v recommends that batteries be occasionally fully discharged in a camera before charging.

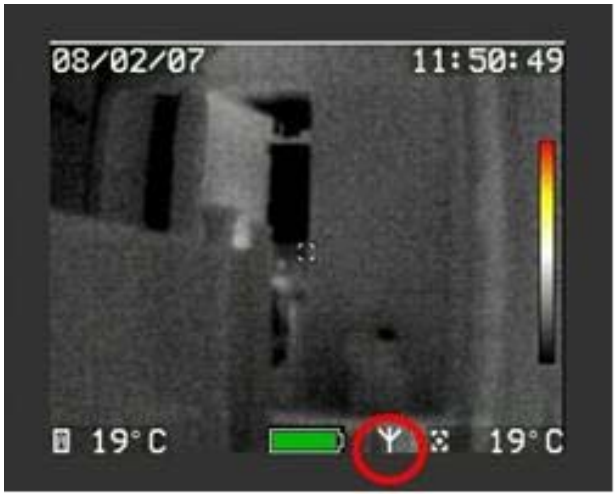
Fit the video capture battery pack to the camera as shown right and click into place.

Switch on the camera with the red button as normal and a picture will be seen on the display.

To initialise the video recording, a long push on the right-hand button is required. The transmit icon will appear on the viewing screen as circled on the image below right.

Once the initialisation process has been completed, after approx 15 seconds, the video capture battery pack will start to record the video.

A further long push on the right-hand button will stop the recording of the video. The transmit icon will disappear. The video capture battery pack will now finish saving the file to its internal memory and shut down the video recording device. This process will take approx 30 seconds and the camera will not turn off during this time.



Do not remove the battery or turn the camera off during the saving process as this will corrupt the recorded file.

Video recording will automatically stop when the battery capacity is nearly empty. This ensures that the recorded file is saved correctly and enables the user to have approximately 10 minutes of camera use before the camera loses power.

The P7030-LITE model does not have a video output facility, and therefore cannot be used to capture video

The default setting for the camera is that it is not saving output video. It is possible to set the camera so that when it is turned on it will commence recording immediately and without user input. See FAQ 1 for instructions on how to do this with the customer software.

Note: It is recommended that before each BA team enters the fire, the camera be fitted with a fully charged rechargeable battery.

Disposal of batteries should be in line with local procedures and they should be segregated from domestic waste.

The battery pack will self-discharge at approximately 2% per day. Battery packs that have been stored off-charge for two weeks will run a camera for at least two hours. It is recommended that the rechargeable batteries are placed into storage fully charged and are routinely recharged so as to be ready for use and to maintain performance. Shelf life is maximised by storage between 10 °C and 25 °C (50 °F and 77 °F). Battery packs that become fully exhausted in storage may suffer irreversible damage.

INSTRUCTIONS FOR PLAYBACK

The files can be played back using the Ateme Player supplied on the enclosed CD; see section 8 of the manual for installation instructions. The files can also be played back on other media players (including Windows Media player) if the correct CODEC for MPEG-4 is present. The CODEC for other media players can be found on the internet.

To play back the saved video, connect the video capture battery pack to a Laptop/PC using the USB Lead supplied with your Argus® camera.

After a short while, the video battery pack should automatically appear on the Laptop/PC as a removable memory device similar to a standard memory stick. The saved video files can now be played directly from the video capture battery pack or copied to the laptop/PC and viewed from the stored location.

Note: The videos stored on the video capture battery packs are a maximum 30 minutes long to keep the size of the files small. When recording these files, there will be no indication to the user that this has occurred. However, any video larger than 30 minutes will be split and would have to be viewed separately. The video filenames will be of the form VSA#####.mp4.

Once the video files have been saved to a Laptop/PC it is recommended that the video files on the video capture battery pack are deleted to ensure full usability of the device.

SECTION 8 – LRT System

The Long Range Telemetry (LRT) video transmission system is an advanced premium system offering exceptional range as well as full quality pictures and higher levels of security than the Wi-Fi system.

This system allows an Argus® 4 camera to transmit video over a digital video link to the receiver and to be viewed on the receiver screen.

The transmitter is incorporated in a battery pack that provides power for both transmitter and camera. Connection to the camera is by replacing the standard battery with the unit supplied. There are no user serviceable parts inside.

The receiver may be purchased as a separate device (DTX1400 or DTX 2400) or in a Remote Receiver Station (DRRS1400 or DRRS2400) in a hard carry case.

This accessory requires a camera with analogue video output. Analogue video is not present as standard on all cameras.

Models P7030, P7030-LITE, P7009, P7130, P7225/D and P7250/D do not have analogue video output capability.

Model P7030-LITE does not have any video output facility.

If in doubt please contact your distributor or e2v for advice on use with the cameras that you own

INSTALLATION

To meet legal requirements, the LRT transmitter is shipped with the RF output turned off, and the transmitter set to a 'nominal' frequency.

THE EQUIPMENT WILL NOT OPERATE AS SHIPPED

Before operating the device, it is the user's responsibility to determine an acceptable frequency and power level and obtain any necessary licences from the appropriate local authorities to operate the transmitter.

The data required for a typical licensing submission is given in the specification section.

The chargers for the LRT system are not certified for use whilst the receiver is switched on.

The frequency, bandwidth and power settings should only be changed by competent persons who have a thorough understanding of the legal implications of the local license conditions for radio transmission.

Transmission with improper settings may be an offence in your location.

The permitted frequency and power should then be set in the transmitter and the transmitter RF enabled. This is performed using the configuration software provided on the CD. Other factory parameters for the transmitter should not be changed. However, if the transmitter is to be used with a pre-installed receiver such as a command vehicle, the transmitter and receiver must be set to matching configurations. A mismatch between transmitter and receiver may cause the system to cease functioning. Consult e2v or the command system provider if setting up a system involving a command vehicle where that system needs priority or to implement higher security settings.

Plug the transmitter into a camera and turn on. Charge if necessary beforehand.

Set the camera to transmit.

Connect the serial lead supplied from the transmitter to the PC serial port or a serial port adaptor.

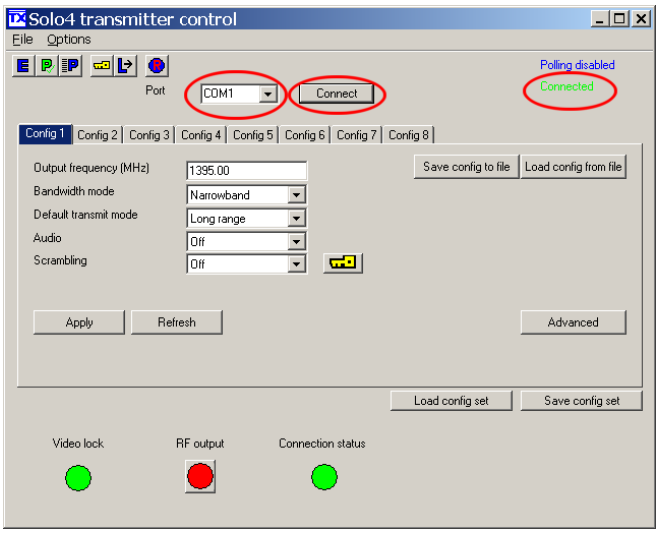
Copy the TX and RX setup programme from the CD to your PC.

Run the TX setup programme.

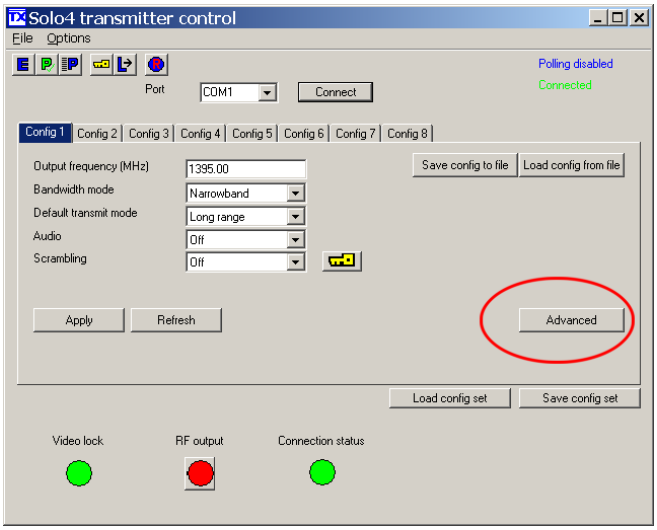
Select the COM port where the transmitter is connected and click on Connect.

The word “Connected” should now turn green, and the Connection status indicator show green.

The boxes will fill with the current settings.



Now click ‘Advanced’



Now set the frequency and adjust the power level if necessary to meet the license conditions granted to you.

1. Enter the output frequency in MHz. This example shows a DTX1400 set to a frequency of 1395 MHz.

The frequency entered is the centre frequency. This must be more than 2 MHz away from any frequency band limits specified in the licence.

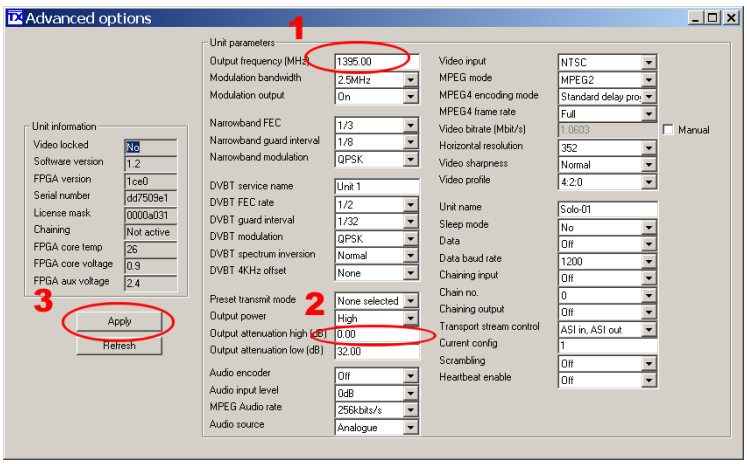
2. Adjust the power level if required. The transmitter is 100 mW output when set to 0 dB attenuation.

For 25 mW set 6 dB attenuation.

For 10 mW set 10 dB attenuation.

3. Click ‘Apply’.

Allow for the antenna gain if setting for a maximum permitted e.i.r.p. level.



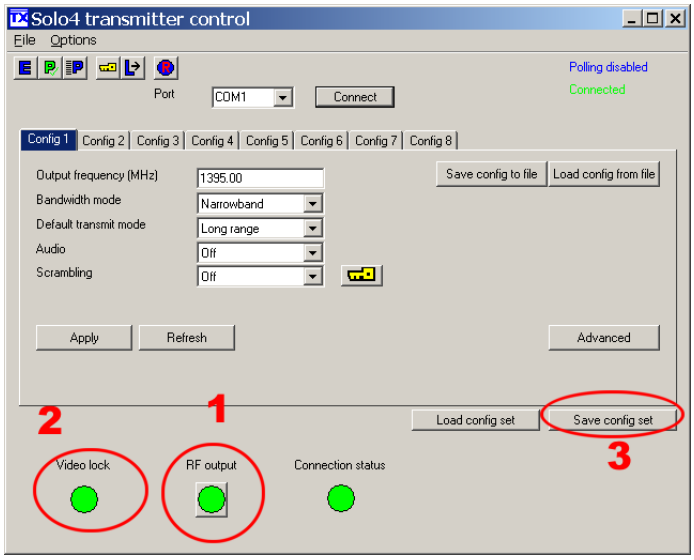
Check that the correct frequency is now shown

1. Click the RF output button to switch on the radio.

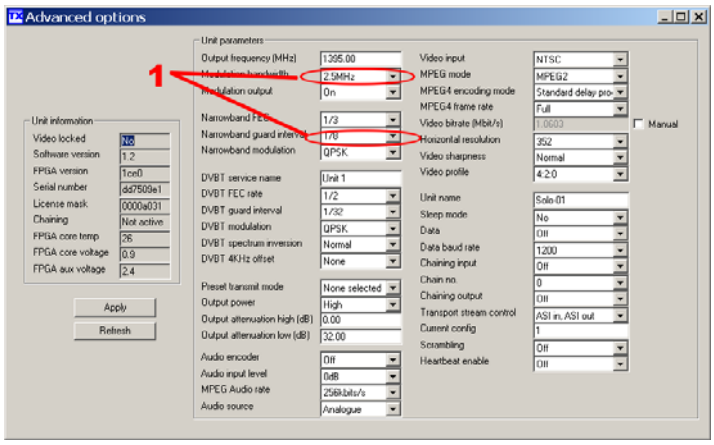
Note the Video lock is green; this means that the camera analogue video is being detected by the transmitter.

If this is red, check that the camera has analogue video output.

3. It is possible to save the configuration to make future set-up easier. This is especially the case if other adjustments have to be made, for instance to suit a command vehicle set-up.



If making advanced adjustments, note that these two settings are not automatically detected at the receiver. If changed, these must also be manually input on the receiver.

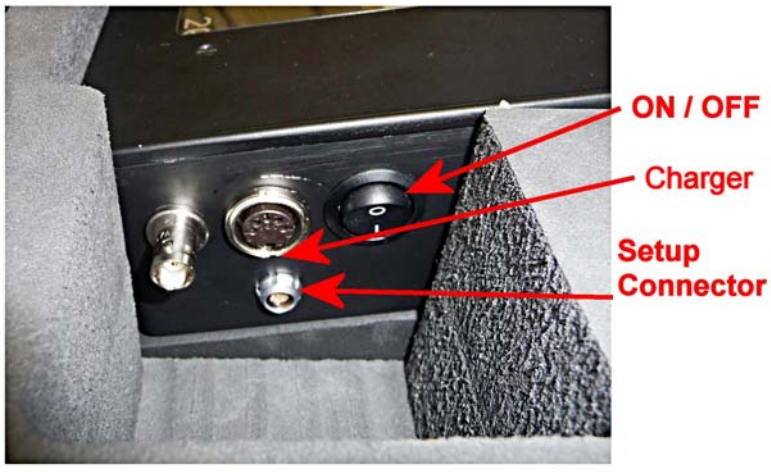


The receiver also requires to be set to the transmitter frequency using the configuration software provided on the CD. Other factory parameters for the receiver should be suitable, but if transmission parameters are adjusted in the transmitter, the receiver will need to be set to match.

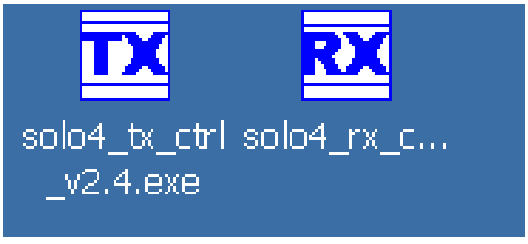
The receiver unit should be charged before use.

Switch the receiver on.

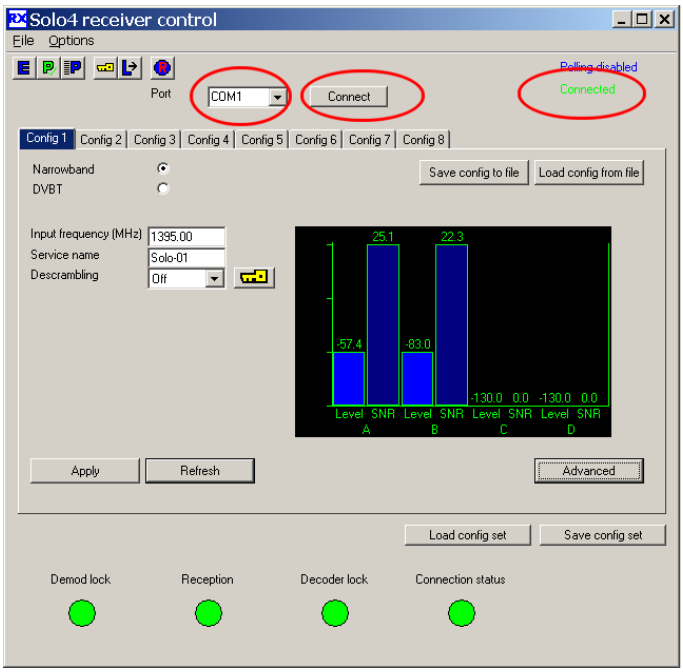
Connect the serial lead supplied from the setup connector to the PC



Run the RX setup programme copied from the CD

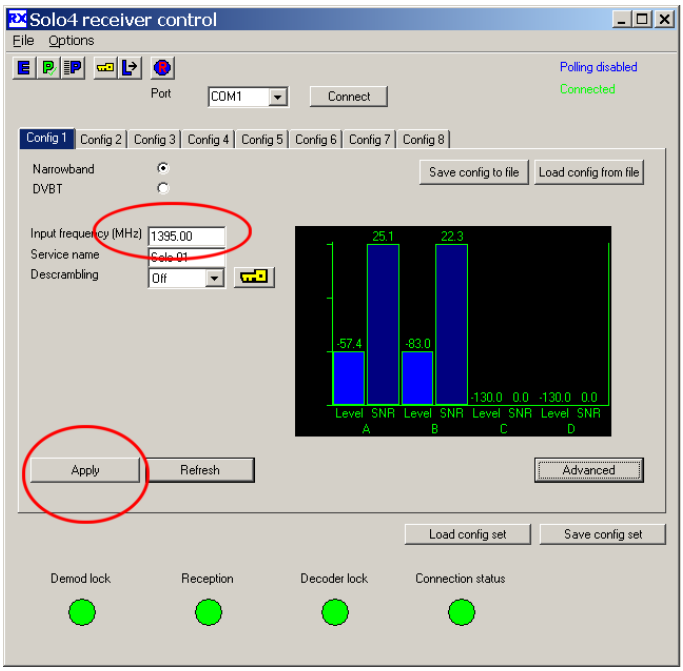


Select the COM port where the transmitter is connected and click on Connect.



The word “Connected” should now turn green.

Enter the frequency of the transmitter.



Click ‘Apply’.

The screenshot shows a typical display when a camera is transmitting nearby. The signal strength and quality from each antenna are shown.

The green indicators show that video is being received and decoded correctly.

It is also possible to set up more than one receive frequency if the location permits more than one transmit frequency this could allow two cameras at once. This is set up in the separate config tabs.

The configuration can be saved to a file for easy application to further receiver units.

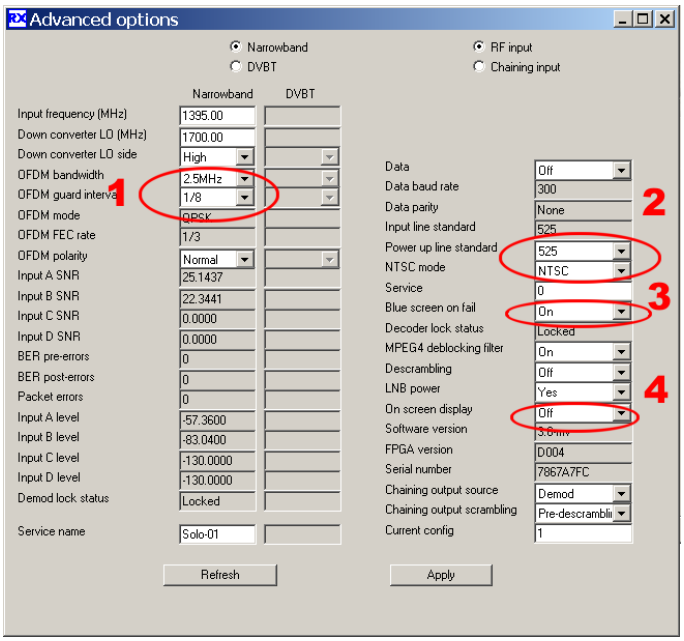
Advanced adjustments should not normally be needed, but the following should be noted:

1. These parameters are not automatically detected in the transmission and have to be set for transmitter and receiver, and must match or the system will not work.

2. Always set for 525 NTSC, this is the camera output

3. If preferred, set the screen to go black when no signal is present.

4. The receiver can be set to display signal strength. This may be of use in setting up a fixed location such as a training centre or observation.



The receiver station is supplied with the two omnidirectional antennae in the lid connected. The receiver station may be removed from the case and the two small rubber aerials used, in the manner of the simple receiver unit.

A performance increase may be obtained if the transmitter is in a known direction. The central antenna in the lid is directional, giving approximately 4 times the signal.

To use this mode, drop the foam from the lid and disconnect one of the outer antennas. Reconnect the lead to the centre connection with the spanner provided.

There is no need to tighten to an extreme, over-tightening may cause damage.

INSTRUCTIONS FOR USE

Camera / Transmitter

The transmitter battery pack contains a standard battery and may be charged with the standard camera charger accessories, the mains charger supplied with the camera (P7030BC+CS) and the vehicle charger (P7030TBC). It contains circuitry to give the same camera display of the battery state as a standard battery, although run time is reduced when transmitting, giving a typical 2 hours in ambient temperatures.

When the battery reaches low, as shown below, the transmitter is automatically turned off to ensure that final runtime beyond the low battery warning is maintained.

To maintain the accuracy of the battery charge indicator, e2v recommends that batteries be occasionally fully discharged in a camera before charging.

Note: A LRT transmitter battery cannot be charged attached to the camera in the vehicle storage mount.

It should also be noted that the battery charger might indicate an error due to high battery temperature following extended use with the transmitter running. Allow the battery to cool before charging.

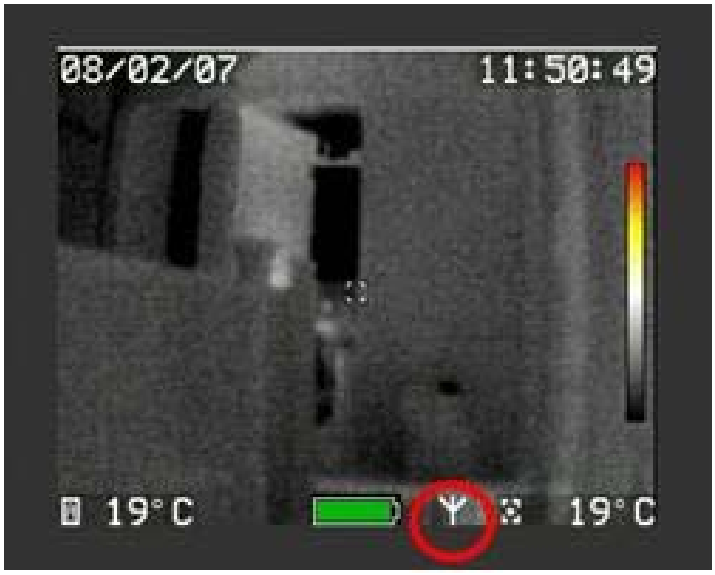
Fit the transmitter unit to the camera as shown below and click into place.

Switch on the camera with the red button as normal and a picture will be seen on the display.

To commence transmitting video, a long push on the right-hand button is required.

When the camera is sending video the ‘transmit’ icon is shown on the camera, circled in red on the image opposite.

A further long push will turn the transmission off. Transmission also ceases when the battery is nearly empty to extend the final few minutes of run time.



The default setting for the camera is that it is not sending output video as this conserves power when in normal battery powered use. It is possible to set the camera to always turn on with output video working by using the customer software or to control this remotely, see FAQ 1.

Note: It is recommended that before each BA team enters the fire, the camera be fitted with a fully charged rechargeable battery.

Disposal of batteries should be in line with local procedures and they should be segregated from domestic waste.

The battery pack will self-discharge at approximately 2% per day. Battery packs that have been stored off-charge for two weeks will run a camera for at least two hours. It is recommended that the rechargeable batteries are placed into storage fully charged and are routinely recharged so as to be ready for use and to maintain performance. Shelf life is maximised by storage between 10 °C and 25 °C (50 °F and 77 °F).

Battery packs that become fully exhausted through extended storage may suffer irreversible damage.

Receiver

The receiver contains a battery pack and is charged using the charger provided. Both AC and DC versions are available.

Do not charge with the standard camera charger accessories.

Do not use this charger to charge camera batteries.

The receiver is switched on with this switch on the side.

The state of charge is indicated by the colour LED.

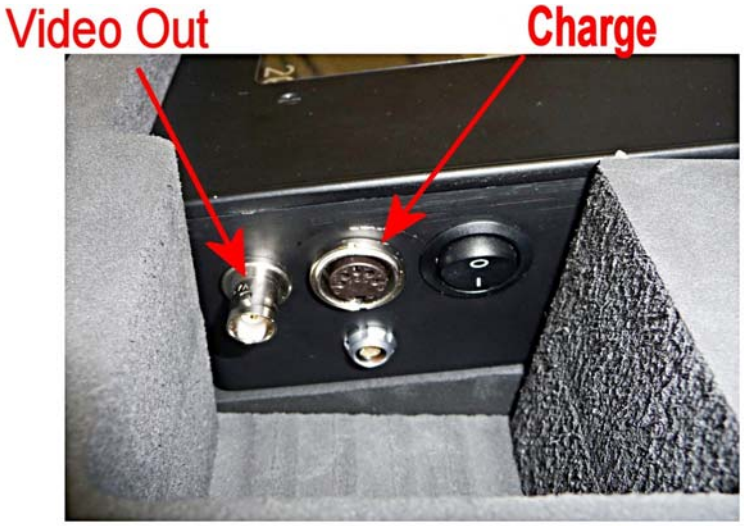
This is normally green, changing to yellow when approximately 1 hour remains and then changing to red approximately 20 minutes before the battery is exhausted.

The receiver is charged through this socket. Only charge using the charger supplied.

The unit must not be switched on whilst being charged.

The video socket allows connection of standard video accessories such as recorders and monitors.

See FAQ 13 and 14 for more details.



SECTION 9 - Ateme Player Installation

Ateme Player Installation

The Ateme player software is supplied to allow viewing of the camera digital video data stream on a PC. The software is pre-installed on the P7030RRS. Installation is only necessary on user-supplied PCs or where a different configuration is desired.

Run setup.exe from the Ateme folder on the CD supplied.

Follow the instructions in the readme.txt file to register the software to remove the logo from the player.

Ateme Player First Use and Set-Up

Once the installation has been successfully completed, double-click on the Ateme icon and run the player.

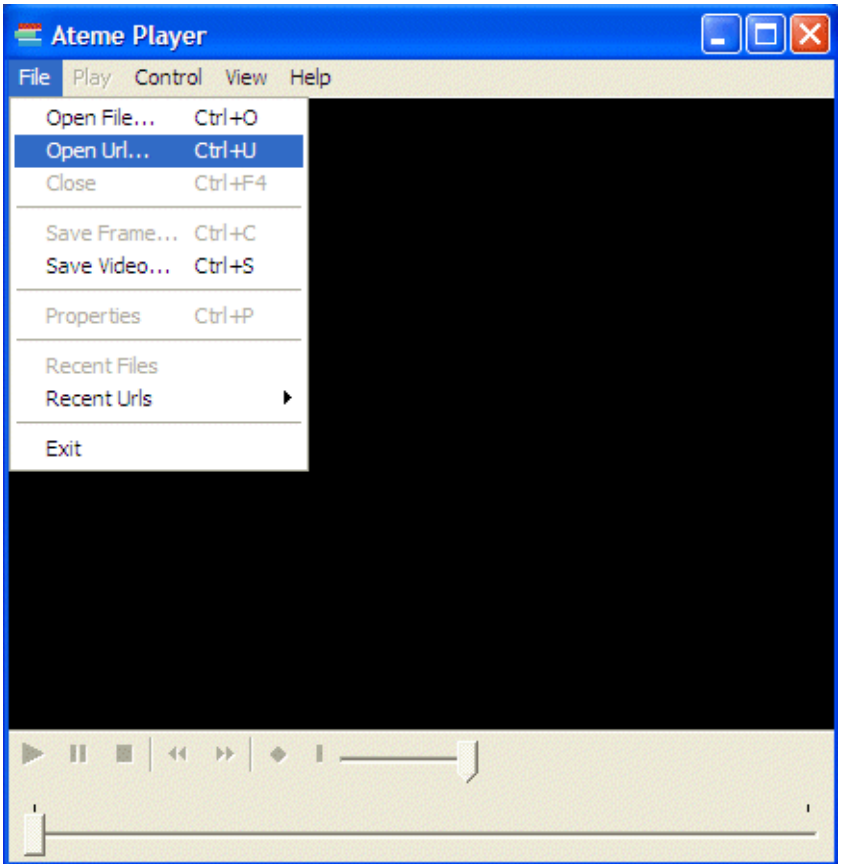
Run Ateme Player either via the icon on the Desktop or from the Start menu.

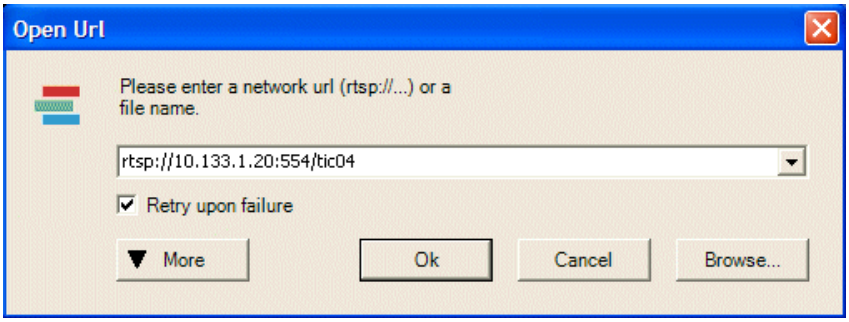
Select 'Open URL' from the File drop down menu and enter rtsp://10.133.1.20:554/tic04 into the dialogue box.

Ensure that the "Retry upon failure" box is ticked and then click OK.

The URL given is for a camera with the default settings. If the camera IP address has been changed for any reason, enter the actual camera address instead of 10.133.1.20

To use the player to play back a recorded file from the video capture battery pack, simply choose 'Open File...' and select the file required.





If a camera is connected by wireless or through a wired connection, video will then appear in the Ateme Player window and start playing automatically.

If no video appears, then study the FAQ section to investigate the problem further.

The desktop icon may be modified to run a given camera address with a single click. Several icons may be created, allowing one for each camera, for example.

1. Right-click the short cut for the ATEME player and select properties.
2. The TARGET box should contain a string like *"C:\Program Files\ATEME\Ateme Player\Ateme Player.exe"*
3. Append the following; *rtsp://nnn.nnn.nnn.nnn:554/tic04 /fullscreen /retry* to the string with an appropriate camera IP address. There is a space between *tic04* and */fullscreen* and between that and */retry*
4. The complete string would be as follows:
"C:\Program Files\ATEME\Ateme Player\Ateme Player.exe" rtsp://10.133.1.20:554/tic04 /fullscreen /retry
for a camera with the default IP address 10.133.1.20
5. Change the setting in the RUN box to *maximized.*
6. Click Apply followed by OK.

Omit ‘fullscreen’ and ‘maximized’ commands if desired.

The Ateme player has several preset video sizes that are selected as shown opposite.

F4 (double size) and ALT+ENTER (full screen) are the most likely to be of use.

It is also possible to drag the window to resize although this is not recommended. It can have unforeseen consequences in creating image artefacts and aspect ratio problems.

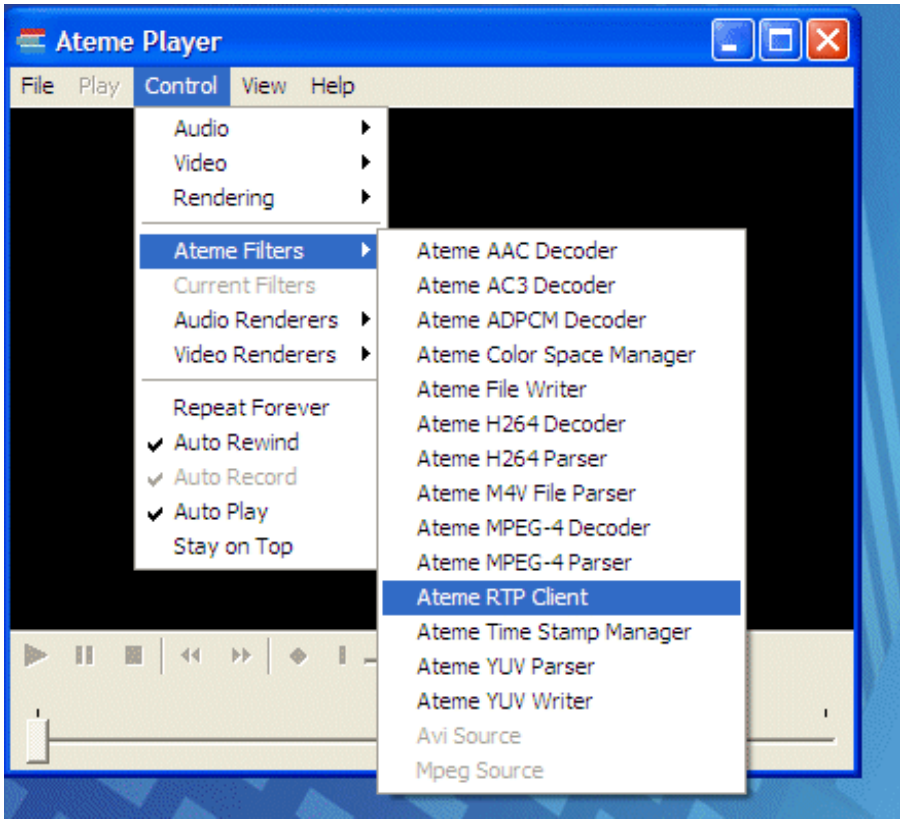
The following optimisations are recommended for the Ateme player:

The screen aspect ratio should be fixed using the method shown opposite.

In the 'Keep Aspect Ratio' options, tick 'Standard (4:3)'.

The delay between the camera image and that displayed should be reduced from the default value.

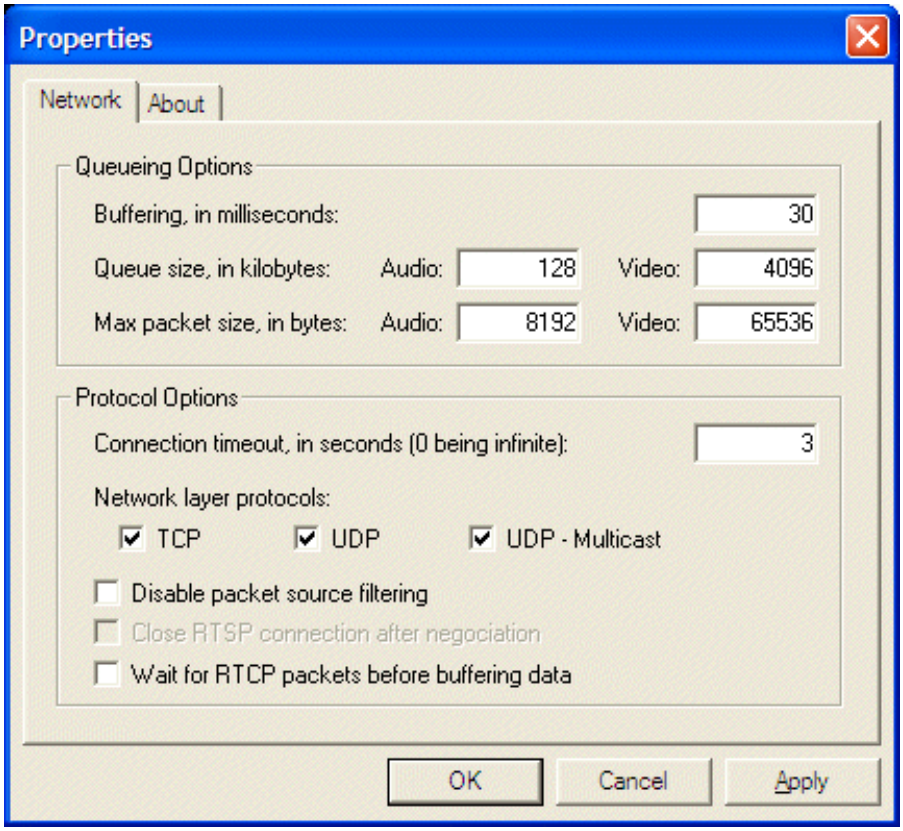
Enter the “Control” drop-down menu in Ateme Player and select ‘Ateme Filters’ and then ‘RTP Client’.



The properties window will then appear.

Set the “Buffering, in milliseconds” value down from the default of 3000 to a much lower figure; it should be set to 30.

Note that a setting of 0 may be found to be unsatisfactory.
Click ‘Apply’ and ‘OK’.



SECTION 10 - Applications and Advanced Use

There are several connection methods available as detailed below, each more suited to certain applications and configurations.

Connecting One Camera to One Computer (Point-to-Point - Wired)

This is applicable to the EPVA. A data connection is established directly between the camera and the network device inside or attached to the computer.

The computer must have either a spare network socket or a USB to network adaptor. If the computer is already networked, a second adaptor or card may be fitted instead of swapping wires and settings.

A suitable streaming video player must also be installed on the computer. e2v have supplied a player by Ateme on the CD, but other players are available. See FAQ 10 for a discussion of the merits of the various alternative players such as Apple Quicktime and VLC.

To make a point-to-point connection, the computer must be set to the same network subnet as the camera. By default, the camera is set to IP address 10.133.1.20, so the computer must be assigned an IP address in the range 10.133.1.x. Typically, this would be 10.133.1.2. These settings have been chosen to avoid any conflicts with the wireless system and should avoid most other network systems in use.

Note that normally the IP address is set to 'Obtain IP address automatically' but this will not work, as there is no automatic address allocation in point-to-point systems. If for any reason a specific computer address is needed, change the camera address instead as detailed in FAQ 24.

Open the network connections window on the computer via:

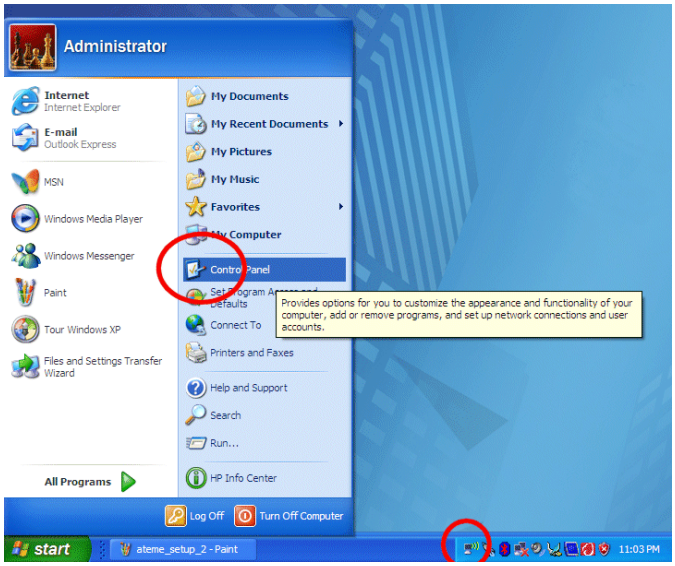
The system tray icon

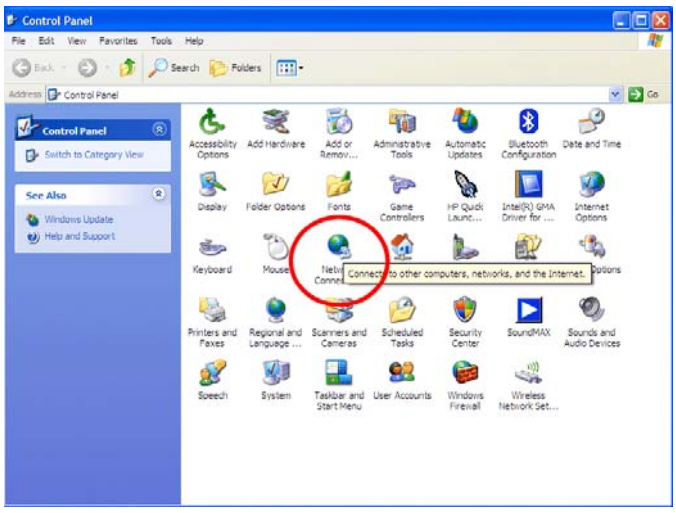
Or

Start/Control Panel/Network Connections

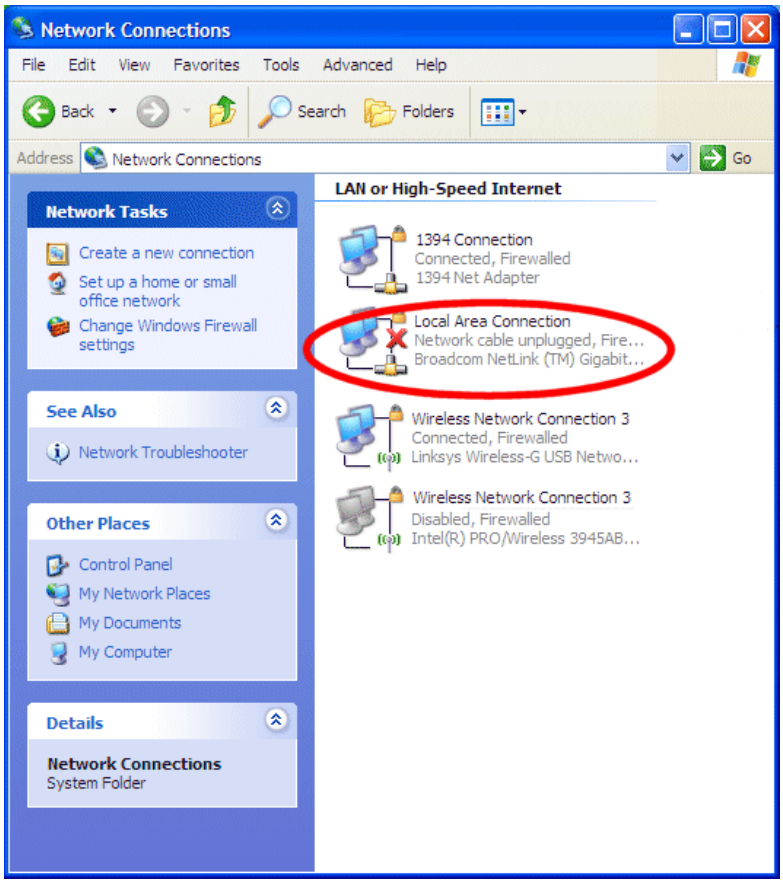
Or

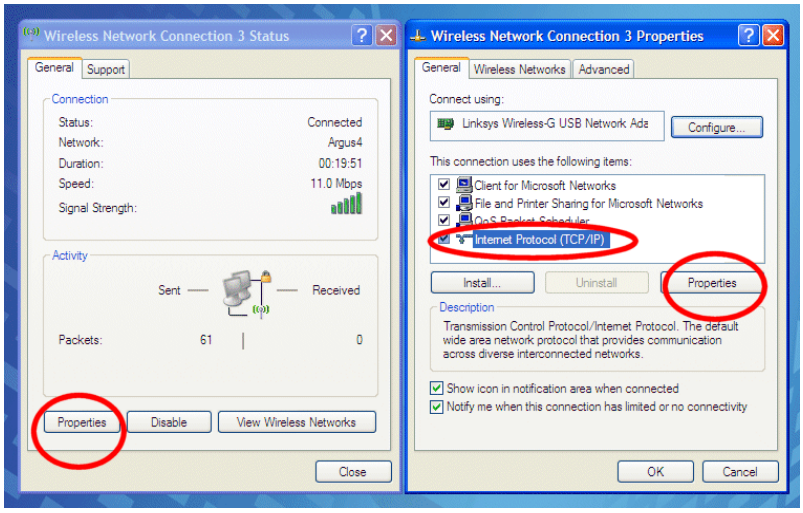
Start/Settings/Network Connections





Select the network connection where the camera is connected, then navigate to the TCP/IP properties window as shown opposite.





On the General tab, click on “Use the following IP Address”.

Enter the IP address of the computer as 10.133.1.2.

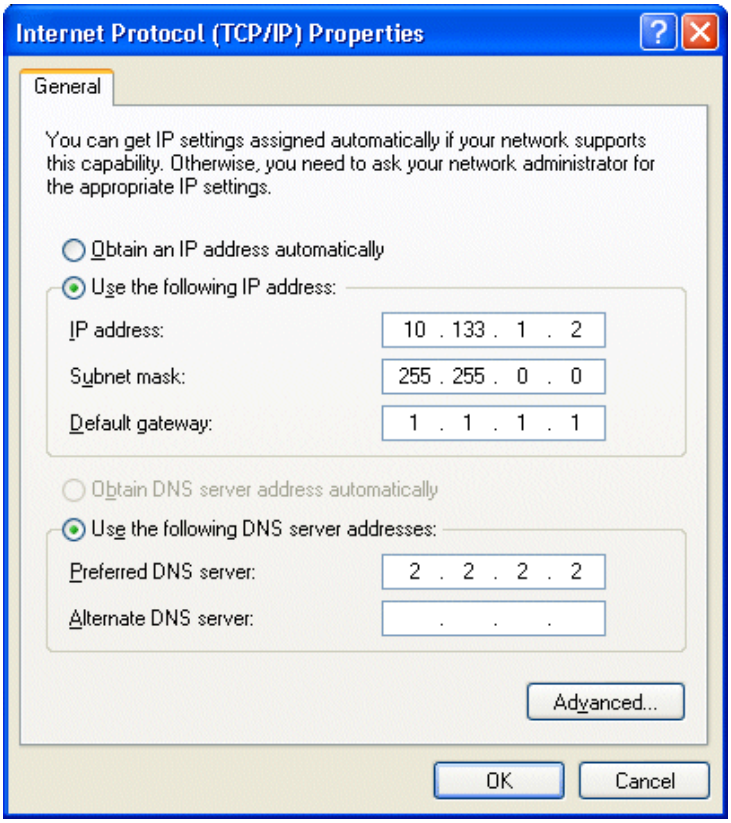
Click in the Subnet mask box, and enter 255.255.0.0.

Enter 1.1.1.1 as the Default gateway Enter 2.2.2.2 as the preferred DNS server.

These are dummy values for this simple connection.

The window should now be populated as shown opposite.

Click OK, followed by OK again.



Connecting Cameras to a Wired Network and Router

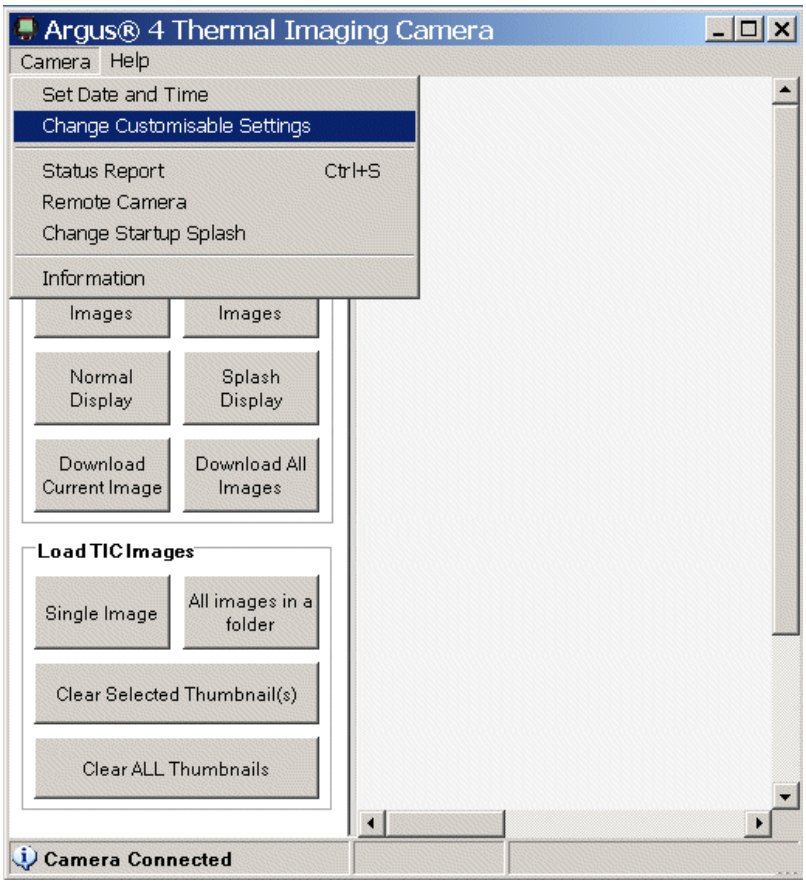
In this configuration the router manages the network of cameras with EPVAs and computers, reducing the PC configuration required. This allows other network functionality to be retained through the router and is also how a camera would be added to a network that already exists. Multiple cameras can be connected and the image(s) viewed can be selected by choosing the desired IP address in the player software. The viewing computer may also be on a wireless link from the router.

The detail of configuration depends primarily upon the selected router and is not within the scope of e2v product support. The information below is general guidance to allow competent users to operate a system in the locally networked configuration.

In this configuration the camera and the network settings of the router must match. It is normally simplest to change the camera IP address to suit the address range of the router, which is typically 192.168.1.x but may vary between manufacturers and local settings. Additionally, make sure that the address chosen for the camera is not in use by any other device on the network.

Connect the camera to a computer with the USB lead and run the customer software.

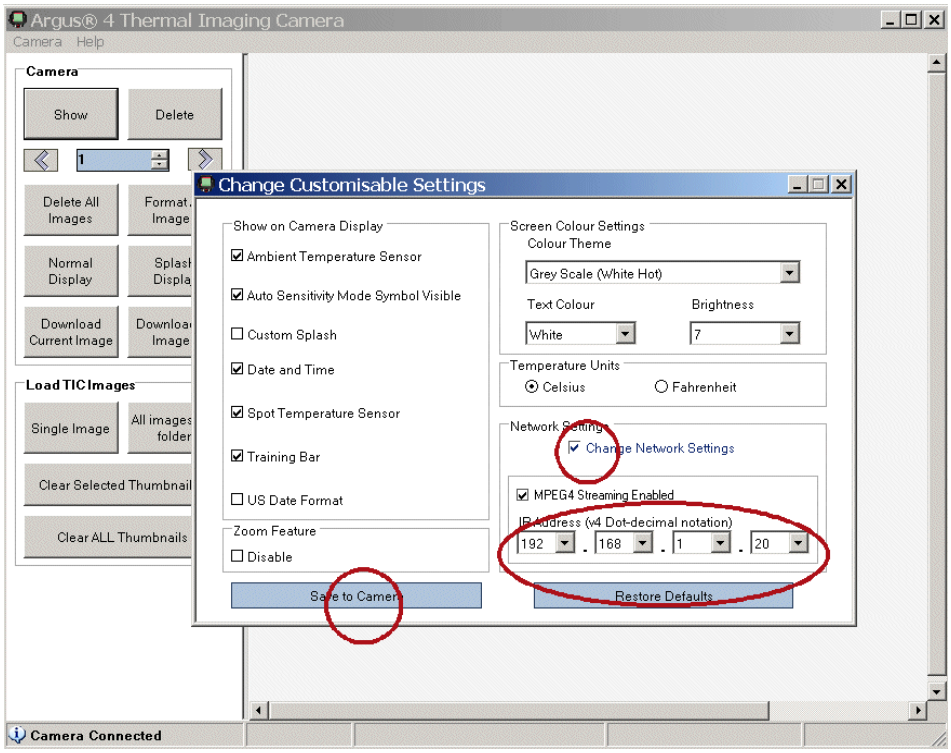
Select the 'Change Customisable Settings' option.



Tick the 'Change Network settings' box.

Enter the desired IP address.

Click 'Save to Camera'.



The camera does not use automatically assigned DHCP IP addresses. It is recommended that the address(es) used for cameras be denied to DHCP address allocation in the router set-up.

Further cameras can be connected as required, but each must be set to a unique IP address in the range used by the router.

A system may also be configured with the router set to use the address range of the cameras (10.133.xxx.xxx), but note that as all cameras are given the same address in the factory at least one will require to be changed to implement a multiple camera configuration.

Connecting to a Computer (Wireless – Point-to-Point)

This is the configuration described for the receiver accessories and is the simplest connection to a camera through the Transmitter battery pack. With all cameras having the same IP address, one transmitter can be swapped between several cameras without further set-up. However, ensure that only one transmitter is in use at any one time. See also FAQ 19 and 20 for advice on using more than one transmitter at a time.

When using with other computers and network adaptors, the configuration depends primarily upon the selected devices and is not within the scope of e2v product support. The information below is general guidance to allow competent users to operate a system in a point-to-point configuration. The process will be similar to that described in section 4 for installing the P7030RKT.

The computer to be used as the receiver must either have a wireless network card fitted or be connected to an external USB network adaptor or similar device. The receiving device chosen should have an external antenna; integral antennae and those used in USB key-fob style network adaptors will give very poor performance.

In all cases establishing a connection follows the same steps:

- The computer must be set for a direct network connection with a fixed IP address in the correct range and suitable subnet masking.
- The camera must be switched on and transmitting.
- Use the PC network setup functions, whether Windows or proprietary to the network adaptor, to perform a ‘network survey’ to find the ‘argus4’ wireless ‘network’ SSID.
- Connect to ‘argus 4’ as an ‘ad-hoc’ connection.

The camera video stream is then available to be played on the computer by playing/opening the url rtsp://xxx.xxx.xxx.xxx:554/tic04 where xxx.xxx.xxx.xxx is the camera IP address. The configuration of the Ateme player is covered in section 6.

It is vital that no clashes of IP addresses exist in the wireless environment, and to understand that some of the devices present may not be under the users’ control. For this reason the address range for the Argus® 4 wireless accessories has been chosen to be different to the normal ranges used by common private systems. To ensure that unique addresses are used within it a numbering scheme of FAQ 23 is suggested whereby device addresses are derived from serial numbers to avoid clashes between Argus® 4 transmission systems. The exception to this is with cameras. Cameras are all supplied with the same address (10.133.1.20) so that one receiver-transmitter pair can be used with several cameras without adjustment. If more than one transmitter is present the camera addresses must be changed as described in FAQ 24.

Connecting to a Computer (Wireless – Networked)

This configuration enables several cameras to operate at once and a combination of wired and wireless cameras to be operated together. Additionally the display computer may also be positioned away from the receiver potentially doubling the range. A router offers some performance benefits in managing the network in a busy wireless environment. It also allows wired camera connections and may allow other networking functionality or internet access for example.

This configuration depends primarily upon the selected devices and is not within the scope of e2v product support. The information below is general guidance to allow competent users to operate a system in the wireless networked configuration.

The adjustment of these settings in the module is different across the various versions of module firmware. Contact e2v for assistance. In some instances familiarity with TELNET access is required as some versions of module do not have a web interface.

Use of a wireless router transfers control of the transmitter frequencies to the router. **Do not** attempt this mode of operation unless certain that the system will be legal at all times by using the correct router settings. The transmitter is under 100 mW 20 dBm effective output power.

Operation on channels 9 – 13 (above 2454 MHz) is not permitted outdoors in France.

Check http://www.art-telecom.fr/ for more details.

Là où utilisé dehors, creuser des rigoles seulement 1 – 8 (2400 - 2454 MHz) peuvent être employés.

Visitez http://www.art-telecom.fr/ pour de plus amples détails.

There are two network devices present for each transmitting camera; the camera video output itself and a transmitter control module in the transmitter battery pack. The configuration set for the transmitter control module as shipped from e2v is for an ad-hoc (point to point) network using fixed IP addressing.

The settings in the transmitter control module must be changed to work within a router controlled ‘infrastructure’ network. It is also recommended that DHCP address allocation be used for the control module. Additionally the camera(s) and the router must be set to use a compatible IP address range. Note particularly that cameras **do not** use DHCP address allocation. This includes any wired cameras and other devices connected to the same router.

A static address may be set for the control module, but note that this does not set the camera address.

Do not use an address that is the same as any camera, the router, the router DHCP range or any other fixed IP device on the network.

All wireless devices must use the same ‘SSID’ as the router. The SSID is best chosen to reflect the router or network identity itself and not ‘argus4’ to avoid confusion with any point-to-point links in the vicinity.

If encryption or MAC address locking is employed as a security measure, this must also be set at the transmitter control module and the camera MAC address must be permitted access to the network.

The transmitter control module can be reset to a known configuration by applying a magnet to the module adjacent to the antenna as shown.

Hold the magnet in position for 30 seconds while the transmitter is turned on.

The reset state is:

- Connection Ad-Hoc
- Channel 1
- IP address 10.133.220.1
- DHCP No – fixed addresses
- SSID argus4
- Encryption Off

This should be changed to the desired setting as soon as possible to avoid the possibility of two reset transmitters coming within range and disrupting the network due to matching IP addresses.

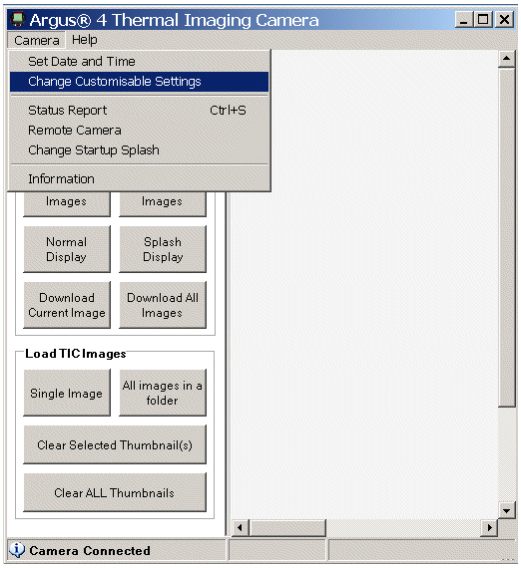
The resetting and adjustment of these settings in the module is different across the various versions of module firmware, please consult the factory for assistance.

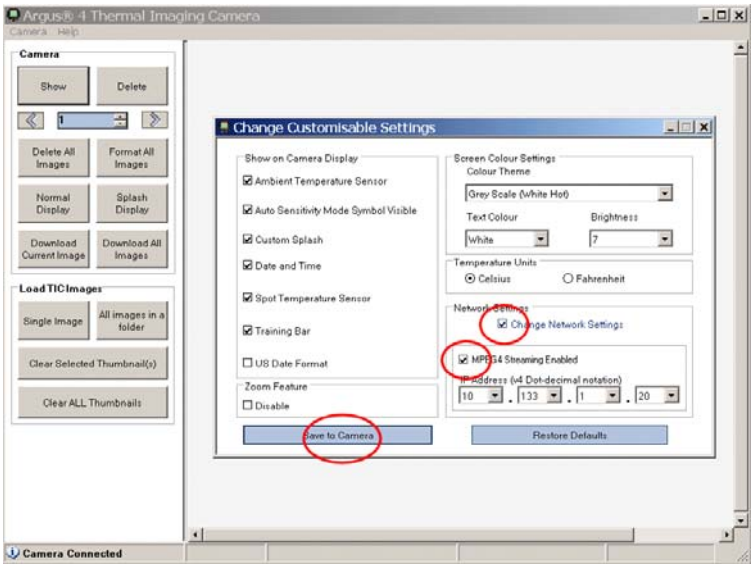
SECTION 11 - FAQ and Troubleshooting

1. Can I make the camera transmit/send/record video all the time?

Yes. To change the camera so that it sends output video from switch-on, connect the camera to a PC that has the customer software installed on it using the USB lead supplied with the camera. Run the software and select Camera – change customisable settings.

Tick the box 'Change Network Settings' and tick the box 'MPEG4 Streaming Enabled'. Click 'Save to Camera'. The analogue output (if fitted), LRT transmitter and video recording battery pack are controlled by the same function.





2. The digital video does not play or has stopped.

Firstly, check all the obvious causes such as switching on, transmitting and plugging in.

Check if the Argus® 4 camera is still sending video either by viewing the antenna icon is visible on the Argus® 4 camera or by using the customer software.

If the icon is not visible, then there is no video transmission from the Argus® 4 camera. Turn the video on either by holding the right grey button (zoom/tx) on the camera for a few seconds or through the control software.

When using the wireless transmitter, it is also possible that the camera has gone out of range. This may be due to obstructions in the radio path, building construction or radio interference as well as simply distance.

The connection to the camera can be tested using the 'ping' command to the camera IP address. See your computer documentation on this function.

Where 'ping' fails, this indicates a network problem that may require specialist knowledge. However, the following is a list of the more common causes:

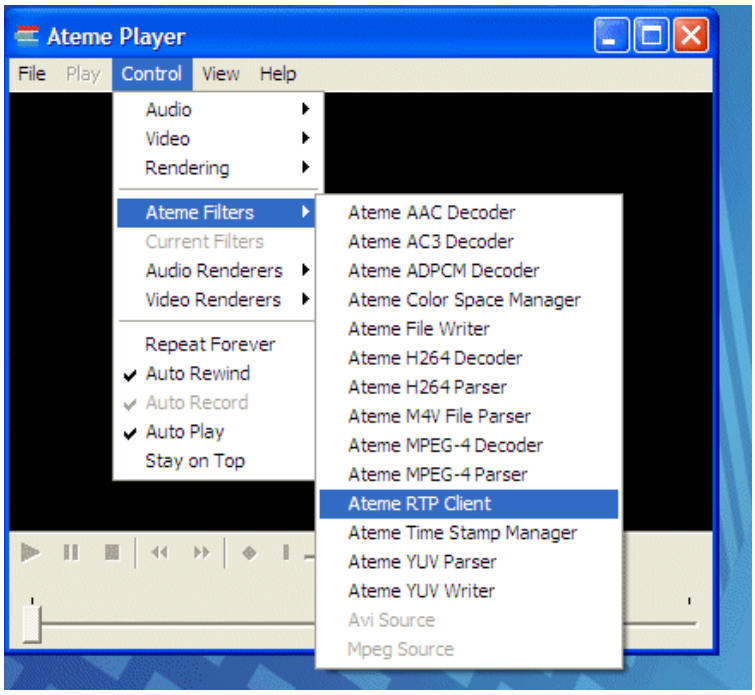
- Interference from devices using the 2.4 GHz frequency, such as cordless phones, microwave ovens or analogue video transmitters.
- The presence of a large number of other Wi-Fi devices.
- Setting the wrong IP address, check the camera address with the customer software.
- Duplicate IP addresses, perhaps where another device is using the fixed address given to the camera.
- Using a crossover cable for a point-to-point network. The necessary network crossover is built into the EPVA junction box.
- A router that does not sense the crossover in the EPVA junction box.
- Another camera or transmitter in range on the same IP address, channel and/or SSID.

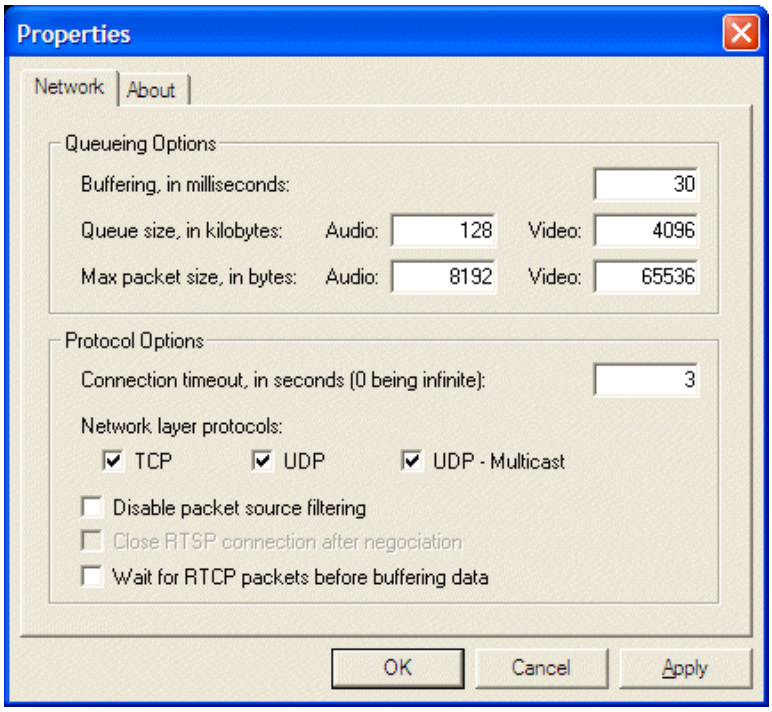
3. There is a delay between the video on my camera and the digital video being displayed on my computer.

If you notice a delay between the video being displayed on the Argus® 4 camera and the video being displayed on the PC, then this is likely to be due to buffering of the video data by the player. This buffering can be reduced in the Ateme player as follows:

Enter the “Control” drop-down menu in Ateme Player and select ‘Ateme Filters’ and then ‘RTP Client’.

The properties window will then appear, and “Buffering, in milliseconds” should be set to 30. Click ‘Apply’ and ‘OK’. A value of 0 is not recommended.





The Ateme player gives by far the best results; similar buffering and delay problems afflict other players but are not so readily or successfully resolved.

4. My video picture has frozen and will not start again.

Firstly, check whether the camera is still transmitting; the power may have disconnected or the user may have turned off transmission. In the case of a wireless system, it is also possible that the camera has not gone out of range or the battery may be flat.

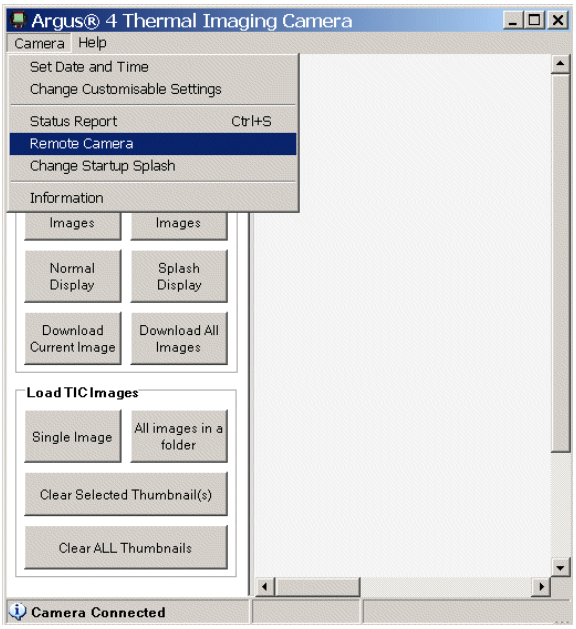
This is most likely due to a break down in communication between the Argus® 4 camera and the computer, particularly in the case of a wireless system.

- Press stop and play on the player.
- Try re-entering the URL as described previously to see if the video streaming restarts.
- Close and restart the player.

With the Ateme player, ensure that the 'retry' option is ticked; this restarts automatically.
Check the system as described under FAQ 2; another wireless device may have been turned on for example.

5. Can I control my camera remotely?

Camera control is performed using a USB link and the customer software. It is not possible to control the camera directly over the network. The control functions are accessed via the 'Remote Camera' interface shown below. The right-hand button is shown split for the dual function of zoom and switching video output transmission. The control of digital zoom, video output and picture capture are available on this interface, while the normal customisable settings such as colour scheme are available as normal.



6. Can I view the camera remotely or via the internet?

This is not currently implemented on the camera. Discuss any special requirements with your distributor or e2v sales office.

This can be achieved to some extent by using a computer to relay the analogue image from an P7030EPVA, P7030AVBP or the analogue output of the P7030DRX using a proprietary TV card or analogue video to network conversion unit. This functionality if often available with command vehicle systems and the camera can be interfaced to these as a video source or directly as a compatible LRT video source.

7. How do I change the size of the video picture on the computer display?

The Ateme player has several preset video sizes selected as shown below left. F4 (double size) and ALT+ENTER (full screen) are the most likely to be of use.

It is also possible to drag the window to resize although this can have unforeseen consequences in artefacts and aspect ratio. The recommended settings are show below.

8. What is the battery indicator showing with the EPVA?

The battery indicator behaves normally when using a Transmitter battery pack or Analogue Output Battery Pack, although runtime is reduced when transmitting.

The battery indicator will always show full when using the EPVA. It is not measuring the vehicle or computer battery.

9. What camera software versions do I need?

There are some compatibility issues with early cameras of type P7030. Other camera types (P7130, P7225 etc) are fully compatible in all software versions except as described with regard to analogue video output.

P7030 with camera software DSP 2.17 and earlier will only work with Apple Quicktime.

P7030 with camera software DSP 2.18 functions correctly but the camera address is set to 192.168.1.20 by default. This may cause problems in locations with high wireless traffic as well as differing from the instructions above.

P7030 with DSP software Versions 3 and above function as described in this guide. This revision also enhances image quality and camera performance.

To work with the video recording battery pack the camera address must be set to 10.133.1.20

Consult your distributor or e2v sales office for these and any further improvements applicable to your Argus®4 camera.

10. Can I use other players?

Any player capable of receiving an rtsp stream should display video from an Argus® 4 camera. e2v recommend and supply the Ateme player as this gives the best overall performance. Other players that may be encountered are:

Microsoft Media Player
This does not work with rtsp streams, either in current version or the apparent derivation 'Quicktime Alternative'. It will play recorded files from the video recording battery pack with a suitable CODEC

Apple QuickTime
A very common installation on computers, but it is a rather heavyweight consumer focused application that can disturb other programmes on the computer. Buffering cannot be reduced and it does not restart; this is particularly an issue with the Wi-Fi transmitter that may come in and out of range.

RealPlayer
A consumer-focused programme which may be felt to be excessive and too invasive for the task. It also requires additional codecs to deal with rtsp.

VideoLAN player VLC
Open source player, some buffering can be removed but not all. Useful for forwarding and recording, VLC also has some very good image adjustment functions not found elsewhere.

M Player
Open source player, some buffering delay can be removed but not all. Useful for forwarding and recording, but it is not totally robust when the input stream is stopped or goes out of reception range. Much lower loading on the computer and so may be preferred on lower specification devices and tablet PCs. There are various user interface builds available such as MPUI. Not all variants support rtsp.

The following player versions have been tested using Win2000, XP-pro and XP-home:

Ateme Player:	2.1.13.2	See user CD
Quicktime:	6 and 7	http://www.apple.com/quicktime/download/win.html
VLC Player:	0.8.4a	http://www.videolan.org/vlc/
MPlayer	1.0-rc1	http://www.mplayerhq.hu
MPlayer UI	1.2-pre2.35	http://mpui.sourceforge.net/

Note that both VLC and MPlayer are 'open-source' players with many variants available.

11. What do I need to view digital video from the P7030EPVA or P7030RKT?

The P7030RRS is a tablet PC fully configured for connection to a camera. However, if it is desired to use a different computer or existing hardware, the following should be suitable:

- A full desktop PC, laptop PC or a Tablet/Portable PC.
- RTSP stream compatible player, such as the ATEME player supplied.
- Suitable operating systems are Windows XP (SP2 preferred), Vista or XP Embedded (Tablets).
- Computers running Windows 2000 are also likely to function correctly although networking set-up will differ from this manual and may not be totally robust.
- Updated Direct X video drivers may be required depending on player software used.

Tablet PCs may struggle to run the more heavyweight players; MPlayer may be preferred in these devices.

12. What do I need to view digital video from the P7030VC?

- A full desktop PC, laptop PC or a Tablet/Portable PC.
- Suitable operating systems are Windows XP (SP2+ preferred), Vista or XP Embedded (Tablets).
- Computers running Windows 2000 and even 98 are also likely to function correctly.
- Updated Direct X video drivers may be required depending on player software used.

Tablet PCs may struggle to run the more heavyweight players; MPlayer may be preferred in these devices.

13. Can I view the camera on a television?

The digital output cannot be viewed on a television. The only way to connect digital video into a television would be by using a 'TV Out' function on a computer.

The analogue video signal from the camera or LRT receiver may be displayed on a television or via a video recorder by using video inputs. The connector on such devices is usually an RCA phono socket and coloured yellow and labelled 'AV in' or similar, or via an adaptor into a SCART socket. The camera does not connect to the antenna socket.

14. How do I record video?

The video recording battery pack allows recording directly from any camera as described in section 7. Alternatively, the various players described above in FAQ 10 have differing levels of recording capability to the computers' memory, hard drive or a network.

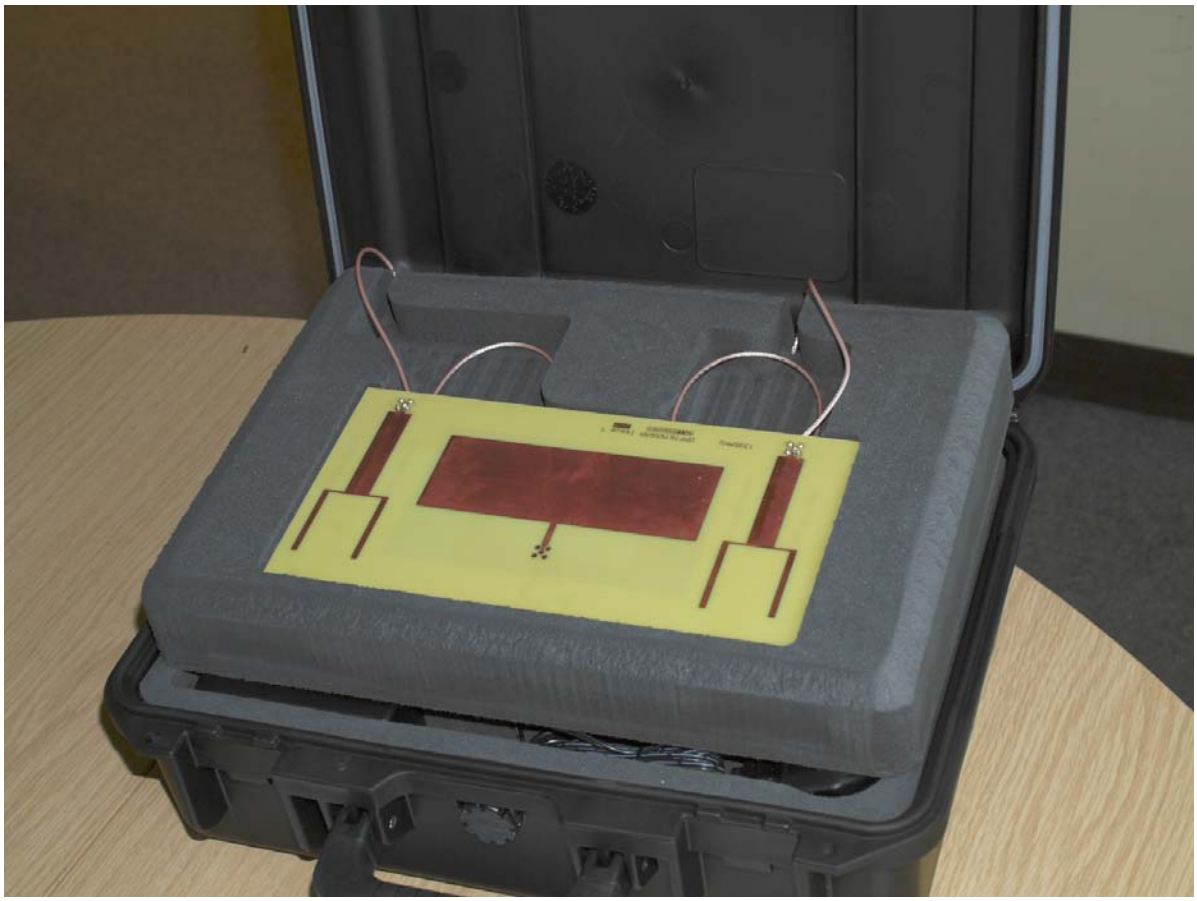
A conventional 'TV' based video recorder can record the analogue video signal from the camera or LRT receiver by using video inputs. The connector on such devices is usually an RCA phono socket and coloured yellow and labelled 'AV in' or similar. The camera does not connect to the antenna socket and the video is NTSC 60 Hz standard.

15. Can I change the antennas on the transmitter?

Changing the transmitter antenna may cause an infringement of regulatory requirements. The transmitter antenna should only be replaced with an equivalent item sourced through your e2v distributor or the factory.

16. Can I change the antennas on the receiver?

Changing the receiver antenna may cause an infringement of regulatory requirements. The receiver antenna should only be replaced with an alternative antenna that has a gain of up to 3 dBi. The LRT receiver allows the use of either the straight antennas or any two of the three in the receiver station lid shown below. Further details are given in section 8 dealing with the LRT system.



17. How do I get the maximum performance from my Wi-Fi system?

The location of the receiver unit or router should be considered carefully to ensure that there is as clear a path as possible to the camera and transmitter. This may involve being outside of a vehicle or selecting an alternative receiving access point, router or network adaptor.

Where a higher power signal is permitted (e.g. USA) and the user is choosing the receiver unit, it is more beneficial to choose a high gain antenna over a higher RF power. Higher power will not improve reception from the camera; using a lower power with a commensurately larger antenna will give better results. If the antenna is directional, this should be pointed towards the camera.

Always check the product documentation to ensure that the resulting system is legal for operation as intended.

Normally little can be done to the transmitter performance or location as this is attached to the camera. As the camera transmissions are standard Wi-Fi, there are a number of ‘extender’ or ‘relay’ product accessories available from the usual Wi-Fi manufacturers and retailers that may be of use. In a known location it may be desirable to change wireless channel to avoid any interference sources, see FAQ 25.

18. What affects the transmitter range?

The Wi-Fi range given in the specification of 300 m is for a clear unobstructed path, for example an open field. Penetration into a building will depend greatly upon the construction of the particular building, with concrete and stone walls being most problematic. The presence of interference may also have the effect of reducing range.

The LRT system offers much greater range and has been tested between a basement and first floor location in an adjacent building.

19. How many cameras can I connect at once?

For the Wi-Fi systems, no more than 3 cameras can be supported on a single wireless channel due to the data rate required. Indeed, 2 may be the practical limit in many situations where other networks are present or reception is poor. A wireless adaptor such as that offered in the P7030RRS and P7030RKT is intended for a single connection, but this is made to the SSID. A connection to the 'argus4' SSID may present 2 or 3 cameras as long as all the IP addresses are different. In this case, the cameras can be chosen by IP address in the player software or several instances of the player software may be run at once, computational power permitting.

Any additional cameras would require a further router or access point using a different radio channel. With only channels 1, 6 and 11 being truly independent, the wireless connection limit is 9 assuming no other significant wireless traffic. A router may be preferred if multiple camera operation is a regular requirement.

The limit in a wired system is the number of network sockets and achieving correct IP address allocation, and of course the computational limits of the display computer. A router-based system will support more than one computer but not to view the same camera.

The LRT system is limited by the number of independent RF channels available, which in turn depends upon the local licensing conditions.

20. How many cameras can I view at once?

The receiver station and similar tablet computers are limited in computational power and may not be able to decode more than one or two pictures at a time.

A modern PC or laptop will generally support 3 pictures at once.

The LRT system is limited by the number of independent RF channels available, which in turn depends upon the local licensing conditions. Each receiver can be switched between any one channel as described in section 8.

21. Are there security issues with Transmitters?

A Wi-Fi connection cannot interfere with the camera, and it is highly unlikely that a successful viewing connection could be made without knowledge of the camera settings in this manual. The computer should be safeguarded in the normal way with good sharing or connection passwords and firewall/anti-virus software. It is also possible to lock to specific SSIDs or MAC addresses, or to employ some encryption depending upon the options offered by the network equipment.

Eavesdropping is much more difficult with this system than with traditional analogue ones. Setting encryption or changing the camera from the factory default IP address will protect the system further. However, there is no guarantee of security with any radio-based system.

The LRT system is significantly more difficult to intercept than Wi-Fi, essentially requiring a matching receiver.

22. Why is my wireless link connecting to another network?

This may occur when there is a stronger signal from another network nearby, or sometimes when a network adaptor finds one of the same brand. This tendency may be reduced by using Windows built-in wireless networking because it favours connection to the most recently-used network. It is also possible to lock to specific SSIDs or MAC addresses depending upon the options offered by the network equipment.

Selection of a different channel as described in FAQ 25 may also help.

23. What IP addresses should be used by the system?

The following IP address allocations are suggested to ensure that all products have a unique address at all times and will therefore avoid conflicts if coming within range of similar products owned by others.

P7030 cameras are all set to 10.133.1.20 as delivered from e2v. This ensures that any camera will appear at the same address to the player, allowing one transmitter to be shared among a number of cameras. This does present a small risk of conflict.

Transmitter control units are set to 10.133.2xx.xxx, where xx.xxx is the serial number. Serial numbers run from 20.001 to 20.254, 21.001 to 21.254 and so on.

Receivers sold as systems are set to 10.133.01x.xxx, where x.xxx is the serial number. Serial numbers run from 0.001 to 0.254, 1.001 to 1.254 and so on.

It is suggested that any other computers used in ad-hoc systems are set to 10.133.0xx.xxx, where xx.xxx is set to match the transmitter in use.

EPVAs do not have an address requirement, they are purely a connection.

A wired only system is best configured using addresses 10.133.1.xxx for the computer with 10.133.1.1 for the router or using the router default address. The subnet mask in this situation may be set to 255.255.255.0

It is strongly recommended that cameras used in multiple camera installations are allocated addresses in the 10.133.1xx.0xx range using their serial numbers. Camera 1234 would be given address 10.133.112.034 by this method. This ensures unique addresses by design.

Note that this scheme requires a subnet mask set to 255.255.0.0 or wider.

10	133	1	1	Router
10	133	1	2 - 19	Computers in router systems or DHCP range for computers.
10	133	1	20	Camera manufacturer's default. Must be used to allow recording with P7030VC
10	133	1	21 - 254	Cameras set up in wired systems.
10	133	10 - 19	1 - 254	Receivers by serial number of receiver.
10	133	20 - 54	1 - 254	User computers set to match transmitters in ad-hoc.
10	133	100 - 199	1 - 99	Cameras reallocated to serial number based IP addresses.
10	133	220	1	Transmitter unit default when reset by magnet.
10	133	220 - 254	2 - 254	Transmitter units by serial number of transmitter.

24. How do I change the camera IP address to suit my network?

This is performed using the customer software through the USB connection to the camera as described in the camera documentation and used for downloading pictures.

Note that the camera does not operate with automatically assigned DHCP IP addresses and that the address selected must not be in use anywhere else on the same subnet for any device. Therefore, in order to have two cameras connected, at least one IP address must be changed.

If using wireless, remember to consider the control module address as well. If any address is duplicated, the system will not work. As indicated in FAQ 23 above, a transmitter serial number 20.017 will have the transmitter control module address set to 10.133.220.17.

The Video Capture Battery Pack will only record from a camera with IP address 10.133.1.20

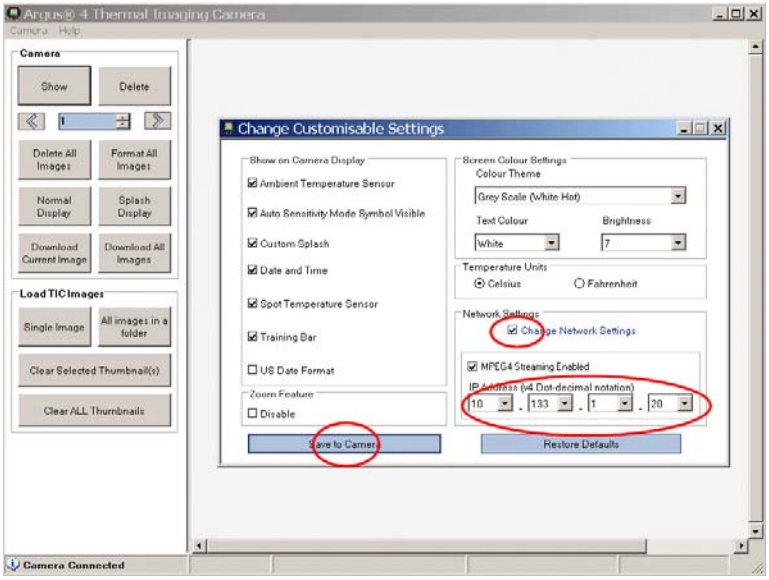
Run the customer software.

Select the 'Change Customisable Settings' option.

Tick the 'Change Network Settings' box.

Enter the desired IP address.

Click 'Save to Camera'.



25. How do I change the Wi-Fi channel or other settings?

This may be of use where there is a known source of interference, for example another Wi-Fi system. Note that, although there are up to 14 channels, several are not permitted in most countries and that only 1, 6 and 11 are independent.

The adjustment of these settings in the module is different across the various versions of module firmware; please consult the factory for assistance. In some instances familiarity with TELNET access is required while other modules are accessible using a web interface.

Do not change channels unless certain that the system will be legal at all times by using the correct router settings.

Operation on channels 9 – 13 (above 2454 MHz) is not permitted outdoors in France.

Check http://www.art-telecom.fr/ for more details.

Là où utilisé dehors, creuser des rigoles seulement 1 – 8 (2400-2454 MHz) peuvent être employés.

Visitez http://www.art-telecom.fr/ pour de plus amples détails.

26. How do I change the LRT channel or other settings?

Do not change power or frequency unless certain that the system will be legal at all times.

The frequency, bandwidth and power settings should only be changed by competent persons who have a thorough understanding of the legal implications of the local license conditions for radio transmission.

Transmission with improper settings may be an offence in your location.

The other settings such as the FEC and guard interval settings have been chosen to give the best range in a difficult environment; they were set while testing a transmitter in a basement being received in the first floor of a nearby building. It should not be necessary to alter these for most uses and a mismatch between transmitter and receiver may cause the system to cease functioning. The only exception would be use with a command vehicle where the transmitter is to be set to suit the system in the vehicle or to implement higher security settings. If in doubt, the installer should contact e2v in this case to determine the best approach.

27. How do I license the LRT transmitter?

Consult your local radio authorities for details of frequencies and permitted powers for your location. Contact details are given in section 15 and 16 or your local distributor may be able to assist. The authorities will need a copy of the DTX RF data from section 12. Using a licensed frequency will generally allow higher power and reduced interference, which will both improve the system performance.

In many countries, low power use is permitted in the 2400 – 2483.5 MHz area without a licence. However this is likely to result in lower performance due to the power restrictions and interference from other licence-exempt uses.

SECTION 12 - Specifications

Wi-Fi Systems

Operating frequency -	2.4 GHz
Data format -	320 x 240 pixel colour camera image at 10 fps MPEG 4 RTSP video stream over port 554 at 600 kb/s
Range -	Up to 350 m (1150 feet) line of sight. Performance in buildings is dependent upon construction. Interference and other transmitting devices may also reduce range.
Transmission standard –	IEE802.11b Data rate approximately 600 kbps

Transmitter P7030TX

Battery Data

Battery type -	Ni-MH Rechargeable
Capacity -	2000 mAH
Battery life -	3 hours @ ambient temp 22 °C (72 °F) transmitting 4 hours @ ambient temp 22 °C (72 °F) not transmitting
Charge time -	2 hours nominal
Recharge cycles -	500 to 80% initial capacity

Mechanical Data

Overall dimensions -	with antenna (H x W x D) -	189 x 126 x 69 mm (7.5 x 5.0 x 2.7 inch)
	without antenna (H x W x D) -	59 x 126 x 69 mm (2.3 x 5.0 x 2.7 inch)
Weight -		380 g (14 oz) nominal

Environmental Data

Operating temperature -	The Transmitter Battery Pack will operate the Argus® 4 in the same rugged environments as the standard battery.
Sealing -	The Transmitter Battery Pack is sealed to IP67.
Storage -	The Transmitter Battery Pack can be stored for short periods but to maintain cell life periodic recharging is recommended. It is recommended that for maximum effective operational life, the storage temperature is kept between –10 °C and +40 °C (14 °F and 104 °F).

Performance Data

Output Power -	EU classification Class 2 100 mW EIRP max.

Receiver Station P7030RRS

The exact device supplied may vary from that shown due to IT product evolution. The following basic requirements will be met:

Connectivity -	USB to network adaptor
Lead length -	1.5m between receiver and antenna location - extendable
Transmission standard -	IEE802.11b

Receiver Kit P7030RKT

The exact device supplied may vary from that shown due to IT product evolution. The following basic requirements will be met:

Connectivity -	USB
Lead length -	1.5 m
Transmission standard -	2.4 GHz

External Power and Video Adaptor P7030EPVA

Electrical

Power	Connector –	Vehicle accessory plug, centre positive
	Input voltage -	10 – 32 V (12 V and 24 V vehicle systems)
	Power consumption -	Typically 5 W with camera operating
Data	Connector -	Woodhead RJ-Lnxx series Compatible with standard RJ45
	Format -	
	Added cable length -	100 m Cat 5E supported to typical router/computer
Video Signal		1 V p - p 75 Ω NTSC 525-line 60 Hz (EIA RS-170)

Mechanical

Overall dimensions	Battery replacement unit (H x W x D) -	60 x 125 x 65mm (2.4 x 5 x 2.5 inch)
	Interconnect cable	1.7 m (67 inches)
	Junction box (H x W x D)	60 x 120 x 80 mm (2.4 x 4.7 x 3.2 inch)
	DC cable -	1.2 m (48 inches)
Weight		690 g (1 pound 8 oz.)

Environmental Data

Thermal conditions -	Maximum operating temperature is 75 °C (165 °F) Minimum operating temperature is –10 °C (14 °F)
Sealing -	Battery Replacement Unit IP67 Junction Box IP54 - only when using approved connectors.
Storage -	The EPVA can be stored for extended periods. It is recommended that for maximum effective operational life, the storage temperature be kept between –10 °C and +40 °C (14 °F and 104 °F) when not in use.

RFI/EMC Emissions	(LAN mode)	72/245/EC (as amended by 2006/28/EC) EN55022:2006 Class A FCC CFR-47 Part 15 Class A ICES-003 Issue 4 AUS/NZ CISPR22:2006
	(Video mode)	72/245/EC (as amended by 2006/28/EC) BS EN 61000-6-3:2007 FCC Part 15B class B AUS/NZ 61000-6-3:2007
RFI/EMC Immunity	(LAN mode)	72/245/EC (as amended by 2006/28/EC) EN55024 A2: 2003
	(Video mode)	72/245/EC (as amended by 2006/28/EC) BS EN 61000-6-2:2005
Safety		IEC 60950-1 and related national standards
Vibration / Shock		BS EN 60721-3-2 Class 2M2.

Warning: Operating in LAN mode this is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Analogue Output Battery Pack P7030AVBP

Battery Data

Battery type -	Ni-MH Rechargeable
Capacity -	2000 mAH
Battery life -	4 hours @ ambient temp 22 °C (72 °F)
Charge time -	2 hours nominal
Recharge cycles -	500 to 80% initial capacity

Video Output

Connector -	BNC 75 Ω
Signal Format -	1 V p - p 75 Ω NTSC 525-line 60 Hz (EIA RS-170)

Mechanical

Overall dimensions	(H x W x D) -	60 x 125 x 65 mm (2.4 x 5 x 2.5 inch)
Weight		315 g (11 oz)

Environmental Data

Operating temperature -	The Analogue Output Battery Pack will operate the Argus® 4 in the same rugged environments as the standard battery.
Sealing -	The Analogue Output Battery Pack is sealed to IP67.
Storage -	The Analogue Output Battery Pack can be stored for short periods but to maintain cell life periodic recharging is recommended. It is recommended that for maximum effective operational life, the storage temperature is kept between –10 °C and +40 °C (14 °F and 104 °F).

RFI/EMC	Emissions	BS EN 61000-6-3:2007 FCC Part 15B class B ICES-003 Issue 4 AUS/NZ 61000-6-3:2007
	Immunity	BS EN 61000-6-2:2005
Safety		IEC 60950-1 and related national standards
Vibration / Shock		BS EN 60721-3-2 Class 2M2.

Video Capture Battery Pack P7030VC

Battery Data

Battery type -	Ni-MH Rechargeable
Capacity -	2000 mAH
Battery life -	3 hours @ ambient temp 22 °C (72 °F) recording 4 hours @ ambient temp 22 °C (72 °F) not recording
Charge time -	2 hours nominal
Recharge cycles -	500 to 80% initial capacity

Data Output

Connector -	Fischer 102 series Use the lead supplied with camera (P7030PC) to convert to a standard USB A plug
Video Format -	MPEG-4 320 x 240 10 Hz

Mechanical

Overall dimensions	(H x W x D) -	60 x 125 x 65 mm (2.4 x 5 x 2.5 inch)
Weight		315 g (11 oz)

Environmental Data

Operating temperature -	The Video Storage Battery Pack will operate the Argus® 4 in the same rugged environments as the standard battery.
Sealing -	The Video Storage Battery Pack is sealed to IP67.
Storage -	The Video Storage Battery Pack can be stored for short periods but to maintain cell life periodic recharging is recommended. It is recommended that for maximum effective operational life, the storage temperature is kept between –10 °C and +40 °C (14 °F and 104 °F).

RFI/EMC	Emissions	BS EN 61000-6-3:2007 FCC Part 15B class B ICES-003 Issue 4 AUS/NZ 61000-6-3:2007
	Immunity	BS EN 61000-6-2:2005 (Recording) EN 55024/A2:2003 (Playback)
Safety		IEC 60950-1 and related national standards
Vibration / Shock		BS EN 60721-3-2 Class 2M2.

LRT Transmitter DTX1400 and DTX2400

Battery Data

Battery type -	Ni-MH Rechargeable
Capacity -	2000 mAH
Battery life -	>75 minutes @ ambient temp 22 °C (72 °F) transmitting 4 hours @ ambient temp 22 °C (72 °F) not transmitting
Charge time -	2 hours nominal
Recharge cycles -	500 to 80% initial capacity

Mechanical Data

Overall dimensions -	with 1400antenna (H x W x D)	189 x 126 x 69 mm (7.5 x 5.0 x 2.7 inch)
	with 2400antenna (H x W x D)	150 x 126 x 69 mm (6.0 x 5.0 x 2.7 inch)
	without antenna (H x W x D) -	59 x 126 x 69 mm (2.3 x 5.0 x 2.7 inch)
Weight -		430 g (15 oz) nominal

Environmental Data

Operating temperature -	The Transmitter will operate the Argus® 4 in the same rugged environments as the standard battery.
Sealing -	The Transmitter is sealed to IP67.
Storage -	The Transmitter can be stored for short periods but to maintain cell life periodic recharging is recommended. It is recommended that for maximum effective operational life, the storage temperature is kept between –10 °C and +40 °C (14 °F and 104 °F).

RF Data

Frequency range L-band	1200 to 1400 MHz
Frequency range S-band	2200 to 2500 MHz
Bandwidth	2.5 MHz
Modulation	QPSK FEC 1/3
ITU designator	2M50D7FEF (ITU radio regulations Article 4 & Appendix 6) If using the 1.25MHz bandwidth the designator is 1M25D7FEF
Duty cycle	100%
Output power	200 mW EIRP max. (100mW with 3dB gain antenna)
Transmitter standards L-band	EN 300 440-2
Transmitter standards S-band	EN 302 064-2 FCC CFR47 Part 90 AS/NZS 4268:2008

RFI/EMC	Emissions	EN 301 489-28
	Immunity	EN 301 489-28
Safety		IEC 60950-1 and related national standards
Vibration / Shock		BS EN 60721-3-2 Class 2M2.

LRT Receiver DRX1400 and DRX2400

Mechanical Data

Overall dimensions -	without antenna (H x W x D) -	189 x 290 x 65 mm (7.5 x 11.5 x 2.4 inch)
Weight -		2 kg (4lb 6 oz) nominal

Environmental Data

Operating temperature -	–10 °C to +50 °C –10 °C to +40 °C battery charging
Sealing -	The Receiver is splash-proof to IP42.
Storage -	The receiver can be stored for short periods. It is recommended that for maximum effective operational life, the storage temperature is kept between –10 °C and +40 °C (14 °F and 104 °F).

RFI/EMC	Emissions	EN 301 489-28
	Immunity	EN 301 489-28
Safety		IEC 60950-1 and related national standards
Vibration / Shock		BS EN 60721-3-2 Class 2M2.

Battery Data

Battery type -	Lithium Ion Rechargeable
Capacity -	5200 mAH
Battery life -	2 hours @ ambient temp 22 °C (72 °F)
Charge time -	3 hours nominal
Recharge cycles -	300 to 70% initial capacity

Charger Data (AC Mains Version)

Input voltage		100 – 240 V nominal 50/60 Hz
Connection		Interchangeable mains plugs supplied
Output	1.5 A	12.6 V
Environmental	Operating temperature	–20 to +40 °C
	Sealing	IP41
Overall dimensions -	(H x W x D) -	70 x 110 x 37 mm (2.5 x 4.2 x 1.4 inch)
Weight -		270 g (10 oz) nominal

Charger Data (DC Version)

Input voltage		10 – 30V nominal
Connection		1.2m / 4 foot DC lead with car accessory plug fitted, 5A fuse
Output	2.3A	12.6 V
Environmental	Operating temperature	–20 to +40 °C
	Sealing	IP41
Overall dimensions -	Excluding wires (H x W x D) -	65 x 110 x 37 mm (2.5 x 4.2 x 1.4 inch)
Weight -		270 g (10 oz) nominal

LRT Receiver Station DRRS1400 and DRRS2400

Mechanical Data

Overall dimensions -	(H x W x D) -	415 x 320 x 165 mm (16.4 x 12.6 x 6.5 inch)
Weight -		5 kg nominal

Environmental Data

Sealing -	The Receiver is splash-proof with the lid open The receiver station is IP67 when closed and locked.
Storage -	The receiver can be stored for short periods. It is recommended that for maximum effective operational life, the storage temperature is kept between –10 °C and +40 °C (14 °F and 104 °F).

Functional data as DRX1400 or DRX2400 respectively.

SECTION 13 - FCC Statement (All products)

NOTE: Unless specified elsewhere described in this user guide this equipment has been tested by verification and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

The P7030EPVA operating in LAN mode is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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 that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

· Reorient or relocate the receiving antenna.

· Increase the separation between the equipment and receiver.

· Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

· Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by e2v technologies (uk) limited could invalid the user's authority to operate the equipment.

INFORMATION FOR CANADIAN USERS (IC NOTICE)

This Class A / B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A/ B est conforme à la norme NMB-003 du Canada.

SECTION 14 - Compliance and Legal Notices (P7030TX Transmitter)

Compliance Information for 2.4 GHz Wireless Products, relevant to the EU and other countries following the EU Directive 1999/5/EC (R&TTE Directive).

The transmitter is a class 2 device.

Declaration of Conformity with Regard to the EU Directive 1999/5/EC (R&TTE Directive)

Български [Bulgarian]	Това оборудване отговаря на съществените изисквания и приложими клаузи на Директива 1999/5/EC.
Česky [Czech]:	Toto zařízení je v souladu se základními požadavky a ostatními odpovídajícími ustanoveními Směrnice 1999/5/EC.
Dansk [Danish]:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 1999/5/EF.
Deutsch [German]:	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.
Eesti [Estonian]:	See seade vastab direktiivi 1999/5/EÜ olulistele nõuetele ja teistele asjakohastele sätetele.
English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]:	Este equipo cumple con los requisitos esenciales asi como con otras disposiciones de la Directiva 1999/5/CE.
Ελληνική [Greek]:	Αυτός ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδεις απαιτήσεις και άλλες σχετικές διατάξεις της Οδηγίας 1999/5/EC.
Français [French]:	Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.
Íslenska [Icelandic]:	Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 1999/5/EC.
Italiano [Italian]:	Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/CE.
Latviski [Latvian]:	Šī iekārta atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]:	Šis įrenginys tenkina 1999/5/EB Direktyvos esminius reikalavimus ir kitas šios direktyvos nuostatas.
Nederlands [Dutch]:	Dit apparaat voldoet aan de essentiele eisen en andere van toepassing zijnde bepalingen van de Richtlijn 1999/5/EC.
Malti [Maltese]:	Dan l-apparat huwa konformi mal-ħtiġiet essenzjali u l-provedimenti l-oħra rilevanti tad-Direttiva 1999/5/EC.
Magyar [Hungarian]:	Ez a készülék teljesíti az alapvető követelményeket és más 1999/5/EK irányelvben meghatározott vonatkozó rendelkezéseket.
Norsk [Norwegian]:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 1999/5/EF.
Polski [Polish]:	Urządzenie jest zgodne z ogólnymi wymaganiami oraz szczególnymi warunkami określonymi Dyrektywą UE: 1999/5/EC.
Português [Portuguese]:	Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.
Română [Romanian]	Acest echipament este in conformitate cu cerintele esentiale si cu alte prevederi relevante ale Directivei 1999/5/EC.
Slovensko [Slovenian]:	Ta naprava je skladna z bistvenimi zahtevami in ostalimi relevantnimi pogoji Direktive 1999/5/EC.
Slovensky [Slovak]:	Toto zariadenie je v zhode so základnými požiadavkami a inými príslušnými nariadeniami direktív: 1999/5/EC.
Suomi [Finnish]:	Tämä laite täyttää direktiivin 1999/5/EY olennaiset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.
Svenska [Swedish]:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

CE Marking

The following standards were applied during the assessment of the product against the requirements of the Directive 1999/5/EC:

Radio: EN 300 328
EMC: EN 301 489-1, EN 301 489-17
Safety: EN 60950

For all products, the Declaration of Conformity is available below and as a .pdf file on the product CD. For the P7030TX Transmitter and Battery Pack, the following CE mark, and notified body number where applicable, are added to the equipment.

CE 0168 ⓘ

National Restrictions

This product may be used in the following EU countries (see limitations for France and Italy).
Ce produit peut être employé dans les pays suivants d'EU (voir les limitations pour la France et l'Italie).
Questo prodotto può essere usato nei seguenti paesi di UE (veda le limitazioni per la Francia e l'Italia).
Dieses Produkt kann in den folgenden EU-Ländern benutzt werden (sehen Sie Beschränkungen für Frankreich und Italien).

AT	BE	CZ	FR	DE	GR	IE	IT	NL	PL
PT	ES	SE	GB	NO	CH				

Les liaisons sans fil pour une utilisation en extérieur d'une distance supérieure à 300 mètres doivent être notifiées à l'Institut Belge des services Postaux et des Télécommunications (IBPT). Visitez http://www.ibpt.be pour de plus amples details.

France
Where used outdoors, only channel 1 – 8 (2400 - 2454 MHz) may be used.
Check http://www.art-telecom.fr/ for more details.
Là où utilisé dehors, creuser des rigoles seulement 1 – 8 (2400 - 2454 MHz) peuvent être employés. Visitez http://www.art-telecom.fr/ pour de plus amples détails.

Italy
This product meets the National Radio Interface and the requirements specified in the National Frequency Allocation Table for Italy. Unless operating within the boundaries of the owner's property, the use of this 2.4 GHz Wireless LAN product requires a 'general authorization'. Check with http://www.comunicazioni.it/it/ for more details.
Questo prodotto è conforme alla specifiche di Interfaccia Radio Nazionali e rispetta il Piano Nazionale di ripartizione delle frequenze in Italia. Se non viene installato all'interno del proprio fondo, l'utilizzo di prodotti Wireless LAN a 2.4 GHz richiede una "Autorizzazione Generale". Consultare http://www.comunicazioni.it/it/ per maggiori dettagli.

Waterhouse Lane Chelmsford Essex CM1 2QU United Kingdom
T +44 (0)1245 493 493 F +44 (0)1245 492 492 www.e2v.com

e2v

EU Declaration of Conformity No. 07/190

PRODUCT TYPE:

P7030TX

PRODUCT DESCRIPTION:

The above product is principally for use by fire fighters. Once incorporated with an Argus 4™ thermal imaging camera, the product provides power to the camera and a short-range wireless video link to facilitate remote viewing of the camera image.

DECLARATION:

It is declared under our sole responsibility that the above Class 2 products, operating in the frequency band 2400 MHz – 2483.5 MHz, conform to the essential requirements of the R&TTE Directive 1999/5/EC having been assessed to the following standards:

IEC60950:2006	Information Technology Equipment – General requirements for safety
EN 50392:2004	Generic Standard : Human exposure to electromagnetic fields (0 to 300GHz)
EN 61000-6-2: 2005	Generic Standard: Immunity standard for industrial environments
ETSI EN 300 328 V1.6.1(2004-11)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques
EN 301 489-1 V1.6.1:2005	Electromagnetic compatibility and Radio spectrum Matters (ERM);
EN 301 489-17 V1.2.1:2002	Electromagnetic Compatibility (EMC) standard for radio equipment and services.

TECHNICAL CONSTRUCTION FILE: TCF2015EU, Issue 1, Dated 26 February 2009.

Neil R. Barker C.Eng. MIET Hon FSEE MIEEE
Manager
Central Quality
Re-issued 26 February 2009 (original issue 27 June 2007) EUD20512A-2

FCC STATEMENT

The P7030TX Transmitter and battery pack includes a radio module that has been tested and found to comply with FCC part 15C. The FCC Identifier is RTAB-WLNB which is shown on the label fitted to the side of the unit.

The P7030TX Transmitter and battery pack does not contain as user adjustable components.

Any unauthorised modification would invalidate the FCC certification.

FCC RF EXPOSURE STATEMENT

To satisfy RF expose requirements, this device and its antenna must operate with a separation distance of a least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

INFORMATION FOR CANADIAN USERS (IC NOTICE)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This device has been designed to operate with an antenna having a maximum gain of 3 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 Ω.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen than the equivalent isotropic radiated power (EIRP) is not more than the required for successful communication.

SECTION 15 - Compliance and Legal Notices

(DTX1400 LRT Transmitter)

Compliance Information for 1.4 GHz Wireless Products, relevant to the EU and other countries following the EU Directive 1999/5/EC (R&TTE Directive).

The transmitter is a Class 2 device.

Declaration of Conformity with regard to the EU directive 1999/5/EC (R&TTE Directive)

English UK	This equipment is in compliance with the essential requirements and other provisions of Directive 1999/5/EC
Nederlands [Dutch] NL	Dit apparaat voldoet aan de essentiele eisenen andere van toepassing zijnde bepalingen van de Richtlijn 1999/5/EC

CE Marking

The following standards were applied during the assessment of the product against the requirements of the Directive 1999/5/EC:
Radio: EN 300 440-2
EMC: EN 301 489-28
Safety: EN 60950

For all products, the Declaration of Conformity is available below and as a .pdf file on the product CD.
For the DTX1400 Transmitter and Battery Pack, the following CE mark is added to the equipment.

National Restrictions

This product may be used in the following EU countries.
Ce produit peut être employé dans les pays suivants d'EU.
Questo prodotto può essere usato nei seguenti paesi di UE.
Dieses Produkt kann in den folgenden EU-Ländern benutzt werden.

NL	GB

A licence is not required in the UK for operation between 1389 and 1399 MHz at up to 500 mW EIRP (i.e. centre frequencies 1391 – 1397 MHz). The 0 dB attenuation setting may therefore be used with a 3 dB antenna (200 mW e.i.r.p.)

A licence is required to operate on any other frequency in the UK and may not be granted. It is the user's responsibility to obtain a licence.

A licence is required in the Netherlands for the use of the frequency band 1375 to 1400 MHz (Frequencies 1377 – 1398 MHz). It is the user's responsibility to obtain a license.

Een licentie is nodig in Nederland voor het gebruik van de frequentieband 1375 tot 1400 MHz. (Frequentie 1377 – 1398 MHz) Het is de verantwoordelijkheid van de gebruikers het verkrijgen van een licentie.

Waterhouse Lane Chelmsford Essex CM1 2QU United Kingdom
T +44 (0)1245 493 493 F +44 (0)1245 492 492 www.e2v.com

EU Declaration of Conformity No. 10/210

PRODUCT TYPE:

DTX1400, DRRS1400, DRX1400

PRODUCT DESCRIPTION:

The above product is principally for use by fire fighters. Once incorporated with an Argus 4® thermal imaging camera, these products provide power to the camera and a short-range wireless video link to facilitate remote viewing of the camera image.

DECLARATION:

It is declared under our sole responsibility that the above Class 2 products, operating in parts of the frequency range 1200 MHz – 1400 MHz, conform to the essential requirements of the R&TTE Directive 1999/5/EC having been assessed to the following standards:

IEC60950:2006	Information Technology Equipment – General requirements for safety
EN 62311:2008	Assessment of Electronic and Electrical equipment related to human exposure restrictions for electromagnetic field (0Hz to 300GHz)
ETSI EN 300 440 V1.2.1(2008-05)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices, 1 to 40 GHz. Part 2 Harmonised EN covering essential requirements of article 3.2 of the RTTE Directive
ETSI EN 301 489-28 V1.1.1 (2004-09)	EMC and Radio spectrum Matters (ERM); EMC standard for radio equipment and services; Part 28: Specific conditions for wireless digital video links

TECHNICAL CONSTRUCTION FILE: TCF2027, Version 1, Dated 5 Aug 2010.

Neil R. Barker C.Eng. MIET Hon FSEE
Manager
Central Quality
Issued 5 Aug 2010 108752 EUD21328A-2

SECTION 16 - Compliance and Legal Notices

(DTX2400 LRT Transmitter)

Compliance Information for 2.4 GHz Wireless Products, relevant to the EU and other countries following the EU Directive 1999/5/EC (R&TTE Directive).

The transmitter is a Class 2 device.

Declaration of Conformity with Regard to the EU Directive 1999/5/EC (R&TTE Directive)

Български [Bulgarian]	Това оборудване отговаря на съществените изисквания и приложими клаузи на Директива 1999/5/ЕС.
Česky [Czech]:	Toto zařízení je v souladu se základními požadavky a ostatními odpovídajícími ustanoveními Směrnice 1999/5/EC.
Dansk [Danish]:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 1999/5/EF.
Deutsch [German]:	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.
Eesti [Estonian]:	See seade vastab direktiivi 1999/5/EÜ olulistele nõuetele ja teistele asjakohastele sätetele.
English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]:	Este equipo cumple con los requisitos esenciales asi como con otras disposiciones de la Directiva 1999/5/CE.
Ελληνική [Greek]:	Αυτός ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδεις απαιτήσεις και άλλες σχετικές διατάξεις της Οδηγίας 1999/5/EC.
Français [French]:	Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.
Íslenska [Icelandic]:	Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 1999/5/EC.
Italiano [Italian]:	Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/CE.
Latviski [Latvian]:	Šī iekārta atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]:	Šis įrenginys tenkina 1999/5/EB Direktyvos esminius reikalavimus ir kitas šios direktyvos nuostatas.
Nederlands [Dutch]:	Dit apparaat voldoet aan de essentiele eisen en andere van toepassing zijnde bepalingen van de Richtlijn 1999/5/EC.
Malti [Maltese]:	Dan l-apparat huwa konformi mal-ħtiġiet essenzjali u l-provedimenti l-oħra rilevanti tad-Direttiva 1999/5/EC.
Magyar [Hungarian]:	Ez a készülék teljesíti az alapvető követelményeket és más 1999/5/EK irányelvben meghatározott vonatkozó rendelkezéseket.
Norsk [Norwegian]:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 1999/5/EF.
Polski [Polish]:	Urządzenie jest zgodne z ogólnymi wymaganiami oraz szczególnymi warunkami określonymi Dyrektywą UE: 1999/5/EC.
Português [Portuguese]:	Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.
Română [Romanian]	Acest echipament este in conformitate cu cerintele esentiale si cu alte prevederi relevante ale Directivei 1999/5/EC.
Slovensko [Slovenian]:	Ta naprava je skladna z bistvenimi zahtevami in ostalimi relevantnimi pogoji Direktive 1999/5/EC.
Slovensky [Slovak]:	Toto zariadenie je v zhode so základnými požiadavkami a inými príslušnými nariadeniami direktív: 1999/5/EC.
Suomi [Finnish]:	Tämä laite täyttää direktiivin 1999/5/EY olennaiset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.
Svenska [Swedish]:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

CE Marking

The following standards were applied during the assessment of the product against the requirements of the Directive 1999/5/EC:

Radio: ETSI EN302064-2
EMC: EN 301 489-28
Safety: EN 60950

For all products, the Declaration of Conformity is available below and as a .pdf file on the product CD.

For the DTX2400 Transmitter and Battery Pack, the following CE mark is added to the equipment.

This product can be used through EU member states as Sub class 22 device when using the frequency range 2400 to 2454 MHz (operating frequency 2402 – 2552MHz) and an EIRP less than 25 mW.

National Restrictions

This product may be used at higher power levels in the following countries within the EEA.

Ce produit peut être employé dans les pays suivants d'EEA.
Questo prodotto può essere usato nei seguenti paesi di AEE.
Dieses Produkt kann in den folgenden EEA-Ländern benutzt werden.

DE	DK	FR	IE	NL	NO	ES	

Germany (DE)
Frequencies are available by licence in the frequency range 2347 to 2385 MHz.
Die Häufigkeiten sind die Lizenzen im Frequenzbereich von 2347 bis 2385 MHz verfügbar.

Demark (DK)
Frequencies are available by licence up to 500 mW EIRP in the following frequency range 2310 - 2400 MHz.
Frekvenser til rådighed med tilladelse op til 500 mW EIRP i følgende frekvensområdet 2310 - 2400 MHz.

France (FR)
Frequencies are available by licence in the following frequency range 2400 - 2483.5 MHz.
Les fréquences sont disponibles par voie de licence dans la gamme de fréquences suivantes 2400 - 2483,5 MHz.
Visitez http://www.art-telecom.fr/ pour de plus amples détails.

Ireland (IE)
Com Reg 08/08 specifies frequencies from 2205 to 2295 MHz up to 1 W EIRP available by short-term licences.

Netherlands (NL)
Frequencies are available by licence up to 1 W EIRP in the following frequency ranges 2322 to 2347, 2357 to 2382 and 2392 to 2417 MHz.
Frequenties zijn beschikbaar via vergunning tot 1 W EIRP in de volgende frequentiegebieden 2322-2347, 2357 tot 2382 en 2392 tot 2417 MHz.

Norway (NO)
Frequencies are available licence exempt up to 2 W EIRP with operating frequencies of 2327 and 2390 MHz. Other frequencies are available under licence.
Spot frekvenser for 2327 og 2390 MHz finnes konsesjon fritatt opptil 2W EIRP. Andre frekvenser er tilgjengelig under lisensen.

Spain (ES)
UN-109 (National Picture of Attribution of Frequencies (C.N.A.F.) specifies that the spot frequencies of 2421, 2449 and 2477 MHz are available and is licence exempt up to 500 mW EIRP.
De las Naciones Unidas-109 (Foto Nacional de Atribución de Frecuencias (CNAF) especifica que el terreno de las frecuencias de 2421, 2449 y 2477 MHz están disponibles y está exenta de licencia de hasta 500 mW PIRE.

Switzerland (CH)
Frequencies are available by licence up to 4 W EIRP in the following frequency range 2290 - 2400 MHz.
Les fréquences sont disponibles par voie de licence jusqu'à 4 W PIRE dans la bande de fréquences 2290 - 2400 MHz suivante.
Die Häufigkeiten sind die Lizenzen bis zu 4 W EIRP in den folgenden Frequenzbereich 2290 - 2400 MHz.

USA and Canada
This product can be licensed under FCC part 90 within the frequency range 2450 to 2483.5 MHz up to a power limit of 5W EIRP. Allowed operating frequencies are therefore 2452 – 2481 MHz allowing for signal bandwidth.

Australia
This product may be used under LIPD Class Licence (item 45A) in the frequency band 2400 to 2483.5 MHz up to a power limit 500 mW EIRP'
Allowed operating frequencies are therefore 2403 – 2481 MHz allowing for signal bandwidth.

Waterhouse Lane Chelmsford Essex CM1 2QU United Kingdom
T +44 (0)1245 493 493 F +44 (0)1245 492 492 www.e2v.com

EU Declaration of Conformity No. 10/211

PRODUCT TYPE:

DTX2400, DRRS2400, DRX2400

PRODUCT DESCRIPTION:

The above product is principally for use by fire fighters. Once incorporated with an Argus 4® thermal imaging camera, these products provide power to the camera and a short-range wireless video link to facilitate remote viewing of the camera image.

DECLARATION:

It is declared under our sole responsibility that the above Class 2 products, operating in parts of the frequency range 2200 MHz – 2500 MHz, conform to the essential requirements of the R&TTE Directive 1999/5/EC having been assessed to the following standards:

IEC60950:2006	Information Technology Equipment – General requirements for safety
EN 62311:2008	Assessment of Electronic and Electrical equipment related to human exposure restrictions for electromagnetic field (0Hz to 300GHz)
EN 302 064-2 V1.1.1 (2004-04)	EMC and Radio spectrum Matters (ERM); Wireless Video Links (WVL) operating in the 1,3 GHz to 50 GHz frequency band; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
ETSI EN 301 489-28 V1.1.1 (2004-09)	EMC and Radio spectrum Matters (ERM); EMC standard for radio equipment and services; Part 28: Specific conditions for wireless digital video links

TECHNICAL CONSTRUCTION FILE: TCF2027, Version 1, Dated 5 Aug 2010.

Neil R. Barker C.Eng. MIET Hon FSEE
Manager
Central Quality
Issued 5 Aug 2010 108752 EUD21329A-2

FCC STATEMENT

The DTX2400 LRT Transmitter includes a radio module that has been tested and found to comply with FCC part 90. The FCC Identifier is PW9-DTX2400, which is shown on the label fitted to the side of the unit.

The DTX2400 LRT Transmitter is only certified for use with antenna with a gain up to +3 dBi.

The DTX2400 LRT Transmitter does not contain any user adjustable components.

Any unauthorised modification would invalidate the FCC certification.

FCC RF EXPOSURE STATEMENT

To satisfy RF expose requirements, this device and its antenna must operate with a separation distance of a least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

INFORMATION FOR CANADIAN USERS (IC NOTICE)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This device has been designed to operate with an antenna having a maximum gain of 3 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 Ω.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen than the equivalent isotropic radiated power (EIRP) is not more than the required for successful communication.

SECTION 17 - Warranty

1. EXPRESS WARRANTY

e2v Technologies ("e2v") warrants that this product is free from mechanical defects or faulty workmanship for one (1) year from the date of shipment, 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.

2. EXCLUSIVE REMEDY

It is expressly agreed that the Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortuous 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.

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, TORTIOUS CONDUCT OR ANY OTHER CAUSE OF ACTION AGAINST e2v.

e2v technologies (uk) limited
Waterhouse Lane
Chelmsford
Essex CM1 2QU, UK
Telephone: +44 (0)1245 493493
Facsimile: +44 (0)1245 492492

e2v technologies inc.
520 White Plains Road, Suite 450
Tarrytown
NY 10591, USA
Telephone: (914) 592 6050
Facsimile: (914) 592-5148

e2v technologies sas
16 Burospace
F-91572 Bièvres Cedex, France
Telephone: (0)16019 5500
Facsimile: (0)16019 5529

e2v technologies GmbH
Industriestrasse 29
D-82194 Gröbenzell, Germany
Telephone: (0)8142 410570
Facsimile: (0)8142 284547

Internet: www.argusdirect.com