USER GUIDE

Andor Metal Halide Light Source

AMH-200-F0/6S

Version 1.0 - June 2011

AMH-200-F0/6S

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PLEASE READ THIS INFORMATION FIRST

1. To ensure correct and safe operation of this product, please read this guide before use and keep it in a safe place for future reference

2. If the equipment is used in a manner not specified by Andor, the protection provided by the equipment may be impaired

3. Before using the system, please follow and adhere to all warnings, safety, manual handling and operating instructions located either on the product or in this User Guide

4. Andor AMH-200-F0/6S light sources are precision scientific instruments containing fragile components Always handle with care

5. Do not expose the product to extreme hot or cold temperatures

6. Ensure that the ventilations slots in the controller case are free from blockages

7. Do not expose the product to open flames

8. Do not allow objects to fall on the product

9. Do not expose the product to moisture, wet or spill liquids on the product. Do not store or place liquids on the product. If spillage occurs on the product, switch off power immediately, and wipe off with dry, lint-free cloth. If any ingress has occurred or is suspected, unplug mains cable, do not use, and contact Andor service

10. The product contains components that are extremely sensitive to static electricity and radiated electromagnetic fields, and therefore should not be used, or stored, close to EMI/RFI generators, electrostatic field generators, electromagnetic or radioactive devices, or other similar sources of high energy fields

11. Operation of the system close to intense pulsed sources (e.g. plasma sources, arc welders, radio frequency generators, X-ray instruments, and pulsed discharge optical sources) may compromise performance if shielding of the AMH is inadequate

12. Use only the power supply cord provided with the system for this unit. Should this not be correct for your geographical area contact your local Andor representative

13. Only the correctly specified mains supply and fuse must be used

14. Make sure the electrical cord is located so that it will not be subject to damage

15. There are no user-serviceable parts beyond the specified user accessible areas of the product (lamp and filter wheel housings) and the enclosure must not be opened. Only authorised service personnel may service this equipment

16. Always disconnect the power supply from the product before accessing the lamp or filter wheel housings or before replacing a fuse

17. Users must be authorised and trained personnel only; otherwise this may result in personal injury, and/ or equipment damage and impaired system performance

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SECTION 1

Recommended procedure:

IN THE RARE EVENT THAT AN AMH MERCURY LAMP BREAKS, THE FOLLOWING ACTION SHOULD BE TAKEN:

1. All personnel should evacuate the room

2. Turn off any air recirculation equipment such as air conditioning

3. Open windows to ventilate the room for at least 30 minutes

4. Wear suitable protective gloves to carry out the following procedure

If the breakage has occurred within the unit:

1. Disconnect the unit from the mains supply and allow the unit to cool for at least 30 minutes

2. When the cooling time has elapsed, open the lamp house access panel (please see **Section 2.1**) and (using the protective gloves) remove the bulk of the lamp

3. Place the lamp in its box

4. Carefully remove any shards of glass from the lamp house area and place them in the lamp box

5. In the unlikely event of mercury being visible in the unit, it can be removed using a pipette (automatic or 'dropper bottle', NOT a mouth suction type) and placed in a sealed container such as a small capped glass bottle

6. Carefully remove all remaining particles of glass

7. Remove the rear cover and treat this area as per the lamp house (please see **Section 4.1**)

8. Place the lamp box and any container used for the spilled mercury in a polythene bag

9. Remove the foam air filters from the rear cover and place them in the bag with the box. The lamp house and rear of the unit should then be wiped down with damp paper towels or similar

10. Place the towels and any container used into the polythene bag and seal it

11. Place the first bag into a second polythene bag and seal it

12. Fit new filters to the rear cover (contact your local Andor representative to obtain replacement filters)

13. Refit the rear cover (please see **Section 4.1** for details)

If the breakage has occurred outside the unit:

- If only the reflector is damaged and the lamp at the centre is intact then the lamp can be treated as broken glass and along with any shards, using appropriate care, should be packed in its box

- If the lamp at the centre of the reflector is broken then mercury may have been released. Use the same procedure for evacuation, ventilation and clean-up as detailed above to package the lamp remains and clean up the affected area

- In either case, treat as hazardous waste and dispose of via a licensed waste contractor

NOTE: IF YOUR COMPANY HAS A MERCURY SPILL PROCEDURE, THAT WILL TAKE PRECEDENCE OVER THIS DOCUMENT.

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SAFETY SYMBOLS

The following are explanations of the safety symbols found on this product:

Caution, risk of electric shock

Caution, risk of exposure to ultra-violet radiation

Caution, surface may be hot

MANUAL HANDLING

Due to the delicate nature of some of the components within, care must be exercised when handling this product. Proper manual handling techniques are important when unpacking and installing the AMH-200-F0/6S to ensure that the integrity of the product is safeguarded and individuals involved are not exposed to unnecessary manual handling risks, such as:

- Lifting a load which is too heavy
- Poor posture or technique during lifting
- Dropping a load
- Lifting objects with sharp edges

SHIPPING & STORAGE PRECAUTIONS

Never ship the unit with the lamp installed.

- Always use the original packaging for shipping and storage purposes

Unpacking and Inspection:

- Carefully unpack the unit and retain packaging to return equipment for servicing
- If the equipment appears damaged in any way, return it to sales outlet in its original packaging. No responsibility for damage arising from the use of non-approved packaging will be accepted
- Ensure all items and accessories specified on the bulleted list in **Section 1.5** are present
- If any items are missing, please contact your local sales outlet

AMH-200-F0/6S   **SECTION 1**

Thank you for choosing the **Andor AMH-200-F0/6S** light source. The unit contains a self-aligning, temperature stabilised, 200 Watt Metal Halide lamp. Light from the unit is coupled into your microscope system using a supplied Liquid Light Guide. Adaptors are available to connect the liquid light guide to microscopes from all of the major manufacturers.

Output power is variable in 1% increments from 0 to 100%, either manually using the buttons on the front of the unit, or by software control via an integrated USB 2.0 interface. The AMH-200-F6S variant includes a 6 position filter wheel.

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If you have any questions regarding the use of this equipment, please contact the representative* from whom your system was purchased, or:

Europe	**USA**
Andor Technology	**Andor Technology**
7 Millennium Way	425 Sullivan Avenue
Springvale Business Park	Suite # 3
Belfast	South Windsor
BT12 7AL	CT 06074
Northern Ireland	USA
Tel. +44 (0) 28 9023 7126	Tel. (860) 290-9211
Fax. +44 (0) 28 9031 0792	Fax. (860) 290-9566
www.andor.com/contact_us/support_request	**www.andor.com/contact_us/support_request**
Asia-Pacific	**China**
Andor Technology (Japan)	**Andor Technology**
7F Ichibancho Central Building	Room 502
22-1 Ichiban-Cho	Yu Yang Zhi Ye Building
Chiyoda-Ku	A2 Xiao Guan Bei
Tokyo 102-0082	Chaoyang District
Japan	Beijing 100029
Tel. +81 3 3511 0659	China
Fax. +81 3 35110662	Tel. +86-10-5129-4977
	Fax. +86-10-6445-5401
www.andor.com/contact_us/support_request	**www.andor.com/contact_us/support_request**

*NOTE: THE CONTACT DETAILS FOR YOUR NEAREST REPRESENTATIVE CAN BE FOUND ON OUR WEBSITE.

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SECTION 1

1.2 - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS PROVIDED "AS IS" WITHOUT WARRANTY, CONDITION OR REPRESENTATION OF ANY KIND, EITHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE.

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1.3 - TRADEMARKS & PATENT INFORMATION

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1.4 - SPECIFICATIONS

Parameter	Specification
Power supply ratings	100 - 240V, 50 - 60 Hz, 5A
Location to be used	Indoor use only
Altitude	Up to 2000 m
Operating temperature range	18°C to 28°C
Storage temperature	-10°C to +50°C
Operating relative humidity	< 70% non-condensing
Overvoltage category	CAT II
Pollution degree	2
Ingress protection rating	IP20
Lamp type	200W Metal Halide
Lamp lifetime	2200 hours
Liquid light guide Numerical Aperture	0.5
Liquid Light Guide output power	4W typical
Spectral range	380 - 650 nm
Filter wheel*	6 position
Filter wheel switching speed	80 ms typical
Control interface	USB 2.0
Electromagnetic compatibility	This is a Class A product. In a domestic environment this product may cause electromagnetic interference, in which case the user may be required to take adequate measures
Cooling vent clearance	100 mm minimum
Dimensions	229 x 221 x 345 mm [9.06 x 8.70 x 13.58 inches]
Weight	9.45 kg [20.8 lb]

*NOTE: AMH-200-F6S variant only

Specifications are subject to change without notice
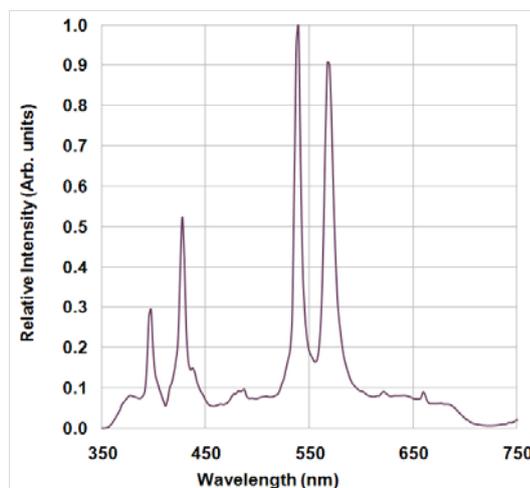
Spectrum of Metal Halide lamp

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Liquid light guides have a limited lifetime, independently of whether they are stored or in use. However, lifetime may vary depending on climatic conditions. Cold and humid environments will extend lifetime, hot and/or dry environments will shorten it. Though the outstanding UV performance will not markedly degrade during usage, we recommend that the light guide is replaced in advance of the expected lifetime of expiration.

- Approximate lifetime: 4 years
- Suggested replacement time: 3 years
- Usage temperature range: Min +5°C (41°F), Max: +30°C (+86°F)

NOTE: Figures based on 23°C and 60% humidity.

Should the temperature limits be exceeded the likely damage is the formation of bubbles inside the liquid. These may be reabsorbed if the light guide is stored at room temperature for several days.

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The main components of the Andor AMH-200-F0/6S system are as follow:

- AMH-200-F0/6S main housing (see photograph below)
- 2 m / 3m Liquid Light Guide as appropriate
- 200W Metal Halide lamp
- Filter change tool
- 2 mm Hex Allen key
- AC power cord

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Details of interfaces on the AMH-200-F0/6S units are shown in the images below:

LCD display

Menu button

Shutter button

Filter / Intensity selection buttons

Liquid Light Guide

AMH-200-F0/6S front view

USB socket

Cooling fan inlets

IEC mains connection* and fuses

Mains power switch
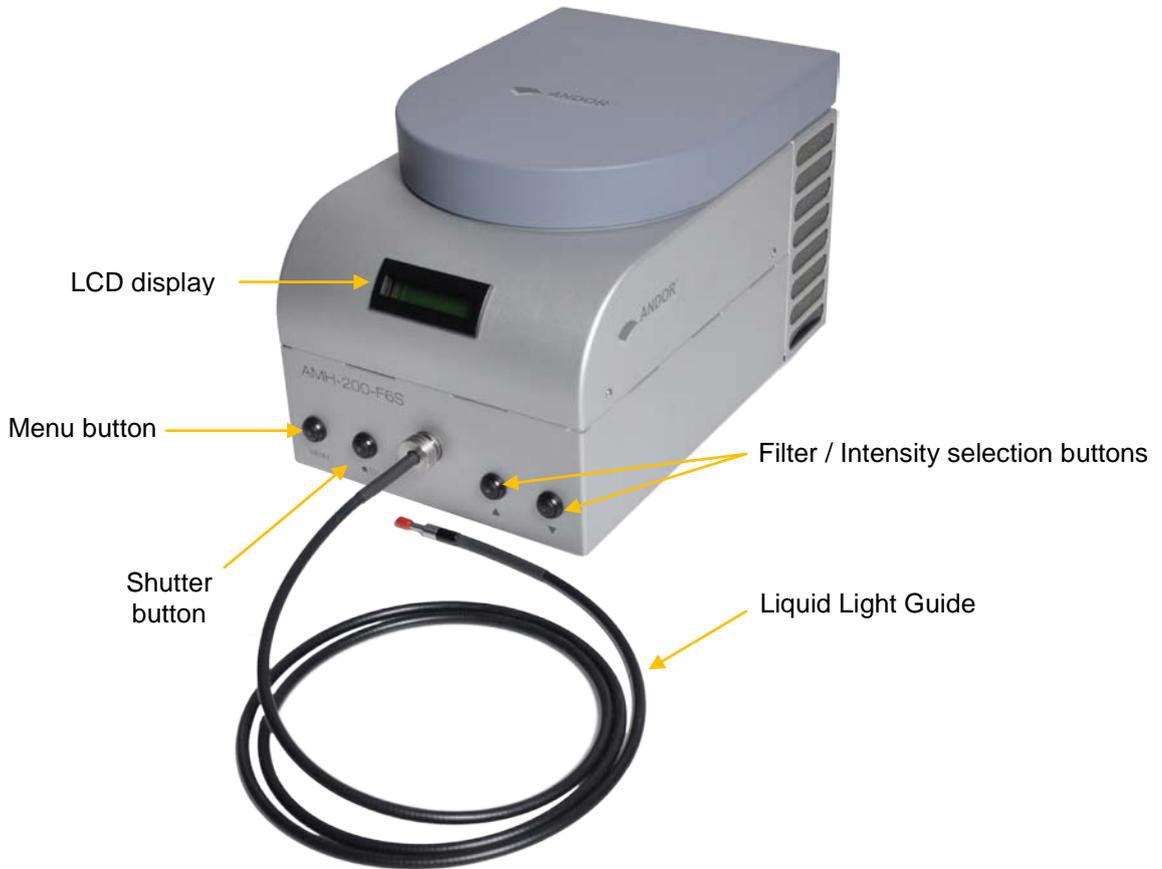
AMH-200-F0/6S side view

* The unit has an IEC 60320 C14 male socket that requires a mains lead with an IEC 60320 C13 female plug that is certified for your country. One will normally be supplied with your product.

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The following accessories are available for your AMH system:

Andor part number	Item description
TR-AMH-200-LMP	200W pre-aligned lamp module
TR-AMH-200-FUSE	AMH-200-F0/6S spare fuse
TR-AMH-LLG-2M	AMH-200-F0/6S 2m liquid light guide
TR-AMH-LLG-3M	AMH-200-F0/6S 3m liquid light guide
TR-AMH-200-FCT	AMH-200- F0/6S filter changing tool
TR-AMH-200-LC1	Leica DM microscope adapter
TR-AMH-200-LC2	Leica MZ microscope adapter
TR-AMH-200-NK1	Nikon TE/Ti microscope adapter
TR-AMH-200-OL1	Olympus microscope IX/BX
TR-AMH-200-ZS1	Zeiss Axio microscope adaptor
TR-AMH-200-ZS2	Zeiss Axio 25/40 microscope adaptor

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SECTION 2 - INSTALLATION

2.1 - SAFETY

- Prior to commencing installation, please refer to the Specifications in **Section 1.2** to ensure all requirements have been met
- As part of the safety features of the AMH, the product is designed to have a protective earth connected via the earth pin on the mains plug of the unit. It is important to ensure that this is connected to the buildings protective earth system
- The equipment should be positioned so that the mains supply plug/cord can be easily accessed for disconnection

2.2 - INSTALLING THE LAMP

Equipment required:

- 2 mm Hex Allen key (supplied)
- Pre-aligned lamp unit (only use TR-AMH-200-LMP)

Caution:

- Do not touch the inside of the reflector of the lamp
- The lamp is delicate, handle with care

Instructions:

1. Disconnect the AMH from the mains power supply

    NOTE: If the AMH has been previously switched on, wait for 30 minutes to allow lamp to cool

2. Find a flat surface and place the AMH upside down on the surface
3. Using the 2 mm Hex Allen key, unscrew the four M2 Hex screws and remove the lamp house access panel, as shown below:

Hex screws

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5. Open the top of lamp carton to reveal the lamp:

V-shaped cardboard holder
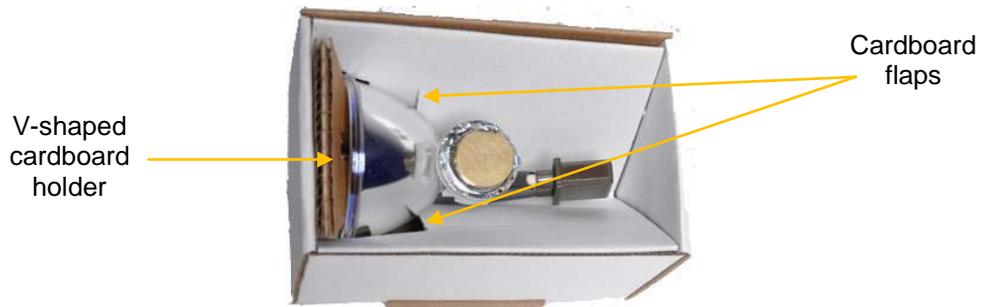
Cardboard flaps

6. Remove the V-shaped cardboard holder and push the cardboard flaps back

7. Lift the lamp carefully out of carton and hold as shown:
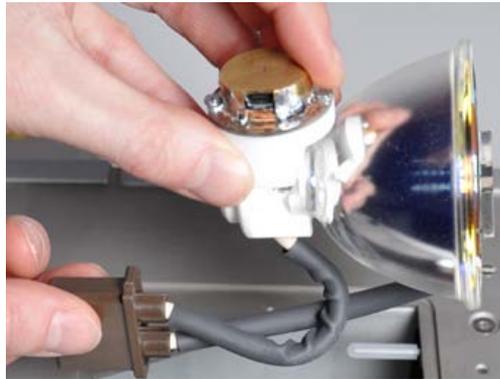
8. Turn the lamp so that the cables and connector hang down into the lamp chamber, then plug the brown connector firmly into the power socket:

Power socket

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SECTION 2
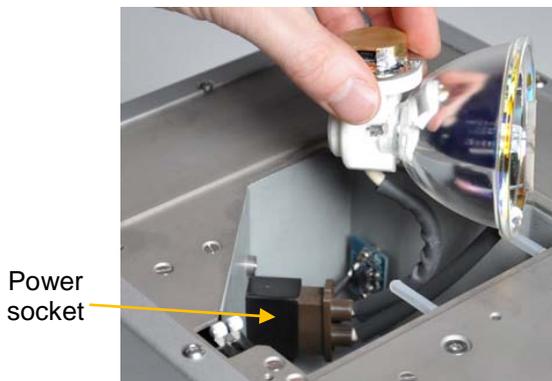
9. Locate the bottom of the lamp, as shown below and fit it into the lamp socket locating groove:
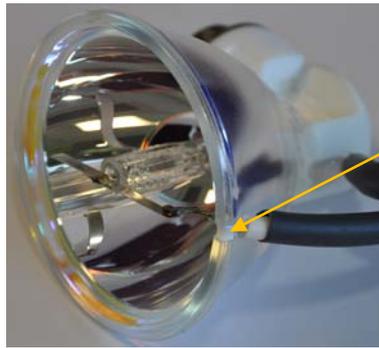
Groove marking bottom of lamp

Lamp orientation

Lamp spring restraints

Lamp springs

Lamp socket locating groove
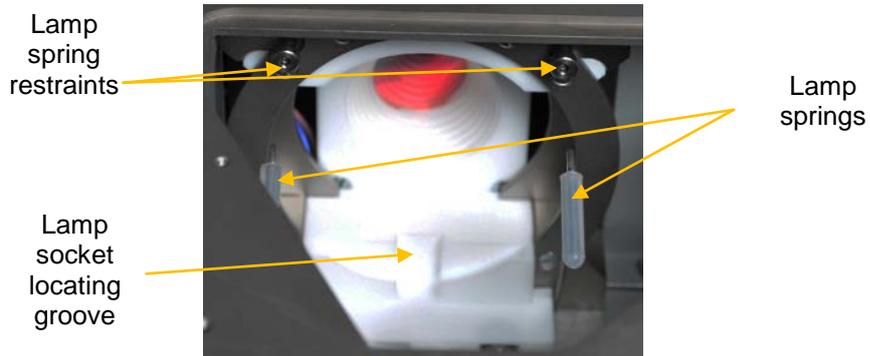
Lamp housing

10. Confirm that the locator key is in its groove by rocking the bulb unit alternately clockwise and anti-clockwise. If the bulb is in correctly, you will feel the groove in the bulb socket stop your rotation on both sides

11. Rotate the lamp back until you think the locator key is centred in the locating groove

12. Push the springs towards the lamp (as you do this, the lamp will be locked into the correct position), then press the springs all the way into the restraints:
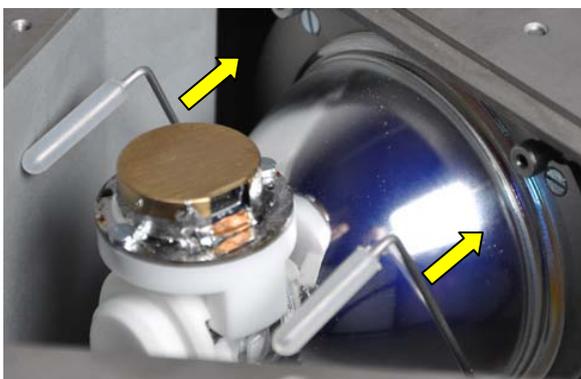
The lamp should now be held firmly in place

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13. Plug the data connector into the base of the lamp:

14. Replace the lamp housing access panel and screw back into place with the hex screws.

15. The AMH is now ready to be connected to the microscope (see next section for details)

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SECTION 2

1. Once the lamp is installed (see **section 2.1**), the AMH is ready to be connected to the microscope

2. Place the AMH in a safe location and ensure none of the fan inlets or outlets are obstructed (minimum clearance should be > 100 mm)

3. Unpack the Liquid Light guide from the foil packaging and remove both plastic caps from the light guide
NOTE: It is important to remove the caps before connecting to the light guide to avoid damage on power up

4. Insert the fibre furrule into the threaded opening of the AMH and screw the clamping nut clockwise until it is finger tight

5. The light guide should now be firmly held in the AMH light guide socket

6. Locate the appropriate light guide adapter for your microscope into the illumination port and loosen the screw on the back of the collimating lens. Firmly push the light guide into the hole ensuring it has reached its end stop and retighten the screw
NOTE: Adapters are not supplied but can be ordered separately. Please use the ordering information table in Section 1.2.1 to select the adapter that works with your microscope

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SECTION 3 - OPERATION

3.1 - STARTING UP THE AMH-200-F0/6S

Caution:

- **Do not power up the AMH without the light guide attached to both the AMH and Microscope**

- **Only power up the AMH when it is installed on a level surface**

    1. Connect the power cable to the AMH

    2. Set the AMH power switch (situated on the side of the unit) to the 1 position

    3. Allow the unit to warm up for at least 5 minutes before use

3.2 - SHUTTING DOWN THE AMH-200-F0/6S

Caution:

- **Do not shut the unit down within 30 minutes of power-up as damage to the lamp may result if instructions not followed**

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The AMH can be controlled manually using the controls and LCD display located on the front of the unit as shown below:

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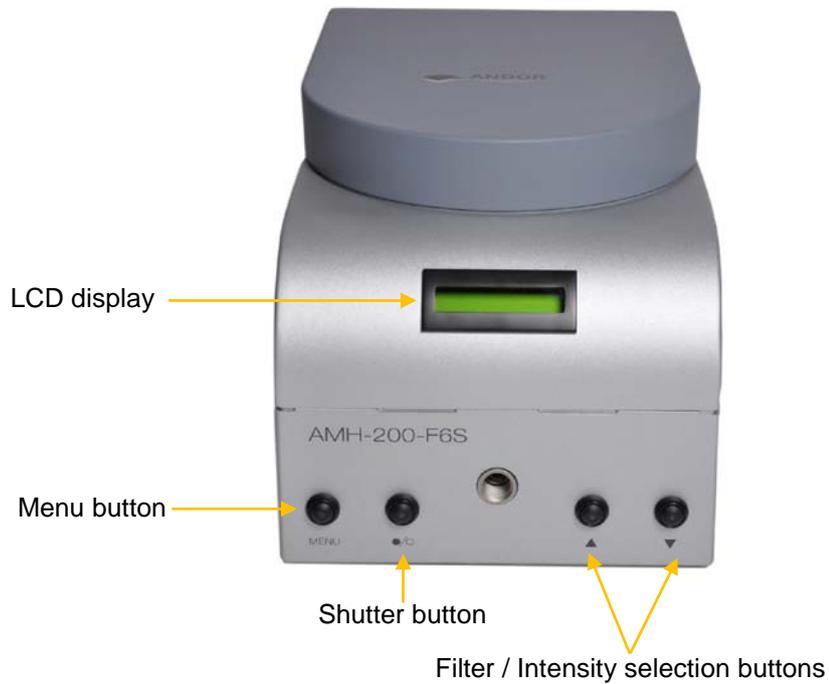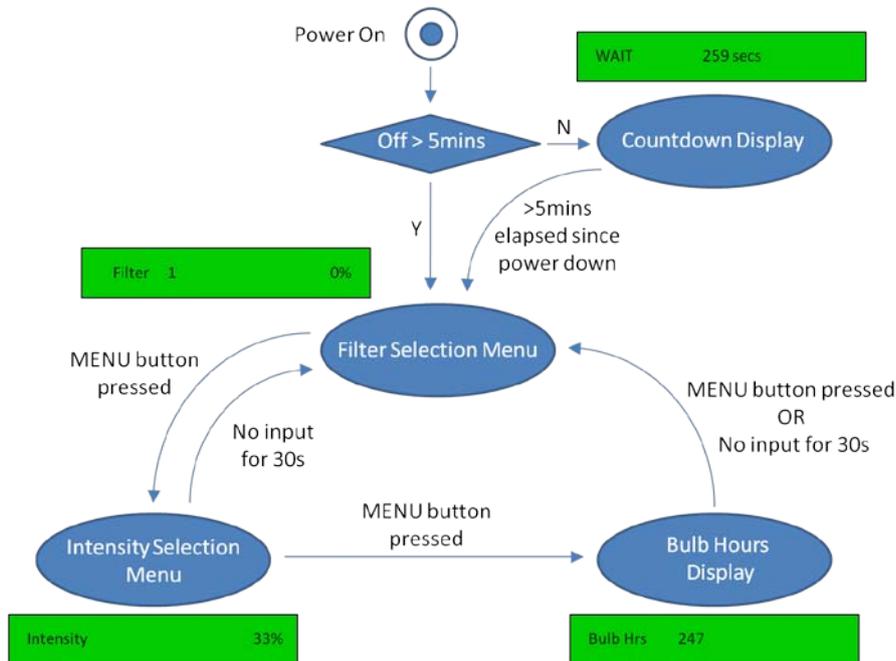
Menu option navigation

This section will help you move systematically through the menus to get your newly installed AMH set up for illumination. The flow chart above is a guide to menu navigation on AMH. If you find yourself in an unintended menu location, refer back to this diagram to help you navigate back to where you want to be.

When the unit is powered up, the 4x green LEDs in the MENU, Shutter & Filter/Intensity selection buttons should light up. If they do not and a countdown timer (example shown below), is running this indicates that the unit was switched off less than 5 minutes previously. The controls are de-activated until the countdown timer stops. This is to protect the bulb from lifetime degradation.

Example of countdown timer display

Once the unit is ready to use, the **LCD Default Display** should indicate the **Filter Name** (up to 6x characters, **Wavelength** (up to 3x characters) and **Intensity** (**%**), e.g.:

Example of LCD Default Display

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The **Filter Selection** is the default screen, e.g.:

```
Filter  1                    0%
```

Using the ▲▼ buttons, select the required filter. The filter wheel should be heard to move and the filter name/number will change on the display as appropriate, e.g.:

```
Filter  3                    0%
```

3.3.1.2 - Setting intensity

To navigate to the intensity setting menu, press the **MENU** button once. The **Intensity Selection** option appears in the LCD screen, e.g.:

```
Intensity                    0%
```

Using the ▲▼ buttons, select the required intensity. The **%** indicator should increase or decrease in 1% steps, e.g.:

```
Intensity                   33%
```

Once you have selected your required intensity, you can open the shutter using the ●/○ button to illuminate your specimen. The shutter button will operate from any of the three menu option windows.

To view the bulb usage in hours, press the **MENU** button once more, otherwise if you do not change any of the settings using the manual controls, the unit will revert to the default menu after 30 seconds.

3.3.1.3 - Checking bulb hours

When the **MENU** button is pressed a second time the elapsed **Bulb Hours** appears in the LCD screen, e.g.:

```
Bulb Hrs   247
```

The shutter can be used from this menu, but all other functions are disabled. To return to the default menu, press the **MENU** button once more, otherwise if you do not change any settings using the manual controls, the unit will revert to the default menu after 30 seconds.

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1. Double-click on the **Configuration Manager** icon [icon] on your PC/laptop

2. The Device Configuration Manager dialog box should appear, e.g.:
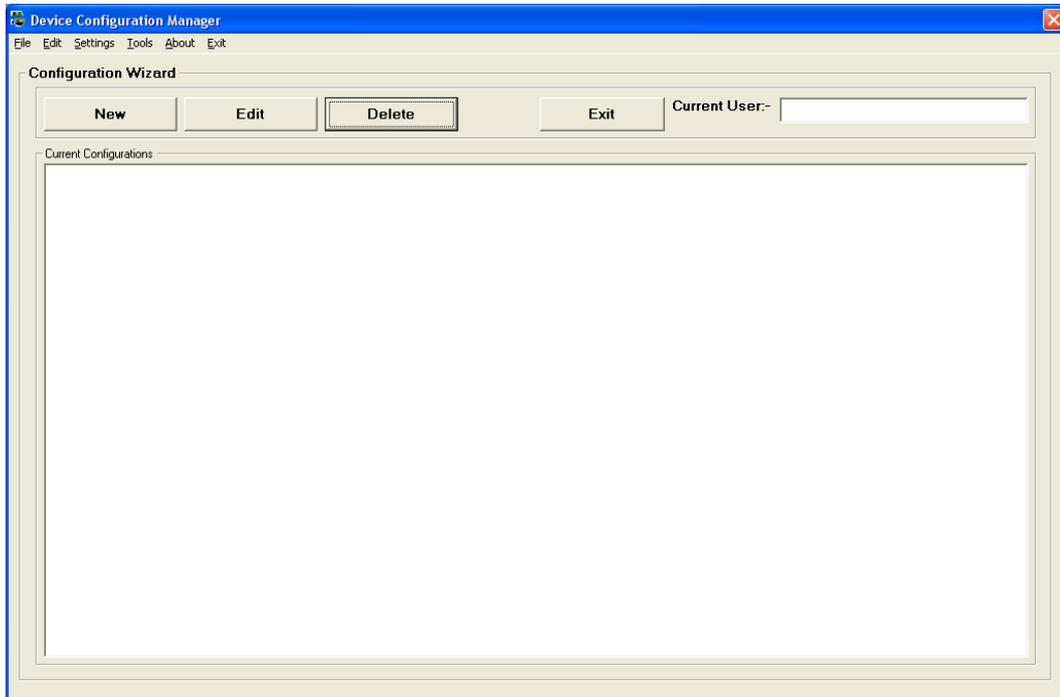
3. Click on the **New** button and the following screen should appear, e.g.:

4. Type in the required **Configuration Name**, e.g.:
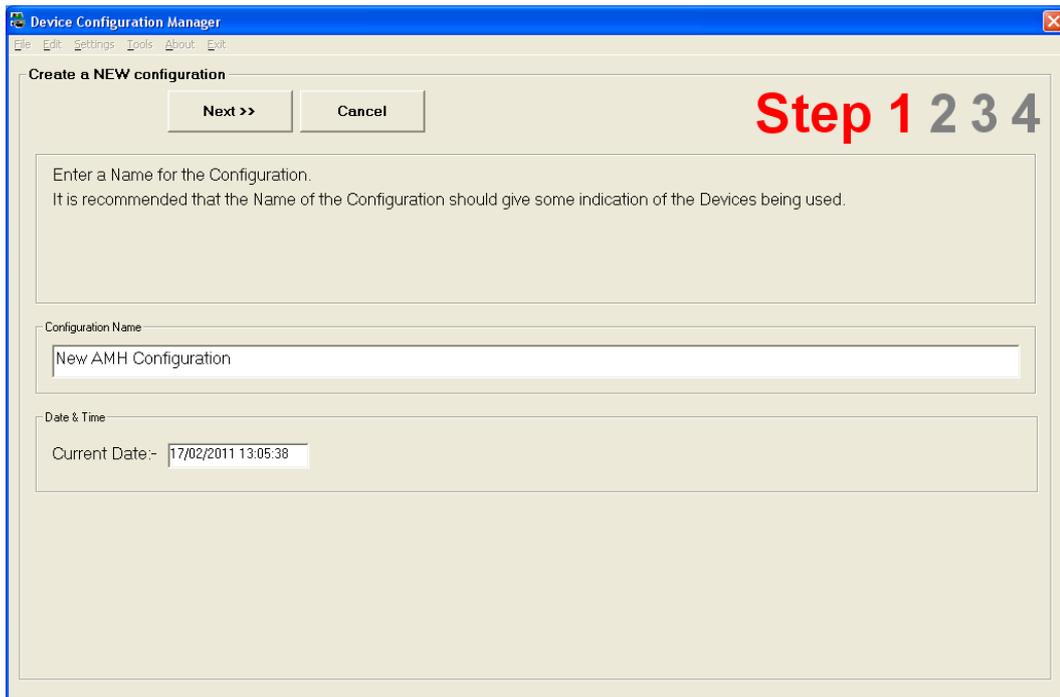
5. Click **Next >>**

6. Select the **Andor Camera** option, e.g.:
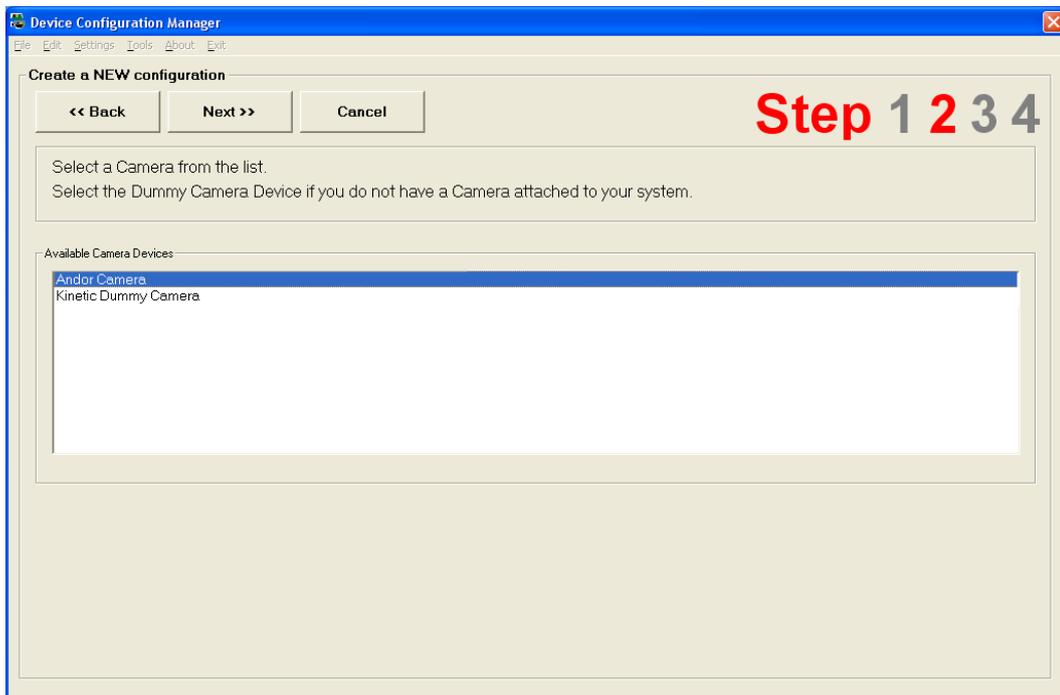
7. Click **Next >>** and a list of **Available Auxiliary Devices** should appear. Tick the box next to the **Andor AMH Device**, e.g.:
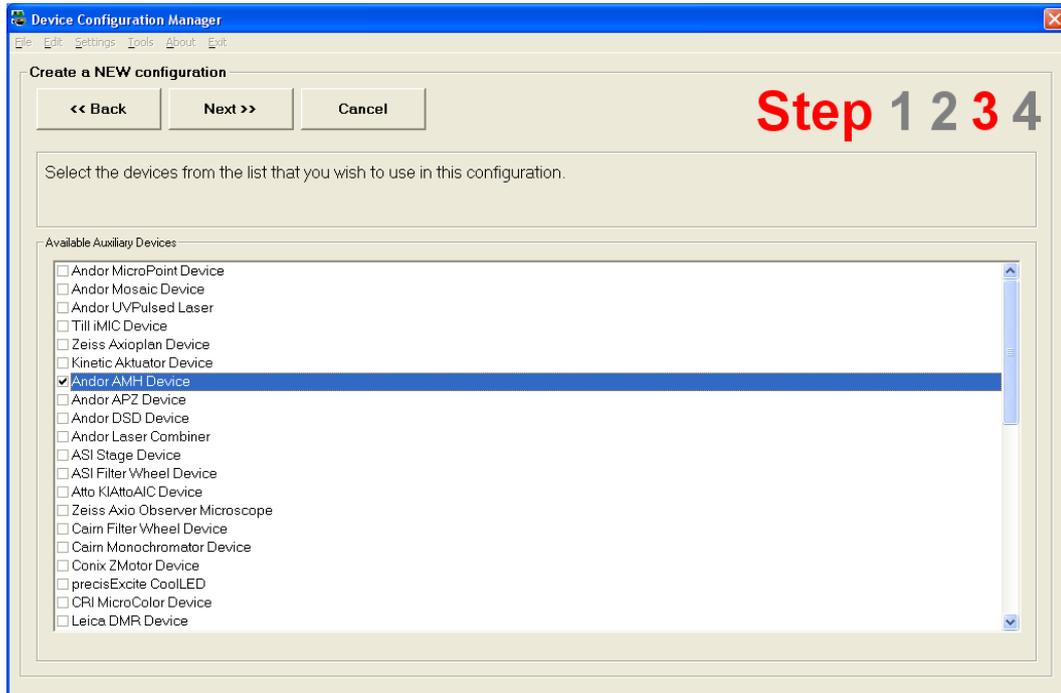
8. Click **Next >>** and a summary of the new configuration should appear, e.g.:
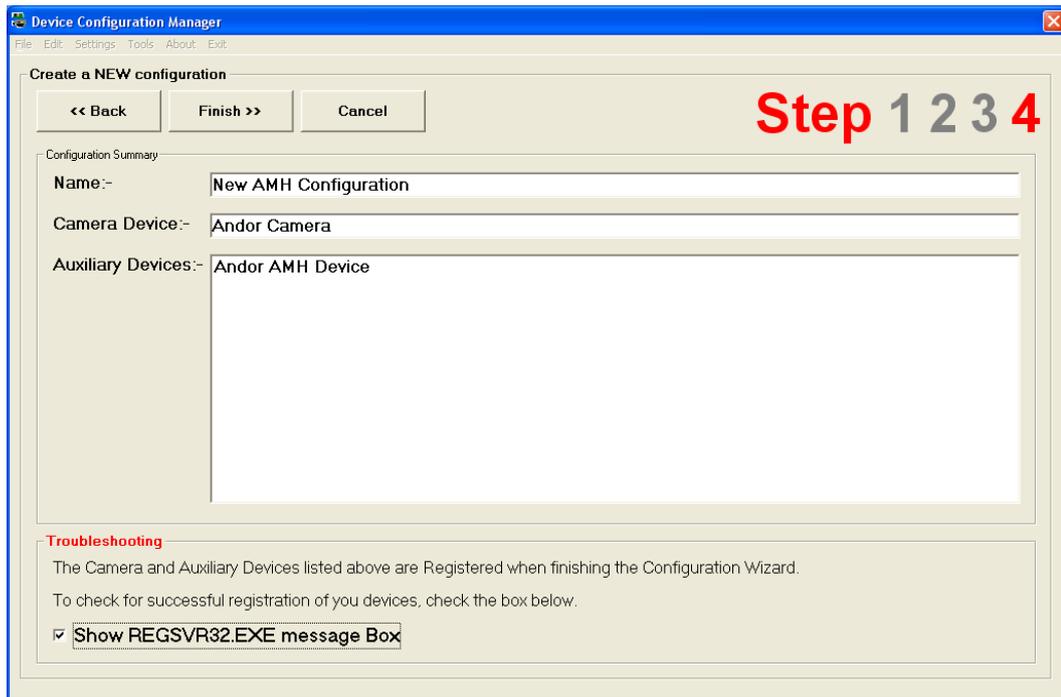
9. Click **Finish >>** and Registry Server Messages will pop-up, e.g.:
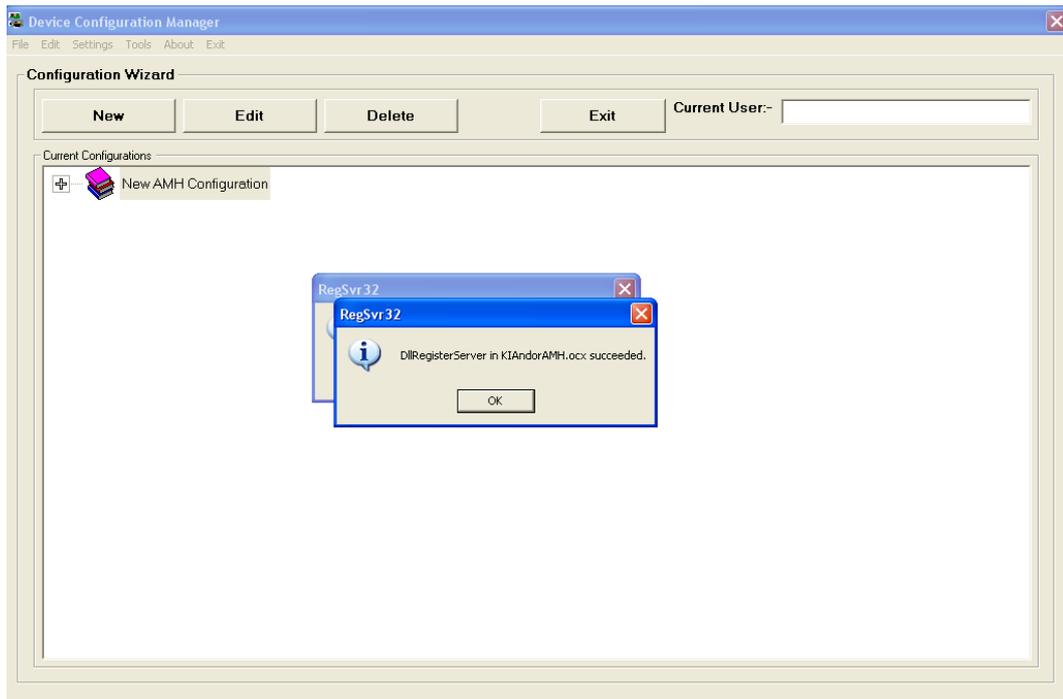
10. Click **OK** on all messages then the final configuration screen should appear, e.g.:
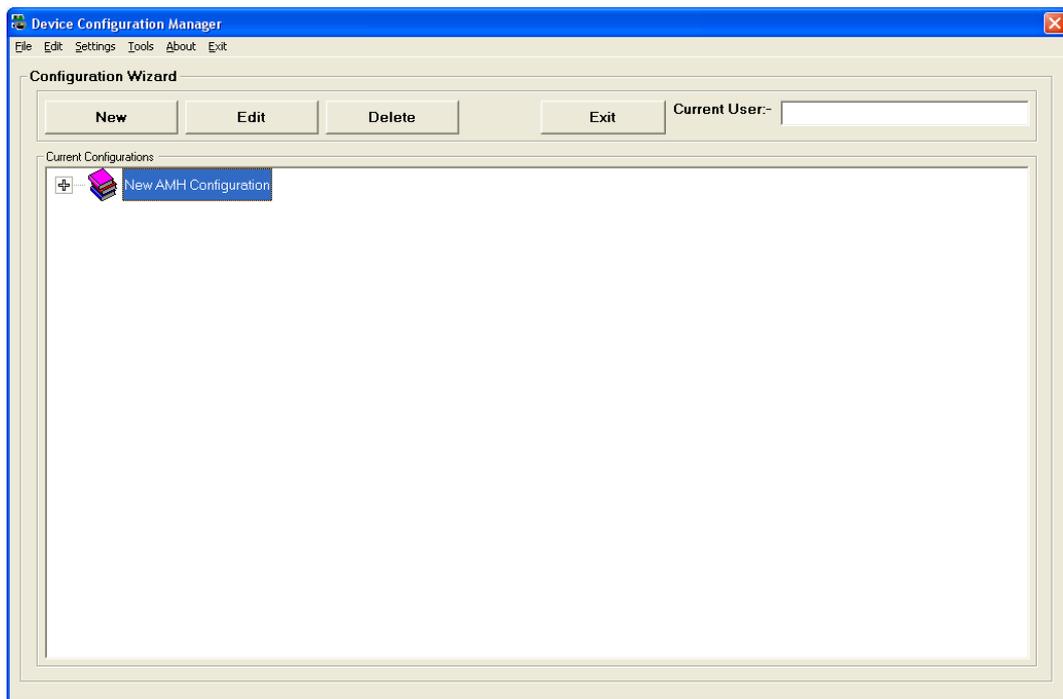
1. Click on the **iQ 2** icon on your PC/laptop

2. The **iQ2 Splash Screen** should appear, e.g.:
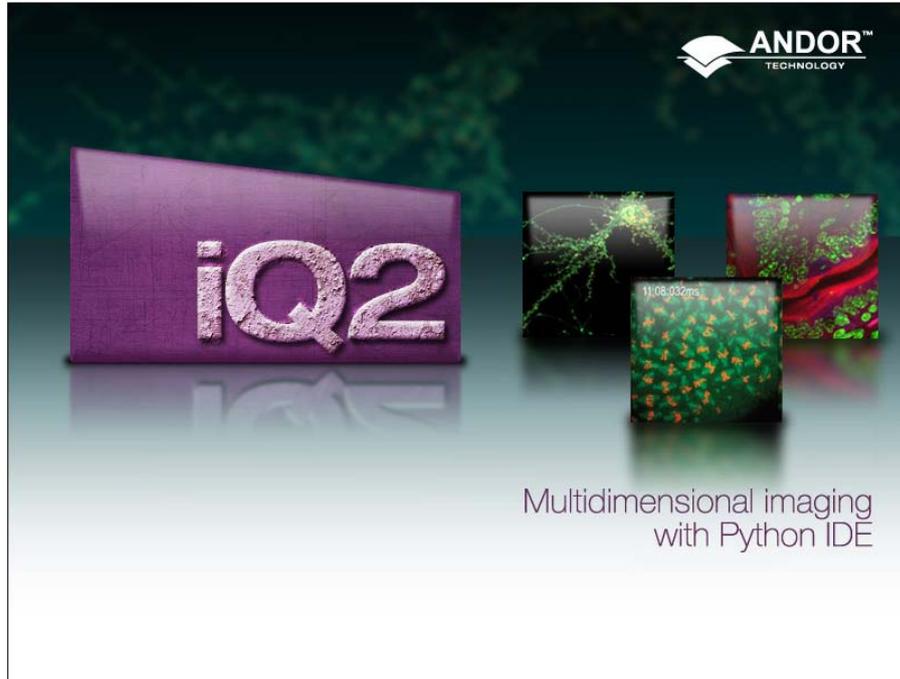
3. The **Registration** dialog box should then appear and you can select the configuration that includes your AMH from the drop-down menu, e.g.:

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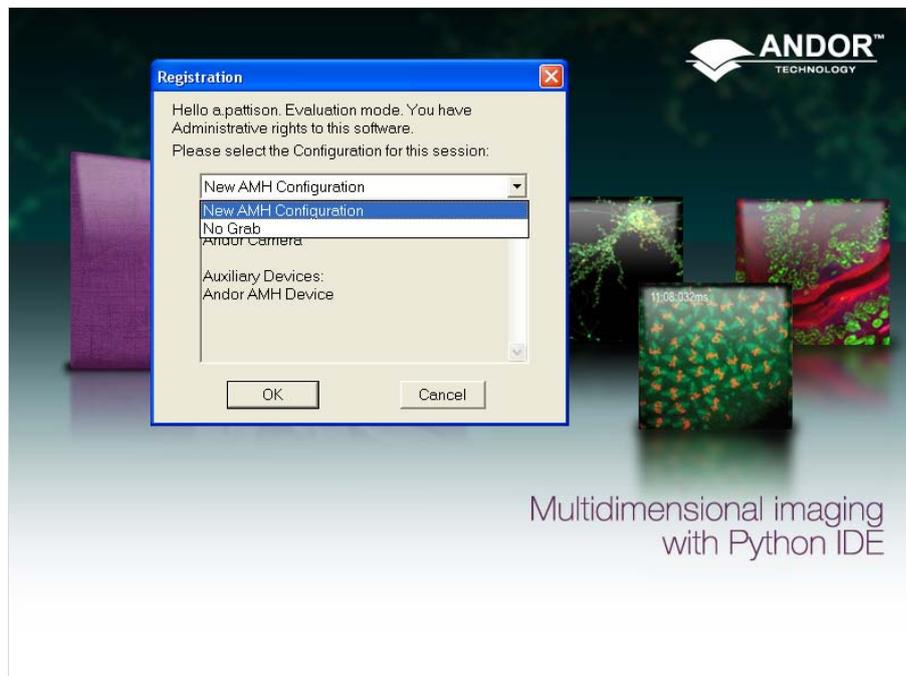
4. After iQ has launched you will see the Main Console. To get access to your AMH click the **Device Setup** button, e.g.:
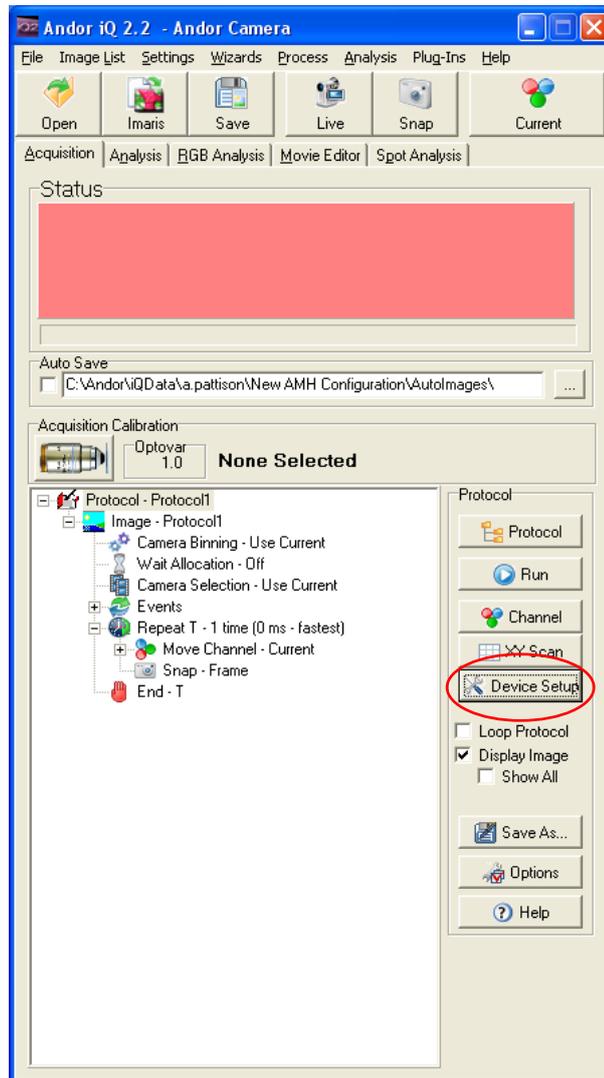
Using the Acquisition/Auxiliary Devices console, you can now connect to your AMH as follows:

1. Click on the **Settings** sub-tab of the **Andor AMH** tab:
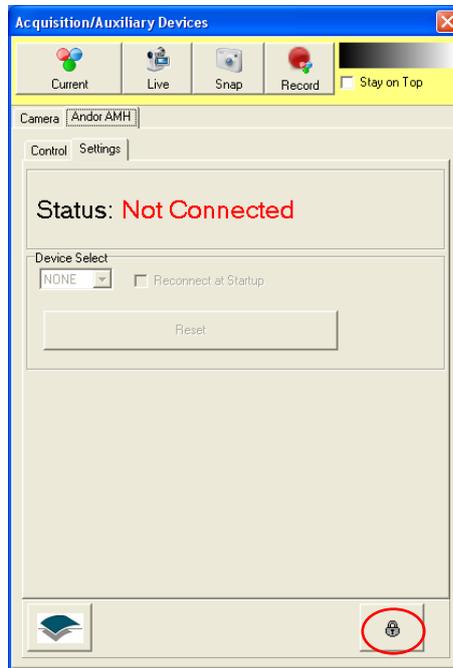
2. Click on the padlock symbol on the bottom-right and the following warning should appear:

3. Click **OK** and the **Device Select** drop-down menu should become active, e.g.:

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4. Select the device required (there may be more than one indicated) e.g.:
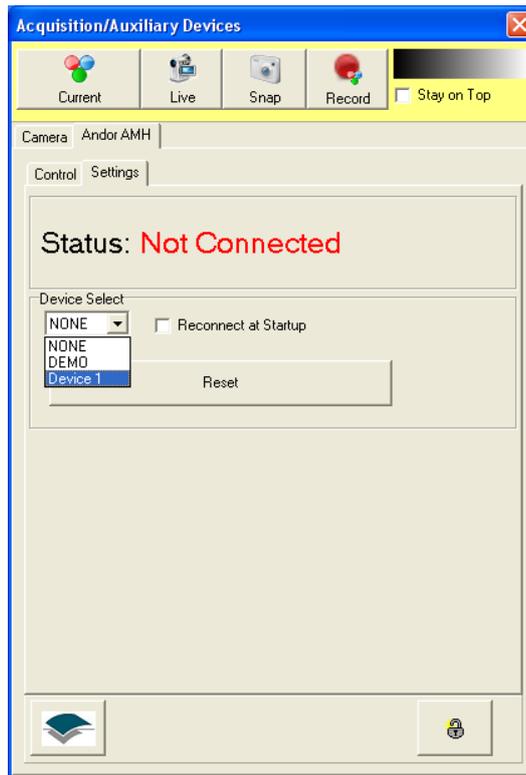
5. The status should then change to **Connected On Device <#>**, e.g.:

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6. If you require iQ to automatically reconnect on the next session, tick the **Reconnect at Startup** option, e.g.:

7. The AMH should now be connected. At this point re-enable the padlock by clicking on the padlock button

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1. Switch to the **Control** sub-tab of the **Andor AMH** tab on the **Acquisition/Auxiliary Devices** console, e.g.:
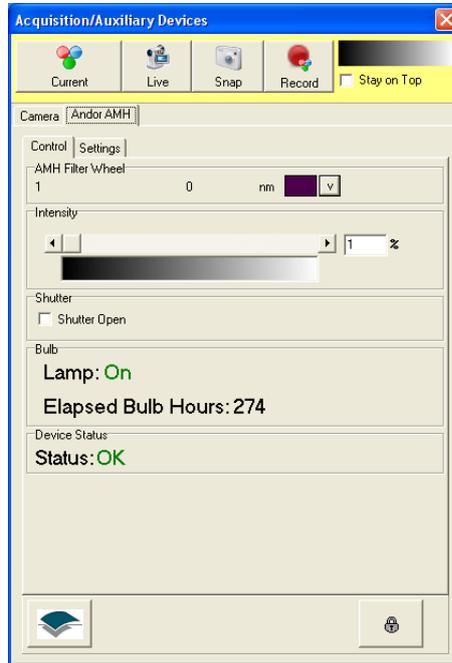
2. Set the bulb intensity either by moving the slider arrow as shown below left or typing the figure in the **%** text box (the green tick and red cross symbols will appear when you start typing) e.g.:
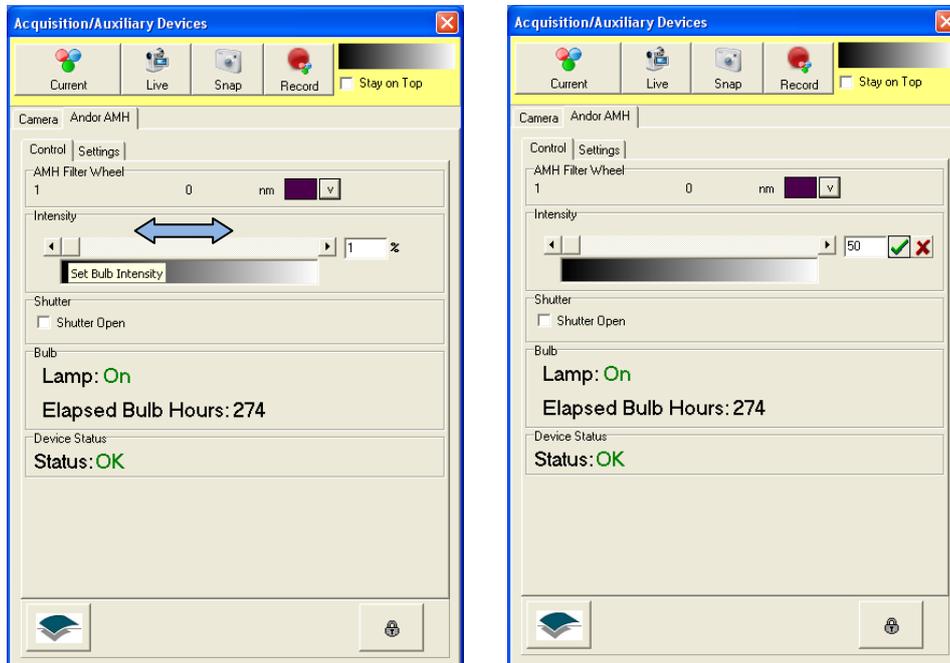
NOTE: ✓confirms your intensity entry, ✗allows you to revert to the previous value without change.

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3. The intensity selected is then shown in the % text box, e.g.:
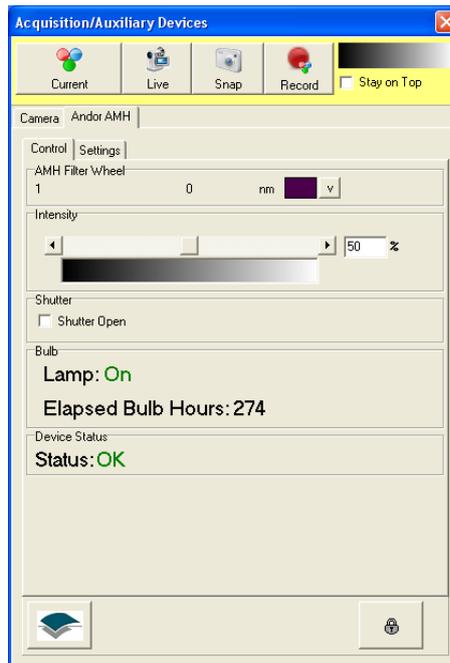
4. In order to launch light into your microscope, tick the **Shutter Open** option, e.g.:

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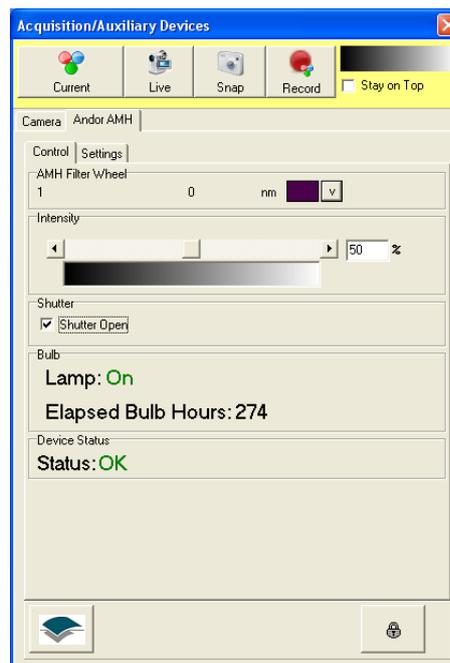
3.4.5 - Filter identification & setting (AMH-200-F6S only)

To name & describe filters carry out the following procedure:

1. In the **Andor AMH** tab of the **Acquisition/Auxiliary Devices** console, **right-click** on the [v] button of the **Control** sub-tab. The filter name/labels drop-down list will become active, e.g.:
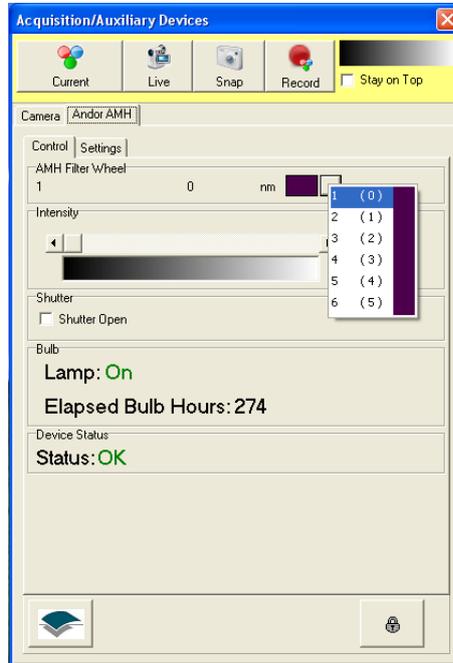
2. Right-click on the filter wheel position you want to describe and the **AMH Filter Wheel** dialog box will appear, e.g.:
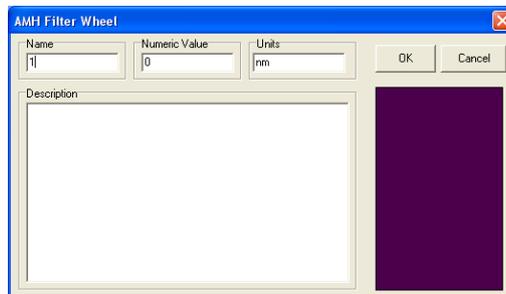
3. Type in the required **Name** (maximum 6 characters) and **Numeric Value,** e.g. centre wavelength (maximum 3 characters) in the appropriate boxes, e.g.:
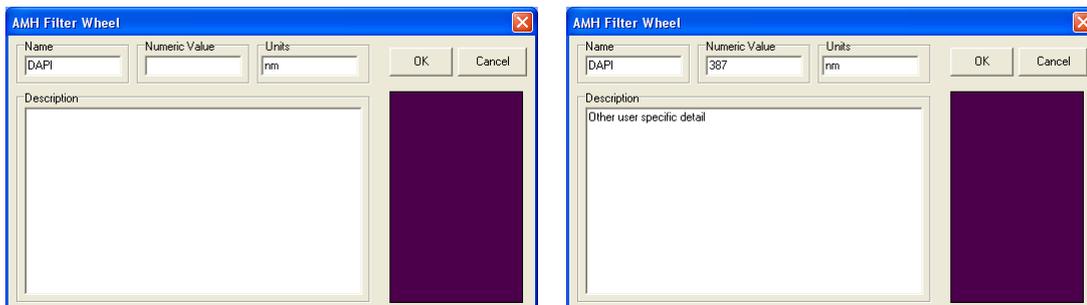
NOTE: User-specified information can be typed into the Description area as shown above

4. Repeat **step 3** until all your filters have been defined

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5. An example of a fully defined list is shown here:
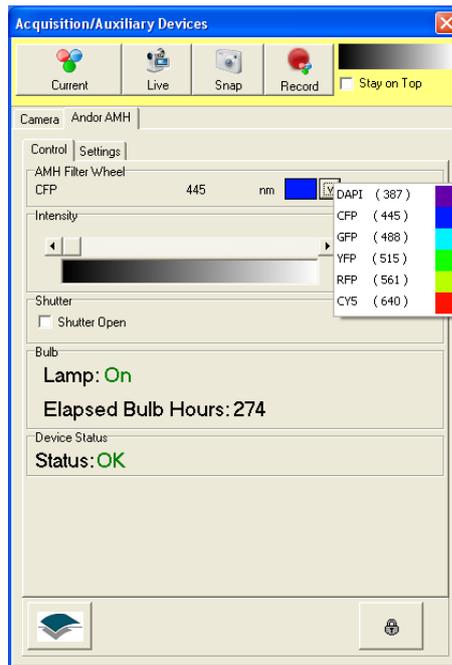
6. To select the required filter, left click on the button and move the mouse down until the filter you want to select is highlighted, then **left-click** on the filter you want to use. The selected filter will now appear on the **AMH Filter Wheel** area of the **Acquisition/Auxiliary Devices** dialog box e.g.:

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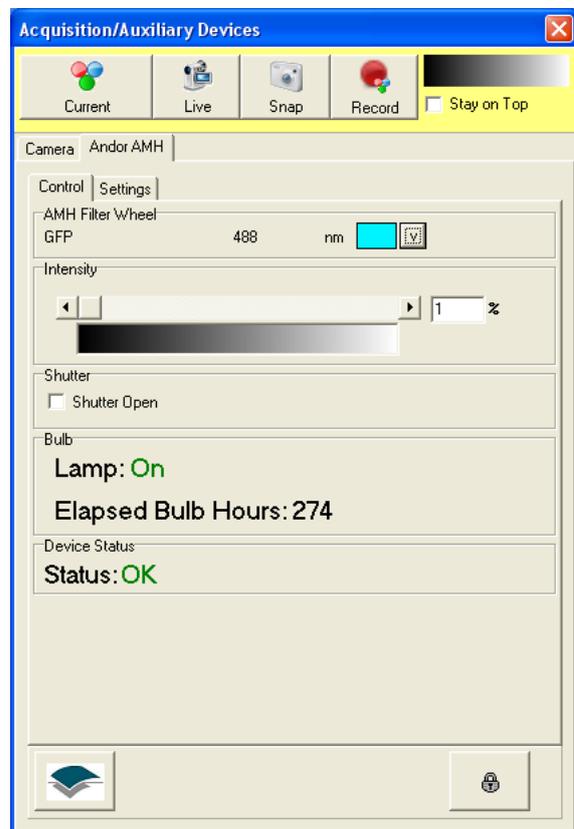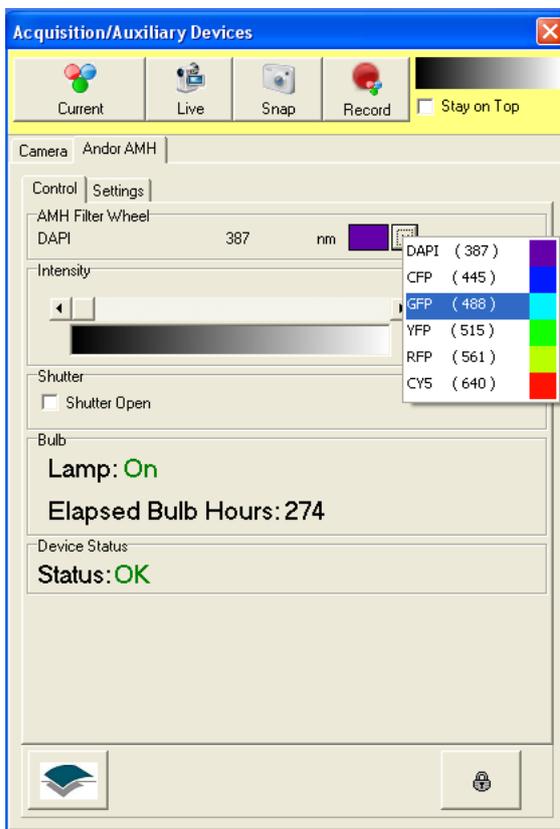
In the **Andor AMH** sub-tab of the **Acquisition/Auxiliary Devices** dialog box, the following status information is available:

- Lamp On or Off
- Elapsed Bulb Hours
- Device Status

An example is shown here:
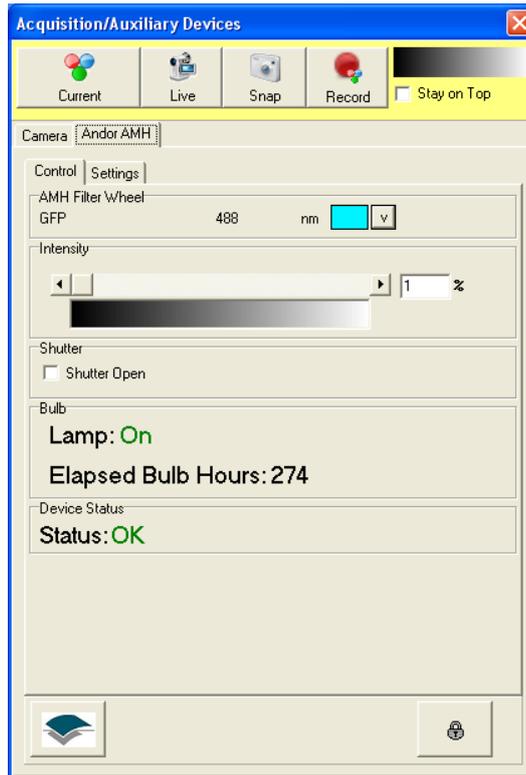
3.5 - FILTER INSTALLATION (AMH-200-F6S ONLY)

The following tools are required:

- Filter ring access tool

- 2 mm Hex Allen key

- Protective gloves

Access to the filter wheel inside the AMH-200-F6S is made using the following procedure:

1. Disconnect the AMH from mains power

2. Allow the unit to cool for a minimum of 10 minutes

3. Place the unit on a flat surface with a clear space in front it

4. Unscrew and retain the 3x hex screws from the side of the unit as shown below:

5. Lift the top of the unit then place it carefully to one side:

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SECTION 3

6. Turn the filter wheel by hand until the desired filter position is in the filter change position (the filter number is displayed on the top left of the filter hole):

7. Filter rings are keyed to allow easy removal with the supplied filter ring access tool. To unscrew the filter ring, locate the keys into the matching slots of the filter ring and turn it anti-clockwise. When you have removed the filter ring, you can then proceed to remove any filter already in the recess:

8. Place the new filter in the recess and secure it in position using the filter ring. Take care not to over tighten the filter ring as some filters will expand as they are heated by the light

9. Repeat the process for all filters as necessary

10. Replace the top of the unit and secure back into place with the 3 hex screws

Your new filter set is ready to use.

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SECTION 3

SECTION 4 - MAINTENANCE

THERE ARE NO USER-SERVICEABLE PARTS INSIDE THE CAMERA. DAMAGE CAUSED BY UNAUTHORISED MAINTENANCE OR PROCEDURES WILL INVALIDATE THE WARRANTY.

4.1 - REGULAR CHECKS

- The state of the product should be checked regularly, esp. the integrity of the External Power Supply and the mains cable
- Do not use equipment that is damaged

4.2 - ANNUAL ELECTRICAL SAEFTY CHECKS

- It is advisable to check the integrity of the insulation and protective earth of the product on an annual basis, e.g. U.K. PAT testing
- Do not use equipment that is damaged

4.3 - FUSE REPLACEMENT

- Prior to replacing any fuse, ensure that mains power has been removed from the unit
- Also refer to the table in **Section 1.2** and the bottom photograph in **Section 1.3**

The characteristics of the fuse used in the unit itself are as follows:

Rated Current: 5 A

Rated Voltage: 500 V a.c.

Size: ¼ × 1 ¼ " (6.35 × 32 mm)

Type: Very fast (FF), high breaking capacity

The actual fuse used in this product is a SIBA 70-125-40 5A.

In the U.K, Ireland and some other countries, the supplied mains cable has a BS 1363 (or Type G) plug that includes an integrated fuse. The characteristics of a replacement fuse are as follows:

Rated Current: 3 A

Rated Voltage: 240 V a.c.

Size: ¼ × 1" (6.3 × 25.4 mm) cartridge

Type: BS 1362

4.4 - CLEANING (EXTERNAL)

Only use a dry, clean, lint free cloth to clean all external painted surfaces and the LCD window panel. If necessary, use a water diluted detergent to lightly dampen the cloth - do not use Isopropyl alcohol, solvents or aerosols.

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Caution:

- Contamination can easily be burned into the surface of the Liquid Light Guide output

- If cleaning is considered necessary, ensure that absolutely no visible contamination remains on the fibre end after cleaning

To clean the end of the Liquid Light Guide, wipe the exposed surface carefully using a lens tissue lightly soaked in Isopropyl alcohol, e.g.:

If the end of the Light Guide has become permanently damaged, contact your Andor representative to order a suitable replacement.

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SECTION 4

The internal dust filters require cleaning every 12 months of use and the procedure is as follows:

1. Remove the two screws holding the rear cover on:

2. Turn the unit upside down and remove the remaining screw :

3. Turn the unit onto its feet and pull the rear cover away from the main body of the unit:

4. Remove the filters from their housings:

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SECTION 4

5. Wash the filters in warm soapy water.

6. Rinse the filters in clean water and allow them to dry

7. Replace the filters

8. Replace the rear cover ensuring the isolator switches are beneath the cover:

Isolator switches
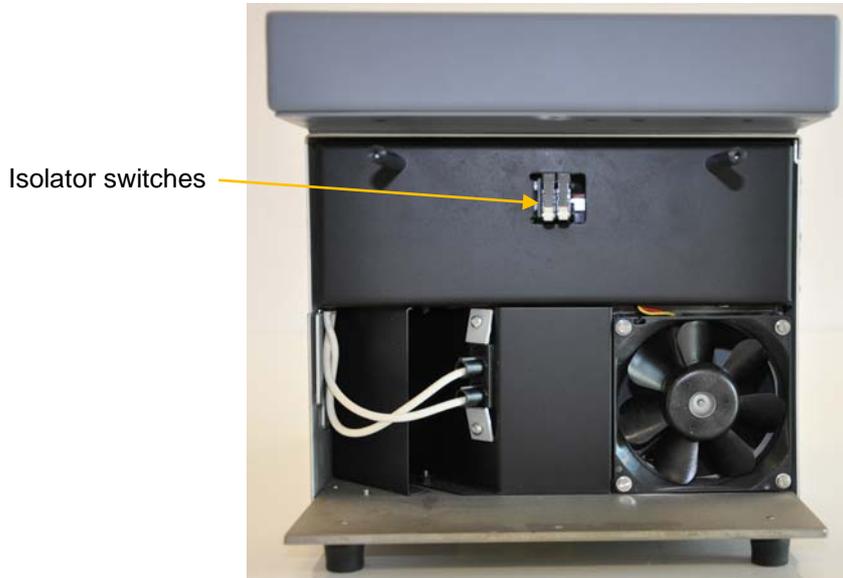
9. Secure the cover back in place using the retaining screws

SECTION 5 - TROUBLESHOOTING

Unit does not switch on

- Check power cord is plugged in and connected correctly to mains supply
- If the unit still does not switch on, check the correct fuse (Andor part number TR-AMH-200-FUSE) is properly installed
- If the unit still does not switch on after the checks above have been carried out, contact Andor Technical Support

No light output from unit on start-up

- Confirm that the unit is plugged in and powered on and that it has been allowed to warm up for at least 2 minutes
- Check the LCD display to confirm that the unit is not counting down and that no error codes are being generated
- When using the unit without iQ, confirm that the LCD is displaying a value other than 0%. If it is, toggle the shutter button to confirm that the shutter is open and that the unit has been configured with an intensity value other than 0%
- When using the unit under iQ control, check that the intensity level has been set to a value other than 0% and that the shutter check box has been ticked

Illumination is not bright on initial start up

- If there is still no light being launched into your system, check that the Liquid Light Guide is installed correctly (please refer to **Section 2.2** for details)
- Finally, check that lamp is installed correctly (please refer to **Section 2.2** for details)

NOTE: Wait 30 minutes after shutting off the illuminator before opening the lamp house access panel.

Low light level after lamp replacement

- Check that lamp is located correctly in its retaining socket (please refer to **Section 2.2** for details)

NOTE: Wait 30 minutes after shutting off the AMH before opening the lamp house access panel.

Just changed lamp and alarm sounds continuously

- Check for error messages on display.
- Bulb Fault 1 on Display:
  ➢ Turn off your AMH and confirm that the Data Connector is installed correctly into its socket (please refer to **Section 2.2** for details)
- Bulb Fault 2 on Display:
  ➢ Turn off your AMH and confirm that the bulb power plug is correctly inserted into its socket (please refer to **Section 2.2** for details)

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- Check for error messages on the display
- **"Change Bulb"** instruction on display:
  - ➤ Your lamp is approaching or has exceeded 2200 hours of operation. Replace the lamp as soon as possible.
- **"Over Temperature"** warning on display
  - ➤ If possible confirm that the ambient temperature in the room is not higher than 28°C
  - ➤ Confirm that there is at least 100mm of clearance between the fan vents and any nearest obstruction. If necessary adjust the unit's position until the 100 mm clearance requirement has been met
  - ➤ Your AMH unit must be power-cycled

Fan stopped warning on LCD

- Check that no foreign bodies are obstructing the fan's rotation

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SECTION 5

1. In these Conditions:

'**BUYER**' means the person who accepts a quotation of the Seller for the sale of the Goods or whose order for the Goods is accepted by the Seller.

'GOODS' means the goods (including any instalment of the goods or any parts for them) which the Seller is to supply in accordance with these Conditions.

'SELLER' means Andor Technology plc.

'CONDITIONS' means the standard terms and conditions of sale set out in this document and (unless the context otherwise requires) includes any special terms and conditions agreed in writing between the Buyer and Seller.

'CONTRACT' means the contract for the purchase and sale of the Goods.

'WRITING' includes telex, cable, facsimile transmission and comparable means of communication.

2. Any reference in these Conditions to any provision of a statute shall be construed as a reference to that provision as amended, re-enacted or extended at the relevant time.

3. The headings in these Conditions are for convenience only and shall not affect their interpretation.

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A2 - STANDARD WARRANTY AND WARRANTY SERVICES

1.1 Introduction

1.1.1 This document describes the general Andor Standard Warranty policy and procedures as it relates to services obtained by a Customer under warranty. It does not replace or supersede any Product or Customer specific Warranty terms and conditions.

1.1.2 Warranty is a guarantee of quality of supplied goods (Software & Hardware). It is an obligation to rectify or replace product defects during an agreed period of time.

1.2 Standard Warranty Policy

1.2.1 Andor's Limited Standard Warranty Policy on Hardware warrants all new products to be free from defects in materials and workmanship for 12 months from the date of dispatch. (Exceptions to the standard hardware warranty offer exist and are shown in 1.2.2, 1.2.3 below). Within this period, Andor will, at its sole option, repair or replace any components which fail in normal use. Such repairs or replacements will be made at no charge to the Customer for parts or labour; however, the Customer shall be responsible for any transportation and insurance costs from the Customer premises to the Andor designated point of return. Andor shall be responsible for transportation and insurance costs related to returning the repaired or replacement unit to the Customer. The customer shall be responsible for any import duties, taxes and customs clearance fees associated with the return of the unit. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alterations or repairs. Andor assumes no responsibility for special, incidental, punitive, or consequential damages, or loss of use.

1.2.2 The following hardware components have warranties greater than 12 months:

Vacuum Warranty: Andor provides a 5 Year warranty on its UltraVac^{TM} seal. The UltraVac^{TM} seal provides a permanent hermetic vacuum head, which protects the CCD sensor. Should the vacuum fail during the warranty period Andor will repair the vacuum and the components protected by it (including the CCD sensor). If you suspect a vacuum failure, typically shown by degradation in quantum efficiency or cooling performance then you should stop using the camera immediately and contact your seller support representative. Continued use of the unit once vacuum failure is suspected will void the warranty on the sensor and the components held inside the vacuum. Components protected by the vacuum, but damaged or defective due to any cause other than vacuum failure, are subject solely to the standard warranty terms.

ICCD: Andor provides a 2 year warranty for its ICCD products. Any damage caused by laser burn, bleaching of the photocathode (brought about by over illumination of the cathode) or ion damage of the cathode (brought about by excessive numbers of photoelectrons in the Multichannel plate) will not be covered by the warranty.

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1.2.3 The following products and parts have specific warranty limitations:

X-RAY Cameras: Andor's standard warranty terms apply to x-ray cameras except for the sensor and other exposed parts, which are not covered in those models a) where the sensor is openly exposed (typically DO/DX models) and/or b) where the sensor is used for the direct detection of x-ray photons.

Sensor: Andor does not warrant sensors to be completely free from defects.

Items considered as consumables are not covered under this warranty, including but not limited to the following items: cables, fibre optics, filters.

Third party products not manufactured by Andor are not covered under this warranty. The customer will only be entitled to the benefit of any such warranty or guarantee as is given by the manufacturer to Andor unless specifically agreed in writing by both parties.

1.2.4 Andor guaranties that the supplied Software substantially conforms to published specifications - original license. Andor does not warrant software to be error free or that Customers will be able to operate software without problems or interruptions. The standard software warranty period is 12 months from dispatch.

1.2.5 During Warranty, customers have access to Andor support to report product defects only. Warranty does not include training or consultancy services.

1.2.6 The Warranty period is deemed to start at the date of dispatch from Andor's manufacturing facility.

1.2.7 Customers must notify the Andor customer service centre within 30 days of taking delivery of a product or part they believe to be defective. Andor will refund all fees associated with the return of any product that has been reported as defective within 30 days of delivery.

1.2.8 Failure to pay invoices when due may result in the interruption and/or cancellation of the standard warranty.

1.2.9 Andor warrants the replacement or repaired parts/components to be free from defects in materials and workmanship for twelve months from the date of dispatch or for the reminder of the warranty period, whichever is longer.

1.2.10 For products returned under warranty Andor will extend the complete product warranty by 30 days.

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Hardware and Software WARRANTY SERVICE

1.3 Service Description

1.3.1 The Andor Repair service provides a repair and return service for defective products supplied by Andor under a supply contract. Using this service the original, defective part sent in by the Customer will be, where possible, returned after repair or will be replaced. Any warranty obligation contained in an Andor supply contract will be carried out in accordance with this Repair Service.

1.3.2 In order to be eligible for warranty repair or replacement, the equipment must be suffering a defect which meets the criteria set out in the supply contract and must be within its specified warranty period. Services such as upgrades to Hardware and Software are excluded from the scope of this service description and should be ordered separately.

1.4 Access to Service

1.4.1 A Customer who has purchased their product via a reseller or third party and who believes they have a warranty defect should in the first instance contact a representative of their seller's product support team. Customers who have bought products directly from Andor can access the Service Desk at www.andor.com/contact_us/support_request .

1.4.2 The Customer should indicate that they are pursuing a warranty claim and specify the equipment type and the contract under which it was supplied. The Service Desk representative will then work with the Customer to establish the nature of the defect and to determine whether the reported defect is one which meets the criteria under the supply contract for warranty remediation. This process will comprise question and answer between Service Desk and Customer and the Service Desk operative may, at their sole discretion, ask the Customer to perform some basic diagnostic actions in relation to the problem item.

1.5 Hardware Remediation

1.5.1 If the issue cannot be resolved remotely and a fault has been diagnosed, a Return Materials Authorization ("RMA") number will be issued. This RMA number will be valid for 30 days from the date of issue. An RMA number must be obtained from Andor prior to the return of any material. The RMA number must appear clearly on the outside of the shipping container and on return paperwork included inside the package.

1.5.2 Following allocation of a RMA number by Andor, the Customer shall ship the PART to Andor at customer expense. The customer is responsible for return shipping and insurance costs. Any products returned without an RMA number may be refused and returned to the customer at their expense. Andor shall provide a single point of return for all products.

1.5.3 On receipt of the part at the Andor repair facility, Andor shall carry out the necessary fault diagnosis and

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repair and return the part to the Customer.

1.5.4 The method of shipment and choice of courier for the return will be at Andor's discretion. Delivery Duties Unpaid (DDU) Incoterms 2000. Andor does not guarantee the arrival time of the part.

1.5.5 Customer must adhere to Andor packing instructions (including anti-static precautions) when shipping the defective unit as any damage incurred during shipment to Andor will not be covered under warranty. The packing instructions can be obtained from Andor as part of the part request procedure.

1.5.6 If the part is not economically repairable then a replacement part (new or refurbished) will be supplied at Andor discretion and expense.

1.5.7 In case of replacement the replacement unit becomes the property of the Customer on an exchange basis.

1.5.8 In case of misuse the Customer will be contacted to decide the course of action. These actions may include:

- Scrapping the part
- Return of the defective unrepaired part to the Customer
- Replacement with a new or refurbished part. Andor will invoice the customer the full merchandise contracted customer price of the unit.

1.5.9 Unless elsewhere agreed between the Customer and Andor, this service does not include root cause analysis, the provision of fault reports or lead-time and performance metrics.

 1.6 Software Remediation

1.6.1 During Warranty Customers have access to the Service Desk at www.andor.com/contact_us/support_request to report product defects. A Customer who has purchased their product via a reseller or third party and who believes they have a software warranty defect should in the first instance contact a representative of their seller's product support team.

1.6.2 Where as a result of the process described in 1.3.2 above it is determined that the defect relates to software, a trouble ticket will be logged in respect of the software issues observed.

1.6.3 Under the warranty provisions of the supply contract we will not provide the customer with a guaranteed SLA (service level agreement) for their problem.

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A3 - THE WASTE ELECTRONIC AND ELECTRICAL EQUIPMENT REGULATIONS (WEEE) 2006

Where appropriate, Andor has labelled its electronic products with the WEEE label (crossed out wheelie bin) to alert our customers that products bearing this label should not be disposed of in a landfill or with municipal waste. If you have purchased Andor-branded electrical or electronic products in the EU after August 13, 2005, and are intending to discard these products at the end of their useful life, Andor are happy to assist.

The cost for the collection, treatment, recycling, recovery and sound environmental disposal of these goods at the end of its useful life has not been included in the price. If you require help/assistance regarding the disposal of this equipment please refer to our website, or contact our sales team at which point instructions and a quotation can be provided.

A copy of the Company's WEEE Policy can be viewed at the Company website www.andor.com .

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