eco-eye

Set up and Operating Instructions Eco-eye SMART

Efficient technology for today's world

V1.1 06/2011

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1. Introduction

Eco-eye Smart is a sophisticated electricity monitor that helps you better understand your electricity consumption and raises awareness of where you can make savings. By seeing your usage in easy to understand formats such as cost per day or Kilowatts per month, you can identify where changes can be made which will reduce your electricity consumption.

The large, uncluttered screen features a single numeric value for each display option and allows you to view any mode (KW, Cost, Amps, etc.) with any time period (hour, day, week, month or year). You can choose your own total daily usage target (KWh) which is constantly displayed graphically, whilst a real-time mode displays the actual percentage of target used. The 'traffic light' load indicator shows whether the current load is in line with your chosen settings. The 'accumulator' option allows usage to be measured over any time period.

Eco-eye Smart is a wireless device which utilises cutting edge micro-power technology avoiding the need for mains power connection. It updates every 4 seconds – that's over 20,000 updates a day - yet a pair of standard batteries has an estimated life of 12 -18 months in the transmitter and 12 -24 months in the display. Being battery powered enables you to move freely and seek out those power hungry devices. Optional AC mains adaptors can be used at the transmitter and display if preferred.

The Eco-eye Smart also allows detailed data analysis, with or without connection to a computer. You can transfer data to a PC, either in real-time using our USB interface cable* or with data logged to our Eco-eye Memory Card*. The Eco-eye Memory Card has 10 years' storage capacity at a resolution of 4 seconds and can be analysed in close detail on a PC using our open source 'Trax' software.

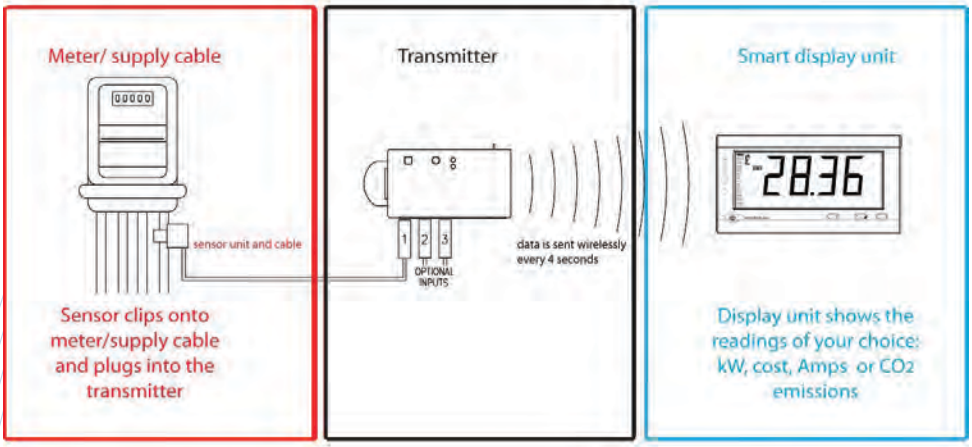
Eco-eye Smart is firmware upgradable by the user and is equipped with transceiver technology enabling bi-directional wireless data transfer ensuring that it is compatible with the evolving Eco-eye energy management product range.

*Optional items

2. Installing Eco-eye Smart

2.1 Overview

Eco-eye Smart has three components - the sensor, the transmitter and the display unit. The sensor clips around any live cable (usually at the meter or the fuse box) and monitors the total current passing through it.
This is simple to do without disturbing or cutting any wiring or the need for a qualified electrician. The sensor is then plugged directly into the transmitter and data is sent by radio to the display unit which translates it into meaningful numbers.



Measure
Sections 2.2 and 2.3

Transmit
Sections 2.4

Display
Sections 2.5

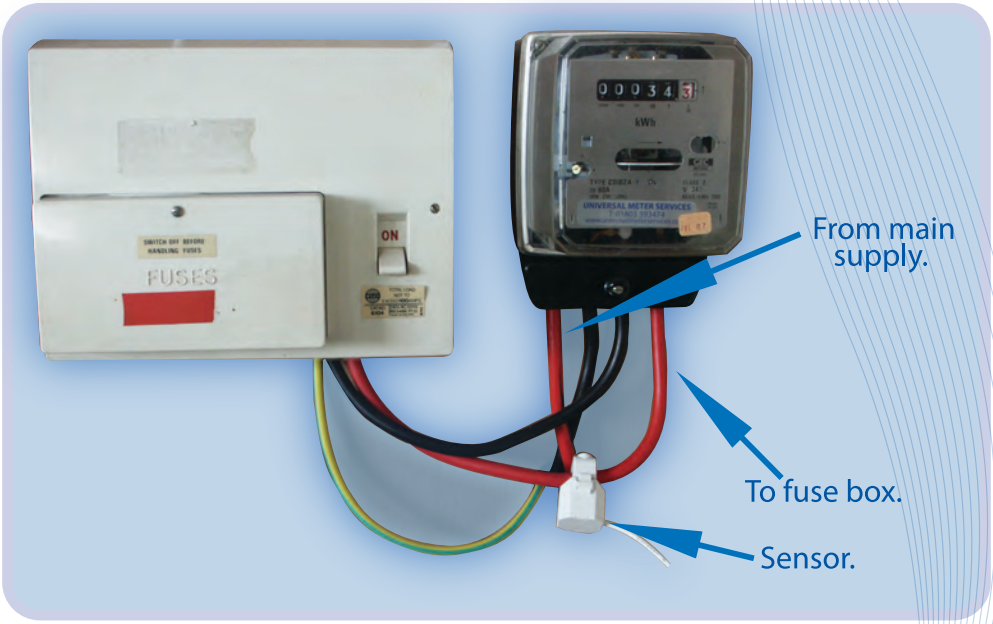
2.2 Find Your Electricity Meter and Fuse Box

Locate your electricity meter – an access key is supplied which you may need if your meter is in an external utility bo. Find the live cable - this is normally the 4th cable from the left and **goes from your meter to the fuse box**.

It is usually coloured or marked with red or brown. If the meter is situated remotely or in an external box, you can fit the sensor onto the live cable either at the meter or inside the property where it enters the fuse box. Inside the property is best in order to improve signal strength.

Eco-eye Smart will only work with **individual cables** (i.e. not multi-core cables).

It is not intended for the direct monitoring of individual appliances.



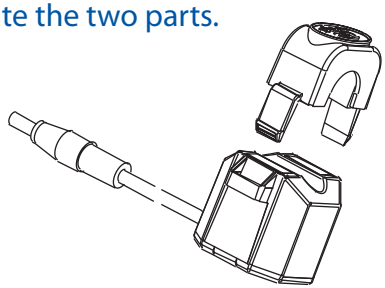
Note - No harm will be done to your monitor or to the electricity supply if the sensor is inadvertently fitted around an incorrect cable.

IF IN ANY DOUBT regarding the installation of this product, consult a qualified electrician before proceeding.

2.3 Attach the Sensor to the Cable

The sensor is in two parts and clips around **any live single core cable up to13mm in diameter**. If the sensor will not fit round the cable you may be trying to use the wrong cable.

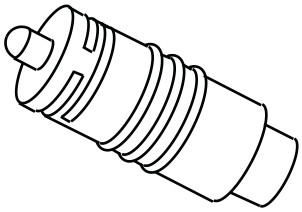
Press the side clips of the sensor to separate the two parts. Place it around the cable.



Click shut - Do not force the clip to close around a cable which is too large. The faces of the sensor on both sides **must** make contact.

The sensor is designed to be a **loose** fit around the cable. Alternative sized sensors are available on request.

Use the live cable tester if you need to check that the sensor is clipped around the correct electricity cable. Fit it to the end of the sensor cable - the LED will illuminate if the cable being monitored is live.



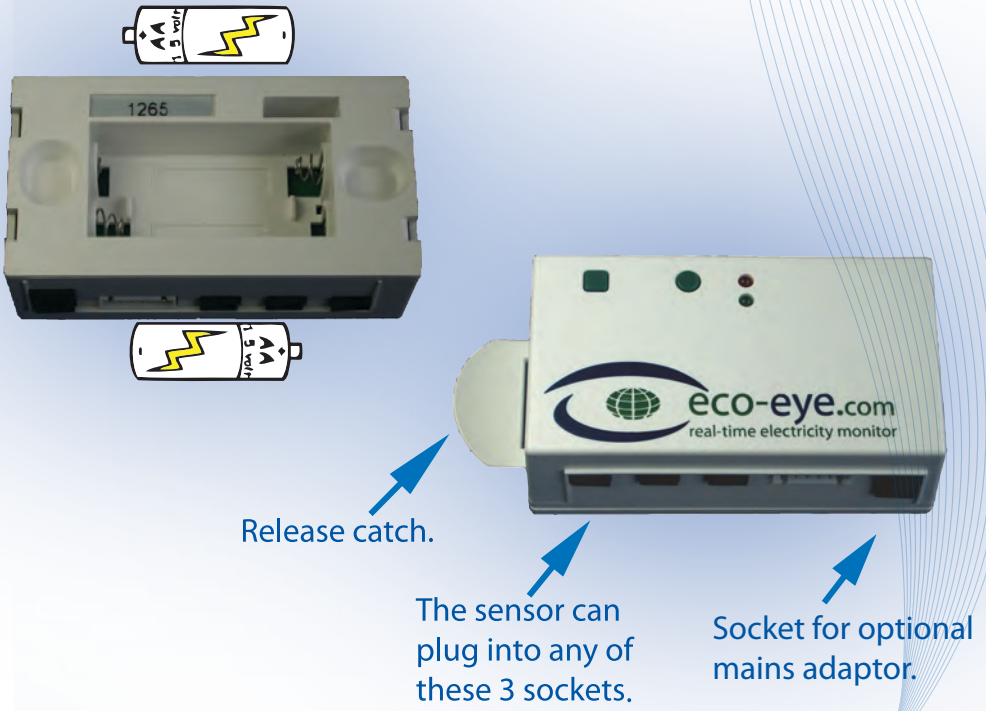
Remember to remove this tester before continuing set up but keep it somewhere safe for future use.

The sensor unit may buzz, especially when not connected to the transmitter; this is perfectly normal and is nothing to worry about.

2.4 Connect the Sensor to the Transmitter

Plug the sensor cable into any one of the sensor sockets on the underside of the transmitter. Press the release catch to remove the wall plate and use the self-adhesive pads supplied or screws (not supplied) to affix in a convenient position close to the cable being monitored. Make sure the release catch is on the left side.

Fit 2 x AA batteries into the transmitter making sure they are the right way round (see below). The light should flash twice (brightly) and emit a regular low intensity flash every 4 seconds. This shows that the wireless signal is transmitting correctly. A solid light indicates an irregularity. If this is the case, remove the batteries and recommence the start-up procedure.



2.5 Power up the display unit

Remove the battery cover from the display unit (and Eco-eye Memory card if installed) and insert 2 x C Cell batteries, ensuring they are in the right way round. Replace the battery cover.

After a short power-up routine you need to input some basic information:

1. Set the currency – use ◀ and ▶ to select £, $, €
   Press ■ to store.
2. Set the date (year, month and day) -use ◀ and ▶ and press ■ to store.
3. Set the time in hours and minutes - use ◀ and ▶ then press ■ to store.

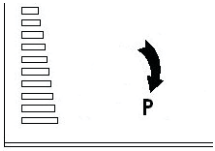
Note: Setting the currency automatically selects the most appropriate country specific values for voltage, and KgCO2. These values can be further amended by the user if necessary.

2.6 Is it working?

If the sensor and transmitter are connected correctly, the display will automatically show the current kW reading and one of the load indicator lights will flash with every incoming signal (every 4 seconds).
Try switching the kettle on; you should see the big number go up and probably the red light will flash.
Remember that the transmitter talks to the display by radio so check that  is visible at the bottom right side of the screen. If it is not visible or flickering have a look at the Common Questions section for answers.

3. The Display

3.1 Predicted Mode



Predicted mode shows you how much electricity you are using right now. You will see the arrow and P when you are in this mode. For instance, if you were showing 1.25KW in the hourly time period, you would consume 1.25KWh in the next hour if you maintained this level of usage.

If you were showing £3.58 in the daily time period, you would consume £3.58 worth of electricity in the next 24 hours if you maintain that level of usage.

3.2 Modes

The different ways of seeing your electricity usage are referred to as "modes".

To view the different "modes" press on the left of the display.

The **modes** are:

(i) Kilowatts
(ii) Cost
(iii) Amps
(iv) Kilograms of CO2 being released while your electricity used
(v) Percentage of your daily target you have used so far.
(vi) Clock, calendar and temperature.

For modes (i) – (iv) the number will go up and down as you switch things on and off, a bit like a car speedometer.

Modes are changed with the round green button.

3.3 Time Periods

You can view (i) to (iv) of these modes in different time periods by pressing on the right of the display.This is the amount of electricity that would be used if you maintained the current level of usage for the selected time period.

The **time periods** are

- Hour
- Day
- Week
- Month
- Year

Time periods changed with the green oblong button

So for example if you are using 250 watts (.250Kw HOUR) the DAY display would be 6.000 Kw, WEEK would be 42Kw etc. They all still change in real-time so should not be used to forecast your electricity consumption.

3.4 Accumulator

There is one extra time period which is the accumulator- this is identified by the calculator icon . This is similar to a car trip meter and shows total usage since Eco-eye Smart was set up or it can be reset to track a particular period not covered by history (see next section)

The accumulator does not go up and down like the other time periods – just up as electricity is used. Reset by pressing and holding down until CLR is displayed followed by 0000.

3.5 History - How much did I use yesterday?

It is useful to compare your current usage with previous usage on a regular basis. Eco-eye Smart stores a 128 day usage summary which can be viewed in Kilowatts, Cost, Amps and KgCo2 and % of target. (Note the graph continues to show today's target.)

To view history press ◀. You will see that the predicted arrow disappears and an arrow with H appears.

You can now press the ◀ and ▶ to move through the history.

As you press each ◀ and ▶, the display will show you which day you are looking at. i.e. – 1 day (yesterday), -2 day (2 days ago), -3 day (3 days ago)etc. followed by the total usage for that day

When you have finished with History, press the green right hand rectangular button ▬ to return to predicted mode.

Daily history is available in Kw, Cost , Amps and KgCO2 modes.

3.6 Daily Usage Target Graph.

The Daily Usage Target Graph is an easy way to track how much electricity you are using over a whole day and provides an instant visual aid to help you save electricity. Unlike most targets, this one is not something you are aiming to reach. Choose a target for how much electricity you think you should use each day - you are aiming to keep within this.

The bar graph on the left of the display shows your progress to (or over) this target.

Eco-eye Smart uses a default daily target of 12 Kilowatt hours which is an average amount for many households. This may be too high or too low but can be changed to make the graph realistic to your own situation.

As the graph needs to show under and over target, the middle of the graph is 100% - all of your target. Over the middle, you are over target.

(i) **(ii)** **(iii)**

(i) The bars fill up from the bottom and the long bar midway flashes to show your target is **under** the 100% threshold.

(ii) When the long bar midway stops flashing you have **reached** your total daily target. You may want to think of ways you can modify your usage pattern to avoid reaching this limit in future.

(iii) When **TARGET** flashes on screen (and the bars fill up over the 100% mark) you have **exceeded** your total daily target – the bars will continue to fill up to the top 200% mark (double your target). At this point the **whole graph** and word **TARGET** will flash. You should review your targets and/or usage. If you have already taken steps to be as energy efficient as possible, you should reset your target to one which is more appropriate.

3.6.1 Making your Target Realistic.

Eco-eye Smart is supplied with a default target value suitable for most households.
The first thing to do is to use History to see your daily usage. Obviously some days will be higher than others. If you are out during the week but at home on Saturdays and Sundays you will probably find that you use more at the weekend. It is best to base the target on weekday usage, maybe setting it bit higher than Monday to Friday but less than Saturday and Sunday.

For example if you look at your history on a Saturday morning you might see the following

-1	-2	-3	-4	-5	-6	-7	-8
Fri	Thurs	Wed	Tues	Mon	Sun	Sat	Fri
10.0 (KWh)	9.8	10.1	10.2	9.9	13.5	12.2	10.5

So, on weekdays you are using about 10 KWh but about 13 KWh at the weekend. If you set your target to 10 KWh you should be able to keep your weekday usage under control but the weekends will be over – but still within the range of the graph. Not a problem but maybe it would help you cut down at the weekends!

3.7 The Red, Amber and Green Traffic Light Load Indicators

The 'traffic light' system shows the **instantaneous load** in relation to the thresholds that have been set and alert you to excessive or abnormal usage.
Eco-eye Smart uses default threshold values which can be reset to user requirements. A red, amber or green light flashes every four seconds.

GREEN (Low usage) – the electricity load currently used is within your chosen lower threshold.

AMBER (Medium usage) - the electricity load currently used is approaching your chosen upper threshold – check if your electricity consumption can be reduced or reset this threshold to a more realistic value.

RED – (High usage) - the electricity load currently used is exceeding your chosen upper threshold. Unless you know of a good reason for this, you should try to reduce your consumption or reset this threshold to a more realistic figure for your lifestyle.

3.8 Changing the Target and Traffic Light Load Indicators

Whilst in the % **target mode**, press and hold . The value displayed is the total daily KWh target value and can be adjusted as required using and
Press to store - the **amber** load indicator light will then illuminate. The value displayed is the instantaneous KW load at which this light will flash. Adjust as required using the and .

Press to store - the **red** load indicator light will illuminate. Adjust the value at which this light will flash in the same way and press to store all settings and return to normal predicted (real time) operation.

4. Changing Settings

Overview

To get the best out of your Eco-eye Smart there are a number of things you can modify to make it respond in the best way for your situation. Some of them are mentioned elsewhere in this manual but this section gathers them together.

Generally, to change any of these, you use the ● to select to a particular mode then press and hold the ▬ until SET is shown on the display (about 3seconds). Then use ◀ and ▶ to change the number. Once you have the correct number entered, press the ▬ again to store the change.

4.1 Changing the unit cost for electricity

Eco-eye Smart is supplied with a default value of 15p for unit cost but for greater accuracy you should change this to the actual unit cost. This information can be found on your latest electricity bill. This is entered as a value with 3 decimal places by pressing and holding ▬ when in cost mode. Unit cost is displayed in pence – so a display of 0.133 is 13.3 pence per unit.

4.2 Changing the voltage

Smart measures energy use in Amps. To get the Kilowatt figure it needs to know the normal voltage of you supply. The default is 240 Amps but this can be changed to help calibrate Smart with your meter. This is changed when Kw is on the display. Press and hold ▬ until SET is displayed and change the value using ◀ and ▶. Press ▬ to set.

4.3 Changing the value for CO2 emitted when making my electricity

Generating electricity releases CO2 into the atmosphere. The amount varies according to the fuel used. Eco-eye Smart uses published average statistics for this value.

This can be changed when KgCO2 is on the display. Press ▬ and hold until SET is displayed and change the value using ◀ and ▶. Press ▬ to set.

4.4 Calibrating the Temperature Value

It is possible to calibrate the temperature display.
This may need to be calibrated against a known temperature value. This is changed when the thermometer is on the display. Press and hold until SET is displayed and change the value using and Press to set.

4.5 Changing the Radio Channel

If the readings on the display are strange and do not react to you switching electrical equipment on and off, you could be getting interference or be picking up the signal from another Eco-eye nearby.

You should change the channel number on both the transmitter and the display – the number must be the **same on both.** The default channel number is cH2 – there are 30 channels to choose from.

Transmitter: The transmitter channel number should be changed before that on the display unit. Remove the batteries. Press and hold the whilst at the same time reinstalling the batteries.
The green LED will illuminate. Release the button, then immediately press it the same number of times as your chosen channel number e.g. Press 5 times for Channel 5. The red LED will flash (brightly) the same number of times as the channel number selected before emitting a low intensity flash to confirm the process has been completed.

Display: The channel number on the Smart display must be changed to match the channel set on the transmitter. Use to scroll to the AMPS screen. Press and hold until ch02 and SET appear.
Use the and to select the same channel number and press to set.

5. Common Questions

1. The display is blank?
Check the batteries are correctly fitted.

2. The big number is 0.00 and the lights are not flashing?
Check that the transmitter light is flashing every 4 seconds.
Does it work when you take the display closer to the transmitter and press the ?
Check the transmitter and display are the same channel.

3. The big number is 0.00 and the lights are flashing?
Check the sensor with the tester to ensure it is monitoring a live cable. Then, make sure the sensor is plugged into the transmitter.
Have you fitted the sensor to the right cable?

4. The big number is not 0.00 but is changing, but not when I switch things on and off?
This could be that you are receiving a neighbours eco-eye or there could be an interference.
Try changing the transmitter and display to a different channel.

5. Sometimes it works and sometimes it doesn't?
Try moving the transmitter to a different location and make sure the red wire is extended and upright. Ensure the  is visible and not flashing. An extension cable is available that allows the transmitter to be mounted further away from the sensor. This can be used to improve radio reception.

6. I have got solar panels and Smart is not showing the right numbers?
You can only monitor cables where the current always flows in the same direction. See www.eco-eye.com for advice on use with solar panels.

7. I have put my SD card in and Smart is not writing to it?
The only cards that will work with Smart are specially preformatted Data Storage cards supplied by Eco-eye.
Details of Trax and using Smart with a computer are available separately.

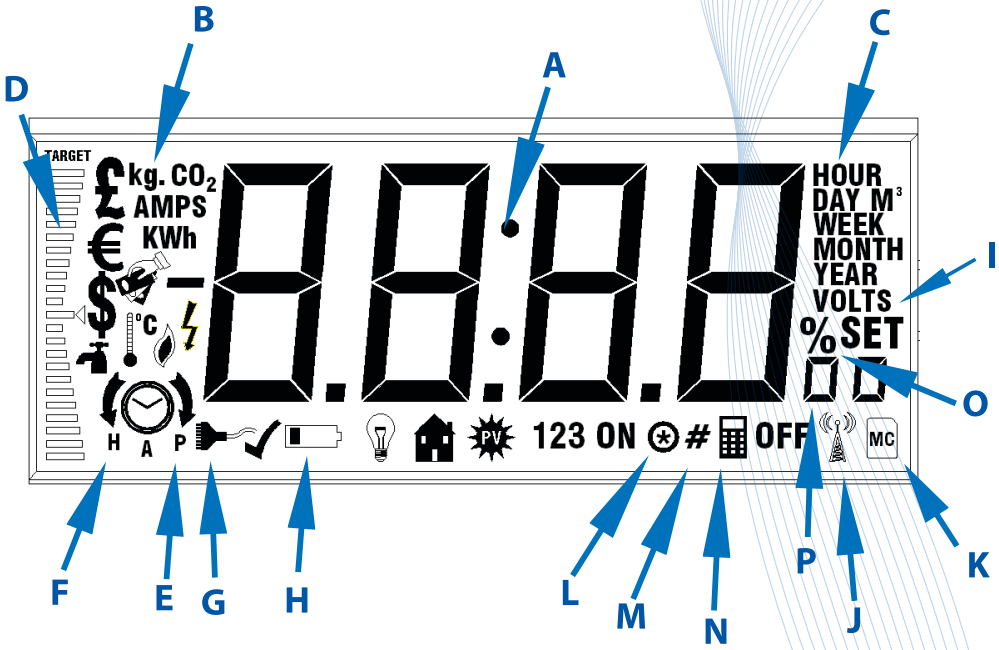
8. How do i check that the battery is ok?
On the Smart Display, the low battery indicator will come on.
You can check the battery voltage by going to the temperature display and pressing the
Smart needs the voltage to be over 2.2 volts to operate correctly.

9. None of those – I need more help?
support@eco-eye.com should get you an answer within 1 working day.
Supply as much information as possible including pictures if you think they might help.

6. Smart Quick Reference

1 Real time load lights
2 History clear button
3 Mode select button
4 Arrow keys
5 Time period button or Hold to change settings (section 4)
6 Power adaptor sockets
7 Battery compartment
8 Memory card socket
9 USB data cable socket
+ Positive end of batteries
- Negative end of batteries

7. Guide to the screen



A. The Big Number
B. Modes
C. Time Periods
D. Target graph
E. Real-time (predicted) display
F. History display
G. Used during firmware upgrade
H. Low battery indicator
I. Used when setting Voltage
J. Good radio reception
K. See Trax manual
L. See Trax manual
M. See Trax manual
N. Big number is accumulated
O. Big number is target %
P. Overflow, used when big number goes over 9999

Some icons are not used in this version of Smart but are on the screen ready for planned upgrades.

8. IMPORTANT - Safety and Care

1. Before attempting to fit Eco-eye, ensure you have read and understood the fitting instructions fully.
2. Do not attempt to carry out any repairs to Eco-eye. Contact your retailer or Eco-eye direct if problems occur.
3. Use of Eco-eye near moisture or liquids; or in extreme temperatures can cause malfunction and damage.
4. Take care when handling and disposing of batteries. They can cause burns to skin or property if in contact with heat, conductive or corrosive materials. Remove batteries when storing Eco-eye for long periods to avoid corrosion.
5. The LCD screen is glass and should be treated carefully to avoid scratches. Should it become damaged, it may leak crystals which could be harmful to your health. Dispose of with great care.
6. Eco-eye should only be cleaned using a damp cloth. – Under no circumstance should any chemicals or cleaning agents be used.
7. Do not subject Eco-eye to any form of impact or shock.
8. **IF IN ANY DOUBT regarding the installation of this product, consult a qualified electrician before proceeding.**

Guarantee

This Eco-eye product is guaranteed for the period of one year from the date of purchase against defects in respect of both material and workmanship.
HOWEVER, this warranty does not apply to normal wear and tear and does not cover any parts damaged by misuse or neglect in any way, or by modifications made by any person other than those working for Eco-eye.
This guaranteed does not cover cracks or scratches to the screen under any circumstance, nor shall Eco-eye be held liable for any direct, indirect, incidental, special or consequential loss or damages whatsoever caused by the use of Eco-eye even if advised of the possibilities of such damages.
In order to validate this guarantee, please ensure you keep your original receipt and read all instructions carefully.

Eco-eye Smart
conforms to quality standards:
CE, PB, RoHS, amendment
2004/108/EC, EN55 022
Class B and EN 55 024 RTTE,
89/336/EEC.

Eco-eye is a trading name of
Modern Moulds and Tools Ltd,
The Modern Moulds Business Centre,
Commerce Way, Lancing,
West Sussex,
BN15 8TA.
Email: info@eco-eye.com
Website: www.eco-eye.com