

Using the O-Lynx Radio system for the first time.

An O-Lynx radio system will consist of the items shown in Figure 1. If you are using the system for the first time then having a practise setup before the event will be worthwhile to get to know how the system operates.

The radios may arrive without the antennas fitted to make shipping easier. Fit these now by screwing into the top of the radios until finger tight. Ideally the

antennas should be kept fitted to the radio units and not removed in between use.



Figure 1: O-Lynx Radio Kit

Locate the “Master” radio. This can be identified by “MASTER” written on the label and also by the “Heartbeat” switch on the right side of the case. This radio is used at the event centre as all other radios are setup to send the punch information back to the “Master”. A 5 metre USB cable is supplied along master to connect to a computer.

Switch on the Master now by pushing the button at the base of the radio. Note the startup sequence that applies to all O-Lynx radios. The 5 LED’s will light up from the bottom, then the unit will beep and the 5 LED’s will show the battery level for about 1 second. For example, fully charged will be indicated by all 5 LED’s on.

Once the startup sequence has finished, the LED’s take on their normal roles as indicated on the units’ label.

The top LED will flash every 3 secs to indicate the unit is powered up.



Figure 2: Master radio

The “Heartbeat” switch turns on when pressed in. Try this now. This will light up the second from top LED every 3 seconds to indicate a heartbeat message is being sent out to all radios. This is used to check range when setting out the “Control” radios at an event.

The “Control” radios are used out on the map and are usually attached to Sportident BSM-7 stations to send the punches at this station back to the “Master” radio. They can also be used stand-alone as repeater type radios to extend the range of the O-Lynx system. Note that all “Control” radios will act as repeaters, whether or not they are attached to Sportident stations and no programming or setup is needed to enable this.

Connect up the Sportident units and Master USB cable to the sockets in the base of the radios. These connectors are keyed to be inserted the correct way around. Once inserted all the way, turn the locking ring to secure the connection.

Turn on the “Control” radios and with the “Master” “Heartbeat” switch in the down position, you should see the Receive (RX) LEDs on the “Control” radios light up in time to the heartbeat signal.



Figure 3: Heartbeat lights off and on.

If 3 of the Rx LEDs light up, it indicates a very strong signal while just one LED means the signal is still OK – if it is regular. If the occasional heartbeat is missed, or no heartbeat signal shows up at all when you are setting up at the event then a repeater “Control” radio will be needed to reach the location.

If you have a SI card, you should also be able to punch the SI stations and see the TX LED light up on the “Control” radio along with the RX LED on the “Master” radio to indicate the punch information is getting sent to the Master.

Setting up a computer for O-Lynx.

Installing the driver for the Master connection.

The serial to USB cable used to connect the “Master” radio requires a software driver to be installed on the PC. This may be supplied with the O-Lynx software or the latest version can be downloaded from... <http://www.ftdichip.com/Drivers/VCP.htm> . Use the “Available as [setup executable](#)” link if downloading from this web page for easiest installation.

The install file will usually be a file with a name similar to “CDM20828_Setup.exe” and can be run by double clicking on the file. This should launch a window which will initially show “Installing driver ...”, followed by a message “Installation Successful” before the window disappears.

Installing the O-Lynx software.

The O-Lynx software can be downloaded from the www.o-lynx.com website. Look under the software link in the web pages menu for the downloads page. Download O-Lynx Event and the O-Lynx Event manual.

Run the install program by double clicking the file you have downloaded. You will be asked where to install the files. Please leave this at the default of “C:\Program Files\O-Lynx”. The next screen will ask if the Nexus database server should be installed. Ensure this is kept ticked. Later on when installing on additional computers that are simply showing results from the master computer, the Install Nexus Server option should be left unticked. Restart the computer after the installation has completed.

When the computer first starts up after installation you may see a message from Windows or your anti-virus software to indicate this is the first time the Nexus Server is being started. Click “UnBlock” to continue. With computers using Windows 10, when you first start the applications, You may also see a Windows message regarding which networks you want to allow the programs to use. Please tick both Private and Public to ensure you do not have issues communicating between the programs at a later stage.

You should now have 3 icons on your desktop for the O-Lynx software and an icon for the Nexus Database Server. As the Nexus Database Server will be set to start when the computer is switched on you should not need this icon unless the server is exited for some reason.

The 3 O-Lynx icons are ...



O-Lynx event – Communicates with the O-Lynx radios. Events details are setup in this program so that the competitors and the courses they are doing can be recognised when the punch information is received.



O-Lynx Results – Provides various windows for displaying information from the radios for commentary and/or spectator use.



O-Lynx Tools – Mainly used just to set the location of the Nexus database server. For example, to provide results on multiple computers, the “Server Address” in the “Database Settings” window of the additional computers needs to be set to the address of the master computer. O-Lynx Tools also provides a link to access remote help if needed.

Plug the O-Lynx “Master” radio into one of the USB ports of the computers. Your setup should now look similar to the one shown. Note the “Master” radio will probably have the blue charging LED on when plugged in to the PC as the USB cable also provides charging power to the radio.

Start up the **O-Lynx Event** program by double clicking the icon.

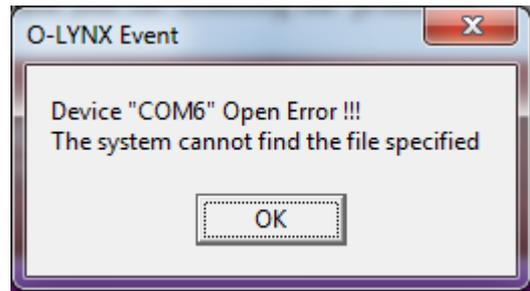


Figure 4: O-Lynx connected to a computer

The first time you start it you may get an error message about a COM port not being found due to the port for the master not being set up. Simply press OK and continue to the main screen.

Down the left hand side of the screen are some icons. Click on the button with the plug to enter the Port Setup window. For the O-Lynx port select the port for the radio connection. This will be listed as a "(USB Serial Port)". The baud rate will depend on the version of the Master radio you have. For most users this should be set at 57600 and there should be a label on the back of the master radio to confirm this. Otherwise try 38400. The "Use" box should also be ticked.

Exit the Port Setup window by pressing the "Save" button. And then close O-Lynx Event and restart.



This time you should see no error message if the correct port was chosen. You should be now able to do a test punch with an SI card. When doing so the TX LED on the "Control" radio should light up followed by the RX LED on the "Master". The punch information with the SI card number, time of punch and "Unknown" as the competitors name should also show up on the status bar of the O-Lynx Event screen.

If this doesn't happen then check the following ...

- Everything is turned on and plugged in.
- The port setup may be incorrect and you may need to change it to try another port.
- If the TX LED light on the "Control" radio does not flash, then the Sportident station may need setting up. For example, it could be set to a start box and so will not send through punch information unless the SI card is cleared. It could also have its "Autosend" property incorrectly set. See **Appendix A** for information on setting up the Sportident stations.

You should now have a basic understanding of setting up the O-Lynx equipment. See **Appendix B** for a guide on attaching the radios to your clubs control stands.

Setting up additional computers.

Once the main “radio” computer is set up, additional computers on a network may be linked to display results at various places such as for commentary and live result boards.

The secondary computers will just need the Results.exe and Tools .exe program files. It also doesn't matter where (what folder on the PC) they go in. For easy setup use the O-Lynx install program to do this, but during the installation, untick the install database server and files question when asked as these are not needed.

Once your network is up and running, the first step is to get the network address of the main computer....

Run the “**O-Lynx Tools**” on the main radio computer - the one that is also the database server. An icon should have been installed on the computers desktop. Press the “**Database Settings**” button and then the “**Lookup Network Information**” button. This will open a window showing a list of possible network connections at the top. If connecting via wireless choose the Network interface that has "wireless" in its wording and click on it.

Look down the information shown in the bottom window for the word **IPAddress** – the value shown to the right is the number you need. E.g. 192.168.2.2 . This is the address network address of the radio computer.

Now this address needs to be set on the secondary computers so they know where to look for the O-Lynx information.

Run “**O-Lynx Tools**” on the other computer, go to “**Database Settings**”, but this time enter the servers **IPAddress** (the numbers from the previous step) e.g. 192.168.2.2 in the “**Server Address**” box and close the window by pushing “OK”.

Now you should be OK to run “**O-Lynx Results**” on the secondary computer and it should automatically connect to the main radio computer.

Note: Sometimes computers may be assigned different network addresses whenever they connect to a network. If this happens the network address you have set up using the steps above will become invalid and an error will occur when trying to start “**O-Lynx Results**”. Repeat the steps above to find and set the correct new address.

Appendix A: Setting up the Sportident stations for use with radio controls.

The course planner has given controls specific numbers. These have been printed on the maps, control descriptions and setup in the computer system. Therefore when replacing an existing control with a radio controls, the same number must first be programmed into the replacement control.

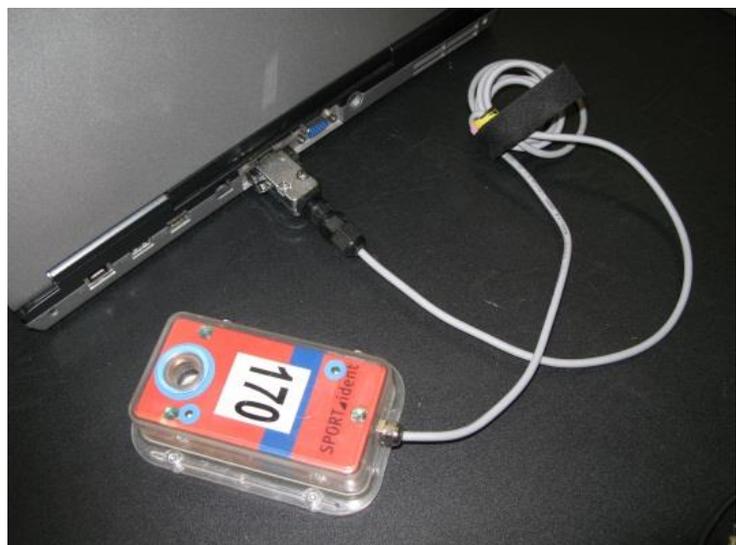
1. **Ensure the PC system and the existing controls have the same time.** This is necessary as the time is programmed along with the control number. All controls on a course **MUST** have their clocks in sync. Note that if the controls will be synchronised later with an SI Time Master however, this step is unnecessary.



Wake up one of the existing controls with an SI card and check the time on the readout underneath the control. Compare this to the time on the PC by clicking on the clock in the lower right hand corner so that seconds can be viewed.

Adjust the time on the PC if necessary to match the SI Control. It is handy to have 2 people to do this – one to read out the seconds from the SI Control and the other to click the OK button on the PC at the right moment.

2. Take the replacement control and fit the serial port adapter so that it will plug into the PC's serial port as shown below. Alternatively a coupling stick can also be used with a master control as when programming standard BS7 or BS8 stations. Note the pickup coil in the BSM-7 box is located close to the top, so if using a coupling stick, place the control station being programmed upside down on the master box.



- Start the SIConfig program and you should see a screen as shown below.

The screenshot shows the SI-Config software interface. At the top, there's a menu bar with 'Program settings', 'View', 'Commands', 'Help', and 'Exit'. Below the menu is a toolbar with icons for various functions. The main window is titled 'SI-Config Prepare stations - basic mode 6/11/2008'. A dropdown menu shows 'remote' selected, and a port selection dropdown shows 'COM7 38400,n,8,1'. The interface is divided into several sections: 'Read' (green header), 'Write' (red header), 'Set time' (pink header), 'Control' (blue header), 'New batteries' (cyan header), and 'Turn off' (yellow header). The 'Read' section contains a table with columns for Ser.no, Firmware, Date, and Function. The 'Write' section has fields for Code no. (13), Working time (02:00:00), and an 'Auto send' checkbox. The 'Set time' section shows a date of 11/01/2009 and a time of 9:48:06 AM. The 'Control' section has a dropdown menu and a checkbox for 'Turn off after write'. The 'New batteries' section shows battery info with a 'Now' indicator at 0%. The 'Turn off' section is currently empty. On the right side, there's a log window showing the following text: 'SI-Config applicable from 6/11/2008 to 6/11/2009', 'Set remote', 'Clear Backup', 'Station written', 'New station time 11/01/2009 9:47:59 AM', 'Set remote', 'Clear Backup', 'Station written', 'New station time 11/01/2009 9:48:07 AM'. A red 'STOP' sign is overlaid on the 'Write' button. Arrows from the text boxes point to the 'remote' dropdown, the 'Read' button, the 'Auto send' checkbox, the 'Control' dropdown, and the 'Write' button.

- Change from “remote” to “direct” if the SI control is plugged directly into the PC. Leave on “remote” if using a coupling stick.

- Press read to get the stations existing details.
- IMPORTANT : Ensure the Autosend box is ticked.**
- Set the control number to what is needed.
- Set the desired function e.g. usually “Control”
- Press “Write” to program the control
- Select “Yes” when asked if OK to program the master station

- Replace the sticker on the control with one with the new number written on it. Check the screen under the control matches what you need i.e. time, type & number.
- The control can then be plugged into the radio and taken out to its position on the course. Ideally a trial set of punches should be carried out and then the SI card downloaded to check everything is setup correctly before the event gets under way.

NOTE: If programming START and FINISH stations, the club may have specific numbers it uses for these type of controls ... e.g. START = 12, FINISH = 13. Normally these numbers don't matter but for radio controls, the numbers are used to recognise the start and finish punches and so must match what is set up in the radio software.

IMPORTANT !!!! If multiple Start or Finish controls are used, they must be programmed with the same number. For example if 2 finish controls are going to be used, they both must be programmed as control 13 (or whatever station number the club normally uses for finish).

SPORTIDENT control numbering notes

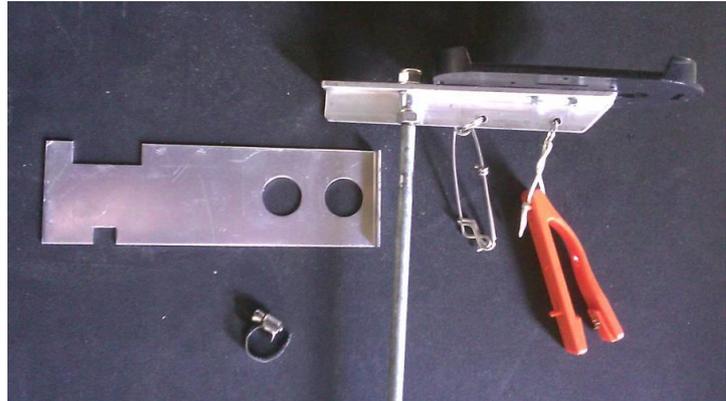
The control numbers assigned to the Sportident controls should be within the range 1 to 255. It is possible to use higher numbers but to ensure compatibility with **ALL** SI cards and event software then **NO** numbers above 255 should be used.

However, if using numbers above 255 is required and you are sure all hardware (e.g. No SI5 cards) and all software will be OK, then the Sportident stations need to be set to send extended messages. In **SIConfig**, use the main menu to go to "View", then tick "Expert View". This will show extra options that can be ticked before programming the station. Tick the "Extended Protocol" box to enable the larger messages that allow for higher control numbers.

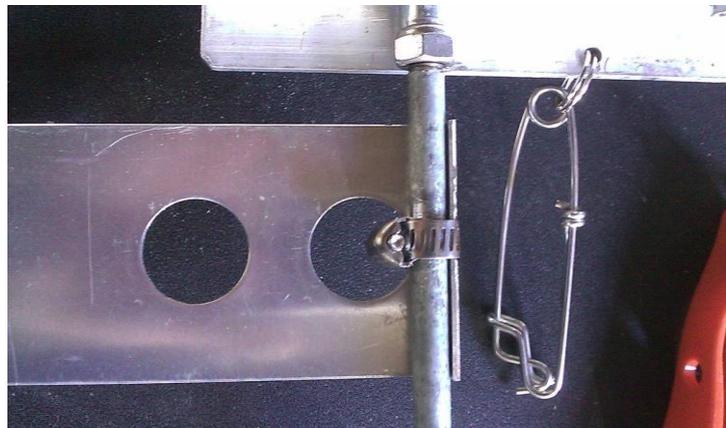
Because a limit needed to be set somewhere, O-Lynx currently expects control numbers to be below 400.

Appendix B: Mounting the O-Lynx radios.

The O-Lynx radios are designed to easily mount to existing controls using the supplied aluminium brackets as shown below. Ensure the bracket is mounted the right way up, with the large notch at the top as shown.



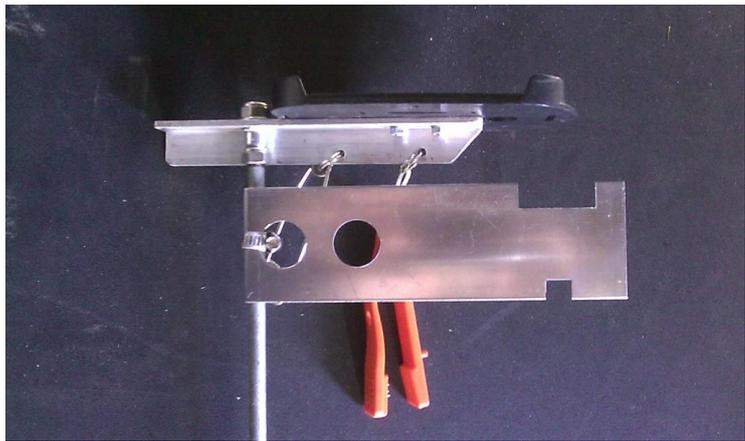
When fitting to round stands (steel, aluminium or fibreglass rods) a hose clip is used to secure the O-Lynx bracket. The round rod of the stand should be placed in the folded part of the bracket and then the hose clip tightened around it. For rented O-Lynx radios or for events where the radios will be only be attached short term, plastic cable ties will also hold the brackets to the stands in place of the hose clips.



The finished stand is shown below along with an O-Lynx radio.



When used on round rods, the bracket can be folded in when not in use to make storing and carrying the stands easier .



Orienteering stands are also commonly made of an equal-angle aluminium profile. The O-Lynx brackets can also easily be fitted to these. If fitting permanently then the mounts are probably best fitted with rivets or bolts. If they will only be used temporarily then a large hose clip or strong electrical cable tie should hold the bracket securely for the duration of the event.



FCC regulation notes.

While the output power of O-Lynx controls is considerably less than that from a standard cellphone, users in the US should note the following information HAS to be advised. The O-Lynx brackets took this regulation into account when they were designed.

RF Exposure:

WARNING: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Appendix C: O-Lynx battery charging and monitoring.

Charging

The standard O-Lynx radios contain a lightweight rechargeable Lithium battery that can usually power the units for at least 16 hours continuously. Usually this will mean 3 events can be done before the need to be charged again.

To recharge the battery, the radios should be plugged into a suitable USB charger using the USB to O-Lynx charging cables as shown.

A blue light will be on while the charging is taking place and go off when complete.



The master radios blue charging light may turn on during an event as it has been designed to charge up via the computers USB port when connected. This uses a low power charging circuit to ensure it is compatible with all USB ports.

O-Lynx radios with higher capacity batteries have also been used on adventure races. These provide the ability to run continuously for at least 48 hours.

Monitoring

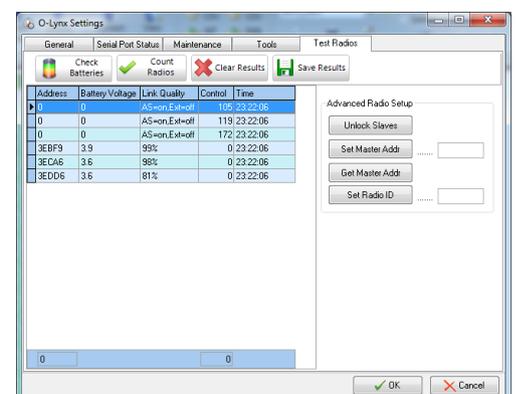
The O-Lynx radios indicate their state of charge when they are tuned on.

The 5 status lights initially light up one after another to indicate the unit is powered up and working. Immediately after this they will show the battery level on the 5 status lights and give a beep. 5 lights means fully charged while 1 light means nearly empty. Ideally when setting up an event you should have at least 3 lights showing to indicate enough charge is available for the event.



The radios battery level can also be checked remotely from the O-Lynx event software. From the main screen, open the O-Lynx Settings window by clicking on the hammer and wrench icon shown on the left edge of the screen. Choose the "Test Radios" tab to see a screen as shown.

Press the "Check Batteries" to show current battery voltages. 4 volts or higher is fully charged, while less than 3 volts should be considered low. The "Check Batteries" button may have to be pressed more than once before all radios are shown.



Appendix D: Setting the Master address for the Control radios.

One of the great features of the O-Lynx radio system is that at events you can just go out and use them. There is no complicated setting up involved as the radios know they need to get the punch messages back to the **Master** at the event centre and just automatically work out the best route to them get there.

In order to do this though, they must know the **'Address'** of the **Master** radio.

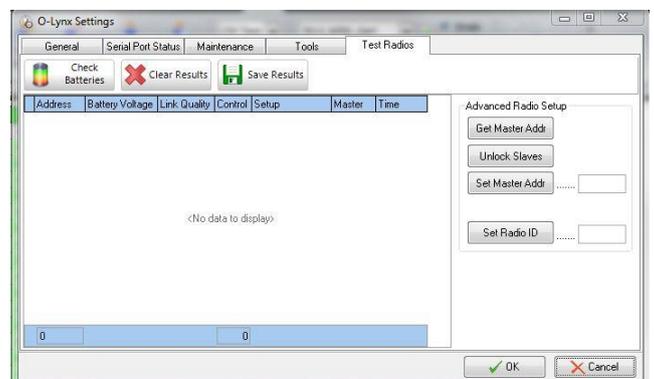
If you received the O-Lynx system as part of a set then usually they will be pre-programmed with the correct **Master 'Address'** and the following instructions will never be needed.



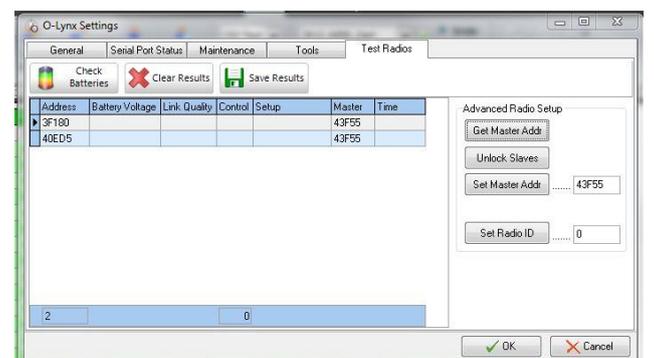
However if you are adding radios to a set or replacing the **Master** radio then the **Control** radios will need to be taught to talk to the correct **Master**. The **Master** radio can be recognised by a "MASTER" label and also has the heartbeat switch on the right side. Most Master Radios will also have red pin striping on the front Panel.

To teach the radios the Master Address, set up the Control radios along with the Master radio and turn them all on. Also connect the master to the computer running the O-Lynx Event software as shown above.

Now start the O-Lynx Event software. Then from the main screen, open the O-Lynx Settings window by clicking on the hammer and wrench icon shown on the left edge of the screen. Choose the "Test Radios" tab to see a screen as shown.



Next find out the **Masters 'Address'**. Press the "Get Master Addr" button. Any powered radios should show up as a list on the left with their current master address setting shown in the "Master" column. The correct Master Address may also show up in the box next to the "Set Master Address" button. The example screen shown here shows a master address of 43F55 with 2 radios set correctly to the same address.



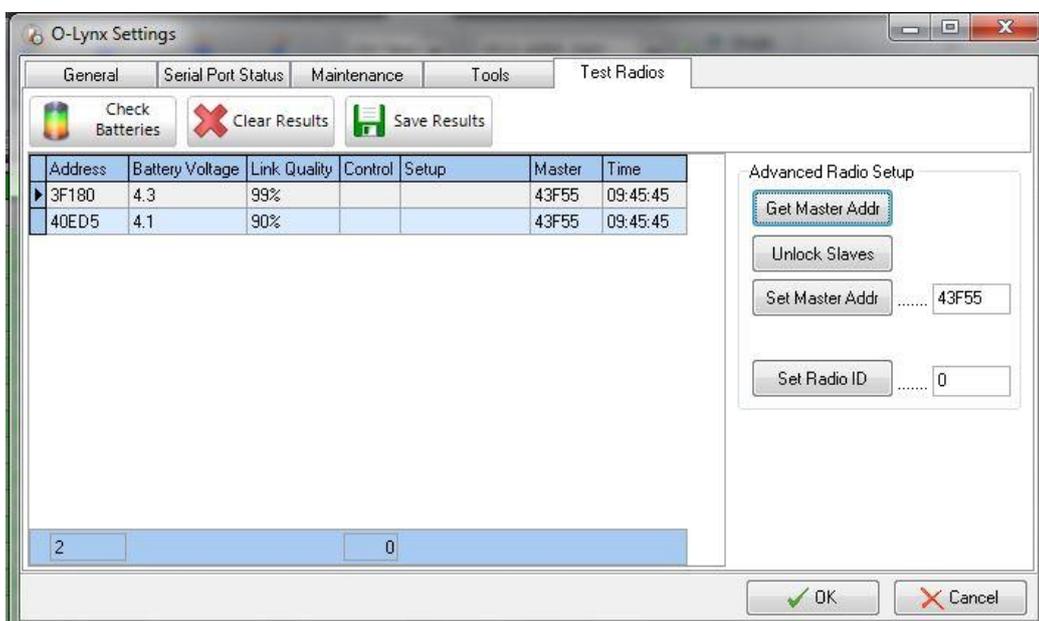
The Master Address is also usually identified on a label on the left hand side of the Master case. If no address showed up in the box next to the “Set Master Address” button, enter this address in this box now. E.g. this photo shows the Master Address as **043F55**



Now follow these steps to teach the radios the correct Master Address.

1. Press the ‘Unlock Slaves’ button. This tells the radios to allow changes to be made to their settings.
2. Press the “Set Master Address”
3. Press the “Clear Results” button at the top of the screen to clear the list on the left so you can test again to check for changes
4. Press “Get Master Addr” to fill the list of radios
5. Check all radios now have the same **Master ‘Address’**.

Finally to test everything is as it should be, once again press the “Clear Results” button. Now press the “Check Batteries” button. The radios will only respond and be shown on the left with their battery readings if their **Master ‘Address’** has been correctly setup.



Appendix E: Replacing the Sportident BSM7 RS232 Connectors.

O-Lynx radios use a locking waterproof connector for connecting securely to the Sportident base stations. This means the D type plugs that come standard on the BSM7 units must be replaced prior to using with O-Lynx.

It is recommended that you purchase the BSM7 RS232 units with the O-Lynx connectors already fitted. However if you already have units that need to be changed over and have someone competent to fit the plugs, these instructions should provide the necessary details to assemble the connectors.

Note : These instructions are provided for use at your own risk. No responsibility is taken for any damage to the base stations or any other equipment that may be caused by following these instructions. Carrying out these steps may also void equipment warranties.

The connector required is LTW Part No. LTWAU-06BFFA-LL7001 and should be available worldwide from mouser.com

Step 1 :

Ensure the base station is turned off and cut the existing connector from the cable.

Step 2 :

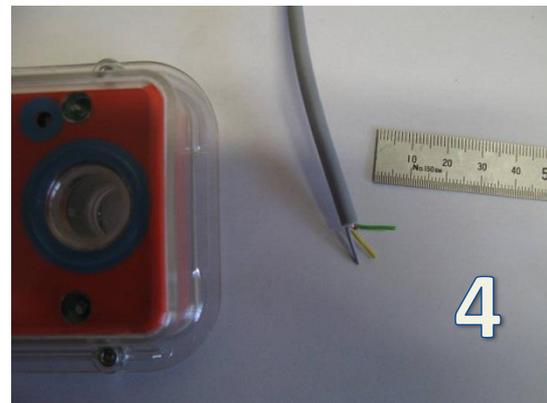
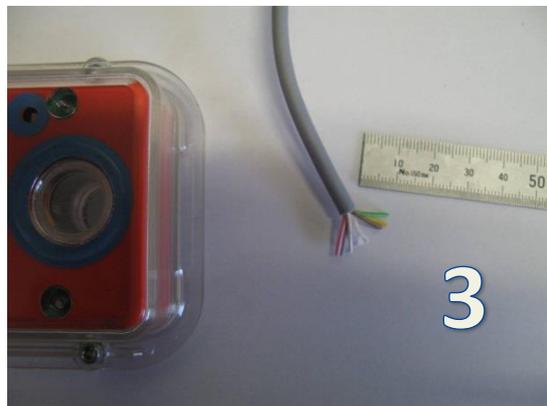
Slide the Velcro cable tie onto the cable.

Step 3 :

Carefully remove 10mm of the cables outer sheath.

Step 4 :

Trim off all coloured wires except Yellow, Green and Grey.



Step 5 : Strip the insulation from the last 2mm of the wires and tin with a soldering iron.

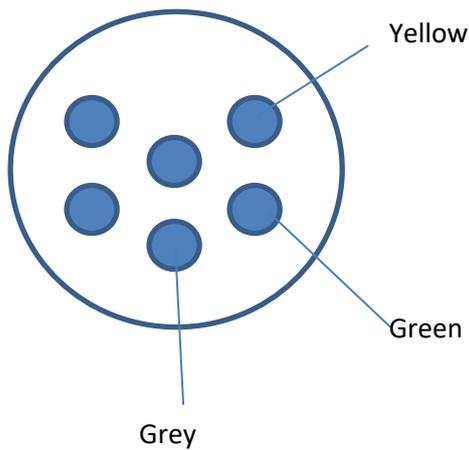
Step 6 : Slide the connector parts onto the cable in the order shown.

Step 7 : Tin the pins of the plug.

Step 8 : Solder the wires onto the plug while being careful not to use too much solder and create bridges between the pins.

Step 9 : Screw the connector together and tighten to ensure watertight.

**BSM7-RS232 Connector Wiring
(Viewed from wire side)**



Appendix F: Making O-Lynx to Serial Port Adapters.

In the event that the BSM7 Stations still need to be connected to a serial port e.g. for programming directly via SI-Config, an adapter is used to convert the O-Lynx waterproof connector back into the standard 9-way serial plug. One of these adapters is normally supplied as part of the starter kit.

However, in case further adapters are needed, the following steps show how these can be easily made from the plugs originally supplied on the Sportident BSM7 serial stations.

Step 1 :

Find the plug and shell removed from the BSM7 Station.

Step 2 :

Disassemble the shell and remove the plug. Then screw the 2 halves of the shell back together.

Step 3 :

Drill the existing cable entry out to 12mm.

Step 4 :

Cut the top and bottom edges off the panel plug.

Step 5 :

Cut the existing wires a suitable length and solder to the panel plug.

Step 6 :

Reassemble the plug and tighten the panel plug nut.

**RS232 to O-Lynx Panel Connector
Wiring**

