

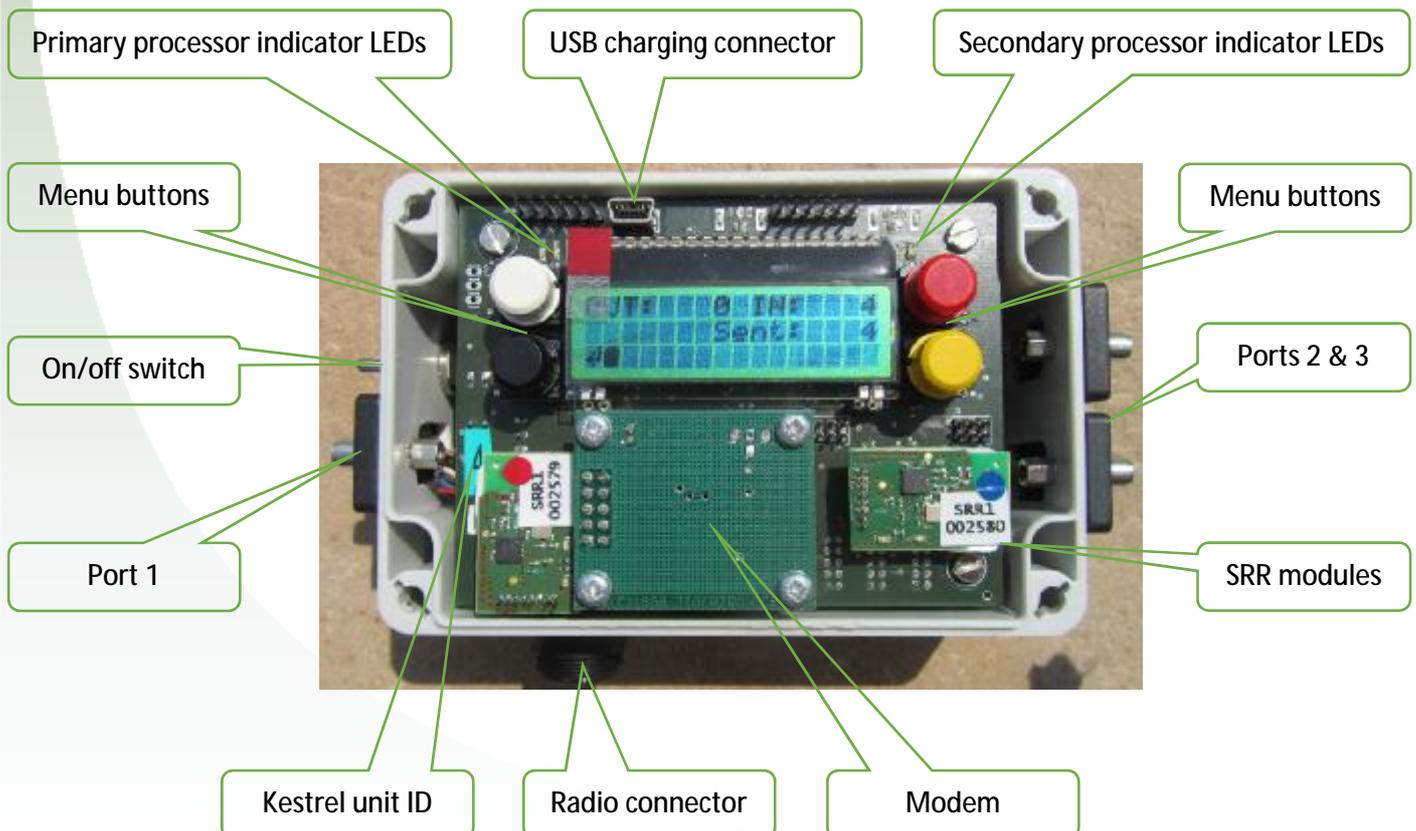
INTRODUCTION

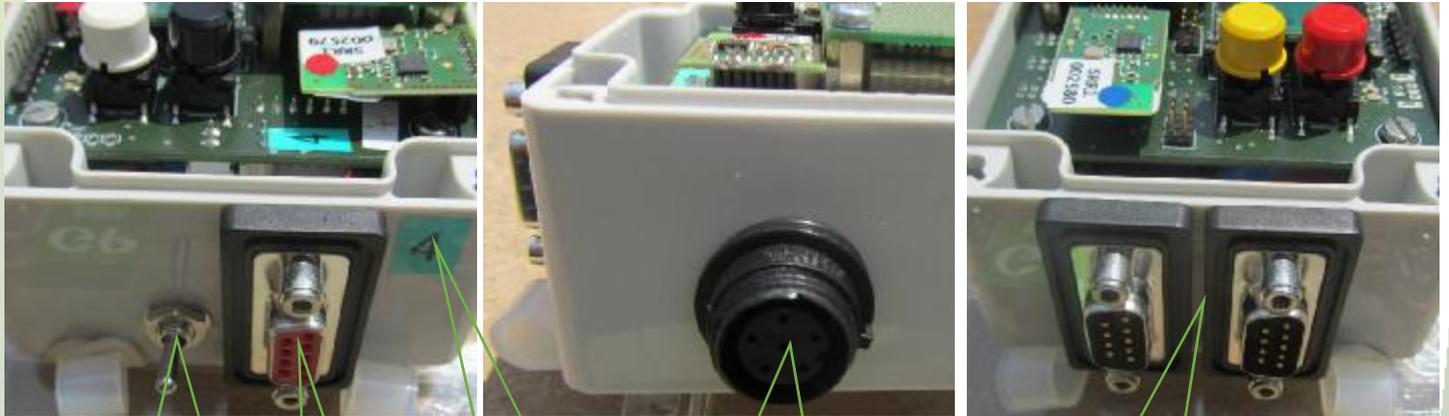


The Kestrel system provides a method of delivering punch data from remote controls wirelessly for safety or commentary purposes. Using FSK radio technology, the Kestrel Control unit sends race data to a receiving Master Kestrel unit connected to a computer running event software. Short Range Radio (SRR) and Merge modules enable greater flexibility and functionality of the Kestrel Control.

EQUIPMENT

ANATOMY OF A KESTREL UNIT





On / Off switch

Port 1

Kestrel unit ID

Radio connector

Ports 2 & 3

SCREEN ORIENTATION

The default screen for the Kestrel unit shows the status of the device.



Out: Indicates the number of punch packets sent out via port 1

In: Indicates the number of punch records received / stored by the Kestrel unit. The 'In' count on the Master Kestrel will be '0'.

Sent: Indicates the number of punch records transmitted by the radio module

- ↶ Menu navigation button
- ↑ Option select up button
- ↷ Option select down button

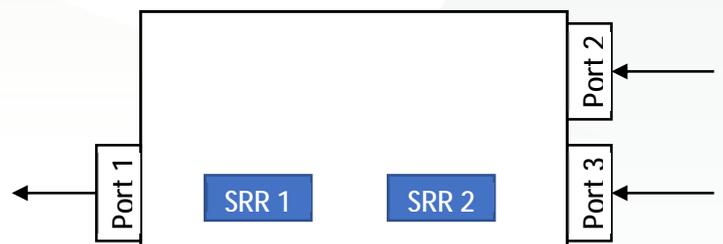
Battery indicator:

-  Battery empty
-  Battery fully charged
-  Battery charging

PORT CONFIGURATION

Port 1 can double as an input by use of a Y-splitter cable.

When in SRR mode, ports 2 and 3 switch to the SRR channels and the external ports are unavailable.





OPERATION

CHARGING

Kestrel units are charged over USB (5 volt). Remove the waterproof lid on the Kestrel unit by releasing the 4 screws (turn by 90 degrees) to attach the USB to mini-USB cable in the charging connector.

Within 30 seconds the battery indicator on the screen will change to the battery charging symbol. The battery

may take up to 6 hours to fully charge. Unplug the USB cable, and check the battery symbol shows full charge.

Under medium usage conditions, the battery in the Kestrel unit should last for approximately two days.

CONFIGURATION SET UP

When the Kestrel unit is turned on, the first screen displayed shows the date and version of the device software. These instructions are correct for version 020815 D0008.

The Kestrel unit is based on a menu configuration system. The four buttons have consistent functions within each menu:

- ~ Black: Move to next menu
- ~ White: Restore setting to factory default
- ~ Red: Move the setting up
- ~ Yellow: Move the setting down

Hardware

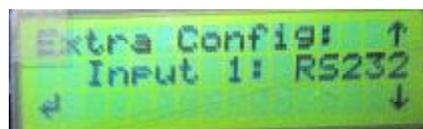


This menu selects what hardware is connected to device. SPORTident operates at either 4800 or 34000 baud rate. When either of the two SRR options are selected, the two SRR channels become ports 2 and 3, and the SRR module LEDs flash red.

The options are:

- ~ SPORTident 4800
- ~ SPORTident 34000
- ~ SPORTident 4800 SRR
- ~ SPORTident 34000 SRR
- ~ Emit

Extra Config

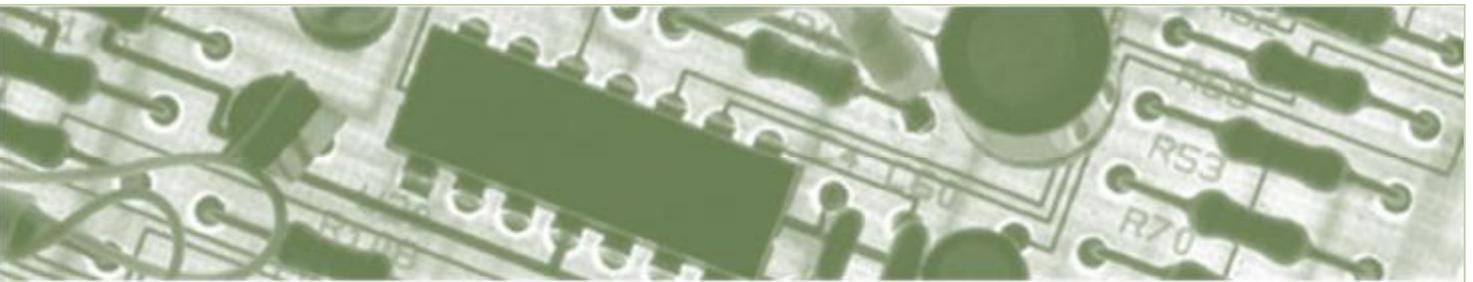


This menu allows the Kestrel unit to be set up as the receiving end of a RS422 feed, e.g. from a wired merge control. Select the input type that will be plugged into port 1: either RS232 or RS422.

Node Address



The node address identifies the Kestrel unit when sending data. It is sensible to set this as the Kestrel ID



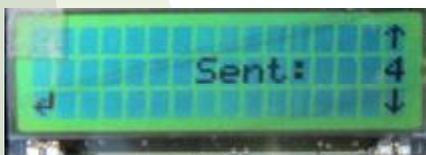
unless the Kestrel is being used as the receiving Master Kestrel (see Master Address).

Master Address



The master address identifies where Kestrel Controls send their punch and status data. Set the number to the node address of the receiving Master Kestrel unit. Conventionally this is '0'. Note: there should only be 1 Master Kestrel unit on a radio frequency channel.

Flash Status



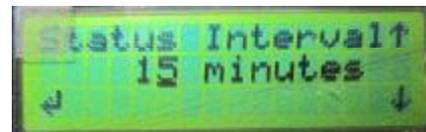
Indicates the current number of records transmitted ('sent') via the radio. Adjusting the number down will force the most recently received records to be resent.

Reset Flash Boot Count



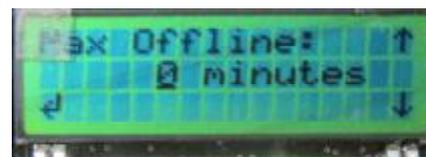
The boot count is the number of times the flash memory in unit has been reset, and helps in time correction by setting a 'baseline'. This should not need to be changed. However, if you need to reset the flash, press the white button on this menu. This will reset the 'Sent' counter to zero and return you to the previous screen for confirmation.

Status Interval



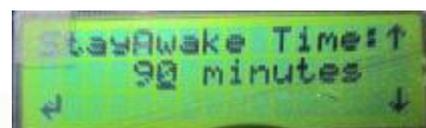
The Kestrel Control will automatically send a status message if there has been no punch data received during the time selected. This allows the receiving end to confirm data is being received from the Kestrel Control, and its current status. To disable this feature set the interval to 0 minutes. The default setting is 65 minutes.

Maximum Offline



The Kestrel Control will go offline after a period of inactivity, as defined in the Stay Awake Menu, which helps to conserve battery if the Kestrel Control is deployed for extended periods. However, when the Kestrel Control is offline, it increases the latency for sending the data. This setting defines how long the Kestrel Control stays offline, assuming no punch data is received. The Kestrel Control will be continuously online if the time is set to 0.

Stay Awake Time



The Kestrel Control will remain online for the defined period after sending a record. Keeping the Kestrel Control online reduces the latency for sending punch data, and allows status packets to be sent. The default time is 90 minutes.



CCA Time



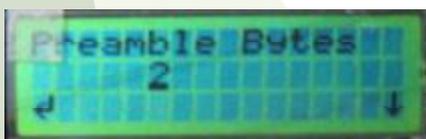
The Clear Channel Assessment (CCA) time defines how long the radio module listens on the channel to see if someone else is using it before transmitting data. Logically, this should be longer than key up time.

KeyUp Time



Different radio types have different 'key up' times. This menu allows you to alter the time the Kestrel Control waits to ensure the radio is fully powered up before transmitting the data.

Preamble Bytes



Defines how many bytes are sent at the beginning of each message (preamble) to allow the Master Kestrel to identify the genuine data stream. It is unlikely that this would ever need to be changed.

Max Packets



This menu defines the maximum length of any one transmission. Increasing the maximum number of

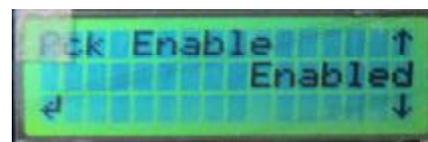
packets makes data transmission more efficient, but will dominate shared bandwidth so we don't recommend changing this number.

NoAck Retries



This menu defines the number of times the Kestrel Control transmits a data packet over the radio without an acknowledgement from the Master Kestrel before expiring the message.

Ack Enable



In a Master Kestrel this menu defines whether messages are acknowledged or not. Disabling acknowledgments increases data throughput (set NoAck to '0') but reliability is likely to decrease.

KeyDown Time



Different radio types have different 'Key down' times. This menu allows you to alter the time the Kestrel Control waits after sending last pack before trying to do anything else on the radio.



DEPLOYMENT

RENTAL KIT

When a Kestrel is rented from GPProjects, the following equipment will be supplied:

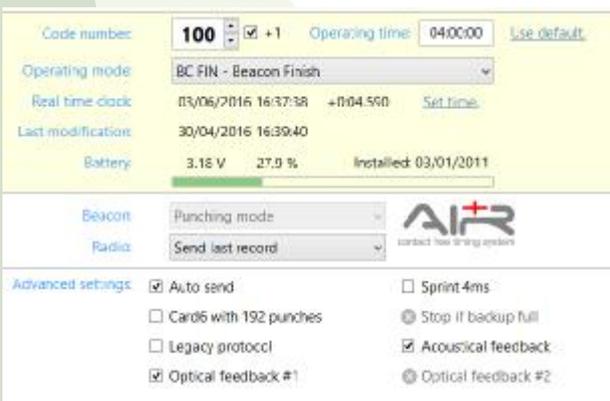
- ~ 2x Kestrel units, one including SRR modules if requested
- ~ 2x TA200 Handi-Pro radios and connector leads
- ~ Y-splitter cable

You will need to source weather protection for the radios.

SPORTident CONTROL SET UP

When using SPORTident controls, use SPORTident Config+ to program the units.

Note, when programming SI control units remotely (i.e. BSF8-SRR units), remember to revert the transmitting unit to a receiving unit before deployment. Simply change connection to 'Direct' and press the 'Read' button.



For an event *without* either SRR controls or Air+

- ~ We recommend the baud is set to 4800 for maximum compatibility
- ~ Under 'Advanced settings', enable 'Autosend'

- ~ Kestrel supports normal and 'Legacy' protocols, but some results software only support 'Legacy'. We recommend checking!

For an event *with* SRR controls but *without* Air+

- ~ We recommend the baud is set to 4800 for maximum compatibility
- ~ Under 'Advanced settings', enable 'Autosend' and disable 'Legacy protocol'
- ~ Check the firmware is 623 or later

For an event *with* Air+

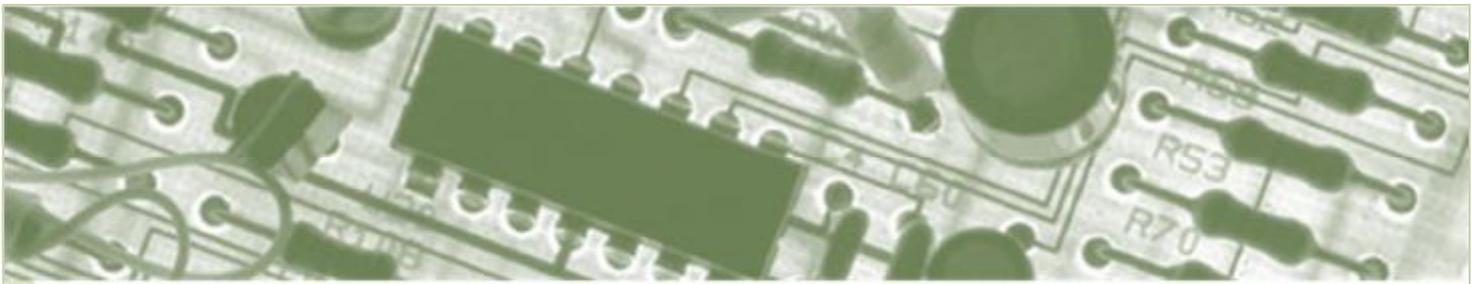
- ~ We recommend the baud is set to 4800 for maximum compatibility
- ~ Set 'Operating mode' to "BC CN – Beacon Control" or "BC FIN – Beacon Finish"
- ~ In the 'Air+' section, set 'Radio' to whatever data you want transmitted (last record, unsent records, all records)
- ~ Under 'Advanced settings', enable 'Autosend' and disable 'Legacy protocol'
- ~ Check the firmware is 623 or later



FUNCTION

The Kestrel Control can function as either a wireless or wired radio control, accepting up to three inputs, two of which can be SRR inputs. It outputs a data feed for transmission over radio, but will also output a RS422 or RS232 feed through port 1. The table below gives the possible hardware set up and menu options:

Function	Hardware	Menu settings	Comments
Kestrel control		Hardware: SportIdent 4800 Extra Config: RS232	
Kestrel SRR control		Hardware: SportIdent 4800 SRR Extra Config: RS232	The SRR control unit can be up to 8 metres from the Kestrel Control. When active the LEDs on the SRR modules flash red. Green LEDs indicate they are being turned on
Kestrel merge	(1) 	Hardware: SportIdent 4800 Extra Config: RS232	If three inputs are required, a Y-splitter cable can be attached to port 1, as shown in image 1, otherwise the RS232-RS422 adaptor can be attached directly (image 2).



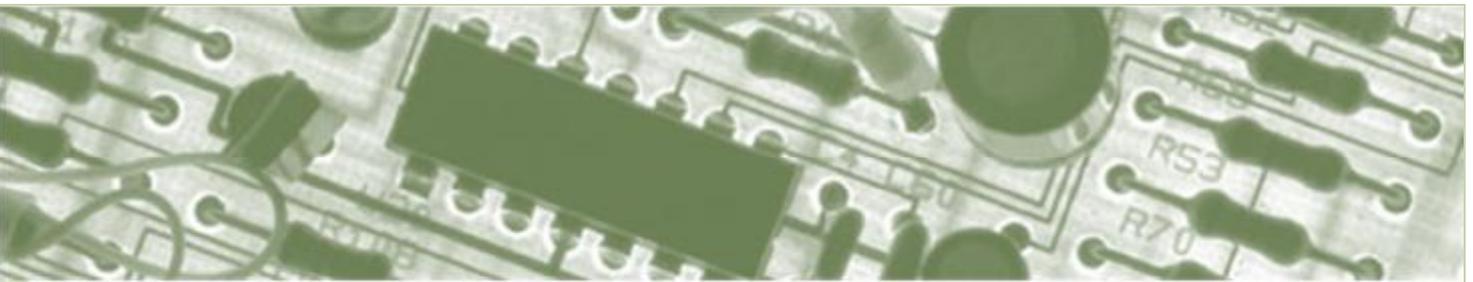
	<p>(2)</p> 		
<p>Kestrel SRR merge</p>		<p>Hardware: SportIdent 4800 SRR</p> <p>Extra Config: RS232</p>	<p>Any accompanying SPORTIdent BSM7-RS232 unit must be plugged into port 1 via a Y-splitter</p>
<p>Kestrel daisy-chain</p>		<p>Hardware: SportIdent 4800 SRR</p> <p>Extra Config: RS232, if connecting units by serial cables, or RS422 if units are further apart and connected by an RJ45 Ethernet type cable.</p>	

AT THE CONTROL SITE

Ensure the screws are tightened (turn through 90 degrees) on the Kestrel Control lid to maintain the waterproof seal. At the control site, attach the radio control(s) and the radio and/or wired link to the Kestrel Control, and switch everything on. The Kestrel Control screen will go through the welcome messages to the base view. Check battery status.

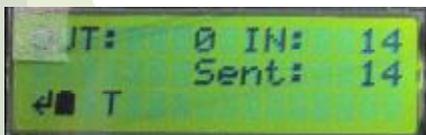
Set the volume level on each radio. Remove any headset and press the 'mon' button on the radio. The white noise should sound 'loud but not distorted'.

Punch radio control, and watch the 'In' count increment. If more than one radio control is attached, punch every one. The 'In' count will include status



updates, so may show a number greater than the number of punches – check every punch makes a corresponding ‘In’ count increment.

Watch the Kestrel Control transmit the data – a T will appear in the screen next to the battery indicator and the ‘Sent’ number will increment by the same number as ‘In’. Depending on the radio you use, you may also be able to see and/or hear the radio transmit the data.



If the Master Kestrel is switched on, with acknowledgement enabled, an ‘Ack’ message will be displayed by the Kestrel Control to confirm receipt of the punch data. This can be helpful to confirm data is being sent and received as expected:



If needed, the red button can be used to create a dummy punch which can be helpful if, for example, your dibber is full. If the Master Kestrel is switched on when a dummy punch is created, the dummy punch will initiate a Ping:Pong communication between the two Kestrel units. You will see the received transmission code ‘PSL F’ and ‘Pong: 000’ appear on the Kestrel Control screen. This can help to confirm the radio link is working.



Finally, using cable ties through the plastic loops on the back of the Kestrel Control, attach it securely to the stake or nearby tree. Place the radio in a waterproof protector (a plastic bag will do), and similarly use cable ties to attach this securely to the stake or nearby tree.

Neatly gather any loose cable and secure with cable ties. If any cable needs to run between the radio control(s) and the Kestrel Control, or between daisy-chained Kestrel Controls, either dig the cable into the ground, or locate the two stakes back to back so that competitors cannot trip over, or damage, the cable.

AT THE RECEIVING END

Function	Hardware	Menu settings	Comments
Master Kestrel radio receiver		Hardware: SPORTident 4800 Extra Config: RS232	When punch records are received a ‘record’ notification will be shown, giving the address of the Kestrel Control.



Similarly, if a dummy punch is created, a 'Ping' notification will be shown, giving the address of the Kestrel Control.



Kestrel merge receiver

(1)



(2)

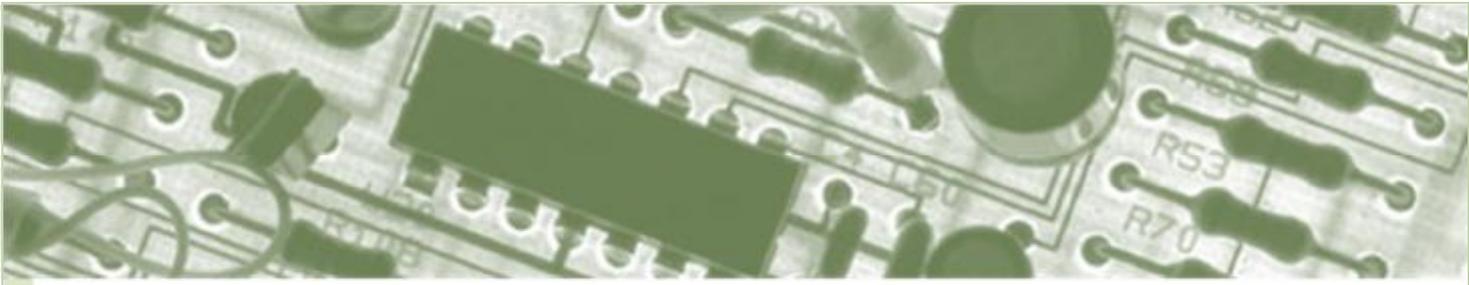


Hardware:
Sportident 4800
SRR

Extra Config:
RS422

At the receiving end of the RS422 cable, connect the RS422-RS232 adaptor to a Y-splitter cable (image 1). The other end of the splitter cable is then attached to your computer by a standard serial to USB adapter.

Alternatively, an RS422-USB adaptor can attach the feed directly to your computer (image 2)



FAQ

Q. I am not receiving data from my radio control, what should I do?

A. Check the Kestrel Control, Master Kestrel, radios and radio controls are all on.

Check the Kestrel Control and Master Kestrel battery level. Check for any Status Messages on the screens - refer to the Product Specification document on our website for more information.

Check 'In'/'Sent'/'Out' status of punch data:-

If punching the radio control doesn't cause the 'In' number to increment, press the red 'dummy punch' button to help identify if the issue is with the control units:

- ~ Check the connection(s) between the radio control(s), radio and the Kestrel Control are securely fixed,
- ~ Check the Kestrel Control is set to receive data from the correct radio control type,
- ~ If using the SRR channels, any accompanying BSM7-RS232 control unit must be plugged into port 1. Check Extra config menu is set to RS232,
- ~ Check the control unit is programmed for autosend.

If 'In' numbers increment with punching, and it transmits (T) as expected, but no acknowledgement is returned:

- ~ Check radio link possible between transmission and receiving locations – move radio (usually upwards) to increase transmission distance. Use a spare radio to listen for 'heartbeats' and data transmissions,
- ~ Check the volume on the radios – it should be loud but not distorted,
- ~ Check the radios on the Kestrel Control and Master Kestrel are using the same channel,
- ~ Check for interference from other traffic on the radio channel. Check the radio channel is used by only one Master Kestrel,
- ~ Check the node and master addresses correspond. Check the receiving transmission code on the Master Kestrel - If you see P (preamble), L (length) but not R (receiving) or F (frame) the packet is not addressed to the Master Kestrel,
- ~ Press the red button on the Kestrel Control to initiate a Ping Pong correspondence. If this works, check the Ack Enable menu setting on the Master Kestrel,
- ~ Check the CCA time and Keyup time are appropriate for the radio being used.

If data is being received by the Master Kestrel, but is not seen in commentary software, check:

- ~ The Master Kestrel is attached to your computer,
- ~ Software used for retrieving data from the Kestrel Control is correctly set up (check port numbers and event settings that may affect data seen, e.g. hide test punches).



8 Fredrick Sanger Road
Surrey Research Park
Guildford, GU2 7YD

Tel: +44 (0) 1483 685200

Fax: +44 (0) 1483 685201