

Instruction Manual

SDL 130 Intelligent Reader

ISO (HDX & FDX-B)

Sync enabled



Preface - Read This First

About This Manual

This manual should be followed to correctly install and operate the SDL 130 Intelligent Reader, produced by Shearwell Data Ltd.

Explanation of the symbols used in this manual to display important information:



Warning

A WARNING is used where care must be taken, or a certain procedure must be followed, in order to prevent injury or harm to your health.



Caution

A CAUTION indicates information on conditions, which must be met, or a procedure, which must be followed, which if not heeded could cause permanent damage to the system.



Information

INFORMATION indicates conditions which must be met, or procedures that should be followed to ensure proper functioning of the system. This symbol is also used to indicate general information which may be of interest to the user.

Thank you for purchasing an SDL130 Intelligent Reader



Contacting Shearwell Data Limited

If you would like further information or assistance you can contact us via:

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Preface - Safety Notices



Warning

- The SDL 130 is intended to be used in an agricultural or industrial environment, contact Shearwell Data if operation in other environments is required.
- The SDL 130 should be installed in accordance with the instructions in this manual.
- 240 V AC or 110 V AC installation should be in accordance with the current IEE wiring regulations.
- It is strongly advised that suitable protection is provided for the mains supply, such as RCD.
- Only use the power cables supplied with the Reader.
- The lid of the Reader should only be removed for installation purposes. Ensure that the mains power supply is disconnected before opening the case. Do not reconnect the power supply until the lid has been refitted.
- Do not remove the clear plastic cover inside the enclosure.
- There are no operator serviceable parts inside the SDL130 Intelligent Reader or the Antenna.
- Do not attempt to repair or replace any part of the Reader.
- Do not allow the Reader or cables to stand in water.

Caution:

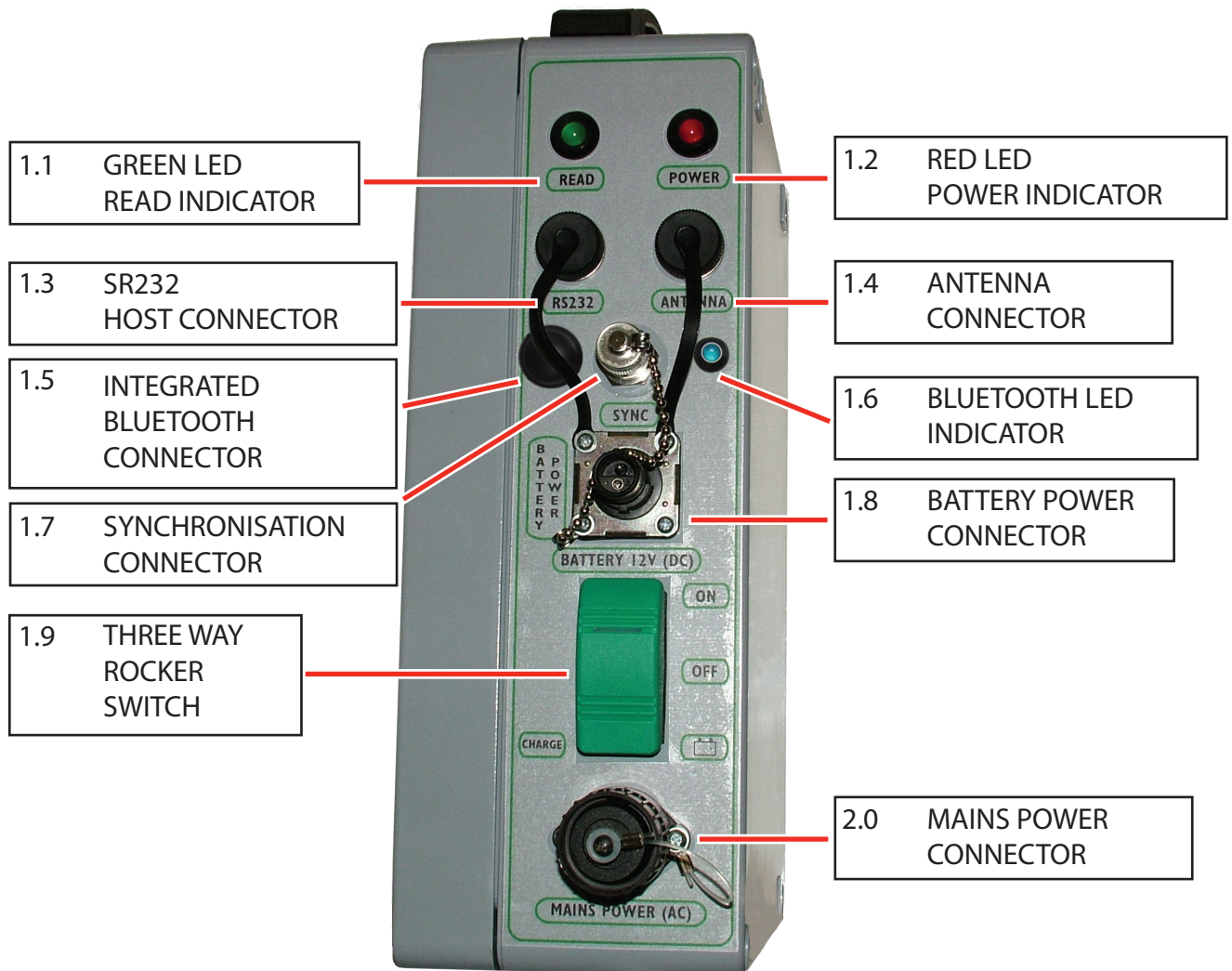
This equipment has been designed, constructed, and tested for compliance with FCC Rules that regulate intentional and unintentional radiators. The user is not permitted to make any modifications to this equipment or use it in any manner inconsistent with the methods described in this User Manual without the express approval from Shearwell Data Ltd. Doing so will void the user's authority to operate this equipment.



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1. Reader Description



1.1 Green LED

The Green LED flashes once when: every time the unit is switched on and each time an EID has been successfully received and transmitted by the Reader.

1.2 Red LED

The Red LED indicates the Reader is powered. In charge mode it will not be illuminated.

1.3 SR232 Host Connector

Socket for attaching the host (PC / Laptop / Hand Held computer) it carries the power and trigger signal to the phase switcher.

1.4 Antenna Connector

Socket for attaching the antenna cable.

1.5 Integrated Bluetooth Antenna

Reader Description

1.6 Bluetooth LED Indicator

The Blue LED illuminates when Bluetooth connection has been established

1.7 Synchronisation Connector

Socket for attaching the synchronisation cable, for synchronising with other SDL130 Readers.

1.8 Battery Power Connector - 12V DC

Socket for attaching the battery power cable (12V DC).

1.9 Rocker Switch

1.9.1 Rocker Switch - ON

In this position the Reader is 'On'.

If only 'Mains Power (AC)' connected then the mains electric will power the reader.

If only 'Battery 12V (DC)' connected then the battery will power the reader.

If both 'Mains Power (AC)' and 'Battery 12V (DC)' are connected, the battery will charge.

1.9.2 Rocker Switch - OFF

In this position the Reader and the charger are 'Off'.

1.9.3 Rocker Switch - Battery Charge

In this position the Reader is 'Off'.

If both 'Mains Power (AC)' and 'Battery 12V (DC)' are connected, the reader will be powered up and the battery will charge.

2.0 Mains Power Connector - AC

Socket for attaching the mains power cable (240V AC).

2. Installation & Operation

2.1 The following items are supplied with the SDL 130 Intelligent Reader

- A Power cable for connection to a 240 AC mains supply (section 1.8).
- A Power cable for connection to a 12V DC Battery (section 1.6).
- An Antenna cable (part of the Antenna) which is used to connect the Antenna to the SDL 130 (section 1.4). An antenna is required for the reader to function and there are different antenna options available for purchase.

2.2 Optional accessories

When more than one reader is going to be used, BNC type cables are required to connect to the Synchronisation connector. Please contact Shearwell Data Ltd on 01643 841611 for further information.

2.3 What you will need

Power source - 240 V AC e.g. mains supply (UK) or 12 V DC @ 1.3 Amp e.g. automotive battery. (or 110 V AC where appropriate.)

Host - e.g. Laptop / PC / Hand Held Computer (loaded with FarmWorks by Shearwell Data - see section 9 & 10).



Information

See section 6.2 for further details on host settings.

2.4 Permanent Mounting of the SDL 130 Intelligent Reader



Caution

When moving the SDL130, the carrying handle should always be used.

The following instructions are for permanently mounting the reader in a fixed position:



Warning

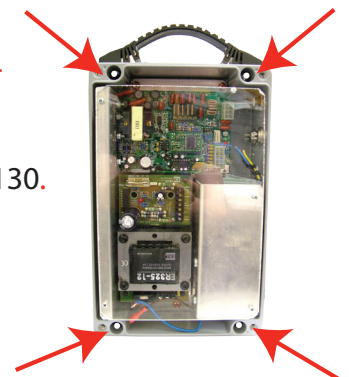
Ensure that the mains power supply is disconnected BEFORE opening the case. Do not reconnect the power supply until the lid has been refitted.

There are no operator serviceable parts inside the SDL130.



Information

1. Remove lid to gain access to the pre drilled fixing holes in each of the corners.
2. Use screw size up to m8 to mount the reader in the desired location.
3. Replace the lid.



Installation & Operation



Information

2.5 Where best to operate the SDL 130 Intelligent Reader and Antenna

There are two factors that can have a significant effect on the operation of an RFID System.

The first of these is the presence of metal in the form of steel paneling or reinforcing bar if the antennae is mounted close to a wall or cut into the surface of a floor. This has the effect of significantly modifying the magnetic fields produced by the Antennae coils and may cause distortion which result in reduced read range as the field no longer extends in the correct direction.

The second effect is one caused by interference from other electrical or electronic equipment. Interference can also be caused by variable frequency motor drives. These are likely to be encountered on industrial sites with conveyors. **The simplest method of avoiding this cause of system failure is to relocate the reader.**

2.6 Operation of the SDL 130



Warning

Make sure ALL the connections are made BEFORE you switch the reader on. Damage may occur to the system if you use cables other than those supplied by Shearwell Data Ltd.



Information

To set up your host correctly please refer to your host manual.

Refer to the diagram on page 5 for the position of the terminals.

Please follow this order:

- 2.6.1 Connect the Antenna to the SDL 130.
- 2.6.2 Connect the SDL 130 Reader to a power source - 'Mains Power (AC)' or 'Battery 12V (DC)'.
- 2.6.3 Switch the Rocker switch to 'ON' (section 1.7.1). The Red LED will illuminate and the Green LED will briefly illuminate, indicating the Auto tune is complete and a report has been sent.
- 2.6.4 Connect the host (PC / Laptop / Hand Held computer) to the SDL 130. If bluetooth is being used to form the connection to the host, please see Appendix 1.
- 2.6.5 The Reader is now ready to use.

Installation & Operation

2.7 Auto Tuning



Information

The SDL 130 Intelligent Reader requires Auto Tuning prior to use. The reader is equipped with a sophisticated self tune facility or auto-tune. The reader performs an auto-tune shortly after power up. This takes less than 1 second.



Caution

Temperature changes can affect the accuracy of the antenna tuning.

The auto tune considers its environment at the time of tuning, if you change the conditions, such as altering the equipment or metal objects present, the auto tune may become invalid.

Restarting the reader will allow it to tune to the new conditions.

2.8 Synchronising



Information

Where it is desired to operate 2 or more SDL 130 Intelligent Readers in close proximity they will require synchronizing or the readers will not work properly particularly HDX (TIRIS). The synchronization allows readers to communicate to each other and plan their cycles with virtually no degradation in the performance for either FDX-B or HDX. The BNC type connector allows the SDL 130 to be connected in daisy chain fashion on a practically infinite network.

The SDL 130 will carry out synchronisation automatically without intervention by the user - provided the correct cable is connected to the Reader.

3. Antenna

Only antennas approved by Shearwell should be used with the SDL130. Two examples of antennas available from Shearwell are shown below.

Curved Antenna



Warning

There are no user serviceable parts in the Antennae.

Twin Plate Antenna



4. Problem Solving

Problem

Solution

4.1 No red indicator (power)



Information

If solutions 4.1.1 to 4.1.3 do not solve the problem please refer to section 7.3 on fuses.

4.1.1 Check all cables are correctly connected and the power is switched on.

4.1.2 Check the rocker switch is in the 'On' position, (section 1.7.1).

4.1.3 If using the battery to power the reader check that it is charged up and correctly connected.

4.2 No green indicator (read)



Information

If solutions 4.2.1 to 4.2.6 do not solve the problem please contact Shearwell on 01643 841611.

4.2.1 Check as for problem 4.1 above.

4.2.2 Check the antenna is connected to the reader.

4.2.3 Check the animals being read have either a bolus or an electronic tag.

4.2.4 Remove sources of interference, including consealed microchips (see section 5 for further details)

4.2.6 If FDX-B works but HDX does not please see section 2.8 on synchronisation.

4.3 Nothing is being displayed on the host computer



Information

If solutions 4.3.1 to 4.3.5 do not solve the problem please contact Shearwell on 01643 841611.

4.3.1 Check as for problems 4.1 and 4.2 above.

4.3.2 Check the host is fully charged / plugged in correctly.

4.3.3 If applicable check that the host is functioning normally when used independently.

4.3.4 Check the host is set up correctly and is set to the correct port (see section 6.2 for further details).

4.3.5 If you have a replacement cable, try switching cables.

5. FDX-B and HDX Problem Solving



Information

Both the FDX and the HDX systems are susceptible to interference and can suffer loss of range when interference is present. Below are listed the main points to check if the range is low. Before doing anything it is a good idea to check the DC current being drawn. If it is the range 0.7-1.3 Amps then it is likely that the RF (radio frequency) field is being generated and that the antenna is OK.



5.1

Information

FDX-B Problem Solving

5.1.1 Make sure the antenna is kept away from mains supply wires. This can induce RF into the lines that may be modulated by the rectifier circuits in electronic equipment, even when the equipment is quite remote.

5.1.2 Do not place the antenna in close proximity to computer monitors.

5.1.3 Do not run two SDL 130 Intelligent Readers or a SDL 130 Intelligent Reader and another commercial reader closer than 20 yards (18.29 metres) unless they are synchronised.

5.1.4 If two SDL 130 Intelligent Readers are used in close proximity then try to rotate one of the antennae so that the two are 90 degrees to each other.



5.2

Information

HDX Problem Solving

5.2.1 Make sure the antenna is kept away from mains supply wires. Mains borne switching interference can reduce the range.

5.2.2 Do not place the antenna in close proximity to computer monitors.

5.2.3 Do not run two SDL 130 Intelligent Readers or a SDL 130 Intelligent Reader and another commercial reader closer than 60 yards (54.86 metres) unless they are synchronised.

5.2.4 If two SDL 130 Intelligent Readers are used in close proximity then try to rotate one of the antennae so that the two are 90 degrees to each other.

5.2.5 HDX will not work if two readers are operating in the same locality and they have not been synchronized. Check the synchronization cable is properly connected.

6. Technical Data

6.1 Specification

Power requirements	Mains Power 240 V AC, 110 V AC or Battery Power 12 V DC
Interface	Full duplex RS232 @ 19,200 baud
Frequency	134.2KHz
Transponder	ISO Transponder
Auto-tune	Internal on switch on
Read Indication	LED and customer connection
Weight	4.85 Kg
Operating Temperature	-5C to 60C

6.2 How the Host should be setup

6.2.1 19,200 Board

8 data bits

1 stop bit

no parity or flow control



Information

To set up your host correctly please refer to your host manual.

6.2.2 The default data output format is set to Hexidecimal Raw data which contains the information stored on the EID device. On request Shearwell Data can supply the configuration information required to change the output format to any of the following. See 6.3.

The SDL130 output format must be configured correctly to meet the requirments of the host.

6.3 Additional data output formats avaiable

6.3.1 Hexidecimal

All information stored on the microchip. This includes the retag counter, species identifier and three reserved digits.

6.3.2 Decimal

Full 16 digits EID device number in decimal format. An example of this is 0940123456789012.

Technical Data

6.3.3 ISO Decimal

EID device number is sent in decimal minus the first 0 of the country code and with a space between the country code and the remaining twelve digits.

An example of this would be 940 123456789012.

6.3.4 FULL ISO

EID device number is sent in a fully ISO compliant format which contains the 6 ISO standard digits, (retag counter, species identifier and three reserved digits) and 15 digit device number.

An example of this would be 1004000940123456789012.

6.3.4 WYSIWYG

EID device with country code 0826i are sent as 'UK' followed by 7 digit flock number, followed by a space and the individual 5 digit animal number.

An example of this would be UK0123456 12345.

If the EID read is not a UK EID the device number will be displayed in decimal.

6.4 Result

Upon switch-on the reader sends a report down the RS232 line. The report indicates the Software Revision and the Tuning Variable. A typical report will be as follows.

A = 1 - F

7. Industry Standards

The SDL130 complies with parts 15.207 and 15.209 of the FCC rules CFR 47:2009. The SDL130 operates at a frequency of 134.2KHZ and complies with part 15C emission requirements. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference in which case the user will be required to correct the interference at his own expense.

The SDL130 also complies with Industry Canada RSS-210 issue 7.

This SDL130 complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device

8. Servicing the SDL 130

8.1 Servicing



There are no operator serviceable parts inside the SDL130 Intelligent Reader or the Antenna.

Servicing should only be carried out by qualified personnel.

8.2 Spares

Spare parts can be obtained directly from Shearwell Data Limited, please ring 01643 841611.

8.3 Fuses

The SDL 130 Intelligent Reader has three fuses: a 3 Amp fuse in the mains plug and two fuses (500 mA AC fuse and a 2 A DC fuse) situated behind the perspex safety cover.



Under no circumstances should unqualified personnel remove the perspex safety cover and tamper with the fuses as serious injury or death could occur.



The 3 Amp fuse in the mains plug can safely be changed if it is blown.
However, the cause of the blown fuse should be established by qualified personnel.

9. Warranty

9.1 SDL 130 Intelligent Reader Warranty

9.1.1 The SDL 130 is guaranteed against defects in materials and workmanship for one year from the original date of purchase.

9.1.2 Any component part or parts which become defective in normal use due to faulty materials or workmanship, will be repaired or replaced at our discretion free of charge.

9.1.3 All costs relating to despatch, transport and insurance will be at the owner's expense.

9.1.4 This guarantee will be null and void if the item has been interfered with in any way by any unauthorised party, or misused in any way. Damage caused by external sources will not constitute a part of this guarantee and is therefore excluded.

9.1.5 This guarantee is in addition to and does not affect your statutory rights as a consumer.

9.1.6 In the case of a defect covered by this warranty please telephone Shearwell Data Ltd 01643 841611.

10.

Users Notes

11.

Appendix 1

Bluetooth connection

The SDL130 comes fitted with a Bluetooth module, which enables wireless connection to numerous devices. The SDL130's Bluetooth can be used to connect to a host (PC / Laptop / Hand Held computer) with the appropriate Bluetooth wireless software. To allow the SDL130 to communicate with the host you will be required to establish a Bluetooth connection.


If you are using a computer and it does not already have a Bluetooth adapter, then Shearwell Data Ltd recommends a Bluetooth adapter by Belkin. These can be supplied on request. The instructions below refer to establishing a Bluetooth connection with a Belkin adapter, but the principles are the same for most adapters.

Set up of Belkin Bluetooth Adapter

For help installing the Belkin Bluetooth adapter please consult the installation guide on the CD provided with the adapter. If the CD automatically runs, the guide can be found by selecting the 'View Installation Guide' option. If the CD does not automatically run, the document 'Quick Install Guide' can be found on the Belkin Bluetooth CD, within the folder titled 'QIG'.


Adding a Bluetooth Device

In order to be able to connect a Bluetooth enabled device to a computer with Bluetooth, it must first be added to the recognised list of Bluetooth devices in 'My Bluetooth Places' on the PC.

Bluetooth may be displayed by the symbol as shown. 

Ensure the SDL130 is switched on, so that it may be discovered by the computer.

Go to 'My Bluetooth Places' via the Bluetooth displayed on your desktop or present in the toolbar at the bottom right hand corner of the computer screen.

If these options are not present 'My Bluetooth Places' may also be accessed from 'My Computer' or for Windows 7 left click on the  button and select 'Control Panel', 'Devices and Printers'.

With the 'My Bluetooth Places' window open, choose the option to 'Add a Bluetooth Device'.

The 'Bluetooth Setup' wizard will run, please follow the steps as prompted. When the 'Bluetooth Device Selection' screen appears wait for the PC to stop searching for devices, then select the device corresponding to the SDL130 you wish to connect to.

On the next screen you will be prompted to type the 'Passkey', this is 1111.

Appendix 1

Continue to follow the instructions and at the 'Bluetooth Service Selection' screen make sure that the 'AT Serial' option is selected.

After selecting 'next' to continue, a window will pop up to confirm that a shortcut for the device has been created in 'My Bluetooth Places'.

The 'Bluetooth Setup Wizard Completion' Page will confirm completion of the Bluetooth setup.

The SDL130 will now be connected to the PC via Bluetooth. When attempting to connect the SDL130 again use the method detailed in the 'Connecting via Bluetooth' section below.

Please note that for Windows 7, only one established bluetooth connection is allowed at any time. If other bluetooth devices have been connected please remove before proceeding. This can be done by left clicking the bluetooth icon displayed in the tool bar at the bottom of the computer screen. Select 'Show Bluetooth Devices' to display all devices currently connected. To remove a device right click on selected item and 'Remove', until only one connection to the SDL130 remains.

SDL130
Bluetooth
number



Connecting via Bluetooth

Please note this next step is not required for Windows 7. A bluetooth device added to Windows 7 remains permanently connected.

Having followed the steps for 'Adding a Bluetooth Device' it will now be possible to connect the SDL130 to the PC within a few simple steps.

Turn on the Stick Reader. Go to 'My Bluetooth Places' within 'My Computer' and right click on the shortcut for the SDL130.

From the menu, choose to 'Connect'. You may be prompted to enter the Bluetooth 'Passkey' again, if so enter 1111. When completed the SDL130 will be connected. Use this method each time you wish to connect the SDL130 to a PC.

Make a note of the com port number the PC has used to establish Bluetooth connection. This will be required when connecting software.