Electrocorder DC-3V-RS
User Instructions

⚠ **WARNING!**

THIS PRODUCT MUST ONLY BE USED BY SUITABLY QUALIFIED PERSONNEL; DO NOT ATTEMPT TO USE THIS PRODUCT UNLESS YOU ARE QUALIFIED TO DO SO.
HIGH VOLTAGES THAT CAUSE BURNS AND LETHAL SHOCKS ARE PRESENT DURING VOLTAGE MONITORING AND RECORDING!

⚠ **Voltage inputs are not isolated from each other, as one input is energised, other will become live!**

General Description

Thank you for purchasing the Electrocorder DC-3V-RS, we hope you enjoy using this product, this package consists of seven main components:

1. Electrocorder logger (1)
The logging unit is housed in a strong ABS case.
2. Carry Case (1)
The ABS case of the logging unit is in turn contained within a soft carry case.
3. Voltage Input Leads (4)
Four voltage input leads are provided to allow easy connection to the voltage system.
4. Communications Lead (1)
For the DC-3V a USB lead is provided to allow connection between the logger and any PC with a USB port.
5. 12Vdc PSU (1)
6. Software CD (1)
Electrosoft software is provided free.
7. User Instructions (1)
These User Instructions are provided to give guidance, to qualified personnel.

PC Hardware requirements

To run Electrosoft you must have certain hardware and software installed on your computer. The system requirements include:-
An IBM® - compatible Personal Computer with a minimum of an 80486 processor.
A hard disk, with at least 5MB spare capacity.
One 1.44MB 3.5" disk drive.
An SVGA 600 x 800 or higher resolution display.
At least 16MB of random access memory (RAM).
A mouse.
Microsoft® Windows 9X, NT4.0, 2000, XP, Vista, Windows 7, Windows 8.

Installing Electrosoft

When you run the Setup program, it will automatically set a path on your hard disk and install Electrosoft there.

In Windows 9X, NT4.0, 2000, XP, Vista, Windows 7, Windows 8, the Setup program will create an option in your Programs menu, which is in the Start menu.

Step 1: To install Electrosoft; run Setup.

For Windows 9X, NT4.0, 2000, XP, Vista, Windows 7
Step 2: From the Taskbar menu click Start and choose Run. The Run dialogue box appears.
Step 3: Type a:\Setup. Click OK. Follow the instructions on the screen to install Electrosoft - you will be alerted when the installation is complete.

Getting started

In order to set-up an Electrocorder, you must first run Electrosoft on your PC. Then connect an Electrocorder to the PC serial port using the correct (supplied) serial lead. In Electrosoft, use the 'Setup' dialog box window and input the details of the location to be monitored. The Electrocorder does NOT need to be connected in to the mains voltage to perform this task.

The recording mode is set by default to commence recording when the Electrocorder detects voltage and to stop recording when the memory is full.

Select the recording method - two options are available:
1. Record to EN50160 standard - the Electrocorder will take a sample once every second for 10 minutes. It then averages the samples taken over that 10 minute period and stores the value. In this mode the unit will record for approximately 50 days until the memory is full.

2. Take a sample over a discrete period - the Electrocorder can be set to take an average over a selected period, 1 (one) sec to 60 (sixty) min and also record the max and min during each period. For example, **a unit set to record every 1 (one) second will record for approximately 2 hours**. A unit set to record every 12 seconds will record for approximately 1 day. **A unit set to record every 60 (sixty) minutes will record for approximately 300 days.**

When the required information has been input, download to the connected Electrocorder by clicking the 'Write Setup' icon. The Electrocorder is now ready to monitor voltage.

When the Electrocorder is recording a flashing red light will show, when it has completed recording, a steady green light will appear on the unit. The database contained within Electrosoft will also advise that the unit has completed recording and is ready to be collected. To download the recorded data connect the Electrocorder to the PC serial port and click the 'Read Setup' icon. The recorded data is displayed for analysis.

This document is produced in conjunction with the Help file contained in Electrosoft, which contains a detailed explanation of all features and contains information, which should be studied prior to using this product.

DUAL RANGE / RANGE SELECT
The range can only be changed when the logger has started logging. The selected range will automatically be displayed if an external 12Vdc power supply is connected to the logger. If no external power is connected pressing the "?" button will display the range, either 0.5V to 60V or 1V to 300V. To change the range, on all 3 input channels press and hold the "?" button and press the adjacent up/down arrow, this will toggle the range. Please note that the range should be set once at the beginning of recording and not changed, the logger does not record which range it was in so you should make note of the range used, as you need to set this when viewing the data.

When the Electrocorder is recording a flashing green light will show, when it has completed recording, the green light will extinguish and if an external PSU is being used then a steady red light will appear on the unit, otherwise the red will not light, so completion is signified by the absence of a flashing green. The database contained within Electrosoft will also advise that the unit has completed recording and is ready to be collected. To download the recorded data connect the Electrocorder to the PC USB port and click the 'Read Setup' icon. The recorded data is displayed for analysis.

When you read the data via the software you will be asked to select the range used during logging, select either 60V or 300V range. If you select the wrong range, the readings will be incorrect. If this happens, use the "select scale" button on the main graph window to change to the correct range/scale. You may even do this with data that has already been saved to file.

⚠ **SAFETY TIPS**

Voltage inputs are labelled 'D1', 'D2', 'D3' and Common is labelled 'C'. For correct operation this recorder must have a proper Common (C) connection.

Prior to connection of the logger to any voltage system:-

1) If possible electrically isolate the conductors to which you wish to connect.

2) Remove (unplug) all voltage leads from the logger.

3) Using insulating gloves where necessary, connect the each voltage lead in turn to the electrical bus-bar with the crocodile clip.

4) When all voltage leads are connected to the voltage bus-bars, then beginning with the Common (C) input, connect in turn each lead to the logger (with the 4mm shrouded plugs).

5) Voltage leads are double layer. The inner layer is white, should the lead become scuffed and/or damaged, the white inner layer should become visible, as opposed to the normal red or black outer layer. When this occurs, you must replace the voltage lead with a new, undamaged one.

Features & Benefits of the DC-3V-RS Logger System

Feature	Benefit
Unit is small and lightweight.	Easy to install
Easy to use Windows software.	Can be used by non-technical staff.
Electrosoft contains internal database.	**Allows effective management of distributed Electrocorders.**
True RMS voltage measurement.	Complies to EN50160:1994.
Soft carry case, with handle	Allows you to keep and carry all the leads etc. together with the logger.

Inputs and Connections on Various Systems

Colour and Input Terminal	Voltage inputs
Red (D1)	0.5V to +60Vdc, & 1V to +300Vdc
Red (D2)	0.5V to +60Vdc, & 1V to +300Vdc
Red (D3)	0.5V to +60Vdc, & 1V to +300Vdc
Black (C)	Common

Single Channel Logging (using inputs 'D1' and 'C')

Simply connect 'C' to System Common (ground, earth or 0V) then 'D1' to voltage input. Connect the 12Vdc PSU, and to start logging, simply press the 'Start' Button, logging is signified by a flashing Green light, when finished the Green light will extinguish and if you are using the 12Vdc PSU a red light will illuminate.

Two or Three Channel, Voltage Logging (using inputs 'D1', 'D2', 'D3' and 'C')

Use either the 60V or 300V range. Simply connect 'C' to System Common (ground, earth or 0V) then 'D1', 'D2','D3' to the positive voltage inputs. Connect the 12Vdc PSU, and to start logging, simply press the 'Start' Button, logging is signified by a flashing Green light, when finished the Green light will extinguish and if you are using the 12Vdc PSU a red light will illuminate.

One Channel, Current Logging (using inputs 'D3' and 'C')

Use the 0.5V to 60V range. Connect 'C' to Transducer '--' (negative output of the 0-10Vdc) then 'D3' to the '+' (positive output of the 0-10Vdc) of the transducer. Connect the 24V PSU or system supply to the transducer. Connect 'D1' and/or 'D2' to the voltage inputs and 'C' to the system ground, connect the 12Vdc to the logger. Then to start logging, simply press the 'Start' Button, logging is signified by a flashing Green light, when finished the Green light will extinguish and if you are using the 12Vdc PSU a red light will illuminate.

DC-3V-60

Technical Specifications

TECHNICAL SPECIFICATIONS (subject to change without notice)	
Measurement range (Vrms)	**0.5Vdc to +60Vdc, & 1Vdc to +300Vdc**
Maximum channel input voltage	+300Vdc with respect to common.
Inputs (non-isolated inputs)	Three positive voltage inputs (D**1**, **D2 & D3**) & Common (C, 0V), I**nput channels are not electrically isolated!**
Input socket types	4mm shrouded 'banana' plugs & sockets, each with insulated crocodile clip.
Voltage measurement range.	60V range, +0.5Vdc to +60Vdc, 300V range , +1Vdc to +300Vdc.
Measurement accuracy	**±1% of scale** (10 bit) within +5Vdc to +60Vdc else ±3%.
Vmin & Vmax meas time resolution	Always one 20ms, independent of selected averaging period.
Sampling frequency	16 samples per 20ms period.
Data recorded	Average voltage, max & min voltage-cycle-value during the averaging period
Memory capacity	192kB able to record 32,000 Voltage levels per channel.
Memory type	Non-volatile SEEPROM
Memory - averaging period & duration	1 sec to 60 mins (1sec. avg gives 2 hrs of logging, 60min. avg gives 300 days of logging)
Real-time clock accuracy	Greater than 0.001%
Input Lead Length	**Metric** 1.2 metres **Imperial** 4' (4 feet)
Battery life (while logging)	Unlimited - mains powered & 1,000 hours, on battery power only.
Battery Type	Unit contains **six** 1.5V Alkaline C-Cell batteries.
Power Supply	12Vdc +/-10%.
Communications Interface type	USB, baud of 19,200
Electrosoft Software	Windows (9x, 2K, ME, NT, XP & Vista, Win 7,1024 x 768 min resolution
Environmental (temp & sealing)	-10C to +40C **or** +14°F to +104°F – **Indoor or protected environment only!**
Dimensions & Weight	**Metric** 250 x 175 x 70mm & 500g **Imperial/English** - 10" x 6" x 3" & 1lb

Calibration
Each unit is individually calibrated during testing.

Battery life (while connected to PSU)
Unlimited - mains powered and battery back up.

Battery life (while unplugged & not logging)
The six 1.5V Alkaline C-Cell batteries should last for at least 9,000 hours (1 year),

Caution
The batteries used in this device may present a risk of fire or chemical burn if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate. Replace with a 1.5V Lithium or Alkaline C-Cell batteries. Use of another battery may present a risk of fire or explosion. Dispose of used batteries promptly. Check for signs of battery (electrolyte) leakage. If leakage has occurred, the PCB must be cleaned in an approved manner by a competent (trained) person. Keep away from children.

Maintenance
Regularly check the Electrocorder casing for signs of damage (cracks, broken or loose parts) or misuse. If the unit is damaged in any way it must **NOT** be used and should be returned to the supplier. The unit must not be used for any other purpose than for that recommended by the manufacturer. The unit must not be submerged in any liquid.

Cleaning
Wipe the outside of the case with a clean cloth damped with IPA (Isopropyl Alcohol).

Warranty
All Acksen products carry a minimum 1 year warranty covering manufacturing defects and component failures. The device contains no user-serviceable parts and as such should only be repaired by skilled and authorised personnel. Failure to comply could result in unsafe operation and should not be attempted under any circumstances. Contact below for a list of approved service agents.
Note: Any unauthorised repair or adjustment will automatically render the warranty invalid.

Repair and spare parts

Acksen Ltd.
28 Station Road
Whiteabbey
Newtownabbey
Co. Antrim BT37 0AW
United Kingdom
Or an approved repair company.

Returning a product for repair
If returning a product to the manufacturer for repair, it should be sent freight pre-paid to the appropriate address. A copy of the Invoice and of the packing note should be sent simultaneously by airmail to expedite clearance through Customs. A repair estimate showing freight return and other charges will be submitted to the sender, if required, before work on the device commences.

WEEE
For EU customers Acksen Ltd offer a product take-back service. For customers within the European Union (only) and products manufactured or sold by us; when those products reach the end of their life, simply send them back to us at your expense, we will dispose of them according to the relevant legislation. Acksen Ltd's WEEE Registration Number WEE/DD2117VU.

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Web: www.acksen.com

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