acksen

Electrocorder PV-3 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 PV-3, we hope you enjoy using this product, this package consists of nine 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 (2)
   Four voltage input leads are provided to allow easy connection to the voltage system.
4. EC-CP100 Current Probe (1)
   The EC-CP100 DC current probe, 300V CAT III.
5. EC-SP-110 Pyranometer (1)
   The EC-SP-110 DC solar Pyranometer.
6. Communications Lead (1)
   For the PV-3 a USB lead is provided to allow connection between the logger and any PC with a USB port.
7. 12Vdc PSU, power supply unit (1)
8. Software CD (1)
   Electrosoft software is provided free.
9. 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:-

- Microsoft Windows XP, Vista, 7, 8 or 2003/2008/2012 Server.
- An RS232-compatible. Serial Port and/or USB Port is required for interfacing to an Electrocorder, depending on model.
- Our minimum system specification is a 2Ghz Intel Core2Duo, 2GB RAM, 1GB free disk space.
- 136x768 resolution, 24-bit colour and Windows XP.
- Our recommended system specification is a 3.1Ghz Intel i5-3450, 8GB RAM, 1GB free disk space.
- 1920x1200 resolution, 24-bit colour and Windows 7.

Installing Electrosoft

When you run the Setup program, it will automatically set a path on When you insert the Electrosoft CD, it will prompt you to run the setup program; follow the on-screen instructions to install Electrosoft. If the setup program does not start automatically, please run “ElectrosoftSetup.exe” on your DVD/CD-ROM Drive.

The setup program will create a shortcut for Electrosoft in the Start menu.

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 800 samples every second (per channel) for 10 minutes. It then averages the samples taken over that 10 minute period and stores the values. In this mode the unit will record for approximately 50 days until the memory is full.

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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.

USB to RS232 Serial Converter
If you have purchased a USB to RS232 converter, you must install the drivers. You can use the drivers shipped with the program which may be in the USB sub-folder within the Program Folder, normally C:\Program Files\Electrosoft\USB. You can download them from the website www.electrocorder.com or use the disk, if one came with the converter.

The following describes the XP installation, other operating systems will vary slightly. When you plug the converter into the PC, it will detect it and identify the new hardware as UC232R, Windows will then ask to search for the drivers, choose "Yes, this time only", then on the next screen choose, "Install from a list location" then specify the location of the drivers, possibly the USB sub folder, in the installation folder, or wherever you saved the files to when you downloaded from the internet.

When installed, make a note of the serial or COM port number the converter has been assigned to and when you run Electrosoft, select the appropriate serial port or COM port number.

SAFETY TIPS
Voltage inputs are labelled 'V1' and Common is labelled '0V'. For correct operation this recorder must have a proper Common (0V) connection.

Prior to connection of the logger to any voltage system:-
1. 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 (0V) 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. Input channel V1 is fused within the logger 600Vdc, FF 500mA quick blow, 6.35mm x 32mm.

6. The EC-CP100 current probe MUST be zeroed prior to connection to the electrical system, to do this, follow the instructions:-

DO NOT connect the EC-CP100 probe to the electrical system. First connect the EC-CP100 probe to the logger, press the green start button on the logger to start the logger recording, (this also starts the 12V supply to the probe). Next turn the EC-CP100 to the correct current range, either 10A, 100A or 300A, now press and hold the 'zero' button on the probe for 5 (five) seconds, this will zero the probe prior to any connection to the electrical system. Now connect the current probe around the insulated current carrying conductor, respecting the polarity.

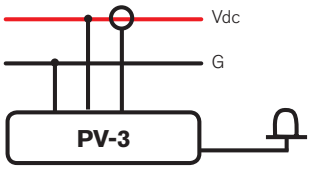
Features & benefits of the PV-3 logger system

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 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	Channel Inputs
Orange (R1)	0 to 1,500 W/m2
Black (A1)	-10A to +10A, -100A to +100A, 300A
Red (V1)	0V to +300Vdc
Black (01)	Common Ground, MUST be 0V

Single Channel Logging (using inputs 'V1' and '0V')
Simply connect '0V' to System Common (ground, earth which MUST BE 0V, zero volts) then 'V1' 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.



Solar Irradiation Logging (using input 'R1')
Position the Pyranometer on a flat, level (horizontal) surface close to or beside the solar installation. Where the solar collector is on a pitched roof, the pyranometer may also be placed on this angled roof, this will better represent the energy irradiating the surface. Connect the 12Vdc PSU, and to start logging, 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.

Current Logging (using input 'A1')
DO NOT connect the EC-CP100 probe to the electrical system. First connect the EC-CP100 probe to the logger, press the green start button on the logger to start the logger recording, (this also starts the 12V supply to the probe). Next turn the EC-CP100 to the correct current range, either 10A, 100A or 300A, now press and hold the 'zero' button on the probe for 5 (five) seconds, this will zero the probe prior to any connection to the electrical system. Now connect the current probe around the insulated current carrying conductor, respecting the polarity marked on the probe.

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. Note, the EC-CP100 may not read exactly zero on occasions, this is due to DC offsets and drifts, it is vital that the probe is zeroed before connection and the range is NOT changed during logging.

Technical specifications

Measurement range (Vrms)	1Vac to +300Vdc
Maximum channel input voltage	+300Vdc
Inputs (non-isolated inputs)	One positive voltage inputs (V1) & Common (C, 0V), Input channels are not electrically isolated!
Input socket types	4mm shrouded 'banana' plugs & sockets, each with insulated crocodile clip
Voltage measurement range	1Vdc to 300Vdc
Measurement accuracy	±5% of reading (10 bit) within +5Vdc to +300Vdc else ±3% of scale
Vmin & Vmax meas time resolution	Always one 20ms, independent of selected averaging period
Voltage Input Fuses	600Vdc, FF 500mA quick blow, 6.35mm x 32mm
DC Current Measurement Range	-10A to +10A, -100A to +100A or 300A
DC Current Accuracy	Typical 5% of reading, except when below 10% of scale
Imin & Imax meas time resolution	Always one 20ms, independent of selected averaging period
Solar Irradiance	1 to 1,500 W/m2
Sampling frequency	All channels are 800Hz
Data recorded	Average, max & min values during the averaging period
Memory capacity	192kB able to record 32,000 readings 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%
Voltage/Current Input Lead Length	Metric 1.2 metres Imperial 4' (4 feet)
Pyranometer Input Lead Length	Metric 5 metres Imperial 16' (16 feet)
Battery life (while powered from PSU)	Unlimited - mains powered & battery backup (200 hours, 1 week while unpowered)
Battery Type	Unit contains 14 (fourteen) 9V Alkaline batteries (E-Block, PP3, 1604A)
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 – IP43, Indoor or protected environment only!
Dimensions & Weight	Metric 250 x 175 x 70mm & 500g Imperial/English - 10" x 6" x 3" & 1lb

(subject to change without notice)

Calibration
Each unit is individually calibrated during testing.

Note, the EC-CP100 may not read exactly zero on occasions, this is due to DC offsets and drifts, it is vital that the probe is zeroed before connection and the range is NOT changed during logging.

Battery life (while connected to PSU)
Unlimited, 12Vdc external powered and battery back-up.

Battery life (while not logging)
The 9V Alkaline batteries should last for at least 9,000 hours (1 year)

Battery life (while logging, with no PSU)
The 9V Alkaline batteries should last for up to 140 hours. We recommend you ALWAYS use the 12Vdc PSU.

Caution
The battery 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 9V Lithium or Alkaline battery IEC Type 6-F22 (PP3, MN1604). 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.