



# **PicoLog CM3**

## **Current Data Logger**

User's Guide



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# 1 Introduction

## 1.1 Overview

The PicoLog CM3 is a three-channel, high-resolution current data logger for monitoring current on up to three channels. With high accuracy and low noise, the PicoLog CM3 is ideal for recording data from three-phase supplies. The USB and Ethernet interfaces allow the logger to be used as a USB-only device, as a USB-powered device with Ethernet interface, or as a Power-over-Ethernet (PoE) device. Using the Ethernet interface, the PicoLog CM3 can be located anywhere on a LAN or on the internet.



### Programmer's Guide

All the software that you need for everyday use of the PicoLog CM3 is supplied with the unit. For more advanced applications, you can write your own software. Information on programming is published in a separate guide:

- PicoLog CM3 Data Logger Programmer's Guide (plcm3pg.en.pdf)

### Driver Installation

The driver was installed automatically when you installed PicoLog Recorder software. Alternatively, you can download the driver from our website at <http://www.picotech.com>.

## 1.2 Safety warnings



We strongly recommend that you read the general safety information below before using your product for the first time. If the equipment is not used in the manner specified then the protection provided may be impaired. This could result in damage to your computer and injury to yourself and others.

DO NOT exceed the maximum input range. The PicoLog CM3 is rated to measure voltage up to 1 V RMS, while the supplied clamps have a range of 0 to 200 A. Any signal in excess of these values may cause permanent damage to the unit and/or the clamps.

DO NOT rely on the product to provide a protective safety earth. The unit does not have a protective safety earth.

DO NOT attempt to repair the unit. The unit contains no user-serviceable parts. Repair or calibration of the unit requires specialised test equipment and must be performed by Pico Technology or its authorised distributors.

DO NOT attempt to feed current directly through the unit. You must use a voltage-output current clamp.

DO NOT attempt to use a current transformer directly. You must use a voltage-output current clamp.

DO NOT install a current clamp over any live, exposed conductors. You must not make an electrical connection to the conductor, as doing so may be dangerous and could cause damage to the equipment, your computer and may cause injuries to yourself and others. The TA138 clamps supplied with the PicoLog CM3 are suitable for work on uninsulated high-voltage cables. You **MUST** ensure that appropriate safety precautions have been made in order to isolate the cable you wish to clamp before fitting takes place. When using alternative current clamps, you should check their suitability for this usage.

## 1.3 Standards compliance

This page details the standards to which the PicoLog CM3 and/or TA138 current clamp currently meets.

### FCC Classification

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. 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 to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

For safety and maintenance information see the [safety warning](#).

### IEC standard

The supplied TA138 clamps comply with the following standards: IEC1010-1 (1995) Category II 600 V, and Category III 300 V.

### CE standard

The PicoLog CM3 Data Logger meets the intent of the EMC directive 89/336/EEC and has been tested to EN61326-1:2006 Class A Emissions and Immunity standard.

The product also meets the intent of the Low Voltage Directive and has been designed to meet the BS EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use standard.

The supplied TA138 clamps comply with the following standards: EN61010-1 (2001) Category II 600 V, and Category III 300 V.

## 1.4 Warranty

Pico Technology warrants upon delivery, and for a period of 5 years unless otherwise stated from the date of delivery, that the Goods will be free from defects in material and workmanship.

Pico Technology shall not be liable for a breach of the warranty if the defect has been caused by fair wear and tear, willful damage, negligence, abnormal working conditions or failure to follow Pico Technology's spoken or written advice on the storage, installation, commissioning, use or maintenance of the Goods or (if no advice has been given) good trade practice; or if the Customer alters or repairs such Goods without the written consent of Pico Technology.

## 1.5 Legal information

The software supplied with this product is licensed, not sold. Pico Technology Limited grants a licence to the person who installs this software, subject to the conditions listed below.

**Access.** The licensee agrees to allow access to this software only to persons who have been informed of these conditions and agree to abide by them.

**Usage.** The software in this release is for use only with Pico products or with data collected using Pico products.

**Copyright.** Pico Technology Limited claims the copyright of, and retains the rights to, all material (software, documents etc.) contained in this release. You may copy and distribute the entire release in its original state, but must not copy individual items within the release other than for backup purposes.

**Liability.** Pico Technology and its agents shall not be liable for any loss, damage or injury, howsoever caused, related to the use of Pico Technology equipment or software, unless excluded by statute.

**Fitness for purpose.** Because no two applications are the same, Pico Technology cannot guarantee that its equipment or software is suitable for a given application. It is your responsibility, therefore, to ensure that the product is suitable for your application.

**Mission-critical applications.** This software is intended for use on a computer that may be running other software products. For this reason, one of the conditions of the licence is that it excludes usage in mission-critical applications; for example, life-support systems.

**Viruses.** This software was continuously monitored for viruses during production, but you are responsible for virus-checking the software once it is installed.

**Support.** If you are dissatisfied with the performance of this software, please contact our technical support staff, who will try to fix the problem within a reasonable time. If you are still dissatisfied, please return the product and software to your supplier within 14 days of purchase for a full refund.

**Upgrades.** We provide upgrades, free of charge, from our web site at [www.picotech.com](http://www.picotech.com). We reserve the right to charge for updates or replacements sent out on physical media.

**Trademarks.** *Windows* is a registered trademark of Microsoft Corporation in the USA and other countries. *Pico Technology Limited*, and *PicoLog* are trademarks of Pico Technology Limited registered in the United Kingdom and other countries.



## 1.6 Minimum PC requirements

To ensure that your PicoLog CM3 operates correctly, you must have a computer with at least the minimum system requirements to run one of the supported operating systems, as shown in the following table. The performance of the data logger will be better with a more powerful PC.

Item	Specification
Operating system	Windows XP SP2 Windows Vista Windows 7
	32 bit and 64* bit versions supported
Processor	As required by Windows
Memory	
Free disk space	
Ports	USB and optional Ethernet ports

\* While the driver will run on a 64 bit operating system, the driver itself is 32 bit, and therefore will run as 32 bit.

## 2 Product information

### 2.1 Pack contents

Please check that your PicoLog CM3 pack contains the following items:

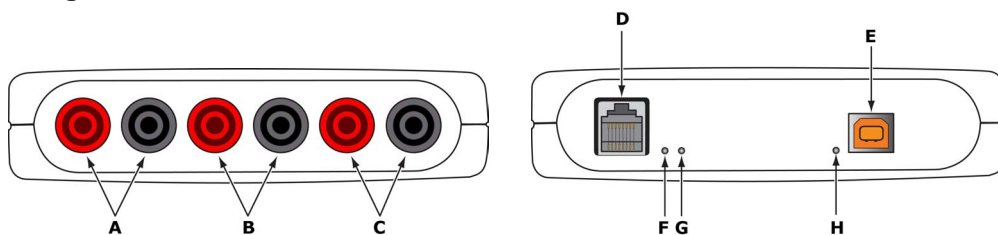
PP803		
Quantity	Reorder code	Description
1	PR136	PicoLog CM3 Current Data Logger
3	TA138	AC current clamp
1	MI106	USB lead
1	TA076	Ethernet patch cable
1	DI025	Software and Reference CD
1	DO112	USB Installation Guide

PP815		
Quantity	Reorder code	Description
1	PR136	PicoLog CM3 Current Data Logger
1	MI106	USB lead
1	TA076	Ethernet patch cable
1	DI025	Software and Reference CD
1	DO112	USB Installation Guide

### 2.2 Connections

**Important:**  
Do not connect your PicoLog CM3 to the PC until you have installed the software.

#### Diagrams



A: Signal and ground\* connection sockets for current clamp 1

B: Signal and ground\* connection sockets for current clamp 2

C: Signal and ground\* connection sockets for current clamp 3

D: [Ethernet port](#)

E: [USB port](#)

F: Ethernet Data indicator - Flashes to indicate Ethernet data transfer.

G: Ethernet Link indicator - On when Ethernet port connected to an active device.

H: Power/Status indicator - On when power is applied. Flashes to indicate conversion in progress.



\*Ground is provided via electrical connection to the USB ground

## USB connection



To use the PicoLog CM3 with its USB connection, connect the USB port on the rear of the device to a USB port on your computer using the cable provided. The first time you connect the device, Windows will install the driver and then tell you that the device is ready for use. You can then run PicoLog Recorder software to start making measurements.

## Ethernet port connection



Before connecting to the PicoLog CM3's Ethernet port, you must first configure the Ethernet settings.

### LAN connection

To use the PicoLog CM3 on a local-area network (LAN), connect it to your network switch or network router using the Ethernet cable provided.

### Direct connection

You can also connect the PicoLog CM3 directly to the network port on your computer. For this connection, you will need to use an Ethernet crossover cable (not supplied).

### Power over Ethernet (PoE)

The PicoLog CM3 can obtain its power from the Ethernet port as a Powered Device (PD) according to the PoE standard (802.3af). To use this feature, you must connect the unit to Power Sourcing Equipment (PSE) such as a network switch, router or power injector that also supports the PoE standard. Any standard Ethernet cable up to 100 m (about 328 ft) in length can be used.

## Current clamp connection



The PicoLog CM3 is compatible with Pico Technology TA138 current clamps.

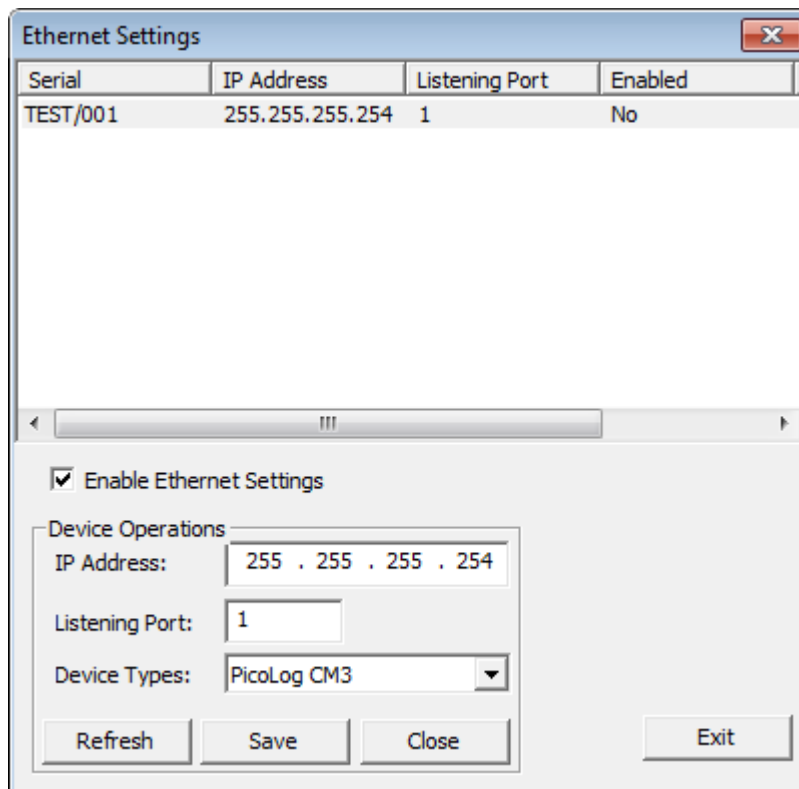
Each current clamp has both a red and a black 4 mm connector, which plug directly into the red and black connections on the front panel of the PicoLog CM3.

Once the current clamp(s) are connected, they are easily fitted around a supply cable by use of the lever on edge of the clamp.

## 2.3 Ethernet setup utility

### Setup utility

1. Connect the unit to your computer using the USB port.
2. Run the *Ethernet Settings* utility. There is a shortcut to this utility in the *Pico Technology* program group under the Windows *Start* menu.
3. Set the *Device Types* control to "PicoLog CM3".
4. The serial number of your device should appear in the device list. Click the device once to select it.
5. Set the *Enable Ethernet Settings* check box.
6. Enter the IP address and port that you wish to give the device. You may need to ask your network manager for an IP address that does not conflict with existing devices on the network.



7. Click *Save*.
8. You can now either continue to use the PicoLog CM3 as a USB device, or unplug the USB cable and reconnect the device using its Ethernet port.

#### Power-saving tip



If you wish to stop using the PicoLog CM3 in Ethernet mode, you can use the *Ethernet Settings* utility to disable its Ethernet port. This reduces the power consumption of the device when used in USB mode.

#### Ethernet and USB

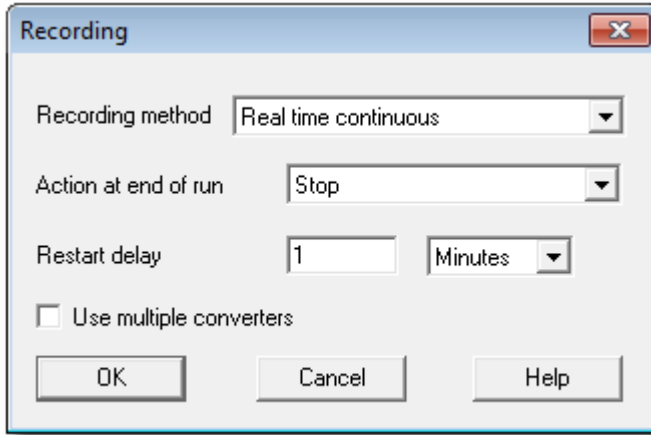


Do not use the PicoLog CM3 in USB mode when it is being powered by Power-over-Ethernet (PoE). This could cause the unit to radiate electromagnetic energy outside the limits permitted by FCC and EU regulations, and could also cause it to produce spurious measurements. It will not, however, cause permanent damage to the unit.

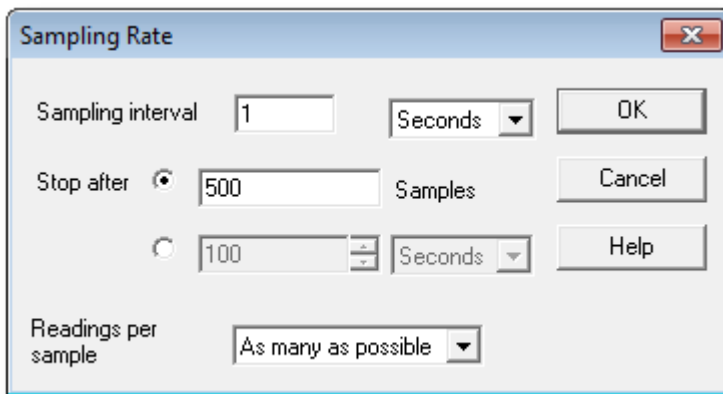
## 2.4 Setting up

Set up the PicoLog CM3 as follows:

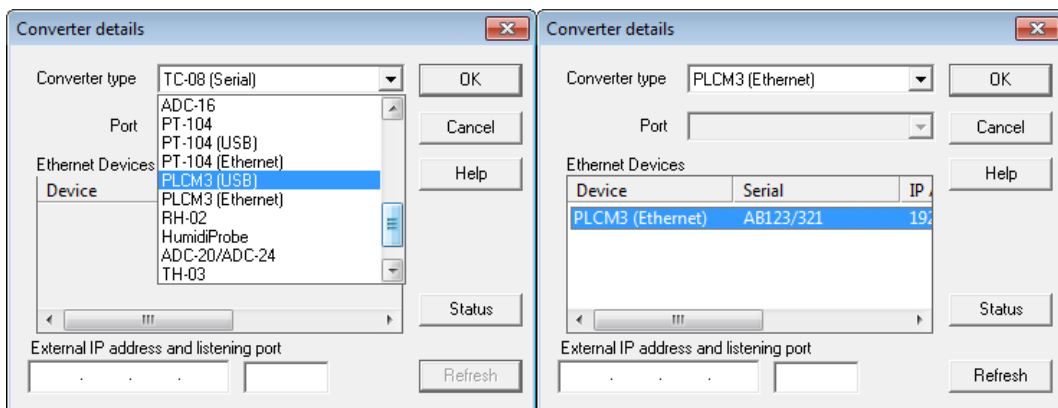
1. From the File menu in the PicoLog Recorder software, select New settings. The Recording dialog box appears:



2. Click OK. The Sampling Rate dialog box appears:



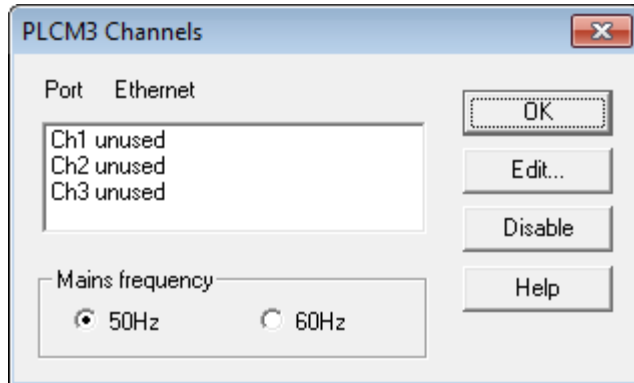
3. Click OK. The Converter details dialog box appears.
4. From the Converter type drop-down list, select either PLCM3 (USB) or PLCM3 (Ethernet). The dialog box will then show the converter list, as shown below:



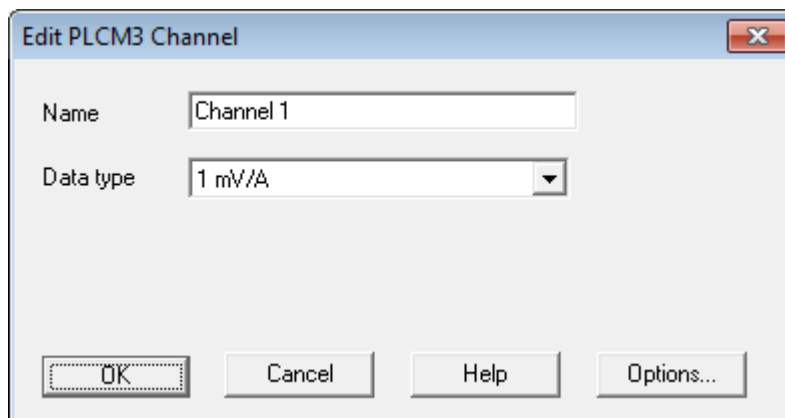
5. USB connection: Select the device with the correct type and serial number, and click OK.

Ethernet connection: Any PicoLog CM3 devices visible to your computer on your local network will appear in the list. Select the device with the correct type, serial number and IP address, and click OK. If your device does not appear in the list, type its IP address and port number in the boxes below the list.

When you click OK, the PicoLog CM3 channels window will appear:

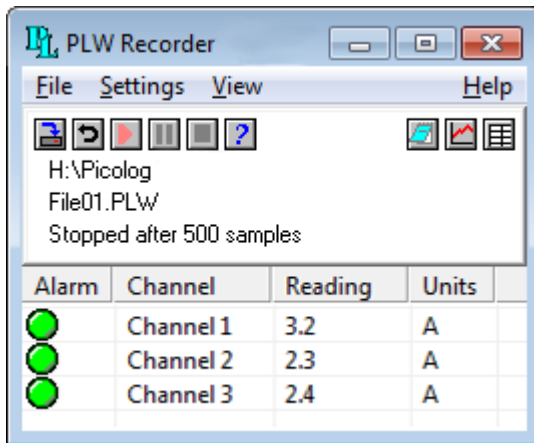


6. In the PicoLog CM3 channels window, double-click on Ch1 unused. The Edit PicoLog CM3 Channel dialog box appears:



7. Type in a name for the channel, if required.
8. Select the data type required i.e 1 mV/A, 10 mV/A , 100 mV/A, or Voltage.

9. Now click OK. Readings from the PicoLog CM3 will appear in the monitor window:



## 2.5 Specifications

Range (voltage)	0 - 1 V AC RMS
Accuracy (voltage)	1% <200 mV (RMS) 2.5% <1 V (RMS)
Range (with supplied current clamps)	(1 mV/A) 0.1 to 200 A AC RMS
Accuracy (with supplied current clamps)	(1 mV/A range) 0 to 200 A $\pm$ 3%
RMS Noise	60 $\mu$ V
Resolution	24-bit
Conversion Time Per Enabled Channel (approx.)	720 ms
Number of inputs	3
Connectors	4 mm Sockets
Input impedance	>1 M $\Omega$ AC Coupled
Overvoltage protection	$\pm$ 30 V DC
Output	USB or Ethernet
Power	Powered by USB or Ethernet: USB: 5 V $\pm$ 10% @ <100 mA USB (Ethernet enabled): 5 V $\pm$ 10% @ <200 mA Ethernet: 48 V $\pm$ 20% @ <40 mA (< 2 W)
Temperature range	20°C to 28°C for stated accuracy 0°C to 50°C operating -20 to +60°C storage
Humidity range	20% to 80% RH non-condensing, operating 5% to 95% RH non-condensing, storage
Dimensions	W 135 x L 184 x H 36 mm (5.31 x 7.24 x 1.42 in.)
Software	PicoLog data logging software. Drivers for Windows XP (SP2 or later)/Vista/Windows 7. Examples for C/C++, Excel, LabVIEW.
Ethernet port	Conforms to IEEE 802.3 10Base-T. Compatible with 10/100/1000Base-T networks. Conforms to IEEE 802.3af Power-over-Ethernet (PoE).
USB port	Conforms to USB 2.0 Full-Speed (12 Mbps)



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plcm3.en-2

28.06.11

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