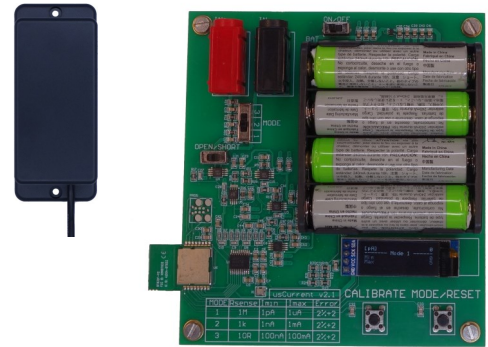


OVERVIEW

The picoammeter is a battery-powered device (4xAA) capable of sampling the current value once per second and sending the results over 2.4GHz RF to a USB data logger. It provides three modes of operation, each utilising different sensing resistor values and providing three current measurement ranges. The maximum error of 2%+2 and the device's competitive price make it the ideal choice for cost-sensitive projects. Its self-calibration functionality assures that accuracy is always within the boundaries, even after years of device duty. The USB data logger is compatible with Windows, Linux and Mac OS operating systems. The log size depends only on the available space on the computer connected to the USB data logger.

With RF Data Logger

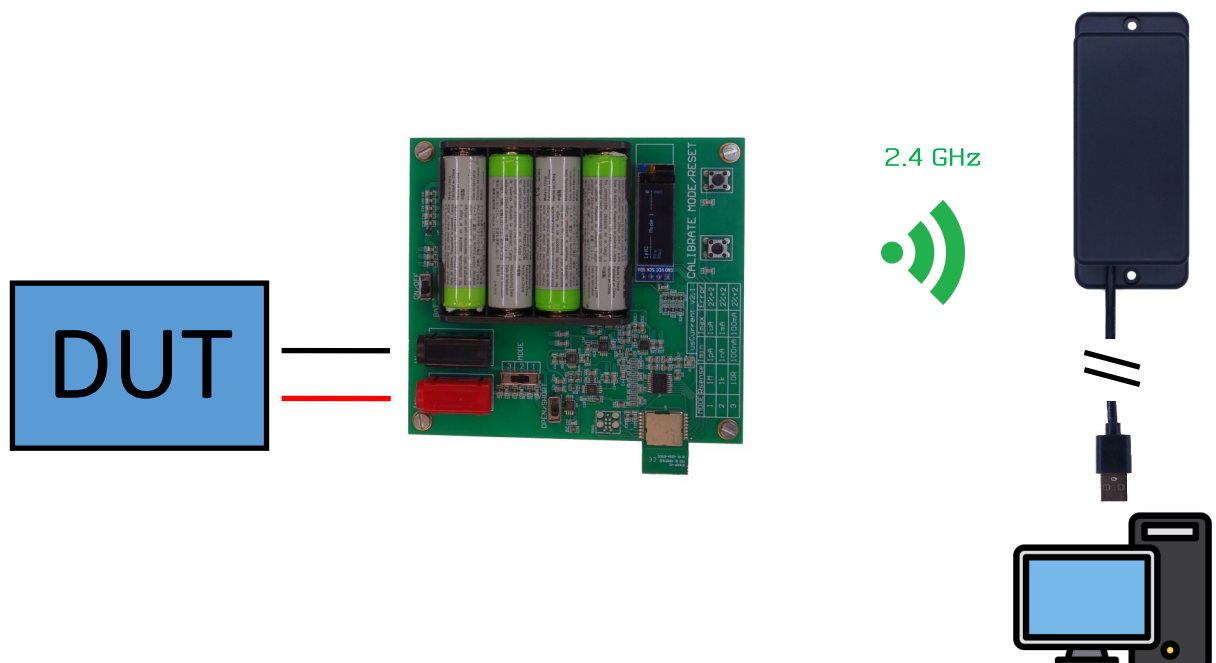


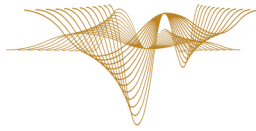
FEATURES

- Minimum resolution of 1pA
- Maximum range of $\pm 100\text{mA}$
- Maximum Error $\pm(2\%+2)$
- One sample per second
- 25ppm sample timestamp accuracy ($\pm 2.16\text{s}$ max error per day)
- More than 100h of operation from four AA batteries
- Self-calibration option
- Digital display with MIN and MAX values
- UKCA / FCC / CE certified

- Low current measurements
- High resistance measurement
- Sensors data logging
- Molecular biology and biosensors
- Spectrometry
- Semiconductor manufacturing / testing
- Linear particle accelerators

TYPICAL SETUP DIAGRAM



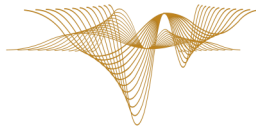


QUICK START GUIDE

1. After powering up the device, wait five minutes to stabilise its temperature.
2. Calibrate after each change of operating mode.
3. To reset Min and Max values, press and hold the MODE/RESET button for at least three seconds.
4. Always power up the device from batteries. It is intended to be used with an isolated, low noise power supply.
5. Always place the device on a ESD-protected surface.
6. Never exceed 1.2V voltage drop on the sensing resistor.
7. The device is sensitive to magnetic flux, which may cause invalid readings. Please ensure the device is reasonably isolated from magnetic field sources and that connected cables are stranded, minimising the flux between them.

CALIBRATION PROCESS

1. Place the device on a ESD-protected surface.
2. Move the OPEN/SHORT switch into the SHORT position.
3. Disconnect everything from IN+ and IN-.
4. Choose the range on the MODE switch and set the same range on the display via the MODE button.
5. Move the OPEN/SHORT switch into the OPEN position.
6. Press the CALIBRATE button.
7. After successful calibration the screen displays 'CALIBRATION OK' message.
8. Connect device under test.



DATA LOGGER

The USB Data Logger, a reliable and user-friendly USB-powered device, is compatible with the USB Serial Port standard. It supports a variety of baud rates, from 110 to 921600 bits/s, and can adapt to any setting for parity and stop bits. When the picoammeter is powered on, it initiates data transmission, regardless of the USB Data Logger's state. These two devices are paired during manufacturing, ensuring consistent and accurate data transmission. Any terminal application with file storage capabilities can be used for data logging. The output data format is compatible with CSV files, with each line containing a timestamp in seconds and a current value in picoamperes. For example:

timestamp_s, current_pA

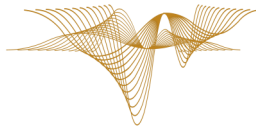
1, 5

2, 10

3, 15

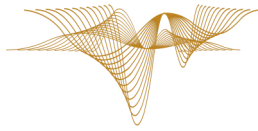
The timestamp value also comes from the picometer and is not reset after powering up the data logger. Below is a list of free applications compatible with the logger that allow data to be logged into a file. The user can access the data from the USB Serial COM port with many programming languages and frameworks if there is a requirement to integrate the device with a more comprehensive system.

Application Name	Website link	OS Support
Tera Term	https://teratermproject.github.io/index-en.html	Microsoft Windows
PuTTY	https://www.putty.org	Microsoft Windows, ReactOS, macOS, Linux
minicom	https://linux.die.net/man/1/minicom	Linux
iTerm2	https://iterm2.com	macOS



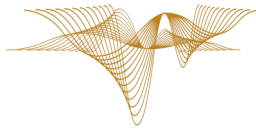
OPERATING MODES SPECIFICATION

Parameter	Mode 1	Mode 2	Mode 3	Unit
Sensing Resistor	1Meg	1k	10	Ω
Resistor Tolerance	0.1	0.1	0.1	%
Minimum Measurable Current	$\pm 1\text{p}$	$\pm 1\text{n}$	$\pm 100\text{n}$	A
Maximum Measurable Current	$\pm 1\mu$	$\pm 1\text{m}$	$\pm 100\text{m}$	A
Resistor Voltage Drop	$\pm 1\mu\text{V} / 1\text{pA}$	$\pm 1\mu\text{V} / 1\text{nA}$	$\pm 10\mu\text{V} / 1\mu\text{A}$	-
Screen Resolution	1p	1n	1n	A
Maximum Error	$\pm(2\% + 2)$	$\pm(2\% + 2)$	$\pm(2\% + 2)$	-



ELECTRICAL SPECIFICATION

Parameter	Minimum	Typical	Maximum	Unit
Power Supply Voltage	3.5	-	7	V DC
Power Consumption	18	19	21	mA
Operating Temperature Range	5	20	45	°C
Storage Temperature Range	-40	-	85	°C
Operating and Storage Humidity Range	20	-	60	% RH (no icing or condensation)
RF Frequency	-	2.4 (802.11n)	-	GHz
Maximum RF Range	5	30	50	meters
Sample period	0.999975	1	1.000025	second



SAFETY NOTES

- 1. Do not plug the device to power supplies or other devices except to measure current.**
- 2. Use the device only on ESD protective surface.**
- 3. Do not operate when wet.**
- 4. Do not operate the device outside specified environmental condition and electrical parameters.**
- 5. Use only good condition AA rechargeable or non-rechargeable batteries.**
- 6. For more information about the product, visit www.kaftstechnologs.co.uk and contact us.**