Open-source data processing solutions for Teledyne RD Instruments Workhorse ADCP

**Python solutions**

pyadps v0.2.0 (Amol Prakash, 2025)

pyadps is a Python package that can be used to process moored ADCP data. It provides data reading, quality control, NetCDF file creation and visualization functionalities in a graphical interface (Streamlit), as well as direct Python package access. The software is designed for Teledyne RDI workhorse ADCPs, and other company’s ADCP files are not compatible. It was last updated on 17/06/2025 and is actively maintained.

* [Homepage & Documentation](https://pyadps.readthedocs.io/en/latest/index.html)
* [GitHub Repository](https://github.com/p-amol/pyadps)

pycurrents\_ADCP\_processing v1.0.1 (Hana Hourston *et al.*, 2023)

pycurrents\_ADCP\_processing provides multi-level processing for raw ADCP data using the UHDAS pycurrents package. This software includes L0, L1 and L2 processing levels, however there is no visualization functionality. This software works with Teledyne RDI Workhorse, Sentinel V and Broadband instruments. The software was last updated on 9/5/2024.

* [GitHub Repository](https://github.com/IOS-OSD-DPG/pycurrents_ADCP_processing?tab=readme-ov-file)

**MATLAB solutions**

mADCP (Gunnar Voet, 2015)

mADCP is a moored ADCP processing toolbox that provides a structured workflow. It focuses on processing raw data, including coordinate transformation and quality control. The software was last updated on 5/5/2017 and is no longer maintained.

* [GitHub Repository](https://github.com/modscripps/mADCP/tree/master)

adcptools v1.0 (Bart Vermeulen, 2021)

adcptools is a set of functions to process raw ADCP data. The functions can read raw Teledyne RDI binary files, perform coordinate transformations, reduce the extent of the homogeneity assumption and fir velocity models directly to the beam velocities. The software was last updated on 4/8/2023 and is no longer maintained.

* [GitHub Repository](https://github.com/bartverm/adcptools?tab=readme-ov-file#readme)

**R solution**

oce package v1.8-3RC1 (Kelley, Richards and Layton, 2022)

oce package provides built in data processing and plotting functions for moored ADCP data. This software was last updated 4/8/2024 and is actively maintained.

* [GitHub Repository](https://github.com/dankelley/oce)
* [Publication](https://joss.theoj.org/papers/10.21105/joss.03594.pdf)

**Related solutions**

IMOS toolbox v2.6.15 (AODN, 2019)

The Integrated Marine Observing System toolbox is a MATLAB toolbox which provides an interface for converting raw instrument data into quality controlled NetCDF files. The typical usage of the toolbox involves importing and pre-processing raw data, followed by automatic and manual quality control. The output is a set of netCDF files which include both original and modified data sets. The toolbox was last updated on 12/01/2023.

* [GitHub Repository](https://github.com/aodn/imos-toolbox)
* [Supported Teledyne RDI instruments](https://github.com/aodn/imos-toolbox/wiki/RDI)
* [Homepage](https://github.com/aodn/imos-toolbox/wiki/RDI)

ADCPy v1.2.0 (Marinna Martini, 2020)

ADCPy is a module of functions that prepare large amounts of single ping ADCP data from raw binary to NetCDF for use with xarray. The code was written for Teledyne RDI ADCPs in Python 3x. The project was last updated on 23/11/2020 and is no longer maintained.

* [GitHub Repository](https://github.com/mmartini-usgs/ADCPy/commits/master/)

adcpreader v0.2.1 (Lucas Merckelbach, 2017)

adcpreader is a Python module for reading Teledyne RDI ADCP raw binary data files. The ensembles are processed according to a user-defined pipeline. Operations that can be performed on the raw data include corrections, rotations, coordinate transformations and quality checks. The module was last updated on 4/9/2023.

* [Documentation](https://adcpreader.readthedocs.io/en/latest/index.html)
* [GitHub Repository](https://github.com/smerckel/adcpreader)

Marine and Hydrokinetic Toolkit (MHKiT) v0.9.0 (Klise *et al.*, 2020)

MHKiT is a marine renewable energy software, developed in Python and MATLAB. It is modular and the functionality includes ingesting, quality controlling, processing, visualizing and managing data. The DOLfYN (Doppler Oceanography Library for Python) module contains a set of functions to analyse binary Teledyne RDI files and return xarray datasets. This module is currently only available in Python. The project was last updated on 11/12/2024 and is actively maintained.

* [Homepage](https://mhkit-software.github.io/MHKiT/index.html)
* [GitHub Repository](https://github.com/MHKiT-Software/MHKiT-Python)
* [DOLfYN Module Documentation](https://mhkit-software.github.io/MHKiT/mhkit-python/api.dolfyn.html)

Velocity Mapping Toolbox (VMT) v4.09 (Parsons *et al.*, 2013)

VMT is a MATLAB-based processing and visualization suite designed for moving-vessel ADCP measurements. The software was last updated on 15/06/2018 and is no longer maintained.

* [Homepage](https://hydroacoustics.usgs.gov/movingboat/VMT/VMT.shtml)
* [Publication](https://onlinelibrary.wiley.com/doi/abs/10.1002/esp.3367)
* [GitHub Repository](https://github.com/frank-engel/VMT)

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Bart Vermeulen (2021) ‘adcptools’. Wageningen. Available at: https://github.com/bartverm/adcptools?tab=readme-ov-file#readme.

Gunnar Voet (2015) ‘mADCP’. La Jolla: Scripps Institution of Oceanography (Multiscale Ocean Dynamics). Available at: https://github.com/modscripps/mADCP/tree/master.

Hana Hourston *et al.* (2023) ‘pycurrents\_ADCP\_processing’. Canada: IOS OSD Data Product Team. Available at: https://github.com/IOS-OSD-DPG/pycurrents\_ADCP\_processing?tab=readme-ov-file.

Kelley, D.E., Richards, C. and Layton, C. (2022) ‘oce: an R package for Oceanographic Analysis’, *Journal of Open Source Software*, 7(71), p. 3594. Available at: https://doi.org/10.21105/joss.03594.

Klise, K. *et al.* (2020) ‘MHKiT (Marine and Hydrokinetic Toolkit) - Python’. Available at: https://doi.org/10.5281/zenodo.3924683.

Lucas Merckelbach (2017) ‘adcpreader’. Available at: https://github.com/smerckel/adcpreader.

Marinna Martini (2020) ‘ADCPy’. United States Geological Survey. Available at: https://github.com/mmartini-usgs/ADCPy.

Parsons, D.R. *et al.* (2013) ‘Velocity Mapping Toolbox (VMT): a processing and visualization suite for moving-vessel ADCP measurements’, *Earth Surface Processes and Landforms*, 38(11), pp. 1244–1260. Available at: https://doi.org/10.1002/esp.3367.