RTDE Connector Quickstart Guide

# Preface

The RTDE Connector was developed as a way to speed up and automate the setup procedure of RTDE, allowing users to debug and develop their interfaces more rapidly. This guide will review the code itself, how to utilize the new input and output functions, and finish off with an example comparing the original method for accessing RTDE to this one. It is assumed that the user already understands the core functionality of RTDE; newer users should visit Universal Robot’s Support site and search for the “REAL-TIME DATA EXCHANGE (RTDE) GUIDE” as well as the “Remote Operation of Robots”.

*Developer Note: The Connector was written in Python 3.8.4 and may not function as intended with previous releases.*

# Connector Overview

The Connector has the following inputs which are modifiable by the user:

1. ROBOT\_HOST = The IP address of the robot.
2. Config\_filename = The XML containing the inputs and outputs the user wishes to use with RTDE (under their respective keys)
3. RTDE\_inputs = The list of all RTDE controller inputs taken from the website (manually copied and turned into a CSV).
4. RTDE\_outputs = The list of all RTDE controller outputs taken from the website (manually copied and turned into a CSV).

The connector takes parameters for the robot’s IP and the XML file, defaulting to the values specified at the top of the program. It can optionally take a frequency to request outputs from RTDE which by default is set to 500Hz for E-series. On startup it will connect to RTDE and check the controller version. The connector will stop program execution if it detects a non-E-series robot or one whose software version is pre-5.10. From there it will iterate through all the keys in the XML and compare the chosen fields against the master list pulled from the RTDE Support article. If the user has incorrectly specified a field, associated the field with an incorrect type, or has a mix of inputs and outputs within one key, the connector will print an error and exit program execution.

# Connector Commands

## receive()

Receive a packet of data from RTDE at the frequency specified in instantiation of the Connector.

## send(key, field, value)

Send RTDE inputs to the robot with a given list of fields and values. All fields within a key must be sent with an associated value.

Parameters:

key (str): the key to pull the corresponding inputs from.  
 field (list): A list of fields (RTDE inputs) to send updated values to. RTDE inputs) to send updated   
 value (list): A list of updated input values to send to RTDE. Must match the order and type of the field parameter.

## sendall(key, value)

Send RTDE inputs to the robot with a given list of values. The order of values matches the recipe XML file for a given key.

Parameters:

key (str): the key to pull the corresponding inputs from.  
 value (list): A list of updated input values to send to RTDE

# Connector Example

For a full example, please see “control\_loop\_connector.py” which mirrors the functionality of the example control loop from the main RTDE guide. The original example is also included in this package.