IBM 3270 Workflow Library

Appian RPA - IBM 3270 Workflow Library - EHLLAPI

The IBM 3270 Workflow Library is a low-code workflow library designed to simplify IBM 3270 terminal management within Appian RPA. By leveraging EHLLAPI (Enhanced High Level Language Application Programming Interface), these methods provide faster execution compared to traditional keyboard-based emulator interactions. The library provides:

- Direct interaction with emulators through EHLLAPI using the emulator DLL
- Abstraction of complex EHLLAPI function inputs and outputs
- Enhanced performance and reliability for mainframe automation

For more details about the EHLLAPI interface, visit the EHLLAPI documentation

This workflow library was developed and tested using QWS3720 (https://jollygiant.com/qws3270-download/) emulator & corresponding EHLLAPI documentation

The library as-is might work with other emulators that support EHLLAPI, but changes might also be needed. **I will appreciate any feed-back to address the needed changes to adapt the code to others emulators**

Methods

- IBM Connect to Emulator
- IBM Disconnect from Emulator
- IBM Maximize Window
- IBM Enter Credential
- IBM Find Text
- IBM Get Text
- IBM Get Field at Coordinates
- IBM Go to Text Position (with Offset)
- IBM Go to Coordinates
- IBM Send Special Control Key
- IBM Write Here
- IBM Write at Coordinates
- IBM Write at Label (with Offset)
- IBM Wait for text
- IBM Wait

Getting Started

- Use Appian low-code method 'Press Keyboard Shortcuts' for Win + (R) to start the application and connect to the corresponding session letter
- Use Appian low-code method 'Wait active window title' to wait until the mainframe session was opened on the desktop
- Once connected, use the other methods in this library to interact with the emulator
- If interacting with 2 or more emulators at the same time, disconnect from the current and connect to another in order to switch between the emulators
- Use Appian low-code methods 'Activate Window' and 'Press Keyboard Shortcuts' for Alt + Function Key (4) to close the application

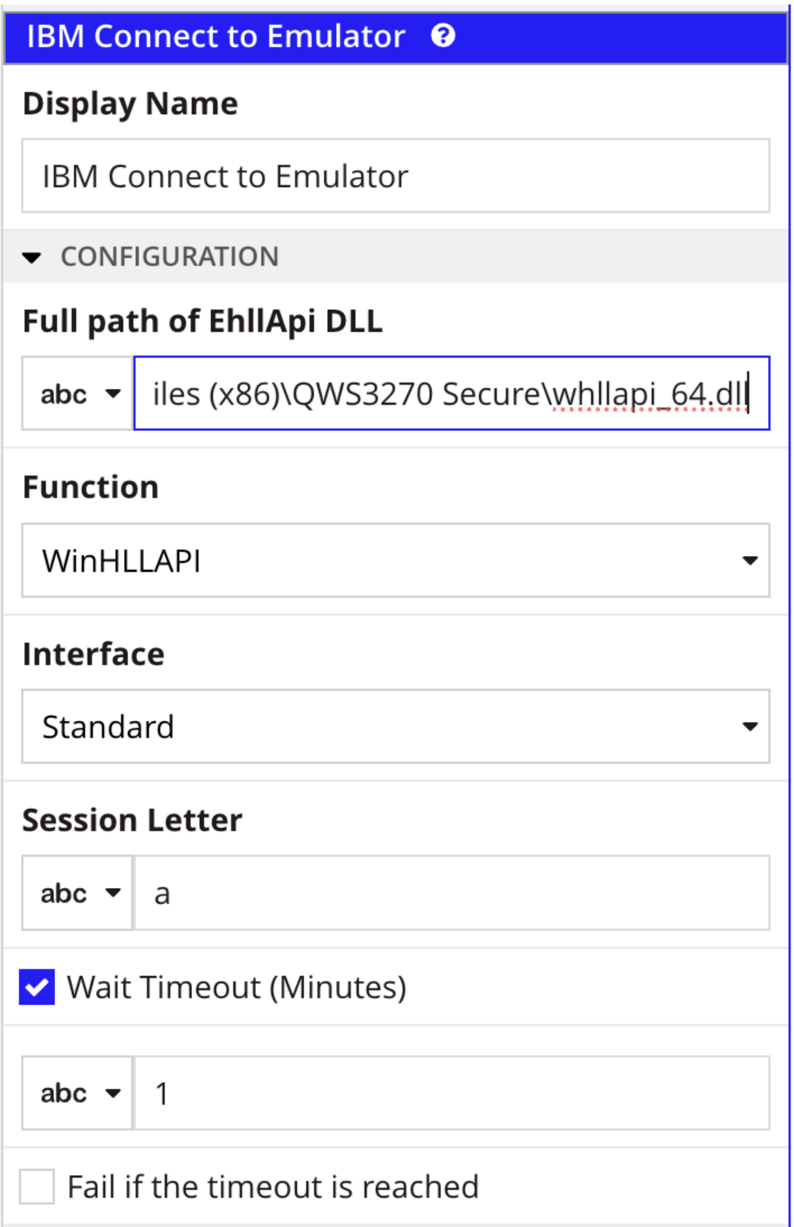
Tips

- The column coordinate in these methods match the column number displayed in the emulator, starting at 1 and incrementing by 1 moving from left to right
- The row coordinate in these methods match the row number displayed in the emulator, starting at 1 and incrementing by 1 moving from top to bottom
- The emulator will show the coordinate position (row,column) in the bottom right of the app and also inside the OIA info bar if shown (View > Expanded OIA)
- To consolidate actions, use IBM Write at Coordinates instead of IBM Go to Coordinates then IBM Write Here

Method Details

IBM Connect to Emulator

- This method must be called at the beginning of the RPA workflow, after the application has launched, before calling any other IBM methods in the workflow library.
- Inputs
  - Full path of EhllApi DLL: For example *C:\Program Files (x86)\QWS3270 Secure\whllapi_64.dll*
  - Function: This field determines if the library will use the HLLAPI or the WinHLLAPI implementation to interact with the terminal. Review [EHLLAPI documentation]() for details
  - Interface: This field determines if the library will use the STANDARD or the ENHANCED interface programming. Review [EHLLAPI documentation]() for details
  - Session Letter: Session letter defined in the terminal configuration
  - Wait Timeout (Minutes): Optional time in minutes to wait for the system to be available after connection
  - Fail if the timeout is reached: Option to throw an exception if the wait timeout is reached



IBM Disconnect from Emulator

- This method disconnects from the current connected session
- Use this when switching between multiple emulator sessions on the same machine
- Use this when done using an emulator or just close the application

IBM Maximize Window

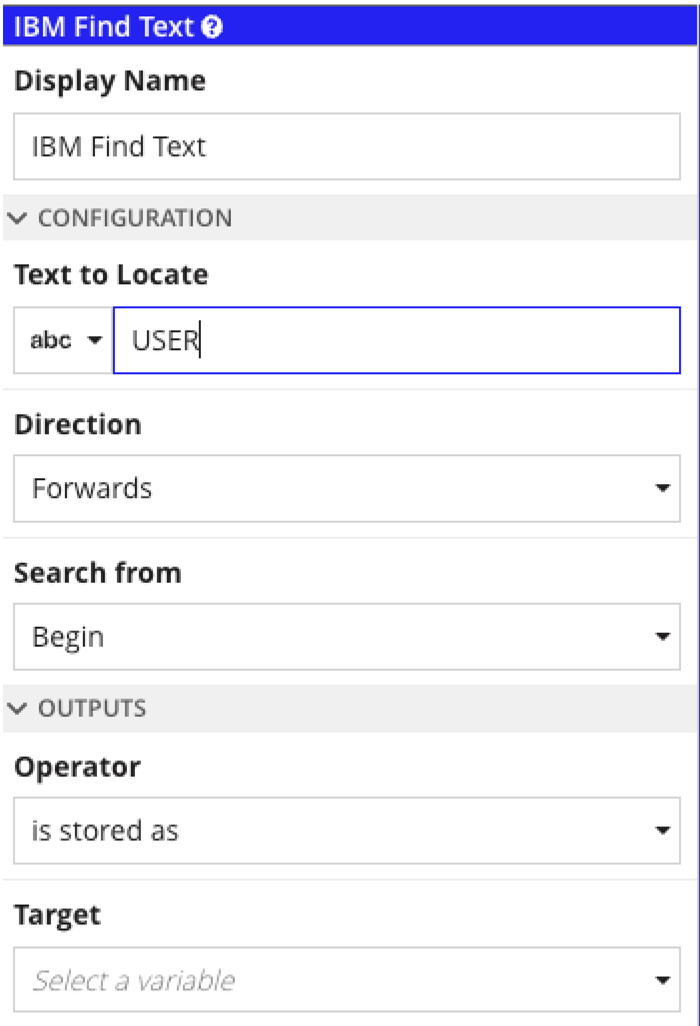
- Maximizes the emulator window

IBM Enter Credential

- This method will get credentials from the Appian RPA Console and enter them into the emulator at the current cursor position.
- If credentials must be entered at a position different than the current cursor position, use 'IBM Go To Coordinates' to navigate first.
- This method will reserve the credentials and release them once the robotic execution is complete (same as the OOTB credentials methods), which only matters if the credentials have a "max use" value set in the Appian RPA Console
- Be sure that the credentials have the same permission as the robotic process
- Inputs
  - Application Name for Credentials: The name of the application defined in the credentials module
  - UserNname for credentials; The user name defined in the credentials module
  - Type: It determines if the action will type the UserName or the Password

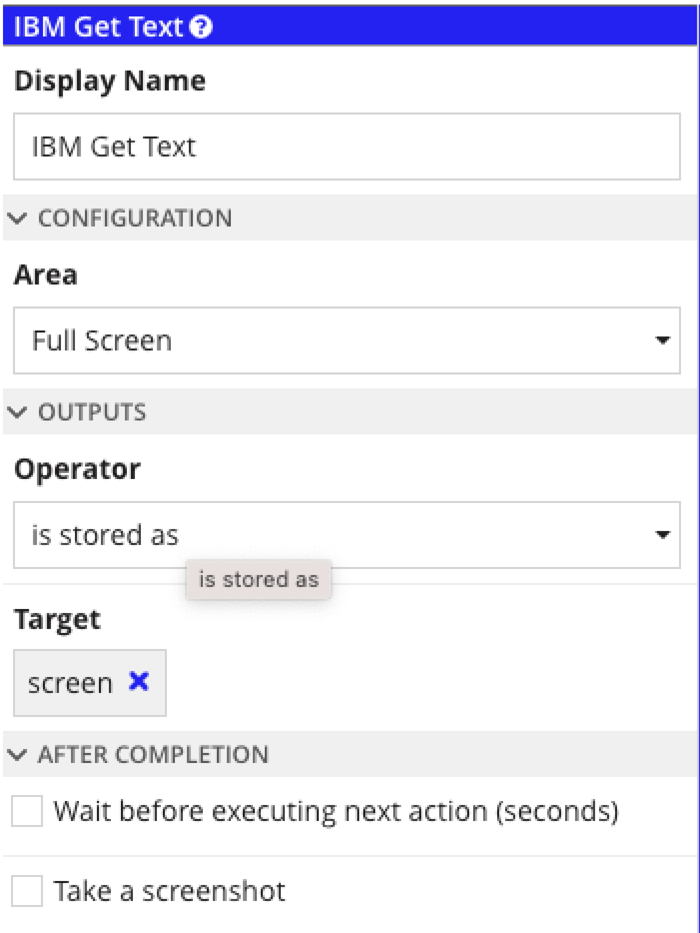
IBM Find Text

- Returns the row column coordinate location of the search string
- Inputs
  - Text to locate : The text lo locate in the terminal, Case-sensitive
  - Direction : Allows you to search forward or backward
  - If direction “Forwards”
    - Search from: Start from begin or from specific coordinates. If search from specific coordinates, the fields “From Row” and “From Column” must be filled
- Output is an Appian map with fields: row & column. Returns null if not found. Example is: {“column”:“40”,“row”:“1”}



IBM Get Text

- Returns the full text string from an specified Area
- Inputs
  - Area: Full Screen or Screen Range
  - If Screen Range. Define the range with the fields “From Row”, “To Row”, “From Column”, “To Column”
- Output is a list of Text values. One value for each line.



IBM Get Field at Coordinates

- Reads a field from the specified row column locations
- Input
  - Row: The row number
  - Column: The column number
- Output is the full text string from the mainframe application field

IBM Go to Text Position (with Offset)

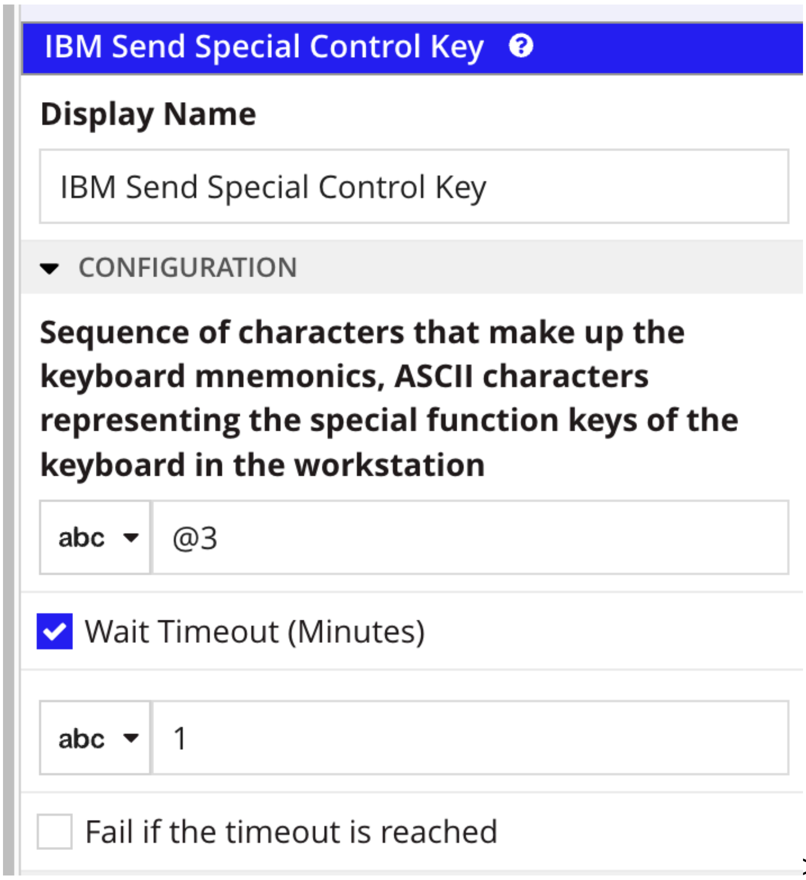
- Navigates to the location of the search string on the screen
- Inputs
  - Text to locate: Case-sensitive
  - Go to: Option to go to the first character or last character of the found string
  - Column and Row Offset: Accepts offset for moving one full space to the right of the search string (go to last character, column offset of 2)

IBM Go to Coordinates

- Navigates to the specified row column location
- Input
  - Row: The row number
  - Column: The column number

IBM Send Special Control Key

- Used for sending keystrokes other than standard characters
- Only this method sends these types of keystrokes since it handles the escape character entry (default is @)
- ‘Keyboard Mnemonics’ section in linked IBM documentation lists [all the character options]()
- Common Examples
  - @E sends the enter key
  - @T sends the tab key
  - @F clears the current field
  - @A@F clears all fields
- Inputs:
  - The special key to type
  - Wait Timeout (Minutes): Optional time in minutes to wait for the system to be available after sending the key (default: 0)
  - Fail if timeout is reached: Option to throw an exception if the wait timeout is reached



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IBM Write Here

- Writes text at the current cursor position
- Inputs
  - Text to write
  - Option to clear the current field before writing
  - Wait Timeout (Minutes): Optional time in minutes to wait for the system to be available after writing (default: 0)
  - Fail if timeout is reached: Option to throw an exception if the wait timeout is reached

IBM Write at Coordinates

- Writes text at the specified row column location
- Combination of 'IBM Go to Coordinates' and 'IBM Write Here'
- Inputs
  - row and column
  - Text to write
  - Option to clear the current field before writing
  - Wait Timeout (Minutes): Optional time in minutes to wait for the system to be available after writing (default: 0)
  - Fail if timeout is reached: Option to throw an exception if the wait timeout is reached

IBM Write at Label (with Offset)

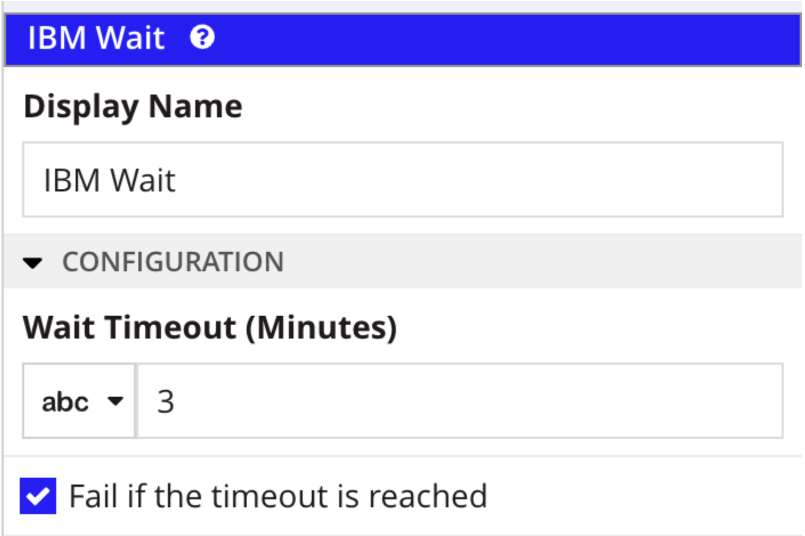
- Writes text at the location of the search string on the screen
- Inputs
  - Field Label: label on which to write. Case-sensitive
  - Start writing from: Option to write at the first character or last character of the found label
  - Column and Row offset: Offset for writing the text one full space to the right of the label (write at last character, column offset of 2)

IBM Wait For Text

- Waits until an specific text is present into the screen
- Inputs
  - Text to Locale : Case-sensitive
  - Find: You can choose to search on the entire screen or the value of a field
    - If *Field value at coordinates" Row and Column of the field location
  - Max wait time: In seconds
  - Option to throws or not an exception if the text is not found.
- Output is an Appian map with the location if the text was found. Returns null if not found. Example is: {"column":"40","row":"1"}

IBM Wait

- Waits for the system to be available. Executes multiple 1-minute waits based on the time parameter.
- Inputs
  - Wait Timeout (Minutes): Time in minutes to wait for the system to be available
  - Fail if the timeout is reached: Option to throw an exception if the wait timeout is reached
- This method helps ensure the presentation space is ready before continuing with other operations


IBM Wait
Display Name
IBM Wait
CONFIGURATION
Wait Timeout (Minutes)
abc
3
Fail if the timeout is reached