



Kairos Autonomi
498 W. 8360 S.
Sandy, Utah 84070
801-255-2950 (office)
801-907-7870 (fax)
www.kairosautonomi.com

**BULLETIN
BUL-003**

Allison External Actuator Redirection Utility

Introduction

The Pronto4 Strap-on Autonomy System has a number of built-in actuators. These actuators are assigned functions for braking, shifting gears, throttle, etc. Sometimes it is necessary to attach electronically to an external actuator and migrate internal Pronto4 actuation assignment to that external actuator. Connection and control of that external actuator occurs through a communications link. That comm. link may be serial (RS-232/422/485), USB or direct analog / pwm output.

This utility handles the connection to an external actuator and its assignment to the particular function.

A modified Allison Transmission control panel is connected to this software through a Kairos serial transmission simulator pendant. The simulator pendant is controlled via a serial port. Commands sent to the simulator pendant using a simple serial protocol cause the pendant to close a contact that allows the Allison Transmission control panel to think that an actual user has pressed the key.

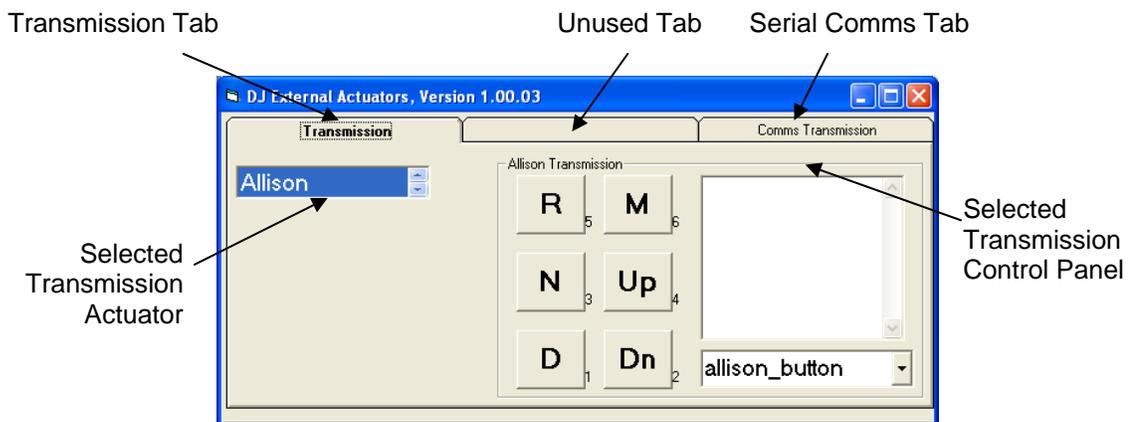
Each key is assigned a unique ordinal. Those ordinals are transmitted over the serial protocol. These ordinals are also written into an assigned shared variable. When the contents of the assigned shared variable changes and is non-zero, a key press is transmitted. The key press has a dwell of 250ms. To press the same key again with the shared variable set it to zero (0) first and then the key ordinal again. There is a default shared variable that is created 'allison_button'. It can be used, or another one created by another program can be used.

| | |
|--------------------------|-------------------|
| Default shared variable: | Allison_button |
| Ordinal 0 | no operation |
| Ordinal 1 | D button |
| Ordinal 2 | Shift Down button |
| Ordinal 3 | N button |
| Ordinal 4 | Shift Up button |
| Ordinal 5 | R button |
| Ordinal 6 | Mode button |

Main and Startup Window

Following the standard Pronto4 user interface of few dropdown menus with all relevant controls present at once on a tabbed interface, the external actuators main window is easy to navigate and use. All selections are stored upon exit and are then recalled when the program is restarted. The following figure shows the primary features of the program's main operation and start-up window.

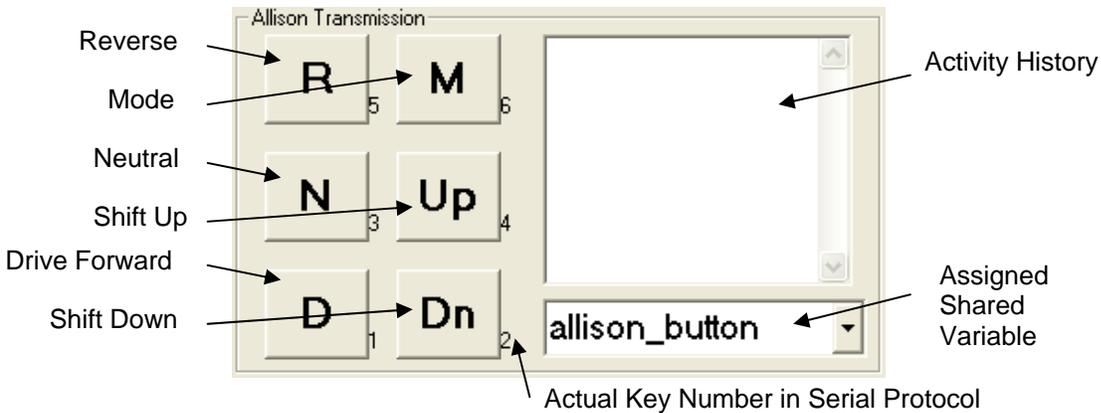
The program has plenty of room for expansion as additional actuators can easily be added to the user interface.



- **Transmission Tab:**
 All functions specifically associated with external transmission actuators are located on this tab.
- **Unused Tab:**
 This tab is available for future assignment. Most likely external brake and throttle actuators.
- **Serial Comms Tab:**
 Communications to the external actuators that occur over serial ports are managed on this tab.
- **Selected Transmission Actuator Drop Down:**
 The selected external transmission actuator is shown from the list of all available external transmission actuators.
- **Selected Transmission Control Panel:**
 Once a desired external transmission type has been selected, its specific control elements are shown in this panel

Allison Transmission Panel

Using the specific panel for operation of the modified Allison Transmission control panel, all keys can be operated.



- **Reverse:**

Pressing this button causes the actual 'R' key to simulate a key press on the modified Allison Transmission control unit. The key press dwell time is .25 seconds. The 'R' key can still be pressed on the actual control unit.

- **Mode:**

Pressing this button causes the actual 'Mode' key to simulate a key press on the modified Allison Transmission control unit. The key press dwell time is .25 seconds. The 'Mode' key can still be pressed on the actual control unit.

- **Neutral:**

Pressing this button causes the actual 'N' key to simulate a key press on the modified Allison Transmission control unit. The key press dwell time is .25 seconds. The 'N' key can still be pressed on the actual control unit.

- **Shift Up:**

Pressing this button causes the actual 'Shift Up' key to simulate a key press on the modified Allison Transmission control unit. The key press dwell time is .25 seconds. The 'Shift Up' key can still be pressed on the actual control unit. This key may have no effect if not in 'shift' mode.



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- **Drive Forward:**

Pressing this button causes the actual 'D' key to simulate a key press on the modified Allison Transmission control unit. The key press dwell time is .25 seconds. The 'D' key can still be pressed on the actual control unit.

- **Shift Down:**

Pressing this button causes the actual 'Shift Down' key to simulate a key press on the modified Allison Transmission control unit. The key press dwell time is .25 seconds. The 'Shift Down' key can still be pressed on the actual control unit. This key may have no effect if not in 'shift' mode.

- **Activity History:**

All actions taken by this control program are displayed in this history list. The action can originate from the user pressing a button or some other program changing the assigned variable.

- **Assigned Shared Variable:**

A shared variable is assigned to the shift process of the Allison Transmission. When this variable changes state and is non-zero the effect is similar to actually pressing the button.

- **Actual Key Number in Serial Protocol**

These values are the assigned ordinals for each of the Allison Transmission keys. Setting the shared variable to this value will cause the button to press and in-turn the remote key on the modified Allison transmission control. To press the same key again set the shared variable to 0 and then the number again. Allow 50ms between changes for software scan time.

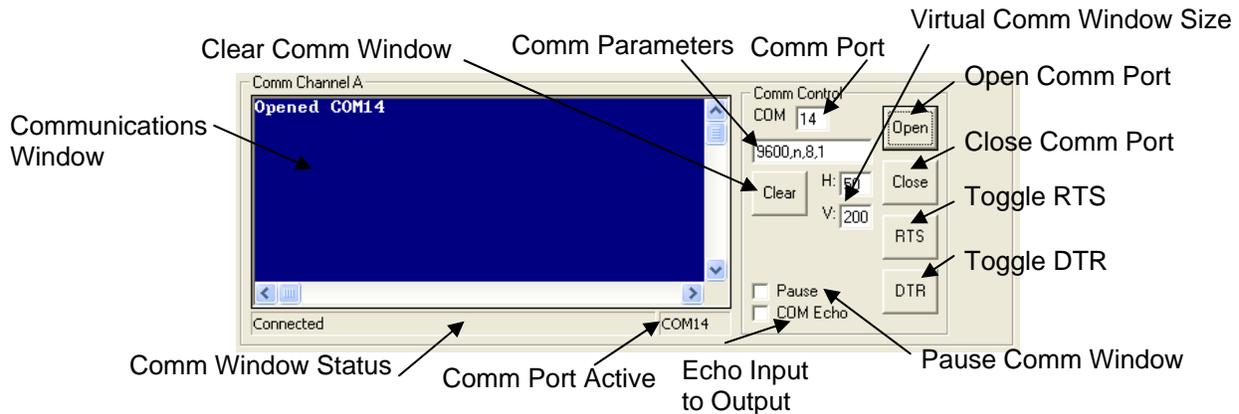
Serial Communications Panel

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v.02.00.03

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Configuration of the serial communications link between the program and the remote serial device is handled on this panel. The selected comm. port can be configured, opened, diagnosed, monitored and closed.



- **Communications Window:**

- **Clear Comm. Window:**

- The communications window is cleared of all content when pushed

- **Comm Parameters:**

- The baud rate, parity, number of data bits and number of stop bits are all set by this entry. The format follows the standard PC serial parameter format.

- Baud, parity, data bits, stop bits

- Baud: 300-512000

- Parity: N-none, E-even, O-odd

- Data Bits: 7 or 8

- Stop Bits: 1 or 2

- **Comm Port:**

- This can be any valid comm. port assigned within the operating system. Invalid port number can be entered for later usage when the comm. port is available. Virtual, USB, serial, etc comm. ports are valid.

- **Virtual Window Size:**

- The size of the window that receives the data is controlled by these parameters. It can really be of any size. If the virtual size is greater than the physical window shown, then scroll bars are active that allow for viewing the entire virtual window. If data is actively being received then the scroll bars are reset with each character received. Set the Pause checkbox to observe data that is outside of the physical window.

- **Communications Window:**

- All communications activity is reflected in this window. As serial characters are received they are painted in a vertical scrolling fashion called a TTY screen. New data is placed left to right on the bottom line of the screen, and old data scrolls off the top. A



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200 line history of old data is maintained. The screen can be directly controlled by VT52/VT100 style commands.

Open Comm. Port:

The entered comm. port is opened. Its success or failure is displayed in the communications window and in the status bar. Only one program can have a comm. port open at a single time, under normal circumstances.

Close Comm. Port:

The opened comm. port is closed. The status is shown.

Toggle RTS:

The RTS signal output is toggled from its current state. Pressing or holding the key will cause the RTS output to toggle state repeatedly. The capitalization of the RTS and rts changed to reflect the actual state of the RTS output. All caps indicate the inactive state. When all lower case, the RTS signal output is active.

Toggle DTR:

The DTR signal output is toggled from its current state. Pressing or holding the key will cause the DTR output to toggle state repeatedly. The capitalization of the DTR and dtr changed to reflect the actual state of the DTR output. All caps indicate the inactive state. When all lower case, the DTR signal output is active. DTR is often used to control reset of the remote CPU on a remote device.

Comm. Window Status:

The state of the communications window is shown.

Comm. Port Active:

The actual port opened is shown.

Echo Input to Output:

Any input received is immediately routed to the output of these communication ports. This is useful in diagnostics.

Pause Comm. Window:

The scrolling screen update of the communications window is paused and will remain paused until this checkbox is cleared. The communications window can easily be inspected while it is paused.