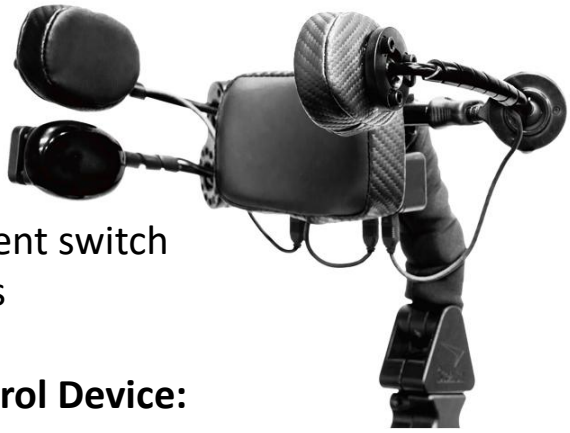
Digital/Switched Drive Control Options



What is a Digital/Switched Device?

- All or nothing response
- Each direction is controlled by a different switch
- Speed changes require profile changes

Considerations for Digital/Switched Control Device:

- Adequate postural support from seating system for operating a power wheelchair
- Proportional devices have been considered and/or trialed and ruled out
- Consistent and reproducible movement in one or more sites
- Adequate strength and ROM to activate and sustain activation of switch site
- Adequate endurance to perform movements throughout the day

What additional electronics are needed to use a digital/switched drive control?

- Expandable controller/harness
- A separate display or specialty control input module (SCIM)

Enhanced Display

Specialty Control Input Module (SCIM)

Switch Types

1. **Mechanical**
   - Variety of shapes, sizes, colors, and textures
   - Variable force and distance required to activate
   - Does not require electricity
   - Can break or wear out with prolonged use
   - Provides auditory and/or tactile feedback when the switch is depressed
   - Water resistant and non-water-resistant types available

2. **Proximity**
   - Electric and therefore a power source is required
   - Does not require force or contact to activate
   - Activates when something that conducts electricity comes into close “proximity” of the switch
   - Distance to activate (aka sensitivity) is sometimes adjustable
   - Commonly used in tray and head arrays

3. **Fiber Optic Switches**
   - Electric and therefore a power source is required
   - Minimal movement required to activate, but no force
   - Emits a beam of light that when interrupted, it reflects the beam back to activate the switch
   - Small size and can be used in very tight places

4. **Pneumatic Switches**
   - Activated by changes in pressure generated by end user “sipping or puffing” through a specialized straw or tubing
   - Commonly referred to as a “sip-n-puff”
   - Often used individually or as a hybrid/combination system

Digital/Switched Control Selection

2 Switch Options

- Allows an individual with 2 switch sites the ability to manage their power wheelchair functions
- 2 options:

1. **Standard 2 Switch Driving**
   - **Forward Drive Command**: Double tap and hold the right switch
   - **Reverse Drive Command**: Double tap and hold the left switch
   - **Left Drive Command**: Tap and hold the left switch
   - **Right Drive Command**: Tap and hold the right switch
   - **Mode:** Double tap on the right or left switch

2. **Linked Driving via Stealth iDrive**

   - Allows an individual with 2 switch sites increased efficiency and ease of using a 3-switch system
   - **Forward Drive Command**: Tap and hold both left and right switches simultaneously
   - **Reverse Drive Command**: First, tap both left and right switches simultaneously to toggle the command from forward to reverse. Then, tap and hold both left and right switches simultaneously.
   - **Left Drive Command**: Tap and hold the left switch
   - **Right Drive Command**: Tap and hold the right switch
   - **Mode:** Double tap on the right or left switch

Digital/Switched Control Selection

1 Switch Option (aka Single Switch Scanning)

- Allows an individual with only 1 switch site the ability to mange their power wheelchair functions
- Directional commands are scanned on the display
- When the desired direction is highlighted, the individual activates the switch
- The wheelchair will continue to operate in the selected direction if the switch is activated
- To stop driving the wheelchair, the switch is released

***Key Programming**

- **Scan Rate:** The time it takes to move to the next directional arrow
- **Latched Driving:** Once the directional command is engaged via a switch, the wheelchair will continue to “drive” without continuous activation of the switch. When the switch is engaged again, the wheelchair will stop. **Best to have a “E-Stop” set up for safety and/or quick braking.
- **Custom Scan Order:** More frequently used directions can be scanned more frequently
- **Step Scanning:** Allows less frequently used directions to be “stored” on another screen

Sip-n-Puff
Quick Reference Guide

- A **pneumatic switch** is used in a in Sip-n-Puff and can be used as part of a hybrid driving system
- A Sip-n-Puff can be used as a 4-direction or 2-direction system:
  - **Typical 4-Direction set up**:
    - Hard Puff → Forward
    - Soft Puff → Right
    - Hard Sip → Reverse
    - Soft Sip → Left
  - **Typical 2-Direction set up:**
    - Double Puff → Forward
    - Single Puff → Right
    - Double Sip → Reverse
    - Soft Sip → Left

- **Hybrid driving systems** allow for the use of multiple switch types to be used within the same system
- A common hybrid driving system is a **sip-n-puff/head array**. In this system, a pneumatic switch (sip-n-puff) is commonly used as forward and reverse commands and proximity sensors (head array) are used as right and left commands.

***Key Programming**

- **Latched:** When a directional command is engaged via activation of a switch, it is maintained without continuous activation of the switch. It remains engaged until another command is given or a stop command is provided.
- Latched is commonly used for the **forward direction** in a sip-n-puff

Revision History:

Rev.	Date	CR/CO#	Detail of Changes
0	7/6/22	1146-22	New form