# MOVE INCREMENTAL DISTANCE (4-DISTANCE, HOME TO HARD STOP)

## MODE DESCRIPTION

*Available on*

**MCPV**

Send a trigger pulse to tell ClearPath to move a user-defined distance [increment] from its current position. Send multiple, quick trigger pulses to tell ClearPath to travel a multiple of any distance in one smooth, uninterrupted move.

### Incremental Positioning

An incremental move is referenced to its own starting position, not to an absolute "home" reference position. So, if the incremental move distance is set to +1000 counts, the shaft will move +1000 counts from its current position each time a trigger pulse is received.

Assert the Enable Input to energize the motor. ClearPath can be set to perform an optional homing routine (home-to-hard stop only in this mode). Move distance is selected with Inputs A and B. Pulsing the Enable/Trigger Input launches each move.

**Position Control**  **Incremental Positioning  (4-Distance Programmable)**

| Signal | Function | Incremental Distance Settings | | | | Example Timing |
|---|---|---|---|---|---|---|
| | | Dist.1 | Dist.2 | Dist.3 | Dist.4 | |
| **Input A** | Increment Select A | LOW | HIGH | LOW | HIGH | |
| **Input B** | Increment Select B | LOW | LOW | HIGH | HIGH | |
| **Enable/ Trigger** | Enable Trigger | Logic:  High=Enable   Low=Disable Pulse Enable line to trigger moves | | | | |
| **Notes:** ClearPath can be programmed to home upon enable (see text for full details). Moves are triggered on rising edge of trigger pulse. | | | | | | |



Motor position vs. time

Trigger pulse

## I/O FUNCTIONS

**Enable Input -** Asserting this input energizes the motor shaft. A short pulse (user-definable) on this input is the trigger that starts a move. (A "pulse" is a momentary interruption of current into the Enable input.)

**Input A -** This input, along with Input B, selects which of the four defined position increments to send upon a trigger pulse.

**Input B -** This input, along with Input A, selects which of the four defined position increments to send upon a trigger pulse.

**Output (HLFB) -** See HLFB section for available modes.

**Notes:**

- A trigger pulse is required to launch each move. Move distance is selected with Input A and B.

- To create a longer continuous move, send multiple trigger pulses and ClearPath will automatically "chain" the move

increments together to form a single non-stop move. Note: To successfully "chain" move increments, the burst of trigger pulses must be sent rapidly. The pulse train must be received by the ClearPath during the acceleration through constant velocity portion of move, *but not during the deceleration phase.*

- If a trigger pulse is received during the deceleration phase of a running move, it will not be chained to the original move. In fact, the "late pulse" will trigger a separate move.

## MODE CONTROLS

**Torque Override Indicator**
When lit, the main torque limit is being overridden by a secondary, user-set torque limit (e.g., when an axis is homing, the main torque limit may be overridden by the separate homing torque limit setting).

**Set Move Increments**
Enter move distance for each input state.

Click to open Torque Limit Setup dialog.

Click to open Homing Setup dialog.

**Position Increment Setup (cnts)**

| 1) A off B off | 2) A on B off | 3) A off B on | 4) A on B on |
|---|---|---|---|
| -50,000 | +50,000 | -10,000 | +10,000 |

**Torque Limit**
OVR  Setup...

**Homing**
○ Disabled
◉ Enabled
Setup...

**Speed Limit (RPM)**
2,000.

**Accel Limit (RPM/s)**
25,000

☐ Use multiple speed/accel

Spd/Acc Setup...

**Profile Conversion**
RAS™ 44 ms
Setup...

**Trigger Pulse**
Setup...

Enter max. desired motor speed.

Enter max. desired acceleration rate.

Use these controls to set different speeds and accelerations for each position increment.

Adjust settings for **RAS™** (or optional **g-Stop™**) to convert standard trapezoidal move profiles into profiles that reduce noise, resonance, and vibration.

Click to adjust trigger pulse timing.

**Hardware Input Status LEDs**
Light = Input asserted (on)
Dark = Input de-asserted (off)

**Inputs and Commands**

Enable On/Off    Trigger

Input A I-sel A

Input B I-sel B

**ServoOn Output**
Servo On

☐ Override Inputs

☐ ◉  Trg    ☐ ◉    ☐ ◉    Set Home Posn

Check to turn on Soft Controls. Override cannot be activated when ClearPath is hardware enabled.

**Soft Inputs and LEDs** emulate hardware inputs. For use only when Soft Controls are active. **Caution: motor may spin when enabled.**

Click during homing operation to manually set home position.

Displays HLFB output status.

# MOVE INCREMENTAL DISTANCE (2-DISTANCE, HOME TO HARD STOP)
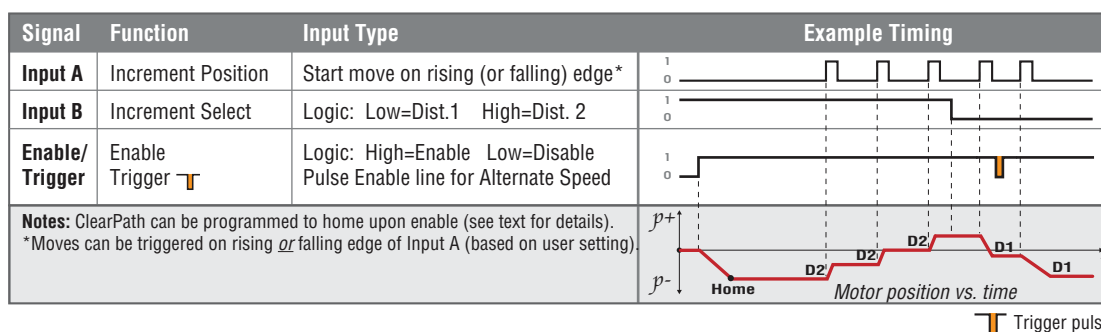
*Available on*

**MCPV**

## MODE DESCRIPTION

Change the state an input to tell ClearPath to move a user-defined, incremental distance from its current position. Send multiple, quick transitions to tell ClearPath to travel a multiple of any distance in one smooth, uninterrupted move.

### What is Incremental Positioning?

An incremental move is referenced to its own starting position, not to an absolute "home" reference position. So, if the incremental move distance is set to +1000 counts, the shaft will move +1000 counts from its current position each time a move is launched.

Assert the Enable Input to energize the motor. (ClearPath can be set up to perform an optional home to hard stop upon enable.) Change the state of Input B to select which of the two move increments is currently active. Change the state of Input A to launch each move at the user-defined speed and acceleration. Briefly pulse the Enable input to execute the next move at the alternate speed limit.

**Position Control**   **Incremental Positioning  (2 Incremental Distances, HS Home)**

| Signal | Function | Input Type | Example Timing |
|--------|----------|------------|----------------|
| **Input A** | Increment Position | Start move on rising (or falling) edge* | |
| **Input B** | Increment Select | Logic:  Low=Dist.1    High=Dist. 2 | |
| **Enable/ Trigger** | Enable  Trigger | Logic:  High=Enable   Low=Disable  Pulse Enable line for Alternate Speed | |

Notes: ClearPath can be programmed to home upon enable (see text for details).
*Moves can be triggered on rising *or* falling edge of Input A (based on user setting).



*Motor position vs. time*

Trigger pulse

## I/O FUNCTIONS

**Enable Input -** Asserting this input energizes the motor shaft. A short pulse (user-definable) on this input tells ClearPath to use the alternate speed limit setting for the next move.

**Input A -** Turning this input on (or off, if desired) sends the position increment.

**Input B -** This input selects which of the two defined position increments to send.

**Output (HLFB) -** See HLFB section for available modes.

**Notes:**

- Send incremental move commands by turning Input A either on or off (user settable).

- Multiple position increments can be smoothly chained together (i.e., with no stops in between) by toggling Input A before ClearPath starts decelerating. For example, three quick cycles of Input A will create one smooth move of three times the length of the selected position increment.
- If you need to move in both directions, make sure you define both a positive and a negative position increment.

## MODE CONTROLS

**Set Move Increments**
Enter move distance for each state of Input B.

Select how you want to launch incremental moves; when Input A turns *on,* or when it turns *off* .

Enter alternate motor speed (optional).

**Torque Override Indicator**
When lit, the main torque limit is being overridden by a secondary, user-set torque limit (e.g., when an axis is homing, the main torque limit may be overridden by the separate homing torque limit setting).

Click to open Torque Limit Setup dialog.

Click to open Homing Setup dialog.

Position Increment Setup (cnts)

1) **B** off   -25,000
2) **B** on   +25,000

Increment Posn When...
Input A Turns On ▾
Input A Turns On
Input A Turns Off

Alt Speed Limit (RPM)
20.

Torque Limit
OVR   Setup...

Homing
○ Disabled
⊙ Enabled
Setup...

Speed Limit (RPM)
500.

Accel Limit (RPM/s)
15,000

☐ Use multiple speed/accel    Spd/Acc Setup...

Profile Conversion
RAS™ 44 ms
Setup...

Trigger Pulse
Setup...

Enter max. desired motor speed.

Enter max. desired acceleration rate.

Use these controls to set different speeds and accelerations for each position increment.

Adjust settings for **RAS™** (or optional **g-Stop™**) to convert standard trapezoidal move profiles into profiles that reduce noise, resonance, and vibration.

Click to adjust trigger pulse timing.

**Hardware Input Status LEDs**
Light = Input asserted (on)
Dark = Input de-asserted (off)

**Inputs and Commands**

Enable
On/Off   Trigger

Input A
I-sel A

Input B
I-sel B

ServoOn Output
Servo On

☐ Override Inputs

☐ ⊙   Trg   ☐ ⊙   ☐ ⊙   Set Home Posn

Check to turn on Soft Controls. Override cannot be activated when ClearPath is hardware enabled.

**Soft Inputs and LEDs** emulate hardware inputs. For use only when Soft Controls are active.
**Caution: motor may spin when enabled.**

Click during homing operation to manually set home position.

Displays HLFB output status.

# MOVE INCREMENTAL DISTANCE (2-DISTANCE, HOME-TO-SWITCH)
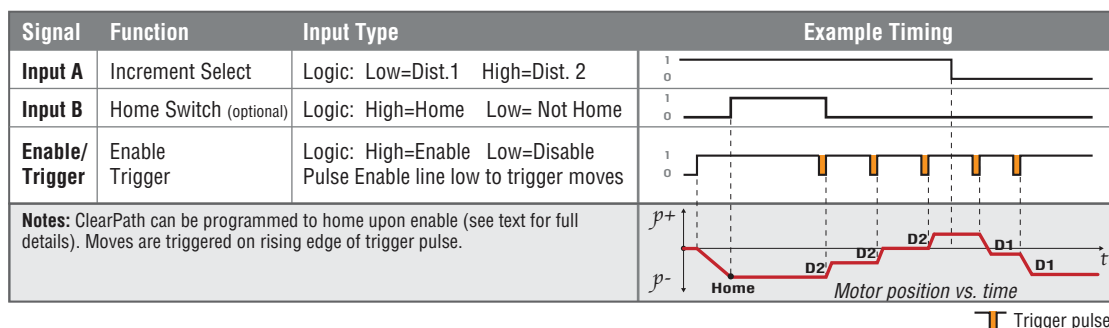
*Available on*

**MCPV**

## MODE DESCRIPTION

Send a trigger pulse to tell ClearPath to move a user-defined distance from its current position. Send multiple, quick trigger pulses to tell ClearPath to travel a multiple of any distance in one smooth, uninterrupted move.

### Incremental Positioning

An incremental move is referenced to its own starting position, not to an absolute "home" reference position. So, if the incremental move distance is set to +1000 counts, the shaft will move +1000 counts from its current position each time a trigger pulse is received.

Assert the Enable Input to energize the motor. ClearPath can be set to perform an optional homing routine (home-to-switch only in this mode). Incremental move distance is selected with Input A. Pulsing the Enable/Trigger Input launches each move.

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**Position Control**    **Incremental Positioning  (2 Incremental Distances)**

| Signal | Function | Input Type | Example Timing |
|---|---|---|---|
| **Input A** | Increment Select | Logic:  Low=Dist.1    High=Dist. 2 | |
| **Input B** | Home Switch (optional) | Logic:  High=Home    Low= Not Home | |
| **Enable/ Trigger** | Enable Trigger | Logic:  High=Enable   Low=Disable Pulse Enable line low to trigger moves | |
| **Notes:** ClearPath can be programmed to home upon enable (see text for full details). Moves are triggered on rising edge of trigger pulse. | | | *Motor position vs. time* |

⊤ Trigger pulse

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## I/O FUNCTIONS

**Enable Input -** Asserting this input energizes the motor shaft.

**Input A -** This input selects which of the two defined position increments to send upon a trigger pulse.

**Input B -** This input is connected to the home switch/sensor. Its function is defined in the homing setup dialog. Home switch polarity can be inverted if desired.

**Output (HLFB) -** See HLFB section for available modes.

**Notes:**

- A trigger pulse is required to launch each incremental move. Move distance is selected with Input A.
- To create a longer continuous move, you can send multiple trigger pulses and ClearPath will automatically "chain" the move increments together to form a single seamless move. Note: To successfully "chain" move increments, the burst of trigger pulses must be sent rapidly. They must be received by

the ClearPath during the acceleration through constant velocity portion of move, *but not during the deceleration phase.* If a trigger pulse is received during the deceleration phase of a move, that move will run to completion (motor will stop). Then the next incremental move will execute.

## MODE CONTROLS

**Set Move Increments**
Enter move distance for each state of Input B.

Click to open Torque Limit Setup dialog.

Click to open Homing Setup dialog.

**Position Increment Setup (cnts)**

1) **A** off    -32,000

2) **A** on    +8,000

**Torque Override Indicator**
When lit, the main torque limit is being overridden by a secondary, user-set torque limit (e.g., when an axis is homing, the main torque limit may be overridden by the separate homing torque limit setting).

**Torque Limit**
OVR    Setup...

**Homing**
◉ Disabled
○ Enabled
Setup...

**Speed Limit** (RPM)    3,000.

**Accel Limit** (RPM/s)    20,000

☑ Use multiple speed/accel    Spd/Acc Setup...

**Profile Conversion**
g-Stop™ 43 ms
Setup...

**Trigger Pulse**
Setup...

Enter max. desired motor speed.

Enter max. desired acceleration rate.

Use these controls to set different speeds and accelerations for each position increment.

Adjust settings for **RAS™** (or optional **g-Stop™**) to convert standard trapezoidal move profiles into profiles that reduce noise, resonance, and vibration.

Click to adjust trigger pulse timing.

**Hardware Input Status LEDs**
Light = Input asserted (on)
Dark = Input de-asserted (off)

**Inputs and Commands**

| Enable On/Off Trigger | Input A Increment | Input B Home Switch | ASG-Position |

At Position

☐ Override Inputs    ☐ ⊙ Trg    ☐ ⊙    ☐ ⊙

Check to turn on Soft Controls. Override cannot be activated when ClearPath is hardware enabled.

**Soft Inputs and LEDs** emulate hardware inputs. For use only when Soft Controls are active. **Caution: motor may spin when enabled.**

Displays HLFB output status.

## MOVE INCREMENTAL DISTANCE (1-DISTANCE, HOME-TO-SWITCH)

*Available on*

MCPV

### MODE DESCRIPTION

ClearPath will make an incremental move when the state of Input A changes. If automatic homing is on, ClearPath will seek for the home switch connected to Input B the first time it is enabled after power up, or, if desired, each time it is enabled.

#### What is Incremental Positioning?

An incremental move is referenced to its own starting position, not to an absolute "home" reference position. So, if the incremental move distance is set to +1000 counts, the shaft will move +1000 counts from its current position each time a move is launched.

Assert the Enable Input to energize the motor. ClearPath can be set up to perform an optional homing routine upon enable (home-to-switch only in this mode). Change the state of Input A to launch each move at the user-defined speed and acceleration. Briefly pulse the Enable input to execute the next move at the alternate speed limit.

**Position Control**  Incremental Positioning  (1 Incremental Distance, Home-To-Switch)

| Signal | Function | Input Type | Example Timing |
|---|---|---|---|
| **Input A** | Start Move | Start move on rising (or falling) edge* | |
| **Input B** | Home Switch | Logic:  High=Home   Low=Not Home | |
| **Enable/ Trigger** | Enable Trigger | Logic:  High=Enable   Low=Disable Pulse Enable line for Alternate Speed | |
| Notes: ClearPath can be programmed to home upon enable (see text for details). *Moves can be triggered on either rising *or* falling edge of Input A ( this is user settable). | | | |



*Motor position vs. time*

Trigger pulse

### I/O FUNCTIONS

**Enable Input -** Asserting this input energizes the motor shaft. A short pulse (user-definable) on this input tells ClearPath to use the alternate speed limit setting for the next move. (A "pulse" is a momentary interruption of current into the Enable input.)

**Input A -** Turning this input on (or off, if desired) sends the position increment.

**Input B -** This input is connected to the home switch/sensor. Its function is defined in the homing setup dialog.

**Output (HLFB) -** See HLFB section for available modes.

**Notes:**

- Send incremental moves by turning Input A either on or off (this is user settable).

- Multiple position increments can be smoothly chained together (i.e., with no stops in between) by toggling Input A before ClearPath starts decelerating. For example, three quick cycles of Input A will create one smooth move of three times the length of the position increment.

- The direction of the move is specified by the sign of the position increment (i.e., a positive position increment will move the shaft in a counter-clockwise direction, while a negative increment will cause a move in the clockwise direction).

- Note that this 1 increment mode only allows for movement in one direction."

## MODE CONTROLS

**Torque Override Indicator**
When lit, the main torque limit is being overridden by a secondary, user-set torque limit (e.g., when an axis is homing, the main torque limit may be overridden by the separate homing torque limit setting).

Select how you want to launch incremental moves; when Input A turns *on*, or when it turns *off*.

Enter alternate motor speed (optional).

Click to open Torque Limit Setup dialog.

Click to open Homing Setup dialog.

**Set Move Increment**
Enter move distance here.

**Position Increment** (cnts)
`+620`

**Increment Posn When...**
`Input A Turns On ▼`

**Alt Speed Limit** (RPM)
`22.`  OVR

`Setup...`

◉ Disabled
○ Enabled
`Setup...`

**Speed Limit** (RPM)
`2,003.`

**Accel Limit** (RPM/s)
`10,203`

**Profile Conversion**
`RAS™ 25 ms`
`Setup...`

**Trigger Pulse**
`Setup...`

Enter max. desired motor speed.

Enter max. desired acceleration rate.

Adjust settings for **RAS™** (or optional **g-Stop™**) to convert standard trapezoidal move profiles into profiles that reduce noise, resonance, and vibration.

Click to adjust trigger pulse timing.

**Hardware Input Status LEDs**
Light = Input asserted (on)
Dark = Input de-asserted (off)

**Inputs and Commands**

| Enable On/Off Alt Spd | Input A Incr Posn | Input B Home Switch | ASG-Position |
|---|---|---|---|
| ◉ — ◉ | ◉ | ◉ | At Position |
| ☐ Override Inputs | ☐ ◉ Alt Spd | ☐ ◉ | ☐ ◉ |

Check to turn on Soft Controls. Override cannot be activated when ClearPath is hardware enabled.

**Soft Inputs and LEDs** emulate hardware inputs. For use only when Soft Controls are active.
**Caution: motor may spin when enabled.**

Displays HLFB output status.