Shanghai Naxing Electronics Co., Ltd.

BeadaPanel

USB Event-Report Developer's Manual

Rev. 0.4

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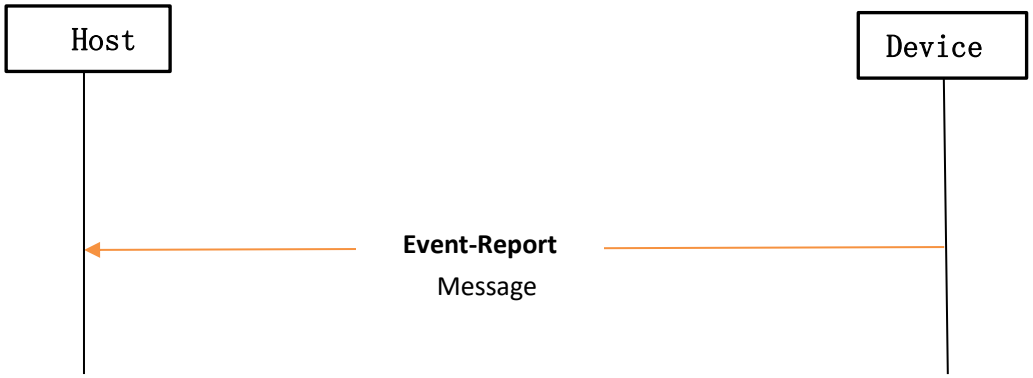
1. Overview

Event-Report is an USB communication protocol to report input events (touch screen, touchpad, etc) from NXElec BeadaPanel Media Display to USB Host.
Event-Report is a unidirectional protocol so it will occupy one dedicated USB interrupt endpoint. In current BeadaPanel firmware(V8.26), the endpoint address is 0x04(input).

2. Event-Report Protocol

Event-Report Primitives

Event-Report protocol communicates from USB Device to Host on a dedicated USB interrupt endpoint.



Event-Report Message

An Event-Report message consists of a unique touch event. Package format of an Event-Report message is as below:

Event-Report Package

Byte Sequence	Field Name	Description
0-1	Type	1 – Raw input event 2 – Gesture Tap event, a unique touch and lift operations was detected 3 – Gesture Double Tap event, two consecutive taps were detected. 4 – Gesture Hold event, a unique touch down kept in a constant period. 5 – Gesture Drag event, a drag operation over touch screen surface. 6 – Gesture Hold and Drag event, a consecutive hold and drag operations were detected.
2-3	Length	Length of message(header + payload) can be variant on different message type.
4-	Payload	Payload of touch event

2-1 Event-Report Package Format

Event-Report Model Feature Comparison Table

Model	5	7	6	3	4	5C	5T	2	2W	5S
Raw Input Event		x					x			x
Tap Event		x					x			x
Doube Tap Event		x					x			x
Hold Event		x					x			x
Drag Event		x					x			x
Hold and Drag Event		x					x			x

2-2 Event-Report Model Feature Comparison Table

Payload format of raw input event is as below:

Byte Sequence	Field Name	Description
0-1	Type	Type of raw input event.
2-3	Code	Code of raw input event.
4-7	Value	Value of raw input event.

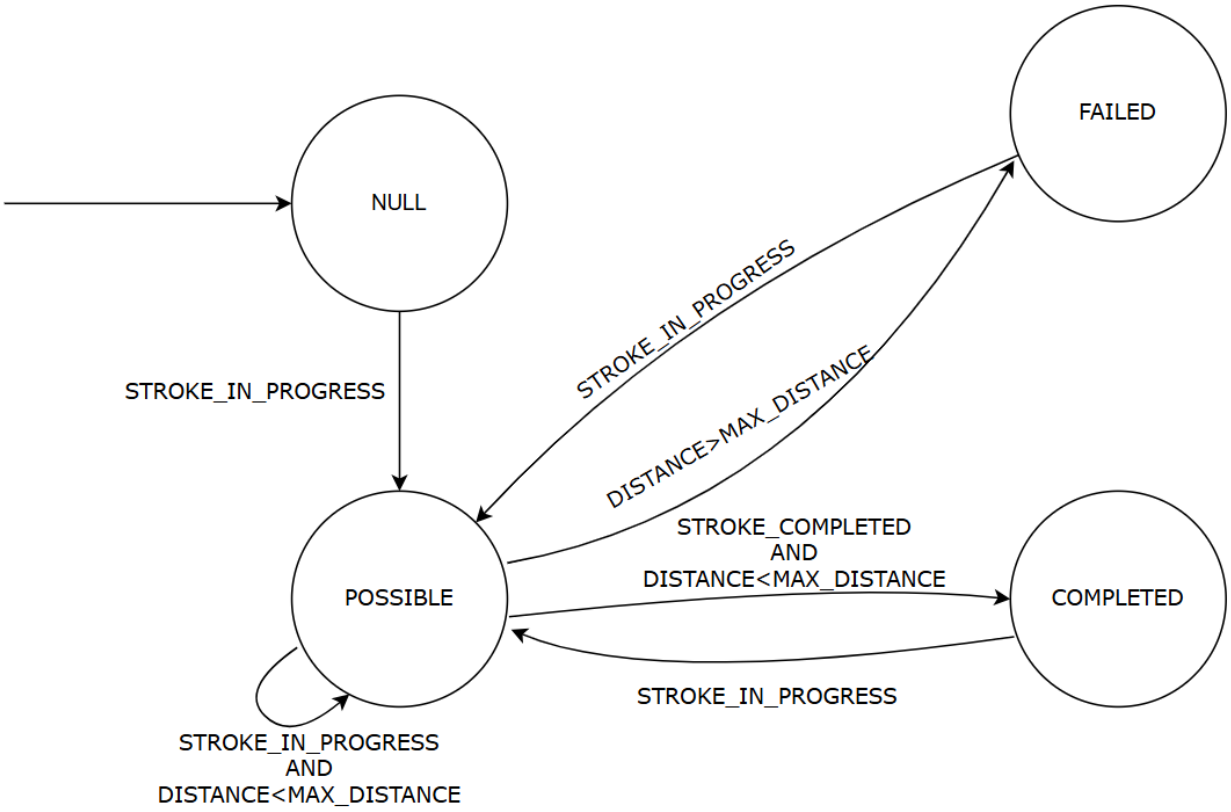
2-3 Raw Input Event Format

Payload format of gesture tap event is as below:

Byte Sequence	Field Name	Description
0-3	State	State of tap gesture 0-STATE_NULL 1-STATE_POSSIBLE 2-STATE_IN_PROGRESS 3-STATE_FAILED 4-STATE_COMPLETED
4-7	X0	Initial position x, in single precision float format.
8-11	Y0	Initial position y, in single precision float format.
12-15	T0	Initial contact time, in single precision float format.
16-19	X1	Current position x, in single precision float format.
20-23	Y1	Current position y, in single precision float format.
24-27	T1	Current contact time, in single precision float format.

2-4 Gesture Tap Event Format

To perform a tap, press down and release within a short time and without moving too much.



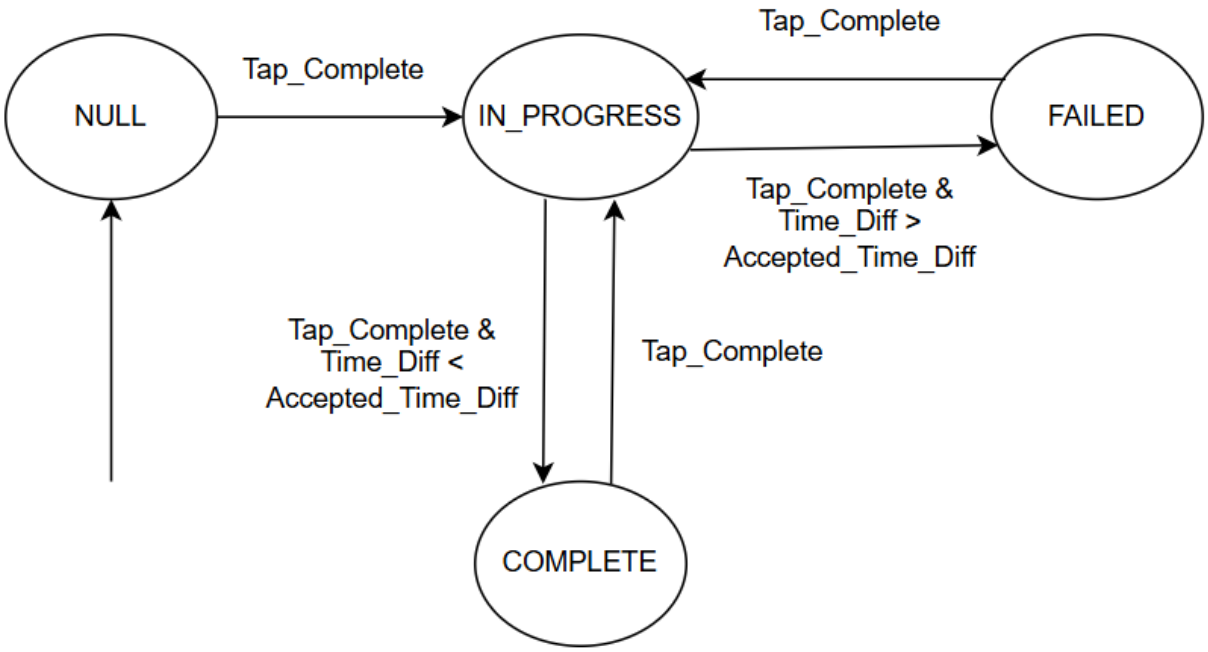
Tap is a simple gesture that contains information about where and when the tap was started and released. If the time between start and release is too long or the distance too great, the tap will fail.

Payload format of gesture double tap event is as below:

Byte Sequence	Field Name	Description
0-3	State	State of double tap gesture 0-STATE_NULL 1-STATE_POSSIBLE 2-STATE_IN_PROGRESS 3-STATE_FAILED 4-STATE_COMPLETED
4-7	Group	Group id of contact point.
8-11	X0	Initial position x, in single precision float format.
12-15	Y0	Initial position y, in single precision float format.
16-19	T0	Initial contact time, in single precision float format.
20-23	X1	Current position x, in single precision float format.
24-27	Y1	Current position y, in single precision float format.
28-31	T1	Current contact time, in single precision float format.

2-5 Gesture Double Tap Event Format

To perform a double-tap, tap twice in close succession.



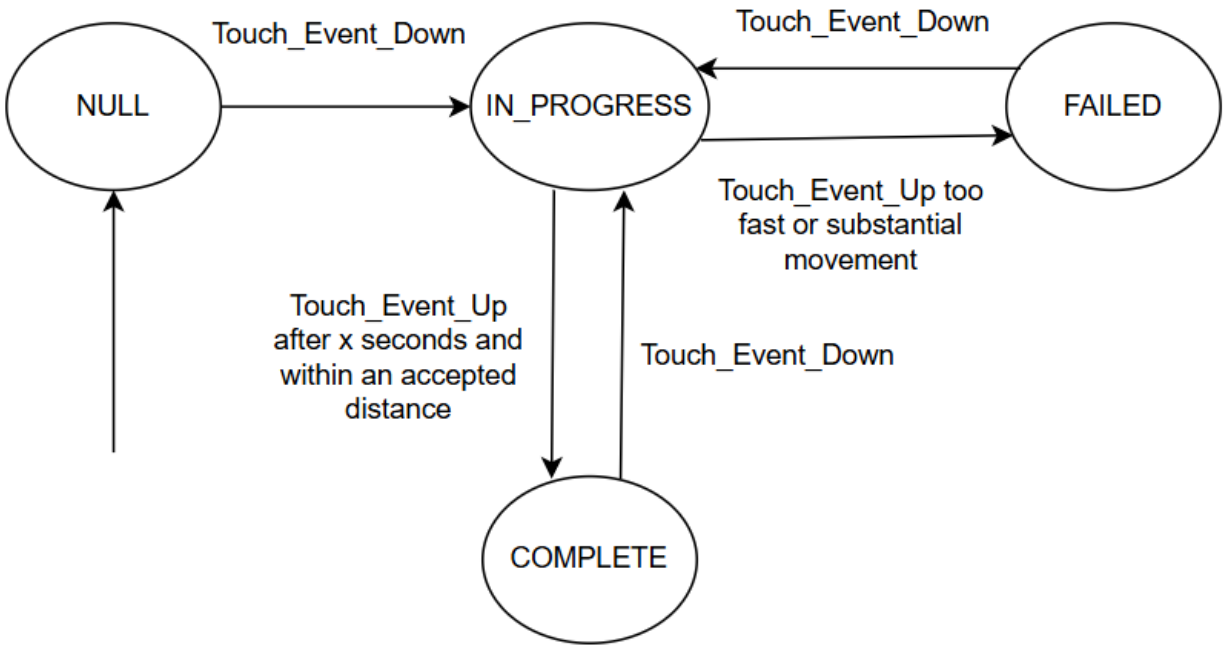
Double-tap stores the same information as a tap.

Payload format of gesture hold event is as below:

Byte Sequence	Field Name	Description
0-3	State	State of hold gesture 0-STATE_NULL 1-STATE_POSSIBLE 2-STATE_IN_PROGRESS 3-STATE_FAILED 4-STATE_COMPLETED
4-7	X0	Initial position x, in single precision float format.
8-11	Y0	Initial position y, in single precision float format.
12-15	T0	Initial contact time, in single precision float format.
16-19	X1	Current position x, in single precision float format.
20-23	Y1	Current position y, in single precision float format.
24-27	T1	Current contact time, in single precision float format.

2-6 Gesture Hold Event Format

To perform a hold, press down for a longer amount of time before releasing.



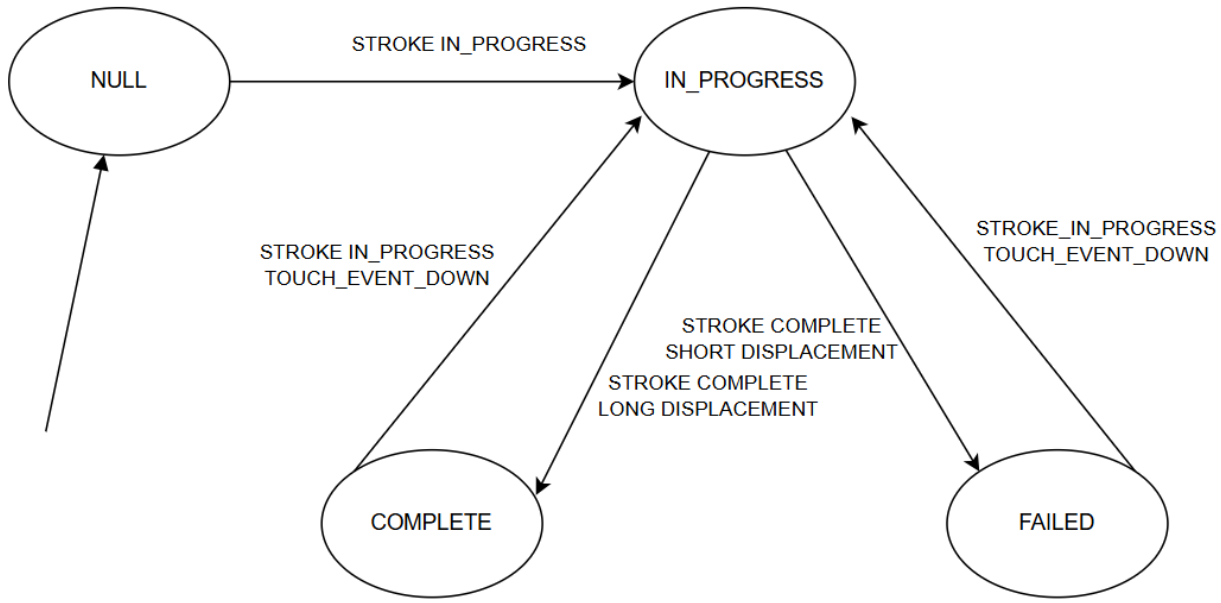
Hold stores the same information as a tap.

Payload format of gesture drag event is as below:

Byte Sequence	Field Name	Description
0-3	State	State of drag gesture 0-STATE_NULL 1-STATE_POSSIBLE 2-STATE_IN_PROGRESS 3-STATE_FAILED 4-STATE_COMPLETED
4-7	Group	Group id of contact point.
8-11	X0	Initial position x, in single precision float format.
12-15	Y0	Initial position y, in single precision float format.
16-19	X1	Current position x, in single precision float format.
20-23	Y1	Current position y, in single precision float format.
24-27	Vx	Velocity in x direction, in single precision float format.
28-31	Vy	Velocity in y direction, in single precision float format.

2-7 Gesture Drag Event Format

To perform a drag, press down and move your finger across the screen.

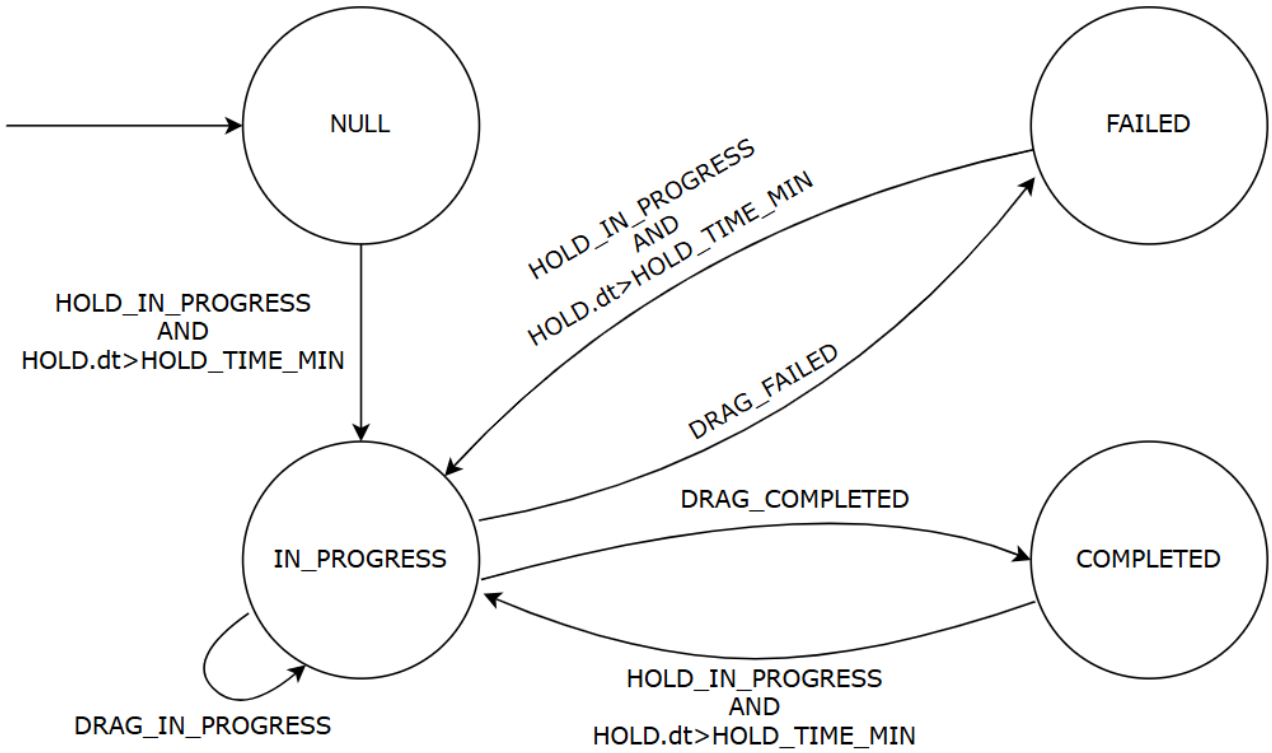


Drag tracks starting position, current position, and current velocity. Current velocity is retrieved in the same fashion as stroke.

Payload format of gesture hold and drag event is as below:

Byte Sequence	Field Name	Description
0-3	State	State of hold and drag gesture 0-STATE_NULL 1-STATE_POSSIBLE 2-STATE_IN_PROGRESS 3-STATE_FAILED 4-STATE_COMPLETED
4-7	X0	Initial position x, in single precision float format.
8-11	Y0	Initial position y, in single precision float format.
12-15	X1	Current position x, in single precision float format.
16-19	Y1	Current position y, in single precision float format.
20-23	Vx	Velocity in x direction, in single precision float format.
24-27	Vy	Velocity in y direction, in single precision float format.

2-8 Gesture Hold and Drag Event Format



3. Endianness Declaration

All data structures listed in this document should be transferred and/or stored in little-endian format, or USB peer may receive corrupted data.

4.Contact Information

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5. Revision History

Rev.	Date	Description	Author
0.1	17-July-2020	Initial release	wdzhou
0.2	4-July-2025	Add support for multi-touch capacitive screen	wdzhou
0.3	23-July-2025	Add state chart for gestures	wdzhou
0.4	26-July-2025	Add BeadaPanel model feature table	wdzhou