

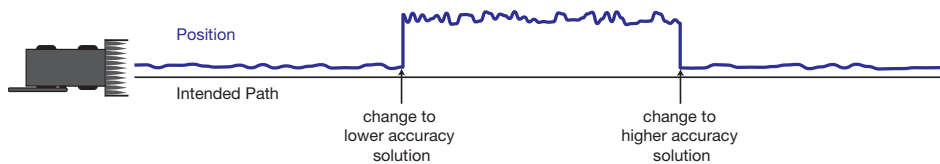
## SMOOTH TRANSITIONS BETWEEN POSITIONING MODES FOR STEERING APPLICATIONS



### REDUCED POSITION JUMPS

NovAtel's STEADYLINE technology reduces position jumps that can occur when a GNSS receiver changes positioning modes. This effect is especially evident when a receiver transitions from a high accuracy RTK position solution to a lower accuracy solution such as PPP (TerraStar), DGPS, SBAS+GLIDE or even autonomous GLIDE™. Smooth transitions are extremely important for precision agricultural steering applications where sudden jumps are disruptive.

FIGURE 1: POSITIONING CHANGE WITHOUT STEADYLINE



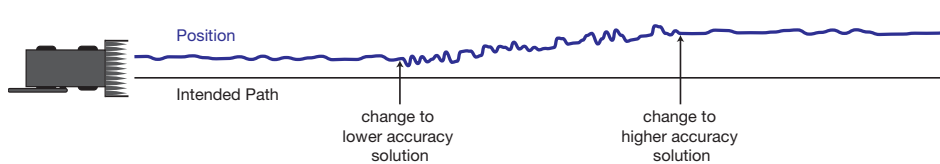
STEADYLINE internally monitors the position offsets between all the positioning modes in the receiver. When the current positioning mode becomes unavailable, the receiver automatically transitions to the next most accurate positioning mode. To handle the transition, STEADYLINE supports multiple accuracy modes including Maintain, Transition and Prefer Accuracy.

There are four STEADYLINE modes: Maintain, Transition, Prefer Accuracy and UAL.

### MAINTAIN

When the receiver transitions to a different positioning mode, it maintains the position offset calculated to limit a potential real position jump. The receiver continues to apply the position offset to all positions calculated in the new positioning mode (Figure 2).

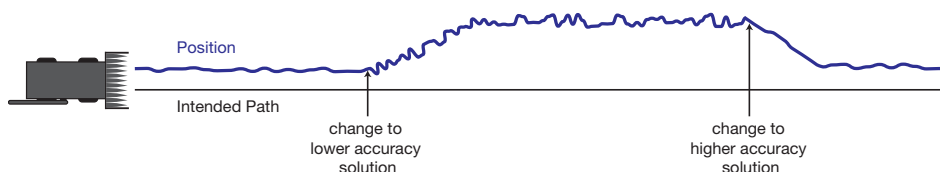
FIGURE 2: STEADYLINE MAINTAIN



### TRANSITION

When the receiver transitions to a different positioning mode, the position offset is applied to the calculated position to limit a potential real position jump. The position then slowly transitions to the new reference position type over a user specified period of time (Figure 3).

FIGURE 3: STEADYLINE TRANSITION



### BENEFITS

- + Provides smooth transitions between positioning modes for use in steering applications

### FEATURES

- + Reduces position jumps when switching between RTK, PPP (TerraStar), DGPS, WAAS and GLIDE positioning modes
- + Available on OEM6® receivers

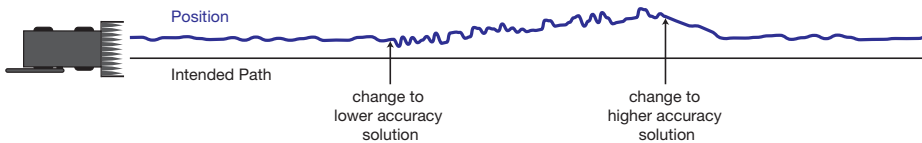
If you require more information about Firmware, visit [www.novatel.com/solutions/smooth-positioning-trajectory](http://www.novatel.com/solutions/smooth-positioning-trajectory)

# STEADYLINE

## PREFER ACCURACY

In Prefer Accuracy mode, the positioning mode change depends on the accuracy level of the positioning modes. When the position mode changes from a more accurate to a less accurate mode the receiver uses the Maintain option. When the position mode changes from a less accurate to a more accurate mode the receiver uses the Transition option.

FIGURE 4: STEADYLINE PREFER ACCURACY

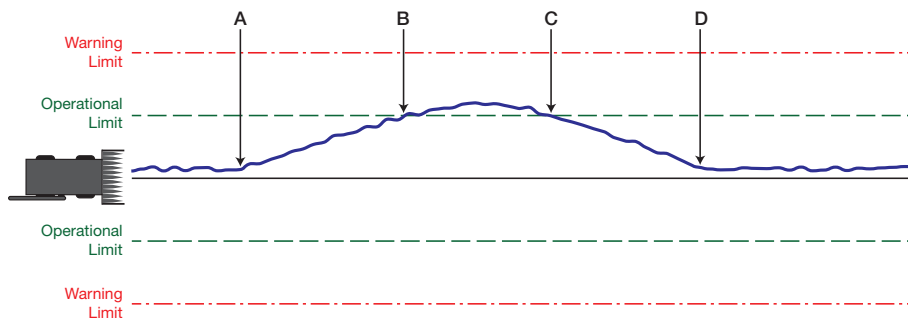


## USER ACCURACY LEVELS (UAL)

User accuracy levels can be set to change the solution type in the GPGLGGA and BESTPOS messages. When User Accuracy Level mode is used along with STEADYLINE, the accuracy mode is adjusted based on the current estimated accuracy.

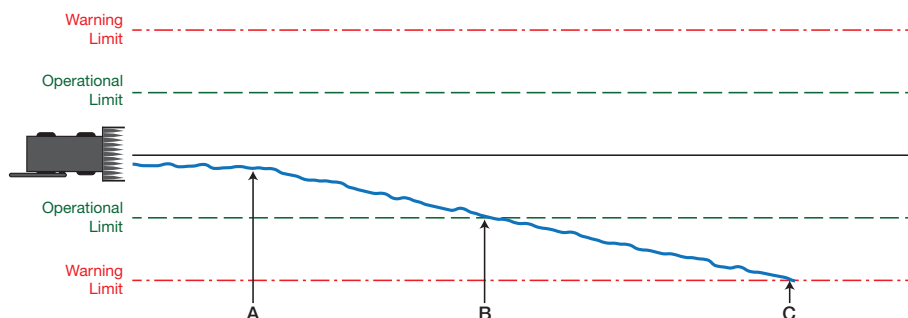
In Figure 5 below, the user has set operational and warning limits using the UALCONTROL command. At point A, higher accuracy corrections are lost and the receiver changes to a lower accuracy solution. When the position reported by the receiver is within the operational limits, the solution type reported in the BESTPOS message is OPERATIONAL and the receiver uses the Maintain accuracy mode. When the position reported is between the operational and warning limits (B), the receiver uses the Prefer Accuracy mode and reports the position type as WARNING in the BESTPOS message. When the position reported by the receiver returns to below the Operational limit (C), the solution type reported is OPERATIONAL but the receiver continues to use the Prefer Accuracy mode until the position offset is removed. After the offset is removed (D), the receiver transitions to the Maintain accuracy mode.

FIGURE 5: STEADYLINE UAL-WARNING LIMIT EXAMPLE



If the receiver position exceeds the Warning limit (point C in Figure 6 below), the solution type reported is OUT\_OF\_BOUNDS and the STEADYLINE feature is automatically disabled.

FIGURE 6: STEADYLINE UAL-OUT OF BOUNDS EXAMPLE



For the most recent details of this product, visit [www.novatel.com/solutions/smooth-positioning-trajectory/](http://www.novatel.com/solutions/smooth-positioning-trajectory/)

**novatel.com**

sales@novatel.com

1-800-NOVATEL (U.S. and Canada)  
or 403-295-4900

China 0086-21-68882300

Europe 44-1993-848-736

SE Asia and Australia 61-400-883-601

**Version 3** Specifications subject to change without notice.

©2016 NovAtel Inc. All rights reserved.

STEADYLINE and GLIDE are trademarks of NovAtel Inc.

NovAtel is a registered trademark of NovAtel Inc.

D20452 July 2016 Printed in Canada.

