1 Introduction

This specification shall describe the method used to effect remote control of GPS speedo gauges connected to a wired switch input. It shall also specify the button event interpretation by the GPS gauge.

2 Remote Button Events

All remote commands for the GPS speedo are implemented with one physical momentary contact pushbutton. The pushbutton event along with a depression duration time determines what command at the GPS gauge is to be executed. Pushbutton events are initiated by the action of the user depressing the switch. While the button is held in the depressed state, a timer with a resolution of 100 msec is started. A message will be sent once per second as long as the switch is pressed. This feature facilitates action at the receiver without waiting for the switch to be released by the user in cases where the user holds the switch until an action becomes obvious. When the user releases the switch, a final signal is transmitted to the GPS gauge along with the time duration. Figure 1 shows an example remote pushbutton event.

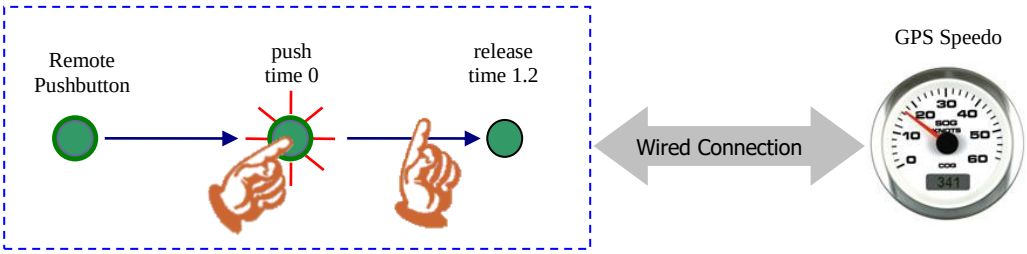


Figure 1 Remote Button Event

3 GPS Button Event Interpretation

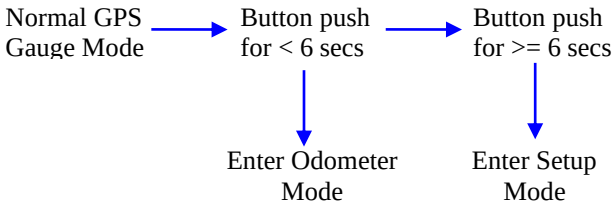
Only one remote button is used for the GPS speedo. Therefore, command interpretation depends on the button duration time and the current state of the GPS gauge. There are three time thresholds implemented to affect certain gauge command execution. To facilitate better control and user interface, button events are sent once per second as long as the switch is held in addition to the final signal transmission. The general format of the remote button messages is shown in section **Error! Reference source not found.** above. Table 1 below shows the state transitions resulting from button events based on current states.

GPS Mode	Current State	New State After Pushbutton Time Duration in Seconds		
		< 3	>= 3 < 6	>= 6
normal	normal operation	odometer	odometer	setup Miles
Odometer	odometer display	trip A	trip A	trip A
	trip A display	trip B	trip A zeroed	trip A zeroed
	trip B display	normal	trip B zeroed	trip B zeroed
Setup	setup Miles	setup Kilometers	setup Kilometers	set units to mile then back to normal
	setup Kilometers	setup nautical miles	setup nautical miles	set units to km then back to normal
	setup nautical miles	setup Miles	setup Miles	set units to n.m. then back to normal

Table 1 GPS Gauge State Transitions

3.1 GPS Modes of Operation

There are three GPS gauge modes of operation; normal, odometer, and setup. Transitioning from one mode to another is accomplished using the button events as shown in Table 1 above.



3.1.1 Odometer Mode

This mode is used to cycle through the odometer displays on the GPS LCD and reset the trip odometers. When the gauge is in its normal running mode and displaying heading, the first button push will display the odometer reading. Subsequent button pushes will display the trip A and trip B odometer readings and then back to normal heading display. If the button is held for 3 or more seconds while displaying one of the trip odometers, it will be reset to zero. The main odometer shall be capable of displaying up to 9,999,999 of the current units (MI, KM, NM). The trip odometers shall be capable of displaying up to 999,999.9 of the current units in tenths. All displays are centered with no leading zeroes. See Figure 2.

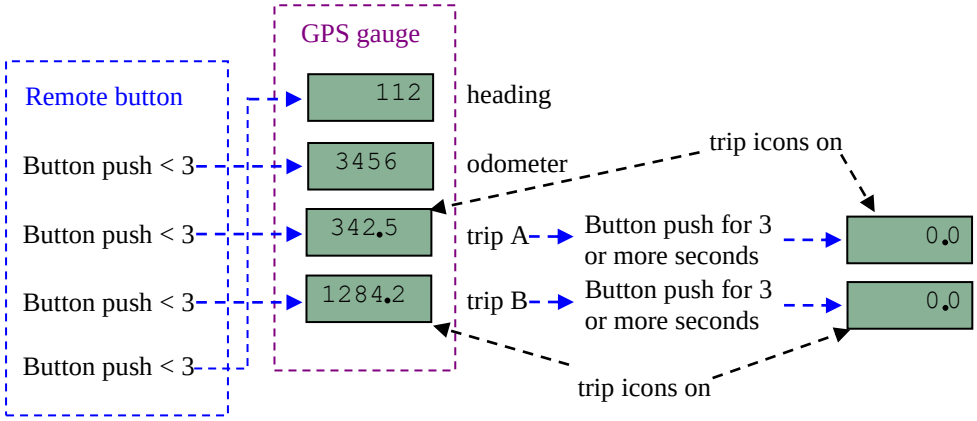


Figure 2 Odometer Mode Displays

3.1.2 Setup Mode

This mode is used to set the units of display. Upon entry into the setup mode, the display will always show MI regardless of the current units setting. Subsequent button pushes of less than 6 seconds will cycle through all three choices as shown in Figure 3 below. Button pushes of greater than or equal to 6 seconds will set the current units to the units displayed and return to normal mode.

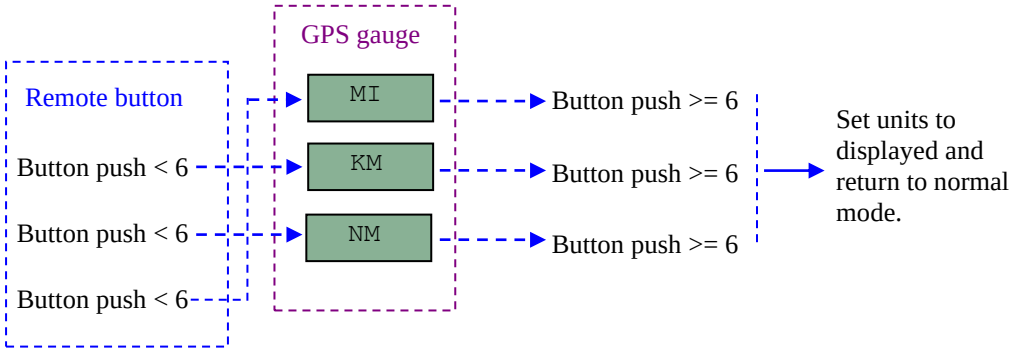


Figure 3 Setup Mode Displays