LED Display User Manual

Version: 3.0

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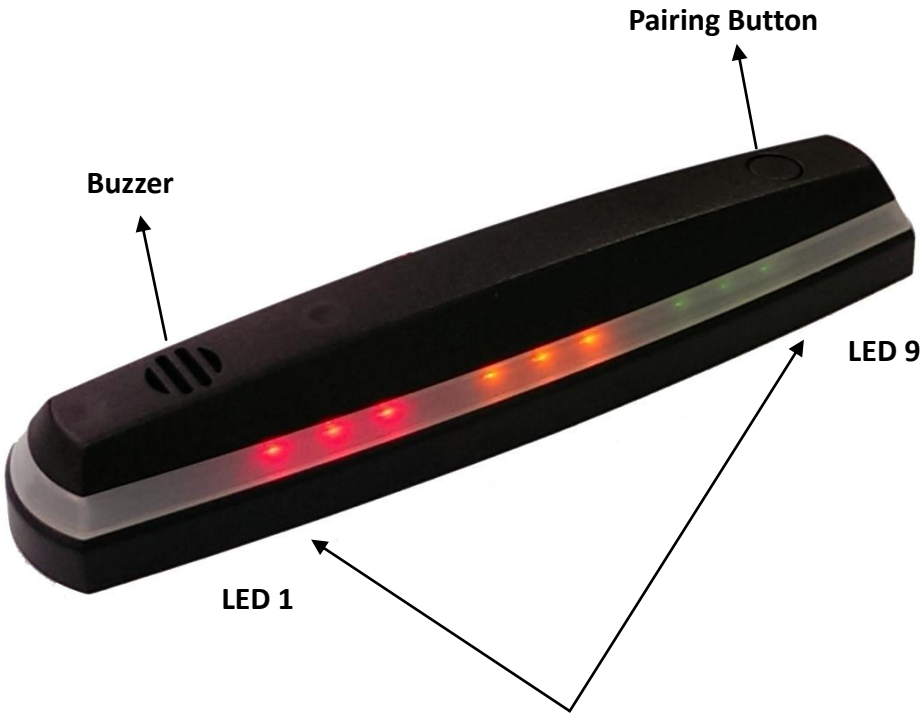
A. Introduction of Hardware Specification:



9 LED indicators from left to right are 3 Red (LED 1, 2, 3), 3 Amber (LED 4, 5, 6), and 3 Green (7, 8, 9).

Note:

- Input power Range: DC 8~24V.
- Communication Channel: RF 2.4GHz.

B. Pairing Check

Each LED display would be given with a unique identification before shipment, and this it is required to be paired with a VT device before starting operation. Please note that every LED display could be paired with single one VT device only.

There are different behaviors of LED indicators which show different statuses after connecting to a power supply:

- **When LED Display has not been paired with any VT devices yet**
  As soon as LED Display is connected to a power supply, all 9 LED indicators would blink 5 times simultaneously and then extinguish. At this stage, the device is required to perform pairing task before starting operation.

- **LED Display has already been paired with a VT device**
  There is no behavior of LED indicators to prove that LED display has been paired with a VT device. It requires users to use $RFCMD command to check if LED Display has been paired with certain VT unit. If there is no reaction shown in LED indicators after sending $RFCMD commands from paired VT unit, it is necessary for user to restart the pairing process again.

C. Pairing Procedure

- **To Start the Pairing Process**

  In order to initiate the pairing process, please press the “Pairing Button” within 15 seconds after issuing $PAIRID command to a VT unit. The 3 amber LED indicators would keep blinking during the pairing process until the process ends.

- **After Pairing Process is Completed**

  The 3 green LED indicators would blink 3 times along with 1 short beep, and then extinguish all LED indicators. This behavior indicates that the pairing process is completed, and now paired VT unit should be able to communicate with LED Display.

- **After Pairing Process is Failed**

  The 3 red LED indicators would blink 5 times along with 2 long beeps, and then extinguish all LED indicators. This behavior indicates that the pairing process is failed which requires user to restart the pairing process again.

D. Command Sets:

1. Pairing with a VT Device

$WP+PAIRID		
Description	Execute this command for pairing task	
Format	Write	$WP+PAIRID+[TAG]=[Password],1
	Read	$WP+PAIRID+[TAG]=[Password],?
Response	$MSG:PAIRID+[Tag]=1, Identification of LED Display	
Error Response	$ERR:PAIRID+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameter	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+PAIRID=0000,1 Response: $MSG:PAIRID=0x30004001	
Note	1. Users have 15 seconds to finish the pairing process after issuing $PIRID command. As long as pairing process is completed within 15 seconds, LED indicators would blink/short beep/extinguish based on previous description. 2. If the VT device does not receive any pairing request (long press “Pairing Button”) from a LED display, the error message $ERR:PAIRID=2 will be shown. 3. If the pairing process fails to be completed within 15 seconds, LED indicators would blink/long beeps/extinguish based on previous description.	

2. LED Controlling Command (Solid on Behavior)

$WP+RFCMD		
Description	Execute this command to control 9 LED indicators (to be solid on)	
Format	$WP+RFCMD+[Tag]=[Password],1,**1**,[LED Mask]	
Response	$OK:RFCMD+[Tag]=1,**1**,[LED Mask]	
Error Response	$ERR:RFCMD+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameter	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	LED Mask	This parameter enables users to control ON/OFF status for all LED indicators: 0: Disable (All LEDs switched off) 1: LED 1 2: LED 2 4: LED 3 8: LED 4 16: LED 5 32: LED 6 64: LED 7 128: LED 8 256: LED 9
Example	Ex: Issue: $WP+RFCMD=0000,1,1,511 Response: $OK:RFCMD=1,1,511	

3. LED Controlling Command (Blinking Behavior)

$WP+RFCMD		
Description	Execute this command to control 9 LED indicators (for blink frequency)	
Format	$WP+RFCMD+[Tag]=[Password],1,**2**,[LED Mask],[Toggle Times],[Toggle Duration], [Status After Process Finished]	
Response	$OK:RFCMD+[Tag]=1,**2**,[LED Mask],[Toggle Times],[Toggle Duration], [Status After Process Finished]	
Error Response	$ERR:RFCMD+[Tag]= [Error code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameter	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	LED Mask	This parameter enables users to control ON/OFF status for all LED indicators: 0: Disable (All LEDs switched off) 1: LED 1 2: LED 2 4: LED 3 8: LED 4 16: LED 5 32: LED 6 64: LED 7 128: LED 8 256: LED 9
	Toggle Times	This parameter enables users to set number of cycles for defined LED indicators to change from ON to OFF Effective range: 0~255 times

	Toggle Duration	This parameter enables users to define the ON/OFF time interval for certain LED indicators during the Toggle mode Effective range: 0~255 100ms **Ex:** 255 100ms =25.5 seconds
	Status after Process Finished	This parameter enables users to control ON/OFF status for all LED indicators after process is finished: 0: Disable (All LEDs switched off) 1: LED 1 2: LED 2 4: LED 3 8: LED 4 16: LED 5 32: LED 6 64: LED 7 128: LED 8 256: LED 9
Example	Ex: Issue: $WP+RFCMD=0000,1,2,53,10,10,1 Response: $OK:RFCMD=1,2,53,10,10,1	
Note	If $RFCMD is reconfigured again while 9 LED indicators are still behaving based on original $RFCMD configuration, these LED indicators would behave differently based on following condition: a. If new $RFCMD covers the same LED indicators with different "Toggle Times", "Toggle Duration", or "Status After Process Finished", those LED indicators would terminate original behavior and behave based on new $RFCMD settings. b. If new $RFCMD covers LED indicators which have been not activated yet, those LED indicators would behave independently with other LED indicators which behave based on original $RFCMD settings. c. The parameter [Status After Process Finished] will be executed followed by latest $RFCMD settings.	

4. Buzzer Controlling Command

$WP+RFCMD		
Description	Execute this command to control buzzer	
Format	$WP+RFCMD+[Tag]=[Password],1,**3**,[Toggle Times],[Toggle Duration]	
Response	$OK:RFCMD+[Tag]=1,3,[Toggle Times] ,[Toggle Duration]	
Error Response	$ERR:RFCMD+[Tag]=[Error code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameter	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Toggle Times	This parameter enables users to set number of cycles for buzzer to change from ON to OFF Effective range: 0~255 times
	Toggle Duration	This parameter enables users to define the ON/OFF time interval for buzzer during the Toggle mode Effective range: 0~255 100ms **Ex:** 255 100ms =25.5 seconds
Example	Ex: Issue command: $WP+RFCMD=0000,1,3,10,5 Response: $OK:RFCMD=1,3,10,5	
Note	If $RFCMD is reconfigured again, current behavior of buzzer would be terminated, and buzzer would behave followed by new $RFCMD settings.	

5. Terminate Current Behavior of LED Indicator/Buzzer

$WP+RFCMD		
Description	Execute this command to terminate current behavior of buzzer and LED indicators.	
Format	$WP+RFCMD+[Tag]=[Password],1,**4**	
Response	$OK:RFCMD+[Tag]=1,4	
Error Response	$ERR:RFCMD+[Tag]=[Error code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameter	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+RFCMD=0000,1,4 Response: $OK:RFCMD=1,4	

E. About Wonde Proud Technology

LED Display is manufactured by Wonde Proud Technology. Wonde Proud Technology provides advanced solution for GPS related solutions including the various GPS components, Automatic Vehicle Location (AVL) device (data logger & real time tracking devices). Please contact us through phone or fax number listed as following or visit our website for further product information.

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