

IPAS manual

PAS-K02

Apr 2024

1. Components



Name	Model Number	Appearance	Summary
PAS2-INDP	PAS-K02-2000		- You can set the mode, warning distance and display the warning status with the touch LCD. - Alarm alerts with built-in speakers, LEDs, and LCDs.
PAS2-VT	PAS-K02-1000		IPAS tag mounted on the equipment.

PAS2-EMT	PAS-K02-1500		Tags for E Mode
PAS2-PT	PAS-K02-0000		Tags for pedestrian.
PAS2-ZT	PAS-K02-4000		Standard Zone tag
PAS2-FZT	PAS-K02-5000		Zone tag with warning light.

2. Hardware specification

2.1. PAS2-INDP

ITEM		SPECIFICATION			
Input Voltage		12 / 48Vdc			
Current consumption		12V, 500mA(Max)			
Processor		Cortex-M7 32bit MCU+FPU STM32F746NEH6, Flash 512KB, RAM 320KB, 168pins, 216MHz			
Sensor		6-Axis(Gyro + Accelerometer)/ICM-42605(TDK)			
MEMORY	SDRAM	32MB			
	eMMC	4GB			
Interface	wired	RS-232, CANx2, USB			
	wireless	Bluetooth v5.0(2.4GHz)			
Display	LCD	Touch LCD 3.5"			
	LED	Visual Alarm			
USER INTERFACE	LCD	Touch pannel			
	External input/output	Switch I/O x 1(Max 2A) DIGITAL INPUT x 1			
Connector	1	■ Part No. : MB08FBAFF08ST(Female 8 Pins)			
		Pin No	Pin Name	Pin Type	Description
		1	VBAT	PI	External Voltage(12 ~ 80V)
		2	VBAT	PI	External Voltage(12 ~ 80V)
		3	RS232_TX	DO	RS232 Transmit Data Output
		4	RS232_RX	DI	RS232 Receive Data Input
		5	CAN_L	BI	CAN Low Signal
		6	CAN_H	BI	CAN High Signal
		7	GND		Ground
	8	GND		Ground	
	2	■ Part No. : MB08MBAFF08ST(Male 8 Pins)			
		Pin No	Pin Name	Pin Type	Description
		1	SENPWR_+12V	PO	Output Voltage(12V)
		2	-	-	No Connect
		3	-	-	No Connect
		4	-	-	No Connect
		5	CAN_L	BI	CAN Low Signal
		6	CAN_H	BI	CAN High Signal
		7	GND		Ground
	8	-		No Connect	
	3	■ Part No. : MB08MBAFF08ST(Male 8 Pins)			
		Pin No	Pin Name	Pin Type	Description
		1	EXT_IN	DI	External Input(Max 2A)
		2	EXT_IN	DI	External Input(Max 2A)
		3	D_INPUT	DO	Digital Input
		4	EXT_GND	-	External Ground
	5	EXT_OUT	DO	External Output(Max 2A)	

		6	EXT_OUT	DO	External Output(Max 2A)
		7	-		No Connect
		8	-		No Connect
BT RF Parameter	Frequency / band	2.4GHz / ISM (2.40000 – 2.4835GHz)			
	Modulation	GFSK			
	Data rate	250kbps, 1 Mbps, 2 Mbps			
	Sensitivity	-97dBm @ 1Mbps Bluetooth LE -103dBm @125kbps Bluetooth LE			
Environment	Operating temperature	-20°C ~ +70°C			
	Storage temperature	-30°C ~ +80°C			
Size		110.0 X 110.0 X 35.2(H)			
Color		ORANGE			
Ingress Protection Rating		IPX0			

2.2 PAS2-VT

ITEM		SPECIFICATION			
Input Voltage		12 / 48Vdc			
Current consumption		Avr. 100mA@12V Max500mA@12V			
Processor		Cortex-M3 32bit MCU, STM32F105RCT6, Flash 256KB, RAM 64KB, 64 Pins, 72MHz			
Display		Status LED 1set			
Sensor		6-Axis(Gyro + Accelerometer, ICM-42605(TDK))			
Interface	Wired	CAN			
	Wireless	UWB, BLE			
UWB RF Parameter	Frequency	6489.6MHz			
	Bandwidth	499.2MHz			
	Conducted Rx Sensitivity	-94.3dBm/500MHz (6.8Mbps, PER 1%)			
	Conducted Tx Power Density	Max -41.3dBm/MHz			
	Data rate	6.8Mbps			
BT RF Parameter	Frequency / band	2.4GHz / ISM (2.40000 – 2.4835GHz)			
	Data rate	250kbps, 1 Mbps, 2 Mbps			
	Sensitivity	-97dBm @ 1Mbps Bluetooth LE -103dBm @125kbps Bluetooth LE			
Connector	1	■ Part No. : MB08MBAFF08ST(Female 8 Pins)			
		Pin No	Pin Name	Pin Type	Description
		1	VBAT	PI	External Voltage(12 ~ 80V)
		2	VBAT	PI	External Voltage(12 ~ 80V)
		3	RS232_TX	DO	RS232 Transmit Data Output(TBD)
		4	RS232_RX	DI	RS232 Receive Data Input(TBD)
		5	CAN_L	BI	CAN Low Signal
		6	CAN_H	BI	CAN High Signal
		7	GND		Ground
		8	GND		Ground
Environment	Operating temperature	-30°C ~ +65°C			

	Storage temperature	-40°C ~ +85°C
	Size	115.5 X 115.5 X 64.5(H)
	Color	ORANGE+BLACK
	Ingress Protection Rating	IPX0

2.3 PAS2-EMT

ITEM		SPECIFICATION			
Input Voltage		12 / 48Vdc			
Current consumption		Avr. 100mA@12V			
Processor		Cortex-M3 32bit MCU, STM32F105RCT6, Flash 256KB, RAM 64KB, 64 Pins, 72MHz			
Display		Status LED 1set			
Sensor		6-Axis(Gyro + Accelerometer, ICM-42605(TDK))			
Interface	wire	CAN			
	wireless	UWB			
UWB RF Parameter	Frequency	6489.6MHz			
	Bandwidth	499.2MHz			
	Conducted Rx Sensitivity	-94.3dBm/500MHz (6.8Mbps, PER 1%)			
	Conducted Tx Power Density	Max -41.3dBm/MHz			
	Data rate	6.8Mbps			
Connector		■ Part No. : MB08MBAFF08ST(Female 8 Pins)			
		Pin No	Pin Name	Pin Type	Description
		1	VBAT	PI	External Voltage(12 ~ 80V)
		2	VBAT	PI	External Voltage(12 ~ 80V)
		3	RS232_TX	DO	RS232 Transmit Data Output
		4	RS232_RX	DI	RS232 Receive Data Input
		5	CAN_L	BI	CAN Low Signal
		6	CAN_H	BI	CAN High Signal
		7	GND		Ground
8	GND		Ground		
Environment	Operating temperature	-30℃ ~ +85℃			
	Storage temperature	-40℃ ~ +85℃			
Size		115.5 X 115.5 X 64.5(H)			
Color		ORANGE+BLACK			
Ingress Protection Rating		IPX0			

2.4 PAS2-PT

ITEM		SPECIFICATION
Power	Input voltage	4.7 ~ 5.5Vdc
	Internal Battery	Li-Po Battery 110mAh, 3.8V
	Current consumption	Avr. 2.2mA
	Work time	About 35 hour
Processor	MCU	Cortex-M4 32bit FPU STM32WB15CCU6E, Flash 320KB, RAM 48KB, 48 Pins, 64MHz

Interface	Wired(debug)	UART		
	Wireless	UWB, Bluetooth v5.4(2.4GHz)		
	Display	LED x 4EA (Battery Level, Status Indicator)		
	Sound	20mm Buzzer Plate		
	Vibration	Cylinder-type vibration motor		
	Button	1EA(Setup Button)		
Connector		■ Part No. : Magnetic Connector		
		Pin No	Pin Name	Pin Type
		1	VBAT	PI
		2	UART_RX	DI
		3	UART_TX	DO
		4	GND	-
		Ground		
UWB RF Parameter	Frequency	6489.6MHz		
	Bandwidth	499.2MHz		
	Conducted Rx Sensitivity	-94.3dBm/500MHz (6.8Mbps, PER 1%)		
	Conducted Tx Power Density	Max -41.3dBm/MHz		
	Data rate	6.8Mbps		
BT RF Parameter	Frequency / band	2.4GHz / ISM (2.40000 – 2.4835GHz)		
	standard	RF transceiver supporting Bluetooth® 5.2 specification		
	Data rate	1Mbps, 2 Mbps		
	Sensitivity	-95.5 dBm (Bluetooth® Low Energy at 1 Mbps)		
Environment	Operating temperature	-20°C ~ +60°C		
	Storage temperature (Battery)	-20°C ~ +45°C (1 months)		
		-10°C ~ +45°C (3 months)		
		15°C ~ +35°C (recomand)		
Design	Size	41.0 X 41.0 X 13.5(H)		
	Color	BLACK		
	Ingress Protection Rating	IPX0		

2.5 PAS2-ZT

ITEM		SPECIFICATION		
Power		12/24Vdc		
Current consumption		Avr. 100mA@12V		
Processor		Cortex-M3 32bit MCU, STM32F105RCT6, Flash 256KB, RAM 64KB, 64 Pins, 72MHz		
Display		OLED, 128×32		
Sensor		-		
Interface	Wired	CAN		
	wireless	Bluetooth v5.0(2.4GHz), UWB (6.5GHz)		
connector		■ Part No. : MB08FBAFF08ST(Female 8 Pins)		
		Pin No	Pin Name	Pin Type
		1	VBAT	PI
		Power Input(12/24V)		

	2	VBAT	PI	Power Input(12/24V)
	3	RS232_TX	DO	RS232 Transmit Data Output
	4	RS232_RX	DI	RS232 Receive Data Input
	5	CAN_L	BI	CAN Low Signal
	6	CAN_H	BI	CAN High Signal
	7	GND		Ground
	8	GND		Ground
UWB RF Parameter	Frequency	6489.6MHz		
	Bandwidth	499.2MHz		
	Conducted Rx Sensitivity	-94.3dBm/500MHz (6.8Mbps, PER 1%)		
	Conducted Tx Power Density	Max -41.3dBm/MHz		
	Data rate	6.8Mbps		
BT RF Parameter	Frequency / band	2.4GHz / ISM (2.40000 – 2.4835GHz)		
	Data rate	250kbps, 1 Mbps, 2 Mbps		
	Sensitivity	-97dBm @ 1Mbps Bluetooth LE -103dBm @125kbps Bluetooth LE		
Environment	Operating temperature	-30°C ~ +85°C		
	Storage temperature	-40°C ~ +85°C		
Design	size	110.5 X 111.5 X 91.6(H)		
	color	ORANGE + BLACK		
	Ingress Protection Rating	IPX0		

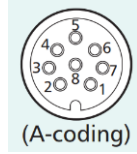
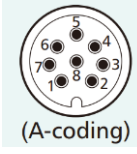
2.6 PAS2-FZT

ITEM		SPECIFICATION			
Power		12/24Vdc			
Current consumption		Max 300mA			
Processor		Cortex-M3 32bit MCU, STM32F105RCT6, Flash 256KB, RAM 64KB, 64 Pins, 72MHz			
Display		OLED, 128×32			
Sensor		-			
Interface	Wired	CAN2.0b			
	Wireless	Bluetooth v5.0(2.4GHz), UWB (6.5GHz)			
Connector		■ Part No. : MB08FBAFF08ST(Female 8 Pins)			
		Pin No	Pin Name	Pin Type	Description
		1	VBAT	PI	Power Input(12/24V)
		2	VBAT	PI	Power Input(12/24V)
		3	RS232_TX	DO	RS232 Transmit Data Output
		4	RS232_RX	DI	RS232 Receive Data Input
		5	CAN_L	BI	CAN Low Signal
		6	CAN_H	BI	CAN High Signal
		7	GND		Ground
		8	GND		Ground
UWB RF Parameter	Frequency	6489.6MHz			
	Bandwidth	499.2MHz			

	Conducted Rx Sensitivity	-94.3dBm/500MHz (6.8Mbps, PER 1%)
	Conducted Tx Power Density	Max -41.3dBm/MHz
	Data rate	6.8Mbps
BT RF Parameter	Frequency / band	2.4GHz / ISM (2.40000 – 2.4835GHz)
	Data rate	250kbps, 1 Mbps, 2 Mbps
	Sensitivity	-97dBm @ 1Mbps Bluetooth LE -103dBm @125kbps Bluetooth LE
Environment	Operating temperature	-30°C ~ +85°C
	Storage temperature	-40°C ~ +85°C
Design	Size	110.5 X 111.5 X 140.6(H)
	Color	ORANGE + BLACK
	방수	IPX0

3. CABLE SPECIFICATION

3.1 Connector

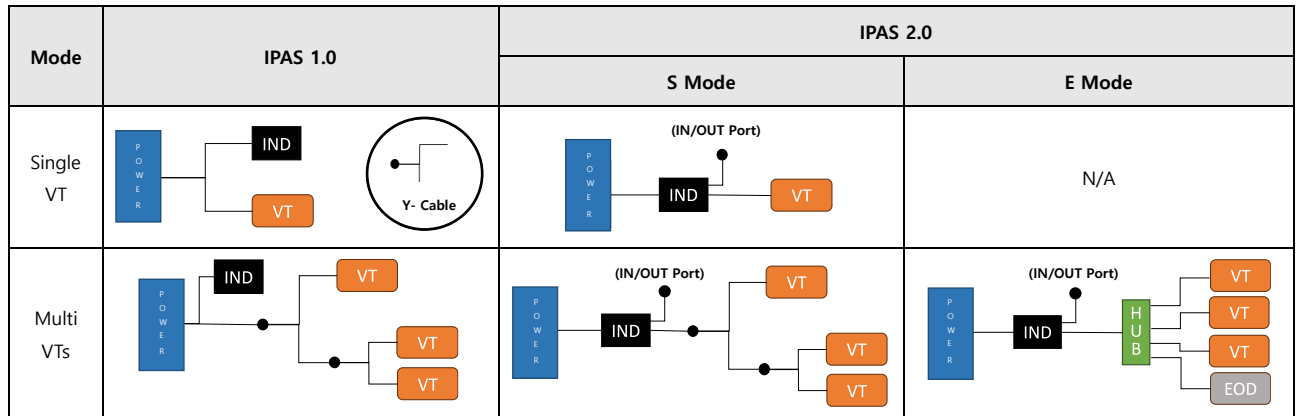
ITEM		PART NO	PIN MAP	Appearance
Female (F)	Wire mount	MA08FAHD08STXXCB14		
	Board mount	MB08FBAFF08ST		
Male (M)	Wire mount	MA08MAHD08STXXRB14		
	Board mount	MB08MBAFF08ST		

3.2 Cable specification & Pin map

UL2464 26AWGTS/6C, Jacket:Black PVC,OD:5.0mm

pin no	color	function
1	Red	VBATT
2	Green	VBATT
3	-	-
4	-	-
5	Yellow	CAN L
6	Blue	CAN H
7	Black	GND
8	Orange	GND

4. Product Connection Diagram



* VT and EMT are powered from IND.

5. GUI manual

- Booting

After power on, the boot screen shows as below, then switches to the idle screen.

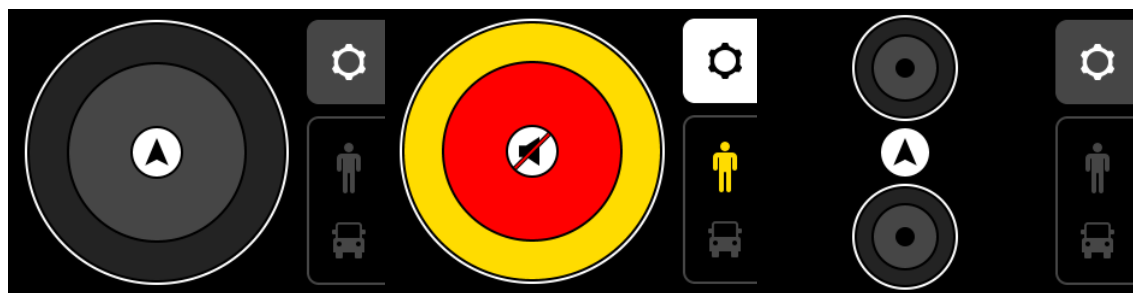


- Main

The idle screen shows the E-Mode or the S-Mode according to number of VTs.

When another VT or PT is approached, the screen has switched as below.

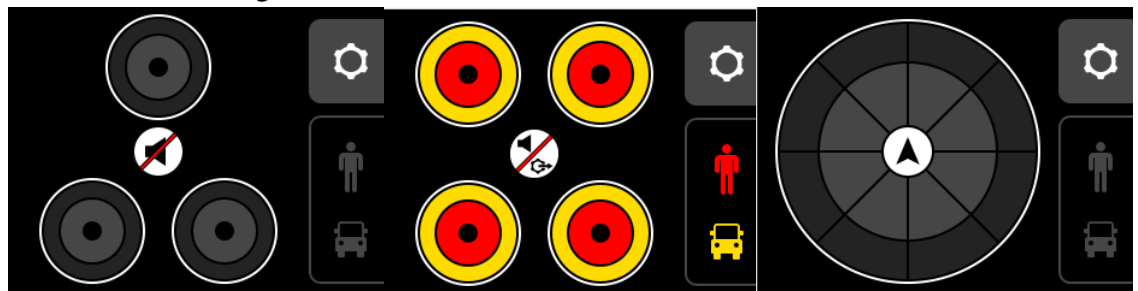
Enter the main menu when touch the setting icon.



Idle screen – single VT

Alarm – single VT

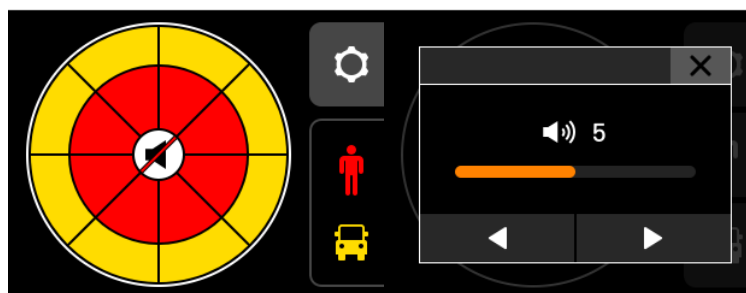
Idle screen - Double VTs



Idle screen - third VTs

Alarm – fourth VTs

Idle screen - S-Mode

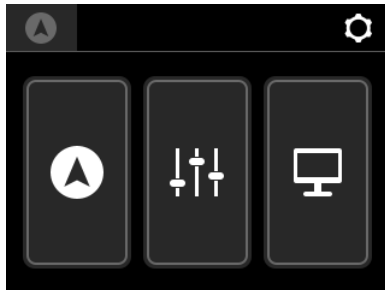


Alarm - S-Mode

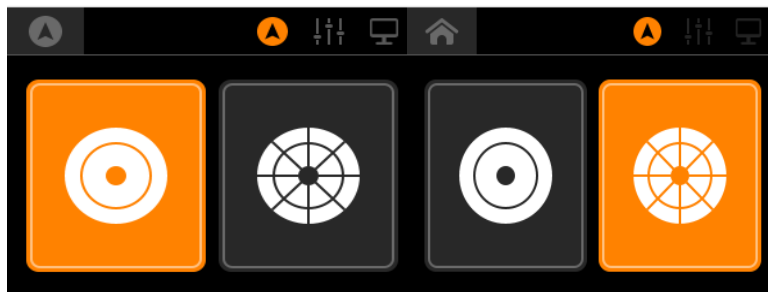
Volume Control

- Setting Menu

Mode / Function / System Set-up



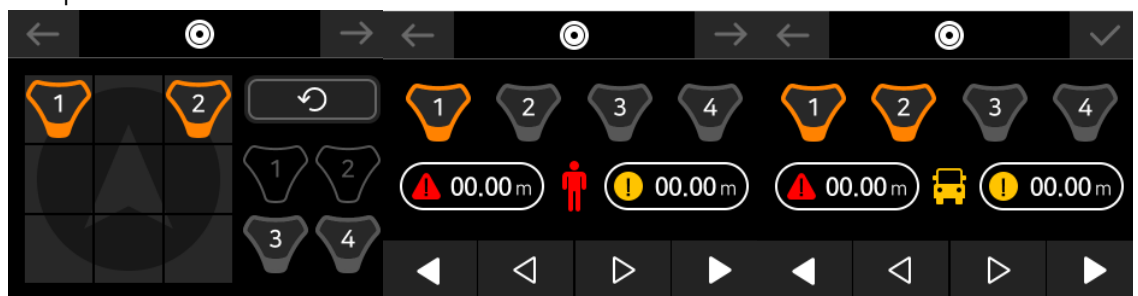
- Mode Selection Menu



S-Mode Selection

E-Mode Selection

- S-Mode Set-up

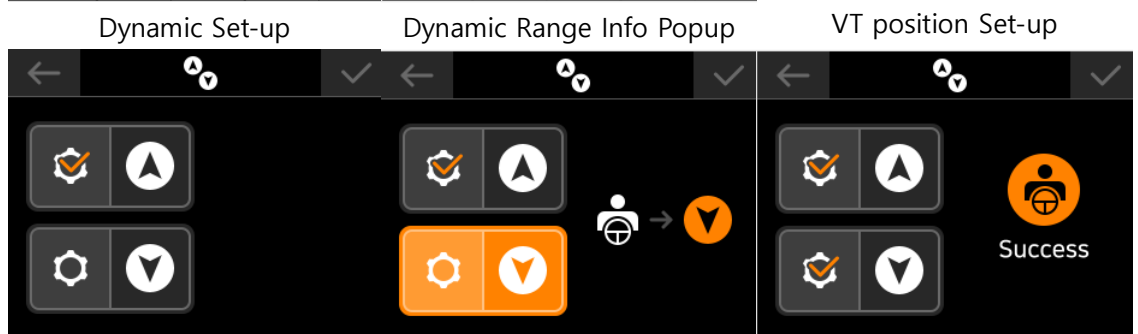
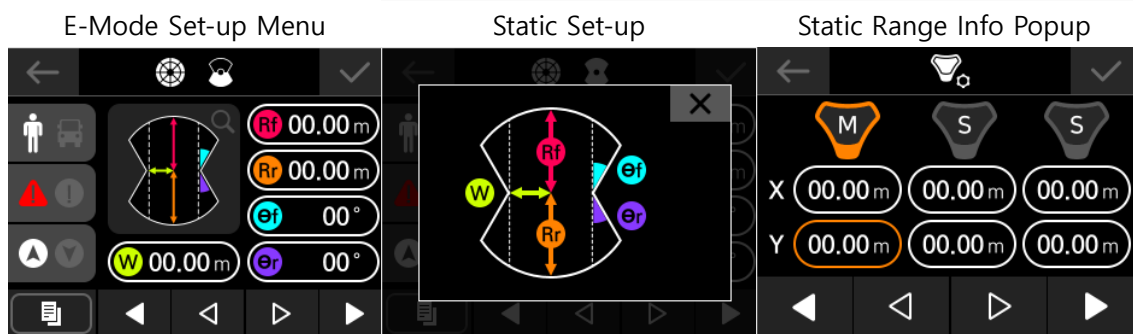
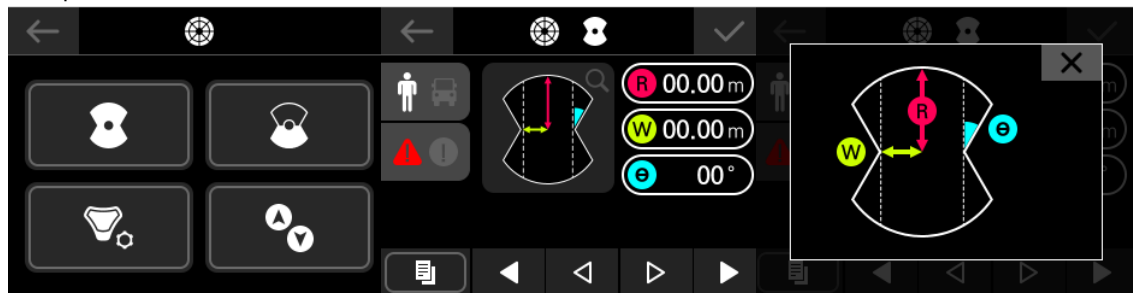


VT Position Set-up

PT Distance Set-up

VT Distance Set-up

- E-Mode Set-up

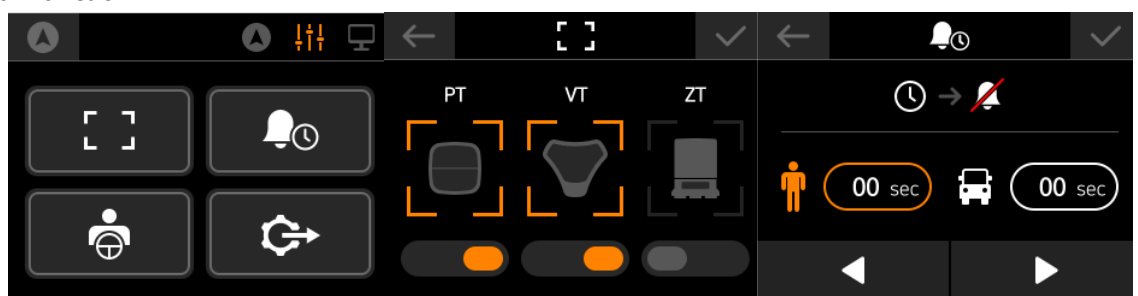


Forward Direction
Correction

Backward Direction
Correction

Correction Completed

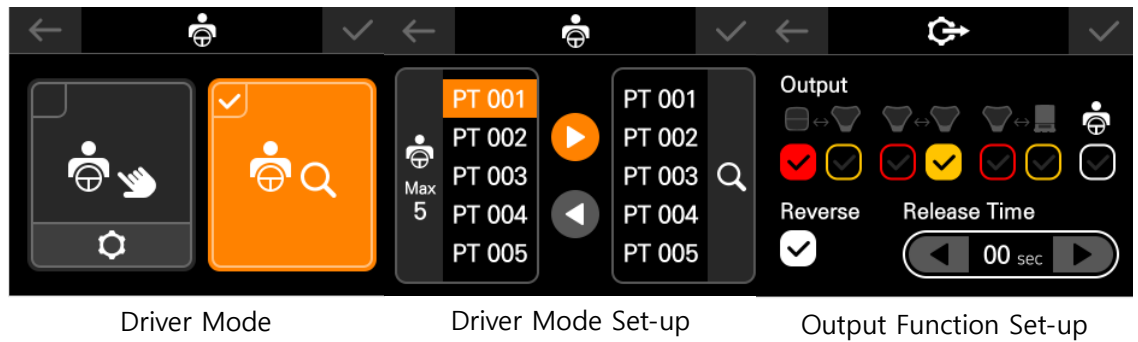
- Additional Function



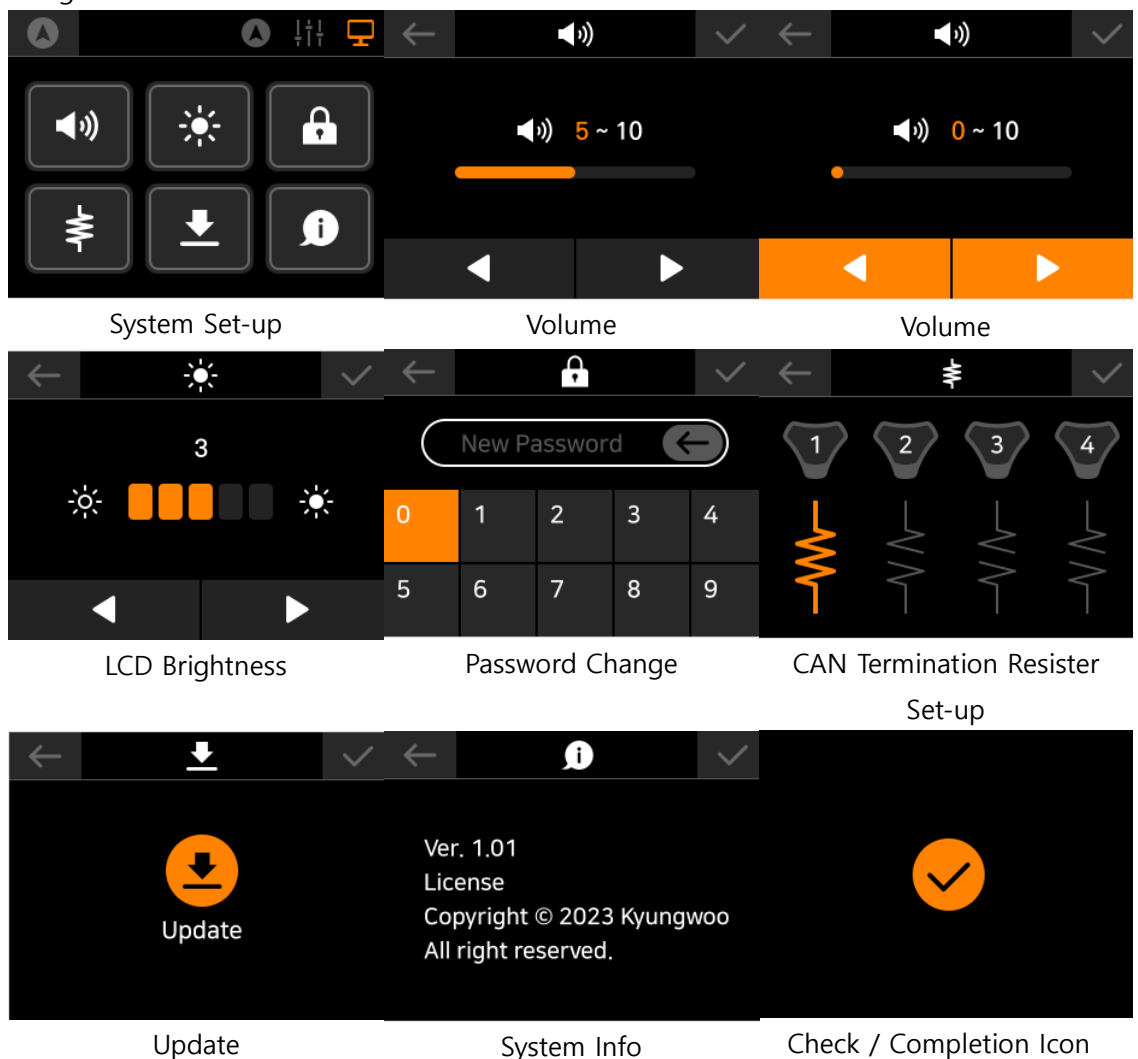
Additional Menu

Sensing Tag Selection

Idle time Set-up



- System Setting



FCC Compliance Information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Part 15.250(c) Operation on board an aircraft or a satellite is prohibited. Devices operating under this section may not be employed for the operation of toys. Except for operation onboard a ship or a terrestrial transportation vehicle, the use of a fixed outdoor infrastructure is prohibited. A fixed infrastructure includes antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with FCC RF exposure requirement.