

AUTO CHARGE

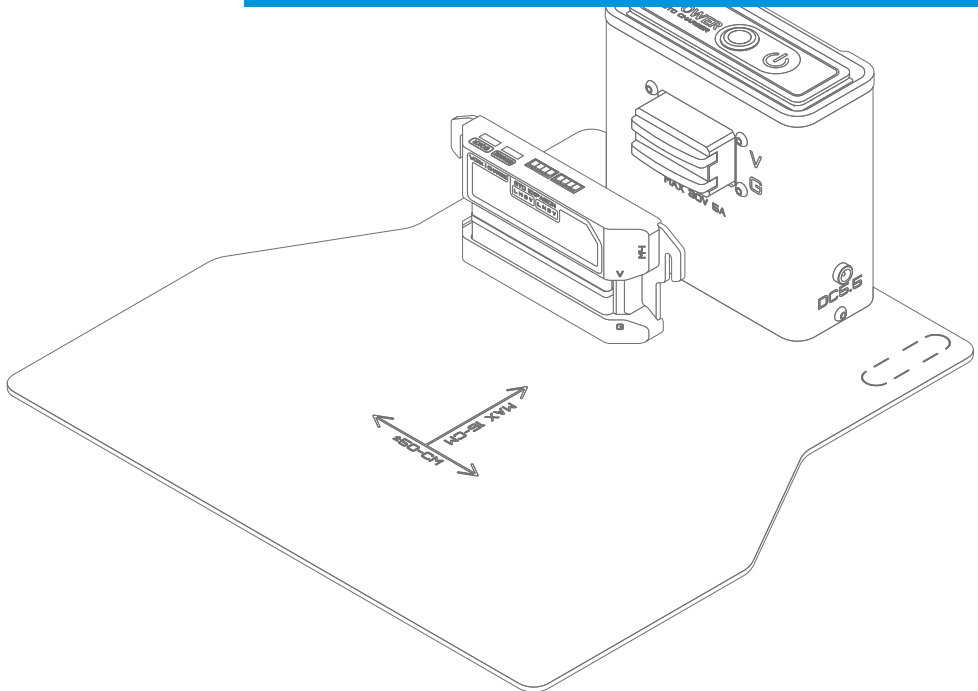
AUTOMATIC
CHARGING
STATION



GENERAL
LASER

USER
MANUAL

V1.1.0



IMPORTANT SAFETY INFORMATION

- PLEASE CONFIRM THE OPERATING VOLTAGE, POWER, INSTALLATION AND OTHER PARAMETERS OF THE DEVICE BEFORE USE. PROBLEMS CAUSED BY HYPER PARAMETERS ARE NOT COVERED BY THE WARRANTY.
- PLEASE EVALUATE THE REQUIREMENTS SUCH AS IP RATING, TEMPERATURE AND EQUIPMENT SUITABILITY OF THE USAGE ENVIRONMENT. PROBLEMS CAUSED BY HARSH ENVIRONMENTS ARE NOT COVERED BY THE WARRANTY.
- THIS DEVICE DOES NOT PROVIDE STABLE AND RELEVANT SAFETY FUNCTIONS SUCH AS ANTI-COLLISION, ANTI-FALL, AND BIOLOGICAL PROXIMITY WARNING. PLEASE CONDUCT A SAFETY EVALUATION ON THE INTEGRATED PRODUCT.
- EVALUATE AND COMPLY WITH CORRESPONDING REGULATIONS AND CERTIFICATIONS TO ENSURE THAT THE PRODUCTS DEVELOPED HAVE NO MAJOR SAFETY HAZARDS.
- PLEASE READ THE RELEVANT MAINTENANCE REQUIREMENTS TO PREVENT IRREVERSIBLE DAMAGE CAUSED BY INCORRECT OPERATION, SUCH AS OVER-DISCHARGE OF THE BATTERY AND LOW TIRE PRESSURE.
- LOW PRESSURE LEADS TO WHEEL HUB DAMAGE, LACK OF LUBRICATION LEADS TO SHAFT WEAR, ETC.
- WHEN USING IT FOR THE FIRST TIME, PLEASE PLACE THE DEVICE IN A SAFE AND OPEN ENVIRONMENT WITHOUT HEAVY OBJECTS, START IT ACCORDING TO THE OPERATING INSTRUCTIONS, AND TEST ALL RELATED
- IF YOU HAVE ANY QUESTIONS ABOUT THE FUNCTION, PLEASE CONTACT THE PURCHASE CHANNEL SERVICE PERSONNEL.
- WHEN THE EQUIPMENT IS ABNORMAL OR AN ACCIDENT OCCURS, PLEASE USE EMERGENCY STOP OR TURN OFF THE POWER IMMEDIATELY TO AVOID SECONDARY DAMAGE, AND CONTACT RELEVANT TECHNOLOGY
- PERSONNEL. DO NOT DISASSEMBLE BY YOURSELF.



NOTE: ANY DAMAGE CAUSED BY THE USER'S OWN DISASSEMBLY, MODIFICATION, ABNORMAL USE, NATURAL DISASTERS AND OTHER FORCE MAJEURE WILL NOT BE COVERED BY THE WARRANTY. THIS PRODUCT DOES NOT BEAR CORRESPONDING RESPONSIBILITY FOR SAFETY ACCIDENTS CAUSED BY USERS' INTEGRATED EQUIPMENT. USERS ARE ASKED TO EVALUATE THE RISKS AND CONDUCT RELIABILITY TESTS BY THEMSELVES. THIS IS HEREBY STATED.

VERSION UPDATE INFORMATION

V1.0.0: STARTING VERSION

V1.0.3: ADD CHARGER INSTRUCTIONS

V1.0.4: MODIFY INSTANCE ACCUMULATION SUM ERROR

V1.0.5: MODIFY DATA DIGIT ERROR

V1.1.0: ADD SETTING NUMBER PROTOCOL AND MODIFY ATTACHMENT SIZE

PRODUCT INTRODUCTION

INDOOR MOBILE ROBOTS OFTEN HAVE COMPLETE AUTOMATIC DRIVING FUNCTIONS AND ARE OFTEN USED IN UNATTENDED WORKING ENVIRONMENTS. MANUAL CHARGING CAN NO LONGER MEET THE NEEDS OF FULLY AUTOMATIC OPERATION. IN ORDER TO SUPPORT A VARIETY OF CHASSIS, WE HAVE DEVELOPED A MODULAR AUTOMATIC CHARGING STATION AUTO-CHARGE SYSTEM TO FACILITATE USERS TO QUICKLY DEVELOP FULLY AUTOMATIC SERVICES.

AUTO-CHARGE IS A MODULAR, QUICK-DETACHABLE, AND CONTROLLABLE AUTOMATIC CHARGING SYSTEM.

MODULARIZATION: THE VEHICLE-MOUNTED END OF THE SYSTEM IS FULLY PACKAGED AND CAN SUPPORT A VARIETY OF CHASSIS MODELS. MANUAL CHARGING EQUIPMENT CAN BE UPGRADED TO AUTOMATIC CHARGING EQUIPMENT.

CONTROLLABLE: CURRENTLY, THE SYSTEM SUPPORTS CAN COMMUNICATION PROTOCOL, PROVIDES AUTOMATIC AND MANUAL MODES, AND IS MODULARIZED FOR REAL-TIME MONITORING OF CHARGING VOLTAGE AND CURRENT.



SOFTWARE PLATFORM



Ubuntu 18
Ubuntu 20

ROS

Melodic
Noetic

ROS2

Galactic
Foxy

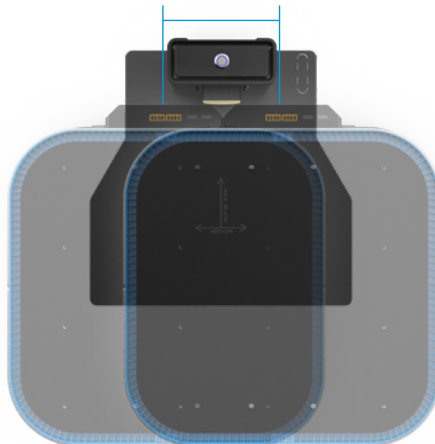
PRODUCT PARAMETERS

MODEL	AUTO CHARGE AUTOMATIC CHARGING STATION
MAXIMUM INPUT VOLTAGE	33V
MAXIMUM INPUT CURRENT	5A
POWER CONSUMPTION	1.2W
COMPRESSIBLE DISTANCE BEFORE AND AFTER	15MM
LEFT AND RIGHT DEVIATION DISTANCE	±50MM
OPERATING MODE	MANUAL / AUTO
COMMUNICATION METHOD	CAN BUS
SECURITY MEASURES	BASE: CONTACT COMPRESSION DISTANCE DETECTION VEHICLE TERMINAL: ELECTRIC SHOCK VOLTAGE DETECTION
OPERATING TEMPERATURE	-20~60°C
IP RATING	P22

COMPRESSIBLE DISTANCE BEFORE AND AFTER

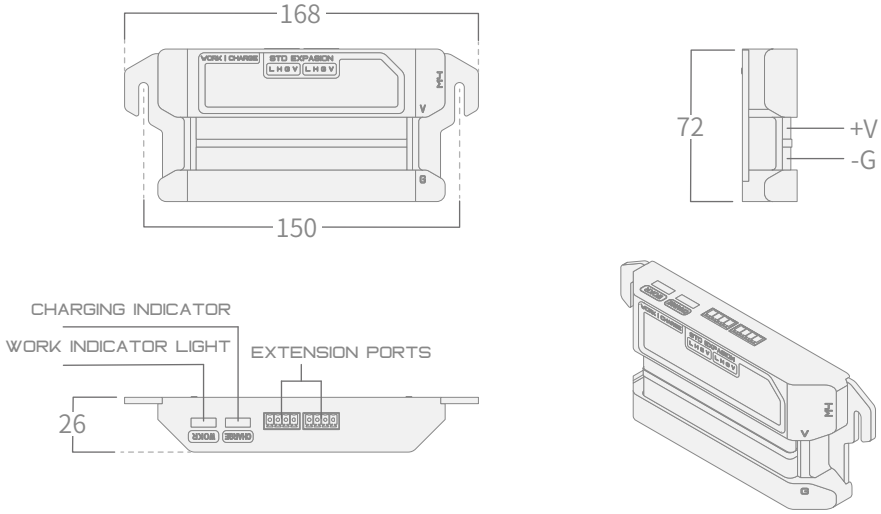


LEFT AND RIGHT DEVIATION DISTANCE

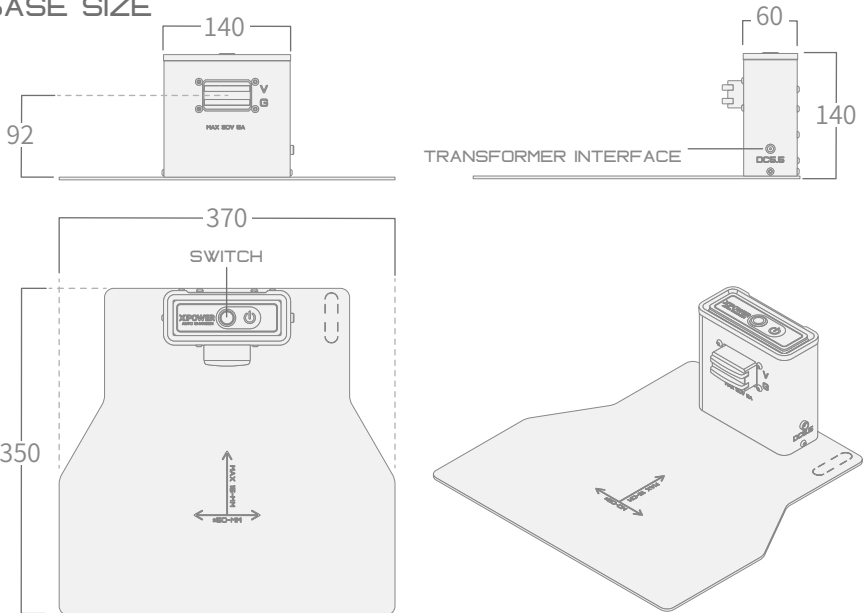


AUTO CHARGE USER MANUAL

VEHICLE TERMINAL SIZE



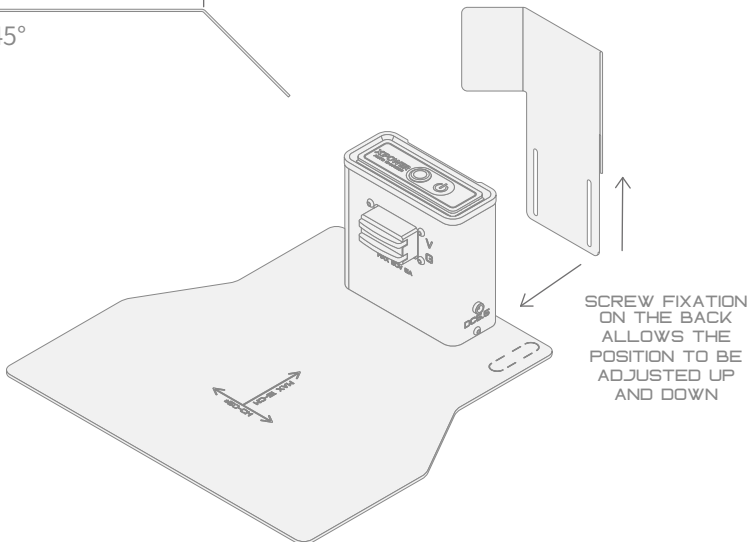
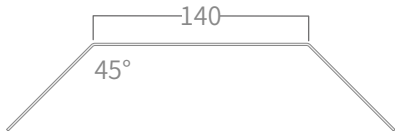
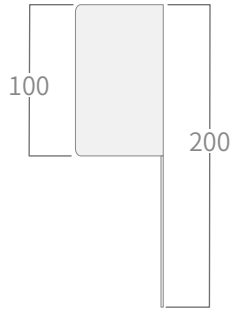
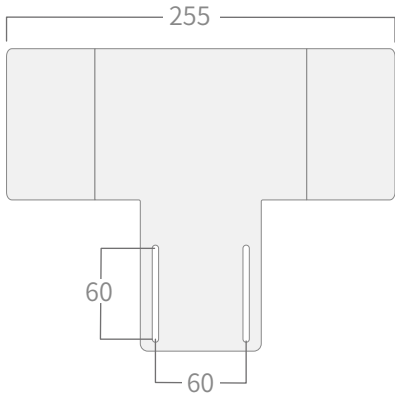
BASE SIZE



ACCESSORIES (OPTIONAL)

IN ORDER TO IMPROVE THE POSITIONING ACCURACY OF THE CHARGING STATION, WE PROVIDE THE CHARGING STATION WITH AN OPTIONAL POSITIONING REFLECTOR. THE HEIGHT OF THE REFLECTOR CAN BE ADJUSTED UP AND DOWN TO MATCH THE INSTALLATION POSITION OF THE LASER RADAR. REFLECTIVE STICKERS CAN ALSO BE PASTED ON THE REFLECTIVE BOARD TO IMPROVE THE EFFECT. IF YOU NEED SPECIAL SIZES, PLEASE CONTACT CUSTOMER SERVICE FOR CUSTOMIZATION SERVICES.

ACCESSORY DIMENSIONS AND INSTALLATION



AUTO CHARGE USER MANUAL

STEPS FOR USAGE

1. PLEASE CONNECT THE OUTPUT INTERFACE OF THE MAINS TRANSFORMER PROVIDED BY THE ROBOT TO THE BASE. THE TRANSFORMER SHOULD USE A DC55 STANDARD COAXIAL INTERFACE, AND THE MAXIMUM OUTPUT VOLTAGE SHOULD NOT EXCEED 33V.
2. PLEASE PRESS THE POWER SWITCH ABOVE THE BASE. THE BLUE LIGHT TURNS ON TO INDICATE THAT IT IS POWERED ON. AT THIS TIME, THE METAL CONTACTS WILL NOT BE CHARGED, AND THE CONTACT OF DIFFERENT GROUPS OF OBJECTS WILL NOT SHORT-CIRCUIT. WHEN THE CONTACTS ARE RETRACTED BY MORE THAN 5MM, THE CONTACTS WILL BE CHARGED.
3. PLEASE INSTALL THE VEHICLE TERMINAL ON THE FRONT OR REAR END OF THE CHASSIS, ADJUST THE HEIGHT TO MATCH THE CONTACTOR, AND CONNECT THE EXTENSION CABLE TO THE CHASSIS POWER SUPPLY. IF CAN COMMUNICATION IS REQUIRED, PLEASE CONNECT THE H AND L LINES OF THE EXPANSION INTERFACE.
4. AFTER POWERING ON THE VEHICLE TERMINAL, WAIT FOR THE BUZZER TO BEEP THREE TIMES, WHICH MEANS THE SYSTEM IS WORKING NORMALLY. IF THE BUZZER BEEPS CONTINUOUSLY, PLEASE CHECK WHETHER THERE IS AN ERROR. PLEASE SEE LED EXAMPLES AND CORRESPONDING COMMUNICATION PROTOCOLS FOR SPECIFIC DETAILS.

PRECAUTIONS

1. PLEASE PLACE THE CHARGING BASE AS CLOSE TO THE WALL AS POSSIBLE TO PREVENT DISPLACEMENT CAUSED BY COLLISION WITH THE CHASSIS.
2. WHEN THE GROUPS ARE NOT IN CONTACT, NEITHER THE BASE NOR THE VEHICLE TERMINAL WILL BE CHARGED, BUT PLEASE DO NOT PUSH THE CONTACT POINTS OF THE BASE MANUALLY.
3. IF THE LASER POSITIONING IS INACCURATE DURING ASSEMBLY, PLEASE USE THE INCLUDED POSITIONING PLATE.

EXPANSION INTERFACE LINE SEQUENCE

V	G	H	L
POSITIVE POLE OF POWER SUPPLY	NEGATIVE POLE OF POWER SUPPLY	CAN BUS H	CAN BUS L

ICATION VEHICLE TERMINAL WORKING STATUS

WORKING STATUS	CHARGING LED STATUS	BUZZER STATUS
NOT CHARGED, NOT IN CONTACT	NO LIGHTS	NONE
NOT CHARGED, CONTACTED	GREEN LIGHT FLASHES	NONE
CHARGING	ALTERNATE RED AND GREEN	NONE
BE FILLED	GREEN LIGHT IS ALWAYS ON	NONE
MISTAKE	RED LIGHT ALWAYS ON	INTERVAL BEEP

WORKING MODE STATUS TABLE

OPERATING MODE	CONTACT STATUS	MANUAL SWITCH	WORKING STATUS
AUTOMATIC	NO CONTACT	INVALID	NOT CHARGED
	TOUCH	INVALID	CHARGE
MANUAL	NO CONTACT	INVALID	NOT CHARGED
	TOUCH	CONNECT	CHARGE
		DISCONNECT (DEFAULT)	NOT CHARGED

VEHICLE TERMINAL INDICATOR LIGHT STATUS

SOME DEVICES MAY HAVE THE VEHICLE-MOUNTED TERMINAL INTEGRATED INTO THE CHASSIS, AND THE STATUS CAN ONLY BE QUERIED THROUGH THE CAN BUS. THE FOLLOWING CONTENT ONLY APPLIES TO EXPOSED VEHICLE-MOUNTED TERMINAL EQUIPMENT.

WORK INDICATOR LIGHT:

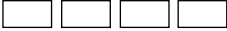


AFTER THE POWER-ON SELF-TEST OR IN THE UPGRADE STATE, THE BUZZER WILL SOUND THREE TIMES.



NORMAL WORKING STATUS

CHARGING INDICATOR:



NOT IN CHARGING STATE, NOT IN CONTACT WITH CHARGING PILE



NOT CHARGING BUT ALREADY IN CONTACT WITH CHARGING STATION



CHARGING



FINISHED CHARGING



AN ERROR OCCURRED

CHARGING PILE INDICATOR LIGHT STATUS

THE CHARGING STATION INDICATOR LIGHT IS LOCATED ON THE RING OF THE POWER SWITCH BUTTON



POWERED ON



THE CAR TERMINAL HAS BEEN CONTACTED AND CHARGING HAS NOT STARTED OR HAS BEEN COMPLETED.



CHARGING

CHARGER INSTRUCTIONS

LITHIUM BATTERY CHARGERS WILL PROVIDE DIFFERENT CHARGING VOLTAGES DEPENDING ON THE NUMBER OF BATTERY STRINGS. THE COMMON SPECIFICATIONS ARE 7 STRINGS (29V) AND 8 STRINGS (25V). PLEASE CHOOSE THE CORRECT CHARGER FOR CHARGING. IT IS RECOMMENDED TO USE THE CHARGER THAT COMES WITH THE DEVICE. IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT CUSTOMER SERVICE.

WORK INDICATOR LIGHT:



NOT CHARGING OR CHARGING COMPLETED



CHARGING

PRECAUTIONS

1. PLEASE BE SURE TO CHECK WHETHER THE CHARGING VOLTAGE IS CORRECT, **THE DEVICE CHARGING VOLTAGE WILL BE MARKED ON THE DEVICE NAMEPLATE.**
2. PLEASE MAKE SURE TO CHARGE IN AN ENVIRONMENT WITH PEOPLE AROUND, AND CUT OFF THE POWER SUPPLY WHEN PEOPLE LEAVE.
3. PLEASE START CHARGING AFTER THE DEVICE IS ALIGNED. DO NOT USE THE DEVICE WHILE CHARGING.
4. CHARGERS AND DEVICES SHOULD BE KEPT AWAY FROM THE BEDROOM, AWAY FROM FLAMMABLE MATERIALS, AND KEPT DRY.
5. THE CHARGER USES 220V AC INPUT POWER SUPPLY, PLEASE ENSURE THAT THE INPUT VOLTAGE IS STABLE.
6. A SINGLE CONTINUOUS CHARGING TIME SHOULD NOT EXCEED 8 HOURS. IF THE CHARGER OVERHEATS, STOP CHARGING IMMEDIATELY.

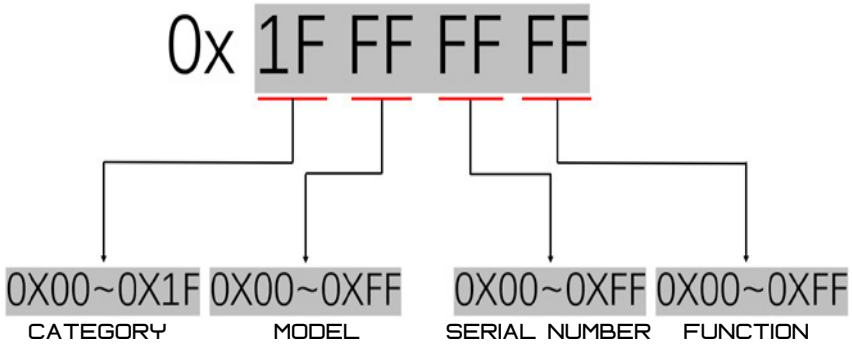
USING THE WRONG CHARGER WILL CAUSE IRREVERSIBLE DAMAGE TO THE BATTERY. PLEASE CONFIRM THE CHARGING VOLTAGE ON THE DEVICE NAMEPLATE BEFORE USE.



THIS PRODUCT IS NOT RESPONSIBLE FOR THE CONSEQUENCES CAUSED BY THE USER'S INCORRECT USE OF THE CHARGER OR UNSUPERVISED CHARGING FOR A LONG TIME. USERS ARE ASKED TO EVALUATE THE RISKS AND CONDUCT RELIABILITY TESTS BY THEMSELVES. THIS IS HEREBY STATED.

CAN PROTOCOL

THE CAN COMMUNICATION IN THE PRODUCT USES CAN2.0B (EXTENDED FRAME), AND THE COMMUNICATION BAUD RATE IS 500K. CAN ID ENCODING SPECIFICATION:



CAN DATA BITS:Byte[0]~Byte[7]:

Byte[0]	Byte[1]	Byte[2]	Byte[3]	Byte[4]	Byte[5]	Byte[6]	Byte[7]
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THE CAN INFORMATION USED BY CAN IS THE CANID AND CAN_DATA MENTIONED ABOVE, TOTALING 12 BYTES OF DATA. WHEN USED, CORRESPONDING CAN_DATA DATA TRANSMISSION IS PERFORMED FOR DIFFERENT CANIDS.

THE CATEGORY AND MODEL IN CANID ARE FIXED PARAMETERS OF THE DEVICE, AND THE VALUE WILL NOT CHANGE. THE DEFAULT NUMBER IS 1. WHEN MULTIPLE SIMILAR DEVICES ARE USED AT THE SAME TIME, THEY CAN BE MODIFIED THROUGH GENERAL INSTRUCTIONS.

CAN DATA FRAME					
DATA BITS	ID[3]	ID[2]	ID[1]	ID[0]	DATA[0~7]
TYPE OF DATA	unsigned int8	unsigned int8	unsigned int8	unsigned int8	8 x unsigned int8
THE DATA SHOWS	CATEGORY	MODEL	SERIAL NUMBER	FUNCTION	8 BYTES CAN DATA

FIXED CATEGORIES OF THIS EQUIPMENT	06	FIXED MODEL	02	DEFAULT NUMBER	01
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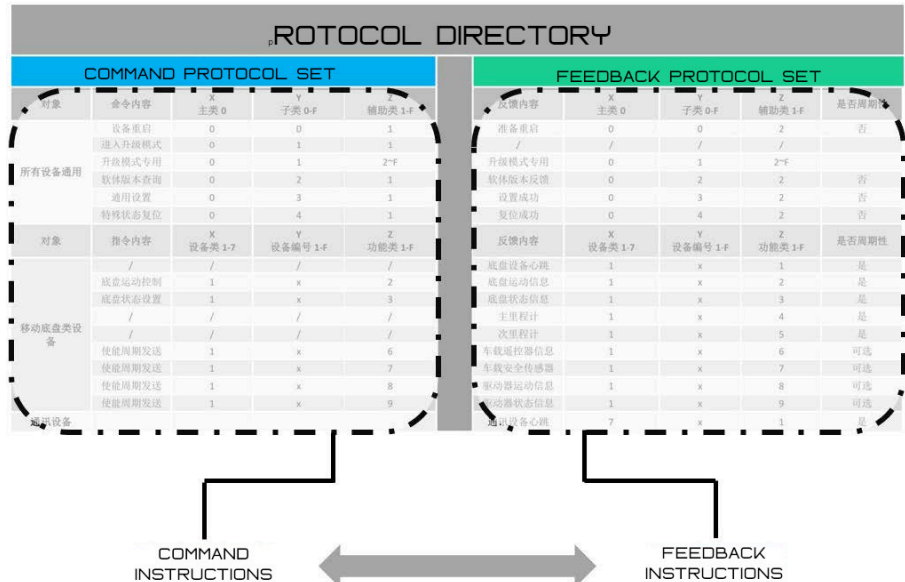
THE FIXED FORMAT OF THE CANID OF THIS DEVICE IS **06 02 XX XX**

INSTRUCTION SET QUERY DESCRIPTION

THE CAN PROTOCOL IS DIVIDED INTO GENERAL EQUIPMENT INSTRUCTIONS AND EQUIPMENT-SPECIFIC INSTRUCTIONS. GENERAL COMMAND OPERATIONS ARE APPLICABLE TO ALL MODULE ACCESSORIES OF THE SYSTEM, AND ARE COMMONLY USED FOR DEVICE STARTUP, SYSTEM UPGRADES, VERSION QUERIES, SYSTEM RESETS, ETC.; DEVICE-SPECIFIC COMMANDS ARE EXCLUSIVE TO DIFFERENT DEVICE MODULES, AND ARE MAINLY USED FOR RESTARTING AND CLEARING ERROR REPORTS FOR CHARGING STATIONS.

PROTOCOL DIRECTORY										
COMMAND PROTOCOL SET						FEEDBACK COLLECTION				
对象	命令内容	X 主类 0	Y 子类 0-F	Z 辅助类 1-F		反馈内容	X 设备号	Y 子设备 0	Z 功能类 1-F	是否周期性
所有设备通用	设备重启	0	0	1		准备重启	0	0	2	否
	进入升级模式	0	1	1		/	/	/	/	
	升级模式专用	0	1	2-F		升级模式专用	0	1	2-F	
	软件版本查询	0	2	1		软件版本反馈	0	2	2	否
	通用设置	0	3	1		设置成功	0	3	2	否
移动底盘类设备	特殊状态复位	0	4	1		复位成功	0	4	2	否
	/	/	/	/		反馈内容	X 设备类 1-7	Y 设备编号 1-F	Z 功能类 1-F	是否周期性
	底盘运动控制	/	/	/		底盘设备心跳	1	x	1	是
	底盘状态设置	1	x	3		底盘运动信息	1	x	2	是
	/	/	/	/		底盘状态信息	1	x	3	是
通讯设备	使能周期发送	1	x	6		主里程计	1	x	4	是
	使能周期发送	1	x	7		次里程计	1	x	5	是
	使能周期发送	1	x	8		车载控制器信息	1	x	6	可选
	使能周期发送	1	x	9		车载安全传感器	1	x	7	可选
	使能周期发送	1	x	9		驱动轴运动信息	1	x	8	可选

THE CAN CLOSED-LOOP CONTROL SYSTEM HAS A RESPONSE MECHANISM FOR MOST INSTRUCTIONS. THAT IS, THE COMMAND FRAME AND THE FEEDBACK FRAME CORRESPOND ONE TO ONE. MONITOR DATA FLOW ACCURACY IN REAL TIME BASED ON FEEDBACK FRAMES.



PROTOCOL DIRECTORY

COMMAND PROTOCOL SET					
OBJECT	COMMAND CONTENT	CATEGORY 00~1F	MODEL 00~FF	SERIAL NUMBER 00~FF	FUNCTION 00~FF
COMMON TO ALL DEVICES	DEVICE RESTART	06	02	01	01
	GENERAL SETTINGS	06	02	01	03
	SPECIAL STATUS RESET	06	02	01	04
	NUMBERING SETTINGS	06	02	01	06
	/	/	/	/	/
OBJECT	COMMAND CONTENT	CATEGORY 00~1F	MODEL 00~FF	SERIAL NUMBER 00~FF	FUNCTION 00~FF
AUTOMATIC CHARGING STATION	CHARGING STATION SETTINGS	06	02	01	13
	/	/	/	/	/

FEEDBACK PROTOCOL SET						
COMMAND CONTENT	CATEGORY 00~1F	MODEL 00~FF	SERIAL NUMBER 00~FF	FUNCTION 00~FF	CYCLICAL	
READY TO RESTART	06	02	01	A1	NO	
GENERAL SETTINGS SUCCESSFUL	06	02	01	A3	NO	
SPECIAL RESET SUCCESSFUL	06	02	01	A4	NO	
SET UP SUCCESS FEEDBACK	06	02	01	A6	NO	
HEARTBEAT BAG	06	02	01	B0	YES	
COMMAND CONTENT	CATEGORY 00~1F	MODEL 00~FF	SERIAL NUMBER 00~FF	FUNCTION 00~FF	CYCLICAL	
CHARGING STATION STATUS INFORMATION	06	02	01	B3	YES	
CHARGING STATION DATA FEEDBACK	06	02	01	B4	YES	

GENERAL INSTRUCTIONS FOR EQUIPMENT
DEVICE RESTART/PREPARE TO RESTART

DEVICE RESTART				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
EXTERNAL	THIS DEVICE	0x06 02 01 01	8	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	CATEGORY	unsigned int8	ALWAYS 0x06	
byte[1]	MODEL	unsigned int8	ALWAYS 0x02	
byte[2]	SERIAL NUMBER	unsigned int8	DEFAULT IS 0x01	
byte[3~7]	/	/	/	

NOTE: WHEN MULTIPLE MACHINES ARE USED IN THE SYSTEM AT THE SAME TIME, THE DEVICE NUMBER CAN BE CHANGED. THE DEFAULT DEVICE NUMBER IS 0x01. THE LENGTH OF THE SENT COMMAND DATA IS 8, AND THE INVALID BITS ARE FILLED WITH 0 (THE SAME APPLIES TO THE FOLLOWING TEXT).

READY TO RESTART				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 A1	0	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0~7]	/	/	/	

NOTE: THE DEVICE RESTART COMMAND RESTARTS THE SYSTEM. WHEN THE DEVICE RECEIVES THE COMMAND, IT PREPARES TO RESTART AND RESPONDS WITH FEEDBACK. THE SYSTEM RESTARTS. AFTER TWO SECONDS, THE BUZZER SOUNDS THREE TIMES, INDICATING THAT THE RESTART IS COMPLETE.

EXAMPLE: SEND 06 02 01 00 00 00 00 00 TO THE SYSTEM ID: 0X06 02 01 01, AND THE SYSTEM WILL RESTART.

SEND INSTANCE					
TRANSFER TARGET	CAN ID	FRAME FORMAT	FRAME TYPE	DATA LENGTH	DATA BITS (L->H)
EQUIPMENT	0x06 02 01 01	DATA FRAME	EXTENDED FRAME	8	06 02 01 00 00 00 00 00
HOST COMPUTER	0x06 02 01 A1	DATA FRAME	EXTENDED FRAME	0	/

GENERAL SETTINGS/GENERAL SETTINGS SUCCESSFUL

GENERAL SETTINGS				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
EXTERNAL	THIS DEVICE	0x06 02 01 03	8	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	CATEGORY	unsigned int8	ALWAYS 0x06	
byte[1]	MODEL	unsigned int8	ALWAYS 0x02	
byte[2]	SERIAL NUMBER	unsigned int8	DEFAULT IS 0x01	
byte[3]	ENABLE	unsigned int8	0x00: TURN OFF THE DEVICE 0x01: TURN ON THE DEVICE	
byte[4~7]	/	/	/	

GENERAL SETTINGS SUCCESSFUL				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 A3	0	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0~7]	/	/	/	

NOTE: THE GENERAL SETTING COMMAND IS USED TO ENABLE THE DEVICE.

THE CHARGING STATION IS ENABLED BY DEFAULT WHEN POWERED ON.

EXAMPLE: THE ENABLED DEVICE NUMBER IS 0x01, AND THE COMMAND 06 02 01 01 00 00 00 00 IS SENT TO THE SYSTEM ID: 0x06 02 01 03; THE DEVICE IS ENABLED.

SEND INSTANCE					
TRANSFER TARGET	CAN ID	FRAME FORMAT	FRAME TYPE	DATA LENGTH	DATA BITS (L->H)
EQUIPMENT	0x06 02 01 03	DATA FRAME	EXTENDED FRAME	8	06 02 01 01 00 00 00 00
HOST COMPUTER	0x06 02 01 A3	DATA FRAME	EXTENDED FRAME	0	/

SPECIAL STATUS RESET / SPECIAL RESET SUCCESSFUL

SPECIAL STATUS RESET				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
EXTERNAL	THIS DEVICE	0x06 02 01 04	8	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	STATUS CLEAR	unsigned int8	0xCC: CLEAR / NO OPERATION FOR OTHER VALUES	
byte[1~7]	/	/	/	

SPECIAL RESET SUCCESSFUL				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 A4	0	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0~7]	/	/	/	

NOTE: SPECIAL STATUS RESET IS USED TO RESET ERRORS WHEN THE SYSTEM IS ABNORMAL.

EXAMPLE: SEND COMMAND CC 00 00 00 00 00 00 00 00 TO SYSTEM ID: 0X06 02 01 04.

SEND INSTANCE					
TRANSFER TARGET	CAN ID	FRAME FORMAT	FRAME TYPE	DATA LENGTH	DATA BITS (L->H)
EQUIPMENT	0x06 02 01 04	DATA FRAME	EXTENDED FRAME	8	CC 00 00 00 00 00 00 00
HOST COMPUTER	0x06 02 01 A4	DATA FRAME	EXTENDED FRAME	0	/

NUMBERING SETTINGS

GENERAL SETTINGS				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
EXTERNAL	THIS DEVICE	0x06 02 01 06	8	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	CATEGORY	unsigned int8	ALWAYS 0x06	
byte[1]	MODEL	unsigned int8	ALWAYS 0x02	
byte[2]	SERIAL NUMBER	unsigned int8	DEFAULT IS 0x01	
byte[3]	NEW NUMBER	unsigned int8	IF THE NUMBER IS NOT CHANGED, IT WILL BE THE SAME AS THE ORIGINAL NUMBER.	
byte[4~7]	/	/	/	

GENERAL SETTINGS SUCCESSFUL				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 A6	0	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0~7]	/	/	/	

NOTE: THE NUMBER SETTING COMMAND IS USED TO SET A NEW NUMBER FOR THE DEVICE. WHEN THE SYSTEM HAS ONLY A SINGLE DEVICE, THE NUMBER ALWAYS DEFAULTS TO 0x01. WHEN THERE ARE MULTIPLE DEVICES IN THE SYSTEM, THE DEVICE NUMBER CAN BE CUSTOMIZED.

EXAMPLE: CHANGE THE DEVICE NUMBER TO 0x02 AND SEND THE COMMAND 06 02 01 02 00 00 00 00 TO THE SYSTEM ID: 0x06 02 01 06; THE DEVICE NUMBER IS SWITCHED FROM 0x01 TO 0x02.

SEND INSTANCE					
TRANSFER TARGET	CAN ID	FRAME FORMAT	FRAME TYPE	DATA LENGTH	DATA BITS (L->H)
EQUIPMENT	0x06 02 01 06	DATA FRAME	EXTENDED FRAME	8	06 02 01 02 00 00 00 00
HOST COMPUTER	0x06 02 01 A6	DATA FRAME	EXTENDED FRAME	0	/

DEVICE HEARTBEAT PACKET

HEARTBEAT BAG				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 B0	1	500
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	ENABLED STATE	unsigned int8	0x00: CLOSED / 0x01: ENABLED	
byte[1~7]	/	/	/	

NOTE: THE HEARTBEAT PACKET IS MAINLY USED TO CONFIRM THE ONLINE STATUS OF THE DEVICE. IT MUST MAINTAIN A SENDING PERIOD OF 500MS IN ANY STATE. IT IS ALSO A KEY FRAME TO CONFIRM WHETHER THE DEVICE IS ENABLED.

DEVICE SPECIFIC INSTRUCTIONS

CHARGING STATION SETTINGS /
CHARGING STATION STATUS INFORMATION

CHARGING STATION SETTINGS				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
EXTERNAL	THIS DEVICE	0x06 02 01 13	8	/
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	OPERATING MODE	unsigned int8	0x00: AUTOMATIC (DEFAULT) / 0x01: MANUAL	
byte[1]	MANUAL SWITCH SETTING	unsigned int8	0x00: DISCONNECT (DEFAULT) / 0x01: CONNECT	
byte[2]	BUZZER ENABLE	unsigned int8	0: OFF / 1: ON (DEFAULT)	
byte[3]	CHARGING RESTART VOLTAGE DIFFERENCE	unsigned int8	UNIT: 0.1V (DEFAULT 1.0V)	
byte[4]	CHARGING CUT-OFF CURRENT	unsigned int8	UNIT: 0.1A (DEFAULT 0.2A)	
byte[5~7]	/	/	/	

CHARGING STATION INFORMATION				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 B3	8	500 / CONTACT TRIGGER
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	OPERATING MODE	unsigned int8	0x00: AUTOMATIC / 0x01: MANUAL	
byte[1]	CONTACT STATUS	unsigned int8	0x00: NOT IN CONTACT / 0x01: IN CONTACT	
byte[2]	WORKING STATUS	unsigned int8	0: DISCONNECTED / 1: CHARGING / 2: FULLY CHARGED (LOW CURRENT) / 3: ERROR	
byte[3]	ERROR STATUS	unsigned int8	VIEW ERROR STATUS TABLE	
byte[4]	BUZZER ENABLE STATUS	unsigned int8	0: OFF / 1: ON (DEFAULT)	
byte[5]	CHARGING RESTART VOLTAGE DIFFERENCE	unsigned int8	UNIT: 0.1V (DEFAULT 1.0V)	
byte[6]	CHARGE CUT-OFF CURRENT	unsigned int8	UNIT: 0.1A (DEFAULT 0.2A)	
byte[7]	/	/	/	

NOTE: 1. CHARGING RESTART VOLTAGE DIFFERENCE MEANS THAT AFTER CHARGING IS COMPLETED, WHEN THE VOLTAGE DROP DIFFERENCE REACHES THIS VALUE, CHARGING WILL BE RESTARTED AGAIN.
 2. CHARGING CUT-OFF CURRENT MEANS THAT WHEN THE CHARGING CURRENT IS LESS THAN THIS VALUE, THE POWER WILL BE DISCONNECTED TO COMPLETE CHARGING. SET 0 TO PERMANENTLY DISCONNECT.
 3. CONTACT TRIGGERING MEANS THAT WHEN THE CONTACT CONTACTS AND DETECTS VOLTAGE, AN INSTRUCTION WILL BE SENT IMMEDIATELY TO FACILITATE THE USER TO BRAKE IN TIME.

ERROR STATUS TABLE		
BYTE	STATUS VALUE	STATUS DESCRIPTION
byte[3]	0x00	NO ERRORS
	0x01	POWER SUPPLY OVERVOLTAGE
	0x02	CHARGING OVERCURRENT
	0x03	SHORT CIRCUIT PROTECTION

CHARGING STATION DATA FEEDBACK

CHARGING STATION INFORMATION				
SENDER	RECEIVER	CAN ID	DATA LENGTH	PERIOD (ms)
THIS DEVICE	EXTERNAL	0x06 02 01 B4	8	500
DATA BITS	FUNCTION	TYPE OF DATA	ILLUSTRATE	
byte[0]	CHARGING VOLTAGE LOW 8 BITS	unsigned int16	UNIT: 0.01V	
byte[1]	CHARGING VOLTAGE HIGH 8 BITS			
byte[2]	CHARGING CURRENT LOW 8 BITS	unsigned int16	UNIT: 0.1A	
byte[3]	CHARGING CURRENT HIGH 8 BITS			
byte[4~7]	/	/	/	

SERIAL COMMUNICATION PROTOCOL

IF YOU NEED TO USE USB SERIAL PORT COMMUNICATION ON THE COMPUTER, YOU NEED TO USE A CAN-COM HUB AS A CONVERSION DEVICE. PLEASE CONTACT CUSTOMER SERVICE FOR MORE TECHNICAL SUPPORT.



SERIAL PORT PARAMETERS

BAUD RATE	460800
CHECK DIGIT	NO CHECKSUM
DATA BIT LENGTH	8
STOP BIT	1

SERIAL DATA FRAME

DATA DEFINITION	HEAD	LEN	DATA[0-11]	FRAME ID	SUM
TYPE OF DATA	uint8	uint8	12 x uint8	uint8	uint8
THE DATA SHOWS	0x55	0x10	12-BIT CAN MESSAGE DATA ENCAPSULATED REFERENCE CAN DATA FRAME	FRAME ID CAN BE FIXED OR ACCUMULATED SEQUENCE STAMP OF COHERENT DATA	THE CUMULATIVE SUM OF THE FIRST 15 DIGITS OF CONTENT THEN TAKE THE LOWEST BIT OF UINT8 FEEDBACK

NOTE: IN ORDER TO SIMPLIFY THE SYSTEM DESIGN AND IMPROVE THE SYSTEM REUSE RATE, THE SERIAL PORT BYTE2-BYTE13 IS CONSISTENT WITH THE TEN-BIT DATA USED IN THE CAN PROTOCOL. PLEASE REFER TO THE CAN DATA FRAME (THE COMMAND FUNCTION CONTENT IS COMPLETELY CONSISTENT WITH THE CAN PROTOCOL). THE START BIT, FRAME LENGTH, AND FRAME ID ARE THE DEFAULT VALUES, AND THE CHECKSUM IS THE SUM OF THE FIRST 15 BYTES, TAKING THE LAST 1 BYTE OF DATA.

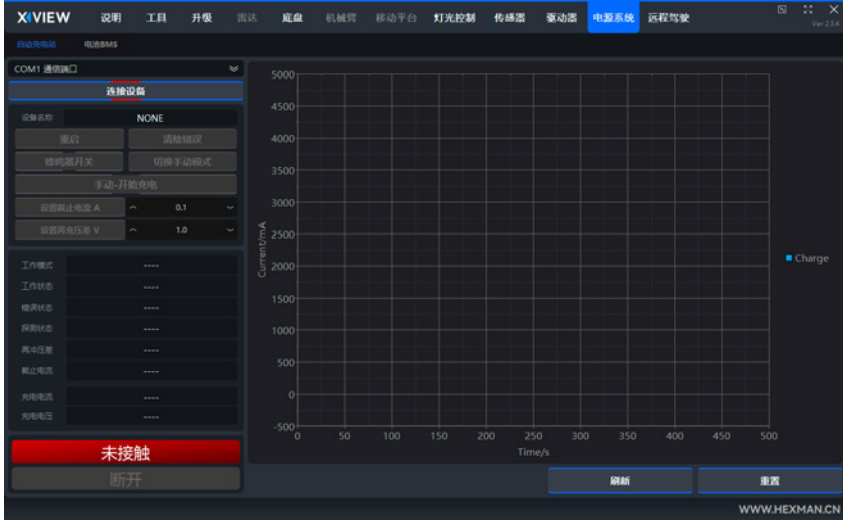
SEND INSTANCE

START BIT	FRAME LENGTH	CAN ID	CAN DATA	FRAME ID	CHECKSUM	FUNCTION
55	10	06 02 01 01	06 02 01 00 00 00 00 00	01	79	DEVICE RESTART
55	10	06 02 01 03	06 02 01 01 00 00 00 00	01	7C	COMMON SETTINGS ENABLED
55	10	06 02 01 04	CC 00 00 00 00 00 00 00	01	3F	CLEAR STATUS
55	10	06 02 01 13	01 01 00 00 00 00 00 00	01	84	SET UP A MANUAL CONNECTION

XVIEW TEST SYSTEM

XVIEW IS A TEST SYSTEM THAT RUNS ON THE HOST COMPUTER, SUPPORTS ONLINE TESTING AND ADJUSTMENT OF VARIOUS CHASSIS, SENSORS, EXPANSION EQUIPMENT, ETC., AND INTEGRATES A CAN ANALYZER AND SERIAL PORT ASSISTANT, MAKING IT A VERY PRACTICAL TESTING TOOL.

NOTE: USING XVIEW REQUIRES A CAN-COM HUB AS A CONVERSION DEVICE. PLEASE CONTACT CUSTOMER SERVICE FOR MORE TECHNICAL SUPPORT.



XROS SUPPORT

XROS IS A SET OF OPEN SOURCE DEVELOPMENT PACKAGES BASED ON ROS, WHICH HELPS USERS QUICKLY USE OUR VARIOUS EQUIPMENT AND PRODUCTS ON THE ROS PLATFORM, REDUCING THE AMOUNT OF LARGE CODE DEVELOPMENT. THIS CODE PACKAGE SUPPORTS THE FULL SET OF XSTD PROTOCOL STANDARDS. PLEASE CONTACT CUSTOMER SERVICE TO OBTAIN THE DEVELOPMENT KIT AND USAGE INSTRUCTIONS. YOU NEED TO INSTALL THE UBUNTU OPERATING SYSTEM AND ROS ROBOT OPERATING SYSTEM BY YOURSELF BEFORE USE. THIS ROS PACKAGE IS SUITABLE FOR ROS AND ROS2 VERSIONS AS FOLLOWS. FOR USAGE, PLEASE REFER TO THE XROS USER MANUAL.

NOTE: USING XROS REQUIRES A CAN-COM HUB AS A CONVERSION DEVICE. PLEASE CONTACT CUSTOMER SERVICE FOR MORE TECHNICAL SUPPORT.



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