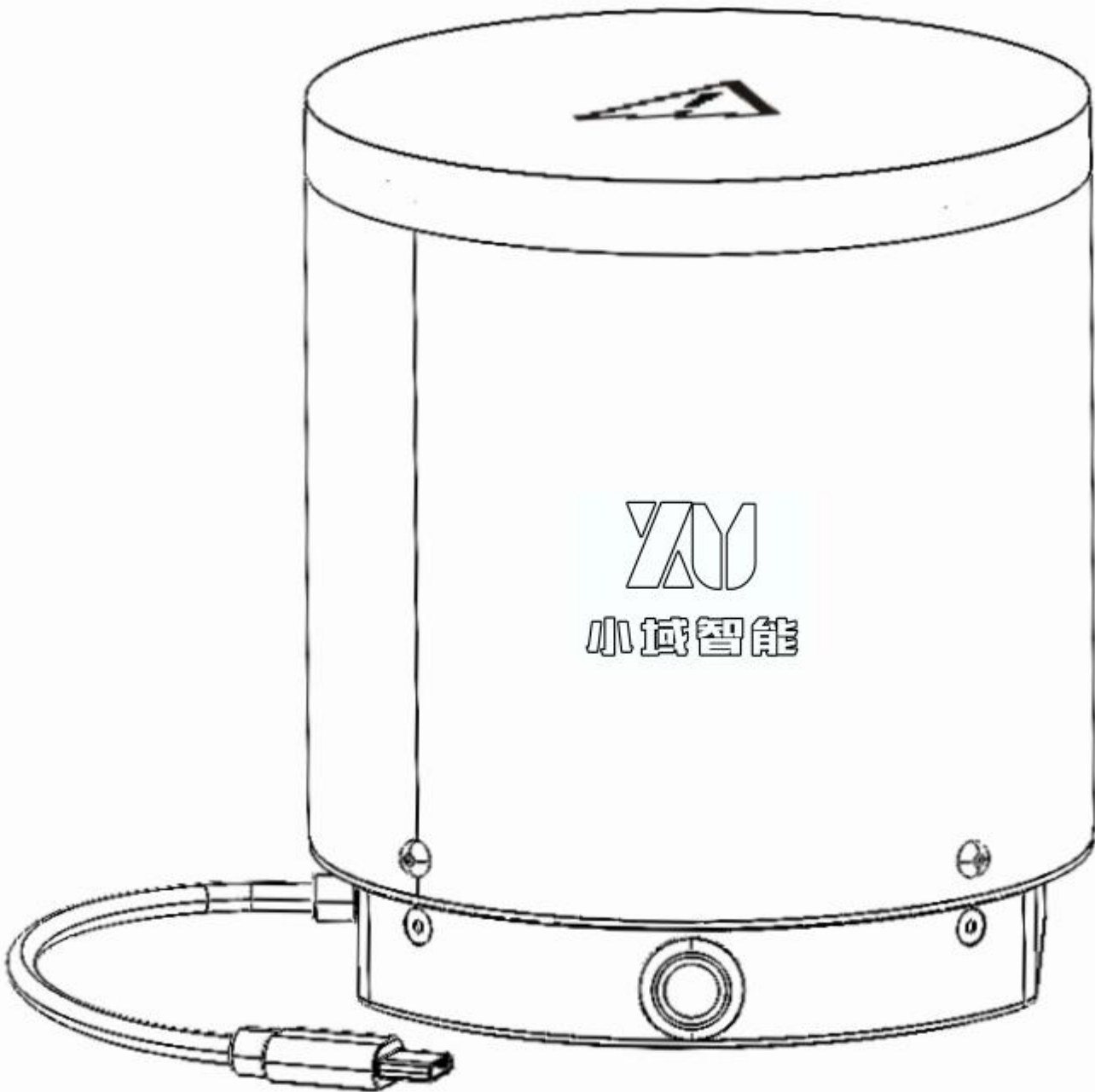


XYU DPS30 5.0

UAV INTELLIGENT EMERGENCY
PARACHUTE LANDING SYSTEM
THE USER MANUAL V1.1.2

2023.7



Disclaimer

Thank you for purchasing XYU DPS series products. Please read this statement carefully before using it. Once used, this statement shall be deemed to be accepted and accepted in its entirety. Please follow this article to install and use the product. Changzhou XYU Intelligent Technology Co., Ltd. and its affiliates shall not be liable for any loss or loss caused by improper use, installation or modification by users. This system is only used to slow down the falling speed of aircraft in an emergency, and cannot fully guarantee that users, equipment, other objects and third parties will not suffer any damage.

Notes for product use

1. The device automatically powers on and enters standby when the power is turned on outside the device, and can not be actively triggered in standby.
2. The system is initialized within 5 seconds of system startup, and the parachute descent device cannot be shaken during the initialization process.
3. Please fold the parachute and place the propellant according to the teaching video.
4. As the solid fuel propellant is flammable, do not contact with open fire. The propellant can be used at -40-85 °C.
5. Please store the propellant in a cool and dry place. The propellant shall be valid for 24 months.
6. Checks are required after transferring the fixed rope bindings to ensure that the length from each fixing point to the apex of the fixed rope remains the same.
7. If the adapter rope is exposed for a long period of time, it should be checked regularly for wear and tear, and if it is damaged, it should be replaced in a timely manner.
8. Do not let the exit turn to person to prevent damage caused by accidental triggering.
9. Please do not block out the top of the parachute landing system or the parachute will not eject normally.
10. Check the parachute and cord when used repeatedly, and replace them in time if there is any damage.
11. When the equipment light is on, do not shake or overturn the equipment violently.
12. Propellant is used for parachute ejection only. Do not use propellant for other scenarios.
13. After opening the parachute, please check and clean the parachute compartment, and wipe the photosensitive sensor and blinker cover to prevent dirt from appearing.
14. Do not cover the speaker outlets, and if they are clogged, clear them to prevent sound blockage.

How To Use

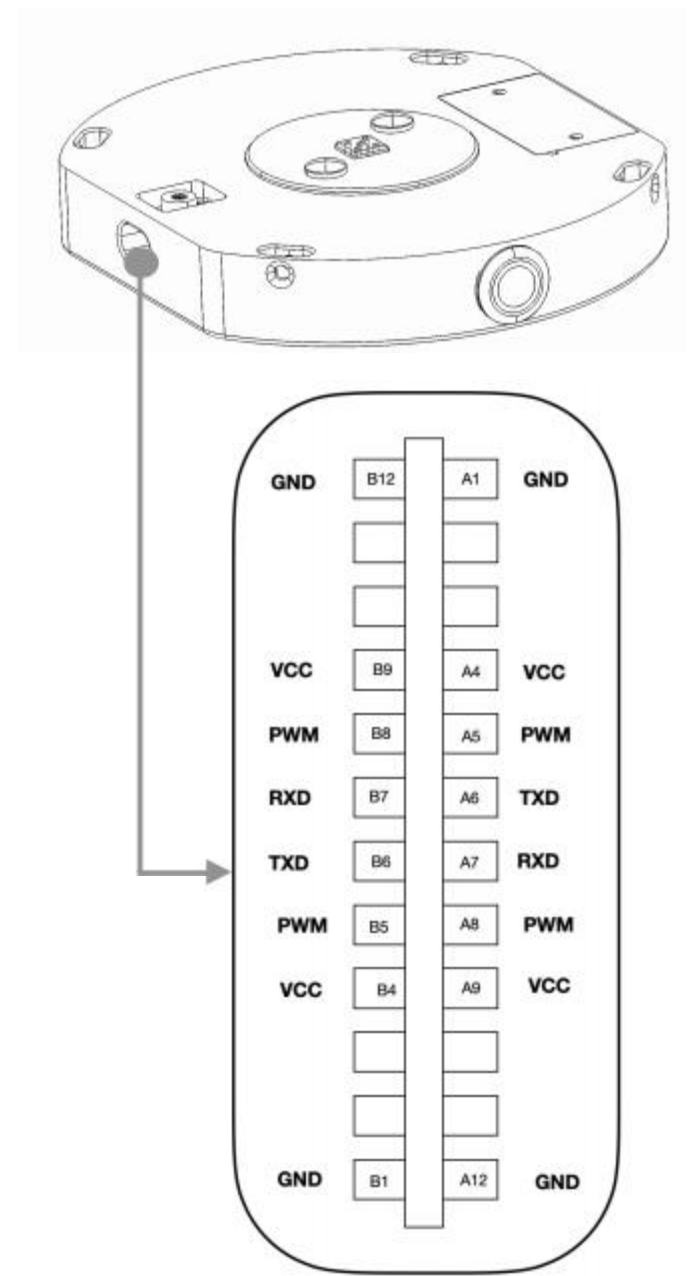
Mounting the device: The parachute device must be mounted with the parachute outlets facing upward and uncovered. The parachute has four M3 screw holes and can be attached to the aircraft with M3 screws. The parachute should be mounted as close to the aircraft's center of gravity as possible. A parachute with a built-in adapter line requires that the device be screwed to a structural member of sufficient strength to permit opening with a force of strength sufficient to give a power of six times the maximum weight of the aircraft. An external adapter is only required to secure the parachute compartment to the fuselage so that it will not fall off and damage the fuselage structure during opening, but the attachment point of the adapter rope to the rig must be sufficient for an impact of 6 times the weight of the aircraft.

The device is used: After installing and securing the parachute equipment, connect the parachute to the controller. The parachute signal line is connected to the parachute control or digital transmission module, and the communication follows the parachute communication protocol. This function can be used in conjunction with the opening and stopping of the parachute. When the parachute is unlocked, it can be triggered automatically by the built-in sensors that detect the aircraft's angularity and weightlessness, and the parachute can be triggered by the remote control or digital transmission through the serial commands or PWM signals. Use a remote control receiver to connect to the parachute PWM signal cable to achieve remote triggered parachute opening. Note that PWM triggering does not require unlocking the equipment to control parachute opening.

Device Description: The parachute can be woken up by the button or external power supply. The built-in battery is for emergency use only, so an external power supply is required for normal use. The parachute shuts down automatically after 30 seconds when the external power supply is disconnected. When the parachute is triggered to open, the unit will sound an audible alarm and have a flashing light.

Equipment Model	DPS30
Equipment size	Diameter 104mm/High 169mm
Installation	68*68/M3 screw fixing
Connector Type	TYPE-C
Load weight	<30kg
Parachute diameter	3500mm
Trigger way	Attitude / Weightlessness / Drop Speed / Command / PWM
Trigger Angle	± 80°[Default]
Falling trigger	0.5g/1.4s [Default]
Falling-speed threshold	12m/s
PWM pulse width	1650-2000ms
Unlock the height	10m
Input Voltage	5-24V
Equipment power consumption	75mw
Built-in battery	500mAh
Cord Fixed Type	External fixation
refresh rate	100Hz
Sound Alarm	have
Light Alarm	have
Equipment weight	600g
Ejection way	propellant
Parachute shield folding frequency	24 months / 12 months in humid environment (regional environment)
Working Temperature	-20-60℃
Working Altitude	-150m ~ 4000m
Guarantee	30 times / a year

Switching Indicator Lights	Meaning	Note
Red and green flashing alternately	Parachute start-up initialisation	The parachute just connects to the initialisation process of the machine.
Yellow light always on	Parachute external power supply normal in standby mode	The parachute enters standby mode, when the shooter parachute can not be triggered to open and needs to be activated.
Yellow light flashing light	Parachute external power supply disconnected in standby mode	When the external power supply is disconnected, the parachute enters standby mode, and the governor parachute can not be triggered to open and needs to be activated.
Red light always on	Parachute external power supply is normal and active	The parachute enters the activation state, and when the governor goes out of control beyond the threshold, the parachute opens.
Red light flashing light	Parachute external power disconnect active	The parachute enters the active state, when the governor exceeds the threshold, the parachute opens and shuts down after 30 seconds.
Green light always on/flashing light	parachute malfunction	Parachute malfunction, low voltage of built-in battery, etc.



TYPE output terminal sub-definition

PCB Footprints	USB Footprints	Parachute definition
1	A1/B2	GND
2	A4/B9	VCC
3	B8	PWM_IN
4	A5	PWM_IN
5	B7	USB_D-
6	A6	USB_D+
7	A7	USB_D-
8	B6	USB_D+
9	A8	PWM_IN
10	B5	PWM_IN
11	B4/A9	VCC
12	B1/A12	GND

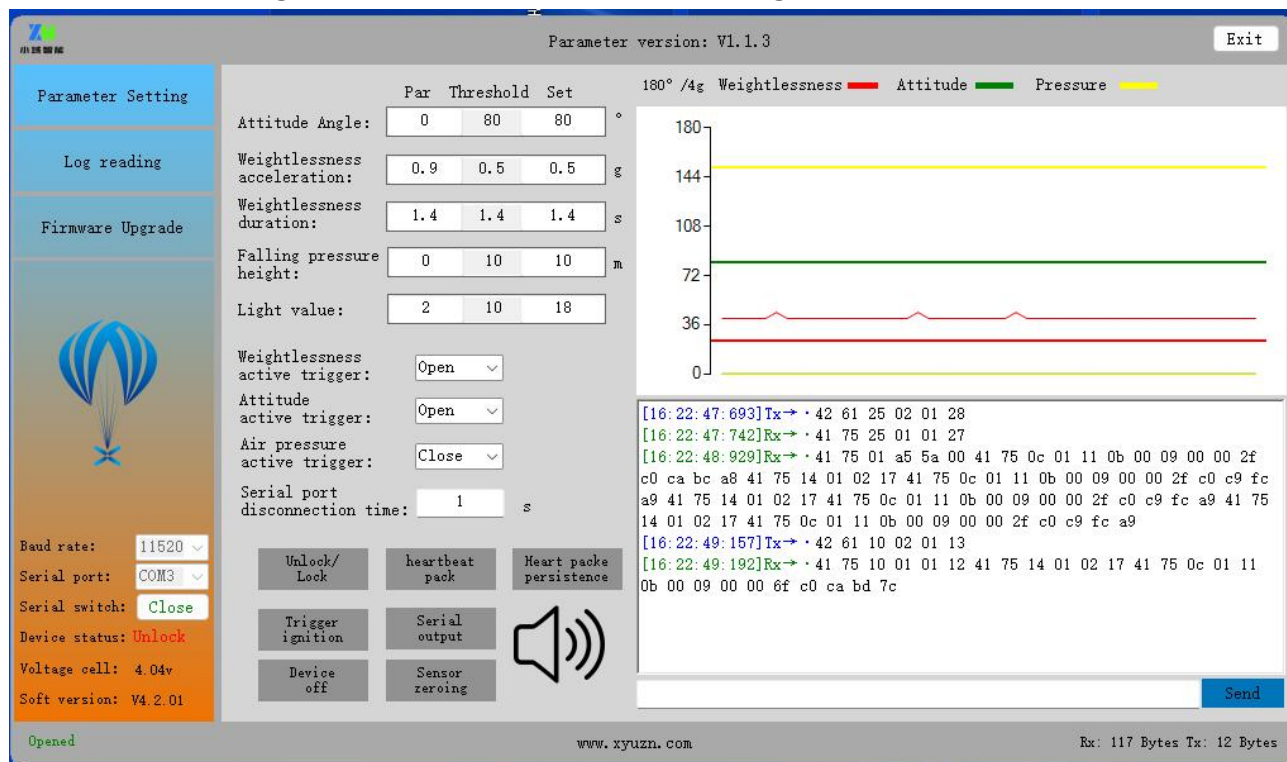
Definition of wire sequence of USB output cable		
Colour	Define	Note
Red	VCC	5-24V input
Black	GND	GND ground
Yellow	PWM	1650-2000ms
Green	TXD	RS232 connector
White	RXD	RS232 connector

Parameter Description of the software



Download and install the special tuning software for the XYU Assistant Small domain Smart parachute device. Use a dedicated connection module to connect the parachute equipment to the computer. Open the parameter adjustment software to complete the parameter reading and setting of parachute equipment; This software can also be used to complete the parachute trigger release record reading analysis, and equipment firmware upgrade.


Parameter setting Interface 1: 【 Parameter Setting 】




[Parameter setting] After the interface is opened, the main parameters of the parachute equipment can be read, including attitude Angle, weightlessness acceleration, weightlessness duration, falling pressure height, light value, etc. Attitude Angle: The real-time parameter is the attitude Angle detected by the gyroscope of the parachute. After the device is installed on the aircraft, the aircraft can be placed horizontally, and then the parameter can be read to confirm whether the parachute is installed horizontally to the aircraft. The default threshold is the threshold of triggering the parachute opening. If the attitude of the device exceeds the threshold after unlocking, opening the parachute will be triggered, which can be set by the user. This can be changed with the user's own settings. Weightlessness acceleration and weightlessness duration: are the combined thresholds. When the gyroscope detects that the device falls down beyond the set weightlessness threshold and continues to exceed the set weightlessness time, the parachute will trigger the release of the parachute in weightlessness. Fall Pressure Altitude: This value is the value detected by the built-in barometer of the device, the real-time parameter is the altitude altitude value detected by the barometer, which is different from the actual value, and the threshold is the altitude at which the device will fall in one second, when the aircraft falls over the set threshold in one second, it will trigger the opening of the parachute.

Active triggers for weightlessness, posture, and pressure can be turned on or off independently. The top right corner shows the real-time curve detected by the sensor. Lower The lower buttons are independent function on/off buttons and test buttons, e.g., a voice-announcing alarm button switch. The lower right-hand corner is a test port for sending commands to perform function tests.

Parameter setting Interface 1: 【 Date Reading 】

 XY 数据终端
Parameter version: V1.1.3
Exit

Parameter Setting	number of startup	startup time	Startup time	Power status	Trigger source	Attitude threshold	Weightlessne threshold	Time threshold	Fall height threshold	Trigger pressure height	Ligth value	Voltage cell
Log reading	11	52s	Disconne	Charging	Serial	80°	0.5g	1.4s	10m	0m	2	4.04v
Firmware Upgrade	12	9s	Disconne	Charging	Serial	80°	0.5g	1.4s	10m	0m	2	4.02v
	13	6s	Disconne	Charging	Serial	80°	0.5g	1.4s	10m	0m	0	0v

Baud rate:
 Serial port:
 Serial switch:
 Device status: lock
 Voltage cell: 0v
 Soft version: V4.2.01

Opened
www.xyuzn.com
Rx: 252 Bytes Tx: 108 Bytes

Read the date: Click the upper left corner of the screen to read the parachute opening records of the parachute device. This includes the number of times the parachute was turned on, the time it was turned on when the parachute was triggered, the status of the serial port connection, the external power supply status of the parachute device, the reason why the parachute was triggered, the parameter thresholds of the parachute module at the time of triggering, the recorded high pressure when the parachute was triggered, the value of the light used to judge the state of the propellant combustion and the parachute storage and the voltage of the built-in power cell.


Parameter setting Interface 1: 【 Firmware upgrade 】

XYUZYU

Parameter Setting

Log reading

Firmware Upgrade



Baud rate: 11520
Serial port: COM3
Serial switch: Close
Device status: Unlock
Voltage cell: 4.04v
Soft version: V4.2.01

Parameter version: V1.1.3

Exit

DeviceS/N: DPS2201255255

Version	Release time	All	Operation	Update log
V4.1.00	20230531	Official	demotion	Update log

Update log:

Opened

www.xyuzn.com

Rx: 129 Bytes Tx: 12 Bytes

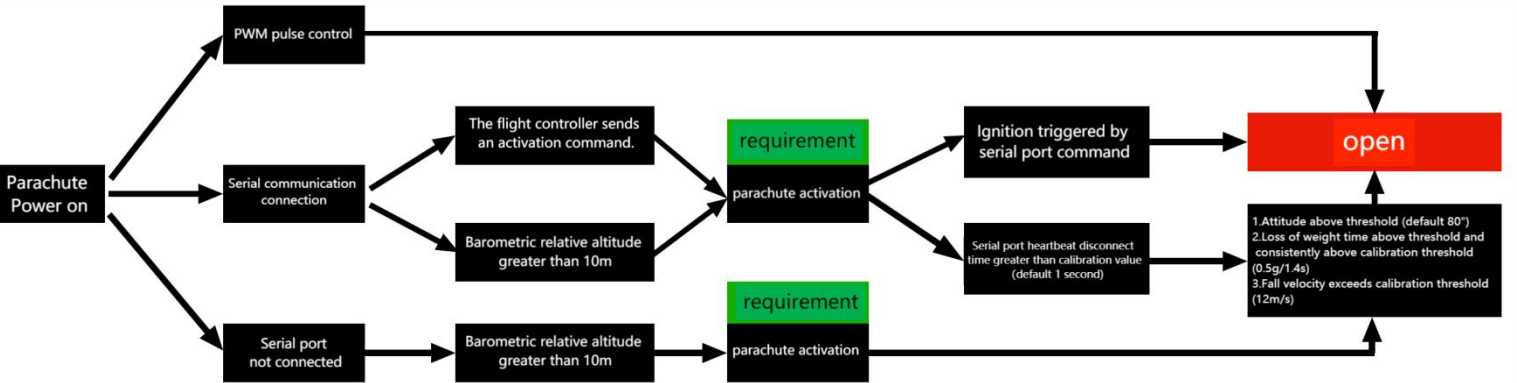
Firmware Upgrade: This screen can read the S/N number of the parachute device and the firmware version of the device. When there is an official firmware upgrade or bug fix, you can update the system of the parachute device through the reference software. Custom users can also download the custom firmware to implement the functions of the specific version.

Communication protocols:

Command Name	Command Code							Command Definition	Instruction code set	Return Value
	D0	D1	D2	D3	D4	D5	D6			
	D0	D1	D2	D3	D4	D5	D6		TX	RX
Parachute Heartbeat Kit	0x42	0x61	0x01	0x5A	0xA5	CKM		The sensor sends two heartbeat packets continuously after power-on (50ms interval), and the subsequent heartbeat packets are initiated by the host computer, and the module replies once, and it is recommended that the host computer sends the packets at intervals of 10/30 seconds. If no reply is received from the module within 1 second, the communication fails and the module is labeled as offline.	42 61 01 a5 5a 00	41 75 01 a5 5a 00
Power-on self-test	0x42	0x61						After initialization of the module is completed, the module takes the initiative to report the self-test internal battery status (low voltage is 1), the board voltage (12V power supply is 1) and the safety switch status (pressed is 1). D4=0x03 binary indicates 00000011, indicating that there is no low-voltage alarm, and there is a 120V power supply input and the safety switch is on.		41 75 02 01 03 06
Serial port disconnect time calibration	0x42	0x61	0x06	0x02	0x0A	0x12		D4 is the heartbeat packet disconnection time, the value multiplied by 20ms is the time to judge the serial port disconnection, 0A=200ms, the default is 200ms, this setting will work with the active trigger mechanism to realize the autonomous trigger function of flight control disconnection. it will not be affected when it is not set.	42 61 06 02 0A 12	41 75 06 01 0A 11
Unlocking Devices	0x42	0x61	0x10	0x02	0x01	0x13		D4=0x01 The module enters the unlocked state. In the unlocked state, the device can be triggered by command or actively.	42 61 10 02 01 13	41 75 10 01 01 12
Locked Device	0x42	0x61	0x10	0x02	0x00	0x12		D4=0x00 The module enters the lock state, the lock state is equivalent to standby, the device cannot be triggered in this state.	42 61 10 02 00 12	41 75 10 01 00 11
Command trigger	0x42	0x61	0x11	0x02	0x01	0x14		D4=0x01 module triggered, serial trigger will continue to ignite for 3 seconds, light detected after triggering (parachute compartment lid open) device into lock mode.	42 61 11 02 01 14	41 75 11 01 01 13
Command shutdown	0x42	0x61	0x12	0x02	0x01	0x15		D4=0x01 Module software shutdown, self-locking switch The device can be commanded to shutdown only if the mechanical switch is not open. Self-resetting switches can be directly commanded to shutdown.	42 61 12 02 01 15	41 75 12 01 01 14
Allow status output	0x42	0x61	0x13	0x02	0x01	0x16		After turning on the output, first return 417513010115,after turning on the device to 10Hz frequency feedback device status information) See Table 1	42 61 13 02 01 16	41 75 13 01 01 15
Disable state output	0x42	0x61	0x13	0x02	0x00	0x15		D4=0x00 stops the module from outputting status messages.	42 61 13 02 00 15	41 75 13 01 00 14
Baud rate setting	0x42	0x61	0x24	0x02	0x06	0x2C		D4 baud rate code (code description), in order to enhance the reliability of communication, it is not recommended to change this parameter arbitrarily. Default 1152001 0x01/4800, 0x02/9600, 0x03/19200, 0x04/38400, 0x05/57600, 0x06/115200	42 61 24 02 06 2c	41 75 24 01 06 2b
Device Status Inquiry	0x42	0x61	0x32	0x01	0x00	0x33		Query device status information, the return result is shown in Table 1	42 61 32 01 00 33	Table 1
Activation Status Inquiry	0x42	0x61	0x30	0x01	0x00	0x31		Query the module system has been activated, the module returns the setting result, D4 = 0x00 means in the locked state; D4 = 0x01 means in the excited.	42 61 30 01 00 31	41 75 30 01 01 32 41 75 30 01 00 31
Trigger Status Query	0x42	0x61	0x31	0x01	0x00	0x32		The return value D4=0x00 means it is in untriggered state; D4=0x01 means it is in triggered state;	42 61 31 01 00 32	41 75 31 01 00 32 41 75 31 01 01 33
Charging Status Inquiry	0x42	0x61	0x33	0x01	0x00	0x34		Return value D4 = 0x00 not charging, 0x01 device in charging state	42 61 33 01 00 34	41 75 33 01 00 34 41 75 33 01 01 35
Cell Voltage Search	0x42	0x61	0x34	0x01	0x00	0x35		Query system module core voltage, D4 indicates the core voltage (a multiple of 0.02V) This value is for reference only, disconnect the external power supply using the built-in core power supply feedback value is the accurate core voltage value. (b=3.8v, c=4.0v, d=2-4.2v)	42 61 34 01 00 35	41 75 34 01 D2 07
Trigger Record Search	0x42	0x61	0x35	0x01	0x00	0x36		Query Recent Trigger Records (Record the last 9 trigger records) See Form 2 for details;	42 61 35 01 00 36	Table 2
Calibration method	D5 of both transmit and receive instructions are parity bits, D5=(D2+D3+D4)&0x00FF,except for the CRC test									
Note	1.The self-reset switch becomes a self-locking switch and is used as a physical switch on demand.The switch pops up during transportation, the switch is not pressed, and the parachute will not open if any threshold conditions are met (including commands). 2.The shutdown command is valid both when the physical switch is flicked up and when it is pressed down. 3.The system does not sleep when the physical switch is pressed or when there is 12V power input;the system sleeps after 10 seconds when the switch is flicked up and there is no external power supply.									

Form II (Annotated Explanation of Trigger Records)																					
	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18		
	Frame header1	Frame header2	frame length	command word	Number of starts	Time high	Time low	Device status bits	Trigger source	Angle Threshold	Weightlessness threshold	Weightlessness time threshold	Resurre drop high threshold	High barometric altitude	Barometric altitude low	lighting	Cell Voltage	Calibration	Calibration		
example	41	75	35	01	0A	03	97	77	C2	50	07	78	06	00	5F	05	B5	01	C8		
Annotati on					Number of power-ups Example: 0x0A is the 10th power on. Example: 0x0B is the 10th power on.	Device power-on time = 0x035x06, example: 0x030x97 is 916 seconds		Bit8:Serial output open status, 0/off, 1/on. Bit7:Activation status, 0/not activated, 1/activated. Bit6:Whether the light exceeds the threshold 0/not exceeded, 1/exceeded. Bit5:Serial port connection status, 0/disconnected, 1/connected normally. Bit4:Speaker switch, 0/off, 1/on. Bit3:LED light, 0/off, 1/on. Bit2:CRC check bit, 0/error, 1/correct. Bit1:Internal 5V power supply flag bit 0/no power supply, 1/power supply positive Bit0:External 5V power supply flag bit 0/no power supply, 1/positive power supply.	Bit8:Weightlessness active switch, 0/off, 1/on. Bit7:Attitude active switch, 0/off, 1/on. Bit6:Air pressure active switch, 0/off, 1/on. Bit5:PWM trigger record, 0/not triggered, 1/trigger in progress. Bit4:Barometric pressure trigger record, 0/untriggered, 1/triggered in. Bit3:Weightlessness trigger record, 0/not triggered, 1/triggered. Bit2:Attitude trigger record, 0/not triggered, 1/triggered. Bit1:Serial port trigger record, 0/not triggered, 1/triggered.	Angle Threshold. Example: 0x50 is 80 Degree	Acceleration threshold = 010x0.1, example: 0x07 is 0.7g -011x0.01, -011x0.01, -011x0.01 Example: 0x78 is 1.2 seconds	Air pressure drop threshold, example: 6m/s for 0x06	Barometer height value -013x255-014, show the value. Example: 0x000x5F for barometric pressure Height 95 meters	Device when triggered The light reference of the value, for Example: 0x05 for 5	Voltage of the device's built-in cell, the value is 010x0.02, example: 0x05 is 3.62V	The checksum method is CRC checksum	The checksum method is CRC checksum				

Form II (Annotated Explanation of Trigger Records)																				
	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	
	Frame header1	Frame header2	frame length	command word	Number of starts	Time high	Time low	Device status bits	Trigger source	Angle Threshold	Weightlessness threshold	Weightlessness time threshold	Resurre drop high threshold	High barometric altitude	Barometric altitude low	Lighting	Cell Voltage	Calibration	Calibration	
example	41	75	35	01	0A	03	97	77	C2	50	07	78	06	00	5F	05	B5	01	C8	
Annotati on					Number of power-ups Example: 0x0A is the 10th power on. Example: 0x0B is the 10th power on.	Device power-on time = 0x035x06, example: 0x030x97 is 916 seconds		Bit8:Serial output open status, 0/off, 1/on. Bit7:Activation status, 0/not activated, 1/activated. Bit6:Whether the light exceeds the threshold 0/not exceeded, 1/exceeded. Bit5:Serial port connection status, 0/disconnected, 1/connected normally. Bit4:Speaker switch, 0/off, 1/on. Bit3:LED light, 0/off, 1/on. Bit2:CRC check bit, 0/error, 1/correct. Bit1:Internal 5V power supply flag bit 0/no power supply, 1/power supply positive Bit0:External 5V power supply flag bit 0/no power supply, 1/positive power supply.	Bit8:Weightlessness active switch, 0/off, 1/on. Bit7:Attitude active switch, 0/off, 1/on. Bit6:Air pressure active switch, 0/off, 1/on. Bit5:PWM trigger record, 0/not triggered, 1/trigger in progress. Bit4:Barometric pressure trigger record, 0/untriggered, 1/triggered in. Bit3:Weightlessness trigger record, 0/not triggered, 1/triggered. Bit2:Attitude trigger record, 0/not triggered, 1/triggered. Bit1:Serial port trigger record, 0/not triggered, 1/triggered.	Angle Threshold. Example: 0x50 is 80 Degree	Acceleration threshold = 010x0.1, example: 0x07 is 0.7g -011x0.01, -011x0.01, -011x0.01 Example: 0x78 is 1.2 seconds	Air pressure drop threshold, example: 6m/s for 0x06	Barometer height value -013x255-014, show Example: 0x000x5F for barometric pressure Height 95 meters	Device when triggered The light reference of the value, for Example: 0x05 for 5	Voltage of the device's built-in cell, the value is 010x0.02, example: 0x05 is 3.62V	The checksum method is CRC checksum	The checksum method is CRC checksum			



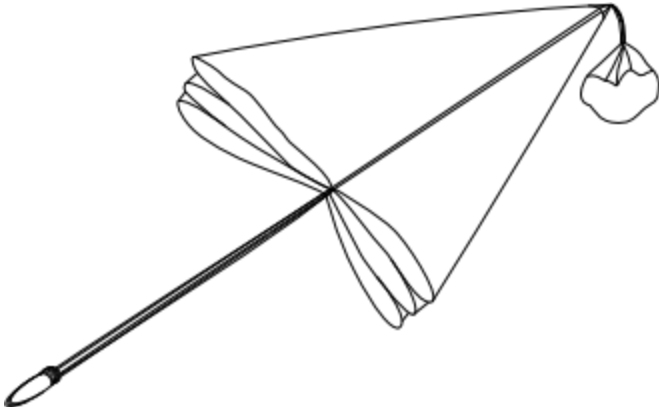


Product technical support and customized email: support@xyuzn.com

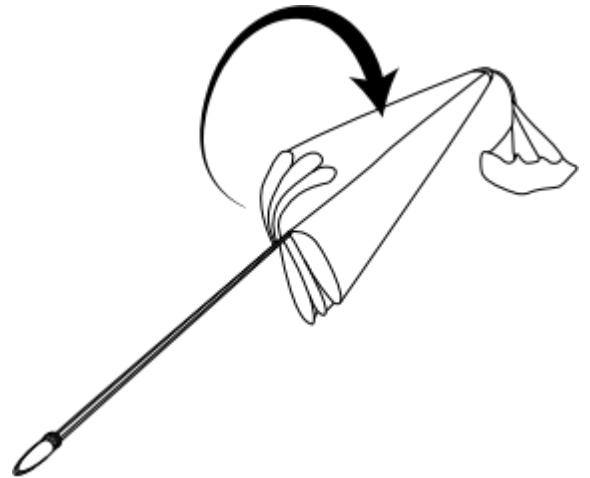
Installation instructions:

Attachment I

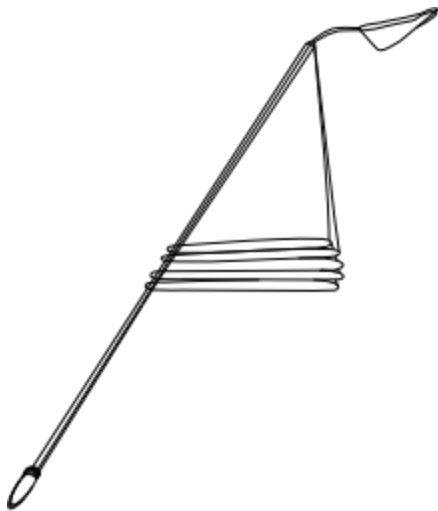
DPS UAV Parachute Landing equipment folding tutorial



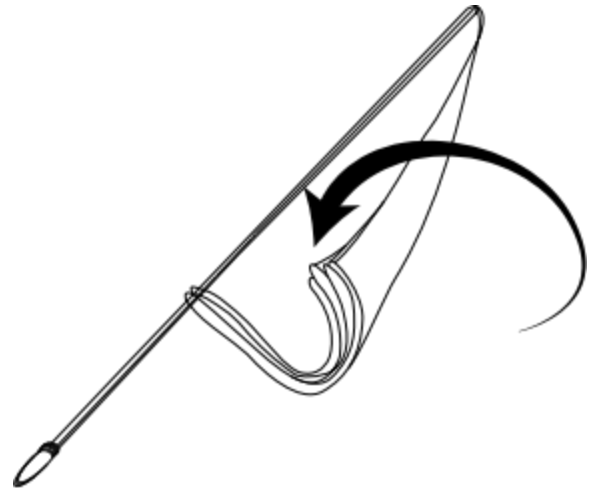
Step 1: Fix the top of the parachute, straighten the parachute and put it in order.



Step 2: Arrange the parachute surface to one side and sort out the parachute rope



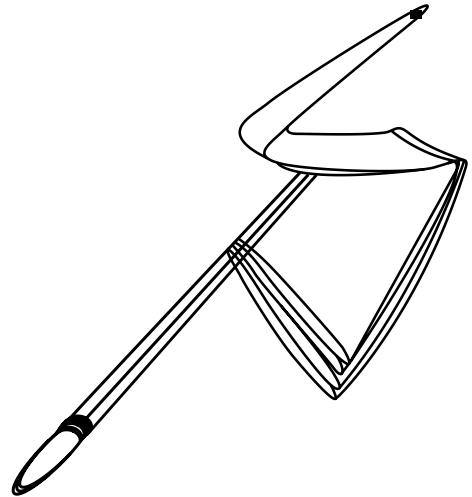
Step 3: Arrange the parachute to one side and then compress it.



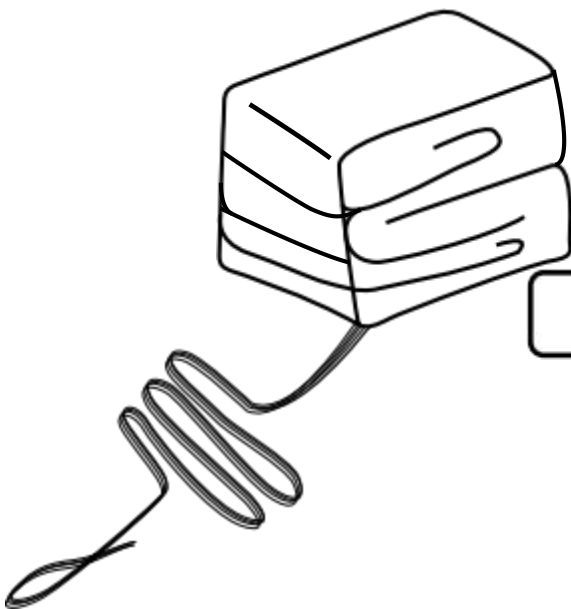
Step 4: Fold the parachute horizontally back according to "Z".



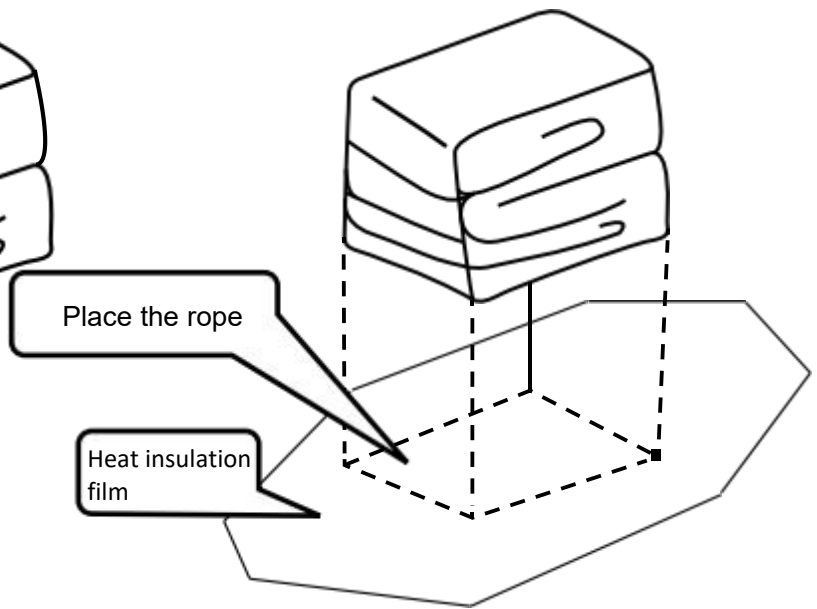
Step 5: Fold the parachute horizontally according to "Z" and then compress it.



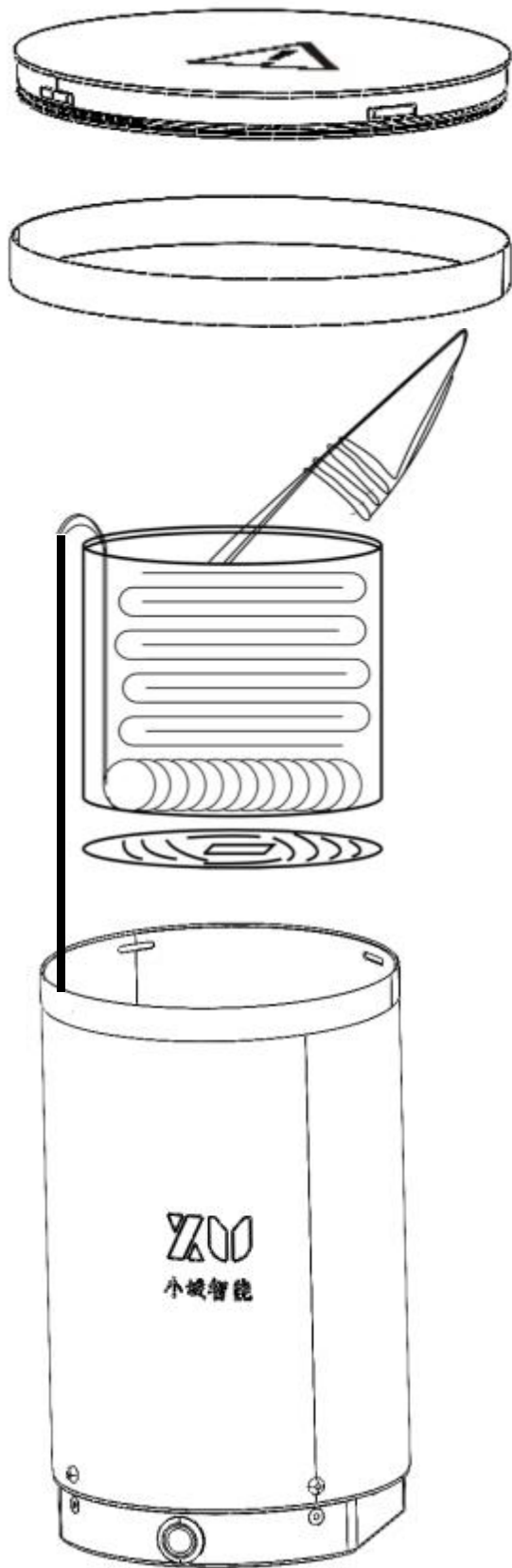
Step 6: Fold the parachute vertically according to "Z".



Step 7: Fold the parachute into cuboids and arrange the parachute rope according to "Z".



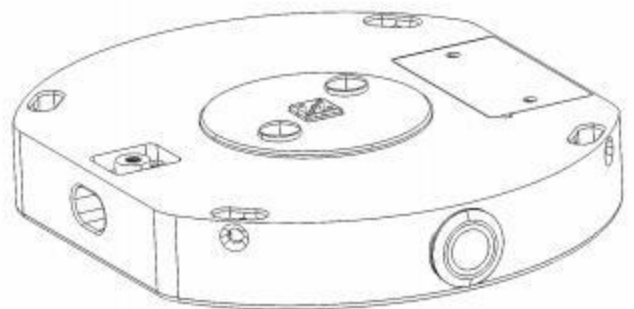
Step 8: Place the cord on the heat insulation film, then place the folded parachute on the cord.

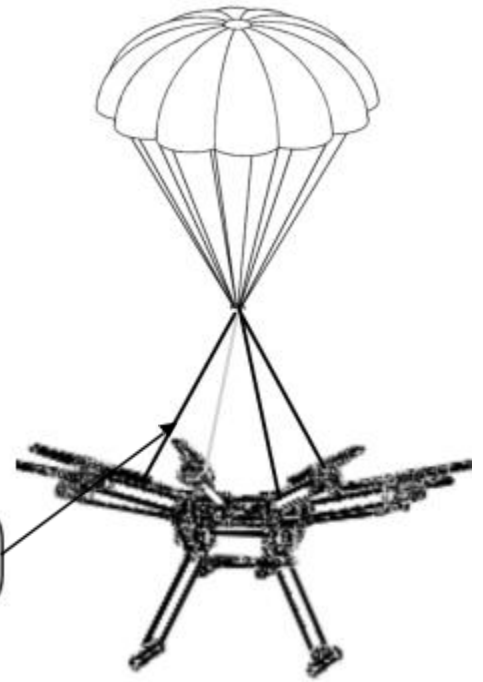
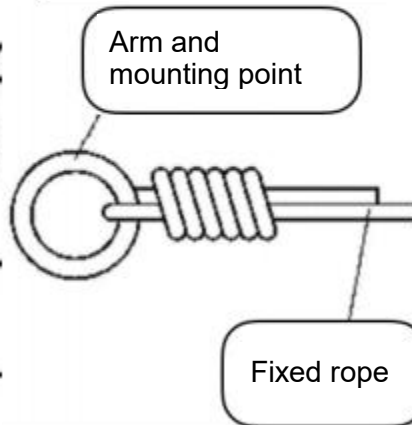
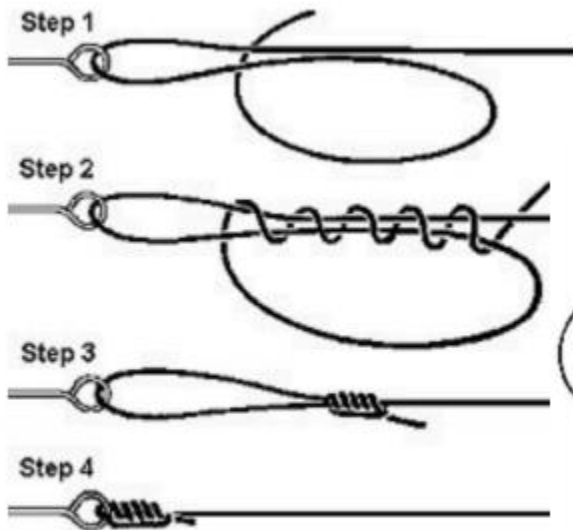


Step 9: Wrap the parachute with heat insulation film according to "U". Place the propellant in the barrels and then put the parachute into the barrels for compaction. Take care that the main cord does not exceed the surface of parachute.



Step 10: Arrange the parachute, cover the parachute, leave the rope through the u-shaped hole at the top of the barrels, and fix it on the side wall of the barrels with Velcro.





The knot way for the fixed rope with fixed points on the aircraft.

The rope is fixed and then pulled up in a "pyramid" shape. Fixing points can be placed on structural members or machine arm.

