High-Precision UWB Anchors & Tags Introduction V1.1

CONTENTS

1 Introduction to anchor models and parameters

1.1 UWB wall-mounted anchor (PROANC-BG-F429).

PROANC-BG-F429 is a high-precision positioning anchor based on UWB. It uses STM32 MCU of ST Company as the main control chip, and carries the UWB high-power MAX2001-IPEX RF module and 10dB gain directional antenna independently developed by YCHIOT. The white curved surface design can be perfectly integrated with the indoor environment. The core patent radio frequency technology from YCHIOT enables PROANC to cover a wider range and have higher positioning accuracy.

1.1.1 UWB anchor PROANC basic parameters

Table 1.1 1 PROANC-BG-F429 positioning anchor working parameters

Power supply	
POE power supply	POE 48V
Powered by a DC power supply	The input is greater than the power 1W, and the input voltage is 12V
Built-in battery capacity	3000mAh (optional).
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4/FIRA standard
Typical transmit power	-22dBm
Data transfer rate	6.8Mbps
Positioning performance	
How the data is uploaded	Ethernet / USB
Ranging accuracy	The error is less than 10cm
Operating environment	
Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃
Waterproof rating	IP67

1.1.2 Directions for use

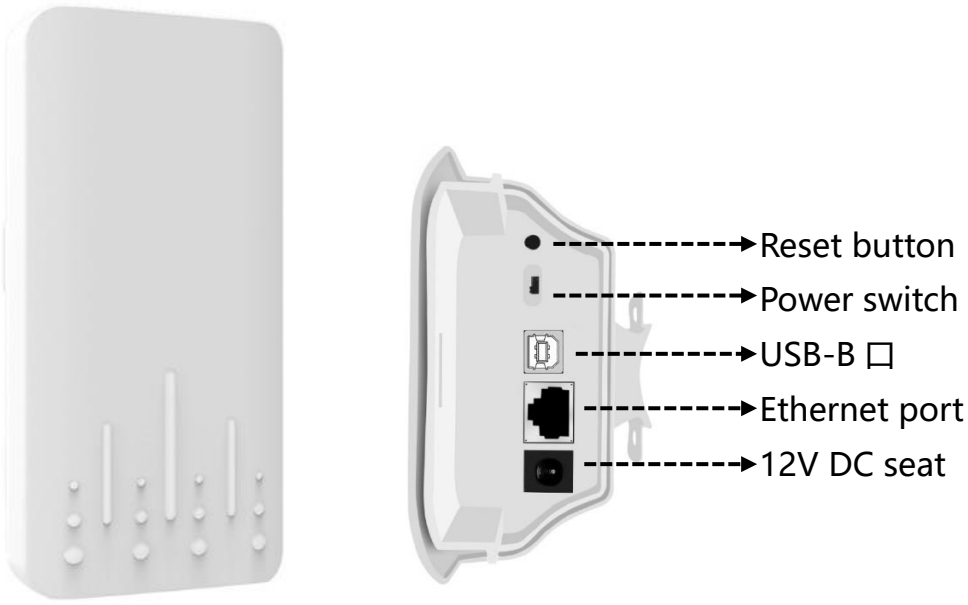


Table 1.1.2 Operation steps

	Procedure
Boot	Select USB or POE or 12V as the power supply mode, after the power is turned on, turn on the power switch, 4 LED indicators begin to flash, and the buzzer rings, indicating that the initialization is successful.
Work	The fourth work indicates that the LED light starts flashing for a short time, with a blink interval of 1 second.
Shutdown	Turn off the power switch and allLED LEDs turn off.
Ethernet access	The first command enables the Ethernet function, sets parameters such as I P, and when the first working indicator flashes, indicating that a TCPIP connection has been established.
Reset button	Long press and hold the reset button to restore initialization of the system.

1.2 UWB waterproof positioning anchor (PROANC-SD-F429).

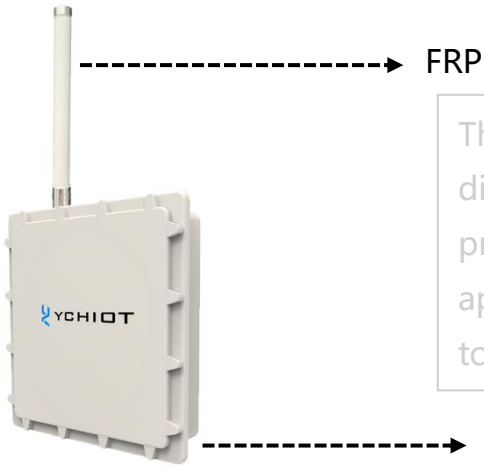
PROANC-SD-F429 is a high-precision positioning anchor based on UWB. It uses STM32 MCU of ST Company as the main control chip, and carries the UWB high-power MAX2001-IPEX radio frequency module and glass fiber reinforced plastic antenna independently developed by YCHIOT. This product is mainly used in harsh industrial control environments such as factories, mines, tunnels, and can also be used outdoors, with good waterproof and dust-proof effects.

1.2.1 UWB anchor PROANC basic parameters

Table 1.2.1 PROANC-SD-F429 positioning anchor operating parameters

Power supply	
POE power supply	POE 48V
Powered by a DC power supply	The input is greater than the power 1W, and the input voltage is 12V
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4/FIRA standard
Typical transmit power	-22dBm
Data transfer rate	6.8Mbps
Positioning performance	
How the data is uploaded	Ethernet
Ranging accuracy	The error is less than 10cm
Operating environment	
Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃
Waterproof rating	IP67

1.2.2 UWB Anchor PROANC User Guide



This figure is only a schematic diagram, and the actual product matches the appropriate antenna according to the actual project situation

Table 1.2.2 UWB anchor PROANC-SD-F429 anchor operation steps

	Procedure
Boot	As soon as the POE is powered on, the system starts working immediately
Work	The LED is on
Shutdown	POE power down, the system into the shutdown state

1.3 UWB in-ceiling anchor (PROANC-XD-F429).

PROANC-XD-F429 is a high-precision positioning anchor based on UWB. It uses STM32 MCU of ST Company as the main control chip, and carries the UWB high-power MAX2001-IPEX RF module and directional antenna independently developed by YCHIOT. It is suitable for indoor positioning.

1.3.1 UWB anchor PROANC basic parameters

Table 1.3.1 PROANC-XD-F429 positioning anchor operating parameters

Power supply	
POE power supply	POE 48V
Powered by a DC power supply	The input is greater than the power 1W, and the input voltage is 12V
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4/FIRA standard
Typical transmit power	-22dBm
Data transfer rate	6.8Mbps
Positioning performance	
How the data is uploaded	Ethernet
Ranging accuracy	The error is less than 10cm
Operating environment	
Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃
Waterproof rating	IP55

1.3.2 UWB Anchor PROANC User Guide

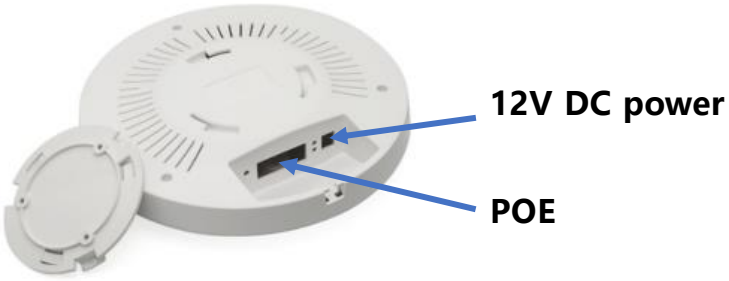


Table 1.3.2 UWB anchor PROANC-XD-F429 anchor operation steps

	Procedure
Boot	As soon as the POE is powered on, the system starts working immediately
Work	The LED is on
Shutdown	POE power down, the system into the shutdown state

2 Introduction to tag models and parameters

2.1 UWB tag (work card type).

The UWB PROCARD indoor positioning card uses the NRF52832 MCU of Nordic Company as the main control chip, carries the UWB high-power MAX2001-CA radio frequency module independently developed by YCHIOT, and uses the indoor high-precision algorithm based on the UWB to realize the ultra-low power standby of the card, the receiving and sending control of the positioning package, etc. It can realize high-precision indoor positioning of the wearer. The built-in acceleration speed sensor of the work card can intelligently switch the positioning frequency of the personnel when they are moving or stationary to achieve standby with the lowest power consumption.

2.1.1 UWB tag PROCARD basic parameters

Table 2 1.1 UWB PROCARD indoor positioning card working parameters

Basic operating parameters	
Motion refresh rate	1Hz
Quiescent refresh rate	0.2Hz
power consumption	Standby 64uA positioning launch 200uA
precision	Positioning error 10cm~20cm
Time spent on one charge	Averages 4 months
Battery capacity	800 mAh
Product size	86mm * 54mm * 7.5mm
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4-2011/FIRA standard
BLE parameters (not open, customizable requirements).	
storage	512kB flash / 64kB RAM

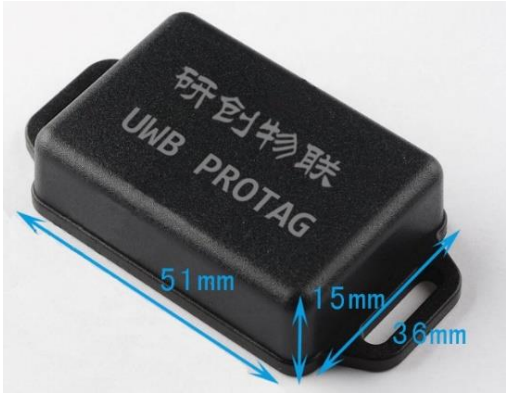
agreement	Support BLE5.0.
frequency	2. 4GHz – 2. 4835GHz
Operating environment	
Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃
Waterproof rating	IP65

2.1.2 UWB tag PROCARD User Guide

Table 2 1.2 UWB tag PROCARD tag operation steps

	Procedure
Boot	Press and hold the button for 3 seconds, the buzzer rings, release the button, and the work indicates that the LED light starts to flash, indicating that the boot is successful. The card will be powered on when charging.
Work	The operating indicator LED begins to blink briefly, at frequency consistent with the UWB ranging frequency.
Shutdown	In the power-on state, long press the button for 3 seconds, the buzzer sounds, release the button, indicating that the shutdown is successful.
charge	Charging wiring method: Insert one end of the supporting charging cable into the 5V DC charging adapter or computer, and the other end is connected to the micro USB interface of the U WB work card.

2.2 UWB tag (material type).



The UWB PROTAG material label uses the NRF52832 MCU of Nordic Company as the master chip, carries the UWB high-power MAX2001-CA RF module independently developed by YCHIOT, and uses the indoor high-precision algorithm based on the UWB to realize the ultra-low power consumption standby of the work card, the receiving and sending control of the positioning package, etc. It can realize high-precision indoor positioning of the wearer. The built-in acceleration speed sensor of the work card can intelligently switch the positioning frequency of the personnel when they are moving or stationary to achieve standby with the lowest power consumption. Sensor, which can intelligently switch the positioning frequency when people are moving or stationary, to achieve standby with the lowest power consumption.

2.2.1 UWB tag PROTAG basic parameters

Table 2 2.1 UWB PROTAG indoor positioning card working parameters

Basic operating parameters	
Motion refresh rate	1Hz
Quiescent refresh rate	0.2Hz
power consumption	Standby 64uA positioning launch 200uA
precision	Positioning error 10cm~20cm
Time spent on one charge	Averages 2 months
Battery capacity	370 mAh
Product size	86mm * 54mm * 7.5mm
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4-2011/FIRA standard
BLE parameters (not open, customizable requirements).	
storage	512kB flash / 64kB RAM

agreement	Support BLE5.0.
frequency	2. 4GHz – 2. 4835GHz
Operating environment	
Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃
Waterproof rating	IP67

2.2.2 UWB Tag PROTAG User Guide

Table 2 2.2 UWB tag PROTAG tag operation steps

	Procedure
Boot	Press and hold the button for 3 seconds, the buzzer rings, release the button, and the work indicates that the LED light starts to flash, indicating that the boot is successful. The card will be powered on when charging.
Work	The operating indicator LED begins to blink briefly, at frequency consistent with the UWB ranging frequency.
Shutdown	In the power-on state, long press the button for 3 seconds, the buzzer sounds, release the button, indicating that the shutdown is successful.
charge	Charging wiring method: Insert one end of the supporting charging cable into the 5V DC charging adapter or computer, and the other end is connected to the micro USB interface of the U WB work card.

2.3 UWB tag (shoulder plate).

The UWB PROTAG shoulder plate type uses the NRF52832 MCU of Nordic Company as the main control chip, carries the UWB high-power MAX2001-CA radio frequency module independently developed by YCHIOT, and uses the indoor high-precision algorithm based on the UWB to realize the ultra-low power standby of the work card, the receiving and sending control of the positioning package, etc. It can realize high-precision indoor positioning of the wearer. The built-in acceleration speed sensor of the work card can intelligently switch the positioning frequency of the personnel when they are moving or stationary to achieve standby with the lowest power consumption.

2.3.1 UWB tag PROTAG-SL-3000 basic parameters

Table 2.3.1 UWB PROCARD indoor positioning card working parameters

Basic operating parameters	
Motion refresh rate	1Hz
Quiescent refresh rate	0.2Hz
power consumption	Standby 64uA positioning launch 200uA
precision	Positioning error 10cm~20cm
Time spent on one charge	Averages 2 months
Battery capacity	370 mAh
Product size	86mm * 54mm * 7.5mm
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4-2011/FIRA standard
BLE parameters (not open, customizable requirements).	
storage	512kB flash / 64kB RAM
agreement	Support BLE5.0.
frequency	2. 4GHz – 2. 4835GHz
Operating environment	
Operating temperature	-40℃~60℃

Storage temperature	-40℃~85℃
Waterproof rating	IP67

2.3.2 UWB Tag PROTAG User Guide

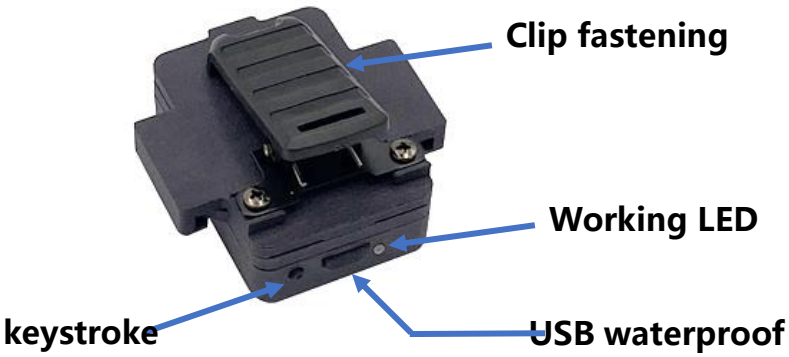


Table 2 3.2 UWB tag PROTAG-SL-3000 tag operation steps

	Procedure
Boot	Press and hold the button for 3 seconds, the buzzer rings, release the button, and the work indicates that the LED light starts to flash, indicating that the boot is successful. The card will be powered on when charging.
Work	The operating indicator LED begins to blink briefly, at frequency consistent with the UWB ranging frequency.
Shutdown	In the power-on state, long press the button for 3 seconds, the buzzer sounds, release the button, indicating that the shutdown is successful.
charge	Charging wiring method: Insert one end of the supporting charging cable into the 5V DC charging adapter or computer, and the other end is connected to the micro USB interface of the U WB work card.

2.4 UWB tag (cap type).

The UWB PROTAG shoulder plate type uses the NRF52832 MCU of Nordic Company as the main control chip, carries the UWB high-power MAX2001-CA radio frequency module independently developed by YCHIOT, and uses the indoor high-precision algorithm based on the UWB to realize the ultra-low power standby of the work card, the receiving and sending control of the positioning package, etc. It can realize high-precision indoor positioning of the wearer. The built-in acceleration speed sensor of the work card can intelligently switch the positioning frequency of the personnel when they are moving or stationary to achieve standby with the lowest power consumption

2.4.1 UWB cap PROTAG-SL-3000 basic parameters

Table 2 4.1 UWB cap PROTAG-SL-3000 operating parameters

Basic operating parameters	
Motion refresh rate	1Hz
Quiescent refresh rate	0.2Hz
power consumption	Standby 64uA positioning launch 200uA
precision	Positioning error 10cm~20cm
Time spent on one charge	Averages 2 months
Battery capacity	370 mAh
Product size	86mm * 54mm * 7.5mm
UWB parameters	
Frequency range	3. 7GHz – 4.2GHz
Support channels	500MHz Channel 2
Protocol standards	IEEE 802.15.4-2011/FIRA standard
BLE parameters (not open, customizable requirements).	
storage	512kB flash / 64kB RAM
agreement	Support BLE5.0.
frequency	2. 4GHz – 2. 4835GHz
Operating environment	

Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃
Waterproof rating	IP67

2.4.2 UWB Cap PROTAG-SL-3000 User Guide

Table 2 4.2 UWB cap PROTAG-SL-3000 operating steps

	Procedure
Boot	Press and hold the button for 3 seconds, the buzzer rings, release the button, and the work indicates that the LED light starts to flash, indicating that the boot is successful. The card will be powered on when charging.
Job	The operating indicator LED begins to blink briefly, at frequency consistent with the UWB ranging frequency.
Shutdown	In the power-on state, long press the button for 3 seconds, the buzzer sounds, release the button, indicating that the shutdown is successful.
charge	Charging wiring method: Insert one end of the supporting charging cable into the 5V DC charging adapter or computer, and the other end is connected to the micro USB interface of the U WB work card.

2.5 UWB tag (Alarming Light)

The UWB alarm light uses the NRF52833 single-chip computer of Nordic Company as the main control chip, carries the UWB DW1000 RF module independently developed by YCHIOT, indoor high-precision algorithm based on UWB, and the receiving and sending control of ranging packets. It can realize the anti-collision function between forklifts.

2.5.1 Basic parameters of UWB Alarming Light

Table 2.5.1 UWB Alarming Light operating parameters

Basic parameters	
Powered by a DC power supply	Input voltage 12V
Silent operating mode power consumption	65mA
Alarm operating mode power consumption	200mA
Battery capacity	1200mAh
Loudness of the sound	105dB
UWB parameters	
Frequency range	6.2GHz – 6.7GHz
Support channels	500MHz Channel 5
Protocol standards	IEEE 802.15.4/FIRA standard
Typical transmit power	-50dBm
Data transfer rate	6.8Mbps
Positioning performance	
Ranging accuracy	The error is less than 10cm
Operating environment	
Operating temperature	-40℃~60℃
Storage temperature	-40℃~85℃

2.5.2 UWB Alarming Light instructions

Table 2 5.2 UWB alarm light operation steps

	Procedure
Boot	Toggle the power switch to ON
Work	When the distance between the two UWB alarm lights is less than 1m from the set alarm distance, the alarm light will produce an audible and visual alarm
Shutdown	Toggle the power switch to OFF
Charge	Charging wiring method: Insert one end of the matching charging cable into a 220V socket, and the other end is connected to the UWB alarm light 12VDC interface.

3 Document Management Information Table

Topic	YCHIOT High-Precision UWB Anchor & Tag Introduction
Version	V1.1
Reference documentation	dw1000-datasheet-v2.08, Decawave DW1000_Software_API_Guide_rev2p7, Decawave UM004-UWB_MAX2001 User Manual _V1.6
Creation time	2020/7/14
Creator	Lynn
Latest release date	2022/09/01

Person	Modified Date	Document Change Record
Lynn	2020/07/14	V1.0 Product Brief
Lynn	2020/09/01	V1.1 New product Alarming Light is introduced