



LinPAC + I-8211W

User Manual

(GPS/GLONASS Time Synchronization)

V1.0.1 Apr 2022



LX-8131/LX-8331/LX-8731
LP-8121/LP-8421/LP-8821

Warranty

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If you have any problem, please feel free to contact us.

You can count on us for quick response.

Email: service@icpdas.com

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1. Introduction

I-8211W-G is a GPS, GLONASS receiver module designed to use GPS, GLONASS satellite time for automatic and precise time synchronization. The I-8211W-G can be plugged into any slot of the LinPAC, the LinPAC will automatically launch the application and acquire GPS, GLONASS time to reduce RTC drift to 1ms. The I-8211W is preset to receive GPS signals, you can modify the LinPAC settings to receive GLONASS signals.

PS: LinPAC with NTPD package: LP-8x21, LX-8x31

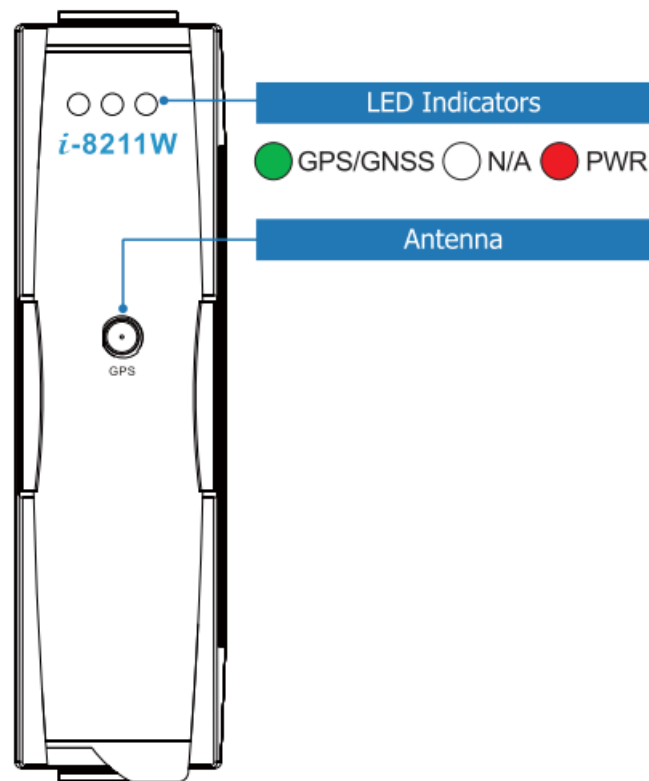
1.1. Features

- Time synchronization, error under 1 millisecond
- Support GPS, GLONASS
- Capable of SBAS (WAAS, EGNOS, MSAS)
- Plug and Play in LinPAC (LX-8x31, LP-8x21) series.
 - LX-8131/8331/8731
 - LP-8121/8421/8821

1.2. Specifications

LED Indicators	
Status	1 x Power 1 x GPS/GNSS
GPS/GNSS	
Acquisition Time	Cold Start (Open Sky)=42 s (typical)
Frequency	L1 1575.42 MHz, C/A code
Max. Altitude	<18,000 m
Max. Velocity	<515 m/s
Position Accuracy	Capable of SBAS (WAAS, EGNOS, MSAS)
Protocol	NMEA 0183 version 3.01
Sensitivity	Tracking: Up to -158 dBm Cold start: Up to -142 dBm
Support Channels	32
Power	
Consumption	0.75 W (Max.)
Mechanical	
Dimensions (mm)	32 x 87 x 114 (W x L x D)
Environment	
Operating Temperature	-25 to +75°C
Storage Temperature	-40 to +85°C
Humidity	10 to 90% RH, Non-condensing

1.3. LED indicators



LED	Status	Description
PWR (Red)	ON	The module's power is working correctly.
	OFF	The module's power turned off (or error).
GPS/ GLONASS (Green)	ON	The module is searching GPS/GNSS.
	OFF	The module's GPS/GNSS error.
	Blanking (1 sec)	The module is working correctly and receiving GPS/GNSS data.

2. LinPAC + I-8211W Getting Started

This chapter provides a guided tour of the I-8211W installation for user working with the LinPAC for the first time.

Before starting any task, please check the package contents. If any of the following package contents are missing or damaged, contact your dealer, distributor.

■ I-8211W Package Checklist



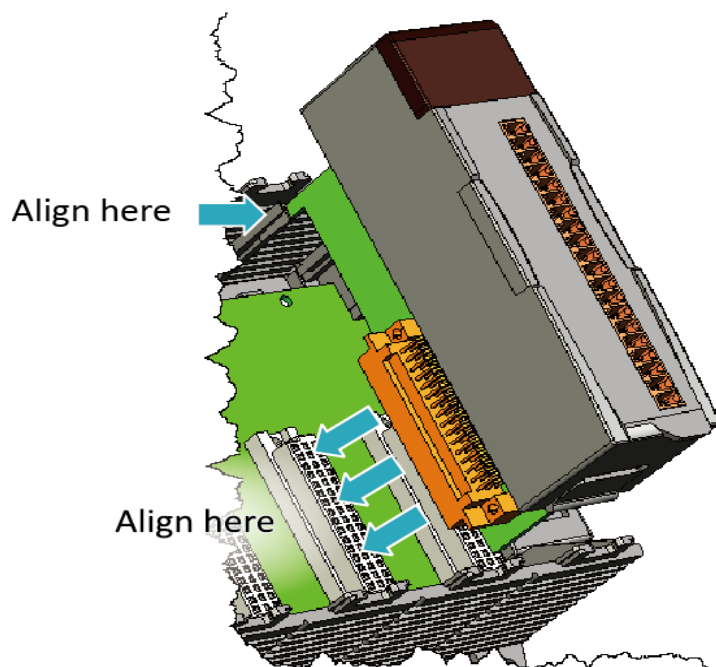
I-8211W and a 5m antenna (ANT-115-03)

2.1. I-8211W (GPS/GLONASS Time Sync Module)

Please refer to below steps to insert a I-8211W module into any expansion slot of LinPAC and synchronize GPS/GLONASS time automatically.

■ LinPAC (LX-8x31and LP-8x21) Series

Step 1: Align circuit card with slot and press firmly to seat module into connector

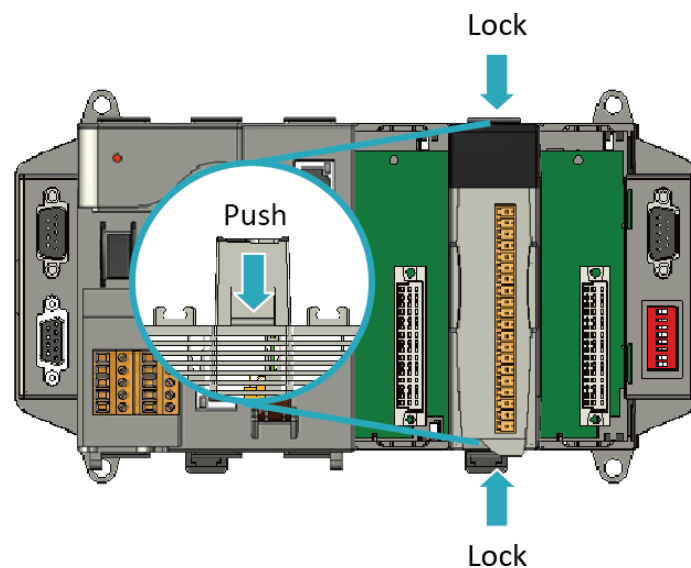


Tips & Warnings



It is recommended that the power to the LinPAC is switched off when wiring the I/O module which are plugging in the LinPAC slots.

Step 2: Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.



Step 3: Power on LinPAC

After boot the Linux OS, the LinPAC will automatically launch the application and get the GPS/GLONASS time to minimize the RTC drift to 1 millisecond. Using “**ntpq -p**” command to check the time’s error (the time error < 1ms). Please refer to below diagram:

```
root@icpdas:~# ntpq -p
      remote           refid  st t when poll reach  delay  Time error < 1ms
=====
oGPS_NMEA(0)    .GPS.      0 1   37   64   377   0.000  0.013  0.037
```

Tips & Warnings



Sometime the ntpd daemon need to spend 10~20 minutes to minimize the time error, so the command “**ntpq -p**” can’t show the symbol ‘o’ or time error less than 1ms immediately.

3. Internet Service

The [internet service](#) provided by ICP DAS will be satisfied and it includes [Technical Support](#) and [User's Manual Download](#) etc. Users can refer to the following web site to get more information:

1. ICP DAS Web Site :

<http://www.icpdas.com/>

2. LX-8x31/ LP-8x21 Product Page:

<https://www.icpdas.com/en/product/LX-8731>

<https://www.icpdas.com/en/product/LP-8821>

3. I-8211W Product Page:

<https://www.icpdas.com/en/product/I-8211W-G>

4. E-mail for Technical Support : service@icpdas.com

Appendix

A. Troubleshooting

Q1: No I-8211W's Linux device name.

Ans: It means the Linux driver isn't installed or the module isn't setup correctly. User can re-plug the I-8211W module into the slot. After the I-8211W installed, user must reinstall the Linux driver module (8250.ko), please refer to below steps:

■ LP-8x21

```
~# modprobe -r 8250 Remove Linux driver module "8250"
~#
~# modprobe 8250 Install Linux driver module "8250"
~#
~# dmesg | grep ttyS3 Check the driver had detected the i-8211W device name "ttyS3" on slot 1
[ 4769.158641] serial8250.0: ttyS3 at MMIO 0x1001060 (irq = 640) is a 16550A
```

■ LX-8x31

```
~# modprobe -r icpdas_8250 Remove Linux driver module "icpdas_8250"
~#
~# modprobe icpdas_8250 Install Linux driver module "icpdas_8250"
~#
~# dmesg | grep ttyS7 Check the driver had detected the i-8211W device name "ttyS7" on slot 1.
[ 4769.162708] serial8250.0: ttyS7 at MMIO 0x1002060 (irq = 641) is a 16550A
```

Q2: The I-8211W's GPS/GLONASS led always show "ON" or "OFF" status.

Ans: If the GPS led (green) of I-8211W always show the "ON" or "OFF" status, it means the I-8211W can't receive the GPS/GLONASS data.

For some complicated reasons:

- (1) The location can't receive the GPS/GLONASS signal.
- (2) No antenna inserted.
- (3) Wrong operator parameters.
- (4) Hardware data interface (/dev/ttyS*) configured incorrectly.

When this happens:

- (1) Connecting antenna correctly.
- (2) Moving the antenna to the location that can receive the GPS signal.
- (3) Checking the I-8211W device name that you used are correct or reinstall the Linux driver again (please refer to the "Q1: No I-8211W's Linux device name?")

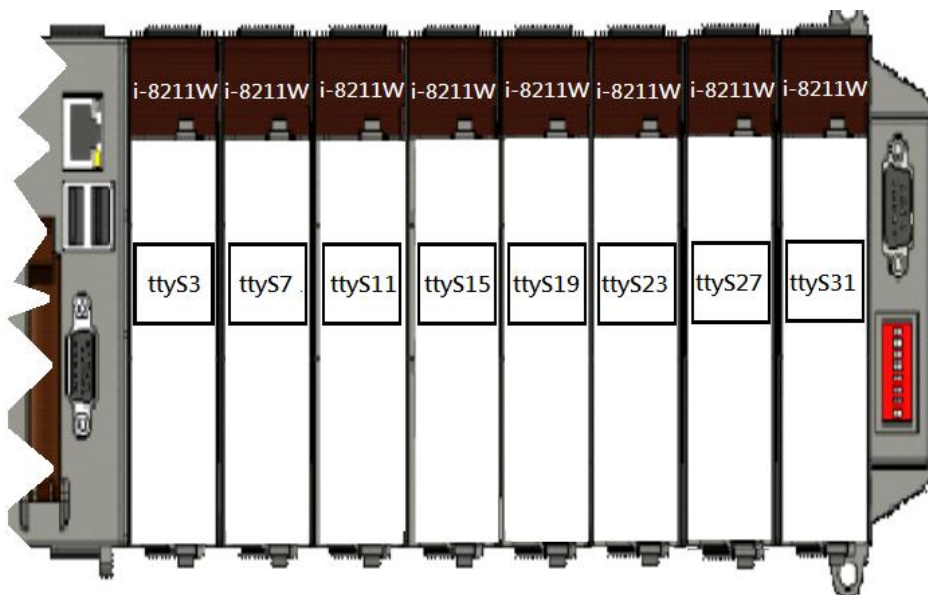
After you have done the above, if the error still exists, try to unplug the power and plug the power again.

B. I-8211W's Device Name in LinPAC

■ LX-8x31(support 1, 3, 7 slots):



■ LP-8x21(support 1,4,8 slots):

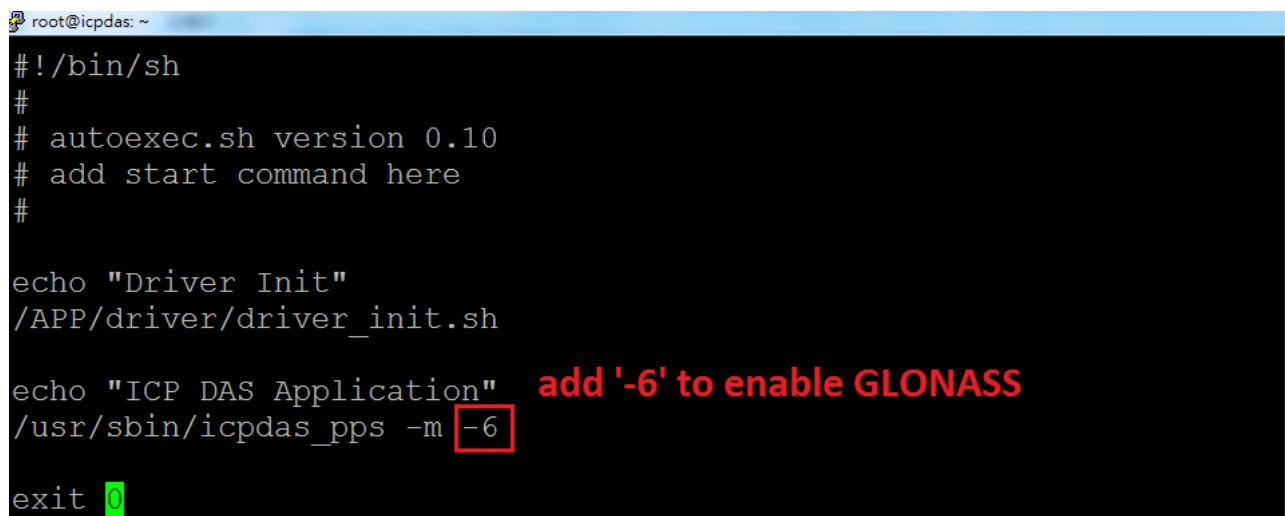


C. GLONASS Satellite Time Synchronization

The LinPAC built-in NTPD package uses GPS signal as default. You can change the setting to use GLONASS signal:

- (1) Connecting antenna correctly.
- (2) Reset the system configuration (add -6 to enable GLONASS)

```
#vi /APP/autoexec.sh
```



```
root@icpdas: ~  
#!/bin/sh  
#  
# autoexec.sh version 0.10  
# add start command here  
#  
echo "Driver Init"  
/APP/driver/driver_init.sh  
  
echo "ICP DAS Application" add '-6' to enable GLONASS  
/usr/sbin/icpdas_pps -m -6  
exit 0
```

- (3) Reboot the LinPAC

D. Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
V1.0.1	Apr 2022	
V1.0.0	Nov 2017	Initial issue