



PX9 Module Datasheet HW 1.0

PX9 Module

NOTICE

Nordian is committed to deliver state-of-the-art precise positioning products to our customers.

This is the manual for the PX9 Module, please read it carefully before using the device.

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PX9 Module

This manual is intended to present the general installation and application guide for PX9 Module usage. For detailed information on PX9 configuration, please refer to [Interface Manual](#). Visit www.nordian.com for more information.

NOTE: The characteristics and instructions presented in this manual are valid for all family products, unless otherwise specified.

Version Log

Date	Version	Changes
12/2024	v1.0	First release of the document

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1. Introduction

1.1. PX9 Module Overview

The PX9 Module by Nordian Inc. is a Plug-and-Play solution powered by ZEO technology, offering exceptional precision with PointPerfect PPP-RTK correction services. It supports L-band and integrates advanced ZED and NEO technologies for accurate and reliable positioning.

With its seamless integration and multiplatform compatibility, the PX9 Module is the perfect choice for agricultural machinery and precision-driven applications, delivering high accuracy with effortless setup.

1.2. Features

- Full GNSS compatibility (GPS, Glonass, BeiDou, Galileo, NavIC, QZSS);
- Receiver type:
 - GPS LIC/A L2C; GLO L1OF L2OF; GAL E1B/C E5b;
 - BDS B1I B2I; QZSS LIC/A L1S SBAS LIC/A L2C;
- Position update rate: up to 10Hz;
- Fast convergence time:
 - Cold start: 24s; Aided start: 2s; Reacquisition: 2s;
- High robustness against interference;
- Communications:
 - One (1) Serial UART COM port;

1.3. Usages

The module is designed for diverse applications that demand high-precision positioning. Its robust performance and Plug-and-Play capability make it ideal for:

Agricultural Machinery: Ensuring precise navigation, planting, spraying, and harvesting with minimal overlap or gaps.

- Autonomous Vehicles: Providing accurate geolocation for safe and efficient operation in both controlled and dynamic environments.
- Surveying and Mapping: Delivering reliable positional data for land measurement, asset management, and topographic surveys.
- Smart Farming Solutions: Enabling efficient resource management through real-time monitoring and georeferenced data collection.

With its advanced correction services and seamless integration, the PX9 Module empowers industries to achieve greater accuracy and productivity.

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2. Technical specifications

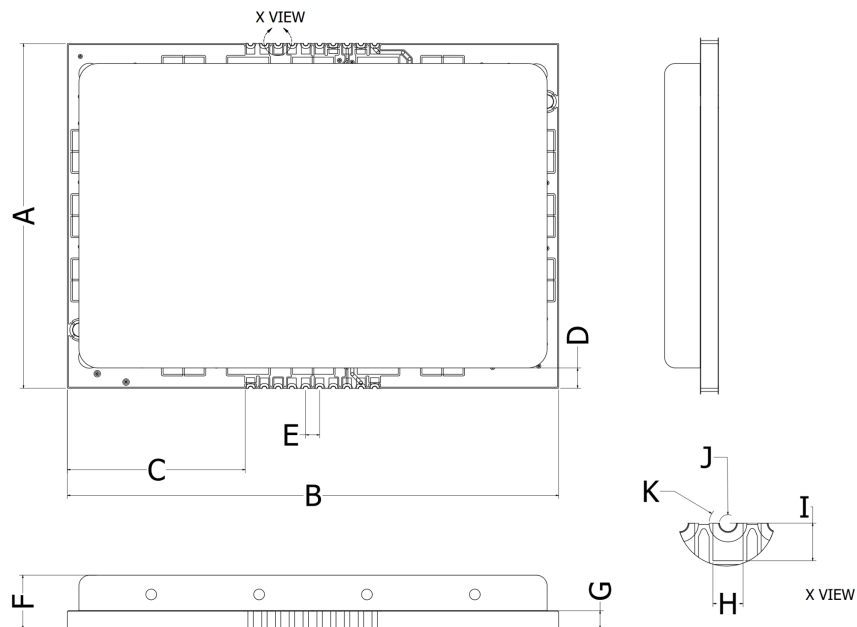
2.1. Mechanical

General mechanical characteristics and specifications are presented in this section.

Table 1: PX9 Mechanical Specifications

Mechanical Specifications	Min	Typical	Max
Board Size	32 mm x 45,4 mm	32,1 mm x 45,5 mm	32,2 mm x 45,6 mm
Board Thickness	1,5 mm	1,6 mm	1,7 mm
Weight	12 g		
Operating Temperature	-40°C to 85°C (-40°F to 185°F)		

Figure 1: PX9 Module Dimensions (millimeters)



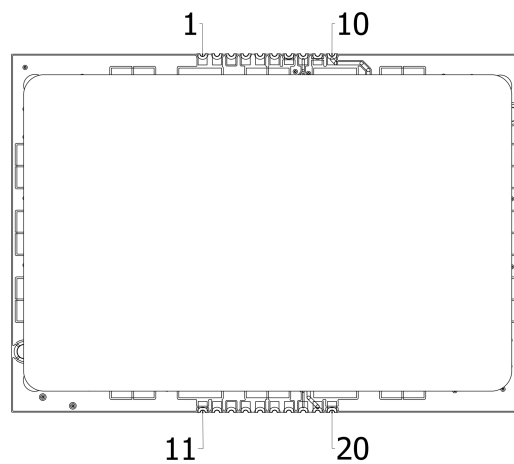
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Table 2: PX9 Module Dimensions (mm)

Symbol	Min [mm]	Typical [mm]	Max [mm]
A	32	32,1	32,2
B	45,4	45,5	45,6
C	16,4	16,5	16,6
D	1,8	1,9	1,7
E	1,2	1,3	1,4
F	4,9	5	5,1
G	1,6	1,7	1,8
H	0,7	0,8	0,9
I	0,9	1	1,1
J	0,2*	0,3*	0,4*
K	0,9*	1*	1,1*

**Radius value.*

Figure 2: PX9 Pinout Numeration



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Table 3: PX9 Module Pinout

Pin Number	Name	Direction	Description
1	VCC	-	Voltage supply
2	GND	-	Ground
3	RF_IN	Input	RF Input
4	GND	-	Ground
5	GNSS_ANT_DET	Input	Active antenna detect - default active high
6	GNSS_ANT_OFF	Output	External LNA disable - default active high
7	GNSS_ANT_SHORT_N	Input	Active antenna short detect - default active low
8	V_RF	Output	Voltage for external LNA
9	USART1_TX	Output	USART1_TX
10	USART1_RX	Input	USART1_RX
11	GND	-	Ground
12	VCC	-	Voltage supply
13	RESET_INPUT	Input	Reset
14	EXTINT	Input	External interrupt pin
15	TX_READY	Output	TX_Buffer full and ready for TX of data
16	TIMEPULSE	Output	Timepulse
17	GEOFENCE_STAT	Output	Geofence status
18	RTK_STAT	Output	RTK status: 0 = fixed Blinking = correction 1 = no correction
19	VCC	-	Voltage supply
20	GND	-	Ground

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2.2. Electrical

The device is guaranteed to work correctly within the specified voltage range. Any voltage outside the specified range may damage the device permanently.

Table 4: Electrical Requirements

Parameter	Min	Max
Power Supply Voltage	-0.5 V	+3.6 V
Voltage Ramp	20 us/V	8000 us/V
Current	350 mA	

2.3. Accuracy

Table 5: Mean Accuracy

	Standalone	UltraPoint
Horizontal Accuracy (RMS)*	1,5 m	0,02 - 0,04 m
Pass-to-Pass Accuracy	0,25 m	0,025 m

*Horizontal accuracy may vary based on satellites in view, clear sky and multipath.

2.4. Convergence Time and Acquisition

Table 6: PX9 Board Convergence Time and Acquisition*

Convergence Time	< 30 s
Acquisition - cold start	24 s
Acquisition - aided start	2 s
Reacquisition	2 s

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**Time may vary significantly based on satellites in view, clear sky and multipath.*

2.5. GNSS

PX9 Module presents protocols NMEA0183 and NMEA2000 output messages. Their configuration can be assessed at the Interface Manual.

Table 7: Receiver Supported Frequencies

Constellation	Frequency
GPS	L1C/A, L2C
GLO	L1OF, L2OF
GAL	E1B/C, E5B
BDS	B1I, B2I
QZSS	L1C/A, L1S
SBAS	L1C/A, L2C

3. Communication

PX9 Module has one serial communication option available via UART port.

3.1.1. UART

PX9 Module configuration is done exclusively through serial communication.

- Available baudrates (kbps): 9600, 19200, 38400, 57600, 115200, 230400, 460800;
- No parity bit / 1 stop bit / 8 data bits / no handshaking;
- For messages configuration please refer to the *Interface Manual*;

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4. Operation

4.1. NMEA0183

This protocol is compatible with serial communication. NMEA0183 available output messages are shown in Table 9.

Table 8: NMEA0183 Available Messages

Message	Description
GGA	Time, position and fix related data
GLL	Latitude, longitude, time of position fix and status
GSA	GPS DOP and active satellites
GSV	Satellites in view related data
RMC	Position, velocity and time
VTG	Course over ground and speed over ground related data

5. General

5.1. Default configurations

Table 9: Communications Default Configurations

Configuration	Default	Unit
\$COM SERIAL1 BAUDRATE _	115200	kbps

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Table 10: GNSS Receiver Default Configurations

Configuration	Default (command)	Default (value 1)	Unit
\$GNSS CONSTELLATIONS _ GPS	ENABLED	-	-
\$GNSS CONSTELLATIONS _ GALILEO	ENABLED	-	-
\$GNSS CONSTELLATIONS _ BEIDOU	ENABLED	-	-
\$GNSS CONSTELLATIONS _ GLONASS	ENABLED	-	-
\$GNSS ELEVATION SET _	-	10	deg.
\$GNSS TALKER_ID SET _	-	GN	-

Table 11: NMEA 0183 Default Configurations

	Configuration	Default Status (command)	Default Period (value 2)	Unit
COM1	\$NMEA0183 SERIAL1 _ GGA _	ENABLED	50	ms
	\$NMEA0183 SERIAL1 _ GLL _	DISABLED	50	ms
	\$NMEA0183 SERIAL1 _ GSA _	DISABLED	50	ms
	\$NMEA0183 SERIAL1 _ GSV _	DISABLED	50	ms
	\$NMEA0183 SERIAL1 _ RMC _	DISABLED	50	ms
	\$NMEA0183 SERIAL1 _ VTG _	ENABLED	50	ms

5.2. Warranty

The PX9 Module has a 12 months warranty period (starting from the date of shipment). Nordian Inc. will repair or replace - free of charge - any malfunctioning device within this warranty period if the device is proven defective.

Warranty is not applicable if PX9 has been subjected to: negligence, misuse, improper storage, application outside physical thresholds, improper application, physical damage, internal modifications or repair by non Nordian Inc. personnel.

It shall be noted that occasional errors or malfunctions with non-recurring characteristics and do not compromise the device's continuous operation do not fall within the scope of a warranty claim.

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5.3. Support

For specific support, doubts and warranty claim, contact Nordian Inc at:

URL: www.nordian.com

SAC: support@nordian.com

