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FURUNO GNSS Receiver Evaluation kit
Model: **VN-87x/ VN-88x**
Startup Manual

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FURUNO ELECTRIC CO., LTD.

www.furuno.com

IMPORTANT NOTICE

This product is intended to evaluate the functions and the performance of our GNSS receiver in an environment in which the temperature (25°C) and vibration (0 m/s^2). Also, any reliability test has not been conducted. Therefore, the functions and the performance are not guaranteed at user's operating condition or environment. In that case, please guarantee the functions and the performance of this product under user's own responsibility.

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The following satellite systems are operated and controlled by the authorities of each government.
- GPS (USA)
- GLONASS (Russia)
- Galileo (Europe)
- QZSS (Japan)
- SBAS (USA: WAAS, Europe: EGNOS, Japan: MSAS)

FURUNO is not liable for any degradation while using these satellite systems. FURUNO cannot guarantee specifications if any of these systems experience degradation. Based on these conditions the user is expected to be familiar with these systems and is fully responsible for their use.

Revision History

Version	Contents Change	Date
0	Initial Release	2019.04.09

Table of contents

1 Outline

The document describes the VN-87x (VN-870, VN-871 and VN-872)[*1] and VN-88x (VN-882)[*1] startup manual.

(*1) VN-87x and VN-88x are the evaluation kits built in FURUNO GNSS module (GN-87, GV-87, GT-87 and GT-88). The differences of these evaluation kits are as follow table.

Type	Module	Note
VN-870	GN-87 (GPS, GLONASS and Galileo Multi GNSS Module)	
VN-871	GV-87 (GPS & GLONASS Multi GNSS + Dead Reckoning Module)	Built in gyro sensor and accelerometer
VN-872	GT-87 (GPS & GLONASS Multi GNSS Timing Module)	
VN-882	GT-88 (GPS, GLONASS and Galileo Multi GNSS Timing Module)	

2 Component List

The component lists of these evaluation kits are as follows.

Type	Antenna	USB Cable	CAR I/F Cable	CD-ROM[*2]
VN-870	Multi GNSS antenna L1 band, G1 band	Attached	-	Attached
VN-871			Attached	
VN-872			-	
VN-882				

(*2) CD-ROM is as follows.
   - Communication software
   - Documentations

3 Overview
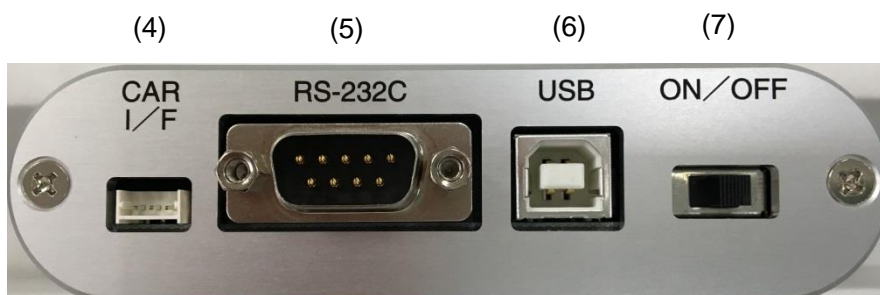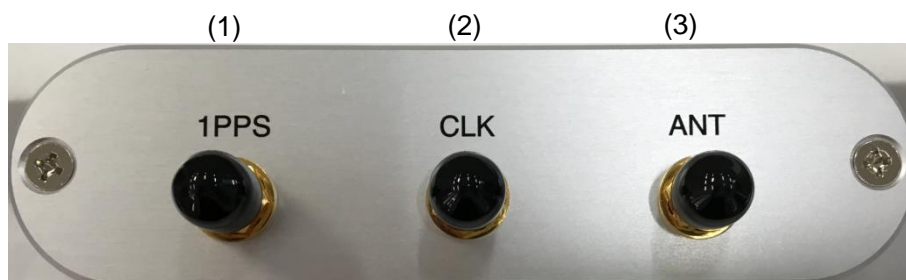
	Name	Type	Description
(1)	1PPS	SMA－J	PPS is output from the connector.
(2)	CLK(*3)	SMA－J	Clock is output from the connector.
(3)	ANT	SMA－J	Use the attached antenna.
(4)	CAR I/F(*4)(*5)	Molex 53254-0370 3 pin	This connector is for inputting speed pulse and reverse signal. Matching Housing: Molex 51065-0300 3 pin Matching Pin contact: 50212-8000
(5)	RS-232C (*6)	D-sub 9 pin	RS-232C Communication Supply power from USB
(6)	USB (*6)	Type B	USB port for power supply and communication between the evaluation kit and PC of customer side
(7)	ON OFF	Slide switch	Main power ON/OFF switch

(*3) VN-872 and VN-882 can only output clock.
(*4) VN-871 can only use this connector.
(*5) See the chapter 4 for the details.
(*6) Communicate from either RS-232C or USB

4   CAR I/F

This chapter describes about the pin assignment of CAR I/F connector and the electrical specifications of the speed pulse and the reverse signal. When the signals are distributed and used, it is necessary to be careful since a signal level decrease may occur by the influence of other circuits.
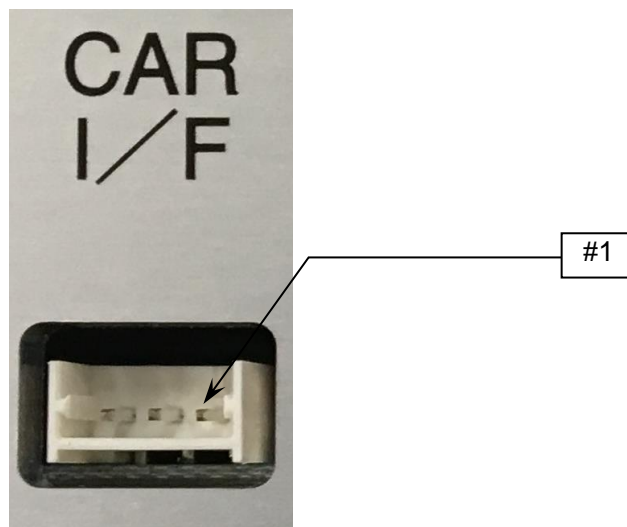
4.1   CAR I/F

Figure 4-1 CAR I/F

Table 4-1 Pin assignment of CAR I/F port

Pin #	Name	I/O	Description	Note
1	SPEED	I	Speed pulse	
2	BACK	I	Reverse signal input L:Forward H:Reverse	
3	GND	-	Ground	

4.2 Speed Pulse

When using the vehicle speed pulse, input the vehicle speed pulse suitable for the specifications in Table 4.2. When distributing signals and use them, be careful to use because signal levels may drop due to the influence of other circuits.

Table 4-2 Electric characteristics of Speed pulse

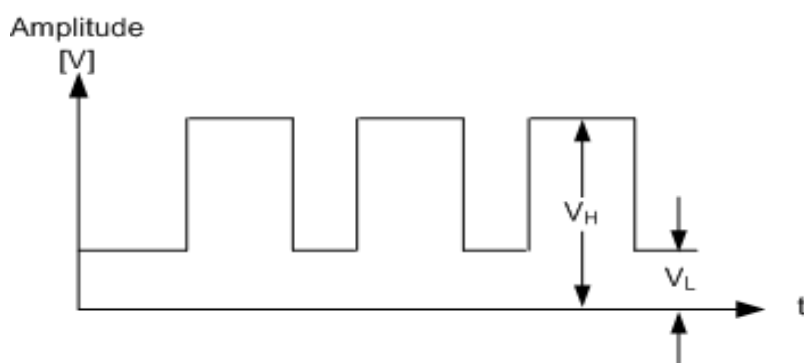| Item	Symbol	Unit	Min	Typ	Max	Condition
High level amplitude	V_H	V	4	-	13.5	
Low level amplitude	V_L	V	-0.3	-	1	Refer to Figure 4-2
Frequency	f	Hz	DC	-	2000	
Duty cycle	-	%	25	50	75	

Figure 4-2 Waveform of Speed pulse

4.3 Reverse Signal

When using a reverse signal, please input a reverse signal suitable for the contents described in Table 4.3.. The reverse signal is a signal that indicates the direction of forward and reverse movement of the vehicle. It is backward when high and forward when low.

Table 4-3 DC characteristics of Forward/ Reverse signal

Item	Symbol	Unit	Min	Typ	Max	Condition
High level amplitude	V_{bH}	V	4	-	13.5	
Low level amplitude	V_{bL}	V	-0.3	-	1	

5 How to Function

①   Install the GNSS Conductor into a PC.
②   Connect the attached antenna to the RF Connector.
③   Switch the evaluation kit off.
④   Connect the evaluation kit and the PC via USB-cable.
⑤   Confirm the connection status between the evaluation kit and PC from the device manager.
⑥   Install the device driver, if "Found New Hardware Wizard" appears.
⑦   Switch the evaluation kit on.
⑧   Operate the evaluation kit with the communication software (GNSS Conductor).

6 Communication Setting

The default communication setting is as follows.

Baud rate	9600 [bps] (VN-870) 115200 [bps] (VN-871) 38400 [bps] (VN-872/882)
COM Port	COM port number connecting the evaluation kit
Data length	8 bit
Parity	None
Stop bit	1 bit

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