

**GNSS**

**Multiband & Multiconstellation**



Model:  
**FFGR-1 & FFGR-5**

# Jamming & spoofing resistant GNSS Receiver

## GNSS

### Multiband & Multiconstellation



- ▶ FFGR-1 & FFGR-5 are high precision multi frequency multi constellation GNSS receivers.
- ▶ Concurrent reception of GPS (L1/L2), Galileo, Glonass and Beidou signals for FFGR-1
- ▶ Concurrent reception of GPS (L1/L5), Galileo, Glonass and Beidou signals for FFGR-5
- ▶ Default NMEA messages GGA, VTG, ZDA, DTM with 4800 bps (2 output channels) and 38400 bps (2 output channels) serial interfaces.

#### What is jamming and spoofing?

- **Jamming** is noise which blocks the signal
- **Spoofing** is when you receive the wrong position

## Benefits

- Operates during ground-based jamming
- Circular polarisation throughout the full bandwidth
- Superior multipath signal rejection
- Excellent signal-to-noise ratio
- Excellent out-of-band signal rejection
- Increased system accuracy
- Ideal for noisy RF environments

## Furuno Finland GNSS Receiver

Multiband & Multiconstellation Resistance against jamming & spoofing with antijamming antenna FFGR-1 and FFGR-5 GNSS receivers provide reliable positioning and robustness in jammed and spoofed environments together with an anti-jam antenna.

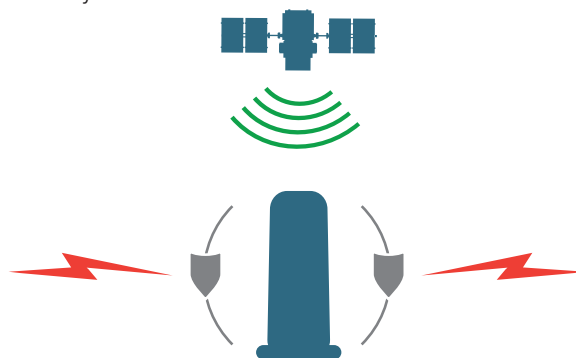
With a special multiband and multiconstellation antenna, functionalities improve remarkably and resistance against all interferences which exist at GNSS frequency bands.

For SOLAS vessels FFGR1/5 GNSS receivers can be used as a backup unit for wheelmarked marine GNSS receivers. Please check with the flag state local requirements.

FFGR-1 and FFGR-5 are both high performance and reliable GNSS receivers with 10 Hz output update rate, Both units are simple to install and integrate into all platforms.

## Tallysman Anti-Jamming antenna

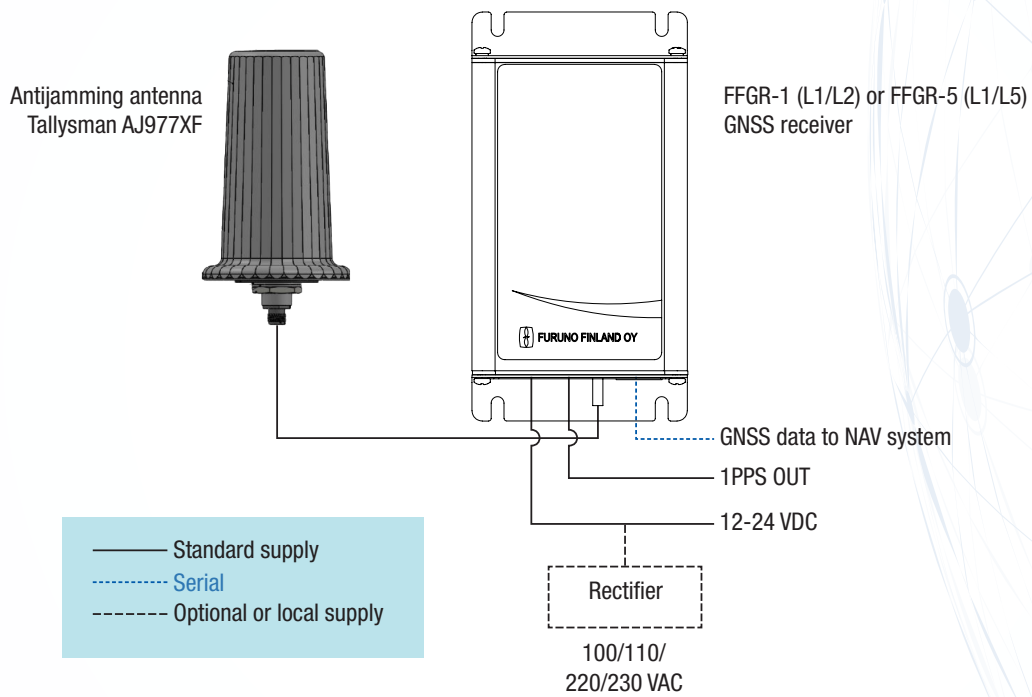
The Tallysman AJ977XF Anti Jam antenna is designed to mitigate interference and jamming signals broadcast from near ground-based transmitters. The radiation pattern of the Low Elevation Angle Nulling Antenna (LEANNA) provides 20 dB (Typical) wideband suppression for all GNSS band signals received at an elevation angle of 0° through to approximately 15°.



## The FFSP-100 Anti-jamming and Spoof Monitoring Device

As a parallel product, the FFSP-100 warns you when GNSS signal is jammed or spoofed. An alarm unit provides relay output which can be connected to vessel alarm management system or control external buzzer. When interference is detected it is important to react and defend rapidly and it is here that can counter the threat by switching to your FFGR-1 or 5.

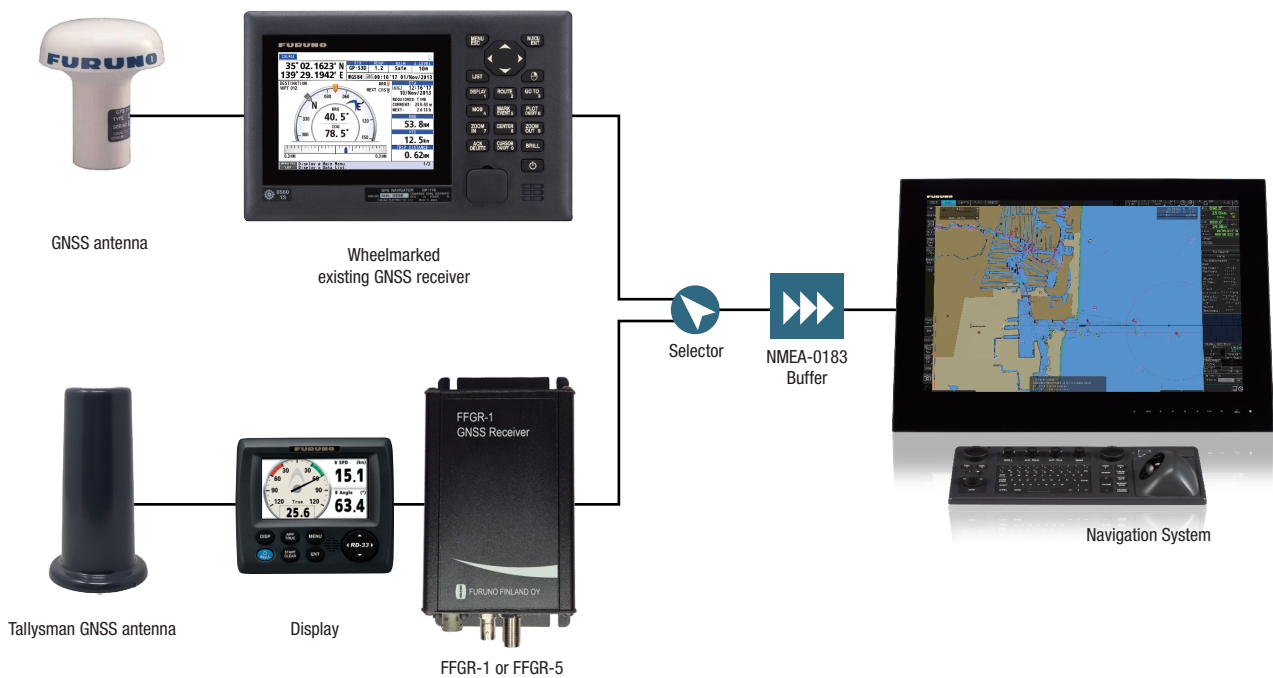
## Interconnection Diagram



## Sample installation

### Installation in SOLAS vessels

FFGR-1/5 GNSS receivers can be installed in SOLAS vessels as a backup unit. Please check the flag state local requirements.



## SPECIFICATIONS

### GENERAL

Parameter	Value	
Power IN	9 - 36 VDC / Max. 2W	
Size	Receiver	159 x 84 x 48 mm
	Antenna unit	Ø90mm x 180 mm
Weight	Receiver	410g
	Antenna unit	245g
GNSS horizontal pos. accuracy	1,5 m	
Sensitivity (tracking)	-167 dBm	
Sensitivity (nav)	-160 dBm	
GNSS acquisition Cold start	24 s	
GNSS acquisition Hot start	2s	

### CONNECTION

VDC	+9 - 36 / max. 2W.
-----	--------------------

### ENVIRONMENT

Temperature range	Receiver	-20 - +70 C
	Antenna unit	-40 °C to + 85 °C
IP Rating	Receiver	IP22
	Antenna unit	IP67
Relative humidity	93% or less at 40°C	
Degree of protection	IP22 at bulkhead mount, IP20 at floor	

### POWER SUPPLY

VDC	+9 - 36 / max. 2W.
-----	--------------------

### EQUIPMENT LIST

#### Standard

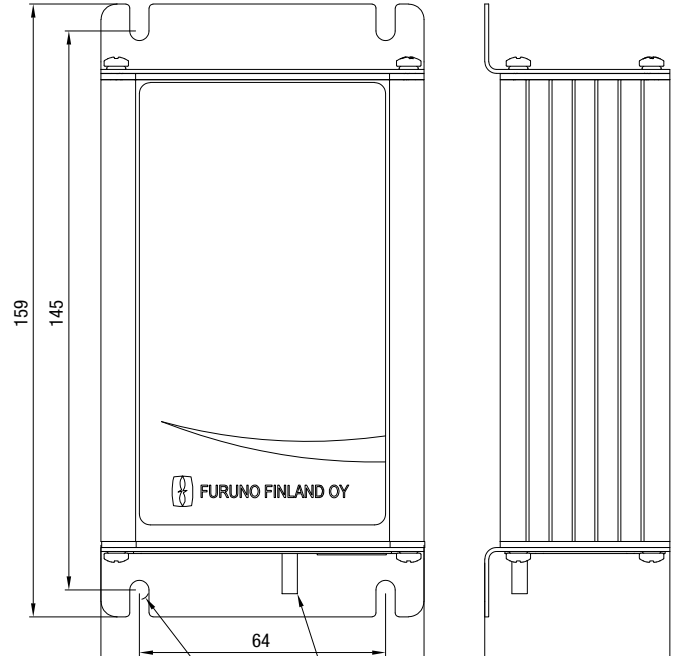
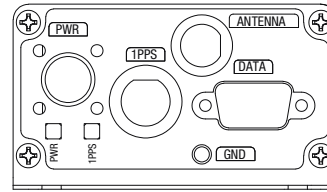
1	Transponder unit	FFGR-1	1 unit
2	Power cable	2 m	1 pc
3	Data cable	1 m	1 pc

#### Option

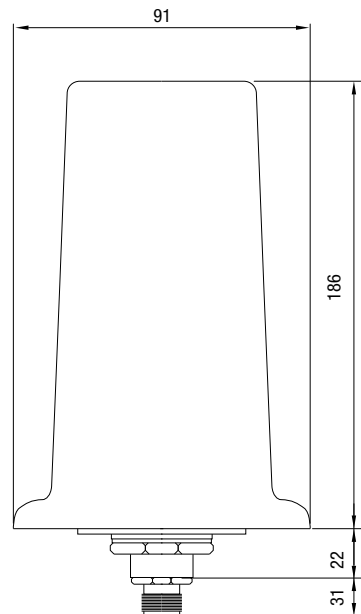
1	Antenna	AJ977XF	1 unit
---	---------	---------	--------

## MECHANICS

### Transponder unit



### Antenna unit



All brand and product names are registered trademarks, trademarks or service marks of their respective holders.  
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE