

NAVITRON SYSTEMS LTD

NT921 MKII SMALL VESSEL AUTOPILOT

Specifically designed for small professional vessel use (typically 11-20m LOA) the NT921 MKII Autopilot provides a powerful combination of steering system control and interface facilities based on an extremely intelligent Control Unit which is clearly marked and simple to operate.



Accordingly, the NT921 MKII offers Navitron steering expertise in a robust and compact package which is purpose designed to communicate as efficiently with the radar and GPS as with the steering gear due to the incorporation of special features which include: -

- **Dual Channel Heading Inputs**
Direct NMEA 0183 (GPS Compass etc) and Mag sensor coil acceptance.
- **Built in Radio Navigator Interface**
for automatic track steering between waypoints.
- **Three heading output types**
NMEA 0183, Step by Step and Furuno format for radar stabilisation etc.
- **Automatic stability adjustment**
compensates for rudder speed variations.

Model NT921 MKII (259 x 176 x 115mm)

Straightforward operation is a key feature of the NT921 MKII thus operator controls are kept to a minimum and are clearly identified by control panel markings which are red backlit for night viewing via a variable intensity illumination control.

A conventionally marked Course Setter provides simple course selection backed up by dedicated LCD displays of heading and rudder angle information which, combined with other indicators, provide permanent visual confirmation of Autopilot status and performance.

When connected to receive Cross Track Error (CTE) or Heading Steer Command (HSC) data transmitted from a proprietary source (GPS, Track Plotter System etc) the RadioNav section may be engaged by simple switch operation (OFF/LO/HI) to 'track' steer between predetermined waypoints stored in the GPS / Trackplotter.

Suitable for console or bracket mounting, the NT921 MKII Control Unit is intended for wheelhouse location and is immediately compatible with GPS compasses transmitting NMEA 0183 heading data in addition to being supplied complete with Heading Sensor Coil and Rudder Reference Unit for installation to solenoid hydraulic systems.

All Navitron Autopilot Systems are covered by comprehensive warranty terms and incorporate the following features as standard: -

- Full P.I.D. Intelligence.
- Servo driven Heading Repeater (Standby mode).
- Dual Course Setting and Steer on Lock on facility.
- Full Automatic Permanent Helm.
- Bar graph and digital Rudder Angle Indication.
- Operator variable control panel illumination.
- 11-40Vdc Power Supply compatibility.
- Solid State Output stages. (11-40Vdc / 5A max.)
- Full range menu driven installation adjustments.

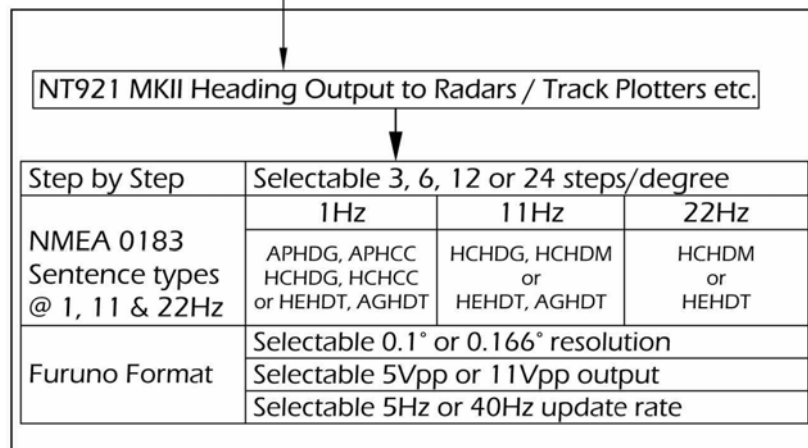
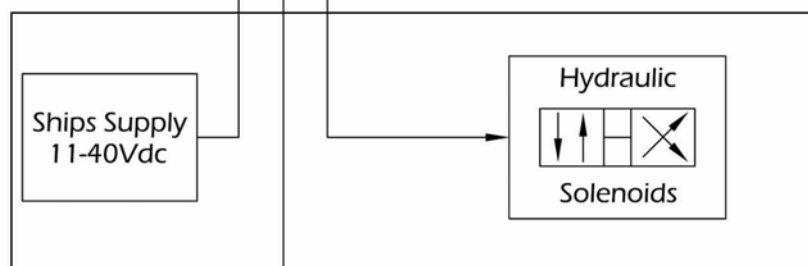
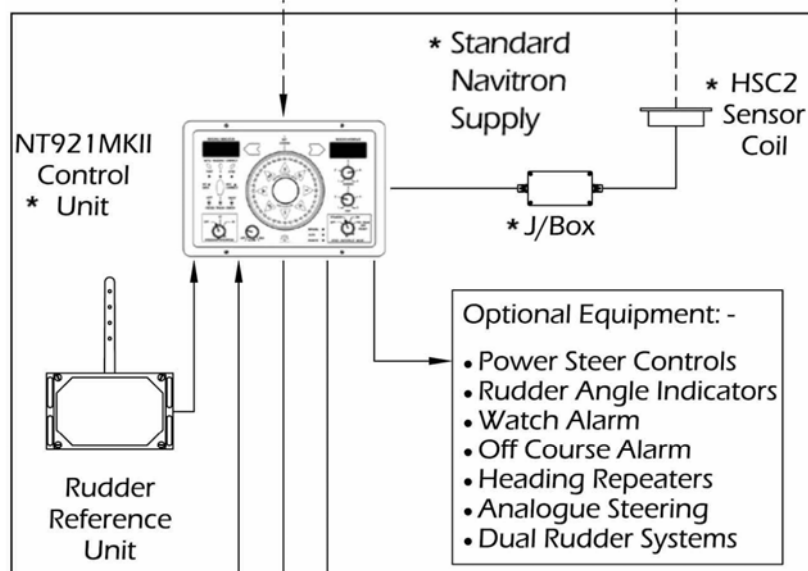
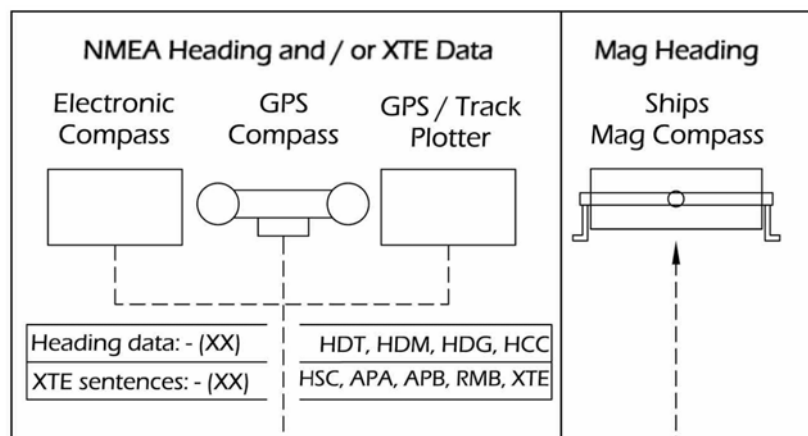


NAVITRON SYSTEMS LTD

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NT921 MKII

Outline Specifications



Supply Voltage 11-40Vdc		
Power Consumption	12v	24v
Standby	3.0w	3.6w
On	3.3w	3.9w
Illumination (max)	5.8w	7.0w

Solenoid Switch Ratings	
Voltage	11-40 Vdc
Current	5A (max)
Switchline Polarity	Installation Selectable
Switch Type	Solid State

Operator Controls	
Yaw	
Rudder	
Autopilot Mode Switch	
RadioNav Mode Switch	
Illumination	Red Backlight

Panel Displays	
Rudder Angle	2 Digit LCD + LCD Bar
Heading Indicator	Servo Card In Standby Mode and 3 Digit LCD Display
XTE Indicator	LED
Autopilot Mode	LED Indication of Standby, Auto & Remote
RadioNav Mode	LED Indication of XTE & Auto Heading Correct
XTE	3 Digit LCD Display
Correction Angle	2 Digit LCD Display
(via automatic Heading display updates at 15 second intervals)	

Panel Alarms	
Remote	LED + Audible
Data Input Fail (XTE)	LED + Audible
Max Correction (XTE)	LED + Audible

Mechanical	NT921 MKII Control Unit
Width	259mm
Height	176mm
Depth behind bezel	115mm
Weight	3.9Kg

NAVITRON SYSTEMS LTD

NT951G SMALL SHIP AUTOPILOT

Fully Type Approved
Notified Body 0191/05



ISO 11674 & IMO A342 (IX) as
amended by MSC 64/67 Annex 3

Purpose designed by Navitron Systems Limited for professional use on Magnetic and/or Gyro based commercial vessels of all types to approximately 2000 gross registered tonnes, the Navitron NT951G is a powerfully equipped and technologically advanced Autopilot which remains simple to operate.



- **Dual Mag Inputs:-**
Sensor Coil and/or NMEA.
- **Dual Gyro Inputs:-**
1:1 Synchro and/or NMEA.
- **Programmable ROT:-**
(Degress/Sec).
- **Built in Off Course Alarm.**
- **Automatic Stability:-**
Compensates for Rudder speed variations.
- **Heading / VDR Out:-**
NMEA, Step by Step and Furuno Heading.
\$HTD & \$RSA VDR

Model NT951G Dims 296mm x 175mm x 110mm (depth)

Equally at home in new build and retrofit applications over an exceptionally wide range (fishing vessels, tugs, dredgers, ferries, coasters, survey and support units etc.) the NT951G Autopilot offers traditional Navitron performance and reliability reinforced by full type approvals to latest IMO and ISO standards.

Comprehensively intelligent, standard features of the NT951G Control Unit include Dual Mag and Gyro Heading Inputs, Serial data outputs for Radar Stabilisation/Nav Computer/VDR use etc, fully Automatic Stability Compensation to accommodate Two Speed Rudder Systems and programmable Rate Of Turn.

Simple to operate via a traditional and clearly marked rotary Course Setter, the NT951G is immediately compatible with existing Navitron equipment including Watch Alarms, Heading Repeaters, Rudder Angle Indicators and Power Steer Controls.

- Full P.I.D Intelligence.
- Servo Drive Heading Repeater (Standby mode).
- Auto Trim (Automatic Permanent Helm).
- Digital Heading and ROT data display.
- Bargraph and digital Rudder Angle display.
- Operator variable control panel illumination.
- 11 - 40Vdc Power Supply compatible.
- Solid State Output stages (11 - 40 Vdc / 5A max.)
- Fully programmable installation parameters.



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NT951G

Outline Specifications

All Navitron Autopilot systems are covered by comprehensive warranty terms and are supplied standard complete with Mag Heading Sensor Coil, Rudder Reference Unit and Control Unit incorporating 11 - 40Vdc 5A rated solid state switches for the control of solenoid hydraulic steering systems. Various optional equipment includes dual solenoid and dual channel analogue outputs (-10V to +10V) for independent dual rudder and analogue steering system control respectively.

NT951G Autopilot Input/Output Specifications

Inputs: -

Supply Voltage Range	11-40Vdc
Power Consumption	2.5W (@24Vdc)
Illumination Max	8.1W (@24Vdc)

Mag Heading Input Ports	
Navitron Heading Sensor Coil mounted above/below Existing Mag Compass	Coil type HSC1 or HSC2
Resolution	0.25°
NMEA 0183 Heading Sentence from Electronic Compass (Priority as shown)	XX HDM XX HDG XX HCC XX HDT
Resolution	0.1°

Gyro Heading Input Ports	
Isolated 1:1 Synchro available in Gyro	400Hz Excitation from Autopilot
Resolution	0.25°
NMEA 0183 Heading Sentence from Gyro (Priority as shown)	XX HDT XX HDM XX HDG XX HCC
Resolution	0.1°

Follow Up Rate (Minimum)	
All Heading Input types	30° / Sec

Operator Controls	
Yaw	Illumination
Rudder	Mode Switch
Counter Rudder	Off Course Alarm
Rudder Limit	Gyro/Mag Selector
Turn Rate	Auto Trim

Operating Temperature Range	-20 to +60 °C
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Compass Safe Distance	0.6m
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Mechanical Data	
Width	297mm
Height	176mm
Depth – behind bezel	110mm
Weight	3.3kg

Outputs: -

NMEA 0183 (Isolated RS422)			
Update Rate	Selectable @ 1Hz, 10Hz or 20Hz		
Sentence types (Mag/Gyro v Update Rate)	Hz	Mag	Gyro
	1	HCHDM HCHDG APHDM APHDG	HEHDT AGHDT
	10	HCHDM (5Hz) HCHDG	HEHDT ADHDT (5Hz)
	20	HCHDM	HEHDT
Resolution	0.1°		
Autopilot Status Data	1	APRSA APHTD	AGRSA AGHTD

Furuno Format	
Update Rate	Selectable @ 5Hz or 40Hz
Resolution	Selectable @ 0.166° or 0.1°
Signal Amplitude	Selectable @ 5Vdc or 12Vdc

Step by Step	
Steps per Degree	Selectable @ 3, 6, 12 or 24
Signal Amplitude	5Vdc

Navitron Serial Data	
To Navitron Digital Repeaters Etc	

Solenoid Switching	
Polarity	Selectable Common +VE/-VE
Max Rating	5A @ 40Vdc

Panel Alarms	
Power Fail	Off Course
Steering System Fail	Rudder Limit
Heading Input Fail	Turn Rate Limit
Alarm Test facility	Remote Engaged

NAVITRON SYSTEMS LTD

NT991G MK2 GYRO/MAG AUTOPILOT

Fully Type Approved
Notified Body 0191 / 05



ISO 11674 & IMO A342 (IX) as
amended by MSC 64/67 Annex 3

Designed and developed by Navitron Systems Ltd for commercially operated ocean going vessels of all types from typically 1800 gross registered tonnes upwards, the Navitron NT991G MK2 Autopilot is fully type approved to latest IMO and ISO standards.



Model NT991G MK2

Dims 296mm x 175mm x 110mm (depth)

- **Dual Mag Inputs :** - Sensor Coil and/or NMEA.
- **Dual Gyro Inputs :** - 1:1 Synchro and/or NMEA.
- **Track Steer :** - Multi waypoint steering via Plotter/ECDIS data.
- **Programmable ROT :** - (Degrees/Min).
- **Built in RadioNav and Off Course Alarm.**
- **Automatic Stability :** - Compensates for Rudder speed variations.
- **Heading / VDR out :** - NMEA, Step by Step and Furuno Heading. \$HTD & \$RSA VDR

Available in various system configurations the NT991G MK2 can be supplied for immediate compatibility with most gyro compass and steering system types rendering it an extremely cost effective solution for new build and retrofit installations. Additionally, the NT991G MK2 Autopilot features automatic Waypoint Steering based on "Heading to Steer" serial data received from proprietary Track Plotters/ECDIS systems etc. (\$HTC, \$HSC, \$APB sentences).

Comprehensively intelligent, other standard features include Dual Mag and Gyro Heading Inputs, serial data outputs for Radar Stabilisation / Nav Computer / VDR use etc, fully Automatic Stability Compensation to accommodate Two Speed Rudder Systems and programmable Rate of Turn in degrees per minute.

Simple to operate via a traditional and clearly marked rotary Course Setter, the NT991G MK2 is immediately compatible with existing Navitron equipment including Watch Alarms, Heading Repeaters, Rudder Angle Indicators and Power Steer Controls.

- Full P.I.D Intelligence.
- Servo Drive Heading Repeater (Standby mode).
- AutoTrim (Automatic Permanent Helm).
- Digital Heading and ROT data display.
- Bargraph and digital Rudder Angle display.
- Operator variable control panel illumination.
- 11 - 40Vdc Power Supply compatible.
- Solid State Output stages (11 – 40 Vdc / 5A max.)
- Fully programmable installation parameters.



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NT991G MK2

Outline Specifications

All Navitron Autopilot systems are covered by comprehensive warranty terms and are supplied standard complete with Mag Heading Sensor Coil, Rudder Reference Unit and Control Unit incorporating 11 – 40Vdc 5A rated solid state switches for the control of solenoid hydraulic steering systems. Various optional equipment includes dual solenoid and dual channel analogue outputs (-10V to +10V) for independent dual rudder and analogue steering system control respectively.

NT991G MK2 Autopilot Input/Output Specifications

Inputs: -

Supply Voltage Range	11-40Vdc
Power Consumption	2.5W (@24Vdc)
Illumination Max	8.1W (@24Vdc)

Mag Heading Input Ports

Navitron Heading Sensor Coil mounted above/below Existing Mag Compass	Coil type HSC1 or HSC2
Resolution	0.25°
NMEA 0183 Heading Sentence from Electronic Compass (Priority as shown)	XX HDM XX HDG XX HCC XX HDT
Resolution	0.1°

Gyro Heading Input Ports

Isolated 1:1 Synchro available in Gyro	400Hz Excitation from Autopilot
Resolution	0.25°
NMEA 0183 Heading Sentence from Gyro (Priority as shown)	XX HDT XX HDM XX HDG XX HCC
Resolution	0.1°

Track Data

XXHTC, XXHSC, XXAPB

Follow Up Rate (Minimum)

All Heading Input types	30° / Sec
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Operator Controls

Yaw	Illumination
Rudder	Mode Switch
Counter Rudder	Off Course Alarm
Rudder Limit	Gyro/Mag Selector
Turn Rate	Auto Trim

Operating Temp Range	-20 to +60 °C
Compass Safe Distance	0.6m

Mechanical Data

Width	297mm
Height	176mm
Depth – behind bezel	110mm
Weight	3.3Kg

Outputs: -

NMEA 0183 (Isolated RS422)

Update Rate	Selectable @ 1Hz, 10Hz or 20Hz		
Heading Sentence types (Mag/Gyro v Update Rate)	Hz	Mag	Gyro
1	1	HCHDM HCHDG APHDM APHDG	HEHDT AGHDT
10	10	HCHDM (5Hz) HCHDG	HEHDT AGHDT (5 Hz)
20	20	HCHDM	HEHDT
Resolution	0.1°		
Autopilot Status Data	1	APRSA APHTD	AGRSA AGHTD

Furuno Format

Update Rate	Selectable @ 5Hz or 40Hz
Resolution	Selectable @ 0.166° or 0.1°
Signal Amplitude	Selectable @ 5Vdc or 12Vdc

Step by Step

Steps per Degree	Selectable @ 3, 6, 12 or 24
Signal Amplitude	5Vdc

Navitron Serial Data

To Navitron Digital Repeaters Etc

Solenoid Switching

Polarity	Selectable Common +VE/-VE
Max Rating	5A @ 40Vdc

Panel Alarms

Power fail	Off Course
Steering System Fail	Rudder Limit
Heading Input Fail	Turn Rate Limit
Alarm Test facility	Remote Engaged