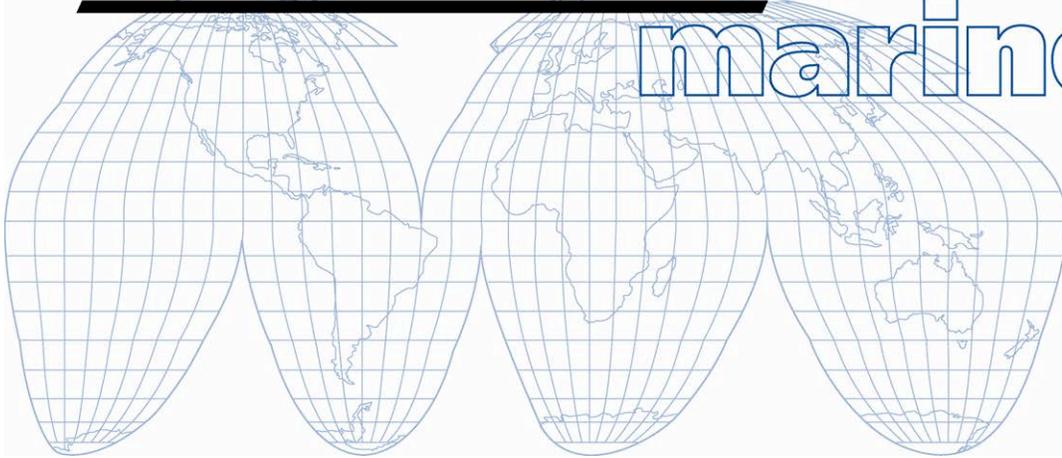


# ComNav<sup>®</sup>

# marine ltd



## **P4 Remotes** *for P4 Autopilot Systems*

### **Installation & Operation Manual**

TS4 Full Follow Up Remote



NF4 Non-Follow up Joystick Remote



ISO 9001



COMPLIES WITH  
CE REGULATIONS



## Welcome

Congratulations on your purchase of ComNav Marine's TS4/NF4 Remote for P Series Autopilot Systems! At ComNav, we are proud of our prominence as a leader in the design and manufacture of marine autopilot systems. Our dedication to performance and reliability will ensure your satisfaction with the Remotes.

ComNav Marine Ltd.

## Warranty Notice

The Warranty for the Remotes is contained within the Warranty of your P4 Autopilot System. Prior to the installation and/or operation of the Remotes, ensure that you read, understand, and accept the conditions of the P Series Autopilot System warranties as detailed in the **Warranty Information** of that system,

## Operator's Warning

The P4 Autopilot System (with or without the Remotes) will steer your vessel. However, it is only an aid to navigation. Its performance can be affected by many factors including equipment failure, environmental conditions, and improper handling or use. An autopilot system does not reduce your responsibility for the control of the vessel when underway. You must always be in a position to monitor the course, supervise the autopilot, and resume manual control if the need to do so arises.

Whenever underway, your vessel must be under the control of a qualified and alert person.

## General Notice

This document, ComNav part number 29010102 ~~Version 0 Revision 1~~,  is the approved Installation and Operation Manual for use with TS4/NF4 Remotes for P4 Autopilot Systems. Where versions of this manual exist in other languages, the English version shall be considered authoritative.

### Document History

Revision	Date	Description
1R0	10 August, 2018	- first release



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# Introduction



## Overview of the TS4 Remote

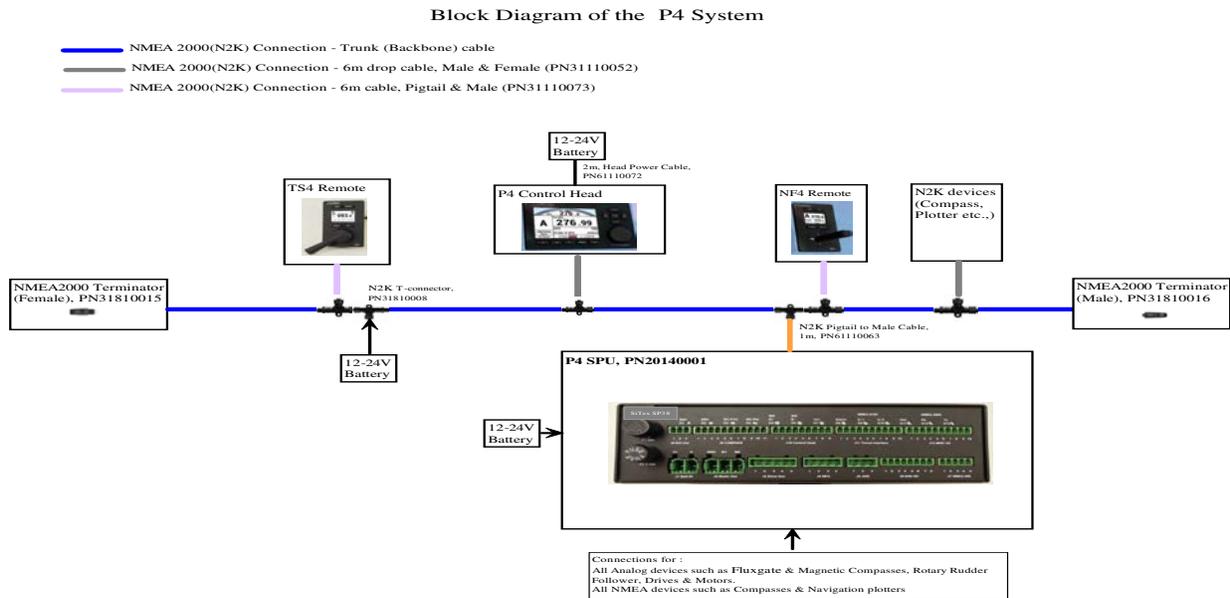
The TS4 Remote is designed to work with ComNav' s P4 Autopilot System.

The TS4 Remote allows the vessel operator to control the P4 Autopilot's steering functions from a workstation, flying bridge, on the side or stern decks, or any other remote location on the vessel.

Features included in the TS4 Remote:

- Backlit graphical LCD display shows important system information, with easy selection of display brightness and day-night display mode.
- Selection of **STANDBY**, **AUTO**, and **NAV** modes are done using the Mode button (also supports **WORK** mode when in **AUTO** mode)
- Handheld operation, with built-in slots for "hang-up posts" on the back side
- Fully watertight case, made of high-impact material with excellent resistance to most chemicals, a cable strain relief and button/switch & Tiller knob seals
- NMEA 2000 installation

The block diagram below shows how the TS4 Remote is used in a P4 system:



**Figure 1 – P Series Autopilot System (partial diagram)**

## About this Manual

This manual provides essential information for the safe and reliable operation of the ComNav Remotes for P4 Autopilot Systems. You are urged to read this manual in its entirety before you use your autopilot for the first time, and to keep it handy until you become thoroughly familiar with the operation of your autopilot.

A number of steps in this manual require use of the setup menus and operational displays on the Control Head of the P Series Autopilot System. Please refer to your P Series *Installation and Operation manual* for instructions.

## Typefaces, Common Phrases & Terms

Throughout this manual, you will see a number of different typefaces used, and several commonly-used words & phrases with very specific meanings, to describe concepts & actions that are fundamental to the operation of the autopilot. Please take a moment to become familiar with the following items:

### Modes of Operation

Specific “modes of operation” are placed in bold uppercase lettering.

Example: **POWER STEER** mode.

### Button

TS4 Remote buttons and controls are placed in uppercase lettering.

Example: the **MODE** button.

### System Component

Specific System Components are capitalized.

Example: The **Control Head**.

### LCD Display

Text that appears in the LCD display is in quotation marks.

Example: “Waypoint Arrival”

### press or momentary press

Press and release the indicated button.

### double-press

Press and release the indicated button twice in rapid succession.

Although this sounds a little complicated, it is actually very easy to do – it is very similar to the “double-click” action on a button of a Personal Computer Mouse.

### press and hold

Press and hold the indicated button for a minimum of one-half of a second.

This time delay is purposely programmed into the system’s response to some buttons, to prevent casual or accidental activation of the button function. For example, pressing the **MODE** switch can, depending on system configuration, drastically alter the steering performance of the P Series Autopilot System.

### maintain

Hold the indicated button for as long as required to achieve a given result.

Example: To avoid obstacle, either take control manually or move the Joystick to the right or left and hold to change course and maintain it in that position until the vessel has dodged clear of the obstacle in its path.

## Manual Format

This manual has been formatted to be printed on both sides of the pages of the manual, and on standard Letter-sized paper (8.5" x 11"). If you have obtained this manual as a soft-copy, please note that it is in Adobe® Portable Document Format ("pdf"), and so may be viewed & printed with Adobe Reader®, or compatible pdf-format viewers.

When printing this manual with Reader, you should select "duplex printing" (or the equivalent term used by your printer's software driver), in order to print it double-sided on the paper. If your printer does not have built-in duplexing capability, you can still print this manual double-sided by following the instructions that came with your printer for doing "hand duplexing".



# Installation



## Installation

### Technical Requirements

The following are the basic technical requirements that should be met before installation of the TS4 Remote on your vessel.

*For information regarding the installation of the complete P4 Autopilot System, consult your P4 Installation & Operation Manual.*

### Caution Warning

*Please refer to the **Warranty Information** document that accompanies your P Series manual before proceeding with installation of the Remotes.*

## **Hazard warning!**

### **CAUTION!**

*Extreme caution is advised when using tools powered by alternating current (AC) from main AC supply circuits, regardless of whether the supply circuits are “indoor”, “outdoor”, “marine” or “industrial” rated. Water, especially sea water, is an **EXCELLENT** conductor of electricity, and can complete a path to AC Ground through a person’s body, causing injury or death, if a tool malfunctions or short-circuits.*

**⇒ Battery powered tools are STRONGLY recommended**



*If AC tools are used, they **MUST** be plugged into a circuit that is adequately protected against Ground Faults and other safety hazards, in accordance with local electrical codes.*

### Electrical Connections

A P4 remote (TS4 or NF4) comes with a 6-meter cable with a male 5-pin micro NMEA 2000 connector. Each unit is also shipped with a T-connector. Insert the T connector to a convenient location in your system, taking into the consideration to make a balanced installation for the whole system.

### Network Connection in a P4 system

An out-of-box P4 remote (TS4 or NF4) will automatically connect to a P4 SPU it first sees after power up. If you have a P4SPU, and you have never made an installation change to the P4 SPU from its factory default, once you power up your P4 remote, the P4 remote is ready to take command and steer your boat as described in the Operation section.

P4 remote is an accessory. It can only be used to operate the autopilot when the autopilot has started up and in normal operation modes. Normal operation modes for P4 SPU are Standby mode, Auto mode, Power Steer mode and Nav mode.

In normal operation mode, a P4 remote displays a screen like those in Figure 3.

If the SPU is not in a normal operation mode, a P4 remote will wait in start up mode, and show a screen like below:



**Figure 3 – TS4 / NF4 LCD Screen**

After the first power up in a P4 system (with a P4 SPU present), your P4 remote however is fixed to that particular SPU, and will not automatically change.

If for any reason you have changed the network installation of your P4 SPU, or you have replaced a new P4 SPU, you must adjust your P4 remote to make another link again. You know your P4 Remote is waiting for an SPU when after power up, it stays in the start-up screen (figure below):



**Figure 2 – TS4 / NF4 LCD Screen**

Refer to Operating Menu in page 25 for how to link the P4 Remote to an SPU again.

# Operation



## User Interface

P4 Autopilot Remotes have 4 buttons and a tiller or Joystick as the user input interface. The table below shows their functions in under different operation mode.

Button	Button Action	Operation mode	Condition	Function Result
CMD	Short Press	Normal operation modes	REMOTE as a repeater	Request to P4 SPU for taking command
	Double click	Start up mode and Normal operation modes	REMOTE as a repeater	Initiate the configuration menu
	Click	Configuration menu	Root menu	Select current item for editing
	Click	Configuration menu	Editing a menu item	Save the item value and go back to the menu list
MODE	Click	Mode selection menu	REMOTE is in command	Immediately request a mode change without waiting for time out
	Short press	Normal operation modes	REMOTE is in command	Initiate Mode selection menu
	Click	Mode selection menu	REMOTE is in command	Move to the next available mode
	Click	Configuration menu	Root menu	Move to the previous menu line
STBY	Click	Configuration menu	Editing a menu item	Increase the item value
	Short press	Normal operation modes	REMOTE is in command	Request to P4 SPU for switching to Standby mode
	Click	Configuration menu	Root menu	Cancel / close the menu
	Click	Configuration menu	Editing a menu item	Cancel editing and go back to the menu root
Lite (*)	Click	Mode selection menu	REMOTE is in command	Cancel the selected mode (cancel the timer) and stay in the current mode
	Click	Normal operation modes	No menu operation	Increase the LCD brightness 1 step. After maximum brightness, it returns to the lowest.
	Long press	Normal operation modes	No menu operation	Toggle between day and night mode
	Click	Configuration menu	Root menu	Move to the next menu line
	Click	Configuration menu	Editing a menu item	Decrease the value of the menu item

Note: Required that the **Config Menu can ONLY be opened in repeater / remote state.**

## Display Controls

You can make adjustments to the display brightness through the button.

### **BRIGHTNESS**

This refers to the brightness of the LCD backlighting. There are 8 levels available; a level of “1” is the minimum level of backlight, while 8 is the brightest.

### **Day/Night mode**

The high brightness may be a safety hazard in night time. These Remotes have a night mode for display where the information is displayed in Red and black. The minimum brightness is also significantly lower than in day time.

## Normal Usage

### Taking Command

In order to use the Remote, it is first necessary to “take command” away from the control head unit in the system.

Check to see that the Station Lock setting on the Control Head is set to “Unlock”. Then press and hold CMD button on the Remote until the letter “R” in the upper right of the display disappears. The Control Head will now have a large letter “R” in the middle left portion of the display, indicating that it is in “Repeater” mode.

**Important!** Always remember that the Remote is “in command” unless a large letter “R” is shown in the upper right of the display.

To take command away from the TS4 Remote, go back to the Control Head (or another Remote) and press the Command (CMD) button on the Head (or Remote). The “R” in the middle left hand of the Control Head’s display will disappear and you will then have command of the Autopilot at that Control Head (or Remote). An “R” will appear in the upper right of the Remote display, which indicates that it is in “Repeater” mode.

## Modes of Operation



TS4 Full Follow Up Remote



NF4 Non-Follow up Remote

Figure 3 – Mode Buttons

## STANDBY (STBY) Mode

If the Remote is In-Command, press STDB button to return to **STANDBY** Mode. No controls on the Remote will have any effect on the vessel's rudder.

## Mode selection menu

If the Remote is In-command, press Mode button will bring up a list of all available modes (except Standby mode). A mark is in front of the item to indicate it as the next pick.

Press Mode again when the mode list is on will move the mark to the next line.

Press CMD, Remote will initiate a mode change immediately.

Press STBY will cancel the selection and the list will disappear. No further action will be taken

The menu selection list will time out in about 2 seconds. After 2 seconds expiration, Remote will request a mode change to SPU.

The following table shows the available mode list in different modes.

Current mode	Available modes	Note
Standby	Power steer, Auto, Nav	
Power Steer	Auto, [Auto-recall], Nav	Auto-recall only when recall course is available
Auto	Work mode, Power steer, Nav	
Auto – work mode	Auto, power steer, nav	
Nav	Power steer, auto	

## TILLER Mode

When your P4 remote is model TS4, the Power steer mode of P4 system becomes TILLER mode. The autopilot will move the rudder to follow the position of TS4'S tiller.

## Non- Follow Up Mode

When your P4 remote is model NF4, the power steer mode of P4 system becomes a Jog switch. Moving the joystick to the right will move the rudder to Starboard and moving the joystick to left will move the rudder to port side as long as the joystick handle is held in the right or left position.

## AUTO Mode

If the TS4 or NF4 Remote is In-Command and the Remote is in "AUTO" mode, the Autopilot will lock on to the present course and maintain it. How to change the course depends on what type of P4 remote you have.

### ***Change Course in TS4***

In Auto mode, the TILLER Lever is used to change the steering course. Move the tiller to starboard and then move it back to the center will increase the course by 1 degree. Likewise if you do that to port side you will decrease the course by 1 degree. If you hold the tiller on starboard or port side without moving back, you will see course changes 1 degree for every second in the first 10 seconds. If you hold the tiller longer than 10 second, the course will change in a 10-degree increment.

## Change Course in NF4

When NF4 Remote is in command and in AUTO mode, moving the Joystick handle UP will switch the mode to AUTO mode, while moving it DOWN will switch to STBY mode.

When NF4 is in AUTO mode and the Joystick is moved once to the right will initiate a 1-degree course change to Starboard and if the Joystick is moved to the left-hand side, it will initiate a 1-degree course change to Port side. When NF4 is in STBY mode, moving the Joystick in Right or left direction switches the Remote into POWER STEER mode.

## WORK Mode

While the Autopilot is in **AUTO** mode, you have the option to toggle between Work mode and non-work mode. This is done through the mode select menu just like you change the operation modes.

A letter "W" will appear in the upper left of the display to indicate that the system is now in **WORK** mode (for most vessel types) Refer to the appropriate section in the P4 Installation & Operation manual for details on these modes.

## Course Recall

Some time when you are in Auto mode, you want to temporarily steer the vessel in manually. In such situation, you can change the mode to (Power Steer) mode, and then switch back to Auto mode. Select Course-recall mode from the mode list will allow you to go back to autopilot's last commanded course.

Note the last commanded course will only be available when you immediately go back to Auto mode.

## NAV Mode

If the TS4 or NF4 Remote is In-Command and is in "NAV" mode, the Autopilot will lock on to the commanded course given by the NMEA Navigation device connected to the Autopilot. For more information on **NAV** Mode, refer to the appropriate sections in the P Series Installation & Operation manual.

The TILLER lever has no effect in **NAV** Mode.

## Alarm Clear

Should an alarm condition occur within the P4, an audible alarm within the Remote will sound. Press CMD button will suppress the alarm.

The audible alarm also sounds whenever a pushbutton is activated.

## Shortcut functions in NF4

If you have an NF4, aside from using buttons to change operation mode, you have a quick access to many functions by using the joystick. Table below shows a summary of these operations.

Initial Mode	Resulting mode and associated functions from Joystick movement		
	Up	Down	Left/Right
Standby	Auto	No action	P.str NFU mode and move rudder
P.Str.	Auto	Center rudder	Move rudder in the direction
Auto	Set current heading as steering course	Standby	Change course
NAV	AUTO	Standby	No action

## Operating Menu

P4 remotes are designed for easy connection and simple operation. However there are still times you may need to make a few twists to your remote. This is done through the root menu.

Double click on the CMD button will bring up the root menu as in Figure 3. Using Mode button or Lite button to scroll up and down the list.

Press STBY will close the root menu if you have not selected an item. If you are editing an item, press STBY will end the editing and ignore the change you have made and go back to old values.

Press CMD selects the current item for editing. If you are editing an item, press CMD will save the current value and end the editing.

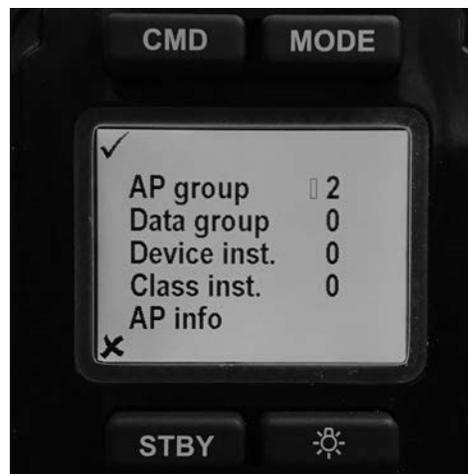


Figure 3 – TS4 / NF4 LCD Screen

### **AP group**

This value is used to identify different P4 systems in a network. If you have only one SPU, it is recommended you don't change the value

### **Data group**

This value is future use

**Device inst.**

This is the combined value of field 3 and field 4 of NMEA 2000 PGN 60928. If you make a change to this value, it only takes effects at the next power cycle/on-off cycle.

**Class inst.**

This is the System instance value of PGN 60928. If you make a change to this value, it only takes effect at the next power cycle/on-off cycle.

**AP info**

This item shows you the current P4 SPU you are linked to. In figure below the NMEA 2000 address of the SPU is 34. If the SPU is not online, you will see a blank address.

You can remove the linked SPU by press LITE button. The P4 remote will make a new scan to the CAN bus to find a new SPU. If you have replaced your SPU, this is how you setup a new link.

However, if you are to installed a second P4 system, and you want to connect the P4 remote to a specific SPU, you must first POWER OFF the SPU you don't want before you press LITE to link the SPU you want.

Numbers behind P4SPU (“—030”) are the last 3 digits of the serial number of the P4 SPU.



Figure 3 – TS4 / NF4 LCD Screen

## Off mode or Sleep mode

P4 remote is powered by the NMEA 2000 bus it connects to. In order to synchronize with the SPU and other control station in the network, P4 remotes do not have a power off state as long as the network power presents.

However you can “turn off” a P4 remote locally if it is a repeater. In “turn off” state, the backlight of P4 remote will be off. No display is seen, and the device will consume minimum power.

To turn off a P4 remote locally, press and hold the STBY button for over 3 seconds. A message will be shown before the system goes to sleep.

To wake up a P4 remote locally, press and hold the STBY button until the screen lights up.

If the SPU the remote linked goes to sleep, the P4 remote will automatically go to sleep mode. When the SPU wakes up, it will also wake up the P4 remotes.



# Appendices



## Multi-SPU installation

If there is more than one P4 system in your NMEA 2000 network, you need to specify which P4 system the Remote is going to join.

Each component in a P4 system has a configuration setting AP group. This group number is an integral in the range of 0 to 13. At factory default all P4 components have an AP group number 2.

Each SPU installed in the same network must be assigned a unique AP group value. Refer to P4 installation manual for how to set AP group for an SPU.

When a Remote joins a P4 system, it will automatically pick up a SPU with the same AP group number. To move the Remote from one group to another, place the Remote in repeater mode, and double click CMD button. Change the AP group number in the menu. After the group number has changed, the Remote will automatically delete SPU information it has already pick up, and scan the network all over again.

## Care & Maintenance

There are no user-serviceable parts or adjustments inside the Remote enclosure. Should the unit become damaged in any way, return it to an authorized ComNav Dealer.

A few precautions will keep the unit in prime condition and result in years of trouble-free service:

- The Remote housing does not require any special maintenance other than an occasional cleaning.
- Avoid exposing the housing to solvents, acids, and bases as some of these may weaken the casing.
- Although the Remotes are watertight, it is not designed for submersion under water.

## Specifications

Supply Voltage	12/24 VDC nominal
Supply Current	60 mA nominal 100mA maximum
Operating Temperature	-20°C to +70°C
Storage Temperature	-30°C to +85°C
Mounting	Keyhole Screw
Dimensions (maximum, without cable)	83mmx145mmx 38mm/3.2"x5.7"x1.4"
Weight w/cable /without cable	1.6lb/0.8 lb
Safe Distance to Compass	30cm/12inch



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# User Notes





