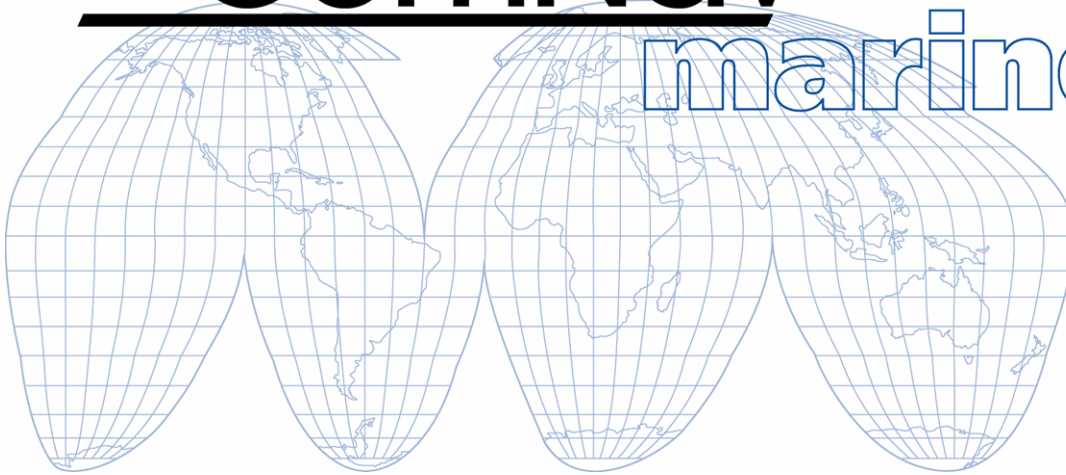


ComNav[®]

marine ltd



CR-203 Remote *for P Series Autopilot Systems*

Installation & Operation Manual



ISO 9001



**COMPLIES WITH
CE REGULATIONS**

PN 29010077

Welcome

Congratulations on your purchase of ComNav Marine's CR-203 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 CR-203 Remote.

ComNav Marine Ltd.

Warranty Notice

The Warranty for the CR-203 Remote is contained within the Warranty of your P Series Autopilot System. Prior to the installation and/or operation of the CR-203 Remote, 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 P Series Autopilot System (with or without the CR-203 Remote) 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 29010077 Version 3 Revision 0, is the approved Installation and Operation Manual for use with CR-203 Remote for P Series Autopilot Systems. Where versions of this manual exist in other languages, the English version shall be considered authoritative.

Document History

Revision	Date	By	Description
1R0	27 October 2005	DC	- first release
2R0	22 November 2005	DC	- added information on the new Display Control features
2R1	04 January 2006	DC	- minor edits
2R2	28 November 2006	DTO	- changed Figure 2 to show alternative colour coding
3R0	29 October 2007	DTO	- brand name change

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Introduction

Overview of the CR-203 Remote

The CR-203 Remote is designed to work with ComNav’s Admiral P3 Wheelmark Autopilot System, or the Commander P2 Advanced Autopilot System. It is based on the same well-proven, rugged design and enclosure as ComNav’s previous Handheld Remote products, but with features specific to the P Series autopilots, including **Special Turns** and a unique **TILLER** Mode.

The CR-203 Remote allows the vessel operator to control the P Series 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 CR-203 Remote:

- Backlit graphical grey-scale LCD display shows important system information, with easy selection of display brightness, contrast, & black-on-white or white-on-black LCD display
- Direct switch selection of the P Series’ **STANDBY**, **AUTO**, and **NAV** modes, and the unique **TILLER** mode (also supports **WORK** mode), and of **Special Turns**
- Colour-coded PORT & STARBOARD Turn/Dodge buttons
- 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
- Standard cable lengths:
 - PN 20310026 is 12 meters (40 feet).
 - PN 20310028 is 18 meters (60 feet).

(Optional cable lengths to 30 meters (100 feet) are available on special order. Contact your ComNav Dealer for information)

The block diagram below shows how the CR-203 Remote is used in a P Series system:

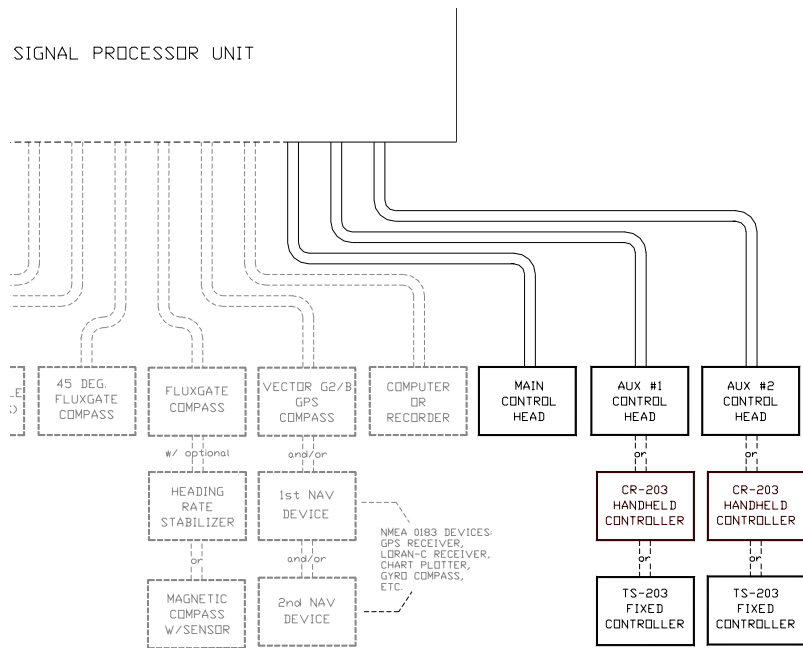


Figure 1 – P Series Autopilot System (partial diagram)

About this Manual

This manual provides essential information for the safe and reliable operation of the ComNav CR-203 Remote for P Series 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

CR-203 Remote buttons and controls are placed in uppercase lettering.

Example: the **TURN** switch.

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 **FN** 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 dodge an obstacle in the water, press either the **PORT ARROW** or **STARBOARD ARROW** button, 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 CR-203 Remote on your vessel.

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

Caution Warning

*Please refer to the **Warranty Information** document that accompanies your P Series manual before proceeding with installation of the CR-203 Remote.*

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.*

Power Supply

For reliable operation of your P Series Autopilot with the CR-203 Remote, your vessel’s power supply system must have an adequately-breakered, or fused, DC (direct current) power supply at a nominal voltage of either 12 or 24 volts. If the circuits are fused, a switch should also be provided. Ensure that adequate wire sizes are used to handle the expected maximum currents.

Special Tools

A slot screwdriver with a tip size of ~2.5 mm (0.1”) is required, for tightening the small screws of the wire clamps in the plugs which mate with the P Series SPU’s pin-receptacle connectors.

Other general-purpose tools such as a portable drill, pliers, wire cutters, screwdrivers, wire, mounting bolts and wrenches will also be required.

Electrical Connections

- 1) Route the CR-203 Remote cable to the P Series SPU (Signal Processing Unit).
- 2) Remove the Wiring Cover from the SPU. It is held in place by two knurled nuts.
- 3) Remove one of the spare nine-position plug-in connectors (supplied with the SPU) from **J12 - AUX 1** or **J13 - AUX 2**.
- 4) Wire the end of the cable onto the nine-position plug-in connector according to the following diagram:

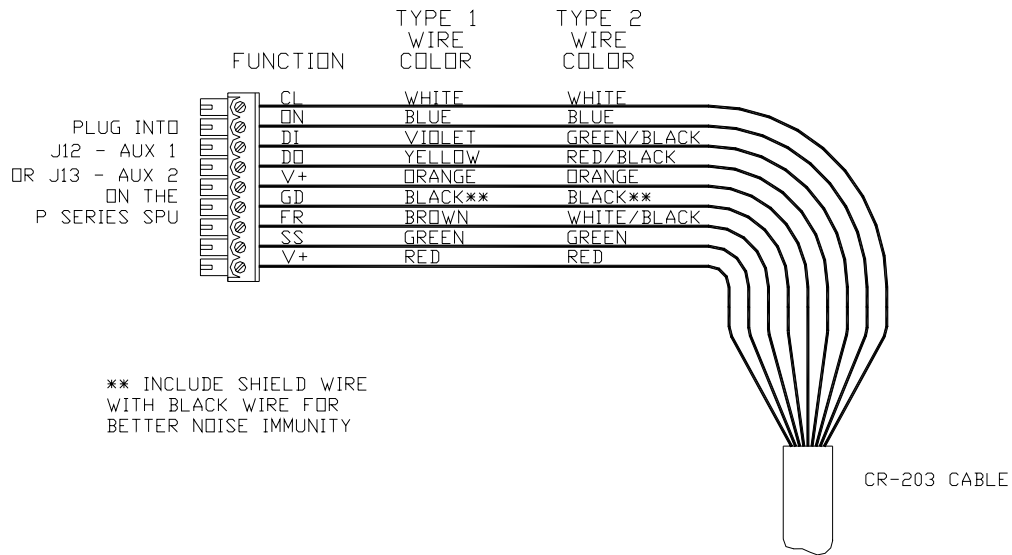


Figure 2 – Wiring for CR-203 Remote at SPU

- 5) Plug the nine-position connector back into the same SPU receptacle (**J12 - AUX 1** or **J13 - AUX 2**) that you removed it from in step 3).
- 6) Replace the Wiring Cover on the SPU and secure it with the two knurled nuts.

Calibration Check

Once your CR-203 Remote is installed and wired, you may wish to perform a re-calibration of the unit's Tiller lever.

Tools required:

- None

Other requirements:

- Commander P2 or Admiral P3 Installation & Operation Manual

Important! Be sure that you read the *P Series Installation & Operation Manual*, and understand how the *Autopilot System* operates, before proceeding.

Important! Be sure to complete the *Drive Setup* function in the *Dockside menu* of the *P Series* system before proceeding. Refer to the *Setup Procedures* section in the *P Series Installation and Operation manual* for details.

- 1) Turn the P Series System on (at the Control head), and leave it in STANDBY mode.
- 2) Switch the CR-203's SELECTOR KNOB to the STANDBY position.
- 3) Double-press the red PORT button.
- 4) The CR-203 should respond by displaying this message on the LCD:

“Press ◀ to start. Press ▶ to exit.”

This indicates that the unit has successfully been placed into SETUP mode.

- 5) Press the red PORT button. The display will show:

“Move tiller to stbd. Then press ▶”.

- 6) Swing the TILLER lever to hard-over Starboard.
- 7) Press the green STARBOARD button. The display will change to:

“Move tiller to port. Then press ◀”.

- 8) Swing the TILLER lever to hard-over Port.
- 9) Press the PORT button. The display will then change to:

“Center the tiller. Then press ◀ & ▶”.

- 10) Swing the TILLER LEVER to the center position, and press both the PORT and STARBOARD buttons at the same time.

- 11) The display will show

“Wait...”

and then a few seconds later will change to

“Setup complete. Press ▶ to exit”.

This indicates that the unit has successfully completed its calibration measurements, and stored the necessary Tiller lever calibration data in non-volatile memory.

If an error occurs during the calibration process:

The display will indicate that an error has occurred by showing the message

“Setup failed. Press ► to exit.”

This message will remain until you press the STARBOARD button to resume normal operation, or take control away from the CR-203 Remote by pressing the PORT and STARBOARD buttons on a P Series Control Head.

If you do not complete the Setup process all the way through to step 11, the CR-203 Remote will retain its factory-default Tiller lever settings.

Operation

Normal Usage

Taking Command

In order to use the CR-203 Remote, it is first necessary to “take command” away from the P Series Control Head.

Check to see that the Station Lock setting on the Control Head is set to “Unlock”. Then press and hold both PORT and STARBOARD buttons on the CR-203 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 upper right portion of the display, indicating that it is in “Repeater” mode.

Important! Always remember that the 203 Remote is “in command” unless a large letter “R” is shown in the upper right of the display.

To take command away from the CR-203 Remote, go back to the Control Head (or another Remote) and press the PORT and STARBOARD DODGE buttons on the Head (or Remote). The “R” in the upper right 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 CR-203’s display, which indicates that it is in “Repeater” mode.

The P Series Autopilot Systems have a feature called Station Lock that prevents repeater stations and remotes such as the CR-203 Remote from taking command. If Station Lock is set to “Lock”, the CR-203 Remote will show a small “key” symbol in the upper right portion of the display. Refer to your P Series Installation and Operation manual for details on setting and removing Station Lock.

Operating Menu

All of the items in the P Series STANDBY Menu are accessible via the CR-203 Remote.

To access the menu, take command with the CR-203 Remote, and place it in STANDBY mode.

Double-press the green STARBOARD button to bring up the menu. You will see a stylized cursor indicating which item in the menu is selected.

- Use the TURN switch to move the cursor down the list of menu items.
- Use the DODGE/FN switch to move the cursor up the list of menu items.
- Use the red PORT button to decrease the value of a menu item.
- Use the green STARBOARD button to increase the value of a menu item.

Double-press the green STARBOARD button to exit the menu, or wait for it to time-out after approximately 5 seconds of inactivity.

Note: depending on the software version and setup of the P Series system, not all items in the system’s STANDBY menu are adjustable from the CR-203 Remote.

Display Controls

You can make adjustments to the appearance of the display by varying the settings for BRIGHTNESS, CONTRAST, and GRAPHICS in the STANDBY Menu.

BRIGHTNESS

This refers to the brightness of the LCD backlighting. There are 9 levels available; a level of "0" (zero) is the minimum level of backlight, while 8 is the brightest.

CONTRAST

There are 8 levels of contrast. Although the LCD is temperature compensated, it may still be necessary to adjust the contrast for best visibility in extreme temperatures. Generally speaking, the colder the temperature, the higher the contrast setting should be.

DISPLAY

You may chose to view the display in "Norm" (normal) or "Rev" (reverse) mode. Normal mode shows dark characters on a light background, while reverse mode shows light characters on a dark background.

Modes of Operation



Figure 3 – Mode Selector Switch

STANDBY (STDBY) Mode

If the CR-203 Remote is In-Command and the Mode Selector Switch is in the “STANDBY” position, then the entire Autopilot System will be in **STANDBY** Mode. No controls on the CR-203 will have any effect on the vessel’s rudder.

TILLER Mode

If the CR-203 Remote is In-Command and the Mode Selector Switch is moved to the “TILLER” position, then the Autopilot will immediately begin moving the vessel’s rudder to a position that is proportional to the angle of the CR-203’s TILLER Lever. Thereafter, the Autopilot will move the vessel’s rudder so as to follow the relative position of the Tiller Lever.

The PORT and STARBOARD buttons have no effect in TILLER Mode.

The TURN and DODGE/FN switch has no effect in TILLER Mode.

AUTO Mode

If the CR-203 Remote is In-Command and the Mode Selector Switch is moved to the “AUTO” position, the Autopilot will lock on to the present course and maintain it.

The PORT and STARBOARD buttons on the CR-203 can be used to make course changes in one-degree increments for every push of the button. Pressing and holding either the PORT or STARBOARD button will cause the commanded course to change at a rate of approximately 10 degrees per second.

The TILLER Lever has no effect in **AUTO** Mode.

Dodge

If you have a Commander P2 Autopilot System:

- To Dodge in **AUTO** Mode, activate and hold the DODGE/FN switch. Then press either the PORT or STARBOARD button depending on which direction you want the vessel to dodge to.
- Pressing both PORT and STARBOARD buttons while the DODGE/FN switch is activated will center the rudder.

If you have an Admiral P3 Autopilot System:

- A Dodge manoeuvre is performed as a Special Turn. Repeatedly activate the TURN switch until “Dodge ◀ ? ▶” is shown, then press either the PORT or STARBOARD BUTTON, depending on which way you want the vessel to turn. See “Special Turns” in the Advanced Operations section of your Admiral P3 Installation and Operation manual for more details.

Special Turns

Activating this switch will bring up the default Special Turn. To initiate the turn, press either the PORT or STARBOARD button to tell the autopilot in which direction to start the turn.

If a different Special Turn other than the default is desired, subsequent activations of the TURN switch will scroll through the available options. See “Special Turns” in the Advanced Operations section of your P Series Installation and Operation manual for more information.

Course Recall

To recall the autopilot’s last commanded course, activate the DODGE/FN switch while rotating the Mode Selector Switch from “TILLER” to the “AUTO” position.

NAV Mode

If the CR-203 Remote is In-Command and the Mode Selector Switch is moved to the “NAV” position, 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.

The PORT and STARBOARD buttons have no effect in **NAV** Mode.

WORK Mode / WIND Mode

While the Autopilot is in either **AUTO** or **NAV** mode, press and hold the DODGE/FN switch for approximately 3 seconds. 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), or **WIND** mode (for sailing vessels, on a Commander P2 system). Refer to the appropriate section in the P Series Installation & Operation manual for details on these modes.

Alarm Clear

Should an alarm condition occur within the P Series system, an audible alarm within the CR-203 Remote will sound. Activating the DODGE/FN switch will suppress the alarm.

The audible alarm also sounds whenever a switch or pushbutton is activated.

Appendices

Care & Maintenance

There are no user-serviceable parts or adjustments inside the CR-203 Remote enclosure. Should the unit become damaged in any way, return it to an authorized ComNav Dealer.

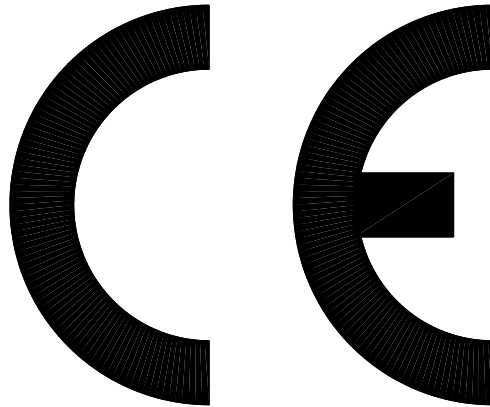
A few precautions will keep the unit in prime condition and result in years of trouble-free service:

- The CR-203 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 CR-203 Remote is watertight, it is not designed for submersion under water.

Specifications

Supply Voltage	10-14 VDC
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)	82 mm X 155 mm X 54 mm (3.20" X 6.10" X 2.13")
Weight (without cable)	410 grams (14.4 ounces)
Safe Distance To Compass	30 cm (12 inches)

CE COMPLIANCE



This product has been tested and is in compliance with the Electro-Magnetic Compatibility (EMC) standards of the European Community, and bears the CE label. It has been tested according to the applicable sections outlined under:

**Technical standard #IEC945/EN60945,
Marine Navigation Equipment,
General Requirements**

Applicable sections for methods of testing and required test results are:

Section 4.5.4:	Radiated Interference
Section 4.5.4:	Immunity to Electro-Magnetic Environment
Annex A, Section A.3:	Immunity to Conducted Audio Frequencies
Annex A, Section A.4:	Immunity to Earth Lead Coupling
Annex A, Section A.6:	Immunity to Radiated Interference

Test results and a declaration of conformity are on file at the ComNav Head Office.

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