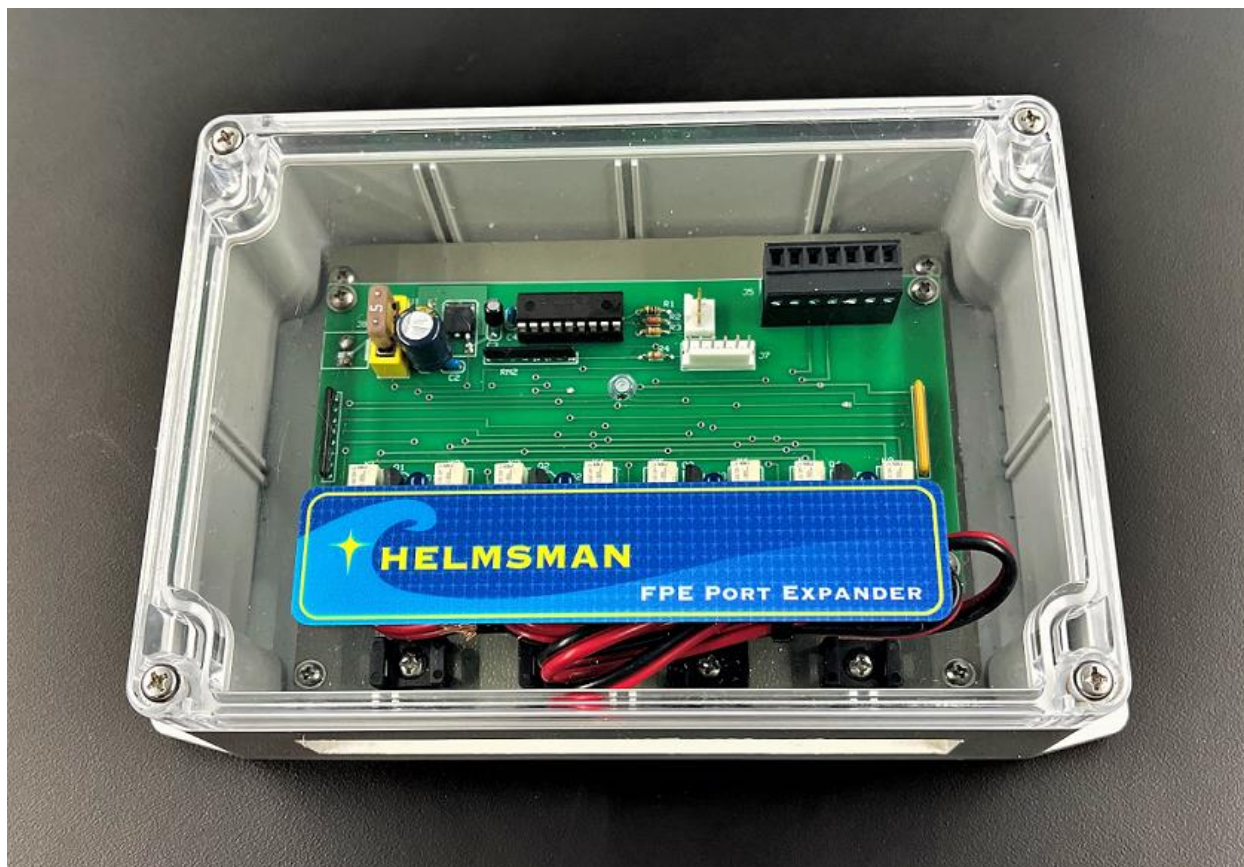


Installation and Operation



Helmsman FPE Port Expander
for
Furuno Automatic Pilots

Scope

This manual serves as a reference guide for installing and operating the Helmsman FPE (Furuno Port Expander). Please read and understand the contents of this manual in order to correctly install the Helmsman FPE and to become familiar with its operation.

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Overview

The Helmsman FPE is designed for use on commercial marine vessels equipped with the popular Furuno 500 or 700 series automatic pilots. The FPE enables the user to connect up to four remote steering controls to a single port of the Furuno autopilot's processor unit. The FPE is simple to install and operate, providing instant command and steering control from any steering station. The benefit of having multi-station, no-conflict, remote control capability greatly expands the utility of these popular automatic pilots on commercial vessels.

Operation

Power up

When power is first applied the FPE the processor will ensure that it wakes up safe, with all connected remote steering stations in STANDBY mode, irrespective of their individual on/off control-switch settings. The Helmsman FPE will also restart safely if power is interrupted momentarily; a situation that often occurs on commercial marine vessels.

Standby mode

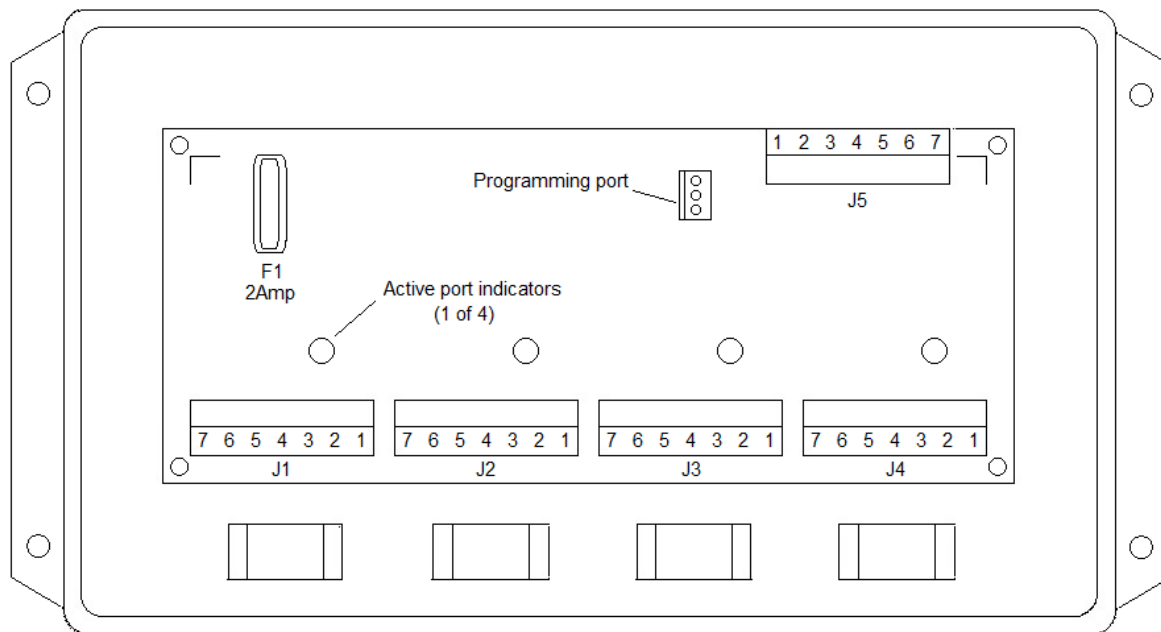
While in STANDBY mode the FPE is effectively disconnected from the Furuno autopilot processor unit, thus allowing the autopilot's main control unit to retain command and to operate normally. The FPE continuously monitors each input port for activity; if a remote station is activated the FPE will enable that station to take command. When an active remote controller is deactivated, the autopilot will revert back to its previous operational mode.

Command mode

To take command from any remote steering control, simply toggle that remote's control switch "off" and then "on". The FPE will automatically recognize the activated remote controller and exclude all other remote controllers that might be connected.

[Caution: Always observe the position of the remote controllers steering lever prior to activating a remote steering control as the vessel's rudder will immediately respond by moving to that position!]

Note: There are 4 active-port indicators located on the FPE circuit board. When any remote controller becomes active, its corresponding LED indicator will illuminate. See figure below.



Installation

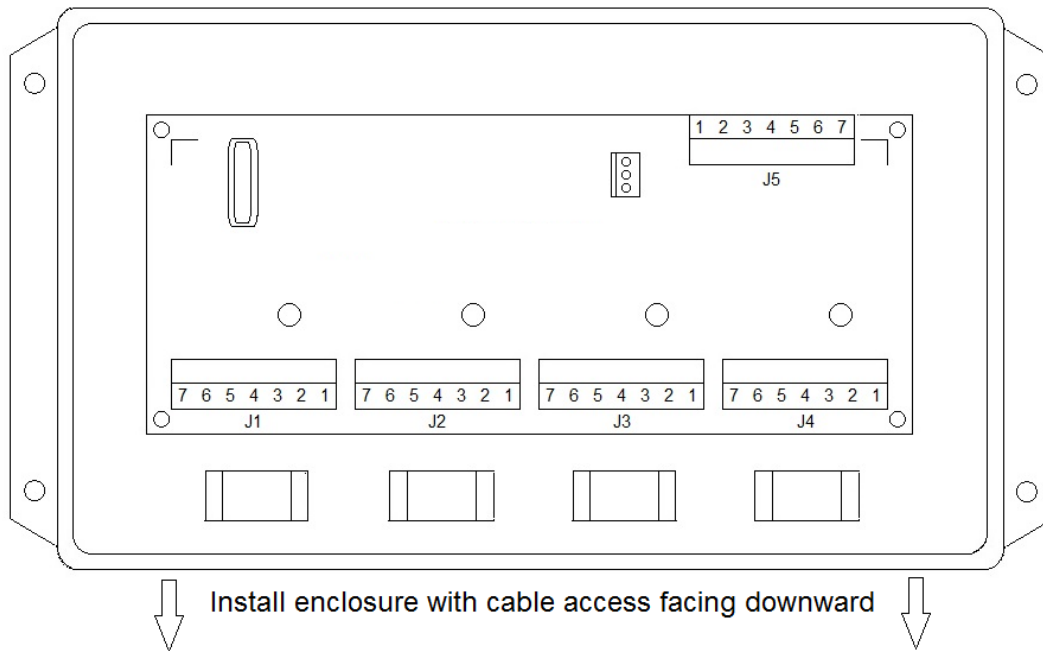
Autopilot compatibility

The Helmsman FPE is designed for use with Furuno models 500, 700, and legacy FAP50 automatic pilots. All diagrams and illustrations referencing “remote controllers” or “steering controls” in this manual are limited to the Helmsman RTC15F steering control. While the Helmsman FPE will also support Jastram and Furuno remote controllers, no installation notes for those brands are included in this manual. If assistance is needed when interconnecting the Helmsman FPE with controllers other than Helmsman, please contact Helmsman support directly.

Mounting the enclosure

The FPE is intended for installation under the vessel’s electronics console. The unit features an external mounting flange to simplify installation. Fasteners are included.

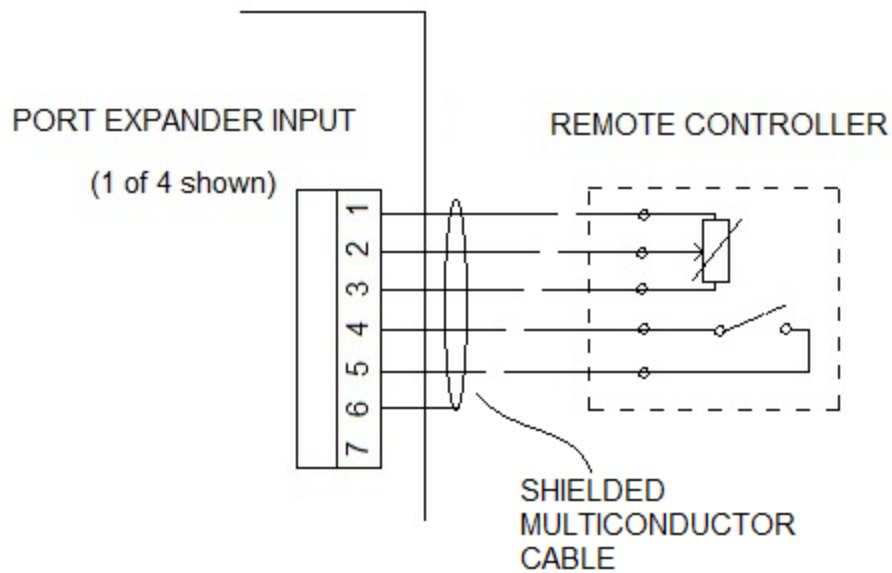
When selecting a mounting location be certain to choose a flat surface area in order to prevent torsion stress on the enclosure or circuit board assembly as the fasteners are secured. Also be careful to avoid proximity with high heat sources, hydraulic oil drips, and water seepage. While the clear, polycarbonate, cover is fully gasketed, the enclosure should be installed with the cable access facing downward in order to prevent drip ingress. See the following illustration.



Cable connections to the Helmsman FPE

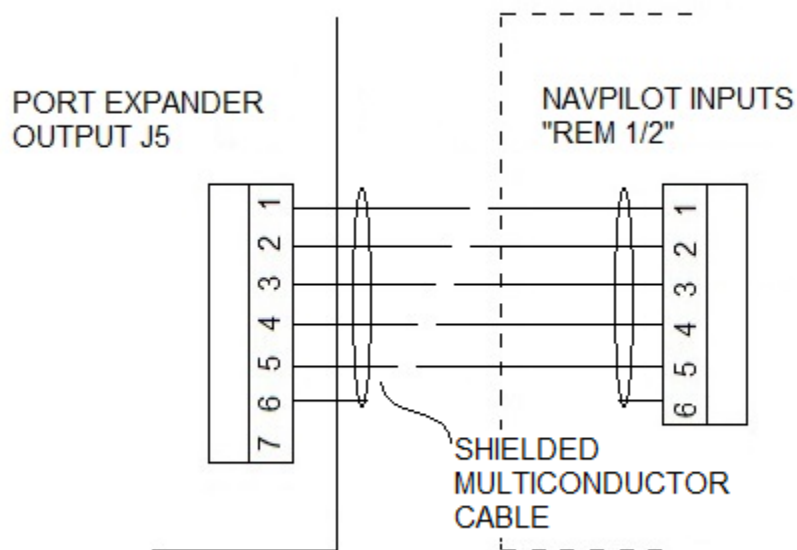
There are four input ports to the Helmsman FPE. The input ports are labeled J1 to J4 on the FPE circuit board. Each input port is fitted with a removeable, 7 position, connector plug. Positions 1 through 7 on each connector correspond directly to positions 1 through 7 in Helmsman's model RTC15F remote steering controls.

Helmsman steering controls are typically supplied with multiconductor cable of specified length. The installer can use an alternative multiconductor cable so long as it uses AWG-20 to AWG-24 stranded conductors having an overall braided shield, or foil shield, with a drain wire.



Positions 1 to 3 connect to the remote steering controls internal potentiometer while positions 4 and 5 connect to the remote steering controls on/off switch. Activity is detected when the remotes on/off switch is set to the ON position. When the switch is ON, position 4 is connected to position 5 and brought to “ground” potential.

Cable connections in the autopilot processor



Connecting the Helmsman FPE to Furuno NAVpilot. Terminal positions match one-to-one. Note that the shield conductor is connected in the Helmsman FPE and at the NAVPILOT REM1/2 input terminal. Also refer to the autopilot interconnection diagram included in Furuno NavPilot Operation and Installation manual.

Connecting power to the Helmsman FPE

The Helmsman FPE should be powered from the same DC source as the autopilot. The unit will operate over an input voltage range of 9VDC to 37VDC. Current draw is minimal. When powered from a 12VDC source, current draw is typically 6mA in standby mode and 65mA in command mode.

The FPE is supplied with a “zip wire” power-lead attached to the circuit board. The power input is reverse-polarity protected and fuse protected as well. A removable, 1 Amp, “mini blade”, automotive type fuse is included.

Configuration of the autopilot

The Furuno NavPilot 500, 600, and 700 series will accommodate three types of remote controllers, Non-Follow-Up (“NFU”), Full Follow-Up (“FFU”), and “Dodge”. The Helmsman FPE supports Full Follow-Up remote controllers such as Helmsman’s RTC15F.

After the FPE has been installed the autopilot processor must be configured. This is done by entering the autopilots [System Setup] menu then selecting [Remote Controller] setup menu. Specify which port to configure [REM1 or REM2].

Three remote controller types will appear in the setup menu; choose [FU]. Also select [CSE After Remote].

Restart the autopilot and confirm that the remote controller is recognized by the processor unit.

Dockside Test

Apply power to the autopilot and confirm that the autopilot system is operating as specified.

Confirm that the autopilot has been configured for FFU

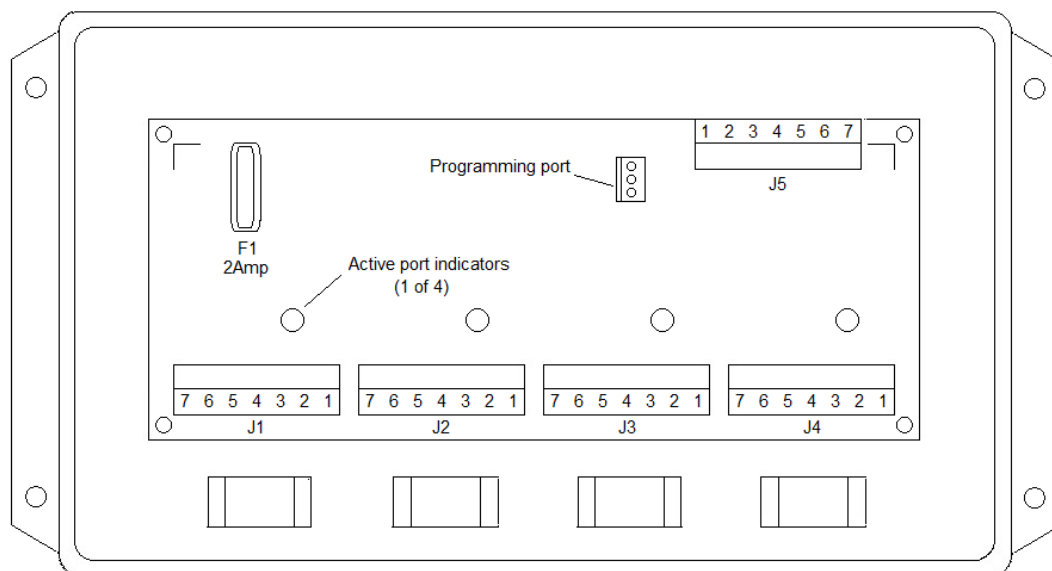
Confirm that power is applied to the Helmsman FPE. (Observe power LED)

Activate one of the remote controller stations by toggling it's on/off control-switch to the ON position.

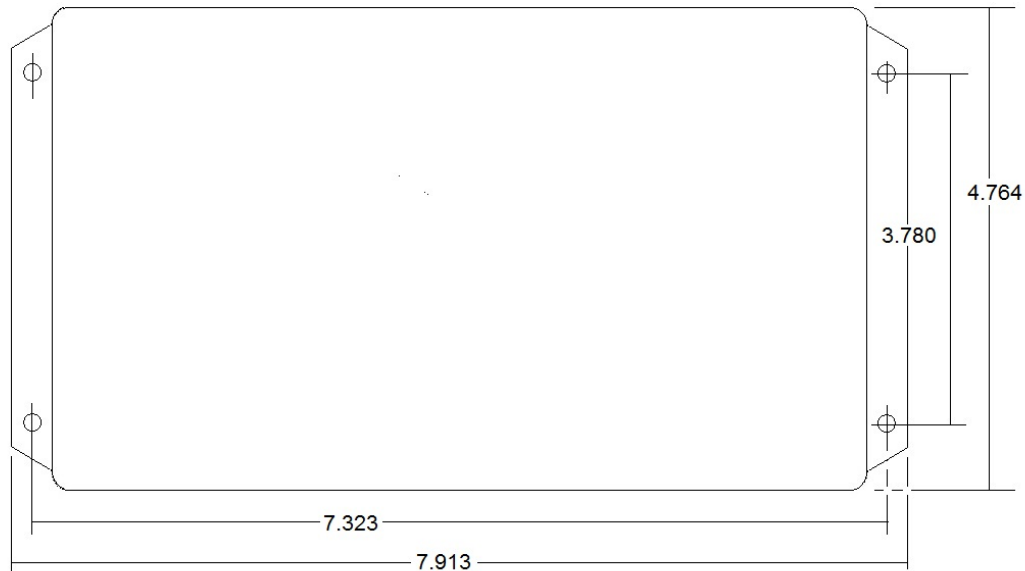
Confirm that the corresponding port-activity LED illuminates. See illustration below.

Confirm that the remote controller moves the vessels rudder in proportion to the placement of the steering lever.

Repeat this for each remote controller station connected to the FPE.



Specifications



Dimensions

Input voltage range: 9VDC to 37VDC.

Polarity protection: Reverse polarity will cause fuse to open.

Current draw: At 12 VDC ,Typically 6mA in standby and 65mA in command mode.

Fuse type: 1 Amp, Fast blow, Automotive “mini”-blade type.

Maintenance and Support

Support is available at 907-518-0341 or at 2rainyisland@gmail.com.

