

CONTROL SYSTEMS



MARINE PROPULSION SYSTEMS





OVER 50 YEARS AGO we introduced the industry's first single lever control systems, and we have been designing and manufacturing control systems for commercial marine vessels, yachts, and pleasure boats ever since. We have established a reputation for reliable, responsive control systems from the beginning and have continued to use new technology to our advantage. This is evident in our SmartCommand control system.

ZF Marine's state of the art control systems are designed for the harsh engine room environment and are available for both mechanical and electronic applications. Our control heads are built to withstand the harshest marine environment while being attractively designed to compliment any application.

Content	
INTRODUCTION	page 3
MICROCOMMANDER & CLEARCOMMAND	page 6
CRUISECOMMAND	page 8
MINICOMMAND	page 9
SMARTCOMMAND	page 10
SMARTCOMMAND OPTIONS	page 12



Product Matrix

	MicroCommander	ClearCommand	Premium ClearCommand	CruiseCommand	SmartCommand	MiniCommand
Mech. Engine	x	x	x			
Elec. Engine		x	x	x	x	x
Mech. Gear	x	x	x			
Elec. Gear		x	x	x	x	x
Mech. Troll	x	x	x			
Elec. Troll		x	x	x	x	x
Up to 2 stations						x
Up to 4 stations				x		
Up to 5 stations	x	x	x			
Up to 6 stations					x	
Back up	x	x	x	x	x	
Joystick Maneuvering System					x	
SteerCommand					x	
Dynamic Positioning Interface			x			

PRODUCT CHARACTERISTICS

All of ZF Marine's control systems carry our product "DNA", features that you will find across all of our control systems families. They include:

- Plug-in Installation** – ZF Marine control systems utilize plug connectors that make installation easier and cut installation time significantly. Determine cable length, engine and transmission requirements, and you're ready to plug in our systems. To simplify things further we can provide custom designed kits for production boat builders.
- Push Button Set Up** – Configuring the parameters for your controls has never been easier. Simply enter the parameter code and the processor instantly makes the correct adjustment. Changing configurations later to meet a new specification is just as easy.
- Start Interlock** – Our neutral start interlock prevents engine start up unless the control system is on, in neutral, and a specified station is in command of the engines and transmissions.
- Emergency Reversal Protection** – Speed / shift sequence protection allows shifting from full ahead to full astern in one motion while preventing damage to the engine or transmission. Designed with safety in mind, this sequencing technology allows you to respond safely to emergency situations.
- Synchronization** – Engine synchronization is standard on all control systems. Synchronization automatically maintain the same speed on multiple engines, thereby increasing operating efficiency, improving fuel economy, and reducing noise and vibration. Synchronization also allows for one lever operation – allowing the control of multiple engines and transmissions with one lever.
- Multiple Control Stations** – All control systems have the capability to support multiple control stations on a vessel including our optional handheld control.
- Built in Processor Displays** – All control system processors feature digital displays that provide information for set up, system status, and diagnostic purposes.
- Troll** – All our control systems are designed to control mechanical or electronic trolling valves as well as ZF AutoTroll. A full range of shaft speed is available below engine idle without the need for additional switches.

MicroCommand & ClearCommand

MicroCommand and ClearCommand are robust controls that have been long established as industry standards in electronic controls technology.

These two products are suited to all applications utilizing mechanical engines and gears with any combination of electronic throttle or shift.



MicroCommand and ClearCommand have been tested to requirements set by survey societies such as ABS and DNV, and meet ABYC standards for performance and functional testing. Both products carry the CE mark and are certified for sale in Europe.

CruiseCommand

CruiseCommand is the next step based on the proven MicroCommand and ClearCommand product families. It is designed specifically for larger vessels with multiple control stations and electronic engines and electrically shifted transmissions. CruiseCommand incorporates all the standard features of ZF Marine control systems including:

- Warm up mode
- Station transfer
- Single lever operation
- Engine synchronization

Electric trolling valve control is a standard feature with CruiseCommand and can be activated as part of the initial system set up. This allows for a range of low speed control at engine idle.

CruiseCommand has a number of type approvals if classification is required for the application.



Premium ClearCommand

Utilizing the proven ClearCommand platform, Premium ClearCommand was developed specifically for unique applications in multi-engine commercial, and very large pleasure craft vessel applications. Premium ClearCommand is designed to interface with many commercially available DP systems and meets the stringent standards of most classification societies.

In addition to all of the standard features of ZF Marine control systems, Premium ClearCommand offers unique features such as:

- Engine room and remote station lock out
- Unique transfer functionality and station in command indication as required by ABS
- Dynamic Positioning and joystick interface
- Fixed neutral delay for shaft brake sequencing



MiniCommand

MiniCommand is the evolution of standard electronic controls. MiniCommand provides affordable single lever control of electronically actuated diesel engines and marine transmissions. Designed specifically for pleasure craft and light duty commercial applications up to 60 feet in length, with a maximum of two control stations, the MiniCommand control processor incorporates the logic circuits for two engines and transmissions in one compact package. The single unit design allows for the processor to be mounted in smaller spaces while maintaining two completely separate operating systems. MiniCommand provides the features of control systems costing significantly more, all with the proven durability from ZF Marine.

For operators already familiar with ZF Marine's existing control systems, MiniCommand offers the flexibility to be paired with the same control heads offered for MicroCommand, CruiseCommand, and ClearCommand. In addition the 4200 Series control head was designed specifically for MiniCommand. A derivative of the popular 5200 control head for the SmartCommand control system, the 4200 offers all the ergonomic comfort and modern European design required by many of today's boat builders.



SmartCommand

SmartCommand is the result of fifty years of experience in designing vessel control systems. A powerful control system for today's electronically controlled engines and ZF transmissions, SmartCommand integrates the latest in CANbus communication technology with a user-friendly multifunction control head for up to six vessel control stations.

The compact control head design combines an ergonomic lever shape with a user-friendly touch pad allowing for all system functions to be easily selected using soft-touch push buttons. Visual indicators help to locate the neutral detent position and two color LEDs indicate station in command, and transmission engagement.

SmartCommand puts you in complete control with dedicated control modes for all standard ZF Marine control system functions with the addition of Easidock, and AutoTroll.

Easidock ensures positive clutch response resulting in easy and precise maneuverability in confined areas. Easidock provides the ability to modulate clutch engagement and control engine speed to obtain the optimum propeller speed for safe docking.

AutoTroll permits a full range of low speed control incorporating a shaftline sensor for closed loop feedback to maintain a specifically demanded propeller rpm. AutoTroll allows for clutch slippage to be controlled while maintaining minimum engine speed.

SmartCommand's CANbus communication perfectly synchronizes engines in all modes without the need for dedicated buttons or switches.



SmartCommand Options

Joystick Maneuvering System (JMS)

ZF Marine's Joystick Maneuvering System, operates off of the SmartCommand control system, and offers simple and intuitive vessel control at your fingertips. JMS manages the vessel's main engines, ZF transmissions and bow thruster all through the joystick, giving the operator precise speed, smooth maneuvering and easy docking. JMS offers vessel operators the ability to move the vessel sideways, rotate 360 degrees on the vessel's axis, and hold vessel position accounting for current and wind.



SteerCommand

For many years commercial aircraft have been using "Steer by wire" technology. Today, SteerCommand brings all the benefits of electronic steering control to the water. SteerCommand technology also brings a number of improvements to system installation. Traditional bulky hydraulic steering systems with their plumbing and many liters of fluid are now replaced with simple electronic harnesses. The vessel control experience is also significantly improved. Steering feel at the helm is more precise, and ZF Marine's patented force feedback system, offers rudder feel at the helm. Individual rudder controls offer increased maneuverability by allowing each rudder to move independently for maximum performance.

Safety is our primary concern and as such SteerCommand has double redundancy built in. Because SteerCommand is tied to the SmartCommand control system, it can operate through either main processor. Also, if complete vessel power is lost, the rudders can still be actuated manually.



Control Head Options

ZF Marine control heads are built to withstand the harshest marine environment while being attractively designed to compliment any application. Our control heads incorporate easy to use functionality to give you complete control from up to six different stations on your vessel.



SmartCommand 5200



MiniCommand 4200



MC 2000-2



MC 2000-1



MC 2000-4



460



463



466-4



Handheld Remote



Tournament Lever



SmartCommand One
Button One Function Panel

Control System Configuration Worksheet*

To ensure that the correct ZF Control system is selected for your vessel, we ask that you fill out the information requested on this worksheet.

General Information	Your Name:		
	Builder:	Boat Owner:	
	Street Address:	City:	
	State:	Postal Code:	
	Contact Name:	Phone:	
	E Mail:	Fax:	
Control System Desired:		Control Head / Model:	
Vessel Information	Vessel Name:		
	Type:	Overall Length:	Hull #:
	Draft:	Displacement (fully loaded):	Length at Waterline:
	Windage or sail area:	Wind Velocity:	No of Screws:
	Classification	<input type="checkbox"/> ABS <input type="checkbox"/> BU <input type="checkbox"/> DNU <input type="checkbox"/> GL <input type="checkbox"/> LRS <input type="checkbox"/> RINA <input type="checkbox"/> None	
	Quantity of Main Prpulsion:		
Aux. Propulsion <input type="checkbox"/> Bow Thruster 1 <input type="checkbox"/> Bow Thruster 2 <input type="checkbox"/> Stern Thruster <input type="checkbox"/> Other			
Numbers of Stations:		Station Locations: <input type="checkbox"/> Engine Synch?	
Dynamic Positioning <input type="checkbox"/> Yes <input type="checkbox"/> No		Shaft Brakes <input type="checkbox"/> Yes <input type="checkbox"/> No	
Propulsion Machinery Information	Engine Mfg:		
	Model:	HP:	RPM:
	Signal Type:		Range:
	<input type="checkbox"/> Mechanical Governor <input type="checkbox"/> Electronic Governor ¹		
Transmission Information	Manufacturer:		
	Model:	Ratio:	
	Select One Interface ²	<input type="checkbox"/> Mechanical <input type="checkbox"/> Pneumatic <input type="checkbox"/> Solenoid <input type="checkbox"/> Electric <input type="checkbox"/> ZF AutoTroll	
	2-Speed?	<input type="checkbox"/> Yes / Ratio:	<input type="checkbox"/> No
	Trolling Valve?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

¹ Note – SmartCommand requires Electronic Governor

² Note – SmartCommand requires a Hydraulic Clutch with a Solenoid Selector

Bow Thruster ¹	Thruster Mfg:		Model:	
	Rated Thrust:		Motor Horse Power (or Hydraulic Pump):	
	Select One	<input type="checkbox"/> Proportional	<input type="checkbox"/> On / Off	
Bow or Stern Thruster*	Thruster Mfg:		Model:	
	Rated Thrust:		Motor Horse Power (or Hydraulic Pump):	
	Select One	<input type="checkbox"/> Proportional	<input type="checkbox"/> On / Off	
Joystick Thruster ²	No. of Joystick Stations (max. 6):		No. Of Display Station (max. 4):	
	iAnchor – Optional <input type="checkbox"/> Yes		<input type="checkbox"/> No	

¹ Bow / Stern Thruster Notes:

- ZF recommends the use of hydraulic thruster for the Joystick Maneuvering System.
- For the iAnchor feature (station keeping) a hydraulic bow thruster is a requirement.
- For Single screw applications bow and stern thrusters are required.

² Note – MCU and SmartCommand are required for JMS

Drive Manufacturer	Select One		<input type="checkbox"/> Fixed Pitch Propeller	<input type="checkbox"/> Controllable Pitch Propeller
			<input type="checkbox"/> Surface Drive	<input type="checkbox"/> Water Jet
			<input type="checkbox"/> Other	
Wire Harness Length Requirements	Item	Quantity:	Description	Cable Lengths
	1		Flybridge Control Head Harness	Port: Starboard:
	2		Pilot House Control Head Harness	Port: Starboard:
	3		Throttle Cable Harness	Port: Starboard:
	4		Clutch / Troll Cable Harness	Port: Starboard:
	5		Power and Start Interlock Cable	Port: Starboard:
	5A		Tachometer Feedback	Port: Starboard:
	6		Serial Communication Cable	Port: Starboard:
	7		Automatic Power Selector?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	7A		All Pluggable Harnesses?	<input type="checkbox"/> Yes <input type="checkbox"/> No

*The configuration worksheet is designed to assist in determining general needs and requirements for a ZF control system. Final configuration approval needs to be provided by an authorized ZF control systems partner.

THE ZF GROUP

Shaping the future responsibly

Our enthusiasm for innovative products and processes and our uncompromising pursuit of quality have made us a global leader in driveline and chassis technology. We are contributing towards a sustainable future by producing advanced technology solutions with the goal of improving mobility, increasing the efficiency of our products and systems, and conserving resources.

Our customers in the automotive and industrial sectors welcome our determined focus on products and services, which provide great customer value. Improvements in energy efficiency, cost-effectiveness, dynamics, safety, and comfort are key to our work. Simultaneously, we are aiming for continuous improvement in our business processes and the services we provide. As a globally active company, we react quickly and flexibly to changing regional market demands with the goal of always providing a competitive price/performance ratio.

Our independence and financial security form the basis of our long-term business success. Our profitability allows us to make the necessary investments in new products, technologies, and markets, thus securing the future of our company on behalf of our customers, market affiliates, employees, and the owners of ZF.

Our tradition and values strengthen our managerial decisions. Together, they are both an obligation and an incentive to maintain a reliable and respectful relationship with customers, market affiliates, and employees. Our world-wide compliance organization ensures that locally applicable laws and regulations are adhered to. We accept our responsibility towards society and will protect the environment at all of our locations.

Our employees worldwide recognize us as a fair employer, focusing on the future and offering attractive career prospects. We value the varied cultural backgrounds of our employees, their competencies, and their diligence and motivation. Their goal-oriented dedication to ZF, beyond the borders of their own field of work and location, shapes our company culture and is the key to our success.



MOTION AND MOBILITY

Pkw-Antriebstechnik
Car Powertrain
Technology

Pkw-Fahrwerktechnik
Car Chassis
Technology

Nutzfahrzeugtechnik
Commercial Vehicle
Technology

Industrietechnik
Industrial
Technology

Lenksysteme
Steering Systems

ZF Lenksysteme GmbH ist ein Gemeinschaftsunternehmen der ZF Friedrichshafen AG und der Robert Bosch GmbH. ZF Lenksysteme GmbH is a joint venture of ZF Friedrichshafen AG and Robert Bosch GmbH.



ZF Services



Learn more
about ZF

**PLEASURE CRAFT
APPLICATIONS**

ZF Padova s.r.l.*

Via Penghe, 48
35030 Caselle di Selvazzano (PD)
ITALY
Tel. +39 049 8299 311
Fax +39 049 8299 550
info.zfpadova@zf.com

MARINE CONTROL SYSTEMS

ZF Padova s.r.l. –

Location Arco

Via S. Andrea, 16
38062 Arco (Trento)
ITALY
Tel. +39 0464 580-555
service.marine@zf.com

**COMMERCIAL AND FAST
CRAFT TRANSMISSIONS**

ZF Friedrichshafen AG

Marine Propulsion Systems

Ehlersstr. 50
D – 88046 Friedrichshafen
GERMANY
Tel. +49 (0)7541 77 2207
service.marine@zf.com

**COMMERCIAL CRAFT
THRUSTERS**

ZF Marine Krimpen B.V.

Zaag 27, P.O. Box 2020
2930 AA Krimpen aan de Lek,
THE NETHERLANDS
Tel. +31 180 331 000
service.marine@zf.com



MOTION AND MOBILITY