



Troubleshooting Manual – EIM Kidney System Replacement

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1. Purpose

This document has been created to provide a Troubleshooting guide on the details of Kinequip, Inc.'s Marine Control Module (MCM) based Electronic Switching System. This guide does not provide model specific details. Care must be taken to ensure a safe and reliable installation and usage. For an installation guide, please refer to the Installation Manual.

2. Safety

Initial power up and testing should be conducted in a manner which will avoid bodily harm or property damage. Prior to servicing equipment, the power to the equipment should be disconnected at the source.

Continually resetting overcurrent faults can be hazardous, potentially damaging the equipment, wiring, or creating a fire hazard. In case of a circuit overload, first attempt to diagnose what caused the circuit to trip before resetting the circuit breaker. Section 6 below discusses fault conditions in more detail.

3. System Level

Table I below lists the components of the MCM based Electronic Switching System. Figure 1 shows a representative diagram of the system post-installation. Communication between each component in the MCM based Electronic Switching System is achieved through the vessel's CANBUS network.

Table I – System Components

Item	Qty	Part Number	Description
1	1	KFA-SRY-SPKP-01	Switch Panel Kidney Port
2	1	KFA-SRY-SPKS-01	Switch Panel Kidney Starboard
3	1	KFA-SRY-MCMKF-1	Marine Control Module Forward Kidney EIM
4	1	KFA-SRY-MCMKA-1	Marine Control Module Aft Kidney EIM
5	1	KFA-SRY-AHEF-01	MCM to EIM Adapter Harness Forward
6	1	KFA-SRY-AHEA-01	MCM to EIM Adapter Harness Aft
7	1	KFA-SRY-JPEA-01	Junction Post EIM Aft
8	1	KFA-SRY-JPEF-01	Junction Post EIM Forward

• Auxiliary Interface Module (Generator Interface Module)

Some boats had an Auxiliary Interface Module which sometimes known as the Generator Interface Module. Kinequip's MCM based Electronic Switching System internally incorporates the functionality of the Auxiliary Interface Module and thus the module is no longer required. The Auxiliary Interface Module is to be removed.

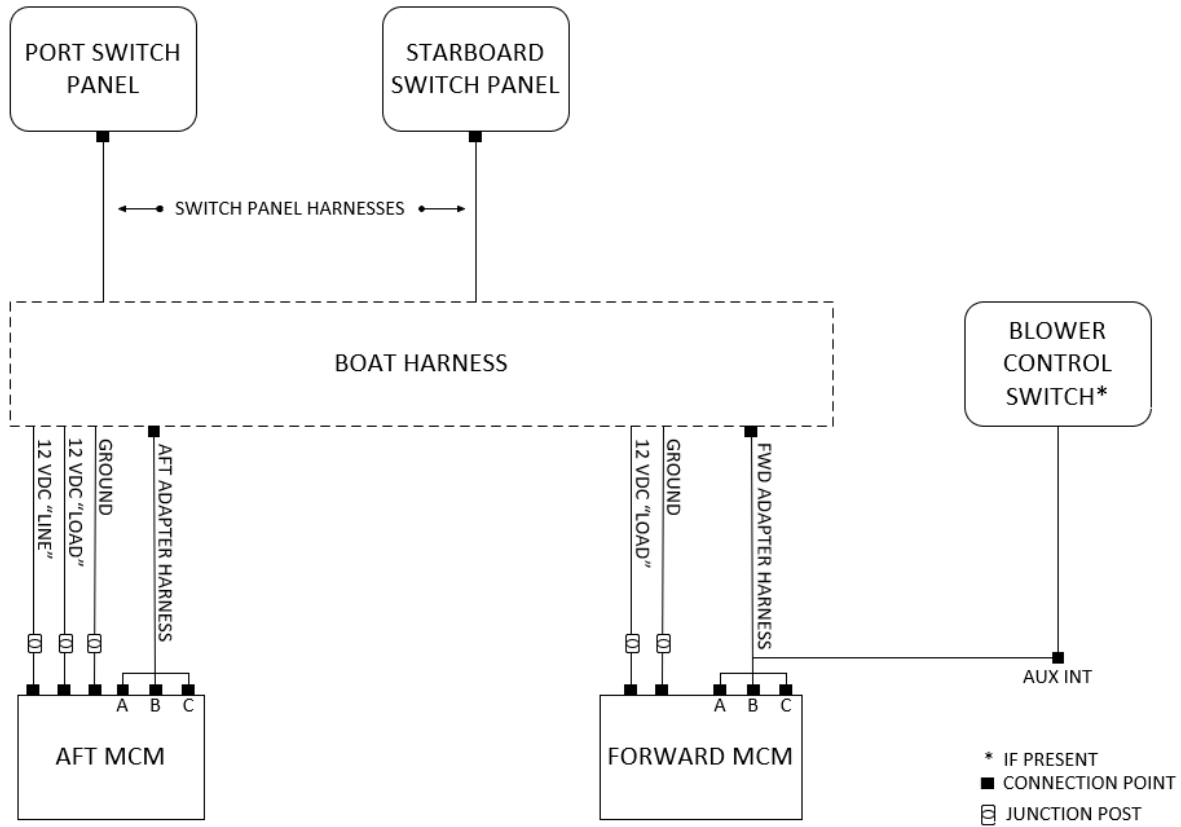


Figure 1 – MCM Based Electronic Switching System Post-Installation

4. Marine Control Modules

Marine Control Modules are factory programmed as either an Aft Module or a Forward Module and cannot be interchanged with each other. Ensure that they are installed in their correct locations.

• Power Connections

MCM power connections are shown in Table II and Table III below. As seen in the tables, the Aft Module connects to both the Always On (Constant Hot) Bus and the Battery Switched Bus while the Forward Module only connects to the Battery Switched Bus.

Table II – Forward MCM Power Connections

Connection	Forward MCM	Description
+12V LINE	+12V LOAD	Battery Switched +12 VDC
GROUND	-NEG	Ground connection

Table III – Aft MCM Power Connections

Connection	Aft MCM	Description
+12V LINE	+12V LINE	Always on +12 VDC
+12V LOAD	+12V LOAD	Battery Switched +12 VDC
GROUND	-NEG	Ground connection

• Output Connections

Outputs are in Banks A, B, and C. Each output has an indicator LED that is OFF, GREEN, or RED. Table IV below shows the output state associated with the LED while Figure 2 displays an example bank. Section 8 at the end of this document tabulates each output connection. The outputs connect to the boat through an Adapter Harness. Ensure that the Aft Adapter Harness is paired with the Aft Module and that the Forward Adapter Harness is paired with the Forward Module.



Table IV – Output LED State

Output LED State	Output Status
OFF	Output is OFF
GREEN	Output is ON
RED	Output over current and is now OFF

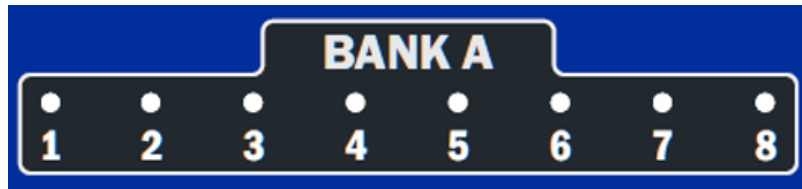


Figure 2 – Example Output Bank

- **MCM Status, Fault, and Fault Reset**

Each MCM has a blue STATUS and a red FAULT indicator LEDs as shown below in Figure 3. There is also a FAULT RESET button that has a red indicator LED that illuminates when the button is pressed. During power up, the STATUS indicator will blink momentarily and then remain solid after the unit boots up. If this blinking does not occur, check the power to the unit. If an output faults or an error is discovered, the FAULT indicator will illuminate. See Section 6 for more detail on fault conditions.

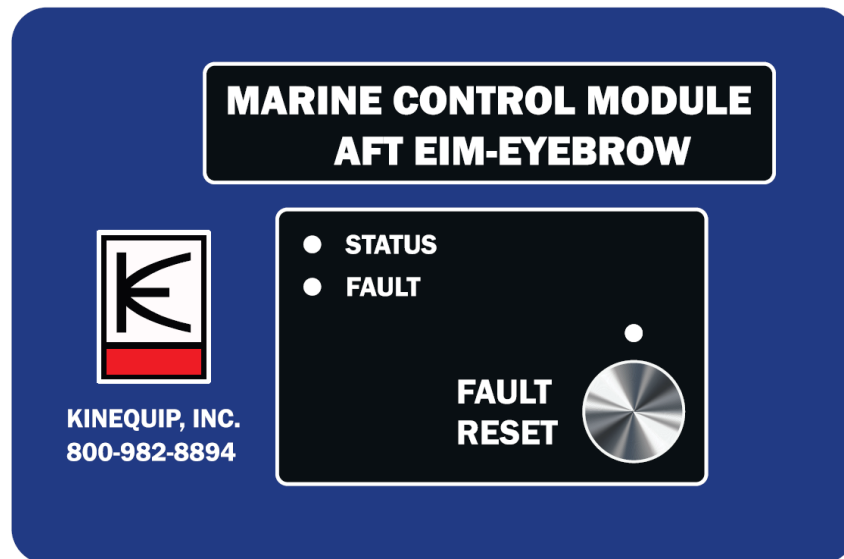


Figure 3 – STATUS, FAULT, and FAULT RESET

5. Switch Panels

The Switch Panels also have a blue STATUS and a red FAULT indicator LEDs. During power up, the STATUS indicator will blink momentarily and then turn off once the panels boots up. If this blinking does not occur, check the connection to the unit. If an output faults or an error is discovered, the FAULT indicator will illuminate. See Section 6 for more detail on fault conditions.



6. Overcurrent Faults

Each output has a preset maximum allowable current. The preset values can be found below in Section 8. If the measured current exceeds the preset value, that output will enter a fault state and turn the output off. In the event of an overcurrent fault the output LED will change from green to red. The FAULT indicator on both MCMs and both Switch Panels will also illuminate red.

- **Resetting Faults**

Overcurrent faults can be reset by pressing the FAULT RESET button on either MCM once. This means that one MCM can clear the faults of another, however, only the faulted MCM will indicate which output has faulted through the output LED.

If the overcurrent fault is persistent, the output will fault again and the associated output LED will turn red. Continually resetting overcurrent faults can be hazardous, potentially damaging the equipment, wiring, or creating a fire hazard.

7. Error Code Diagnosis

Error codes can be read from the STATUS and FAULT indicator LEDs. Error codes can be found below in Table V.

Table V – Error Codes

Device	LED	Diagnosis	Resolution Steps
MCM	Blue: Off	Unit does not have power	<ul style="list-style-type: none">• Ensure power is applied to unit.• Check wiring for loose connection.• Check that the battery switch is On.
MCMs and Switch Panels	Red: Solid	Overcurrent Fault	<ul style="list-style-type: none">• Verify the device powered by the output is working properly.• Verify the wiring from the MCM to the device is connected properly and no electrical shorts are present.• Press the “Fault Reset” Button on one of the MCM’s.
MCM or Switch Panel	Red: Flashing	Unit is missing communication with at least two modules.	<ul style="list-style-type: none">• Check wiring to this unit(s) for a bad connection of the communication bus.

8. Adapter Harness Connections



Table VI - AFT EIM ADAPTER HARNESS PINOUT

EIM PIN #	FUNCTION	BREAKER SIZE	MCM PIN#
1	AFT ACCY	15	C2
2	HATCHLIFT	20	C9
3	HATCHLIFT	20	B16
4	WINDLASS MAIN	5	A1
5	GROUND	-	C13
6	GROUND	-	A9
7	STEREO MEMORY	15	C7
8	PORT MERCATHODE	15	C8
9	STBD MERCATHODE	15	C5
10	SYSTEM MONITOR	5	C6
11	BILGE PUMP	10	C4
12	HATCHLIFT	20	C1
13	HATCHLIFT	20	B8
14	GROUND	-	A10
15	GROUND	-	A13
16	GROUND	-	A14
17	GROUND	-	C10
18	GROUND	-	C11
19	WINDLASS SENSE	-	C3
20	TRIM TABS	20	A6
21	ACCY #2	15	B3
22	TxRx+	-	B12
23	TxRx-	-	B11
24	GROUND	-	B15
25	GROUND	-	A11
26	GROUND	-	A12
27	GROUND	-	C12
28	GROUND	-	C14
29	GROUND	-	A15
30	TRIM TABS	20	A7
31	BLOWER #2	7	B4
32	WINDLASS MAIN	5	A8
33	ANCHOR	7	B5
34	RUNNING	6	B1
35	BLOWER #1	7	B6
36	COCKPIT LIGHTS	15	B2
37	BILGE LIGHTS	15	A3
38	COMPARTMENT LIGHTS	15	A5
39	TRIM TABS	20	A2
40	TRIM TABS	20	A4



Table VII – FWD EIM ADAPTER HARNESS PINOUT

EIM PIN #	FUNCTION	BREAKER SIZE	MCM PIN#
1	ACCY #3	10	C1
2	STEREO	3	A5
3	CONSOLE DIMMER	5	C3
4	KEYPAD	5	C4
5	KEYPAD	5	C5
6	GROUND	-	A10
7	UNSWITCHED ACCY	10	A2
8	12V RECEPTACLE	15	A3
9	SPOTLIGHT	10	A4
10	ACCY #1	3	B7
11	HORN	5	A6
12	TxRx+	-	B14
13	TxRx-	-	B9
14	TxRX-	-	B10
15	GROUND	-	C10
16	GROUND	-	A15
17	GROUND	-	A11
18	GROUND	-	A12
19	GROUND	-	A13
20	FWD ACCY	15	B1
21	STBD WIPER	5	B2
22	TxRx+	-	B13
23	TxRx+	-	B12
24	TxRx-	-	B11
25	GROUND	-	C14
26	GROUND	-	C15
27	GROUND	-	A14
28	GROUND	-	B15
29	GROUND	-	A9
30	PORT WIPER	5	B3
31	WINDLASS UP	5	B4
32	WINDLASS DOWN	5	B5
33	WINDSHIELD VENT	5	A1
34	WINDSHIELD VENT	5	A8
35	GROUND	-	C12
36	GROUND	-	A16
37	NAV LIGHTS ANCHOR	6	C6
38	NAV LIGHTS RUNNING	6	B6
39	SPOILER LIGHTS	10	B8
40	COMPARTMENT LIGHTS	10	C7

Table VIII – FWD AUXILLARY INTERFACE PINOUT

PIN #	FUNCTION	MCM PIN#
1	LIGHT (INDICATOR)	C8
2	SWITCH	C2
3	(-) RETURN	C11
4	N/C	N/C