Technical Instruction Document

Edge Controller Board Field Replacement Kits:

- **64113-1 Seven Segment Board**
- **64131-1 Interface Board**
- **64139-1 Edge [ii] Connector Board**
- **69333-TAB Front Panel**
- **69353-TAB Front Panel & MCB**
- **124361-1 Ignition Stepper Board**
- **124362-1 Power Supply Board**
- **124363-1 Low Water Cutoff Board**
- **124366-1 Edge [i] Connector Board**

SECTION 1: Introduction

This document provides instructions for retrofitting the following Edge [i] and Edge [ii] Controller Board Field Replacement (FRU) Kits. It applies to both the Edge [i] and Edge [ii] Controllers. The following kits are available:

P/N	Qty.	Description	Edge [i]	Edge [ii]
Edge Controller Field Replacement Kits			**Applies to:**	
Seven Segment Display Board FRU Kit, P/N 64113-1				
64113	1	Seven Segment Display Board	✔	✔
59250	4	Spacer, 9/16" long, for #6 screw	✔	✔
54146	4	Screw, #6-32 x 7/8"	✔	✔
63207	1	Ribbon Cable	✔	✔
Interface Board FRU Kit, P/N 64131-1				
64131	1	Interface Board	✔	✔
59250	4	Spacer, Unthreaded	✔	✔
54146	4	Screw, #6-32 x 7/8"	✔	✔
Front Panel FRU Kit, P/N 69333-TAB				
69294-1	1	Edge Controller Front Panel Kit	✔	✔
72229-1	3	Edge [ii] Compatibility Label – Benchmark Platinum	✔	✔
72229-2	3	Edge [i] Compatibility Label – Benchmark & Innovation	✔	✔
64114-HEX	1	Edge MCB Firmware – Benchmark Boiler	✔	✔
64164-HEX	1	Edge MCB Firmware – Innovation Water Heater	✔	✔
79082	1	Blank Tag	✔	✔
Front Panel & MCB FRU Kit, P/N 69353-TAB				
69352	1	Front Panel, MCB and LWCO Harness	✔	✔
79082	1	Blank Tag	✔	✔
72229-5	3	Edge [ii] Compatibility Label – Benchmark Platinum	✔	✔
72229-6	3	Edge [i] Compatibility Label – Benchmark & Innovation	✔	✔
64114-HEX	1	Edge MCB Firmware – Benchmark Boilers	✔	✔
64164-HEX	1	Edge MCB Firmware – Innovation Water Heaters	✔	✔
Ignition/Stepper Board (IGST) FRU Kit, P/N 124361-1				
124361	1	IGST Board	✔	✔
Power Supply Board FRU Kit, P/N 124362-1				
124362	1	Power Supply Board	✔	✔
Low Water Cutoff Board FRU Kit, P/N 124363-1				
124363	1	Low Water Cutoff Board	✔	✔
Edge [i] Connector Board FRU Kit, P/N 124366-1				
124366	1	Edge [i] Connector Board	✔	
Edge [ii] Connector Board FRU Kit, P/N 64139-1				
64139	1	Edge [ii] Connector Board		✔

WARNINGS!

- **Electrical voltages up to 120, 208, 480, or 575 volts AC may be used in Benchmark boilers and Innovation water heaters. It is required that all power be removed from the unit before starting the procedure below.** Serious personal injury or death may occur if this warning is not observed. Use extreme care when accessing circuits and electrical connections within the equipment.

- Static electric discharges could permanently damage the PCM Board's electronic components. *Be sure to discharge all body static electricity by touching the metal enclosure or wear a static discharge wrist strap before starting the procedure below.*

- The PMC Board and Edge Enclosure Box may have sharp metal edges and solder points, which could cut or scratch an unprotected hand. *Always exercise caution when working within the Edge Enclosure Box to prevent cuts and scratches*

IMPORTANT!

Observe all local requirements and lockout procedures when working on electrical equipment.

SECTION 2: Preparing the Unit for Board Replacement

Before replacing any of the Edge Controller boards, you should first backup the full configuration, which includes the state of all parameters and the latest combustion calibration values. The backup can be saved to a USB device plugged into the Controller's USB port, on the Controller's left side. Full instructions are included in the Operation and Maintenance Manual (OMM) shipped with the unit; the manual is also available on the AERCO web site at aerco.com.

After completing the Controller's backup, complete the following steps to prepare the unit.

1. Set the Controller's Enable/Disable switch to **Disable**.
2. Disconnect the unit from all electrical power by turning the external power switch to **OFF**.
3. Remove the unit's front panel, exposing the Controller.
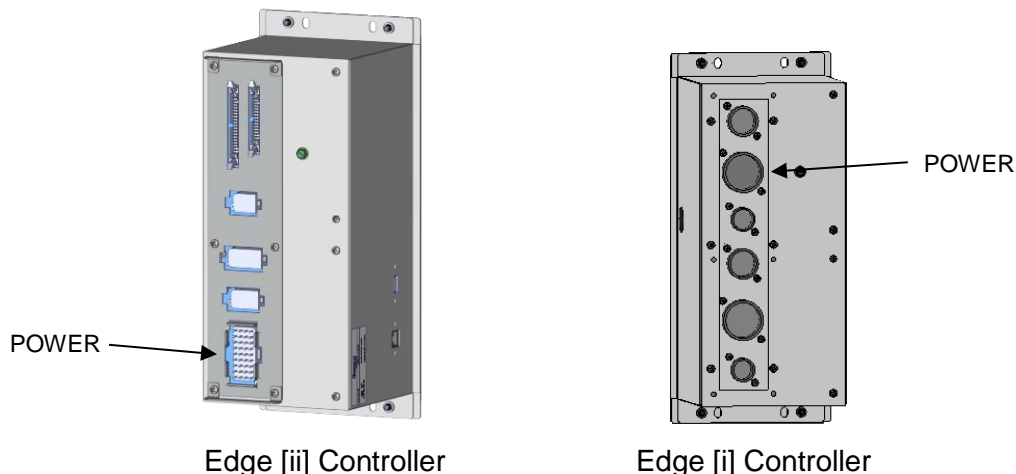4. Disconnect the Edge Controller's power cable from the back of the Controller.

Edge [ii] Controller   Edge [i] Controller

Figure 1 – Edge Controller – Rear Views

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5. Depending on which board(s) you are replacing and the space available to work, you can remove the Edge Controller's Front Panel, then turn it around and loosely attach it to the Enclosure Box with one of the four (4) screws or bolts that held it in place, as shown below. Alternatively, it may be easier to unplug all cables from the Controller's rear panel and then remove the Controller entirely from the unit and place it on a table.

Figure 2 – Edge Controller – Front Panel Removed and Reversed

SECTION 3: Edge [i] Controller Boards

The following diagram shows the location of all replaceable boards in the Edge [i] Controller.

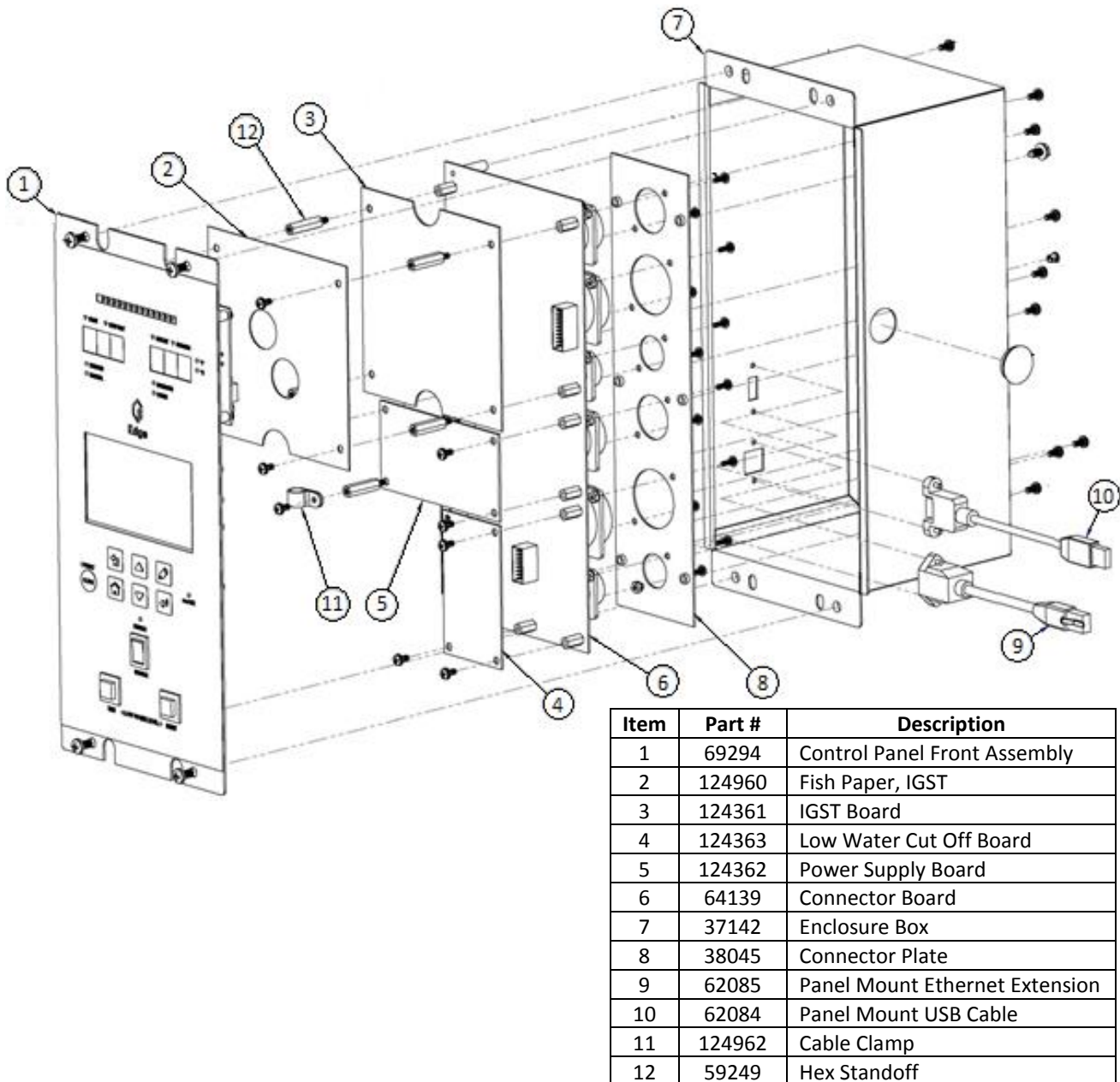| Item	Part #	Description
1	69294	Control Panel Front Assembly
2	124960	Fish Paper, IGST
3	124361	IGST Board
4	124363	Low Water Cut Off Board
5	124362	Power Supply Board
6	64139	Connector Board
7	37142	Enclosure Box
8	38045	Connector Plate
9	62085	Panel Mount Ethernet Extension
10	62084	Panel Mount USB Cable
11	124962	Cable Clamp
12	59249	Hex Standoff

Figure 3 – Edge [i] Controller (P/N 69344-3) - Exploded View

3.1 Edge [i] Board Replacement

Complete the instructions below to open the Edge [i] Controller and replace one or more of its boards.

3.1.1 Replacing the Edge [i] Front Panel and/or Its Components

The instructions below replace the entire front panel or its individual components.

1. Remove the four screws or bolts attaching the Controller's Front Panel to the Enclosure Box.

2. Carefully pull the Front Panel away from the Controller's body. **Be careful to avoid pulling on the ribbon and electrical cables** connecting the Front Panel to the boards inside the Controller.

3. Reverse the Front Panel, as shown below. It consists of the following components:

   - Front Panel Assembly (Kit **69333-TAB** or **69353-TAB**)
   - Interface Board (Kit **64131-1**)
   - 7 Segment Board (Kit **P/N 64113-1**)
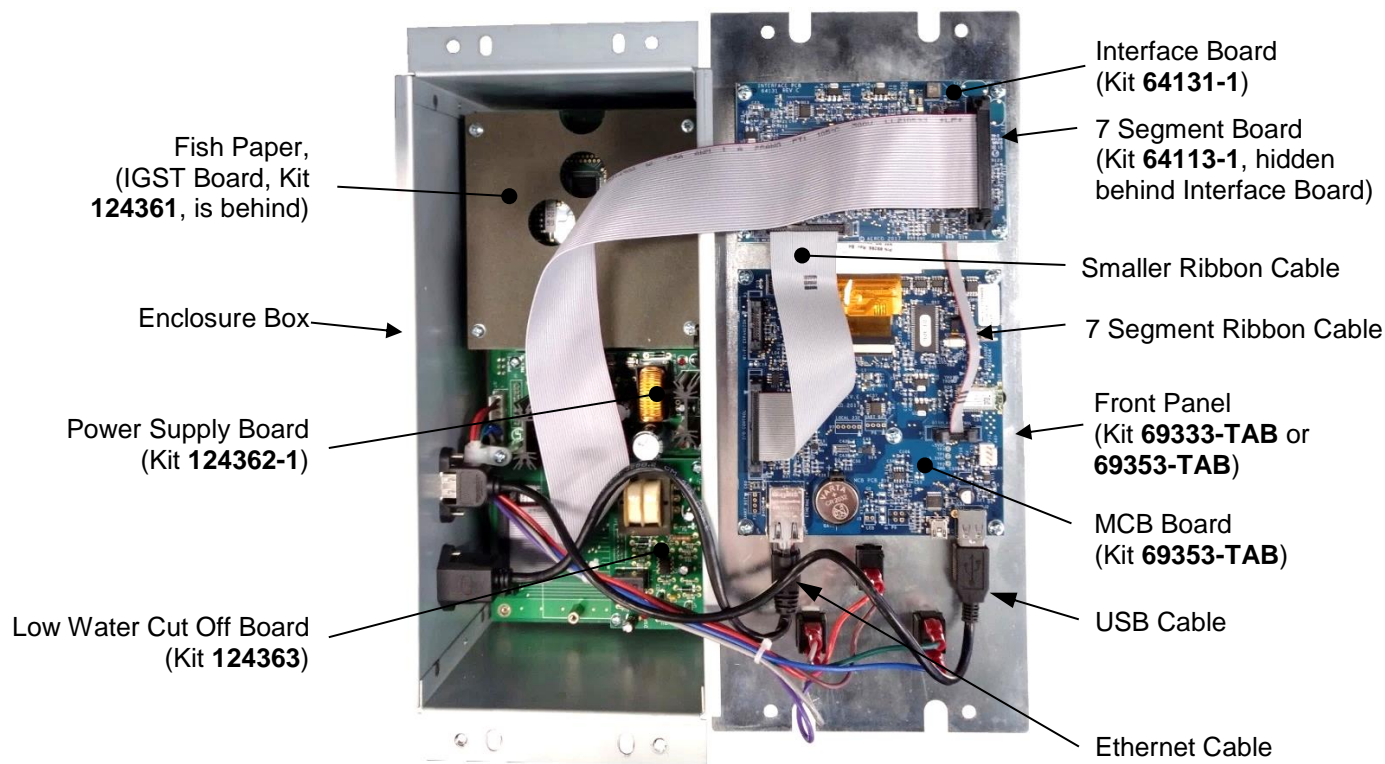   - MCB Board (Kit **69353-TAB**)

Figure 4 – Edge [i] Controller – Opened

4. Carefully note where all electrical connectors are connected, then disconnect them from any board you are replacing.

5. To remove the ribbon cable(s) from any board, pull the tabs back on both sides of the cable's connector, then pull the connector up and off the pins on the board.

REASSEMBLY NOTE:
To reattach the smaller ribbon cable (see Figure 4) to the Interface Board, push the tabs half way closed before pressing the ribbon cable's connector down on the pins. If the tabs are fully open, the connector won't seat properly. Once fully seated, close the tabs over the connector.

6. Remove the screws holding the board(s) you are replacing. Note the following:

    - If you are replacing the 7 Segment, you must first remove the Interface Board.

    - If you are replacing the Interface and/or MCB Board, you **_must_** set the DIP switches on the new board(s) to the same positions as on the original board(s).

3.1.2 Replacing Other Edge [i] Boards

The instructions below replace the components inside the Enclosure Box:
- IGST Board (Kit **124361-1**)
- Power Supply Board (Kit **124362-1**)
- Low Water Cut Off Board (Kit **124363-1**)

1. Complete the instructions in the previous section to remove the Front Panel, exposing the interior of the Enclosure Box.

2. Carefully note where all electrical connectors are connected to the board(s) you are replacing, then disconnect the ribbon and electrical cables attached to those board(s).

3. To replace the Power Supply Board (Kit **124362-1**) and/or Low Water Cut-Off Board (Kit **124363-1**), remove the screws mounting them to the Connector Board, then remove the board(s).

4. To replace the IGST Board (Kit **124361-1**), remove the screws holding the Fish Paper in place (see Figure 4, above), then remove the four (4) Hex Stand-offs on which the Fish Paper is mounted. The IGST Board can then be lifted out of the Enclosure Box.
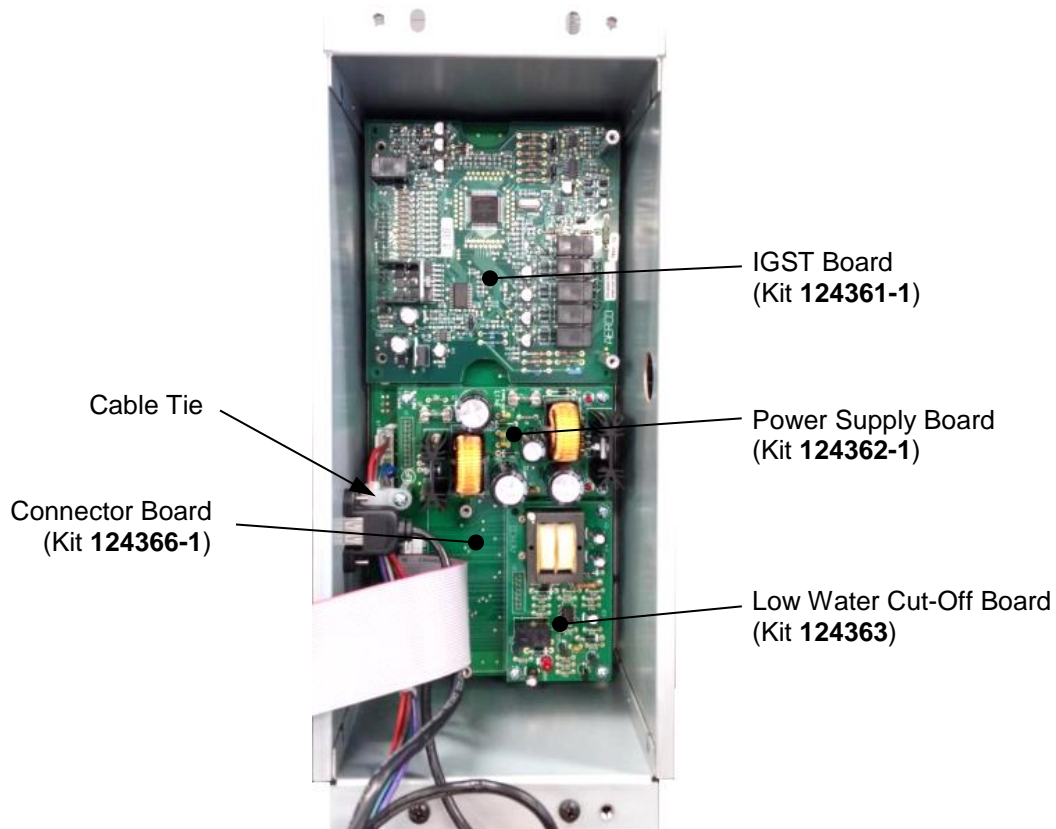

Figure 5 – Edge [i] Controller – IGST Exposed

3.1.3 Replacing the Edge [i] Connector Board

The instructions below replace the Edge [i] Connector Board (Kit **124366-1**). These instructions require removing the Edge Controller from the unit.

1. Label all cables connected to the back of the Edge Controller, then disconnect all cables.

2. Remove the four (4) screws or bolts holding the Edge Controller to the front face of the unit, then pull the Controller out of the unit and lay it on a clean, flat surface.

3. If you have not already done so, remove the IGST Board, the Power Supply Board, and the Low Water Cut-off Board from the Controller, as described in the previous section.

4. Remove the screw from the cable tie (see Figure 5, above), then disconnect the connector from the Power Supply Board.

> **REASSEMBLY NOTE:**
> The connector must be reinstalled in the same orientation as it was originally, with the **brown** wire <u>above</u> the others.

5. Unplug the USB and Ethernet cables from the MCB Board (see Figure 4, above). NOTE: the Ethernet cable has a plastic tab that must be pushed down before the cable can be removed.

6. Once all electrical connections have been disconnected, set the Front Panel aside.

7. Turn the Controller on its left side (USB and Ethernet ports down), then remove 8 (eight) of the nine (9) screws from the Controller's back surface holding the Connector Board in place.

Figure 6 – Edge [i] Controller – Back Panel

8. Place one hand inside the Enclosure Box on the Connector Board, then remove the last of the nine (9) screws holding the Connector Board in place. This step disconnects the Connector Board from the Enclosure Box, so be sure it is supported before removing the last screw.

9. Tilt the Connector Board up and over the USB and Ethernet connectors inside the Enclosure Box, then remove the board.

10. When reinstalling the new Connector Board:

   a) Place the Enclosure Box flat on its back.

   b) Tilt and lower the new Connector Board in place.

   c) Once in place, hold the Connector Board in place with one hand while you tilt the Enclosure Box on its left side and reattach the nine (9) screws removed in Steps 7 and 8.

   d) Reinstall the boards removed above.

   e) Reconnect all electrical connections and ribbon cables.

11. Reinstall the Edge Controller in the unit and reconnect the cables disconnected in Step 1.

SECTION 4: Edge [ii] Boards

The following diagram shows the location of all replaceable boards in the Edge [ii] Controller.
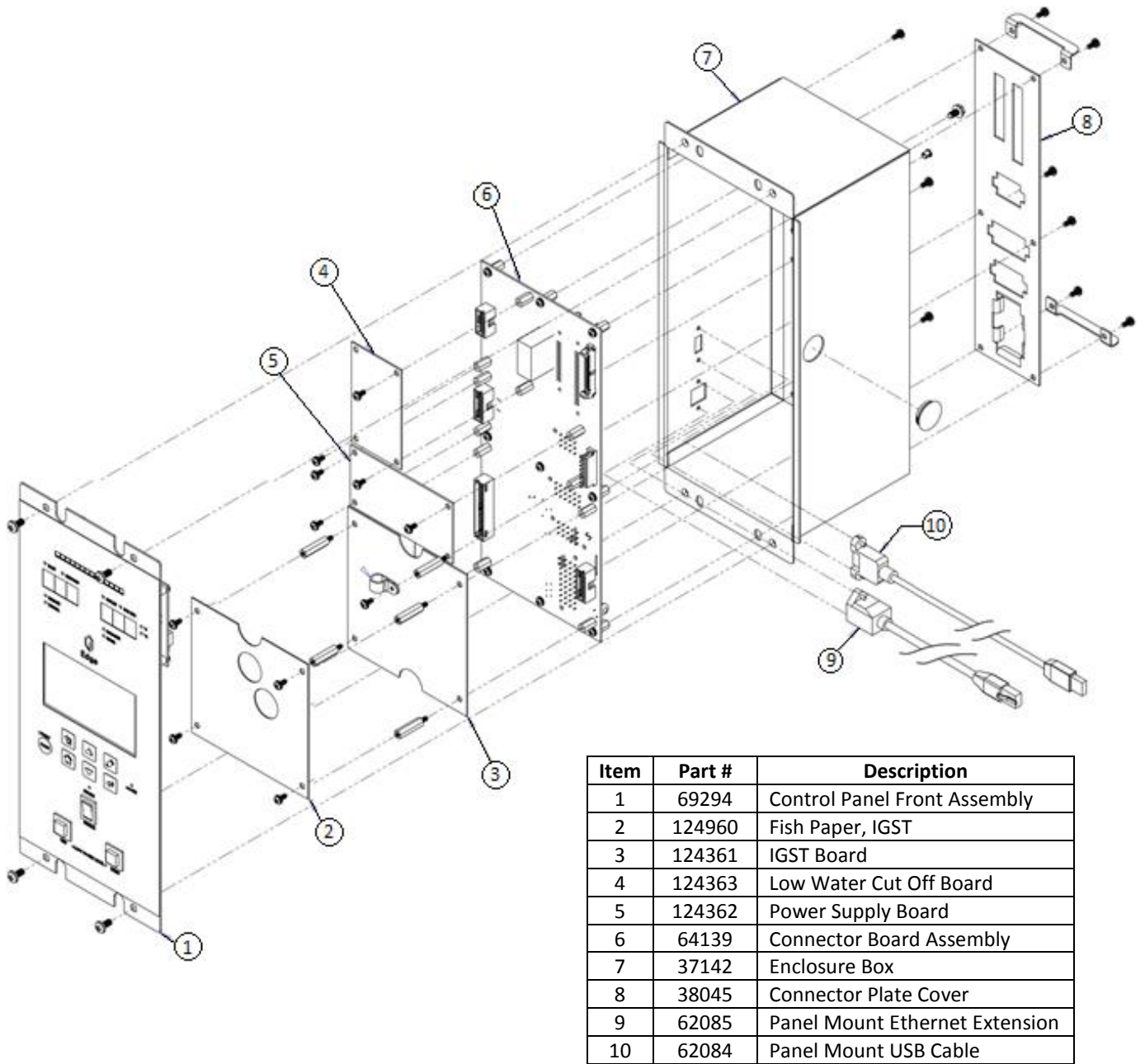
Item	Part #	Description
1	69294	Control Panel Front Assembly
2	124960	Fish Paper, IGST
3	124361	IGST Board
4	124363	Low Water Cut Off Board
5	124362	Power Supply Board
6	64139	Connector Board Assembly
7	37142	Enclosure Box
8	38045	Connector Plate Cover
9	62085	Panel Mount Ethernet Extension
10	62084	Panel Mount USB Cable

Figure 7 – Edge [ii] Controller (P/N 69344-1) - Exploded View

4.1   Edge [ii] Board Replacement

Complete the instructions below to open the Edge [ii] Controller and replace one or more of its boards.

4.1.1   Replacing the Edge [ii] Front Panel and/or Its Components

The instructions below replace the entire front panel or its individual components.

1. Remove the four screws or bolts attaching the Front Panel to the Controller's Enclosure Box.

2. Carefully pull the Front Panel away from the Controller's body. **Be careful to avoid pulling on the ribbon cable and electrical cables** connecting the Front Panel to the boards inside the Controller.

3. Reverse the Front Panel, as shown below. It consists of the following components:

   - Control Panel Front Assembly (Kit **69333-TAB** or **69353-TAB**)
   - Interface Board (Kit **64131-1**)
   - 7 Segment Board (Kit **P/N 64113-1**)
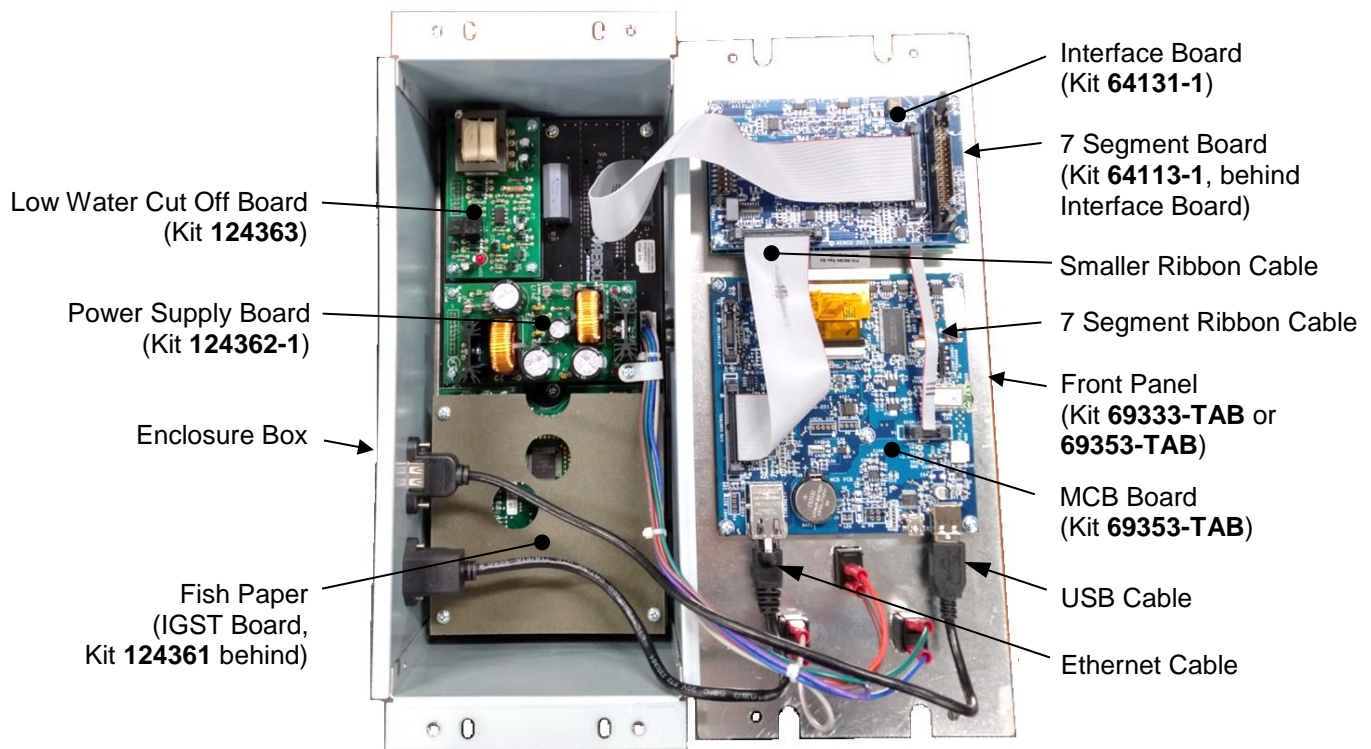   - MCB Board (Kit **69353-TAB**)

Figure 8 – Edge [ii] Controller – Opened

4. Carefully note where all electrical connectors are connected, then disconnect them and the ribbon cable(s) from any board you are replacing.

5. To remove the ribbon cable(s) from any board, pull the tabs back on both sides of the cable's connector, then pull the connector up and off the pins on the board.

REASSEMBLY NOTE:

To reattach the smaller ribbon cable (see Figure 8) to the Interface Board, push the tabs half way closed before pressing the ribbon cable's connector down on the pins. If the tabs are fully open, the connector won't seat properly. Once fully seated, close the tabs over the connector.

6. Remove the screws holding the board(s) you are replacing. Note the following:

    - If you are replacing the 7 Segment Board, you must first remove the Interface Board.

    - If you are replacing the Interface and/or MCB Board, you **_must_** set the DIP switches on the new board(s) to the same positions as on the original board(s).

4.1.2 Replacing Other Edge [ii] Components

The instructions below replace the components inside the Enclosure Box:
- IGST Board, Kit **124361-1**
- Power Supply Board, Kit **124362-1**
- Low Water Cut Off Board, Kit **64139-1**)

1. Complete the instructions in the previous section to remove the Front Panel, exposing the interior of the Enclosure Box.

2. Carefully note where all electrical connectors are connected to the board(s) you are replacing, then disconnect the ribbon and electrical cables attached to the board (s).

3. To replace the Power Supply Board (Kit **124362-1**) and/or Low Water Cut-Off Board (Kit **124363-1**), remove the screws mounting them to the Connector Board, then remove the board(s).

4. To replace the IGST Board (Kit **124361-1**), remove the screws holding the Fish Paper in place (see Figure 8, above), then remove the four (4) Hex Stand-offs on which the Fish Paper is mounted. The IGST Board can then be lifted out of the Enclosure Box.
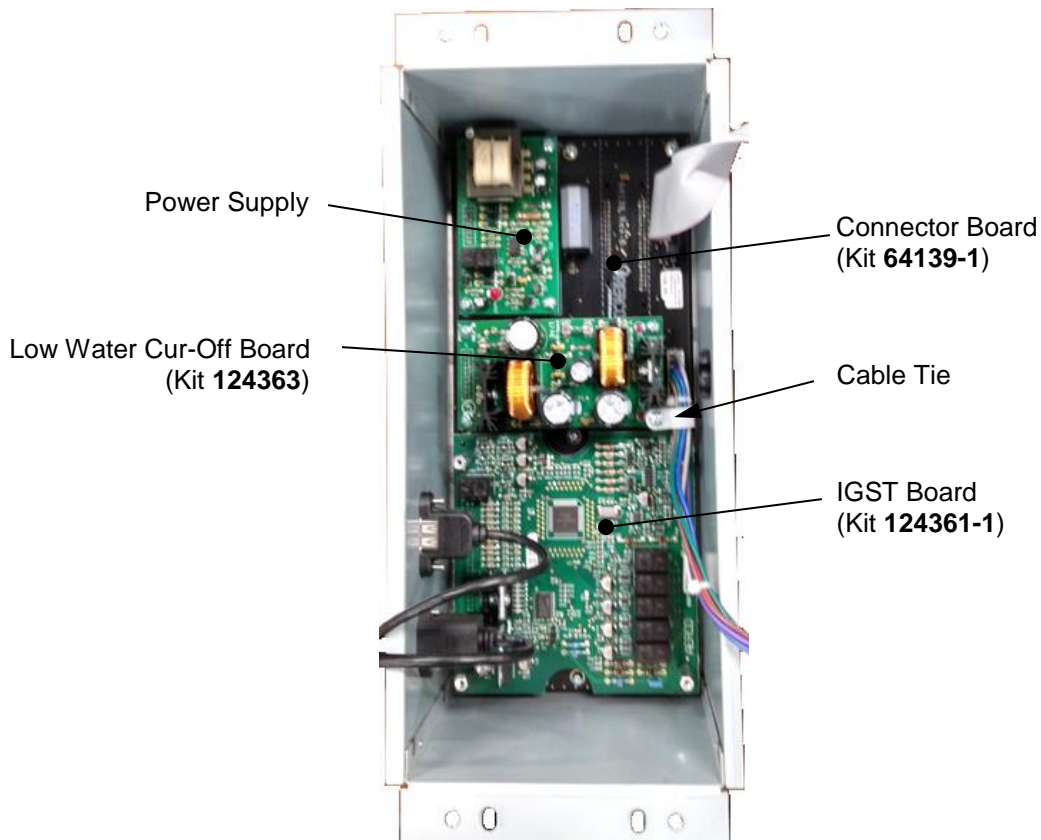

Figure 9 – Edge [ii] Controller – IGST Board Exposed

4.1.3 Replacing the Edge [ii] Connector Board

The instructions below replace the Edge [ii] Connector Board (Kit **64139-1**). These instructions require removing the Edge Controller from the unit.

1. Label all cables connected to the back of the Edge Controller, then disconnect all cables.

2. Remove the four (4) screws or bolts holding the Edge Controller to the front face of the unit, then pull the Controller out of the unit and lay it on a clean, flat surface.

3. If you have not already done so, remove the IGST Board, the Power Supply Board, and the Low Water Cut-off Board from the Controller, as described in the previous section.

4. Remove the screw from the cable tie (see Figure 9, above), then disconnect the connector from the Power Supply Board.

> **REASSEMBLY NOTE:**
> The connector must be reinstalled in the same orientation as it was originally, with the **brown** wire <u>above</u> the others.

5. Unplug the USB and Ethernet cables from the MCB Board (see Figure 8, above). NOTE: the Ethernet cable has a plastic tab that must be pushed down before the cable can be removed.

6. Once all electrical connections have been disconnected, set the Front Panel aside.

7. Turn the Controller on its left side (USB and Ethernet ports down), then remove 8 (eight) of the nine (9) screws from the Controller's back surface holding the Connector Board in place.

Figure 10 – Edge [ii] Controller – Back Panel

8. Place one hand inside the Enclosure Box on the Connector Board, then remove the last of the nine (9) screws holding the Connector Board in place. This step disconnects the Connector Board from the Enclosure Box, so be sure it is supported before removing the last screw.

9. Tilt the Connector Board up and over the USB and Ethernet connectors inside the Enclosure Box, then remove the board.

10. When reinstalling the new Connector Board:

    a) Place the Enclosure Box flat on its back.

    b) Tilt and lower the new Connector Board in place.

    c) Once in place, hold the Connector Board in place with one hand while you tilt the Enclosure Box on its left side and reinstall the nine (9) screws removed in Steps 7 and 8. Start with the 3 (three) screws on the bottom row (see Figure 10, above), as this will simplify reinstalling the remaining six (6).

    d) Reinstall the boards removed above.

    e) Reconnect all electrical connections and ribbon cables.

11. Reinstall the Edge Controller in the unit and reconnect the cables disconnected in Step 1.

Change Log:		
Date	**Description**	**Changed by**
1/8/2020	**Rev A**: Initial release (reference DIR 18-73, PIR 1434-23)	