iQUBE³® Digital Junction Box

Quick Start Guide

The iQUBE³ Digital Junction Box is compatible with a variety of Rice Lake Weighing System indicators and remote displays. This document provides instructions for wiring and configuring the iQUBE³ and 1280 with RS 232 communication.

Manuals are available from Rice Lake Weighing Systems at **www.ricelake.com/manuals**
Warranty information is available at **www.ricelake.com/warranties**

The following steps must be followed to configure the iQUBE³.

1.0 Configure iQUBE³ Hardware

1.1 Identify iQUBE³ Boards, Ports and Switches

All iQUBE³ builds must have one CPU Board . Optional iQUBE³ 4 channel boards may be added to increase load cell connectivity.

This information is also available on the label affixed to the inside cover of the iQUBE³.

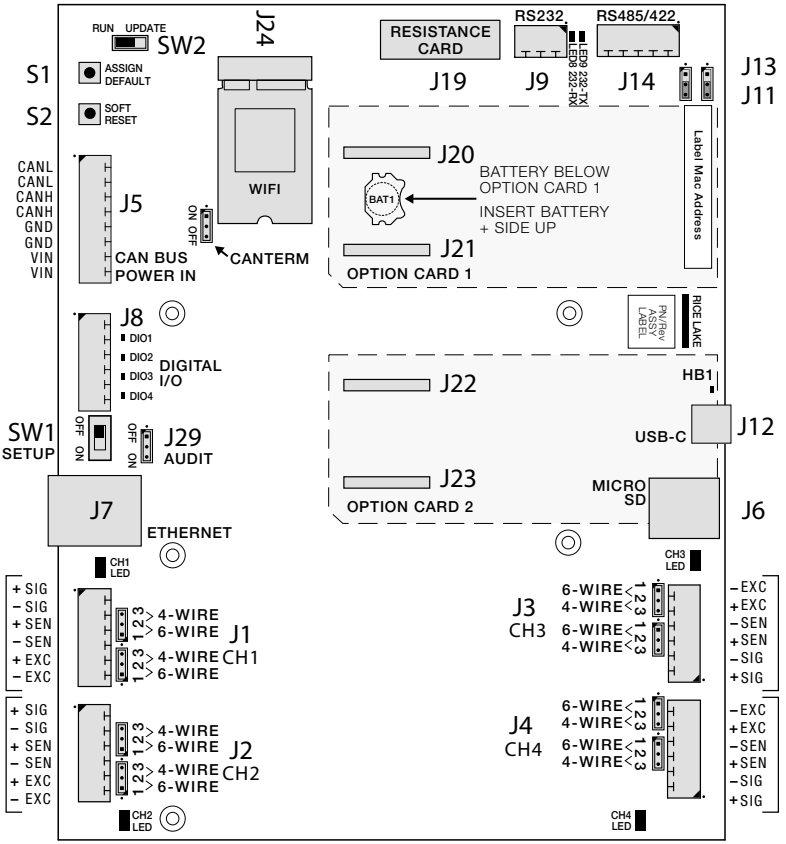


Figure 1. iQUBE³ CPU Board

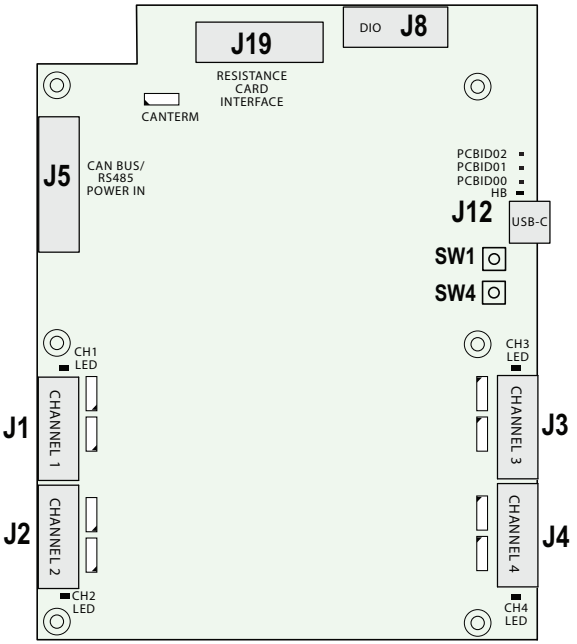


Figure 2. iQUBE³ 4 Channel Board

LEDs	CPU Board	4 Channel Board	Function
4 channel Board PCBID LEDs	No	Yes	Lit LEDs signify assigned board number • Board 1 = PCBID00 • Board 2 = PCBID01 • Board 3 = PCBID00 and PCBID01 • Board 4 = PCBID02 • Board 5 = PCBID02 and PCBID00
HB1	Yes	Yes	LED blinks green when firmware is running
Channel LEDs	Yes	Yes	• Only used in Weigh Mode • LED lights green when Cell is assigned to a scale and connected without error • LED lights red when cell is assigned to a scale with a diagnostic error • LED are off when channel is not associated with any scale and/or not being used.

Table 1. CPU and 4 Channel Board LEDs

iQUBE³ J9	1280 Serial Port
Pin1 - GND	Pin1 - GND
Pin2 - RX	Pin2 - RX
Pin3 - TX	Pin3 - TX

Table 2. Wiring for RS-232

iQUBE³ J14	1280 Serial Port
Pin1 - ISOGND	Pin1 - ISOGND
Pin 2 - N/A	Pin 2 - N/A
Pin 3 - N/A	Pin 3 - N/A
Pin 4 - + (TX+)	Pin 4 - (Z)
Pin 5 - – (TX–)	Pin 5 - (Y)

Table 3. Wiring for RS-485 2-Wire

iQUBE³ J14	1280 Serial Port
Pin1 - ISOGND	Pin1 - ISOGND
Pin 2 - RX– (B)	Pin 2 - RX– (B)
Pin 3 - RX+ (A)	Pin 3 - RX+ (A)
Pin 4 - TX– (Z)	Pin 4 - TX– (Z)
Pin 5 - TX+ (Y)	Pin 5 - TX+ (Y)

Table 4. Wiring for RS-485 4-Wire

Switch/ Jumper	Description
SW1	OFF normal operation ON setup mode
S1	Board assignment/sequence Load cell assignment System default
S2	Soft reset per board (not system reset)
J29	ON enables regulatory audit trail OFF disables audit trail
CANTERM	ON for the two endpoints OFF for midpoints

Table 5. CPU Board Jumper Pin and Switch Guide

Load Cells	4-Wire	6-Wire
Pins 1 and 2 or no shunt	N/A	Yes
Pins 2 and 3	Yes	N/A

Table 6. Load Cell Sense Jumper Pins J30-33 and J15-18

Port	Connector	CPU Board	4 Channel Board	More Information
J1- J4	Load Cell Connections	Yes	Yes	Section 1.3 on page 6
J5	Can Bus/Power Connector	Yes	Yes	Section 2.3 on page 5
J6	SD Card	Yes	No	See Technical Manual
J7	Ethernet	Yes	No	See Technical Manual
J8	Digital I/O	Yes	Yes	See Technical Manual
J9	RS232 Serial Port	Yes	No	Section 2.4 on page 9
J12	USB-C	Yes	Yes**	See Technical Manual
J14	RS485/422 Serial Port	Yes	No	See Technical Manual
J19	Resistance Card Connector	Yes	Yes	See Technical Manual
J20 - 23	Option Cards	Yes	No	See Technical Manual
**For programming purposes only				

Table 7. CPU and 4 Channel Board Connections

1.2 Ground Cables to Enclosure

Except for the power cord, all cables routed through the cord grips must be shield grounded on the ground shield bracket. Remove the insulated jackets and shielding per the following instructions.

Shielding Procedure

1. Route the cables through the cord grips and the shielding clamps to determine the cable lengths required to reach the appropriate cable connectors.
2. Mark cables to remove insulated jacket as described below under Foil Shielded Cables and Braid Shielded Cables.

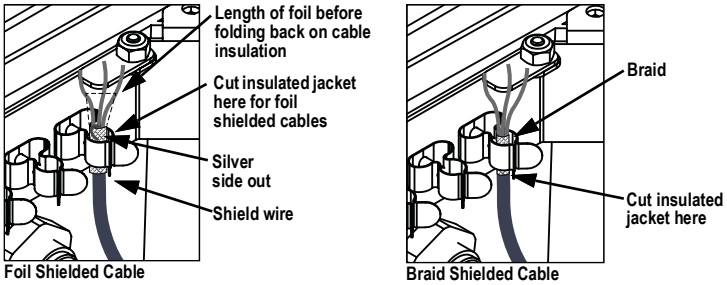


Figure 3. Cable Shielding

Foil Shielded Cables

1. Strip the insulated jacket and foil 1/2 in (15 mm) past the shielding clamp.
2. Strip another 1/2 in of the insulated jacket, leaving the foil shielding exposed.
3. Fold the foil shielding back on the cable where the cable passes through the clamp.
4. Ensure the silver (conductive) side of the foil is turned outward.
5. Wrap the shield wire around the cable, ensuring it contacts the foil where the cable passes through the clamp.
6. Press cable into shielding clamp. Ensure cable is secure and clamp is contacting the braided shielding of the cable.

Braid Shielded Cables

1. Strip the insulated jacket and braided shielding from a point just past the shielding clamp.
2. Strip another 1/2 in (15 mm) of the insulated jacket, leaving braid exposed where the cable passes through the clamp.
3. Press cable into shielding clamp. Ensure cable is secure and clamp is contacting the braided shielding of the cable.

1.3 Wire Load Cell Cables to the iQUBE³

To attach load cell cables to the CPU or 4 channel board:

1. Route the cables through the cord grips of the enclosure.
2. Strip 1/4 in of insulation from the ends of the load cell wires and ground cable to enclosure as in Section 1.2 on page 5.
3. Install wires into load cell channels.
4. Secure the load cell cables to the enclosure with cable ties and mounts after connections are complete.
5. Ensure sense shunts are correctly placed on J30-33 and J15-18 to avoid error conditions (see Table 6 on page 4).

NOTE: If load cell has 4 wires, place shunt over pins 2 and 3. If load cell has 6 wires, remove shunt or place over pins 1 and 2. Jumpers must be placed correctly over all jumpers.

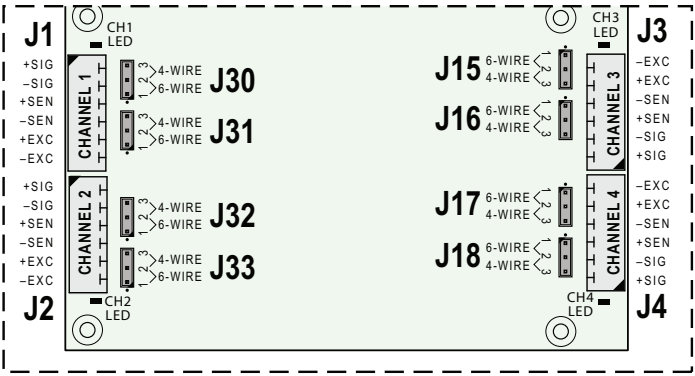


Figure 4. iQUBE³ CPU Board and 4 Channel Board Load Cell Jumper Pin Locations

NOTE: Channel LEDs light green when load cells are assigned to a scale with no errors. Channel LEDs light red when cell is assigned to a scale, but in an error state. The CPU board and the 4 channel board share the same junction numbers

When load cells are wired to iQUBE³ connectors, J1-J4 are assigned by default as channels 1-4 (5-8, 9-12, 13-16, 17-20, 21-24 for 4 channel boards).

Load Cell Connector	iQUBE³ CPU Board	iQUBE³ 4 Channel #1	iQUBE³ 4 Channel #2	iQUBE³ 4 Channel #3	iQUBE³ 4 Channel #4	iQUBE³ 4 Channel #5
J1	1	5	9	13	17	21
J2	2	6	10	14	18	22
J3	3	7	11	15	19	23
J4	4	8	12	16	20	24

Table 8. Cell Numbering for Multiple-Board System

1.4 Connect iQUBE³ to Power Supply

Connect the power supply and a single point ground to the iQUBE³ CPU board J5 board.

J5 Pin	J5 Pin	Signal
1	CN_L	OPEN
2	CN_L	To optional 4 channel board
3	CN_H	OPEN
4	CN_H	To optional 4 channel board
5	GND	Power supply V-
6	GND	To optional 4 channel board
7	PR_IN	Power Supply V+
8	PR_IN	To optional 4 channel board

Table 9. CPU board J5 Pin Assignments

1.5 Wire Multiple iQUBE³ Boards Together

- Connect up to five iQUBE³ 4 channel boards sequentially via the J5 connectors on each board with either EL147 cable or CAT6 cable.
  - Wire J5 connectors in parallel from the iQUBE³ CPU board J5 to the J5 connector of each 4 channel iQUBE³ board. Figure 5 displays an example for wiring multiple iQUBE³ boards.
  - Parallel: CN_L to CN_L, CN_H to CN_H, GND to GND, PR_IN to PR_IN
- Place shunt over pins 1 and 2 of the CANTERM jumper of the first and last boards in the sequence. Remove CANTERM jumper from all boards in between the first and last board.

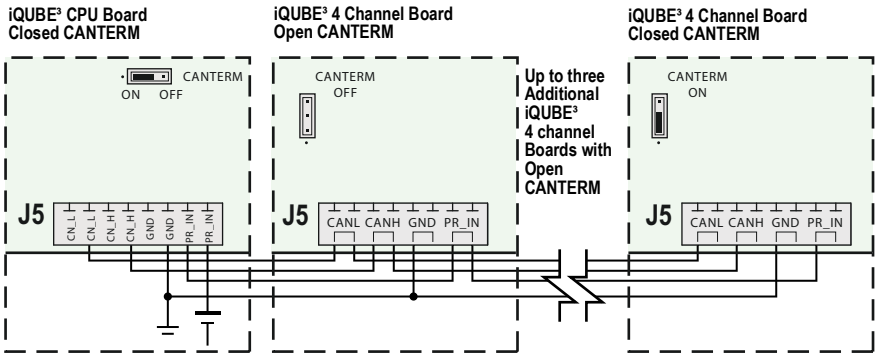


Figure 5. J5 CANBUS Wiring

1.6 Wire Serial RS-232 Connection between iQUBE³ and Indicator

Wire an RS-232 connection from the 1280 serial port to the J9 serial port pin (see Table 10 and Figure 1 on page 2).

J9 Pin	Signal
1	GND
2	Rx
3	Tx

Table 10. Port 1: J9 RS-232 Pin Assignments

2.0 Configure iQUBE³ Firmware

2.1 Enter 1280 Configuration Mode from Weigh Mode

1. Press ≡ in upper right corner of the 1280 Weigh Mode screen.
2. Press **Configuration** to enter 1280 Configuration mode.

2.2 Configure 1280 to Communicate with iQUBE³

1. Enter ***1280 Configuration Mode*** (see Section 2.1).
2. Press **Communication** to enter the ***Communication*** menu.
3. Select **Input Type.** ***Input Type*** options display.
4. Select **iQUBE³** and press **DONE**.
5. Select **Port Type.** ***Port Type*** options display.
6. Select **RS-232** and press **DONE**.

NOTE: Serial Port 1 is the default displayed menu choice. If the iQUBE³ is connected to a different serial port, select the Serial Port 1 drop-down menu and then select the connected port from that drop-down menu. The selected port's configuration settings will be displayed to the right.

2.3 Configure iQUBE³ Scale in 1280

1. Enter 1280 Configuration Mode (see Section 2.1).
2. Press **Scales.** ***Format*** interface displays.
3. Press the edit scale icon at the top of the screen. ***Scale Kind*** options display.
4. Select **iQUBE³ Scale.** ***Select Scale Hardware*** options display.
5. Select ***Connection : Port1 : Scale1***.

NOTE: The default Scale Hardware type reads as "Connection: Port 1: Scale 1". This refers to the connected serial port and specified scale. Select connected 1280 serial port.

6. Press **DONE**. iQUBE³ is set as Scale 1.
7. Press **DONE** again. iQUBE³ ***Setup*** menu displays.

NOTE: See the 1280 Technical Manual for more information on scale setup. Settings can be made to the iQUBE³ independently of setting it as the scale kind. The 1280 must be set to the iQUBE³ scale kind for the indicator to read weight from the iQUBE³.

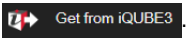
2.4 Enter iQUBE³ Setup Mode

1. Enter 1280 Configuration Mode (see Section 2.1 on page 9).
2. Press **Scales** to enter the ***Scales*** menu.
3. Select **iQUBE³ Setup**. ***iQUBE³ Setup*** prompt displays.
4. Press **YES** to enter setup. ***iQUBE³ Setup*** user interface displays.

2.5 Test Communication Between iQUBE³ and 1280

1. Enter iQUBE³ Setup Mode (see Section 2.4).
2. Select **Test iQUBE³ Connection**. ***Test iQUBE³ Connection*** prompt displays.
3. Press **OK**.
4. If iQUBE³ connection is successful, ***Successfully connected to iQUBE³ with serial number XXXXXX*** displays.
5. Press **OK**.

2.6 Get Configuration From iQUBE³

1. Enter iQUBE³ Setup Mode (see Section 2.4).
2. Select 

. ***Get Configuration from iQUBE³*** prompt displays.
3. Press **YES**. iQUBE³ sends configuration to the indicator.

2.7 Auto Assign 4 Channel Boards

Perform 4 channel board Assignment Auto Assign ProcedureiQUBE³.

1. Enter iQUBE³ Setup Mode (see Section 2.4).
2. Press **Base**. ***Board Assignment*** menu displays.
3. Select **Start Auto Assign Procedure** in board assignment menu. The iQUBE³ scans for and recognizes available 4 channel boards.

2.8 Set Load Cell Capacity and Factory Sensitivity

1. Enter iQUBE³ Setup Mode (see Section 2.4).
2. Press **Base**. ***Base Menu*** Displays in blue on the left of the screen.
3. Select **Load Cells** in Base Menu. ***Load Cell*** menu displays.
4. Select **Capacity** in load cell menu. Input screen displays.
5. Enter the specified ***Load Cell Capacity*** and press **DONE**.
6. Select **Factory Sensitivity**. Input screen displays.
7. Enter the specified ***Factory Sensitivity*** and press **DONE**.
8. Press **Apply to all Load Cells** below ***Load Cell*** menu.

2.9 Assign Load Cells to Scale

1. Enter iQUBE³ Setup Mode (see Section 2.4 on page 9).
2. Press **Base** in left side menu. ***Base Menu*** displays in the left column.
3. Select **Load Cell Assignment** in ***Base Menu*** in the left column.
4. Press drop down and select ***Scale #1***.
5. Press **Assign** next to each load cell to assign to the scale.
6. Press **Up** or **Down** to arrange load cell locations.
7. Return to step 5 and select Scales 2 through 4 if needed to repeat ***Load Cell Assignment*** for additional scales.

2.10 Configure iQUBE³ Scale

1. Enter iQUBE³ Setup Mode (see Section 2.4 on page 9).
2. Press in left side menu. ***Scales Menu*** displays in the left column.
3. Select **General** in ***Scales Menu*** in the left column.
4. Press drop down and Select ***Scale #1***.
5. Select **Full Scale Capacity** in the right column. Input screen displays.
6. Enter the specified **Full Scale Capacity** and press **DONE**.
7. Select **Formatting** in ***Scales Menu*** on the left column.
8. Select **Decimal Position**. Decimal Position option list displays.
9. Select specified decimal position and press **DONE**.
10. Select **Display Divisions.** ***Display Divisions*** option list displays.
11. Select specified ***Display Division*** and press **DONE**.
12. Repeat ***Scale Configuration*** from step 4 for Scales 2 through 4 if needed.

2.11 Send Configuration to iQUBE³

1. Select Send to iQUBE3. ***Send Configuration to iQUBE³*** prompt displays.
2. Press **CONFIGURATION**. 1280 send configuration to iQUBE³.
3. Press Back to 1280 Setup. ***1280 Configuration Menu*** displays.

3.0 Perform Standard Calibration

Each calibration completely overwrites any previous calibration settings.

1. Enter 1280 Configuration Mode (see Section 2.1).
2. Press **Scales.** ***Format*** interface displays.
3. Select **Calibration.** ***Calibration Screen*** displays.
4. Press **Calibrate Scale**. ***iQUBE³ Scale Calibration*** menu displays.
5. Select ***Standard Calibration*** and press **Next>.**
6. Select ***Chains/Hooks are NOT used during calibration*** and press **Next>**.
7. Remove all test weights from the scale.
8. Press **Calibrate Zero**. ***Zero Calibration Complete*** displays.
9. Press **Next>**. ***Calibrate Span*** prompt displays.
10. Press 123... ***Calibration Weight*** entry prompt displays.
11. Enter the calibration weight for the test weight and press **DONE**.
12. Place test weight on the scale.
13. Press ***Calibrate Span***. Indicator calibrates Span.
14. Press **Next>**. ***Calibration Results*** display.
15. Press **Finish**. ***Calibration Screen*** displays.
16. Press **Save and Exit**. Indicator returns to ***Weigh Mode***.

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