

ShelfX Installation Guide



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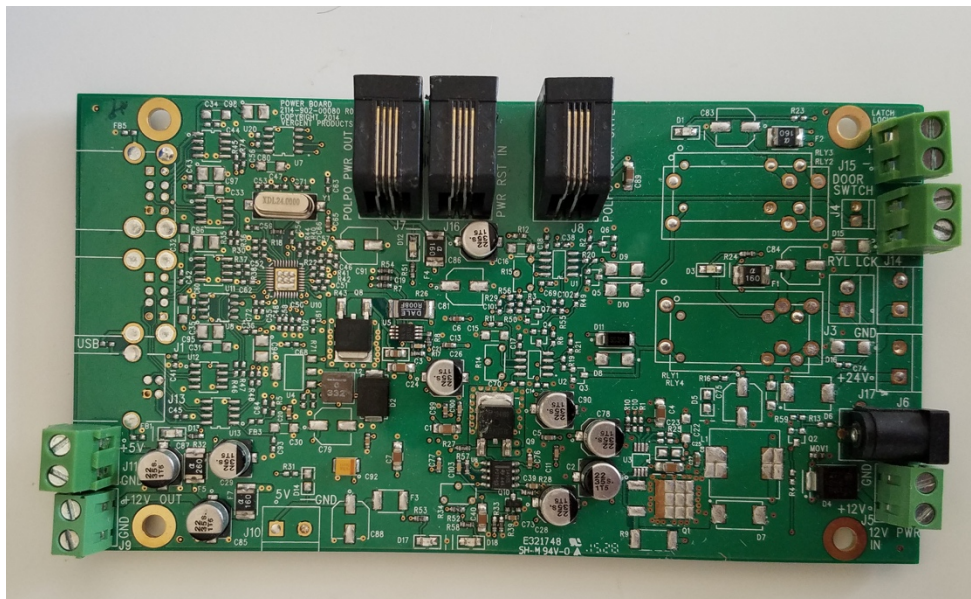
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Terminology and ShelfX Devices

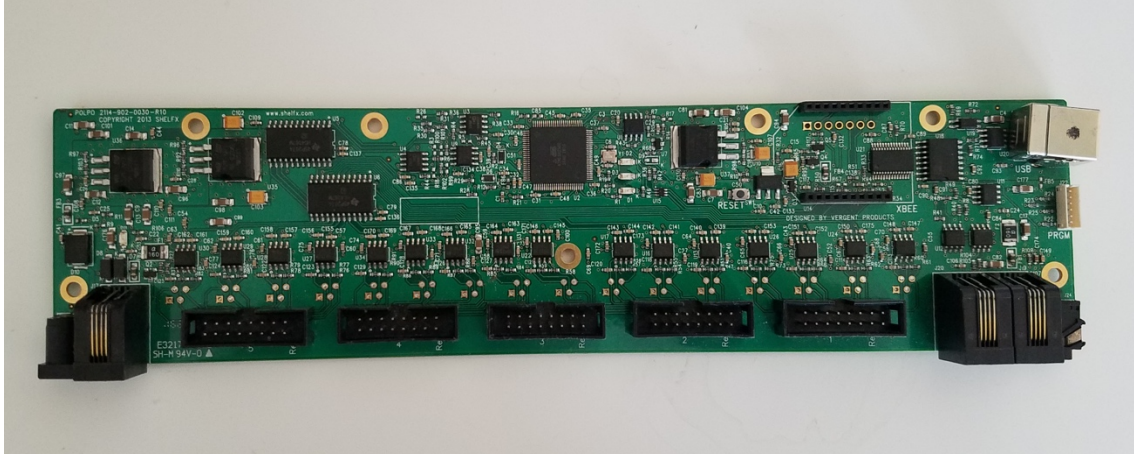
All of our hardware is proprietary and was designed by ShelfX. Since these devices are unique to our system, this section will go over terminology that we use for all of our hardware and across our system.

Boards and Devices:

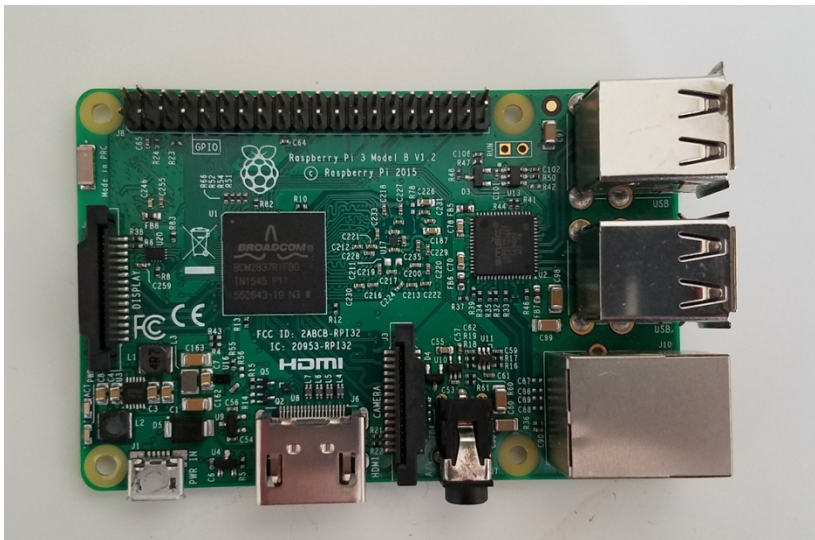
The ShelfX hardware kits have 3 electronics boards inside. The smallest is the Raspberry Pi, the CPU. The larger rectangular, almost square board, is the powerboard. The longer, thin rectangular board is our shelf connector unit (what we call the Polpo). We have several other devices that are placed inside or around the fixture itself.



Powerboard



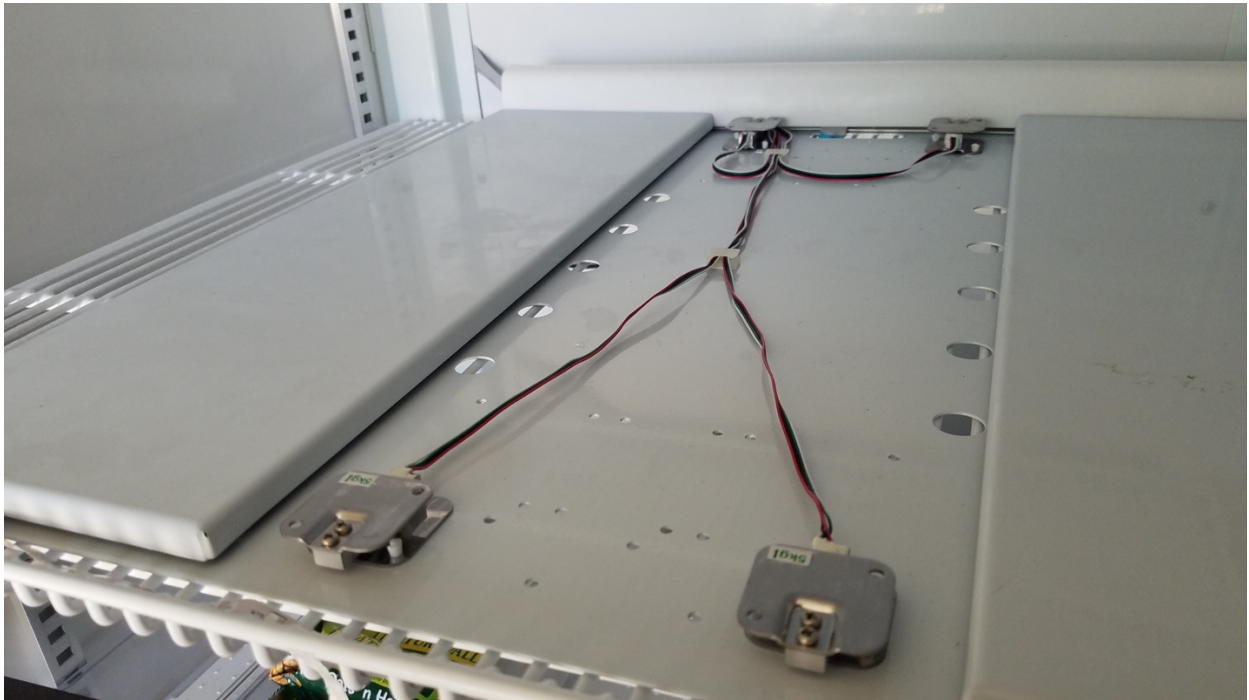
Polpo



Raspberry Pi (CPU)



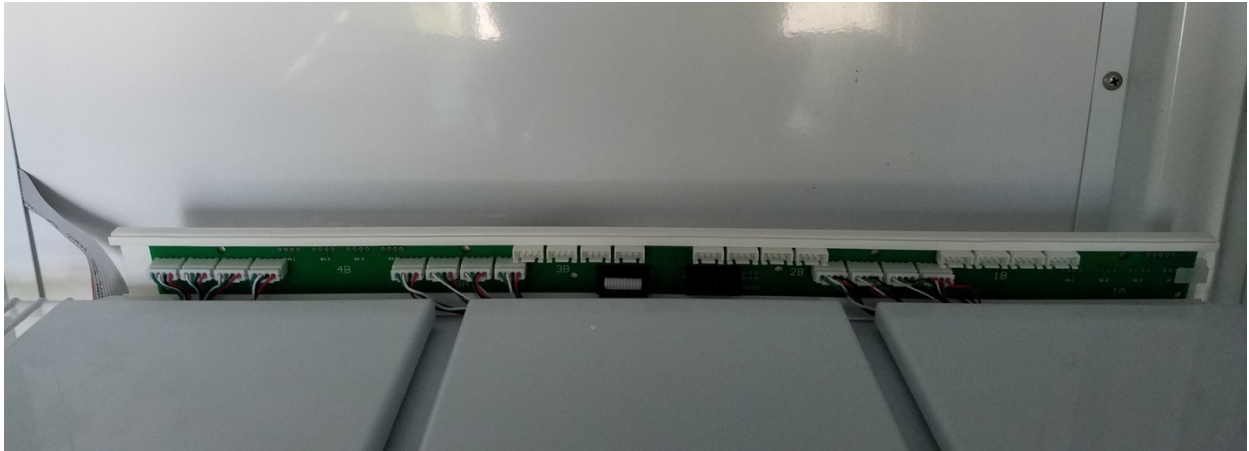
Carino



Load Cells/Sensors



Plates



Load Cell Connector Board

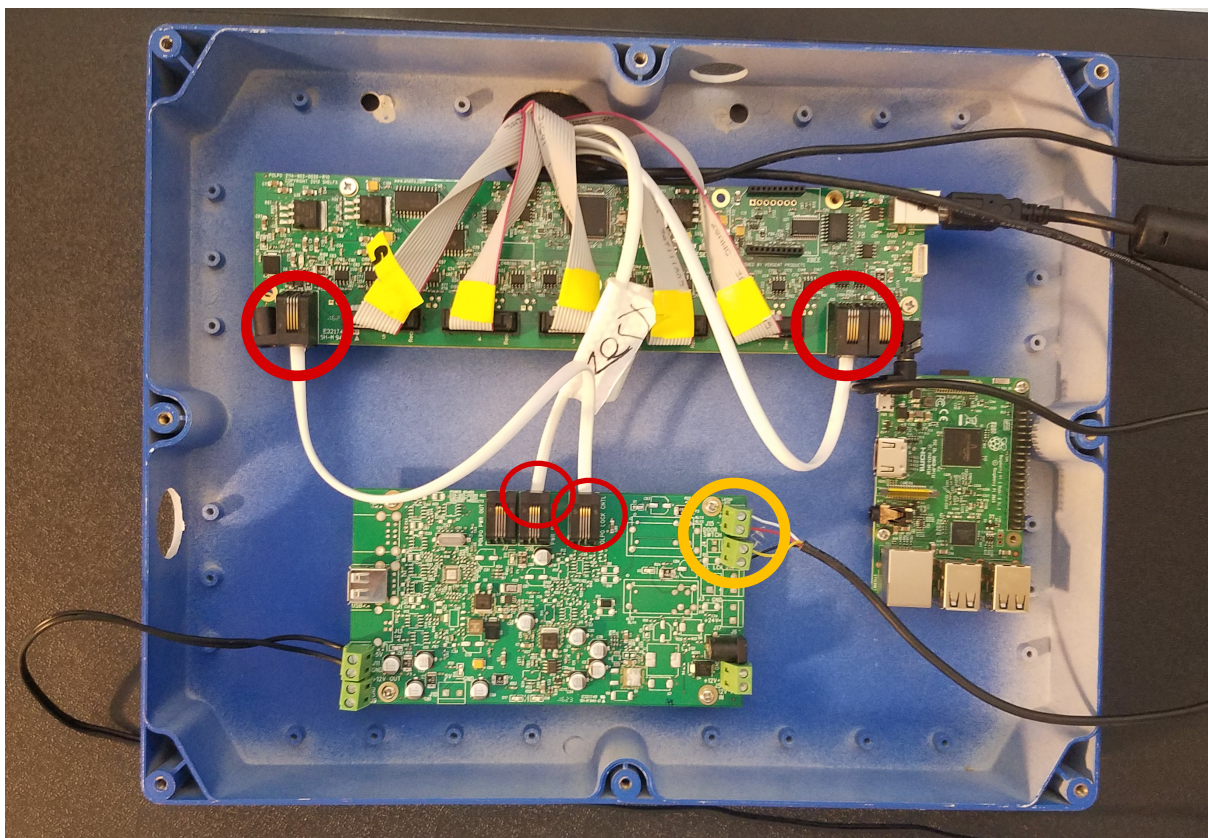


RJ9 Cable

Device Installation and Hardware Connections

Open the kit containing the main electronics for the ShelfX system and remove the three loose wires (one black, two white). The white wire that has two RJ9 heads connects the Carino to the Polpo and handles communication. Connect one side to the Polpo (top right circle) and the other side to the back of the Carino. The other white wire connects the powerboard to the Carino (bottom left) and is a power-reset wire used to reset the system if the connection is down. Place the RJ9 head in the powerboard (bottom left circle) and the other connector into port 1 on the back side of the Carino (it is covered by a small rubber seal that can be lifted up).

Connected to the powerboard should be a third RJ9 wire that runs from the powerboard to the Polpo (bottom right circle). This controls the lock mechanism for the machine.



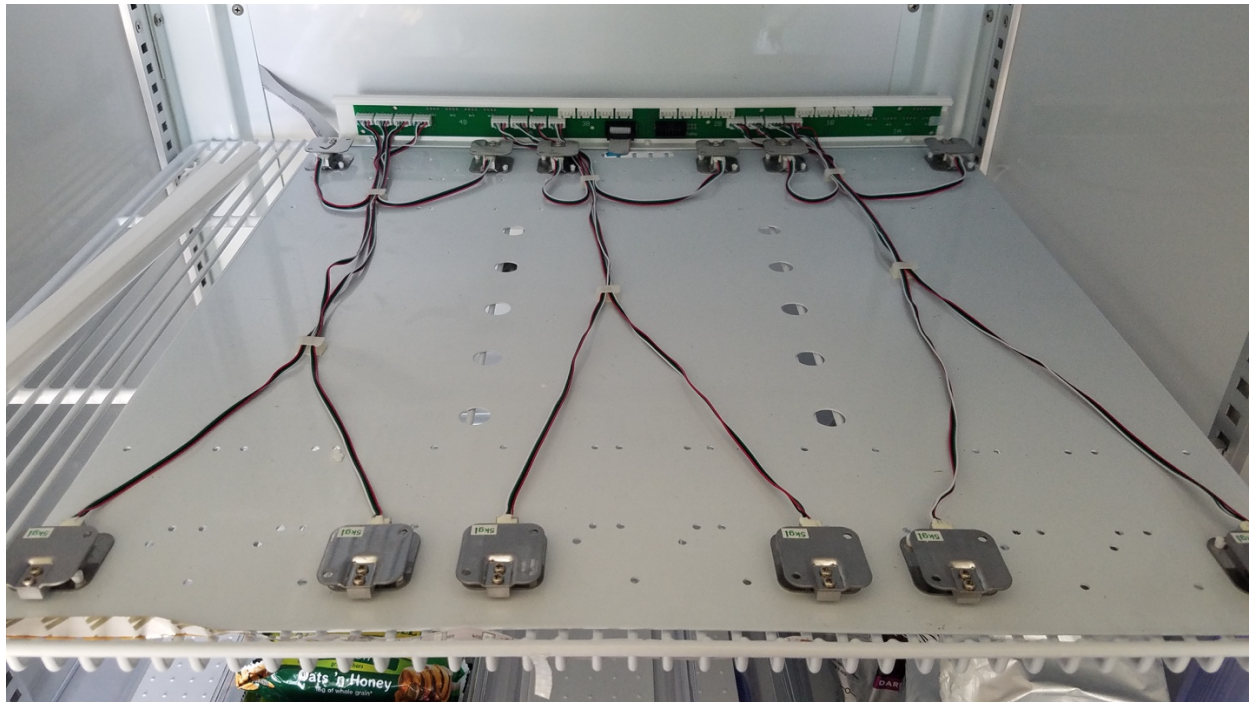
The final, black wire should be wired directly to the powerboard (yellow circle). The connector holes can be unscrewed and the ends of the four wires can be connected directly to the board. This wire controls the lock mechanism and the door sensor. Note: These connectors have a label just above them that reads 'Door Switch'. These are separate connectors from the top of the power board, which are 5v and 12v outputs that can feed power to different electronics directly.

Finally, connect the USB end of the micro-USB wire to the powerboard USB port at the top. This will then be connected to the Raspberry Pi and provide a 5v power source for the CPU. The Pi will then be connected via a USB cable to a silver connector on the corner of the Polpo, which controls all of our communication to the system inside the unit.



Shelf Connections

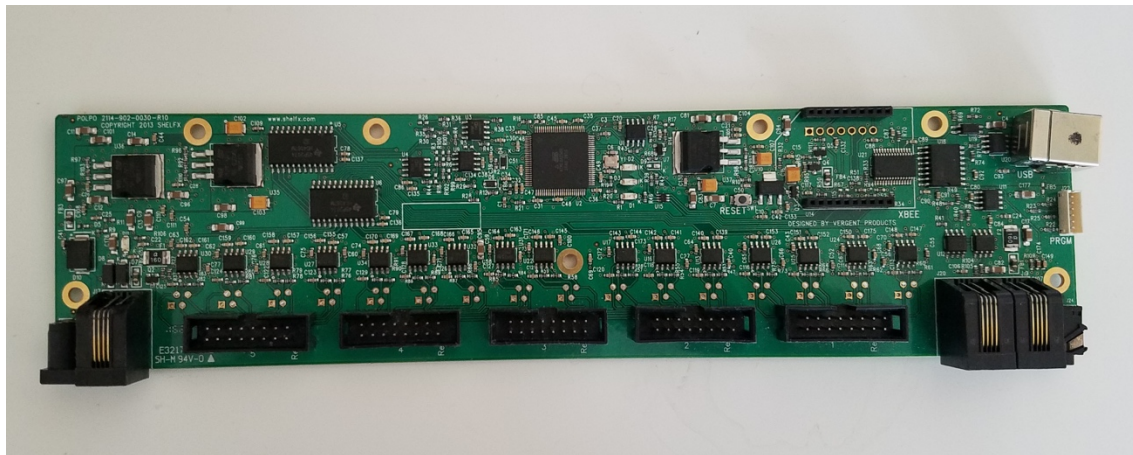
Each row of shelves has a dedicated load cell connector board and a grey flat ribbon cable that runs from that board to the Polpo. On the center of the connector board, the left black connector (A) corresponds to the lower 3 or 4 series of white connectors that connect to each load cell. The right black connector (B) corresponds the upper series of white connectors.



The flat ribbon connector then connects to the Polpo where we then map each connection to a corresponding set of load cells. The white connectors map to ports on the Polpo, so, for instance, if the Polpo is mapped to ports 16, 15, 14, then the left most shelf will be connected to port 16, the center port 15, and the right, port 14.

Polpo Mapping

Depending on the layout of your fridge, you will connect the flat ribbons to the Polpo in one of two ways. For fridge layouts with 4 or less rows of shelves, the ribbons go into connectors 5, 4, 2, and 1, leaving connector 3 in the middle open, and then can be mapped according. These connectors respond to these ports respectively [16, 15, 14, 13], [12, 11, 10, 9], [8, 7, 6, 5], [4, 3, 2, 1].



If you have 5 rows of shelves, a fifth flat cable can be placed into connector three and the corresponding port layout will be [16, 15, 14], [12, 11, 10], [13, 9, 5], [8, 7, 6], [4, 3, 2].

For fridges that will have more than 16 sets of plates and load cells, a second Polpo can be added and the layout will remain exactly the same with the second board.

Credit Card Readers and Other USB Devices

Any USB device that you will be using with these machines – whether they are credit card readers, fingerprint scanners, numeric keyboards, or 4G USB dongles – will plug into the USB ports on the Raspberry Pi. Some devices require a reset of the electronics in order to function.

On the ShelfX website where you manage your machine settings, also make sure to click the checkbox for your USB devices (such as credit card readers) and 'Sync' the fridge to update the settings.