



## JEA

Advanced Energy Management Temperature Controller  
with Built-in Display and Connectivity

## USER MANUAL

Important: This manual contains important safety instructions. Before using this product please read all instructions carefully. Keep this manual handy for reference.

Please read the following warnings to maintain the safe function and continued performance of your Sollatek device.



#### INSTALLATION

Mounting of the unit must be in accordance with orientation as specified in the "Description & Install" section. The device must only be installed and configured by trained and authorized staff as specified in the "Description & Install" section.



#### WASHDOWN

The front of the unit may be exposed to water jets. The rear of the unit must not be exposed to high pressure water jets or temporary submersion.



#### CHEMICALS

The Sollatek device is made of polycarbonate and should not be exposed to chemicals which attack this material.



#### TEMPERATURE

The Sollatek device must only be subjected to temperatures as specified in the "Technical Specifications" section of this manual.



#### VIBRATION AND IMPACT

The device MUST be installed in such a way as to be protected from impact in operation. Do not hit or drop the device.



#### NO SERVICEABLE PARTS

There are no serviceable parts inside the device. Do NOT open the housing.



#### VOLTAGES

The Sollatek device must only be connected to power supplies which comply with the acceptable voltage ranges specified in the "Technical Specification" section of this manual.



#### VOLTAGE FLUCTUATIONS AND SERGE

The Sollatek device has surge protection as specified in the "Technical Specification". Exposure to surge voltages outside these limits, or excessively repeated surges within the limits may cause damage to the electrical circuits.



#### CURRENTS

Outputs should not be connected to short circuits or to loads which exceed the currents specified in the "Technical Specification" section of this manual. Care must be taken to ensure that cables and terminations are safely terminated.



#### SEGREGATION OF POWER AND SIGNAL CABLING

Correct segregation of power and signal cabling must be followed. Do not run power and signal cables together in the same conduit. Induction from power cables may corrupt data signals, leading to incorrect operation.



#### CONSEQUENTIAL FAILURES

The Sollatek device includes features to protect both itself and connected components. However, failure of connected components may cause damage to the JEA controller and / or connected components. Critical or vulnerable components should be protected independently against failure.



#### FIT FOR PURPOSE

The Sollatek device must only be used for the purpose and functions described in this manual. As each application requires different configuration and setup, no liability is accepted by Sollatek UK Ltd for the correct operation of the final equipment.



Failure to comply with the warnings may result in the device becoming damaged leading to premature failure or unsafe operation. In extreme cases failure to comply may cause risk of electrocution or fire.



### SAFETY PRECAUTIONS

Precautions should be taken when installing or disconnecting the device. Isolate power supply before installation or servicing.

Trained and Authorised personnel only should install / service this equipment



### THE DANGERS FROM ELECTRICITY

Harm can be caused to any person when they are exposed to 'live parts' that are either touched directly or indirectly by means of some

Conducting object or material. Voltages over 50 volts AC or 120 volts DC are considered hazardous.

Most electrical accidents occur because individuals:

1. Are working on or near equipment which is thought to be dead but which is, in fact, live.
2. Are working on or near equipment which is known to be live, but where those involved are without adequate training or appropriate equipment, or they have not taken adequate precautions.
3. Misuse of equipment or use electrical equipment which they know to be faulty.

### REDUCING THE RISK OF ELECTRIC SHOCK

To reduce the risk of electric shock:

1. Install the device in an area free of conductive contaminants. Ambient temperature must not exceed 60°C.
2. Isolate the power to the device before installation, repair or removal.
3. Use tools with insulated handles.

### FIRST-AID

Before commencing any work:

1. Find out the location of a suitably stocked first-aid box
2. Find out the arrangements that exist on site for first-aid, and who is responsible for taking charge of these.



### DISPOSAL

Sollatek devices are subject to the EU directive 202/96/EC, and may also be subject to other national legislation for safe disposal of e-waste.

1. The device cannot be disposed of as municipal waste and such should waste should be collected and disposed of separately.
2. The device can be disposed of through an approved WEEE collection point, or alternatively can be returned to Sollatek UK Ltd at the end of its working life.
3. The device may contain hazardous substances, which if disposed of incorrectly may cause harm to the environment and/or human health.
4. Penalties may be applicable for incorrect disposal, as specified by local legislation.

Sollatek devices complies with EU directive 2002/95/EC (RoHS).

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## 1. INTRODUCTION

The JEA is arguably the most advanced electronic refrigeration controller / Energy Management Device (EMD) designed to provide precise reading and efficient control of multiple outputs. The interface permits different levels of control for different user groups.

The JEA has Self-learning capabilities by observing the usage behaviour of the cooler to construct a pattern/matrix of output operation for the compressor, lights, fan and defrost controls to deliver an energy-saving routine which will be the most cost-effective and extend output life.

The JEA has optional internal Bluetooth or can be connected to an external BLE device allowing remote access via the Smart Device App to authorized service personnel to access controller data logs and configure control parameters. BLE also transmits Eddystone and iBeacon for proximity marketing (nearby customer engagement).

The JEA is built to last meeting industry benchmarks and offering voltage protection to all connected outputs. A compact design allows installation even when space is tight. The Front face plates are available in various colours to fit into cooler aesthetics.



## 2. DESCRIPTION







The JEA controller consists of three main groups of features:

- The Front Display Panel with the user interface and controls.
- The Rear Connector Panel for input, output, and data cables.
- The Main Housing includes the mounting clips, mounting screws and bezel.





### 2.1 JEA FRONT PANEL - WITH DISPLAY



#### ICONS

	Bluetooth	Flashing when connected to a device, otherwise OFF
	Compressor	ON when the compressor is on, otherwise OFF
	Door	ON when the door is open, otherwise OFF
	Alarm	ON when a fault occurs, otherwise OFF
	Superfrost Mode	ON when the controller is in superfrost mode, otherwise OFF
	Eco Mode	ON when the controller is in eco mode, otherwise OFF

#### BUTTONS

	Left Button	Enter / Exit Superfrost Mode Back / Cancel
	Up button	Enter Menu List ON/OFF Mode
	Down Button	Toggle Lights ON / OFF
	Right Button	Enter/Exit Eco Mode Enter /set menu/parameter

*Note: The first digit is used as a minus sign when needed  
The display also has decimal point which is lit when needed.*

*Note: The controller acknowledges every button press with a beep.*

2.2 JEA FRONT PANEL - WITHOUT DISPLAY



LED Indicators

Green Power Icon	Yellow Comp Icon	Red Alarm Icon	Status
ON	X	X	FFA Power Supply running
ON	ON	OFF	Compressor ON (unit in On Mode)
ON	ON	ON	Compressor ON (unit in On Mode) but in under or over voltage blind time (voltage is momentarily low or high)
ON	OFF	Flashing (500mSec ON/500mSec OFF)	OFF Mode (mains voltage is bad)
ON	Cycling (500mSec ON/500mSec OFF)	Cycling (500mSec ON/500mSec OFF)	OFF Mode (mains frequency is bad)
ON	OFF	Flashing (One Second ON/One Second OFF)	Wait Mode (temperature above cut-in, waiting for time delay)
ON	OFF	Flashing (Two Seconds ON/Two Seconds OFF)	Wait Mode (temperature still below cut-in)
ON	OFF	Flashing (Four Seconds ON/Four Seconds OFF)	Defrost Mode
ON	OFF	Flashing three times (Two Seconds ON/500mSec OFF) every 10 seconds	Heater Control Mode (Winter Mode)

See Section 11. Errors & Faults for LED patterns during equipment failure events.



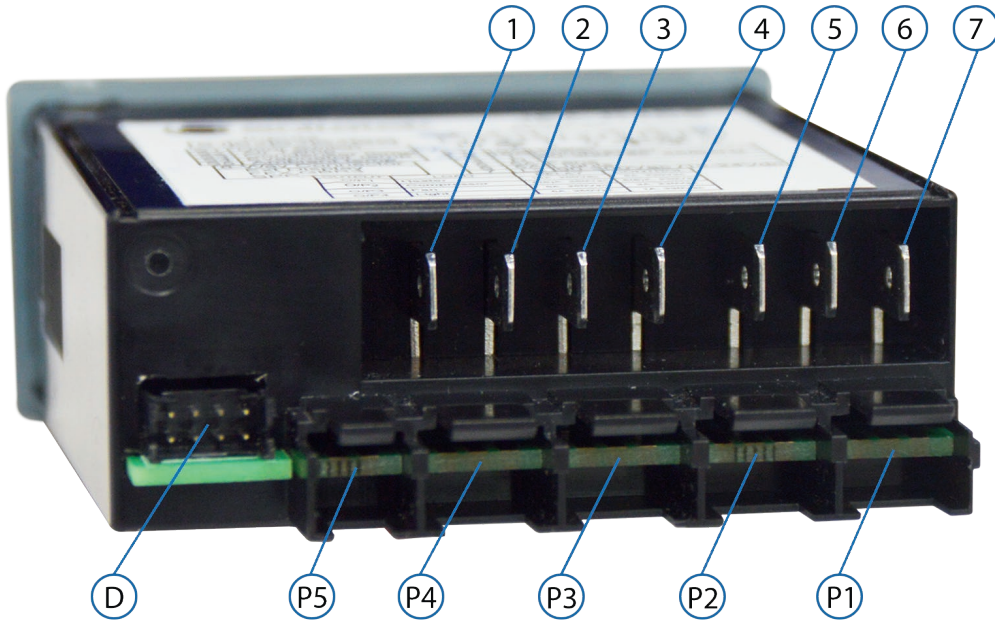
## 2.3 REAR CONNECTORS

### 2.3.1 JEA WITH 4 RELAYS



#### WARNING! MAINS CONNECTION

Risk of electrocution or damage to equipment. Ensure Mains is isolated before installation or repair of the unit or any connected equipment.



1	Heater	10 Amp Relay 90-250 VAC O/P
---	--------	--------------------------------

2	Compressor	16 Amp Relay 90-250 VAC O/P
---	------------	--------------------------------

3	Live in	90-300 VAC I/P
---	---------	----------------

4	Neutral	90-300 VAC I/P
---	---------	----------------

5	Evaporator Fan	5 Amp Relay 90-250 VAC or 0-24 VDC O/P
---	----------------	--

6	Lights	5 Amp Relay 90-250 VAC or 0-24 VDC O/P
---	--------	--

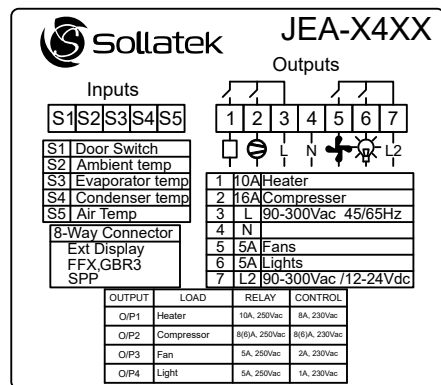
7	Live in 2	90-300 VAC or 0-24 VDC I/P
---	-----------	-------------------------------

P5	Sensor I/P	Door Switch
----	------------	-------------

P1 - P4	NTC Temperature Sensor I/P PIR Sensor Humidity Sensor	10 kΩ NTC (β <sub>25/85</sub> : 3435 k)
---------	--	--

D	Data Connector	External Display FFX Expander Port Connectivity Module
---	----------------	--

#### 4 RELAY CONNECTION LABEL ON PRODUCT



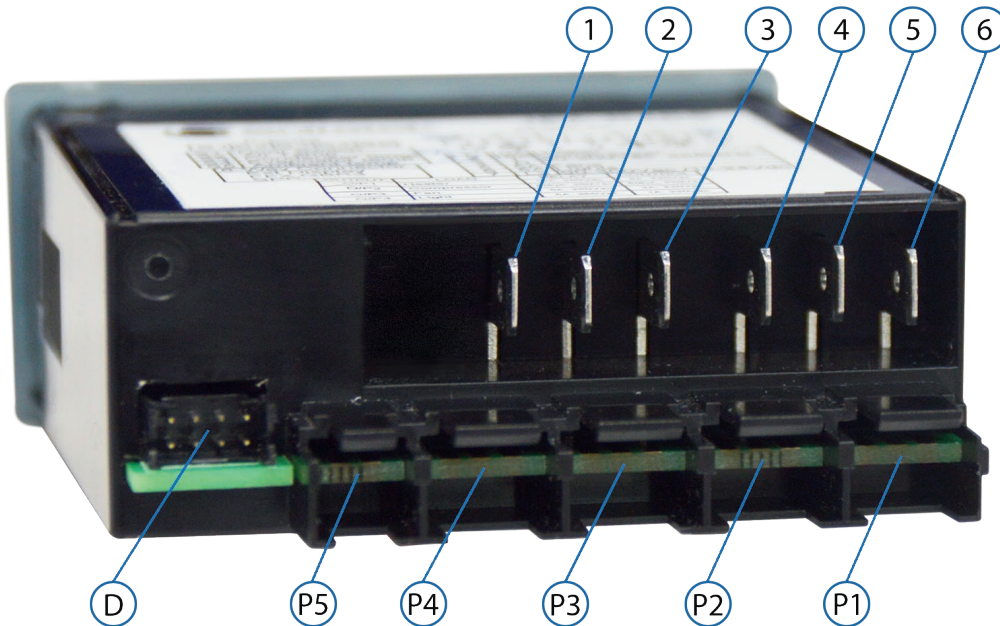




### 2.3.2 JEA WITH 3 RELAYS

#### WARNING! MAINS CONNECTION

Risk of electrocution or damage to equipment. Ensure Mains is isolated before installation or repair of the unit or any connected equipment.



1	Compressor	16 Amp Relay 90-250 VAC O/P
---	------------	--------------------------------

2	Live in	90-300 VAC I/P
---	---------	----------------

3	Neutral	90-300 VAC I/P
---	---------	----------------

4	Evaporator Fan	5 Amp Relay 90-250 VAC or 0-24 VDC O/P
---	----------------	--

5	Lights	5 Amp Relay 90-250 VAC or 0-24 VDC O/P
---	--------	--

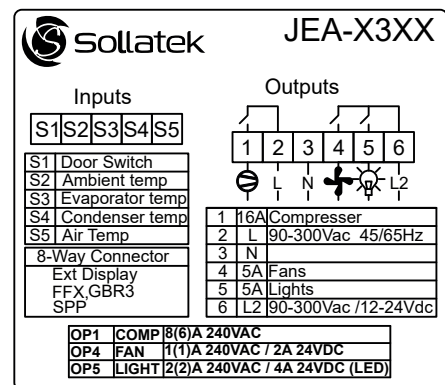
6	Live in 2	90-300 VAC or 0-24 VDC I/P
---	-----------	-------------------------------

P5	Sensor I/P	Door Switch
----	------------	-------------

P1 - P4	NTC Temperature Sensor I/P PIR Sensor Humidity Sensor	10 kΩ NTC (β <sub>25/85</sub> : 3435 k)
---------	--	--

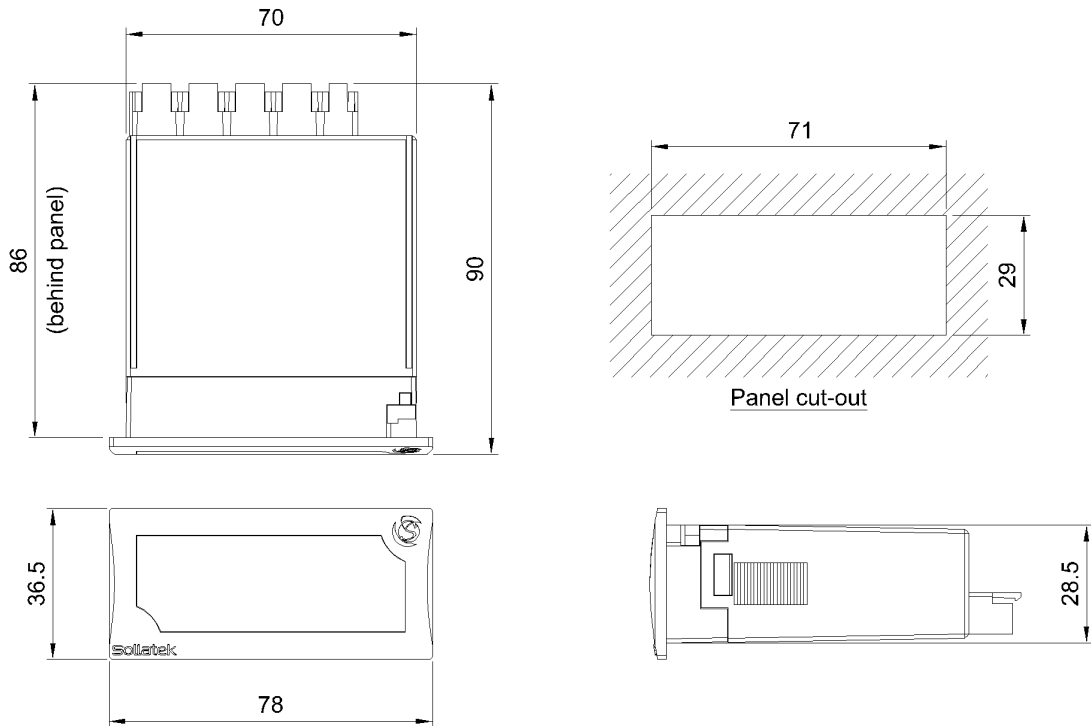
D	Data Connector	External Display FFX Expander Port Connectivity Module
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#### 3 RELAY CONNECTION LABEL ON PRODUCT



### 3. INSTALLATION

#### 3.1 DIMENSIONS AND PANEL CUT-OUT



#### 3.2 PANEL MOUNTING



**WARNING!**

Avoid installing the JEA in the following environments:

- Strong vibrations or knocks
- Exposure to continuous water spray
- Aggressive and polluting atmospheres to avoid corrosion
- Environments where explosive or mixes of flammable gases are present

1. Cut a rectangle aperture in the panel of the cooler where the display is to be located as per the panel cut diagram. Ensure the aperture is free of burrs and sharp edges.

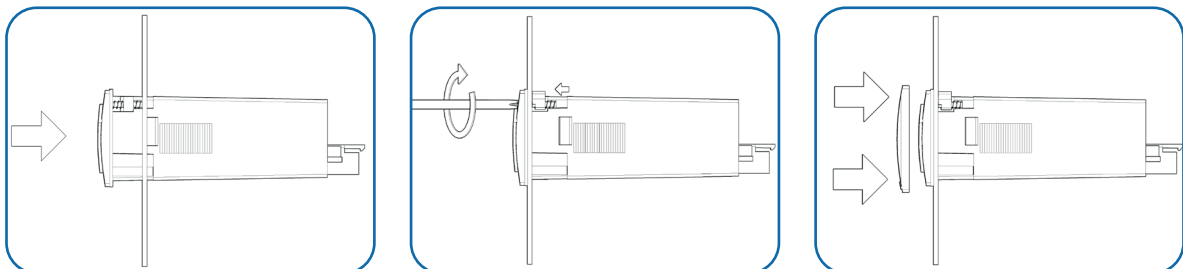
Note: The Maximum panel thickness must not exceed:

Front screw mounting: 1.6mm maximum with gasket and 3.6mm maximum without the gasket.

Side clip mounting: 6.6mm maximum with gasket and 8.6mm maximum without the gasket.

##### 3.2.1 FRONT MOUNTING

2. Remove the bezel from the front of the JEA by pulling it off. Insert the JEA from the outside (front) of the panel.
3. Tighten the screws. After turning 90o the catch will come out of its slot and press onto the panel. Tighten the screw until the front panel is secure, DO NOT over-tighten the screw.
4. Push the bezel back onto the front of the JEA.

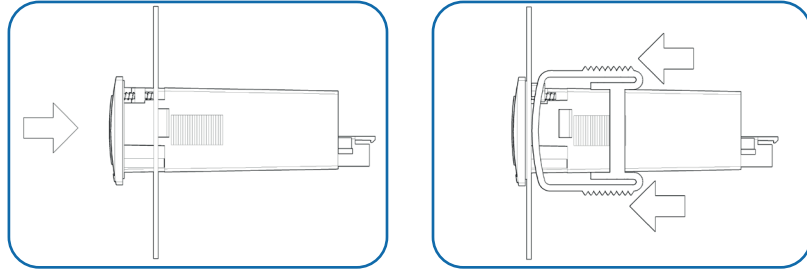


### 3.2.2 REAR MOUNTING

Note: Side mounting clips are purchased separately

1. Insert the JEA into the front of the panel.
2. Insert one of the side clips into the guides within the top and bottom of the body. Slide towards the front of the JEA until it is securely against the panel. Repeat the same operation for the other side.

Note: Ensure the clips are securely attached to the JEA and are tight against the panel.



### 3.3 WIRING

#### 3.3.1 OUTPUT WIRING



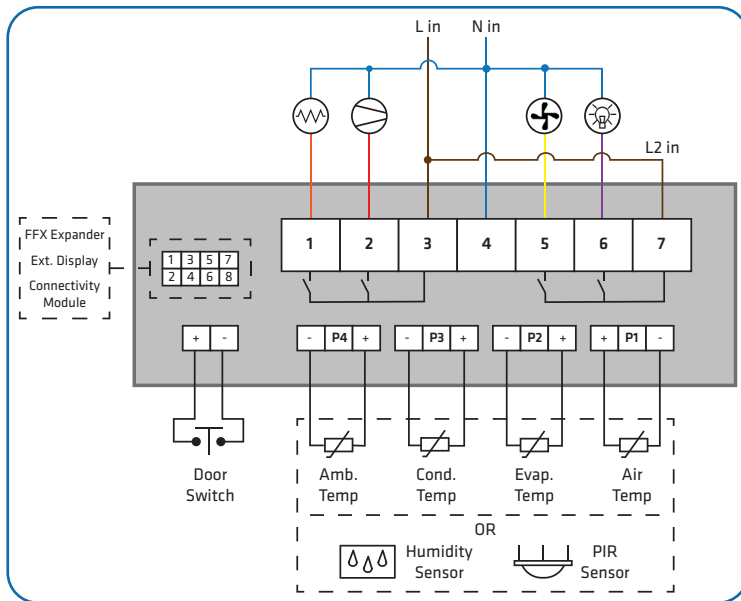
#### WARNING! MAINS CONNECTION

Risk of electrocution or damage to equipment. Ensure Mains is isolated before installation or repair of the unit or any connected equipment.



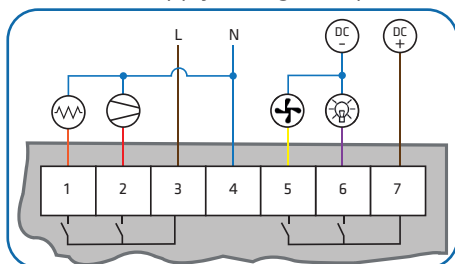
##### 3.3.1.1 JEAx4 models

Standard Wiring (All outputs supplied with 90-300 VAC)



1. Connect the Live-In wire to terminal 3 on the JEA.
2. Connect a loop from terminal 3 (Live-In) to terminal 7, Live-2-In on the JEA.
3. Connect the Neutral wire to terminal 4 on the JEA.
4. Connect the Compressor to terminal 2 of the JEA.
5. Connect the Heater to terminal 1 of the JEA, if required.
6. Connect the fan (Evaporator or Condenser) to terminal 5 of the JEA, if required.
7. Connect the lights to terminal 6 of the JEA, if required.

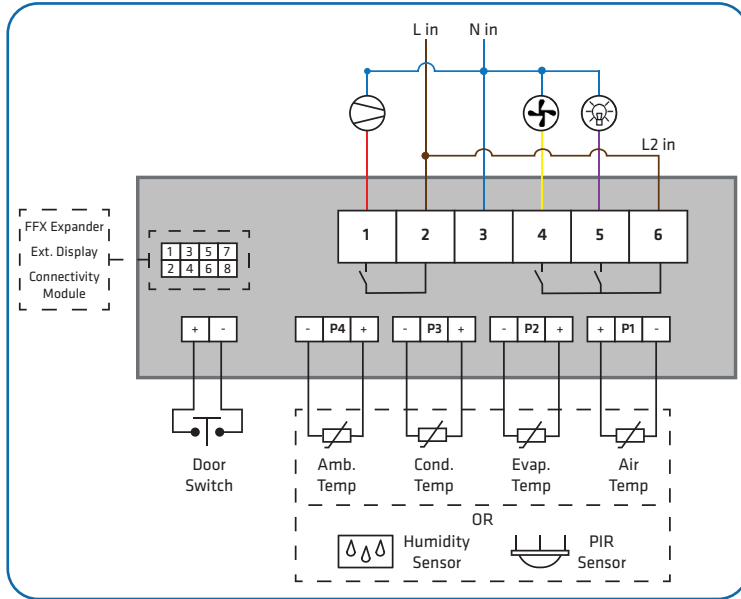
AC And DC Supply Wiring (Compressor and Heater supplied with AC, Fan and Lights supplied by DC)



1. Connect the Live-In (do not Loop to terminal 7), Neutral, Compressor, Heater, Fan and lights as described above.
2. Connect the DC Live to terminal 7 on the JEA.
3. Connect the fan and lights to the DC Negative.

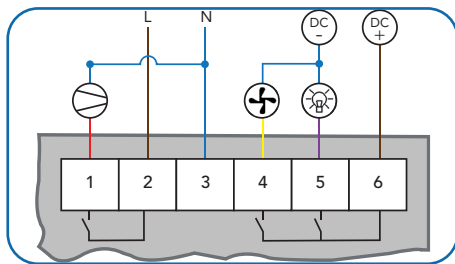
### 3.3.1.2 JEAX3 Models

#### Standard Output Wiring (All outputs supplied with 90-300 VAC)



1. Connect the Live-In wire to terminal 2 on the JEA
2. Connect a loop from terminal 2 (Live-In) to terminal 6, Live-2-In on the JEA
3. Connect the Neutral wire to terminal 3 on the JEA
4. Connect the Compressor to terminal 1 of the JEA
5. Connect the fan (Evaporator or Condenser) to terminal 4 of the JEA, if required.
6. Connect the lights to terminal 5 of the JEA, if required.

#### AC And DC Supply Wiring



1. Connect the Live-In (do not Loop to terminal 6), Neutral, Compressor, Heater, Fan and lights as described above.
2. Connect the DC Live to terminal 6 on the JEA.
3. Connect the fan and lights to the DC Negative.

### 3.3.2 INPUT SENSOR WIRING



#### WARNING!

Separate as much as possible the input sensors and cables carrying inductive load and power. Do Not run power and signal cables together in the same conduit.

The input connectors on the rear of the JEA are 3-way (temperature probe and PIR sensor) and 2-way (door switch) RAST connectors.

*Note: Ensure the RAST connectors of the sensors are pushed firmly onto the terminal. When fully connected, the connector will be locked in place by a retaining clip built into the enclosure.*

1. Connect the Air temperature probe to terminal P1 on the JEA.
2. Connect the Evaporator temperature probe to terminal P2 on the JEA (If required).
3. Connect the Condenser temperature probe to terminal P3 on the JEA (If required).
4. Connect the Ambient temperature probe to the P4 terminal on the JEA (If required).

*Note: Temperature probe selection can be configured, if probe selection is modified then the resulting probes will have to be connected to the responding terminal (see section 9.1 for more details). The stated above connectors are as per the default probe selection.*

A PIR sensor can be connected to any of the 4 temperature probe connectors (P1 to P4). If a PIR sensor is required, then the PIR sensor must be enabled, and the probe connector selected in the controller configuration (see Section 8.1 for more details)

5. Connect the Door switch, to the P5 terminal on the JEA (If required).



### 3.3.3 EXTERNAL DEVICES



#### **WARNING!**

Separate as much as possible the data cables and cables carrying inductive load and power. Do Not run power and signal cables together in the same conduit.

The JEA has an 8-way connector for adding external modules to further enhance the controller's capabilities.

You can connect:

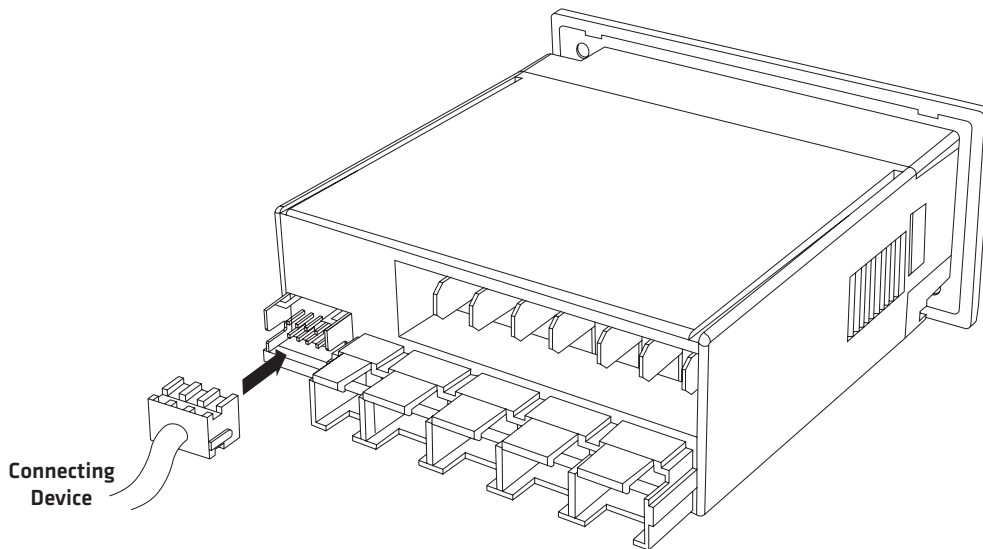
- Displays (FFD, FDM3)
- FFX expander port with plug-in modules
- GMC4 connectivity device
- programming device (SPPO3)

Sollatek provides a connection cable for all devices which connect to the JEA to make connecting quick and easy.

1. Plug the 8-way connector of the connecting cable into the port on the rear of the JEA.

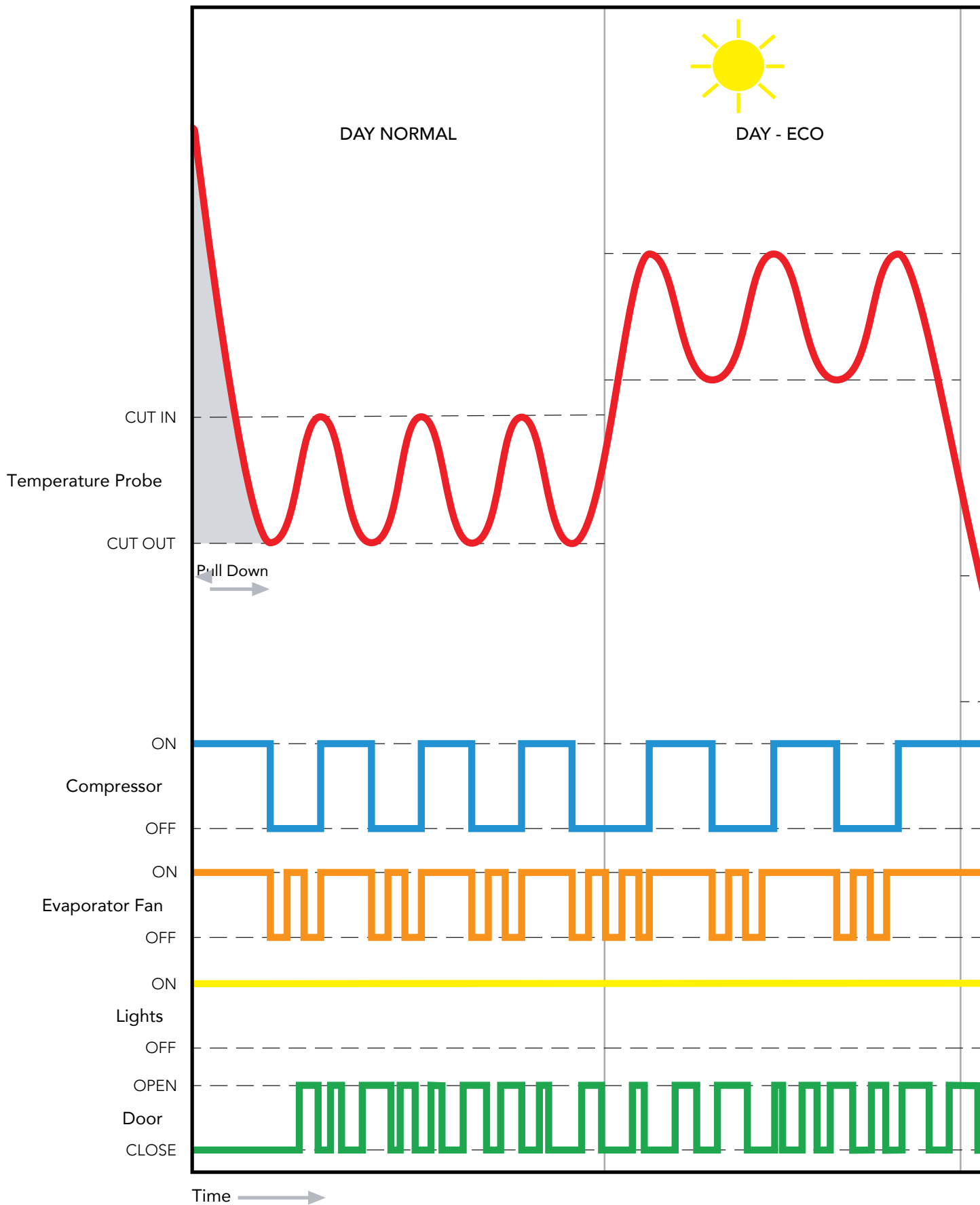
*Note: The connector will only fit into the port in one orientation.*

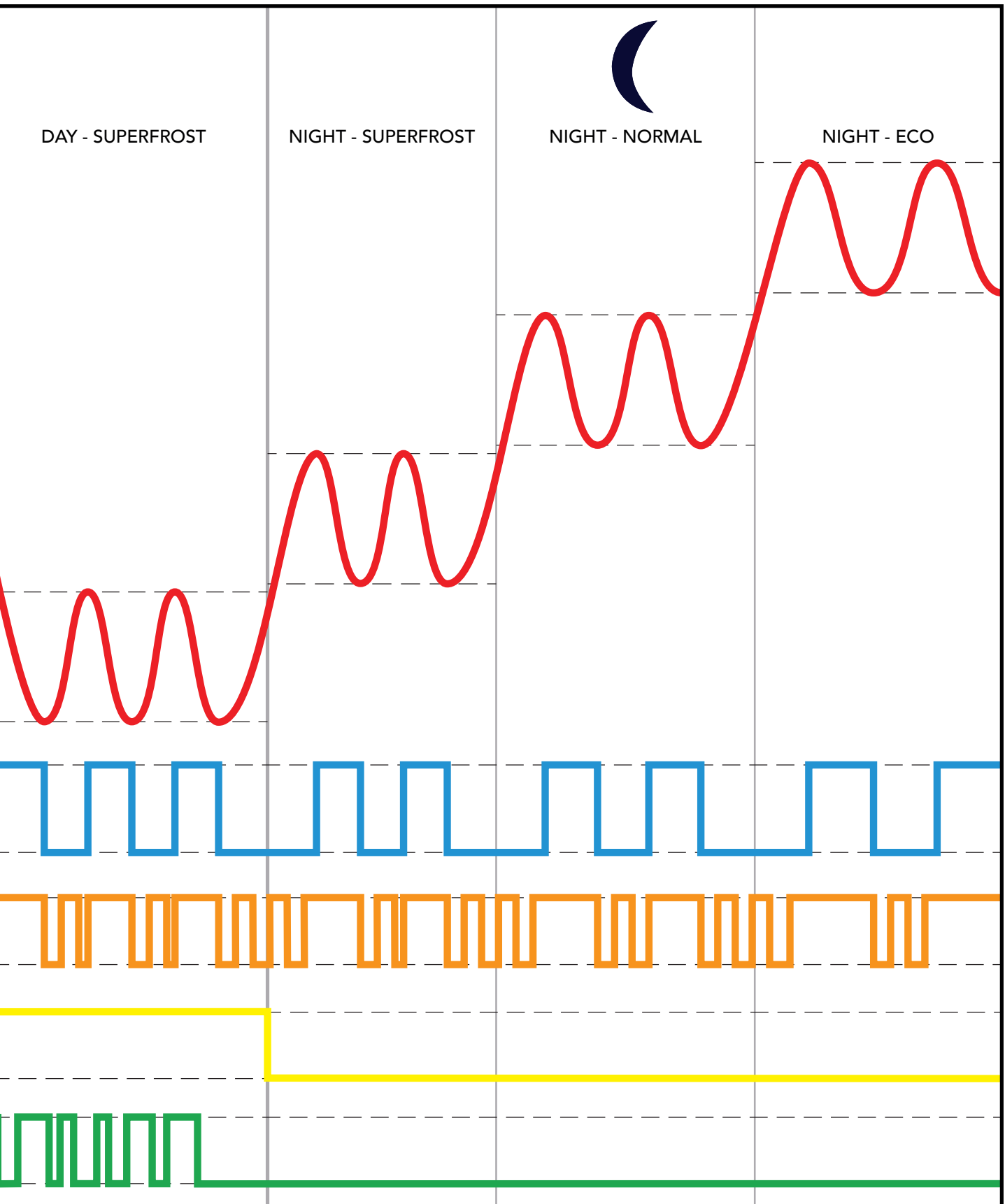
2. Plug the other end of the connecting cable into the other device (refer to the device manual for port type and location).



## 4. OPERATION

### 4.1 OVERVIEW





## 4.2 DAY AND NIGHT MODE

In DAY mode, the temperature is lower to keep the products inside the cooler at the correct temperature for resale, and the lights are ON for Point of Sale (POS). In NIGHT mode the regulated temperature is higher than in DAY mode as the products do not need to be as cold, and the lights are OFF as no need for POS. This saves energy and reduces the workload of the outputs (compressor) to extend operational life. Switching between day and night mode is controlled by either the energy-saving feature or the self-learning algorithm (model dependant).

## 4.3 NORMAL, ECO AND SUPERFROST MODE

In either Day or NIGHT mode, there are 3 different temperature cut-in/cut-out settings which can be implemented: Normal, Eco or Superfrost. The values can be customisable. Normal is the standard cut-in/cut-out temperature required for general cooler operation. Eco has a higher cut-in/cut-out temperature than Normal and Superfrost has lower cut-in/cut-out temperature values than Normal. These settings are manually activated by pressing buttons on the display interface.

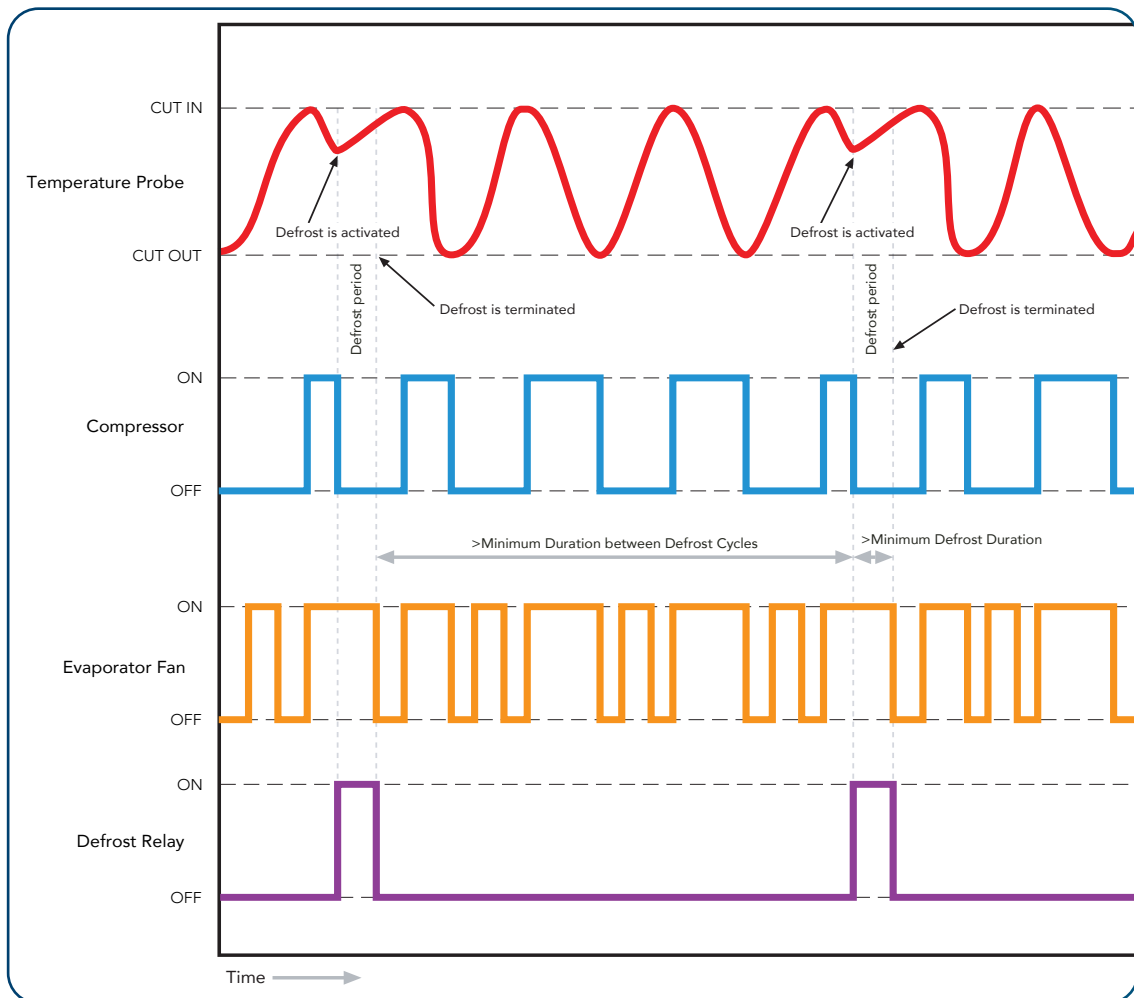
## 4.4 DEFROST MODE

### 4.4.1 STANDARD DEFROST

Depending on customer requirements there are different parameters which can trigger the defrost mode:

Defrost can be triggered by either using the temperature of the evaporator probe or/and by time-lapse (see defrost in parameters for different types of timers). When both settings are enabled, whichever event happens first will trigger or end the defrost cycle.

The JEA has a minimum defrost duration and minimum duration between defrost cycles which must be satisfied before it will act no matter the status of the other parameters. This is to ensure the defrost cycle is not stopped too early or defrost cycles are not initiated to close together.





Operation during a DEFROST cycle

Compressor:	OFF or ON (configurable)
Evaporator Fan:	OFF or ON (configurable)
Defrost Relay (if fitted):	ON

Example of Configuration

Active Heater Defrost		Hot Gas Defrost	
Compressor:	OFF	Compressor:	ON
Evaporator Fan:	ON	Evaporator Fan:	OFF
Defrost Relay (if fitted):	ON	Defrost Relay (if fitted):	ON

4.4.2 POST DEFROST DRIPDOWN

Post Defrost Dripdown can be used only with active defrost e.g. Heater or Hot Gas defrost. After defrost has been terminated by either time or temperature (depending on configuration), the JEA will turn the compressor, fan and defrost relay OFF until the evaporator temperature drops to the set temperature (if an evaporator probe is fitted) or the maximum dripdown duration has elapsed to prevent freeze up by allowing excess moisture to drip off the evaporator coil. Once dripdown is terminated the JEA will resume normal operation.

Operation During Post Defrost Dripdown

Compressor:	OFF
Evaporator fan:	OFF
Defrost Relay (if fitted):	OFF

4.5 WINTER MODE

Winter mode is designed for when coolers are in extremely cold temperatures (For example: outdoor coolers in cold countries such as Russia) and require a heater to be fitted. The compressor will be turned OFF and the heater will be turned ON. This is to warm up the inside of the cooler to ensure products in the cooler do not get too cold and freeze. Winter mode is entered automatically based on configurable parameters.

Standard operation During Winter Mode

Compressor:	OFF
Evaporator fan:	ON
Cabinet Heater (if fitted):	ON



## 5. FEATURES

### 5.1 ENERGY SAVING

The JEA tracks door openings. If no door openings are logged for a pre-set time (customisable) then the JEA will enter NIGHT mode. This is to maximise energy saving when the outlet is closed and no customer demand.

#### 5.1.1 NORMAL, ECO AND SUPERFROST MODE

Whichever mode: Normal, Eco or Superfrost, the JEA was running in during DAY mode, the JEA will remain in the same mode in NIGHT mode, i.e. JEA running in DAY-Eco mode then the JEA will switch to NIGHT-Eco mode respecting the corresponding cut-in and cut-out temperatures. The only way the JEA will switch modes (Normal, Eco or Superfrost) is by using the display buttons to manually switch the mode.

#### 5.1.2 BREAK-OUT FROM NIGHT MODE

The JEA will revert into DAY mode when either a day activity is seen or the Longest Night Mode Duration (customisable) has elapsed, whichever occurs first.

#### 5.1.3 DOOR SWITCH FAILURE

In the event of a door switch failure, the JEA will stop switching modes and will remain in DAY mode until the failure has been rectified.

### 5.2 SELF LEARNING

#### 5.2.1 LEARNING ALGORITHM

The JEA observes the usage behaviour of the cooler and constructs a daily pattern. Each day is represented by 48 slots, of 30-minute duration. Each slot is then assigned a mode, either DAY-mode or NIGHT-mode, depending on the cooler's usage level during that slot. The JEA learns 7 days' worth of operation (336 slots) to reflect one week's worth of cooler's usage pattern.

Example Pattern: In the following sample, 8 AM to 9 PM is the cooler's busy period.

Slot:1-2	Slot:3-4	Slot:5-6	Slot:7-8	→	Slot:29-30	Slot:31-32	Slot:33-34	Slot:35-36
NIGHT	NIGHT	DAY	DAY		DAY	DAY	NIGHT	NIGHT
6 AM	7 AM	8 AM	9 AM		8 PM	9 PM	10 PM	11 PM

#### Week Array

When 24 hours elapses, the 24-hour array will be transferred to a Week-Array. After this, the pattern is saved in non-volatile memory after each full week of learning. This becomes the feedback array that determines cooler functionality moving forward. The feedback array is continually updated with outlet traffic and usage.

*Note: During the first week of operation the JEA controller will remain in DAY mode while it observes the cooler's operation pattern. After 7 days, the JEA will begin switching from DAY to NIGHT mode based on what it has learned and saved in the week array.*

#### 5.2.2 ADVANCED LEARNING FEATURES

##### 5.2.2.1 Break-out of Learning:

Break out is when the JEA is in NIGHT mode and there is a door opening. If the accumulated door opening is >threshold, the lights will turn on and the temperature settings will switch to DAY mode for this slot and the next two slots. The slot is learned as DAY mode for the next week. Those extra slots however will not be learnt as day mode unless there are door openings in them. If door openings occur in the following slot, then the breakout period is extended by 2 slots from that slot.

##### 5.2.2.2 Refill Period:

The Refill period is introduced to ignore times when the cooler is being refilled with products before the shop opens. If the JEA is in NIGHT mode, door open = 1 and door open time > 3 Minutes, then this specific door opening is ignored by the learning timers and scheme, so the slot will remain learnt as NIGHT.

##### 5.2.2.3 Look-Ahead:

The Look-ahead is added to allow setting the temperature of the cooler products for the products to reach the correct temperature at the shop opening time. The Look-Ahead value is set to 3 hours (6 slots).



The JEA will take the cooler pattern and then switch into DAY mode from NIGHT mode 3 hours (6 slots) earlier than the learning pattern.

#### 5.2.2.4 Software Irregularities Filtration:

A software filter is added to change periods of NIGHT less than the Look-Ahead value to DAY in order to overcome irregularities.

For example, Look-Ahead = 6, then if the 24-hour array is found to be:

[D D D D N N N N N N D D D] this will be changed to [D D D D D D D D D D D D]. Every 24 hour the filter will be applied to the 24-hour array elements that has been saved.

#### 5.2.3 DOOR SWITCH FAILURE

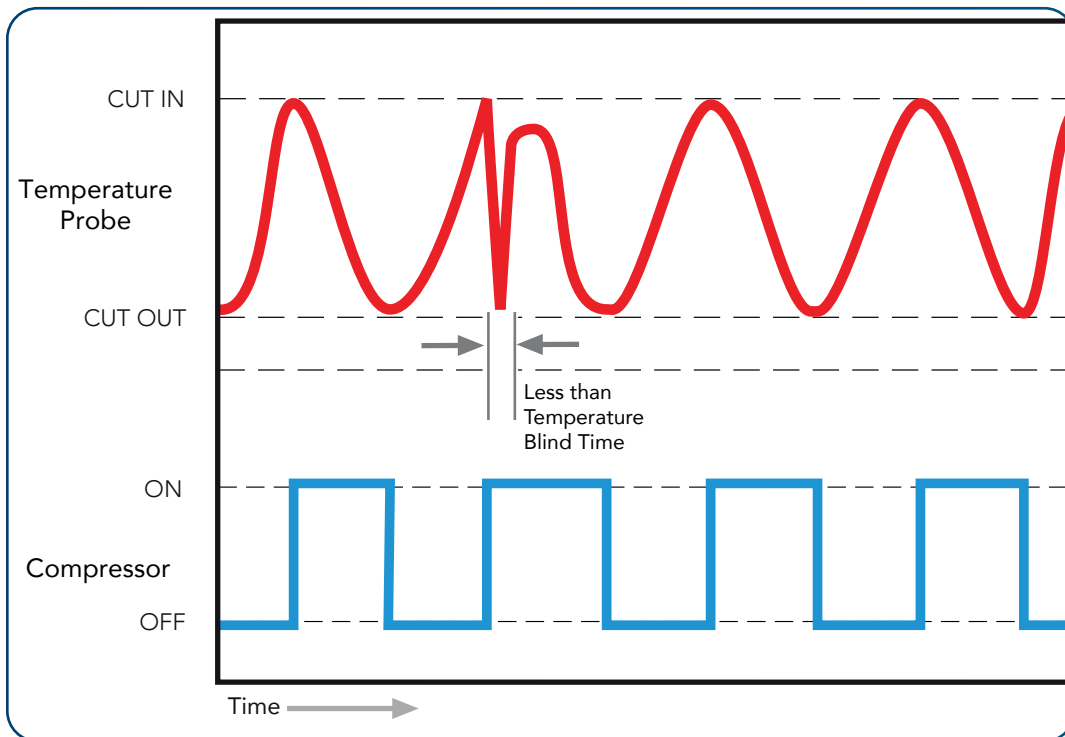
In the event of a door switch failure, the JEA will stop updating its learning pattern based on the cooler usage and will remain in DAY mode until the failure has been rectified.

After the door switch operation is restored (failure has been rectified), then the unit will reset its learning pattern and will start the learning process from the beginning.

### 5.3 PROTECTIVE DELAYS

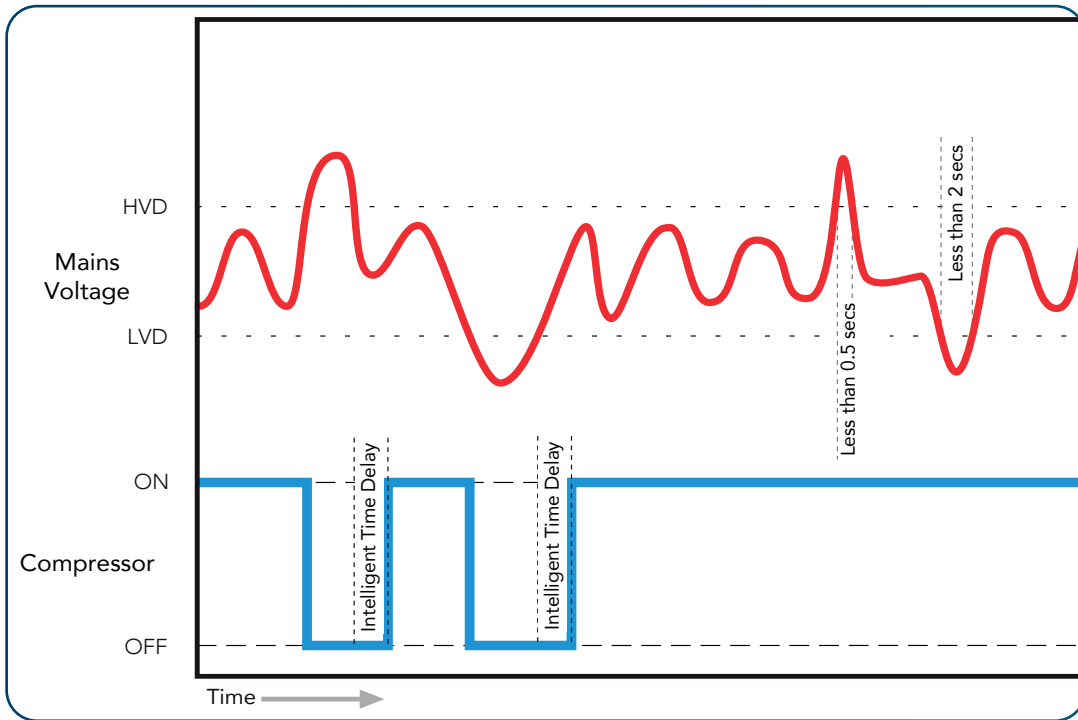
#### 5.3.1 TEMPERATURE BLIND TIME

The software will ignore the sensor temperature reading for the first few seconds (a pre-set value of 10 seconds) after the compressor is switched on. This is to prevent short-term thermal effects such as those caused by the fan starting to operate causing disconnection.



### 5.3.2 BAD VOLTAGE BLIND TIME

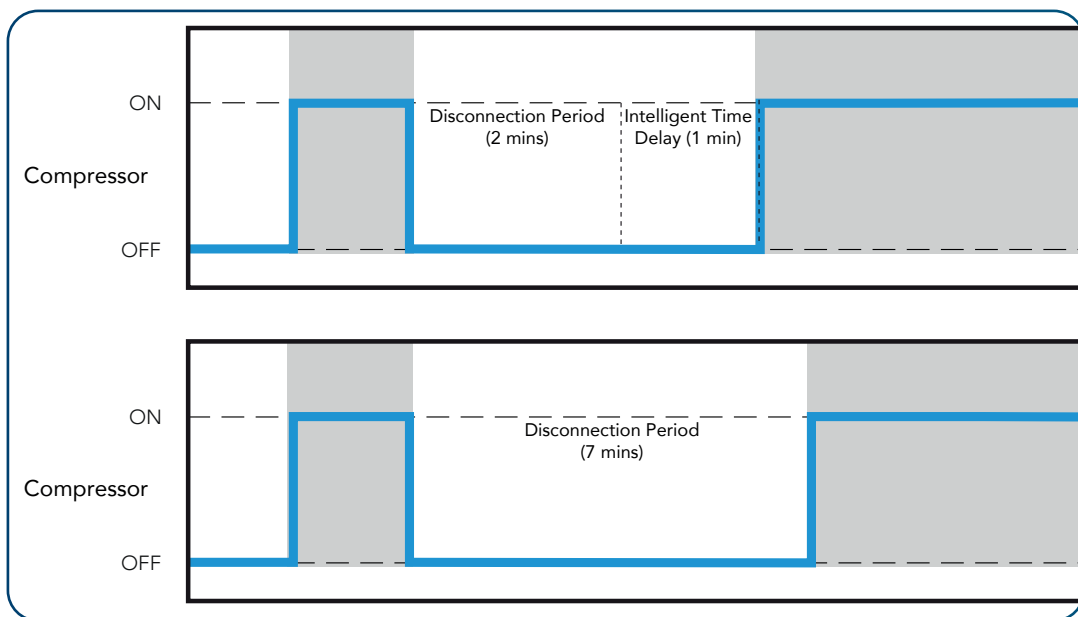
The JEA provides high and low voltage protection by disconnecting the supply from the compressor and outputs if the voltage exceeds the set High Voltage Disconnect (HVD) or falls below the Low Voltage Disconnect (LVD) (both configurable). Once the voltage has returned with the reconnection voltage and delay timers have been satisfied, the JEA will automatically reconnect the outputs. The JEA permits high and low mains voltages transitions for short periods of time preventing inadvertent compressor stop-starts. Pre-set values of 0.5 and 2 seconds (configurable) respectively are implemented.



### 5.3.3 INTELLIGENT TIME DELAY

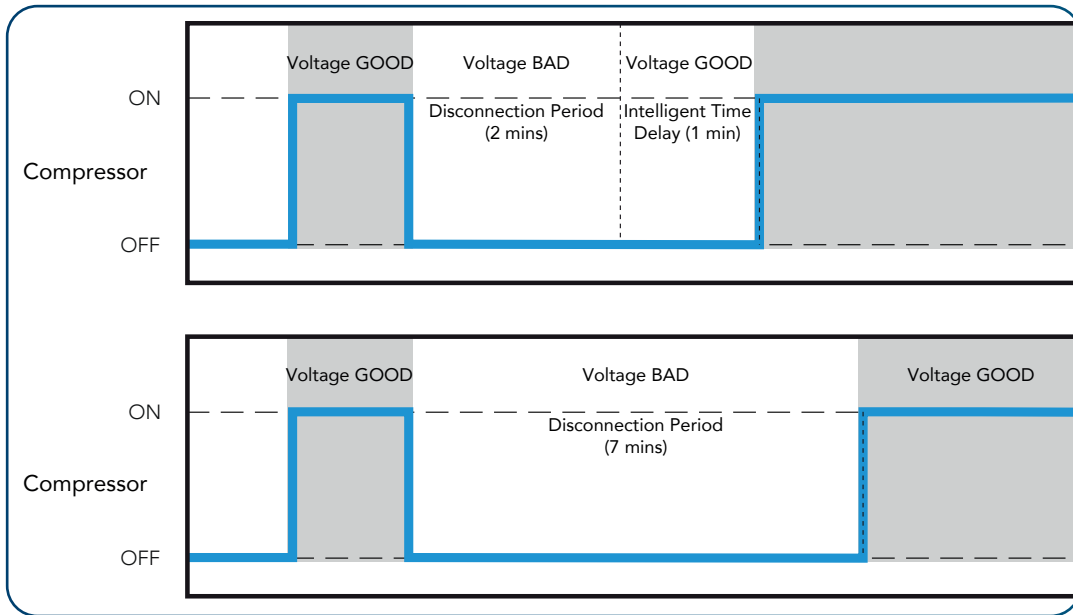
The JEA controller has a built-in intelligent time delay of up to 5 minutes (customer configurable). After a compressor disconnection period, either from cycling OFF, defrost or HVD / LVD the JEA will automatically adjust the time delay on the disconnection period before allowing the compressor to turn ON. For example, if the Time delay is set to 3 minutes, a 2-minute disconnection will result in only a 1-minute additional delay, making the total delay 3 minutes. Any disconnection of 3 minutes or over and the JEA will immediately turn the compressor ON.

The time delay is essential in allowing compressor gases to neutralise, ensuring that the mains power has stabilised before re-connection and avoiding a locked rotor condition.



### 5.3.4 INTELLIGENT BLACKOUT TIME DELAY (self-learning models only)

The JEA also has an Intelligent Blackout delay, meaning depending on the disconnection period, caused by no power i.e. power cut or mains being turned off, the JEA will adjust the wait period before allowing the compressor and other outputs to turn on. For example, if the Time delay is set to 3 minutes, a 2-minute disconnection will result in only a 1-minute additional delay, making the total delay 3 minutes. Any disconnection of 3 minutes or over and the JEA will immediately turn the compressor ON. Time delay is configurable (intelligent time delay and blackout time delay is set as the same value).



## 5.4 PRODUCT SAFETY FEATURES

### 5.4.1 DOOR LOCK

The JEA can control a door lock system via a Modbus interface. This feature prevents coolers from being opened when stores are closed, or contents could be compromised to prevent theft/sale of defective food or drinks.

Currently, the door lock is set to "normally locked". This means the door is locked and when triggered the door is unlocked for 10s. Normally unlocked settings can be implemented if required.

### 5.4.2 LOCK OUT MODE

The JEA will enter cooler lockout mode if the regulating temperature is above a customer-defined temperature (LtP) continuously for a settable duration (LDr). In this mode, all relays are OFF and flagged as an alarm via the display (Loc for models with a display or the red and green LED flashing for models without a display). The JEA will remain in lock-out mode even if the power is cut, the only way to exit lockout mode is via manual intervention by sending a special command (either via Modbus or the GUI) to the JEA. By forcing manual intervention, the operative while resetting the JEA can also ensure foods and drinks have not perished during prolonged overtemperature and remove anything that has to ensure customers receive quality, fresh products.

Once the lockout is released, the cooler starts operating normally in Initial Pull Down mode. Next lockout can happen only after the temperature inside the cooler reaches cut-out temperature (pull down is over).

## 5.5 CONNECTIVITY SOLUTION (if fitted)

Connectivity devices are fitted to the 8-way data connector at the rear of the JEA. Refer to the Section 3. Installation for more details on how to do this.

### 5.5.1 BLUETOOTH

JEA controllers are equipped with Bluetooth capability, enabling them to connect to the Sollatek Smart device Application. The Sollatek App has extensive cooler management capabilities. The JEA controller also features iBeacon and Eddystone Beacon capabilities allowing proximity marketing to send engaging and interactive content to consumers' smartphones while they buy in real-time. There are several options to equip the JEA with BLE:

- JEA with internal built-in BLE
- FFX Expander port with built-in BLE plugged into the JEA
- Connectivity device with BLE plugged into the JEA

### 5.5.1.1 iOS And Android Smart Device Application

The Sollatek Smart device application provides technicians with all the tools to view, configure and upload controller status and event data.

- Real-time Data Analysis - View real-time telemetry data, operational status, and performance data.
- Cooler Event Log - Access all historical data which has occurred between store visits to identify any issues or problems.
- Manage Settings And Parameters - View, configure or reset JEA controller parameters for cooler optimisation. Set BLE Beacons protocols and event logging.
- Connect To The Cloud - Upload data to the cloud for access on the online portal for further analysis.
- Firmware Update - Update the JEA and Bluetooth firmware over the air

### 5.5.2 GSM AND GEO-LOCATION

GSM modules/devices (2G, 3G and LTE) can be connected to the JEA to provide cooler monitoring without the need for a technician/sales visit. The GSM sends telemetry and performance data from the JEA to an online portal for further analysis. GSM can be added via:

- FFX Expander port with GSM module (2G, 3G or LTE)
- Wi-Fi or GNSS modules/devices provide precise asset location and tracking. The information gathered to determine the location is sent to the online portal via the GSM. Location capability can be added via:
  - FFX Expander port with Wi-Fi and GSM Modules
  - FFX Expander port with GNSS and GSM Modules
  - Connectivity device with Wi-Fi and GSM plugged into the JEA

#### 5.5.2.1 Online Portal For Complete Analysis

The Sollatek online portal turns your fleet data into usable sales and performance data.

- Detailed Reports - View a vast list of controller operational data such as temperature, event history and faults.
- Intelligent Data Analysis - Monitor technical and operational data in easy-to-read graphs and charts.
- Accurate Sales Performance - view and analyse cooler KPIs for enhanced sales forecasting and strategy.
- Dynamic Map - View and track cooler's movements within a map and view the operational status of each cooler.
- Plan-o-gram Conformity - Monitor cooler purity, out of stocks & shelf voids without the need for a store visit (available only when a BLE camera is connected).
- Remote Cooler Shut-down - In the event the cooler is stolen, disable the cooler so it cannot be used. Once the cooler is recovered the cooler can then be enabled.

### 5.6 INTERNAL RECHARGEABLE BATTERY (If fitted)

The internal battery powers the internal Bluetooth in the event of no mains power. The purpose of powering the BLE with no mains is to:

- Retain cooler logged data in the event of a black-out until power is reconnected.
- Connect and locate coolers when they are not plugged in, i.e. locate a cooler within a warehouse

The battery will last several days on a single charge.



#### CAUTION! RISK OF EXPLOSION

It is not recommended for users to replace the battery so please contact Sollatek. The replacement battery should be of the same type.



#### WARNING!

Dispose of the used batteries according to national standards and directives.

### 5.7 EXTERNAL DIGITAL DISPLAY

An External display can be easily connected to the JEA via the data port on the rear of the unit. The display will display and control as per the user display interface built-in to the JEA. (Refer to the display manual as button labels and annunciators may differ from the JEA).

## 6. START-UP

### 6.1 START-UP SEQUENCE

Connecting the JEA to mains power initiates the start-up sequence. The short start-up sequence is to allow the JEA to check the status of outputs and gather live data from inputs. The JEA will go through the following steps:

Step 1: All LEDs power ON and a long continuous beep

Step 2: LED's will turn OFF and the display will momentarily go blank. The beeping will stop.

Step3: The JEA will then display the live regulation temperature. On start-up the JEA will enter DAY-Normal mode of operation.

### 6.2 DISPLAY CHARACTERS

For clarity on the display and to ensure readings and codes are easily identifiable, the below characters are used:

Upper Case Characters:

A C E F H L P S U

Lower Case Characters:

d e d i n o r t -

Numerals:

1 2 3 4 5 6 7 8 9 0

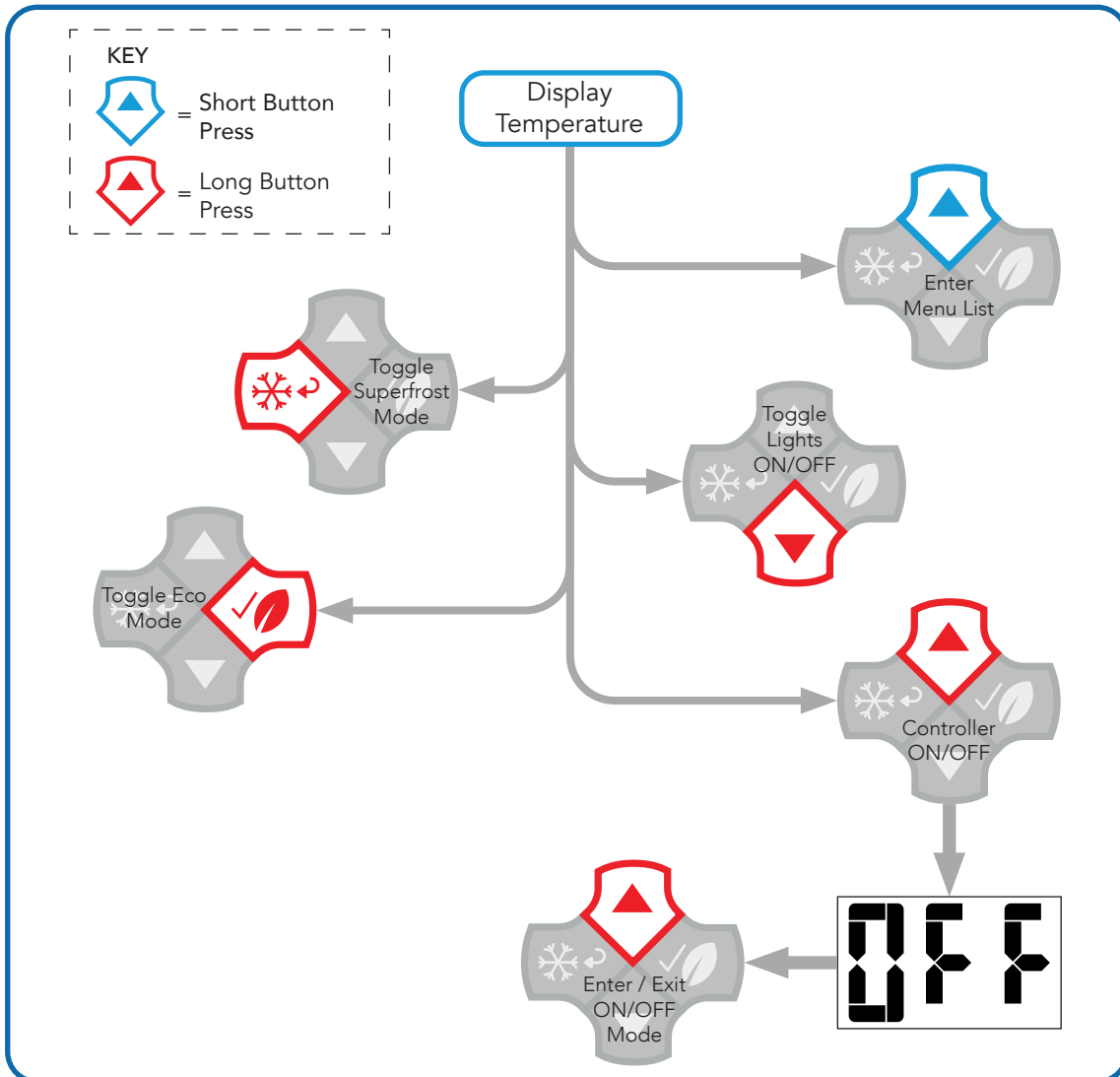
## 7. INTERFACE

### 7.1 JEA FRONT DISPLAY

#### 7.1.1 HOME DISPLAY FUNCTION

- Manually toggle Eco Mode ON and OFF
- Manually toggle Superfrost Mode ON and OFF
- Manually toggle Lights ON and OFF
- Manually toggle JEA ON and OFF

##### 7.1.1.1 Home Display Flowchart



##### 7.1.1.2 Eco Button

###### JEA In Normal, Superfrost or Winter Mode

Press and hold the ECO button for more than 3 seconds to implement ECO mode. Once the button press has been accepted the JEA will beep in acknowledgement and the Eco icon will switch ON.

###### JEA In Eco Mode

Press and hold the ECO button for more than 3 seconds and the JEA will switch to NORMAL mode. Once the button press has been accepted the JEA will beep in acknowledgement and the Eco icon will switch OFF.

###### JEA In Defrost Mode

If the ECO button is pressed while the JEA is in defrost mode, then the JEA will remain in defrost mode until defrost is complete



by either time or temperature. Once complete, depending on the mode of the controller before entering defrost, the JEA will respond accordingly to the button press.

Normal or Superfrost before defrost - Eco mode is entered after defrost mode

Eco mode before defrost - Normal mode is entered after defrost mode

### 7.1.1.3 Superfrost Button

#### JEA In Normal, Eco or Winter Mode

Press and hold the SUPERFROST button for more than 3 seconds to implement Superfrost mode. Once the button press has been accepted the JEA will beep in acknowledgement and the Superfrost icon will switch ON.

#### JEA In Superfrost Mode

Press and hold the SUPERFROST button for more than 3 seconds and the JEA will switch to NORMAL mode. Once the button press has been accepted the JEA will beep in acknowledgement and the Superfrost icon will switch OFF.

#### JEA In Defrost Mode

If the SUPERFROST button is pressed while the JEA is in defrost mode, then the JEA will remain in defrost mode until defrost is complete by either time or temperature. Once complete, depending on the mode of the controller before entering defrost, the JEA will then respond accordingly to the button press.

Normal or Superfrost before defrost - Eco mode is entered after defrost mode

Eco mode before defrost - Normal mode is entered after defrost mode

### 7.1.1.4 UP Button - controller ON/OFF

Press and hold the UP button for more than 3 seconds. The display will start flashing with "OFF". While the display is flashing, press the UP button momentarily and the JEA will enter OFF Mode.

*Note: If no button is pressed while the display is flashing "OFF", the JEA display will revert to the regulation temperature reading and resume operation.*

#### Operation During OFF Mode:

Compressor:	OFF
Evaporator fan:	OFF
Heater (if fitted):	OFF
Lights:	OFF
Main Display	Shows "OFF"
Buttons:	Disabled apart from UP button to turn JEA ON

#### Exit OFF Mode:

Press the UP button to exit OFF mode. The JEA display will revert to the regulation temperature reading and resume the operational mode the JEA was in before entering OFF Mode i.e. Day-Eco / Day-Normal.

*Note: If the power is disconnected to the JEA while it is in OFF Mode when the power is reconnected, the JEA will power ON and resume in OFF Mode. When the JEA is switched out of OFF mode the JEA will enter Day-Normal mode.*

### 7.1.1.5 UP Button - Enter menu list

Press the UP button.

- If no passcode is implemented, the display will enter the menu list.
- If a passcode is implemented, the display will show "PAS"

PAS

#### Entering the passcode

- The password is a four-button sequence of the four display buttons. For example, the sequences could be: Up, Enter, Down, Back.
- If the password is correct, the display will enter the menu list. You will hear a double beep for confirmation.
- If an incorrect button is pressed at any point, the display will revert to the home display. You will hear a long beep to indicate an incorrect password has been entered.
- If at any point, there is a 20-second period of inactivity the display will revert to the home display.

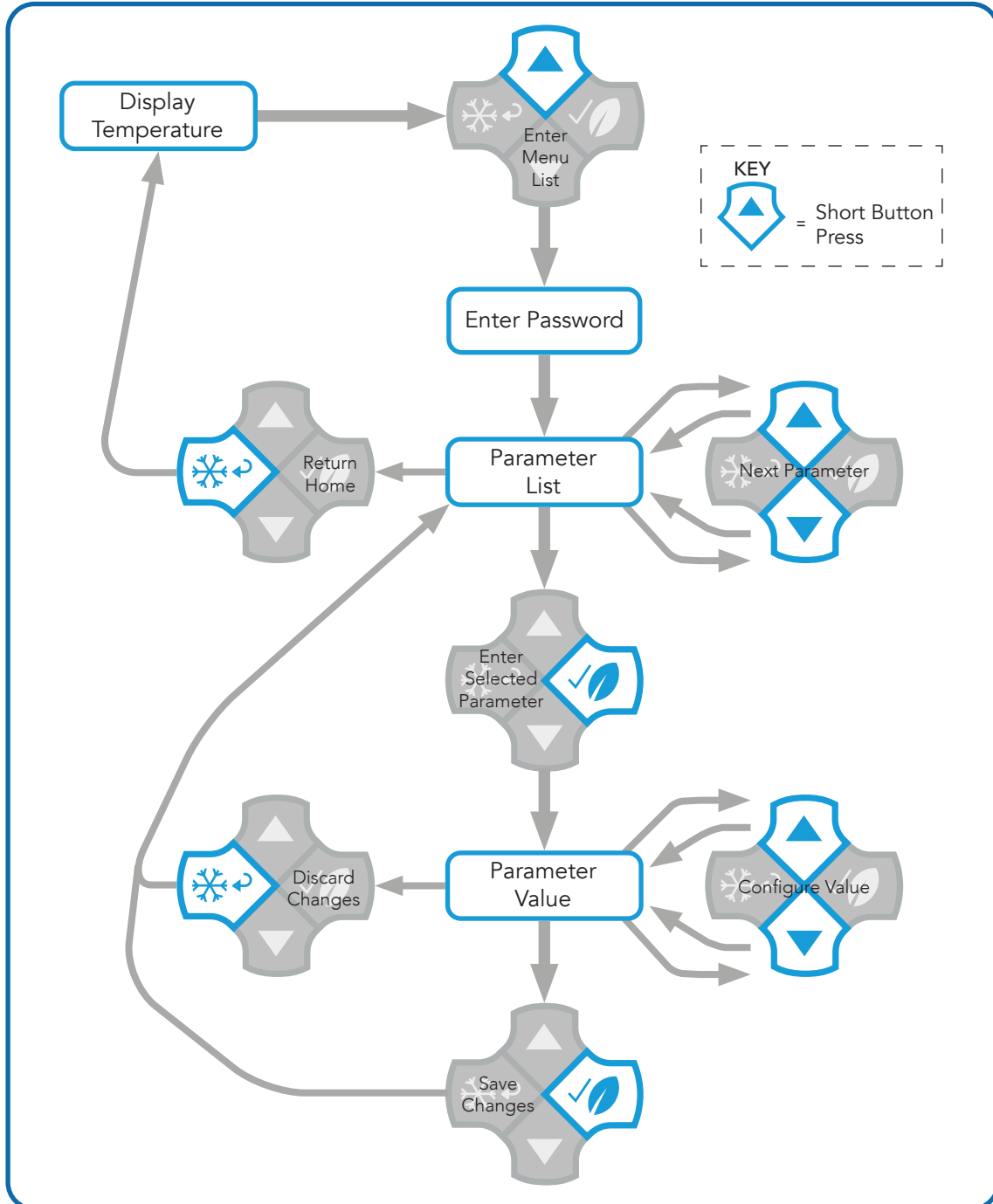


### 7.1.2 MENU LIST

In level 1 users can:

- Configure Parameters
- Reset parameters to factory-set
- Reset the learning algorithm (self-learning models)

#### 7.1.2.1 Menu List operational Flow Chart



Note: If the display is in the menu list or parameter values then holding down either the UP or DOWN button will scroll through the items quickly.

### 7.1.2.2 Menu list and value changing guide; Day, normal cut-out temperature:



Press the UP button to enter the menu list (you may be required to enter a passcode if implemented).



Toggle through the menu items by pressing the UP & DOWN buttons until "dno" is displayed.



When "dno" is displayed, press the ENTER button to show the current set temperature.



While any parameter name is displayed, press the BACK button to return to the home display (showing regulation temperature).



Toggle through the available values by pressing the UP & DOWN buttons.



To save a value, press the ENTER button. The display will return to the menu list (parameter names).



Press the BACK button to return to the parameter list without saving changes (if any were made). The JEA will revert the operation to the saved value.



Press the BACK button when the display is on the menu list to get back to the home display (showing regulation temperature).

### 7.1.2.3 LEARNING ALGORITHM RESET

The Learning Algorithm reset operation is needed to reset the learning algorithm timers. It does NOT change any of the registered parameter values. Menu item "LrS" is used to reset the Learning Algorithm matrix.



Go to the menu list, and navigate to item "LrS" by Pressing the UP and DOWN buttons. Press the ENTER button to enter the value.



The displayed value will be "no". Change to "yes" with either the UP or DOWN button Press the ENTER button to confirm.



### 7.1.2.4 PARAMETERS RESET

Parameter Reset is needed to reset all parameters back to the default (factory-set) value. Menu items "PrS" is used to reset the parameters settings



Go to the menu list, and navigate to item "PrS" by Pressing the UP and DOWN buttons. Press the ENTER button to enter the value.



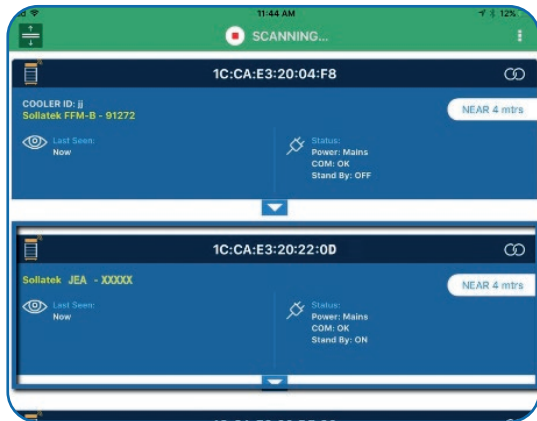
The displayed value will be "no". Change to "yes" with either the UP or DOWN button Press the ENTER button to confirm.



## 7.2 SMART DEVICE APPLICATION (IF BLUETOOTH IS PRESENT)

The Sollatek Smart device application provides a wireless connection to the JEA controller (via either internal BLE or external devices) from smartphones or tablets.


This gives users access to controller and Bluetooth settings as well as live and historical telemetry data.

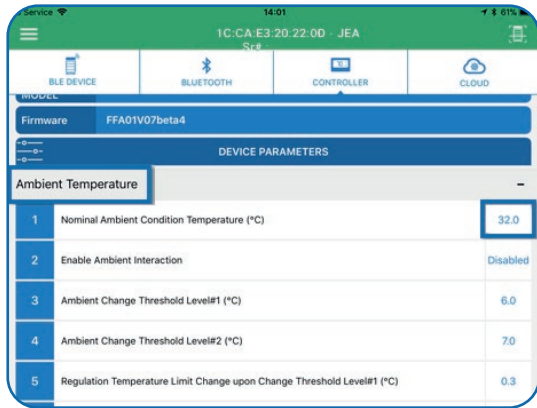


1. Download and log in to the Sollatek App.  
*Note: Ensure the device's Bluetooth is turned on.*

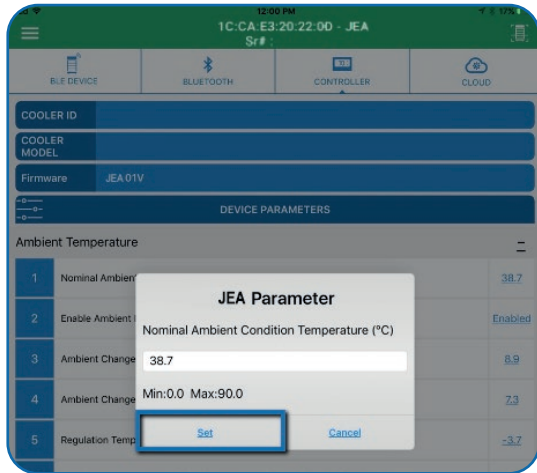
2. The App will then scan for all nearby BLE devices. If more than one device is found, find the required device within the BLE scanning screen by scrolling down the list.

*Note: The device MAC address is displayed in the device header. The device type, as well as the BT serial number, is listed to help you identify the required device.*

3. To connect to the device, click the  icon in the device header on the right-hand side of the screen.



4. Once connected to the device, press the "Controller" tab below the menu bar.
5. The parameters are organised into the same categories as listed in "section 8 Parameters" of this manual and the JEA interface software. The app will display all parameter categories in a list.
6. Expand a category to display individual parameters and their corresponding values by clicking on the category header for example "Ambient Temperature".
7. Click on the current value of the parameter you require to edit.



8. A dialog box will appear on the screen with the current parameter value and the minimum and maximum value of the parameter selected.
9. Depending on the parameter selected, either type the required value in the text box or select it from the drop-down menu.
10. Press "Set" to save the changes. Changes will be implemented immediately by the JEA.

*Note: For more details on how to view cooler live telemetry or historic data or to adjust Bluetooth or beaconing settings please refer to the Sollatek Smart Device Application Manual.*

### 7.3 DESKTOP INTERFACE SOFTWARE

The JEA Interface software provides easy creation, checking and saving of parameters.

#### 7.3.1 INSTALLATION AND LOGIN

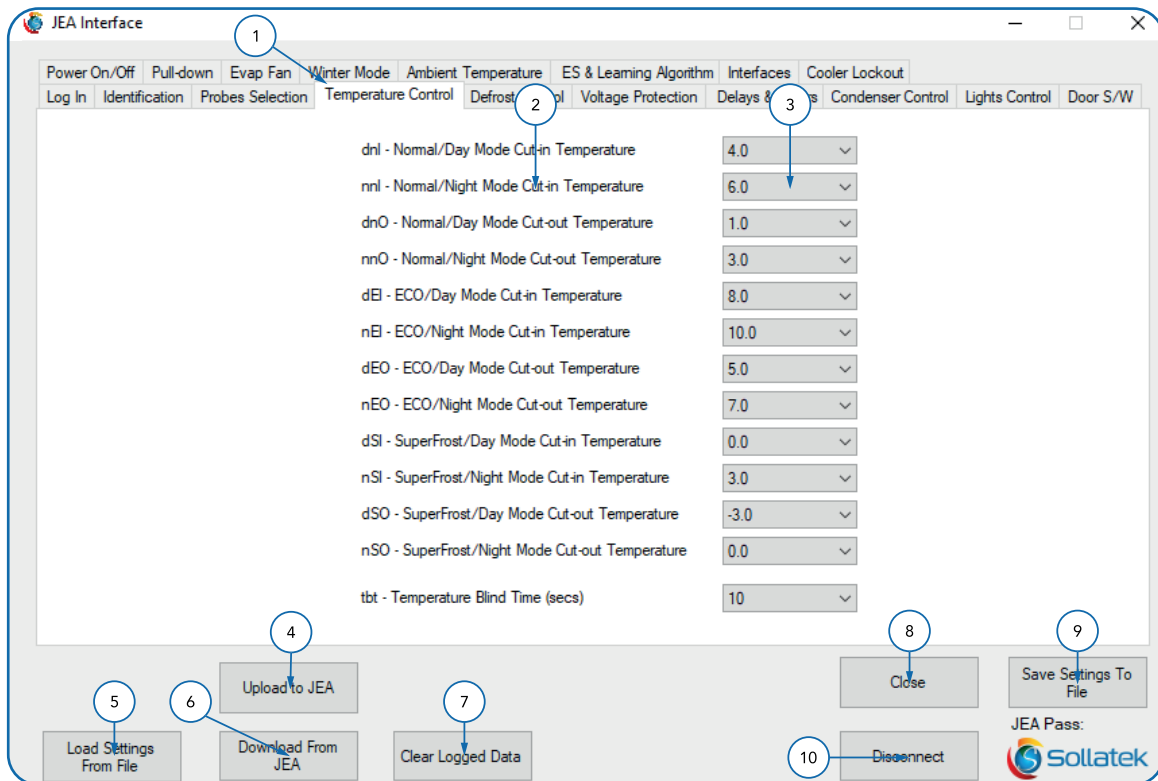
From the link provided by Sollatek, select all files, and click download. Click Open to open the folder location of the downloaded files.

Run the setup file. Follow any security prompts to allow installation. A security message will pop up, click Install to continue the installation.

The installer wizard window will appear on the screen. The program executable files and data will be automatically extracted without any user intervention. Progress will be indicated on the status bar within the wizard.

Once the JEA Interface has been installed on your computer, the program will open on the login tab. Enter your login credentials provided by Sollatek and click the login button.

#### 7.3.2 INTERFACE NAVIGATION



1	Parameter category	Parameters are divided into relevant categories to make parameter finding quick and easy
2	Parameter List with Display Code	All editable parameters are listed alongside the three-digit display code which appears on the display
3	Parameter Value Options	Drop down menu with all acceptable values for the parameter item
4	Upload to JEA	Save the current parameters in the configuration software in the JEA
5	Load Settings from File	Open an existing settings file into the software
6	Download from JEA	Download the current JEA settings into the software
7	Clear Logged Data	Clear logged event data saved in the JEA
8	Close	Close the software interface. Any unsaved changes will be discarded
9	Save Settings To file	Save the current values in the configuration software as a settings file on the PC
10	Disconnect	Safely disconnect the JEA from the PC. Once discounted the JEA can be unplugged from the computer



### 7.3.3 DOWNLOAD/UPLOAD PARAMETERS INTO THE JEA / DESKTOP INTERFACE

1. Connect the JEA interface cable to the data port on the rear of the JEA and the USB port on your computer. If plugging in for the first time, you may have to wait until drivers are installed.
2. Connect the JEA to a mains supply (Live & Neutral), then turn the power ON.  
*Note: Parameters will not be uploaded unless the JEA is Powered ON*
3. Open and log in to the JEA Interface using your credentials provided by Sollatek.

#### To download Parameters from the JEA into the interface

4. Once the JEA is connected to your PC and mains, click the Download from JEA button in the interface, downloading may take a few minutes so ensure all parameters are downloading before proceeding.
  - Parameters can then be saved or edited as required.
  - Within the Identification tab the JEA serial number, firmware and hardware version will be displayed. Cooler serial number and customer asset tracking number will also be displayed if assigned.

#### To upload Parameters from the interface into the JEA

5. Ensure the parameters in the interface are set to your required configuration.
6. Once the JEA is connected to your PC and mains, click the Upload to JEA button in the interface.
7. Once all parameters have been uploaded successfully a success message will pop up.



## 8. SERVICE MODE

Service mode can be used for diagnosing relays and reading live sensors data, the normal operation of the JEA is disabled while in service mode. Service mode can be entered via PC or phone app.

**Operational Status** – Allows service personnel to inspect sensor values and basic operational status

- Live Temperature of each probe
- Temperature Display Unit to decide if the temperature should be displayed in C or F
- Input Voltage
- Status of each relay
- Probe faults for each probe and door open flag
- PIR counter (if present)
- Relative humidity (if present)

**Relay Diagnosing** – Allows service personnel to test relays/output are fully operational.

- Comp ON / OFF
- Fan ON / OFF
- Light ON / OFF
- Heater ON / OFF

On exiting service mode, the JEA will resume normal operation.

There is also a safety timeout implemented to avoid accidentally leaving a cooler in Service Mode. If no command is received for more than 10 minutes while in Service Mode, the JEA resets and starts normal operation.



## 9. PARAMETERS

### 9.1 PROBES SELECTION

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
tPS	Temperature Control Probe (Air)	Number	N/A, 1	4	1
dPS	Defrost Control Probe	Number	N/A, 1	4	2
cPS	Condenser Control Probe	Number	N/A, 1	4	3
aPS	Ambient Control Probe	Number	N/A, 1	4	4
PPS	PIR Sensor Probe	Number	N/A, 1	4	N/A
HPS	Humidity Sensor Probe	Number	N/A, 1	4	N/A
rHt	Relative Humidity Threshold	%	10	100	80

Note: If changes are made to the probe connection port, then the probe connected to the JEA must match accordingly and not as per the connection diagram (connection diagram as per default settings)

#### Temperature Control Probe (Air)



Selects the Air temperature probe connection port:

N/A = Not connected

- 1 = Probe 1
- 2 = Probe 2
- 3 = Probe 3
- 4 = Probe 4

#### Defrost Control Probe (Evaporator)



Selects the defrost temperature probe connection port:

N/A = Not connected

- 1 = Probe 1
- 2 = Probe 2
- 3 = Probe 3
- 4 = Probe 4

#### Condenser Control Probe



Selects the condenser temperature probe connection port:

N/A = Not connected

- 1 = Probe 1
- 2 = Probe 2
- 3 = Probe 3
- 4 = Probe 4

#### Ambient Control Probe



Selects the ambient temperature probe connection port:

N/A = Not connected

- 1 = Probe 1
- 2 = Probe 2
- 3 = Probe 3
- 4 = Probe 4

#### PIR Sensor Probe



Selects the PIR sensor connection port:

N/A = Not connected

- 1 = Probe 1
- 2 = Probe 2
- 3 = Probe 3
- 4 = Probe 4





### Humidity Sensor Probe



Selects the humidity sensor connection port:

N/A = Not connected

1 = Probe 1

2 = Probe 2

3 = Probe 3

4 = Probe 4

### Relative Humidity Threshold



The threshold above which high humidity mode is entered. In high humidity mode, the evaporator fan is always ON, overriding other fan settings.

*Note: Temperature probe selection has priority so PIR and humidity sensor should not use any of the inputs already configured for probes.*

## 9.2 TEMPERATURE REGULATION

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
dnO	Normal Mode Cut-Out – DAY	°C °F	-40 -40	40 104°F	1 33.8
dnI	Normal Mode Cut-In – DAY	°C °F	-40 -40	40 104	4 39.2
dEO	ECO Mode Cut-Out – DAY	°C °F	-40 -40	40 104	5 41
dEI	ECO Mode Cut-In – DAY	°C °F	-40 -40	40 104	8 46.4
dSO	SUPERFROST Mode Cut-Out – DAY	°C °F	-40 -40	40 104	-3 26.6
dSI	SUPERFROST Mode Cut-In – DAY	°C °F	-40 -40	40 104	0 32
nnO	Normal Mode Cut-Out – NIGHT	°C °F	-40 -40	40 104	3 37.4
nnI	Normal Mode Cut-In – NIGHT	°C °F	-40 -40	40 104	6 42.8
nEO	ECO Mode Cut-Out – NIGHT	°C °F	-40 -40	40 104	7 44.6
nEI	ECO Mode Cut-In – NIGHT	°C °F	-40 -40	40 104	10 50
nSO	SUPERFROST Mode Cut-Out – NIGHT	°C °F	-40 -40	40 104	0 32
nSI	SUPERFROST Mode Cut-In – NIGHT	°C °F	-40 -40	40 104	3 37.4
tbt	Temperature Blind Time	Seconds	0	255	10
tdu	Temperature Display Unit	°F - Fahrenheit / °C - Celsius			°C

#### Normal Mode Cut-Out – DAY



The temperature at which the compressor will turn OFF when the system is running in Day-Normal mode. The compressor will remain ON until the temperature reaches the Cut-Out temperature.

#### Normal Mode Cut-In – DAY



The temperature at which the compressor will turn ON when the system is running in Day-Normal mode. If the temperature is below this value, the compressor will remain OFF

#### ECO Mode Cut-Out – DAY



The temperature at which the compressor will turn OFF when the system is running in Day-Eco mode. The compressor will remain ON until the temperature reaches the Cut-Out temperature.



#### ECO Mode Cut-In – DAY



The temperature at which the compressor will turn ON when the system is running in Day-Eco mode. If the temperature is below this value, the compressor will remain OFF

#### SUPERFROST Mode Cut-Out – DAY



The temperature at which the compressor will turn OFF when the system is running in Day-Superfrost mode. The compressor will remain ON until the temperature reaches the Cut-Out temperature.

#### SUPERFROST Mode Cut-In – DAY



The temperature at which the compressor will turn ON when the system is running in Day-Superfrost mode. If the temperature is below this value, the compressor will remain OFF

#### Normal Mode Cut-Out – NIGHT



The temperature at which the compressor will turn OFF when the system is running in Night-Normal mode. The compressor will remain ON until the temperature reaches the Cut-Out temperature.

#### Normal Mode Cut-In – NIGHT



The temperature at which the compressor will turn ON when the system is running in Night-Normal mode. If the temperature is below this value, the compressor will remain OFF

#### ECO Mode Cut-Out – NIGHT



The temperature at which the compressor will turn OFF when the system is running in Night-Eco mode. The compressor will remain ON until the temperature reaches the Cut-Out temperature.

#### ECO Mode Cut-In – NIGHT



The temperature at which the compressor will turn ON when the system is running in Night-Eco mode. If the temperature is below this value, the compressor will remain OFF

#### SUPERFROST Mode Cut-Out – NIGHT



The temperature at which the compressor will turn OFF when the system is running in Night-Superfrost mode. The compressor will remain ON until the temperature reaches the Cut-Out temperature.

#### SUPERFROST Mode Cut-In – NIGHT



The temperature at which the compressor will turn ON when the system is running in Night-Superfrost mode. If the temperature is below this value, the compressor will remain OFF

#### Temperature Blind Time



The duration the JEA ignores the regulation (Air) temperature after the compressor switches ON.

#### Temperature Display Unit



Select the unit of temperature the JEA will display all temperature values.

F = Degree Fahrenheit

C = Degree Celsius

### 9.3 DEFROST

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
dF1	Defrost Start Timer Type	-	rEL / aCC / Cnt		rEL
dF2	Threshold For Enabling Defrost Function	°C °F	N/A, -40 N/A, -40	40 104	N/A
dF3	Defrost Start Interval	Hours	N/A, 1	255	10
dF4	Defrost End Interval	Minutes	N/A, 1	255	15



dF5	Defrost Start Temperature	°C °F	N/A, -40 N/A, -40	40 104	-15 5
dF6	Defrost End Temperature	°C °F	N/A, -40 N/A, -40	40 104	10 50
dF7	Minimum Defrost Duration	Minutes	N/A, 1	255	10
dF8	Minimum Duration Between Two Consecutive Defrost Cycles	Hours	N/A, 1	255	10
dF9	Temperature Reading Displayed During Defrost	-	nor/Frn/dEF		nor
dPd	Allow Defrost During Initial Pull-Down	-	No / Yes		Yes
dPt	Defrost Start Interval During Initial Pull-Down	Hours	N/A, 1	255	15
dPE	Defrost End Interval During Initial Pull-Down	Minutes	N/A, 1	255	10
dtP	Defrost Operation Type	-	Off / nAt / ACt		ACt
d0F	Evaporator Fan During Defrost	-	Off / On		On
d0C	Compressor During Defrost	-	Off / On		Off
ddE	Evaporator Temperature threshold for terminating Dripping Delay	°C °F	-10 14	10 50	0 32
ddt	Max Dripping Delay Time after defrost	Seconds	0	255	0

### Defrost Start Timer Type



Select the type of timer to start a defrost cycle:

rEL: Real Time = The defrost start time will continuously count regardless of whether the compressor is On or Off and the defrost will start when the timer value exceeds the value of dF3 (if enabled).

aCC: Accumulated Time = The defrost start timer will count only when the compressor is On and stops counting (not resetting) when the compressor is Off. In other words, the timer resumes counting every time the compressor is On, resulting in counting the accumulated durations during which the compressor has been On. The defrost will start when the timer value exceeds the value of dF3 (if enabled).

Cnt: Continuous Timer = The defrost start timer will count only when the compressor is On and resets to zero whenever the compressor is Off. The defrost will start when the timer value exceeds the value of dF3 (if enabled).

### Threshold For Enabling Defrost Function



The regulation temperature that the defrost function is enabled. Regardless of any other parameters, if the regulation temperature is above this temperature, the JEA will never enter defrost mode, unless it's a forced defrost (see Cd5).

### Defrost Start Interval



The duration between the finish of a defrost cycle and the start of the next one, if not started due to temperature.

### Defrost End Interval



The duration of a defrost cycle if not ended due to temperature.

### Defrost Start Temperature



The temperature at which a defrost cycle will be initiated. This will only be respected if the evaporator probe is not faulty.

### Defrost End Temperature



The temperature at which the defrost cycle will terminate. This will only be respected if the evaporator probe is not faulty.

### Minimum Defrost Duration



The minimum allowable time for a defrost cycle. The Defrost cycle will not end until this time has elapsed regardless of if Defrost Start Interval (dF4) or Defrost Start Temperature (dF6) have been met.

### Minimum Duration Between 2 Consecutive Defrost Cycles



The minimum allowable time between the finish of one defrost cycle and the start of the next defrost cycle. The next defrost cycle will not start until this time has elapsed regardless of if Defrost Start Interval (df4) or Defrost Start Temperature (df6) have been met.

### Temperature Reading Displayed During Defrost



Select what is displayed during the defrost cycle:

nor: normal = Displays the regulation temperature

frn: Frozen = Displays the regulation temperature as the JEA went into Defrost mode

ACt: Active = Display cycles between the regulation temperature and (dEf)

### Enable Defrost During Initial Pull-Down



Select if defrost is allowed during the initial pull-down

No: Defrost will not initiate until the cut-out temperature has been reached for the first time

Yes: Defrost will initiate once the defrost start interval during initial pull-down (dPt) has been met

### Defrost Start Interval During Initial Pull-Down



The period from the JEA turning ON and the start of the defrost.

### Defrost End Interval During Initial Pull-Down



The duration for the defrost cycle during initial pull-down.

### Defrost Operation Type



Select which defrost method is used:

Off = Defrost function disabled

nAt: Natural = Defrost cycle by turning OFF the compressor

ACt: Active = Defrost cycle using a heater

*Note: If winter mode is enabled and activated, then defrost function will be disabled until the winter mode is terminated.*

### Fan During Defrost (not configurable via the display)



Select if the fan is ON during defrost / Winter mode

OFF: Fan will turn OFF (if ON) when defrost or winter mode (if enabled) is initiated and remain OFF for the duration of each mode.

ON: Fan will turn ON (if OFF) when defrost or winter mode (if enabled) is initiated and remain ON for the duration of each mode.

### Compressor During Defrost (not configurable via the display)



Select if the compressor is ON during defrost mode

Off: Compressor will turn OFF (if ON) and remain OFF during defrost

On: Compressor will turn ON (if OFF) and remain ON during defrost (for Hot Gas defrost).

### Evaporator Temperature Which Terminates Dripping Delay



The evaporator temperature at which drip-down will terminate. The JEA will resume normal operation

### Dripping Timeout



The maximum duration for the JEA will remain in drip-down mode. After this, the JEA will resume normal operation regardless of temperature. Set the duration to "0" to disable drip-down.

## 9.4 VOLTAGE PROTECTION CONTROL

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
UPt	Enable Voltage Protection Feature	-	No / Yes		Yes
UHo	High Voltage Disconnect	V AC	60	300	266
UHi	High Voltage Reconnect	V AC	60	300	260
ULo	Low Voltage Disconnect	V AC	60	300	180
ULi	Low Voltage Reconnect	V AC	60	300	186
Hbt	High Voltage Blind Time	Seconds	0	25	0.5
Lbt	Low Voltage Blind Time	Seconds	0	25	2

### Enable Voltage Protection Feature



Select whether voltage protection is active

No = Voltage protection is disabled. All other voltage protection parameters become de-active, and JEA will not respond to High or Low Voltage

Yes = Voltage Protection is enabled. JEA will act according to set parameters

### High Voltage Disconnect



The maximum allowable voltage before the JEA disconnects power to all the outputs

### High Voltage Reconnect



The voltage, which the JEA will reconnect power to all the outputs after a High Voltage Disconnect event.

### Low Voltage Disconnect



The minimum allowable voltage before the JEA disconnects power to all the outputs

### Low Voltage Reconnect



The voltage, which the JEA will reconnect power to all the outputs after a Low Voltage Disconnect event.

### High Voltage Blind Time



The duration of the voltage must be higher/lower than the High Voltage Disconnect (UHo)/High Voltage Reconnect (UHi) before disconnecting/reconnecting power to the compressor and outputs.

### Low Voltage Blind Time



The duration of the voltage must be lower/higher than the Low Voltage Disconnect (ULo)/Low Voltage Reconnect (ULi) before disconnecting/reconnecting power to the compressor and outputs.

## 9.5 DELAYS & TIMERS

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
ltd	Intelligent Time Delay	Seconds	0	300	180
Cd0	First Plug-In Delay	Seconds	0	255	10
Cd3	Minimum Compressor Off Time	Minutes	0	255	3
Cd4	Minimum Compressor On Time	Minutes	0	255	1
LAd	Loads Activation Delay	Seconds	0	255	3
Cd5	Maximum Compressor On Time Forced Defrost	Hours	N/A, 1	50	4
Cd6	Maximum Compressor On Time Refrigeration Fault	Hours	N/A, 1	50	6
dCO	Compressor On Cycle Probe#1 Faulty - Day	Minutes	0	255	2
dCF	Compressor Off Cycle Probe#1 Faulty - Day	Minutes	0	255	3



nCO	Compressor On Cycle Probe#1 Faulty - Night	Minutes	0	255	4
nCF	Compressor Off Cycle Probe#1 Faulty - Night	Minutes	0	255	5
Clb	Compressor Protection Delay Initial Bypass Count	Number	N/A, 1	10	N/A

#### Intelligent Time Delay



The minimum time the compressor must be OFF, before turning ON. If the compressor is OFF for longer than the set duration, then this delay will not be added before switching the compressor ON.

#### First Plug-in Delay



The time delay between plugging in the JEA and the lights, fans and heater outputs being switched ON.

#### Minimum Compressor OFF Time



The minimum amount of time that must elapse between when the compressor is turned OFF to when the compressor is permitted to start again

#### Minimum Compressor ON Time



The minimum amount of time that must elapse between when the compressor is turned ON to when the compressor is permitted to turn OFF

#### Loads Activation Delay



The time delay between any two outputs turning ON. The start-up sequence is:

1. Lights
2. Fans
3. Compressor

#### Maximum Compressor ON Time Without Temperature Drop Before Initiating A Forced Defrost



The maximum permitted time that the compressor can run continuously before the JEA is forced into defrost mode. If 3 consecutive forced defrost occur, on the third time, the JEA initiates Refrigeration Failure Mode.

#### Maximum Compressor ON Time Without Temperature Drop Before Initiating Refrigeration Fault Mode



The maximum permitted time that the compressor can run continuously before the JEA enters Refrigeration Fault Mode

#### Compressor ON Cycle Duration Regulation Probe Fault - Day Mode



The duration the compressor will remain ON for one operation duty cycle when the regulation (air) Temperature probe is faulty when the controller is in Day mode. This time will be obeyed regardless of mode; Normal, Eco or Superfrost.

#### Compressor OFF Cycle Duration Regulation Probe Fault - Day Mode



The duration the compressor will remain OFF for one operation duty cycle when the regulation (air) Temperature probe is faulty when the controller is in Day mode. This time will be obeyed regardless of mode; Normal, Eco or Superfrost.

#### Compressor ON Cycle Duration Regulation Probe Fault - Night Mode



The duration the compressor will remain ON for one operation duty cycle when the regulation (air) Temperature probe is faulty when the controller is in Night mode. This time will be obeyed regardless of mode; Normal, Eco or Superfrost.

#### Compressor OFF Cycle Duration Regulation Probe Fault - Night Mode

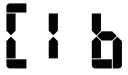


The duration the compressor will remain OFF for one operation duty cycle when the regulation (air) Temperature probe is faulty when the controller is in Night mode. This time will be obeyed regardless of mode; Normal, Eco or Superfrost.

*Note: When the unit is in winter mode and the regulation probe is faulty, then the unit should exit winter mode (go back to normal mode by starting to operate the compressor relay as opposed to the heater relay) and operate as per normal mode under regulation probe faulty condition.*



**Compressor Protection Delay Initial Bypass Count (not configurable via the display)**



The number times the JEA can be powered up with Intelligent Delay disabled. After the specified number of power ups the delay works as per settings (Itd).

*Note: For testing purpose ONLY to avoid waiting 3 minutes for Compressor to turn on.*

**9.6 CONDENSER CONTROL**

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
OH	Condenser Temperature High Threshold	°C °F	N/A, -40 N/A, -40	90 194	70 158
Ohd	Condenser Temperature High Differential	°C °F	1 1	130 234	5 9
SC	Condenser Temperature Low Threshold	°C °F	N/A, -40 N/A, -40	90 194	-20 -4
SCd	Condenser Temperature Low Differential	°C °F	1 1	130 234	5 9

**Condenser Temperature High Threshold**



The maximum temperature that turns OFF the compressor for system protection.

**Condenser Temperature High Differential**



The temperature differential below the Condenser Temperature High Threshold, which the JEA will revert to normal operation

**Condenser Temperature Low Threshold**



The Minimum temperature that turns OFF the compressor for system protection.

**Condenser Temperature Low Differential**



The temperature differential above the Condenser Temperature Low Threshold, which the JEA will revert to normal operation

*Note: Only condenser control or cooler lockout can be enabled at one time.*

**9.7 LIGHTS CONTROL**

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
L0	Lights Regulated By Logic	-	AOn / ESL / Dr		ESL
L1	Lights On Delay (Night To Day Mode Switch)	Minutes	0	255	0
L2	Lights Off Delay (Day To Night Mode Switch)	Minutes	0	255	0
L3	Lights Switch Enable	-	No / Yes		Yes

*Note: The lights will ALWAYS turn ON when the door is opened regardless of any of the settings and modes.*

**Lights Regulated By Logic**



Select whether the state of lights will change when the controller changes Modes

Always On (AOn): Lights are ON unless the controller is in Refrigeration Failure Mode or switched OFF manually.

By ES Logic (ESL): Lights will turn ON/OFF when the controller changes from Day to Night mode and vice versa.

By Door (Dr): Lights will only turn ON when the door is open. When the door is closed the lights will turn OFF

**Light ON Delay (Night to Day Mode)**



The time delay between the controller switching from Night to Day mode, and the lights turning ON.



### Light OFF Delay (Day to Night Mode)



The time delay between the controller switching from Day to Night mode, and the lights turning OFF.

### Lights Switch Enable



Select whether the state of lights will change with a button press

No = Light button disabled. Lights will only turn ON/OFF with logic or if Refrigeration Failure Mode is entered

Yes = Light button enabled.

## 9.8 DOOR OPERATION

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
d1	Door Open Alarm Delay	Minutes	0	255	2
d2	Door Switch Malfunction Delay Delta	Minutes	0	255	5
d3	Door Close Duration Compressor On	Seconds	0	255	0
d4	Door Open Duration Evap Fan Off	Seconds	0	255	0
d5	Door Close Duration Evap Fan On	Seconds	0	255	0

### Standard Door Open Operation

If the door opens and Door Opening Event (Fd0)= YES

- Any Operational Mode
  - Fan: OFF (respecting d4)
  - Door Open Indicator: ON (solid)
- Defrost Operation
  - Fan: ON
  - Door Open Indicator: ON (solid)

### Door Open Alarm Delay



The time between the door opening and staying open, and the Door Alarm Triggering.

### Door Switch Malfunction Delay Delta



The Time differential above the Door Open Alarm Delay (d1) which will trigger the Door Malfunction operation.

### Door Close Duration Compressor ON



The duration for the door to remain closed after a Door Open Alarm before the compressor will turn back ON.

### Door Open Duration Evap Fan OFF



The duration the door to remain open before the evaporator fan will switch OFF if Switch OFF fan on Door Opening Event (Fd0) is set to Yes.

### Door Close Duration Evap Fan Back ON



The duration the door to remain open before the evaporator fan will switch back ON if Switch OFF fan on Door Opening Event (Fd0) is set to Yes.

## 9.9 POWER ON/OFF BUTTON (only editable through the JEA display)

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
POF	Enable Power ON/OFF Button	-	No / Yes		Yes
PCt	Power Cut HACCP Alarm Time Threshold	Minutes	N/A, 1	255	1



**Enable Power ON/OFF Button**



Select whether the JEA can be turned OFF through the display buttons  
 No = Button function disabled. JEA is always on when plugged in.  
 Yes = Button function enables. JEA and outputs can be manually turned OFF through the display button

**Power Cut HACCP Alarm Time Threshold**



The minimum duration of a power cut for the JEA to log it as an alarm.  
 Note: Only available on JEA versions with self-learning (JEA-xxxS model)

**9.10 INITIAL PULL DOWN**

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
Pdt	Initial Pull-Down Initial Temperature	°C °F	-40 -40	40 104	25 77
Pt1	Time Before Initial Pull-Down Cut-Out (Pd0) Is Activated	Hours	0	255	4
Pd0	Initial Pull-Down Cut-Out Value	°C °F	-40 -40	40 104	0 32

**Initial Pull-Down Initiate Temperature**



The temperature, which if exceeded fat power up, will enable a pull-down.

**Time Before Initial Pull-Down Cut-Out is Activated**



The minimum time the regulation temperature must exceed the Initial Pull-Down Initiate Temperature (Pdt), during pull-down to change the cut-out to the initial pull-down cut-out value (Pd0).

**Initial Pull-Down Cut-Out Value**



The cut-out temperature which will be applied during pull-down in case the regulation temperature remained above Pdt for longer than Pt1.

Note: Defrost is disabled during Pull-down unless Allow Defrost During Initial Pull-Down (dPd) is enabled. Pull-down is also forced when the controller is taken out of lockout mode, regardless of the temperature.

**9.11 EVAPORATOR FAN MANAGEMENT**

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
Fd0	Fan Cycle With Compressor	-	No / Yes		Yes
Fd1	Day Duty Cycle On Time Compressor Cycles Off	Minutes	0	255	2
Fd2	Day Duty Cycle Off Time Compressor Cycles Off	Minutes	0	255	3
Fn1	Night Duty Cycle On Time Compressor Cycles Off	Minutes	0	255	2
Fn2	Night Duty Cycle Off Time Compressor Cycles Off	Minutes	0	255	3
FC1	Allow Fan Management During Normal Operation	-	No / Yes		Yes
FC2	Allow Fan Management During Eco Mode	-	No / Yes		Yes
FC3	Allow Fan Management During Superfrost Mode	-	No / Yes		Yes
Fd	Switch Off Fan On Door Opening Event	-	No / Yes		Yes
FH	Fan Duty Cycle Override Temperature	°C °F	0 32	90 194	15 59
FHd	Fan Duty Cycle Override Temperature Differential	°C °F	0 0	25 45	2 4
FSt	Fan Minimum Stop Time	Seconds	0	255	2

**Fan Cycle With Compressor**



Select the operation of the evaporator according to the compressor  
 No = Fan is ON when the compressor is OFF. If set to No, Fd1, Fd2, Fn1, Fn2, FC1, FC2 & FC3 will be ignored  
 Yes = Fan cycles when the compressor is OFF



#### DAY Duty Cycle ON Time Compressor Cycles OFF



The time the evaporator fan is ON when the compressor is OFF and the system is running in Day mode if Fan Cycle with Compressor (Fd0) is enabled. If 0 is set, the fan will remain on when the compressor is OFF.

#### DAY Duty Cycle OFF Time Compressor cycles OFF



The time the evaporator fan is OFF when the compressor is OFF and the system is running in Day mode if Fan Cycle with Compressor (Fd0) is enabled. If 0 is set, the fan will remain on when the compressor is OFF.

#### NIGHT Duty Cycle ON Time Compressor Cycles OFF



The time the evaporator fan is ON when the compressor is OFF and the system is running in Night mode if Fan Cycle with Compressor (Fd0) is enabled. If 0 is set, the fan will remain on when the compressor is OFF.

#### NIGHT Duty Cycle OFF Time Compressor Cycles OFF



The time the evaporator fan is OFF when the compressor is OFF and the system is running in Night mode if Fan Cycle with Compressor (Fd0) is enabled. If 0 is set, the fan will remain on when the compressor is OFF.

#### Allow Fan Management During NORMAL Operation



Select whether the evaporator fan cycles with the compressor while in Normal operating mode  
No = Fan remains ON when the compressor is OFF  
Yes = Fan cycles as regulated by Fd1 & Fd2 (if in Day mode) or Fn1 & Fn2 (if in Night mode)

#### Allow Fan Management During ECO Mode



Select whether the evaporator fan cycles with the compressor while in Eco operating mode  
No = Fan remains ON when the compressor is OFF  
Yes = Fan cycles as regulated by Fd1 & Fd2 (if in Day mode) or Fn1 & Fn2 (if in Night mode)

#### Allow Fan Management During SUPERFROST Mode



Select whether the evaporator fan cycles with the compressor while in Superfrost operating mode  
No = Fan remains ON when the compressor is OFF  
Yes = Fan cycles as regulated by Fd1 & Fd2 (if in Day mode) or Fn1 & Fn2 (if in Night mode)

#### Switch OFF Fan On Door Opening Event



Select whether the evaporator fan cycles with the compressor while in Superfrost operating mode  
No = Fan remains ON when Door is Open  
Yes = Fan turns OFF, respecting Door Open Duration to Switch Fan OFF (d4)

#### Fan Duty Cycle Override Temperature



The maximum regulation temperature at which the evaporator fan is permitted to cycle. If the override temperature is exceeded the fan will always be ON until the temperature differential is reached.

#### Fan Duty Cycle Override Temperature Differential



The temperature differential below the override temperature, which the fan will resume duty cycling

#### Fan Minimum Stop Time



The Minimum time the fan must be OFF before being allowed to turn back ON

### 9.12 WINTER MODE (Designed for coolers in sub-zero conditions and a cabinet heater fitted)

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
Ht	Enable Winter Mode	-	No / Yes		No
HAt	Heater Activation Temperature Threshold	°C	-40	40	-10
		°F	-40	104	14



HAd	Heater Activation Delay	Minutes	0	255	0
HdF	Heater Activation Temperature Differential	°C	0	25	2
		°F	0	45	4

#### Enable Winter Mode



Select whether Winter mode is enabled  
 No = Winter mode disable. Other Winter mode parameters ignored  
 Yes = Winter mode enabled

#### Heater Activation Temperature Threshold



The minimum regulation temperature which will trigger the JEA to enter Winter mode if lower for longer than the Heater Activation Delay.

#### Heater Activation Delay



The maximum permitted time that the Heater Activation Temperature Threshold can be exceeded before triggering Winter Mode.

#### Heater Activation Temperature Differential



The temperature differential above the Heater Activation Temperature Threshold, which will turn OFF the heater and normal operation mode is resumed.

*Note: If Winter mode is enabled and activated, then defrost function will be disabled until the Winter mode is terminated.*

*Note: If the JEA is in Winter mode and the Regulation Probe is detected to be faulty, then the JEA will exit Winter mode and will resume normal operating mode.*

### 9.13 AMBIENT CONDITION INTERACTION

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
AnA	Enable Ambient Temperature Interaction	-	No / Yes		Yes
AdE	Enable Defrost In High Ambient Condition	-	No / Yes		Yes
An	Nominal Ambient Condition	°C °F	0 32	90 194	40 104
An1	Ambient Change Threshold 1	°C °F	0 0	10 18	5 9
An2	Ambient Change Threshold 2	°C °F	0 0	10 18	10 18
AS1	Regulation Temperature Limit Change On An1	°C °F	-5 -9	5 9	0 0
AS2	Regulation Temperature Limit Change On An2	°C °F	-5 -9	5 9	0 0
ALL	Lower Ambient Safety Limit	°C °F	-50 -58	0 32	-40 -40
ALU	Upper Ambient Safety Limit	°C °F	0 32	80 176	40 104

*Note: This functionality is adjusting the Set Point (cut-in and cut-out values in any operating mode) to reduce energy consumption according to ambient conditions.*

#### Enable Ambient Temperature Interaction



Select whether the cut-in and cut-out values (set point) are influenced by the ambient temperature  
 No = Ambient temperature will be ignored and no adjustments will be made to the compressor cut-in and cut-out values  
 Yes = Adjustments will be made based on the ambient temperature

#### Enable Defrost in High Ambient Condition



Select whether defrost occurs when the ambient temperature rises above nominal ambient conditions (An). Enable Ambient Temperature Interaction (AnA) must be enabled, and the ambient temperature probe is



configured and present.

No = Defrost is disabled when the ambient temperature is above An

Yes = Defrost is enabled. Defrost will be triggered as normal depending on set defrost parameters.

#### Nominal Ambient Condition



The maximum temperature the ambient temperature can reach before adjustments to cut-in and cut-out values are made if Ambient Interaction Enabled (AnA) is set to Yes.

#### Ambient Change Threshold 1



The maximum temperature differential above the Nominal Ambient Condition (ambient temperature probe  $> An$  and  $\leq An + An1$ ), which will increase the respective mode cut-in and cut-out values by Regulation Temperature Limit Change On An1 (AS1).

#### Ambient Change Threshold 2



The maximum temperature differential above the Nominal Ambient Condition plus the Ambient Change Threshold 1 (ambient temperature probe  $> An + An1$  and  $\leq ALU$ ), which will increase the respective mode cut-in and cut-out values by Regulation Temperature Limit Change On An2 (AS2).

#### Regulation Temperature Limit Change On An1



The temperature which will be added to the cut-in and cut-out values if the ambient temperature probe is between the Nominal Ambient Condition and the Nominal Ambient Condition plus Ambient Change Threshold 1

#### Regulation Temperature Limit Change On An2



The temperature which will be added to the cut-in and cut-out values if the ambient temperature probe is between the Nominal Ambient Condition plus the Ambient Change Threshold 1 and the Upper Ambient Safety Limit.

#### Lower Ambient Safety Limit



The minimum ambient temperature the JEA can resume normal operations.

#### Upper Ambient Safety Limit



The maximum ambient temperature the JEA can resume normal operations.

### 9.14 LEARNING ALGORITHM (only applicable in Self Learning models)

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
dOt	Learning Algorithm Door Operating Duration	Seconds	1	255	5

#### Learning Algorithm Door Operating Duration



The accumulated time of door openings in order to register the 30-minute slots as Day mode operation within the learning pattern.

### 9.15 ENERGY SAVING

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
ESL	Enable Energy Saving Learning	-	On / Off		On
ndn	Duration Of No Door Activity To Enter Night Mode	Hours	1	24	2
lnd	Maximum Night Mode Duration	Hours	0	24	8

#### Enable Energy Saving



Select whether the energy-saving feature is enabled. If disabled, other energy-saving parameters become de-active.

ON = Energy Saving enabled. JEA will switch between Day/Night mode accordingly.

OFF = Energy Saving disabled. JEA will remain in Day mode.

Note: Depending on the model of JEA, this parameter will enable/disable either self-learning or basic energy saving.

**Duration of No Door Activity To Enter Night Mode** (applicable in non-self-learning models)



The Time the controller will wait in Day Mode without any door activity before it enters Night Mode.

**Maximum Night Mode Duration** (applicable in non-self-learning models)



The maximum duration the controller is in Night Mode before reverting to Day Mode.

## 9.16 INTERFACE

PARAMETER	DESCRIPTION	OPTIONS	DEFAULT
U1	Communication Port Configuration	JEA Interface (0) / Modbus 9600 baud (1) / Modbus 9600 baud (Inverted Logic) (2) / Modbus 19200 baud (4)	JEA Interface
U2	Display Port Configuration	Remote Display / Lock Control	Remote Display

**Communication Port Configuration**



Select the communication protocol for the JEA data connector

JEA Interface (0) = Standard UART for communication with Sollatek external devices and JEA interface software.

Modbus 9600 baud (1) = Modbus RTU communication with external devices

Modbus 9600 baud (Inverted Logic) (2) = Modbus RTU communication with inverted logic states of Rx and Tx lines (e.g. to be used with GIO-04)

Modbus 19200 baud (4) = Modbus RTU communication with external devices

**Display Port Configuration**



Select the type of device connected to the JEA data connector.

Remote Display (dSP) = Sollatek external devices such as displays & connectivity modules.

Lock Control (LoC) = Cooler door lock system.

## 9.17 COOLER LOCKOUT (not configurable via the display)

PARAMETER	DESCRIPTION	UNITS	MIN	MAX	DEFAULT
LEn	Enable Cooler Lockout	-	On / Off		Off
LTp	Cooler Lockout Temperature Threshold	°C °F	-40 -40	90 194	N/A
LDr	Cooler Lockout Over Temperature Duration	Minutes	0	255	N/A

**Enable Cooler Lockout**



Select whether the cooler lockout feature is enabled. If disabled, other lockout parameters become de-active.

ON = Lockout Mode is enabled. JEA will disconnect all load when set conditions are met and keep them off until it has been manually overridden.

OFF = Lockout mode is disabled. JEA will operate as normal.

**Cooler Lockout Temperature Threshold**



The regulation temperature which will trigger the JEA to enter lockout mode if continuously above it for more than the cooler lockout over temperature duration (LDr).

**Cooler Lockout over Temperature Duration**



The minimum duration of the temperature must remain above the cooler lockout temperature threshold (LTp) before entering lockout mode.

Note: Only cooler lockout or condenser control can be enabled at one time.

# 10. FIRMWARE UPDATE

## 10.1 SPP03 - SOLLATEK PRODUCT PROGRAMMER PROCEDURE (Under Development)

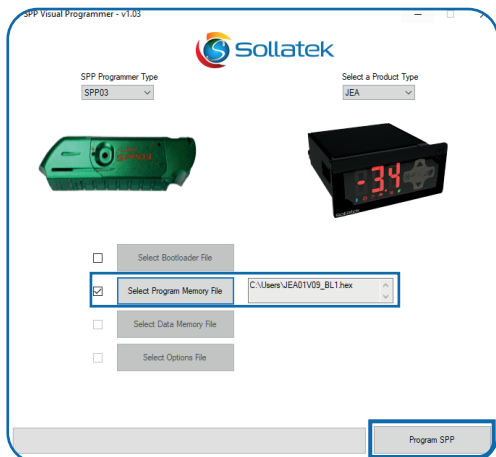


The SPP03 allows you to update the JEA firmware in-situ without the need of connecting the device to a computer.

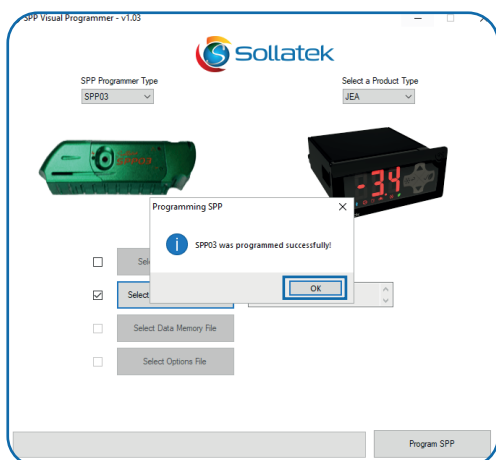
Uploading the firmware onto the SPP03.



1. Open the SPP Visual Programmer Software, supplied by Sollatek.
2. Plug the SPP03 Programmer into the computer's USB port, if plugging in for the first time please wait for all the drivers to be installed before proceeding.
3. Select the Programmer Type to SPPO3.
4. Select the Product type to JEA.



5. Enable Program Memory by clicking on the box on the left-hand side of the window next to the Select Program Memory File button.
6. Click the Select Program File button to open the file directory. Select the .hex firmware file from your PC.
7. Once uploaded click the Program SPP button at the bottom of the window. The LED on the SPP03 will turn ON and remain on as the data is being uploaded.
8. Progress of the uploading will be indicated in the status bar at the bottom of the window.



9. On successful uploading, the LED on the SPP03 will start flashing and then turn OFF. A success message will also appear on your PC.
10. Click "Ok" to close the window.
11. You may now remove the SPP03 device from your computer.





## Programming the JEA



### WARNING! MAINS CONNECTION

Isolate supply before attempting to program the JEA. Failure to do so can result in damage to equipment and electrical shock.


This Equipment is to be serviced by trained personnel only.

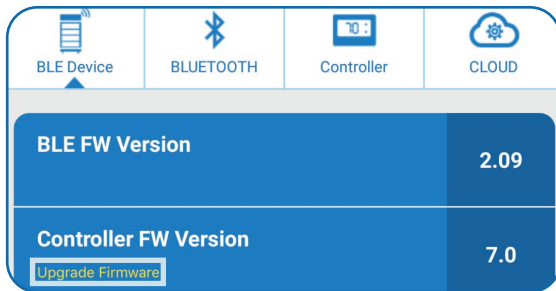
1. Connect the mini-USB connector of the SPP03 to the mini-USB port on the extension cable.
2. Connect the 8-way connector of the extension cable into the 8-way port on the rear of the JEA.
3. Press the button on the side of the SPP03 programmer. The  LED on the SPP03 will turn ON and will remain on as the JEA is being programmed.
4. On Completion, the  LED on the SPP03 will start flashing and then turn OFF.
5. Unplug the SPP03 and extension cable from the JEA. Reconnect mains to the JEA. The JEA is now ready to use.

Note: If you have any problems during programming or want to use the SPP Visual software to upload to the SPP03, then please refer to the SPP03 Visual Programmer User Instructions for more details and troubleshooting.

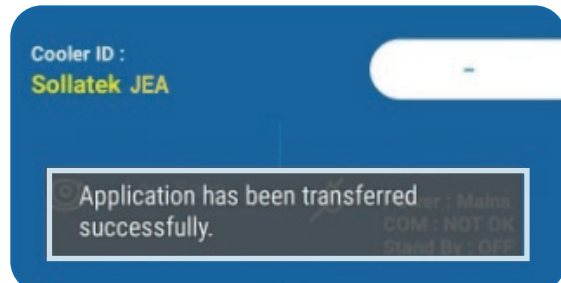
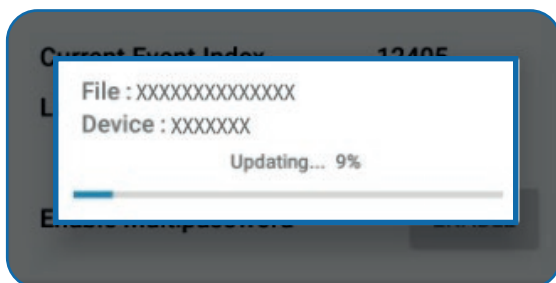
## 10.2 OVER THE AIR UPDATE (if Bluetooth is present)

If the JEA has built-in or is connected to an external Bluetooth device, the JEA firmware can be updated using the Sollatek smart device application.


1. Open the Sollatek smart device app on your phone/tablet. Login using your credentials.
2. Find the required JEA from the list of BLE devices. Connect the device to the app by clicking the  icon in the device header.
3. Select the BLE Device Tab. If new BLE firmware is available for the JEA, Upgrade Firmware will appear below Controller FW Version.
4. Click on the text Upgrade Firmware to start.
5. A dialogue box will appear to confirm you want to proceed with the upgrade. Press YES to proceed.

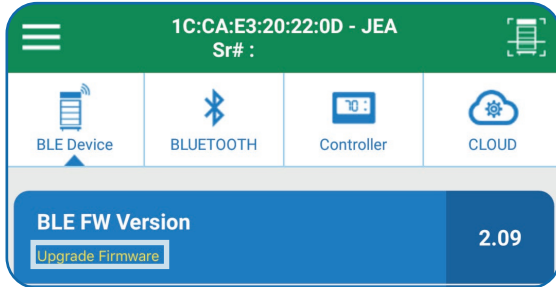


6. The dialog box will close, and the update will start automatically. Progress will be shown in a status window.
7. Once complete the status window will show "done". The window will then close, and the app will disconnect with the JEA and revert to the BLE scanning page.
8. A success message "Application has been transferred successfully" will momentarily appear over the device's operational status to confirm the firmware has been updated.

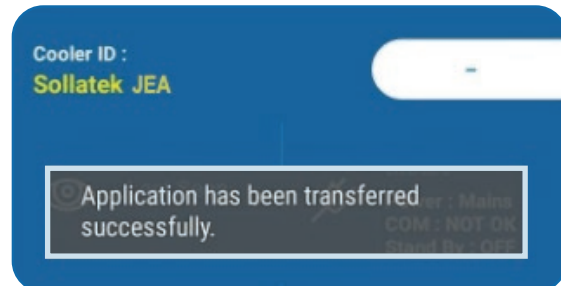
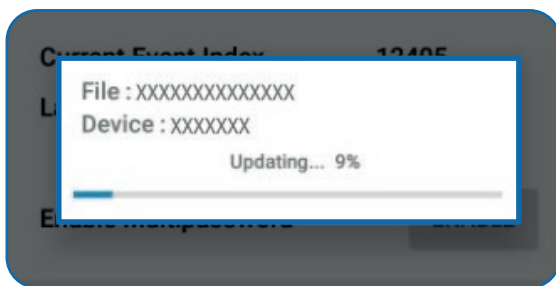


### 10.3 BLUETOOTH FIRMWARE UPDATE THROUGH THE APP (if Bluetooth is present)

1. Open the Sollatek smart device app on your phone/tablet. Login using your credentials.
2. Find the required JEA from the list of BLE devices. Connect the device to the app by clicking the  icon in the device header.
3. Select the BLE Device Tab. If new BLE firmware is available for the JEA, Upgrade Firmware will appear below BLE FW Version.
4. Click on the text Upgrade Firmware to start
5. A dialogue box will appear to confirm you want to proceed with the upgrade. Press YES to proceed.



6. The dialog box will close, and the update will start automatically. Progress will be shown in a status window.
7. Once complete the status window will show "done". The window will then close, and the app will disconnect with the JEA and revert to the BLE scanning page.
8. A success message "Application has been transferred successfully" will momentarily appear over the device's operational status to confirm the firmware has been updated.





## 11. ERRORS AND FAULTS

### 11.1 REGULATION PROBE FAILURE



- Compressor: Cycles according to set ON/OFF cycle duration in Delays and Timer (dCO, dCF, nCO, nCO)
- All other operations as normal

#### With Display

- Master Alarm Indicator: ON
- Main Display: Toggles between -50 and PF1 assuming default probe selection.\*

#### Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: OFF
- Red Alarm Icon: Flashing once (50 ms ON) every 4 seconds

\* If a probe is not selected as the regulation probe the display will toggle between regulation probe temperature and PF1

\*\* If the JEA is in Winter Mode, then it will revert to normal mode and operate as above

### 11.2 EVAPORATOR PROBE FAILURE



- All functions using the Evaporator Probe will be deactivated.
- All defrost start and end temperatures (if enabled) will be disabled.
- Defrost will only be entered or exited through start and end time (if enabled)
- dF2 is not respected (Defrost function is not suspended even if the regulation temperature is above dF2).
- All other operations as normal

#### With Display

- Master Alarm Indicator: ON
- Main Display: Toggles between the regulation probe temperature and PF2 assuming default probe selection.\*

#### Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: OFF
- Red Alarm Icon: Flashing twice (50 ms ON/250 ms OFF) every 4 seconds

\* If the probe is selected as the regulation probe the display will toggle between -50 and PF2.

### 11.3 CONDENSER PROBE FAILURE



- The condenser protection feature will be disabled
- All other operations as normal

#### With Display

- Master Alarm Indicator: ON
- Main Display: Toggles between the regulation probe temperature and PF3 assuming default probe selection.\*

#### Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: OFF
- Red Alarm Icon: Flashing three times (50 ms ON/250 ms OFF) every 4 seconds

\* If the probe is selected as the regulation probe the display will toggle between -50 and PF3.



#### 11.4 AMBIENT SENSOR FAILURE



- Set points (cut-in and cut-out values) are as programmed and are not adjusted due to ambient conditions.
- All other operations as normal

##### With Display

- Master Alarm Indicator: ON
- Main Display: Toggles between the regulation probe temperature and PF4 assuming default probe selection.\*

##### Without display

- Green Power Icon: ON
- Yellow Compressor Icon: OFF
- Red Alarm Icon: Flashing four times (50 ms ON/250 ms OFF) every 4 seconds

\* If the probe is selected as the regulation probe the display will toggle between -50 and PF4

#### 11.5 DOOR SWITCH ALARM



Activated when the door is open for longer than Door Open Alarm Delay (d1)

- Compressor: OFF
- Evaporate Fan: OFF\* (respecting d4)

##### With Display

- Master Alarm Indicator: ON
- Main Display: Toggles between the regulation probe temperature and dOP

##### Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: OFF
- Red Alarm Icon: Flashing twice (500 ms ON / 500ms OFF) every 8 seconds

\* If the JEA is in Defrost mode, the evaporator fan will obey Fan management settings

Note: Controller resumes normal operation once the alarm is reset and a door closing event is sensed. Indicators switch OFF and the display only shows the regulation probe temperature.

#### 11.6 DOOR SWITCH FAILURE/MALFUNCTION



Activated when door is open for longer than Door Open Alarm Delay plus the Door Switch Malfunction Delay Delta (d1 + d2)

- Unit resumes working normally (compressor coming ON when there is cooling demand)
- Unit switches to DAY mode if it was in NIGHT mode when the Door Switch Failure was observed.
- During Door Switch Failure, the lights remain always ON and cannot be switched OFF manually.

##### With Display

- Master Alarm: ON (solid)
- Main Display: Toggles between the regulation probe temperature, dOP and dSF

##### Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: ON
- Red Alarm Icon: Flashing three times (500 ms ON / 500 ms) every 8 seconds
- Self-learning models - The unit stops updating the learning matrix and will not switch to NIGHT mode due to the learning algorithm. Once the door switch is restored, then the learning matrix will reset.

Note: Controller resumes normal operation once the alarm is reset and a door closing event is sensed. Indicators switch OFF and the display only shows the regulation probe temperature.



### 11.7 CONDENSER OVER TEMPERATURE



- Compressor: OFF
  - Evaporate Fan: ON (respecting the door switch status)
- With Display
- Master Alarm Indicator: ON
  - Main Display: Toggles between the regulation probe temperature and COt
- Without Display
- Green Power Icon: ON
  - Yellow Compressor Icon: OFF
  - Red Alarm Icon: Flashing twice (500 ms ON / 500 ms) every 10 seconds

*Note: If three consecutive OH events occur, then the JEA will Initiate Refrigeration Failure Mode*

### 11.8 CONDENSER UNDER TEMPERATURE



- Compressor: OFF
  - Evaporate Fan: ON (respecting the door switch status)
- With Display
- Master Alarm Indicator: ON
  - Main Display: Toggles between the regulation probe temperature and CUt
- Without Display
- Green Power Icon: ON
  - Yellow Compressor Icon: OFF
  - Red Alarm Icon: Flashing twice (500 ms ON / 500 ms OFF) every 10 seconds

*Note: If three consecutive SC events occur, then the JEA will Initiate Refrigeration Failure Mode*

### 11.9 AMBIENT OVER TEMPERATURE



- Compressor: OFF
  - Evaporate Fan: ON or Cycling (respecting the Evaporator Fan Management settings)
- With Display
- Master Alarm Indicator: ON
  - Main Display: Toggles between the regulation probe temperature and AOt
- Without Display
- Green Power Icon: ON
  - Yellow Compressor Icon: OFF
  - Red Alarm Icon: Flashing (2 s ON / 500 ms OFF)
- Defrost is disabled

### 11.10 AMBIENT UNDER TEMPERATURE



- Compressor: OFF
  - Evaporate Fan: ON or Cycling (respecting the Evaporator Fan Management settings)
- With Display
- Master Alarm Indicator: ON
  - Main Display: Toggles between the regulation probe temperature and AUt
- Without Display
- Green Power Icon: ON
  - Yellow Compressor Icon: OFF
  - Red Alarm Icon: Flashing (2 s ON / 500 ms OFF)
- Defrost is disabled



### 11.11 REFRIGERATION FAILURE



Refrigeration Failure Mode will be initiated if any of the following events take place:

- The compressor has been running continuously for longer than Cd6
- 3 consecutive defrost cycles due to Cd5
- Condenser temperature (when condenser probe is enabled and not faulty) exceeds OH over 3 consecutive events
- Condenser temperature (when condenser probe is enabled and not faulty) drops below SC over 3 consecutive events

Refrigeration Failure Mode Operation:

- Compressor: OFF
- Evaporate Fan: OFF
- Lights: OFF
- Heater (if fitted) OFF

With Display

- Master Alarm Indicator: ON
- Main Display: Toggles between the regulation probe temperature and rFF
- Buttons: Disabled but menu item can still be accessed

Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: Flashing (250 ms ON / 250 ms OFF)
- Red Alarm Icon: Flashing (250 ms ON / 250 ms OFF)
- Buzzer: ON (beeping 0.5 s ON / 0.5 s OFF)

*Note: The alarm is reset by cooler unplugging only.*

### 11.12 COOLER LOCKOUT



Activated when the regulation temperature is continuously above the set temperature for longer than the set duration.

- All Relays: OFF

With Display

- Main Display: Toggles between the regulation probe temperature and Loc

Without Display

- Green Power Icon: ON
- Yellow Compressor Icon: OFF
- Red Alarm Icon: Flashing (250 ms ON / 250 ms OFF)

*Note: Lockout can only be quit by manual intervention via Modbus or the GUI.*

### 11.13 POWER CUT ALARM

When power is cut for more than the set alarm threshold (PCT), the event will be flagged and saved as an alarm which can be viewed and cleared via Modbus. Up to three alarms with time stamps and duration of the power cut can be stored by the JEA.



## 12. SPECIFICATION

TEMPERATURE CONTROL		
Temperature Control Method	Air or Evaporator	
Temperature Control Range	-50°C to +90°C (-58°F to +194°F)	
Temperature Control Modes	Day or Night Normal Mode, Eco Mode, Superfrost Mode	
Defrost Control	Manual, Timed or Active	
Energy Saving	Basic Energy Saving - Door tracking to switch between Day and Night mode or Self Learning Algorithm - utilising a Matrix of 48 slots over 7 days (columns) operating pattern Switches from Day or Night mode automatically to maximise cooler efficiency Advanced Breakout features	
Intelligent Time Delay	0 seconds to 5 minutes - maximise compressor availability	
Temperature Blind Time	1 to 255 s	
Refrigerant Compatibility	CO2 & Hydrocarbon	
DISPLAY INTERFACE		
With Display	Display Type	3 x 7 segment digit, LED display
	Digit Height	16.6 mm
	Display Colour	Red, Yellow, Green, Blue & White
	Annunciators	Decimal point & 6 x operational status indicators Compressor, Door, Alarm, Superfrost, Eco mode & Bluetooth
	Keypad	4 x Capacitive touch buttons Up, Down, Back/Superfrost Mode, Tick/Eco Mode
Without Display	Annunciators	3 x operational status indicators Green Power, Yellow Compressor, Red Alarm
Bezel Colour	Customisable colour to match cooler aesthetics (Not supplied with JEA)	
BLUETOOTH AND BATTERY (OPTIONAL)		
Bluetooth	Version	4.1 BLE
	Connectivity	iBeacon, Eddystone & connection to the Sollatek smart device application
	Memory	On-board storage of approx. 13,000 events
Battery	Type	Rechargeable Lithium coin battery
	Nominal Voltage	3 V
	Capacity	17 mAh
	Operating life on one charge	Approx. 50 days (dependent on the beaconing protocol(s) and frequency requested)
INPUT AND OUTPUT		
Input Type	Temperature Probes, Door Switch, PIR, Humidity Sensor	
Temperature Probe Type	10 kΩ NTC ( $\beta_{25/85}$ : 3435 K)	
Input Connector	1 x 2-way RAST Edge connector and 4 x 3-way RAST Edge connectors	
Output Control	Compressor, Evaporator fan, Condenser fan, Lights, Defrost heater, Cabinet heater *Lights and Fan can be powered from a 12 or 24 VDC supply	
	<b>Relay Rating</b>	<b>Control Rating</b>
Compressor Relay	16 A, 250 V	8(6) A, 230 V
Fan Relay	5 A, 250 V	1 (1) A, 230 V
Light Relay	5 A, 250 V	2 (2) A, 230 V
Heater Relay*	10 A, 250 V	8 A, 230 V
Power / Output Connector	Up to 7 x 0.25" (6.35 mm) Fast-on	
Data / Interface Connector	8-way connector	



VOLTAGE PROTECTION	
Powered By	External Mains Power
Operating Voltage	90 - 300 VAC
Voltage Protection	High and Low voltage disconnect
Immediate Disconnect Voltage	60 / 300 VAC
Low Voltage Blind Time	0 - 255 sec
High Voltage Blind Time	0 - 255 sec
Working Frequency	Auto-sense 45/65 Hz
Surge Protection	6.5 kA, <10 ns, 160 J
ENVIRONMENTAL	
Ingress Protection	IP65 Front for wash-down
Operating Temperature	-20°C to +50°C
Operating Humidity	0 - 100%
MECHANICAL SPECIFICATIONS	
Mounting	2 options for Panel Mounting: Front mounting: Screws Rear mounting: Clips (Not supplied with JEA)
Unit Dimensions	78.0 x 90.0 x 36.5 mm
Unit Weight	Approx. 116g depending on model

\*Only present in 4 relay models



## 13. ACCESSORY LIST

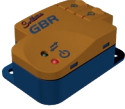


### JEA ACCESSORIES

	PRODUCT CODE	PRODUCT DESCRIPTION
	72121589-1	JEA - Red Bezel Printed
	72121589-1B	JEA - Black Bezel Printed
	72121589-1Y	JEA - Yellow Bezel Printed
	72121589-4	JEA - Side Fixing Clip (2 clips per unit required)


### INPUT SENSORS

	PRODUCT CODE	PRODUCT DESCRIPTION
	9TM66015BR	T Probe 6.0/1.5/16 10K BK24 C4E
	9TM66015WR	T Probe 6.0/1.5/16 10K WT24 C4E
	9TM66035BR	T PROBE 6.0/3.5/16 10K BK24 C4A
	9TM66035WR	T PROBE 6.0/3.5/16 10K WT24 C4A
	9W10110BT	D/SWITCH N/O SPST 1.0/BK24/C5S
	9W10110WT	D/SWITCH N/O SPST 1.0/WT24/C5S
	9W10120BT	D/SWITCH N/O SPST 2.0/BK24/C5S
	9W10120WT	D/SWITCH N/O SPST 2.0/WT24/C5S
	9W10130BT	D/SWITCH N/O SPST 3.0/BK24/C5S
	9W10130WT	D/SWITCH N/O SPST 3.0/WT24/C5S
	9W10145BT	D/SWITCH N/O SPST 4.5/BK24/C5S
	9W10145WT	D/SWITCH N/O SPST 4.5/WT24/C5S
	91622000-C	FMP1-C PIR SENSOR MODULE
	8M293480	CABLE JEA TO FMP1-C 0.5M
	8M293481	CABLE JEA TO FMP1-C 2.0M
	91624102	FMH2 Humidity Sensor For JEA 2m

### CONNECTIVITY DEVICES

	Product Code	Product Description
	9530BR30	GBR3 REMOTE BLE MODULE
	9530BR3B	GBR REMOTE BLE MODULE + BATTERY
	92363XB0	FFX-B EXPANDER PORT WITH BLE W/O BATTERY
	92363XBB	FFX-BB EXPANDER PORT + BLE AND BATTERY
	92363XBB-Y	FFXy-BB Expander Port + BLE and Battery
	92363X00-M2	FFX-M2 Module 2G/Batt/Wi-Fi/32Mb
	92363X00-M4	FFX-M4 Module Cat-M/Batt/Wi-Fi/32Mb
	92363X00-ML	FFX-ML Module LoRa + Batt + WiFi
	92363X00-MN	FFX-MN Module NB/Batt/Wi-Fi/32Mb
	92363X00-MB8	FFX-MB8 Battery Module 800mAh
	8M293424	CABLE 2X4 WAY TO μUSB 2M
	95342WB0	GMC4-2BBW 2G
	95344WB0	GMC4-4BBW 4G
	TBC	JEA-GMC4 Cable

### EXTERNAL DISPLAY

	PRODUCT CODE	PRODUCT DESCRIPTION
	92363DR0	FFD-R DIGITAL DISPLAY MODULE RED
	8M293490	JEA TO FFD DISPLAY CABLE 2M DWG 3816.01



92393R00	FDM3R 14MM RED 3 DIGIT DISPLAY
92393B00	FDM3B 14MM BLUE 3 DIGIT DISPLAY
92393BNS	FDM3B 14MM BLUE 3 DIGIT DISPLAY N/S
92393G00	FDM3G 14MM GREEN 3 DIGIT DISPLAY
8M293490	JEA TO FFD DISPLAY CABLE 2M DWG 3816.01

#### PROGRAMMING



Product Code	Product Description
90500500	SPP03 FFA-GMC0-GMC2
8M291012	SPP03 TO CABLE SHELL 2X4.2MM DWG 3418.03
8M293425	USB FTDI TO JEA 2X4 WAY DWG 3792.01

## 14. VERSION HISTORY

VERSION	DATE COMPLETE	DESCRIPTION	REVIEWED BY
1.0	10/08/2018	Initial Version	Ziad Azzabi
1.1	05/10/2018	Changes to sections: 4.3, 9, 11 Sections added: 6.1, 7, 8.1, 9.15, 10.3	Pawel Sochon
1.2	15/10/2018	Changes to sections: 8.1, 9.3, 9.9	Pawel Sochon
1.3	13/11/2018	Changes to sections: 7.1, 8.1, 9, 11.1, 11.11	Pawel Sochon
1.4	28/11/2018	Changes to section: 3.1, 4.3, 5, 8.3, 11 Sections added: 3.2	Ziad Azzabi
1.5	20/03/2019	Changes to sections: 8.1, 9.15	Ziad Azzabi
1.6	16/01/2020	Safety warnings updated and moved to prologue. Changes to sections: 2.3, 3.3, 5.3, 5.4, 7.2, 8, 9, 12 Sections added: 9.2, 12	Pawel Sochon
1.7	15/06/2020	Changes to sections: 5.2, 11	Pawel Sochon
1.8	26/11/2021	Changes to sections: 4.3, 4.4, 9, 11 Sections added: 5.4, 8	Pawel Sochon
1.9	04/08/2022	Changes to sections: 2.3, 3.3, 5.3, 12	Pawel Sochon
1.10	19/12/2022	Changes to section: 9.2	Pawel Sochon
1.11	03/05/2023	Changes to section 4.4, 9.7	Pawel Sochon



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Product specifications and other information in this manual are subject to change without prior notice to make improvements.

The information in this document has been carefully checked and is believed to be accurate. Nevertheless Sollatek assumes no responsibility for any errors or omissions.

PS	18/08/2023	JEA User Manual Aug 2023 v1.11 A/I: 10910526
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