

# JHUB

by  **BM PRO**

## OWNER'S MANUAL



# SAFETY PRECAUTIONS

Please read the Safety Precautions carefully before using this system. Be sure to observe all precautions without fail.



## CAUTION

Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstances.

J35 & ControlNode101 Correct installation is the most critical factor in ensuring the safe use of the power supply. If every consideration of these instructions has been satisfied the power supply will be safe to operate.

Ensure that there is always good ventilation for the battery and the J35 power supply

Take care that dropping or touching of metal objects onto the battery terminals does not cause short circuits. Remove any personal metal adornment such as a chain, watch or ring, which could cause short circuits and personal injury.

Batteries are electrically alive at all times and must be treated with extreme caution. They can supply high short circuit currents, even if they appear damaged or undamaged.

Before servicing a battery, disconnect the power supply from all power sources

Do not attempt to charge non-rechargeable batteries. Charging a non-rechargeable battery risks catching fire or possible explosion.

Do not allow water or other liquids to enter the power supply area.

JHub System Table Do not drop or shake the product vigorously to avoid damaging it. Do not shock the equipment, batteries and charger, which may cause device or battery failure, fire or explosion.

Stay away from magnetic equipment; radiation may erase the information stored on the device.

Please note that the battery can only reach top performance level after it has been fully charged and discharged two or three times.

Keep the device dry; do not expose it to water. Do not use it where it can fall into water (such as near a pool, pond, bath etc.). Do not let the device, battery or charger come into contact with water vapour or operate it with wet hands. Contact with water will cause the device to short-circuit, corrode or cause electric shock.

Do not use this product where it is excessively hot, cold, dusty or humid, or where it is exposed to strong magnetic fields or long periods of sunshine. Such exposure may cause device or battery failure, fire or explosion.

Only use the device with the battery and cable supplied. Use of other accessories not recommended in this manual may cause damage to the unit and will void your warranty.

Clean the housing of the device lightly with a dry or moist cotton cloth. Do not use alcohol, thinners, benzene or any other chemical cleaner

This device is a high precision electronic product. It contains no user-serviceable parts inside. Do not try to dismantle, modify or repair it yourself. Disassembly by unauthorised persons will void the warranty.

Specifications are subject to change and improvement without notice

# WELCOME!

Dear Jayco Customer,

Congratulations on the recent purchase of your new Jayco Caravan!

For your convenience, this Jayco caravan has been expertly fitted with the new JHub System from BMPRO, the next generation in tablet-driven management for your caravan's onboard features.

Just like our mates at Jayco, all of our BMPRO products are designed and built right here in Australia with the greatest pride and dedication assuring we deliver the best possible experience for you while you're out on the road!

We know you'll enjoy the convenience that your new JHub System brings. So from us to you, all the best and the safest of travels!

Kindest Regards,

**Team BMPRO**

Setec Pty Ltd

[www.teambmpro.com](http://www.teambmpro.com)

---

# 'HOME' SCREEN



- 1 Battery Isolate**  
When selected battery is disconnected and in sleep mode
- 2 Slide-out Control**  
Controls caravan Slide-Out mechanism
- 3 Area 1 Master Light Switch**
- 4 Area 2 Master Light Switch**
- 5 Area 3 Master Light Switch**
- 6 Hot Water Switch**  
Controls water heater on / off
- 7 Water Switch**  
Controls the water pump on / off
- 8 Time Remaining**  
For battery at current discharge rate
- 9 Tank Levels**  
Indicates levels of your Fresh and Grey water
- 10 Control Panel / Home Screen**  
Moves you between Control Panel and Home Screen
- 11 Temperature**  
Internal Ambient Temperature
- 12 Time and Date**

# 'CONTROL PANEL' SCREEN



## ① Power Source

Shows which source is supplying power

## ② Consumption Indicators

*Battery*

Indicates flow from battery when discharging

*Output*

Indicates current being delivered to the loads

*Voltage*

Indicates the actual battery voltage

## ③ Settings Menu Button

Allows settings and actions for:

Nominal battery capacity

Tank names

Disabling 'Power Saver' mode

Bluetooth pairing with remote devices

Manually navigating between screens

## ④ Bluetooth Connectivity Icon

Shows connectivity status

## ⑤ Tanks

Tank levels and status

## ⑥ Control Panel / Home Screen

Moves you between Control Panel and Home Screen

# CONTENTS

<b>The JHub System</b>	<b>7</b>
What's Included	7
About the JHub System	7
JHub System Diagram	7
<b>JHub System Tablet</b>	<b>8</b>
'Home' Menu — Detailed	8
'Control Panel' Menu — Detailed	10
<b>JHub Tablet Internal Features</b>	<b>13</b>
<b>J35 Power Supply</b>	<b>17</b>
<b>Description of Parts</b>	<b>18</b>
<b>Servicing, Features and Maintenance</b>	<b>23</b>
<b>Battery</b>	<b>25</b>
<b>Set-Up JHub System Devices</b>	<b>30</b>
Setting up the J35	30
Setting up the ControlNode101 (CN101)	30
Setting up the JHub Tablet	30
Connecting the JHub Tablet to the CN101	31
<b>Troubleshooting</b>	<b>34</b>
<b>System Status Indicator (J35)</b>	<b>39</b>
<b>JHub System Specifications</b>	<b>40</b>

Manual Part No. 029966  
Revision 1

Copyright © SETEC 2016

**Disclaimer** SETEC accepts no liability for any loss or damage, which may occur as a result of improper or unsafe use of its products. Warranty is only valid if the unit has not been modified or misused by the customer.

# THE JHUB SYSTEM

## THIS JHUB SYSTEM INCLUDES:

### JHUB Tablet

J35 Power Supply (J35 – Page 17)

ControlNode101 (CN101 - Page 30)

JHUB System Owner's Manual

MicroUSB-to-jumpdrive adaptor

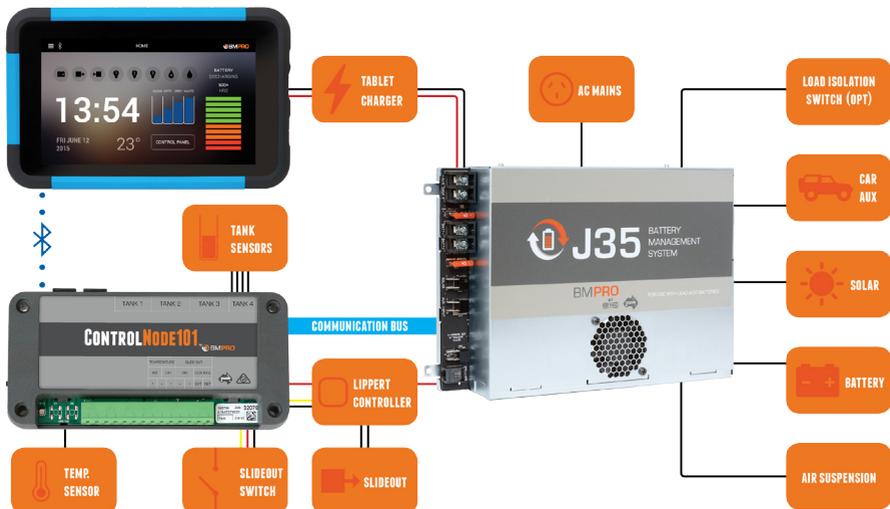
MicroUSB-to-USB connector cable

## ABOUT THE JHUB SYSTEM

The **JHUB** System is a tablet-driven 'control hub' and distribution system designed specifically for charging and managing your Jayco caravan's battery(s) 12V system, as well as controlling your Jayco caravan's onboard features. The system can operate from the following power supplies: 240 VAC, the tow vehicle's 12V auxiliary supply or from Solar Panels (if they are installed).

The **J35** is linked to, and powers, the **ControlNode101 (CN101)** via a CAN bus connection. The **ControlNode101** provides a Bluetooth link to the **JHUB Tablet** and connection to the caravan's Slide-Out (where fitted) as well connecting to four tank sensors and internal ambient temperature.

## JHUB SYSTEM DIAGRAM



# JHUB SYSTEM TABLET

## JHUB 'HOME' MENU – DETAILED



### STATE-OF-CHARGE BAR GRAPH

The State-of-Charge bar graph, gives an indication of how much of the battery's current capacity is available.

When your battery needs to be charged (with only one red bar left), and there is no other source of power available (i.e. Mains, AUX, solar) the system will enter a battery preservation mode (sleep).

You can manually put your battery in to storage mode by touching the 'battery isolate' icon on the top left corner.

For more information on 'storage mode' and battery isolation please see page 28.

**Note:** the State-of-Charge indicator is not shown when no battery is detected.

## TANK LEVELS

There are up to four tanks that can be remotely monitored. Each tank icon on the screen has four levels which represents the liquid level in its respective tank. The tank properties are configurable via the 'Settings' menu on the **JHub Tablet**. Each tank can be given a unique name. The user can also select the sort of tank it is - i.e. fresh or grey water. The indicators on the tablet behave differently, depending on whether the tank is selected as "fresh" or "grey".

A "Fresh" tank will display blue segments by default, but when almost empty, the lowest segment will turn red to indicate that the tank is almost out of water.

A "Grey" tank will also display blue segments by default, however the display will instead turn red when the tank is full indicating that the tank needs to be emptied.

## TIME REMAINING

When the battery is not charging, the lightning bolt is replaced by an estimate of the time remaining at the current discharge rate.

## TEMPERATURE

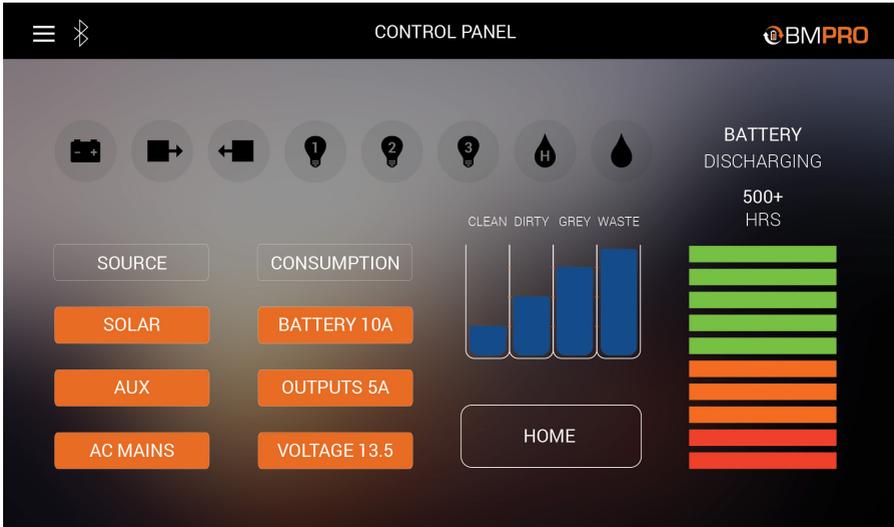
Displays the ambient indoor temperature.

## CONTROL PANEL BUTTON

The Control Panel button moves you between the Control Panel and Home Screen.

## 'CONTROL PANEL' MENU – DETAILED

**Note:** State-of-Charge, Tank Levels and Charging/Time remaining information carries-over from 'Home' screen along with the **JHub Tablet** control icons.



## SETTINGS MENU BUTTON

In the top left corner is the settings menu button, which allows settings to be adjusted including:

- Nominal battery capacity
- Tank names
- Enabling 'Power Saving' mode
- Bluetooth pairing status
- Manually navigate between screens
- Set time & date

## BLUETOOTH CONNECTIVITY ICON

The Bluetooth icon in the top left corner to the right of the 'Settings' menu button displays the Bluetooth connectivity status. It is **Blue** to confirm connectivity, **Yellow** when connecting and **Red** if the connection is lost.

If the JHub Tablet is removed from the caravan or goes flat, the wireless link between the tablet and the rest of the system will be lost. The JHub Tablet will automatically pair again with the rest of the system when it comes within range or has been fully re-charged. Should it fail to pair, please see the 'Troubleshooting' section in the Owner's Manual.

**Note:** When the tablet is not paired, the information displayed on the screen will not be valid.

## SOURCE

There are 3 possible external power sources: AC Mains, Aux and Solar.

See page 17 under **J35** Power Supply for more information on charging sources.

## CONSUMPTION

There are 3 numerical indicators of the Current Flow and Battery Voltage.

- 'Battery' indicates the flow from the battery when it is discharging, or if the Lightning Bolt symbol is present, it displays the charge current flowing into the battery.
- 'Output' indicates the current being delivered to the loads.
- 'Voltage' is the actual battery voltage.

When there is no battery detected, it displays the simulated battery voltage generated by the **J35** from either the AC Mains or Auxiliary input.

## BATTERY ISOLATE

The 'Battery Isolate' button places the battery into/out-of sleep mode, which disables all loads other than the **JHub Tablet** power supply, the **J35** internal power system and the **ControlNode101**. This is useful to preserve the battery. Communication between the **ControlNode101** and the J35 is still active at this point.

In order to maximise battery preservation, a hardware Load Isolation Switch is also provided. More information can be found on page 17, under J35 Power Supply.

## **SLIDE-OUT CONTROL**

The caravan's Slide-Out can be operated from the **JHub Tablet** by touching and holding the in-and-out 'Slide Out' buttons. The Slide-Out movement will stop when button is released. The Slide-Out can also be operated from manual buttons. Refer to your vehicle Owner's Manual for the location of the manual Slide-Out switch.

## **MASTER LIGHT SWITCH**

A Master Light Switch enables a group of lights which can then be turned on or off manually. It provides a central point to disable all lights.

The Master Light Switch button has an orange background when the lights are on and grey when they are off.

## **HOT WATER SWITCH**

The Hot Water Switch turns the water heater on or off.

## **WATER SWITCH**

The Water Switch turns the water pump on or off.

## **HOME**

The 'Home' button moves you between the Control Panel and the Home Screen.

## JHUB TABLET INTERNAL FEATURES

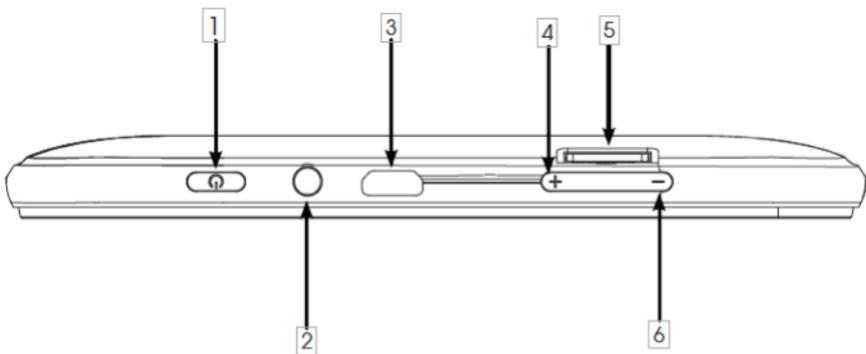
Your **JHub** System Tablet is the 'heart and soul' of your Jayco caravan's features, however it has other useful features.

### BEFORE STARTING

As previously noted, before using your **JHub Tablet** for the first time, fully charge the internal battery via the tablet's docking station or the supplied MicroUSB Cable. After the initial charge, recharge the battery whenever the battery power is low.

### BASIC OPERATION

There are 3 buttons located on the side of the tablet that allow you to power the tablet (on/off) **1**; and adjust the volume level up or down: **4** & **6**.



This is also where you will find access to the stereo output **2**; MicroUSB/Power connection **3**; and the Micro SD Card slot **5**.

### MAIN SCREEN - TURN ON/OFF THE SCREEN

After a period of inactivity, the **JHub Tablet** screen will automatically turn off to save power. This timeframe can be set using the 'Sleep' setting from the Display Menu in the Settings Menu. If after a long time in 'sleep' state, the screen does not turn on, long press the power button to turn off. Then short press the power button (#1) and your device will power off and power on again.

## MAIN SCREEN – UNLOCK THE SCREEN

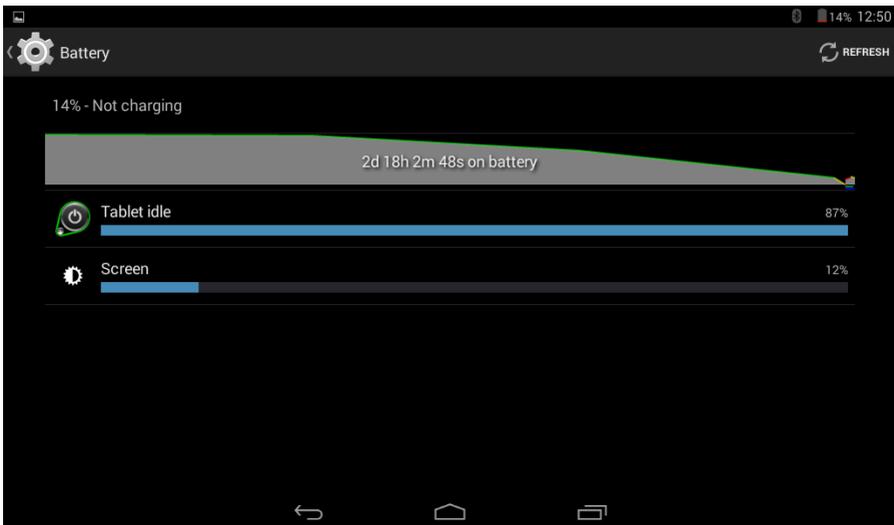
Press and hold 'lock' icon and two options will appear. Drag the lock icon to the right to unlock the screen.

These icons will always be present on the tablet screen no matter what function you are using so as to make navigation as easy as possible.

Button	Name	Description
	Return	Go to the last page (even in another application). When returned to the main screen, you cannot go to the last page again.
	Main screen	One key to return to the main page
	Recent applications	Display a list of recently used applications / background applications (see page 18 ).

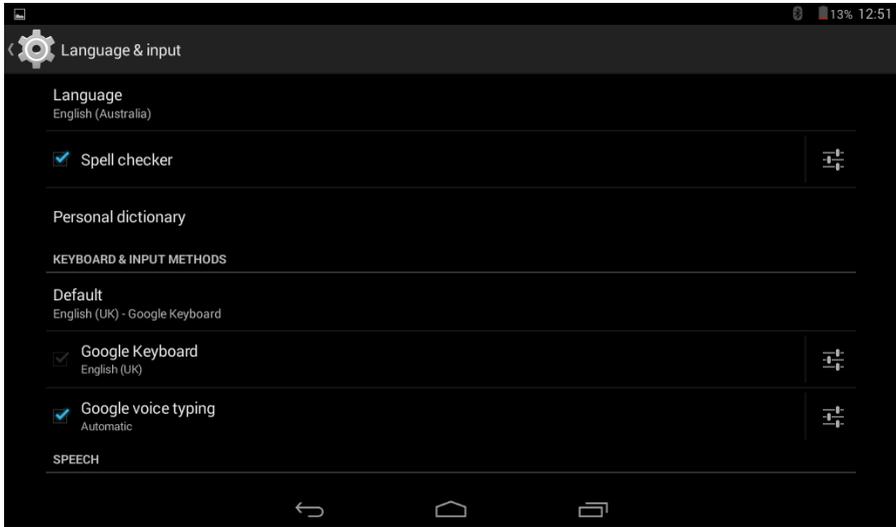
## TABLET BATTERY

Shows battery balance and consumption.



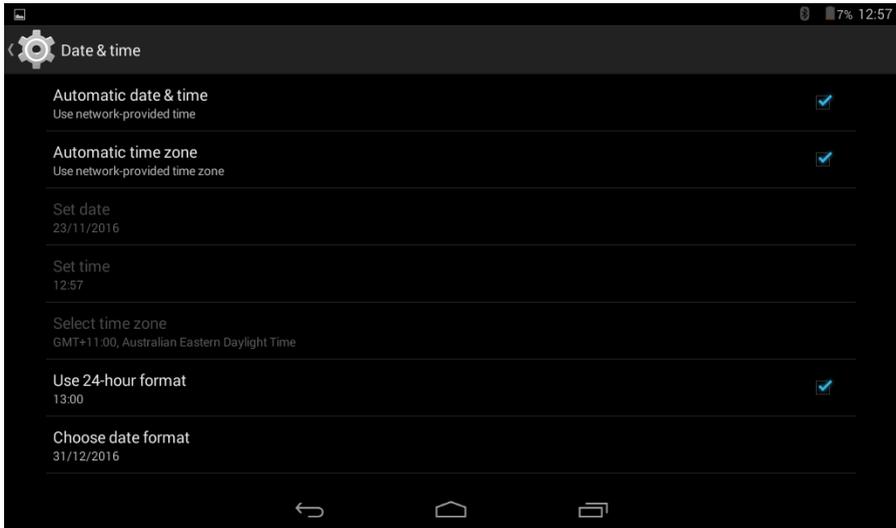
## LANGUAGE AND INPUT

In this area you can change the system language and settings for the keyboard. Note that some apps open the keyboard automatically; others require you to click on an input field first. You can hide the keyboard by pressing the 'down arrow' that appears where the on-screen return button normally is (bottom left of tablet screen).



## DATE AND TIME

Contains options for setting the Time Zone, Date & Time



## BACKGROUND APPLICATIONS, WEB ACCESS AND MORE...

As previously noted, your **JHub Tablet** can be a whole lot more than the control centre for your new Jayco caravan. To stay up-to-date on the latest app releases, product news or just to learn more about your **JHub Tablet's** capabilities, visit the **BMPRO** website for hot tips and the latest insights specific to the **JHub** System.

Catch all the latest here: [www.teambmpro.com](http://www.teambmpro.com)

## THE J35 POWER SUPPLY

The **J35** is a full battery management system with a multi-stage battery charger including bulk, absorption and float charging modes to ensure long battery life. The charging current is limited to a maximum of 15A. The power supply is able to deliver 35A maximum to the battery and loads. The 15A battery charging rate is only possible if there are no load currents. If more than 20Amps is being used, the maximum battery charging current will be reduced accordingly. Note that for **J35** to operate in the manner described above, **all loads must be connected to load terminals, not directly to the caravan battery.**

# DESCRIPTION OF PARTS

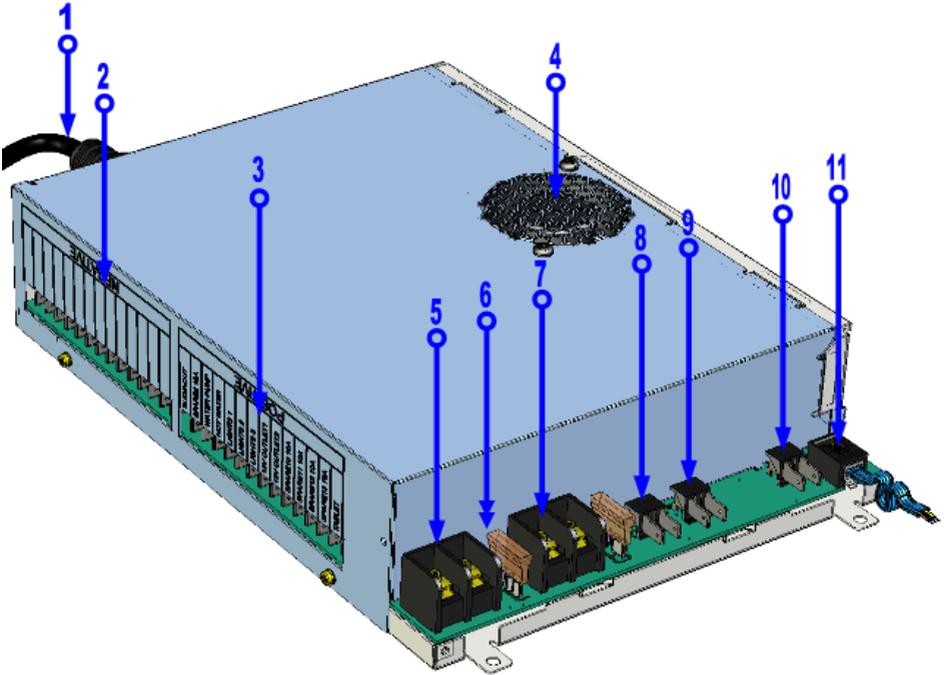


Figure 1: J35 Parts

## 1. Mains Cable (permanently connected)

240 VAC main input power for powering loads and/or charging the loads

## 2. Load Terminal Block, Common Negative Connection

Used for connecting the negative wire of the 12V loads

## 3. Load Terminal Block, 12V Load Outputs (Output labels for J35-C, current rating)

1. SLIDE-OUT	15A	8. 12V OUTLET 1	10A
2. SPARE2	15A	9. 12V OUTLET 2	10A
3. WATER PUMP	10A	10. SPARE 10	10A
4. HOT WATER	10A	11. SPARE 11	10A
5. LIGHTS 1	10A	12. SPARE 12	10A
6. LIGHTS 2	10A	13. SPARE 13	10A
7. LIGHTS 3	10A	14. TABLET	10A

#### 4. Fan

Fan to cool down internal temperature of **J35** when required.

#### 5. Air Suspension Output

Connection point to power the Air Suspension of the caravan (where fitted).

#### 6. LED Indicator

The LED is a status indicator. Refer to item LED Output Status Indicator for more details.

#### 7. BATT+ and BATT-

Connection point for battery positive and negative terminal.

#### 8. SOLAR Input

Connection point for SOLAR input positive and negative wire.

#### 9. AUX INPUT (Auxiliary)

Connection point for external DC input positive and negative wire

#### 10. LOAD ISOLATION SWITCH

Terminal block for connecting an optional remote switch. This switch is used to simultaneously disconnect the loads from all power.

#### 11. CAN Bus Communication

CAN Bus Communication connection point between **CN101** and **J35**

### 1. Mains Cable

 **WARNING** If the supply cord is damaged, it must not be replaced and the appliance should be scrapped.

This is pre-cabled and fitted with a mains plug. Ensure that AC Mains source always have the earth terminal.

### 2. Common Negative Connections

All load negative returns are connected directly to the **J35** negative terminals. All are terminated by using quick connect (QC). Dimension of the QC is specified in Figure 2.

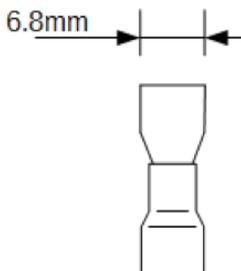


Figure 2: Quick Connect (QC) Dimension

### 3. 12V Load Outputs

Each load had been connected to a specific terminal. Load outputs are labelled accordingly. Figure 1 provides the details of output labels and current limit of each output.

#### “SLIDE-OUT”

The Slide-Out output is different among other outputs. Unlike the others, the Slide-Out output is always OFF whenever the auxiliary voltage is present, regardless if AC mains is ON or OFF. This is a safety mechanism of the **J35**. To prevent from accidentally engaging the Slide-Out while caravan is in transit, **J35** effectively inhibits the Slide-Out to engage if auxiliary input is ON. To operate the Slide-Out, turn off auxiliary input. Turning off the towing car engine would suffice.

#### “TABLET”

The TABLET output terminal is where charger (12V input/5V output) for tablets or mobile phones can be connected to. When the caravan battery is running low and reaches 10.8V (Low Voltage Disconnect), all the outputs will turn OFF except the TABLET output. This means that in case of emergency, the last remaining charge from the caravan battery can be used to charge a mobile phone and ensure phone calls can be made.

### 4. Fan

 **WARNING** Ventilation holes must never be blocked to ensure continuous air-flow.

Fan keeps the internal temperature to a safe and operational level. If there is blockage on the ventilation holes or the fan is externally prevented from operating, the internal temperature will rise. This may either cause the **J35** to shut-down or de-rate its current output from its maximum to a lower value, depending on the actual internal temperature.

### 5. Air Suspension Output

Output to power the Air Suspension of the caravan. Beside it is a 40A automotive fuse.

 **WARNING** Air Suspension output is not controlled by the Load Isolation Switch circuitry. Even when **J35** system has gone through Low Voltage Disconnect and Storage Mode (refer to Battery Health Preservation section), this output remains ON. Battery could be overly discharged if charging source is not available and Air Suspension is always engaged.

## 6. LED

The LED indicates the status of the **J35** power supply. Refer to section LED Output Status Indicator for more details on page 39.

## 7. BATT+ and BATT-

The terminal block with label Batt+ and Batt- is where the caravan battery connections are terminated. Termination is done via screw.



### **WARNING**

Terminating the battery negative return to any point other than the Batt- may cause the battery to overheat and be overcharged. It is imperative that the caravan battery negative return is not connected anywhere else, like earth ground or caravan chassis.

## 8. SOLAR INPUT (Auxiliary)

The power supply input terminal “SOLAR INPUT” provides an alternative option for charging the caravan battery. If battery is not present, all of the 14 outputs will remain OFF.

The **J35** System supports up to a nominal 450W of panels suitable for use with batteries (open circuit voltage between 18 and 28 VDC).

Depending on the available sun, size, cleanliness, shading and orientation of the panels and on how much load is being drawn, the battery will either be charging or discharging. Reducing loads will increase how much solar power is available for charging the battery. Ensuring the panels are clean, not partially shaded by trees or other interference will promote solar charging. If the battery voltage is too low, the system will enter storage mode and disconnect the loads. In this state if there is sufficient uniform sun on the panels they will charge the battery.

Solar regulator is limited to 27A input current or equivalent to 3 x 150W solar panel.

**Note:** **J35** does not provide battery charging management (Bulk, absorption, float and periodic boost) when operating in this configuration.

## 9. AUX INPUT (Auxiliary)

The power supply input terminal “AUX INPUT” provides an alternative option for powering the loads and charging the caravan battery when mains voltage is not present. This input is powered from a suitable +12 V system (e.g. your vehicle). The voltage of this external DC power source must not exceed 14.8 V.

This input is isolated using an internal relay, so it is strictly an input. **J35** will never supply current to anything connected to this terminal.

**Note:** **J35** does not provide battery charging management when operating in this configuration. In this configuration, current and voltage control for the battery must be provided through the external source.

Also, not all DC-DC chargers in the market that are used to boost the charging voltage coming from the auxiliary of the towing car are compatible with the **J35**.

## 10. Load Isolation Switch

A pair of contacts, item 10 in Description of Parts, had been provided for connection to an external switch. When the switch is shorted, all loads are electronically disconnected and turned OFF. After which, all buttons in the **JHub Tablet** will grey out and deactivated. For the Tablet to regain control of the system, remove short on the Load Isolation Switch.

Battery charging is not affected by this switch.

The actual load isolation switch may be located in the control panel inside a shelf in the caravan. Contact caravan dealer if assistance is required in locating where the actual load isolation switch (or control panel) is.

## 11. CAN Bus Communication

The communication bus connection uses a data cable for communication between **J35** and the **CN101**. The cable used is **CN101 CABLE DATA** 0.5m.

# SERVICING, FEATURES AND MAINTENANCE

This product contains hazardous voltages and energy hazards, which can result in death or injury. Only qualified service personnel may service it. The only serviceable parts are the external fuses.

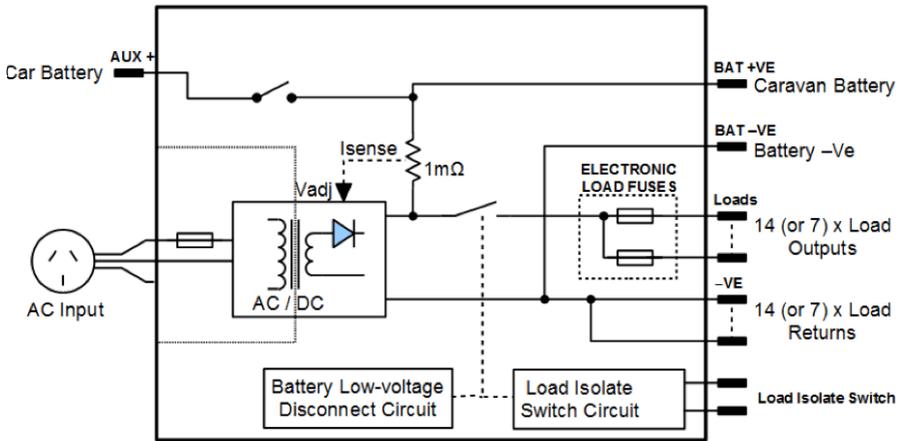


Figure 3: Functional Schematic

## AC/DC POWER SUPPLY

**J35** provides an isolated output for powering the loads and charging the battery. It enters into power supply mode if it is powered by AC mains without a battery, providing an output voltage of 12.8V. With a battery present, battery current is sensed and monitored by the power supply. Charging current is 15A maximum. Refer to item Battery Charging Management for more details.

## MULTIPLE INPUTS

**J35** may have two sources present at one time, AC mains or auxiliary. There will only be one source providing power at one time even though all are available. Priority matrix is given below.

<b>AC Mains</b>	✓	—	—
<b>Solar</b>	✓	✓	—
<b>Auxiliary</b>	✓	✓	✓
<b>Dominating Source</b>	<b>AC Mains</b>	<b>Solar</b>	<b>Aux</b>

Table 1: Priorities when multiple inputs are available

**Note:** If no battery is attached to the **J35**, yet power is being supplied from Mains or Auxiliary, the nominal voltage is 12.80V.

## FAULT PROTECTION

The power supply provides automatic protection for overload including short circuit, over-voltage and over-temperature.

During overload and short circuit conditions, the specific output will momentarily shut down. It will automatically attempt to restart every 30 seconds until the fault is removed.

An output over-voltage condition (could be caused by surge, lightning, etc.) or excessive internal temperature will latch the power supply off until the fault is removed and **J35** AC mains is cycled on and off.

For Reverse Battery protection, two battery fuses are installed. (Refer to item Battery Fusing). If one or both of the fuses need to be replaced, contact dealer for assistance.

## FUSING

### Electronic Load Fuses

Each load output is protected by an internal electronic fuse which turns off for currents above its programmed limits. (For current rating of each output, refer to item Description of Parts).

Electronic fuses are auto-recoverable and they eliminate the need for the user to replace blown fuses when output is short circuited (or over loaded). The status of the outputs can be checked through the state of the LED

status indicator. In case of an output fault, corresponding output will shut-down but will auto-recover once the fault has been removed.

### **Battery Fusing**

Apart from the fuse along the Batt+ wire that is connected to the positive line of the battery, a 40A automotive fuse is also mounted in the PCB. In case there is a short circuit in the battery line, this may cause either (or both) the PCB mounted or the external battery fuse to open. If the fuse/s need to be replaced, contact dealer for guidance.

### **Auxiliary (AX) Fusing**

To protect the auxiliary input from excessive current, a fuse (rating not exceeding 30A) along the auxiliary input wire has been installed. If the fuse need to be replaced, contact dealer for guidance.

### **Mains Fusing**

The AC mains input is protected by an internal fuse. This is not serviceable. It is rated 250V 10A, quick acting, and high breaking capacity type.

## **BATTERY**

### **Connection / Disconnection Procedure**

 **WARNING** Sparks have the potential to cause an explosion should combustible gases be present. The following procedures are designed to minimise the risk of spark generation while connecting or disconnecting the battery. The positive terminal of the battery must not be connected to the chassis of the vehicle.

### **BATTERY CONNECTION PROCEDURE**

The caravan battery should be connected as per the following steps.

1. Remove input sources to **J35**
2. Disconnect all loads  
*Turn off all 12V equipment connected to J35*
3. Connect the positive battery terminal
4. Connect the negative battery terminal

## BATTERY DISCONNECTION PROCEDURE

The caravan battery should be disconnected as per the following steps.

1. Disconnect all loads

***Turn off all 12V equipment connected to J35  
or disconnect the loads using the load isolation switch.***

2. Remove input sources to the **J35**

3. Disconnect the negative battery terminal

4. Disconnect the positive battery terminal

## BATTERY TYPES

**Note:** This battery charger is rated to charge lead acid battery banks of up to 300 Ah capacity. Charging current is limited to 15A. Refer to About the **J35** Series Power Supply.

When using batteries other than what is originally installed by caravan dealer, always consult with the battery manufacturer for a detailed description of the installation, uses, and maintenance of the battery.

This product is suitable for charging 12V Sealed Lead-Acid (SLA) batteries including Valve-Regulated Lead-Acid (VRLA) batteries, both Absorbed Glass Mat (AGM) and Gel batteries.

## PARALLELING BATTERIES

When paralleling multiple batteries, all batteries **MUST** be:

- of the same type, e.g. deep cycle battery
- of the same capacity, e.g. 100 Ah
- of the same manufacturer
- fully charged before connecting them together

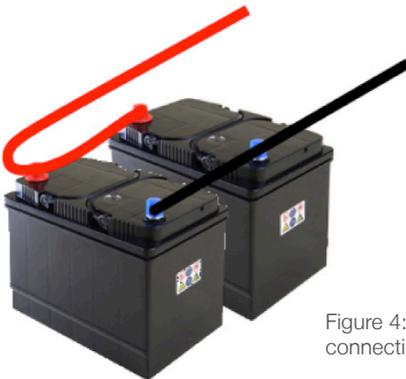


Figure 4: Recommended wiring for connecting batteries in parallel.

Figure 4 is only a recommendation. A qualified auto-electrician may wire this differently depending on system requirements.

 **WARNING** Do not install battery in the same compartment where flammable material such as petrol is stored.

## STORAGE

If the caravan is to be stored for a long period of time, fully charge the battery first and ensure all loads are disconnected. It is recommended to recharge the battery at least once every 6 months. Regular recharging will prevent the battery from becoming deeply discharged—a condition which can significantly shorten battery life.

## DEEPLY DISCHARGED BATTERIES

This battery charger is not designed to charge deeply discharged batteries. Its effectiveness in charging such a battery is a function of the depth of discharge and the battery size.

In normal use, a battery connected to **J35** should never become deeply discharged, so recharging it should never be a problem. If a battery has become deeply discharged though, **J35** will not charge it. Remove the battery and charge it with a stand-alone charger. Once the battery voltage has recovered to normal levels, it may be reinstalled. For guidance in reinstalling, refer to Connection/Disconnection Procedure.

## BATTERY CHARGING FEATURES

**J35** is a full battery management system with a multi-stage battery charger including bulk, absorption, float, and periodic boost charging modes to ensure long battery life. Charging current is limited to a maximum of 15A. Details of the charging process can be found in Figure 5: Charging Algorithm.

Charge Current	Battery Capacity	Bulk/Absorption Charging Times
15 A	100 Ah	5 hours
	200 Ah	10 hours

When powered by AC mains, the power supply is able to deliver 35A (or 450W) maximum to the battery and loads. The 15A battery charging rate is only possible if there are no load currents. If the load current is present, the maximum battery charging current may be reduced accordingly.

## BATTERY HEALTH PRESERVATION

**J35** preserves the health of the battery by inhibiting it from getting overly discharged. There are two stages in which this is achieved; via Low Voltage Disconnect and Storage Mode.

### LOW VOLTAGE DISCONNECT

**J35** disconnects the loads (except the TABLET output) from the battery when the battery is not charging and its voltage falls below 10.8V.

When the AC mains returns, the charging of the battery is commenced and the loads auto reconnect (turn back ON).

If instead of the AC mains, the auxiliary input is used to charge the battery after the **J35** system has gone through LVD, outputs will not turn back ON unless the Load Isolation Switch is cycled or the tablet icon is pressed (from OFF, to ON, then turn back OFF).

### STORAGE MODE

All loads including the TABLET output are turned off when in this mode. CAN power to the Control Node will be turned off causing the communication between the **J35** and the **JHub Tablet** to be lost. **J35** enters into storage mode when the Load Isolation Switch is turned ON. To exit storage mode, turn OFF Load Isolation Switch .

Also, if caravan battery voltage has gone lower than 10.8V (LVD set voltage) and reaches 10.5V, **J35** consequently will be forced to enter storage mode. At this point, outputs will only turn back ON if:

1. battery is charged by AC mains, or
2. battery is charged by AUX and then Load Isolation Switch cycled.

### BATTERY CHARGING MANAGEMENT

To maintain the battery in a good state of health, an intelligently controlled charging algorithm is used. The purpose is to ensure that the correct voltages are applied to the battery terminals at the appropriate times throughout its charging cycle. The basics of the charging algorithm are detailed in Figure 5: Charging Algorithm.

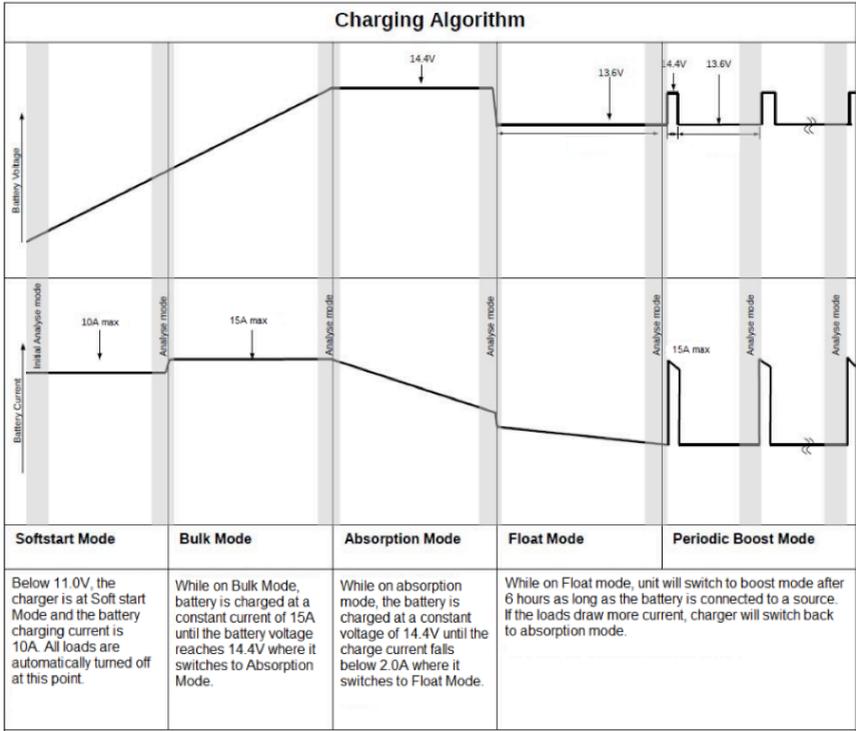


Figure 5: Charging Algorithm.

**J35** will operate as described above if all loads are connected to the load terminals, not directly to the caravan battery. Charging time for the battery depends on the capacity of the battery installed. **J35** auto detects the battery capacity and adjusts the time duration for Bulk/Absorption mode before it transitions to Float mode.

# SET UP JHUB SYSTEM DEVICES

The information below pertains to basic instructions on how to set-up the **JHub Tablet** on the **J35** System to control your caravan's on board features. Should you require information in greater detail due to system malfunction, please refer to your Jayco dealer for in-depth product support.

## SETTING-UP THE J35

Below are three different ways to enable the **J35** and get it ready for connection.

1. Connect an adequately charged Battery.
2. Connect AC Mains input.
3. Connect to Auxiliary input.

When LED in the **J35** is illuminated either green or orange, this indicates the system is enabled, and the **J35** is capable of providing power to **CN101**.

**Note:** With a solar input connection alone but without a battery, **J35** will not have an output and **CN101** power is not provided.

## SETTING-UP THE CONTROLNODE101 (CN101)

Follow instructions below to set-up **CN101**.

1. Connect **CN101** to **J35** via modular jack connection.
2. When **CN101** emits green light, it is ready for connection.

## SETTING-UP THE JHUB TABLET

Follow instructions below to set-up **JHub Tablet**.

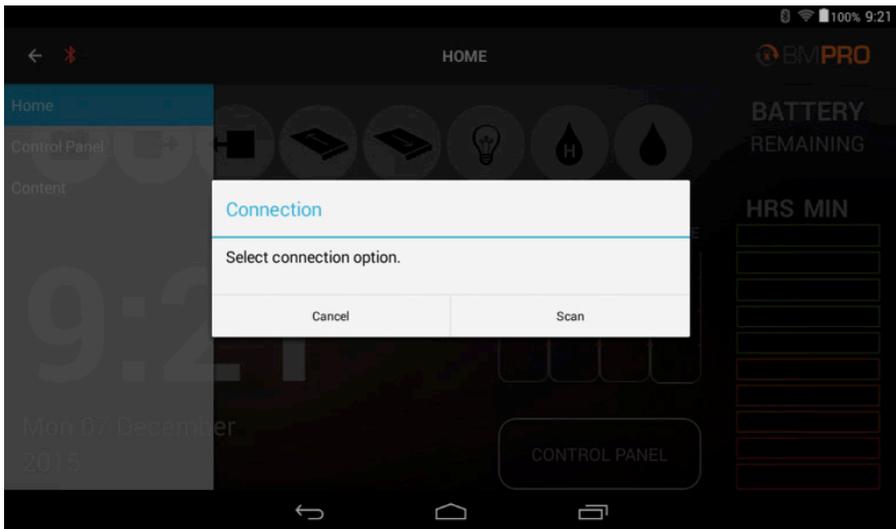
1. Power-up **JHub Tablet** (switch located on the right side of the tablet where volume button, audio jack, and MicroUSB charger connection are also found).
2. If locked, unlock screen (Slide Lock Icon to the right).
3. Turn ON Bluetooth (if not yet ON).  
Go to Settings and SLIDE switch icon into ON position.
4. Access **JHub** System application (app).  
The **JHub** app should automatically open when you turn your tablet on. If not, you can find the application on the tablet home screen.

## CONNECTING THE JHUB TABLET TO THE CONTROLNODE101

If the corresponding **JHub Tablet** and **CN101** has been previously paired or connected, launching the **JHub Tablet** application will automatically re-connect the two devices.

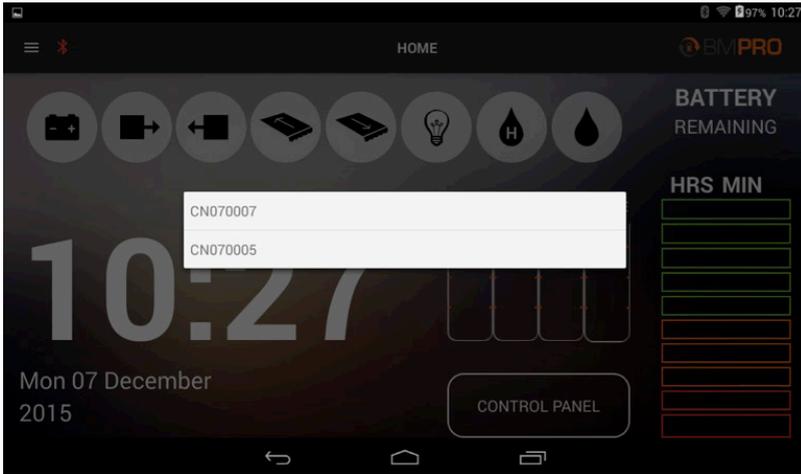
In order for the Bluetooth connection between the **CN101** and **JHub Tablet** to progress, go to Set-Up System Devices (page 34) and then follow the instructions below.

1. When the **JHub** app icon has been pressed, a prompt appears (as shown below)

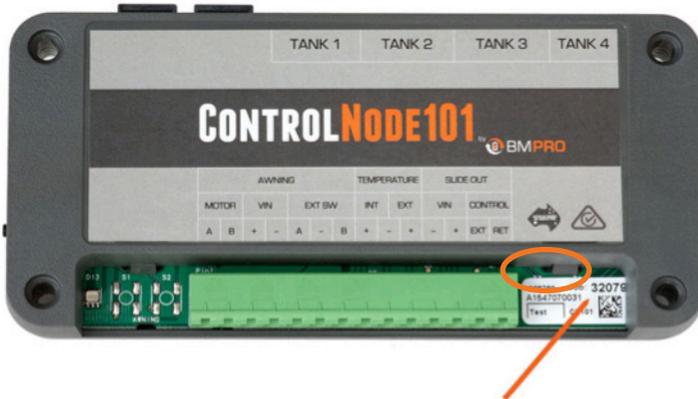


2. Click 'Scan'
3. Tablet will scan for available **CN101** devices.

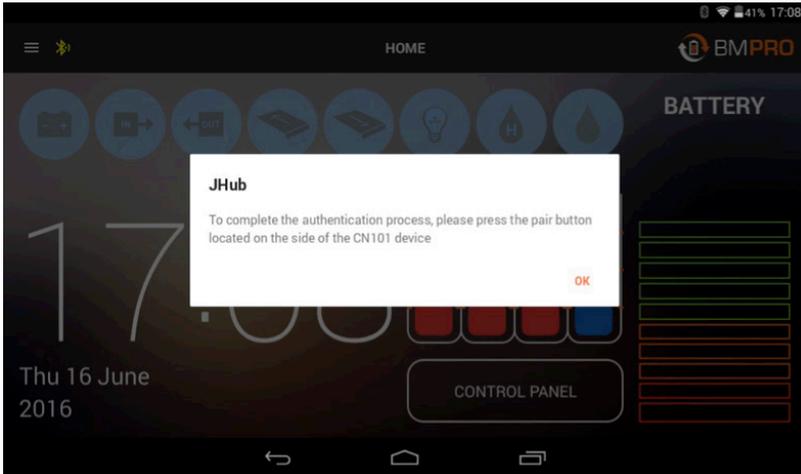
4. When the **JHub Tablet** is finished scanning, a window will pop-up with a list of available **CN101**s that are ready for connection.



5. Select the number that has the same “last 6 digits” of the serial number of the **CN101**. The serial number of the **CN101** is located on the white label found in the bottom right side of the unit (as shown below).



6. Upon matching the **CN101** device, the LED on the ControlNode101 which was previously blinking green will now blink blue and a message in the **JHub Tablet** then pops up (as shown below).



7. Then, press the black button on the left side of the **CN101** as seen below.  
**Note:** Press the black button within 30 seconds



8. The LED on the **CN101** will turn off. This indicates that **CN101** and **JHub Tablet** are now paired and connected.

# TROUBLESHOOTING

## Battery fitted but not detected

Check the following:

1. Battery connections tight and not loose or corroded
2. Battery orientation – Red - positive, Black – Negative
3. In line battery fuse in the red positive cable near the Battery is fitted and not blown. Correct value is 40A.
4. Battery fuse on the **J35** is fitted and not blown. Correct value is 40A.

## No JHub Tablet display

Check the following:

1. Operate the button at the right hand corner just above where the charge cable enters the **JHub Tablet**.
2. The **JHub Tablet** may be flat due to the system having entered the 'Storage' mode to preserve the house battery. Connect the system to AC Mains or the Tow Vehicle with engine running to provide necessary Auxiliary power.

## Bluetooth Connection lost (Red Bluetooth Icon)

Check the following:

1. Ensure the **JHub Tablet** is in its mount or within the Caravan and is powered up
2. Ensure the **JHub System** is powered up from battery, auxiliary or mains
3. Touch the Settings Menu button in the top Left corner
4. Select 'Scan for Devices'
5. When the tablet has completed scanning, a list will be displayed which shows the serial numbers of all the **CN101** devices within proximity of the tablet (if none are discovered, the list will be empty). The serial number of the **CN101** is located on the white label found in the bottom right side of the unit.
6. From the list press to select the correct number. The tablet should now automatically re-connect. Depending on the state of the **CN101**, the tablet may ask the user to press the pair button on the **CN101** to complete the pairing process.

7. If this does not work, either:

Check that the system has not gone into storage mode which turned off all loads and communications to preserve the battery. If it has gone into storage mode, enabling a charging source will re-activate the Bluetooth connection. Or;

Press the black button on the side of the **ControlNode101** for approx 3 seconds, then repeat the procedural steps stated above.

### **Some loads appear to be powered-down**

The **J35** System protects against short circuits on each of its outputs, which can appear to disable the output if a fault is present. A faulty load should be disconnected from the **J35**. If there is a heavy load on the **J35** System exceeding 35A, the **J35** will shed some of the loads. Turn off some of the electrical loads and the desired load should return.

### **All loads appear to be powered-down except the JHub Tablet**

The system can be placed into a 'Sleep' mode to preserve the battery by using the Battery icon on the **JHub**. Touch the Battery icon to resume normal use if the Battery Capacity icon has more than 1 bar. This condition can also be exited by toggling the Isolate Switch (see caravan Owner's Manual).

It can also enter this mode if the first 'Low Battery Detect' point is reached indicated by the battery capacity icon only displaying the last red bar. To exit from this state, recharge the battery by connecting to Mains power or running the tow vehicle. Exposure to solar will also recharge the battery under the right conditions. Exit will occur when 3 bars are present or if the battery Icon is toggled with at least 2 bars present. The next state down is the 'Storage' mode which will disconnect power to the **JHub Tablet**, but the **JHub Tablet** will continue to run on its internal battery for sometime. In this state, the Bluetooth icon will appear red as the communication system to the **J35** System will also have been shut down. In this condition please follow the instructions below.

### **All loads appear to be powered-down including the JHub Tablet**

The system can be placed into a storage mode for longer term preservation of the battery by operating the Isolate Switch. This condition can be exited by toggling the Load Isolation Switch (see caravan Owner's Manual).

The 'Storage' mode is also entered if the second Low Battery Detect point is reached requiring significant protective action to preserve the battery. To exit from this state, recharge the battery by connecting to Mains Power

or running the tow vehicle. Exposure to solar will also recharge the battery under the right conditions. Exit will occur when 3 bars are present or if the battery icon is toggled with at least 2 bars present. In this state, the **JHub Tablet** will continue to run on its internal battery for sometime, but with the Bluetooth icon red.

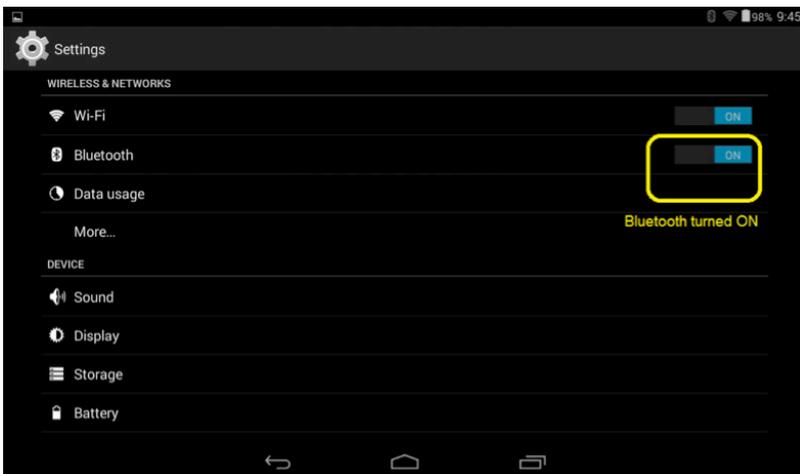
### Solar output appears to be lower than expected

Ensure that there are no shadows on any part of the solar panel(s) such as from nearby trees or roof mounted assemblies such as the air-conditioning unit. The panels performance will be restricted by the most shaded cell on a panel. Also ensure panels are clean.

In Winter, in more southerly locations, and early in the morning and late in the day the sun strikes the panels at very low angle reducing their output significantly even in full sun. If the battery is close to fully charged and there are few loads on, the system will periodically turn off the solar input to avoid over charging the batteries. If Auxiliary or Mains Power are present, the Solar input will not be used.

### No List of available CN101 devices came up after scanning.

It's possible that the Bluetooth of the **JHub Tablet** is not turned ON. If that is the case, proceed to App drawer of the tablet and access 'Settings'. SLIDE the switch icon to the ON position as seen below (encircled in yellow).

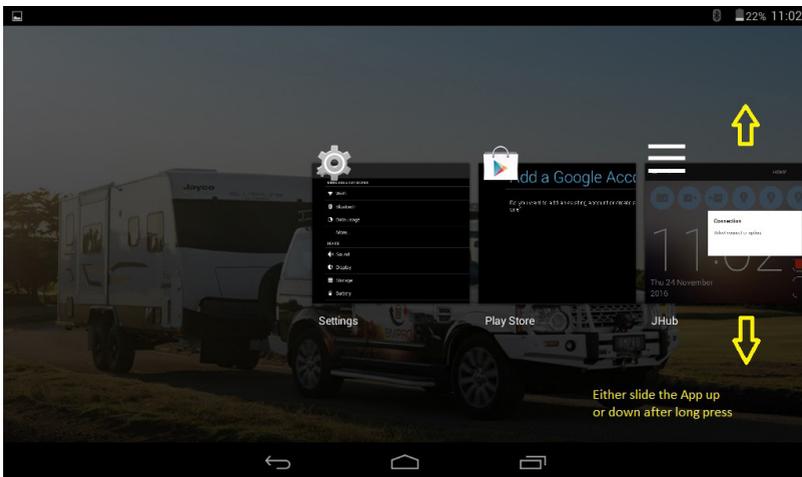


## Need to 'pair' the CN101 with another JHub Tablet.

Restart **CN101** Bluetooth connection by pressing the black button on the left side of the **CN101** for about 3 seconds (long press). The **CN101** LED will emit a blinking green light after that. Then press the 'Recent Apps' key on your tablet (Refer to below, encircled in yellow).



After this a new window will appear (as below). Press the 'JHub App' and slide either up or down. The connection process can now restart. Follow the instructions in "**CN101 and JHub Tablet Connection**" on Page 35 of this manual to complete process.



**The CN101 and JHub Tablet do not reconnect when they are within range of each other after an 'Out of Range' disconnection.**

Try restarting the Bluetooth connection process via the provided solution on page 34 of Troubleshooting Section.

**JHub Application buttons are not responsive.**

From a system shut-down (either Low Voltage Disconnect, battery turned-off, or other) followed by the system being powered-up, it could take about 30-seconds for the **JHub** application buttons (light, hot water, grey water, etc.) to become responsive. With continuous pressing of the **JHub** application buttons, sometimes the button can become unresponsive for about 10 seconds.

**Note:** When the caravan's battery is charging via the 'Auxiliary' input, the Slide-Out buttons are greyed-out and not activated. This means that the Slide-Out can not be operated through with the **JHub Tablet**.

# SYSTEM STATUS INDICATOR (ON THE J35)

On the **JHub** System's **J35**, there is a multi-colour LED which is located between the 'battery' connection and the 'air suspension' connection. This LED is used to display the status of the **J35** unit. Below is a table which covers the different states that might be shown by the LED:

		Colour Code	Flashing Status
White	Internal Error	████████████████████	On, Solid
	Identify Device	.....	Flashes, 5 Times Quickly
	Storage Mode	■     ■     ■	Flashes Every 2min
Yellow: Charging	AC, Charging Normally	████████████████████	On, Solid
	AC, Low Battery Voltage	■   ■   ■   ■   ■	Flashes, 1 Time
	Solar, Charging Normally	■■   ■■   ■■   ■■   ■■	Flashes, 2 Times Quickly
	Aux, Charging Normally	■■■   ■■■   ■■■   ■■■   ■■■	Flashes, 3 Times Quickly
Green: OK	AC, Fully Charged or No Battery	████████████████████	On, Solid
	Solar, Fully Charged	■■   ■■   ■■   ■■   ■■	Flashes, 2 Times Quickly
	Aux, Fully Charged	■■■   ■■■   ■■■   ■■■   ■■■	Flashes, 3 Times Quickly
	Normal, No source present	■   ■   ■   ■   ■	Flashes, 1 Time
Red: Error	One (or more) Output is Overloaded	████████████████████	On, Solid
	Critical Fault	■■■■   ■■■■   ■■■■   ■■■■	Flashes, 4 Times Quickly
	Battery Fault	■■   ■■   ■■   ■■   ■■	Flashes, 2 Times Quickly
	Solar Fault	■■■   ■■■   ■■■   ■■■   ■■■	Flashes, 3 Times Quickly
	Over Voltage Fault, or High Temperature Fault	■   ■   ■   ■   ■	Flashes, 1 Time
	Unit is Not Powered	Off	Off

# JHUB SYSTEM SPECIFICATIONS

J35 System Charger	
Input Voltage Range:	240 Vac nominal, 50 Hz
Input Surge:	< 40 A (cold start)
Output Current:	35 A Continuous (load + battery current)
Factory Set Voltage:	13.65 V +/-0.1 V (Float voltage)
Output Ripple Voltage:	< 150 mV
Over Voltage Protection:	< 18 V
Over Current Protection:	35 A to 38 A (load + battery current)
Battery Current Limit:	15 A max
Battery Connect:	11.5 ± 0.2 V
Disconnect:	10.8 ± 0.2 V
Battery Drain:	About 7mA (When JHub System is at Storage Mode)
Efficiency:	> 83 %
Cooling Fan:	Thermally controlled
Solar Input Current:	<27A
Solar Input Voltage	15V to 25V
Ambient:	0°C – 50°C
Communication:	Communication bus available
Weight:	2 kg
Standards:	Safety: IEC60335-2-29, IEC62109-1,UL458, CSA C22.2 No.107-1, EMC: CISPR 14, IEC61000-3-2, IEC61000-3-3 Approvals: RCM, UL, cUL
JHub System Tablet	
Tablet Input Voltage:	5VDC
Input Current:	3A
(Provided) Charger Input Voltage:	12V
Communication/Charger Cable:	USB micro B
Weight:	0.5 kg
CN101	
Input Voltage:	8 – 15 Vdc
Battery Drain:	< 21 mA
Ambient Temperature:	0 °C – 50 °C







# THE BM PRO BATTERYCHECK



The BatteryCheck is an easy to install device that sets a new standard in battery management systems. This innovative product connects to your deep cycle battery and communicates wirelessly with smart phones. The BatteryCheck provides real time battery management data that allows you to effectively manage remaining battery energy via a simple to use app.

### Key features

- › Communicates via Bluetooth with smart phones
- › Free downloadable app via Google Play and App Store
- › Instant real time data - view information including volts and amps, time remaining, temperature, battery status, state of charge and battery health
- › Easy installation – no mechanical expertise required
- › Works with multiple batteries when in parallel (7Ah-800Ah Battery Bank)
- › Internal shunt capacity - 80 amps continuous
- › Set automatic alarm warnings via app
- › Compatible with any deep cycle 12 or 24V Lead Acid, AGM and Gel 7Ah-800Ah battery

**A WORLD FIRST, INNOVATION  
PATENTED PRODUCT SHOWCASING  
THE LATEST TECHNOLOGY IN  
WIRELESS BATTERY MANAGEMENT**



BM PRO - 19 Henderson Road, Knoxfield 3180, Victoria, Australia  
Phone +61 3 9763 0962 | Fax +61 3 9763 8769  
Email sales@teambmp.com | Web www.teambmp.com

**SWITCH OFF. POWER UP**