User Manual

ZELLABOX[™]



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1 Introduction

A Micro Data Centre is a standalone housing unit that replicates all of the cooling, security and power capabilities of a traditional data center on a much smaller, lower cost scale. It miniaturizes the data centre into the size of an average refrigerator, offering its own cooling and power capabilities, significantly reducing operational and energy costs by 30-60%, and on-premise IT footprint. Moreover, it allows for portability and can be moved from location to location, and expanded to a set of 'modular' data centers as business grow.

The micro data centre is a self-contained facility designed to house your critical networking equipment and to provide the infrastructure of a conventional server facility in a portable and robust environment. The Micro Data Centre eliminates the need for a server room.

Our micro data centres offer a robust and dependable answer to the question of housing and securing your networking and data storage equipment. The facility, in the form of a cabinet, has a host of built-in features, which ensure that your server is secure, accessible and fully portable.

The Micro Data Centre can accommodate your requirements based on a plug-and-play operation of any of the following components:

The Micro Data Centre is available in two models namely; Cubb® and Cubb®Duo. The Cubb is a single cooling unit and the CubbDuo is a dual cooling unit.

- Power Distribution Unit
- Internal Cooling System
- Uninterrupted Power Supply (Rack mounted up to 6000 VA)
- Access Control System (Code / Card / Biometric)
- Environmental Monitoring
- Automated Fire extinguishing System
- Cabinet Lighting
- Cable Management System

2 Safety Instructions

2.1 Overview

This manual contains instructions relating to safety, installation, operation, maintenance and warranty of this product and its components.

Please keep this manual in a safe place for future references.

Handling Safety

Do not lift heavy loads without assistance.







32-55 kg



Important safety note

- Caution needs to be taken when removing the side panels of the Micro Data Centre, in particular when dealing with the 38U as they are heavy, we recommend a 2 man lift when removing and re-installing the side panels.
- ALWAYS ENSURE the bottom brackets are locked in and that the top pins are COMPLETELY slotted in.

VERY IMPORTANT SAFETY NOTE

If you need to remove grommets from the side cooling vents ALWAYS ENSURE they DO NOT fall into the cooling vent chute.

2.2 Pyrorack

Important note

TO ENSURE A UNIFORM DISCHARGE IT IS IMPORTANT THAT THERE ARE NO OBSTRUCTIONS BELOW THE DISCHARGE AREA.

This manual contains essential system & safety information regarding the Pyrorack, before beginning any work involving the Pyrorack please read this manual.

When installation is complete please keep this manual in a safe place.

WE RECOMMEND THAT INSTALLATION AND SERVICING OF THE PYRORACK SHOULD ONLY BE CARRIED OUT BY SUITABLY QUALIFIED PERSONNEL WITH THE NECESSARY TRAINING.

This product is classed as not user serviceable

The use of non-recommended spares or parts or attempts at servicing other than described herein will invalidate conformity and any warranty.

- Toxicity: Always avoid inadvertent exposure to Pyrogen Aerosol!
- Re-entry: Following a discharge, personnel should not enter the protected area until it has been thoroughly ventilated. Avoid exposure to the fire by-products and extinguishing mixture. Should it be necessary to enter the area before it is fully ventilated, the use of a respirator or other means of protection may be required.
- Clean-up: After a discharge, the aerosol particles that have settled should be vacuumed, blown, or if appropriate, washed away. Protective gloves and goggles should be worn. A respirator or mask may be required.
- Do not handle generators immediately following a discharge. The generators Can be HOT; therefore protective gloves should be worn. Do not handle generators for 15 minutes after a discharge

- Dangerous Goods Classification:
 Pyrogen is a class 4.1 article in accordance with the United Nations

 Dangerous Goods Classification Code.
- Ensure that all doors are tightly shut on the cabinet and that all opening doors have warning stickers attached.
- Where an external bell or siren is to be used, the e.o.l resisters inside the control unit must be removed and placed at E.O.L.
- Replacing the mag unit after a discharge (to be performed by suitably qualified personnel with the necessary training only).

2.3 Uninterruptible Power Supply

This equipment is intended for installation in a controlled temperature indoor area free from Conductive contaminants.

Important Safety Warning
Please comply with all warnings and
operating instructions in this manual. Save
this manual properly and read carefully the
following instructions before installing the
unit. Do not operate this unit before reading
through all safety information and operating
instructions carefully

2.3.1 Transportation

Please transport the UPS system only in the Micro Data Centre to protect against shock and impact.

2.3.2 Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed.
- Please allow at least two hours for the UPS system to acclimate to the environment.
- Do not install the UPS system near water or in moist environments.

- Do not install the UPS system where it would be exposed to direct sunlight or near a heater housing.
- Do not block ventilation holes in the UPS

2.3.3 Installation

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).
- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.

Pluggable equipment includes a protective earth conductor that carries the leakage current from the load devices (computer equipment). Total leakage current must not exceed 3.5mA.

2.3.4 Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent fluids or other foreign objects entering the UPS system.

2.3.5 Maintenance, service and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- Caution risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.
- Before carrying out any kind of service and/ or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUScapacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations.
 Unauthorized persons must be kept well away from the batteries.
- Caution risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!

 Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:

Remove wristwatches, rings and other metal objects

Use only tools with insulated grips and handles.

- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It is toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

2.4 Switchboard

Important Safety Warning

WE RECOMMEND THAT INSTALLATION
AND SERVICING OF THE SWITCHBOARD
SHOULD ONLY BE CARRIED OUT BY
SUITABLY QUALIFIED PERSONNEL WITH THE
NECESSARY TRAINING.

- Do not open the switchboard
- Do not remove the switchboard from the Micro Data Centre without contacting Zellabox first.
- Power-down procedure:
 - **Switch** off each component first before switching off mains plug.
 - In order to power down one component at a time simply switch off relative plug before working on respective component. Note – there is no need to switch off entire switchboard.
 - Caution ensure you are switching off the correct component before working on that component.

3 Start-up procedure

The Zellabox Micro Data Centre is a **PLUG N PLAY** unit therefore once it has been installed by a qualified contractor the Micro Data
Centre is ready for use!

Follow these steps to start up your unit:

- Start-up the switchboard
- Switch Mains Isolator switch to the ON position
- Switch Cooling System switch to the **ON** position
- Switch UPS switch to the ON position
- Switch all remaining switches to the ON position

- Follow Pyrorack Commissioning steps from the installation manual.
- Populate the Micro Data Centre with your critical equipment.

NOTE: Ensure adequate gaps are left between the equipment housed within the Micro Data Centre to ensure an effective air-flow is maintained. The cooling system will maintain the optimal cooling air-flow between the equipment if this recommendation is adhered to. NOTE: DO NOT exceed the cooling system's recommended BTU/h specifications (listed in the cooling system section) as this will overheat the equipment.

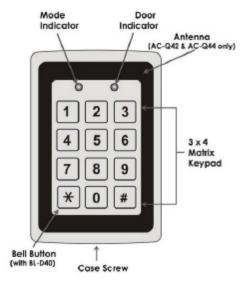
4 Technical data

4.1 Access control

4.1.1 Metal Keypad Key Features

- 500 Users
- Water and vandal resistant
- Backlight (Backlit family, option "B")
- Three user levels: normal; secure; master
- Three modes of operation: normal; bypass; secure
- Integrated keypad for PIN entry (Piezo electric - Q44 only)
- Integrated proximity card reader (Q42 and Q44 only)
- Selectable PIN code length up to 8 digits
- Auxiliary input and auxiliary output
- Ten auxiliary modes including: door ajar; forced door: shunt: door monitor: normal/ secure: LED control
- Input for Request to Exit (REX) button Code search feature for easy maintenance of user codes
- Internal buzzer
- Vandal proof screw (special tool supplied)
- Two tri-colour LED indicators for status / programming Interface
- Built-in case and back tamper protection
- Lockout feature on wrong entries (Keypad/Card Tamper)
- Bell, chime, siren and strobe features available with BL-D40
- Programmable siren time (with BL-D40) Programmable lock strike release time. Supplied with mounting template for easy installation

Front panel description



- Once entered there will be 3 beeps and system will return to normal
- The front panel indicators will be as follows:

Mode Indicator = Door Indicator =

Changing the access codes

Step 1 – Enter Programming mode

Press # key twice quickly within 5 seconds

Enter 1234 quickly

The controller has now entered programming mode and the front panel door indicator

should have changed from
RED to GREEN.

Step 2 – Changing the front door code

- Press 1 (The front panel indicators must still show as indicated in step 1)
- Enter new code
- Once entered there will be 3 beeps and system will return to normal
- The front panel indicators will be as follows:

Mode Indicator =

Door Indicator = O

Step 3 – Changing the back door code

- Start process again at STEP 1 to enter programming mode once again
- Press 2 (The front panel indicators must still show as indicated in step 1)
- Enter new code
- Once entered there will be 3 beeps and system will return to normal
- The front panel indicators will be as follows:

Mode Indicator = Door Indicator =



4.1.2 Digital Keypad Key Features

- 500 Users
- Water and vandal resistant
- Backlight (Backlit family, option "B")
- Three user levels: normal; secure; master
- Three modes of operation: normal; bypass; secure
- Integrated keypad for PIN entry (Piezo electric Q44 only)
- Integrated proximity card reader (Q42 and Q44 only)
- Selectable PIN code length up to 8 digits
- Auxiliary input and auxiliary output
- Ten auxiliary modes including: door ajar; forced door; shunt; door monitor; normal/ secure; LED control
- Input for Request to Exit (REX) button Code search feature for easy maintenance of user codes
- Internal buzzer
- Vandal proof screw (special tool supplied)
- Two tri-colour LED indicators for status /programming Interface
- Built-in case and back tamper protection
- Lockout feature on wrong entries (Keypad/Card Tamper)
- Bell, chime, siren and strobe features available with BL-D40
- Programmable siren time (with BL-D40)
 Programmable lock strike release time. Supplied with mounting template for easy installation

Key Pad Card reader



Programming Guides

Programming Password # Programming Password # 0 new Programming Password # New Programming Password # If Programming Password lost, perform

3.2 reset to Factory Default (123456)

- Add user card
 # Programming Password # 1 read
 card # If add multi cards, read cards
 continuously
- Set Common Access Password
 # Programming Password # 21 new
 Common Access Password #
 Common Access Password is only one.
 Open method: Common Access
 Password #
- Delete all users
 - # Programming Password # 40 000 # Delete all cards and PIN except Common Access Password
- Delete user by read card # Programming Password # 41 read card # If delete multi cards, read cards continuously

4.2 Pyrorack

4.2.1 Introduction

The Pyrorack is a self-contained automatic fire detection and extinguishing system. It is designed to be housed in the Zellabox Micro Data Centre for the protection of delicate electronic equipment. The PyroRack is fully capable of detecting fire using coincidence detection and responding by extinguishing the fire in less than 10 seconds of detection. Signals can also be sent to other equipment via Voltage Free Relay Contacts to inform of the units status and to key personnel for immediate investigation.

By installing the Pyrorack at the top of the equipment rack, equipment is being protected at the centre of the potential risk, therefore more accurately identifying the fire at a very early stage and eliminating the need to discharge large costly quantities of fire suppressant.

The section which houses the extinguishing agent is easily accessed after a discharge and the agent replaced as required. This product has been designed, manufactured and tested under stringent requirements. The installation of this product should only be carried out by a competent person and comply with applicable current National or International standards.

4.2.2 Indications and functions

4.2.2.1 Indications

Indication	Description	Colour
Z1 fault	Fire condition Z1 detected.	Red
Z1 isolated	Fault condition Z1 detected. Fire detection Z1 isolated, Extinguishant	Amber
Zone 2 fire	release isolated.	Amber
Z2 fault	Fire condition Z2 detected.	Red
Z2 isolated	Fault condition Z1 detected.	Amber
Silence sounders	Fire detection Z2 isolated, Extinguishant release isolated.	Amber
Silence buzzer	Sounders Silenced activated	Amber
System on	Buzzer Silenced activated	Amber
System fault	Control Unit operational	Green
P.S.U. Fault	Any fault condition detected	Amber
Sounder fault	Mains or Battery fault detected	Amber
System fire	Bell or Siren fault detected	Amber
Extinguishant released	Z1 or Z2 fire detected	Red
Extinguishant fault	Extinguishant Released confirmation	Red
Automatic	Extinguishant Fault detected	Amber
Manual	Automatic release enabled – system should be left in this position if unattended Automatic release disabled, Manual	Amber
	release enabled	Green

4.2.2.2 Functions

Function	Description
Isolate z1	Isolates Z1and prohibit Extinguishant release.
Isolate z2	Isolates Z2 and prohibit Extinguishant release.
Silence sounders	Silence the external Sounders if activated.
Silence buzzer	Silence the Buzzer if Activated.
Test	Illuminates all LED's.
Reset/abort	A system reset is Performed.

The "EXTINGUISHING RELEASE" button will operate in the "MANUAL" condition only.

4.2.3 fault diagnostics

Fault Conditions: When a fault occurs on a part of the system the panel responds by activating the internal sounder (which will pulse intermittently) and illuminating the

fault light (amber). The internal sounder may be silenced however this will still give a reminder every 15 seconds, which cannot be silenced until the fault is rectified. The fault will automatically reset if the fault clears on its own, however this information is logged in the event log memory for engineering purposes.

The types of faults that would activate these are as follows:

4.2.3.1 Zone 1 Fault

- Cause open or short circuit fault is detected from detection circuit No. 1.
- Remedy check detector 1 is situated on the base correctly, also check that the end of line resistor is in place on the detector base.

4.2.3.2 Zone 2 Fault

- Cause open or short circuit fault is detected from detection circuit No. 2.
- Remedy check detector 2 is situated on the base correctly, also check that the end of line resistor is in place on the detector base.

4.2.3.3 System Fault

- Cause see all other Fault Indications and Detectors.
- Remedy Check Detectors in place and properly fitted.

4.2.3.4 Power Supply Fault

- Cause fault signal is detected from the power supply (mains or battery failure).
- Remedy check all external fuses and that mains supply is present.
- Check batteries are in circuit, check on rear external plate that the battery fuse is in place, check batteries for signs of malfunction – corrosion, overheating, shape distortion.

4.2.3.5 Sounders Fault

- Cause open or short circuit has been detected on one or both of the sounder circuits.
- Remedy Check all connections and E.O.L resistor in place.

4.2.3.6 Extinguishing Agent Fault

- Cause open circuit has been detected on the extinguishing agent circuit.
- Remedy ensure that internal extinguishing actuator is in circuit. If the fault persists it should be changed.

4.2.4 Service

4.2.4.1 User Checks

- Ensure Extinguishing Agent is ISOLATED before carrying out any work.
- The user should ensure that the system is in good working order at all times. The user should carry out on a monthly basis inspections of the system, these should include:-
- Looking out for obstructions to the discharge area, alteration/extensions of protected equipment.
- Checking all openings, which should be securely closed, is not left in the open position.
- Area is free from dust or other foreign objects, which could cause unwanted false alarms.

4.2.4.2 Engineer Checks

- Ensure Extinguishant is ISOLATED before carrying out any works.
- The responsible person should ensure that every 3 months the following checks are carried out by a competent person:-
- Entries in the Log Book are checked and any necessary action taken.
- Batteries and their connections should be examined and tested to ensure they are in a good serviceable condition and not likely to fail before the next quarterly inspection.

- The alarm functions of the control and indicating equipment by operation of a detector.
- Visual inspection.
- Any defects should be recorded in the logbook and reported to the responsible person, and action taken to correct it.
- On completion of the work, a certificate of testing should be given to the responsible person.

4.2.5 External pin connection details

D-connector female j1

Pin no.	Connection
1	Bell - positive
2	Siren positive
3	Not used
4	Gas released relay n/o
5	Gas released relay n/c
6	Bell – negative
7	Siren – negative
8	Not used
9	Gas released relay common

D-connector male j2

Pin no	Connection
1	General fault relay n/c
2	General fault relay n/o
3	Second knock relay common
4	General fire relay n/c
5	General fire relay n/o
6	General fault relay common
7	Second knock relay n/c
8	Second knock relay n/o
9	General fire relay common

Note: all relay outputs are volt free, 1a - 125vac and 2a - 30vdc.

Mag. Unit Fuse F3 - 500ma TI

D-Conn. - Male J2 D-Conn. - Female J1

Battery Fuse F4 - 500ma TI

MainsFuse - F5 500ma TI

SEE INSTALLATION INSTRUCTIONS FOR OPERATION AND CONNECTIONS.

4.3 Uninterruptibale power supply

4.3.1 Introduction

Please refer to relevant UPS User Manual provided in the Zellabox or alternatively go online.

4.4 Switchboard

The Zellabox switchboard sits at the bottom of the Micro Data Centre and is responsible for providing and distributing power within the Micro Data Centre. The 2 main components that rely on this power are the UPS and the Cooling System.

The UPS provides uninterruptible power for the client's critical equipment as well as the fire extinguishing system, which is housed at the top of the unit and the access control system. The only component running directly from the switchboard other than the UPS is the cooling system – this is plugged directly into the switchboard.

4.4.1 Features & Functions

The switchboard is plugged or hardwired directly into the building's power source and has a green light on the front panel which MUST be illuminated at all times indicating there is a power supply.

4.4.1.1 Back Panel

The back panel consists of plug points for the following components:

- Mains Input sockets 6Kva switchboard
- Main input cable 8Kva switchboard
- Cooling System
- UPS

4.4.1.2 Front Panel

The front panel consist of the following switches:

Tag on switchboard	What does it refer to?	What does it do?
Main Isolator	Mains power switch	Controls the mains power
RCD	Residual current device or safety switch	Provides fast power cut-off in problem Situations.
Surge Arrestor	A protective device designed primarily for connection between a conductor of an electrical system	
Cooling System		
5 & 6 Kva UPS	UPS	32amp supply
1 to 3 Kva UPS	UPS	16 Amp supply
Power available	Power availability within the MDC	When the light is on there is power within the MDC.

4.4.2 Troubleshooting

Problem	Potential Cause	Solution
Green light on front panel IS NOT illuminated	The main isolator switch is not in the ON position	Turn switch on
	There is no power to the switchboard	Ensure there is no problem with the main supply from building
Cooling system	The switch on the front panel is not in the ON position	Turn switch on
	Cooling is not plugged into the back panel of the switchboard	Plug the cooling system into the 15AMP socket

All queries need to be directed to ZELLABOX at: Tel: 1300 117 644 / www.zellabox.com

4.5 Cooling System

The cooling system in the Micro Data Centre is designed to work continuously at an efficient rate enough to ensure equipment is kept at the desired temperature. The 38U and the 25U Micro Data Centres have the same cooling system however the one is smaller in capacity than the other.

The Cubb Micro Data Centre contains only 1 cooling unit as opposed to the CubbDuo Micro Data Centre which contains 2 units which alternate every 4 days.

The following table depicts the cooling capacity of each cooling system:

Problem	Cooling capacity (BTUh)	Cooling capacity (Watts)
Micro Data Centre	8900	2600
Micro Data Centre	11900	3500
Micro Data Centre	8900	2600
Micro Data Centre	11900	3500
Micro Data Centre	15695	4600

4.5.1 Operation

The cooling system has a controller which is located at the back of the box. The controller allows the user to control the temperature within the Micro Data Centre.

ALL Micro Data Centre's cooling systems are preset in the factory to run efficiently and effectively on one setting. Zellabox DOES NOT recommend tampering with the cooling system controller but rather switching the cooling system off at the switchboard to reset the controls.

The recommended temperature setting is between 20 and 23 degrees for maximum efficiency.

4.5.1.1 CubbDuo – Operation Instructions

The Cubb Duo's cooling system consists of two separate cooling systems within one Micro Data Centre. Each system works independently of each other and alternate every 15 days.

If one system fails the temperature will begin to rise within the Micro Data Centre triggering the secondary unit to start up.

If the Micro Data Centre experiences temperatures over 42 degrees within the data centre while a cooling unit is running, the alternate unit will start up and provide extra cooling for the Micro Data Centre. Once the temperature drops below 20 degrees the secondary unit will shut down resuming normal operation.

4.5.2 Trouble Shooting

Problem	Potential Cause	Solution
The Cooling system not working	Cooling is not plugged into the back panel of the switchboard	Plug the cooling system into the 15AMP socket
	The cooling switch on the main switch board is not in the ON position	Turn switch on
	The remote that controls the temperature is turned off.	

4.6 Intelligent Management & Monitoring System

4.6.1 Intelligent PDU

Zellabox Intelligent PDUs are architected with components, features, and fail safes that ensure the most reliable infrastructure possible, both now and for years to come.

Billing-grade accurate monitoring of user defined thresholds ensure that potential failures are identified far in advance. Real-time alarms notify you of potential risk conditions in the power chain.

Immediately identify faulty power supplies and react to tripped breakers that would otherwise go undetected by building management systems, branch circuit monitoring, and other brand PDUs.

Employing the most reliable components available, PX Intelligent PDUs with outlet switching consume less energy, protect against in-rush currents, and hold the critical power load even in the event of catastrophic failure.

Help eliminate human error and can withstand the harshest environments. With monitoring features that spot problems in advance and physical design elements that adapt to the toughest conditions, our solution protects your critical load under any circumstances.

Offer a simple user experience for seamless physical deployment, configuration, commissioning, monitoring, and power delivery.

Zellabox power distribution hardware will remain in place through multiple technology refresh cycles, often for a decade or more. PX Intelligent PDUs support both your current and future growth demands with the most advanced technology and highest power densities available in the market.

4.6.2 Centralised monitoring and management

Power IQ® DCIM Monitoring Software enables managers to closely monitor their Zellaboxes anywhere in the world. With health maps, power analytics, cooling charts, and reports alert you to potential trouble, and help you understand real-time power load, trends, and capacity at all levels of infrastructure. A configurable dashboard provides vendor agnostic views of power capacity, environmental health, and energy consumption. Get single-click access to rack power, cooling, airflow, events, and much more.

Main features:

- Energy Management
- · Environment Monitoring
- Vendor Agnostic Management
- Power Management
- Vendor Agnostic Power Control
- Real-Time Dashboards
- Smart MDC View
- World Maps or location maps
- · Thresholds and Alerts
- MDC Inspector
- Custom Reports



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