

# Cardinal iMDU

## Range of intelligent Mains Distribution Units



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# The Cardinal iMDU range



Cardinal with dual input



Cardinal with single input

This intelligent range of iMDUs features an intuitive web based user interface, SNMP MIB based control and monitoring, e-mail messaging and alerts. The units have an error log to record events, power and current monitoring and an optional temperature and humidity sensor to monitor local conditions in the equipment rack.

## Single and dual input versions

Single input and dual input versions are available. The dual input version enables main and back up power sources to be connected to a single Cardinal unit. Switching to the back up input supply is automatic on power fail of the main source. The changeover system is designed to allow non phase coherent inputs to be switched.

## Automatic power shedding

If a back up power supply is selected, it may be necessary to switch off non-critical equipment by shedding a number of MDU outputs. Power shedding is configured for automatic operation in the MDU configuration page.

## High inrush current protection

Both single and dual input versions are designed for use with equipment that has modern switch mode PSU's that can exhibit high inrush currents. Individually switched outputs are rated to 60A inrush and the dual input changeover version has an inrush limiting circuit that restricts the current at switch on to 40A.

## Sequential power on/off

All outlets are individually switched enabling the user to control and set sequential switching, to prevent an excessive current surge on start-up and an orderly power-down when shedding outputs.

## Fail-safe

As standard the MDU outputs will switch off in the event of failure of the internal control system. Ordering the fail-safe option enables the outputs to remain on if the internal control system fails and the unit will revert to a conventional MDU.

## Power management

The Cardinal range of MDUs include remote power monitoring for optimising operational efficiency and early detection of faults within a rack.

- Power
- Energy (KWh)
- Power factor
- Input voltage
- Input current

## Network interface

The dB Cardinal intelligent mains distribution unit provides fully featured web and SNMP interfaces giving easy access to sophisticated remote control and configuration facilities.

On loss of mains input large capacitors sustain the microcontroller for approximately ten seconds. This is long enough to record the fault and send SNMP traps to alert the management system.

## Email alerts

The Cardinal range can be configured to provide email alerts for various conditions including; loss of input mains power, blown fuses and output status changing (i.e. relay on or off).

## Logging

As well as error logging the MDU records five days of the peak and minimum values of certain parameters.

## IP reset

An optional controller reset button can be added which enables the iMDU internal control system to be reset without interrupting any of the MDU outputs

## Temperature and humidity sensing

An optional remote temperature and humidity sensor can be added for monitoring the temperature and humidity at any position within the equipment bay.

## General purpose inputs

Each MDU includes 16 general purpose inputs for connection of alarms from other equipment. These alarms can be reported in the same way as those for the MDU.

Cardinal web interface

**System Status**  
MDU: Cardinal MDU  
IP: 192.168.0.98  
Control: DISABLED (when logged out)

Date: 12:20:30 Tue Jun 26 2018  
Temp: 33 C  
Humidity: 18 %

**Input**

Input	A	B
Status	Active	Available

**Power Monitoring**

Voltage	227.1 V
Current	4.2 A
Active Power	8.95 kW
Energy	100.24 kWh (Since 11:12:13 10/12/2017)
Power Factor	0.99

**Output**

Number	1	2	3	4	5	6	7	8	9	10	11	12
Name	RX 1	RX 2	RX 3	RX 4A	PSU 1	PSU 2	PSU 3	PSU 4	Out 9	Out 10	Out 11	Out 12
Switch	T	T	T	T	T	T	T	T	T	T	T	T
Status	On	On	On	On	On	On	On	On	Off	Off	Off	Off
Fuse	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

**General Purpose Inputs**

GPI	1	2	3	4	5	6	7	8
Name	GPIx 1	GPIx 2	GPIx 3	GPIx 4	GPIx 5	GPIx 6	GPIx 7	GPIx 8
Status	Open	Open	Open	Open	Open	Open	Open	Open
GPI	9	10	11	12	13	14	15	16
Name	GPIx 9	GPIx 10	GPIx 11	GPIx 12	GPIx 13	GPIx 14	GPIx 15	GPIx 16
Status	Open	Open	Open	Open	Open	Open	Open	Open

**General Purpose Outputs**

Relay	1	2
Name	Relay 1	Relay 1
Switch	Relay 1	Relay 2
Status	Off	Off

**System status**  
This page allows the status of the MDU to be determined at a glance. It also allows control of the relays, providing they haven't been locked.

**IP configuration**  
The IP configuration page is used to configure the network interfaces including the IP address, NTP, 2 trap destinations and the email address for alarms.

**System Status**  
MDU: Cardinal MDU  
IP: 192.168.0.98

Date: 12:03:37 Tue Jun 26 2018  
Temp: 32 C  
Humidity: 19 %

Name	Value	Enabled
DHCP		<input type="checkbox"/>
MAC Address	00:22:33:44:55:11	
IP Address	192.168.0.98	
Subnet mask	255.255.255.0	
Default gateway	192.168.0.1	
DNS Server 1	192.168.0.2	
DNS Server 2	192.168.0.3	
SNMP trap destination 1	192.168.0.9	<input type="checkbox"/>
SNMP trap destination 2	192.168.0.11	<input type="checkbox"/>
SNMP trap community	Public	
SNMP write community	Private	
NTP server	192.168.0.40	
Email address for alarms	sales@dbroadcast.co.uk	<input checked="" type="checkbox"/>
Reply email address (from)	mdu@dbroadcast.co.uk	
SMTP server	192.168.0.4	
Username	cardinal	
Password		

## MDU configuration

The input and output parameters such as names and start-up sequences are configured on this page. In addition, this page is used to determine whether alarms are sent as emails or SNMP traps.

**System Status**  
MDU: Cardinal MDU  
IP: 192.168.0.98

Date: 12:05:06 Tue Jun 26 2018  
Temp: 33 C  
Humidity: 19 %

**MDU**

Name: Cardinal MDU

**Passwords**

Set admin password:

Confirm admin password:

Password Protect System Status Controls:

**Input**

Input Voltage alarm enable:

Input Voltage lower threshold: 250

Input Voltage upper threshold: 270

Shed outputs on first input fail:

**Power Monitoring**

Power alarm enable:

Power upper threshold (kW): 2.70

Power display refresh time (sec): 5

**Output**

Number	1	2	3	4	5	6	7	8	9	10	11	12
Name	RX 1	RX 2	RX 3	RX 4A	PSU 1	PSU 2	PSU 3	PSU 4	Out 9	Out 10	Out 11	Out 12
Switch lock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Selection Alarm	<input type="checkbox"/>											
Fuse alarm	<input checked="" type="checkbox"/>											
Can shed	<input type="checkbox"/>											
Startup delay (sec)	0	1	2	3	4	5	6	7	8	9	10	11
Shed delay (sec)	0	0	0	0	0	0	0	0	0	0	0	0
Shed on overheating	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





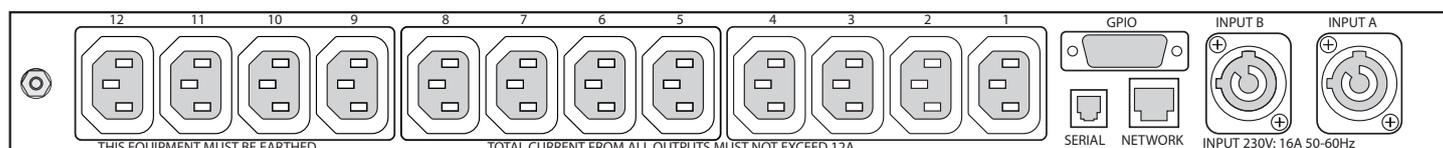
## Intelligent iMDU

The Cardinal range of intelligent mains distribution units provide 12 separately controlled outputs, input power and current monitoring, SNMP, web based user interface and e-mail messaging, all in 1RU.

With a choice of single input or dual input changeover versions, sequential start or fail-safe mode with inrush current protection and optional temperature & humidity sensor, the Cardinal iMDU provides a comprehensive solution for remote control and management of power distribution in an equipment rack.



### Technical specifications:



#### Inputs

Connector: 1 or 2 Neutrik Powercon inlets (depending on model type)  
 Input voltage: 230V +/- 10%  
 LEDs: Single I/P; Supply LED (green)  
 Dual I/P; Supply Active / Available LEDs per I/P (green)

#### Outputs

Connector: 12 x IEC sockets on the rear panel  
 Individual fuse rating: 6A per output  
 Total load: Up to 12A at 230V  
 LEDs: 2 per output for "on/off" and "fuse blown"

#### Inrush Current Protection

Output: Up to 60A max per output  
 Input: Up to 200A at switch on

#### Temp & Humidity Sensor

Temp range: -20 to +80 degrees  
 Temp accuracy: +/- 2 degrees  
 Humidity range: 5 to 95%  
 Humidity accuracy: 5%

#### Physical

Height: 1RU bay mounted unit  
 Width: 483mm (standard 19 inch rack)  
 Depth: 380mm (including tie bar)  
 Switch: Front panel switch is also a thermal over-current circuit breaker  
 Tiebar: At the rear for cable retention  
 Weight: 2.9kg (single input version)

#### Environmental

Operational temp: 5 to 40 deg C, non condensing  
 Operational humidity: Up to 85% relative humidity

#### Control/monitoring

Network: Ethernet RJ45, 10/100baseT for SNMP interface and web configuration and monitoring via browser  
 Serial: RS232 via 6 way Modular Jack  
 GPIO: 27 way high density 'D' type. 16 inputs and 2 dry contact outputs  
 LEDs: Network Activity and Link (green)

### Ordering information:

#### Cardinal MDUs:

##### iMDU12B-S

Cardinal intelligent MDU with single input and 12 outputs, SNMP and sequential turning on/off of outputs

##### iMDU12B-D

Cardinal intelligent MDU with dual inputs and 12 outputs, SNMP and sequential turning on/off of outputs

#### Options — factory fit:

- F Fail-safe option. Outputs remain on if controller fails or is reset. Includes inrush current limiter.
- H Humidity and temperature sensor, integral
- R Controller reset (recessed button on front panel)

#### Options — other:

- iMDU12-O-H** Humidity and temperature sensor, external, requires iMDU12-O-C-3
- iMDU12-O-C-3** Cable for sensor, serial screened, length 3m (custom cable length available up to 5m)
- iMDU12-O-G** Switch guard
- iMDU12-O-W2** Extended warranty from 1 to 2 years
- iMDU12-O-W3** Extended warranty from 1 to 3 years

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