Cabinet level access security has become critically important for all data centers and server rooms. More and more IT managers have recognized this need and are upgrading their cabinets with secured Door Lock access control. Our DL series provides data center managers a complete networked solution with monitoring, control, alarm & reporting. It allows cabinet access remote management - saving traveling time / costs and hence increases the data center operation efficiency.

Key Benefits

>>> Affordable Price
A basic cabinet can be upgraded with Our DL Series access control at an affordable price.

>>> Compatibility

Hardware - Our DL handle is already designed for some global IT branded cabinet models. Other cabinets just need to make a custom handle mounting cut-out on the door to suit our DL handle.

Software - We offer software for remote management. Besides, our DL Series also supports SNMP for integration to the existing BMS of data center. Users can use their own platform for a centralized management.

Smartcard - Our DL handle caters for the 2 most common alternatives - Proximity & MiFARE format. The users can keep using their existing Smartcard to apply on the cabinet access system if their Smartcards are in either format as above.

>>> Functionality
Functionality is not limited to cabinet access management. In addition to cabinet access control, DL Series can be further expanded to PDU and environmental management. Users can remotely manage the above devices via the provided software.

>>> Expandability
The managing capacity of DL Series is expandable to a maximum of 3000 cabinets. And control box GUI allows up to 100 concurrent client access to remotely manage the locking handles. DL Series provides the scalable flexibility to the data center projects, especially to the project with several phases.
Key Hardware - Control Box - DL-2001 & DL-2002

Control Box consolidates all the hardware components in a cabinet and controls the management functions. All control boxes in cabinet can be connected to each other for centralized management.

DL Series offers 2 optional control box models:
DL-2001 for Cabinet Smartcard Access
DL-2002 for Cabinet Smartcard Access + PDU / Fan / Environmental Management

### DL-2001

- Power input
- Dual power input (option)
- Door cable DB-9 connector x 2 (Connect to the front and rear handle)
- "Act in Out" LED
- Daisy chain RJ45 port x 2 (Link & Out)

### DL-2002

- Power input
- Dual power input (option)
- Door cable DB-9 connector x 2 (Connect to the front and rear handle)
- "Act in Out" LED
- Daisy chain RJ45 port x 2 (Link & Out)
- Temp. LED display x 2
- Smoke / Shock sensor port x 2
- LED Light Bar port x 2
- Port for 3rd party alarm board x 1
- LED beacon port x 1
- Temp. & Humid. sensor port x 2
- PDU port x 1 (RJ-45, up to PDU daisy chain level x 4)
- Fan unit port x 1 (RJ-45, up to fan unit daisy chain level x 2)
- Water sensor port x 2

### Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Dimension (W x D x H)</td>
<td>400 x 135 x 39.7 mm / 15.7 x 5.3 x 1.6 inch</td>
</tr>
<tr>
<td>Net Weight</td>
<td>1.06 kgs / 2.3 lbs</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Auto-sensing 100 to 240VAC, 50 / 60Hz, Max. 48 Watt</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0 to 55°C Degree</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-5 to 60°C Degree</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>5-90%, non-condensing</td>
</tr>
<tr>
<td>Mounting</td>
<td>1U Rackmount</td>
</tr>
<tr>
<td>Safety Regulatory</td>
<td>FCC &amp; CE certified</td>
</tr>
<tr>
<td>Environmental</td>
<td>RoHS2 &amp; Reach compliant by SGS</td>
</tr>
</tbody>
</table>
Key Hardware Installation Diagram - InfraBox / Handle / Door Sensor

1. InfraBox
2. Smartcard handle
3. Door sensor with 6’ cable
4. Door cable (door section)
5. Door cable (cabinet section)

Installation Diagram - PDU / Fan / Sensor / Peripheral

<table>
<thead>
<tr>
<th>Item</th>
<th>Cabinet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LED Light Bar</td>
<td>2</td>
</tr>
<tr>
<td>2. Smoke Sensor</td>
<td>1</td>
</tr>
<tr>
<td>3. Flashing LED Beacon</td>
<td>1</td>
</tr>
<tr>
<td>5. Shock Sensor</td>
<td>1</td>
</tr>
<tr>
<td>6. Fan Unit</td>
<td>2</td>
</tr>
<tr>
<td>7. PDU</td>
<td>4</td>
</tr>
<tr>
<td>8. Water Sensor</td>
<td>1</td>
</tr>
</tbody>
</table>
The patented DL-1003 door lock handle is designed specially for CR16xx cabinets. Cabinet manufacturers just need to make a custom handle mounting cut-out to suit DL-1003. It is an alternative for users who look for a stylish and different outlook design.

### Features

<table>
<thead>
<tr>
<th>DL-1003P</th>
<th>DL-1003M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligent design with patent</td>
<td>Universal mounting design for global branded cabinets</td>
</tr>
<tr>
<td>Universal mounting design for global branded cabinets</td>
<td>Dual locking system (electronics and mechanical lock)</td>
</tr>
<tr>
<td>Dual locking system (electronics and mechanical lock)</td>
<td>Electronic lock released either by smartcard or software</td>
</tr>
<tr>
<td>Electronic lock released either by smartcard or software</td>
<td>Proximity 26-bit smartcard compatible</td>
</tr>
<tr>
<td>Proximity 26-bit smartcard compatible</td>
<td>MiFARE 26-bit smartcard compatible</td>
</tr>
<tr>
<td>MiFARE 26-bit smartcard compatible</td>
<td>Cabinet access status and alarm indication by LED</td>
</tr>
</tbody>
</table>

### Mounting Cut-out

![Mounting Cut-out Diagram](image)

### Handle Releasing

DL-1003 handle allows 3 lock releasing ways - by Software remote, Smartcard or Mechanical key.

- **By Software Remote**
- **By Smartcard**
- **By Mechanical Key**
The patented DL-1004 handle is an intelligent design with universal mounting cut-out. Most global branded cabinets have applied a standard handle cut out dimension on the door. To achieve the highest level of interoperability offered in the cabinet industry, the DL-1004 handle applies the same mounting dimension. It avoids costly and complicated door customization for the smartcard handle integration.

Worldwide patents on appearances, mechanism, functions and connections.

<table>
<thead>
<tr>
<th>DL-1004</th>
<th>Features</th>
<th>DL-1004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intelligent design with patent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Universal mounting design for global branded cabinets</td>
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</tr>
<tr>
<td></td>
<td>Proximity 26-bit smartcard compatible</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>MiFARE 26-bit smartcard compatible</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Cabinet access status and alarm indication by LED</td>
<td></td>
</tr>
</tbody>
</table>

**Universal Mounting Cut-out**

**Handle Releasing**

DL-1004 handle allows 3 lock releasing ways - by Software remote, Smartcard or Mechanical key.
Door Sensor is an important component which should never be overlooked. DL Series provides high quality, durable and precise door sensors to ensure 100% right door detection.

( I ) Inductive Door Sensor, pair ( DLS-102I )
- light weight / adhesive
- easy setup for existing cabinet retrofit
- no custom cutting required on doors

( II ) Mechanical Door Sensor, pair ( DLS-101 )
- low cost / precise
- cost efficient integration to new cabinet
- custom cutting required on doors

- Close door
- Inductive sensor detects the cabinet frame
- DOOR CLOSE SIGNAL sends out

- Open door
- Inductive sensor loses detection with cabinet frame
- Red LED of sensor light up
- DOOR OPEN SIGNAL sends out

Steel mounting plate with 2 screw holes
Cable connector
Press button ( total travel distance : 9.25 mm )
( min. actuation distance : 3.00 mm )
DL Series provides 3 connection ways - Daisy Chain, Star, Mixed. Which connection users apply is related to the site scale, environment and users’ requirements.

< I > Daisy Chain
Connect all control boxes by Cat5/6 cable, and no any network switch required.

Key Benefits
- Simple connection
- No network switch required
- Appropriate for small networks

Quantity of Control Box / Cabinet: Up to 50
Total distance in daisy chain: Up to 100M

< II > Star
Connect to network switch by a point-to-point connection.

Key Benefits
- Appropriate for large networks
- Increased fault tolerance
- Easy for troubleshooting

Network switch required
Total distance for each Control Box to Network Switch: Up to 100M

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< III > Mixed  Combining daisy chain with star connection

**Key Benefits**
- Most effective and practical for large scale of networks
- Take all advantages of Daisy Chain and Star connection
- Flexible to meet a variety of network environments and needs

Total Control Box Qty in Mixed Network : Up to 3000
**Data Center**

By mixed connection, DL Series can be scalable up to 3000 cabinets. DL-2002 and DL-2001 Control Boxes can be coexisted in the same network. Users are enabled to manage and remotely access all cabinets under a centralized and user friendly GUI.

- Connect the 1st InfraBox in each daisy chain to the network switch
- Connect the management PC and client PCs via the network switch
- Up to 3000 InfraBoxes / Cabinets

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< II > Intelligent Building

It is essential for a Multi-Storey Intelligent Building to be applied with a centralized management system for the building’s mechanical and electrical equipment such as security, power, ventilation, and lighting systems, etc.

DL Series system allows equipment to be distributed throughout a building simply by deploying an Ethernet network. To keep capital costs down, DL Series can also be cascaded between boxes up to 100m over a Cat5/6 cable. Signal weakness problem for long distance between Control Boxes can be solved by applying network hubs with repeater function.

**Setup Scenario in the whole Intelligent Building**

- Connect the DL Series network in each floor via the network ethernet / fiber switch
- Up to 3000 control boxes / Cabinets

---

**Daisy Chain Scenario**
(Up to 50)

**Star Connection**
(Up to 50)

**Mixed Connection**
(Up to 50)

**Management PC**

**Control Room**

**Client PCs**

**Backbone Network / Fiber Switch**

**Network Switch for Star / Mixed Connection**
< III > Remote Site

DL Series can be also applied to the remote site for access and monitoring over IP anytime and anywhere.

DL Series Software License is required for each remote site / management PC
<IV> Branches

For a global or scalable company, it is vital to remote access and monitor the network of their nationwide and worldwide branches. DL Series provide an ideal solution to keep an eye on cabinet access security and environmental condition.

DL Series Software License is required for each remote site / management PC

Application - DL Series

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Prepare a management PC
- Install Java SE 6 / 7
- Install Microsoft Visual C++ 2008 SP1 Redistributable Package

Remote Access Setting
- Enable firewall
- Set incoming port
- Set outgoing port

MFP - Master Floor Plan
- Create MFP
- Add cabinet
- Configure cabinet IP setting

User Setup
- Create user

System Setup
- Alarm / email server / temp. unit
- Door opening overdue setting
- Time rule
- Backup & restore

Software installation
- Disable firewall
- Install InfraSolution X manager
- Reboot management PC

Software activation
- Activate InfraSolution X manager

CA - Control Area
- Create CA
- Load cabinet

Group Setup
- Create user group

Tips for System Setup - DL Series
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DL Series Manager **X-ISM** is a LICENSED cabinet management software to monitor up to 3000 cabinets remotely.

Each Control Box connects a pair of smartcard handles to secure the cabinet access control, and connect a variety of sensors to provide an environmental monitoring solution. To enhance the functionality, up to 1920 x kWh PDU / 960 x Fan Unit can be monitored through X-ISM Manager as well. Up to 100 concurrent users can access the management software remotely to achieve the demand of multi-user / multi-tasking in nowadays’ time sharing data center operation.

<table>
<thead>
<tr>
<th>Features</th>
<th>X-ISM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td></td>
</tr>
<tr>
<td>Control Box</td>
<td>3000</td>
</tr>
<tr>
<td>Concurrent User</td>
<td>100</td>
</tr>
<tr>
<td><strong>System Setup</strong></td>
<td></td>
</tr>
<tr>
<td>Backup / Restore Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Time Rule Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Alarm Mail Server Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Audio and Visual Alarm Output Setting</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Cabinet Overview</strong></td>
<td></td>
</tr>
<tr>
<td>Door</td>
<td>✔</td>
</tr>
<tr>
<td>Status of Door, PDU, Sensor &amp; Fan Unit</td>
<td>✔</td>
</tr>
<tr>
<td>Door Open by Remote</td>
<td>✔</td>
</tr>
<tr>
<td>Last Door Open &amp; Close Record</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Sensor / Peripheral</strong></td>
<td></td>
</tr>
<tr>
<td>Status Monitoring</td>
<td>✔</td>
</tr>
<tr>
<td>Temp-Humid Alarm Threshold Setting</td>
<td>✔</td>
</tr>
<tr>
<td><strong>PDU</strong></td>
<td></td>
</tr>
<tr>
<td>Energy Consumption kWh / Amp Monitoring</td>
<td>✔</td>
</tr>
<tr>
<td>Outlet Level Measurement</td>
<td>✔</td>
</tr>
<tr>
<td>PDU Outlet Schedule</td>
<td>✔</td>
</tr>
<tr>
<td>Outlet Switch ON / OFF</td>
<td>✔</td>
</tr>
<tr>
<td>Amp Alarm Threshold Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Amp Rising / Low Alert Threshold Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Temp-Humid Monitoring</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Fan Unit</strong></td>
<td></td>
</tr>
<tr>
<td>CFM &amp; Temp. Monitoring</td>
<td>✔</td>
</tr>
<tr>
<td>Unit CFM (fan speed) Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Auto CFM Control Setting</td>
<td>✔</td>
</tr>
<tr>
<td>Individual Fan Kit ON / OFF</td>
<td>✔</td>
</tr>
<tr>
<td>Fan Unit ON / OFF</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Chart / Event / Reporting</strong></td>
<td></td>
</tr>
<tr>
<td>System &amp; Device Event Reporting</td>
<td>✔</td>
</tr>
<tr>
<td>Temp-Humid Line Chart of InfraBox</td>
<td>✔</td>
</tr>
</tbody>
</table>
**MFP - Master Floor Plan**

- An actual Cabinet floor plan
- To create Cabinet & configure the IP setting for the cabinet.
- MFP can be more than one. No. of MFP is subject to the site scale & plan by floor, zone, building, branches or remote sites.

**CA - Control Area**

- To build a Control Area for some specific cabinets to monitor, configure & control.
- All cabinets in the CA should be loaded from the MFP.
- CA can be more than one. How many CA is subject to the User plan.
- CA has 2 modes: Edit mode & View mode.
- Under Edit mode, users can configure not only cabinets but also devices such as PDU, Fan unit & sensors.
- View mode is designed for users with limited authority so they can only monitor the status of Cabinet & device.
User Setup
- To create a user list for building the user group.
- Each user has his own login name & password for remote System login.
- Each user also has his own smartcard for cabinet access
- Before users join a user group, they can do nothing.

User Group
- To form a user group from the User list.
- To define the user group with authority and which Control Area(s) to monitor & access.
- Each user subordinated to only ONE user group.
- If the user wants to join one more user group, a new login name, password & smartcard number MUST be assigned.
- Each user group MUST select ONE time rule. All group user can access the cabinet according to the time period of the selected time rule.
- Without time rule assignment, All group user cannot access the cabinet.

Time Rule
- To set time rules up to 32.
- Afterward, all time rules will be shown in user group for their selection.
- Only ONE time rule can be assigned to ONE user group.
Cabinet Icon - DL Series

Cabinet icon has two layers, the layer one by default shows on all control area under view mode for status monitoring.
User can click cabinet icon to switch to layer two.

Layer one
- show PDU status (P1,P2, P3, P4)
- if PDU is enabled & connected, P icon in WHITE color
- if PDU is enabled BUT disconnected, P icon in RED color
- if PDU is on alarm status, P icon also in RED color
- if PDU is disabled, P icon in GREY color

Layer two
- show TH sensor status (S1, S2)
- if TH sensor is enabled & connected, S1, S2 icon in WHITE color
- if TH sensor is enabled BUT disconnected, S1, S2 icon in RED color
- if TH sensor is on alarm status, S1, S2 icon also in RED color
- if TH sensor is disabled, S1, S2 icon in GREY color

- show smoke & shock sensor status (S3, S4)
- if smoke & shock sensor is enabled & connected, S3, S4 icon in WHITE color
- if smoke & shock sensor is on alarm status, S3, S4 icon also in RED color
- if smoke & shock sensor is disabled, S3, S4 icon in GREY color

- show water sensor status (S5, S6)
- if water sensor is enabled & connected, S5, S6 icon in WHITE color
- if water sensor is on alarm status, S5, S6 icon also in RED color
- if water sensor is disabled, S5, S6 icon in GREY color

- show Fan unit status (F1, F2)
- if Fan unit is enabled & connected, F icon in WHITE color
- if Fan unit is enabled BUT disconnected, F icon in RED color
- if Fan unit is on alarm status, F icon also in RED color
- if Fan unit is disabled, F icon in GREY color

Door status
- Door close status in white
- Door open status in green
- Door open overdue status in red (show overdue time)
- Door alarm status in red (unauthorized open)

Connection status
- Normal connection status (color in blue)
- Disconnection status (color in red)

Non-configure cabinet
- (color in grey)
  In MFP master floor plan, the grey cabinet icon shows that the cabinet has not been configured with IP setting yet.

- (color in grey)
  In CA control area, the grey cabinet icon shows that the cabinet has been deleted in master floor plan.
  The user should remove this non-function cabinet from control area.

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Cabinet Alignment
- Provided by MFP & CA
- For user to arrange the cabinet in a neat way
- Top / middle / bottom alignment
- Left / center / right alignment

Individual Cabinet Door
- Door open by remote
- View the record of last door open & close record

Fan
- Status
- Fan Unit Setting
- Temp. Setting

Sensor / Peripheral
- Sensor Status (provided by CA view mode)
- Sensor Setting

PDU
- Status
- PDU / Temp + Humid Setting
- Outlet Schedule
- Outlet Switch ON / OFF

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System Setup

- Backup & Restore
- Alarm Setting, Mail Server Setting, Audio Visual Alarm
- Temperature unit
- Door opening overdue setting
- Time Rule

Device & Event Log

**Devices:**
- Cabinet
- Door Access
- Fan
- PDU
- Sensors
- T/H Sensor

**System:**
- Console
- Control Area
- MFP
- Outlet Grouping
- System Setup
- User
- User Activity
- User Group
- Visitor

SNMP

InfraBox can manage the following connected devices via SNMP:

- Smartcard handles
- PDUs
- Fan Units
- Sensors
- Peripherals
Individual Key Lock

• Up to 500 individual key-locks available
  Part no. : DLS-501 set of 2 for front & rear door

Unique Key Lock

• Unique key dedicated to single project / customer regionally
  Part no. : Call for information

Proximity Smartcard

• Proximity 26-bit format
• Single card for multiple application
• Custom layout available
  Part no. : DLS-401P pack of 10

MiFARE Smartcard

• MiFARE 26-bit format
• Single card for multiple application
• Custom layout available
  Part no. : DLS-401M pack of 10

Proximity Card Reader

• Compatible to Proximity 26-bit Smartcard format
• Convenient way for Smartcard ID checking
• Driverless for easy installation
  Part no. : DLS-402P

MiFARE Card Reader

• Compatible to MiFARE 26-bit Smartcard format
• Convenient way for Smartcard ID checking
• Driverless for easy installation
  Part no. : DLS-402M