USER MANUAL

CB-CP100, CB-ACC-IR-UNI, CB-APP-LIC, CB-PS-12V, CB-PS-24V, CB-CP-RMK

# CONTROL BRIDGE PROCESSOR


BLACK BOX

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## Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

# NOM STATEMENT

## Instrucciones de Seguridad (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    - A: El cable de poder o el contacto ha sido dañado; u
    - B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    - C: El aparato ha sido expuesto a la lluvia; o
    - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    - E: El aparato ha sido tirado o su cubierta ha sido dañada.

# TABLE OF CONTENTS

# CHAPTER 1: SPECIFICATIONS

## 1. CB-CP100 Specifications

| | |
|---|---|
| Approvals | **Power Supply: IEEE 802.3af**<br>**CE, FCC, RoHS** |
| Audio | — |
| Bidirectional Serial RS-232/485 | 3 |
| Bidirectional Serial RS-232/422/485 | — |
| Enclosure | Aluminum |
| General I/O (Analog In/Digital Out) | — |
| IR Receivers | For capture: 1 |
| IR/Serial Output | — |
| Low-Voltage Relay, 24 V / 0.5 A | — |
| RAM / Non-volatile flash | 64 MB / 256 MB |
| Versatile I/O Ports | 8 |
| Wired 10/100BASE-T Ethernet | 1 |
| Power | 24 VDC power supply, maximum 4 W, PoE, IEEE 802.3af Class 0 |
| Dimensions | 1.7"H x 4.1"W x 3.6"D (4.4 x 10.5 x 9.2 cm) |
| Weight | 0.7 lb. (0.3 kg) |

# CHAPTER 2: OVERVIEW

## 2. Overview

### 2.1 Description

The ControlBridge unit is an Ethernet IP enabled controller equipped with various types of control ports. Control ports include bi-directional serial channels RS-232/485 and versatile I/O ports. The Ethernet port allows for bi-directional IP control of any manufacturer IP enabled products. It is fully compatible with ControlBridge button panels.

An Internal IR sensor allows users to capture IR codes and, for some models, receive IR codes from hand-held remotes.  Convenient for testing and troubleshooting, the ControlBridge Unit also has front panel indicator LEDs to indicate the status of all the control ports.

The controller keeps date and time with its on-board real time clock (RTC), allowing for a wide variety of distributed intelligence scheduling applications.

A single cable Ethernet connection provides easy network integration. The controllers are equipped with Power over Ethernet (PoE) technology, enabling an Ethernet network cable to deliver both data and power.

This controller comes complete with a web server and allows setup through a standard web browser. Unit programming is based on the Black Box ControlBridge Builder standard programming tool.

The unit includes a web server and allows for setup through a standard web browser.

The aluminium enclosure can be installed on a tabletop or a 19-inch rack using the ControlBridge Control Processor 19-inch Mounting Kit (CB-CP-RMK).

# CHAPTER 2: OVERVIEW

## 2.2 Features

- Ethernet IP enabled controller
- Modern ARM® processor platform
- On-board real time clock
- Wired 10/100BASE-T LAN
- Bi-directional control of any IP enabled products through the Ethernet port
- Various types of control ports
- Bi-directional serial RS-232/485
- Real time clock (RTC) for scheduling application
- Web server and Admin Web for setup through a standard web browser
- Aluminium enclosure design for desktop and 19-inch kit enables rackmounting
- Various accessories available

# CHAPTER 2: OVERVIEW

## 2.3 What's Included

Your package should include the following items:

- (1) ControlBridge 100
- (1) 24-VDC power supply
- (1) straight-through Ethernet cable
- (1) connector set

# CHAPTER 2: OVERVIEW

## 2.4 Hardware Description

### 2.4.1 ControlBridge Processor 100 (CB-CP100)

Figure 2-1 shows the ControlBridge Processor 100 (CB-CP100). Table 2-1 describes its components.

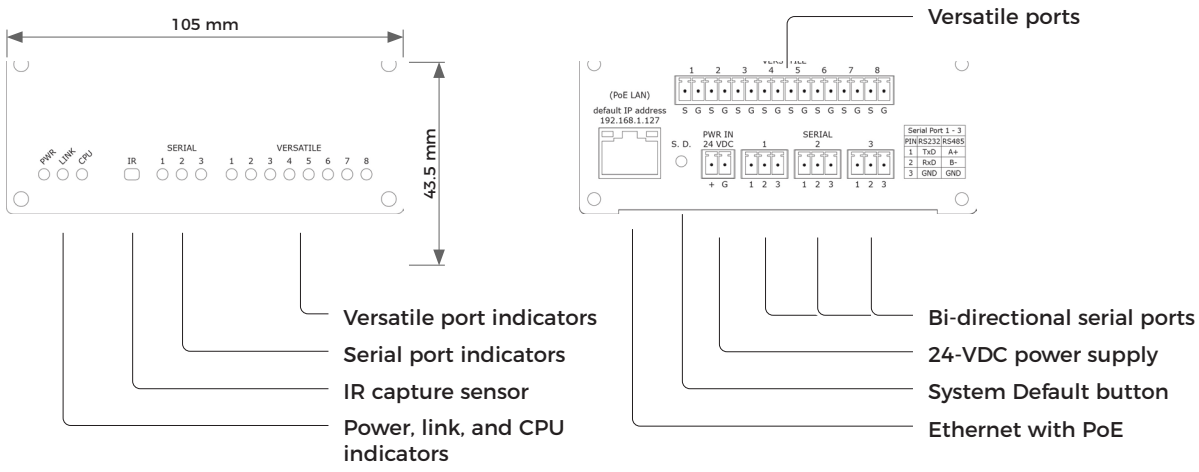



Figure 2-1. ControlBridge Processor 100.

### 2.4.2 Accessories

**IR Adapter**

The IR Adapter (CB-ACC-IR-UNI) is an infrared emitter that is compatible with versatile I/O ports. The adapter mounts on the receiver window using double-sided adhesive tape.

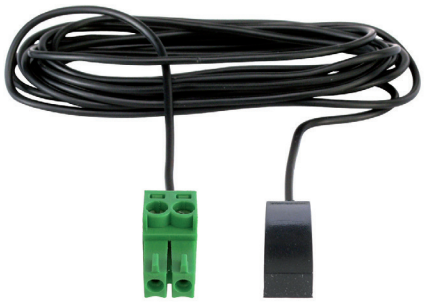



Figure 2-2. IR adapter.

**ControlBridge Control Processor 19-inch Mounting Kit (CB-CP-RMK)**

The ControlBridge Control Processor 19-inch Mounting Kit (CB-CP-RMK) is a shelf that supports your ControlBridge Processor in a 19-inch rack. It's made of stainless steel and measures 1 U high (1.75") and 19" wide. The shelf weighs 1.3 kg and includes mounting hardware.

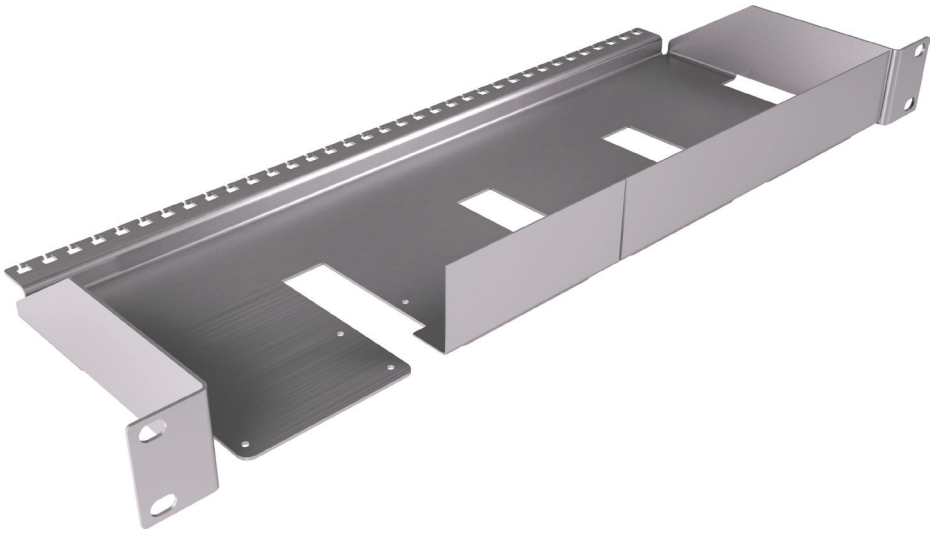


Figure 2-3. ControlBridge Processor rackmounting shelf.

# CHAPTER 3: INSTALLATION

## 3. Installation

### 3.1 Shelf Placement or Stacking

Four rubber feet are provided for shelf placement or stacking. Stick the rubber feet near the corner edges on the bottom side of the controller. See picture below.

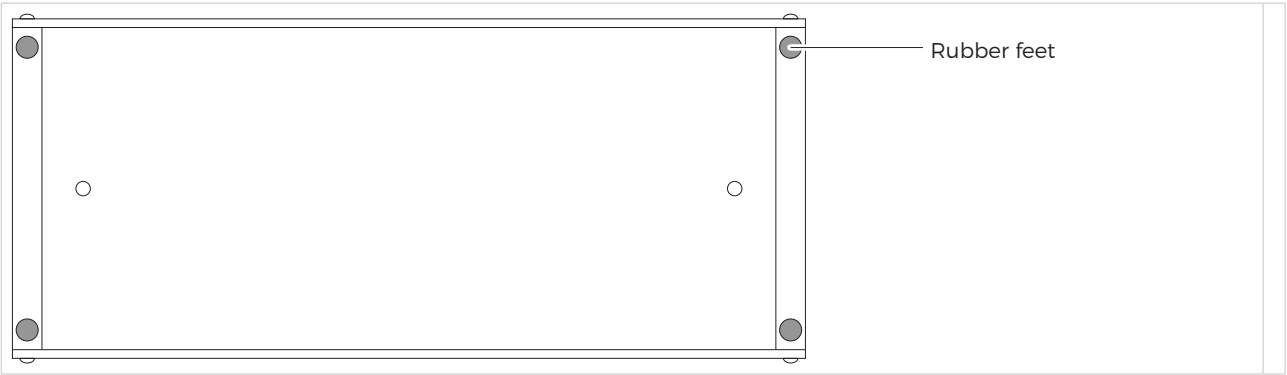


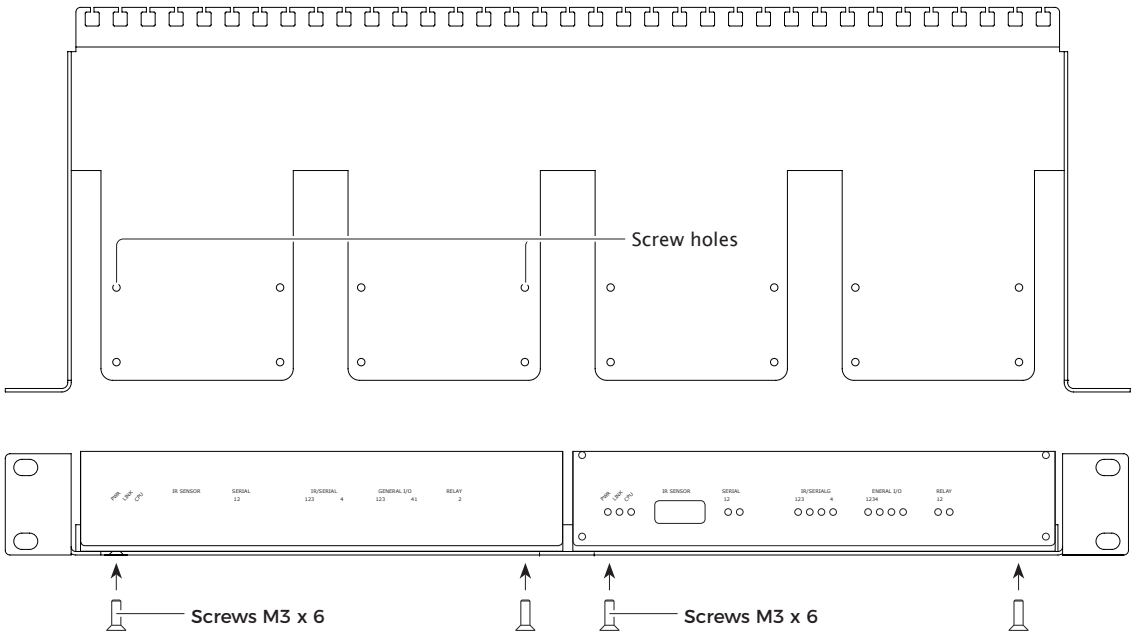

Figure 3-1. Installing rubber feet on the ControlBridge Processor.

# CHAPTER 3: INSTALLATION

## 3.2 Rackmounting

The Rackmounting Shelf (CB-CP-RMK) provides a simple solution for installing controllers in a 19-inch rack. It allows you to install up to two, half-rack-sized controllers in a single 19-inch unit rack space. All necessary accessories are supplied with the shelf.

Using two M3 x 6 screws, attach the controller to the Rackmounting Shelf using the female threads on the bottom side of the controller. See picture below. The M3 x 6 screws are included with the Rackmounting Shelf. Don't use longer screws; this might damage PCBs inside the unit. If you install only one controller, use the cover panel delivered with the shelf.




NOTE: If you install fewer controllers, use the cover panels delivered with the shelf to cover empty positions.

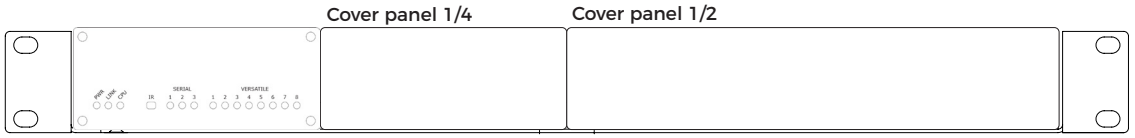



Figure 3-2. Rackmounting the ControlBridge Processor(s).

# CHAPTER 4: OPERATION

## 4. Operation

### 4.1 Factory and System Default Settings

Every device shipped from the factory is set according to information in the Factory Default column in Table 4-1 below.

To restore the System Default settings, press the System Default (S.D.) button. This button enables you to connect if you lost the password or if you do not know the IP settings. Press the S.D. button until the CPU LED indicator flashes to confirm the system defaults settings are restored according to information in the System Default column in Table 4-1 below. Use a thin screwdriver to press the S.D. button.

Table 4-1. Factory and System Default settings.

| | | | Factory Default | System Default |
|---|---|---|---|---|
| Configuration | Identification | Name | Empty | Not changed |
| | IP settings | Host name | Empty | Not changed |
| | | IP address | 192.168.1.127 | 192.168.1.127 |
| | | Subnet mask | 255.255.255.0 | 255.255.255.0 |
| | | Default gateway | 192.168.1.1 | 192.168.1.1 |
| | DNS | Primary DNS server | Empty | Not changed |
| | | Secondary DNS server | Empty | Not changed |
| Date and time | Date and Time | Day, month, year | Real | Not changed |
| | | Hour, minute, second | Real | Not changed |
| | | Time zone | (UTC) Coordinated Universal Time | Not changed |
| | Internet clock | Use Internet clock | Not | Not changed |
| | | Primary NTP server | Empty | Not changed |
| | | Secondary NTP server | Empty | Not changed |
| Applications | | | Empty | Not changed |
| File storage | | | Empty | Not changed |
| System | Firmware | | Current version | Not changed |
| Password | | | Empty | Empty |

# CHAPTER 4: OPERATION

## 4.2 Indicators

Table 4-2. General Indicators.

| Indicator | Color | Off | On / Flashing |
|---|---|---|---|
| POWER | Blue | No power presented. | Power is ON. The unit is ready. |
| LINK | Green | Network is not detected. | Network link/activity |
| CPU | Yellow | No activity. | System default indication. |

Table 4-3. Control Port Indicators.

| Indicator | Color | Off | On / Flashing |
|---|---|---|---|
| SERIAL | Green<br>Red | No data transmitted or received. | Data is being transmitted.<br>Data is being received. |
| VERSATILE | Green<br>Yellow | Output is switched OFF.<br>No data or IR code transmitted. | Output is switched ON.<br>Data or IR code is being transmitted. |

## 4.3 IR Sensor

The following table explains how the IR sensor works for the ControlBridge 100.

Table 4-4. IR sensor functions.

| Controller | IR codes capture | IR control panels receiver |
|---|---|---|
| ControlBridge 100 | ü | Not applicable |

# CHAPTER 4: OPERATION

## 4.3.1 Capturing IR Codes

The controller is equipped with an IR capture sensor, and it is able to capture IR codes. Captured IR codes can be used in the controller.

To capture:

1. Connect the capture unit and the PC with ControlBridge Builder to the same Network.

2. Arrange the IR remote and the capture unit as described below.

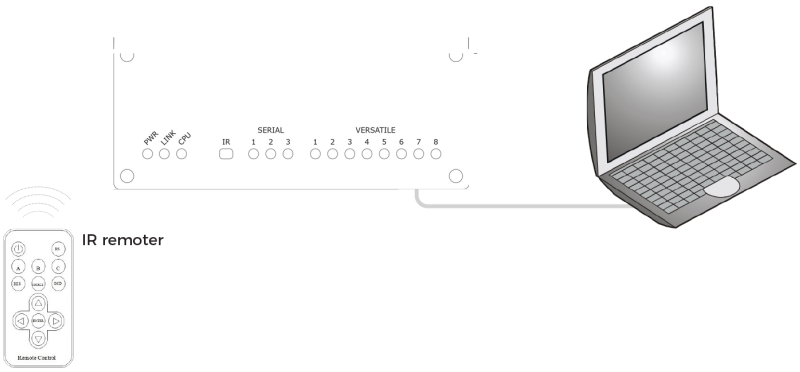



Figure 4-1. IR remote configuration.

- Set the proper distance between the capturing unit and the remote unit to accommdate the capturing unit's requirements.
- Start ControlBridge Builder and go to the appropriate driver and command.
- Set the IP address of the unit used for capture.
- Push the Start Capture button in ControlBridge Builder, and then press the appropriate button on the IR remote.

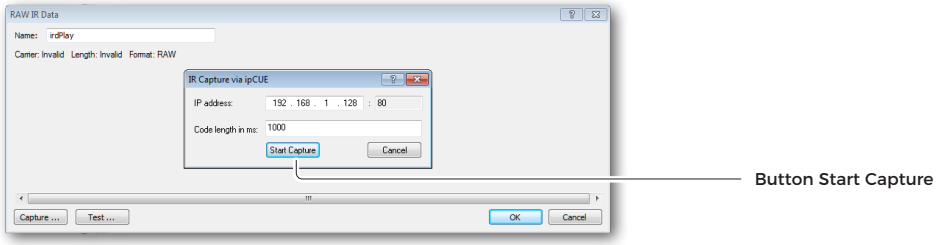
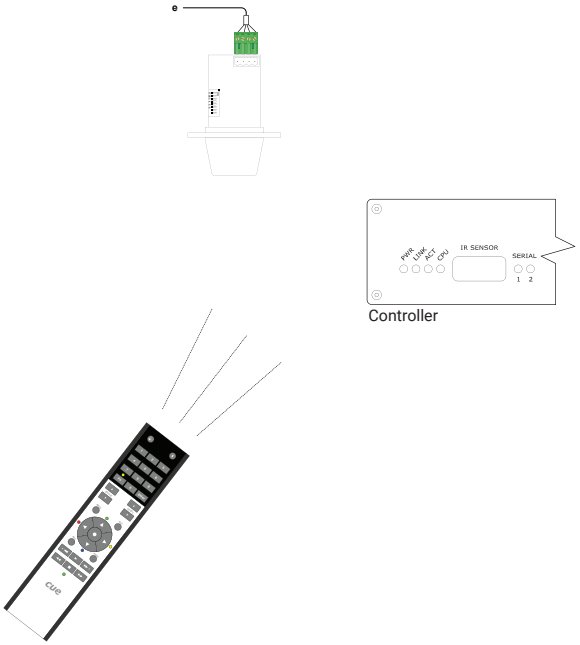



Figure 4-2. Start Capture button.

### 4.3.2 IR Control Panels Receiver

The built-in IR sensor functions the same as other IR receivers. Therefore, the ControlBridge can receive an IR signal from wireless IR control panels without using an external IR receiver.




The IR Adapter connects to the rest of the control system via IR communication.

As the IR receiver you can use:

- The remote control unit
- IR receiver built into ControlBridge controllers
- IR receiver built into 8-Button Laminated Keypad and 8-Button Engraved Keypad keypads.

Figure 4-3. IR control panel receiver.

# CHAPTER 5: CONNECTING

## 5. Connecting

The following table describes connections for both controllers.

Table 5-1. ControlBridge connections.

| Unit | | | Connection | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Power supply 24 VDC | Power over Ethernet | Ethernet | Serial RS-232/485 | Serial RS-232/422/485 | IR/Serial output | Versatile | General I/O | Low-voltage relay | DALI | KNX | DMX512 | EnOcean |
| ControlBridge 100 | 1 | 1 | 1 | 3 | | | 8 | | | | | | |

## 5.1 Power In

The unit requires power 24 VDC from an external power supply. Use any unit ONLY with the power adapter supplied in the product package. Using another power supply may damage the unit.

Power consumption

- ControlBridge 100: max. 4 W

Table 5-2. Connector Pin Out.

| PWR IN | | |
|---|---|---|
| 2-pin 3.5 mm | Pin | Description |
|  + G | + | Power +24 VDC |
| | G | Ground |

# CHAPTER 5: CONNECTING

**Power Adapter**

A standard power adapter is delivered with the ControlBridge. Attach the 2-pin connector of the power supply unit to the PWR IN connector located on the rear panel. Then attach the power cable to a power outlet.

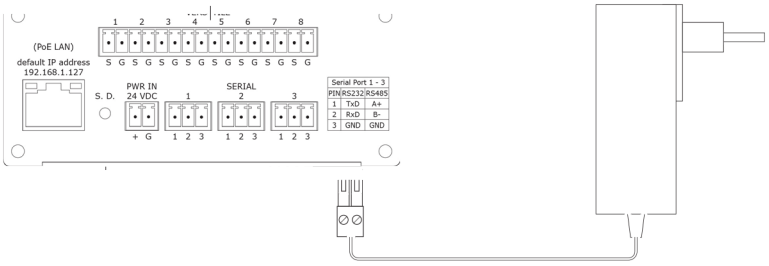



Figure 5-1. Power adapter.

## 5.2 Power over Ethernet (PoE)

The ControlBridge unit is equipped with PoE, and it is compatible with standard IEEE 802.3af/Class 0 Ethernet with PoE Infrastructure.

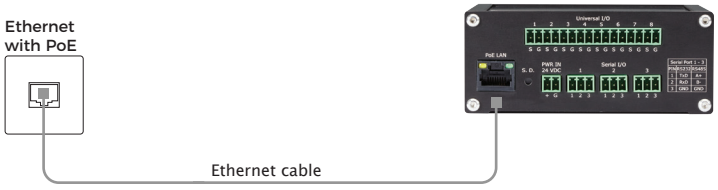



Figure 5-2. Ethernet connection with PoE infrastructure.

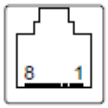
# CHAPTER 5: CONNECTING

## 5.3 ControlBridge Network

The ControlBridge links to a 10/100 BASE-T LAN via its RJ-45 connector.

The length of the Ethernet cable connecting controller to the network must not exceed 100 meters.

Table 5-3. Connector pinout.

| RJ-45 | Pin | Signal | CAT5 Cable Color |
|---|---|---|---|
|  | 1 | TX_D1+ and PoE | White / Orange |
| | 2 | TX_D1- and PoE | Orange |
| | 3 | RX_D2+ and PoE | White / Green |
| | 4 | | Blue |
| | 5 | | White / Blue |
| | 6 | RX-D2- and PoE | Green |
| | 7 | | White / Brown |
| | 8 | | Brown |



### Direct PC Connection

Attach one end of an RJ-45 Ethernet cable to the ControlBridge Network port, and attach the other end of the RJ-45 Ethernet cable to your computer. Use straight-through cable if your PC supports autosensing. Use cross-over cable if your PC doesn't support autosensing.

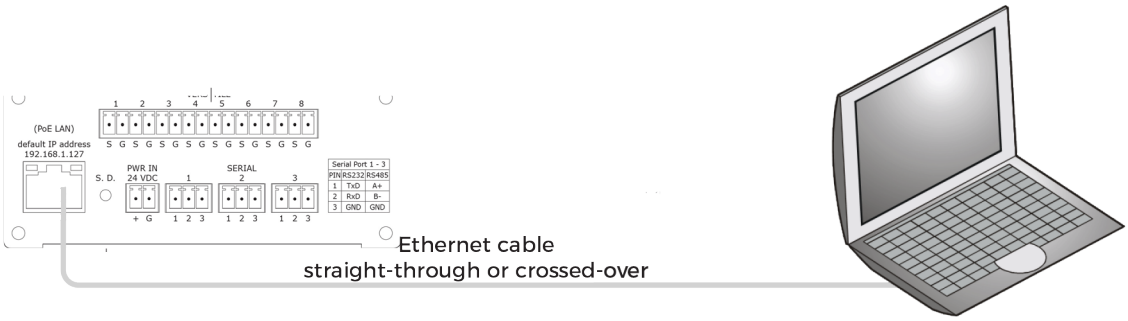



Figure 5-3. Direct PC connection.

# CHAPTER 5: CONNECTING

### LAN Network Connection

Attach one end of an RJ-45 Ethernet straight-through cable to the ControlBridge Network port, and attach the other end of the RJ-45 Ethernet cable to your computer.

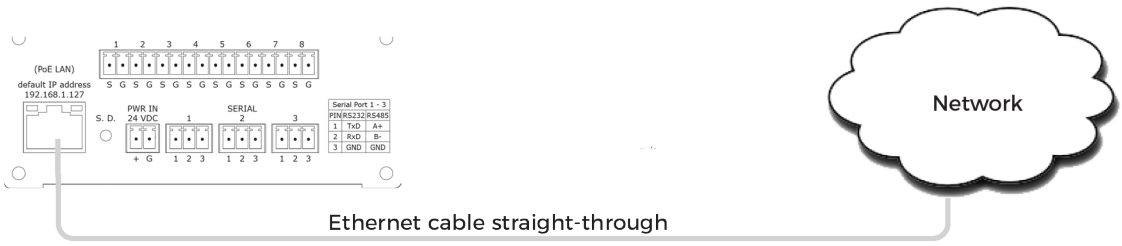



Figure 5-4. LAN network connection.

### Windows Local Network Settings

Follow these steps for Windows 7:

1. Start Windows 7.
2. Click Start.
3. Enter ncpa.cpl into the Search Box and press Enter. The following window is displayed.

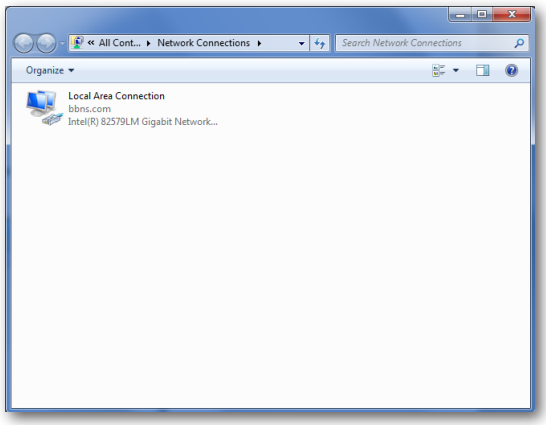



Figure 5-5. Windows 7 screen 1.

3. Right-click on network adapter used for connection with controller. Then right-click and select Properties.
4. Select Internet Protocol (TCP/IP). Then click on the Properties button.

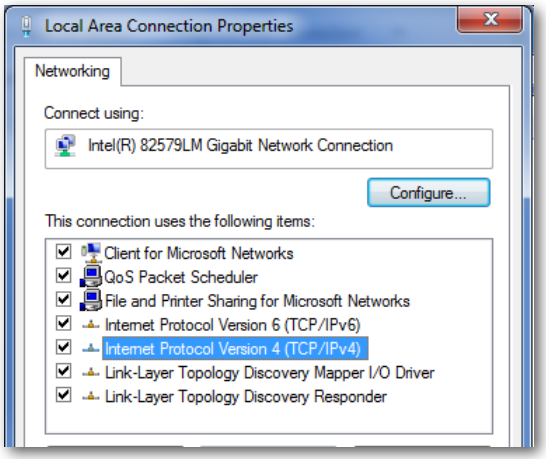



Figure 5-6. Windows 7 screen 2.

Follow these steps for Windows XP:

1. Start Windows XP.
2. Click Start. Then click Control Panel and choose the option to switch to Classic View.
3. Double-click on Network Connections.

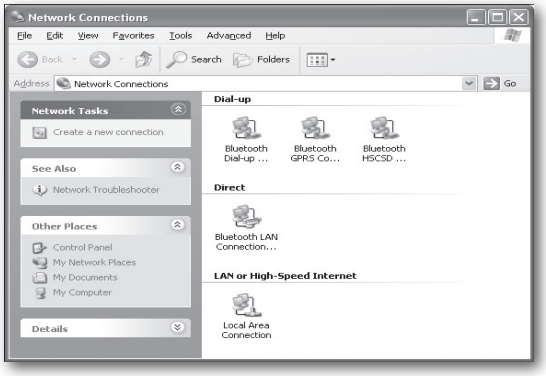



Figure 5-7. Windows XP screen 1.

1. Select Use the following IP address option. Set IP address to 192.168.1.1 (or other address different from 192.168.1.127 and from 192.168.1.128) and Subnet mask to 255.255.255.0. Leave other options unchanged. Then click on the OK button.

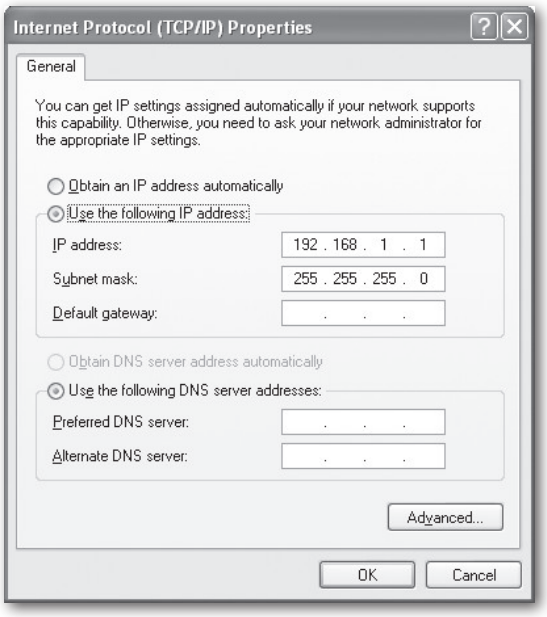



Figure 5-8. Windows XP screen 2.

## 5.4 Serial

Table 5-4. Serial ports on the ControlBridge units.

| Unit | Serial port | | |
|---|---|---|---|
| | Serial RS-232/485 | Serial RS-232/422/485 | Serial RS-232/422/485 with power 24 VDC |
| ControlBridge 100 | 3 | | |

### Bi-directional Serial RS-232/485

These bi-directional serial channels are used for RS-232 and RS-485 communication. The maximum speed is 115,200 bps. The default mode for all channels is RS-232; you must set other modes in the programming application. For more details, see your programming manuals.

### RS-232 Mode

The output signal levels for RS-232 are in the -10 V to +10 V range. This is the default mode for all channels.

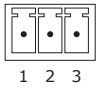
Table 5-5. RS-232 pinout.

| SERIAL RS-232 | | | | |
|---|---|---|---|---|
| 3-pin 3.5 mm | Pin | Signal | Description | Direction |
|  | 1 | TxD | RS-232 Transmitted Data | From controller |
| | 2 | RxD | RS-232 Received Data | To controller |
| | 3 | GND | Ground | — |

### RS-485 Mode

You must set this mode in the programming application.

Table 5-6. RS-485 pinout.

| SERIAL RS-485 | | | |
|---|---|---|---|
| 3-pin 3.5 mm | Pin | Signal | Description |
|  | 1 | A+ | RS-485 Data + |
| | 2 | B- | RS-485 Data - |
| | 3 | GND | Ground |

## 5.5 Versatile I/O Ports

Depending on the application, the versatile I/O ports can be used in multiple ways as described in Table 5-7 below:

Table 5-7. Versatile port functions.

| | |
|---|---|
| **Input modes** | |
| Digital input | Adjustable threshold<br>• High sensitivity - binary 0 < 1.45 V, binary 1 > 2.05 V<br>• Low sensitivity - binary 0 < 5.8 V, binary 1 > 8.2 V<br>Input impedance >100 kΩ<br>Adjustable digital filter |
| Pulse counter | Adjustable threshold as above<br>Input impedance as above<br>Pulse length min. 1 ms, max. frequency 500 Hz<br>Max. number of pulses 2 147 483 647 (Long)<br>Adjustable digital filter |
| Voltage input | Range 0 to 2.5 VDC, 0 to 10 VDC, auto<br>Input impedance >100 k-ohms<br>Resolution 12-bit<br>Adjustable digital filter<br>Accuracy ±0.1 % of reading, ±0.1 % of range<br>(0.1 to 10 V, digital filter applied) |
| Resistance input | Range 2 kohms, 20 kohms, 200 kohms, auto¸<br>Resolution 12-bit<br>Adjustable digital filter<br>Accuracy (digital filter applied)<br>• 100 ohms to 800 ohms: ±3 % of reading, ±0.1 % of range<br>• 800 ohms to 20 kohms: ±0.3 % of reading, ±0.1 % of range<br>• 20 kohms to 200 kohms: ±1 % of reading, ±0.1 % of range |
| **Output modes** | |
| Digital output | Max. sink current 200 mA / max. 30 VDC<br>Catch diodes for use with real load |
| Current pullup | Current-source pull-up 12 V / 10 mA |
| Current pulldown | Current-source pull-down -12 V / 10 mA |
| IR output | Maximum IR carrier frequency 500 kHz<br>Up to 3 original IR Adapter in parallel |
| Serial output | RS-232<br>Serial data baud rate 300 bps ÷ 115,200 bps |

# CHAPTER 5: CONNECTING

**Warnings**

• The port is protected to 30 VDC maximum. Exceeding this voltage may damage the port.

• Incorrect wiring may damage the versatile port or the connected device.

• All versatile ports in the unit have common ground which connects to the grounds of other control ports. That means versatile ports are not isolated from other control ports.

Table 5-8. Connector pinout.

| 2-pin 3.5 mm | Pin | Signal | Description |
|---|---|---|---|
|  S G | S | Signal | Versatile port signal (input/output) |
| | G | GND | Ground |

Digital Input

Every versatile port can be used as a digital input for contacts, buttons, sensors, etc. For digital input usage, the output must be in an open state, and current pull-up and current pull-down can be used.

The parameters of pulse counter input follow:

• Adjustable threshold

• High sensitivity - binary 0 < 1.45 V, binary 1 > 2.05 V

• Low sensitivity - binary 0 < 5.8 V, binary 1 > 8.2 V

• Input impedance >100 kohms

• Adjustable digital filter

The port offers an adjustable threshold as described in Figure 5-9 below:

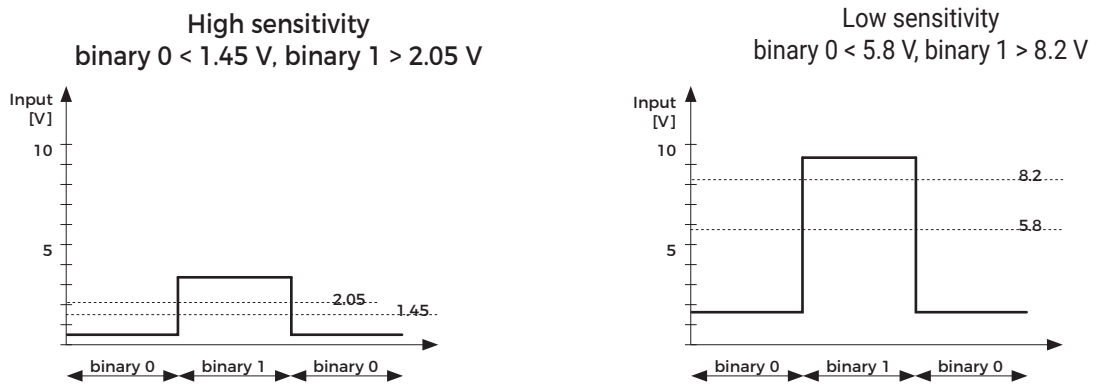
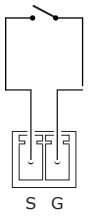



Figure 5-9. Adjustable threshold.

Table 5-9 describes how to use digital input.

Table 5-9. Digital input.

| | |
|---|---|
| Detecting a pushbutton or contact | |
|  | Any button or contact closure can be connected. |

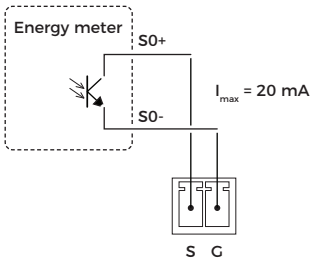
**Pulse Counter**

Pulse counter input parameters follow:

- Adjustable threshold (as above)
- Input impedance (as above)
- Pulse length min. 1 ms, max. frequency: 500 Hz
- Max. number of pulses: 2 147 483 647 (Long)
- Adjustable digital filter

Table 5-10 describes how to use pulse counter input.

Table 5-10. Pulse countter input.

| Energy meters S0 interface pulse counter | |
|---|---|
|  | Many meters have pulse outputs, including electric meters (single phase, 3-phase), gas meters, and water flow meters. For an electric meter, a pulse output corresponds to a certain amount of energy passing through the meter (kWhr/Whr). For single-phase domestic electric meters, each pulse usually corresponds to 1 Whr (1000 pulses per kWhr). For higher power meters (often three-phase), each pulse corresponds to a greater amount of energy eg. 2 Whr per pulse or even 10 Whr per pulse.<br><br>For pulse outputs from third-party energy meters, S0 interface defines a simple galvanically isolated open-collector output channel. |

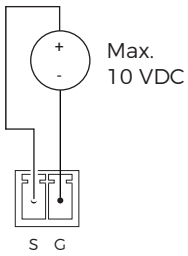
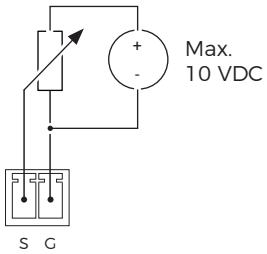
**Voltage Input**

Voltage input parameters follow:

- Range 0 to 2.5 VDC, 0 to 10 VDC, auto
- Input impedance >100 kohms
- Resolution 12-bit
- Adjustable digital filter
- Accuracy ±0.1 % of reading, ±0.1 % of range (0.1 to 10 V, digital filter applied).

Table 5-11 describes how to use voltage input.

Table 5-11. Voltage input.

| | |
|---|---|
| Detecting a voltage | |
|  | Sensors with voltage output 0 - 10 VDC |
| Reading voltage | |
|  | Potentiometer with external power supply |

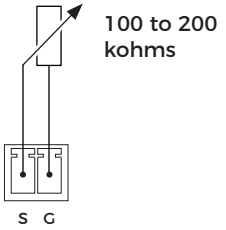
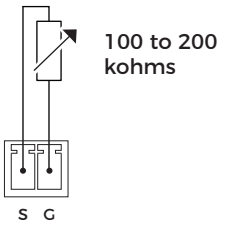
**Resistance Input**

Parameters of resistance input follow:

- Range 2 kohms, 20 kohms, 200 kohms, auto
- Resolution 12-bit
- Adjustable digital filter
- Accuracy (digital filter applied)
- 100 ohms to 800 ohms: ±3 % of reading, ±0.1 % of range
- 800 ohms to 20 kohms: ±0.3 % of reading, ±0.1 % of range
- 20 kohms to 200 kohms: ±1 % of reading, ±0.1 % of range

Table 5-12 describes how to use resistance input.

Table 5-12. Resistance input.

| | |
|---|---|
| Reading resistance | |
|  | Potentiometer for light, temperature and volume control. |
| Temperature sensors | |
|  | Thermistors and temperature sensors can be connected. |

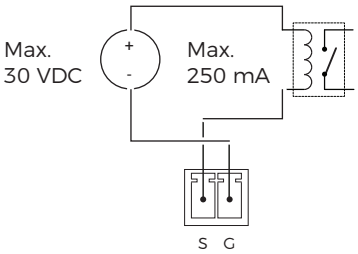
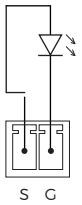
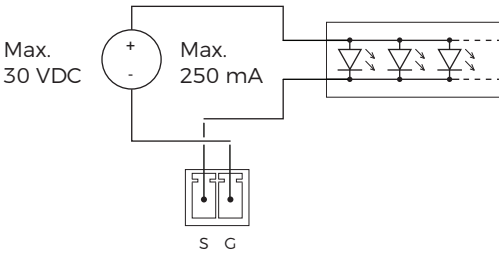
**Digital Output**

For digital output the open collector switch is used. The parameters of digital output follow:

- Max. sink current 200 mA / max. 30 VDC
- Catch diodes for use with real load

Table 5-13 describes how to use digital output.

Table 5-13. Digital output.

| | |
|---|---|
| Driving a relay coil | |
|  | Driving relays with low-voltage coil |
| Driving LED indicator | |
|  | Driving LEDs for custom indicators on keyboards, control panels, etc. |
| Driving LED strip | |
|  | Driving LED strips with max. voltage 30 VDC and max. current 200 mA. |

**IR Output**

This mode of versatile port provides output for infrared emitters (IR Adapters). The parameters of IR output follow:

- The maximum IR carrier frequency is 500 kHz.
- Up to three original infrared emitters (IR Adapters) can be connected to each output in parallel. All emitters send the same IR codes. This configuration can be used for different types of devices.

WARNING: We do not recommend connecting more infrared emitters from various manufacturers in parallel because the output can be either overloaded or damaged.

Connecting

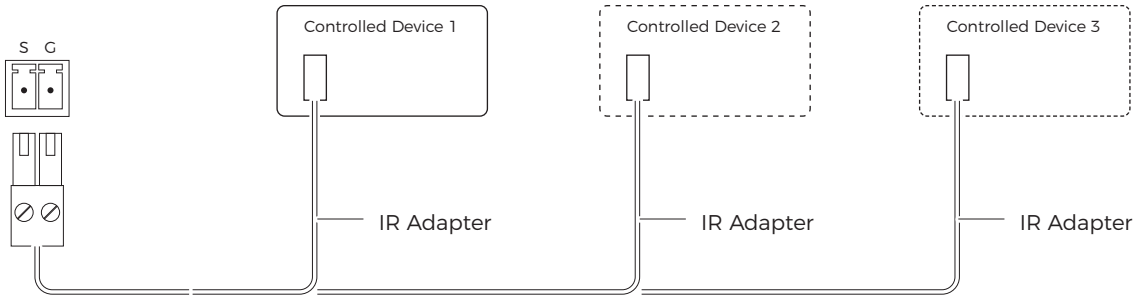



FIgure 5-10. IR output.

**Serial Output**

This mode provides one-way RS-232 output channel.

The serial output parameters follow:

- RS-232 mode only
- Serial data baud rate 300 bps to 115,200 bps

WARNING: If there are more ports in the unit, all pins labelled G are connected together.

**Connecting**

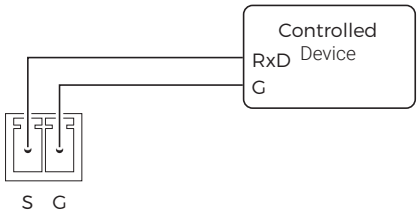



Figure 5-11. Serial output.

**IR/SERIAL**

**This type of port provides:**

- Output for infrared emitters (IR Adapters); the maximum IR output rate is 1.2 MHz.
- For RS-232 serial output (one way), the maximum serial data rate is 115 200 Bd (bps), and output signal levels for RS-232 are in the -12 V to +12 V range.

**The IR outputs and RS-232 outputs can be combined on independent outputs. For example, three outputs can be used as IR, and five outputs can be used as RS-232.**

Table 5-14. IR/Serial.

| IR/SERIAL | | | |
|---|---|---|---|
| 2-pin 3.5 mm | Pin | Signal | Description |
|  S G | S | Signal | IR/Serial Signal (Output) |
| | G | GND | Ground |

NOTES:

- All pins labelled G are connected together.
- Up to three original infrared emitters (IR Adapters) can be connected to each output in parallel
- We do not recommend connecting more infrared emitters from various manufacturers in parallel, because the output can be either overloaded or damaged.

# CHAPTER 6: USER APPLICATION

## 6. Upload User Application

The user application is dedicated to control, and it is programmed by ControlBridge Builder programming tools.

## 6.1 Using ControlBridge Builder

To use the ControlBridge Builder:

1. Connect the controller to your computer as described in the Connecting/ControlBridge Network chapter.

2. Run ControlBridge Builder on your PC.

3. Open a project in ControlBridge Builder. You must have the appropriate controller properly inserted and configured.

4. Use the tool bar "Final" button to open the "Upload and Export Application" dialog box.

5. Verify that your controller is checked.

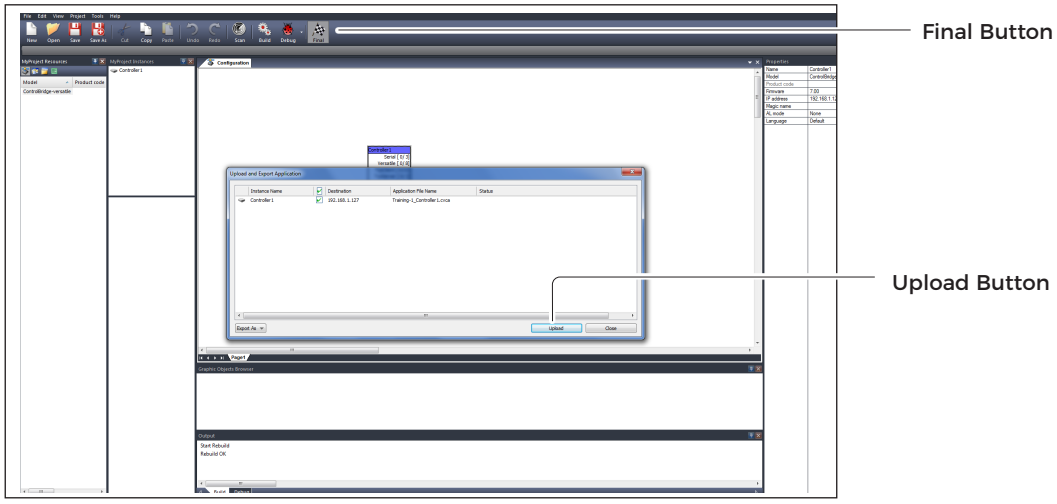



Figure 6-1. ControlBridge Builder screen.

6. Use the "Upload" button to start the application upload.

7. If controller firmware isn't updated, it will be uploaded automatically and then the application upload will finish.

# CHAPTER 6: USER APPLICATION

## 6.2 Using Admin Control Panel

To use the Admin Control Panel:

1. Run ControlBridge Builder on your PC.
2. Open a project in ControlBridge Builder. It's necessary to have the appropriate controller properly inserted and configured.
3. Use the tool bar "Final" button to open the "Upload and Export Application" dialog box.

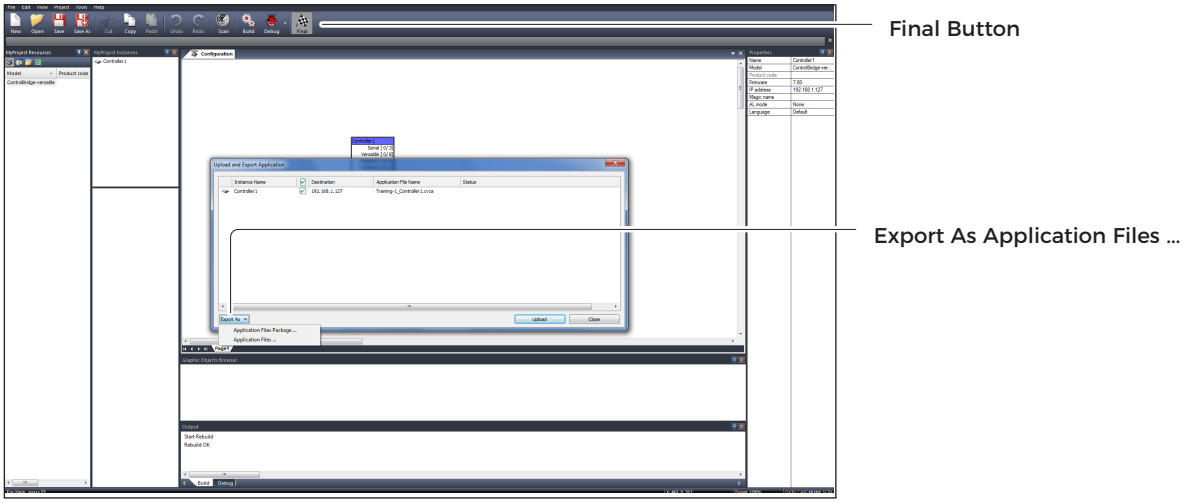



Figure 6-2. Admin Web screen.

4. Verify that your controller is checked.
5. Use the "Export As..." button and select "Application Files ..." to export an application and store it in file named *.cvca.
6. Connect the controller to your computer as described in the Connecting/ControlBridge Network chapter.
7. Run the Internet browser on your PC and type in the same controller IP address that you see in the ControlBridge Builder project, Properties/IP address window.
8. The Admin Control Panel is shown.
9. Go to the System page and check the current firmware version. If there is no actual controller firmware version, upload the firmware version that corresponds to the firmware version in the ControlBridge Builder project.
10. Go to the Applications page and upload the application file *.cvca.
11. Start the uploaded application by pressing the "Start" button.

# CHAPTER 7: ADMIN CONTROL PANEL

## 7. Admin Control Panel

### 7.1 Access Admin Control Panel

Run the Internet browser on your PC and type in the controller's IP address. The factory default IP address is 192.168.1.127.

### 7.2 Login


Figure 7-1. Login screen.

This screen isn't displayed if the password is empty (factory default status).

If the password isn't empty, you have to log in first in order to access the configuration web pages.

Enter your password into the Password box. Then click on the "Login" button to enter the ControlBridge Unit's web pages.

Remember that the password is case sensitive. To change your password, use the Password menu after you are logged in.

### 7.3 Configuration

#### Identification

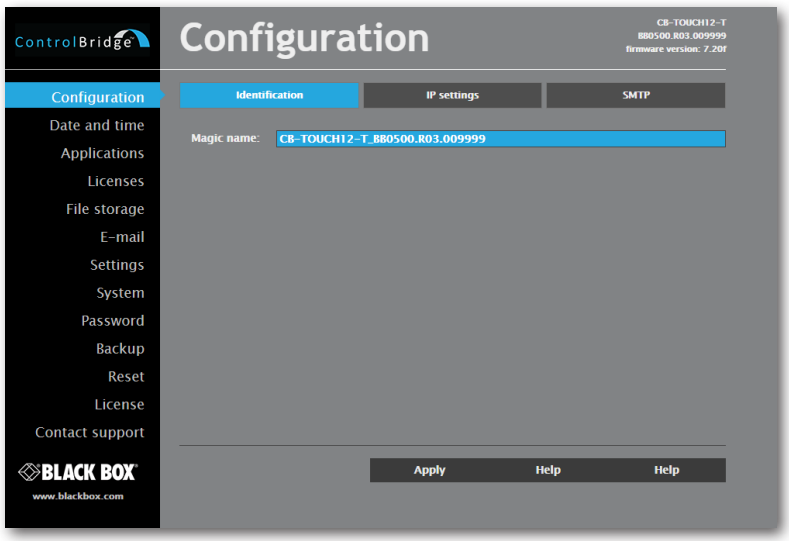



Figure 7-2. Configuration screen, Identification tab.

# CHAPTER 7: ADMIN CONTROL PANEL

Each ControlBridge Unit can be identified by a unique identification name. Unique names are most useful in applications requiring more than one ControlBridge Unit. This enables programmers and installers to reference ControlBridge Units with logical, user friendly names, such as “boardroom,” or “lobby.” To set the ControlBridge Unit identity, enter the unique name you wish to use in the Name box. Click on the "Apply" button for any changes to become effective.

### IP Settings

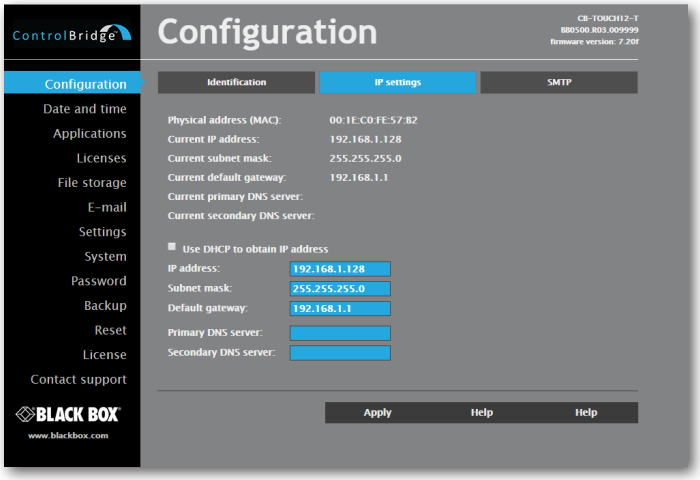



Figure 7-3. IP Settings tab.

This page is used for setting the communication parameters for your ControlBridge Unit.

The ControlBridge Unit uses standard internet protocol (IP) communication parameters. Certain parameters can be reset by the user. On start up, this page will display the ControlBridge Unit’s given Physical address (MAC) and Current IP Address. Note this addressing information (and any changes you elect to make to the IP address, subnet mask, or default gateway). You must enter this information into the ControlBridge Builder program written for your specific application. For control systems with more than one ControlBridge Unit, you must give a unique IP address to each ControlBridge Unit.

Some control systems are “standalone” and not part of a larger network. For such “standalone” systems, the Host name is optional. However, for control systems that are connected to a larger network, obtain the Host name from the network administrator, and enter it into the corresponding box. DHCP is not supported in this release.

Click on the "Apply" button for any changes to become effective.

### SMTP

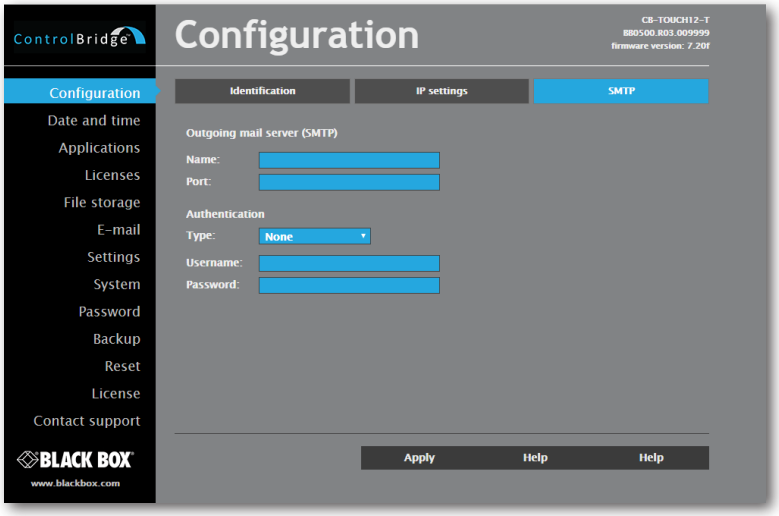



Figure 7-4. SMTP tab.

This page is used to set SMTP server parameters. Set a name or an address and the port of your SMTP server. The SMTP server and port are used by the XPL2 commands EmailSend and PresetEmailSend.

Click on the "Apply" button for any changes to become effective.

## 7.4 Date and Time

### Current Date and Time

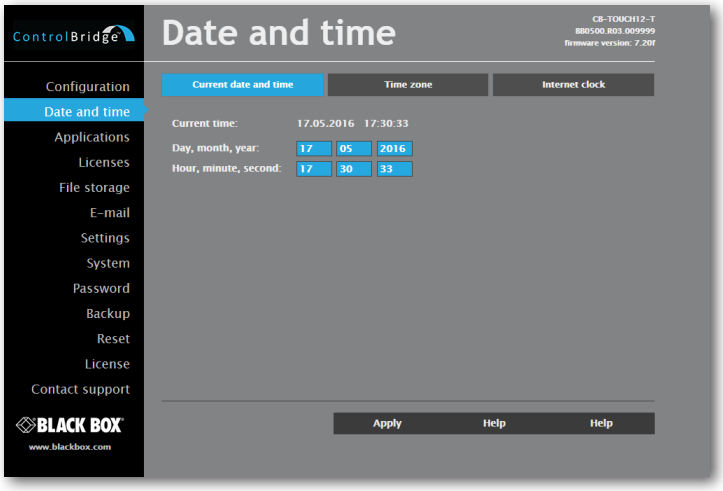



Figure 7-5. Current Date and Time screen.

Use this  page to set the time clock on your ControlBridge Unit. The current date, time, and time zone are shown on the Current time line.

# CHAPTER 7: ADMIN CONTROL PANEL

The applicable boxes can be selected to enter changes to the

• date: day/month/year,

• time: hour/minute/second.

Click on the "Apply" button for any changes to become effective.

### Time Zone

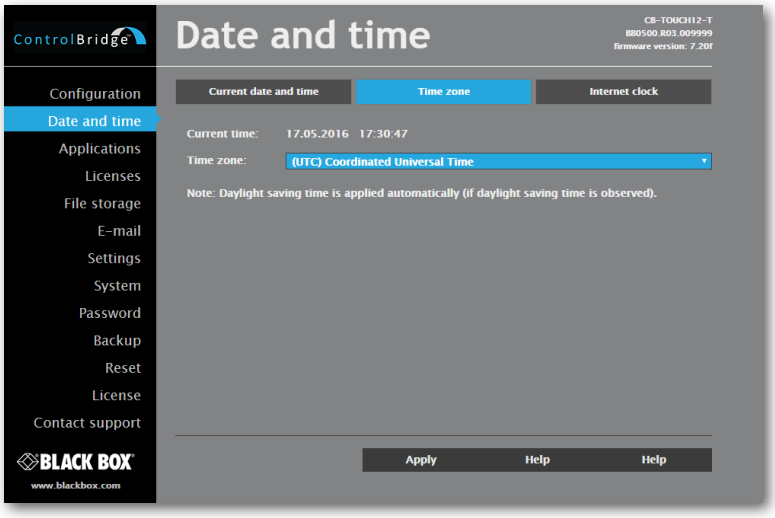



Figure 7-6. Time Zone.

Use this page to set the time zone on your ControlBridge Unit. The current date, time, and time zone are shown on the Current time line. Select the time zone box to enter changes to the Time zone.

Click on the "Apply" button for any changes to become effective.

### Internet Clock

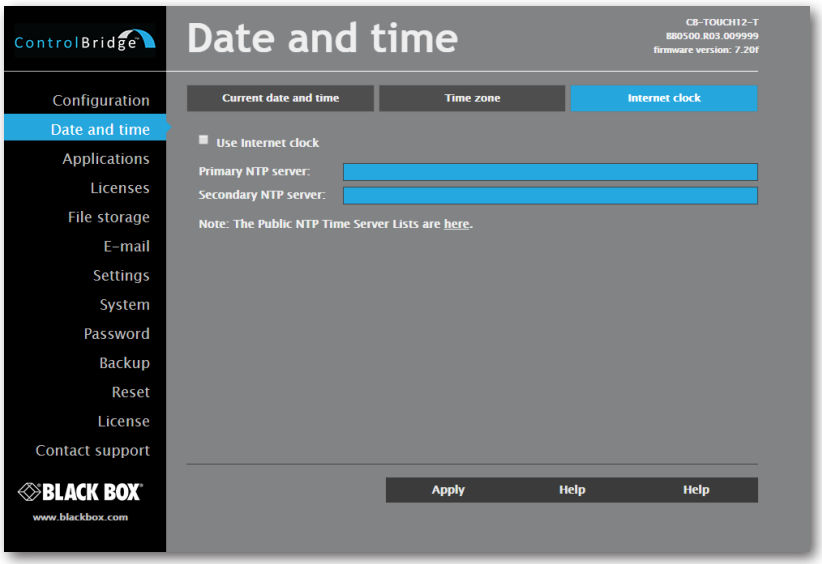



Figure 7-7. Internet Clock screen.

Use this page to synchronize the ControlBridge Unit's date and time with an internet clock. Begin by selecting the check box for "Use Internet clock." Next, enter the IP addresses (or complete address name) of the primary and secondary NTP servers in the Primary NTP server and Secondary NTP server boxes.

Be sure to click on the "Apply" button for any changes to the internet clock to become effective.

## 7.5 Applications

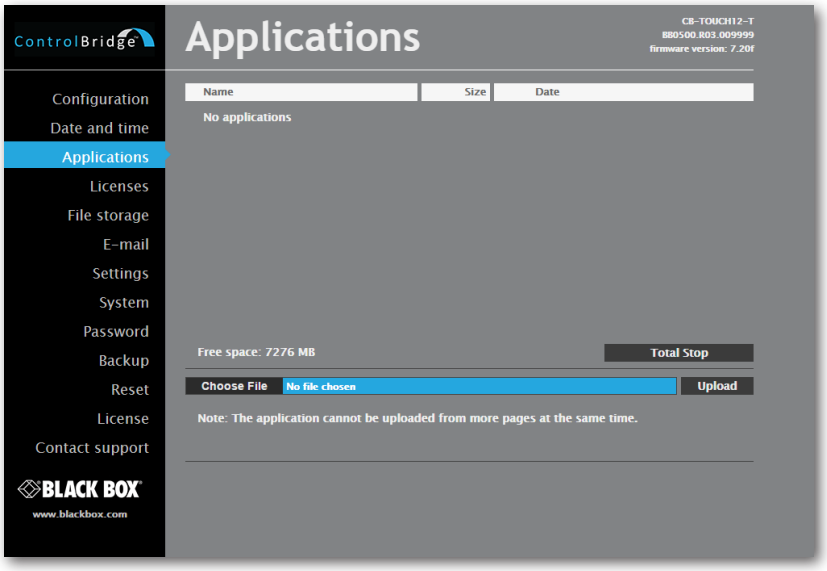



Figure 7-8. Applications.

Use this page to upload compiled ControlBridge Builder programs to your ControlBridge Unit.

All uploaded applications are listed on this page, along with their file properties: file name/file size/date. The ControlBridge Unit has a generous memory pool; unused free space is shown at the bottom of this page. The ControlBridge Unit also permits other service functions, including deleting files, downloading programs back to a personal computer, and starting/stopping specific applications.

A "running flag" denotes the active application. To stop the running application, press the Start/Stop button. To restart a stopped application, press the Start/Stop button again.

Files are uploaded from a personal computer to the ControlBridge Unit by selecting the desired application program, and clicking on the "Upload" button. Files are downloaded from the ControlBridge Unit to a personal computer by clicking on the File name. Files are easily deleted with the "Delete" button. The Total stop button stops a running application. This application will not automatically start after reset.

# CHAPTER 7: ADMIN CONTROL PANEL

## 7.6 File Storage

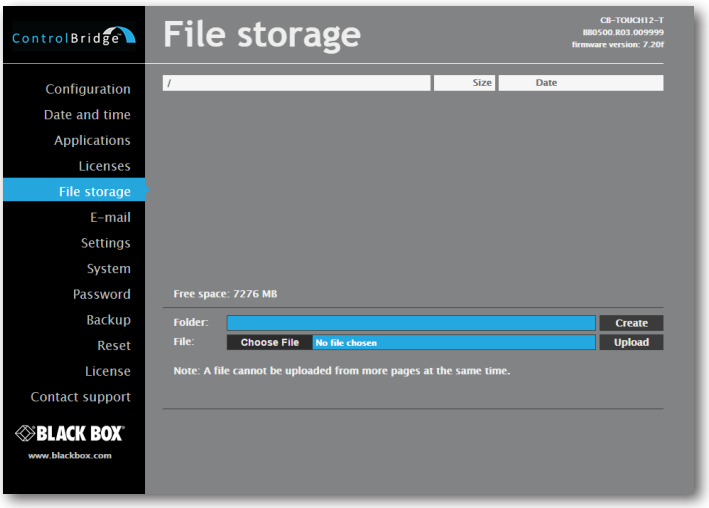



Figure 7-9. File storage screen.

You can use the ControlBridge Unit's generous memory pool for an auxiliary file storage. This is helpful for storing presets, in archiving electronic manuals, pdf files, and other support documentation. You can manage file storage via the file storage page.

A list of existing files, folders, and their properties is shown. To delete a file or a folder, click on the "Delete" button on the corresponding line. To delete all files and folders from the current folder, click on the "Delete All" button.

To create a new folder, enter a name for the new folder, and click on the "Create" button. To upload a file, select the desired file, and click on the "Upload" button.

NOTE: Files are automatically compressed for the ControlBridge Unit's internal file system. Accordingly, the size of your uncompressed file before storing may not match the decrease of free space shown on the ControlBridge Unit.

# CHAPTER 7: CONTROL PANEL

## 7.7 E-mail

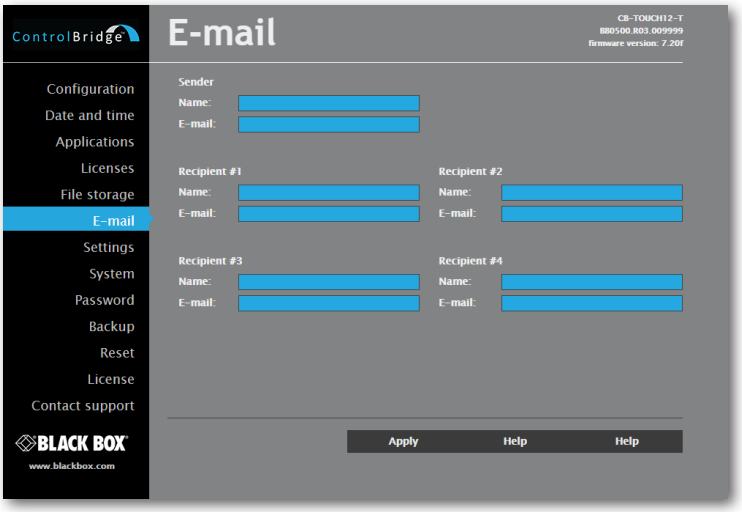



Figure 7-10. E-mail screen.

Use this page to set e-mail parameters and recipients' addresses.

You must set the SMTP server. See the Configuration/SMTP setting.

The sender Name and E-mail are the addresses of your ControlBridge Unit. The sender Name and E-mail are used by the XPL2 commands EmailSend and PresetEmailSend.

The recipient Names and E-mails are addresses of recipients where e-mails will be sent using the XPL2 command PresetEmailSend.

# CHAPTER 7: ADMIN CONTROL PANEL

## 7.8 System

### Firmware

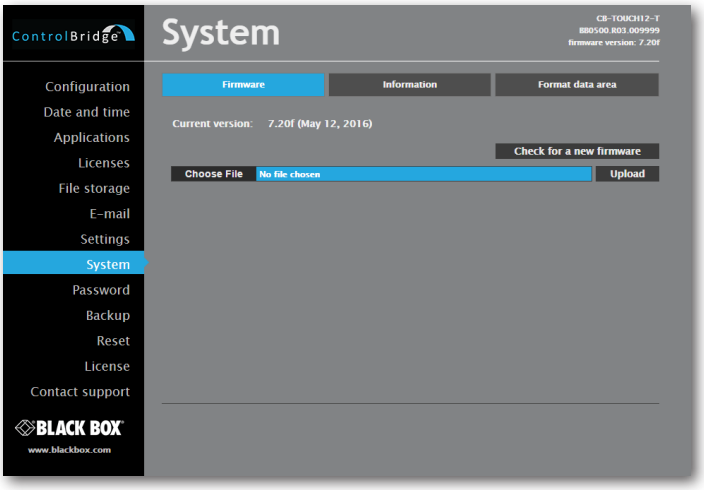



Figure 7-11. Firmware screen.

Use this page  to update the ControlBridge Unit firmware. The Current version of firmware is shown. To upload new firmware, select the desired version, and click on the "Upload" button.

### Information

The Information page shows basic information about your ControlBridge Unit's firmware and version.

### Format Data Area

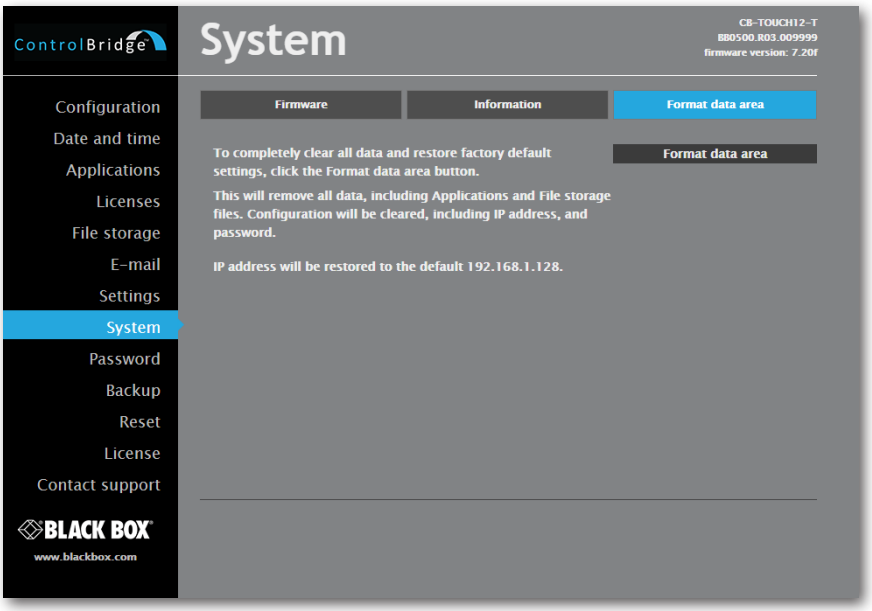



Figure 7-12. Format Data Area tab.

To completely clear all data and restore the factory default settings, click on the "Format data area" button.

This will remove all data, including Applications and File storage files. Configuration, including IP address and password, will be cleared. The IP address will be restored to the default 192.168.1.127.

## 7.9 Password

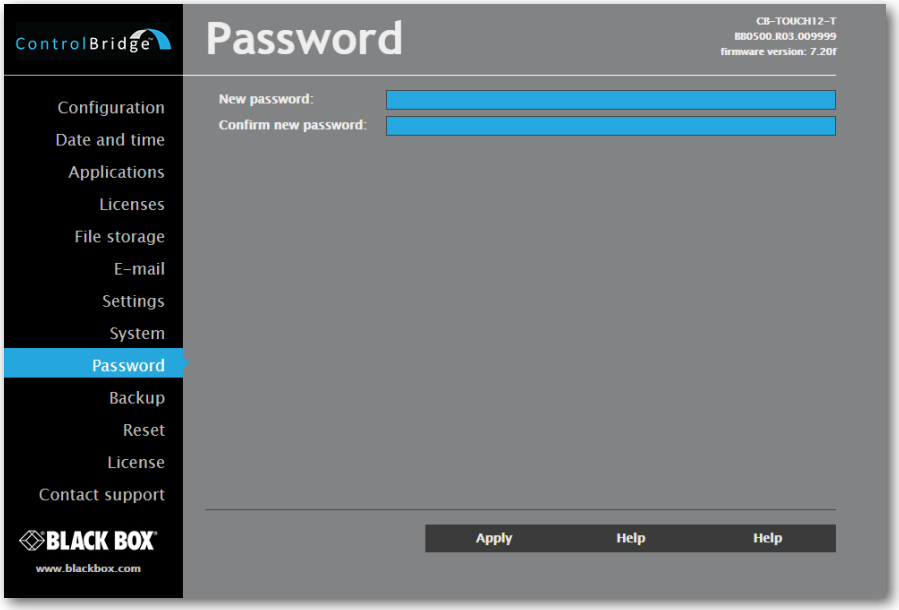



Figure 7-13. Password screen.

You need a case-sensitive password to log into the admin web pages. Set a new password via the "New password" box. You must reenter the password in the "Confirm new password" box. An error message will appear if the confirmation does not match, in which case you should reenter your password again in both boxes.

Finally, click on the "Apply" button to implement the new password.

## 7.10 Backup

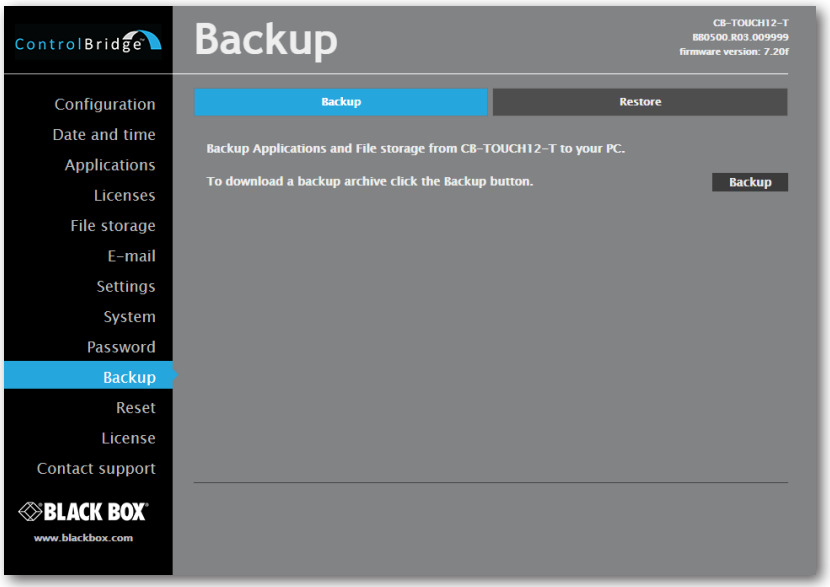



Figure 7-14. Backup screen.

Use this page to back up applications, files, folders and the ControlBridge Unit's configuration. The backup procedure copies all Applications, Application data, File storage, and ControlBridge Unit's settings to one archive. This archive is saved to the PC. To start the backup process, click on the "Backup" button.

NOTE: To see the backed-up/restored applications, click on the "Applications" menu. To see backed-up/restored files and folders, click on the "File Storage" menu. Use this page to back up all applications, files, and folders.

### Restore


Figure 7-15. Restore screen.

# CHAPTER 7: ADMIN CONTROL PANEL

READ ALL IMPORTANT NOTES THAT FOLLOW BEFORE USING THIS OPERATION!

Use this page to restore all applications, files, and folders. Restore copies of all applications, files, and folders from a backup archive on the PC to their corresponding locations on the ControlBridge Unit.

To start the restore process, select the desired backup archive. Then click on the "Restore" button. The restore process can take up to 10 minutes, depending on the size of the files being restored.

The ControlBridge Unit's settings can also be restored;  check the "Restore configuration" box. The ControlBridge Unit's settings are accessible via the Configuration, Date and time, and Password menus.

Important note: Actual password and IP settings will be restored too.

Important note: When restoring files, the running application will stop, and all applications, files, and folders currently stored in the ControlBridge Unit will be deleted. If you want to retain them, use the Backup command before the Restore command.

NOTE: To see the backed-up/restored applications, click on the "Applications" menu. To see backed-up/restored files and folders, click on the "File Storage" menu.

## 7.11 Reset

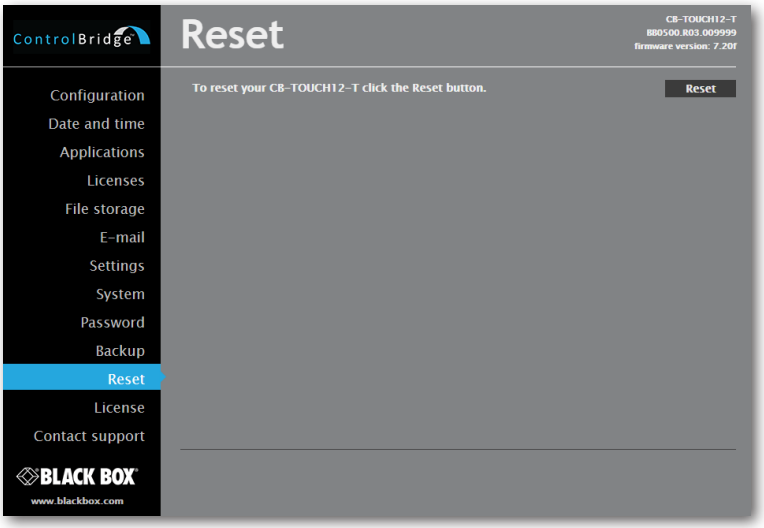



Figure 7-16. Reset screen.

To restart your ControlBridge Unit, click on the "Reset" button.

## 7.12 Logout

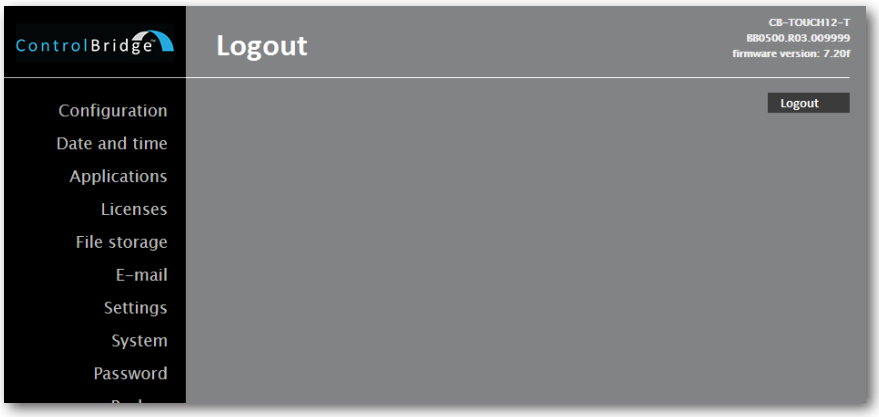



Figure 7-17. Logout screen.

This screen isn't displayed if the password is empty (factory default status).

## 7.13 License

This page describes the software license.

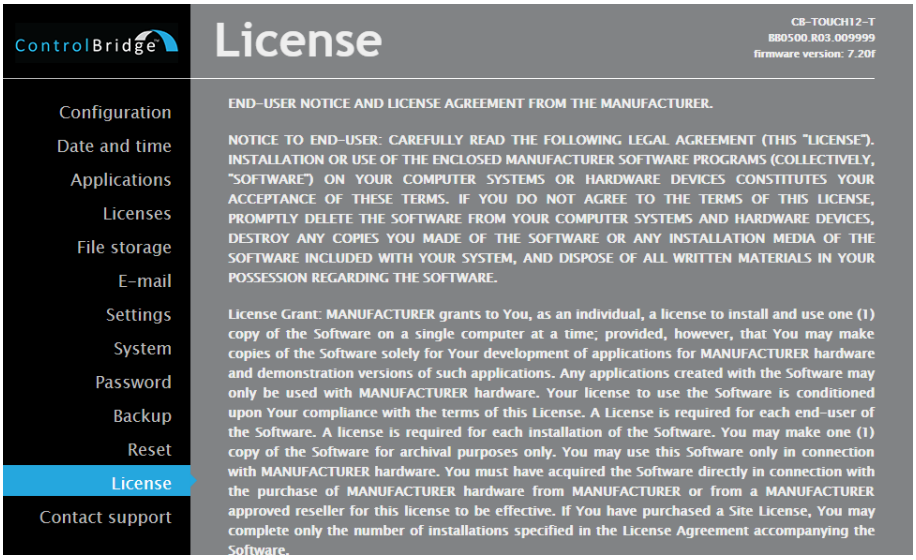
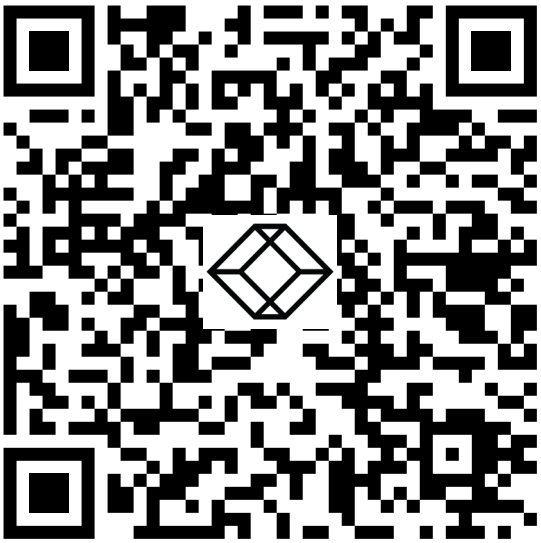



Figure 7-18. License screen.

# CHAPTER 8: CONTACT AND TECH SUPPORT

## 8. Contact and Technical Support

Visit blackbox.com/discover-bb/global-presence for regional technical support and contact information.



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