CXE2000/CXE3000 CompletePBX: Getting Started Guide

Package Contents

- CXE2000/CXE3000 (2U 19" width unit)
- Power cord
- Support hardware for 19" cabinet
- CompletePBX software preinstalled on the hardware

Prerequisites

You need a computer equipped with an Internet browser. Firefox is recommended.

Step 1: Powering Up the Unit

1. For safety reasons, if the line wiring exits the building, it is essential to ground the unit.
   Note: Not properly grounding this device will void your warranty!
   a. Connect a grounding tab to the grounding screw on the rear panel.
   b. Using 12-16 gauge wire, connect the grounding tab to a reliable ground.

Figure 1: Grounding Screw on CXE2000 Rear Panel

Figure 2: Grounding Screw on CXE3000 Rear Panel

3. Connect the unit to the LAN.
4. Connect the power cord to the device and turn on the power using the power button on the front panel. The device startup process takes about 2 minutes. The startup time depends on the number of telephony ports installed in your CXE2000/CXE3000 unit. You will see the "Loading..." notification on the Liquid Crystal Display (LCD) panel. When the booting process is near completion, "XORCOM" will appear on the LCD panel.

Step 2: Submit Warranty Activation Request

At this point activate the product warranty (a pre-requisite for submitting any request for technical support). Go to www.xorcom.com/warranty.html, complete and submit the form found there.

Step 3: Configure or Obtain the IP Settings for CXE2000/CXE3000

It is possible to configure or obtain the IP settings by using either the LCD panel or a keyboard and a display monitor.

Method 1: **Using the LCD Panel**

    a. How to obtain IP address(es) received from DHCP server

The CXE2000/CXE3000 will try to obtain the IP address from your DHCP server, if one is available. To check the received IP address by using the LCD panel:

Press the "Menu" button and then navigate as follows:
Status->SystemInfo->IP address
You will see the "IP address:" notification. Scroll down by using the down arrow navigation button to review the received IP addresses for the eth0 and eth1 interfaces. If an interface failed to receive an IP address from the DHCP server the display will read: 0.0.0.0

    b. How to configure a static IP address(es)

Press the "Menu" button and navigate to Settings->ManualNet. "Manual Net:" will appear on the display.
Press the down arrow button to navigate from one parameter to another. You will be able to define the following parameters:
- the default gateway ("Enter gateway"),
- two DNS servers ("Enter DNS1" and "Enter DNS2")
- IP address and network mask for eth0 ("eth0 IP" and "eth0 Netmask")
- IP address and network mask for eth1 ("eth1 IP" and "eth1 Netmask")

You can use the number buttons to enter the required IP addresses. Use the '*' (asterisk) button for the '.' (period) character.
Press the Enter button once you have defined all the required data. You will be prompted for confirmation.
Note: The Enter button should be pressed only once after all the parameters are defined. Use the down arrow and up arrow buttons to navigate between parameters.

Method 2: **Using a keyboard and display monitor**

1. Connect a keyboard and a VGA/SVGA screen.
2. Login to the CXE2000/CXE3000 as follows:

User name: `root`

    1. Password: **!x0rc0m!voip5472#**
    Note: Note the use of the number zero in the password

    The default CompletePBX keyboard configuration is US English. When entering the password, the # (hash) key is shift/3 (i.e. uppercase three).

On UK keyboards, the hash character is located below the backspace, above the right-hand enter key.

a. How to obtain IP address(es) received from DHCP server

To see the IP addresses of the eth0 and eth1 interfaces use the command: `ifconfig -a`
As a result you'll get a block of data like this:

```
eth0    Link encap:Ethernet   HWaddr 00:1C:C0:1F:ED:A0
        inet addr:192.168.0.64  Bcast:192.168.0.255  Mask:255.255.255.0
        inet6 addr: fe80::21c:c0ff:fe1f:eda0/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:13221 errors:0 dropped:0 overruns:0 frame:0
        TX packets:3658 errors:0 dropped:0 overruns:0 carrier:0
        collisions:2129 txqueuelen:1000
        RX bytes:5031371 (4.7 MiB)  TX bytes:397301 (387.9 KiB)
        Interrupt:217 Base address:0x2000
eth1  Link encap:Ethernet   HWaddr 00:1F:1F:E9:B9:C1
        BROADCAST MULTICAST  MTU:1500  Metric:1
        RX packets:0 errors:0 dropped:0 overruns:0 frame:0
        TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
        Interrupt:217 Base address:0CXE000
```

In this example the CXE2000/CXE3000 eth0 interface received IP address 192.168.0.64. The eth1 interface did not receive an IP address.

b. How to configure a static IP address(es)

Insert the required variables into `/etc/sysconfig/network-scripts/ifcfg-eth0`:

```
cat > /etc/sysconfig/network-scripts/ifcfg-eth0 <<EOF
DEVICE=eth0
BOOTPROTO=static
IPADDR=192.168.0.64
NETMASK=255.255.255.0
ONBOOT=yes
TYPE=Ethernet
EOF
```

If you also want to define the eth1 interface, then:

```
cat > /etc/sysconfig/network-scripts/ifcfg-eth1 <<EOF
DEVICE=eth1
BOOTPROTO=static
IPADDR=192.168.0.65
NETMASK=255.255.255.0
ONBOOT=yes
TYPE=Ethernet
EOF
```

1. Define the default gateway in the /etc/sysconfig/network file:
   ```
   GATEWAY=192.168.0.1
   ```

2. Define the DNS server in the /etc/resolv.conf file:
   ```
   nameserver 192.168.0.1
   ```

Note: Correct network parameters settings are extremely important for normal CompletePBX functionality. Always make sure that the 'localhost' is defined in the /etc/hosts file:
127.0.0.1 localhost.localdomain localhost

Step 4: Configure the CXE2000/CXE3000

If the unit is equipped with FXS ports they are configured as CompletePBX extensions starting from number 1001.

In order to configure the device follow these steps:

a) From a computer's Internet browser enter the CXE2000/CXE3000 IP address (for example http://192.168.0.64).

b) Click on the Administration icon, enter user name **superadmin**, and password **!XORCOM!**

Now you can modify your CXE2000/CXE3000 CompletePBX configuration. See the *CompletePBX Reference Guide*.

If you want to connect external Astribank devices to the CXE2000/CXE3000, then you can perform the new hardware detection and automatic configuration procedure by running the following command in the Linux command line prompt:

```
/var/lib/asterisk/bin/detect_zap
```

Please be aware that detect_zap utility will overwrite the DAHDI channels configuration. For example, FXS ports, extension numbers etc.

Enabling Calls to/from External Endpoints

To ensure the maximum PBX protection, the **CompletePBX firewall** allows access to the standard SIP signaling ports 5060/udp, 5060/tcp and 5061/tcp only for the SIP endpoints with the following private IP addresses: 10.0.0.0/8; 172.16.0.0/12; and/or 192.168.0.0/16.

In addition, **CompleteSBC** is configured to reject any SIP requests reaching its public interface. To enable VoIP calls you must follow the instructions in the CompleteSBC Getting Started document.

Step 5: Protect CompletePBX Against Unauthorized Access

Once you have **fully configured** CompletePBX we highly recommend that you use the following procedures and applications supported in CompletePBX to protect it against unauthorized access:

Change the Linux Password

The password for the Linux root user can be changed by using the Linux `passwd` command.

Credentials to Access CompletePBX

CompletePBX is preconfigured with four administrators, each having a different set of permissions. User **superadmin** is the most powerful, and has full access rights. You must modify the passwords for the remaining three administrators in order to activate them:

a) From a computer's Internet browser enter the CXE2000/CXE3000 IP address (for example http://192.168.0.64).

b) Click on the **Administration** icon, enter user name **superadmin**, and password **!XORCOM!**

c) Navigate to the **Admin** menu, and select **Administrators** dialog.

d) In turn, select each of the remaining three administrators (**admin**, **superuser**, and **user**) and modify the password of each one.

Asterisk Manager Password

Modify the default value of the password for the Asterisk manager:

a) Connect to the CompletePBX Web interface as described in "Step 4: Configure the CXE2000/CXE3000" (above).

b) Navigate to the **Settings** menu, and select **Advanced** dialog.

c) Navigate down to the **Asterisk Manager** section and modify the value of **Asterisk Manager Password** to a value of your choice.

Alternatively you can connect to the PBX via SSH and run the Linux shell based wizard that allows changing Asterisk Manager and Asterisk database passwords:
`/root/change_password`

IP Protection

CompletePBX must be installed on a protected LAN and must not be directly connected to the public Internet. The LAN must be protected by a Firewall/NAT router.

Fail2Ban and Firewall

In order to maximize protection from external threats, the **fail2ban** process is activated, in addition to the internal firewall. You can use **System Settings** to modify the internal firewall as follows:

a) Connect to the CompletePBX Web interface as described in "Step 4: Configure the CXE2000/CXE3000" (above).

b) Navigate to Admin

c) Navigate down to System Settings and then select Firewall in the menu on the right side of the dialog.

Unit Status LED (Light Emitting Diode) Indicators

The CXE2000/CXE3000 is equipped with varying LED indicators on the front panel.

Digital CXE2000/CXE3000 Models

These are models that have at least one digital PSTN port – ISDN BRI or PRI. They have a vertical array of four status indicators on the left side of the front panel (**Fig 3**).

Fig. 3 – BRI/PRI Panel (allows up to additional 24 FXS ports)

LED Label	Indication
PHONE	This yellow LED indicates that the CXE2000/CXE3000 is supplying the necessary voltage for analog or ISDN telephone sets.
SYNC	This green LED is the synchronization. It blinks once the CXE2000/CXE3000 is synchronized with the telephony modules.
ACTIVE	This red LED lights up when at least one PSTN / Analog phone is active.
ON	This green LED lights up when the CXE2000/CXE3000 is powered.

Analog (FXS and/or FXO) CXE2000/CXE3000

These models do not have digital modules and therefore have a different set of indicators, as described in **Fig 4**:

Fig 4. All-Analog Panel

The functionality of the LED indicators is the same, with two exceptions:
1. All the indicators are Red.
2. The Phone indicator is replaced with H/W LED, indicating hardware failure (when on).

Port Status LED (Light Emitting Diode) Indicators

The CXE2000/CXE3000 has a single green LED status indicator for analog ports (**Fig. 4**). The Red LEDs are NOT USED for line status indication), and there are two LED indicators for digital ports.

- FXS ports: The Green LED is on for off-hook status. It blinks when the phone rings.
- FXO ports: The Green LED is on for off-hook status. It blinks when the line rings.

BRI port (**Fig. 4**): Solid green indicates that the port is configured as TE. Solid yellow indicates that the port is configured as NT. Two fast green blinks Indicates that ISDN TE layer 1 is active. Two fast yellow blinks Indicates that ISDN NT layer 1 is active. One green blink indicates that ISDN TE layer 2 is active. One yellow blink indicates that ISDN NT layer 2 is active.

PRI port (**Fig. 4**): Solid green indicates that the port is configured as TE. Solid yellow indicates that the port is configured as NT. Two fast green blinks Indicates that ISDN TE layer 1 is active. Two fast yellow blinks Indicates that ISDN NT layer 1 is active. One green blink indicates that ISDN TE layer 2 is active. One yellow blink indicates that ISDN NT layer 2 is active.

For more information about the unit status and port status LED indicators refer to the **Astribank** manual on the Xorcom Web site: http://www.xorcom.com.

Additional Functionality Supported by the LCD Touch Panel

Internal Flash Drive for Restore Functionality

In addition to the standard **external** Rapid Recovery disk-on-key, all CXE series CompletePBX models feature an **internal** device as well, which is attached to the LCD panel inside the appliance.

Initially, factory defaults are stored on this device. Later on, you can create and store your own customized backups here as well.

To activate the "restore" image function from the internal flash drive:
1. Connect a monitor and keyboard to the server.
2. Switch off the server.
3. Switch on the server and press the Enter button on the LCD keypad until the "Loading from internal flash..." message appears on the LCD.
4. The Xorcom Rapid Recovery menu will be displayed on the monitor.

Additional LCD Panel Functions

Status
- System Info
  - IP Address (shows all configured IP addresses)
  - Hardware Status (CPU utilization, temperature, etc. -- not implemented yet)
- PBX Info
  - Blink port
    - Extension (blink Astribank port that corresponds to a given extension number)
    - Channel (blink Astribank port that corresponds to a given DAHDI channel number)
    - XPD (blink Astribank ports that correspond to a given DAHDI XPD number)
    - SPAN (blink Astribank ports that correspond to a given DAHDI SPAN number)
  - Active Calls (current number of active calls)
- TwinStar Status (DRBD role, DRBD connection status)
- RPS Status (status of power supplies in dedicated Redundant Power Supply unit, which provides redundant power to Astribanks connected to the CXEn000 server)

Maintenance
• Asterisk restart
• DAHDI restart
• Server reboot
• Server power off

Settings
• DHCP (enable/disable DHCP on particular Ethernet interface)
• Manual Net (manual IP configuration)

Scan the QR code on the front panel of the IP-PBX for easy access to all relevant product info *for this specific product*, including detailed technical documentation, "how to" videos, and more.