serc o net

Revolutionizing Home Networking

SercoNet Smart Outlet™ Network

Technical User Guide

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1. INTRODUCTION

1.1. The Smart Outlet™ Network and Benefits

The SercoNet Smart Outlet™ network distributes residential and SOHO broadband communication to devices such as PCs, printers and scanners. The system uses existing phone wires to deliver free-flowing, uninterrupted data, voice, and video streams at broadband speeds. Simply replacing the home phone jacks with SercoNet Smart Outlets™ automatically creates a home 10Mbps Ethernet LAN backbone over the home phone wires.   This new backbone guarantees the Smart Outlet™ network's high bandwidth and allows the customer to run multimedia applications alongside data services. In addition, customers need not worry about losing telephone services, since the Smart Outlet™ network maintains intact Telephone services during power outages.
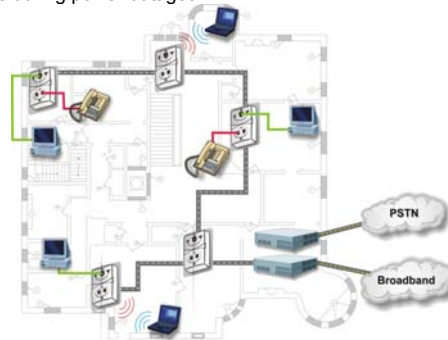

Figure 1.1. SercoNet Smart Outlet™ Network Diagram

1.1.1 Flexible Interfacing

The Smart Outlet™ network features various physical interfaces to connect multiple home device types without extra protocol or interface converters. The Smart Outlet™ itself is endowed with the dominant standard 10BaseT interface, enabling customers to directly connect multiple home devices to the Smart Outlet™ network's backbone. Beyond 10BaseT, the Smart Outlet™ network supports other standard interfaces like IEEE-802.11b, providing maximum device connectivity and flexibility via interchangeable parts.

1.1.2 Broadband Service Providers' Extended Reach

The Smart Outlet™ network suits a wide spectrum of customers:
- Home users desiring a smart-home.
- Installers seeking easy broadband provision.
- Broadband service providers wishing to sell new value-added services over the Smart Outlet™ network.

The network's house-wall demarcation point enables broadband providers to redefine the border between the customer and service provider domains. Thus, the Smart Outlet™ network integrates the home broadband backbone with the provider's service equipment. This fusing of the home backbone with the broadband service provider's remote-controlled home-networked applications increases customer loyalty and reduces customer churn.

Also, by using the SercoNet Smart Outlet™ network, broadband service providers can provide maintenance and support for their customers' home networking services, a one-stop-shop transparency that paying customers expect and value.

1.2. How the Smart Outlet™ Network Works

Implementing the *No-New-Wires* approach, SercoNet's Smart Outlet™ broadband network makes home networking effortless, requiring nothing more than a simple, fast replacement of standard

home phone jacks with Smart Outlets™. The easy-to-install Smart Outlets™ serve as mini-repeaters: each Smart Outlet™ terminates and regenerates network data and then transfers the data to the next Smart Outlet™. The resulting network guarantees constant high-speed data in every room of the customer's home.

2. INSTALLATION

2.1. What's in the box?

SercoNet's Smart Outlet™ Installation Kit includes the following items (the exact packing list may vary depending on system topology and ordered equipment):
- Power Unit
- Smart Outlet
- StarBox
- Primary Smart Outlet™ Adaptor
- Surface Mount Adaptor
- Wall Mount Adaptor
- Outdoor Box for Smart Outlet™
- Smartester
- Additional Package Items

2.1.1 Power Unit

Catalog No: SRC-PWRU
Description: The Power Unit provides power to the Smart Outlet™ network and prevents information based on data from entering or exiting the house. One Power Unit is required for each telephone line system.
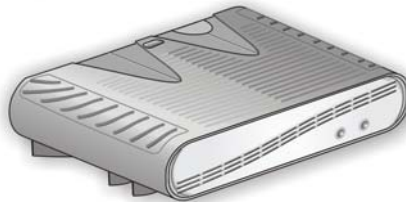
Figure 2.1: SercoNet Power Unit – Front View

Figure 2.2: SercoNet Power Unit – Rear View

Additional Accessories for SRC-PWRU: Power cable

2.1.2 Smart Outlet™

Catalog No.: SRC-10MPS
Description: The SercoNet Smart Outlet™ enables communication between data devices at 10Mbps over existing phone wires while leaving the phone system operable. To form a home network, at least two Smart Outlets™ are required (quantity per order request).
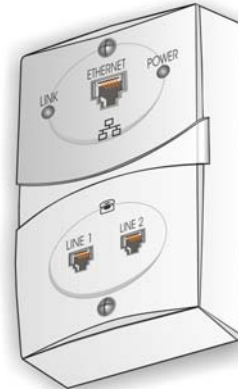
Figure 2.3 SercoNet Smart Outlet™

2.1.3 StarBox

Catalog No.: SRC-10STAR
Description: The StarBox is the central unit supporting star (home-run) topology. The StarBox supports up to seven extensions for 10BaseT and one Ethernet 10BaseT port that can be used for broadband connectivity (optional).

Figure 2.4: SercoNet StarBox – Front View

Figure 2.5: SercoNet StarBox – Rear View

2.1.4 Primary Smart Outlet™ Adaptor

Catalog No.: SRC-10FRST
Description: The Primary Smart Outlet™ Adaptor enable connection of SercoNet Power Unit and a direct Central Office Telephone line in locations where there is no demarcation point or suitable physical position to install the Power Unit. In addition, the adaptor enables direct xDSL connection to the phone line system. The adaptor includes mini DIN and Telephone RJ-11 connections (optional).

Figure 2.6: Primary Smart Outlet™ Adaptor

2.1.5 Surface Mount Adaptor

Catalog No.: SRC-ADPROUN
Description: Adaptor plate per outlet for surface mount where irregular phone jacks exist or round jacks (optional).
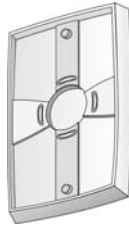
Figure 2.7: SercoNet Surface Adaptor

2.1.6 Wall Mount Adaptor

Catalog No.: SRC-ADPWMNT
Description: Adaptor plate for wall mount phones (optional).
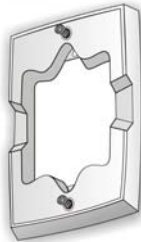
Figure 2.8: SercoNet Wall Mount Adaptor

2.1.7 Outdoor Box for Smart Outlet™

Catalog No.: SRC-ADPOUTDOOR
Description: The adaptor for Smart Outlet™ outdoor installation (optional).

Figure 2.9: SercoNet Outdoor Box

2.1.8 Smartester

Catalog No.: SRC-MINITST
Description: Smartester is an easy to use installer's tool for data transmission, error detection and telephone line existence testing, diagnostics and verification during and after the Smart Outlet™ network installation (optional – quantity per order request).

Figure 2.10: SercoNet Smartester

2.2. Pre-Installation

Prior to starting your Smart Outlet™ installation, it is recommended to match the home wiring topology with one of the following typical wiring topologies (for further topology options and variations, please see *Appendix A – 'Topologies'*).

2.2.1 Determining Phone Wiring Topology

Determine whether the demarcation point (the Central Office Telephone line connection) is inside or outside the home. Also, check the home's phone-wiring topology: Is it daisy-chained, Star (Home-Run), or a hybrid of the two topologies?

2.2.1.1. Daisy-Chain Topology

Most homes have daisy-chain phone-wiring topology. That means that the first outlet is connected directly to the demarcation point while the remaining outlets are connected in series. (See Figure 2.11 below for an example of a daisy-chain topology).

Existing Phone Outlets

Figure 2.11: Daisy-Chain Topology

2.2.1.2. Star (Home-Run) Topology

Some new homes have Star phone wiring topology (also known as Home-Run topology). In such cases, each outlet connects directly with the demarcation point without going through any other outlets (see Figure 2.12, below, for Star (Home-Run) topology illustration).
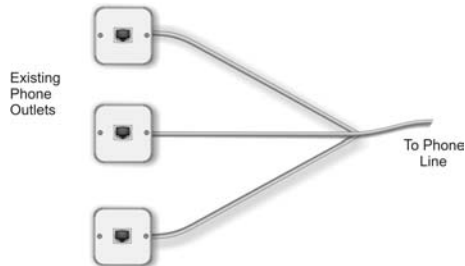
Figure 2.12: Star (Home-Run) Topology

2.2.1.3. Hybrid Daisy-Chain/Star Topology

In some homes, Star (Home-Run) and daisy-chain topologies are combined so that some outlets are directly connected to the demarcation point, while others are connected indirectly through other outlets.
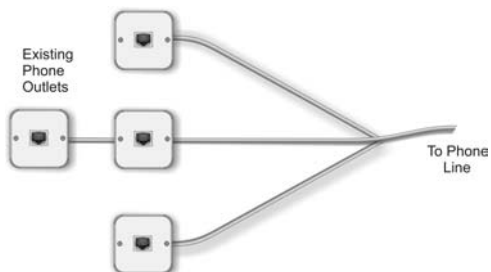
Figure 2.13: Hybrid Daisy-Chain/Star Topology

2.3. Equipment Installation

Attention!

> *a. Old telephone wires may be susceptible to corrosion. For quality connections, rub off any rust or corrosion using sandpaper.*
> *b. Installation of the SercoNet network is simple, and requires minimal tools. In most cases, a screwdriver, a wire-stripper or cutter and a dial tone detector are all you need for installation.*

2.3.1 Power Unit and Smart Outlets™

Identify a suitable location to position the Power Unit. It can be wall-mounted or placed on a clean, stable desktop.

2.3.1.1. Installing the Power Unit

Note: For various Power Unit installations topology options beyond what is described in the following paragraph refer to Appendix A – 'Topologies'.

If the demarcation point is inside your home, such as in the basement, then the Power Unit should be installed near the demarcation point. The Power Unit can be installed anywhere on your existing telephone cable and the Smart Outlet™ network will start from this point and into the house. Another option is to connect the Power Unit to the Primary Smart Outlet™ point (see *Installing the Primary Smart Outlet™ Adaptor* on page 26). Also, the Power Unit should be located within a short distance of the phone wiring and an AC-mains plug outlet. When dealing with Star (Home-Run) topology, make sure that the location you have selected is suitable for both the Power Unit and the StarBox.

2.3.1.2. Power Unit Connections

Note: Perform Step 1 only in the case that the Power Unit is connected to the Primary Smart Outlet™ Adaptor.

Step 1   Connect one end of the 6 ft. Mini-DIN cable, supplied with the Primary Smart Outlet™ adaptor between the Power Unit rear panel mini DIN connector marked as "Special Adaptor" and the Primary Smart Outlet™ Adaptor DIN connector.

CAUTION: Do not plug the power cable into the AC main power outlet until all necessary phone outlets have been replaced with Smart Outlets™.

Note: Perform Steps 2 and 3 only in the case that there is a direct connection between the Central Office line and the Power Unit.

Step 2 Connect the Central Office line to the assigned RJ-11 jack or terminal block as shown in Figures 2.14 and 2.15.

Step 3 Connect the closest Smart Outlet™ using phone wires to the assigned terminal block.
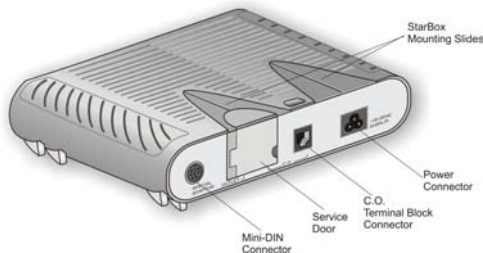
Figure 2.14: Power Unit Rear Panel
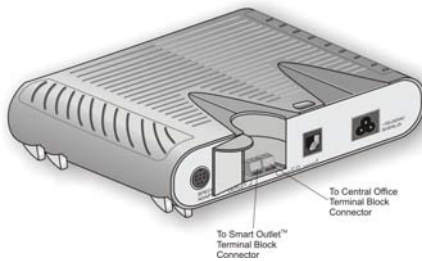
Figure 2.15: Power Unit Wiring

CAUTION: Do not plug the power cable into the AC main power outlet until all necessary phone outlets have been replaced with Smart Outlets™.

Step 4 Connect the remaining Smart Outlets™, as described in Section 2.3.1.3.

Step 5 Plug the power cable to the AC mains power outlet.

Step 6 Check the Power Unit LED indicators.
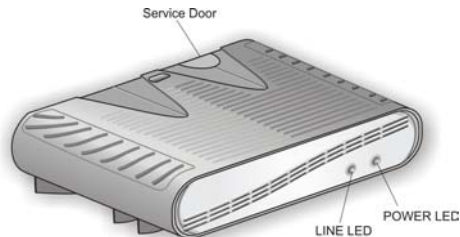
Figure 2.16. SercoNet Power Unit Front Panel

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STATE	LED	
	POWER	**LINE**
PU off	**-**	**-**
Power Unit initialization process – up to 8 sec (flashing with 1 sec period)	**Yellow**	**Yellow**
Normal Operating State	**Green**	**Green**
PU circuits failure	**Red**	**Yellow**
CO is not connected	**Green**	**Yellow**
Line feeding problem (might be short circuited)	**Yellow**	**Red**
Start-up problem (might be high capacity line load).	**Red**	**Red**

Table 2.1: Power Unit LEDs

After approximately one minute, when the Power Unit finishes a self-testing cycle, the front panel 'POWER' LED should light-up green to indicate that the Power Unit is functional. Should the Power Unit front panel 'POWER' LED light up red, then the self-test has failed. This could be due to a Power Unit fault or short-circuit along the phone wiring: In this case, disconnect the Power and refer to *TROUBLESHOOTING* on page 49. Should the Power Unit front panel POWER LED light up red; this indicates that a problem occurred following the startup sequence.

For further information on LED functionality, please refer to table 2.1.

2.3.1.3. Installing Smart Outlets™

The Smart Outlet™ system requires the replacement of all phone outlets located along the phone-wiring segment used for home networking. If you are not entirely familiar with home phone wiring topology, it is recommended that you replace all the existing phone outlets with the Smart Outlets™. To replace the existing phone outlets with Smart Outlets™ do the following:

Step 1   Remove necessary existing phone jacks as shown in Figure 2.17.
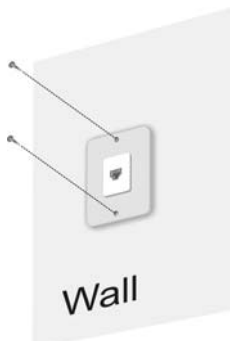
Figure 2.17: Phone jack removal

Step 2   Disconnect the wiring at the rear of the phone jack and put the old phone jack aside. Make sure to keep track of the phone wire pairs.

Note: The telephone wire connections are made on the terminal blocks at the rear of the Smart Outlet™, as shown in Figures 2.18 and 2.19.
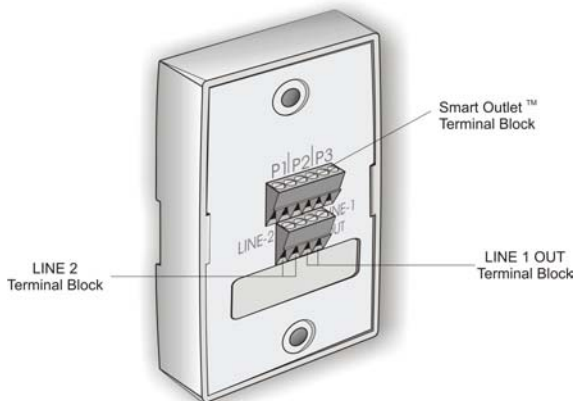
Figure 2.18: Smart Outlet™ Rear Panel

Step 3   Connect the telephone wires on the terminal block at the rear of the Smart Outlet™ as shown in Figure 2.19, locations P1, P2, or P3. Loosen the screw of each terminal, and then insert the wire into the corresponding slot. Fasten the screw to hold the wire in place.

Optional terminal
block for an additional
wire branch
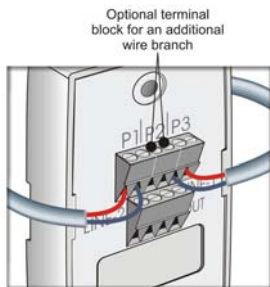
Figure 2.19: Wiring the Smart Outlet™

The Smart Outlet™ connector has an additional two-wire terminal
block for an additional branch connection, as shown in Figure 2.19,
above.

*Note: Make sure to keep wire pairs juxtaposed. The sequence of
wire pairs within the terminal block is not important. In rare
cases, some phone sets are polarity sensitive. (If for some
reason, the phone set does not function; try switching the wires
within each pair). Connect the wires starting from the left or right
end of the connector. See Figure 2.20 below for an illustration of
incorrect wiring installation.*
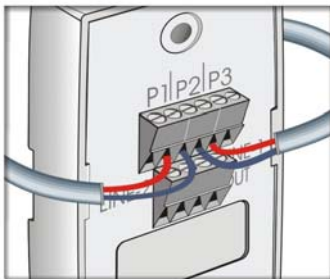
Figure 2.20: Incorrect Wiring Connection

Step 4   Connecting a second phone line is done using the Line 2 connection. The second phone line incoming wires must be shorted to the outgoing wires using the same terminal block connections, as shown in Figure 2.21.
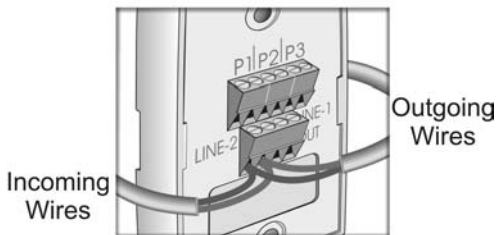
Figure 2.21: Terminal Block second line connector

The internal wiring of each outlet is that P1-P3 and "LINE-1 OUT" terminal blocks on the back panel are connected to RJ-11 right (LINE 2) pins 2 and 5, and RJ-11 left (LINE 1) pins 3 and 4. "LINE-2" terminal block on the back panel is connected to RJ-11 right (LINE 2) pins 3 and 4 and PJ-11 left (LINE 1) pins 2 and 5, as shown in Figure 2.22.
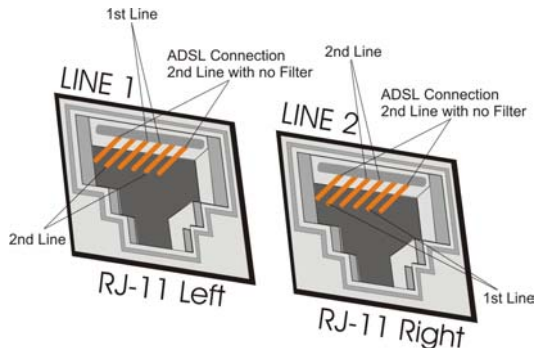
Figure 2.22: RJ-11 Connector Pins

Step 5   In cases where only a portion of the house is installed with the Smart Outlet™ network, it is possible to terminate the system and continue only with a telephony system, without needing to replace additional phone jacks. In this case, connect the outgoing wires to the LINE-1 OUT terminal block at the back of the Smart Outlet™.

Step 6   Fasten the Smart Outlet™ to the back plate using the screws provided by SercoNet, as shown in Figure 2.23.

Note: It is important that no standard phone outlets exist along the phone-wiring segment between SercoNet outlets. Phones plugged in these outlets could sustain damage.
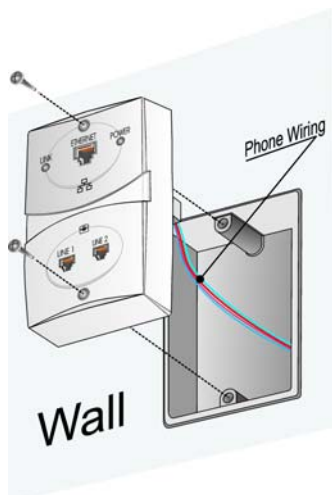
Figure 2.23: Mounting the Smart Outlet™ onto a standard phone jack

Step 7 After installing all relevant Smart Outlets™, power up the system.

Step 8 Check the Smart Outlet™ LED indicators. (See Figure 2.24).

Each Smart Outlet™ includes LEDs indicating the functional status of the Smart Outlet™, as shown in Table 2.2.

POWER LED
To Ethernet Device (PC)
LINK LED

To Telephone Set
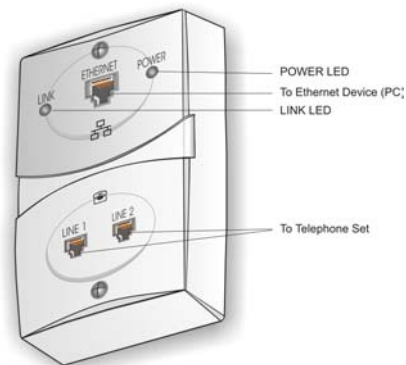
Figure 2.24: SercoNet Smart Outlet™ Front Panel

LINK (yellow)	Lights steadily ON or blinks when the data equipment connected to the Smart Outlet™ is communicating on the network.
POWER (green)	Lights steadily ON when the Power Unit is supplying power to the Smart Outlet™.

Table 2.2 Smart Outlet™ LEDs

2.3.2 Installing the Primary Smart Outlet™ Adaptor

The Primary Smart Outlet™ Adaptor is assembled together with the SercoNet Smart Outlet™, as shown in Figure 2.26. It includes a mini DIN and one Telephone RJ-11 connectors. The mini DIN is used for connection to the Power Unit (cable supplied with the product). This cable is 6 feet long and is direct-wired pin-to-pin (i.e., pin 1 on one end

is shorted to pin 1 on the other end). Connecting the Power Unit to the Primary Smart Outlet™ Adaptor enables power feeding of a complete SercoNet Smart Outlet™ network (see Figure 2.25 below). The telephone RJ-11 connector connects ADSL modems directly to the Central Office lines.

In addition, the Primary Smart Outlet™ Adaptor provides protection against power spikes coming from the telephone central office.

In case the connection between the Power Unit and the Primary Smart Outlet™ Adaptor is disconnected, the C.O. line is connected directly to the home wiring, preserving life line emergency telephone services.

Attention!!
When using the Primary Smart Outlet™ Adaptor, the Central Office must be connected to the Primary Smart Outlet™ Adaptor and not directly to the Power Unit Central office connector. Connecting the Central Office directly to the Power Unit will cause the lifeline to become lost in case of a power outage.
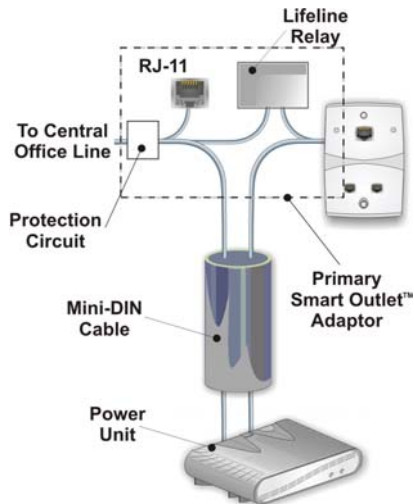
Figure 2.25: Primary Smart Outlet™ Adaptor Block Diagram

To install the Primary Smart Outlet™ Adaptor:

Step 1 Remove the current phone jack faceplate.
Step 2 Disconnect the wires attached to the phone jack.
Step 3 Locate and identify the Central Office telephone line wire pair that enters the home by listening for a dial tone with a phone set.
Step 4 Connect the Central Office Line wire pair to the Primary Smart Outlet™ Adaptor connection marked C.O. (Central Office Line) (Figure 2.26 & 2.27)**.**

Step 5   Connect the wire pair that goes into the next phone outlet to one of the rear connections marked P1, P2, or P3 (Figure 2.26 & 2.27)**.**

Note: In rare cases, some phone sets are polarity sensitive. If the phone set does not function as before the installation, change the wire polarity within each pair.

Step 6   Using the attached wires, connect the Primary Smart Outlet™ Adaptor to the Smart Outlet™ assembled on top of the device.

Step 7   Attach the Primary Smart Outlet™ Adaptor together with the Smart Outlet™ to the wall instead of the phone faceplate, by using the faceplate screws provided by SercoNet (see figure 2.27).

Step 8   Using the mini DIN cable, connect the Primary Smart Outlet™ Adaptor to the Power Unit.

Figure 2.26: Rear Panel of Primary Smart Outlet™ Adaptor
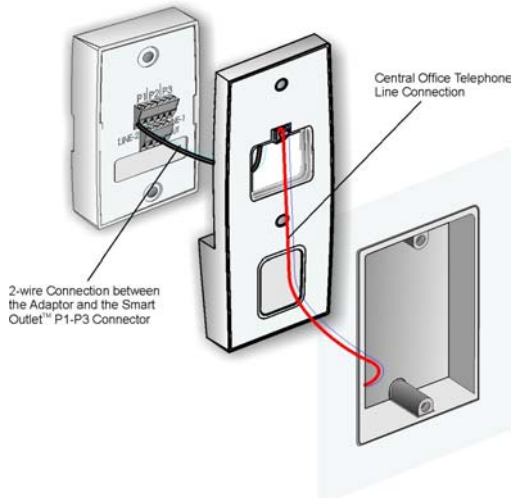
Figure 2.27: Mounting Primary Smart Outlet™ Adaptor

2.3.3 Installing a StarBox

Typically, most homes possess a daisy-chain topology. However, recent years have witnessed an increasing number of new homes built with Star (Home-Run) topology phone wiring. These latter topologies require use of the StarBox (see StarBox, section 2.1.3). If you need to install a StarBox, make sure that the location you have selected is suitable for both the Power Unit and the StarBox.

The rear panel of the StarBox includes an opening for connecting multiple phone line branches that go to different locations in the home. Install SercoNet Smart Outlets™ only in each phone wire branch that you would like to connect to the network, as shown in Figure 2.28 and 2.29 below**.**

The Central Office phone line is connected to the SercoNet Power Unit. Terminal block connectors located in the StarBox allow connection to one or two Power Units and to multiple phone line extensions (*not to be confused with the PBX, please see Appendix A – 'Topologies'*).

An additional Ethernet connector located at the StarBox rear panel allows direct Broadband modem connection.
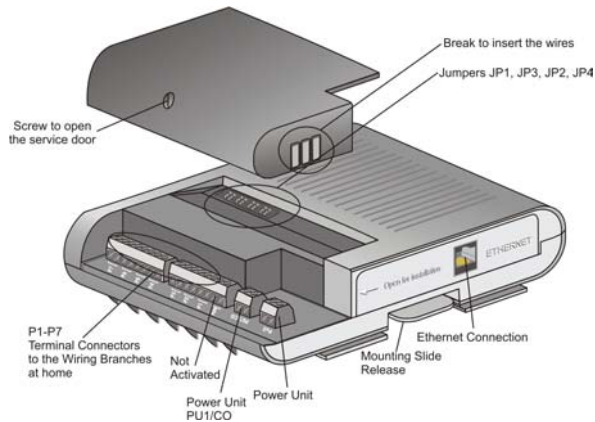
Figure 2.28: StarBox Connections
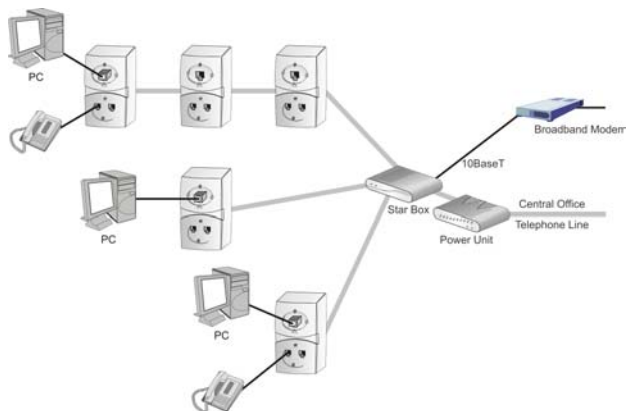
**Figure 2.29: StarBox Configuration with Smart Outlets™,
Broadband Modem, Power Unit, and Accessories**

The StarBox enables connection to two Power Units, allowing the
Smart Outlet™ system to run on two different phone line systems.
Internal jumpers (JP1-JP4) enable selection of four out of seven
branches (P4-P7) to operate over one of the two possible phone
systems, as described in Tables 2.3 and 2.4.

Power Unit Connection	Jumper Positions	Note
PU1/CO	2-3; 4-5	Default setting
PU2	1-2; 5-6	

Table 2.3 StarBox Jumper Settings for the Power Units

Port	Jumper Group
P7	JP1
P6	JP2
P5	JP3
P4	JP4

Table 2.4 StarBox Jumper Settings for the Smart Outlets™
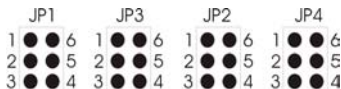
Figure 2.30: StarBox Jumpers

To install the StarBox:

Step 1   Open the StarBox cover by removing the service door screw.

Step 2   Connect the phone wires to the appropriate terminal blocks P1-P7.

Step 3   Connect using a pair of phone wires between the StarBox terminal block marked "PU1" the Power Unit. In case that a second Power Unit is required, use additional pair of phone wires for connecting between the StarBox terminal block marked "PU2" and the second Power Unit.

Step 4   In case of two Power Unit, select between the two phone systems for branches 4-7 using JP1-JP4.

Step 5   Secure the wires to the binding post with a tiewrap.

Step 6   Close the top cover.

Step 7   Connect the broadband modem to the Ethernet port (if applicable).

Step 8   Attached the StarBox to the Power Unit as described below.

Step 9   Replace the phone jacks at the remote side of the phone wire with SercoNet Smart Outlets™.

Step 10   Connect the Power Unit to the AC power mains.

> *CAUTION: The connection to the AC power must be the last step taken when installing a system. Any changes in the wiring require that you first disconnect the power cord from the Power Unit and return it only after the installation is complete.*

To attach the StarBox to the Power Unit:
1. Align the front of the StarBox with the rear panel of the Power Unit.
2. Slide the StarBox towards the front of the Power Unit until it clicks into place.

To remove the StarBox from the Power Unit:
1. Lift the flap on the lower middle rear panel of the StarBox towards the StarBox.
2. Slide the StarBox towards the rear of the Power Unit.

To install the StarBox on a table top or wall:
1. Unscrew the four screws holding the mounting slides to the bottom of the StarBox.
2. Remove the mounting slides from the StarBox and place on a tabletop or attach to the wall using the wall mount holes at the bottom of the StarBox.

2.3.4   Mounting and Installation with Special Mechanical Adaptors

2.3.4.1. Surface mount adaptor

Occasionally, a phone jack is physically incompatible with the Smart Outlet™ or is non-standard. For this reason, SercoNet provides adaptors for surface mounting these particular situations (see Figure 2.31).

Use of the adaptors may be for any of the following reasons:

- In case that there is no phone jack.
- In case of an existing round phone jack.
- For low cost wiring instead of Primary Smart Outlet™ Adaptor.

The Outlet Adaptor allows you to install the Smart Outlets™ on non-standard phone jacks (see Figure 2.31).
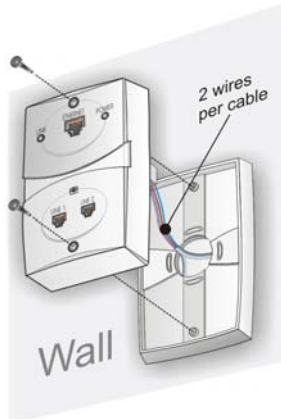
Figure 2.31: Mounting the Smart Outlet™ with the Surface Outlet Adaptor

2.3.4.2. Wall Mount Adaptor

In some cases, it is required to replace a phone jack where there is a wall mount phone attached. In theses cases, the Wall Mount Adaptor enables replacing the phone jack with the Smart Outlet™ while keeping the wall mount phone operational and mounted on top of the outlet.

Figure 2.32: Mounting the Smart Outlet™ with the Wall Mount Adaptor

2.3.5 Connecting Broadband (xDSL and Cable Modem) to the Smart Outlet™ Network

Homes with Broadband Internet (xDSL, Cable modem, Residential Gateway, ISDN Router, or WLL) are becoming increasingly common worldwide. The SercoNet Smart Outlet™ network offers an ideal solution for connecting an entire home with Fast Internet. There are several installation scenarios that can be implemented using a Smart Outlet™ network. The section below describes a general broadband topology. For further topology scenarios, see Appendix A, Topologies.

Note: In many cases, a Ethernet cross-over cable is required for connecting a broadband modem to the Smart Outlet™

2.3.5.1. Two-Wire Home Infrastructure

If the broadband modem is connected at the home entrance to the closest Smart Outlet™, then the broadband signal is terminated at the home entrance, and the SercoNet transmission continues from that point onward, inside the home.
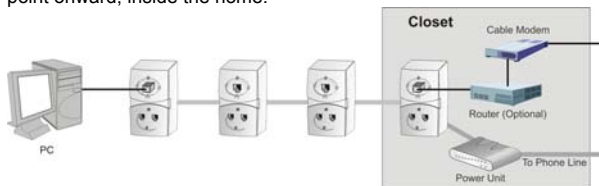
Figure 2.33:   Example of Basic 2-Wire Daisy-Chain Broadband Topology.

2.3.5.2. Four-wire home infrastructure

Some home wiring is installed using four (4) or more wires. In these cases, one pair can be used for carrying the voice and SercoNet signals, while the other pair can carry ADSL or similar transmissions. If the home possesses at least a 4-wire infrastructure, the topology has greater flexibility for voice, data, and broadband communications. Refer to Appendix A, Topologies, for an illustration of the various four-wire connection scenarios.

3. OPERATING THE SYSTEM

After assembling all Smart Outlets™ and wiring the Power Unit, initialize the network as follows:

3.1. Cable Connection

Connect a telephone set to the LINE1 or LINE2 port of each Smart Outlet™ unit. Verify that a dial tone is activated on the proper connector. For a two-wire home, dial tone will only exist on LINE1 connector.

3.2. Ethernet Connection

Connect the 10BaseT cable to the network devices at one end and to the Smart Outlets™ at the other end. Usually, when connecting a broadband modem, a cross Ethernet CAT5 cable is used. In the remaining cases, a straight pin-to-pin Ethernet CAT5 cable is used.

CAUTION: Verify that no standard phone jacks exist on segments between Smart Outlets™ prior to powering on the Power Unit. Attempting to power a network with mixed outlet types (Smart Outlets™ and standard outlets) can result in damage to telephones connected to the network and degrade the Ethernet network throughput.

3.3. Network Configuration

In order to enjoy Internet sharing and communication between data services within the home, all devices must be configured to work in a home networking environment. For networking tips, please refer to Appendix D.

4.   TESTING AND VERIFICATION

4.1. Voice Testing Procedure

Step 1   With the AC power disconnected from the Power Unit, connect the phones to the Smart Outlets™.

Step 2   Check that you can hear clear dial tone from all the outlets in the house.

Step 3   Dial the house telephone and make sure that all phones ring.

Step 4   Dial from the house and make sure that you can successfully place a call, and the voice is clear.

Step 5   If you have Caller ID, an answering machine or speakerphones, please verify that they work properly.

Step 6   Connect the AC power to the Power Unit. Repeat all of the above steps.

4.2. Data Testing Procedure

Step 1   After completing the SercoNet Smart Outlet™ network installation, plug the Power Unit AC power cable to the main power source.

Step 2   Verify that the telephone system is working at every outlet by plugging in a phone at each location and listen for dial tone.

Step 3   In case you have a SercoNet Smartester, check for data
(Optional)   integrity on each Smart Outlet™ (see Ethernet Testing, section 4.3.).

Step 4:
   a. Verify that the PCs' networking configuration is set correctly to work in a home-networking environment (see Appendix D, Networking Tips).

    b. Connect the PC's and other data devices to the Smart Outlets™ using a CAT-5 straight cable.

    c. Verify that the Link LED is lit. If the LED is not lit, please refer to Troubleshooting, Section 5.

    d. Verify that there is data streaming between the data devices; if not, see Troubleshooting, Section 5.

4.3. Ethernet Testing Hardware – Smartester

4.3.1 Smartester Description

The Smartester (Figure 4.2) is a SercoNet designed diagnostic tool intended for the installer to test the SercoNet Smart Outlet™ network once it is installed in the home. In addition to its ability to verify error-free data transmission, the Smartester has the ability to detect phone availability on line 1 and line 2. The tester is a compact and easy-to-operate unit, connected to the SercoNet Smart Outlet™ using CAT5 Ethernet cables.

The on-site data testing uses a single device set to Transmitter mode and one or more devices set to Receiver mode. The Transmitter periodically broadcasts a packet to the Ethernet media and the Receivers detect this packet and verify that its content is valid (0xFFFFFFFFFFFF is set to be the MAC destination address).

The Smartester can be powered by internal 9V DC battery.

Note: The battery operation lifespan is limited.

Note: In order to change the operating mode, first turn the Smartester off.

The Smartester has two RJ-45 connectors:
- Direct Ethernet connection (PC)

- Cross-over Ethernet connection (broadband modem or hub)
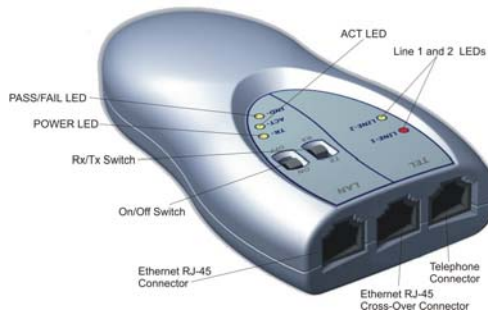
Figure 4.2: Smartester

4.3.2 Transmitter Operation

1. Connect the Smartester using one of the two RJ-45 connectors. The ACT LED should light green.
2. Each time the Transmitter sends a packet, the green ACT LED located on the front panel (part of the RJ-45 connector) flashes yellow.

4.3.3 Receiver Operation

1. The Receiver constantly monitors for packets coming from the network.
2. Each time a packet is received, the ACT LED located on the front panel (part of the RJ-45 connector) flashes yellow.
3. If a CRC error occurred in the last 15-second operating interval, the FAIL LED lights red for 15 seconds.

4. If no CRC errors were indicated during the last 15-second operating interval, the PASS LED lights green for 15 seconds.

LED	Color	Functionality
STATUS	Green	Flashes once every second for one second while power is ON.
STATUS	Red	Indicates low battery or internal error.
PASS/FAIL	Green	Solid green in Rx Mode if no errors were detected.
PASS/FAIL	Red	Solid red in Rx Mode if errors were detected in 15 sec time interval.
ACT	Green	Indicates "LINK" status.
ACT	Red	Flashes when packets are received or transmitted.

Table 4.1 Smartester LEDs

Switch	Functionality
ON/OFF	Power ON/OFF for the Smartester
Tx/Rx	Selects Tx or Rx mode for the Smartester

Table 4.2: Smartester Switches

5. TROUBLESHOOTING

```
                                    ┌───────┐
                                    │ Start │
                                    └───────┘
                                        │
                   ┌────────────────┬───┴────────────────┐
            ┌──────────────┐   ┌──────────────┐
            │ Do you have  │No │ Do you have  │No
            │ dial tone in │──▶│ dial tone in │──▶
            │ all outlets? │   │ some outlets?│
            └──────────────┘   └──────────────┘
```

Flowchart boxes and decision nodes:

- **Start**
- **Do you have dial tone in all outlets?** — No → **Do you have dial tone in some outlets?**
  - **Do you have dial tone in some outlets?** — No → **Check for wires short circuits or that the CO phone wires are connected**
  - Yes → **Check that the phone wires are properly connected between the outlets** → **Change Wire Polarity** → **Go to start**
- Yes → **Are the PU LEDs green?**
  - No → **Check that the Main AC power is connected** → **Check that there is no short circuit over the phone wires** → **Are the PU LEDs green?**
    - No → **Replace PU** → **Go to start**
    - Yes → **Are all outlet On-LEDs lit?**
  - Yes → **Are all outlet On-LEDs lit?**
    - No → **Check the outlet wiring connections** → **Are all outlet ON LEDs lit?**
      - Yes → **Go to start**
      - No → **Replace outlet** → **Go to start**
    - Yes → **Are all outlet Link LEDs lit?**
      - No → **Check the CAT5 cable between outlet and data device** → **In case of Broadband modem, verify cross cable** → **Verify networking configuration (unique IP, DHCP, workgroup, shared devices)**
      - Yes → **Verify networking configuration (unique IP, DHCP, workgroup, shared devices)**
        → **Is there data transfer?**
        - No → **Replace outlet** → **Go to start**
        - Yes → **Verify that all voice devices function property when power is ON and OFF** → **End**

5.1. Installation Troubleshooting

5.1.1 Determining Home Wiring Topology

a. Identify the location where the telephone line enters the house (location of NID). The most common location is near the power entrance.
b. If there is a split of many wire-pairs leading from this point, then the topology is Star (Home-Run).
c. If only one pair of wires originates from this point, then the topology is daisy-chain.

Note: The house wiring topology has many variations. It is recommended the installer understand the wiring topology of the house before proceeding.

5.1.2 My outlets do not physically fit the Smart Outlets™.

SercoNet has specific mechanical adaptors for different outlet situations:

a. Wall mounting
b. Surface and round mounting

For details, please see sections 2.3.4.1 and 2.3.4.2.

5.1.3 I cannot determine the Primary Smart Outlet™ Adaptor location:

The primary Smart Outlet™ Adaptor should be located in place of the first phone outlet where the SercoNet network begins. Therefore, the Adaptor should be located at a desired place where the home

networking system starts and within reach of the SercoNet Power Unit.

5.2. Post Installation Troubleshooting

5.2.1 The phone is working, but there is no data transfer:

a. Check if the power is connected properly to the SercoNet Power Unit and from the SercoNet Power Unit to the Smart Outlets™ by checking that all POWER LEDs are lit.
b. Check the network device connections to the Smart Outlets™.
c. Verify that the LINK LEDs on the Smart Outlets™ are lit.
d. Check the network configuration on the computer.
e. Connect the computer directly to the CPE (xDSL, Cable Modem, Residential Gateway, other) and verify the connection when bypassing the SercoNet system.
f. Replace the Smart Outlet™.

5.2.2 The data rate is very slow.

There are three possible reasons for slow data rate:
a. Another user on the same subnet is overloading the network.
b. There may be Internet connection problems to the home. Check with the Internet service provider.
c. The devices are connected by USB or wireless interfaces. These interfaces are inherently slower than Ethernet IEEE 802.3 interfaces.

5.2.3 POWER LED on the SercoNet Smart Outlet™ is not lit:

The POWER LED indicates whether power is being provided to the Smart Outlet™. There are three possible variations of unlit POWER LEDs:

a. *POWER LED on all the Smart Outlets™ not lit*: Verify that there is no short circuit over the phone wires and that there is a proper connection to the SercoNet Power Unit. Verify that there is a suitable AC main power provisioning to the PC.
b. S*ome POWER LED Smart Outlets™ are lit, some are not*: Check the phone wiring connections to the outlets that are not lit.
c. *Only one Smart Outlet™'s POWER LED is not lit*: If properly wired, replace the Smart Outlet™ with another.

5.2.4 LINK LED on the SercoNet Smart Outlet™ is not lit:

The 'LINK' LED indicates the existence of an Ethernet connection between the Smart Outlet™ and the network device (computer, printer, xDSL modem, cable modem, etc).
a. Check that the computer is turned on (the computer must be turned on for the LINK LED to be on).
b. Check the Ethernet cable connection between the network device and the Smart Outlet™.
c. If possible, try to connect the computer and the cable to another Smart Outlet™.

Note: In some cases there is a need for an Ethernet cross-over cable.

5.2.5   LINE and POWER LEDs on the SercoNet Power Unit show varying colors:

Table 2.1:   Power Unit LEDs on page 20 can assists you in pinpointing faulty conditions using the POWER and LINE LEDs of the Power Unit.

5.2.6   POWER LED on the StarBox is not lit:

The POWER LED indicates when power is being transferred to the StarBox.

a. *If all the Smart Outlets™ are NOT lit:* Check the SercoNet Power Unit power connection and the connection between the StarBox and the SercoNet Power Unit.
b. *Only StarBox POWER LED is not lit*: Replace the StarBox with another.

5.3.   Replacing Units

5.3.1   Replacing a Faulty Smart Outlet™:

a. Disconnect the SercoNet Power Unit.
b. Unscrew the Smart Outlet™ mounting screws.
c. Remove the faulty Smart Outlet™.
d. Taking note where each wire was connected, disconnect the phone wires.
e. Reconnect the wires to the new outlet.
f. Reattach the Smart Outlet™ to the wall with the two screws.
g. Reconnect the SercoNet Power Unit.
h. Verify dial tone and data transmission.

5.3.2   Replacing a Faulty Power Unit:

a. Disconnect power from the SercoNet Power Unit.

b. Disconnect the Smart Outlet™ system and the C.O. connection from the SercoNet Power Unit.

c. Replace the SercoNet Power Unit.

d. Reconnect the Smart Outlet™ system and the C.O. connection.

e. Reconnect the power to the SercoNet Power Unit.

f. Verify dial tone and data transmission.

Warning: When disconnecting the C.O. phone wires, the phone system is not functional, including emergency calls.

5.3.3   Replacing a Faulty StarBox:

a. Disconnect the power from the SercoNet Power Unit.

b. Disconnect the broadband modem from the Ethernet connector (if applicable).

c. If mounted to a Power Unit, physically disconnect the StarBox from the Power Unit.

d. Lift the StarBox cover.

e. Taking note where each wire was connected and jumpers selection, disconnect all the phone line extensions.

f. Reconnect all the phone line extensions to the new StarBox.

g. If two Power Units are installed, set the phone system selection jumpers.

h. Reconnect the SercoNet Power Unit to the new StarBox.

i. Close the new StarBox cover.

j. Reconnect the broadband modem to the Ethernet connector (if applicable).

k. Reconnect the power to the SercoNet Power Unit.

l. Verify dial tone and data transmission.

6. SPECIFICATIONS

6.1. Smart Outlet™

Ethernet Interface	
Standard	IEEE-802.3
Connector	RJ-45 – front panel
Range	According to IEEE-802.3
Phone Line Interface	
Connector	Two RJ-11s – front panel

Pin-out	RJ-11 left (LINE 1)
	        Pins 3 and 4 – primary line
	        Pins 2 and 5 – secondary line
	        Pins 1 and 6 – non-filtered secondary line
	RJ-11 right (LINE2)
	        Pins 3 and 4 – secondary line
	        Pins 2 and 5 – primary line
	        Pins 1 and 6 – non-filtered secondary line

Device Support	Regular telephone sets, dial-up modems, faxes, speakerphones, answering machines and caller ID systems
Smart Outlet™ System Interface	
Transmission Type	Integrated voice, standard Ethernet, and power
Connector	3 pair terminal block – back panel
Terminal Block Wire Support	22-28 AWG
Range between Smart Outlets™	Up to 150 feet (50 meters) over any type of cable. Better wire (Cat. 3) quality enables range extension of up to 450 feet (150 meters)
Supported Wiring Configurations	Daisy chain or Star
Secondary Line Support	
Transmission Type	Regular telephony
Connector	1 pair terminal block – back panel
Terminal Block Wire Support	22-28 AWG

Extended Phone Line Interface	
Transmission Type	Regular telephony
Connector	1 pair terminal block – back panel
Terminal Block Wire Support	22-28 AWG
Regulatory	UL, CUL, FCC B, CE
Mechanical	
Dimensions (HxDxW)	4.57" x 3.07" x 0.79" 120 x 78 x 20 mm
Weight (approximate)	146 gr.
Operating Temperature	32°F to 104°F 0° to 40°C
Operating Humidity	0-85% RH non-condensing
Storage Temperature	-4°F to 158°F -20°C to 70°C

6.2. Power Unit

Power	
Maximum Input Voltage	85-265 VAC
Power Consumption	65 Watts maximum
Output Voltage	55V – 59 VDC
Input Surge Protection	6 kV
Phone Line Interface	
Ring Load	0.7 REN
DC Input Impedance	Similar to one telephone set.
AC Input/Output Impedance	600 Ohm, 900 Ohm, or complex. Depends on internal home telephone sets quantity
Connectors	Rj-11 and terminal block – for direct connection, Mini-DIN (via SRC-10FRST) – for indirect connection
Terminal Block Wire Support	22-28 AWG
Phone Line Life Line (Fail Safe) Supporting Conditions	Power – OFF or SRC-POWERU failure
Smart Outlet System Interface	
Connectors	Mini-DIN and terminal block
Terminal Block Wire Support	22-28 AWG
Short Circuit Protection	Protection against wires short circuit
Regulatory	UL, CUL, FCC B, CE
Mechanical	
Dimensions (HxDxW)	2" x 6" x 9" 50 x 152 x 230 mm
Weight (approximate)	870 gr.
Operating Temperature	32°F to 104°F 0°C to 40°C
Operating Humidity	0-85% RH non-condensing
Storage Temperature	-4°F to 158°F -20°C to 70°C

6.3. Primary Smart Outlet™ Adaptor

Phone Line Interface	
Connector	Terminal block (for phone line access) – back panel RJ-11 (for terminal equipment access) – bottom panel Mini-DIN – bottom panel
Device Support	Regular telephone sets, dial-up modems, faxes, speakerphones, answering machines and caller ID systems
Phone Line Life Line (Fail Safe) Supporting Conditions	Power - OFF
Smart Outlet System Interface	
Transmission Type	Integrated phone (voice and signaling), standard Ethernet and power
Connector	1 pair of wires – back panel
Power Interface	
Transmission Signals	Power feeding
Connector	Mini-DIN
Connection Method	Mini-DIN cable (provided with the product)
Regulatory	UL, CUL, FCC B, CE
Mechanical	
Dimensions (HxDxW)	6.89" x 1.50" x 3.15" 175 x 38 x 80 mm
Weight (approximate)	250 gr.
Operating Temperature	32°F to 104°F 0°C to 40°C
Operating Humidity	0-85% RH non-condensing
Storage Temperature	-4°F to 158°F -20°C to 70°C

6.4. StarBox

Power Interface	
Transmission Signals	Power and phone (voice and signaling)
Connector	Terminal block
Terminal Block Wire Support	22-28 AWG
Number of PU Supported	2
Smart Outlet System Interface	
Standard	Smart Outlet (integrated voice, standard Ethernet and power on single pair)
Connector	7 pair terminal block
Terminal Block Wire Support	22-28 AWG
Number of Selectable Branches between the 2 PUs	4
Ethernet Interface	
Standard	IEEE-802.3
Connector	RJ-45
Range	According to IEEE-802.3
Regulatory	UL, CUL, FCC B, CE
Mechanical	
Dimensions (HxDxW)	1.2" x 6" x 6.8" 30 x 152 x 172 mm
Weight (approximate)	380 gr.
Operating Temperature	32°F to 104°F 0°C to 40°C
Operating Humidity	0-85% RH non-condensing
Storage Temperature	-4°F to 158°F -20°C to 70°C

6.5. Smartester

Power Interface	
Battery	+9VDC
Power Indication	Green – OK, Red – low battery
Ethernet Interface	
Standard	IEEE-802.3
Connector	2 x RJ-45
RJ-45 pin out	One direct PC connection and one cross-over connection

Telephone Interface	
Telephony Indication	LINE 1 and LINE 2
Indication Signal	OFF-HOOK current
Minimum Current	6mA
Maximum Current	0.1A
Connector	RJ-11
Front Panel Switches	
ON/OFF Switch	Enables operation or reset the product
RX/TX Selector	Allows to choose operation mode
Front Panel Indicators	
Telephone Indicators	LINE 1 and LINE 2
LAN Indications	TR (Transmit/Receive), ACT (Activity), and IND (Indication)
Mechanical	
Dimensions (HxDxW)	TBD
Weight (approximate)	TBD
Operating Temperature	32°F to 104°F 0°C to 40°C
Operating Humidity	0-85% RH non-condensing
Storage Temperature	-4°F to 158°F -20°C to 70°C

6.6. Surface Mount Adaptor

Mechanical	
Dimensions (HxDxW)	0.4" x 3" x 4.6" 11 x 77 x 117 mm
Weight (approximate)	30 gr.

6.7. Wall Mount Adaptor

Mechanical	
Dimensions (HxDxW)	0.9" x 2.9" x 4.5" 22 x 73 x 113 mm
Weight (approximate)	50 gr.

APPENDIXES

A.Topologies

> *Note: For the vast majority of homes, the following scenarios are uncommon. Most homes have simple phone-wiring topologies. However, in the rare instance of more complex wiring, the following tables and diagrams will simplify the Smart Outlet™ installation process.*

A.1. Typical Wiring Topologies

There are several possible typical wiring topologies when installing the SercoNet network. In most cases, the demarcation point is inside the home. However, in some rare cases, a Smart Outlet™ must be placed outdoors (see next paragraph, 'Demarcation Outside House').

Demarcation Outside House

In this type of topology, the telephone connections must be made to the outdoor Smart Outlet™ as the telephone wires are branched at the demarcation point. In this case, a weatherproof box supplied by SercoNet is necessary. See Figure A.1. and A.2. below.

There are two options for connecting the Power Unit with the Smart Outlet™ located outside the house:

Option 1 Use an existing pair for connection between the C.O. and the Power Unit and a second pair for connection between the outdoor Smart Outlet™ and the indoor Power Unit or Smart Outlet™ (See A.2 diagram).

Option 2 In cases where there is a physical way to run the mini-DIN cable between the indoor and the outdoor locations, place the Primary Smart Outlet™ Adaptor in the weather proof box. Connect a mini-DIN cable between the Power Unit and the Primary Smart Outlet™ Adaptor DIN connectors.
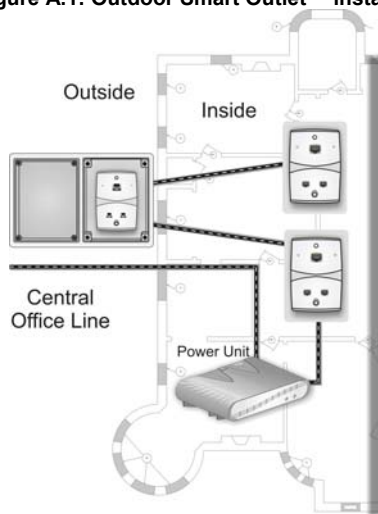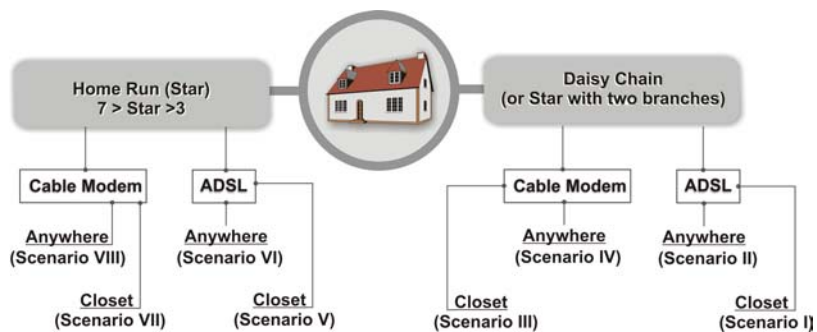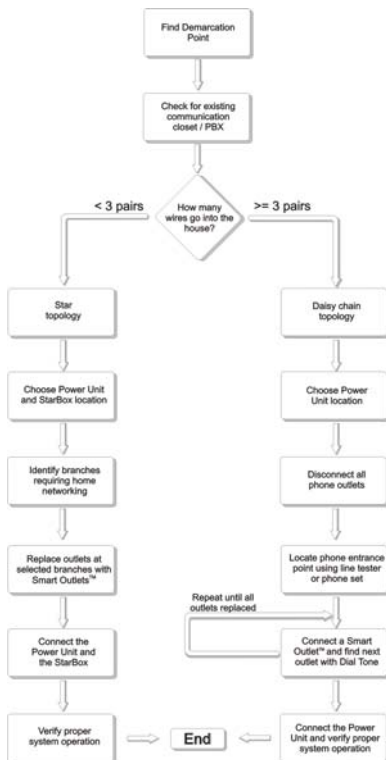
Figure A.1: Outdoor Smart Outlet™ installation

Figure A.2: Outside Demarcation

Topology Finder, Determination Flow Chart and Scenarios I – VIII

# Determining House Topology

```
                    ┌─────────────────┐
                    │ Find Demarcation│
                    │     Point       │
                    └─────────────────┘
                             │
                    ┌─────────────────┐
                    │ Check for existing│
                    │  communication   │
                    │  closet / PBX    │
                    └─────────────────┘
                             │
        < 3 pairs        ╱─────────╲        >= 3 pairs
    ┌────────────────────│ How many │────────────────────┐
    │                    │wires go into│                  │
    │                    │ the house? │                  │
    │                    ╲─────────╱                      │
    │                                                     │
┌────────────┐                                   ┌────────────────┐
│    Star    │                                   │  Daisy chain   │
│  topology  │                                   │    topology    │
└────────────┘                                   └────────────────┘
    │                                                     │
┌────────────────┐                              ┌────────────────┐
│ Choose Power Unit│                            │  Choose Power  │
│ and StarBox location│                         │  Unit location │
└────────────────┘                              └────────────────┘
    │                                                     │
┌────────────────┐                              ┌────────────────┐
│ Identify branches│                            │ Disconnect all │
│ requiring home  │                             │ phone outlets  │
│   networking    │                             └────────────────┘
└────────────────┘                                       │
    │                                          ┌────────────────┐
┌────────────────┐                             │ Locate phone entrance│
│ Replace outlets at│                          │ point using line tester│
│ selected branches with│        Repeat until all│  or phone set   │
│ Smart Outlets™  │          outlets replaced  └────────────────┘
└────────────────┘                                       │
    │                                          ┌────────────────┐
┌────────────────┐                             │  Connect a Smart│
│ Connect the     │                            │ Outlet™ and find next│
│ Power Unit and  │                            │ outlet with Dial Tone│
│ the StarBox     │                            └────────────────┘
└────────────────┘                                       │
    │                                          ┌────────────────┐
┌────────────────┐           ┌──────┐          │ Connect the Power│
│ Verify proper   │  ═══>     │ End  │   <═══   │ Unit and verify proper│
│ system operation│           └──────┘          │ system operation│
└────────────────┘                              └────────────────┘
```
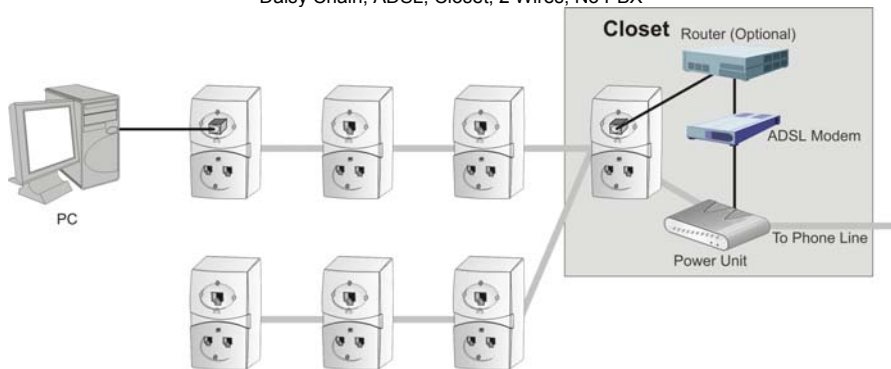
Topology Scenario I - a
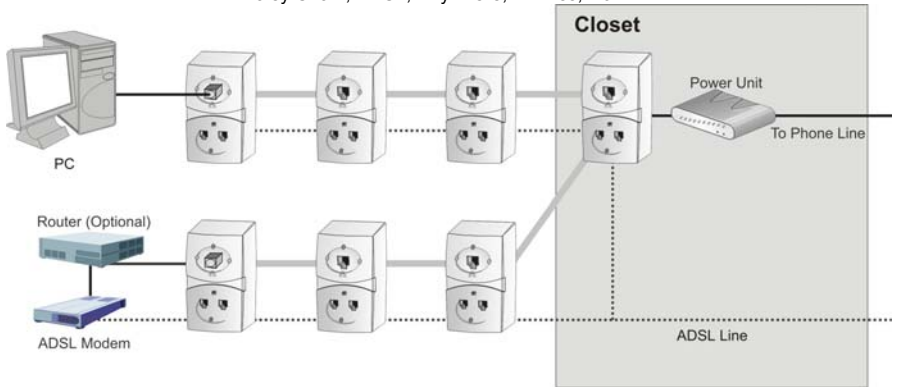Daisy Chain, ADSL, Closet, 4 Wires, PBX
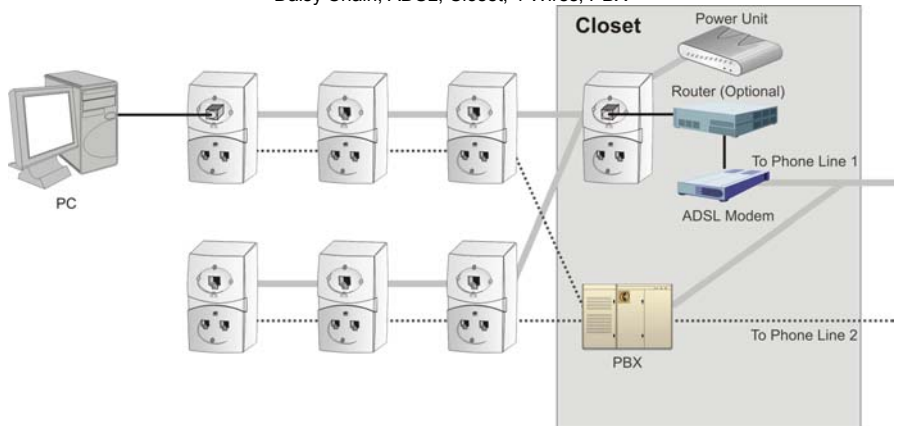
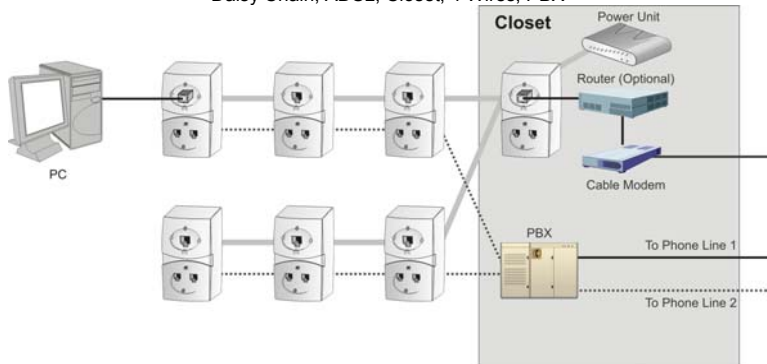# Topology Scenario I – b

Daisy Chain, ADSL, Closet, 2 Wires, No PBX

Topology Scenario II

Daisy Chain, ADSL, Anywhere, 4 Wires, No PBX

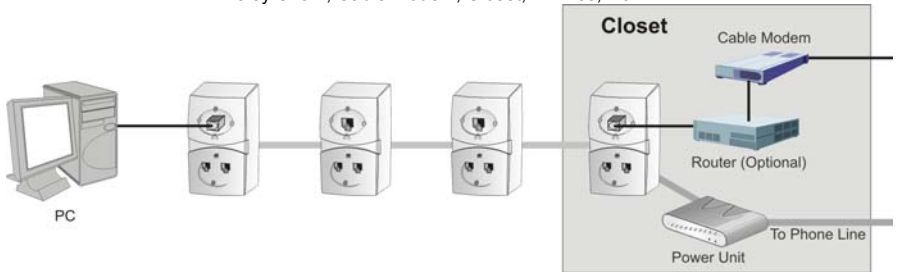# Topology Scenario III – a

Daisy Chain, ADSL, Closet, 4 Wires, PBX

Closet

Power Unit

Router (Optional)

Cable Modem

PC

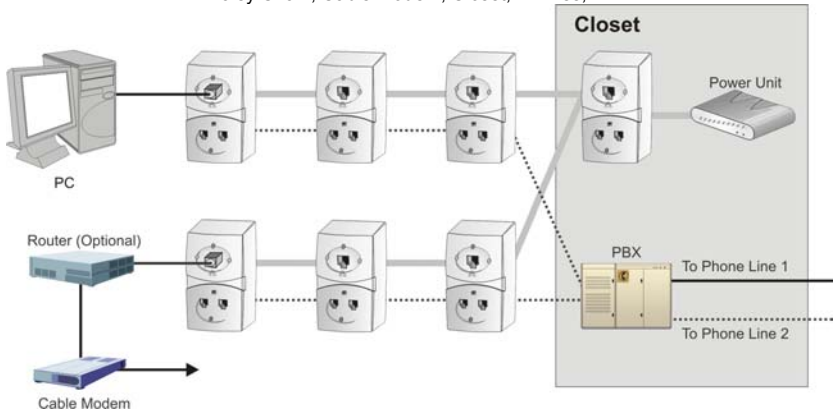PBX

To Phone Line 1

To Phone Line 2

Topology Scenario III – b
Daisy Chain, Cable Modem, Closet, 2 Wires, No PBX

66

Topology Scenario IV – a
Daisy Chain, Cable Modem, Closet, 4 Wires, PBX

Topology Scenario IV – b

Daisy Chain, Cable Modem, Anywhere, 2 Wires, No PBX
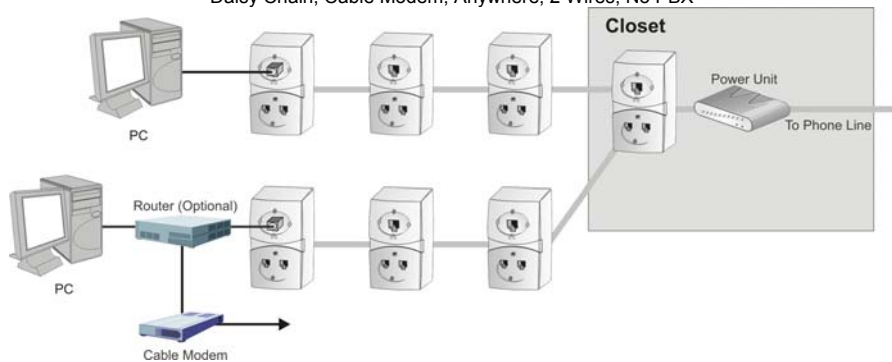
Topology Scenario V – a
Home Run, ADSL, Closet, 4 Wires, PBX

Closet

Router (Optional)

ADSL Modem

Star Box

Power Unit

PBX

To Phone Line 1

To Phone Line 2

PC

L1/L2 - Phone Line Splitter

Topology Scenario V – b

Home Run, ADSL, Closet, 2 Wires, No PBX
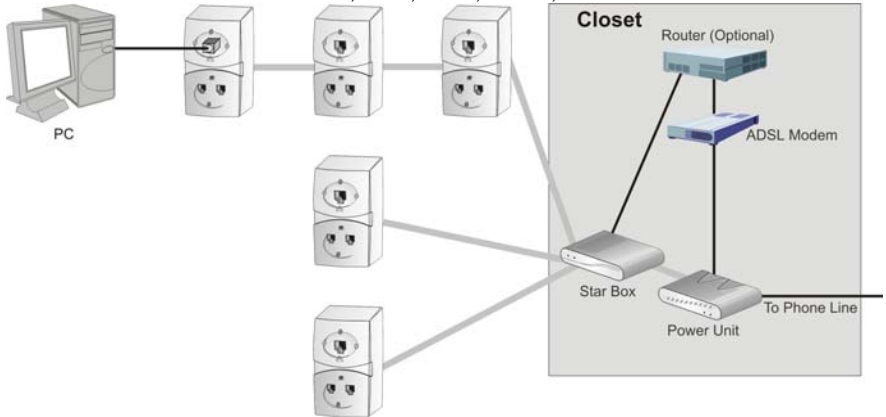
Topology Scenario VI – a

Home Run, ADSL, Anywhere, 4 Wires, No PBX
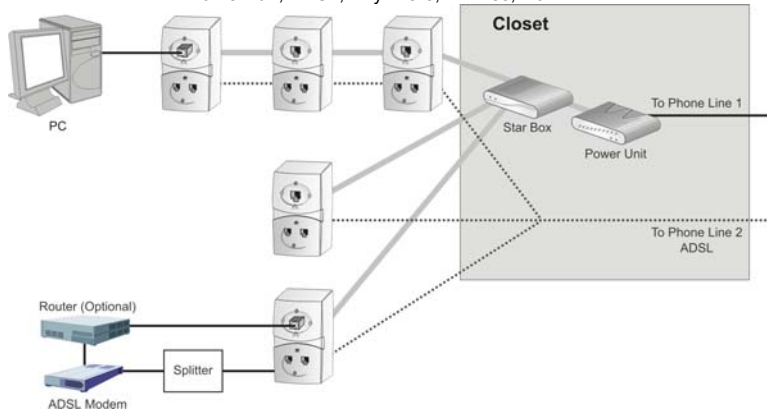
Topology Scenario VI – b

Home Run, ADSL, Closet, 4 Wires, PBX
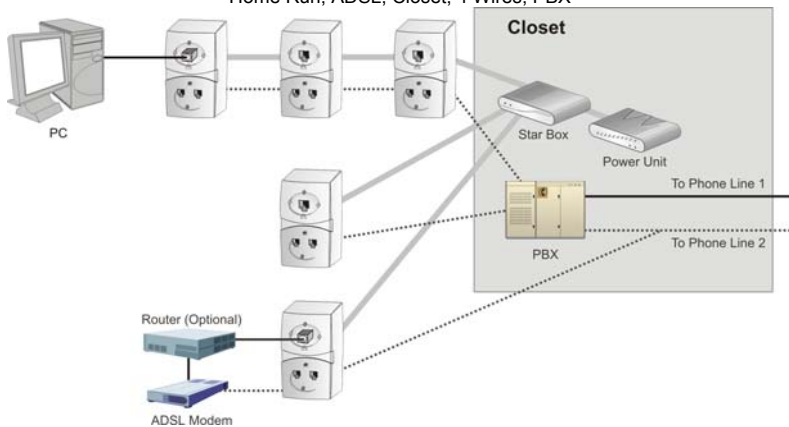
Topology Scenario VII – a
Home Run, Cable Modem, Closet, 4 Wires, PBX

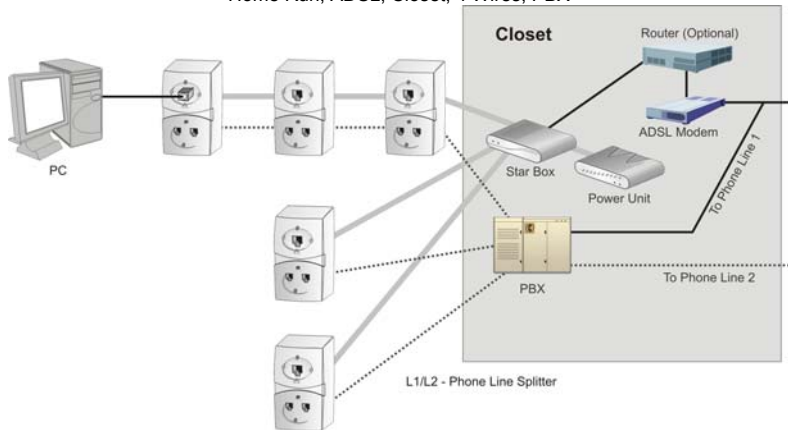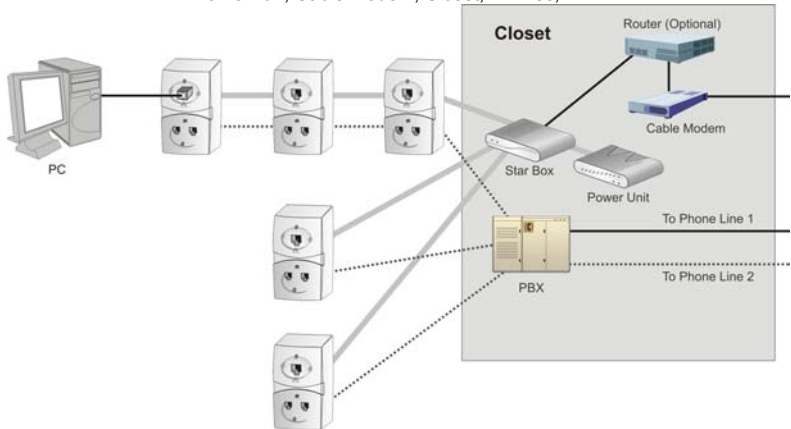# Topology Scenario VII – b
Home Run, Cable Modem, Closet, 2 Wires, No PBX

Closet

Cable Modem

Router (Optional)

Star Box

Power Unit

To Phone Line

PC
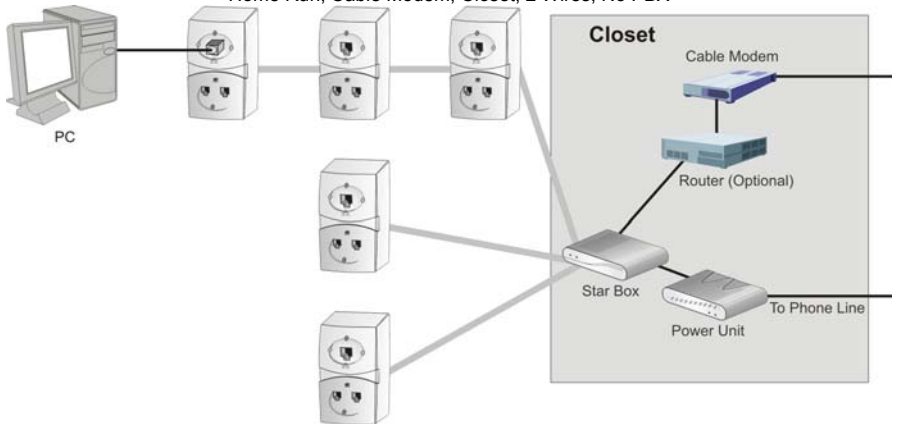
Topology Scenario VIII – a

Home Run, Cable Modem, Anywhere, 4 Wires, PBX

75
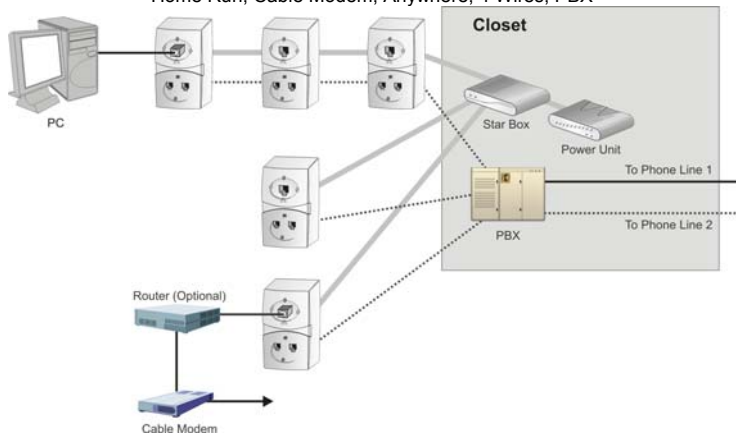
Topology Scenario VIII – b
Run Run, Cable Modem, Anywhere, 2 Wires, No PBX
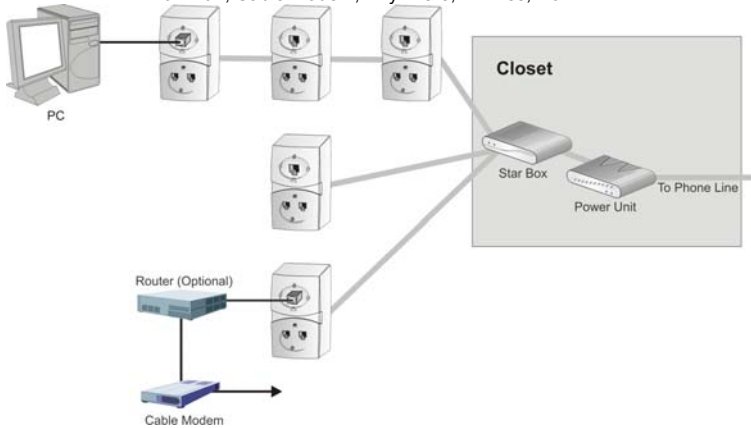
A.2. Topology Tips

- In some cases, the house wiring is laid out in a closed loop. In these cases, one of the two connections to the Central Office should be disconnected, see the diagram below.
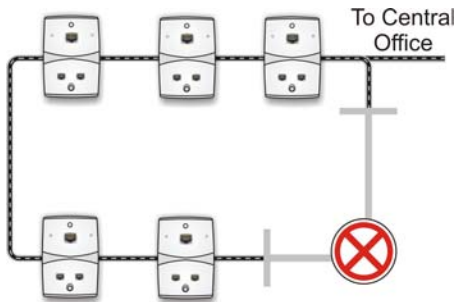
- During the Topology Finding stage, you may reduce installation time by shorting the incoming and outgoing pair at each outlet and follow the dial tone throughout the house.

- Additional tips for reducing and simplifying the installation procedure may be found at http://www.serconet.net

B. Product List and Ordering Information

	Products	
No.	**Catalog Number**	**Description**
1	SRC-10MPS	SercoNet Smart Outlet™ – 10BT
2	SRC-POWERU	Home power and central unit for 10BT
3	SRC-10AP802B	Wireless Access Point IEEE-802.11b outlet
4	SRC-10STAR	StarBox for 10BT system
5	SRC-10FRST	Primary Smart Outlet™ Adaptor for 10BT system
6	SRC-MINITST	Smartester for data and telephone line existence testing and diagnostics
	Adaptors	
No.	**Catalog Number**	**Description**
7	SRC-ADPSURF	Surface mount adaptor
8	SRC-ADPADSLT	ADSL Adaptor to connect phone line1, phone line 2, ADSL Modem line 2
9	SRC-ADPADSLC	ADSL Adaptor cable to connect phone line1, phone line2, ADSL Modem line 2
10	SRC-ADPWMNT	Wall mount adaptor
11	SRC-ADPOUTDOOR	Outdoor box for Smart Outlet™

	Cables	
No.	Catalog Number	Description
12	SRC-CBLETH	Cable set for 10BT RJ-45 straight
13	SRC-CBLETHX	Cable set for 10BT RJ-45 Cross
14	SRC-CBLPUSA	Power Cable for USA
15	SRC-CBLTRJ-11	Tel Cable RJ-11
16	SRC-CBLDIN	Cable Mini DIN to connect Power Unit to Outlet or StarBox
17	SRC-CBLSTRTB	Cable from StarBox to phone wiring box or PBX.
	Documents	
No.	Catalog Number	Description
18	SRC-DOC10MAN	Operator manual for 10BT system
19	SRC-DOCAPMAN	Wireless Access Point Outlet Manual

C. Phone and Data Cabling
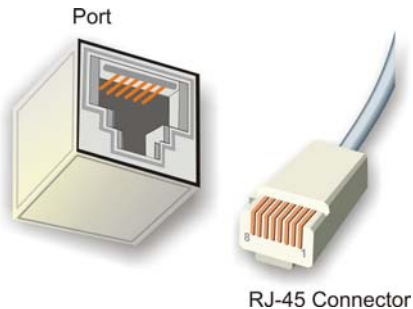
Figure C.1. : RJ-45 Port and Connector

RJ-45 Color Chart	
Wire 1	White with an Orange Stripe
Wire 2	Orange
Wire 3	White with a Green Stripe
Wire 4	Blue
Wire 5	White with a Blue Stripe
Wire 6	Green
Wire 7	White with a Brown Stripe
Wire 8	Brown

Table C.1: RJ-45 Color Chart

To recognize Wire 1, hold the cable so that the end of the plastic RJ-45 tip (the part that goes into a wall jack first) is facing away from you. Face the clip down so that the copper side faces up (the springy clip will now be parallel to the floor). When looking down on the copper side, Wire 1 will be on the far left.

D. Quick Networking Guide

D.1. Windows 98™

Step 1 – Verify that every PC has a unique IP address

There are two ways in which an IP address may be set – automatically
from a DHCP server or configuring manually a known unique IP
address.
3. Right-click the "Network Neighborhood" icon.
4. Select "Properties".
5. Select the network card.
6. Click "Internet protocol (TCP/IP)".
7. Select "Properties".
8. Verify that the PC has a unique IP address.

Step 2 – Verify communications between PCs

Select "Start", "Run" and type "Ping <IP address>" and press "Enter".
The <IP address> should be the one set on the PC with which you
would communicate. This test should be repeated between every PC
that is connected to the SercoNet Smart Outlet™ network.

Step 3 – Become a client for Microsoft networks

1. Right-click the "Network Neighborhood" icon.
2. Select "Properties".
3. Select the network card.
4. Click "Client for Microsoft Networks".
5. Select "Add".
6. Select "Client".
7. Select "Microsoft".
8. Select "Client for Microsoft Networks".
9. Click "OK".

Step 4 – Set the NetBEUI option for automatic detection of network computers

1. Right-click the "Network Neighborhood" icon.
2. Select "Properties".
3. Select the network card.
4. Click "Client for Microsoft Networks".
5. Select "Add".
6. Select "Protocol".
7. Click "Add".
8. Select "Microsoft".
9. Select "NetBEUI".
10. Click "OK".

Step 5 – Assign a workgroup

1. Right-click the "Network Neighborhood" icon.
2. Select "Properties".
3. Select "Identifications".
4. Enter the workgroup to whom this computer should belong in the "Workgroup" field.

Step 6 – Verify that other PCs are recognized as part of the network

1. Click the "Network Neighborhood" icon.
2. Select "Entire Network".
3. Select "Search for computers". At this stage, all the connected and properly configured computers should appear on the screen.

Step 7 – Force the network to recognize other computers

If, after following the above steps, the network still does not recognize all the PCs in your network segment, perform the following steps:
1. Activate the "Windows Explorer" search engine.
2. Search for "hosts.*" file.
3. Open the file using the "Notepad" editor.
4. In a new line, add the IP address and the missing PC's computer name.
5. Save the file
6. Reboot the PC.

Step 8 – Sharing files and computers

In order to use the network, it is recommended to share a common space in each computer so that shared files can be stored. Computers in the network can also use local printers connected to a specific PC.

1. Right-click the "Network Neighborhood" icon.
2. Select "Properties".
3. Select "File and Printer Sharing".
4. Check the two empty boxes and click "OK".
5. Click the "My Computer" icon.
6. Browse until reaching the folder you would like to share. It is possible to create a new folder for sharing purposes.
7. Right-click the folder to be shared.
8. Select "Properties". There are multiple options available on this screen for file sharing. Choose the most suitable for your needs. Some options may require a password – verify that the people involved are aware of the password for shared files access.

D.2. Windows 2000™

Step 1 – Verify that every PC has a unique IP address

There are two ways in which an IP address may be set – automatically from a DHCP server or configuring manually a known unique IP address. Clicking with the right mouse, click on the "My Network Places" icon can set these options. Select using right click on "Local Area Connection" and select "Properties", select the network card, then click on the "Internet protocol (TCP/IP)" and select "Properties". Verify that the PC has a unique IP address.

Step 2 – Verify communications between PCs

Select "Start", "Run" and type "Ping <<IP address>>" and press "Enter". The <<IP address>> should be the one set on the PC with which you would communicate. This test should be repeated between every PC that is connected to the SercoNet Smart Outlet™ network.

Step 3 – Set the NetBEUI option for automatic detection of network computers

With the right mouse button click on the "My Network Places" icon, select "Properties", select "Local Area Connections" and select "Properties". Select the network card, select "Client for Microsoft Networks" and then click on "Install". Select "Protocol" and press the "Add" button.   Select "NetBEUI protocol" and press the "OK" button.

Step 4 – Assign a workgroup

With the right mouse button, click on the "My Computer" icon; select "Properties", select the "Network Identifications" and select "Properties". Fill the "Workgroup" field with the relevant workgroup to whom this computer should belong. In case you work with a company domain server, use the domain field option.

Step 5 – Verify that other PCs are recognized as part of the network

With the left mouse button, click on "My network places" icon, select "Entire Network" and select "Search for computers". At this stage, all the connected and properly configured computers should appear on the screen.

Step 6 – Force the network to recognize other computers

If by following the above steps the network still does not recognize all the PCs in your network segment, follow the next steps. Activate the "Internet Explorer" search engine and search for the "hosts.*" file. Open the file using the "Notepad" editor. In a new line, add the IP address and computer name of the missing PC. Save the file and reboot the PC.

Step 7 – Sharing files and computers

With the right mouse button, click on the "My Network Places" icon; select "Properties", select "Local Area Connections" and select "properties". Verify that the box next to "Files and Printers Sharing for

Microsoft Networks" is checked. Click on the "My Computer" icon and browse until reaching the folder you would like to share. It is possible to create a new folder for sharing purposes. Click with the right mouse on the folder to be shared and select "Properties". There are multiple options available on this screen for file sharing. Choose the option that best suits your needs. Some options may require a password – verify that the people involved are aware of the password for shared files access.

D.3. Windows XP™

Step 1 Right-click " my network place " then "properties".
Step 2 Click "create a new connection".

a. Click "Next".
b. Choose the third option "Set up a home or small office
   network" and click "Next".

New Connection Wizard

Network Connection Type
What do you want to do?

○ **Connect to the Internet**
Connect to the Internet so you can browse the Web and read email.

○ **Connect to the network at my workplace**
Connect to a business network (using dial-up or VPN) so you can work from home, a field office, or another location.

◉ **Set up a home or small office network**
Connect to an existing home or small office network or set up a new one.

○ **Set up an advanced connection**
Connect directly to another computer using your serial, parallel, or infrared port, or set up this computer so that other computers can connect to it.

[< Back] [Next >] [Cancel]

c. Click "finish" in the next window and a new network setup wizard will pop up.

Network Setup Wizard

Welcome to the Network Setup Wizard

This wizard will help you set up this computer to run on your network. With a network you can:

- Share an Internet connection
- Set up Internet Connection Firewall
- Share files and folders
- Share a printer

To continue, click Next.

[< Back] [Next >] [Cancel]
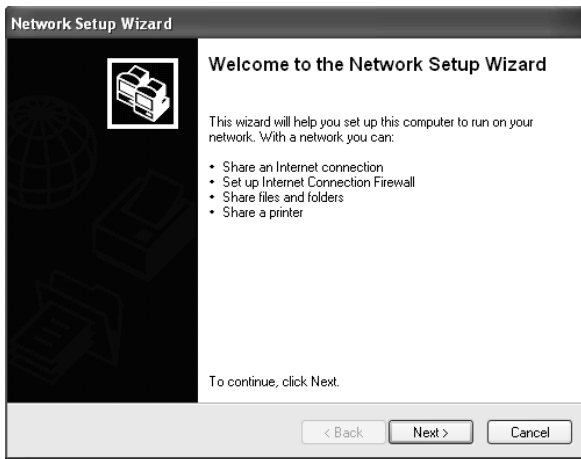
a. Click "Next" and click "Next" again.
b. If the PC connected directly to the Internet has an XP OS installed on it then choose the first option.
c. If the PC uses another computer's Internet connection or gateway, then choose the second option.
d. Otherwise, choose 'Other.'

Network Setup Wizard

Select a connection method.

Select the statement that best describes this computer:

○ This computer connects directly to the Internet. The other computers on my network connect to the Internet through this computer.
   View an example.

⊙ This computer connects to the Internet through another computer on my network or through a residential gateway.
   View an example.

○ Other

Learn more about home or small office network configurations.

[< Back] [Next >] [Cancel]

    a. Click "Next".
    b. Add the computer name.

Note: All computers on the network should have a unique computer name.

    c. Add the computer description (optional).

Network Setup Wizard

Give this computer a description and name.

Computer description:

Examples: Family Room Computer or Monica's Computer

Computer name: TEST1

Examples: FAMILY or MONICA

The current computer name is TEST1.

Learn more about computer names and descriptions.

[< Back] [Next >] [Cancel]

    a. Click "Next".
    b. Add the workgroup name.

Note: All computers on the network must have the same workgroup name.

Network Setup Wizard

Name your network.

Name your network by specifying a workgroup name below. All computers on your network should have the same workgroup name.

Workgroup name: | MSHOME

Examples: HOME or OFFICE

[< Back] [Next >] [Cancel]
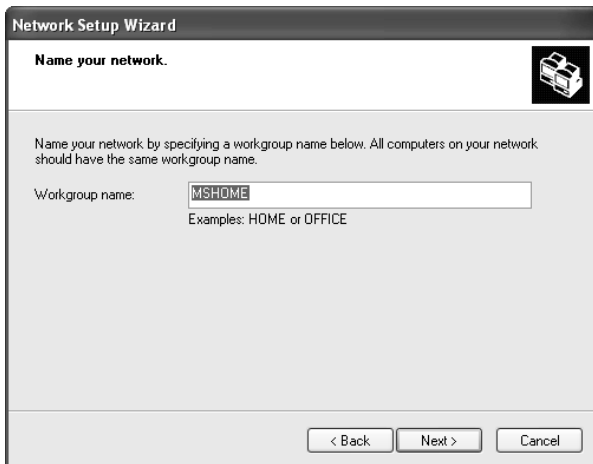
a. Click "Next".
b. Verify that the settings in the new window are and then click 'Next.'
c. Choose the best case for you.

Network Setup Wizard

You're almost done...

ⓘ You need to run the Network Setup Wizard once on each of the computers on your network. To run the wizard on computers that are not running Windows XP, you can use the Windows XP CD or a Network Setup Disk.

What do you want to do?

◉ Create a Network Setup Disk

◯ Use the Network Setup Disk I already have

◯ Use my Windows XP CD

◯ Just finish the wizard; I don't need to run the wizard on other computers

[< Back] [Next >] [Cancel]

    a. Click 'Next' and then 'Finish.'
    b. You will be asked to restart your computer. Do so.

E. Glossary of Home-Networking Terms

10Base2 (thin Ethernet). The IEEE specifications for thin wire or thin net Ethernet network cable with a maximum segment length of 610.5 ft., using thin coaxial cable and daisy-chain configuration for 10Mbps.

10baseT (The "T" stands for twisted pair cable) Sub specification of IEEE-802.3 that requires the use of unshielded twisted pair telephone cabling with RJ-45 phone jacks to be used by Ethernet applications. The maximum length of a segment of twisted pair cable is 330 feet. It is the most common form of Ethernet, with a peak transmission speed of 10 Mbps using copper twisted-pair cable.

100baseT (The "T" stands for twisted pair cable) IEEE specification for fast Ethernet, an upgraded standard for connecting computers into a local area network (LAN). 100BaseT Ethernet works just like regular Ethernet except that it can transfer data at a peak rate of 100 Mbps. It's also more expensive and less common than 10baseT.

Access point
An IEEE-802.11 term, referring to any device that transports data between a wireless network and a wired network or bridge between several wireless devices.

Asymmetric Digital Subscriber Line (ADSL)
A group of DSL technologies that allows for more data to be transmitted over existing copper telephone lines. Because they are asymmetric, more downstream bandwidth is reserved (coming to the user from the Internet) than upstream bandwidth (going from the user to the Internet). This type of DSL is ideal for residential users that do not need the same bandwidth speed in both directions. The fastest downstream rate is 8 Mbps, and the fastest upstream rate 640 Kbps.

Analog A continuously varying signal or wave. Telephone transmission and/or switching that are not digital.

Attenuation
A decrease in a signal's strength (measured in decibels) as it transmits over wires or cables. The shorter the wire or cable the less attenuation occurs.

Backbone The part of a communications network that handles the major traffic using the highest-speed and often longest paths in the network. It is the centralized part of a large network that links two or more sub networks and is the primary path for data transmission

Bandwidth
A measurement of a communications channel/network capacity. Greater bandwidth allows for more information communication in a given period of time. Bandwidth is measured in terms of analog signals (Hertz - Hz) or in digital signals (Mbps).

Bit The basic unit in data communications, represented as either a one or a zero.

Bit rate The number of bits of data transmitted over a line or media per second

Bluetooth An open technology specification for short-range radio links between wireless communication devices. Created by an industry alliance known as the Bluetooth SIG (special interest group).

Broadband
Represents the largest size bandwidth category, where channels of data move over a single communication medium, allowing information (data, voice, and video) to be received and sent most quickly. Broadband uses xDSL, cable and satellite systems.

Byte A compilation of bits.

Cable modem
> A modem that provides a local area connection (connects you computer to the Internet) by means of the cable provided by your cable operator.

Category 3 or CAT3 Cable
> Twisted pair copper cables rated for data rate networks such as 10Mbps Ethernet.

Category 5 or CAT5 cable
> A category of cabling that is used for local area networks with voice and data needs. Category 5 describes network cabling that consists of four twisted pairs of copper wire terminated by RJ-45 connectors. CAT5 cabling supports frequencies up to 100 MHz and speeds up to 1000 Mbps. It can be used for ATM, token ring, 100Base-T, and 10Base-T networking. Computers working on LAN network are connected using CAT5 cables.

Central Office Line
> A telephone company facility that handles the switching of telephone calls on the public switched telephone network (PSTN) for a small regional area.

Coaxial cable
> A conductor used in Ethernet networks protected with shields of wire mesh and plastic insulation.

Crossover cable
> A conductor for networking two computers without the use of a hub.

Crosstalk Interference from an adjacent channel, i.e., when you are able to hear a person on your telephone line that you did not call, or when your mobile phone rings and interferes with your Internet connection.

Customer Premises Equipment (CPE)
> Any piece of equipment in a communication system that resides on the customer's premises. Examples include

modems, television set-top boxes, telephones and
televisions.

Data link The communications link used for data transmission from a
source to a destination. For example, your telephone is a
data link.

Data transfer rate
The average number of bits per unit of time passing in a
data transaction.

Demarcation point
The boundary between the service provider domain and
the customer domain.

Dial-up connection
A data communication link established when the
communication equipment (e.g. a modem) dials a phone
number and negotiates a connection with the equipment
on the other end of the link.

Digital signal
A signal that takes on only two values, off or on, typically
represented by "0" or "1." Digital signals require less power
but (typically) require more bandwidth than analog.

Data over Cable Service Interface Specification (DOCSIS)
Developed by CableLabs, a standard for data
communication over cable television.

Dynamic Host Configuration Protocol (DHCP)
A TCP/IP protocol that allows servers to assign IP
addresses dynamically to PCs and workstations. The PC
or workstation "borrows" the IP address for a period of
time, then the IP address returns to the DHCP server for
reassignment.

E-1 A dedicated digital communication link provided by a European telephone company that offers 2.048 Megabits per second of bandwidth, commonly used for carrying traffic to and from private business networks and Internet service providers.

Ethernet An industry standard local area networking technology (LAN) that supports data transfer rates of 10Mbps. It is the most commonly used LAN standard. The most common form of Ethernet is called 10BaseT, which denotes a peak transmission speed of 10 mbps using copper twisted-pair cable.

Fast Ethernet

Fast Ethernet is an upgraded standard for connecting computers into a local area network (LAN). It works just like regular Ethernet except that it can transfer data at a peak rate of 100 mbps. Also referred to as 100BaseT, fast Ethernet is more expensive and less common than its slower 10BaseT sibling.

Firewall A security product that employs a combination of hardware and software to prevent unauthorized users or traffic from the Internet from gaining access onto a private local area network (LAN).

Frequency

The rate at which an electromagnetic waveform (or electrical current) alternates, usually measured in Hertz (Hz).

Gateway A combination of software and hardware that links two different types of networks.

High Bit-Rate Digital Subscriber Line (HDSL)

A symmetric DSL technology that provides a maximum

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bandwidth of 1.5 Megabits per second in each direction over two phone lines, or 2 Megabits per second over three phone lines.

High Bit-Rate Digital Subscriber Line II (HDSL II)
A descendant of HDSL that offers the same performance over a single phone line.

Home Networking
Connecting multiple electronic devices in a household by way of a local area network (LAN).

Hub The point on a network where circuits are connected. It is a device that links communication lines at a central location in a network. It serves as a common wiring point so that information can flow through one central location to any other computer on the network.

Institute of Electrical and Electronics Engineers (IEEE)
An alliance comprised of engineers, scientists, and students that sets standards for computers and communications.

IEEE-802.X
The set of specifications for local area networks (LAN) from the Institute of Electrical and Electronics Engineers (IEEE).

IEEE-802.3
An IEEE specification for SCMA/CD based Ethernet networks.

IEEE-802.11
A family of IEEE specifications for setting wireless LAN standards. Specified for 1 and 2 Megabits per second (Mbps) wireless Local Area Networks (LANs).

IEEE-802.11b
An IEEE specification for 5.5 or 11 Megabits per second (Mbps) wireless Local Area Networks (LANs).

IEEE-1394 *(also known as Firewire)*
> A universal standard serial interface that handles multimedia bandwidth requirements for a variety of devices.

Integrated Services Digital Network (ISDN)
> A circuit-switched communication network, closely associated with the public switched telephone network that allows dial-up digital communication at speeds up to 128 Kilobits per second.

Internet Protocol (IP)
> The standard signaling method used for all communication over the Internet.

Internet Service Provider (ISP)
> An organization offering and providing Internet access to the public using computer servers connected directly to the Internet.

Intranet   A network serving a single organization or site that is modeled after the Internet, allowing users access to almost any information available on the network. Unlike the Internet, intranets are typically limited to one organization or one site, with little or no access to outside users.

IP Address
> A numeric identifier for your computer.

Local Area Network (LAN)
> A network connecting a number of computers to each other or to a central server so that the computers can share programs and files.

Local loop
> The copper lines between a customer's premises and a telephone company's central office, also known as "Last Mile" connections.

Mbps   Megabits per second. One million bits per second.

Megabit   One million bits.

Megabyte 1,000,000 bytes, or 1,000 kilobytes.

Megahertz (MHz)
          One million cycles per second.

Microcell
          A bounded physical space in which a number of wireless
          devices can communicate.

Modem (modulator-demodulator)
          A device that converts digital data and analog signals for
          transmission over a telephone or cable line.

Multicast The transmission of information over the Internet to a
          select group of recipients on a network.

Multimedia Content
          Information containing multiple data types (audio, voice,
          files)

Narrowband
          A designation of bandwidth less than 56 Kilobits per
          second.

Network Access Provider (NAP)
          Another name for a provider of networked telephone and
          associated services, usually in the U.S.

Network Interface Card (NIC)
          A card that connects a workstation to a local area network.

Network Service Provider (NSP)
          A high-level Internet provider that offers high-speed
          backbone services.

Network Termination Equipment (NTE)
          The equipment at the ends of the communication path.

Node   Any network station.

Private Branch exchange (PBX)
A private phone switching system that connects telephones to each other, allowing users to make inbound as well as outbound telephone calls. In most companies, a digital PBX switching system utilizes digital telephones and includes features such as voicemail, call management, and caller ID.

Peripheral
An electronic device, such as a printer or scanner, that is not integral to running a PC, but increases the PC's capabilities.

Plain Old Telephone Service (POTS)
An acronym identifying the traditional function of a telephone network to allow voice communication between two people across a distance.

Point of Presence (POP)
The physical point of connection between a data network and a telephone network.

POTS splitter
A device that uses filters to separate voice from data signals when they are to be carried on the same phone line, required for several types of DSL services.

Point-to-Point Protocol (PPP)
A protocol allowing a computer to access the Internet using a dial-up phone line and a high-speed modem. This can be accomplished over Ethernet (PPPoE), or over Asynchronous Transfer Mode (ATM; PPPoA)

Protocol   A standard for data transmission between two devices.

Public Switched Telephone Network (PSTN)
The worldwide communications network that carries phone calls and data.

QoS (Quality of Service)
>   The performance properties of a network service, including throughput and priority.

Residential Gateway
>   A device that bridges the Broadband Internet connection and the home network.

RJ-11 Connector
>   Short for Registered Jack-11, the RJ-11 is a six-wire jack used to connect telephone equipment.

RJ-45 Connector
>   A connector used for the 10baseT, 100baseT and 100baseT4 type of networks. It is a small flat plastic connector with 8 pins. 10BbaseT/100baseT uses pairs 2 and 3 only. 100baseT4 uses pairs 1,2,3,4

Router   The central switching device in a packet-switched computer network that directs and controls the flow of data through the network.

Scalable network
>   A network that can easily expand in size.

Security   Ensuring that data stored in a computer cannot be read by outside parties.

Standard   A definition that has been approved by recognized standards organizations in the relevant industry. Standards are important in the computer industry because they allow the combination of products from different manufacturers to create a customized system.

Switch   A device that selects paths or circuits. Routers are smart switches.

Twisted pair

> The set of two copper wires used to connect a telephone customer with a switching office, loosely wrapped around each other to minimize interference from other twisted pairs in the same bundle.

Universal Serial Bus (USB)

> A computer interface with a maximum bandwidth of 1.5 Megabytes per second used for connecting computer peripherals such as printers, keyboards and scanners.

Value-added services

> Applications such as VoIP, video streaming, and interactive gaming that are enabled through broadband service.

Very High Bit-rate Digital Subscriber Line (VDSL)

> A type of asymmetric DSL that delivers from 13 to 52 Megabits per second downstream bandwidth and 1.5 to 2.3 Megabits per second upstream.

Video on Demand (VOD)

> A pay-per-view television service in which a viewer can order a program from a menu and have it delivered instantly to the television set, typically with the ability to pause, rewind, etc.

Voice over IP (VoIP)

> Technology that enables people to use the Internet as the transmission medium for phone calls.

Wide Area Network (WAN)

> A network that interconnects geographically distributed computers or local area networks.

F. FAQ

How does SercoNet's Smart Outlet™ network function as the Ethernet home backbone?

The SercoNet system works through the existing phone wires in the home. The Smart Outlets™ supply the user with an Ethernet backbone in addition to the phone services. All services transferable over standard Ethernet are available with the SercoNet Smart Outlet™ network in the home environment.

How fast does the SercoNet system work?

The SercoNet Smart Outlet™ network guarantees 10Mbps over all existing phone wires. With IEEE-802.11b outlets there may be data rate degradation due to limitations of wireless technology.

Is any computer configuration necessary?

No. As long as a network has been previously set up before installing the SercoNet Smart Outlet™ network, then the SercoNet system functions as a "HUB" between the computers. If you did not have a network previously set up on your computer, then you must configure a network using Windows standard tools for networking. Once you have configured the networking environment, you may connect the computers using the SercoNet Smart Outlets™.

Will any new wires have to be installed?

No. The SercoNet Smart Outlet™ network runs on existing phone wires over any wire topology.

Will the phone be affected after installing the SercoNet system?

The phone will continue to operate as it had prior to the SercoNet system installation.

Can dial-up Internet or fax operate simultaneously with the SercoNet system?

Yes. The SercoNet system has no effect on dial-up connections or fax transmissions. The systems can operate simultaneously.

How are network devices (computer, printer, cable modem, etc.) connected to the SercoNet Smart Outlets™?

Each device is connected to one of the Smart Outlets™ by an Ethernet cable. Some Broadband modems may require an Ethernet CAT5 cross cable to connect to the SercoNet Smart Outlet™ network. The protocol that runs between the Smart Outlets™ is standard Ethernet 10BT.

What specific Windows versions are supported?

The SercoNet system supports all Windows versions, as long as they in turn support Ethernet and networking.

In case of a power outage, will the telephone still work?

The SercoNet system is designed to support *lifeline* telephony. In the case of a power outage, the telephone lines will continue to operate in the manner prior to your SercoNet system installation.

If a neighbor has a phone-line home network, will the Smart Outlet™ network cause interference?

The SercoNet system does not transmit outside the house. It filters all incoming and outgoing signals, and does not cause interference on neighbors' lines.

Does the Smart Outlet™ system support two phone-line connections?

Yes. Each Smart Outlet™ includes a special terminal block connector enabling the connection of a second telephone and dual RJ-11 front panel connectors for direct connection of two telephone sets.

What is the benefit of combining wired and wireless?

The wired network is a reliable and robust solution. However, in many cases, mobility and accessibility are the key customer request. The mobility of wireless is enhanced by the performance of the SercoNet backbone connected to the broadband service. An added benefit of combined SercoNet wireless solution is the flexibility of the wireless access point placement for optimum signal strength.

G. Customer Support

For help with the installation or operation of your SercoNet Smart Outlet™ and Power Unit, contact Customer Support at the following telephone and fax numbers, e-mail addresses and web sites:

<u>North America</u>
Tel: 1-800-396-9887
Office: (508) 229-3670
Fax: (508) 229-3601

<u>International</u>
Tel: +972-9-7411833
Fax: +972-9-7481333

E-mail: <u>support@serconet.net</u>

Please visit our Website at <u>www.serconet.net</u>

H. Warranty Information

SercoNet guarantees that the SercoNet Smart Outlet™ network, including its Power Unit, is free from any physical defects in material or workmanship under normal use for a period of one year from the date of purchase. If the products prove to be defective during the warranty period, contact SercoNet Customer Support.

Note: SercoNet's warranty does not extend to any equipment that has been damaged through negligence. The warranty only covers equipment supplied by SercoNet.

LIMITED WARRANTY
SercoNet Ltd. ("SercoNet") provides this limited warranty for its product only to the person or entity that originally purchased the product from SercoNet or its authorized reseller or distributor.

Limited Hardware Warranty: SercoNet warrants that the hardware portion of the SercoNet products described below ("Hardware") will be free from material defects in workmanship and materials from the date of original retail purchase of the hardware, for the period set forth below applicable to the product type ("Warranty Period") if the Hardware is used and serviced in accordance with applicable documentation and proof-of-purchase.

Product Type	Warranty Period
Product (excluding power supplies), if purchased and delivered in the fifty (50) United States, or the District of Columbia ("USA")	Standard One (1) Year
Product purchased or delivered outside the USA	One (1) Year
Power Supplies	One (1) Year
Spare parts and spare kits	Ninety (90) days

SercoNet's sole obligation shall be to repair or replace the defective Hardware at no charge to the original owner. Such repair or replacement will be rendered by SercoNet at an Authorized SercoNet Service Office. The replacement Hardware need not be new or of an identical make, model or part; SercoNet may in its discretion replace the defective Hardware (or any part thereof) with any reconditioned product that SercoNet reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. The Warranty Period shall extend for an additional ninety (90) days after any repaired or replaced Hardware is delivered. If a

material defect is incapable of correction, or if SercoNet determines in its sole discretion that it is not practical to repair or replace the defective Hardware, the price paid by the original purchase for the defective Hardware will be refunded by SercoNet upon return to SercoNet of the defective Hardware. All Hardware (or part thereof) that is replaced by SercoNet, or for which the purchase price is refunded, shall become the property of SercoNet upon replacement or refund.

Limited Software Warranty: SercoNet warrants that the software portion of the product ("Software") will substantially conform to SercoNet's then current functional specifications for the Software, as set forth in the applicable documentation, from the date of original delivery of the Software for a period of one (1) year ("Warranty Period"), if the Software is properly installed on approved hardware and operated as contemplated in its documentation. SercoNet further warrants that, during the Warranty Period, the magnetic media on which SercoNet delivers the Software will be free of physical defects. SercoNet's sole obligation shall be to replace the non-conforming Software (or defective media) with software that substantially conforms to SercoNet's functional specifications for the Software. Except as otherwise agreed by SercoNet in writing, the replacement Software is provided only to the original licensee, and is subject to the terms and conditions of the license granted by SercoNet for the Software. The Warranty Period shall extend for an additional one (1) year after any replacement Software is delivered. If a material non-conformance is incapable of correction, or if SercoNet determines in its sole discretion that it is not practical to replace the non-conforming Software, the price paid by the original licensee for the non-conforming Software will be refunded by SercoNet; provided that the non-conforming Software (and all copies thereof) is first returned to SercoNet. The license granted respecting any Software for which a refund is given automatically terminates.

What You Must Do For Warranty Service:
<u>Proof of Purchase</u>. Proof of purchase shown to the Authorized SercoNet Service Office is required for each SercoNet product within one year after the product is purchased and/or licensed in order to validate the warranty. The addresses/telephone/fax list of the nearest Authorized SercoNet Service Office is provided in the back of this manual. FAILURE TO SHOW PROPER PROOF-OF-PURCHASE MAY AFFECT THE WARRANTY FOR THIS PRODUCT.
<u>Submitting a claim</u>. Any claim under this limited warranty must be submitted in writing before the end of the Warranty Period to an Authorized SercoNet Service Office. The claim must include a written description of the Hardware

defect or Software non-conformance in sufficient detail to allow SercoNet to confirm the same. The original product owner must obtain a Return Material Authorization (RMA) number from the Authorized SercoNet Service Office and, if requested, provide written proof of purchase of the product (such as a copy of the dated purchase invoice for the product) before the warranty service is provided. After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. The packaged product shall be insured and shipped to SercoNet Inc., with all shipping costs prepaid. SercoNet may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay SercoNet any reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by SercoNet not to be defective or non-conforming.

What Is Not Covered: The limited warranty provided by SercoNet does not cover:

A. Products that have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed;

B. Initial installation, installation and removal of the product for repair, and shipping costs;

C. Operational adjustments covered in the operating manual for the product, and normal maintenance;

D. Damage that occurs in shipment, due to an act of God, failures due to power surge, and/or cosmetic damage; and

E. Any hardware, software, firmware or other products or services provided by anyone other than SercoNet.

Disclaimer of Other Warranties: EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY OF ANY KIND INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IF AN IMPLIED WARRANTY

CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO ONE (1) YEAR. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

Limitation of Liability: TO THE MAXIMUM EXTENT PERMITTED BY LAW, SERCONET IS NOT LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY LOSS OF USE OF THE PRODUCT, INCONVENIENCE OR DAMAGES OF ANY CHARACTER, WHETHER DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, LOSS OF INFORMATION OR DATA CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO SERCONET FOR WARRANTY SERVICE) RESULTING FROM THE USE OF THE PRODUCT, RELATING TO WARRANTY SERVICE, OR ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY, EVEN IF SERCONET HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE SOLE REMEDY FOR A BREACH OF THE FOREGOING LIMITED WARRANTY IS REPAIR, REPLACEMENT OR REFUND OF THE DEFECTIVE OR NON-CONFORMING PRODUCT.

Governing Law: This Limited Warranty shall be governed by the laws of the State of New York*.* Some states do not allow exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the foregoing limitations and exclusions may not apply.

This limited warranty provides specific legal rights and the product owner may also have other rights which vary from state to state.

I. Approvals

I.1. FCC / PART 15 Compliance Statements

I.1.1   FCC / PART 15 Notification

The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
a) Reorient or relocate the receiving antenna.
b) Increase the separation between the equipment and receiver.
c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
d) Consult the dealer or an experienced radio/TV technician.

FCC Warning
Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

Tested To Comply With FCC Standards
FOR HOME OR OFFICE USE

I.1.2 FCC / PART 15 Compliance Conditions:

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received,
including interference that may cause undesired operation.

I.1.3 FCC / PART 15 Declaration Of Conformity
regarding the Wireless Access Point (WAP) Unit,
Model SRC-10AP802B

FCC Declaration Of Conformity

We, the undersigned,

Company: SercoNet Inc.
Address: Deerfoor Office Park, 257 Turnpike Road, Suite 340, Southborough,

MA 01772
Country: U.S.A.
Telephone Number: 508-229-3670
Fax Number: 508-229-3671

are the Responsible Party for this Declaration, certify and declare under our sole responsibility that the following equipment:

Brand	Type	Product Description
Smart Outlet System, Wireless Access Point IEEE-802.11b	SRC-10AP802B	2.4 GHz Wireless Access Point

complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including

interference that may cause undesired operation.

Date:

Company Stamp:

Signature:

Name and Function:

I.1.4 FCC / PART 15 Warning regarding the Wireless Access Point (WAP) Unit, Model SRC-10AP802B:

The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and not be co-located or operating in conjunction with any other antenna or transmitter.

I.2. FCC / PART 68 Compliance Statements

I.2.1 Customer Information Statement

General Requirements for ALL Equipment:

1. This equipment complies with 47 CFR, Part 68 of the rules.
   On the rear side of the SRC-POWERU, SRC-10MPS and SRC-10FRST Units of this equipment is a label that contains, among other information, the certification number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

2. The Application Certification Jack USOC (Universal Service Order Code) used for the equipment is RJ11C.

3. A compliant telephone cord and modular plug is provided with this equipment. This equipment is designated to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.

4. If the terminal equipment **Smart Outlet System** causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

5. The telephone company may make changes in it's facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted services.

6. If trouble is experienced with this equipment **Smart Outlet System,** for repairs or warranty information, please contact **SercoNet Inc., Deerfoot Office Park, 257 Turnpike Road, Suite 340, Southborough, MA 01772, Tel. 508-229-3670, Fax. 508-229-3671.** If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

7. No repairs can be performed on the **Smart Outlet System** by the customer (user).

8. The equipment cannot be used on public coin phone services provided by the telephone company. Connection to party line services is subject to state tariffs. Contact the state public utility commission, public service commission, or corporate commission for information.

I.2.2   FCC / PART 68 Product Label Sample and Statement

The following is a **Short Form** representative drawing of the FCC / ACTA Label for the **Model SRC-POWERU** that appears at the rear side of the Model SRC-POWERU:

```
Certification Number:  US: AAAHN05BSI010
Model Number:  SRC-POWERU
```

The **Complete Form** of the above label appears below, as follows:

```
Complies with 47 CFR Part 68
Certification Number:  US: AAAHN05BSI010
Ringer Equivalence Number:  0.5B
Made in Israel
Use USOC Jack:  RJ11C
Responsible Party Name:  SerCoNet Ltd.
Model Number:  SRC-POWERU
Serial Number:  VYYWWSSSSS
```

The structure of the Serial Number appearing at the above label is as follows:

- V indicates the Vendor / Manufacturer Name.
- YY indicate two digits, ranging from 00 to 99, for the Year.
- WW indicate two digits, ranging from 00 to 54, for the Week.
- SSSSS indicate five digits, ranging from 00000 to 99999, for the Serial Number.

I.2.3 FCC / PART 68 FIC/SOC Codes for Analog Equipment Facility Interface Codes and Service Order Code

FIC Codes for Analog Equipment:

Applies (x)		FIC Codes	Description
√		02LS2	2-Wire, Local Switched Access, Loop-Start
-		02GS2	2-Wire, Local Switched Access, Ground-Start
-		02RV2-0	2-Wire, DID, Customer Originates (only for E911 Identification Service)
-		02RV2-T	2-Wire, Local Switched Access, Reverse Battery, Customer Term, DID Ports
-		*04LS2	4-Wire, Local Switched Access, Loop-Start
-		*04GS2	4-Wire, Local Switched Access, Ground-Start
-		*04RV2-T	4-Wire, Local Switched Access, Reverse Battery, Customer Termination
-		02LR2	2-Wire, Private Line Automatic Ring-down
-		04LR2	4-Wire, Private Line Automatic Ring-down

* Subject to local availability

SOC Code for Analog Equipment:

Applies (x)		SOC Codes	Description
√		9.0F	Provides full protection to the Network from systems using live voices. Only registered terminal equipment can be connected to station ports.
-		9.0N	Unprotected systems. Requires use of registered protective couplers or filing of affidavits with the telco. See Section 68.215 (d) and (e).
-		9.0Y	Provides full Part 68 protection. Provides signal limiting for **all** signal sources (not just MOH)
-		7.0Y	Provides total protection to the network for connection for private communication systems.

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