

MODEL M5800SB-AP-60
5.8 GHz Digital Spread-Spectrum Wireless Internet Access Point

**Installation and Operating Instructions for the
SunStream5800™ Broadband Access Solution**

Access Point Manual

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QUICK SETUP GUIDE

- 1 Read through these instructions fully before doing anything!
- 2 Using the instructions provided, configure the radio settings before installing outdoors.
- 3 Mount the optional mounting arm to an earth-grounded mast measuring approximately 1.5 to 2.5 inches in diameter. The mast *must be* securely mounted to the mast.
- 4 Attach the radio to the dish antenna mounting arm using the supplied "V" brackets and nuts. *The unit case must be grounded to earth via the bracket hardware.*



WARNING

USE EXTREME CARE WHEN INSTALLING ANTENNAS NEAR POWER LINES.

- 5 Construct or purchase a shielded twisted-pair (STP) CAT5 straight-through eight-conductor Ethernet cable terminated with shielded RJ45 connectors long enough to go from the radio along the mast or wall to the building entry point. Use conduit and a drip loop as appropriate in accordance with the National Electrical Code.
- 6 Carefully connect the cable to the unit RJ45 input, tightening the flange around the cable or conduit.
- 7 Install the Junction Box indoors near the entry point into the building. Plug the Ethernet cable going to the radio into the ODU port (located above the power input). Plug the 20 V wall mount adapter into the wall and then into the power input. *This step will be completed successfully when both LEDs illuminate steadily after approximately thirty seconds.*
- 8 Align the antenna for the desired coverage pattern. The elevation beamwidth is 10 degrees and the azimuth beamwidth is 60 degrees.
- 9 After the alignment is completed, fasten all nuts and bolts securely. Use cable ties on all cables to prevent movement in windy conditions.
- 10 For protection against potential lightning damage, use an Ethernet lightning surge arrester in line with the STP cable at the entry point to the building. Install according to manufacturer's instructions.



CAUTION

DO NOT APPLY POWER TO THE TRANSMITTER UNTIL THE ANTENNA IS CONNECTED. PERMANENT DAMAGE MAY RESULT.

Thank you for choosing SunStream Wireless to fulfill your wireless Internet access needs. Unpack your system carefully. Packaged in three boxes, the Subscriber Kit contains the following items:

Description	Quantity	SunStream Part Number
SunStream5800 BAS™ Access Point Radio	1	M5800SB-AP-60
SunStream5800 BAS™ Access Point User Manual	1	M5800SB-AP-MAN
"V-shaped" Mounting Brackets	2	ES-9118
Nuts (for Mounting Brackets)	4	H-9068
Junction Box Kit (contains 20V adapter)	1	ODU-PKIT-1

If any items are missing, notify your sales representative. If an item appears to be damaged from shipment, replace it in its packing material and notify the shipper.

Service:

If the unit ever needs repair service, contact your service provider or a SunStream Wireless distributor for return authorization and shipping instructions.

FCC Information:

This device complies with Part 15 of FCC Rules and Regulations. 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.

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 these instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in any 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 correct the interference by one of more of the following measures:

- 1) Reorient the antenna;
- 2) Increase the separation between the affected equipment and the unit;
- 3) Connect the affected equipment to a power outlet on a different circuit from that which the receiver is connected to;
- 4) Consult the dealer and/or experienced radio/TV technician for help.

FCC ID: NCYM5800SBAP60
CANADA: Pending

IMPORTANT NOTE:

Intentional or unintentional changes or modifications must not be made unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty.

To comply with FCC RF exposure requirements, the following antenna installation and device operating configurations must be satisfied. The antenna for this unit must be fixed and mounted on outdoor permanent structures with a separation distance of at least two meters from all persons. Furthermore, it must not be co-located or operating in conjunction with any other antenna or transmitter.

System Description:

The M5800SB-AP-60 is a part of the SunStream5800 Broadband Access Solution. Specifically, the M5800SB-AP-60 is a broadband wireless Internet access point designed for sending and receiving Ethernet-based data traffic in a point to multi-point configuration and presents an alternative to conventional wiring which may be impractical and/or too slow.

An Access Point can manage up to five hundred Subscriber Units per sector. A sector is defined a 60 degree coverage area that an Access Point's integrated antenna "sees". The system utilizes robust spread-spectrum technology to reduce susceptibility to interference.

The typical Access Point installation consists of one or more M5800SB-AP-60 radios that are mounted outdoors and one or more Junction Boxes that are mounted indoors. Each Junction Box provides power to the radio by injecting the power onto the unused pairs of an Ethernet cable.

The Access Point is aligned towards the service area. The coverage area will depend on the unit mounting height and down tilt, but in general it is a 10-degree (elevation) by 60-degree (azimuth) projection perpendicular from the unit's radome onto the service area.

Items you will need to supply:

Certain items are not included with the Access Point Kit and you will need to provide these items for a successful installation. These items are listed below:

One (1) length of straight through CAT5 cable, not to exceed 50 meters, to connect the Subscriber Unit Radio to the Junction Box. This cable will carry Ethernet traffic and power.

One (1) length of CAT5 cable, not to exceed 50 meters, to carry Ethernet traffic. This cable will be connected one on end to the Junction Box and the other end to a Network Interface Card (NIC); i.e., router and/or PC (depending on wiring).

Appropriate hardware tools such as adjustable wrench, Ethernet crimping tool, wire-cutter/stripper, Philips screwdriver and/or ladder.

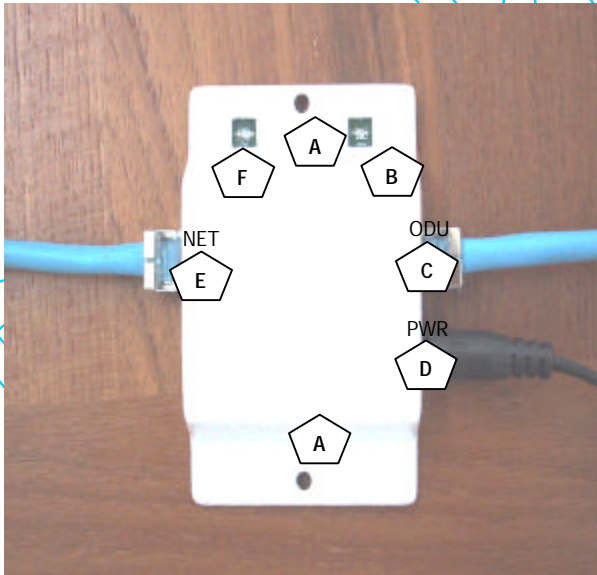
Lastly, access to a laptop PC will be useful to poll the serial port of the Subscriber Unit radio for setup and troubleshooting. The PC should be running Windows95 or later and have a free COM port and a serial interface utility (e.g., HyperTerminal). Installers may wish to purchase the CBLDAT-1 (this is a serial port to RJ11 converter cable).

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FIGURE 1

An Access Point radio properly attached. There is a single CAT5 cable that provides power and data to the Access Point. The Access Point is mounted to a pole using an optional pole mount bracket.



Symbol	Description
A	Mounting Hole
B	LED ON = Access Point OK
C	ODU Port - connects to AP (RJ45 Port w. CAT5 UTP)
D	Power Port (20 Vdc input)
E	NET Port - connects to Switched Hub or PC NIC (use crossover cable for PC)
F	LED ON = Junction Box OK

FIGURE 2

A Junction Box showing a CAT5 straight-through power/data cable connected to the "ODU" port with a power adapter cable connected to the "PWR" port and an Ethernet cable connected to the "NET" port (use a crossover cable at the NET port when connecting to a PC NIC).

**FIGURE 3**

A bottom view of an Access Point showing power/data cable feed and access door. The access door can be removed during installation for access to the internal serial port. Link status can be checked with the access door attached; LEDs will show TX and RX packet activity will show as well as RSSI through the opening in the access door.

Installation:

Typically, the service provider will program the radio and professionally install the entire system. However, if you are installing the system yourself, below is a step-by-step installation procedure to guide you.

FIRST STEP: RADIO SET-UP PRIOR TO INSTALLATION

Before installing the hardware, you must set up the radio operating parameters and load the initial subscriber unit information into the database. The following steps will guide you through this process.

- 1) Obtain the SunStream5800 BAS Setup Wizard™ program, .CFG file diskette, and serial interface cable (CBLDAT-1). The cable will only be required during setup.
- 2) Load the SunStream5800 BAS Setup Wizard™ program onto a PC or laptop.
- 3) Connect the ODU port on the Junction Box to the Access Point with a short section of eight-conductor UTP CAT5 network cable.
- 4) Connect the serial port end of the CBLDAT-1 to the PC or laptop serial port; the other end will be connected to an RJ11 jack inside the Access Point.
- 5) Using a Philips screwdriver, remove the access door (you will re-attach the access door once setup is complete). Inside, you will find an RJ11 jack (phone connector interface).
- 6) Connect the free end of the CBLDAT-1 to the phone connector interface.
- 7) First, plug the Power Adapter into the Junction Box and then into a 120 VAC wall outlet.
- 8) Wait thirty seconds for the unit to power up. The LEDs on the Junction Box should both be glowing solid.
- 9) Go to your laptop or PC and click on the wizard program icon.
- 10) Click on the "Serial Port" button, choose the appropriate COM port, and enter the password "sunstream". This is the default password the unit is shipped with and should be changed before the unit is put into service.
- 11) Click the "Connect" button.
- 12) The System Information page screen will now appear, displaying "PG-SYSINFO" in the bottom right-hand corner.
- 13) Click the "Load Configuration" button to install any predefined configuration files that the may have already been set up.

NOTE: If no .CFG files have been set up, the settings may be individually modified from the wizard or the default .CFG file may be modified. Please see the Access Point Wizard Manual for details on this procedure

- 14) A dialog box pops up prompting for the .CFG file. Locate the .CFG file on the diskette provided or download it from the web. Once the file is located, highlight it and click on the "open" button.
- 15) The program should return to the PG-SYSINFO page and show the new values just loaded from the .CFG file.
- 16) Click "Reboot Unit" and wait one minute.
- 17) Exit the program by clicking on the "Quit" button.
- 18) The unit is now ready for service and may be powered down. All settings loaded will be retained in the non-volatile memory.

- 19) Before any communications with subscriber units will occur, subscribers must be loaded into the unit's database. Log into the unit again using the AP wizard program and select "Wizard Tree" from the "PG-SYSINFO" page.
- 20) Select "Add Entry" under the "SU Database Management" heading, then click "Run".
- 21) Enter the appropriate information for the subscriber.
- 22) Select "Write SU Database to Flash Memory" to save the changes.
- 23) Repeat steps 20-22 until all subscribers are added to the Access Point's database table. You can now exit the wizard.

SECOND STEP: MOUNTING PROCEDURES

Mount the Access Point(s) units above human and mechanical traffic, aiming it in the general direction of the service area. A typical rigging situation would include a steel mast, ten feet tall, 2³/₈ inches in diameter, mounted on top of a building. Make sure that the mast is well grounded to earth ground with an 8 AWG or larger wire. For best performance, the antenna must be fifteen to twenty feet above all obstacles in the line of sight to any subscriber unit.

Keep the transmission path as open as possible. Objects such as walls and metallic objects near the transmission path reflect signals and may reduce the transmission distance.

Use standard outdoor-to-indoor drip loop and grounding per National Electrical Code and electrical conduit if appropriate and follow the steps below:

- 1) Mount the Access Point on the mounting pole as shown in Figure 1.
- 2) You will now prepare a CAT5 (STP) run from the Access Point's RJ45 connector to the Junction Box's ODU port. Connect the STP run (no longer than 50 meters) when using the standard 20 V supply (found in the ODU-PKIT-1) or 100 meters (when using a qualified 24-volt supply). Use straight-through eight-conductor CAT5 cable, making sure that the RJ45 terminations are shielded.
- 3) Connect the Junction Box to an interior wall near the entry point of the cable.
- 4) Plug the STP cable into the ODU port of the Junction Box as shown in Figure 2.
- 5) Plug the wall-mount power adapter into the Junction Box.
- 6) Plug the wall-mount adapter into the wall outlet.
- 7) The LEDs on the Junction Box should both be on, indicating that the power is coming into the Junction Box properly and that the Access Point is powered up properly. If this is not the case, check the wiring.

THIRD STEP: CONNECTION VERIFICATION

After the alignment is completed, an Ethernet cable can be connected to the "NET" port of the Junction Box and then to a switched hub or PC network card.

NOTE: A crossover cable will be required if connecting to a PC NIC.



CAUTION

DO NOT APPLY POWER TO THE RADIO UNTIL THE ANTENNA IS SECURELY ATTACHED.

M5800SB-AP-EXT Inputs and Outputs

1. POWER INPUT

The unit accepts a 10.5 - 24 Vdc power source and the standard 20 Vdc adapter supplied should be used (supplied with SunStream part number ODU-PKIT-1).

2. ETHERNET DATA INTERFACE

Use a shielded CAT5 cable to connect the Junction Box to the Subscriber Unit radio. Unshielded twisted pair may be used for the indoor connection to the switched hub or PC.

3. LED INDICATORS

These LEDs indicate when a data packet is transmitted (red) or received (green). The yellow LED will light up and is used only during site survey.



CAUTION

WHEN THE UNIT IS IN OPERATION, AVOID STANDING DIRECTLY IN FRONT OF THE ANTENNA. STRONG RF FIELDS ARE PRESENT WHEN THE TRANSMITTER IS ON.