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

Installation and Operating Instructions

1•Setup transceiver per instructions herein before installing outdoors.

2•Mount the articulated mounting arm to an earth grounded mast approximately 2.5 inches in diameter. The pole *must be* securely mounted so that it does not move.

3• Install transceiver articulated mounting arm.

⚠ **WARNING**
USE EXTREME CARE WHEN INSTALLING ANTENNAS NEAR POWER LINES.

4• Construct or puchase a shielded twisted pair (STP) cat 5 straight through 8 conductor Ethernet cable terminated with shielded RJ45 connectors long enough to go along the pole or wall to the building entry point. Use conduit and a drip loop as appropriate per National Electrical Code.

6• Connect the cable to the unit and tighten 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 transceiver into the ODU port (above the power input). Plug the wall mount 20 V adapter or 24 Volt power source into the wall and then into the power input. Verify that both LEDs come on solid after approximately 30 seconds.

8• Align the antenna for the coverage pattern desired. The elevation beamwidth is 10 degrees and the azimuth beamwidth is 60 degrees.

9• Tighten all nuts and bolts down after the alignment is completed.

10• To help protect against potential lightning damage, use an ethernet lightning surge arrestor in line with the STP cable at the entry point to the building.

Thank you for choosing Sunstream Wireless to fulfill your wireless internet access needs. Unpack your system carefully. 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. The subscriber kit contains the following items packaged in three boxes:

- 1 transceiver unit
- 2 mounting brackets
- 4 nuts for mounting brackets
- 1 Junction box (optional)
- 1 power adapter (optional)
- 1 warranty card

Service:

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

FCC Information:

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.

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 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 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 an 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**

<u>IMPORTANT NOTE:</u>
Intentional or unintentional changes or modifications not expressly approved by the party responsible for compliance must not be made. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty.

IMPORTANT NOTE:
**To comply with FCC RF exposure compliance requirements, the
following antenna installation and device operating configurations must
be satisfied – The unit must be fixed-mounted on outdoor permanent
structures with a separation distance of at least 2 meters from all persons
and must not be co-located or operating in conjuction with any other
antenna or transmitter.**

System Description:

The M5800SB-AP-60 is a broadband wireless internet access system designed for sending and receiving Ethernet based data traffic where conventional wiring is impractical or when higher connection speeds are required. 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 transceiver mounted outdoors and a junction box mounted indoors. The junction box provides power to the transceiver by injecting the power onto the unused pairs of the Ethernet cable. The transceiver antenna is aligned towards the service area. The coverage area will depend on the unit mounting height and downtilt, but in general it is a 10 degree (el) by 60 degree(az) projection perpendicular from the unit radome onto the service area.

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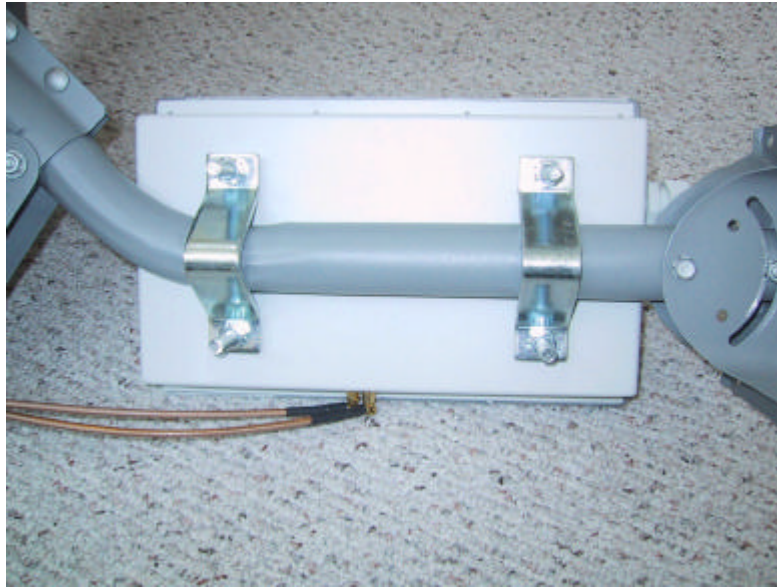
• **FIGURE 1** •

Figure 1 shows installation of the transceiver on the pole.
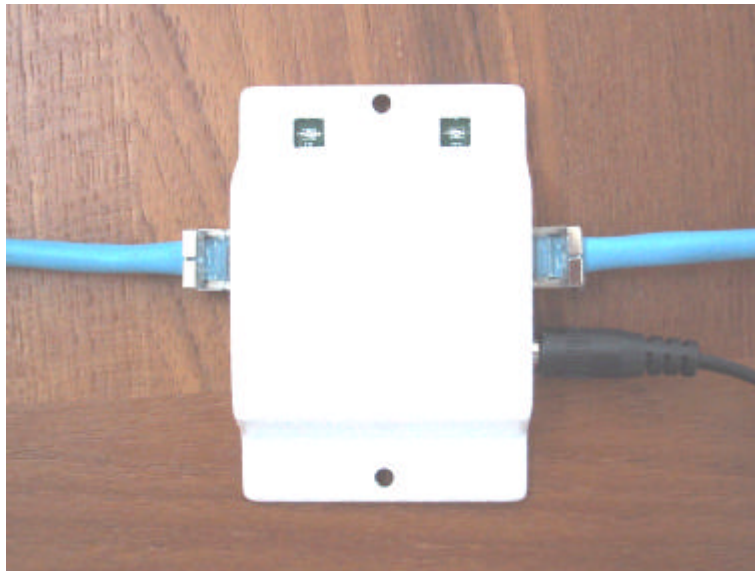
• **FIGURE 2** •

Figure 1 shows installation of the junction box and power adapter.

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Installation:

Typically the service provider will program the transceiver and professionally install the entire system. If you are installing the system yourself, below you will find a step by step guide.

TRANSCEIVER SETUP PRIOR TO INSTALLATION

Before installing the hardware you must set up the transceiver to allow communication with the the subscriber database.

1) Obtain the M5800S-AP Series Wizard program, .cfg file diskette, and Setup cable (CBLDAT-1) from your service provider.
2) Load the wizard program onto a PC or Laptop
3) Connect the junction box ODU port to the transceiver with a short section of 8 conductor UTP cat 5 network cable.
4) Connect the CBLDAT-1 to the PC or laptop serial port.
5) Use a Philips head screwdriver to remove the access door temporarily. Inside is an RJ11 jack
6) Connect the phone connector end into the RJ11 jack.
7) Plug the power adapter into the junction box and then into a 120 VAC wall outlet.
8) Wait 30 seconds for the unit to power up. The LEDs on the junction box should both be glowing solid.
9) Click on the wizard program icon.
10) Click on the "Serial Port" button, choose the appropriate COM port, and enter the password (obtained from your service provider). If none was provided, the default is "sunstream".
11) Click the "Connect" button.
12) The screen should change to a display with the notation "PG-SYSINFO" at bottom right.
13) Click the "Load Configuration" button.
14) A dialog box pops up prompting for the .cfg file. Locate the default.cfg file on the diskette provided or download it from the web. Highlight it and click "open"
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 1 minute.
17) Click "Quit"
18) The unit is now ready for service and may be powered down . All settings loaded will be retained in the non-volatile memory.

HARDWARE INSTALLATION

Mount the transceiver units above human and mechanical traffic, aiming it in the general direction of the service area. In general, the higher above the ground the antenna is, the better. A 10 foot 2 3/8" diameter steel mast on top of a building is typical. 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 15 to 20 feet above all obstacles in the line of sight to the any one subscriber unit.

1) 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.

2) Mount the transceiver on the mounting pole as shown in Figure 1.

3) Connect the STP run no longer than 300 feet (when using a 24 Volt supply), 150 feet if using the standard 20 V supply– Use straight through 8 conductor cat 5 cable, making sure that the RJ45 terminations are shielded.

4) Use standard outdoor to indoor drip loop and grounding per National Electrical Code and electrical conduit if appropriate.

5) Connect the Junction Box to an interior wall near the entry point of the cable.

6) Plug the STP cable into the ODU port of the Junction Box.

7) Plug the wall mount power adapter into the Junction box.

8) Plug the wall mount adapter into the wall outlet.

9) The LEDs on the Junction box should both be on, indicating that the power is coming into the junction box properly and that the outdoor transceiver is powered up properly. Check the wiring if this is not the case.

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

M5800SB-AP-60 Inputs and Outputs

1. POWER INPUT
Accepts a 10.5-24 Vdc power source such as the standard 20 Vdc adapter (supplied with Sunstream part number ODU-PKIT-1).

2. ETHERNET DATA INTERFACE
Use a shielded cat 5 cable to connect the junction box to the transceiver unit. It is ok to us UTP for the indoor connection to the switch or PC.

4. LED INDICATORS
These LEDs indicate when a data packet is transmitted(red) or received (green). The yellow LED indicates the strength of the signal received from the base station.

⚠ 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.

M5800SB-AP-60 Specifications

Receiver Section

<u>Radio Section</u>

LO Frequencies:

Default channel plan-	Channel 1: 5.256 GHz
	Channel 2: 5.276 GHz
	Channel 3: 5.396 GHz
	Channel 4: 5.316 GHz
	Channel 5: 5.336 GHz
	Channel 6: 5.356 GHz
	Channels 7-32: not programmed

Cascade Noise Figure:	< 6 dB
Sensitivity for 1E10-6 BER:	- 80 dBm max 1000 byte packets
Adj. Channel Rejection:	> 20 dB
Image Rejection:	> 60 dB
Frequency Plan:	Single conversion, IF at 480 MHz
LO stability:	.000435 % PLL Stabilized (4.35 ppm) over temp
Input compression point:	> -10 dBm

<u>Data Output Section</u>

Buffer size:	128K Bytes
Data Rate (User):	9.5 MBPS Maximum sustained throughput
Format:	10/100 BaseT IEEE 802.3 Ethernet compliant

Mechanical and Environmental

<u>General</u>

Material:	Powdercoated aluminum base with polycarbonate radome
Size:	12.5"x5"x8" including mounting studs
Weight:	4 lb
Mounting:	Grey steel pole/wall mount

<u>Connectors/Indicators</u>

RF Output:	MCX for integral dual pol antenna
	SMA per Part 15C, 15.203.

FCC Compliance:	The transmitter shall comply with the following:
	FCC Part 15.405, 15.407

FCC Part 15.207(a)

Serial Interface: RJ11 connector
LAN Interface   Shielded RJ45 connector
Power: Carried on 4 unused pins of Ethernet cable

Environmental
Operating Temp: -40 to 60 deg C
Storage: -40 to 85 deg C
Humidity: 100 % When sealed properly
NEMA Rating: NEMA 4X
Shock: Sustain 3 axis drop from 5 feet

STANDARD EXTERNAL POWER SUPPLY

20 Volt DC Power adapter and J-Box supplied in ODU-PKIT-1 accessory package.

Type: Linear wallmount transformer
Input: 120 VAC
Output: 20 VDC +/- 1 V
Max current: 1200 mA

STANDARD ANTENNA

Type: Sectoral Patch Antenna
Polarization: Vertical, Horizontal electrically selectable
Frequency: 5.7 to 5.9 GHz
Gain: +18 dBiL
Az Beamwidth: >60 degrees
El Beamwidth: >8 degrees
Cross Pol: >15 dB
Front/Back Ratio:>30 DB as mounted in M5800SB-AP-60
VSWR: < 2.0:1 over Bandwidth