SENSAPHONE® SCADA 3000
APPLICATION SUPPORT BULLETIN

<u>SUBJECT:</u>
Equipment requirements
for a typical Sensaphone SCADA 3000 remote site
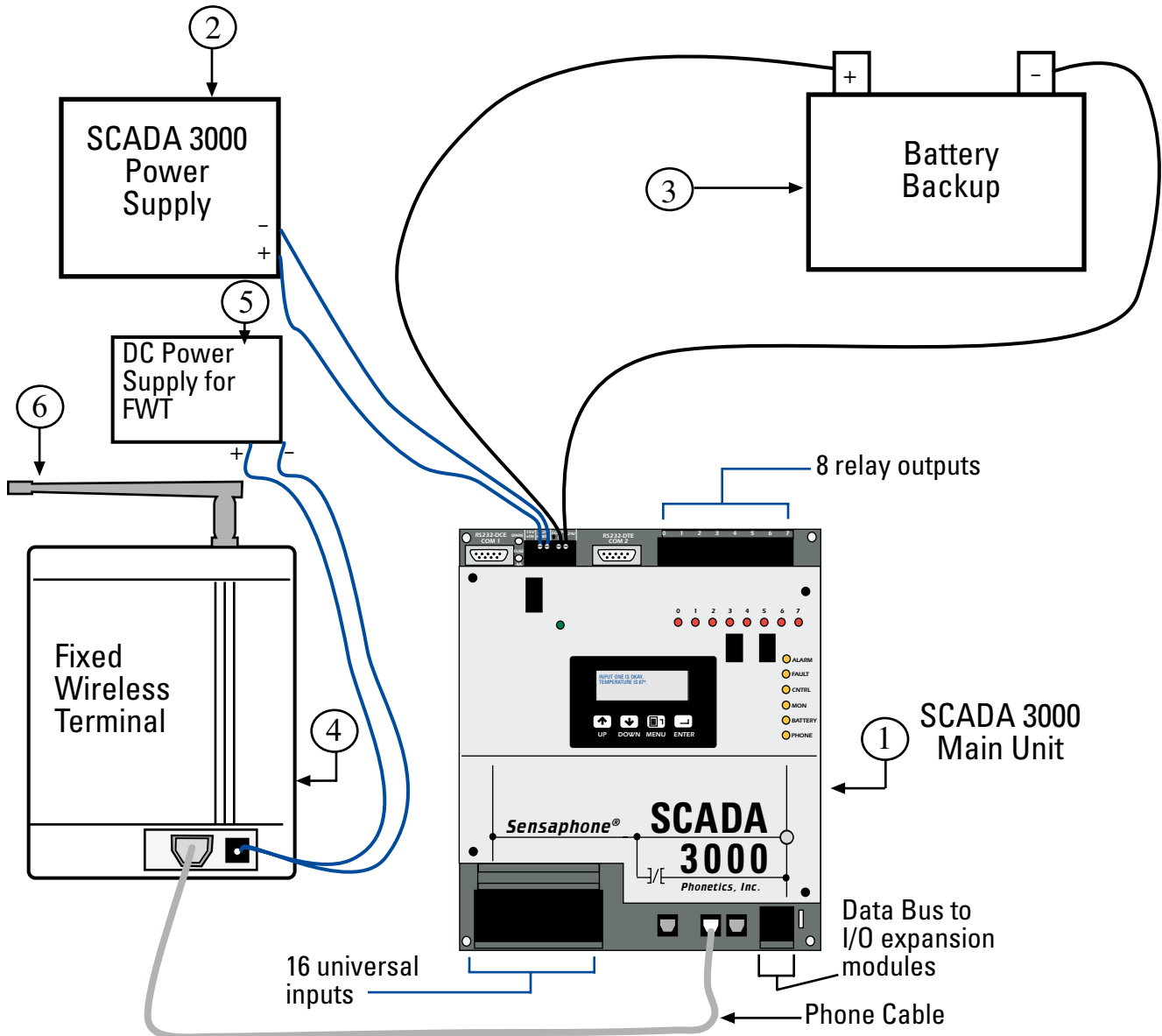# using a cellular telephone

The purpose of this bulletin is to give the designer or user a general idea of the equipment required for a typical application. It is not intended to be an engineering specification.

SCADA 3000 Remote Site using a Cellular Phone

8 relay outputs

SCADA 3000 Main Unit

Data Bus to I/O expansion modules

Phone Cable

16 universal inputs

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***SENSAPHONE*®** SCADA 3000 APPLICATION SUPPORT BULLETIN
SUBJECT
Equipment required for typical SCADA 3000 remote site using a cellular telephone

Bill of Materials (item numbers from page 2)

① SCADA 3000 RTU

Includes 16 universal inputs and 8 relay outputs. If more I/O is needed, you may add up to 15 SCADA 3000 expansion modules.

Phonetics Part # FGD-3000

For SCADA 3000 to communicate using a telephone line at least one of the following modules is required:

> Phonetics Part # FGD-3400: Modem module for RTU. Adds 33.6Kbps modem for phone line data communications. Enables the RTU to communicate via modem with PC's, alphanumeric pagers, fax machines, and e-mail addresses.

> Phonetics Part # FGD-3500: Voice module for RTU. Adds custom voice capability over standard phone lines. Enables the RTU to provide voice dial-out alarms and call-in status reports containing user-recorded descriptive voice messages.

② SCADA 3000 DC power supply

This device supplies 15V DC to power the SCADA 3000 RTU and any I/O expansion modules. Phonetics offers two power supplies as accessories.

> Phonetics Part # FGD-3100: Hard-wired power supply for 110V or 220V operation. The 110V or 220V source voltage must be hard-wired to the screw terminals on this power supply.

> Phonetics Part # FGD-3110: Plug-in power supply for 110V operation. Plugs into a standard 110V outlet receptacle.

Notes on powering the SCADA 3000:

SCADA 3000 is designed to be powered from a 10-15V DC power supply (15V required to charge an external battery). This wide operating voltage permits the unit to be powered from 12V solar cells in truly remote applications. However, most applications will have 120VAC available and we recommend using one of the 15VDC power supplies listed above.

③ Backup Battery (optional)

In the event of a power failure, SCADA 3000 can continue to operate if connected to a sealed lead-acid gel-cell rechargeable battery. Phonetics offers two battery kits as accessories.

> Phonetics Part # FGD-3200: Standard 5AH Battery & Mounting Kit.
> Dimensions: 3.54" x 2.76" x 4.02"
> Provides 12-20 hours of backup time for the SCADA 3000 main RTU and up to 2 I/O expansion modules.

> Phonetics Part # FGD-3210: Extended 17AH Battery & Mounting Kit.
> Dimensions: 7.13" x 3.00" x 6.58"
> Provides over 24 hours of backup time for the SCADA 3000 main RTU and up to 4 I/O expansion modules.

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④ **Fixed Wireless Phone Terminal (Cellular Phone)**

The Fixed Wireless Terminal (FWT) is essentially a specially packaged analog cell phone with no display or handset. The FWT unit is designed specifically for sites where land lines are unavailable or impractical, and is a great match for any Sensaphone product.

The FWT has a standard RJ-11 phone jack that is connected to the PHONE LINE jack on the SCADA 3000. The SCADA 3000 is presented with a standard dial tone, causing the unit to "believe" it's making a regular telephone call. Like any other wireless phone, a service account must be established and the FWT must be programmed to operate on the local cellular network.

Wireless service activation note: When wireless service providers program new cell phones, they use personal computers with specific adapter cables to connect to programming ports on the phones. Programming and account data is then downloaded into the phone. The Telular SX3e FWT used by Phonetics and recommended in its application note has no such programming port. This may confuse your local cellular service provider—it certainly confused ours. The SX3e is programmed by entering touch-tone commands with a standard telephone (like the one in your home). The SX3e owner's manual documents this procedure thoroughly.

⑤ **DC Power Supply for Fixed Wireless Terminal**

The Telular SX3e FWT runs on 10.5-15VDC. You must select a power source for the FWT that will be able to supply enough current during peak operation. The SX3e Fixed Wireless Terminal dissipates 25 Watts (2.5 Amps @ 12VDC) peak and 6 Watts (0.5 Amps @ 12VDC) when in standby mode.

Note that there are already several sources of DC power available at the SCADA 3000.

> a) +15V IN terminals on the SCADA 3000

> This is the same DC source that powers the SCADA 3000 main unit. If you power the FWT unit from this source, you must add the current draw of the SCADA 3000 and any I/O expansion modules to the current draw of the FWT and take care not to overload the power supply. Also note that this source is NOT battery-backed. If there is a power failure, cellular telephone service to the site goes down.

> b) AUX PWR terminals on the SCADA 3000

> This DC source is generated by the SCADA 3000 main unit and is meant to power SCADA 3000 I/O expansion modules. This is a good source of power for the FWT provided you don't have more than 2 or 3 I/O expansion modules attached. Check the current draw of the FWT and take care not to overload the power supply. Also, this source IS battery-backed. This means, if there's a power failure, the cell phone link to the site WON'T go down.

If you're using the SCADA 3000 with many I/O expansion modules, the current power supply may not be able to provide enough additional power for the Fixed Wireless Phone Terminal. In this case, a separate DC power supply is required.

To use the SCADA 3000 main unit as the DC power source for the Telular FWT, the following cable assembly is required:

> Phonetics Part # ASY-????: Fixed Wireless Terminal DC Power cable assembly for SCADA 3000.

If a separate DC power supply is not required for the FWT, the following power supply is available from Phonetics.

> Phonetics Part # FGD-????: 12VDC power supply for Fixed Wireless Terminal.

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⑥ Antenna

When choosing and installing an antenna for a cellular telephone site, there are two important factors to consider: The type of phone call being made (voice or modem) and the strength of the cellular signal available at the SCADA site.

For a voice call, the cellular signal doesn't have to be as strong. The voice message will probably still be understood by the person receiving the call, but the transmission may sound scratchy or noisy.

For modem calls, a strong signal is essential. Scratchy or noisy telephone connections will cause problems. There could be data transmission errors, dropped data packets, and if the connection is bad enough, the modems won't be able to stay connected and the call could be terminated.

Antennas focus and absorb radio energy in specific directions, depending on how they're designed. Omnidirectional or spike antennas transmit radio energy in all directions. They are inexpensive and provide good performance for sites that aren't very remote and have a strong cellular signal available.

High-Gain directional or "YAGI" antennas focus radio energy in a single direction. They are recommended if the available cellular signal is weak, or if the SCADA 3000 will be making modem calls requiring reliable data communications. YAGI antennas must be directed at your service provider's nearest cell tower. If you don't know the location of the nearest tower, check the signal strength indicator LED on the front of the SX3e Fixed Wireless Terminal.

RED = No Service

YELLOW = Moderate Signal

GREEN = Good Signal

Many things can obstruct the cellular signal, and moving the antenna as little as 3 feet can dramatically improve signal strength and call reception.

For best cellular communication results, mount the antenna outdoors, above ground, and as high as possible.

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