# Paradox Communicator Module
# GPRS Edition
# PCS100 V1.6


## Installation and User Manual

PARADOX®
SECURITY SYSTEMS

# Warranty

For complete warranty information on this product please refer to the Limited Warranty Statement found on the website www.paradox.com/terms. Your use of the Paradox product signifies your acceptance of all warranty terms and conditions.

# Patents

One or more of the following US patents may apply: 7046142, 6215399, 6111256, 6104319, 5920259, 5886632, 5721542, 5287111, 5119069, 5077549 and RE39406. Canadian and international patents may also apply.

INCLUDED ITEMS

- PCS100 Communicator Module
- Metal box
- Antenna
- Serial cable

IMPORTANT BEFORE STARTING

- Requires active SIM Card (sold by your GSM network provider)

OPTIONAL ACCESSORIES

**Antenna Extension:** An antenna extension can be used if the reception at the PCS100 installation location is not satisfactory. The use of antenna extensions greater than 7m (24ft) can cause a loss of signal quality between the antenna and the PCS100 module. Signal loss is proportionate to the length of the antenna extension. Try to locate the best antenna location while using the shortest possible extension to avoid losing signal quality. Refer to page 8 for antenna connection information. The following is a list of available antenna extensions'.

EXT2: 2m(6ft) EXT15: 14.5m(48ft)
EXT4: 4m(12ft) EXT18: 18m(60ft)
EXT7: 7m(24ft)

**12 Vdc External Power Supply:** The PCS100 is designed to be powered by the control panel. However, if you want the PCS100 to function even if the control panel's battery is low, or if power failures are anticipated, an external power supply with a backup battery (such as the PS-817, sold separately) is highly recommended. Also, the current draw increases as the signal quality diminishes. If the signal strength is weak, the PCS100 will use more power during transmission. Refer to page 6 for power supply connection information.

# Table of Contents

# Chapter 1
# Product Overview

The PCS100 Communicator Module provides Paradox control panels with wireless communication capabilities to report system events to a monitoring station and remotely upload/download with WinLoad software via GPRS. All of this is achieved through proprietary communication via simple 4-wire serial connection between the control panel and the PCS100 module.

- **Upload/Download via GPRS:** The PCS100 provides fast upload/download via a GPRS connection. GPRS allows internet communications through a GSM (cell phone) network at data rates of up to 38.8 Kbit/s. Refer to Chapter 3 “Configuring the PCS100 Module” on page 11.

- **GPRS Reporting:** Control panels with a PCS100 module can report system events to a monitoring station via GPRS. Refer to Chapter 3 “Configuring the PCS100 Module” on page 11.

- **Control panel communication supervision:** The PCS100 will report to the monitoring station should there be a loss of communication with the control panel. Refer to Chapter 6 “Supervision Options” on page 34.

- **GSM RF jamming detection:** When detected, the control panel will generate a trouble as well as report it to the monitoring station. Refer to Chapter 6 “Supervision Options” on page 34.

- **In-field upgradeable:** The PCS100 is in-field firmware upgradeable. The firmware upgrade can be conducted remotely using the WinLoad software or upgraded directly on-site. Refer to Chapter 5 “Upgrading the Firmware” on page 31.

- **Simple installation:** The PCS100 can be installed with a simple 4-wire serial connection up to 2m (8ft) from the panel. The module antenna can be installed up to 18m (60ft) from the module using optional antenna cable extensions depending on the local signal strength. Refer to Chapter 2 “Installation” on page 5.

## Technical Specifications

| | |
|---|---|
| Compatibility | EVO48 and EVO192 control panels V2.02 with EVO641 and EVO641R keypads V1.51 or higher<br>SP Series control panels V3.42 with K32LCD keypads V1.21.<br>E65 control panels V2.1 (labels must be programmed using WinLoad)<br><br>Visit the paradox.com website for updated information. |
| Output power | Class 4 (2W) @ 850 / 900 MHz |
| | Class 2 (1W) @ 1800 / 1900 MHz |
| Antenna bandwidth: | 70 / 80 / 140 / 170 MHz<br>Automatic band detection (refer to “Frequency Bandwidth Selection” on page 9) |
| Antenna | Gain < 3dBi; impedance 50 ohm; input power > 2W peak power |
| Power input | 12Vdc (from control panel or external power supply, refer to “Step 3: Connections” on page 6 for additional information) |
| Current consumption | Typical 400mA (max. 1A during transmission) |
| Dimensions | 18cm x 13.5cm x 4cm (7in x 5.25in x 1.6in) |
| Operating temperature | 0 to 50°C (32 to 122°F) |
| Data encryption | 128-bit (MD5 and RC4) or 256-bit (AES) |
| SMS protocol | 8-bit (“IRA” ITU-T.50) - or 16-bit (“UCS2” ISO/IEC10646) |

# Chapter 2
# Installation

This chapter describes the basic hardware installation steps.

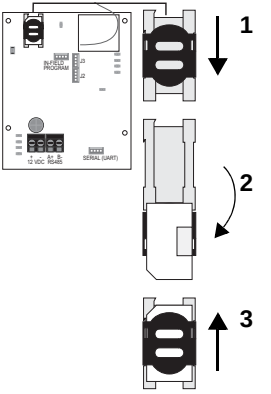


## Step 1: Preparing the Installation

Open the metal box, then remove the screws holding the PCB in place to facilitate wire connection.

## Step 2: Insert the active SIM Card

The SIM card contains all information concerning your cell phone account. It is sold by GSM network provider that support GSM. To activate your SIM card, contact your GSM network provider.




***Open the SIM card tray slowly to avoid damage to the tray.***

*Note: The International Mobile Equipment Identity (IMEI) number is located on the white sticker placed next to the antenna connection on the PCS100 board.*

1. Slide the SIM card tray towards the bottom of the board to unlock it.
2. Flip the SIM card tray open then insert the SIM card in the tray with the cut-off corner at the bottom left.
3. Close the SIM card tray; the cut-off corner should be in the top left. Slide the SIM card tray up to lock it into place.

# Step 3: Connections

The PCS100 is connected from the In-Field connector directly to the control panel using a serial cable, as shown in Figure 2 on page 7. The connection to the PCS100 GPRS editor is different from the connection used with the GSM edition.

### External Power Supply

The PCS100 is designed to be powered by the control panel via the serial cable. However, if you want the PCS100 to function even if the control panel's battery is low, or if power failures are anticipated, an external power supply with a backup battery (such as the PS817) is highly recommended. The optional external power supply connection is also explained in the connection diagram on page 7.

*Note: The current draw increases as the signal quality diminishes; if the signal strength is weak, the PCS100 will use more power during transmission.*

### Connection with External Power Supply

If your PCS100 is powered by an external power supply such as the PS817, the serial cable's wires need to be modified prior to connection onto the PCS100 Module and the control panel. This modification is necessary to maintain proper voltage readings on the control panel.

### Serial Cable Modifications

1. Ensure that one end of the serial cable's white wire is cut prior to connecting it to the PCS100's In-Field Program connector.
2. Connect the other end directly to the control panel's Serial connector.

**Figure 1: Serial Cable Modifications**

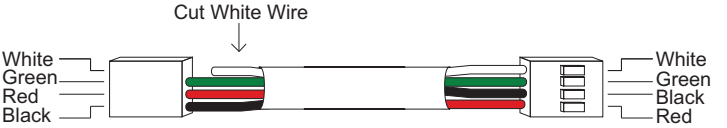
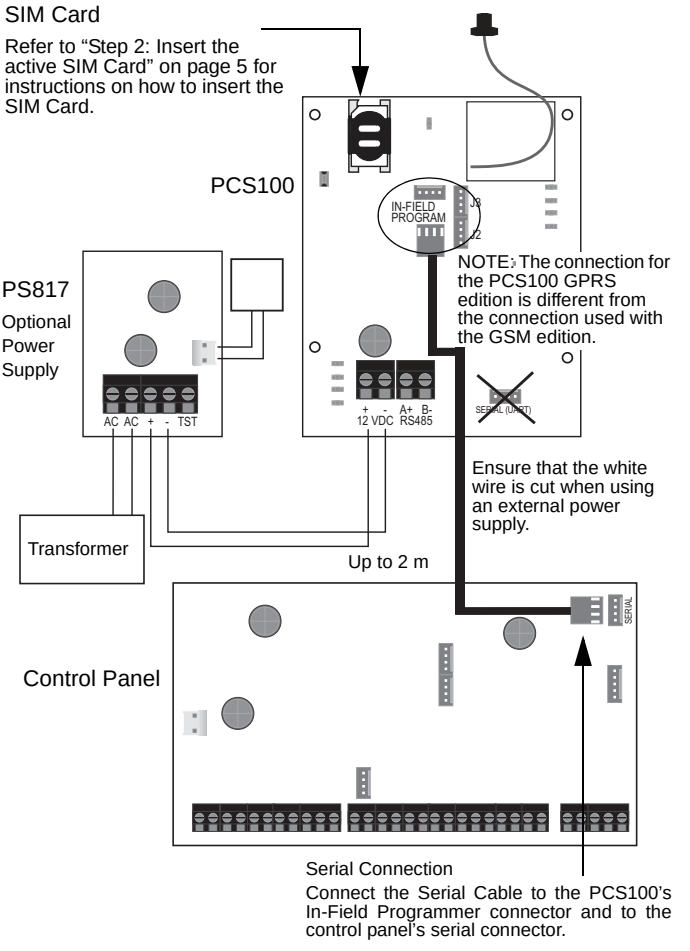


**Figure 2: GPRS Serial Connection**

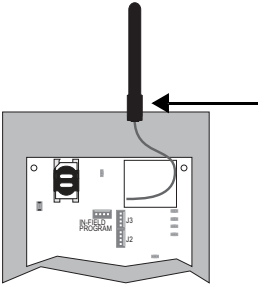


## Step 4: Mounting the Metal Box

Mount the metal box as far away as possible from any electronic equipment and as high as possible to ensure protection from interference and to maximize the signal quality.

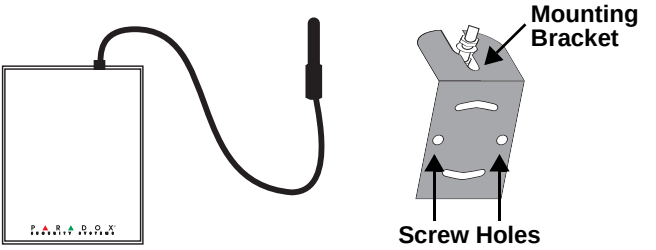
## Step 5: Connect the Antenna

The antenna connects to the antenna cable connector located on the PCS100's PCB. The antenna cable's connector is outside of the metal box.




**Antenna Extension (Optional)**

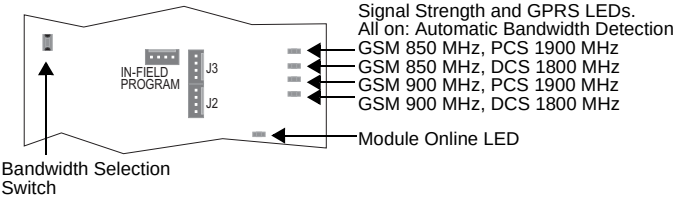
Antenna extensions are available to improve reception by moving the antenna. Refer to "Optional Materials" on the inside cover for the list of extensions. The antenna extension is sold with a wall mounting bracket. Insert the antenna extension in the bracket until it snaps in and mount the bracket to the wall using the two screw holes.



## Frequency Bandwidth Selection

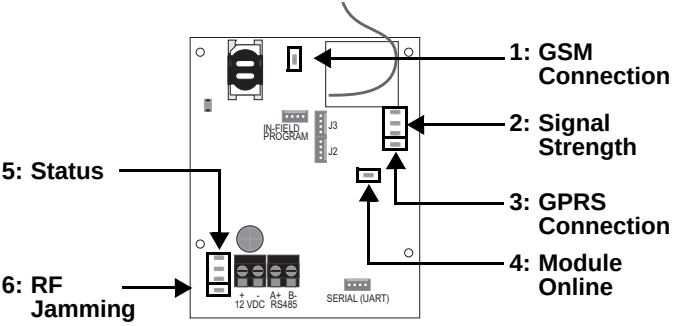
The PCS100 automatically detects the bandwidth that must be used for GSM communications. If you wish to manually select the bandwidth:

1. Press and hold the bandwidth selection switch for 10 seconds. The Module Online LED will flash rapidly.
2. The Signal Strength and GPRS LEDs will light up to indicate the bandwidth.




3. Press the bandwidth selection switch to change between automatic band detection and specific bandwidths.
4. Press and hold the bandwidth selection switch for at least 5 seconds until the module reboots (the selections will be saved and all 4 LEDs will turn off during the reboot process). If the bandwidth selection switch is not pressed for more than 5 seconds, the module will exit bandwidth selection mode without saving any changes.

## LED Status Display




| | |
|---|---|
| 1 | **GSM Connection (Green)**<br>Flashes once every 3 seconds: Connected to GSM network<br>Flashes every second: Not connected to GSM network |
| 2 | **Signal Strength Indicators (Green)**<br>These LEDs indicate the quality of the GSM Signal. 1 LED lit indicates a weak signal, 3 LEDs indicate a strong signal. |
| 3 | **GPRS Connection Status (Green)**<br>On: Communication enabled<br>Flashes: Communication in progress |
| 4 | **Module Online LED (Green)**<br>Flash once every second = Normal operation<br>Slow Flash:<br>With GSM Connection LED flashing = No SIM card inserted<br>With GSM Connection LED off = On-board GSM power supply failure |
| 5 | **Status LEDs**<br>Error (Red): Lights up to indicate problems with the communications with the control panel<br>RX (Green): Flashes when receiving information from the panel<br>TX (Green): Flashes when transmitting information to the panel |
| 6 | **RF Jamming (Red)**<br>On: Indicates jamming of the GSM network communications |

# Chapter 3
# Configuring the PCS100 Module

The following sections describe how to configure the PCS100 module for WinLoad access via GPRS, GPRS reporting, and how to program and register the control panel to the monitoring station.

This chapter describes the configuration steps for the PCS100 module.



## Step 1: Connecting to the GPRS Network

To connect the PCS100 Module to the GPRS network, certain registration parameters must be set (supplied by your GSM network provider). These parameters include:

- Access Point Name (APN)
- APN User Name
- APN Password

*Note: The Access Point Name, APN User Name and APN password are determined by your GSM network provider; contact them to get that information.*

### GSM Network Provider Information

To begin the configuration of your GSM network provider information, enter the section required for your control panel, as detailed below.

*Note: When entering into GSM network provider information sections, the LCD screen of the control panel's keypad will display "Messages".*

**Access Point Name (APN)**

This information can be obtained from your GSM network provider. For APNs over 16 characters, use the second section to enter characters 17 to 32.
Default: Blank

APN Part 1 (Characters 1 to 16)
Digiplex EVO Section **[2960]**
SP Series / E65 Section **[921]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _

*Note: Use the numeric keys on the control panel's keypad to enter letters.*

*APN Part 2 (Characters 17 to 32)*
Digiplex EVO Section **[2961]**
SP Series E65 Section **[922]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _
Example: wap.provider.com

*Note: Refer to "Entering Special Characters" on page 44 for information on how to enter characters and special characters. It is possible to program the PCS100 with any compatible keypad, refer to "Technical Specifications" on page 4 for more information. To enter text without a K32LCD when programming with an SP Series or E65, use WinLoad.*

**APN User Name**

This information can be obtained from your GSM network provider. For user names over 16 characters, use the second section to enter characters 17 to 32.
Default: Blank

User Name Part 1 (Characters 1 to 16)
Digiplex EVO Section **[2962]**
SP Series / E65 Section **[923]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _

User Name Part 2 (Characters 17 to 32)
Digiplex EVO Section **[2963]**
SP Series / E65 Section **[924]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _

Example: user

**APN Password**

This information can be obtained from your GSM network provider. For passwords over 16 characters, use the second section to enter characters 17 to 32.
Default: Blank

Password Part 1 (Characters 1 to 16)
Digiplex EVO Section **[2964]**
SP Series / E65 Section **[925]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _

Password Part 2 (Characters 17 to 32)
Digiplex EVO Section **[2965]**
SP Series / E65 Section **[926]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _
Example: password

# Step 2: Configuring WinLoad Access

The PCS100 provides remote access for upload and download with WinLoad via a GPRS connection at data rates of up to 38.8 Kbit/s. The following site specific information must be configured for WinLoad access.

## Site Specific Information

The following information is determined by the installer and is specific to the installation site.

**Software Port**

The Software Port must match the port entered in the WinLoad or NEware software's GPRS Connection Settings for that site's account. This is the port that the module will listen on for incoming GPRS communication.

Default: 10000

Port
Digiplex EVO Section **[2966]**
SP Series / E65 Section **[920]**
_ / _ / _ / _ / _

**Installer Software Password**

The Installer Software Password is used to access installer software through TCP/IP and GPRS networks. The password is case sensitive. This password is entered in WinLoad's GPRS Connection Settings for that site's account.

Default: admin

WinLoad TCP/IP/GPRS Password (default "admin")
Digiplex EVO Section **[3013]**
SP Series / E65 Section **[927]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _

## Step 3: Programming and Registering the Control Panel for GPRS Reporting

Control panels with a PCS100 module can report system events to a monitoring station over an IP network. The process of setting up reporting through a PCS100 is similar to that of standard telephone reporting, however the PCS100 module must first be registered with IP receivers located at the monitoring station.
Before registering the PCS100, the following information must be obtained from the monitoring station:

- Account number(s) - One account number for each partition used. IP/GPRS reporting uses a different set of account numbers than those used for dialer reporting. The specific section numbers for the IP/GPRS Account Numbers are listed in this document.
- IP address(es) - The IP address(es) indicates which of the monitoring station's IP receivers will be used for IP reporting. The IP address is a 12-digit number for e.g. 195.4.8.250 must be entered as 195.004.008.250.
- IP port(s) - The IP port refers to the port used by the monitoring station's IP Receiver. The IP port is a 5-digit number. For 4-digit numbers, enter 0 before the first digit.
- Receiver password(s) - The receiver password is used to encrypt the PCS100 registration process. The Receiver password can be up to 32-digits.
- Security profile(s) - The security profile indicates how frequently the monitoring station is polled by the PCS100. Security profile numbers and polling frequency are defined by the monitoring station. The security profile is a 2-digit number.

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# DIGIPLEX EVO

This section provides you with the minimum requirements to set up GPRS reporting with your PCS100 module.

### Setting up a PCS100 Module and Registering with a Monitoring Station

1. Ensure that the panel's report code format is set to either Ademco Contact ID (default) or SIA (refer to section **[3070]** in the control panel's programming guide). The settings, event call direction, and reporting formats will be shared by the telephone reporting and IP reporting. Telephone number 1 will share settings with IP Receiver

1, telephone number 2 with IP receiver 2, telephone number 3 with IP receiver 3 and telephone number 4 with IP receiver 4.

2. If the PCS100 module is not already connected, connect the PCS100 as described in “Step 3: Connections” on page 6.

3. Enter the account numbers (one for each partition). The account numbers are used to register the PCS100 to the IPR512 Receiver.

   *Note: To enter letters A-F, use the function keys on the control panel's keypad. For more information, refer to the control panel's programming guide.*

| Section | Data | Description |
|---|---|---|
| **[2976]** | ___/___/___/___ | IP/GPRS Reporting Partition 1 / Account 1 number |
| **[2977]** | ___/___/___/___ | IP/GPRS Reporting Partition 2 / Account 2 number |
| **[2978]** | ___/___/___/___ | IP/GPRS Reporting Partition 3 / Account 3 number |
| **[2979]** | ___/___/___/___ | IP/GPRS Reporting Partition 4 / Account 4 number |
| **[2980]** | ___/___/___/___ | IP/GPRS Reporting Partition 5 / Account 5 number |
| **[2981]** | ___/___/___/___ | IP/GPRS Reporting Partition 6 / Account 6 number |
| **[2982]** | ___/___/___/___ | IP/GPRS Reporting Partition 7 / Account 7 number |
| **[2983]** | ___/___/___/___ | IP/GPRS Reporting Partition 8 / Account 8 number |

4. Ensure IP reporting is enabled in section **[2975]**, option **[8]**:

| **[2975]** | | OFF | ON |
|---|---|---|---|
| **[7]** | Use dialer reporting (telephone) | ☐ **As backup for IP/GPRS reporting** | ☐ In addition to IP/GPRS reporting |
| **[8]** | IP/GPRS reporting | ☐ Disabled | ☐ **Enabled** |

5. Enter the monitoring station's IP address(es), IP port(s), receiver password(s), and security profile(s):
   Use the up and down arrow to navigate in the displays. The data is saved every time a new page is accessed.

.

**Receiver 1**

**[2984]** __/__/__. __/__/__. __/__/__. __/__/__
WAN1 IP address

__/__/__/__/__
WAN1 IP port (default: 10000)

*NOTE: For 1- or 2-digit numbers, add "0"s before the digit(s) e.g. 138.002.043.006*

__/__/__. __/__/__. __/__/__. __/__/__
WAN2 IP address

__/__/__/__/__
WAN2 IP port (default: 10000)

__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password
NOTE: **[MEM]** = blank space

__/__
Security profile

*Note: The IPR512 Monitoring Receiver provides two ethernet ports for Internet Service Provider (ISP) redundancy. If you wish to use this feature, configure the WAN ports through two different Internet Service Providers. For more information on how to configure the WAN Ports, refer to the "IPR512 Monitoring Receiver" document.*

**Receiver 2**

**[2986]** __/__/__. __/__/__. __/__/__. __/__/__
WAN1 IP address
__/__/__/__/__
WAN1 IP port (default: 10000)
__/__/__. __/__/__. __/__/__. __/__/__
WAN2 IP address
__/__/__/__/__
WAN2 IP port (default: 10000)
__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password
__/__
Security profile

**Receiver 3**

**[2988]** __/__/__. __/__/__. __/__/__. __/__/__
WAN1 IP address
__/__/__/__/__
IP port (default: 10000)
__/__/__. __/__/__. __/__/__. __/__/__
WAN2 IP address
__/__/__/__/__
WAN2 IP port (default: 10000)
__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password
__/__
Security profile

**Receiver 4**

**[2990]** __/__/__. __/__/__. __/__/__. __/__/__
WAN1 IP address
__/__/__/__/__
WAN1 IP port (default: 10000)
__/__/__. __/__/__. __/__/__. __/__/__
WAN2 IP address
__/__/__/__/__
WAN2 IP port (default: 10000)
__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password
__/__
Security profile

6. Register the PCS100 module with the monitoring station.
The following sections also displays IP Receiver registration status and any registration errors. If a registration error occurs, use the arrows keys and scroll to see the type of trouble.

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**Receiver 1**

**[2985]** To register IP/GPRS Module, press **[ARM]**.

**Receiver 2**

**[2987]** To register IP/GPRS Module, press **[ARM]**.

**Receiver 3**

**[2989]** To register IP/GPRS Module, press **[ARM]**.

**Receiver 4**

**[2991]** To register IP/GPRS Module, press **[ARM]**.

Once the module has been successfully registered, the keypad's LCD screen will display the message "Registered". To ensure that GPRS has been set up, verify the GPRS connection status LED. For more information, refer to "LED Status Display" on page 10.

**The following sections and options have been added to support the IP Receiver (IPR512):**

- **New IP Troubles**

| Trouble Group | Trouble |
|---|---|
| **[9]** | **[5]** Fail to communicate with IP receiver 1<br>**[6]** Fail to communicate with IP receiver 2<br>**[7]** Fail to communicate with IP receiver 3<br>**[8]** Fail to communicate with IP receiver 4<br>**[9]** IP Receiver Unregistered |

- **New GPRS PGM Events**

| Event Group | Event | Feature Group | Feature | Start | End |
|---|---|---|---|---|---|
| 004 | Non-reportable Event | 000 | IPR512 1 Registration Status | 021 | 021 |
| | | | IPR512 2 Registration Status | 022 | 022 |
| | | | IPR512 3 Registration Status | 023 | 023 |
| | | | IPR512 4 Registration Status | 024 | 024 |
| 038 | Module Trouble | 001 | Fail to Com. IPR512 1 | 004 | 004 |
| | | | Fail to Com. IPR512 2 | 005 | 005 |
| | | | Fail to Com. IPR512 3 | 006 | 006 |
| | | | Fail to Com. IPR512 4 | 007 | 007 |
| 039 | Module Trouble Restore | 001 | Fail to Com. IPR512 1 | 004 | 004 |
| | | | Fail to Com. IPR512 2 | 005 | 005 |
| | | | Fail to Com. IPR512 3 | 006 | 006 |
| | | | Fail to Com. IPR512 4 | 007 | 007 |

- **New PCS100 Report Codes**

| Section | | |
|---|---|---|
| **[2969]** | ____/____ | Fail to Com. IPR512 1 |
| | ____/____ | Fail to Com. IPR512 1 Restore |
| | ____/____ | Fail to Com. IPR512 2 |
| | ____/____ | Fail to Com. IPR512 2 Restore |
| **[2970]** | ____/____ | Fail to Com. IPR512 3 |
| | ____/____ | Fail to Com. IPR512 3 Restore |
| | ____/____ | Fail to Com. IPR512 4 |
| | ____/____ | Fail to Com. IPR512 4 Restore |
| | ____/____ | Fail to Com. IPR512 4 |
| | ____/____ | Fail to Com. IPR512 4 Restore |

# SP SERIES / E65

This section provides you with the minimum requirements to set up GPRS reporting with your PCS100 module.

### Setting up a PCS100 Module and Registering with a Monitoring Station

1. Ensure that the panel's report code format is set to either Ademco Contact ID (default) or SIA (refer to section **[810]** in the control panel's programming guide). The settings, event call direction, and reporting formats will be shared by the telephone reporting and IP reporting. Telephone number 1 will share settings with IP Receiver 1, telephone number 2 with IP receiver 2.
2. If the PCS100 Module is not already connected, connect the PCS100 as described in "Step 3: Connections" on page 6.

3. Enter the account numbers (one for each partition). The account numbers are used to register the PCS100 to the IPR512 Receiver.

   *Note: To enter letters A-F, use the function keys on the control panel's keypad. For more information, refer to the control panel's programming guide..*

| Section | Data | Description |
|---|---|---|
| **[918]** | ___/___/___/___ | GPRS Reporting Partition 1 / Account 1 number |
| **[919]** | ___/___/___/___ | GPRS Reporting Partition 2 / Account 2 number |

4. Ensure IP reporting is enabled in section **[806]** option **[8]:**

| **[806]** | | OFF | ON |
|---|---|---|---|
| **[7]** | Use dialer reporting (telephone) | ☐ **As backup for IP reporting** | ☐ In addition to IP reporting |
| **[8]** | IP reporting | ☐ Disabled | ☐ **Enabled** |

5. Enter the monitoring station's IP address(es), IP port(s), receiver password(s), and security profile(s):
   Use the up and down arrow to navigate in the displays. The data is saved every time a new page is accessed.

**Receiver 1**

**[929]** __/__/__. __/__/__. __/__/__. __/__/__
IP address

*NOTE: For 1- or 2-digit numbers, add "0"s before the digit(s) e.g. 138.002.043.006*

**[930]** __/__/__/__/__
IP port (default: 10000)

**[933]** __/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password

*NOTE: **[MEM]** = blank space*

**[934]** __/__
Security profile

**Receiver 2**

**[936]** __/__/__. __/__/__. __/__/__. __/__/__
IP address

**[937]** __/__/__/__/__
IP port (default: 10000)

**[940]** __/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password

**[941]** __/__
Security profile

**Receiver 3**

**[943]** __/__/__. __/__/__. __/__/__. __/__/__
IP address

**[944]** __/__/__/__/__
IP port (default: 10000)

**[947]** __/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__/__
Receiver password

**[948]** __/__
Security profile

6. Register the PCS100 module with the monitoring station.
The following sections also displays IP Receiver registration status and any registration errors. If a registration error occurs, use the arrows keys and scroll to see the type of trouble.

**Receiver 1**

**[935]** To register GPRS Module, press **[ARM]**.

**Receiver 2**

**[942]** To register GPRS Module, press **[ARM]**.

**Receiver 3**

**[949]** To register GPRS Module, press **[ARM]**.

Once the module has been successfully registered, the keypad's LCD screen will display the message "Registered". To ensure that GPRS has been set up, verify the GPRS connection status LED. For more information, refer to "LED Status Display" on page 10.

The following sections and options been added to support the IP Receiver (IPR512):

- **New IP Troubles**

| Trouble Group | Trouble |
|---|---|
| **[4]** Communication Trouble | **[7]** Fail to communicate with IP Receiver 1 or 2 (GPRS)<br>**[9]** GSM Network Failure<br>**[STAY]** GSM RF Interference<br>**[OFF]** IP Receiver Unregistered (IP/GPRS) |

| Trouble Group | Trouble |
|---|---|
| **[10]** Module supervision loss | **[9]** GSM Module |

- **New IP PGM Events**

| Event Group | Event | Feature Group | Feature |
|---|---|---|---|
| 44 | Non-reportable Event New Trouble | 26 | GPRS Registration Status |
| | New Trouble | 16 | Failure to communicate with IP Receiver 1 (GPRS) |
| | New Trouble | 17 | Failure to communicate with IP Receiver 2 (GPRS) |
| 45 | Trouble Restore | 16 | Failure to communicate restore with IP Receiver 1 (GPRS) |
| | | 17 | Failure to communicate restore with IP Receiver 2 (GPRS) |

- **New IP Receiver Report Codes**

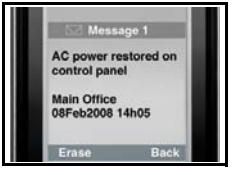
| Section | | |
|---|---|---|
| **[879]** | ____/____ | GSM RF Jam |
| | ____/____ | GSM No Service |
| | ____/____ | GSM Module Supervision Lost |
| | ____/____ | GPRS Receiver Failure to communicate |
| **[881]** | ____/____ | GSM RF Jam Restore |
| | ____/____ | GSM No Service Restore |
| | ____/____ | GSM Module Supervision Restore |
| | ____/____ | IP Receiver Failure to communicate restore (GPRS) |

# Chapter 4
# Text Message (SMS) Notification

In addition to reporting control panel events via a GSM cell phone network through GPRS, the PCS100 can also send text messages (SMS) to the end user on up to 16 cell phones. The PCS100 can send text messages for any control panel event due to its proprietary communication through the panel's serial port. Each text message contains a detailed description of the event including site name, date and time, and any associated labels, such as area, zone and serial number. The detailed description of each system event is pre-programmed and hardcoded into the PCS100 module.

Installer Programming:
- Select SMS Language
- Enter Site Name

Master (End-User) Programming:
- Set up to 16 cell phone numbers
- Assign areas per phone number
- Select event group per phone number
- View GSM IP information

# Text Message Language

Select the language that will be used by the PCS100 when reporting system events via text message (SMS).

### SMS Language

Digiplex EVO Section **[2953]**
SP Series / E65 Section **[856]**
_ / _ / _ (000 - 255)

Table 1: SMS Language

| Language | Value | Language | Value | Language | Value |
|---|---|---|---|---|---|
| English* | 000 | Turkish | 008 | Bulgarian | 016 |
| French | 001 | Hungarian | 009 | Romanian | 017 |
| Spanish | 002 | Czech | 010 | Slovak | 018 |
| Italian | 003 | Dutch | 011 | Chinese | 019 |
| Swedish | 004 | Croatian | 012 | Serbian | 020 |
| Polish | 005 | Greek | 013 | * Default value | |
| Portuguese | 006 | Hebrew | 014 | | |
| German | 007 | Russian | 015 | | |

***Some languages are not currently supported. If an unsupported language is selected messages will be sent in English. Some languages, like Hungarian or Romanian, will generate 2 SMS messages per event reported and other languages will use special LCD characters not supported on all cell phones. Refer to the paradox.com website for the list of languages that are supported, that generate 2 SMS messages or that use special characters.***

### Site Name

The site name will be included in every SMS notifications to indicate at what site the event was generated. (e.g., Paradox Headquarters).

*Note: Refer to page 38 for information on how to enter characters and special characters. It is possible to program the PCS100 with any compatible keypad. To enter text without a K32LCD when programming with an SP Series,* / E65 *use WinLoad.*

SMS Site Name
Digiplex EVO Section **[2954]**
SP Series / E65**[780]**
_ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ / _ /
Default: “Your Alarm Site”

# End User SMS Programming

With Master Programming, you can:

- Set which phone numbers (up to 8 with SP Series / E65 or 16 with Digiplex EVO) will receive text messages sent by the PCS100 to report system events.
- Select from which area the PCS100 will send text messages (per phone number).
- Select which event groups (alarm, arm/disarm, trouble and trouble restore) will generate text messages.

**End User SMS Programming with Digiplex EVO**

1. To access Master Programming, enter the control panel [MASTER CODE] then press [0].
2. Press [1] to enter the SMS settings menu.
3. Select which phone number you wish to program ([01] to [16]).
4. Enter or modify the phone number (up to 32 characters). To go to the next screen press [ENTER].
5. Select which partitions are enabled for that SMS number by enabling options [1] to [8]. Press [ENTER] to go to the next screen.
6. To select which events generate a SMS message, enable or disable options [1] to [4]. (see Table 2 on page 29)
7. To save press [ENTER].

After saving or in the main SMS settings menu press [▼] to see which SMS numbers ([01] to [16]) are programmed. To program the SMS number currently displayed, press [ACC].

**End User SMS Programming with SP Series / E65**

1. To access Master Programming, press the **[ ⏻ ]** key.
2. Enter **[MASTER CODE]**.
3. To enter SMS Setup, press **[ARM]**.
4. Using the [▲] and [▼]* or [STAY] keys, select one of the eight telephone number you wish to program and press **[ENTER]**.
   *With K10LEDV/H or K636 keypads, use [SLEEP] for [▲] and [STAY] for [▼].
5. Enter the telephone number and press **[ENTER]**.
6. Select the SMS Event Call Options (see Table 2 on page 29) you wish to apply to the telephone number
7. To save press **[ENTER]**.
8. Select which areas are assigned to this telephone number.
9. To save press **[ENTER]**.

Table 2: Event Call Options

| Option | Events that send SMS |
|---|---|
| [1] | Any Alarm (See Table 4 on page 38) |
| [2] | Arming and Disarming (See Table 5 on page 39) |
| [3] | Any Trouble (See Table 6 on page 40) |
| [4] | Any Trouble Restore (See Table 7 on page 41) |
| [5] to [8] | Future Use |

## View GSM IP Information

It is possible to view the following GSM IP information in Master Programming:

- IP Address: Access this to determine what IP address to enter in WinLoad or NEware's GPRS connection settings. The IP address is determined automatically when the PCS100 connects to the GSM network. In order to properly read the IP address assigned, the GPRS LED must be on.
- IP Port: Access this to determine what IP port to enter in WinLoad or NEware's GPRS connection settings. This is the port that the module will listen on for incoming GPRS communication. This port is programmed in section [2966] with Digiplex EVO or [920] with SP Series / E65.
- User PC Software Password: This password is needed to connect to the control panel using the NEware software. This password is determined in the NEware software.

**View GSM IP Information With Digiplex EVO**

1. To access Master Programming, enter the [MASTER CODE] then press [0].
2. In Master Programming, press [2] to display the PCS100's IP information.
3. The first screen displays the PCS100's IP Address, press [▼] to access the next screen.
4. The second screen displays the PCS100's IP Port. Press [▼] to access the third screen.
5. The third screen displays the PCS100 User PC Software Password. If you press [▼] again, the Exit Message will be displayed.

### Viewing GSM IP Information With Magellan Spectra SP and E65 Control Panels

To view IP Address, IP Port, and Site Name settings:

1. Press the **[ ⏻ ]** key.
2. Enter **[MASTER CODE]**.
3. To enter SMS Setup, press **[ARM]**.
4. Using the [▲] key, scroll up to **[9]** GSM IP Address and press **[ENTER]**. To return to the GSM menu, press **[ENTER]**.
5. Using the [▲] key, scroll up to **[10]** GSM IP Port and press **[ENTER]**. To return to the GSM menu, press **[ENTER]**.
6. Using the [▲] key, scroll up to **[11]** GSM PC Password (Future use). To return to the GSM menu, press **[ENTER]**.
7. Using the [▲] key, scroll up to **[12]** Site Name. To return to the GSM menu, press **[ENTER]**.
8. To exit the GSM menu, press **[CLEAR]**.

## Cancel SMS Communications

### Cancel SMS Communication With Digiplex EVO

To cancel all text messages notifications waiting to be sent, press [DISARM] on the keypad in Installer or Master programming.

### Cancel SMS Communication with SP Series / E65

To cancel all text messages notifications waiting to be sent, use the Installer Quick Menu

| Step | Action | Details |
|---|---|---|
| 1 | ⏻ + **[INSTALLER CODE]** | ⏻ = flash. **[MAINTENANCE CODE]** may also be used. |
| 2 | MEM | |
| 3 | [9] | Cancels all communication with WinLoad / GSM module. |

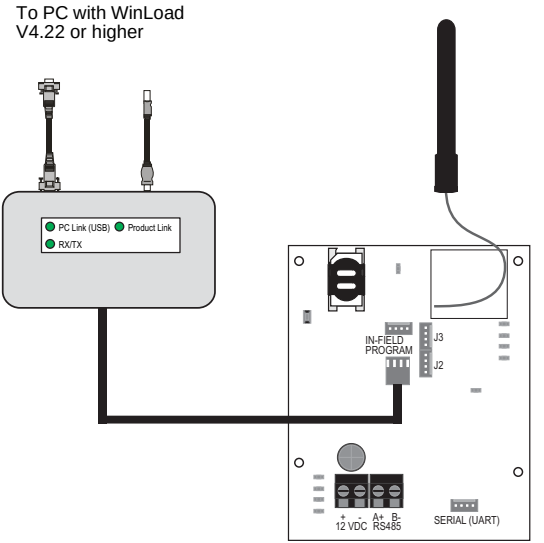
# Chapter 5
# Upgrading the Firmware

The PCS100 Module's firmware can be upgraded using the WinLoad software application. Firmware can be upgraded either on-site, where a physical connection is required to the PCS100 module or remotely via the GPRS network.

## On-Site Firmware Upgrade

To upgrade the firmware of the PCS100 module, connect a 307USB to the In-Field Program connector and to a PC with WinLoad. Start WinLoad and click on the "In-Field Firmware Programmer" button. Select the type of connection, select the product and the firmware then press "Start Transfer". For detailed firmware upgrade instructions, visit paradox.com (paradox.com > Software > Winload > Firmware Upgrade Instructions).

*Note: Ensure that the module is powered either by the panel or by the external power supply.*



## Remote Firmware Upgrade

The firmware of the PCS100 module can be upgraded remotely using the WinLoad software application via the GPRS network.

**To upgrade the firmware of the PCS100 module remotely**

1. Start WinLoad.
2. Enter your **Login Name** and **Password**.
3. Click on the **In-Field Firmware Programmer** button.
4. Select the type of connection.
5. Select the product and the firmware then press **Start Transfer**.

For detailed firmware upgrade instructions, go to www.paradox.com. (paradox.com > Software > WinLoad > Firmware Upgrade Instructions)

*Note: If you receive an error message, refer to “Trouble Connecting to the PCS100 Module” on page 36 for information on how to upgrade firmware on a PCS100 module that uses a private IP address.*

## IP Information

In order for WinLoad to establish a connection with the PCS100 module that you wish to upgrade, you must first know the module's IP address.

**To receive the IP address of the PCS100 Module via Text Message**

1. Using a cellular phone, enter the SMS text message using the below format.

   P[TCP/IP password].IP.[phone number to answer back]

   Example: Padmin.IP.5551231234

2. Wait until the PCS100 sends a response to the specified phone number displaying the IP address of the PCS100 Module.
3. Enter this information in the WinLoad application. The IP address can then be used to configure remote software access. For more information, refer to "Configuring the PCS100 Module" on page 11.

# Chapter 6
# Supervision Options

The PCS100 provides several supervision and protection options to ensure you or your monitoring station is notified of problems such as RF jamming, loss of GSM service or loss of communication with the control panel.

## GSM No Service Trouble Options

The PCS100 module verifies the presence of the GSM cell phone network approximately every 20 seconds. If it is lost, the panel can generate an alarm or trouble after the delay has elapsed (programmed in section **[2952]** or **[855]**). When the GSM Network connection is lost, the green GSM Connection LED will flash every second.

Table 3: GSM No Service Trouble Feedback

| Digiplex EVO Section **[2950]**; options **[5]** & **[6]**<br>SP Series / E65 Section **[805]**; options **[5]** & **[6]** | | |
|---|---|---|
| [5] | [6] | |
| OFF | OFF | Disabled |
| OFF | ON | When armed: Generates a trouble (default) |
| ON | OFF | When armed: Generates an audible alarm |
| ON | ON | Silent alarm becomes and audible alarm |

GSM No Service Timer
The delay before a GSM No Service trouble is reported.
Digiplex EVO Section **[2952]**
SP Series / E65 Section **[855]**
_ / _ / _ (000 - 255 x 2 seconds)
Default: 016 (32 seconds)

## GSM RF Jamming Supervision

This option determines if the control panel generates a trouble when RF Jamming on the GSM network is detected. This trouble can then be reported to the monitoring station. When RF Jamming is detected, the red RF Jamming LED will light up.
Digiplex EVO Section **[2950]** Option **[8]**
SP Series / E65 Section **[805]** Option **[8]**
ON: RF Jamming Supervision enabled (Default)
OFF: RF Jamming Supervision disabled

## Control Panel Supervision

Unique to Paradox, the PCS100 can supervise the presence of the control panel. If the communication with the control panel is lost, the PCS100 will send the report code programmed in section **[2951]** or **[884]**. When communication with the control panel is lost, the red Error LED will light up.

Reports are sent to Monitoring Station / Pager Telephone #1 using Account Number 1
Digiplex EVO Section **[2951]**
SP Series / E65 Section **[884]**
_ / _ Panel Supervision Lost (GSM)
_/ _ N/U
_/ _ N/U
_/ _ N/U

Default: FF

When this section is programmed with FF, the following report codes are sent:
With ContactID, the code is 551 (Dialer Disabled) with a 099 ID.
With SIA, the code is “IA” (Equipment failure condition) with a 099 ID.

# Chapter 7
# Private Networks

## Trouble Connecting to the PCS100 Module

WinLoad remote access for upload and download is supported by both public and private networks. If your SIM Card Provider belongs to a private network, you may have trouble connecting to the PCS100 module. If this is the case, it is possible that a private IP address has been assigned to your PCS100 module. To verify the IP address of your module, refer to “View GSM IP Information” on page 29.

*Note: Contact your local SIM card provider for more information regarding your provider’s network.*

If your SIM card provider is on a private network, communication to the PCS100 module must first be established via an SMS message. When the SMS message is sent to the PCS100 module, the PCS100 module will then initiate contact with WinLoad. Once communication is established, firmware upgrades, as well as, upload and download configurations, and system programming can begin.

*Note: Ensure that the router, used with the PC application (Winload and NeWare), has been setup for port forwarding to ensure proper IP100 system functionality with WinLoad.*

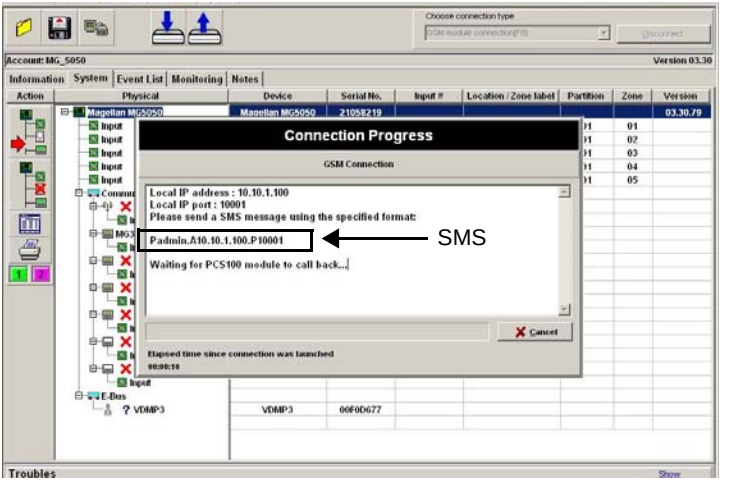
**To send an SMS message to the PCS100 Module**

1. Launch **Winload**.
2. Select the account in which you wish to establish communication with.
3. From the menu bar, select **System** > **Wait for Call**. The Connection Progress window will then be displayed.
4. Enter the SMS text information to be sent to the PCS100 Module as you see it on screen.

   e.g., P[TCP/IP password].IP.[phone number to answer back]

The Connection Progress window will then be displayed on your screen displaying the SMS text information to be sent to the PCS100 module.

**Figure 3: Connection Progress**




To upgrade the firmware using the In-Field Firmware Programmer, refer to “Upgrading the Firmware” on page 31.

# Appendix

## SMS Message Information

## Event Groups

The following tables list all pre-defined text messages that can be sent (see Chapter 4 on page 26). These messages follow the 8-bit or 16-bit SMS protocol and include the elements from the information column. The message will also use the labels programmed in the system for the Site Name, Area Name, Zone Name, User Name and Module Name.

Table 4: Alarm Messages

| Message | Information* |
|---|---|
| Alarm cancelled | 1-2-3-4 |
| Alarm cancelled with remote | 1-2-3-4 |
| Alarm cancelled through Internet | 1-2-3-4 |
| Alarm cancelled through End-User PC Software | 1-2-3-4 |
| Alarm cancelled through Voice Module (Phone) | 1-2-3-4 |
| Alarm cancelled through SMS | 1-2-3-4 |
| Alarm cancelled with keyswitch | 1-2-3-5 |
| Alarm cancelled through Installer PC Software | 1-2-3 |
| ALARM | 1-2-3-4 |
| FIRE ALARM | 1-2-3-4 |
| DURESS ALARM | 1-2-3-4 |
| PANIC ALARM | 1-2-3-4 |
| MEDICAL PANIC ALARM | 1-2-3-4 |
| FIRE PANIC ALARM | 1-2-3-4 |
| PARAMEDIC PANIC ALARM | 1-2-3-4 |

* 1: Site Name
2: Date and Time
3: Area Name
4: Zone / User / Module Name
5: ID
6: Module Serial Number

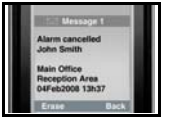


Table 5: Arming Disarming Messages

| Message | Information* |
|---|---|
| Arming | 1-2-3-4 |
| Arming with remote | 1-2-3-4 |
| Arming through Internet | 1-2-3-4 |
| Arming through End-User PC Software | 1-2-3-4 |
| Arming through Voice Module (Phone) | 1-2-3-4 |
| Arming through SMS | 1-2-3-4 |
| Arming with keyswitch | 1-2-3-5 |
| Arming through Installer PC Software | 1-2-3 |
| One-Touch Arming | 1-2-3 |
| Auto-Arming | 1-2-3 |
| Disarming | 1-2-3-4 |
| Disarming with remote | 1-2-3-4 |
| Disarming through Internet | 1-2-3-4 |
| Disarming through End-User PC Software | 1-2-3-4 |
| Disarming through Voice Module (Phone) | 1-2-3-4 |
| Disarming through SMS | 1-2-3-4 |
| Disarming with keyswitch | 1-2-3-5 |
| Disarming through Installer PC Software | 1-2-3 |

* 1: Site Name
2: Date and Time
3: Area Name
4: Zone / User / Module Name
5: ID
6: Module Serial Number

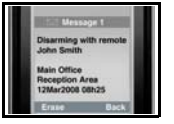


Table 6: Trouble Events Messages

| Message | Information* |
|---|---|
| AC power failure on control panel | 1-2 |
| Battery failure on control panel | 1-2 |
| Bell overload on control panel | 1-2 |
| Bell disconnected from control panel | 1-2 |
| Phone line trouble on control panel | 1-2 |
| Pager communication from control panel failed | 1-2-5 |
| Central station communication from control panel failed | 1-2-5 |
| Voice communication from control panel failed | 1-2 |
| Installer PC communication from control panel failed | 1-2 |
| Date and time loss on control panel | 1-2 |
| RF interference detected on system's wireless communication | 1-2 |
| Tamper trouble on module | 1-2-4-6 |
| Phone line trouble on module | 1-2-4-6 |
| Central station communication from module failed | 1-2-4-6 |
| Printer module trouble | 1-2-4-6 |
| AC power failure on bus or wireless module | 1-2-4-6 |
| Battery failure on bus or wireless module | 1-2-4-6 |
| Auxiliary power overload on bus or wireless module | 1-2-4-6 |
| Missing module | 1-2-4-6 |
| Tamper trouble on zone | 1-2-3-4-6 |
| Trouble on fire zone | 1-2-3-4-6 |
| Low battery on wireless zone | 1-2-3-4-6 |
| Missing wireless zone (supervision loss) | 1-2-3-4-6 |
| Auxiliary power overload on control panel | 1-2 |
| Communication with GSM network lost | 1-2 |
| GSM communication with control panel lost | 1-2 |

* 1: Site Name
2: Date and Time
3: Area Name
4: Zone / User / Module Name
5: ID
6: Module Serial Number

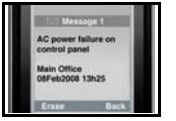
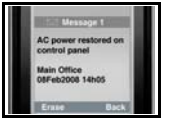


Table 7: Trouble Restore Messages

| Message | Information* |
|---|---|
| AC power restored on control panel | 1-2 |
| Battery power restored on control panel | 1-2 |
| Bell restored on control panel | 1-2 |
| Bell connected on control panel | 1-2 |
| Phone line restored on control panel | 1-2 |
| Central station communication from control panel restored | 1-2-5 |
| Date and time restored on control panel | 1-2 |
| System wireless communication restored | 1-2 |
| Tamper restored on module | 1-2-4-6 |
| Phone line restored on module | 1-2-4-6 |
| Central station communication from module restored | 1-2-4-6 |
| Printer module restored | 1-2-4-6 |
| AC power restored on bus or wireless module | 1-2-4-6 |
| Battery power restored on bus or wireless module | 1-2-4-6 |
| Auxiliary power restored on bus module | 1-2-4-6 |
| Missing module restored | 1-2-4-6 |
| Tamper restored on module | 1-2-3-4-6 |
| Fire zone restored | 1-2-3-4-6 |
| Battery on wireless zone restored | 1-2-3-4-6 |
| Wireless zone restored | 1-2-3-4-6 |
| Auxiliary power restored on control panel | 1-2 |
| Communication with GSM network restored | 1-2 |
| GSM communication with control panel restored | 1-2 |

* 1: Site Name
2: Date and Time
3: Area Name
4: Zone / User / Module Name
5: ID
6: Module Serial Number



## List of SMS Phone Numbers

See “End User SMS Programming” on page 28.

Table 8: SMS Phone Numbers

| # | Phone Number | Partition | Options | |
|---|---|---|---|---|
| 01 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 02 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 03 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 04 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 05 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 06 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 07 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 08 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 09 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 10 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 11 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 12 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 13 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 14 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 15 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |
| 16 | | | ☐1: Any Alarm<br>☐3: Any Trouble | ☐2: Arming/Disarming<br>☐4: Any Trouble Restore |

# Programming Sections Quick Reference

For more detailed information on programming sections, refer to “Configuring the PCS100 Module” on page 11.

Table 9: Installer Programming Sections

| Digiplex EVO | SP Series / E65 | | Value |
|---|---|---|---|
| **WinLoad Access Via GPRS** | | | |
| [2960] | [921] | Access Point Name Part 1 | |
| [2961] | [922] | Access Point Name Part 2 | |
| [2962] | [923] | User Name Part 1 | |
| [2963] | [924] | User Name Part 2 | |
| [2964] | [925] | GPRS Password Part 1 | |
| [2965] | [926] | GPRS Password Part 2 | |
| [2966] | [920] | Software Port | |
| [3013] | [927] | WinLoad TCP/IP/GPRS Password | |
| **Text Message (SMS) Notification** | | | |
| [2953] | [856] | SMS Language | |
| [2954] | [780] | SMS Site Name | |
| **Supervision Options** | | | |
| [2950] | [805] | GSM No Service Trouble Feedback | |
| [2952] | [855] | GSM No Service Timer | |
| [2950] | [805] | GSM RF Jamming Supervision | |
| [2951] | [884] | Control Panel Supervision | |

## Entering Special Characters

To enter special characters, press the [mem] key on the EVO641 or EVO641R keypad. The line will turn to a square, then enter the digit code for the character you wish to enter.

| 032 | 048 | 064 | 080 | 096 | 112 | 128 | 144 | 160 | 176 | 192 | 208 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ø | @ | P | ` | p | Û | Ê | a | § | ● | · |
| 033 | 049 | 065 | 081 | 097 | 113 | 129 | 145 | 161 | 177 | 193 | 209 |
| ! | 1 | A | Q | a | q | Ù | È | Î | ± | L | ¨ |
| 034 | 050 | 066 | 082 | 098 | 114 | 130 | 146 | 162 | 178 | 194 | 210 |
| " | 2 | B | R | b | r | Ú | É | Ì | ij | Đ | ○ |
| 035 | 051 | 067 | 083 | 099 | 115 | 131 | 147 | 163 | 179 | 195 | 211 |
| # | 3 | C | S | c | s | Ü | Ë | í | ↑ | ß | ` |
| 036 | 052 | 068 | 084 | 100 | 116 | 132 | 148 | 164 | 180 | 196 | 212 |
| $ | 4 | D | T | d | t | û | ê | Ï | ↓ | ç | ´ |
| 037 | 053 | 069 | 085 | 101 | 117 | 133 | 149 | 165 | 181 | 197 | 213 |
| % | 5 | E | U | e | u | ù | è | ì | ↵ | ® | ~ |
| 038 | 054 | 070 | 086 | 102 | 118 | 134 | 150 | 166 | 182 | 198 | 214 |
| & | 6 | F | V | f | v | ú | é | Ñ | ƒ | ¤ | ÷ |
| 039 | 055 | 071 | 087 | 103 | 119 | 135 | 151 | 167 | 183 | 199 | 215 |
| ’ | 7 | G | W | g | w | Ô | ë | ñ | £ | ■ | « |
| 040 | 056 | 072 | 088 | 104 | 120 | 136 | 152 | 168 | 184 | 200 | 216 |
| ( | 8 | H | X | h | x | Ò | Å | Ñ̃ | → | µ | » |
| 041 | 057 | 073 | 089 | 105 | 121 | 137 | 153 | 169 | 185 | 201 | 217 |
| ) | 9 | I | Y | i | y | Ó | Ä | g | ↓ | Ø | ▌ |
| 042 | 058 | 074 | 090 | 106 | 122 | 138 | 154 | 170 | 186 | 202 | 218 |
| * | : | J | Z | j | z | º | å | g | ↑ | ÿ | \ |
| 043 | 059 | 075 | 091 | 107 | 123 | 139 | 155 | 171 | 187 | 203 | 219 |
| + | ; | K | [ | k | { | Ô | â | v | ↓ | Ã | X |
| 044 | 060 | 076 | 092 | 108 | 124 | 140 | 156 | 172 | 188 | 204 | 220 |
| , | < | L | ¥ | l | \| | ò | à | v | ¶ | ¢ | ● |
| 045 | 061 | 077 | 093 | 109 | 125 | 141 | 157 | 173 | 189 | 205 | 221 |
| - | = | M | ] | m | } | ó | á | w | ½ | ã | ● |
| 046 | 062 | 078 | 094 | 110 | 126 | 142 | 158 | 174 | 190 | 206 | 222 |
| . | > | N | ^ | n | → | ö | ä | ω | ⅓ | Õ | ■ |
| 047 | 063 | 079 | 095 | 111 | 127 | 143 | 159 | 175 | 191 | 207 | 223 |
| / | ? | O | _ | o | ← | ¿ | A | Æ | ¼ | õ | ☰ |

# Index

## NOTES

We hope this product performs to your complete satisfaction. Should you have any questions or comments, please us at visit www.paradox.com.

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