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SYSTEM: SIESPACE

Installation and Commissioning Guide for GPRS Based Siespace Systems

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Issue: 04.00

Change Ref.:TS005328 & TS006198

Date: July 2012

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1. INTRODUCTION

1.1 Purpose

This document provides information on the configuration of a GPRS based Siespace system. Troubleshooting and Radio Survey procedures are also contained here.

1.2 Scope

This document covers the configuration of the following pieces of equipment for a GPRS based Siespace system:

- a) MC35 Terminal GPRS Modem
- b) iConnector Module
- c) VMS
- d) OMU
- e) Siespace Instation.
- f) Sequoia SQ864 DCD Siemens Gateway modem

Interfacing of a Gemini with an APT Skidata based car park system is also covered in this document.

1.3 Related Documents

667/HB/30325/000
667/HB/27770/000
666/BT/16940/156

667/HB/26568/000
667/HB/30600/000
667/DG/30709/000

Modular VMS Handbook
Enclosure VMS Handbook
Siespace Car Park and VMS
Management System
OMU 3U Traffic Outstation Handbook
Gemini Handbook
Installation of GPRS Puck antenna

1.4 Glossary

GSM	Global System for Mobile Communications
I/O	Input/Output
ISDN	Integrated Services Digital Network
LAN	Local Area Network
MEC	Miscellaneous Equipment Cabinet
MMI	Man Machine Interface
OMU	Outstation Monitoring Unit
OTU	Outstation Transmission Unit
PAD	Packet Assembler/Disassembler
PC	IBM Compatible Personal Computer
PSTN	Public Switch Telephone Network
RDT	Radio Data Technology Limited
RMS	Remote Monitoring System
STCL	Siemens Traffic Controls Limited
TCP/IP	Transmission Control Protocol/Internet Protocol - Industry standard network protocol
UPS	Uninterruptable Power Supply
UTC	Urban Traffic Control
VMS	Variable Message Sign
WAN	Wide Area Network
WWW	World Wide Web

1.5 Issue State and Amendments

Issue	
01:00C	Engineering release for use by STC Systems Engineers.
01:00F	Further corrections by Eddie
01:00	Formal issue
02:00	Minor corrections and inclusion of APT Skidata interface setup
03:00	Added information on the new iConnectors being installed.
04:00	Added information on the Sequoia SQ864 DCD Siemens Gateway modem being installed.

2. GENERAL DESCRIPTION

2.1 MC35 Terminal

The Siemens MC35 Terminal unit is a GSM modem capable of GPRS transmission. The unit is similar to the Siemens M20 which is used on RMS for GSM communications. The MC35 supports GPRS transmission up to 21.4Kbps per time slot.

Interfaces to the unit include an RS232 data port, power and an FME (male) aerial connector. An integrated SIM card reader is included. A diagnostic LED shows the current state of the unit.

2.2 iConnector

The ConnectOne iConnector module provides a means of connecting legacy devices to the packet switched public data network (PSPDN). It provides a number of modes of operation and TCP/IP application protocols.

Serial Net mode provides a near transparent connection to the packet switched public data network such that any string of data sent to the iConnector will be encapsulated in a TCP or UDP header over IP over PPP and communicated to a pre-programmed destination IP address. Data received by the iConnector will have the TCP/IP related headers removed and the raw data payload forwarded to the outstation serial port.

The iConnector is available in Commercial or Industrial versions. New projects should use the Industrial version.

3. COMMISSIONING OF GPRS VMS & CAR PARK EQUIPMENT

The iConnector / Sequoia SQ864 DCD Siemens Gateway modem is required on VMS an old style OMU equipment, it is not required if a Gemini OMU is used.

3.1 Identify Industrial or Commercial part

Four versions of the iConnector are available, Industrial and Commercial parts. The first GPRS based Siespace systems used the Commercial part due to non availability of the other, new systems must always use the Industrial parts. The parts use different chipsets and therefore require different bootblock and firmware files. They can be identified as shown below:

Commercial iConnector part number: iC101-FM-C-0 (Obsolete product, but in use in the field)

Industrial iConnector part number: iC101-FM-I-0 Rev 1.5 (Obsolete product, but in use in the field)

iConnector part number: iC101-FM-I-1 (Obsolete product, but in use in the field)

iConnector part number: iC100-FM-I-1

3.2 iConnector Setup (VMS & Car Parks)

Note: Assumes iConnector is in 'as delivered state' (a previously configured one will require baud rate setting to 9600).

- 1) Connect iConnector to a PC using a straight through 9 pin male to 9 pin female lead. Connect to the 'Device' port on the iConnector.
- 2) Run the iChipConfig program on the PC.
- 3) Select Exit SerialNET mode from the menu (ignore any warnings or failure messages associated with this).

3.2.1 Check and Modify Firmware Version (VMS & Car Parks)

Note: If the iConnector does not respond then follow the 'locked up iConnector' procedure in the Troubleshooting section of this document.

- iConnectors iC101-FM-C-0 and iC101-FM-I-0

- 1) Select the 'iChip Uploader via Serial' option.
- 2) Verify that the Software Version displayed is as shown below:

	Commercial part	Industrial part
Firmware Version	IS704B09 (1.7.2003)	IS704B20 (18.2.2004)
Bootblock version	0708	0706

Note: Until advised otherwise the versions in the table above must be used.

- 3) To change the firmware:

NOTE: The files must be programmed in this order.

- a) Select the 'iChip Uploader via Serial' option
- b) Select the 'Firmware' option.
- c) Browse to the Bootblock file, select Open & OK.
- d) Select the 'Firmware' option.
- e) Browse to the Firmware file, select Open & OK.
- f) Verify that the Software Version & Boot Block codes are now as shown above.

Filenames are as follows

Item	Version	Filename
Commercial Firmware	IS704B09 (1.7.2003)	i5s704b09.imf
Industrial Firmware	IS704B20 (18.2.2004)	i6s704b20.imf
Commercial Bootblock	0708	BBI5S0708.imf
Industrial Bootblock	0706	BBI6S0706.imf

- iConnectors iC101-FM-I-1 and iC100-FM-I-1

These iConnectors use the firmware supplied.

3.2.2 Configure GPRS Parameters (VMS & Car Parks)

The iConnector is configured from an .RPF file; this will differ for each project as parameters such as the Instation IP address are contained here. Other parameters relating to the Network Operator are also programmed into the iConnector.

For Gemini these parameters are programmed into the unit via the handset port.

3.2.2.1 Network Operator Parameters

The parameters below relate to O2, these should be confirmed when the Sim cards are purchased for a project and will change if a different Network Operator is used.

Parameter	O2 setting during development	Identification in .RPF file
APN (Access Point Name)	mobile.o2.co.uk (Added to Modem Initialisation string to form : at+cgdcont=1,ip,mobile.o2.co.uk)	MIS
Username	web (or bypass)	USRN
Password	web	PWD
Primary DNS	193.113.200.200	DNS1
Secondary DNS	193.113.200.201	DNS2
Key Address	*99***1#	ISP1

Note: Using 'bypass' as the logon name (password must be present but can be anything) will disable certain network optimisations which are aimed at web browsing. At the time of issue this has not been tested but has been recommended by O2.

The parameters below relate to Vodafone, these should be confirmed when the Sim cards are purchased for a project.

Parameter	Vodafone setting	Identification in .RPF file
APN (Access Point Name)	internet or mylan (Added to Modem Initialisation string to form : at+cgdcont=1,ip,internet)	MIS
Username	web	USRN
Password	web	PWD
Primary DNS	0.0.0.0	DNS1
Secondary DNS	0.0.0.0	DNS2
Key Address	*99***1#	ISP1

Note: At the time of issue Vodafone has stated that their public internet APN is only intended for web browsing. A content filter implemented on the internet APN has also caused problems for Siespace systems. Use of the mylan APN is still not recommended by Vodafone

but is much more stable, this is now on use on Siespace systems. For new customers Vodafone systems should use IPSEC as a minimum. (O2 have no such policy on their public internet APN).

The parameters below relate to Orange, these should be confirmed when the Sim cards are purchased for a project.

Parameter	Orange setting	Identification in .RPF file
APN (Access Point Name)	Orange internet (Added to Modem Initialisation string to form : at+cgdcont=1,ip,internet)	MIS
Username	web	USRN
Password	web	PWD
Primary DNS	0.0.0.0	DNS1
Secondary DNS	0.0.0.0	DNS2
Key Address	*99***1#	ISP1

Note: Pay As You Go SIM's should not be used on customer systems as there is no easy way to remotely top up their credit. Vodafone Pay As You Go does not provide internet access. Orange Pay As You Go does provide internet access with the APN 'payginternet' (this has been used for some tests but nothing long term).

3.2.2.2 *Instation & Outstation Parameters*

These parameters define the IP address and port number of the Instation PC (or router if translating through one). The port number for use on the Outstation is also defined here, for consistency it should be the same as the Instation.

The Outstation IP address is defined dynamically each time the MC35 connects to the GPRS network.

Parameter	O2 setting during development	Identification in .RPF file
Instation IP Address & Port Number	213.208.79.197:555	HSRV
Outstation Port Number	555	LPRT

3.2.2.3 *Typical Contents of RPF file*

```
RP_START_FROM_FACTORY_DEFAULTS=YES
#Email format
MT="4"
XFH="1"
FN=""
MST=""
BDY=
.
CC4=""
CC3=""
CC2=""
CC1=""
FRM=""
REA=""
TO=""
TOA=""
SBJ=""
```

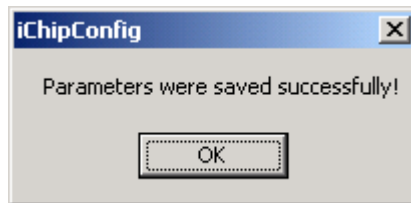
```
FLS=" "  
HDL="0 "  
#Server profiles  
SMP=" "  
SMU=" "  
SMA="0 "  
LVS="1 "  
MBX=" "  
POP3=" "  
SMTP=" "  
DNS2="193.113.200.201"  
DNS1="193.113.200.200"  
#Operational parameters  
MIS="at+cgdcont=1,ip,mobile.o2.co.uk"  
TUP="0 "  
MPS="0 "  
CPWD=" "  
DMD="0 "  
TTO="0 "  
BDRF="5 "  
BDRM="5 "  
MTYP="2 "  
XRC="0 "  
FLW="0 "  
WTC="45 "  
#LAN parameters  
#Remote firmware update  
UEN="0 "  
UPOP=" "  
UMBX=" "  
#ISP connection  
ISP1="*99***1#"  
ATH="2 "  
RTO="30 "  
RDL="1 "  
USRN="web"  
ISP2="*9***#1 "  
PWD="web"  
#Remote parameters update  
RPG=" "  
#HTTP parameters  
WPWD=" "  
URL=" "  
#SerialNET parameters  
RRRL=" "  
RRWS=" "  
RRSV=" "  
RRMA=" "  
AWS="0 "  
IATO="0 "  
SWT="600 "  
SDT="20 "  
SPN=" "  
MBTB="4 "  
STYP="0 "  
HSRV="213.208.79.197": "20843 "  
LPRT="20843 "  
FCHR=" "  
MCBF="0 "  
MTTF="1000 "  
DSTR="1234 "  
SNRD="0 "
```

SNSI="5,8,N,1,0"

Note: The PWD parameter is not saved in the .RPF when using the iConfig program, this was added manually afterwards.

3.2.2.4 Write parameters to iConnector

- 1) From the config program top level menu select the File menu then 'Load RPF File'.
- 2) Select the relevant RPF file, when loaded the program will switch to the Full configuration screen.
- 3) Due to a bug in the iChipConfig program version 2.2.22 the following is required:
 - a) Select 'Operational Parameters' and enter 'at+cgdcont=1,ip,mobile.o2.co.uk' under 'Modem Initialisation String (MIS)' heading (or replace 'mobile.o2.co.uk' with the relevant APN).
- 4) Select Apply to write the config to the iConnector. If an error message is displayed (usually concerning CC4, an unused email address parameter) then select Apply for a second time. The following message indicates successful completion.



- 5) Select 'Close'
- 6) To verify configuration select 'Full Configuration', this will read back current settings from the iConnector. Check that the configuration conforms to the following screenshots:

Figure 1 - ISP Connection Configuration

The screenshot shows the 'iChip parameters' window with the 'ISP connection' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and several tabs: 'Email Format parameters', 'Server profiles', 'Operational parameters', 'LAN Parameters', 'Remote Firmware update', 'ISP connection' (selected), 'Remote parameter update', 'HTTP', 'SerialNET parameters', and 'IP Registration'. The 'ISP connection' tab contains the following fields:

- First phone number (ISP1):** Text box with value '*99***1#'
- Authentication method (ATH):** Dropdown menu with value 'CHAP'
- Second phone number (ISP2):** Text box with value '*9***#1'
- Max redial trials (RDL):** Text box with value '1'
- User name (USRN):** Text box with value 'web'
- Wait time before redialing (RTO):** Text box with value '30'
- Password (PWD):** Text box with value 'web'

At the bottom, there is a status bar showing 'iChip type: C0561AD-S iChip dialup', 'Firmware ver: IS704B09 (1.7.2003)', 'Serial num.: 03160145', and 'Boot block: 0708'. Below this are 'Save', 'Apply', and 'Close' buttons. The bottom status bar shows 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'.

Figure 2 - Remote Parameter Update Configuration

The screenshot shows the 'iChip parameters' window with the 'Remote parameter update' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and several tabs: 'Email Format parameters', 'Server profiles', 'Operational parameters', 'LAN Parameters', 'Remote Firmware update', 'ISP connection', 'Remote parameter update' (selected), 'HTTP', 'SerialNET parameters', and 'IP Registration'. The 'Remote parameter update' tab contains the following field:

- Remote update password (RPG):** Text box (empty)

At the bottom, there is a status bar showing 'iChip type: C0561AD-S iChip dialup', 'Firmware ver: IS704B09 (1.7.2003)', 'Serial num.: 03160145', and 'Boot block: 0708'. Below this are 'Save', 'Apply', and 'Close' buttons. The bottom status bar shows 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'.

Figure 3 - HTTP Configuration

The screenshot shows the 'iChip parameters' window with the 'HTTP' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and several tabs: 'Email Format parameters', 'Server profiles', 'Operational parameters', 'LAN Parameters', 'Remote Firmware update', 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', and 'IP Registration'. The 'HTTP' tab is active, showing two text input fields: 'URL to retrieve (URL)' and 'Web password (WPWD)'. At the bottom, there are three buttons: 'Save', 'Apply', and 'Close'. The status bar at the bottom indicates 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'.

URL to retrieve (URL)

Web password (WPWD)

iChip type: C0561AD-S iChip dialup Firmware ver: IS704809 (1.7.2003)
Serial num.: 03160145 Boot block: 0708

Save Apply Close

Ready Serial port: COM1 Baud Rate: 9600

Figure 4 - SerialNET Parameters Configuration

The screenshot shows the 'iChip parameters' window with the 'SerialNET parameters' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and several tabs: 'Email Format parameters', 'Server profiles', 'Operational parameters', 'LAN Parameters', 'Remote Firmware update', 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', and 'IP Registration'. The 'SerialNET parameters' tab is active, showing various configuration fields. On the left, there are fields for 'Characters to enforce flush (FCHR)', 'Max characters before flush (MCBF)', 'Max timeout to flush (MTTF)', 'Disconnection string (DSTR)', 'Timeout before reestablishing connection (SHRD)', 'Port settings for serialNET (SNSI)', 'Max bytes to buffer (MBTB)', and 'Serial Wakeup Timeout (SWT)'. On the right, there are fields for 'Socket type (STYP)', 'Server serialNET port (LPRT)', 'IP address to connect to (HSRV)', 'Serial Phone Number (SPN)', and 'Serial Dial Timeout (SDT)'. At the bottom, there are three buttons: 'Save', 'Apply', and 'Close'. The status bar at the bottom indicates 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'.

Characters to enforce flush (FCHR)

Max characters before flush (MCBF)

Max timeout to flush (MTTF)

Disconnection string (DSTR)

Timeout before reestablishing connection (SHRD)

Port settings for serialNET (SNSI)

Max bytes to buffer (MBTB)

Serial Wakeup Timeout (SWT)

Socket type (STYP)

Server serialNET port (LPRT)

IP address to connect to (HSRV)

Serial Phone Number (SPN)

Serial Dial Timeout (SDT)

iChip type: C0561AD-S iChip dialup Firmware ver: IS704809 (1.7.2003)
Serial num.: 03160145 Boot block: 0708

Save Apply Close

Ready Serial port: COM1 Baud Rate: 9600

Figure 5 - IP Registration Configuration

The screenshot shows the 'iChip parameters' window with the 'IP Registration' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and a series of tabs: 'Email Format parameters', 'Server profiles', 'Operational parameters', 'LAN Parameters', 'Remote Firmware update', 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', and 'IP Registration'. The 'IP Registration' tab is active, displaying four text input fields: 'IP address to send IP (RRSV)', 'Email address to send IP (RRMA)', 'Ring response Web Server url (RRWS)', and 'Ring Response Return Link to Website (RRRL)'. At the bottom, there is a status bar showing 'iChip type: C0561AD-S iChip dialup', 'Firmware ver: IS704B09 (1.7.2003)', 'Serial num.: 03160145', and 'Boot block: 0708'. Below this are 'Save', 'Apply', and 'Close' buttons. The bottom-most status bar shows 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'.

Figure 6 - Remote Firmware Update Configuration

The screenshot shows the 'iChip parameters' window with the 'Remote Firmware update' tab selected. The window layout is identical to Figure 5, but the 'Remote Firmware update' tab is active. It displays a checkbox labeled 'Email firmware update enable (UEN)' which is currently unchecked. Below this are three text input fields: 'Dedicated firmware update mailbox (UMBX)', 'Dedicated firmware update mailbox password (UMPW)', and 'Dedicated firmware update POP3 (UPOP)'. The bottom status bar and controls are the same as in Figure 5.

Figure 7 - LAN Parameters Configuration

Note: The tab for this screen may be greyed out. This is not a problem as there are no relevant parameters to configure here.

The screenshot shows the 'iChip parameters' window with the 'LAN Parameters' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and several tabs: 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', 'IP Registration', 'Email Format parameters', 'Server profiles', 'Operational parameters', 'LAN Parameters' (active), and 'Remote Firmware update'. The 'LAN Parameters' section includes fields for 'MAC address (MACA)', 'Assigned IP address (IPA)', 'Host name', 'Default IP address (DIP)' (0.0.0.0), 'Sub Net address (SNET)' (0.0.0.0), and 'Gateway IP address' (0.0.0.0). There are checkboxes for 'Use DHCP' and 'Use IP Finder'. At the bottom, it shows 'iChip type: C0561AD-S iChip dialup', 'Serial num.: 03160145', 'Firmware ver: IS704809 (1.7.2003)', and 'Boot block: 0708'. There are 'Save', 'Apply', and 'Close' buttons. The status bar at the bottom shows 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'.

Figure 8 - Operational Parameters Configuration

The screenshot shows the 'iChip parameters' window with the 'Operational parameters' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area contains the 'ConnectOne™' logo and several tabs: 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', 'IP Registration', 'Email Format parameters', 'Server profiles', 'Operational parameters' (active), 'LAN Parameters', and 'Remote Firmware update'. The 'Operational parameters' section includes fields for 'Extended return code (XRC)' (0 - Blind Dial), 'Modem initialization string (MIS)', 'Modem type designator (MTYP)' (GSM Modem), 'Wait time constant (WTC)' (45), 'Tcp timeout (TTO)' (0), 'Inactivity timeout (IATO)' (0), 'CDPD Password (CPWD)', 'Max Packet Size (MPS)' (0 - Auto), 'Baud rate (BDRM)' (5 - 9600), 'Fix baud rate (BDRF)' (5 - 9600), 'Flow control (FLW)' (No flow control), 'Dial Mode (DMD)' (Tone), 'Activate Web Server (AWS)' (Disabled), and 'Triggered UP'. There are checkboxes for 'Blind dial', 'Suppress ATZ', and 'Disable reflection'. At the bottom, it shows 'iChip type:', 'Serial num.:', 'Firmware ver:', and 'Boot block:'. There are 'Save', 'Apply', and 'Close' buttons. The status bar at the bottom shows 'Ready', 'Serial port:', and 'Baud Rate:'.

Figure 9 - Server Profiles Configuration

The screenshot shows the 'iChip parameters' window with the 'Server profiles' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area is divided into several tabs: 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', 'IP Registration', 'Email Format parameters', 'Server profiles' (active), 'Operational parameters', 'LAN Parameters', and 'Remote Firmware update'. The 'Server profiles' tab contains the following fields and options:

- ☒ Leave copy on server
- Primary domain names server (DNS1): 193 113 200 200
- Secondary domain names server (DNS2): 193 113 200 201
- Outgoing mail server (SMTP): [text box]
- Incoming mail server (POP3): [text box]
- Mailbox user name (MBX): [text box]
- Mailbox password (MPWD): [text box]
- ☐ SMTP Authentication (SMA)
- User Name (SMU): [text box]
- Password (SMP): [text box]

At the bottom of the window, there is a status bar showing 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'. Above the status bar, there are buttons for 'Save', 'Apply', and 'Close'.

Figure 10 - Email Format Parameters Configuration

The screenshot shows the 'iChip parameters' window with the 'Email Format parameters' tab selected. The window has a menu bar with 'File' and a toolbar with standard window controls. The main area is divided into several tabs: 'ISP connection', 'Remote parameter update', 'HTTP', 'SerialNET parameters', 'IP Registration', 'Email Format parameters' (active), 'Server profiles', 'Operational parameters', 'LAN Parameters', and 'Remote Firmware update'. The 'Email Format parameters' tab contains the following fields and options:

- ☒ Transmit Email headers (XFH)
- Limit number of headers (HDL): 0
- Filter String (FLS): [text box]
- Subject (SBJ): [text box]
- Email address (TOA): [text box]
- Address description (TO): [text box]
- Return Email address (REA): [text box]
- Sender description (FRM): [text box]
- Alternate addressee (CC1): [text box]
- Alternate addressee (CC2): [text box]
- Alternate addressee (CC3): [text box]
- Alternate addressee (CC4): [text box]
- Message body (BDY): [text box]
- Media type (MT): Application
- Media subtype string (MST): [text box]
- Attachment file name (FN): [text box]

At the bottom of the window, there is a status bar showing 'Ready', 'Serial port: COM1', and 'Baud Rate: 9600'. Above the status bar, there are buttons for 'Save', 'Apply', and 'Close'.

3.3 To modify an existing iConnector setup

Note: If the iConnector does not respond then follow the 'locked up iConnector' procedure in the Troubleshooting section of this document.

- 1) Connect iConnector to a PC using a straight through 9 pin male to 9 pin female lead. Connect to the 'Device' port on the iConnector.
- 2) Run the iChipConfig program on the PC.
- 3) Select Exit SerialNET mode from the SerialNet menu. If this times out the baud rate display will be shown, select 9600 baud and try again.
- 4) Select the Full Configuration option.
- 5) Modify the required parameters then select apply.

3.4 Sequoia SQ864 DCD Siemens Gateway modem Setup (VMS & Car Parks)

- 1) Connect Sequoia SQ864 DCD Siemens Gateway modem to a PC using a straight through 9 way cable.
- 2) Run 'config_standard' program on the PC.
- 3) Select the port that the unit is connected to.
- 4) Click on the Connect button and power the unit off and then back on again.
- 5) The configuration data will be displayed.
- 6) Modify the parameters to reflect the configuration detailed below (see note) then select Save Changes.
- 4) Click on the Disconnect button and unplug the unit unit.

Note: gprs_apn: < change to current installation, i.e. mobile.o2.co.uk >
gprs_userid: < change to current installation, i.e. web >
gprs_passwd: < change to current installation, i.e. web >
baud: 9600
charformat: 8N1
flowcontrol_md: rts
flowcontrol_dm: cts
mode: client
smspassword: connect
client_maintain: 1
local_ip: any
local_port: 1024
remote_server: < change to current installation, i.e. 217.40.206.233 >
remote_port: < change to current installation, i.e. 20843 >
sock_timeout: 0
send_timeout: 10
packet_size: 0
dialin_enabled: 0
END

3.5 Sims

SIM cards will usually be supplied by the customer. These must be GPRS enabled and preferably data only (voice and data can be used but the tariffs may be higher and the voice service is not used).

3.5.1 IPSEC

If the link to the Instation is by IPSEC then the Sims must be enabled for the IPSEC APN. This is accomplished by the service provider, it is useful to request that the Sims are enabled for BOTH the standard internet and IPSEC APN. The IPSEC APN will be provided by the customer or the service provider who is installing it, typically it would be of the form 'countyname.gov.uk'.

3.5.2 Sim Card PIN Setup (VMS & Car Parks)

This requires a terminal (Laptop with Hyperterminal or Techterm device) to be plugged directly into the MC35. The MC35 must be fitted with a valid SIM card for the relevant Service Provider.

- 1) Configure the terminal for 9600-8-N-1 No flow control.
- 2) Switch on MC35 and enter AT+CPIN?<cr>. The MC35 should respond with either SIM PIN indicating the PIN is required or READY indicating that the PIN has already been entered.
- 3) Enter the PIN with AT+CPIN=xxxx<cr>
- 4) Disable the PIN with AT+CLCK="SC",0,xxxx<cr>

3.5.3 Sim Card GPRS Enabled check procedure

The following procedure can be used to check that a Sim is GPRS enabled.

Access to the public internet APN is required, if the Sims are IPSEC only then this check cannot be used.

FOR SECURITY REASONS THE PC USED FOR THIS MUST NOT BE CONNECTED TO ANY OTHER EXTERNAL NETWORKS DURING THIS TEST.

- 1) Connect the MC35 terminal to spare Com port on the PC.
- 2) Configure a standard 19200 bps modem for that com port.
- 3) Under the modem Advanced properties add the following string under Extra initialisation commands:

+cgdcont=1,"ip","internet"

Where 'internet' is the APN for the service provider used refer to section 3.2.2.1.

- 4) Create a new Dial up networking icon using this modem and enter the username,password and dial string (key address) as required (refer to section 3.2.2.1).
- 5) Double click the connection and check whether it is successfully established. Use Internet Explorer to verify that access to the internet is now possible. This proves the Sim is correctly enabled for internet access but not necessarily for IPSEC communications. Communications with the Instation over the IPSEC link is the only way to test this.

3.6 OMU Commissioning

These notes describe configuration of a GPRS based OMU Car Park Outstation but should be read in conjunction with the OMU 3U and Gemini Handbooks (ref.section 1.3). The Commissioning Procedure in these Handbooks should be followed except where it refers to Paknet configuration, in these cases follow the setup listed in this document.

When the OMU/Gemini is configured and powered, refer to section 3.5.6 to check for GPRS connection.

3.6.1 Description

The OMU is fitted with an iConnector and MC35 Terminal in the same way as a VMS (Gemini units do not require an iConnector). As well as configuring these items the OMU itself requires to be setup from its handset port.

The OMU can handle 10 loops in total, either entry and exit and all loops associated with one car park must be connected to the same OMU as it normally sends occupancy values to the instation for the car park as a whole.

The Gemini is also capable of interfacing directly with an APT Skidata system. In this case the loops are not used, the count is taken directly the Skidata system. Refer to section 3.5.5 for details on setting this up.

3.6.2 Configuration

Access to the status information is gained by entering codes on an approved handset and interpreting the response on the display.

The handset port connector is a 25-way female D-type and operates at 1200 baud, even parity, 1 stop bit. Firmware PB680 issue 5 and later will auto-baud to 1200, 9600 or 19200 baud, on first receiving characters after the handset is plugged in.

This section lists all the handset codes, together with their data ranges and access levels for the OMCU GPRS Car Park application.

The following list gives a summary of all the Handset codes applicable to a Car Park Outstation, for use as a quick lookup reference guide:

Note: Some commands are only available on the new Gemini OMU.

3.6.2.1 OMU/Gemini Car Park Command Table

Code	Major Index	Minor Index	Data Range	Description	Access Level	Gemini Only ?
ACC	-	1 - 23	0 - 1	APT Counting category Counts on an APT Skidata systems are divided into categories to cover, for example, contract parking, public parking, people who have used credit cards etc. 0 - Do not include count category 1 - Include count category All categories selected as included will be added together to produce the final count. The default APT count categories are : 1 - Short term parker 2 - Contract parker 3 - Total 4 - 24 - user defined	Maint	Yes
ACN	-	-	0 - 254	APT Car Park Number Specified by APT Skidata	Maint	Yes
ACV	-	-	0 - 1	APT Skidata Host Comms version 0 - Version 1 1 - Version 2	Maint	Yes
ADN	-	-	10 ASCII digits	APT Device Number e.g. 1 Specified by APT Skidata (Usually 1)	Maint	Yes
ADR	-	-	0 - 254	Address of the OMCU This is used to check the message received from the Instation is for this OMCU.	Maint	No
ADS	-	-	0 - 1	Enable interface with APT Skidata equipment 0 - Count from loops 1 - Count from APT Skidata	Maint	Yes
AFN	-	-	10 ASCII digits	APT Skidata Facility Number e.g. 550012 Specified by APT Skidata	Maint	Yes
AFR	-	-	0 - 1	Enable / Disable reporting of loss of comms with APT Skidata equipment to Siespace. NOTE: IF SIESPACE IS AT VERSION 7.4 OR LOWER THEN TURN FAULT REPORTING OFF. 0 - fault reporting off 1 - fault reporting on	Maint	Yes
AFT	-	0	0 - 16383	Car park almost full increasing threshold This value indicates the car par occupancy level when the car park state changes from Spaces to Almost Full .	Maint	No
		1	0 - 255	Car park almost full decreasing threshold offset This value is subtracted from the almost full increasing threshold and the result indicates the car park occupancy level when, the car park state changes from Almost Full to Spaces .		
AIP	-	-	15 ASCII digits	IP Address of APT Skidata equipment e.g. 169.254.253.1	Maint	Yes
APN	-	-	32 bit no.	APT Port Number (Default for APT Skidata equipment is 10200)	Maint	Yes
CCL	-	0 - 9	0 - 255	Current Car Park Loop Counts Indicates the number of vehicles counted by each entry or exit loop since the last status message was transmitted to the Instation.	RO	No
COS	-	-	0 - 3	Car Park Occupancy Status 0 = Normal 1 = Underflow 2 = Overflow 3 = Overflow and Underflow	RO	No
CPC	-	-	0 - 16383	Car Park Capacity	Maint	No
CPL	0 - 9	0	0 - 1	Car Park Loop Type 0 = Entry loop 1 = Exit loop	Maint	No
		1	0 - 255	0 - 47 = Input on 1 st I/O board 48 - 95 = Input on 2 nd I/O board 96 - 143 = Input on 3 rd I/O board 255 = Loop not used		
		2	0 - 255	No Detect Period 1 - 255 = The car park loop is reported faulty if no vehicle is detected for this number of hours. 0 = Not monitored		

Code	Major Index	Minor Index	Data Range	Description	Access Level	Gemini Only ?
		3	0 - 255	Permanent Detect Period 1 - 255 = The car park loop is reported faulty if a permanent detection is present for this number of minutes. 0 = Not monitored		
CPO	-	-	0 - 65535	Current Car Park Occupancy	Maint	No
CPS	-	-	Binary	Car park State Bit 0 = spaces Bit 1 = Almost full Bit 2 = Full Bit 3 = Closed	RO	No
CPT	0 - 9	0	0 - 23	Timetable hours	RO	No
		1	0 - 59	Timetable Minutes		
		2	0 - 59	Interval in minutes		
DBG	-	0	0 or 1	Enable / Disable debug output for APT Skidata host comms interface 0 - off 1 - on	Maint	Yes
DOR	-	-	0 - 255	Door Input 0 - 47 = Input on 1 st I/O board 48 - 95 = Input on 2 nd I/O board 96 - 143 = Input on 3 rd I/O board 255 = Door switch not used	Maint	No
ENG	-	-	-	Use ENG=65 0 to show GPRS modem state, <ret> turns this off.		Yes
FCP	-	-	1 - 63	Fill Rate Calculation Period The number of minutes of historical count data that the fill rate is computed over.	Maint	No
FUT	-	0	0 - 16383	Car park full increasing threshold This value indicates the car par occupancy level when the car park state changes from Almost Full to Full .	Maint	No
		1	0 - 255	Car park full decreasing threshold offset This value is subtracted from the full increasing threshold and the result indicates the car park occupancy level when, the car park state changes from Full to Almost Full .		
GUP	-	-	-	GPRS User logon:password e.g. GUP=web:web	Maint	Yes
IPI	-	0	-	Set IP address and port number of Instation PC e.g. IPI 0=192.168.100.1:2084	Maint	Yes
IPM	-	0	Number	IP Outstation Address Manual configuration. Number is of the form: xxx.xxx.xxx.xxx	Maint	Yes
		1	Number	IP Gateway Address configuration. Number is of the form: xxx.xxx.xxx.xxx Default – not specified.		
		2	Number	IP Broadcast Address configuration. Number is of the form: xxx.xxx.xxx.xxx. Usually 255.255.255.255 Default – not specified.		
		3	Number	IP Subnet Mask configuration. Number is of the form: xxx.xxx.xxx.xxx Usually 255.255.0.0 or 255.255.255.0 Default – not specified.		
IPR	-	-	1 or 2	IP Reset Command. Used to initialise communications with the instation via the Ethernet port. For networks with automatic address allocation, use IPR=1. For networks with manual address allocation, enter address using IPM 0 etc and then use IPR=2. IPR=1 initiates an automatic BOOTP sequence across the network. If the request is not successful it will retry automatically every 10 minutes. IPR=2 activates the manual IP address setting entered by the IPM command.	Maint	Yes
KEY	-	-	16 ASCII digits	GPRS Encryption key	Maint	No
MOS	-	-	-	PDP Context string e.g. for O2 : MOS=at+cgdcont=1,ip,mobile.o2.co.uk	Maint	Yes
PPD	-	-	-	GPRS debug on=1, off=0	Maint	Yes
PTO	-	-	-	PPP Link Timeout in seconds	Maint	Yes

Code	Major Index	Minor Index	Data Range	Description	Access Level	Gemini Only ?
RCA	-	-	14 ASCII digits 0 - 9	Remote Comm's user address (NUA) of the form : 2353ABCDEFGHJ 2353 is the Data Network Identification Code allocated to the Vodafone Data Network by OFTEL. ABCD identifies the base station channel with which the Radio-PAD is communicating. EFGHIJ is the unique address of a port on the Radio-PAD. For example : The NUA of ports 100122 and 100123 on a Radio-PAD tuned to a base station channel with identification 1990 would be 23531990100122 and 23531990100123.	Maint	No
RCB	-	-	0 - 4	Remote Comm's Baud Rate where 0 = 300, 1 = 1200, 2 = 2400, 3 = 4800, 4 = 9600	Maint	No
RCT			0 - 3	Remote Comm's type 0 = PSTN 1 = PAKNET 2 = GPRS 3 = GPRS with no iConnector (Gemini only)	Maint	See text
RCU	-	-	0 - 1	Remote Comm's Update This command requests the OMCU to dial the Instation and transmit the status message.	Maint	No
RDF	-	-	0 - 1	Reset Detector Fault When a detector fault on the car park loops has been reported this command will clear the fault for any loops that have changed state since the failure was detected.	Maint	No
RMP	-	0	0 - 63	Ramp Up Time Threshold The number of minutes before the FULL state is reached at which ramp up mode is entered	Maint	No
		1	0 - 15	Ramp Up Period The interval in minutes between status reports to the Central Office whilst in ramp up mode		
		2	0 - 63	Ramp Down Time Threshold The number of minutes before the ALMOST FULL state is reached (from the FULL state) at which ramp down mode is entered		
		3	0 - 15	Ramp Down Period The interval in minutes between status reports to the Central Office whilst in ramp down mode		

3.6.2.2 *Programming*

- 1) Program the parameters using the tables shown in 3.5.2.3, 3.5.3.1 or 3.5.5.2 as a guide.
- 2) The handset command LDV=3, loads the following default values:
 - Inputs 0 to 4 configured as Entry Loops
 - Inputs 8 to 12 configured as Exit Loops
 - Input 15 Door input
 - 'No detect' monitoring disabled
 - 'Permanent detect' monitoring disabled

 - Car park full increasing threshold = 950
 - Car park almost full increasing threshold = 900
 - Car park capacity = 1000
 - Car park almost full decreasing threshold offset = 20
 - Car park full decreasing threshold offset = 20
 - Fill rate calculation period = 15 minutes

The default values for the timetable (3 time slots only) are shown in the following table.

Time Slot	Frequency per Hour	Comments
00:00 to 07:00	1	Report sent every 60 minutes starting at 00:00
07:00 to 18:00	4	Report sent every 15 minutes starting at 07:00
18:00 to 00:00	2	Report sent every 30 minutes starting at 18:00

The timetable can only be modified using a SIESpace Instation.

Note that when entering Car Park Capacity values (and thresholds) these must be entered in the correct order i.e. almost full thresholds first (the lowest) then full thresholds and then typically the capacity. The OMU will usually reject values if the capacity is too small for one of the proposed threshold values etc.

3.6.2.3 OMU Car Park Configuration (Based upon Nottingham)

Overwritten by Siespace Site Data				Fletcher Gate	Royal Centre	Talbot Street	Mount Street	St. James	Stoney Street	Forest Park & Ride	Pheonix Park & Ride	Spare
	CMD	Major	Minor									
	PME											
	INI			1	1	1	1	1	1	1	1	
	PME											
	LDV			3	3	3	3	3	3	3	3	
Yes	AFT		0	900	900	900	380	420	280	900	900	
Yes	AFT		1	5	5	5	5	5	5	5	5	
Yes	FUT		0	950	950	950	400	450	301	950	950	
Yes	FUT		1	5	5	5	5	5	5	5	5	
Yes	CPC			1000	1000	1000	427	470	320	1000	1000	
	FCP			15	15	15	15	15	15	15	15	
	CPL	0	0	0	0	0	0	0	0	?	0	
	CPL	0	1	0	0	0	0	0	0	?	0	
	CPL	0	2	0	0	0	0	0	0	?	0	
	CPL	0	3	0	0	0	0	0	0	?	0	
	CPL	1	0	0	1	1	1	1	1	?	1	
	CPL	1	1	1	1	1	1	1	1	?	1	
	CPL	1	2	0	0	0	0	0	0	?	0	
	CPL	1	3	0	0	0	0	0	0	?	0	
	CPL	2	0	1	0	0	0	0	0	?	0	
	CPL	2	1	2	255	255	255	255	255	?	255	
	CPL	2	2	0	0	0	0	0	0	?	0	
	CPL	2	3	0	0	0	0	0	0	?	0	
	CPL	3	0	1	0	0	0	0	0	?	0	
	CPL	3	1	3	255	255	255	255	255	?	255	
	CPL	3	2	0	0	0	0	0	0	?	0	
	CPL	3	3	0	0	0	0	0	0	?	0	
	DOR			255	255	255	255	255	255	255	255	
Yes	RMP		0	15	15	15	15	15	15	15	15	
Yes	RMP		1	5	5	5	5	5	5	5	5	
Yes	RMP		2	10	10	10	10	10	10	10	10	
Yes	RMP		3	5	5	5	5	5	5	5	5	
	KEY			As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	
	RCB			4	4	4	4	4	4	4	4	
	ADR			200	201	202	203	204	205	206	207	
	CPO			Current Occupancy	Current Occupancy	Current Occupancy	Current Occupancy	Current Occupancy	Current Occupancy	Current Occupancy	Current Occupancy	
	RCT			2	2	2	2	2	2	2	2	

Note RCT=2 will reset OMU & start GPRS connection sequence.

Note: Values for AFT, FUT, CPC and RMP are dummy values in advance of car park info, these will be overwritten by site data from Siespace when the correct values are entered there.

3.6.2.4 Gemini Car Park Configuration (Based upon Chelmsford)

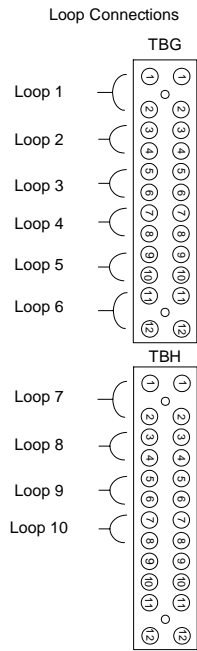
Overwritten by Siespace Site Data				High Chelmer	Meadows Multi-Storey	Meadows Surface	Meadows Retail Multi	Meadows Retail Surface	Wharf Road	Riverside	Coval Lane	Townfield	New Writtle Street	Baddow Road	Rectory Lane	Parkway
	CMD	Major	Minor													
	PME			1	1	1	1	1	1	1	1	1	1	1	1	1
	INI															
	PME															
	LDV			3	3	3	3	3	3	3	3	3	3	3	3	3
Yes	AFT		0	900	900	900	900	900	900	900	900	900	900	900	900	900
Yes	AFT		1	5	5	5	5	5	5	5	5	5	5	5	5	5
Yes	FUT		0	950	950	950	950	950	950	950	950	950	950	950	950	950
Yes	FUT		1	5	5	5	5	5	5	5	5	5	5	5	5	5
Yes	CPC			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	FCP			15	15	15	15	15	15	15	15	15	15	15	15	15
	CPL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1
	CPL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	CPL	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	2	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	CPL	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
	CPL	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	3	0	1	0	1	1	1	0	0	0	1	0	0	0	0
	CPL	3	1	3	255	255	255	255	3	3	3	3	3	3	3	3
	CPL	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	4	1	4	255	255	255	255	255	255	255	255	255	255	255	255
	CPL	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	5	0	1	0	1	1	1	0	0	0	1	0	0	0	0
	CPL	5	1	5	255	255	255	255	255	255	255	255	255	255	255	255
	CPL	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	6	1	6	255	255	255	255	255	255	255	255	255	255	255	255
	CPL	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPL	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0
	DOR			255	255	255	255	255	255	255	255	255	255	255	255	255
Yes	RMP		0	15	15	15	15	15	15	15	15	15	15	15	15	15
Yes	RMP		1	5	5	5	5	5	5	5	5	5	5	5	5	5
Yes	RMP		2	10	10	10	10	10	10	10	10	10	10	10	10	10
Yes	RMP		3	5	5	5	5	5	5	5	5	5	5	5	5	5
	KEY			As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required
	RCB			4	4	4	4	4	4	4	4	4	4	4	4	4
	ADR			201	202	203	204	205	206	207	208	209	210	211	212	213
	IP1			10.137.8.170:20843												
	MOS			AT+CGDCONT=1,IP,ESSEX.GOV.UK												
	GUP			WEB:WEB												
	PPD			0	0	0	0	0	0	0	0	0	0	0	0	0
	PTO			5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	CPO			Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ	Current Occ
	RCT			3	3	3	3	3	3	3	3	3	3	3	3	3

Note RCT=3 will reset OMU & start GPRS connection sequence.

Note: Values for AFT, FUT, CPC and RMP are dummy values in advance of car park info, these will be overwritten by site data from Siespace when the correct values are entered there.

3.6.3 Physical Loop Connections

The physical connections for these loops on an ST700 Car Park Outstation are as shown below.



The actual loops are connected as shown in the following example table. This shows the Chelmsford configuration, other projects should use this table as a base.

3.6.3.1 Physical Loop Connections (Based upon Chelmsford)

Loop Number	1	2	3	4	5	6	7	8	9	10
Car Park										
High Chelmer	In Lane 1 (Left hand side as entering)	In Lane 2 (Middle)	In Lane 3 (Right hand side as entering)	Exit Lane 1 (Left hand side as leaving)	Exit Lane 2	Exit Lane 3	Exit Lane 4 (Right hand side as leaving)			
Meadows Multi Storey	In Lane 1 (Left hand side as entering)	In Lane 2 (Right hand side as entering)	Exit Lane	-	-	-	-			
Meadows Surface	In Lane	Exit Lane 1 (Left hand side as leaving)	Exit Lane 2 (Right hand side as leaving)	-	-	-	-			
Meadows Retail Multi	In Lane	Exit Lane 1 (Left hand side as leaving)	Exit Lane 2 (Right hand side as leaving)							
Meadows Retail Surface	In Lane	Exit Lane 1 (Left hand side as leaving) SEE NOTE 1	Exit Lane 2 (Right hand side as leaving) SEE NOTE 1							
Wharf Road	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						
Riverside	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						
Coval Lane	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						
Townfield	In Lane 1 (Left hand side as entering)	In Lane 2 (Right hand side as entering)	Exit Lane 1 (Left hand side as leaving)	Exit Lane 2 (Right hand side as leaving)						
New Writtle Street	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						
Baddow Road	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						
Rectory Lane	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						
Parkway	In Lane first loop	In Lane second loop	Exit Lane first loop	Exit Lane second loop						

Note 1: The two exit loops for Meadows Retail Surface connect to the ST4R in the remote Smartlink pole.

Note 2: Where first / second loops are identified, these are the first / second loops a car will traverse when going in the correct direction for that entrance or exit.

3.6.4 OMU Operation

The following section contains extracts from the OMCU 3U Handbook (ref. section 1.3) to assist in fault finding and commissioning.

3.6.4.2 *OMCU Status Message to SIESpace*

The OMCU generates the same status report format regardless of the reason for generating the status report. The status report contains the following information:

- Occupancy status
- Occupancy
- Vehicle count for each configured loop
- DFM state for each configured loop
- Ramp mode
- Car park state
- Door state
- Power fail
- Emergency input state

When the Central Office resets the difference count, the OMCU replies as above with the occupancy and the vehicle count for each loop set to 0.

A status message is automatically transmitted to the SIESpace Instation when any of the following events occur:

- Cabinet Door is opened or closed
- Power fail is detected or restored
- Routine Poll is requested
- Ramp-up or Ramp-down mode is entered
- Car park state changes (i.e. Spaces, Almost Full, Full , Closed)

3.6.4.3 *Routine Poll*

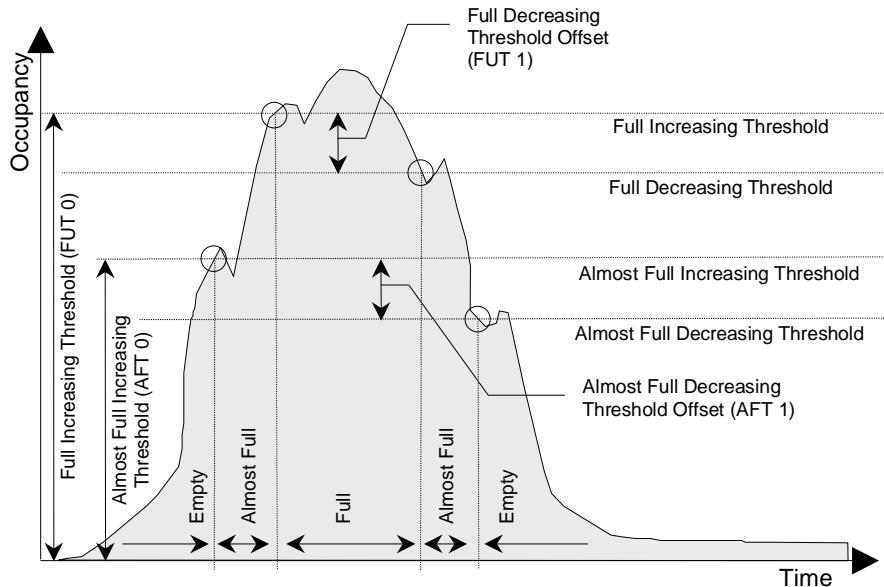
The OMCU contains a timetable that indicates the periodic rate at which status messages must be transmitted to the Instation.

This ensures that the Instation will receive a status message with a minimum time interval specified in the table. If an event occurs that forces a status message to be transmitted (e.g. cabinet door is opened) then the routine poll timer is reset. This ensures that a routine poll is not transmitted just after the status as a result of the event.

3.6.4.4 Difference Count and Thresholds Algorithm

The following describes the algorithm for the OMCU when used in the Car Park system.

Car Park States



OMCU Car Park Thresholds

The OMCU maintains 3 distinct states – 'SPACES', 'ALMOST FULL' and 'FULL'.

The car park occupancy is compared to these thresholds to determine whether a state transition is required.

- The 'SPACES' state is set when the almost full decreasing threshold is crossed from the 'ALMOST FULL' or 'FULL' states.
- The 'ALMOST FULL' state is set when the almost full increasing threshold is crossed from the 'SPACES' state or when the full decreasing threshold is crossed from the 'FULL' state.
- The 'FULL' state is set when the full increasing threshold is crossed from the 'SPACES' or the 'ALMOST FULL' states.

A status report is sent to the Central Office whenever any one of these thresholds is crossed.

Extrapolation

A straight line extrapolation is made N minutes into the future to assess whether the car park is filling or emptying at a fast enough rate to require more frequent status reports to the Central Office.

The extrapolation is based on two occupancy values (a) the current occupancy and (b) the occupancy from M minutes earlier. M is the fill rate calculation period (handset command FCP).

The value of N depends on the state:

- If the state is 'FULL' then N is set to the ramp down time threshold.
- If the state is 'SPACES' or 'ALMOST FULL' then N is set to the ramp up time threshold.

If the state is 'SPACES' or 'ALMOST FULL' and the car park is filling fast enough so that the 'FULL' state would be reached in N minutes. Then status reports are sent to the Central Office at X minute intervals (ramp up mode) where X is set to the ramp up period. The first status report is sent as soon as the decision is taken to enter ramp up mode.

If the fill rate changes so that the 'FULL' state would not be reached within N minutes then status reports are no longer sent to the Central Office at X minute intervals. If the occupancy reaches the 'FULL' state, status reports are no longer sent at X minute intervals.

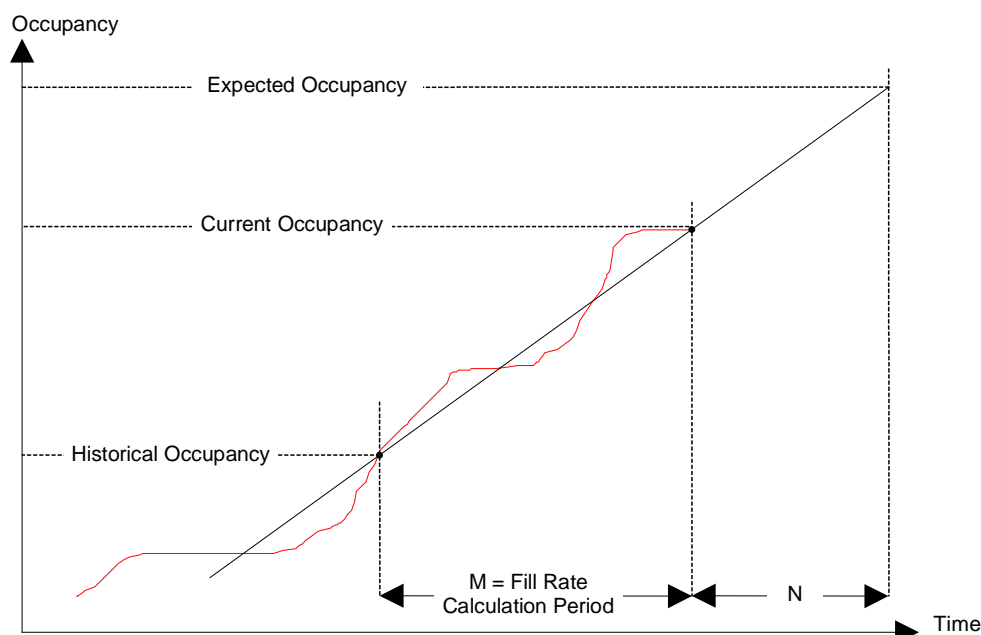


Figure 1 - Extrapolation

If the state is FULL and the car park is emptying fast enough so that the ALMOST FULL state would be reached in N minutes then status reports are sent to the Central Office at X minute intervals (ramp down mode) where X is set to the ramp down period. The first status report is sent as soon as the decision is taken to enter ramp down mode.

If the emptying rate changes so that the ALMOST FULL state would not be reached within N minutes then status reports are no longer sent to the Central Office at X minute intervals. If the occupancy reaches the almost FULL state, status reports are no longer sent at X minute intervals.

The Historical Occupancy is calculated and stored at 1-minute intervals.

3.6.4.5 *Detector Fault Monitoring*

Each of the car park entry and exit loops can be configured to have detector fault monitoring, by default this facility is disabled.

Each loop can provide a separate detector 'Active' and 'Inactive' time, the timing range is 0 to 255 minutes and hours respectively. Handset command CPL is used to set-up these times.

If the detector remains in either the 'active' or 'inactive' state for longer than the configured time then a failure is recorded. Once a DFM fault has been reported it remains active even if the detector starts to operate again.

To clear the fault firstly the detector fault must be fixed and have started to operate again (i.e. it has changed state at least once). Handset command RDF=1 must then be entered to clear the fault, the handset display will change to RDF:0 once all faults have been cleared (this may take up to 1 minute).

3.6.4.6 *Door Switch*

A Door switch can be provided to indicate to the Instation when the cabinet door has been opened. This input is connected to one of the low voltage inputs on the OMCU. By default the door switch is assigned to input 16 (PL3 pins 15 and 16)

Handset command DOR can be used to modify the OMCU input assigned to this facility.

3.6.5 Connecting a Gemini to an APT Skidata System

APT Skidata manufacture car park management systems. These consist of such items as barrier entry, ticketing, control offices, CCTV etc. The current Skidata equipment provides an interface using one of two communications protocols, Host Communications 1 or 2. Some very old Skidata systems predate this interface.

The interface is LAN TCP/IP based, Gemini is capable of interfacing with APT Skidata using Host Communications 1 or 2 using its network port connection. The customer will need to liaise with APT Skidata to determine which version the equipment has (version 2 is the later and more flexible). The Host communications is not necessarily enabled on all Skidata equipment and a licence fee may be payable by the customer or car park operator to provide this functionality.

With Host Communications version 1 Gemini would need exclusive access to the port on the SKIDATA equipment, with the later version 2 it is possible to share with any existing devices that may already be connected.

3.6.5.1 *Information required from APT Skidata*

The following information is required from APT Skidata to setup the Gemini (The handset command for this parameter is shown in brackets) :

1) APT Facility Number (AFN)

Overall identifier for the installation controlled by the APT Skidata equipment (could contain multiple car parks).

2) Car Park Number (ACN)

Identifies individual car parks within a facility. With Host comms 2 multiple Gemini units can be connected to one facility and setup for different car park numbers to return data to Siespace. Host comms 1 only supports a single device hence we can only return a single car parks data.

3) APT Device Number (ADN)

Used to set a field in request messages sent from Gemini to the Skidata system. Set to 1 during development and testing but APT to advise if this needs to be altered.

4) Counting category (ACC)

Counts on an APT Skidata systems are divided into categories to cover, for example, contract parking, public parking, people who have used credit cards etc. All categories selected as included will be added together to produce the final car park count. The customer must also be involved in choosing which counts go into producing the total shown on the VMS. It is possible that only categories containing public space counts would be required such that the signs show the number of public spaces available. Any combination of categories can be included.

The default APT count categories are:

- 1 - Short term parker
- 2 - Contract parker
- 3 - Total
- 4 - 24 - user defined

5) APT Comms version (ACV)

Selects either host comms version 1 or 2. Version 2 is the later and is preferred.

6) APT Port number (APN)

Defines the port number we connect to the APT Skidata equipment on. The default value is 10200.

7) APT IP Address (AIP)

Defines the IP Address of the APT Skidata equipment that is running the host comms interface.

8) Gemini IP Address (IPM0 or 3)

The IP address of the Gemini should be obtained from Skidata as it needs to be compatible with any other devices connected to the host comms port. For host comms version 1 this IP address will also need to be programmed into the APT Skidata equipment. Use IPM3 to set the subnet mask if required.

The handset commands required setup this interface are shown in section 3.5.2.1. An example of a complete set of commands to configure a Gemini with an APT Skidata system is shown in the following section:

3.6.5.2 Gemini to APT Skidata example configuration

Overwritten by Siespace Site Data	CMD	Major	Minor	Example data
	PME			
	INI			1
	PME			
	LDV			3
Yes	AFT		0	900
Yes	AFT		1	5
Yes	FUT		0	950
Yes	FUT		1	5
Yes	CPC			1000
	FCP			15
Yes	RMP		0	15
Yes	RMP		1	5
Yes	RMP		2	10
Yes	RMP		3	5
	DOR			255
	KEY			As Required
	RCB			4
	ADR			200
	ADS			1
	AFN			550012
	ACN			0
	ADN			1
	ACC		1	1
	ACC		2	0
	ACC		3	0
	ACC		4	0
	ACC		5	0
	ACC		6	0
	ACC		7	0
	ACC		8	0
	ACC		9	0
	ACC		10	0
	ACC		11	0
	ACC		12	0
	ACC		13	0
	ACC		14	0
	ACC		15	0
	ACC		16	0
	ACC		17	0
	ACC		18	0
	ACC		19	0
	ACC		20	0
	ACC		21	0
	ACC		22	0
	ACC		23	0
	ACV			1
	APN			10200
	AIP			169.254.253.1
	DBG			1
	AFR			1
	IPM0			169.254.253.2
	IPR			2
	RCT			3

Note RCT=3 will reset Gemini & start GPRS connection sequence.

Note: Values for AFT, FUT, CPC and RMP are dummy values, these will be overwritten by site data from Siespace when the correct values are entered there.

3.6.6 OMU / Gemini Check for GPRS connection

When the OMU is configured and powered it will attempt to connect to the Siespace Instation.

3.6.6.1 *OMU with iConnector*

Section 4.5 specifies the OMU startup procedure. When the connection to the Instation is complete the iConnector CD LED will be constantly illuminated. The second green LED on the OMU also shows the CD state (as the iConnector is obscured when the unit is installed in the cabinet).

Check that the car park timetable has been downloaded (ref. section 3.5.6.3)

3.6.6.2 *OMU with Sequoia SQ864 DCD Siemens Gateway modem*

Section 4.5 specifies the OMU startup procedure. When the connection to the Instation is complete the blue and green LEDs will be constantly illuminated.

Check that the car park timetable has been downloaded (ref. section 3.5.6.3)

3.6.6.3 *Gemini*

On Gemini the top green LED flashes to show the unit is running. The second green LED reflects the following states:

Flashing - Gemini talking to MC35 modem
Constant on - Connected to Instation
Blink off occasionally - Sending data

If the LED is off then there is no connection to the Instation.

Check that the car park timetable has been downloaded (ref. section 3.5.6.3)

Additionally the following Engineering level commands at the handset provide further low level information on the connection state of the Gemini unit:

BAS=2

ENG=65 0

The returned number indicates the following:

- 0 - GPRS Car Park Connect
- 1 - GPRS Car Park Connect Wait
- 2 - GPRS Car Park Register with OMU
- 3 - GPRS Car Park Idle
- 4 - GPRS Car Park Outgoing call Ack
- 5 - GPRS Car Park Disconnect

6 - GPRS Car Park Exit Wait

7 - GPRS Car Park Exit

Additionally the command PPD=1 enables debug output (0=off)

3.6.6.4 *Check car park timetable downloaded*

The most reliable way to check communications at the Outstation is to check whether Siespace downloads the car park timetable to the OMU/Gemini. This proves that full communications are possible and that messages are being decrypted successfully.

It can take around 10 minutes for the timetable to be downloaded to the OMU/Gemini.

From the Engineers terminal examine the car park timetable (command CPT0 0).
The default timetable loaded by the LDV=3 is as shown below:

```
CPT0 0
CPT 0 0:0
CPT 0 1:0
CPT 0 2:60
CPT 1 0:7
CPT 1 1:0
CPT 1 2:15
CPT 2 0:18
CPT 2 1:0
CPT 2 2:30
```

Assuming the standard GPRS 5 minute timetable has been setup at Siespace then this will change as shown below:

```
CPT0 0
CPT 0 0:0
CPT 0 1:0
CPT 0 2:5
CPT 1 0:7
CPT 1 1:0
CPT 1 2:5
CPT 2 0:18
CPT 2 1:0
CPT 2 2:5
```

Note: The actual values depend on what has been programmed into the Siespace Installation. The values shown above reflect a timetable with 3 separate periods throughout the day each set to 5 minutes.

3.7 VMS Commissioning

The iConnector and MC35, or the Sequoia SQ864 DCD Siemens Gateway modem should be configured and fitted to the VMS prior to installation.

Commissioning of the VMS should be in line with the VMS standard handbook (ref. para. 1.3). The following additional steps should also be followed:

3.7.1 GPRS VMS

Notes:

1. PB825 Firmware Issue 10 or above must be installed when using the iConnectors detailed below:
 - Commercial iConnector part number: iC101-FM-C-0
 - Industrial iConnector part number: iC101-FM-I-0 Rev 1.5
 - iConnector part number: iC101-FM-I-1
 2. PB825 Firmware Issue 17 or above must be installed when using the new iConnector LE part number: iC100-FM-I-1. This iConnector has no leds to indicate power, CD, etc.
 3. PB825 Firmware Issue 18 or above must be installed when using the Sequoia SQ864 DCD Siemens Gateway modem (i.e. no iConnector)
- 1) Ensure that the antenna cable is securely connected to the MC35 module or the Sequoia SQ864 DCD Siemens Gateway modem.
 - 2) Check that either, both the MC35 and iConnector are powered, or the Sequoia SQ864 DCD Siemens Gateway modem is powered by observing their indicators.
 - 3) Refer to section 4 for an explanation of the power up and connection sequence.
 - 4) Communications should be tested by setting the VMS from the Instation. The Instation fault logs should be monitored for any signs of intermittent operation.

Refer to the Troubleshooting section of this document for a detailed description of the VMS startup procedure.

3.8 Encryption Configuration

Encryption keys are controlled by STC Systems Engineering. For the VMS the key is programmed into the config prom, the OMU has it programmed via the handset. The Siespace Instation holds the key in its database.

Encryption keys are 16 bytes long and are entered in ascii. The key should be as random as possible. As well as all upper and lower case letters (See Note below) and numbers the following characters may also be used to make up a key:

! # \$ % ^ & * () _ + @ ~ : ' { } [] < > - = ?

Do not use “ and / and \ as these cause compilation problems with VMS prompts.

NOTE: The OMU cannot accept lower case letters through its handset port, use only upper case for Car Parks.

3.9 iConnector / Gemini Remote Update

Note: This feature is disabled when the Sequoia SQ864 DCD Siemens Gateway modem is being used.

The instation has the ability to remotely update parameters held within the iConnector modules on the car park and VMS equipment. Any parameter that can be programmed by an AT command can be modified by this method.

This facility should only be utilised by STC Systems Engineering. Extreme care should be taken with this facility as a complete GPRS system can be rendered unusable.

Changing parameters that affect the GPRS connectivity will cause the Outstation equipment to go offline and attempt to reconnect to/with the newly configured address/parameters. If these are not valid the iConnector will need to be directly accessed and reprogrammed locally using the procedures in this document. A change such as the IP address of the Instation will cause all equipment to go offline and attempt to connect to the new address. The only way to regain communications would be to then reconfigure the Instation to the new address.

Changes to the iConnector configuration are one way, they will not revert unless the Outstation equipment receives a new valid reconfiguration message.

The reconfiguration parameters are entered into a text file named 'outstationmodemconfig.txt' which when placed in the C:\Siespace\Server directory will trigger the update. Siespace will send the configuration to each GPRS device repeatedly until it receives an Ack. The Outstation will send an Ack before resetting & applying the new configuration to the iConnector.

When Siespace receives an Ack from an Outstation after an update it stores the time against the device. This time is compared to the date of the 'outstationmodemconfig.txt' file to determine if it should be resent. Resaving the config file will therefore cause it to be resent to all devices.

The config update is common to all VMS and OMU equipment connected to the Instation.

The configuration text is encrypted and the total length of the message must not exceed 196 bytes. Any more and the OMU equipment will not act upon it (The VMS will accept up to 244 byte length updates).

The text below shows an example 'outstationmodemconfig.txt' file. When encrypted and sent this file is 196 bytes in length.

Note: The file must not have any blank lines before the first command.

Note: The last line of config text in the file must have a carriage return onto the next line (otherwise there is no <cr> at the end of the file and the update will fail).

Example 1 'outstationmodemconfig.txt' file

```
at+iDNS2="193.113.200.201"  
at+iDNS1="193.113.200.200"  
at+iMIS="at+cgdcont=1,ip,mobile.o2.co.uk"  
at+iIATO="0"  
at+iUSRN="web"  
at+iPWD="web"  
at+iHSRV="213.208.79.197": "555"  
at+iLPRT="555"
```

Note: It is occasionally necessary to power cycle the iConnector when changing some parameters. If the Outstation does not recommence communications after a parameter update then power cycle the equipment before resorting to retrieving the iConnector.

This example file contains the Inactivity Timeout timer for the iConnector.

Example 2 'outstationmodemconfig.txt' file

```
at+iATO="0"
```

This update facility is enabled by the registry key

[HKEY_LOCAL_MACHINE\SOFTWARE\Siemens\Traffic\CPS\Configure Outstation
Modem Every (Minutes)

The value entered determines how often the system checks if the configuration is required. **It is recommended that the system be left with this value set to 0, and only changed when an update is actually required.**

3.9.1 Notes for remote update on Gemini car parks

Gemini car parks do not use iConnectors but will still accept a remote update to change items such as the IP address or APN. AT commands that are not relevant to Gemini are ignored. Gemini will action the following AT commands in a remote update file:

at+iMIS - Modem initialisation string with APN e.g. "at+cgdcont=1,ip,mobile.o2.co.uk"

at+iIATO - Inactivity timeout - same as the PTO timeout handset command (usually 5000 for Gemini and 0 for iConnector - USE CAREFULLY AS VALUES ARE DIFFERENT !)

at+iUSRN - GPRS logon username

at+iPWD - GPRS logon password

at+iHSRV - Instation IP address and port number e.g. "213.208.79.197":20866"

Note: The config file must use the upper and lower case characters as shown for it to work with Gemini. If these are incorrect the update is ignored.

3.10 To connect Siespace Server via a Remote Internet Connected PC

As well as a direct connection to Siespace, an indirect connection via another PC is also supported. The other PC has the internet link and a separate LAN connection to the Siespace Server. Siespace is configured as shown below to remotely run the GPRS Port.exe process on this other PC. Data is then passed via the Port.exe application from the other PC to the Siespace Server.

Note: A single Easysoft ODBC licence can be used for both PC's, this is within the terms of the licence.

1. Create the directory c:\siespace\server and copy the files port.exe, ecnb.dll and ex25.dll into it.
2. Create the directory c:\siespace\shared and copy the files config.dll, log_fault.dll, MailMgrCInt.dll, MBXCIntRPC.dll, SiespaceMessage.dll and WdgAPI.dll into it.
3. Copy rcmdsvc.exe & rcmd.exe to server directory then from a command prompt run rcmdsvc -install to install the Remote Command Service
4. Select Control Panel\Administrative Tools\Services\Remote Command Service, change the startup type to Automatic and start the service.
5. Add the directories c:\siespace\server and c:\siespace\shared to the PATH environment variable.
6. Install the InterBase client software.
7. Install the Easysoft ODBC-InterBase driver.
8. Use the ODBC Data Source Administrator to create a System DSN for the Siespace database that resides on the Siespace server PC. For example, set the database to AN16004964:C:\Siespace\Database\Siespace.gdb.
9. Create the registry value HKEY_LOCAL_MACHINE\Software\Siemens\Traffic\Mail Manager\RPC\NetworkAddress and set it to the name of the Siespace server PC. (Steps 10 and 11 will create this registry value, but it defaults to localhost.)
10. Set up the Siespace server PC to run port.exe remotely on the web server PC: add a row to the REMOTE_EXECUTION_PARAMETERS table; change the DEVICEMAP table REMOTE_EXECUTION column value to Y for the required COM_PORT column values;
11. Enter fields in REMOTE_EXECUTION_PARAMETERS with username password etc. of remote computer (ENSURE PASSWORD CASE IS CORRECT). Id is unique to this table so can be 1 if no other entries.
12. Change the REMOTE_EXECUTION_PARAMETERS_ID column value to the REMOTE_EXECUTION_PARAMETERS table ID column value (will flag up an error if an Id has yet to be entered there).
13. REBOOT the web server PC (The modified paths are not read otherwise).
14. Start Siespace on the Siespace server PC; port.exe should start on the web server PC. (Debug window will still appear on Siespace server PC but toolbar icon will be different indicating it is running remotely). Port.exe will be running locally on the Webserver PC.
15. Stop Siespace on the Siespace server PC; port.exe should stop on the web server PC.

4. TROUBLESHOOTING

4.1 MC35 Diagnostic LED

The MC35 Diagnostic LED is used to indicate the following states.

Operating state	LED
Immediately after power up	On for 2 seconds
Network search or No SIM card inserted or No PIN entered or No GPRS network available	Flashes approx 2 secs on, 2 secs off
Standby GPRS Network	Flashes twice quickly every 4 secs approx
Data Transfer	Flashes on for approx 1 sec when data is transferred. (This flash usually replaces the two quick flashes for the Standby state above)

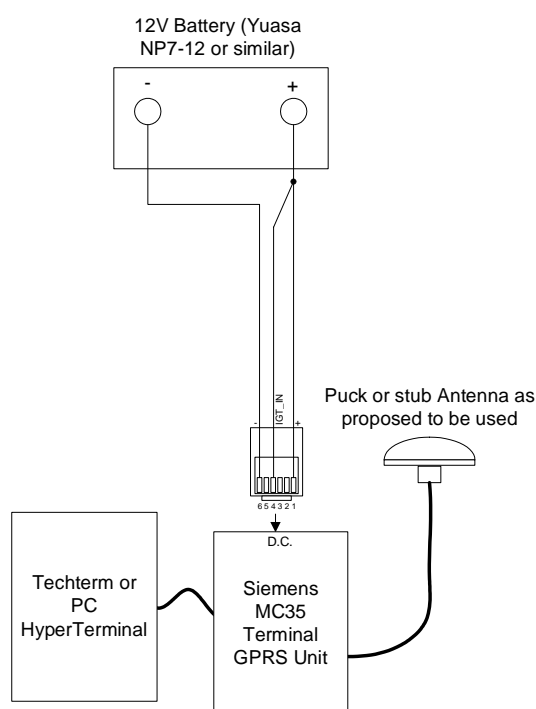
4.2 Measuring Signal Strength at MC35

This procedure can be used for Radio Survey purposes as well as troubleshooting.

This requires a terminal (Laptop with Hyperterminal or Techterm device) to be plugged directly into the MC35. The MC35 must be fitted with a valid SIM card for the relevant Service Provider.

This procedure can be carried out at an installed Car Park or VMS Outstation or using the equipment shown below for a portable Radio Survey setup.

(The battery used was a Yuasa NP7-12 charged up on VDO Outstation. This will run the MC35 for an extended period and is not too heavy to carry)



- 1) Configure the terminal for 9600-8-N-1 No flow control (use CTRL-SHIFT-F1 on Techterm for setup display)
- 2) Switch on MC35. Ensure that the PIN has been disabled (see previous section). Alternatively use CPIN=xxxx<cr> to enter PIN.
- 3) Wait for MC35 LED to flash briefly indicating that it has logged onto the network.

4.2.1 Signal Strength

- 1) Enter AT+CSQ<cr>. Response will be +CSQ: x,y where x indicates the signal level:

Value of x	Meaning
0	-113dBm or less
1	-111dBm or less
2-30	-109dBm to -53dBm
31	-51dBm or greater
99	Not known or not detectable

- 2) A value of 12 or more is required, less than this and calls may be dropped (Recommended by Sequoia Training Course).

4.2.2 GPRS Connect

- 1) Enter AT+CGATT=1, the MC35 should respond with OK indicating that the MC35 has connected to the GPRS service.
- 2) Enter AT+CGATT=0, the MC35 should respond with OK indicating that the MC35 has disconnected with the GPRS service.

4.3 Locked up iConnector

It can sometimes be difficult to establish comms to an iConnector from the iConfig program (Version 2.2.22). The following points should be observed:

- Firmware IS703B03 / Bootblock 0706 has a bug whereby an iConnector in Serialnet mode if power cycled may not respond again. This only occurs on some modules. This problem is fixed in firmware IS702P15 & 704B09 / Bootblock 0708.
- An iconnector will stay in serialnet mode even when powered down then up again. if the first command from the iConfig program is not 'exit serialnet mode' then it may lock. Power cycle the iConnector and send 'exit serialnet mode' first to overcome this.
- The iConfig program 'exit serialnet mode' command can say state 'exited' when it has not and sometimes says nothing when it has exited ! The best way is to ignore the screen display and to watch the iConnector LED's, RX will flash when +++ is sent to exit serialnet mode, the TX LED will flash if the unit responds OK to this. To confuse things further as of firmware issue 702P15 if the module is not in Serialnet mode then it will not respond OK to an exit (no TX LED to watch for), in this case check comms by trying the 'Full Configuration' menu, if the parameters are read off then you have comms.
- Once configured the iConnector baud rate is 9600. Delivered units are set to autobaud. The iConfig program uses the last set baud rate. It is best to always use 9600 unless flashing the firmware, in this case it can save a lot of time to set the unit to 38400
- . The iConnector autobaud setting expects an 'a' or 'A' to be the first character sent to it.
- If the iConfig program displays 'Scanning Ports' then it is best to shut down the program and start again. The program is sending data to each com port at every baud rate, this takes some time and very rarely rectifies the problem.

4.4 VMS Startup and reset procedure

The following is intended to aid the understanding of the VMS startup and reset procedure when operating under GPRS:

- Black iConnector:

	Communications	iConnector LED's
1)	Power on	CD on briefly at startup
2)	VMS sends +++ to iConnector (to exit SerialNet mode)	RX flashes
3)	Wait 45 seconds	TX LED flashes if coming out of Serialnet mode. Will not flash if already out of Serialnet.
4)	Send AT+CFUN=1,1<cr> to iConnector (to reset the MC35 terminal)	RX Flashes
5)	Wait 10 seconds	CD comes on briefly as MC35 and iConnector reset
6)	Send AT+iSNMD<cr> to iConnector (to enter SerialNet mode)	RX Flashes
7)	Wait 10 seconds	TX Flashes
8)	Send Idxy to iConnector, x=device address, y=type 1 for Car Park, 2 for VMS (This initiates the connection to the Instation and will cause the CD light to illuminate on the iConnector).	RX Flashes then several seconds later CD should come on.
9)	The Instation should now reply, if not the ID will be sent at 7 minute intervals until the VMS blanking time is reached (see below).	TX flashes on receipt of data from the Instation. CD should stay on.

Note: For VMS Issue 11

If the VMS has had no communications for the Link Verify Timeout period it will resend the ID to the Instation.

If the VMS has no communications for the blanking time (set in the configuration eeprom), then a watchdog will be forced which will blank the sign, the +++ restart sequence is then initiated.

Note: For VMS Issue 12

If the VMS has had no communications for the Link Verify Timeout period it will perform the +++, restart sequence (the sign will not blank).

If the VMS has no communications for the blanking time (set in the configuration eeprom), then a watchdog will be forced which will blank the sign, the +++ restart sequence is then initiated.

- Grey iConnector:
Note: If the grey LE iConnector is being used; VMS Issue 17 onwards must be used.

	Communications
1)	Power on
2)	VMS sends +++ to iConnector (to exit SerialNet mode)
3)	Wait 45 seconds
4)	Send AT+iMCM<cr> to iConnector (puts the Iconnector into command mode so that it passes though AT commands)
5)	Wait 10 seconds
6)	Send AT+CFUN=1,1<cr> to iConnector (to reset the MC35 terminal)
7)	Wait 9 seconds
8)	Send At+i<cr> to iConnector (exit command mode on Iconnector)
9)	Wait 10 seconds
10)	Send AT+iSNMD<cr> to iConnector (to enter SerialNet mode)
11)	Wait 10 seconds
12)	Send Idxy to iConnector, x=device address, y=type 1 for Car Park, 2 for VMS (This initiates the connection to the Instation and will cause the CD light to illuminate on the iConnector).
13)	The Instation should now reply, if not the ID will be sent at 7 minute intervals until the VMS blanking time is reached (see below).

- Sequoia SQ864 DCD Siemens Gateway modem:
Note: If the Sequoia SQ864 DCD Siemens Gateway modem is being used; VMS Issue 18 onwards must be used.

	Communications
1)	Power on
2)	Sign sends Idxy to the Sequoia SQ864 DCD Siemens Gateway modem, x=device address, y=type 1 for Car Park, 2 for VMS. This message is sent every 5 seconds until the connection to the Instation is established.
3)	Red LED flashes once per second; blue and green LEDs are off
4)	Red LED flashes once every 3 seconds when unit is registered; blue and green LEDs are off
5)	Blue LED illuminates when the IP address has been established.
6)	Green LED illuminates when the connection to the Instation is established.
7)	The Instation should now reply, if not the ID will be sent at 7 minute intervals until the VMS blanking time is reached (see below).

4.5 OMU Startup and reset procedure (not Gemini)

The following is intended to aid the understanding of the OMU startup and reset procedure when operating under GPRS:

- Black iConnector:

	Communications	iConnector LED's
1)	Power on	CD on briefly at startup
2)	OMU sends +++ to iConnector (to exit SerialNet mode)	RX flashes
3)	Wait 45 seconds	TX LED flashes if coming out of Serialnet mode. Will not flash if already out of Serialnet.
4)	Send AT+CFUN=1,1<cr> to iConnector (to reset the MC35 terminal)	RX Flashes
5)	Wait 10 seconds	CD comes on briefly as MC35 and iConnector reset
6)	Send AT+iSNMD<cr> to iConnector (to enter SerialNet mode)	RX Flashes
7)	Wait 10 seconds	TX Flashes
8)	Send Idxy to iConnector, x=device address, y=type 1 for Car Park, 2 for VMS (This initiates the connection to the Instation and will cause the CD light to illuminate on the iConnector).	RX Flashes then several seconds later CD should come on.
9)	The Instation should now reply, if not the ID will be sent at 7 minute intervals for three more times. The OMU will then restart the +++ sequence above.	TX flashes on receipt of data from the Instation. CD should stay on.

- Grey iConnector:
Note: If the grey LE iConnector is being used; VMS Issue 17 onwards must be used.

	Communications
1)	Power on
2)	VMS sends +++ to iConnector (to exit SerialNet mode)
3)	Wait 45 seconds
4)	Send AT+iMCM<cr> to iConnector (puts the Iconnector into command mode so that it passes though AT commands)
5)	Wait 10 seconds
6)	Send AT+CFUN=1,1<cr> to iConnector (to reset the MC35 terminal)
7)	Wait 10 seconds
8)	Send At+i<cr> to iConnector (exit command mode on Iconnector)
9)	Wait 10 seconds

	Communications
10)	Send AT+iSNMD<cr> to iConnector (to enter SerialNet mode)
11)	Wait 10 seconds
12)	Send Idxy to iConnector, x=device address, y=type 1 for Car Park, 2 for VMS (This initiates the connection to the Instation and will cause the CD light to illuminate on the iConnector).
13)	The Instation should now reply, if not the ID will be sent at 7 minute intervals for three more times. The OMU will then restart the +++ sequence above.

- Sequoia SQ864 DCD Siemens Gateway modem:
Note: If the Sequoia SQ864 DCD Siemens Gateway modem is being used; VMS Issue 18 onwards must be used.

	Communications	LED's
1)	Power on	Red LED flashes once per second
2)	Sequoia SQ864 DCD Siemens Gateway modem registered	Red LED flashes once every 3 seconds
3)	IP address has been established.	Blue LED illuminates
4)	Connection to the Instation is established.	Green LED illuminates
5)	Whilst data is being transmitted	Red LED illuminates