Siemens Traffic Controls Limited,
Sopers Lane,
Poole,
Dorset,
BH17 7ER

SYSTEM/PROJECT/PRODUCT : Remote Monitoring System (RMS)

Operator Handbook
for
Remote Monitoring System
Instation

Prepared :M Gilham

Function : Technical Specialist

THIS DOCUMENT IS ELECTRONICALLY HELD AND APPROVED

Issue	Date	ECN
5	16/5/00	
6	04/09/01	TS000598
7	5/02/03	TS001220
8.0	16/11/07	TS003491

CONTENTS

1 INTRODUCTION

This document provides an overview of the installation and facilities of the RMS Instation.

The online help text for the actual version being used should be consulted for full and detailed information on the available features.

Section 2

This section gives a general description and overview of the RMS Instation system as a whole and then the Instation and Outstations as individual units.

Section 3

This section describes how to Install the instation software and some basic tips on how to 'get started' with RMS.

Section 4

This section describes the various facilities available for archiving and saving data held on the hard disk.

1.1 Related documents

667/HB/17500/000	Handbook for Outstation Monitoring Unit.
667/HB/30600/000	Gemini Traffic Outstation Handbook.
667/HB/32600/000	Gemini Mk2 Traffic Outstation Handbook.
667/HB/26131/100	Handbook for DUSC

2 RMS OVERVIEW

2.1 The RMS system

The Siemens Remote Monitoring and Control system provides an easy to use and highly reliable facility enabling the efficient monitoring and management of a wide range of “on street” equipment.

The advanced Windows™ based Instation allows operators to appreciate the status of all monitored equipment at a glance using a fully user customisable map based display.

Equipment monitoring is performed by a powerful 3U-sized Outstation Monitoring and Control Unit (OMCU) that can easily be fitted into most equipment housings. Fault and status reporting is via a PSTN or GSM network, allowing the most cost effective communications infrastructure to be chosen on a site by site basis.

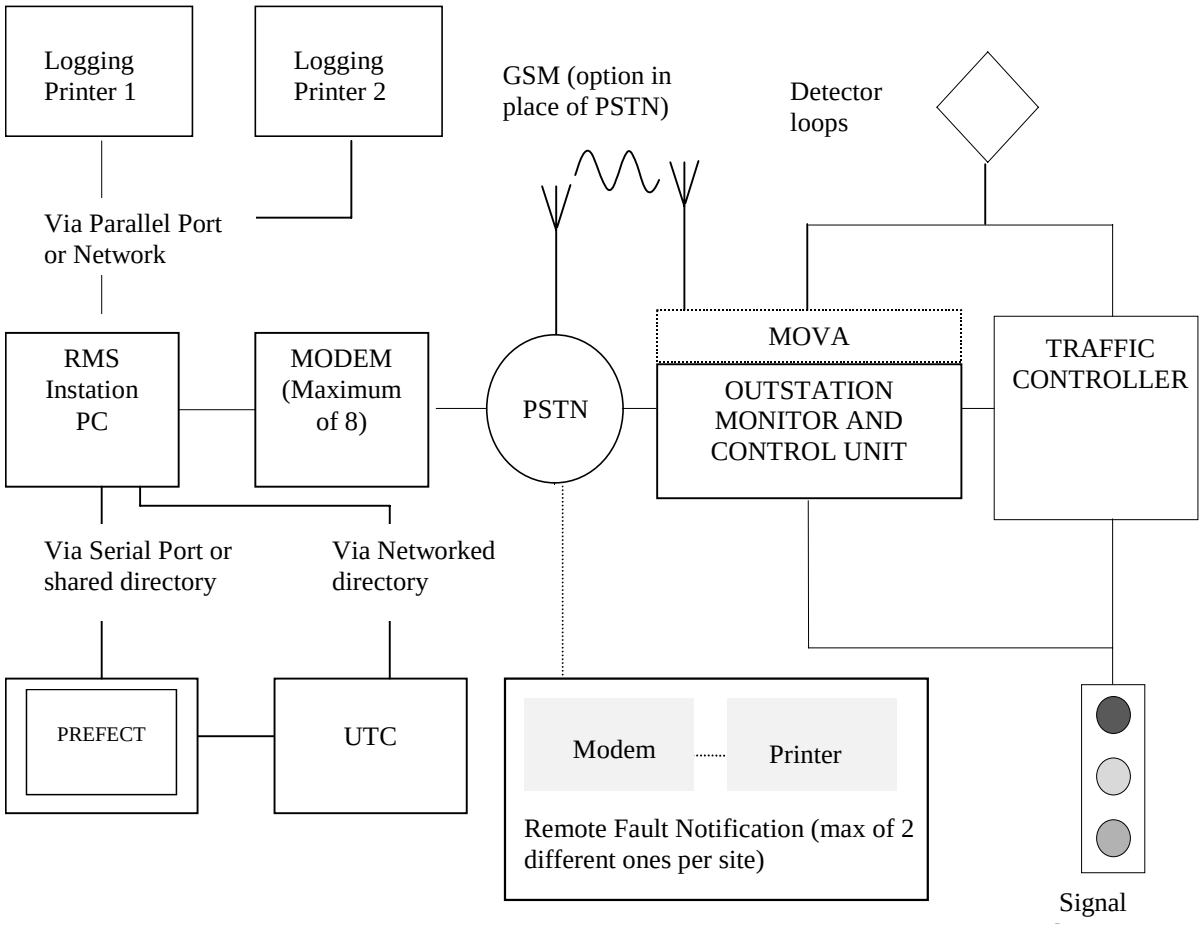
As well as monitoring applications the system may be used for the remote control of various equipment’s including Variable Message Signs. Direct interface to the Siemens Sietag Reader also provides an integrated bus and emergency vehicle priority system, complete with detailed recording of travel times and events.

An additional option that can be provided is the RMS DUSC (Dial Up Strategic Control) system, which allows a series of intersections to be controlled in a synchronised manner. Strategic control is implemented using the CLF (Cableless Linking) principal, but with plans being prepared and downloaded from the Instation and implemented in each OMCU. As there is no need to hold the plans in the traffic controller configuration, modification of plan data, should the need arise, is very simple. Realising the plans within the OMCU rather than the controller also has the added benefit of avoiding the potential for inconsistent plan execution because of different controller CLF implementations.

Another additional option that can be provided is sieClass (Vehicle Classification), which allows vehicle classification by length into a maximum of 14 user specified categories. The vehicle classification information is stored locally at the OMCU and periodically uploaded to the instation where graphing utilities are provided to analyse the data.

Gemini based Graphos Graphical Variable Message Signs (GVMS) are also compatible with the RMS Instation. This allows the RMS Instation to be used to configure and monitor GVMS operation.

RMS System Overview



2.2 The Instation computer system

The Instation Operator Interface has been carefully designed to allow operators to easily appreciate the status of all equipment being monitored at a glance. OMCU's are identified by symbols positioned onto the map identifying their location and these are dynamically colour coded to reflect the fault status of the site.

Greater detail sub-maps may be defined and simply accessed to improve the clarity of the display where overcrowding of OMCU symbols occurs.

To enhance the task of managing "on street" equipment, data such as pictures, textual notes and log information uploaded from Traffic Controllers may be attached to the site symbol on the map. Data is accessed by simply selecting the site symbol and picking the information to be displayed from a list of that available. The appropriate application for viewing the information is started automatically.

The Instation is used to:

a) Enter data into the system and then download that data to each OMCU to configure it to oversee its associated controller.
b) Monitor controller operation (using the live up date and remote handset facilities).
c) Receive, log and print OMCU fault reports. Fault reports can be printed both at the Instation and at remote sites using the remote printer option.
d) Control e.g. signs

Once configured the OMCU checks the operation of the signal controller and reports any abnormalities to the Instation via its integral Auto Dial/Auto Answer modem.

Faults are time-stamped and logged on receipt at the Instation and innovative tabbed displays allow easy filtering of information to be displayed. Where hard copy records of fault receipts are required fault information may be automatically directed to up to two local or networked "logging" printers. The fault information can also be redirected to remote printers via the PSTN.

Typical reports would be:

(a) detector failures
(b) bulb failures etc.

When the OMCU is monitoring 0141 type controllers the operator may, using the OMCU handset, directly access controller parameters such as minimum green times etc. The facility to access parameters in a 0141 controller is also available from the Instation provided that the controller has suitable software to prevent critical timings from being changed.

In a multi-staff environment ensuring correct levels of access and clear indication of functionality available to different operators is an important consideration.
This is facilitated by the provision of 5 user configurable "log on" levels. A system administrator may set the facilities available at each level and the menu descriptions

for each facility. Access to each level is enabled by a password defined by the system manager thus preventing access to the system by unauthorised personnel.

The Instation software runs in a MS-Windows environment (see RMS Installation CD Readme for details) which provides the concurrency necessary to allow the Instation to communicate with up to eight OMCU's simultaneously, while at the same time enabling you to use the computer, for example to configure an OMCU. The user interface is provided via a user-friendly application.

2.3 The Outstation monitoring unit

The OMCU unit has been proven to be highly reliable in several thousand installations and Its small 3U sized enables it to be easily mounted in a wide variety of Traffic Controllers and other equipment.

The OMCU is able to monitor and report:-

- Signal lamp failures and replacements.
- Detector and pushbutton failures.
- Detector counts (using N and N+1 algorithms).
- Violations of traffic controller timings.
- Traffic controller status via handset terminal port.
- Status of contact data (from barrier controllers, overheight detectors, variable message signs and other equipment).
- Vehicle detection's from Sietag Readers (and provide priority based on these detections to an associated traffic controller).

Configuration at the Instation is accomplished using a simple "screen based" editor. Data may be downloaded remotely via the telephone link, or locally on site if required.

To ensure maximum utility of fault data generated by the OMCU, considerable flexibility is offered in defining limits and sensitivity for fault conditions as part of the configuration process.

Once configured the unit continuously monitors the operation of its associated equipment. When it detects a fault it initiates an auto-dial sequence establishing a communication path to the Instation over the telephone network.

To minimise call costs configuration options allow faults to be classified so those that are non-urgent are recorded at the OMCU but not uploaded unless requested by an Operator at the Instation, or an urgent fault is detected.

2.4 Bus Processor Functions

When used for Bus Processor applications the OMCU is connected to up to 8 Sietag readers and provide both logging and access control functions.

Vehicles to be given access / priority are fitted with an electronic tag that may be

programmed with amongst other things vehicle operator identification and individual vehicle number. A loop is located in each access lane that is used by a reader to interrogate tags as they pass over. Data from the tags is filtered by the outstation which will log the information and can be programmed to output access requests to barriers or other equipment such as Traffic Controllers, via up to 16 isolated relay contacts (expandable to 48 by the addition of additional I/O boards).

Several levels of filtering may be configured in each outstation. Filtering options range from specific access just for uniquely identified vehicles through to all vehicles of a particular operator. Access may be restricted by time of day and individual or groups of vehicles may be blacklisted.

The Bus processor is also able to interface to certain City of London (TCSU) bus priority beacons and provides similar facilities to those described for Sietag above

Both Bus Processor and OMCU functions are able to be performed simultaneously, limited only by the number of I/O cards that can be accommodated.

See Appendix B for details of the file format

2.5 Prefect / UTC Interface

The Siemens Prefect Fault management system may be installed on the same machine. Faults can be passed automatically from RMS to Prefect and then directly on to a maintenance organisation for action, without operator intervention. This close integration allows both applications to share the same communication modems and telephone lines, reducing infrastructure costs.

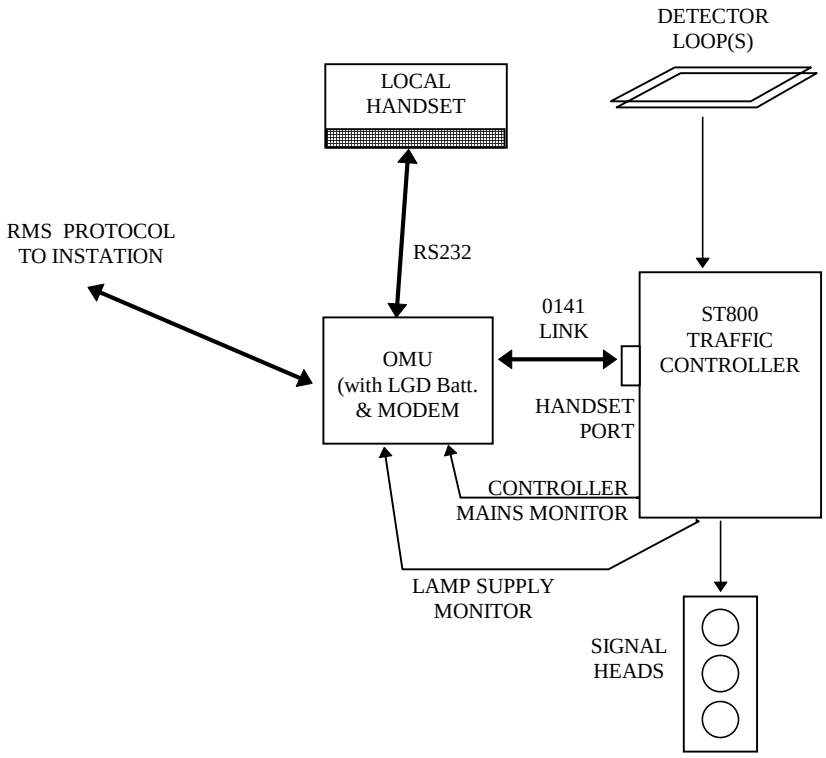
It is possible to transfer RMS fault data to UTC or Prefect via a network or simple serial interconnection.

2.6 MOVA

Siemens MOVA units may be integrated into the Instation map display so that access to them is simply achieved by clicking on their map symbol. To simplify user activities the Instation manages communication with the MOVA unit and launches the appropriate TRL applications as required.

2.7 ST800 Serial Interface

The OMCU can be configured to monitor the ST800 controller via an enhanced MCE0141 serial link, using the lamp monitoring and DFM configured on the controller (rather than using the OMU I/O and current sensors). This creates a semi-integral OMCU that provides reduced wiring, simplified installation and improved reliability. Close integration allows the OMCU to take advantage of the sophisticated monitoring proved by the ST800 enabling lamp faults to be reported on all 32 phases.



2.8 Vehicle Classification

The Vehicle Classification System continuously monitors vehicle data on a per lane basis. This DATA collected includes: Vehicle counts, Occupancy, Speed, Headway, Class type and Length.

The classifier uses pairs of loops so that speed and directional information can be obtained. One pair of loops is fitted in each running lane. Up to 8 pairs of loops can be controlled and monitored by a single Outstation.

Vehicles may be classified into 14 groups according to configurable lengths.

The site speed thresholds may be programmed in km/hr or mph.

16 statistical Category bins are available, these allow specified events to be recorded.

Detector Fault Monitoring is available.

Sign driving facility is via relays, RS232 or RS485. The latter 2 options are protocol configurable.

2.9 GVMS

Gemini based GVMS units can be configured and monitored by the instation. Specific configuration and fault reports relating to GVMS operation are provided. Also Live Update Diagram representations of 'live real-time' GVMS operation can be created.

3 RMS: GETTING STARTED

3.1 Installing RMS

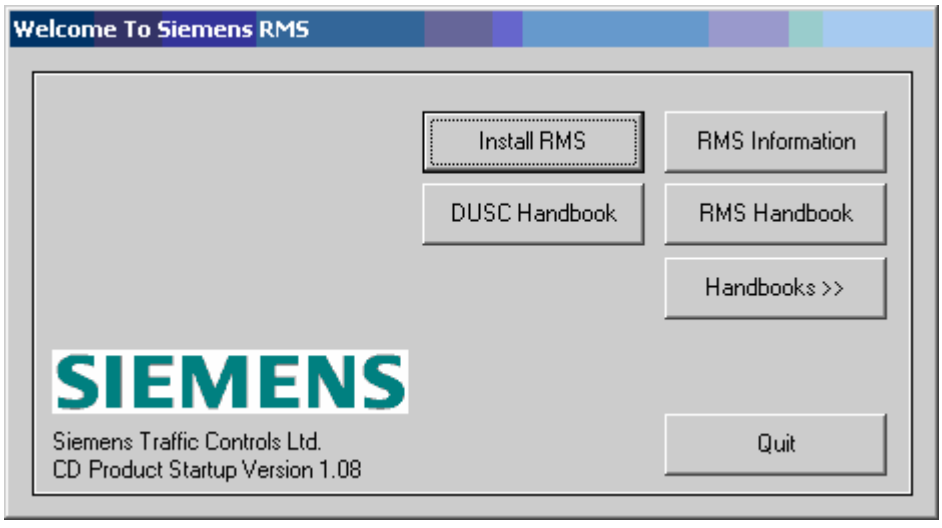
3.1.1 Dongle

Before attempting to install this software you must connect the supplied DONGLE in to the parallel or USB port of the PC.
Special Note: For parallel port dongles and additional device connection.
If you have a printer connected to the PC LPT1: port, insert the DONGLE first and then insert the printer cable in to the DONGLE. If you have an IOMEGA external ZIP disk, or other intelligent parallel device with a through port facility, it may be necessary to connect the DONGLE in to the devices external connector, not the LPT1: port. Ensure all devices connected to LPT1 are switched ON.

Note: It is possible to provide 'multi functional' dongles, which support more than 1 STCL product, hence if Prefect and RMS are to be run on the same PC then a RMS/PREFECT dongle is required. Contact STC for further details.

3.1.2 Siemens Welcome Application

If your CD Drive supports auto running a CD, each time the RMS CD is inserted the Siemens “Welcome Program” will be displayed. If your CD Drive does not support auto running you can run this program manually. From the “Windows Start” menu, select the “Run” option. Enter the text “<CD>:\WELCOME.EXE”, where <CD> should be replaced with the drive letter of your CD.



From the “Welcome Program” it is possible to complete the following RMS related function:

1. “RMS Information” will display information regarding the software installation or upgrade contained on this CD.

2. “RMS Handbook” will display the RMS handbook using Acrobat Reader.

3. “DUSC Handbook” will display the RMS Dial-up Strategic Control handbook using Acrobat Reader.

4. “Install RMS” will run the installation software, and install the issue of the software on the CD. If this option is selected proceed to the section headed copying files.

5. "Handbooks" opens an extra area for the Welcome program allowing Adobe Acrobat Reader to be installed. All STCL product handbooks are stored on the RMS CD in Acrobat format and can be viewed from the displayed list.

3.1.3 Installaing Software

The installation program will guide you through installing files to your target disk. User input is required to specify the target drive and directory. This is defaulted to “C:\RMS”, for consistency and ease of support it is recommended that this is NOT changed.

The installation program will indicate exactly what directory has been selected before continuing the installation.

The user must also select the “type” of installation with respect to a client server installation. Select the required installation type as indicated by the on-screen instructions. If this is a client installation will also need to enter the name of the server PC.

Once you have completed copying files to the target directory you will be prompted to restart your PC. You should not attempt to run RMS until the PC has been restarted.

3.1.4 Starting RMS After Installation

RMS will be added to the “all users” startup-group if this option is selected during installation. This means it will automatically restart each time your PC is started. Any RMS applications that resided in the startup group will automatically be removed. If it was selected not to autostart RMS on this PC it can be run from the Windows “Start” menu.

The first time RMS is started it will display a message box, indicating that files need to be updated or created before RMS can be used for the first time. For new installations, a set of system database files will be created ready for RMS to be run for the first time.

3.1.5 Uninstalling RMS

RMS can be uninstalled by selecting the "Add/Remove Components" icon from the windows "Control Panel". This installation program will not remove any new files that

have been added by RMS. For example if you have added a new site, the site and configuration files will not be removed.

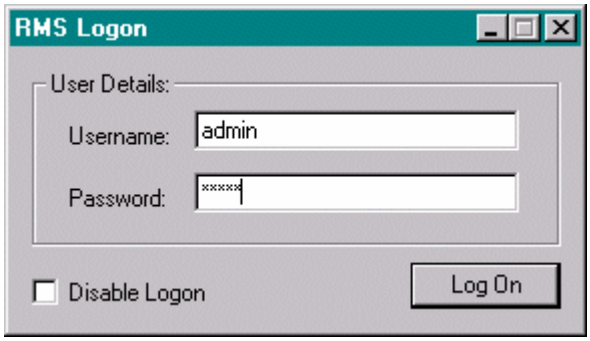
To fully remove all additional RMS components, locate the "RMS" directory, on the disk where RMS was installed. Delete this folder and all its contents. It is also necessary to delete the files "C:\rmssys32.cfg" and “C:\windows\winrms.ini.”

3.1.6 User Access

By default RMS now has a logon screen that requires a valid user and password to be entered before RMS can be used. Two passwords are provided with the default installation. Please note all usernames and passwords *ARE CASE SENSITIVE*.

Username	Password
admin	admin
guest	guest

If you logon as guest you will have limited access, almost all of the available options will be disabled. If you logon as admin you will have full access. Also when entering the admin username and password the checkbox “Disable Logon” will be enabled.



If this checkbox is selected when you logon you will be given the option to disable all further logon messages. It is possible for an admin user to re-enable the logon dialog from within RMS. NOTE: selecting this option will mean anybody with access to the RMS PC will be able to use any RMS functions.

3.1.7 Setting Up Comms And Mova Configuartion

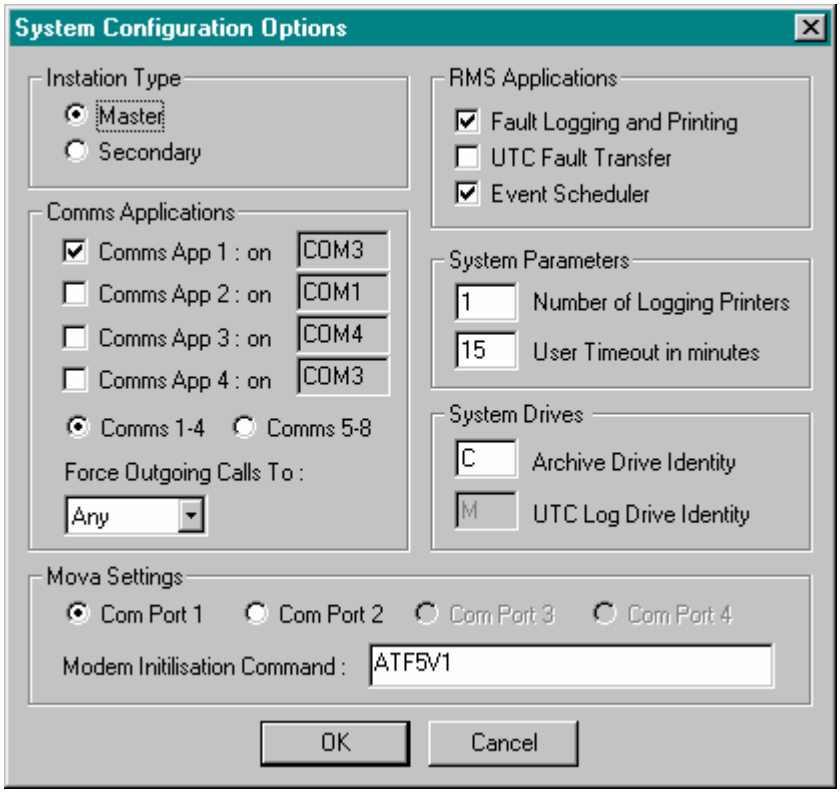
After the RMS installation has been completed the required communication and MOVA applications must be configured. This information is configured via the “Tools, Options” menu as shown below and should be configured in the following sequence.

1. Determine how many Communications application are to be used by RMS (maximum of 8) and select the required ones, in the example RMS uses comms1 and 2.

2. The PC com port used by each communications application is displayed, this information can only be modified once the comms application is running by ‘right

clicking' with the mouse on the 'telephone' in the task tray and selecting the comms options menu. If the Com ports are incorrect exit the option dialogue and restart RMS, this will then start the required comms application so that the Com port can be modified.

3. Select which Com port is to be used for MOVA communication. This must match with one of the Com ports used by the comms applications.



3.1.8 Where To Find Further Information

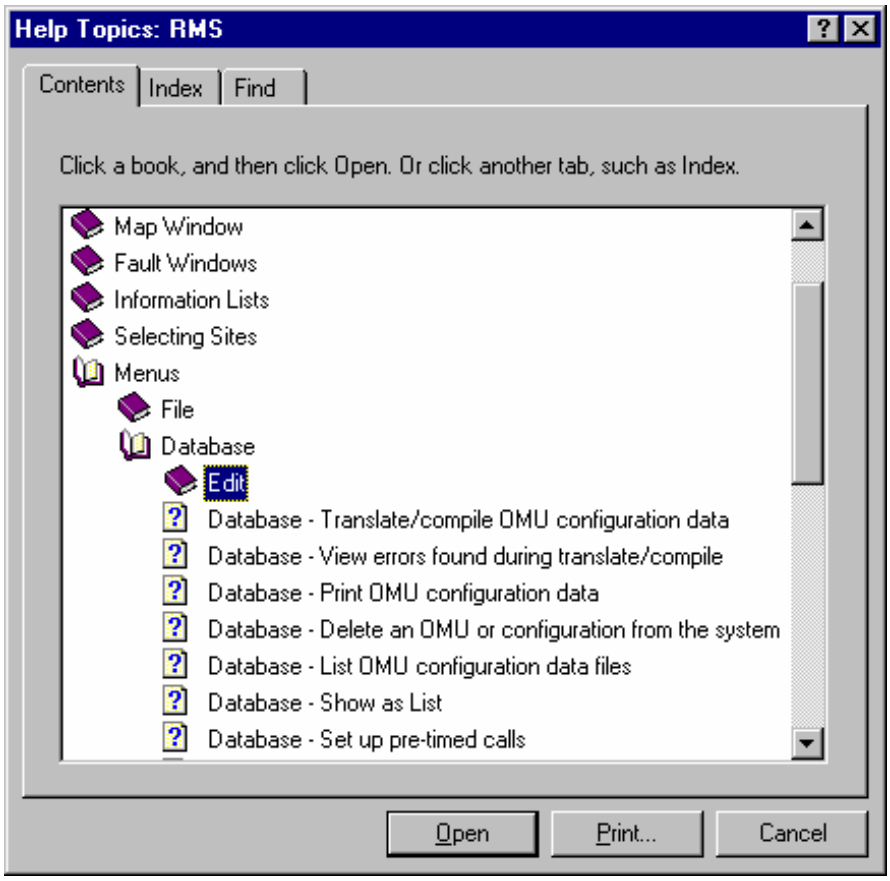
Further information regarding all RMS functionality can be accessed from the RMS online help. To access online help press the "F1" key. "F1" help is context sensitive, this means the help displayed will be relevant to the current dialog, or menu that is active. You can also access the RMS online help by selecting the menu option "Help, Help Contents".

3.1.9 Printing Help Information

The RMS online help can be printed if paper copies are required.

1. To print specific topics select the required topic and select the print option.

2. It is possible to print a group of help topics (e.g. all the edit screens) in one operation rather than having to select each topic individually. This is achieved by displaying the RMS contents window and selecting the "book" which contains the group of topics you wish to print, (e.g. in the example below all edit screens would be printed) then selecting the print button.


Help Topics: RMS
Contents
Index
Find
Click a book, and then click Open. Or click another tab, such as Index.
Map Window
Fault Windows
Information Lists
Selecting Sites
Menus
File
Database
Edit
Database - Translate/compile OMU configuration data
Database - View errors found during translate/compile
Database - Print OMU configuration data
Database - Delete an OMU or configuration from the system
Database - List OMU configuration data files
Database - Show as List
Database - Set up pre-timed calls
Open
Print...
Cancel

4 DATA PROTECTION

4.1 Overview

The instation computer provides a number of ways of backing up system data to protect against loss in the event of failure or malfunction of the Hard Disk.

It is recommended that the data on the PC Hard Disk be backed up on a regular basis as detailed below.

4.2 Archiving the RMS fault/count log

To reduce the number of entries in the instation fault log, sections of the log may be "archived" as required from within the RMS menu structure. This removes any cleared fault / count information from the working RMS system files and appends the data to an archive fault / count file.

Note: Any faults that are still active will not be archived.

Siemens recommends that fault/count data should be typically archived once a month. The actual frequency is dependent on the PC speed, number of installed OMCU's etc. RMS continually monitors the number of fault records that exist and if this reaches a predefined limit (defaulted to 5000 Records) then a warning message is displayed, at this point an archive should be performed.

It is recommended that the records are archived to the RMS\RMSARCH directory on the instation PC, then the whole of the RMS directory is backed up as detailed below.

4.3 Backing up the Hard Disk

See the proprietary documentation provided with the backup system being used.

To ensure that all files including the system logs are backed up correctly the RMS system should be shut down using the EXIT option from the RMS FILE menu before commencing the backup.

STCL recommend that the whole of the ?:\RMS directory on the PC (where ? is the working directory for RMS) is backed up to long term storage media, in addition the following files should be copied the backup media.

C:\RMSSYS32.cfg
C:\windows\winrms.ini
C:\windows\rms_prefect_comms.ini

This ensures that all RMS information can be recovered in the event of a system failure. Contact STCL for details on how to recover RMS data in the event of PC

failure.

4.4 Backing up Site Configuration Data

It is advisable to maintain backup copies of all Site configuration data. This can be done on a system basis if backups of the entire contents of the RMS directory are being taken. Alternatively individual sites can be backed up.

Site by Site Data Backup is available from the main menus ‘Tools’ menu. The configuration source data and Live update diagram background and dynamic symbol definitions are then **copied** to a backup media

Appendix A Abbreviations

ADC	Analogue to Digital Converter
BABT	British Approvals Board for Telecommunications
BER	Bit Error Rate
BIOS	Basic Input Output System
bps	Bits per second
BT	British Telecom
CLF	Cableless Linking Facility
DAA	Data Access Arrangement to telephone network
DBF	Database file
DCE	Data Channel Equipment
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency (dialling system)
DTp	UK Department of Transport
DUSC	Dial Up Strategic Control
EPROM	Erasable Programmable Read Only Memory
FSK	Frequency Shift Keying (modulation)
GEM	Graphics Environment Manager
GSM	Global System for Mobile Communications
GND	Ground
INI	Initialisation File Extension
LED	Light Emitting Diode
LGD	Last Gasp Dialling
MTBF	Mean Time Between Failure
MTTR	Mean Time to Repair
NTTP	Network Termination & Test Point
OMCU	Outstation Monitoring Control Unit
PCB	Printed Circuit Board
PSTN	Public Switch Telephone Network
PTZ	Pan, Tilt, Zoom
RAM	Random Access Memory
REN	Ringer Equivalent Number
RMS	Remote Monitoring System
SDE/SA	Speed Discrimination Equipment / Speed Assessment
TAMP	Type Approval Maintenance Provision
TLC	Traffic Light Controller
UTC	Urban Traffic Control

Appendix B Glossary

Answer Tone
After automatically answering a call, the answering modem will transmit an answer tone back to the originating modem. This is an indication to the originating modem system that the remote modem has answered the call. In addition, answer tones are often used to disable network echo suppresser devices.

Application
A computer program that performs a task for the user. Typical applications are word processing programs and graphics programs.

Archive
This is the transferring/appending of fault or count data from the live RMS files to another file which is not updated as new faults are processed.

Asynchronous Transmission
Data transmissions scheme that handles data on a character-by-character basis without clock synchronisation. The character code normally includes a "start" bit which signifies the beginning of a data character, 5-9 data bits, a parity bit and one, one and a half, or two stop bits.

Backup
This is the copying of data to bulk storage media. The data is still required by the 'live' system and the copy is required in case the 'live' data becomes corrupt.

Baseband
Information which exists in an unmodulated state. For instance, digital or analog data prior to modulation and transmission is baseband data.

Baud Rate
The number of modulation periods per second. For an FSK modem, one bit is encoded per modulation period, hence, the bit rate equals the baud rate. For higher speed modems, more than one bit is encoded per baud interval, so the bit rate equals the number of bits per baud times the number of baud's per second.

Bit Error Rate (BER)
A measure of the average number of incorrectly demodulated bits by a modem receiver out of the total number of bits received.

Bit Rate (bps)
Number of bits transmitted per second.

CCITT (Consultative Committee on International Telegraph and Telephone)
An international body concerned with the standardisation of communications related specifications throughout the world.

Click
To press and immediately release the mouse button.

Data Access Arrangement (DAA)
Protective circuitry required by BT to protect the user from the sometimes harsh telephone network, and to protect the network from customer equipment malfunction.

Data Terminal Equipment (DTE)
A term used in data communications to denote the source/destination of digital data. Common data terminal equipment devices are serial or parallel computer input/output ports and computer terminals.

dBm
A logarithmic ratio measurement of the power of a signal relative to one milliwatt. Normally, the power of the signal is referenced to 600 ohms.

Direct Connection
Connection to the telephone network directly rather than using an acoustic coupler.

Directory
A list of files that are contained on a hard or floppy Disk. The files may be arranged in groups (sub directories) for easy reference.

Dual Tone Multi-Frequency (DTMF)
Telephone network signaling tones which consists of two distinct frequencies. Each of the frequencies used in DTMF is not harmonically related to any of the other DTMF frequencies. New or central offices use DTMF dial tones, and all touch-tone telephones generate DTMF signals when the telephone is being dialed.

Duplexor (Same as hybrid)
Circuit which matches the 4-wire modem signal (Transmit Carrier and GND, Receive Carrier and GND) with the two-wire telephone network.

Exchange
Common term describing the point at which subscriber telephone lines meet and are switched into other areas of the network. There are, however, a number of levels of exchanges in the telephone network which provide different switching functions.

Frequency Shift Keying (FSK)
A frequency modulation technique whereby the modulated frequency is directly related to the digital bit or word present at the input to the modulator. For instance, a logical "1" at the modulator input will produce a certain frequency output while a logical "0" will produce a different frequency output. The OMCU and Instation uses FSK modems.

Folder
Also known as a subdirectory. It can contain documents applications and other folders.

Full-Duplex
Full-duplex data transmission allows simultaneous data transmission by two modems at the same speed in different directions.

Handshaking
The protocols of the external modem control signals constitute the handshake. The control signals provided on a typical RS-232/V.24 connector for modem control are examples of handshake signals.

Hybrid, Two-to-Four-Wire
Circuit which matches the 4-wire modem signaled (Transmit Carrier and GND, Receive Carrier and GND) with the two-wire telephone network.

Icons
Pictures that represent components of the computer system or RMS software, including disks, folders, documents and applications.

Instation
The computer system which controls and receives fault reports from a number of OMCUs.

Last Gasp Dialing (LGD)
The facility which enables the OMCU to make a report to the Instation that the mains supply to it has failed.

Mark
The frequency that corresponds to a logic "one" in frequency shift keying (FSK) modulation.

Menu
A list of commands or options.

Menu bar
A horizontal band identifying the menus of the Windows desktop, Windows application or RMS application that appears across the top of the screen.

Modem
Acronym for MOdulator/DEModulator. A modem modulates baseband data for transmission over a communications channel and demodulates data from another modem over the same channel.

Modulator
A modem modulator changes baseband information, which is often digital, into an analog carrier for transmission over a communications channel. The transmitter in a modem is a modulator.

Mouse
A small box with buttons. Moving the mouse moves the pointer on the screen.

Off-Hook
State in which the customer's equipment is electrically connected to the telephone network. When in the off-hook state, loop current flows from the central office through the user's equipment and back to the central office again.

On-Hook
State in which the customer's equipment is disconnected from the telephone network. When in the on-hook state, no loop current is able to flow from the central office because of an open relay at the customer's site.

On-line Help
This refers to the help text available to users by using the Help menu from the application menu bar.

Outstation Monitoring Unit (OMCU)
The equipment, used to monitor the operation of traffic signal controllers as part of the RMS system.

Prefect
Siemens Traffic Controls Fault Management system

Pointer
An arrow on the screen that moves using the mouse.

Public Switched Telephone Network (PSTN)
The network available to standard users of telephone company equipment. Telephone lines in the home or office are connected to the PSTN when special data communications equipment is not used.

Ringer Equivalence Number (REN)
The REN enables you to determine the maximum number of telephones and associated equipment that can be connected to any on exclusive telephone line. The REN for instruments provided by British Telecom (BT) is assumed to be 1 unless otherwise marked; that for the OMCU is 3. The total REN value for all equipment must not exceed 4.

Space
The frequency that corresponds to a logic "zero" in frequency shift keying (FSK) modulation.

Scroll
To move to a different part of a directory, document or picture in a window.

Scroll bar
A shaded bar in the right or bottom border (or both) of many windows. The scroll bar contains the slider and is visible only when the window does not show the entire directory.

Slider
An unshaded rectangle inside the scroll bar. If the entire directory or document is visible in the window, the slider fills the scroll bar. The slider shows where you are in the directory or document window and how much of your directory or document is visible in the window. You can drag the slider to move quickly to another part of the directory or document.