

# MOVA7 Handbook For ST950 And Stratos Outstation 667/HB/46000/003

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# 1 INTRODUCTION

## 1.1 Overview

This handbook details the configuration and operation of the MOVA7 application and is generally independent of the platform on which the application is installed.

Platform specific information is clearly identified e.g.

This text relates to the ST950 platform.

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This text relates to the Gemini 3 Stratos Outstation platform.

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or else is covered in section 3 Platform Specific Information.

The handbook currently covers the MOVA application on the following equipment:-

- ST950 Controller
- Gemini 3 Stratos Outstation

The MOVA7 algorithm which forms part of the installed application is distributed under license from TRL.

This document is maintained to reflect the current latest released version of the equipment. In most cases existing features do not change significantly between versions but it is likely that users without the latest version may find that some of the items and features described are not present on their equipment. Updating equipment to the latest released version will make those items & features available.

## 1.2 Contact Us

If you have any comments on this handbook, or need any further information, you can contact us at [trafficwebmaster.stc@siemens.com](mailto:trafficwebmaster.stc@siemens.com).

## 1.3 Related Documents

AG44 (from TRL)	MOVA Traffic Control Manual NB: Covers MOVA traffic principles, and the location and installation of detectors.
AG45 (from TRL)	Guide to MOVA Data Set-Up and Use NB: Covers the data needed to configure MOVA for control of a particular junction, the use, operation, and checking and commissioning of the equipment. Includes MOVA error log descriptions and problem solving guide.
667/HB/46000/004	UTMC OTU Handbook (for ST950 and Stratos Outstation)
667/HU/46000/000	User Interface Handbook (for ST950 and Stratos Outstation) NB: Includes web interface, licensing, Ethernet and firmware update.
667/HQ/31601/002	MOVA 7 Alerts Quick Start Guide
667/HQ/46000/004	ST950 MOVA Quick Start Guide
667/HQ/31601/001	UTMC/MOVA OTU – MOVA Quick Start Guide
667/HE/46950/000	Installation, Commissioning and Maintenance Handbook for the ST950 Controller

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667/HE/45950/000	Installation, Commissioning and Maintenance Handbook for the ST950 ELV Controller	ST950
667/HB/52250/000	Installation, Commissioning and Maintenance Handbook for the Gemini 3 Stratos Outstation	Stratos OS

## 1.4 Abbreviations

AC	Alternating Current
ASCII	American Standard Code for Information Interchange
Bit	Binary Digit
BOOTP	Bootstrap Protocol
CPU	Central Processing Unit
CRB	MOVA Controller Ready Bit
CSI	Controller Serial Interface
CSV	Comma Separated Value
DC	Direct Current
DCE	Data Communication Equipment
DDNS	Dynamic DNS
DNS	Domain Name System
DSL	Digital Subscriber Line
DST	Daylight Saving Time
FLASH	Non-volatile memory that may be programmed under software control
Full UTC	Full UTC MIB v1.0, also known as UTC type 2 or UG405 (UTMC ref: TS004.004:2008UM/008, Full UTC MIB)
GMT	Greenwich Mean Time
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
GVP	Generic Versatile Platform software layer
IO	Input and Output
ICMP	Internet Control Message Protocol
IP	Internet Protocol
JFFS2	Journaling Flash File System Version 2
LAN	Local Area Network
LED	Light Emitting Diode
LMU	Lamp Monitoring Unit
MD5	Message Digest 5
MIB	Management Information Base
MIB-II	Management Information Base II (Two)
NTP	Network Time Protocol
OS	Outstation
OSE	On Street Equipment
OSS	Outstation Support Server (this may be a stand-alone product or functionality within Stratos)
OTU	Outstation Transmission Unit
PAP	Password Authentication Protocol
PC	Personal Computer
PCB	Printed Circuit Board
PIN	Personal Identification Number
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit
RAM	Random Access Memory

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ROM	Read Only Memory
ROMFS	ROM File System
RS232	EIA Data Communications Interface - Level based serial communications standard
RS485	EIA Differential Data Communications Interface - Differential serial communications standard
SHA-1	Secure Hash Algorithm 1
Simple UTC	Simple UTC MIB v0.2, also known as UTC type 1 (UTMC ref: TS004.004:2008 UM/004, Simple UTC MIB)
SNMP	Simple Network Management Protocol
Telnet	Telnet Protocol
TfL	Transport for London
TFTP	Trivial File Transfer Protocol
TMA	Traffic Management Act
UDP	User Datagram Protocol
UMTS	Universal Mobile Telecommunications System
UTC type 1	See Simple UTC
UTC type 2	See Full UTC
UTMC	Urban Traffic Management and Control
UVMS	Urban VMS
VMS	Variable Message Sign
VPN	Virtual Private Network
XML	Extensible Markup Language
ZXO	Mains Zero Crossover

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## 2 INTRODUCTION

### 2.1 Overview

What is MOVA? The following is an extract from the introduction of AG44.

*MOVA (Microprocessor Optimised Vehicle Actuation) is the signal control strategy researched and developed by TRL Limited for use at isolated (uncoordinated) road traffic intersections. MOVA caters for all traffic conditions from very low flows through to a junction that is overloaded. For non-overloaded junctions, MOVA minimises delay; if any approach becomes overloaded, a capacity maximising procedure is used. MOVA is also able to operate at a wide range of junctions.*

Also refer to the Highways Agency Installation Guide for MOVA (MCH 1542) and the TRL manuals AG44 and AG45. These documents complement this handbook by covering the design of MOVA intersections, such as determining the location of the vehicle loops and the construction of the MOVA site data, as well as commissioning the completed MOVA intersection.

**MOVA Maximum Capabilities per Stream**

Feature	Maximum
Detector Inputs	64
Confirm Inputs	32
Controller Ready Inputs	1
Force Bit Outputs	10
Take Over Output	1

The above maximums may be further restricted where facilities are shared, e.g. where detector inputs are also used by SCOOT, or where limited I/O is fitted.

### 2.2 Interfaces

#### 2.2.1 Controller Interface

The interface between MOVA and the controller can be either via freestanding, serial (also known as semi-integral) or integral. Each of these is described below.

**Integral:** The control, reply and detector bits are transferred internally in software via virtual ports.

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**Freestanding:** The control and reply signals are wired via TR2523 compliant voltage-free relay contacts. The detectors are connected directly and do not pass through the controller.

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**Serial (or semi-integral):** The control, reply and detector bits are transferred via RS232 serial cable.

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## 2.3 Commissioning

This section describes the typical sequence of operations to be carried out when commissioning MOVA.

Pre-requisites:-

1. The controller has already been installed and configured for MOVA/UTC control. In the semi-integral case, this includes the allocation of detectors for MOVA.
2. Where MOVA is running together with UTMIC OTU, the UTMIC OTU configuration has already been performed and additional I/O mapping for MOVA has been created (see section 3.3 for detail).
3. The MOVA data set has been defined and is available.
4. The IP network has been set up and is operating (if remote access is required).
5. The appropriate MOVA licence has been obtained and installed (see section 2.3.1).

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### 2.3.1 MOVA Licence

Licences are installed using the GVP licence manager (*Status and Configuration – System – Settings – Licence System – Manager*). One of the following licences would be required for MOVA:-

**MOVA 7 Streams X – Y,  
UTMIC OTU + MOVA 7 streams X – Y**

Please refer to the User Interface Handbook (667/HU/46000/000) for details on installing licences.

## 2.4 MOVA Commissioning Checklist

The following checklist should be used to commission MOVA. The steps are expanded upon in the sections referenced.

Step	Section	Action to be Performed
1)	2.5.2	Start the MOVA applications.
2)	2.5.2	Check the MOVA site Names
3)	2.5.3	Initialise MOVA data
4)	2.5.4	Use the appropriate MOVA Comm shortcut to connect to the required MOVA stream.

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Step	Section	Action to be Performed
5)	2.5.5	Check/Set the time and date in the unit.
6)	2.5.6	MOVA detector and control/reply bit mapping
7)	0	Download the site data into the MOVA unit from the PC.
8)	2.5.8	<p>Use the commissioning screen to check for following.</p> <p>a) MOVA is currently not enabled (MOVA enabled = 0)</p> <p>b) The Controller is ready* (CRB = 1)</p> <p>c) The Confirm bits are all set to '1', except for the current stage which should be set to '0'.</p> <p>Watch the controller perform at least one complete cycle to check that each stage and phase confirm bit is being activated correctly by the controller.</p> <p>* If UTC is active, request the MO bit to be set to allow MOVA control (or else apply local UTC override) since UTC will inhibit the 'Controller Ready Bit'.</p>
9)	2.5.8	<p>Use the commissioning screen to check the operation of each detector is correct. MOVAComm uses highlighting to indicate detector active.</p> <p>Also check that vehicles in adjacent lanes do not activate the loop.</p>
10)	2.5.8	<p><b>Important:</b> The following causes the MOVA unit to take control of the Intersection and care should be taken to avoid undue disruption to traffic flows.</p> <p>Still using the commissioning screen, force each stage in turn and check that the controller moves to the required stage and that the correct stage / phase confirm bits are activated.</p>
11)	2.5.9	Check that the Error Log contains no unexpected entries and then clear the error log.
12)	2.5.10	<p>Again using the commissioning screen, put the MOVA unit on control:</p> <p>a) Set the 'MOVA enable' flag to '1'</p> <p>b) Close communications ('FI' from the menu)</p> <p>c) On the outstation web interface, 'System' screen, stop the MOVA application and then start it again.</p> <p>d) Restart MOVAComm and return to the commissioning screen</p>
13)	2.5.10	<p>Check that as the controller changes from stage to stage that the 'Warm-up Count' increments.</p> <p>When this count reaches the number of stages plus one (e.g. 6 on a 5-stage controller) the MOVA unit will put itself on control. Check :</p> <p>a) The 'On Control' flag changes from '0' to '1'.</p> <p>b) The 'TO' bit changes from '0' to '1'.</p> <p>c) The MOVA unit demands the current (or next) stage.</p> <p>d) The 'Error Count' remains at zero.</p> <p>e) The UTC 'MR' and 'ML' reply bits are active.</p> <p>d) The controller is running under MOVA control.</p>
14)	2.5.10	Examine the operation of the controller under MOVA control to ensure that reasonable operation is achieved, e.g. no demands are been ignored and no excessive queues build-up, and that no faults have been generated and the error count remains at zero.

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Step	Section	Action to be Performed
15)	2.6.1	If TMA log file export to an OSS is to be used, set up the TMA export start time and period and enable the OSS
16)	2.6.3	Enable TMA alerts if required
17)	2.5.11	<p>This completes the commissioning steps. Restore the UTC MO signal to its normal state and check that UTC takes control of the junction. The MOVA unit can, depending on the client's instructions and the validity of the data, be left operational.</p> <p>Note that for highly critical junctions where the loss of a detector without the historical flow data could result in serious complications, it may be necessary to leave the MOVA disabled for one week. When the unit has built-up this back-up data, the unit can be enabled. Note that the unit can be enabled remotely if the communications network is available.</p>

### MOVA Commissioning Complete

## 2.5 MOVA Commissioning Detail

This section expands on the steps in the commissioning checklist from the previous section.

### 2.5.1 Start the MOVA Applications

1)	2.5.2	Start the MOVA applications.
----	-------	------------------------------

With a Stratos Outstation connected to a controller via its serial port it is necessary for the serial port to be configured correctly. This is performed either manually or by the Controller Monitor application. If the latter is to be used then it is necessary to start this application also.

On the web 'System' screen, click the 'Start' button for each MOVA stream which is required. Note MOVA streams do not run by default.

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Once a MOVA stream has been started, the MOVA application can be accessed via MOVAComm.

The screenshot shows the Siemens ST950 Controller web interface. The top navigation bar includes links for Home, Status and Configuration, System (highlighted), System Log, Fault Table, Site Log, and Access Level. The main content area is titled 'Site Information Export:' and contains a button 'Export Site Information'. Below this is a table titled 'Applications:' with the following data:

Name	Description	Part Number	Issue	State	Control
Tester	App to test drivers, etc..	667/TZ/31795/000	1.0.0	Not Running	Start
UTMCFullUTC	UTMC Type 2 UTC (full) Application	667/TZ/32373/002	2.0.0	Running	Stop
UTMCSimpleUTC	UTMC Type 1 UTC (Simple) Application	667/TZ/32374/002	2.0.0	Not Running	Start
OSEWebConf0	I/O Mapping (OSE) Web Configuration	667/TZ/32376/002	2.0.0	Running	Stop
Mova1	MOVA 7 application	667/TZ/32377/002	2.0.0	Running	Stop
Mova2	MOVA 7 application	667/TZ/32377/002	2.0.0	Running	Stop
Mova3	MOVA 7 application	667/TZ/32377/002	2.0.0	Running	Stop
Mova4	MOVA 7 application	667/TZ/32377/002	2.0.0	Running	Stop

A callout box points to the 'Start' button for the 'Tester' application, stating: 'Start each of the required MOVA streams, if not already running'.

## 2.5.2 MOVA Site Names

2)	2.5.2	Check the MOVA site Names
----	-------	---------------------------

On the Status and Configuration MOVA web screen (see screenshot) check the MOVA Site Names.



MOVA uses the site name to access its force and reply bits, so if it is not correct then MOVA will not operate correctly

For the ST950, the site names should be MOVA1, MOVA2, MOVA3 and MOVA4.

The screenshot shows the Siemens ST950 Controller web interface for the 'MOVA' configuration. The left sidebar shows a tree view with 'System', 'Controller', 'UG405 UTC', 'Simple UTC', 'MOVA' (highlighted), 'Advanced', 'TMA Logs', 'TMA Log Auto-export', 'I/O Mapping', 'Peripherals', and 'LoadTest'. The main content area is titled 'MOVA' and contains a table with the following data:

Default	Item	Value
<input type="checkbox"/>	MOVA Site 1 Name ?	MOVA1
<input type="checkbox"/>	MOVA Site 2 Name ?	MOVA2
<input type="checkbox"/>	MOVA Site 3 Name ?	MOVA3
<input type="checkbox"/>	MOVA Site 4 Name ?	MOVA4
<input type="checkbox"/>	Base IP Port Number ?	12000

Below the table are 'Save' and 'Reload' buttons. An orange arrow points to the 'ST950' label in the top right corner of the interface.

For the Stratos Outstation running MOVA-only (no OTU), the site names should be MOVA1, MOVA2, MOVA3 and MOVA4.

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For the Stratos Outstation running MOVA and OTU, the MOVA site names should match the UTC site names to which they are related.

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The screenshot shows the Siemens MOVa configuration interface. The sidebar on the left lists 'System' and 'MOVa' sections. The 'MOVa' section is expanded, showing a table of MOVa site names and their values. Callouts explain that MOVa stream 1 controls UTC site J99111, MOVa stream 2 controls UTC site J99112, and MOVa streams 3 and 4 are not used, so they have default names.

Default	Item	Value
<input type="checkbox"/>	MOVa Site 1 Name ?	J99111
<input type="checkbox"/>	MOVa Site 2 Name ?	J99112
<input type="checkbox"/>	MOVa Site 3 Name ?	MOVa3
<input type="checkbox"/>	MOVa Site 4 Name ?	MOVa4
<input type="checkbox"/>	Base IP Port Number ?	12000

MOVa stream 1 controls UTC site J99111

MOVa stream 2 controls UTC site J99112

MOVa streams 3 and 4 are not used, so they have default names

The MOVa site names are allocated automatically by the software when the MOVa application is started or when the I/O mapping configuration is changed, so there should be no need to change the site names unless some problem has occurred.

## 2.5.3 Re-initialising MOVa

3)	2.5.3	Initialise MOVa data
----	-------	----------------------

If it is required to clear the MOVa data sets and working data, then the `movaini` command can be used via a telnet connection to GVP:

```
movaini1      - this will initialise MOVa stream 1
movaini2      - " " " " stream 2
movaini3      - " " " " stream 3
movaini4      - " " " " stream 4
```

If the command is not recognised, the MOVa application for that stream must be started running (to view running applications, use the web interface and display the "System" web screen).

When the `movaini` command is executed, the MOVa data sets, MOVa working data, MOVa error logs, flow logs and assessment logs for that MOVa stream are cleared to the first time start-up state. Other MOVa streams will be unaffected.

## 2.5.4 Communicating via MOVa Comm

4)	2.5.4	Use the appropriate MOVa Comm shortcut to connect to the required MOVa stream.
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Select the PC shortcut for stream 1, 2, 3 or 4 as required to initiate MOVaComm. If the shortcuts have not yet been set up, then complete the steps in section 4.1.

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## 2.5.5 Setting the Time and Date

5)	2.5.5	Check/Set the time and date in the unit.
----	-------	--

Check if the date and time on the unit is already being set via the NTP service – check on the NTP configuration screen.

If not being set by NTP, then the date and time can be set manually via the web interface. Ensure that the Daylight Saving and Timezone settings are also correct.

The ST950 can run with two separate clocks – one for system time and one for controller time. MOVA uses the system time clock for it's operations (e.g. fault logs, plan changes TMA data timestamps etc).

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## 2.5.6 MOVA Detector and Stage Control/Reply Bit Mapping

6)	2.5.6	MOVA detector and control/reply bit mapping
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By default, MOVA obtains its control, reply and detector bits directly from the ST950 controller and no site specific I/O mapping is required. In this case, the allocation of the individual control, reply and detector bits is determined by the IC4 controller configuration.

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When required, the mapping can be setup manually via the I/O Mapping screen. However, it is recommended that the default mapping is not changed so that the allocations are all defined by the IC4 controller configuration.

The default ST950 port mappings used by MOVA are detailed below:-

Name	Function Description	ST950 Default Port Mapping	Port Bit Usage
MOVATO	MOVA Take Over	csi.mova.to.out.1	Bit per MOVA stream, 1 = MOVA TO active.
MOVACRB	MOVA Controller Ready Bit	csi.crb.in.1	Bit per MOVA stream, 1 = controller ready.
Fn	Stage Control	csi.movaX.control.out.1	Bit per stage on MOVA stream X, 1 = MOVA stage force active.
Gn	Stage confirm	csi.movaX.reply.in.1	Bit per stage on MOVA stream X, 1 = stage/phase active.
MOVADETN	MOVA Detectors	csi.movaX.det.in.1	Bit per detector on MOVA stream X, 1 = detector active.

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The I/O mapping for Stratos Outstation is detailed in section 3.3.2.

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## 2.5.7 Download MOVA Site Data

7)	0	Download the site data into the MOVA unit from the PC.
----	---	--



If the new site data contains a different number of links, lanes or stages, or different time-of-day data then MOVA must be re-initialised – see section 2.5.3. Only if the configuration is the same as the configuration currently running in the MOVA unit (except for minor changes to timing values), can the new site data be downloaded without initialising the unit.

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Site data is not compatible between different versions of MOVA. The MOVA Tools software from TRL will convert between the differing formats, e.g. so that existing MOVA 6 data sets can be converted to MOVA 7 format.

NB: MOVA Tools incorporates functionality previously provided by the TRL MOVA Setup software.

## MOVA Site Data Loading

New site data can be downloaded into the MOVA unit using the 'Data Set' option – 'DS' from the MOVA main menu, followed by the 'R' command.

Up to four 'plans' can be loaded into the MOVA unit's memory. Normally, only plan 1 will be used. However, it is possible to configure the MOVA unit to switch between the plans at different times of day or by external input trigger. Hence up to four plans, numbered 1 to 4, may have to be downloaded.

The MOVA site data file name is usually suffixed by the '.MDS' extension.

When the download of a plan is complete, the MOVA unit enters a dialogue sequence, as shown on the following page.

```
Download finished

File name: . . . . . NEWPARLEY.MDS
Version: . . . . . M7.0
Creation time & date: 9:45 29/10/ 4
Title: . . . . . NEW PARLEY WITH LANE TEN
Stage/links/lanes: . . 5 /14 /10

Enter repository plan number to place this download data:
1,2,3 or 4, (or 99 to reject this download)

1

Plan number 1 selected

Area 1 is empty. To confirm that you want to place
the downloaded dataset in this area, select 'Y'.
Else, select 'N' to place the dataset in a different area.
Do you want to place the dataset in this area? (Y/N)
Y
This plan has been placed in repository area 1
and will be loaded as active data

      Filename  St/Lk/Ln
A      HUGEMOVA.MDS  10/24/20
1      NEWPARLEY.MDS  5/14/10

Press <ENTER> to Continue

The MOVA unit will now reboot in order to clear all of its working data, load
the new site data and begin monitoring the intersection.
Note: MOVA will be initially disabled. Use the "Look" screen to put MOVA back
on-control after a warm-up cycle.

Press [Return] to reconnect to the unit after it reboots...
```

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## Checking the Site Data

When new site data has been loaded, check it by displaying the site data using the 'L', 'T' and 'D' options.

The 'T' option shows the names of the plans loaded into each of the four repository areas and the name of the plan that currently resides in the working area. If there are no time-of-day changes, i.e. only one plan has been loaded, then the MOVA unit will automatically load that plan into its working area.

If more than one plan has been downloaded, the 'L' option allows one of the plans to be loaded into the working area.

The 'D' option displays the site data from the selected area.

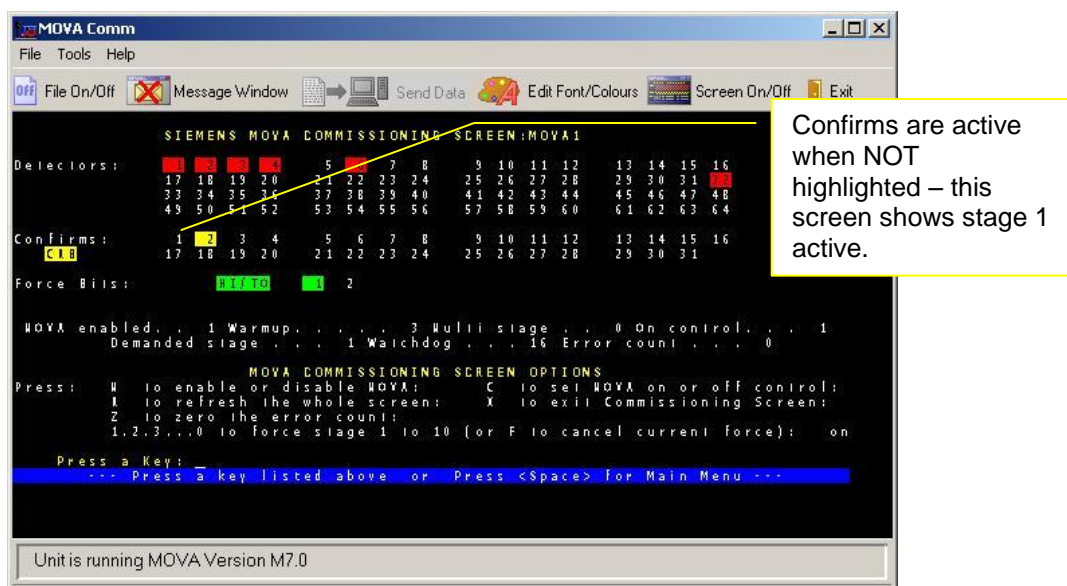
## 2.5.8 Commissioning Screen

8)	2.5.8	<p>Use the commissioning screen to check for following.</p> <ul style="list-style-type: none"> <li>a) MOVA is currently not enabled (MOVA enabled = 0)</li> <li>b) The Controller is ready* (CRB = 1)</li> <li>c) The Confirm bits are all set to '1', except for the current stage which should be set to '0'.</li> </ul> <p>Watch the controller perform at least one complete cycle to check that each stage and phase confirm bit is being activated correctly by the controller.</p> <p>* If UTC is active, request the MO bit to be set to allow MOVA control (or else apply local UTC override) since UTC will inhibit the 'Controller Ready Bit'.</p>
9)	2.5.8	<p>Use the commissioning screen to check the operation of each detector is correct.</p> <p>MOVAComm uses highlighting to indicate detector active.</p> <p>Also check that vehicles in adjacent lanes do not activate the loop.</p>

The commissioning screen is used extensively to check the operation of the detectors, the force bits and the confirm bits.

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## Typical MOVA Commissioning Screen



The top of the screen shows the live state of all the detector inputs, followed by the **Controller Ready Bit (CRB)** and confirm bit inputs from the controller, and the force bits that the MOVA unit is currently outputting. The **'MOVA enabled'** and **'On Control'** flags and the **'Warm-up'** and **'Error counts'** are described in more detail in section 2.5.10.

For Detectors,	black background = not active,	red background = active.
For Confirms,	black background = active,	yellow background = not active.
For CRB,	black background = not active,	yellow background = active.
For Forces,	black background = not active,	green background = active.

The **'Multistage'** flag is set to '1' if the confirm inputs indicate more than one stage is active, e.g. when the controller has failed or the I/O cables have been disconnected from the back of the MOVA unit.

The **'Demanded stage'** entry shows the stage that MOVA is currently demanding, or would try to demand if it was on control.

The **'Watchdog'** count should normally increment every half a second and remain in the range 0 to 21. It is used internally by the MOVA software to ensure that the various MOVA sub-systems are functioning correctly.

While the commissioning screen is active (and the description of these keys is being displayed), the state of the **'MOVA enabled'** flag and the **'On Control'** flag can be toggled by simply pressing 'M' or 'C' respectively. Similarly, the **'Error Count'** can be cleared back to zero by pressing 'Z'.

10)	2.5.8	<p><b>Important:</b> The following causes the MOVA unit to take control of the Intersection and care should be taken to avoid undue disruption to traffic flows.</p> <p>Still using the commissioning screen, force each stage in turn and check that the controller moves to the required stage and that the correct stage / phase confirm bits are activated.</p>
-----	-------	---

**(Remember to press <SPACE> to display the 'Screen Keys' before attempting to use any of the 'single key' commissioning screen commands)**

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To test the force bits and the confirms from the controller, the MOVA unit should first be switched off-line, i.e. if the '**MOVA Enabled**' flag is set to '1', press 'M'.

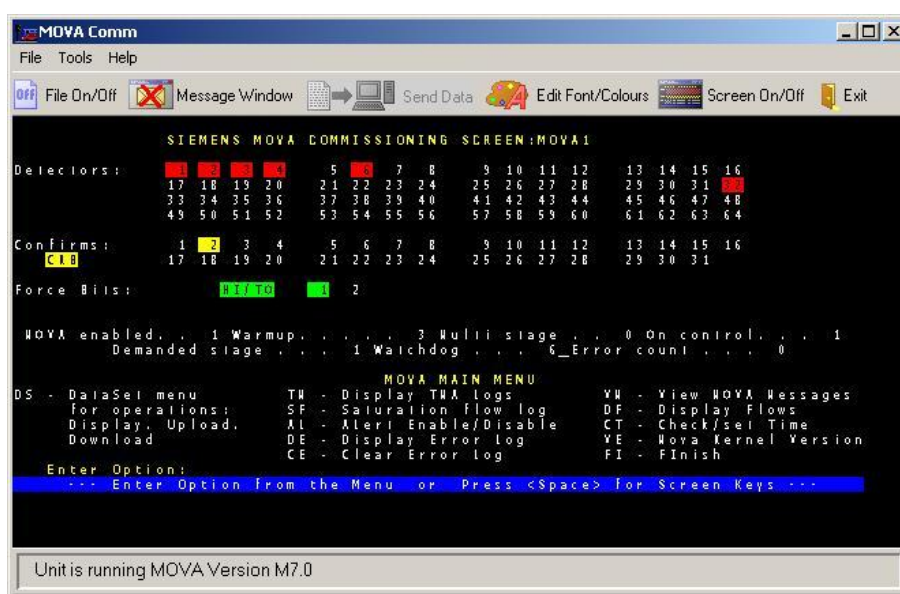
To force a stage simply press the number of the required stage, e.g. press '1' for stage 1 and then press '2' when stage 2 is required.

The MOVA unit will keep forcing the selected stage for about one minute after the key is pressed. To end the test, press '0'.

Pressing 'X' will exit the commissioning screen and the MOVA Main Menu will be displayed.

Pressing the space bar toggles between the single key press commands and the MOVA Main Menu (which may vary between different versions of MOVA):

### Typical MOVA Main Menu Screen



While the MOVA Main Menu is being displayed, enter the two-letter menu option required and press 'Return'. When the required option completes, the main screen will automatically re-appear.

## 2.5.9 The Error Log (DE and CE)

11)	2.5.9	Check that the Error Log contains no unexpected entries and then clear the error log.
-----	-------	---

To display the error log, enter 'DE' from the main menu,

This displays time stamped reports of any warnings or errors detected by the MOVA unit. This log may help diagnose the reason why the MOVA unit has gone off control for example.

At the end of the log, the MOVA unit will display some debug information that can normally be ignored:

CRASH (1-4) =	0	0	0	0
TERM=	0	RCV (2) =	0	ABO= 0

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To clear the error log, enter 'CE' from the main menu.

It is recommended that the error log be cleared after each site visit if all entries can be explained and the unit is functioning normally. Then the engineer making the next visit to site will only see faults that have occurred since the last visit.



For descriptions of MOVA log entries, see TRL document AG45.

## 2.5.10 Enabling MOVA Control

12)	2.5.10	Again using the commissioning screen, put the MOVA unit on control: a) Set the 'MOVA enable' flag to '1' b) Close communications ('FI' from the menu) c) On the outstation web interface, 'System' screen, stop the MOVA application and then start it again. d) Restart MOVAComm and return to the commissioning screen
13)	2.5.10	Check that as the controller changes from stage to stage that the 'Warm-up Count' increments.  When this count reaches the number of stages plus one (e.g. 6 on a 5-stage controller) the MOVA unit will put itself on control. Check : a) The 'On Control' flag changes from '0' to '1'. b) The 'TO' bit changes from '0' to '1'. c) The MOVA unit demands the current (or next) stage. d) The 'Error Count' remains at zero. e) The UTC 'MR' and 'ML' reply bits are active. d) The controller is running under MOVA control.
14)	2.5.10	Examine the operation of the controller under MOVA control to ensure that reasonable operation is achieved, e.g. no demands are been ignored and no excessive queues build-up, and that no faults have been generated and the error count remains at zero.

The purpose of re-starting the MOVA application as part of the above set of steps is to check that the warm-up sequence is operating correctly.

This section describes in the more detail the '**MOVA Enabled**' and '**On Control**' flags and their interaction with the '**Error Count**' count and the '**Warm-up**' count.

Both flags must be set to '1' before MOVA will attempt to control the junction. If either flag is set to '0', then MOVA will not attempt to control the junction at that time, but may still be monitoring the traffic flows over its detectors.

The '**MOVA Enabled**' flag is normally only changed by the user, not by the MOVA unit itself. It is this flag which must be set to '1' by the user to allow the MOVA unit to take control of the junction and should be set to '0' to disable the MOVA unit for a long period of time.

Note that the unit will log the fault 'MOVA Disabled' in the fault table when MOVA is disabled, i.e. when the '**MOVA Enabled**' flag is set to 0.

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The '**On Control**' flag is normally only changed by the MOVA unit itself, although the user can change its state manually. If the '**MOVA Enabled**' flag is set, then following the warm-up cycle, the MOVA unit will set the '**On Control**' flag and start to control the junction.

During the warm-up cycle, the MOVA unit will increment the warm-up count on the commissioning screen every time a new stage starts. When this count reaches the number of stages plus one (e.g. 6 on a 5-stage junction) then the warm-up cycle is said to be complete. This warm-up cycle allows the MOVA unit to gather information about the junction before it takes control.

Following various fault conditions, the MOVA may put itself off control by clearing the '**On Control**' flag and incrementing its '**Error Count**'. Depending on the nature of the fault, the MOVA unit will increment the '**Error Count**' by one, two or five. If the Error Count reaches 20, the unit will reset the MOVA Enabled flag back to 0 and drop off control.

Every hour (on the hour) the MOVA unit decrements the '**Error Count**', unless it has already reached the value of 20.

### 2.5.11 Completing MOVA Commissioning

To close communications with the MOVA unit, type 'FI' at the main menu. This will allow the MOVA unit to tidy-up and then on MOVAComm, press F10 to close the application.

## 2.6 TMA Logging and alerts

MOVA7 provides an extended logging facility to enable traffic managers to monitor the performance of a MOVA site in detail. The following logs are available for each stream:-

- Lane flow
- Occupancy
- Stage count and length
- Pedestrian Level-of-Service
- End-sat
- Oversaturated Cycles
- Suspect Detector History

Access to these logs is provided via the web interface, rather than via the MOVAComm terminal program. The data in the logs is available for viewing or saving on the local browser machine.

Additionally the logs can be downloaded automatically to an Outstation Support Server (OSS) if available and the facility is enabled. This is an additional feature not available through Movacomm. Logs will be exported to the OSS at a configurable interval with only data collected since the last upload being transmitted. A complete history will be available therefore in consecutively loaded log files.

The logs collect and record data in intervals of 15, 30, 45, 60 or 90 minutes, as configured by the MOVA data set. In total 672 records (one weeks worth at 15 minute intervals) rounded up to the nearest number of whole days will be recorded, with the oldest records being deleted from the unit as new records are created.

### 2.6.1 Enabling TMA reporting to OSS

15)	2.6.1	If TMA log file export to an OSS is to be used, set up the TMA export start time and period and enable the OSS
-----	-------	--

Ensure that the OSS interface has been configured (on the DSL/Fibre configuration screen or on the OSS Interface screen).

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Configure TMA log export to the OSS at suitable times for the installation:-

- TMA Log Export Enable. Setting this enables the automatic transmission of TMA logs to OSS.
- TMA Log Export Start Time which designates a time and date at which transmission of TMA logs to the OSS starts.
- TMA Log Export Period which designates the period between successive log exports after the start time. The default value is 7 days i.e. once per week. The value can be changed to 1 day if daily export of logs is required.

**Figure 2.1 TMA Log Auto-Export Screen**

The screenshot shows the Siemens ST950 Controller web interface. The top navigation bar includes the Siemens logo, the controller name 'Siemens ST950 Controller: IT6', a dropdown menu for 'ADSL', and a 'Hi-vis' checkbox. Below the navigation bar is a breadcrumb trail: 'Home | Status and Configuration | System | System Log | Fault Table | Site Log | Access Level'. The left sidebar contains a tree view with expandable sections: 'System', 'Controller', 'UG405 UTC', 'Simple UTC', 'MOVA' (with sub-items 'Advanced', 'TMA Logs', 'TMA Log Auto-export', and 'I/O Mapping'), and 'Peripherals'. The 'TMA Log Auto-export' item is highlighted. The main content area is titled 'MOVA - TMA Log Auto-export'. It contains a table with three columns: 'Default', 'Item', and 'Value'. The table has three rows: 1) 'TMA log export enable?' with a checked checkbox in the 'Default' column and a checked checkbox in the 'Value' column; 2) 'TMA log export start date-time (UTC)?' with an unchecked checkbox in the 'Default' column and a text input field containing '21:06:13-12:25' in the 'Value' column; 3) 'TMA log export period?' with an unchecked checkbox in the 'Default' column and a text input field containing '00:06:00' in the 'Value' column. Below the table are 'Save' and 'Reload' buttons. At the bottom left of the interface, there is a small text box containing 'javascript:void(0);'.

On enabling the OSS and setting the export times the logs will now be periodically exported and can be viewed on the OSS see Figure 2.2 OSS MOVA Flow Log Screen

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Figure 2.2 OSS MOVA Flow Log Screen

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Outstation Support Server  
[Home](#) | [Outstations](#) | [Packages](#) | [Admin](#) | [About](#)  
Licensed to SiemensMOVA7Test, Expires December 2012

Outstation List  
Outstation Map  
Register  
Upload Default

Flow0619.log	Tue Jun 19 19:37:43 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0619.log	Tue Jun 19 20:37:48 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0619.log	Tue Jun 19 21:37:53 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0619.log	Tue Jun 19 22:37:57 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0619.log	Tue Jun 19 23:38:02 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 00:38:07 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 01:38:12 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 02:38:16 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 03:38:20 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 04:38:24 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 05:38:29 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 06:38:33 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 07:38:38 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 08:38:42 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 09:38:46 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 10:38:47 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 11:38:55 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 12:38:59 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 13:39:04 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 14:39:09 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 15:39:18 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0620.log	Wed Jun 20 16:54:21 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 08:28:45 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 08:29:46 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 09:29:33 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 10:00:34 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 10:31:35 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 11:02:35 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 11:33:36 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>
Flow0621.log	Thu Jun 21 12:04:36 BST 2012	<a href="#">delete</a>	<a href="#">view</a>	<a href="#">export</a>

[New](#)
[Refresh](#)

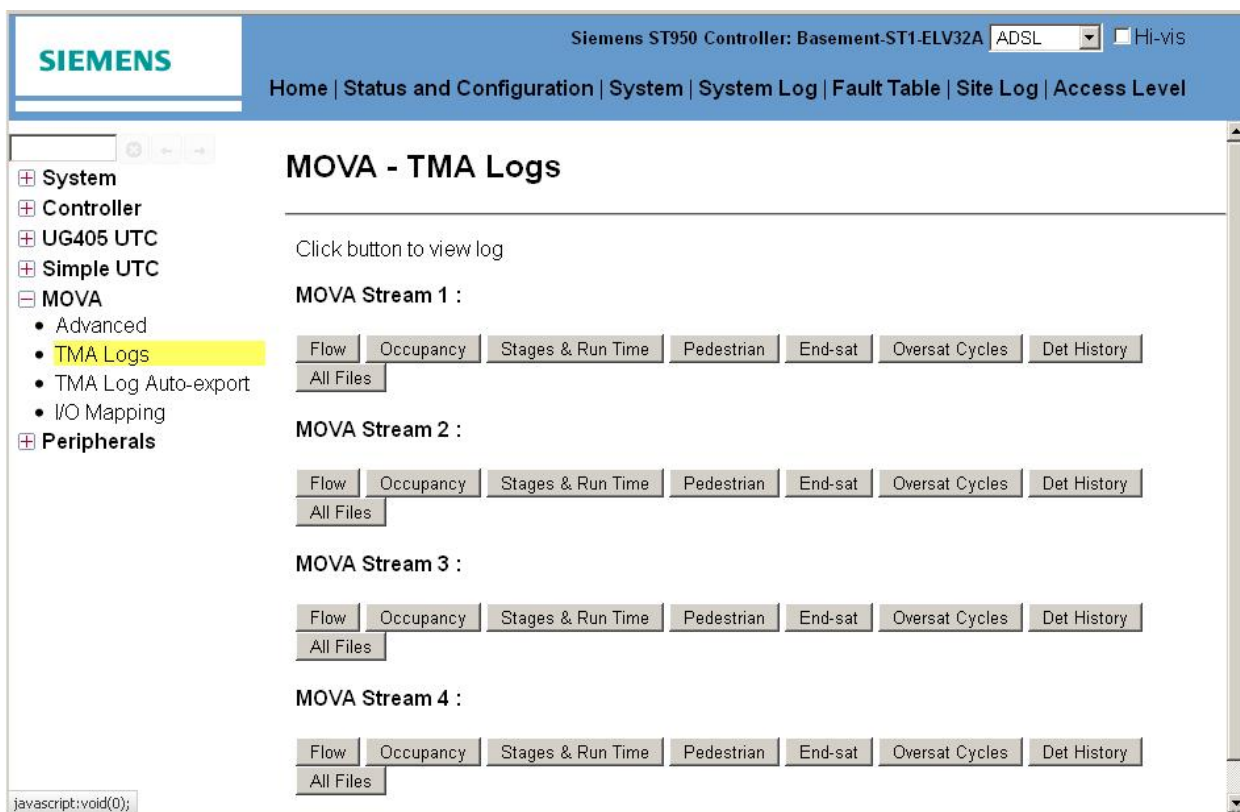
Done
Internet
100%

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## 2.6.2 Browser Access

The log data held within the unit can also be accessed directly via the browser – menu item TMA Logs. This will provide a row of buttons for each log for each stream. Selecting a button will present a choice as to whether to view the log immediately or to save it to the users PC. See Figure 2.3 TMA Logs Screen Shot below. There is also an option to save the complete set on the users PC.

Figure 2.3 TMA Logs Screen Shot



## 2.6.3 TMA Alerts

16)	2.6.3	Enable TMA alerts if required
-----	-------	-------------------------------

MOVA7 also introduces 'alerts'. The intention of alerts is to bring exceptional or unusual conditions at a junction to the attention of the traffic manager.

The alerts implemented in MOVA 7 are:-

- Oversaturation alert
- Exit blocking alert
- Occupancy Alert

See TRL MOVA documentation for a description of these.

In order to bring the alerts to the attention of the traffic manager they will be transmitted back to a connected UTC instation when they occur. It is a prerequisite that the MOVA unit be connected to a UTC instation so that this can be used as the alert reporting mechanism.

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The alert API within the MOVA kernel has been used to set virtual input port bits mova1.alerts.in.1, mova2.alerts.in.1, etc. These in turn need to be mapped back to the UTC instation, as General Purpose reply bits GPn), where the operator can define an action to execute on their occurrence.

To engage the alerts they will need to be mapped to a general purpose bit using the GP function as follows:-

Stream	Alert type	Function	Card / Port	Bit
1	Any	GPn	mova1.alerts.in.1	1
1	Oversaturation	GPn	mova1.alerts.in.1	2
1	Exit blocking	GPn	mova1.alerts.in.1	3
1	Occupancy	GPn	mova1.alerts.in.1	4
2	Any	GPn	mova2.alerts.in.1	1
2	Oversaturation	GPn	mova2.alerts.in.1	2
2	Exit blocking	GPn	mova2.alerts.in.1	3
2	Occupancy	GPn	mova2.alerts.in.1	4
3	Any	GPn	mova3.alerts.in.1	1
3	Oversaturation	GPn	mova3.alerts.in.1	2
3	Exit blocking	GPn	mova3.alerts.in.1	3
3	Occupancy	GPn	mova3.alerts.in.1	4
4	Any	GPn	mova4.alerts.in.1	1
4	Oversaturation	GPn	mova4.alerts.in.1	2
4	Exit blocking	GPn	mova4.alerts.in.1	3
4	Occupancy	GPn	mova4.alerts.in.1	4

For an overview of the process for setting up alerts, see the MOVA 7 Alerts Quick-Start Guide 667/HQ/31601/002.

## 2.7 MOVA Comm Notes

This section describes some of the MOVAComm options, which may be useful once MOVA is functioning normally. See the TRL MOVAComm User Guide for full descriptions. See section 4.1 and 4.2 on how to set up a MOVAComm connection.

### 2.7.1 MOVA Flags (LF and SF)

The MOVA flags can be viewed, and then changed, using the LF (Look at Flags) option from the main menu:

stage force bits										BST									
1	2	3	4	5	6	7	8	HI	TO	Mar	Oct	MARK1	MARK2	FLAG (29-32)					
0	0	0	0	0	0	0	0	0	0	23	15	1234	0	0	0	0	0		
error phone watch con- MOVA ready hour stage stage assess error 0=VA																			
count	home	dog	trol	mess	flag	flow	stuck	dmnded	-ment	log	1=MOVA								
0	0	13	0	0	1	0	0	1	1	0	0								
Do you want to Set Flags <S>																			
Look at Flags <L>																			
Clear force bits <C>																			
set Force bits <F>																			
or Return to MAIN MENU <R> ?																			

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The majority of these flags can be ignored, either because they are more easily viewed and changed using the commissioning screen for example, or because the flags are set directly by other options from the main menu.

The Look Flags sub-menu gives five options. In reverse order these are:

#### Return to MAIN MENU <R>

The fifth and final option is used to return to the main menu.

#### Set Force bits <F>

#### Clear force bits <C>

The third and fourth options allow force bits to be tested. This option is only provided for backward compatibility as it is recommended that the commissioning screen be used to test the force bits.

#### Look at Flags <L>

The second option displays all the flags and the menu again. Use this option to 'refresh' the display, e.g. when looking for a change of state of a particular flag.

#### Set Flags <S>

The first option can also be called directly from the main menu by typing 'SF' rather than 'LF'. This option allows some of the flags to be changed:

```
SET FLAGS :
Flag(17)  ERROR COUNT      . . . . . <X>
Flag(18)  PHONE HOME      . . . . . <L>
Flag(20)  ON CONTROL FLAG {1=ON CONTROL} <C>
Flag(21)  MOVA MESSAGE LOG {note 1} . . <M>
Flag(23)  HOURLY FLOW LOG  {note 2} . . <F>
Flag(26)  ASSESSMENT LOG   {note 2} . . <A>
Flag(27)  ERROR LOG        {note 1} . . <E>
Flag(28)  VA {=0} / MOVA {=1} FLAG . . . <V>
          for HELP {notes} enter . . . . <H>

ENTER CHOICE (or Q to quit) ...
```

The 'error count' and the 'on control' and 'VA/MOVA' flags are more easily modified using the commissioning screen which is described in section 2.5.10.

The MOVA messages, hourly flow, assessment and error log flags should not need to be changed as viewing these logs should be performed using the explicit options from the main menu. However, the logging of hourly flow and assessment data can be switched on and off using these flags. By default, the MOVA unit records both normal assessment data and hourly flow data in its assessment log. Changing the setting of these two flags can alter this.

For example, to get the MOVA unit to also record hourly flow data in its assessment log, type 'F' and press 'Return'. The MOVA unit will then display the current value of the flag and ask for the new value. At this point, enter '1' followed by 'Return' to set the hourly flow flag to '1'. This can be confirmed when the MOVA unit displays all the flags again.

```
ENTER CHOICE (or Q to quit) ... F
FLAG(23) = 0 Enter new value =
```

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### 2.7.2 Phone Home Flag

The 'phone home flag' is not used directly. MOVA indicates a serious fault by setting the UTC MF reply bit and so the 'phone home flag' is not required.

### 2.7.3 View MOVA Messages (VM)

The commissioning screen is mainly concerned with checking the I/O connections to the MOVA unit. To aid diagnosis of run-time problems with the MOVA algorithm, MOVA produces a series of output messages.

To view these MOVA messages, select the 'VM - View MOVA Messages' option from the main menu:

```

ENTER OPTION . . . VM

Enter number of minutes messages output for <1-9> or 0 for continuous
(NB - Press ANY key to pause messages)  ENTER NUMBER ...

Abandon messages now ? (y/n)Y

Return to continue

```

Enter '0' so that the MOVA unit outputs messages continuously since the messages can be stopped at any time by simply pressing any key and then pressing 'Y' to confirm that you do wish to stop the messages. The main menu will re-appear after 'Return' is pressed.

The messages themselves are by no means self-explanatory because it is essential to minimise the amount of text within each message.

Once the messages start appearing, press the 'F3' key and the MOVA Communications application will show a full screen display of the information it receives in the messages in a much more understandable form.

To exit view messages, press the 'F4' key to close down the full screen displays and then press any key to inform the MOVA unit that no more messages are required.

### 2.7.4 MOVA Detector Status Output

The detector status area of the MOVA Commissioning screen is capable of displaying the status of up to 64 detectors. It should be noted that this is the true detector state only where the detector is designated in the MOVA configuration data set. Where a detector is not designated it will be displayed as inactive. Care should therefore be taken when verifying a MOVA installation, if a detector is displayed as inactive when a vehicle crosses it then this may be because the MOVA configuration is wrong and not that the detector is defective.

The detector operation should be double-checked on the controller using the controller web interface or the IOP handset command.



If the controller DFM has timed out the detector will may be forced active or inactive on the MOVA Commissioning screen. View the controller fault log to check this.

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## 3 Platform Specific Information

### 3.1 MOVA on the ST950

ST950

#### 3.1.1 ST950 Use of Streams and Detectors

MOVA operates as an integral facility on the ST950 controller (see also section 2.5.6). For multi-stream control, each MOVA stream, or MOVA kernel, runs as a separate MOVA application (MOVA1, MOVA2 etc) and it is recommended that MOVA1 controls the first controller stream etc

MOVA Application	Controller Stream
MOVA1	Stream 0
MOVA2	Stream 1
MOVA3	Stream 2
MOVA4	Stream 3

When generating the IC4 configuration, MOVA is assigned its own controller mode, separate from UTC, with its own force and confirm bits and its own mode priority. The MOVA detectors can be configured separately for each MOVA stream or shared:-

#### Combined MOVA and UTC Detectors

A single set of up to 64 detectors is configured, which are common to all of the MOVA applications and to UTC SCOOT loops. By convention, the SCOOT loops are allocated from 64 downward. This option provides compatibility with IC4 detector data allocation generated for an ST900 controller.

#### Separate MOVA and UTC Detectors

A different set of up to 64 detectors can be configured for each of the MOVA applications and for UTC SCOOT loops. This option provides the maximum capability for larger junctions e.g. where the total number of MOVA and SCOOT detectors exceeds 64. Note that the overall maximum capability will be limited by the number of inputs equipped on the controller and the allocation of inputs to other functions.



The option chosen for the detectors (combined or separate) will need to match the MOVA data set usage. Thus with "separate" detectors, each MOVA data set can have a different loop as detector 1 whereas with "combined" detectors all the MOVA data sets must have the same loop as detector 1.

#### 3.1.2 ST950 MOVA Force Bits

Stages called by MOVA force bits are defined in the MOVA Stages page of the controller configuration; example shows a configuration with two streams of MOVA.

**MOVA0F1**, this force bit is from the first MOVA application - **MOVA Stream 1**.

MOVA Stream 1  
Force bit 1 calls  
Stage 1 on the  
controller

MOVA Stream 2  
Force bit 1 calls  
Stage 4 on the  
controller

MOVA Stages		
Stage	Force Bit	Green Confirm Bit
0		
1	MOVA0F1	MOVA0CON1
2	MOVA0F2	MOVA0CON2
3		
4	MOVA1F1	MOVA1CON1
5	MOVA1F2	MOVA1CON2
6		

See also section 2.5.6.

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### 3.1.3 ST950 MOVA CRB

The Controller Ready Bit (CRB) is automatically handled by the ST950 controller software and is only set active when all the controller modes which are higher priority than MOVA are inhibited or inactive i.e. CRB is only set when the controller would be prepared to respond to MOVA forces. Previously, it was necessary to toggle CRB periodically via controller special conditioning to ensure that MOVA would take control under some conditions. This toggle function has been included in the controller software, so that special conditioning is no longer necessary. The timing of the CRB toggle can be set in IC4 and viewed/changed on the controller:-

Default	Item	Value
<input type="checkbox"/>	MOVA CRB Control Timer ?	240
<input type="checkbox"/>	MOVA CRB Deactive Period ?	2.0
<input type="checkbox"/>	MOVA Release Timer ?	1
<input type="checkbox"/>	MOVA Reporting as ?	MOVA



Any change to the data will be lost the next time that the controller configuration is imported, unless the change is also applied to the IC4 configuration source data.

### 3.1.4 ST950 MOVA Mode Reporting

When a Gemini OMU is monitoring the ST950 via the handset port, then MOVA mode should be reported as UTC in order to maintain compatibility.

Default	Item	Value
<input type="checkbox"/>	MOVA CRB Control Timer ?	240
<input type="checkbox"/>	MOVA CRB Deactive Period ?	2.0
<input type="checkbox"/>	MOVA Release Timer ?	1
<input type="checkbox"/>	MOVA Reporting as ?	UTC

### 3.1.5 MOVA Linking

In certain installations it may be of benefit to allow one stream to have some knowledge of traffic flow in the other. To fulfil this requirement the MOVA lane over-saturation (SAT) and link end of saturation (ESLI) codes have been made available to the controller special conditioning.

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Over-saturation is defined as "the condition when a lane is left with a significant queue at the end of green". MOVA outputs an over-saturation bit for each lane (up to 30), indicating a '0' if the previous cycle was not over-saturated and a '1' if it was. The data is accessed via special conditioning mnemonic:-

Where            k = MOVA stream/kernel number 0 to 3  
                      n = lane number 1 - 30

MOVA provides 'end of saturation flow' outputs indicating when link saturation flow has ended. Several values are provided to indicate the different reasons for end of saturation flow having been reached. The data is accessed via special conditioning mnemonic:-

Where k = MOVA stream/kernel number 0 to 3  
n = link number 1 – 60

- 0 = Not yet end-sat
- 1 = Normal end-sat
- 2 = End-sat due to combination of codes 5 and 6 if link persistently oversaturated.
- 3 = End-sat as queue of X-det; green being wasted
- 4-6 = End-sat when link is oversaturated, due to various capacity-maximising decisions.  
See TRL MOVA Guides AG44 and AG45.
- 7 = End-sat link maximum reached
- 8 = End-sat from historical flows because detectors faulty
- 9 = End-sat because bonus green  $\geq$  lost time



When configuring the mode priorities in IC4, MOVA mode should be set at a lower priority than UTC.

Where MOVA and UTC are both configured on the ST950 controller, it is possible to select between MOVA and UTC operation at the UTC instation without an MO bit by using the UTC command:

PLAN Jnnnnn 0 ;Request plan 0 (local control – allowing MOVA to run)  
; where nnnnn is the junction SCN

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There is generally no need for a specific “MO” bit on the ST950 since MOVA and UTC run as separate modes on the controller and as soon as the UTC force bits drop, MOVA will take control of the junction.

If there is some special requirement to have UTC user control over the enabling of MOVA, then this can be achieved by defining a UTC “MO” control bit and writing special conditioning to perform the required action. The special conditioning would need to inhibit MOVA when UTC comms is active (Transmit Confirm bit active) and the “MO” bit is 0

The suggested ST950 IC4 special condition to control MOVA on controller stream 0 via the MO bit is:-

```
;Inhibit MOVA on stream 0 when UTC comms active and MO bit is 0
;NB: Requires mapping of TC to port csi.cond.out.1 bit 1
;    (conditioning bit ESPRX0) on the I/O Mapping Web Page
;=====
ESPRX0.NOT(MO0) = DISMOVA0
```

The conditioning makes use of the ESP conditioning flags to interface between the integral OTU and the controller. It requires the UTC transmit confirm bit (TC) to be mapped to the selected conditioning flag, as shown in the example below.

## I/O Mapping

Site Name ? : J34161

Edit Site Contents: ?

Func?	No.?	UTC Offset?	Direction?	Card/Port?	Bit?	Invert?
TC	-	0	Output	csi.cond.out.1	1	<input type="checkbox"/>

The special conditioning ensures that MOVA is only disabled when UTC comms is active and the XMVA command has been used at the instation to clear the MO bit and thus prevent MOVA from taking control. If UTC comms fails then MOVA is allowed to take control, irrespective of any previous value of the MO bit.

Then the “MR” reply bit would be controlled by special conditioning, as a simple confirm for “MO”, e.g.

```
;Return the 'MR' reply bit when 'MO' is active for stream 0
NOT MO0=MR0
```

Where an MO bit is configured, then the UTC commands MOVA and XMVA can be used to enable and disable MOVA operation on the junction.

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### 3.1.7 ST950 MOVA UTC Reply Bits

Where MOVA and UTC are configured on the controller, it may be required to return MOVA status bits to UTC e.g. ML and MF. These will need to be configured in special conditioning, as MOVA and UTC operate as independent facilities on the ST950.

UTC Bit	Conditioning Mnemonic	Notes
ML $n$	MOVA $k$ TO	The bit is set active when MOVA is in control of the junction. $n$ = UTC stream number (0, 1 etc) $k$ = MOVA stream/kernel number (0, 1 etc)
MF $n$	MOVA $k$ MF	The bit is set active when MOVA has detected a serious fault (MOVA fault count greater than 20). $n$ = UTC stream number (0, 1 etc) $k$ = MOVA stream/kernel number (0, 1 etc)
MR	-	Where an MO bit has been configured, MR is simply a confirm for MO. See section 3.1.6.

Typically, the UTC reply bits are defined on the IC4 "UTC Control and Reply Data Format" screen and then those names are used in special conditioning to pick up the required items e.g.

```
;Set up the 'MF' (MOVA Fault) UTC reply bit for MOVA stream 0
NOT MOVA0MF=MF0
;Set up the 'ML' (MOVA on-control) UTC reply bit for MOVA stream 0
NOT MOVA0TO=ML0

;Set up the 'MF' (MOVA Fault) UTC reply bit for MOVA stream 1
NOT MOVA1MF=MF1
;Set up the 'ML' (MOVA on-control) UTC reply bit for MOVA stream 1
NOT MOVA1TO=ML1
```

### 3.1.8 ST950 Software Upgrade

When the software on the ST950 controller is being upgraded, then the shutdown of the controller software can generate MOVA "multiple stage confirm" entries in the system log, e.g.

```
Tue 06 Aug 2013 09:07:00 BST N(Mova2): mova now off control
Tue 06 Aug 2013 09:07:00 BST E(Mova2): ERROR 14 MULTIPLE STAGE CONFIRMS
```

These system log entries are a consequence of the software upgrade sequence and not a problem in MOVA, provided that they do not appear during normal system operation.

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### 3.2 Using Gemini Semi-Integral UTM C OTU/MOVA with ST950

Generally, it is recommended that the MOVA facility is provided by the ST950 internal MOVA. However, where it is required to install an ST950 controller with a Gemini 2 (or Gemini 3) Semi-Integral UTM C OTU/MOVA, the following points should be noted:-

- Two network points should be provided; one for the Gemini OTU/MOVA and one for the ST950.
- The ST950 web pages will contain features for the internal MOVA - these should be ignored and the Gemini web pages used instead.
- The Gemini will extract and display the controller's "ST900-style" rolling LOG on its web pages. This will only be a subset of the total fault information, so it is better to use the ST950 System Log for more comprehensive log information.
- There are two Fault Tables – one for the Gemini and one for the ST950.
- There are two System Logs – one for the Gemini and one for the ST950.
- If OTU is also required, the OTU facility in the Gemini OTU must be used (or else both MOVA and OTU can be configured as ST950 integral facilities, removing the need for the Gemini completely).
- For systems with an OSS, there will be two entries at the OSS – one for the Gemini UTM C OTU/MOVA and one for ST950.
- The Gemini OTU will be unable to retrieve the IC4 configuration file from the ST950 controller. The ST950 controller configuration file can be exported directly from the ST950 via the ST950 web interface.
- The Gemini OTU will fetch timing data (min times, max times etc) from the controller as for the ST900. However, this is a legacy facility and does not cover all of the ST950 controller timing data items. It is recommended that the ST950 web pages are used to view and change the controller timing data instead of using this facility.

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## 3.3 MOVA on the Stratos Outstation

Stratos OS

### 3.3.1 Configuring MOVA-Only operation

The MOVA-Only setup is used to configure the I/O where there is only MOVA control and no UTC. If UTC is to be added at some later date, then it is better, if possible, to configure the site for both UTC and MOVA based on the CSV file exported from the UTC instation, rather than using this facility.

The MOVA-Only setup can also be used to add MOVA detectors to a combined UTC/MOVA installation.

#### Import CSV File ?

No file selected.

☐ Freestanding

☒ Semi-Integral

☐ Wipe Existing Sites on Import ?

Site ?	Del ?
J99111	<input type="checkbox"/> <input type="button" value="Edit"/>
J99112	<input type="checkbox"/> <input type="button" value="Edit"/>
J99113	<input type="checkbox"/> <input type="button" value="Edit"/>
J99114	<input type="checkbox"/> <input type="button" value="Edit"/>
X99110	<input type="checkbox"/> <input type="button" value="Edit"/>

#### I/O Mapping

**Site Name ? : X99110**

**Edit Site Contents: ?**

Func ?	No. ?	UTC Offset ?	Direction ?	Card/Port ?	Bit ?	Invert ?	DFM Act (min)	DFM Inact (hrs)
VS	1	33	Input	csi.det.in.1	64	<input type="checkbox"/>	0	0
VS	2	37	Input	csi.det.in.1	63	<input type="checkbox"/>	0	0
VS	4	45	Input	csi.det.in.1	61	<input type="checkbox"/>	0	0

**Add Bits Table: ?**

No Description Set

Func ?	No. ?	UTC Offset ?	Direction ?	Card/Port ?	Bit ?	Invert ?
	auto	0	auto	csi.reply.in.1	0	<input type="checkbox"/>

#### Getting Started

This screen allows configuration of the mapping between UTC/MOVA control and reply bits, and the controller interface.

CSV files generated by the instation can be imported here, to define the bit mappings. Alternatively, a new configuration can be created and the bit mappings entered individually.

When updating the

Use this button to access the MOVA-Only setup controls shown below.

Any changes (including CSV import) will not be applied until the "Save to File" button is used.



Before using this facility, ensure that any required I/O cards are connected and operating correctly, since the software will only be able to assign inputs and outputs which are actually equipped on the unit.

☐ Freestanding

☒ Semi-Integral

Confirms: 7 Start: 1

Forces: 7 Start: 1

Detectors: 32 Start: 1

☐ per Stream

☒ Shared

#### Freestanding

Select freestanding when the MOVA forces and confirms are connected to the controller via individual inputs and outputs on the I/O cards.

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## Semi-integral

Select semi-integral when the MOVA forces and confirms are passed to a Siemens controller via the serial interface.

## Confirms

Enter the number of confirms to be generated, to match the controller configuration. The number of confirms should include both stage and phase confirms. A MOVACRB input is automatically allocated on the end of the confirms.

## Start

Enter the start offset of the first stage confirm. For semi-integral, this will match the position of the stage confirm as configured in IC4. For freestanding, it will match the input line number wired to the stage confirm from the controller.

## Forces

Enter the number of stage forces to be generated, to match the controller configuration. A MOVATO output is automatically allocated on the end of the stage forces.

## Start

Enter the start offset of the first stage force. For semi-integral, this will match the position of the stage force as configured in IC4. For freestanding, it will match the output line number wired to the stage force signal into the controller.

## Add MOVA Site

This button adds a MOVA site with stage forces and confirms to the site list.  
Before use,

- Select free-standing or semi-integral
- Set the required number of MOVA confirm bits (including stage and phase confirms)
- Set the required number of MOVA stage force bits
- Set the correct start offsets for the forces and confirms to match the site configuration/wiring

A new MOVA site will be created each time the button is used. A MOVATO output is automatically allocated on the end of the stage forces and a MOVACRB input is automatically allocated on the end of the confirms. Also, the start offsets will be updated to the next free positions. Up to four MOVA sites can be added, named MOVA1 to MOVA4.

## Detectors

Enter the number of MOVA detector inputs to be allocated, to match the MOVA configuration. Typically 32 for a small/medium installation or 64 for a large installation.

## Start

Enter the start offset of the first MOVA detector. For semi-integral, this will match the position of the stage confirm as configured in IC4. For freestanding, it will match the input line number wired to the stage confirm from the controller.

## Per Stream

Select "per Stream" when different MOVA detectors are allocated separately for each MOVA stream.

## Shared

Select "shared" when the same set of MOVA detectors are configured on all of the MOVA streams.

## Add Detectors

This button adds MOVA detectors, if there are none already defined.  
Before use,

- Select free-standing or semi-integral

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- Set the required number of MOVA detectors
- Set the correct start offset for the detectors to match the site configuration or wiring
- Select shared if multiple MOVA streams use a common set of detectors. Select per-Stream if the detectors for each MOVA stream are to be mapped separately

Shared detectors are added to a site named MOVA. Per-stream detectors are added first to site MOVA1, then MOVA2, MOVA3 and finally site MOVA4.

### 3.3.2 Configuring MOVA in conjunction with UTC

When both MOVA and UTC are configured on the Stratos Outstation, they share the same force and reply bits on the interface to the controller. The I/O bits relating to MOVA operation are listed below.

Name	Function	Direction	Bit Usage
Fn	Stage Control	output	One bit per stage. MOVA will only activate one stage force bit at a time and will check that the controller moves to the forced stage. A force bit can remain active for a long period of time if there are no opposing demands.
MOVATO	MOVA Take Over	output	One bit per MOVA stream. The bit is active when MOVA is on control. The signal is used by the controller to differentiate between MOVA and UTC control e.g. forces can be demand dependent on UTC but not on MOVA.
MO	MOVA Override	output	One bit per MOVA stream. The bit is active when the MOVA command is used at the UTC instation. The bit is used by the outstation to
MOVACRB	MOVA Controller Ready Bit	input	One bit per MOVA stream. The bit is gated by MO in the outstation so that it is active when the controller is ready to accept MOVA control AND MO is active (or UTC comms has failed).
Gn	Stage confirm	input	One bit per stage, plus an additional bit for each phase confirm required by MOVA e.g. for pedestrian phases. The sense of confirm signals is generally inverted, so that the inactive state of the signal indicates the stage or phase is at green.
MOVADETN	MOVA Detectors	input	One bit per detector. One set of detectors (64 max) can be shared across all MOVA streams or each MOVA stream can be configured with its own set of up to 64 detectors.

The steps to configure the I/O mapping are slightly different for semi-integral and freestanding interfaces, as described in the following sections.

### 3.3.2.1 Configuring semi-integral UTC and MOVA

The steps for configuring the semi-integral UTC and MOVA I/O mapping are:-

1. Configure UTMC OTU so that the I/O Mapping contains the UTC control and reply bits to match the UTC instation (usually created by importing the CSV file with semi-integral option selected).
2. **Add MOVA Phase Confirms:** On the I/O Mapping screen, create any additional green confirms for phases if required for MOVA. Map the inputs to match the controller reply bits.
3. **Add MOVATO:** On the I/O Mapping screen, create output bit function MOVATO and map it to the csi.control.out.1 port and bit position as configured for the MOVA Take Over control bit the controller. Use the "submit" button at the bottom of the page to enter the values.  
NB: A separate MOVATO bit should be configured on the controller for each MOVA stream, typically called MOVA0 for the first stream MOVA1 for the second stream etc. The bits are used in special conditioning in the controller to differentiate between MOVA and UTC control e.g. to light a LED on the manual panel when MOVA is active or to provide demands for demand dependent forces.
4. **Add MOVA Detectors:** Either import the detector configuration from a prepared CSV file or create the detectors using the MOVA-only setup (see section 3.3.1).
5. **Save to File:** Used this button to save and apply all the new settings.

**I/O Mapping**

Site Name ? : J11991

Edit Site Contents: ?

Func?	No.?	UTC Offset?	Direction?	Card/Port?	Bit?	Invert?
TC	-	0	Output	csi. utc. to. out. 1	1	
MOVATO	-	0	Output	csi. control. out. 1	16	
F	1	1	Output	csi. control. out. 1	1	
F	2	2	Output	csi. control. out. 1	2	
F	3	3	Output	csi. control. out. 1	3	
F	4	4	Output	csi. control. out. 1	4	
MO	-	15	Output	csi. control. out. 1	15	
MOVACRB	-	0	Input	csi. crb. in. 1	1	
G	1	1	Input	csi. reply. in. 1	1	
G	2	2	Input	csi. reply. in. 1	2	
G	3	3	Input	csi. reply. in. 1	3	
G	4	4	Input	csi. reply. in. 1	4	
MR	-	25	Input	internal	1	
ML	-	26	Input	internal	1	
MF	-	27	Input	internal	1	

**Getting Started**

This screen allows configuration of the mapping between UTC/MOVA control and bits, and the controller.

CSV files generated by the instation can be imported here, to define the bit mappings. Alternatively, a new configuration can be created and the bit mappings entered individually.

When updating the configuration, first use the "Submit" button to hold the results of the edits to each site in turn, then use the "Save to File" button to changes permanent and the "Save to File" button is used.

Any changes (including import) will not be applied until the "Save to File" button is used.

**MOVA-ONLY Set Up**

Use MOVA-Only setup to add MOVA detectors.

TC for MOVA stream 1 is mapped to bit 1, stream 2 would be bit 2 etc

MOVATO mapped to controller's MOVA Take Over

MO mapped to unused output.

MOVACRB mapped to CRB input from controller.

MR, ML and MF are generated in the OTU, set to "internal".

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An example of the semi-integral MOVA detector allocation is shown below:-

Add Site?

Site? Del?

MOVA ☐ Edit

J11991 ☐ Edit

Rename or Delete?

Save to File?

Revert Changes?

☐ Freestanding
☒ Semi-Integral

Confirms: 7 Start: 28  
Forces: 7 Start: 16  
Add MOVA Site?

Detectors: 32 Start: 1  
☐ per Stream  
☒ Shared  
Add Detectors?  
Hide MOVA-ONLY Set Up?

## I/O Mapping

Site Name? : MOVA

Edit Site Contents: ?

Func?	No.?	UTC Offset ?	Direction?	Card/Port?	Bit?	Invert?
MOVADET	1	0	Input	csi.det.in.1	1	<input type="checkbox"/>
MOVADET	2	0	Input	csi.det.in.1	2	<input type="checkbox"/>
MOVADET	3	0	Input	csi.det.in.1	3	<input type="checkbox"/>
MOVADET	4	0	Input	csi.det.in.1	4	<input type="checkbox"/>
MOVADET	5	0	Input	csi.det.in.1	5	<input type="checkbox"/>
MOVADET	6	0	Input	csi.det.in.1	6	<input type="checkbox"/>
MOVADET	7	0	Input	csi.det.in.1	7	<input type="checkbox"/>
MOVADET	8	0	Input	csi.det.in.1	8	<input type="checkbox"/>
MOVADET	9	0	Input	csi.det.in.1	9	<input type="checkbox"/>
MOVADET	10	0	Input	csi.det.in.1	10	<input type="checkbox"/>
MOVADET	11	0	Input	csi.det.in.1	11	<input type="checkbox"/>
MOVADET	12	0	Input	csi.det.in.1	12	<input type="checkbox"/>
MOVADET	13	0	Input	csi.det.in.1	13	<input type="checkbox"/>
MOVADET	14	0	Input	csi.det.in.1	14	<input type="checkbox"/>
MOVADET	15	0	Input	csi.det.in.1	15	<input type="checkbox"/>

## Getting Started

This screen allows

Where the MOVA detectors have been equipped and configured on the controller, use port csi.det.in.1 to make them available to MOVA on the outstation.

created and the bit mappings entered individually.

When updating the configuration, first use the "Submit" button to hold the results of the edits to each site in turn, then use the "Save to File" button to make all changes permanent and active.

Any changes (including CSV import) will not be applied until the "Save to File" button is used.



The semi-integral interface allows a maximum of 64 detectors, which are shared by both MOVA and SCOOT. The default convention is to allocate MOVA detectors from 1 upward and to allocate SCOOT detectors from 64 down (i.e. SCOOT loop 1 mapped to csi.det.in.1 bit 64, SCOOT loop 2 mapped to csi.det.in.1 bit 63 etc).

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## 3.3.2.2 Configuring freestanding UTC and MOVA

The steps for configuring the freestanding UTC and MOVA I/O mapping are:-

1. Configure UTMC OTU so that the I/O Mapping contains the UTC control and reply bits to match the UTC instation (usually created by importing the CSV file with "freestanding" option selected).
2. **Add MOVA Phase Confirms:** On the I/O Mapping screen, create any additional green confirms for phases if required for MOVA. Map the inputs to match the controller interface wiring.
3. **Add MOVATO:** On the I/O Mapping screen, create output bit function MOVATO and map it to the gpio port and bit position as configured for the MOVA Take Over control bit the controller. Use the "submit" button at the bottom of the page to enter the values.  
NB: A separate MOVATO bit should be configured on the controller for each MOVA stream. The bits are used in the controller to differentiate between MOVA and UTC control.
4. **Add MOVA Detectors:** Either import the detector configuration from a prepared CSV file or create the detectors using the MOVA-only setup (see section 3.3.1).



Before allocating the MOVA detectors, ensure that any required I/O cards are connected and operating correctly, since the software will only be able to assign inputs and outputs which are actually equipped on the unit.

5. **Save to File:** Used this button to save and apply all the new settings.

An example configuration is shown below:-

The screenshot shows the 'I/O Mapping' screen for site 'J11991'. The interface includes a sidebar with 'Import CSV File' (Freestanding selected), 'Site' management, and 'Save to File'. The main table lists functions, their numbers, UTC offsets, directions, card/port mappings, bit positions, and invert settings.

**Annotations:**

- Select freestanding before importing the CSV file:** Points to the 'Freestanding' radio button in the 'Import CSV File' section.
- Map inputs and outputs to match controller interface bit definitions:** Points to the 'Card/Port' and 'Bit' columns in the table.
- MO mapped to unused output:** Points to the 'MOVATO' function mapped to 'gpio1.out.6' bit 8.
- The general convention is to invert the sense of signals from the controller:** Points to the 'Invert' checkbox, which is checked for many input functions.
- MR, ML and MF are generated in the OTU, set to "internal":** Points to the 'Card/Port' dropdown for functions MR, ML, and MF, which are set to 'internal'.

Func?	No.?	UTC Offset?	Direction?	Card/Port?	Bit?	Invert?
MOVATO	-	0	Output	gpio1.out.6	8	<input type="checkbox"/>
TC	-	0	Output	gpio1.out.7	8	<input type="checkbox"/>
F	1	1	Output	gpio1.out.6	1	<input type="checkbox"/>
F	2	2	Output	gpio1.out.6	2	<input type="checkbox"/>
F	3	3	Output	gpio1.out.6	3	<input type="checkbox"/>
F	4	4	Output	gpio1.out.6	4	<input type="checkbox"/>
MO	-	15	Output	gpio1.out.7	7	<input type="checkbox"/>
MOVACRB	-	0	Input	gpio1.in.2	8	<input checked="" type="checkbox"/>
G	1	1	Input	gpio1.in.0	1	<input checked="" type="checkbox"/>
G	2	2	Input	gpio1.in.0	2	<input checked="" type="checkbox"/>
G	3	3	Input	gpio1.in.0	3	<input checked="" type="checkbox"/>
G	4	4	Input	gpio1.in.0	4	<input checked="" type="checkbox"/>
MR	-	25	Input	internal	1	<input type="checkbox"/>
ML	-	26	Input	internal	1	<input type="checkbox"/>
MF	-	27	Input	internal	1	<input type="checkbox"/>

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An example of freestanding MOVA detector allocation for shared MOVA detectors is shown below.

**Import CSV File ?**

Browse... No file selected.

☒ Freestanding

☐ Semi-Integral

☐ Wipe Existing Sites on Import ?

Import

Go to UD Options ?

Add Site ?

**Site ? Del ?**

J11991 ☐ Edit

MOVA ☒ Edit

Rename or Delete ?

Save to File ?

Revert Changes ?

☒ Freestanding

☐ Semi-Integral

**Site Name ? : MOVA**

**Edit Site Contents: ?**

Func?	No.?	UTC Offset Direction?	Card/Port?	Bit?	Invert?
MOVADET	1	0	Input	gspio1.in.2	1
MOVADET	2	0	Input	gspio1.in.2	2
MOVADET	3	0	Input	gspio1.in.2	3
MOVADET	4	0	Input	gspio1.in.2	4
MOVADET	5	0	Input	gspio1.in.2	5
MOVADET	6	0	Input	gspio1.in.2	6
MOVADET	7	0	Input	gspio1.in.2	7
MOVADET	8	0	Input	gspio1.in.2	8
MOVADET	9	0	Input	gspio1.in.3	1
MOVADET	10	0	Input	gspio1.in.3	2
MOVADET	11	0	Input	gspio1.in.3	3
MOVADET	12	0	Input	gspio1.in.3	4
MOVADET	13	0	Input	gspio1.in.3	5
MOVADET	14	0	Input	gspio1.in.3	6
MOVADET	15	0	Input	gspio1.in.3	7
MOVADET	16	0	Input	gspio1.in.3	8
MOVADET	17	0	Input	gspio1.in.4	1
MOVADET	18	0	Input	gspio1.in.4	2

**Getting Started**

This screen of the map shows the UTC/MOVA bits, and the CSV files of the installation can be imported here, to define the bit mappings. Alternatively, a new configuration can be created and the bit mappings entered individually.

When updating the configuration, first use the "Submit" button to hold the results of the edits to each site in turn, then use the "Save to File" button to make all changes permanent and active.

Any changes (including CSV import) will not be applied until the "Save to File" button is used.

Start the MOVA detectors away from gspio ports which are already allocated for UTC reply bits and MOVA confirms

The single MOVA site is used to define one set of detectors used by all MOVA streams.

An example of mapping separate detectors for each MOVA stream is shown below ("per Stream" mapping).

**Add Site**

**Site ? Del ?**

J11991 ☐ Edit

J11992 ☐ Edit

MOVA1 ☐ Edit

MOVA2 ☒ Edit

Rename or Delete ?

Save to File ?

Revert Changes ?

☒ Freestanding

☐ Semi-Integral

Confirms: 7 Start: 28

Forces: 7 Start: 16

Add MOVA Site ?

Detectors: 32 Start: 81

☒ per Stream

☐ Shared

Add Detectors ?

**I/O Mapping**

**Site Name ? : MOVA2**

**Edit Site Contents: ?**

Func?	No.?	UTC Offset Direction?	Card/Port?	Bit?	Invert?
MOVADET	1	0	Input	gspio2.in.0	1
MOVADET	2	0	Input	gspio2.in.0	2
MOVADET	3	0	Input	gspio2.in.0	3
MOVADET	4	0	Input	gspio2.in.0	4
MOVADET	5	0	Input	gspio2.in.0	5
MOVADET	6	0	Input	gspio2.in.0	6
MOVADET	7	0	Input	gspio2.in.0	7
MOVADET	8	0	Input	gspio2.in.0	8
MOVADET	9	0	Input	gspio2.in.1	1
MOVADET	10	0	Input	gspio2.in.1	2
MOVADET	11	0	Input	gspio2.in.1	3
MOVADET	12	0	Input	gspio2.in.1	4
MOVADET	13	0	Input	gspio2.in.1	5
MOVADET	14	0	Input	gspio2.in.1	6
MOVADET	15	0	Input	gspio2.in.1	7

**Add MOVA Detectors:**

This button adds MOVA detectors, if there are already defined. Be sure to select the correct card and port.

Select free-standing or semi-integral

Set the required number of MOVA detectors

Set the correct start offset for the detectors to match the site configuration or wiring

Select shared if multiple MOVA streams use a common set of detectors. Select per-Stream if the detectors for each MOVA stream are to be mapped separately

In this example, MOVA1 only has 32 detectors which all fit on the first I/O card (gspio1), so the detectors for MOVA2 can start on the second I/O card (gspio2).

Each MOVA stream has a separate site for mapping detectors.

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## 4 Additional Information

### 4.1 Configuring Direct MOVAComm shortcuts

Use this sequence to configure desktop shortcuts for MOVAComm direct IP communication. MOVAComm must be installed on the PC first and is available from the TRL web site at <http://www.trlsoftware.co.uk/support/downloads> or <http://www.trl.co.uk>.

Pre-generated shortcuts can also be copied from the ST950 MOVA directory which can be accessed via "My Computer" as an external CD Drive when a PC is connected via the USB device port connection on the front of the CPU card.



If a shortcut does not work because MOVAComm.exe cannot be found, check that the MOVAComm executable has been installed in the target path identified in the shortcut. Different versions of Windows may have different default installation paths for the MOVAComm executable.

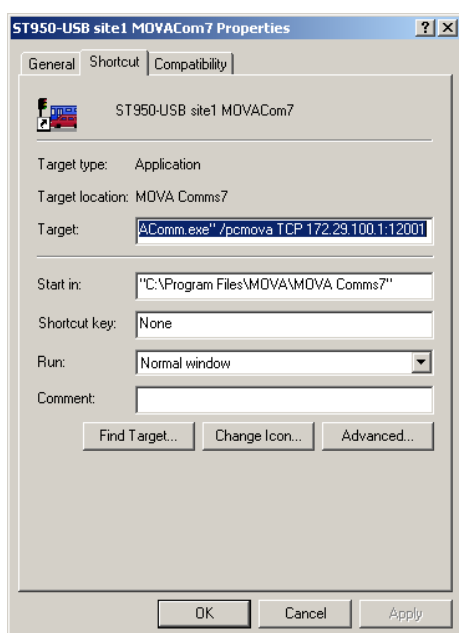
1. Make a copy of the MOVAComm shortcut on the desktop.
2. Rename it to "USB site1 MOVAComm" or similar.
3. Right-click and select "Properties"
4. Add the Target parameters **/pcmov TCP x.x.x.x\*:12001** and click **OK**. See example below.



The base port number used by MOVA can be configured via the web interface. If the base port has been changed, the port numbers (12001 etc) will need to be updated accordingly.

5. Repeat the above steps for each MOVA stream, naming the shortcut accordingly and changing the port number in the Target parameters according to the stream number:-  
**/pcmov TCP x.x.x.x\*:12002** - MOVA stream 2  
**/pcmov TCP x.x.x.x\*:12003** - MOVA stream 3  
**/pcmov TCP x.x.x.x\*:12004** - MOVA stream 4

\* **x.x.x.x** is 172.29.100.1 when connecting via USB or 172.28.100.1 when connecting via WiFi.



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## 4.2 Starting MOVAComm Remote Communications

To communicate remotely with the MOVA unit when a UTC instation is available on the system, use the link on the UTC instation screen as shown below:-

The users PC must be set up as follows:-

1. Install the MOVAComm URL Handler distributed with the PCSCOOT software version 29.0 or later. This includes the TRL MOVAComm application.
2. Ensure the PC is connected on the network and has routing access to the outstation. Please refer to the network system administrator for assistance as each different network can have it's own configurations for routing and firewalls.

MOVA uses TCP on the following port numbers:-

- MOVAComm stream 1 – IP port 12001
- MOVAComm stream 2 – IP port 12002
- MOVAComm stream 3 – IP port 12003

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- MOVA stream 4 – IP port 12004

If the outstation IP address is known, then MOVAComm application can be launched manually from a DOS prompt using the command format:-

```
MOVAComm.exe /pcmova TCP <IP-address>:12001
```

Where <IP-address> is the IP address of the outstation

```
e.g. MOVAComm.exe /pcmova TCP 172.16.100.96:12001
```

The command can be pasted into a shortcut (see section 4.1) for ease of use.

After a short delay, the MOVA unit will ask for the password to validate access. Once the password has been accepted, the MOVA unit communicates remotely in exactly the same way as it does locally.

To end communications, select the 'FI – Finish' option from the MOVA main menu and then press F10 to close the MOVAComm application.

## 4.3 Built-in MOVAComm Functionality

MOVAComm functionality is available through the GVP terminal for some product firmware versions. This allows these features to be used in cases where it would not be possible to use the standard PC based MOVAComm application e.g. not using a PC, MOVAComm port blocked for security reasons. The MOVAComm functionality supported includes:

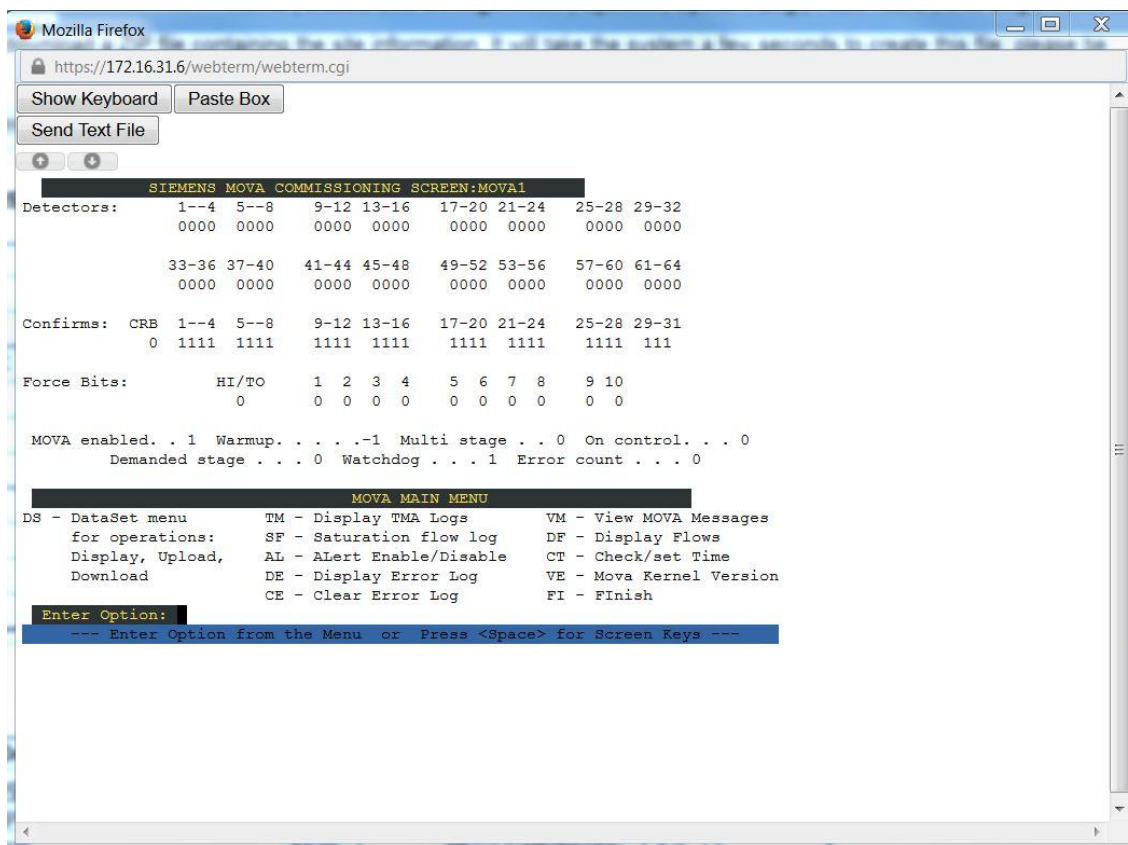
- The MOVA commissioning & main menu screens
- Loading of MOVA data set into equipment
- Extraction of MOVA data set from equipment
- Decoding of commonly used MOVA messages

There are some differences between the built-in functionality and the MOVAComm application. These differences are summarised below.

### 4.3.1 MOVA Commissioning Screen

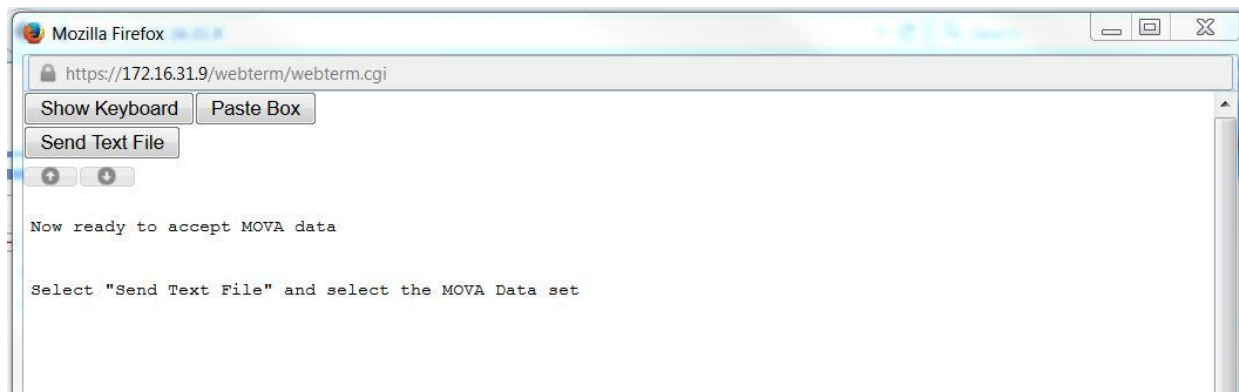
Access to the MOVA commissioning screen is through the terminal command *movacomm<n>* where <n> represents the MOVA stream e.g. *movacomm1*. The layout and operation of this screen is very similar to that of the MOVAComm application although there are minor differences e.g. the colours used.

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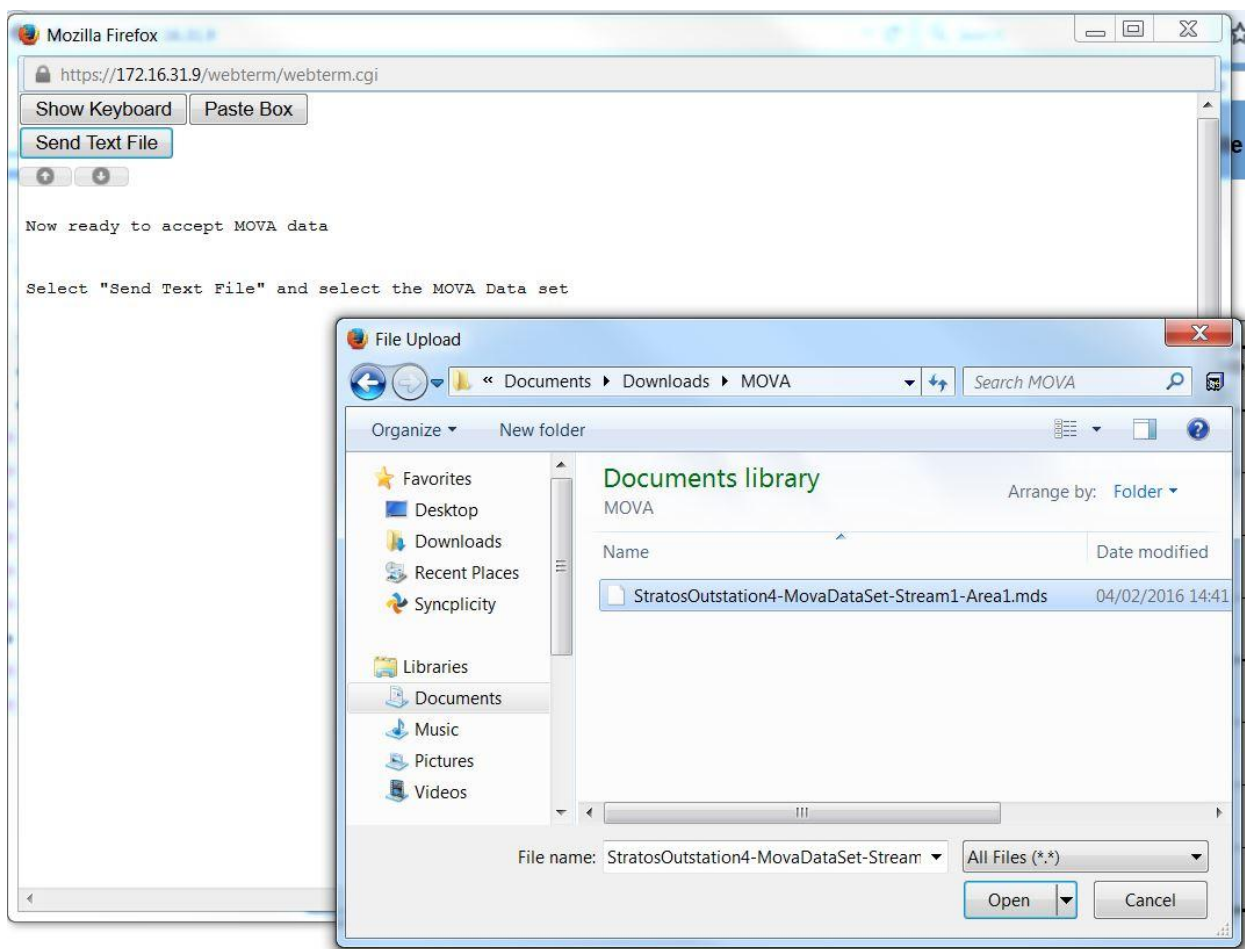


## 4.3.2 Load MOVA Data Set

A data set can be loaded using the standard MOVAComm *R* command. After pressing R, the file containing the data set can be selected by pressing the *Send Text File* button.



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### 4.3.3 Extract MOVA Data Set

The MOVA data set is extracted through the System – OSS Data Files configuration web page. If the operation is attempted using the standard MOVAComm *U* command then a warning is displayed.

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Show Keyboard
Paste Box
Send Text File

MOVA Data Handling sub-menu

```

Load Data from repository. . . . . L
Download (Read) Site Data . . . . . R
Display Site Data . . . . . D
Display titles and time stamps . . T
Upload Data from repository. . . . U
Remove ToD plan change data. . . . P
Enable/disable
Exit to MOVA
Select Option and

```

MOVA DataSet Export

The MOVA dataset can be downloaded using the OSS DataFiles page:  
Status and Configuration -> System -> OSS Data Files

The System – OSS Data Files configuration web page allows the current MOVA data set to be exported to either the OSS or the user's machine.

SIEMENS
Stratos Outstation: StratosOutstation4, User: Demo User Ethernet Hi-vis
Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal

System
Settings
Status
Advanced
Upgrade
OSS Data Files
Controller Monitor
UG405 UTC
Simple UTC
MOVA
Peripherals
Controller Serial Link
Heart
Support Battery
Intelligent Parking

### System - OSS Data Files

OSS Data Files

Data File	Last Uploaded to OSS	Trigger Upload to OSS	Export File
System Log	Thu 17 Sep 2015 13:36:46 BST	Trigger	Export File
Configuration Database	Thu 17 Sep 2015 13:36:46 BST	Trigger	Export File
Fault Table in XML Format	Thu 17 Sep 2015 13:36:46 BST	Trigger	Export File
Site Information Store	Thu 17 Sep 2015 13:36:46 BST	Trigger	Export File
MOVA Dataset for Stream 1, Repository Area 1	Wed 16 Dec 2015 03:39:59 GMT	Trigger	Export File
MOVA Dataset for Stream 1, Repository Area 2	Wed 16 Dec 2015 03:39:59 GMT	Trigger	Export File
MOVA Dataset for Stream 1, Repository Area 3	Wed 16 Dec 2015 03:39:59 GMT	Trigger	Export File
MOVA Dataset for Stream 1, Repository Area 4	Wed 16 Dec 2015 03:39:59 GMT	Trigger	Export File

### 4.3.4 Decode MOVA Messages

Most commonly used MOVA messages are decoded automatically. The decodes are available using the standard MOVAComm VM command. Windows are automatically opened as messages are recognised and decoded.

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