E1UC-4

Quad Stream E1 Switch/Groomer

SOFTWARE INSTALLATION AND OPERATION

Applicable Products

E1UC-4 Quad *Stream E1 Switch/Groomer/Capture/Replayer*

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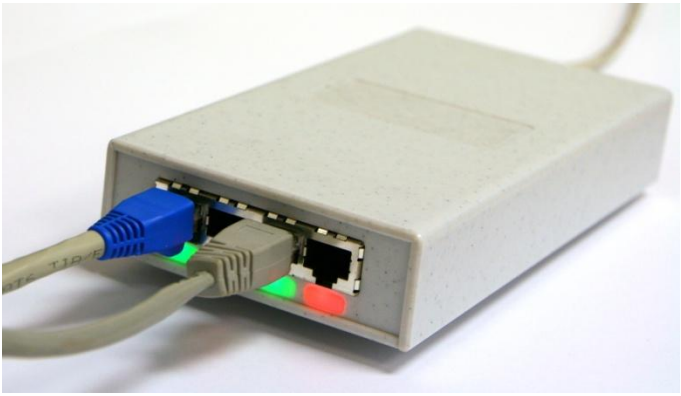
Somerdata Ltd.
1 Riverside Business Park
Bristol
BS4 4ED
UK

Sales & Customer Support

Phone: +44 (0)1179-634050
Fax: +44 (0)1173 302929
E-Mail: *sales@somerdata.com*
support@somerdata.com
Website: *www.somerdata.com*



Installation and Operation

REVISION HISTORY

Issue	Date	Notes
2	Feb 2012	Addition of Capture and Replay Sections
1	13 Oct 2011	Initial Issue

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1. INTRODUCTION

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What's in this User Guide

This User Guide covers Application Software Installation and Use for SomerData's E1UC Quad Stream Portable combination Switch/Groomer/Recorder/Replayer for E1 bitstreams.

Section 2 – APPLICATION DESCRIPTION gives an overview of the software capabilities and features.

Section 3 – APPLICATION INSTALLATION provides details and pre-requisites for nstallling the software.

Section 4 – APPLICATION USAGE provides details of the operation of the software.

Section 5 – APPLICATION: SWITCHING describes the use of the Application for switching and routing inputs to outputs .

Section 6 – APPLICATION: GROOMING describes use of the Application for Grooming timeslots.

Section 7 – APPLICATION DATA CAPTURE Application for Data Capture.

Section 8 – APPLICATION REPLAYING Application for Replaying from File.

Section 9 – APPLICATION PROGRAMMING INTERFACE describes where to get API information.

Section 10 – SUPPORT describes the procedure and contact details for obtaining customer support on this product.

Section 11 – WARRANTY your rights and obligations in support of this product.

Section 12 – NOTICES statutory documentation and certificates.

Section 13 – INDEX

User Guide Availability

Printed copies of Hardware and Software User Guides are supplied with the original products on request.

Additional printed copies, including the Programmer's Reference Guide can be supplied on request. Please contact your local supplier or SomerData for ordering details.

Electronic copies (Adobe Acrobat files) are included on the SomerData electronic delivery medium that is supplied with the original products.

The User Guide library, which also includes product data sheets, can be accessed by browsing the *Documents*\ folder for the required document.

Additional and updated copies are available through our website. or can be supplied on request. Please contact your local supplier or SomerData for ordering details.

2. APPLICATION DESCRIPTION

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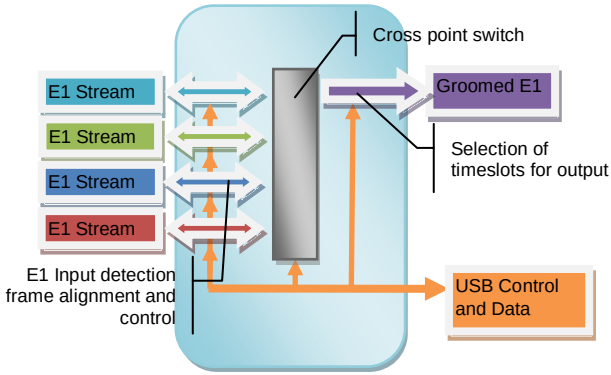
Introduction

The E1UC-4 quadstream switch/groomer is a composite device capable of fully switching 4 pairs of E1/PRI signals, selecting timeslots to a dedicated groomed output, recording data in a time indexed file, replaying data as a test or reconstituted data source.

The unit is USB powered with an alternative DC powered source for use when a pc is not available. All settings are stored in non-volatile memory and are automatically applied on power resumption.

Block diagram



E1UC Controller

The E1UC Controller Application allows control of the Switching and Grooming Functions of E1UC to set up routing and timeslot extraction.

The Application runs under Microsoft Windows XP, Vista and Windows7 operating systems

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3. APPLICATION INSTALLATION

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Installation Pre-requisites

E1UC Controller should be installed on a Microsoft Windows PC running XP, Vista or Windows 7 operating systems.

Ensure that the following Service packs are installed before commencing E1UC Controller installation

XP	Service pack 3
Vista	Service Pack 2
Windows 7	Service Pack 1

E1UC Controller uses the run-time .NET framework 4. If not installed, this will be downloaded on installation so a working internet connection will be required.

Installing

The installer is provided as a setup.exe file. You will need Administrator privileges to install the software. (Windows 7 Run as… then use your administrator's password if appropriate.

Follow the on-screen instructions. Depending on the original state of your PC it may be necessary to reboot to complete the installation.

By default, the Application is stored in Program Files/Somerdata/E1UC. Application configuration is saved in a XML file in this directory.

Switching/Routing settings are saved in a sub-directory, /Grooming Settings as XML files with identifiers you choose yourself.

Re-installation

If you are re-installing, or installing an application upgrade, ensure that you have saved your XML configuration settings. They will normally be preserved during an upgrade but as with all installations, a backup of your settings is a wise precaution.

Step-by Step

Double click ‘setup.exe’ to begin the process. A welcome screen should appear. Note that the setup program checks for pre-requisites on your pc. You may be prompted to update your Windows Installation if your PC does not have required Windows components installed.

A window (Figure 3.1) should appear.

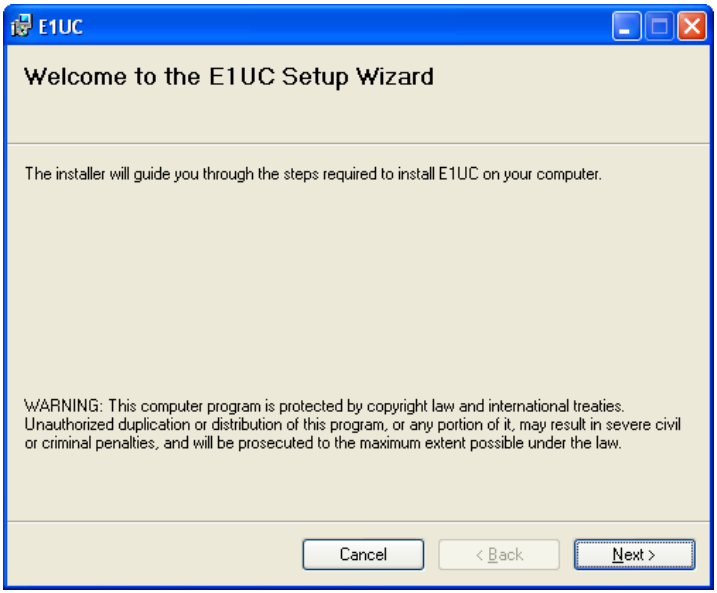
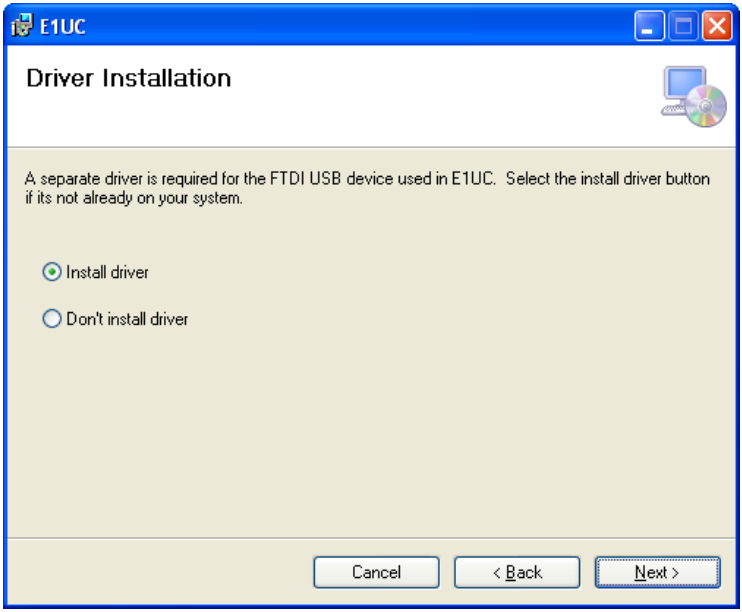


Figure 3.1- FTDI Driver installer

First, the FTDI drivers (for USB communications with the device) must be installed. If you know these are already installed you can chose to skip this step. (Figure 3.2).



Press 'Next' to authorise installation of the Driver.

Figure 3.2- Driver Installation

You will be asked to agree to the conditions of the Licence Agreement for use of this software (Figure 3.3). Please read carefully before accepting.

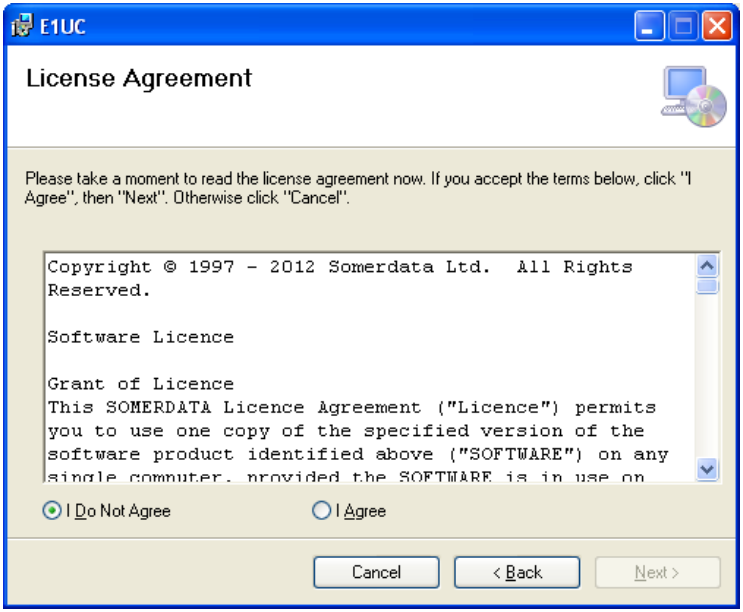


Figure 3.3- E1UC Licence Agreement

Press 'Next' then choose the root folder for the program on your computer (Figure 3.4) and decide whether you want it installed on your profile, or on every profile on this machine. Press 'Next' once ready.

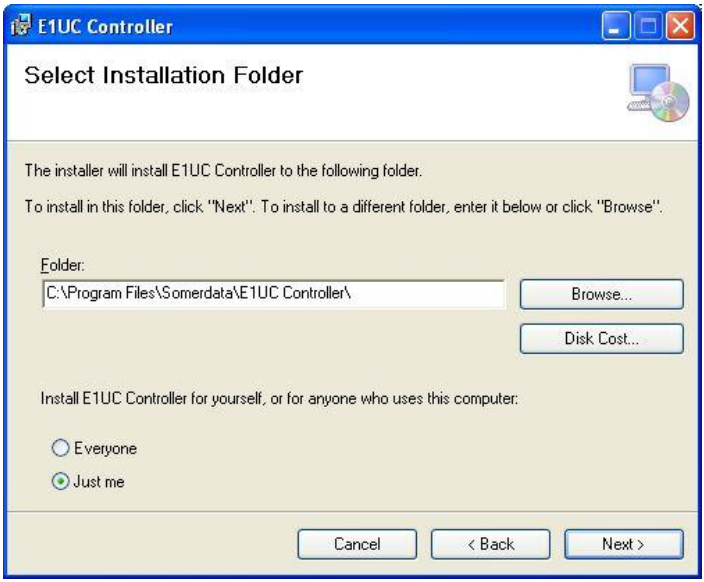
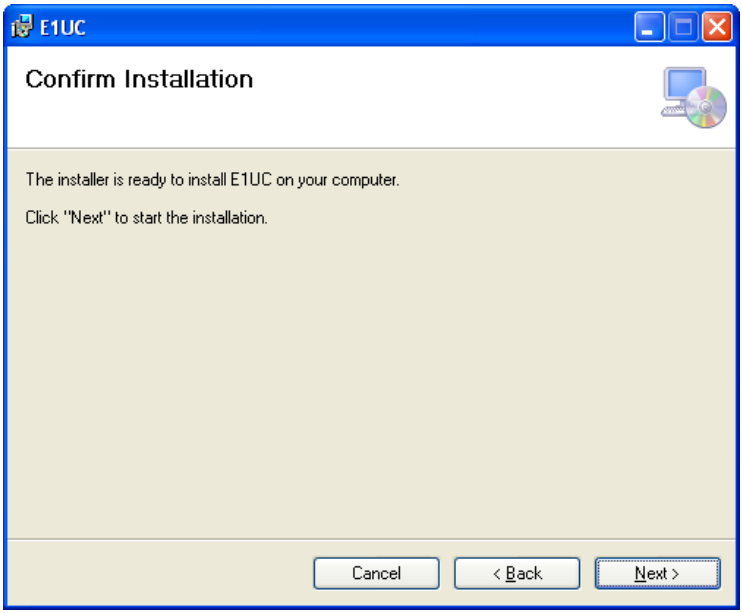


Figure 3.4- Installation Location

A Final Confirmation of installation screen will appear. Click 'Next' to continue.



You will now be asked to confirm installation of the software dongle driver. Please note that the dongle if supplied with your software, controls the functionality of E1UC controller. Without it, the application defaults to basic operation only. (Fig 3.5)

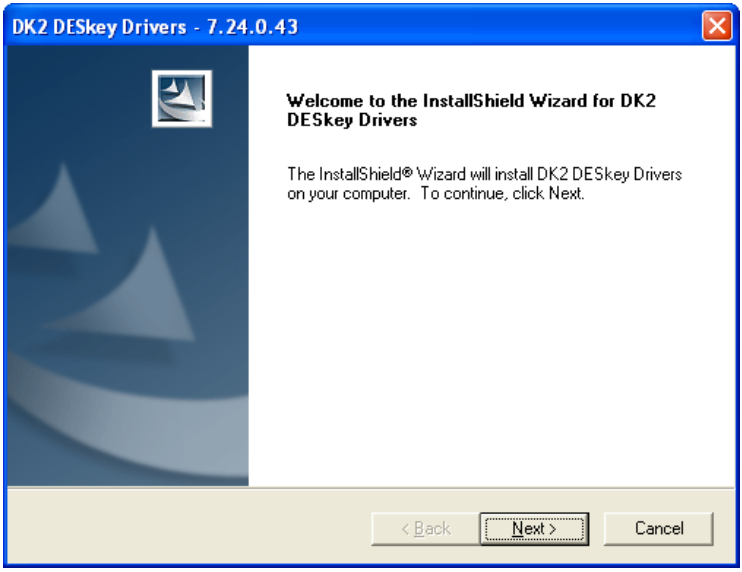
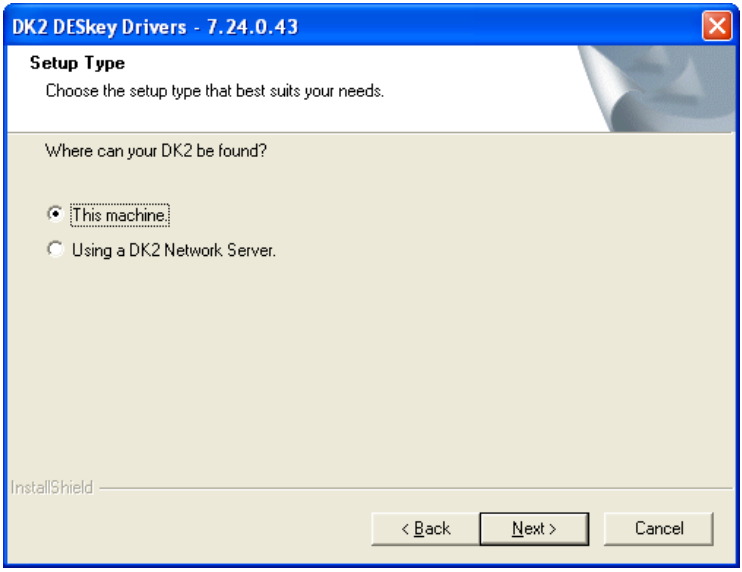


Figure 3.5- DESKey Installation

Select 'This Machine' when prompted for the location of the DEsKey dongle.



The installation process will take a few seconds.

You may be prompted with another security warning, if this is the case, press 'Run'. Once complete, a window will appear and inform you of a successful installation. Close this window, insert your dongle if appropriate, and you can begin using E1UC Controller.

4. APPLICATION USAGE

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Application Start

Upon opening the E1UC Controller, the software will search for a valid device and if found, load the main screen. If no such device is found, the software will display a message to inform the user no device has been found. If this is the case, make sure the E1UC is correctly connected using the USB cable and press 'Retry'.

Figure4.1- No device found warning

Application Main Window

Once the E1UC device has been found, the main window will be displayed. Figure 4.2 shows the features of the main window.

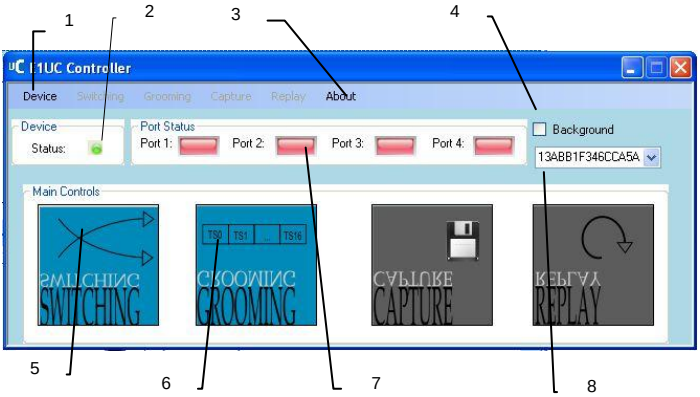

Figure 4.2- Main Application Window

Features:

1. Device Menu: Includes options to view device info and change settings, set up device preferences and restore the device to factory settings.
2. Device Status: Shows an intermitted flashing when device is connected. Click on the light to change device settings.
3. About Menu: Includes software information.
4. Background setting: Sets the window to a minimal size so that only the device status and port status lights can be seen.
5. Switching: Displays current switching settings and allows user to change them.
6. Grooming: Displays current groom settings and allows user to change them.
7. Capture: Enables the Recording option. This requires a dongle and appropriate authorisation.

8. Replay: Enables the Replaying option. This requires a dongle and appropriate authorisation.
9. Port status lights: 3 way LED lights show the status for each port (Red: No framing, no data. Yellow: Data, no framing. Green: Framing and data). Clicking on any of these lights allows user to change individual port settings.
10. Device Select: Displays each of the devices connected.

Device Information

The device information display shows device specific information such as part number, firmware version and revision and serial number.

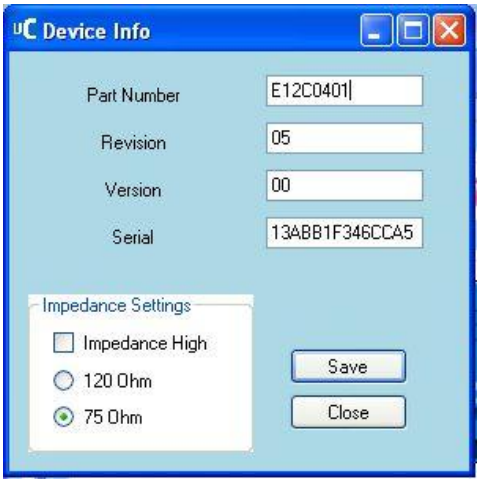

Figure 4.3- Device Information

The user can also change impedance settings for the whole device. 3 options are available:

- High impedance
- Low impedance:
  120 Ohm
  75 Ohm

Pressing 'Save' will apply the selected settings or press 'cancel' to keep the settings as before.

Preferences

The preferences menu allows users to customise port colour and names for the E1UC device.

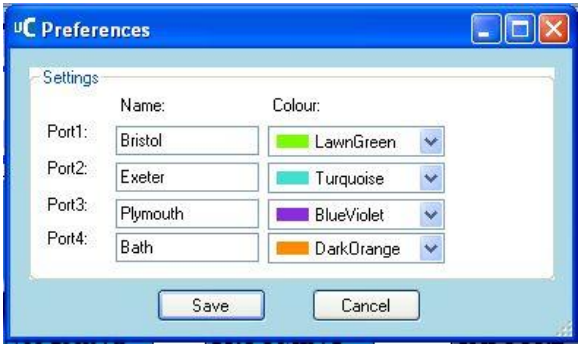

Figure 4.4- Preferences

For each port the user can define a custom name and colour which will be associated with the port for the grooming function. Figure 4.4 shows the preferences window. Press 'Save' to change to new settings or 'Cancel' to lose changes.

. 'Save' to change to new settings or 'Cancel' to lose changes.

Restore Device

Selecting 'Restore Device' (Device>Restore Device) will prompt the user to decide whether to restore the device to the factory defaults.

If 'Yes' is selected then all the customised settings for Grooming and Switching will be reverted. Also any changes made to device impedance and port settings will be set to default. The associated port names and colours will not be changed.

Application Information

By opening the software information window (About>Software Information) the user can view all the information about E1UC Controller.

Port Settings

Individual port settings can be displayed/updated by clicking the mouse on the status light of the port desired.

Figure 4.5- Port settings

For each port the output can be enabled/disabled and the framing aligned to the G.704 standard. For more information on the G.704 standard see: http://www.itu.int/rec/T-REC-G.704/e

Background

By checking the 'background' checkbox as shown on Figure 4.2, the program will revert to its background size. Only the menu items, device status and port status lights can be seen.

Figure 4.6- Background mode

To revert to normal operation, uncheck the 'background' checkbox.

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5. SWITCHING

In this Section

SWITCHING OVERVIEW ERROR! BOOKMARK NOT DEFINED.
APPLYING SETTINGS ERROR! BOOKMARK NOT DEFINED.

Switching Overview

E1UC allows users to internally route an input to any of the outputs. Each output may only have one input routed at a time but an input can be routed to multiple outputs..

Applying Settings

Clicking on the 'Switching' button, causes the window to extend to display the current switching settings.

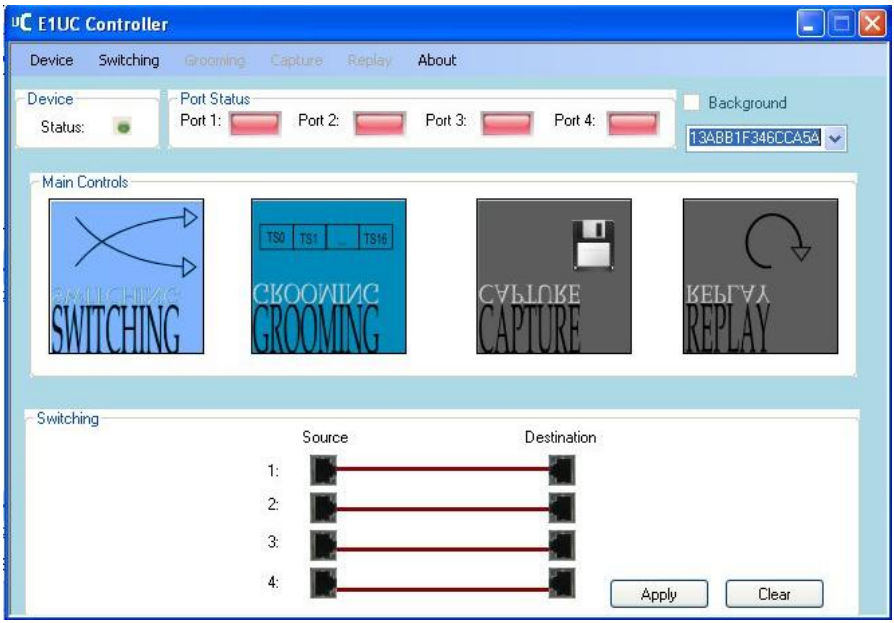

Figure 5-1- Switching display

The left side corresponds to the four input ports and the right is the output. A line connecting an output to input shows the current internal routing and if an output has no line entering it, no switching is being applied.

Figure 5- shows the switching display. The E1UC is currently setup to route each input to its corresponding output.

To change the settings, simply press and hold down the mouse button over one of the sources and drag it to the destination port as desired. The line will update after a valid operation. To remove the lines press ‘Clear’.

To update the E1UC switching settings press ‘Apply’ when necessary changes have been made. These settings will be stored in the non-volatile memory of the device until either new switch settings are written, or the device is reset.

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6. GROOMING

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Grooming Overview

The role of E1UC as a groomer is to populate the timeslots of the groomed E1 output with timeslots from the input E1 streams. The frame alignment timeslot (TS0) can only be sourced from frame alignment timeslots. Data timeslots (TS1 to TS31) can only be sourced from input data timeslots.

The groomed output takes its clock from the master input.

The groomer is set-up using software command. These commands are stored in non-volatile memory so the configuration will be restored on power up.

Grooming Main Menu

To view the current groom settings press the 'Grooming' button on the main menu. This will extend the window. **Error! eference source not found.** shows the main grooming menu.

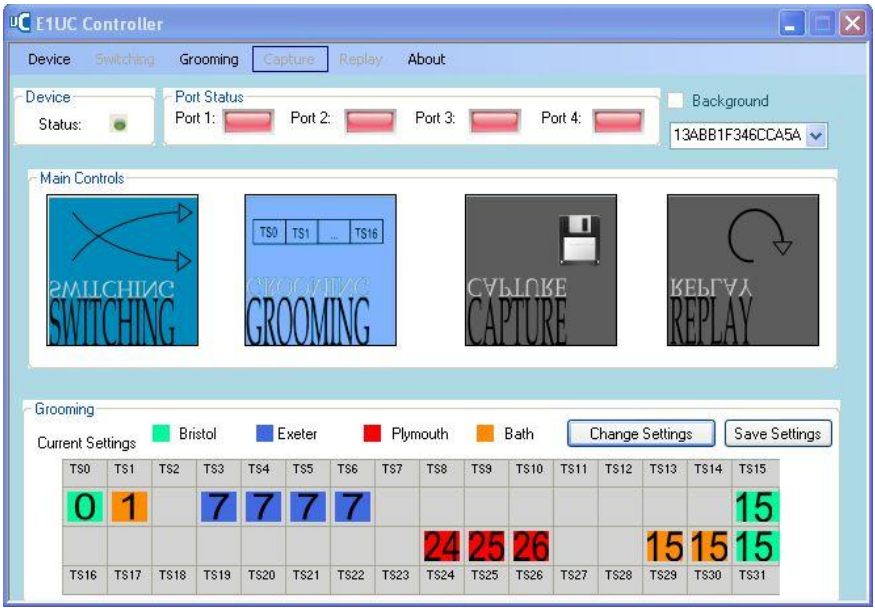

Figure 6-1 groomer functional diagram

Shown is the groomed output which is made up of 32 timeslots. Each timeslot may have either a timeslot from one of the inputs, or may be left blank. The number inside corresponds to the timeslot of the source and the colour surrounding the number matches input source from which the timeslot is grromed

Grooming Settings

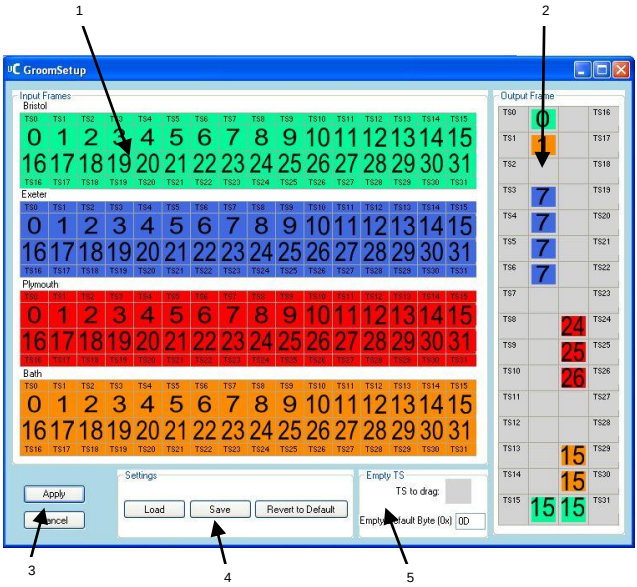

Figure 6-2 Groom settings

Pressing the 'Change settings' button whilst viewing the grooming menu will enable the user to change the current settings, load previously saved favourites or save new favourites. This will open a new window as in **Error! eference source not found.**

1. Input frames: 4 E1 frames corresponding the input streams.
2. Output frame: The groomed E1 output.
3. Apply and Cancel buttons: Accept or disregard changes made.
4. Settings: Load and save previously stored settings using an XML format. Restore to default to fill the groomed output with empty timeslots
5. Empty timeslot: Change the Hex value of an empty timeslot. Empty timeslot to drag.

Changing Settings

To change the groomed output:

1. Drag a timeslot from one of the input E1 frames or an empty timeslot to the correct timeslot in the output frame
2. Continue process until groomed frame is as desired
3. Change the default byte of the empty timeslot (this is optional and as standard is set to 0x55)
4. Press apply to accept any changes made

Saving and Loading Settings

To quickly switch settings it is possible to save and load customised outputs.

When the groomed output is as needed, press save to open the save file dialog and name the file. Files will be stored as .xml.

Pressing load will open a dialog in which users can choose files saved previously. Opening a file will automatically load the settings. To write settings to the E1UC press 'Apply'. Settings may also be saved from the main menu of the E1UC Controller.

Pressing 'Revert to Default' will clear the groomed output and fill it with empty timeslots.

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Capture Overview

E1UC allows users to capture up to 4 streams simultaneously to disk storage. Each stream is separately identified and timestamped within a file. Multiple streams are captured to one file for easy replay and analysis timeslot association..

Starting Capture

Clicking on the 'Capture' button, causes the window to extend to display the capture options.

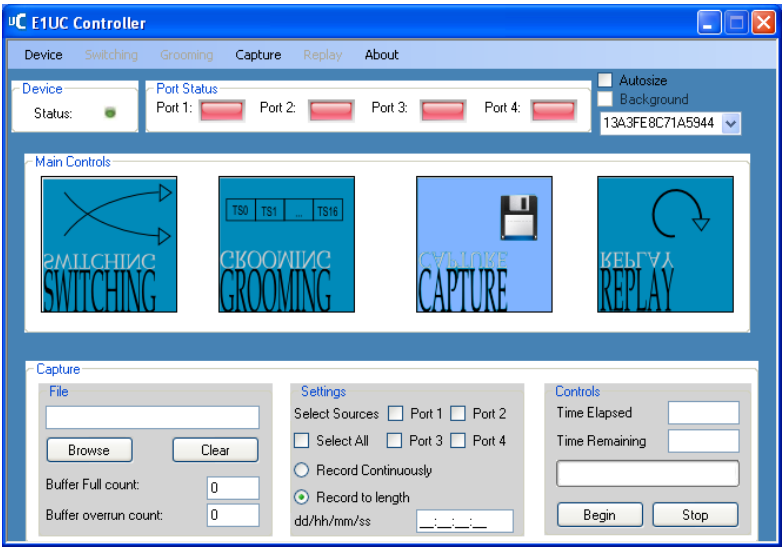

Figure 7-1- Capture display

File Selection

You can type in a valid path and filename for the captured file or browse to a directory or existing file and overwrite it. You must have user rights to access existing files or directories. E1UC capture files by default have the extension '.1UC'.

Stream Selection

Check the box of the stream(s) you wish to capture. Note that data is captured even if invalid, such as lost signal or frame error. This is by design to allow such events to be later analysed. Selecting multiple streams causes an equivalent entry to be created in the captured file. If no valid data is available the stream space in the file is substituted by a valid frame alignment sequence and FF_{16} in each of the timeslot positions.

To conserve storage space, only enable streams for which you expect valid data.

Duration Selection

The length of time you wish to record the captured data can be set in the time set box. Enter a valid number of days/hours/minutes/seconds depending on the capacity of your chosen storage location. Note that use of the selected storage medium by other applications may change the total available storage capacity.

If you choose a duration that exceeds the *current* capacity of your storage location, you will receive an error message.

You can also choose 'Max'. This wil cause the maximum capability of the storage location to be used.

Start/Stop Capture

When you have completed your selections, use the 'Begin' button to start recording.

Recording will continue until either

a) the Stop button is pressed
b) the selected duration has elapsed
c) the data storage capacity is reached.

The length of time you wish to record the captured data can be set in the time set box. Enter a valid number of days/hours/minutes/seconds depending on the capacity of your chosen.

The amount of time recorded and the amount left to go before the end are continuously updated in the Time Elapsed and Time Remaining displays.

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8. REPLAY

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Replay Overview

E1UC Controller alows pre-recorded files to be replayed, restoring the original stream data content and allowing data to be transmitted to E1/PRI interfaces.
Replay functions can be combined with those of Switching, allowing one file source to be replicated across multiple streams or a file recorded from one source to be replayed to a different output.
Files from raw binary sources can also be replayed, albeit with limited functionality compared with the E1UC format.

Starting Replay

Clicking on the 'Replay' button, causes the window to extend to display the replay options.

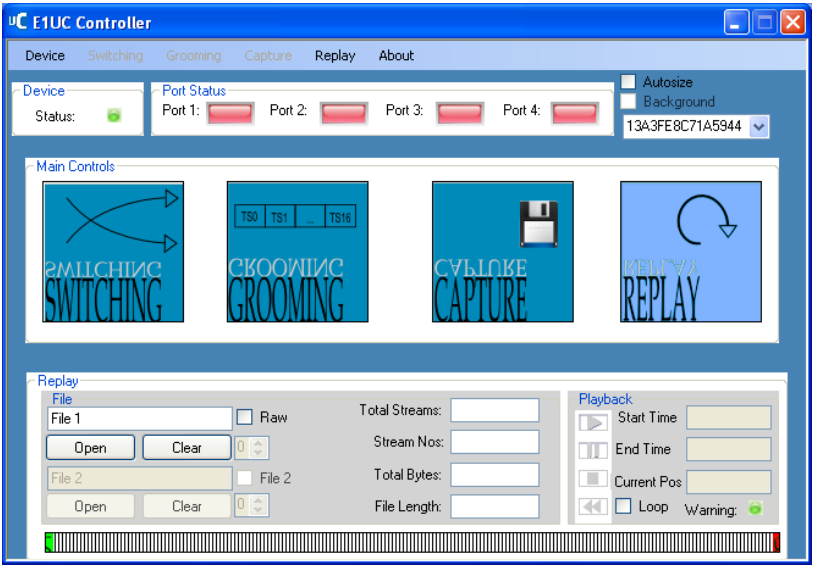


Figure 8-1- Replay display

File Selection

You can type in a valid path and filename for the file to be replayed or browse to a directory using the Open button. You must have user rights to access existing files or directories. E1UC capture files by default have the extension '.1UC'.

On opening a file, some statistics about it are displayed, including number of streams in the recording and their identities, the duration of the recording and the length in bytes of the recording.

Opening a file successfully also enables the Replay Controls.

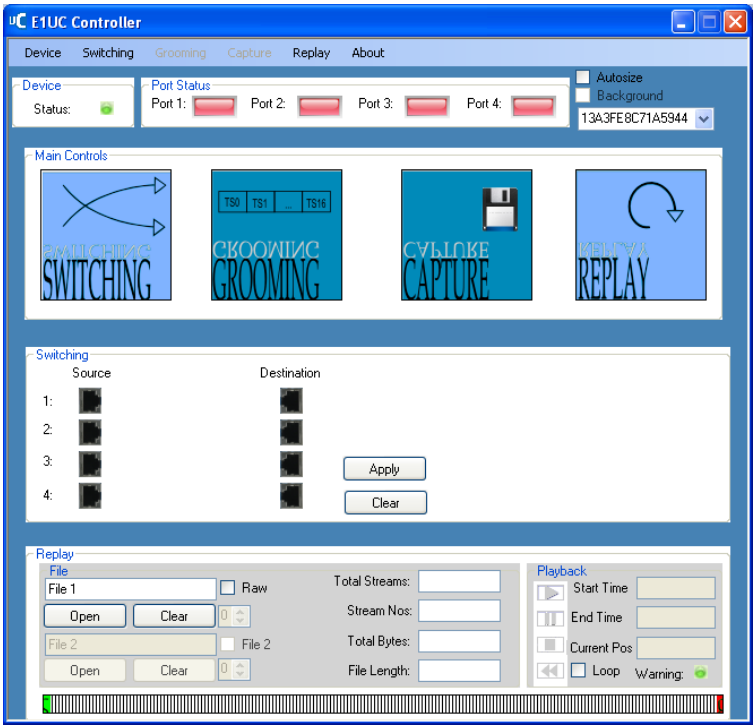
Raw File Selection

Checking the 'Raw' box allows more than one file to be selected as a source. Raw files are expected to have been recorded as a continuous bitstream with no markers. The special case of Somerdata's R2D format with a 1024 byte header is automatically accommodated when this file type is encountered.

Note: Multiple raw data files must be exactly the same length and format as each other. Certain Timestamping and Data Integrity features are not available when replaying raw files.

Switching

Clicking on the 'Switching' button, causes the window to further extend to display the current switching settings.



These may be used to determine the destination of the file sources. Note that file sources correspond to the orginal stream input source so streams may be routed in the same manner. See Switching section for details.

Start/Stop Replay

When you have completed your selections, use the ' ' button to start replaying and the button to stop replay.

Invoking the Loop checkbox causes the file to be replayed continuously.

Pause Replay

You can pause the replay using the button. Continue replaying using the ' ' button.

Status Indicators and Displays

Displays of relative file start and stop times are shown together with a current position indicator.
Note: In cases of high processor utilisation fromother applications, it is possible that delayed reading from the storage subsystem can cause data starvation to the Replayer and E1UC. A warning light (normally green) indicates when red that this condition may be happening, causing data errors in the output stream. It is necessary to restrict or stop other applications if this condition occurs. Typically these may be 'background' tasks such as Windows updates. anti-virus scans or launching a disk intensive application such as a Browser.

9. APPLICATION PROGRAMMING INTERFACE

All of E1UC's functions are available in a simple API for easy OEM integration. See the API's programmer's reference guide for more information.

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10. SUPPORT

In this Section

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What to do if you have a problem

Firstly, please ensure that you have followed the installation, connection and operation instructions in the appropriate User Guide.

Also, check the Troubleshooting section (where appropriate) to eliminate common problems.

Servicing, Maintenance and Repairs

Please contact your supplier or SomerData for all questions relating to maintenance and repairs.

Any unauthorised attempt to open, modify or otherwise repair the product will invalidate the SomerData warranty and may result in the product being left in an irreparable condition.

If you need Support

For warranty, technical and application support issues, you should initially contact your supplier to check whether your SomerData product is covered by warranty, extended warranty or maintenance contract.

At SomerData, we will make our best efforts to provide prompt and friendly support by phone, fax and e-mail.

Diagnosing a problem will require your co-operation and we expect you to provide a detailed description of the problem in the form of a detailed Fault Report.

Support Requests

When contacting SomerData for support, please provide as much information as possible about the problem or issue for which you require assistance.

We will be able to deal with your request more efficiently if you provide the following details (where available) in your Fault Report:

- Part Number or Model Number
  (for example E1UC-4)
- Serial Number (for example 2011/09/001)
- Software Version (for example 2.0)
- Details of any symptoms or error messages
- Diagnostics information (if available)
- Sequence of events/actions or other circumstances that triggered the problem
- How you are able to identify that there is a problem
- How you have been able to measure, log or otherwise display the problem
- Details of the host PC (if appropriate) including: operating system; hardware configuration; other hardware devices (e.g. additional PCI cards); other software applications (e.g. analysis or processing programs) that are running at the same time
- Sample data files (if appropriate)

When we acknowledge your support request, you will be given a *Support Tracking Number* (STN), which should be quoted in all further correspondence relating to that specific support request.

Returns

Please do not return any products to SomerData without first contacting SomerData and obtaining a Return Merchandise Authorisation (RMA) Number. Goods returned without a RMA will be subject to a handling charge and returned unopened.

This will ensure that the processing of any repair or upgrade is handled efficiently and in accordance with any agreed action.

If the SomerData product is under warranty, repairs are free-of charge. If not, there will be a repair charge, which will comprise an initial evaluation fee and quotation, followed by repair and parts (if authority is given to carry-out the repair).

Pack the item in its original packaging. If the original packaging is not available, it must be packed in such a way to avoid transit damage. Damage sustained in transit is not covered under warranty.

Returned goods should be accompanied by documentation that indicates the RMA Number along with a detailed fault report and contact details (name, organisation, phone, fax and e-mail).

Mark the RMA Number on the outside of the package.

Ship the item by insured, prepaid carrier to the above address.

Items being returned from outside the European Community must be accompanied by a Commercial Invoice. This should include a description of the goods, value for Customs Purposes and state that the goods are being temporarily returned to the UK for repair. SomerData will not accept liability for UK importation costs resulting from inadequate documentation.

SomerData Contact Information

Address:	Somerdata Limited 1 Riverside Business Park Bristol BS4 4ED England	
Phone:	UK International	01179-634050 +44 1179-634050
Fax:	UK International	01173-302929 +44 1173-302929
E-Mail:	*support@somerdata.com*	
Website:	www.somerdata.com	

End-of-Life Disposal

Your SomerData product may be returned to SomerData at the end of its life provided that the product is free from radiation or biological contaminants and that no other legislation forbids the return. The end user is responsible for all shipping costs and the Returns procedure should be followed.

Waste Electrical & Electronic Equipment (WEEE)

In the UK, Somerdata products may be recycled free of charge at any local authority recycling centre as long as the SomerData logo appears on the product and the following WEEE producer registration number is quoted: WEE/HA0074UR/PRO.

11. WARRANTY

In this Section

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Introduction

This section describes SomerData's Warranty Terms and Conditions.

Where the SomerData product has been supplied via an authorised Reseller, the Warranty and Support is between SomerData and its Reseller. Local Warranty and Support arrangements should be agreed between the Reseller and the Customer.

The following information is subject to change without notice.

Warranty: Terms and Conditions- Hardware

SomerData warrants all goods supplied by it to be free from defects in material and workmanship, under normal use, care, storage and service, for a maximum period of twelve months from the date of delivery (per Incoterms 2000) by SomerData.

This warranty is limited to the repair or replacement, as SomerData may elect and at an establishment authorised by it, of such items as shall appear to SomerData, upon inspection to have been defective in material or workmanship.

All decisions relating to the validity and processing of Warranty claims shall be at the sole discretion of SomerData.

This warranty does not apply to normal maintenance service or to normal replacement of service goods.

Any claim under this warranty shall expire unless made in writing immediately after the appearance of a claimed defect.

This warranty excludes damage from incorrect installation, unauthorised modification, negligence, misuse or abuse or any item of equipment which has been serviced or worked on by anyone other than SomerData or its authorised representative.

SomerData will repair or replace, at its option, any product purchased from SomerData which, under normal conditions of use and service, proves to be defective in material or workmanship.

No charge will be made for labour or parts with respect to defects covered by this warranty, provided that the work is done by SomerData.

This warranty does not cover expenses incurred in the removal or reinstallation of any SomerData products, whether or not proven defective

Replacement or repairs furnished under this warranty are subject to the same terms and conditions of the original warranty.

Warranty: Terms and Conditions- Software

Limited Warranty

SOMERDATA warrants that

a) the SOFTWARE will perform substantially in accordance with the accompanying written materials for a period of ninety (90) days from the date of receipt; and

b) any hardware accompanying the SOFTWARE will be free from defects in materials and workmanship under normal use and service for a period of 12 months from the date of shipment by SOMERDATA. Any implied warranties on the SOFTWARE and hardware are limited to ninety (90) days and 12 months, respectively.

Customer Remedies

SOMERDATA's entire liability and your exclusive remedy shall be, at SOMERDATA's option:

repair or replacement of the SOFTWARE or hardware that does not meet SOMERDATA's Limited Warranty and that is returned to SOMERDATA. This Limited Warranty is void if failure of the SOFTWARE or hardware has resulted from accident, abuse or misapplication. Any replacement SOFTWARE will be warranted for the remainder of the original warranty period or thirty (30) days, which ever is longer.

No Other Warranties

SOMERDATA disclaim all other warranties, either express or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the SOFTWARE, the accompanying written materials, and any accompanying hardware.

Exclusions:

SOMERDATA does not accept any liability or warranty responsibility for versions of software which are specifically identified and supplied for the purposes of demonstration, evaluation or Beta testing. Installation and use of such software will be at the user's risk.

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12. NOTICES

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General Information

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In no event will SomerData be liable for direct, indirect, special, exemplary, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages.

In the interest of continued product development, SomerData reserves the right to make improvements in this publication and the products it describes at any time, without notice or obligation.

All product names mentioned herein are used for identification purposes only, and may be the trademarks or registered trademarks of their respective companies.

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Grant of Licence

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The SOFTWARE is owned by SOMERDATA Ltd. and is protected by United Kingdom copyright laws and international treaty provisions. Therefore, you must treat the SOFTWARE like any other copyrighted material (e.g., a book or musical recording) except that you may either

a) make one copy of the SOFTWARE solely for backup or archival purposes, or

b) transfer the SOFTWARE to a single hard disk provided you keep the original solely for backup or archival purposes. You may not copy the written materials accompanying the SOFTWARE.

Other Restrictions

This SOMERDATA Licence Agreement is your proof of licence to exercise the rights granted herein and must be retained by you. You may not rent or lease the SOFTWARE, but you may transfer your rights under this SOMERDATA Licence Agreement on a permanent basis provided you transfer this Licence Agreement, the SOFTWARE and all accompanying written materials, retain no copies, and the recipient agrees to the terms of this Agreement. You may not reverse engineer, decompile, or disassemble the SOFTWARE. If the SOFTWARE is an update, any transfer must include the update and all prior versions.

Somerdata and the Environment

SomerData is committed to design and introduce products that conform to applicable environmental legislation and standards.

One of our missions is to integrate environmental stewardship into the business of providing quality products, services, and customer support at the best value.

In order to achieve this, SomerData has established a strategic team to focus on the importance of meeting our environmental obligations in the design, manufacture and support of our products.

We have developed a broad appreciation of the impact of these directives on our entire business model, from technical processes for materials, to finished goods manufacturing.

Current Compliance Activities

The Company's current environmental compliance commitment has been structured to meet the following European Union directives:

- Restriction of use of Hazardous Substances or RoHS Compliance (EU Directive 2002/95/EC)
- Waste Electrical & Electronic Equipment or WEEE Compliance (EU Directive 2002/96/EC)

Our goal is to meet or exceed compliance obligations of these EU directives.

Restriction of use of Hazardous Substances (RoHS)

Somerdata has also established a RoHS qualification process to help ensure that products meet stringent reliability and quality requirements, as well as regulatory compliance requirements.

The maximum allowable hazardous substance at a homogeneous material level under the EU RoHS Directive is shown in the following table.

From 1st July 2006 all SomerData manufactured products used lead-free soldering

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