TELEDYNE TSS
Everywhereyoulook™

SDC10

Topside processing computer for HydroPACT systems

User Manual

B933640 - SDC10

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Revision History

Issue No.	Date	Details
1.3	January 2019	Service/support details and legal entity updated
1.2	November 2018	Scope of supply added
1.1	September 2018	Tables in section 2.3.3 updated with d.c. pin connections
1.0	November 2017	First Issue

1 Introduction

The Surface Display Computer (SDC) is a topside user interface for Teledyne TSS's range of subsea cable and pipeline detection systems. It is a touch screen panel PC that can be operated from its portable transit case or mounted in a 19" rack, and provides a selection of standard and legacy interfaces for communicating with the subsea installation, as well as coming pre-installed with Teledyne TSS's proprietary DeepView for Windows software.

1.1 Conventions used

This manual uses the following conventions that signal important Warnings, Cautions and Notes:

WARNING

A **Warning** indicates the risk of death or serious injury to personnel.

CAUTION

A **Caution** indicates the risk of injury to personnel, or damage to equipment, or loss of data.

NOTE

A **Note** emphasises important information about the use of the product.

Throughout this Manual, unless stated otherwise, all measurements conform to the SI standard of units.

1.2 Warranty

Please refer to your sales agreement with Teledyne Limited for information about the terms and duration of the warranty for this product.

NOTE

Retain the original packaging to use when shipping this product between installation sites or when returning it to Teledyne Limited or an authorised distributor for repair. The use of improper packaging for shipping any part of this equipment may invalidate the warranty. For information about the proper return location and procedure, contact Teledyne Limited or an authorised distributor.

1.3 Product Support

For questions about installing your product or any other product operating enquiry contact our technical support. See our website at **www.teledynemarine.com/tss** for more information.

2 Installation

2.1 Unpacking and Inspection

Upon receipt of the SDC, check all items against the shipping documents and inspect them for damage that might have occurred during transportation.

Notify Teledyne Limited immediately if there are parts or sub-assemblies missing from your shipment. If you see any damage to the system, file a claim with the insurers and inform Teledyne Limited. The title page of this manual lists the contact details for Teledyne Limited. Teledyne Limited also operates a 24-hour emergency telephone support line managed by trained and experienced technicians.

To avoid loss or damage to any components of the system, store all sub-assemblies safely in their transit cases until you need to install them.

2.1.1 Scope of supply

Case: SDC10

- ❒ 1 x SDC10 industrial panel PC
- ❒ 1 x Mains lead (UK)
- ❒ 1 x Mains lead (EU)
- ❒ 1 x Mains lead (US)
- ❒ 1 x Coax phono lead
- ❒ 1 x Current loop data cable
- ❒ 1 x Allen key 2.5mm
- ❒ 1 x Allen key 3mm
- ❒ 1 x USB drive (DeepView)
- ❒ 1 x USB drive (Recovery)

2.2 Physical Installation

⚠ WARNING

You must take precautions to secure the SDC when you store and operate this unit in its transit case. Protect personnel from the hazard of falling equipment and protect the unit from damage when the survey vessel moves due to the action of waves. Install cables away from walkways and secure them so they do not present a hazard to personnel.

⚠ CAUTION

To avoid potential damage to the SDC, make certain it has sufficient ventilation to dissipate the heat that it generates during normal operation. You might damage the SDC if you allow it to overheat. To operate the SDC inside its transit case,

release and remove the lid of the transit case to allow effective ventilation and heat dissipation.

If you mount the SDC in a 19” instrument rack you must allow a minimum 30mm clearance between the top of the SDC and any other equipment mounted directly above it in the rack. Also, allow a minimum 100mm space between the SDC rear panel and the rear of the instrument rack to allow for connectors and cable routing.

NOTE

Throughout this manual any references to the SDC refer to the SDC10. Earlier versions may not support the same feature set.

Although the SDC uses solid state electronics, the hard-disk drive and parts of the display panel are susceptible to damage through shock or sustained vibration. You must therefore exercise some care when you select a suitable location for this unit:

- Install the SDC where you have easy access to the controls. Choose a position for the SDC that allows you to see the screen easily while you operate the ROV.
- If you do not mount the SDC in an instrument rack, use the original SDC transit case to provide shock protection for the unit. Secure the transit case so that it cannot slide or fall with movements of the vessel.
- Make certain there is sufficient ventilation space above the SDC to remove the heat that it generates during normal operation. If necessary, use an electric fan to provide additional ventilation.
- Do not subject the SDC to extremes of temperature or humidity, or to severe vibration or electrical noise. Never allow the SDC to become wet.

2.2.1 Operation from transit case

1. Open the four latches located on the front and rear of the transit case.
2. Remove the transit case lid and set aside.
3. Secure the transit case base so that it cannot slide or fall with movements of the vessel.

2.2.2 Installation in a 19” rack

1. Open the four latches located on the front and rear of the transit case.
2. Remove the transit case lid and set aside.
3. Remove the 8 x fixing screws securing the SDC to the angled brackets fixed to the transit case base.
4. Fit SDC into rack and secure with fixing screws.

NOTE

If you intend to change the analogue output configuration make the necessary changes to the SDC *before* you install it into the instrument rack. Refer to section 2.3.7 for instructions to change the analogue output settings.

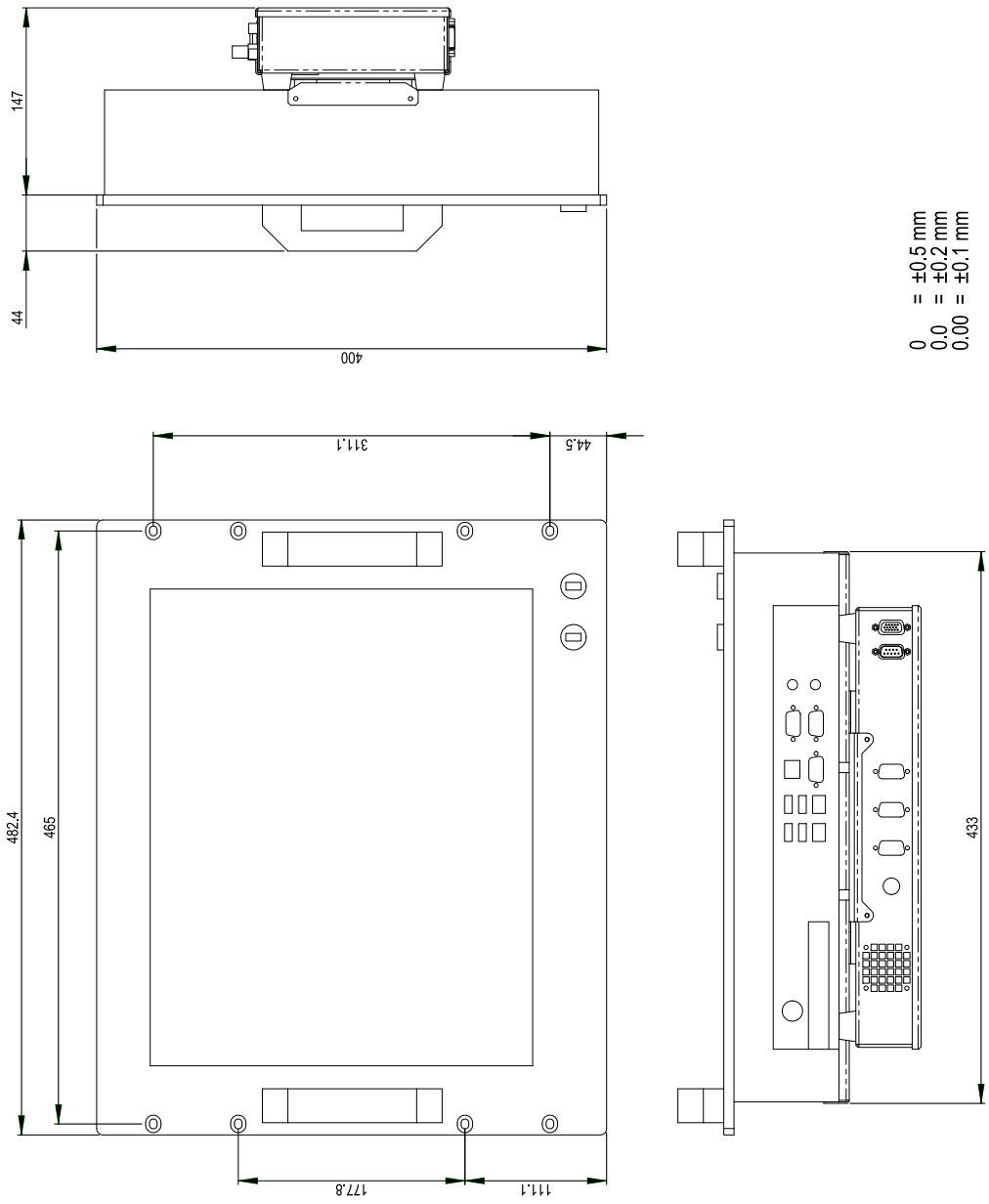

Figure 2-1: SDC dimensions

2.3 Electrical Installation

All connections to the SDC are through the VESA-mounted comms module attached to the rear of the Panel PC. They are located on the top face of the comms module.

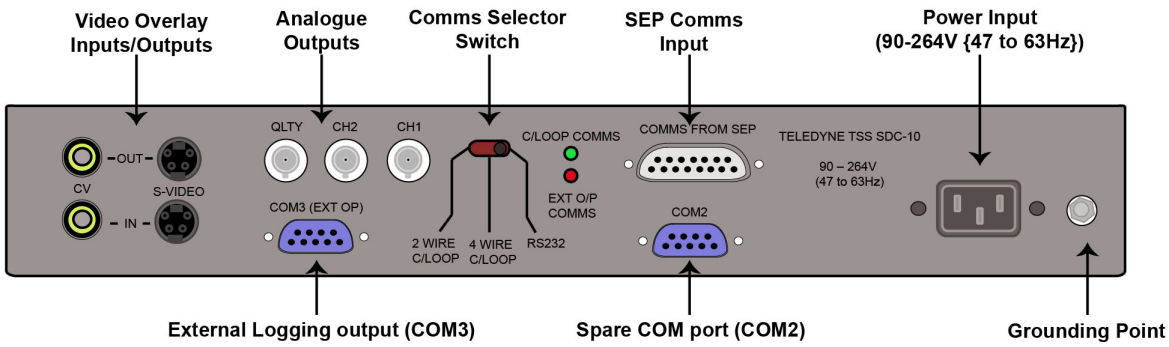

Figure 2-2: SDC rear comms module with key to ports

2.3.1 Power Connection

Connect AC electrical power to the SDC through the 3-core electrical supply cable and standard 3-pin IEC electrical inlet. The SDC has an auto ranging power supply unit that configures itself automatically to use an electrical supply in its acceptable range 85 to 264V AC (47 to 63Hz).

2.3.2 Communication ports

The SDC has four serial communication ports that it uses to communicate with external and peripheral equipment. The standard assignations for these ports are as follows. You may change these if necessary.

- COM1 is used to pass serial communications between the SEP and the SDC.
- COM2 on the rear connector panel of the SDC is used to accept serial data from any compatible altimeter that is not connected directly to the SEP.
- COM3 (labelled 'LOG O/P (COM3)' on the rear connector panel of the SDC) is used to connect the SDC to a separate user-supplied data logger. You should use a data logger to record the survey measurements acquired by the SDC10.
- COM5 is used by the SDC to communicate with the video overlay card. This port is not available on the Rear Comms Enclosure but is internally connected to the video overlay interface card.

DeepView for Windows allows you to set the communication parameters for each of the serial ports. Choose settings that are appropriate for the connected equipment – refer to the technical manuals of the attached equipment if necessary. Note that the standard communication parameters for COM1, the communication link between the SDC and the SEP are set to operate at 9600 baud using eight data bits, two stop bits and no parity.

NOTE

The update rate for your System will reduce if you set a lower baud rate for the SDC to SEP communication link. You should consider reducing the baud rate for this link only if you experience persistent communication problems caused by an umbilical cable of poor quality. Ideally, in these circumstances you should swap to using an umbilical cable of good quality instead.

2.3.3 Communication link to Subsea Electronics Pod (SEP)

Use the SDC port – 'COMMS FROM SEP'

The standard communication link between the SDC and the subsea installation uses RS232. This is a 3-wire link suitable only for communication over distances up to 15 metres. You may use this method to transmit data to the survey control room using the ROV multiplexer and an existing data link to the survey control room.

There are two further methods that you may use to establish successful communication between the SDC and the subsea installation.

NOTE

Not all Teledyne TSS detection products support current-loop communication. Check the user manual for the system to confirm. If you intend to use current-loop communication you will need to reconfigure the SDC and the SEP to use this communication method. See section 2.3.7 for instructions.

- 2-wire 20mA digital current-loop

  If the umbilical cable is of good quality, experience has shown that you may use this communication method successfully through transmission distances up to 1000 metres.

  2-wire 20mA digital current-loop is carried on a twisted pair within the ROV umbilical. To avoid possible communication conflicts, the SDC acts as the 'Master' and the SEP acts as the 'Slave' in this link.

  To ensure reliable communications through the umbilical, select a twisted pair that has the following characteristics:

Table 2-1: Ideal twisted pair characteristics for successful communication

Twisted pair characteristic	Ideal value
Overall resistance	Less than 200Ω
Core size	0.5 to 1.0mm^2
Inter-conductor capacitance	Less than 100pF per metre

- 4-wire 20mA digital current-loop

  You should select this method when the umbilical link to the ROV is longer than 1000 metres, or where you cannot establish reliable communication using a 2-wire current-loop.

  After you have made the necessary changes in the SEP and the SDC, perform a simple communication check.

The communication parameters used between the SDC and the SEP are 9600 baud with 8 data bits, 2 stop bits and no parity. These cannot be changed by the user.

NOTE

These communication settings are valid even when you use 2-wire or 4-wire current-loop communications. This is because the SDC converts between current-loop and RS232 communications through a special converter card. All communication between the SDC and the subsea installation passes through the relevant SDC serial port.

Communication lines between the SDC and the subsea components are opto-isolated at both ends.

The following tables show the connections that you must make between the SEP and the SDC for each of the three communication methods.

Table 2-2: Power and Communications cable - 2-wire current loop connections

SEP Power/ Comms (a.c.) Pin number	SEP Power/ Comms (d.c.) Pin number	Function		SDC 'COMMS FROM SEP' (15 way) pin connection
4 5	7 8	CL- CL+	⇔ ROV umbilical	3 4

Table 2-3: Power and Communications cable - 4-wire current loop connections

SEP Power/ Comms (a.c.) Pin number	SEP Power/ Comms (d.c.) Pin number	Function		SDC 'COMMS FROM SEP' (15-way) Pin connection
4 5	7 8	CL+ Input CL- Input	⇔ ROV umbilical (Tx in SDC)	3 4
6 7	9 10	CL+ Output CL- Output	(Tx in SEP)	5 6

Table 2-4: Power and Communications cable - RS232 connections

SEP Power/ Comms (a.c.) Pin number	SEP Power/ Comms (d.c.) Pin number	Function		SDC 'COMMS FROM SEP' (15-way) Pin connection*
4 5	7 8	Tx output from SEP Rx input to SEP	⇔ Data cable	3 4
6	9	Common		5
*You may connect RS232 communications directly to the 9-way D-type serial communication port COM1 on the SDC.				

To use current-loop communications you must reserve either one or two conductor pairs in the ROV umbilical for the exclusive use of the subsea installation. The system includes a cable that you should use to connect the 'COMMS FROM SEP' port on the SDC to the twisted pairs in the ROV umbilical. The cable has a 15-way D-type connector for connection to the SDC 'COMMS FROM SEP' port, and open tails for connection to the umbilical at a junction box.

When you connect the communication cable to the SDC, it is internally linked to COM1 of the Panel PC. Hence, if you use RS232 communications through an existing multiplexed link, you will still need to

connect the cable from your de-multiplexer to the SDC ‘COMMS FROM SEP’ at the 15-way D-type connector.

2.3.4 Subsea Altimeter

Use the SDC port ‘COM2’

Third party altimeters must be connected directly to the SDC rather than the SEP. To send their signals through the umbilical, you must add them to the ROV multiplex unit and extract them at the surface. You must also provide a separate power supply for the altimeter.

Make the following provisions if you intend to use one of the compatible alternative altimeters with the SDC:

- Connect the altimeter to an available serial port. This will normally be the ‘COM2’ port. Note that, because the altimeters use RS232 communications, they cannot transmit their signals farther than approximately 15 metres. Therefore, you must add the altimeter signals to the ROV multiplexer and then extract them at the surface. You must then convert the signals to RS232 for application to the SDC.
- Provide a separate power supply to drive the altimeter.

Refer to the manual supplied by the altimeter manufacturer for relevant connection details.

Connect the RS232 altimeter signals to the SDC through the 9-way D-type male serial communication port labelled ‘COM2’ on the rear comms module of the SDC. The pin designations for the 9-way D-type ports are as follows:

Table 2-5: RS232 connections for the altimeter (9-way D-type female cable)

Altimeter signal	Pin Number	SDC Altimeter pin connections
RS232 data from altimeter	2	Receive
RS232 Comms to altimeter	3	Transmit. *Necessary for use only with the OSEL Bathymetric System, where communications must be bi-directional.*
RS232 common	5	Ground

2.3.5 Interface to Data Logger

Use the SDC port ‘COM3 (EXT O/P)’

During normal survey operations, the subsea hardware acquires data at a rate of up to 1MB per hour. You should arrange to record the official survey log on a suitable data logger.

The system can also create a logged record internally on the SDC hard disk. Data stored using the internal logging facility does not possess the same format as that transmitted to the external data logger and should not be used as the primary survey log. Internal logging allows sections of the survey to be recorded and replayed subsequently using the graphical display facilities of the SDC. External logging files cannot be replayed through the SDC in this way.

Make a connection between the SDC and an external data logger using the 9-way D-type ‘COM3 (EXT O/P)’ port on the Panel PC rear comms module. The pin designations for this port are as follows:

Table 2-6: RS232 connection to SDC ‘COM3 (EXT O/P)

Signal to Data Logger	SDC ‘LOG O/P’ (COM3) Pin connections
RS232 input to data logger	3 (transmit)
RS232 common	5 (ground)

2.3.6 Interface to Video

Use the SDC ports ‘CV IN’ and ‘CV OUT’ or ‘S-VIDEO IN’ and ‘S-VIDEO OUT’

1. Video input – Use appropriate input port for your format (COLOUR CV IN or S-VIDEO IN) These are clearly marked on the SDC comms module. The SDC accepts video input in PAL or NTSC format from a camera mounted on the ROV. Apply the video signal to the SDC through the appropriate video input port. CV cables (dual phono to phono) and a pair of BNC to phono adapters are supplied to assist video connection with the SDC10.

NOTE

You cannot display the video channel on the SDC screen.

The SDC mixes video images from the subsea camera with graphical information generated by the SEP. You may view the composite image through the appropriate video output port.

2. Video output – Use appropriate output port for your format (COLOUR CV OUT or S-VIDEO OUT). The format of the SDC video output signal will match that of the input video signal. That is if your input is PAL, then the output will be PAL. Similarly if your input is NTSC then the output will be NTSC. Further the video output will reflect the specific connections used i.e if the video input is monochrome CV, the output will be monochrome CV and will be provided via the ‘MONO CV O/P’ port (similarly colour CV input will provide via the ‘COLOUR CV O/P’, and S-Video output will be provided via the ‘S-VIDEO O/P’).

You may connect this signal to a standard video monitor using 75Ω screened cable. The output can drive a single monitor or multiple monitors if you add a suitable video drive amplifier.

2.3.7 Interface to analogue outputs

2.3.7.1 Analogue output overview

The analogue output operates directly from the DeepView for Windows external output. The external output (COM3) is hard-wired to the analogue PCB input via a bespoke cable loom. This cable should not be removed or modified without contacting Teledyne Limited. If the external output is disabled via DeepView, the analogue output will not provide any outputs.

Three analogue outputs are provided at the BNC connectors located on the external comms enclosure. Each output varies in amplitude and polarity with the lateral offset of the target. The CH1, CH2 and Quality BNC connectors represent unqualified data, qualified data and quality flag where the qualified data, (CH2), is gated by the quality flag.

2.3.7.2 Analogue output DIP switch settings

The analogue output is configurable via DIP switches located on the underside of the comms enclosure facing the rear of the SDC. These switches can only be accessed by removing the rear comms enclosure. It is recommended this task is carried-out before the SDC is installed.

The following steps outline how to correctly remove the comms enclosure:

NOTE

The external comms enclosure has connections from the panel PC routed through the underside of the enclosure. Take care removing the enclosure from the panel PC mounts ensuring these connections are not damaged.

1. Remove the transit case lid using the 4 x fixings provided.
2. Remove the 8 x fixings from the SDC attaching it to the angled brackets secured to the transit case base.
3. Carefully remove the SDC from the angled brackets.
4. Remove the 4 x fixings attaching the rear enclosure to the panel PC.

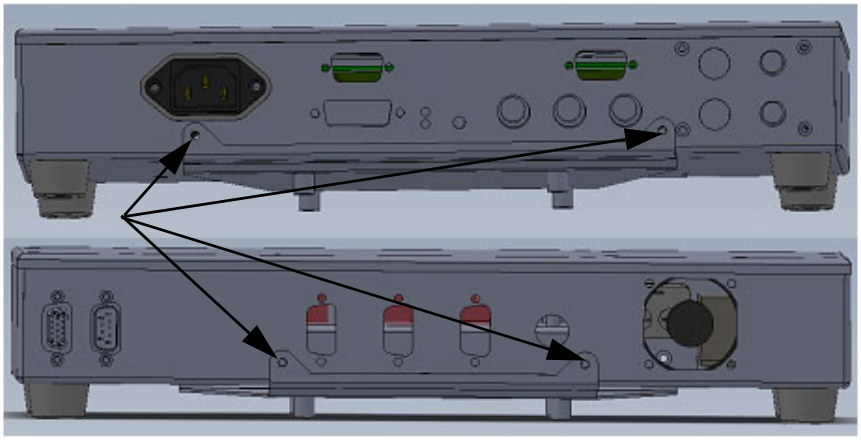

Figure 2-3: Removing the rear enclosure fixings

5. Carefully remove the comms enclosure from the fixing bracket. Ensure the cables connected to the underside of the enclosure are not damaged.
6. Table 2.7 outlines the function of each the DIP switches. Configure the switches to meet installation requirements.

Table 2.7: Analogue output DIP switch settings

Switch	Function	State	Output
SW1	CH1 gain	OFF	CH1 2V/m
		ON	CH1 1V/m

Table 2.7: Analogue output DIP switch settings

Switch	Function	State	Output
SW2	CH2 gain	OFF	CH2 2V/m
		ON	CH2 1V/m
SW3	Quality (QLTY)	OFF	12V
		ON	5V
SW4	CH1 Polarity	OFF	Reverse polarity
		ON	Normal polarity
SW1	CH2 Polarity	OFF	Reverse polarity
		ON	Normal polarity
SW2	Input Baud Rate	OFF	9600
		ON	4800

7. Position the enclosure back onto the bracket and replace the 4 x fixing screws.
8. If operating the SDC from the transit case, fit the 8 x fixings attaching the SDC to the angled bracket secured to the transit case base.
9. If operating the SDC from ta 19” rack, return the system to the rack and secure it with the 8 x fixings.
10. Verify the SDC is operating as required.

3 Operating Software

NOTE

The DeepView for Windows software application is used with all Teledyne TSS detection systems.

The SDC has DeepView for Windows pre-installed and configured to start automatically when it is powered on. The SDC is not provided with a keyboard or mouse as it has a touch-screen display. A short-cut to a software keyboard is provided that can be used to select commands and options from within DeepView for Windows. Although you may access all the commands using the SDC's touch-screen, you may prefer to operate the software using either a mouse or keyboard. These can be connected to the SDC using the USB ports located on the front panel.

3.1 Initialisation

NOTE

It is usually better to power-on the subsea installation before you power-on the SDC. This ensures data is available to the SDC and will allow any configuration settings to be initialised.

NOTE

The SDC has a power-switch located on the underside of the panel PC. This switch is set to ON by default and should not need to be accessed by the user during normal operation. However, it is important to be aware of this switch if the SDC is removed from the transit case. When installed at the required location, always ensure this switch is set to ON. If this switch is set to OFF and power is applied, the rear comms enclosure will receive power but the panel PC will not power-up. This can be identified by the rear comms enclosure fan being activated but the panel PC remaining inactive.

After you apply power to the SDC, it will launch Microsoft Windows and DeepView for Windows automatically after it has completed the initialisation sequence.

Provided the software launches successfully, you will see the DeepView for Windows opening splash screen. DeepView for Windows will then search for an initialisation file on the SDC that includes details of the previous operating configuration. If the software finds the initialisation file and the SDC receives data packets from the SEP that are compatible with that file, then it will begin to operate using the same configuration. Otherwise, DeepView for Windows will launch the System Configuration Wizard that allows you to define the operating parameters used by the System.

3.2 System Recovery Procedure

If the SDC fails to operate correctly try the following methods to resolve the problem.

- Close the DeepView for Windows software application and restart it.

- If closing and restarting DeepView for Windows does not resolve the problem, close down the SDC and restart it by disconnecting and then reconnecting power, or by pressing the power reset On-Off button.
- If closing and restarting the SDC does not resolve the problem, reinstall the DeepView for Windows software (see section 3.3).
- If reinstalling DeepView for Windows does not resolve the problem, you may consider using the System Recovery Procedure to perform a factory reinstall of the Microsoft Windows 7 operating system, followed by reinstalling the DeepView for Windows software.

CAUTION

- The System Recovery Procedure deletes all existing software from the SDC and reinstalls the Windows 7 operating system only. You will need to reinstall DeepView for Windows and any other software you have installed on the SDC.
- The System Recovery Procedure deletes all existing data files, such as log files, from the SDC, and these files cannot be recovered. Back up your data files to external media before you carry out this procedure.

3.2.1 Required equipment

To perform the System Recovery Procedure you need:

- The SDC recovery USB drive.
- A USB Keyboard (not supplied).

3.2.2 Recovery procedure steps

Make sure you have backed up all your data files to external media before you carry out this procedure.

1. Shut down the SDC.
2. Remove the USB port dust cover caps on the front of the panel PC and attach the SDC10 recovery USB drive and a USB keyboard.
3. Hold down the F11 key on the keyboard and switch on the SDC. If the unit does not restart automatically press the Power On-Off button located on the underside of the base of the panel PC (Figure 3-4).

NOTE

The Power On-Off button is not easily accessible when the panel PC is being operated from its transit case.

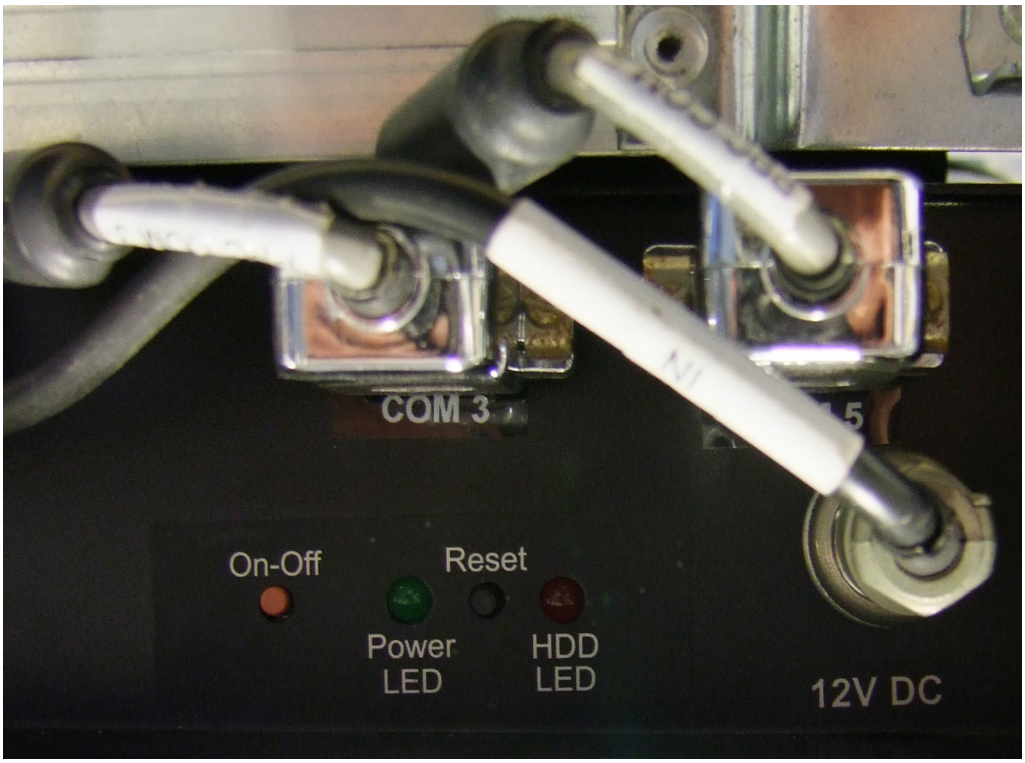

Figure 3-4: Power On-Off button

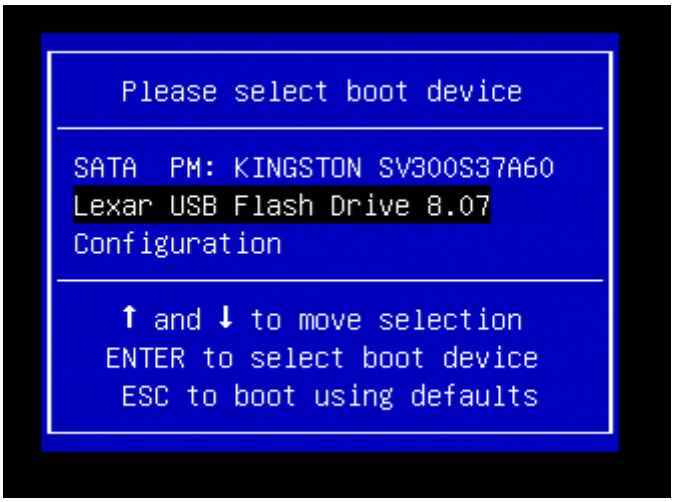

Figure 3-5: Boot Menu

4. Use the arrow keys to select the USB drive. The name of the drive may be different from the one shown in Figure 3-5. Press the Enter key on your keyboard to continue. You will see a blank screen.

5. Immediately press the Enter key for a second time.

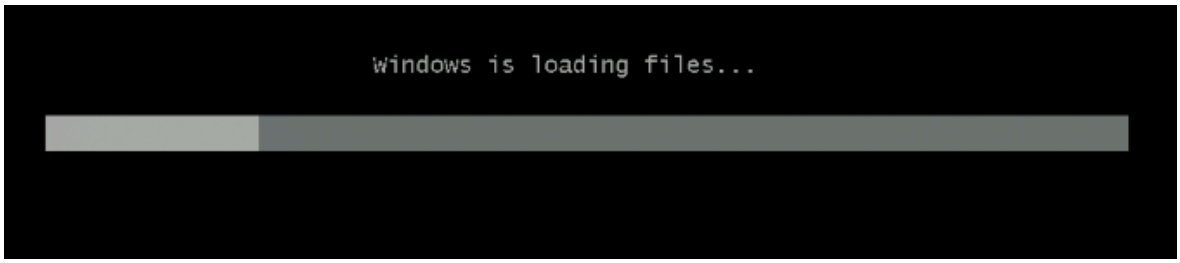

Figure 3-6: Windows Setup in progress

6. The Windows Setup programme displays a progress bar (Figure 3-6).

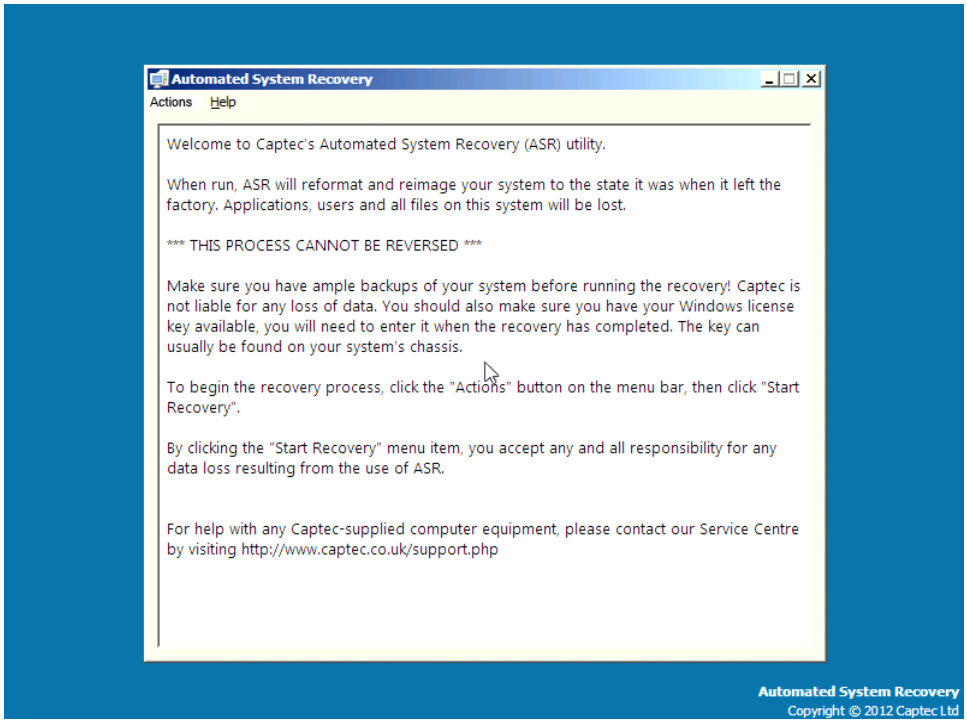

Figure 3-7: Automated recovery screen

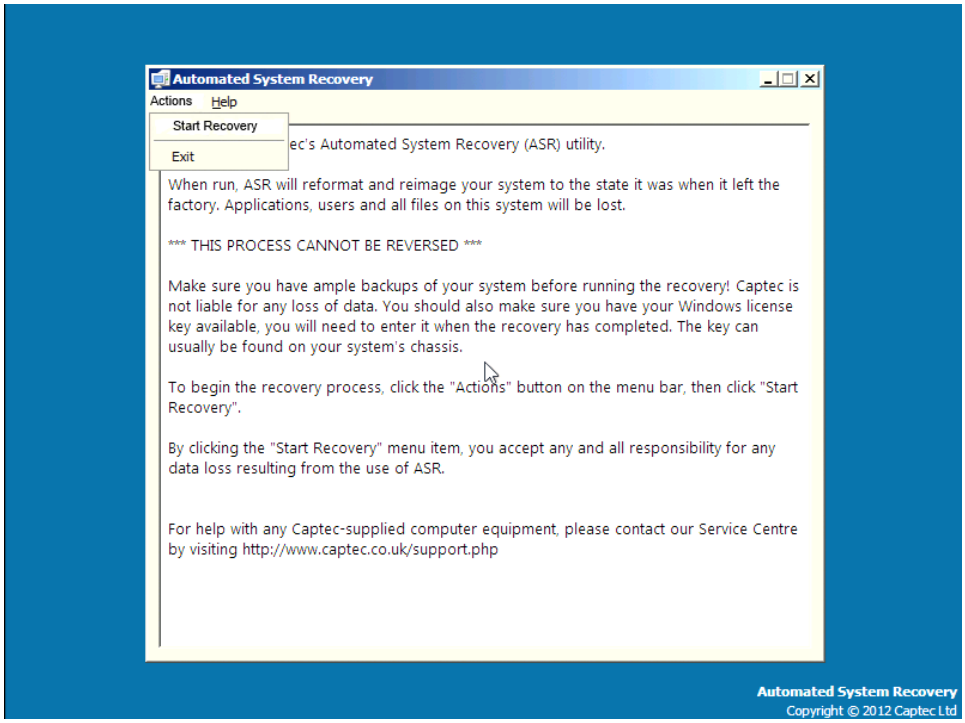

Figure 3-8: Select Start Recovery command

7. After a few moments the Automated System Recovery screen appears. Use ALT +A on your keyboard to select Actions from the top left-hand corner (Figure 3-7). Use the arrow keys on your keyboard to select Start Recovery if it is not already highlighted and press Enter (Figure 3-8).

NOTE

If you have any difficulties with the system recovery procedure please do not use the contact details on the Automated System Recovery screen and instead contact Teledyne Limited.

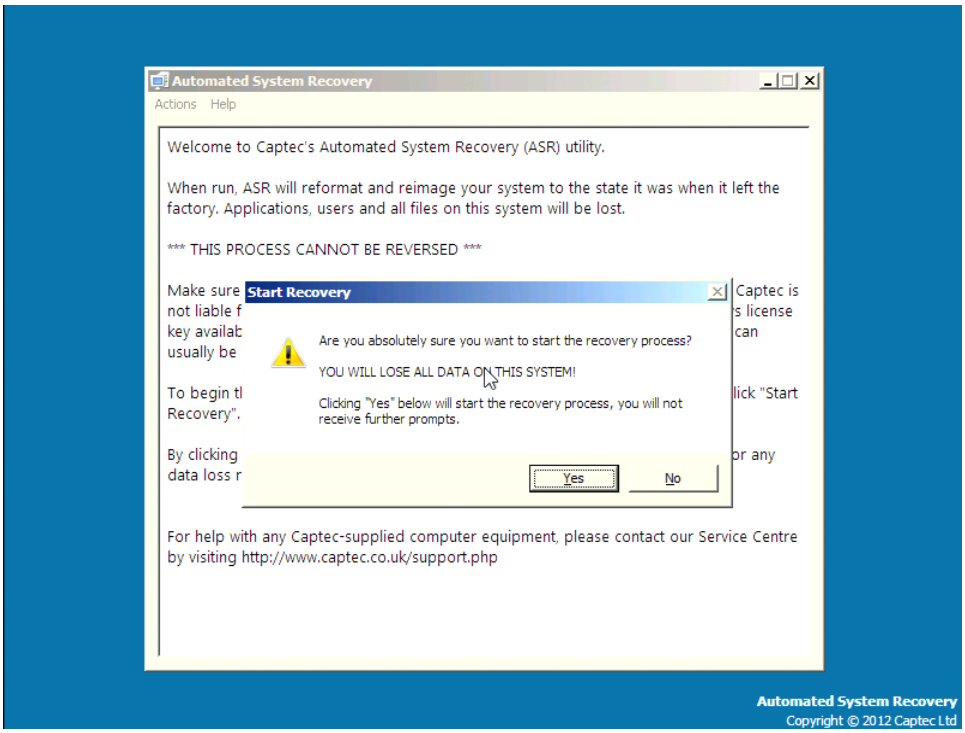

Figure 3-9: Confirm recovery

8. On the confirmation dialog use the arrow keys on your keyboard to select Yes and press Enter (Figure 3-9). While the Reinstall Procedure is running the system displays a progress bar (Figure 3-10).

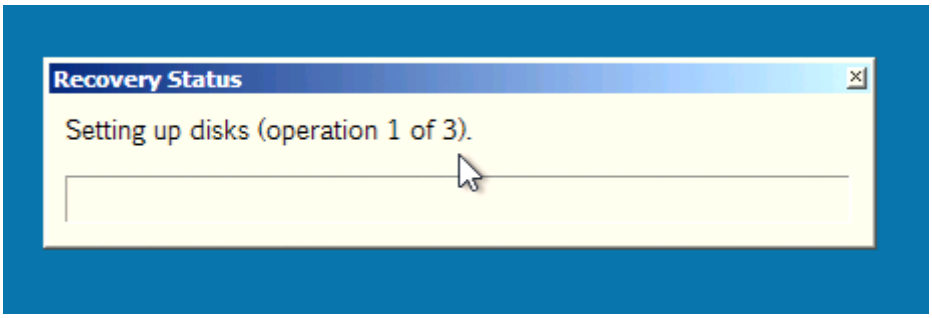

Figure 3-10: Recovery in progress

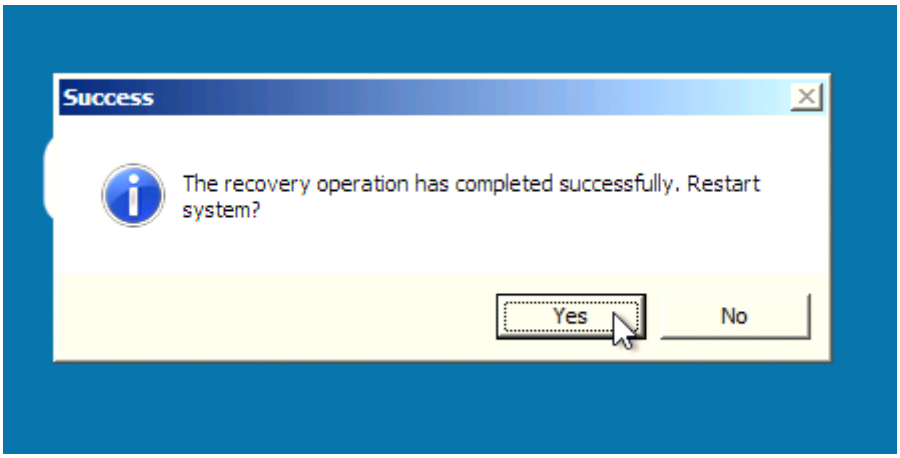

Figure 3-11: Recovery complete before reboot

9. When the Reinstall procedure is complete remove the Recovery USB and Press Enter to restart the SDC (Figure 3-11).

10. After the system restarts reinstall DeepView for Windows.

3.3 Reinstall DeepView for Windows Procedure

Follow these steps to reinstall the DeepView for Windows software:

1. Select the Windows Start menu, and then select Control Panel, and Programs and features

2. Select the DeepView for Widows entry in the list of installed programs, and select Uninstall. If there is more than one DeepView entry in this list you must uninstall them all.

3. In the Windows File Manager, select the folder C:\Program Files\TSS, and delete the subfolder DeepView for Windows.

4. Insert the software USB, and run the installer file DeepView_Install.exe (the exact name of this file may vary.

3.4 PC Software Installation

A USB drive containing the DeepView for Windows software is supplied with the SDC. You may install this software, under licence, on a separate PC to support the main installation on the SDC or to replay an internally logged data file. The following instructions explain how to install the software on a separate PC.

Before you install the software it is recommended that you read the readme.txt file on the USB pen drive which describes any enhancements or issues to be aware of prior to installing the software:

1. Insert the USB pen drive into a suitable USB port on your PC.

2. The software should start automatically. If it does not, within the Windows environment select ‘My Computer’ and the respective drive for your USB port. Within the contents of the USB pen drive you will find the setup program which automatically installs the software.

3. To use DeepView for Windows, double click on the Teledyne logo icon that the installation programme places on your Windows 7 desktop.

NOTE

Take the following precautionary measures to maintain the SDC and your PC in optimal condition:

- Check all the drives on your PC for viruses using current versions of an approved anti-virus program.
- Perform a Windows disk check and a defragmentation session regularly.
- Follow the correct procedures to close down Windows and power-off the SDC and your PC.
- NEVER install unauthorised software on the SDC.
- NEVER make any alterations to the Windows registry unless you are entirely certain that you know what you are doing, and have backed up the registry files ‘system.dat’ and ‘user.dat’. Inappropriate modifications to the Windows registry can prevent the SDC from operating.

4 System Specifications

Along with a detailed specification of the SDC10 and its major assemblies, this section of the manual also includes examples to show the measurement performance that the system can deliver under ideal operating conditions.

NOTE

Teledyne Limited has made every effort to ensure that the specifications included are correct. However, in line with the Teledyne Limited policy of continual product development and improvement, Teledyne Limited reserves the right to change equipment specifications without notice. Refer to Teledyne Limited for advice if necessary.

Processor:	Built-in Intel fan-less N270 Atom 1.6GHz CPU
Operating System:	Windows 7
RAM size:	2 GB
Hard disk size:	32GB
Panel PC Interfaces:	2 x front-mounted USB ports
Comms Enclosure Interfaces:	IEC mains input (90 - 264V {47 to 63Hz})
	15-Way D-Type (Comms from SEP)
	2 x RS232 serial ports (COM2 and COM3)
	S-Video and Composite Video In/Out (video overlay)
	3 x BNC Analogue Outputs (CH1, CH2 and QLTY)
	RS232, 2-wire and 4-wire current loop selector switch
Keyboard:	On-screen touch-screen keyboard.
Monitor:	19” military grade touch-screen Panel PC
Overall size:	599.2mm(W) x 480mm(D) x 345mm (H) (inc. transit case)
Weight:	28kg
Power input voltage:	90 - 265V (47 to 63Hz) auto-ranging
Power consumption:	250W maximum
Operating temperature range:)	0° to 50°C {*32°F to 122°F*}
Relative humidity:	10% to 95% R.H. non-condensing at 40^{o}C

Vibration resistance:	5 to 17Hz 2.5mm double amplitude displacement. 17 to 500Hz 1.5g peak-to-peak
Ingress protection:	IP65

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MANAGEMENT SYSTEM CERTIFICATION
DNV·GL
ISO 9001 = ISO 14001
OHSAS 18001
UKAS MANAGEMENT SYSTEMS
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