

SECTION 3

SMART PAYOUT MANUAL SET

ITL SOFTWARE SUPPORT GUIDE

INTELLIGENCE IN VALIDATION

Innovative Technology assume no responsibility for errors, omissions, or damages resulting from the use of information contained within this manual.



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SMART PAYOUT MANUAL SET – SECTION 3

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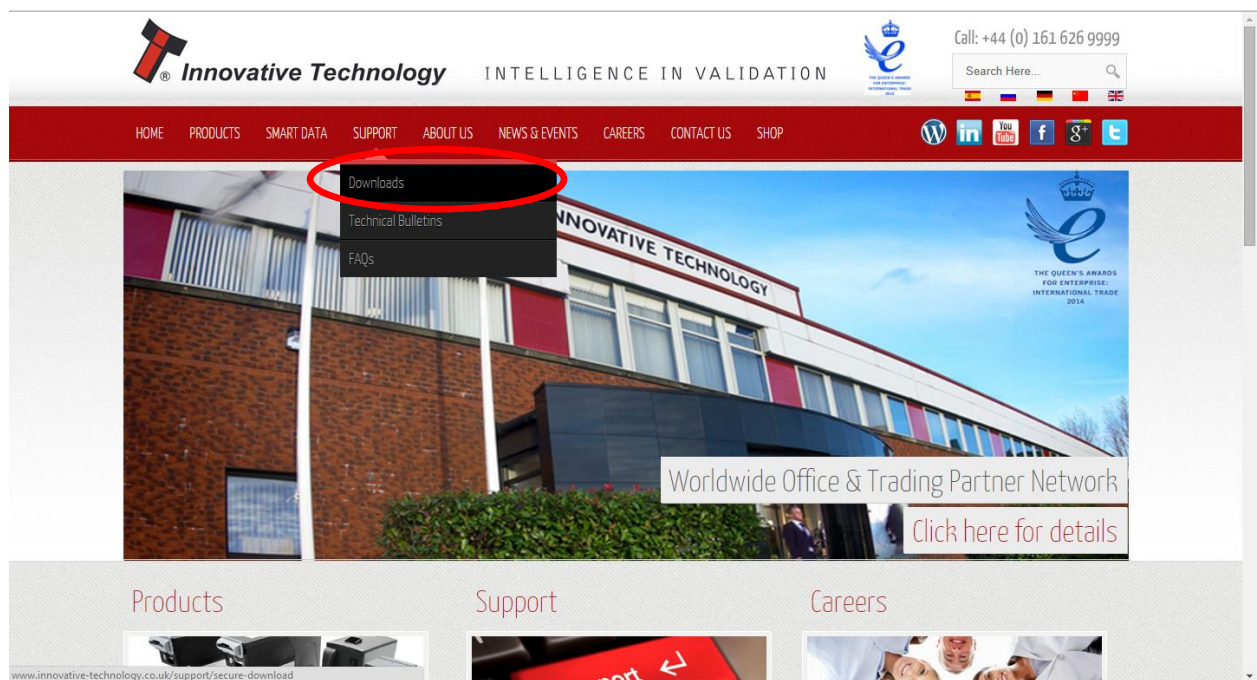
3. ITL SOFTWARE SUPPORT GUIDE

3.1 PiPS Software

PiPS (Pay in Pay out System) is a software package developed by Innovative Technology Ltd to allow customers to carry out programming, setup and operational tasks on the full range of Smart Payout devices.

3.1.1 Preparing for Installation

If you do not have the PiPS software on CD, you can easily download it from the Innovative Technology website. Visit www.innovative-technology.co.uk, and select 'Software Download' from the 'Support' tab:



Clicking this link will take you to the software download page. To download any files you must log in as a registered user – if you have not already registered this is a very quick process; just click the 'create an account' link and follow the on-screen instructions.

To download a software file you must first login.
NB: All users must re-register with the new site.

Enter your login details here, or create a new account

Always ensure you are using the most up-to-date software before altering any firmware or currency dataset files.

Username
 Password
 Remember Me
 Login

- [Forgot your password?](#)
- [Forgot your username?](#)
- [Create an account](#)

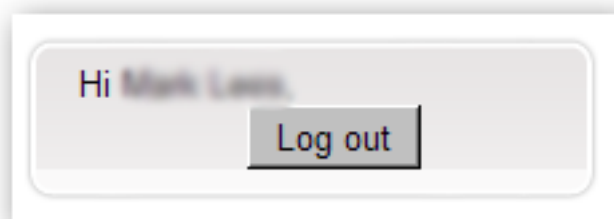
Latest Datasets

- TWD01204** (BV20)
- TWD02201** (BV20)
- VEF01B01** (NV9USB)
- E004610100** (NV10)
- E0046101** (NV10USB)
- AUD01004** (SMART Hopper)
- BAM01002** (SMART Hopper)
- CLP01002** (SMART Hopper)
- CNY01003** (SMART Hopper)
- CZK01003** (SMART Hopper)

Title	Version	File		
VPS (Validator Programming System)	1.0.16			
Bank Note Validator Currency Manager	3.3.11			
Bank Note Validator Diagnostics Tools	1.0.4			
SMART PIPS (Pay In Pay Out System)	1.4.5			
DA2 Drivers - 32 bit				
DA2 Drivers - 64 bit	1			
BV Interface Driver Install - 32 bit	2			
BV Interface Driver Install - 64bit	1			
eSSP Developer Kit	2			
NV4 Currency Manager	2.5.3			

After logging in, the download screen will change slightly:






















Your user name will be displayed in the top right hand corner of the screen



The padlock icon for each file will change from locked to unlocked. To download a file, just click on the padlock icon opposite the file name. If you want to find more information about the file before you download it, you can click on the blue information icon.



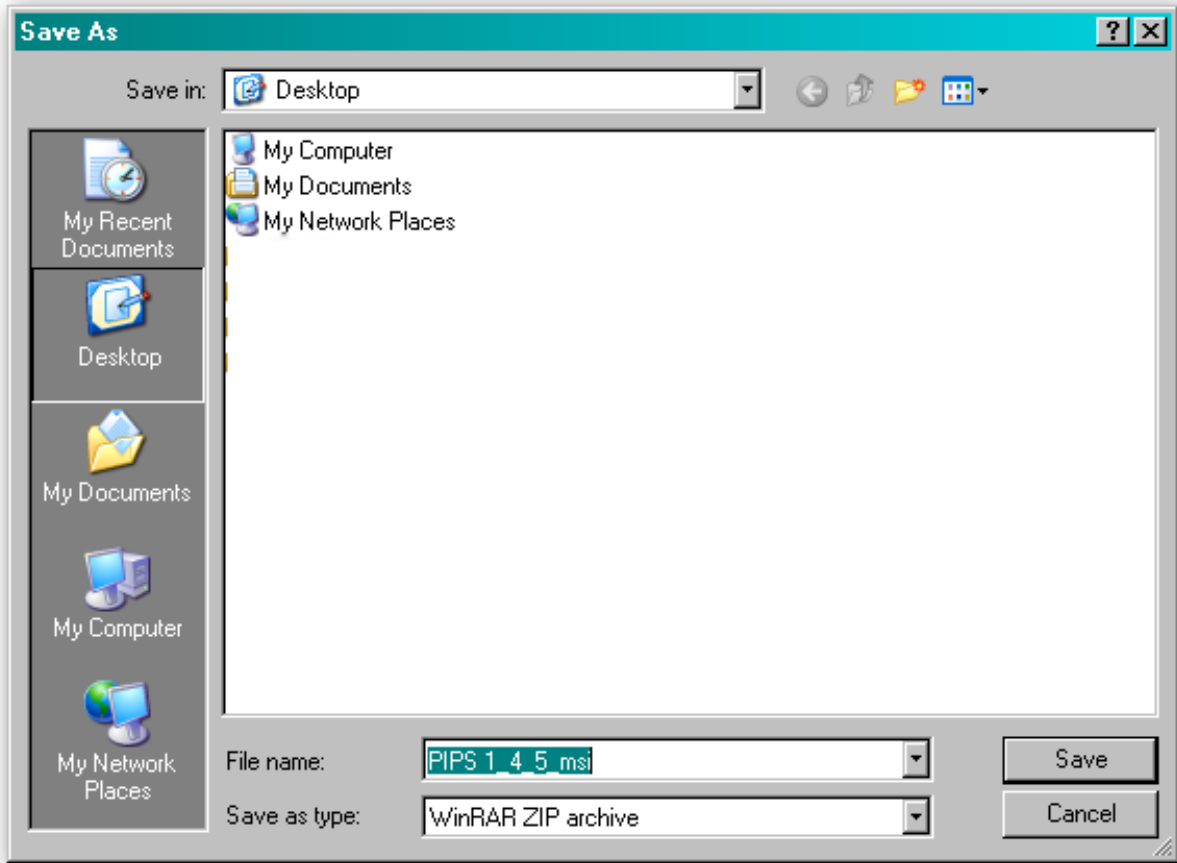
In this case, we want to download the PiPS software, so we click on the padlock icon opposite the 'SMART PIPS (Pay in Pay out System)' filename:

Title	Version	File
VPS (Validator Programming System)	1.0.16	 
Bank Note Validator Currency Manager	3.3.11	 
Bank Note Validator Diagnostics Tools	1.0.4	 
SMART PIPS (Pay In Pay Out System)	1.4.5	  
DA2 Drivers - 32 bit		 
DA2 Drivers - 64 bit	1	 
BV Interface Driver Install - 32 bit	2	 
BV Interface Driver Install - 64bit	1	 
eSSP Developer Kit	2	 
NV4 Currency Manager	2.5.3	 

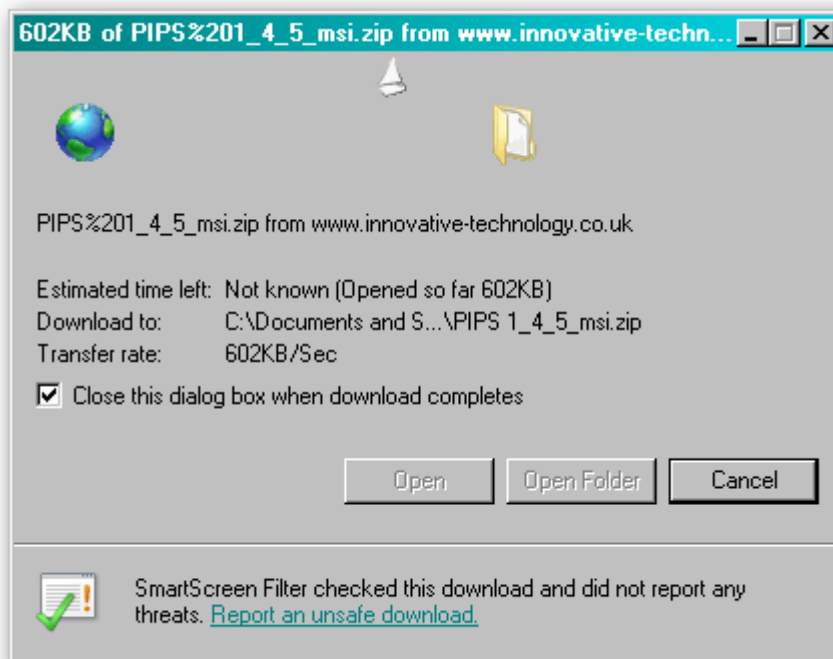
After clicking the link, a file download dialog box will appear – choose the option to **save** the file:



You can save the file anywhere that is convenient, as long as you can remember where it is when you want to install the software.

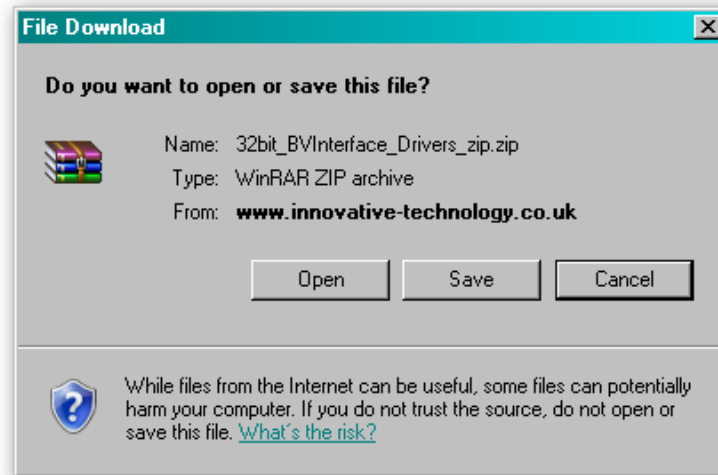


After choosing where to save the file, a file transfer dialog box will appear showing the progress of the file download:

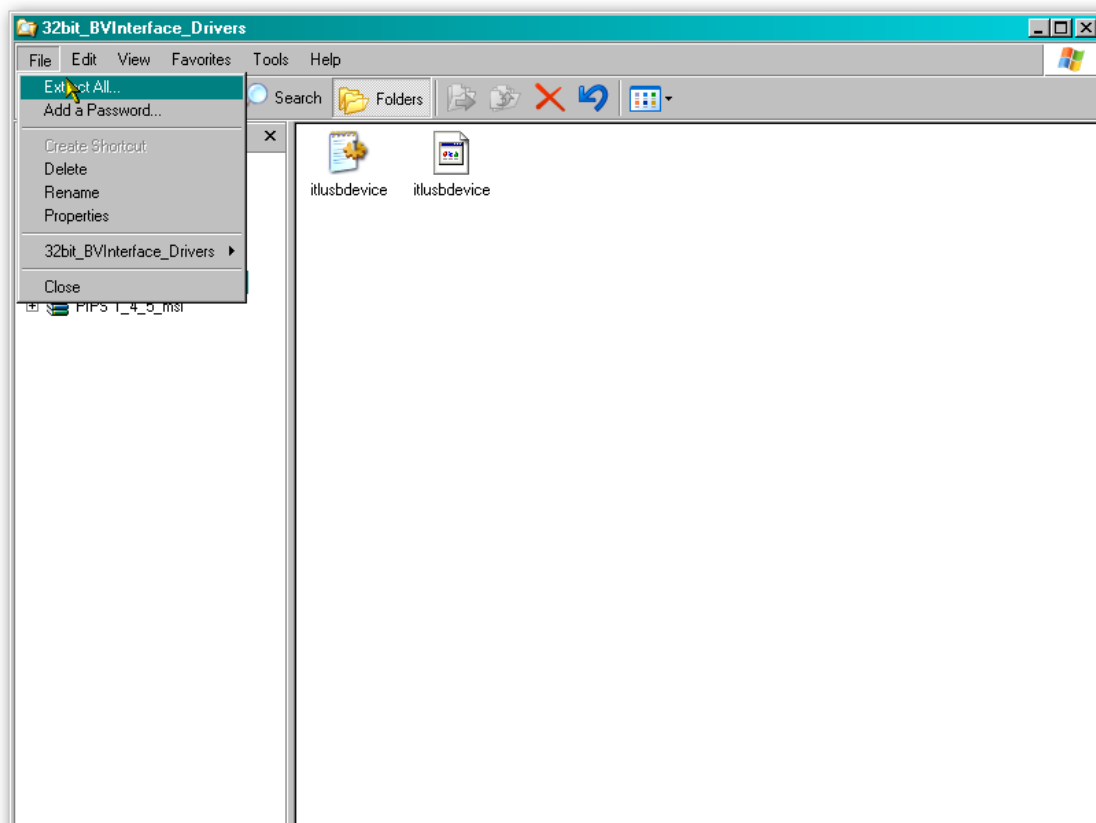


3.1.2 BV Interface Drivers

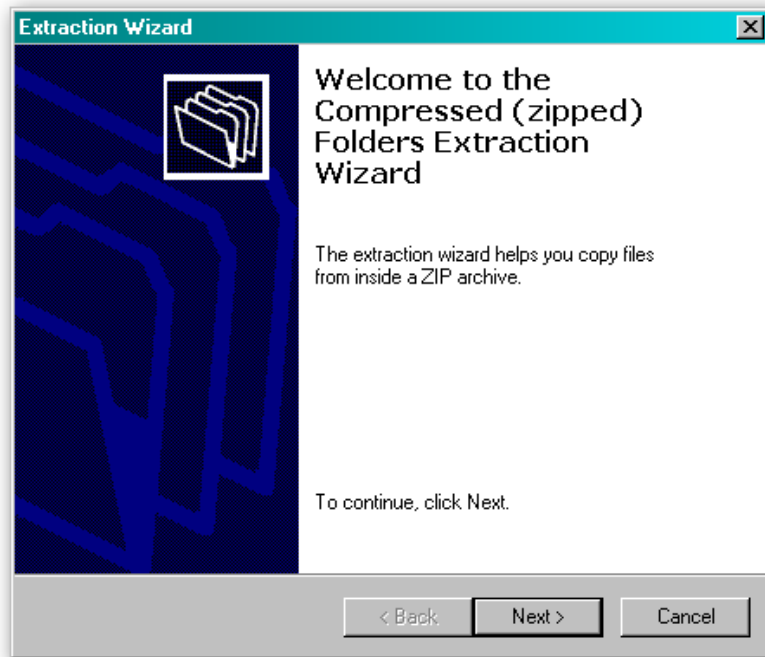
After downloading the PiPS software, you will also need to download the Banknote Validator (BV) Interface drivers – two versions are available (32 bit and 64 bit) so choose the correct type for your operating system. Again, remember where you saved the file.



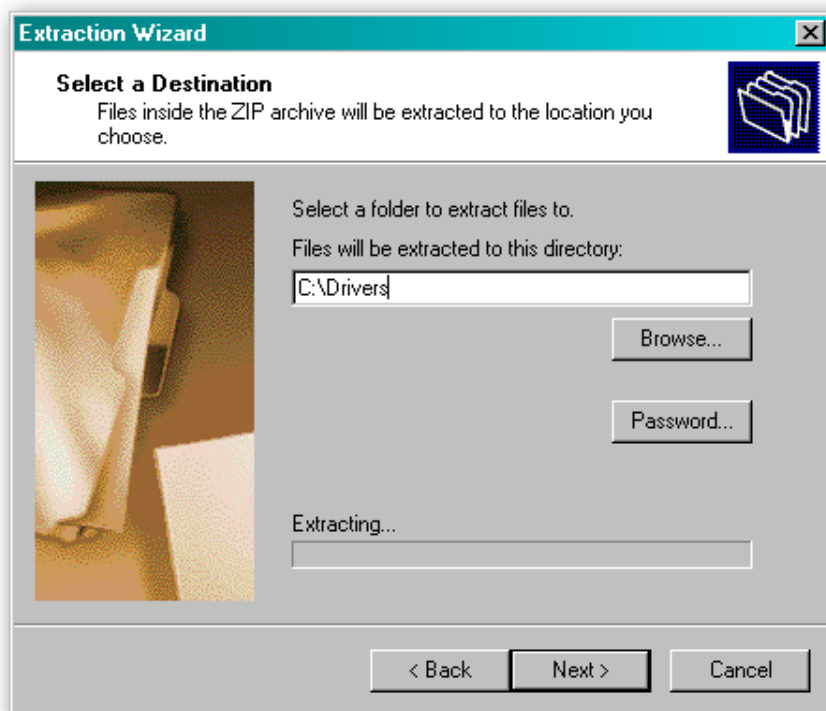
Both files are provided in a 'zipped' (compressed) form – you will need to extract the files from the zipped file before you can install the software or driver. Any version of Windows from Windows 98 onwards can open zipped files; or you may want to use a third party software tool such as Winzip or WinRAR.

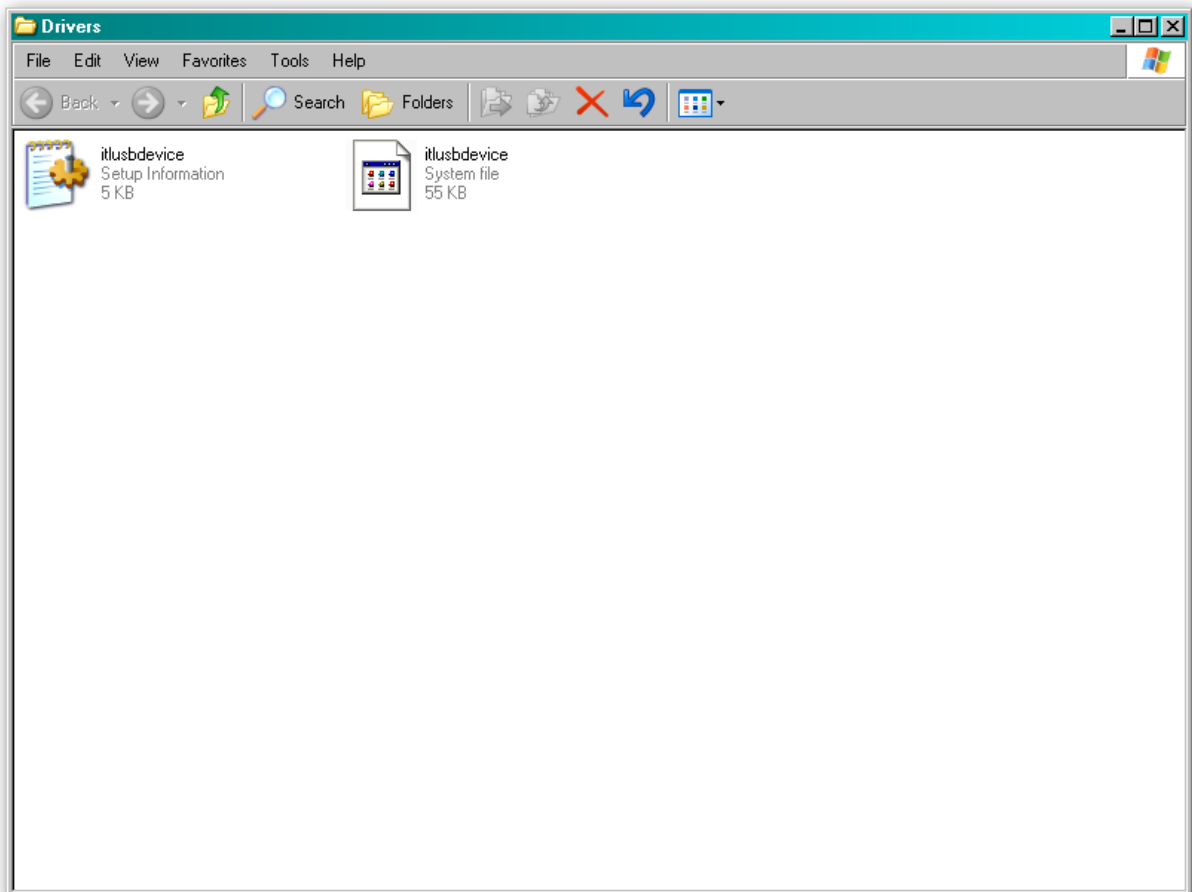
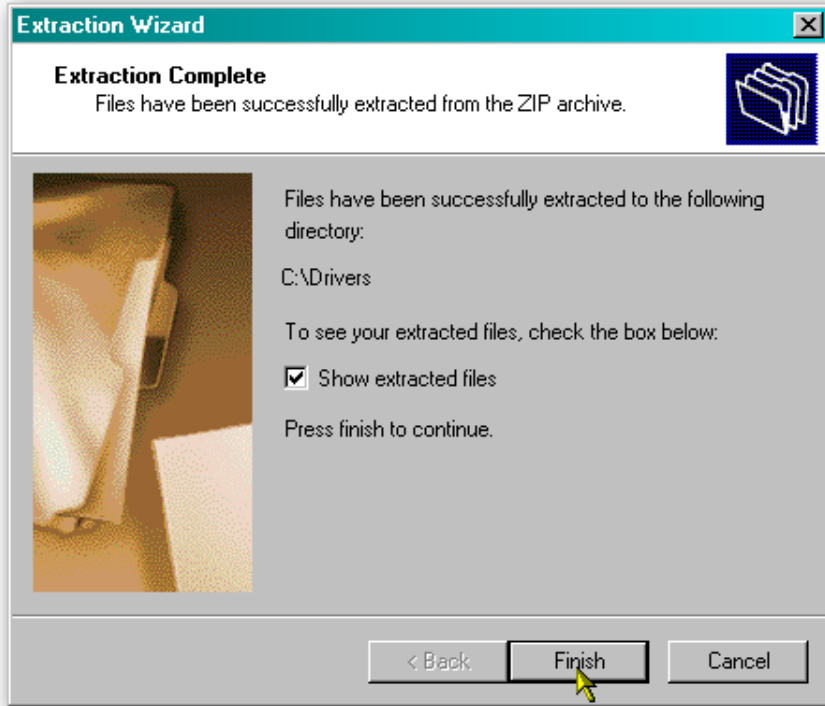


Extract the files to a convenient location – this might be an existing folder, or you may want to save them into a new folder.



In this example, the BV Interface driver files are being saved into a folder called 'Drivers' on the computers C: drive.

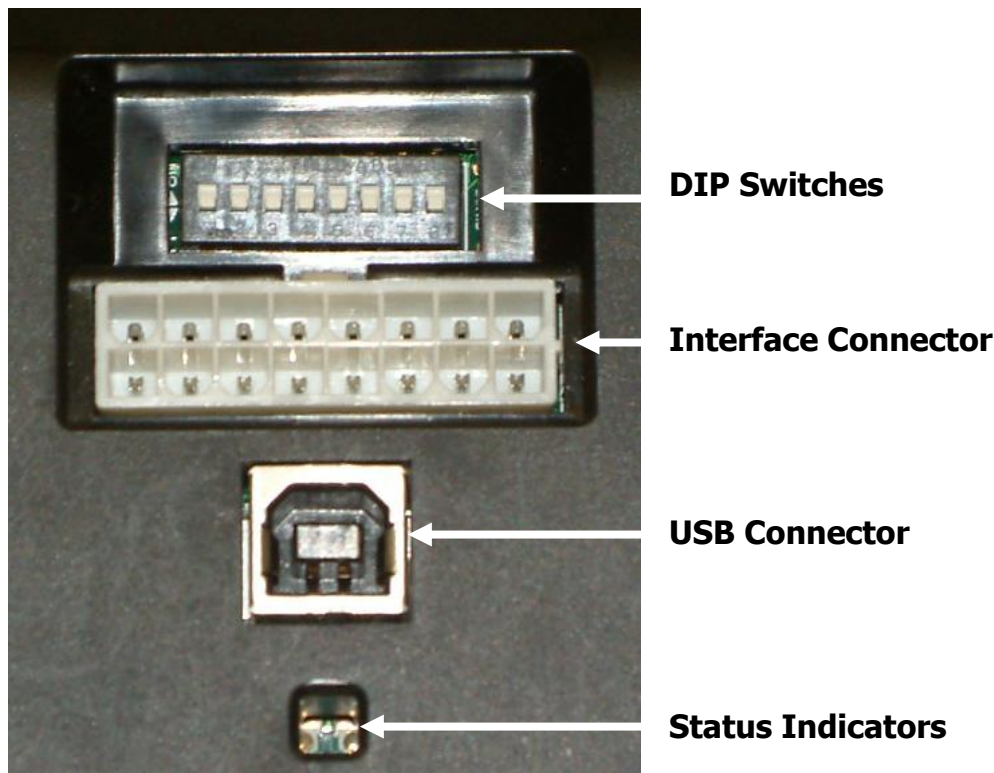




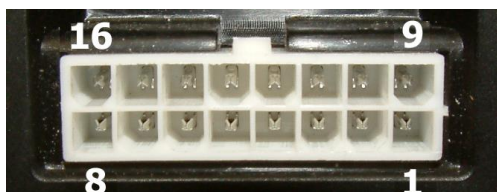
3.1.3 Installing the Drivers

There are several ways to communicate with the SMART Payout unit, which include using a direct connection from computer to SMART Payout unit with a USB cable, or by using an interface unit called n IF17 (TTL to USB). **Note: Direct USB is only recommended for on the bench testing/Programming.** Host communications should be via an IF17 if USB is required.

To install the drivers, you need to connect a standard USB 2.0 compliant Type A to Type B cable from your computer to the USB interface socket on the rear of the SMART Payout unit:



The SMART Payout unit must be powered up for the interface to be recognised by Windows. If the SMART Payout unit is not in the host machine, you will need to provide power to the 16 way interface connector first. The connection information and pin numbering is as follows:

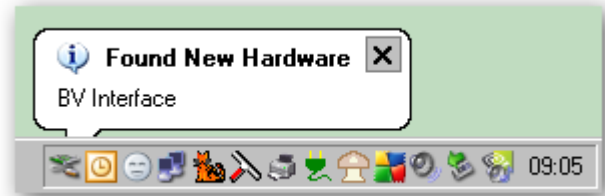


Pin	Description
1	0V / Ground Connection
9	+12V DC

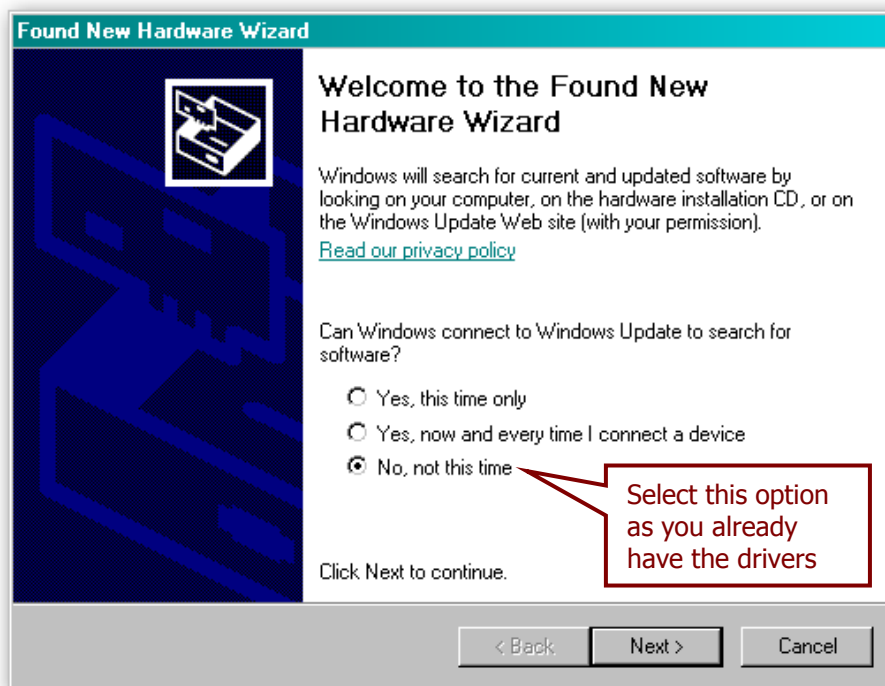


Before connecting the USB cable, make sure that the unit is powered up and that only the GREEN Status Indicator is lit (it should be flashing about once every second). Once you have carried out these steps, plug the USB cable into the SMART Payout unit.

After connecting the USB cable, Windows should then detect the SMART Payout unit interface – a 'Found New Hardware' bubble or dialog box should appear.



A 'Found New Hardware' wizard should then start to guide you through the installation process (this first screen is not always shown on some computers):

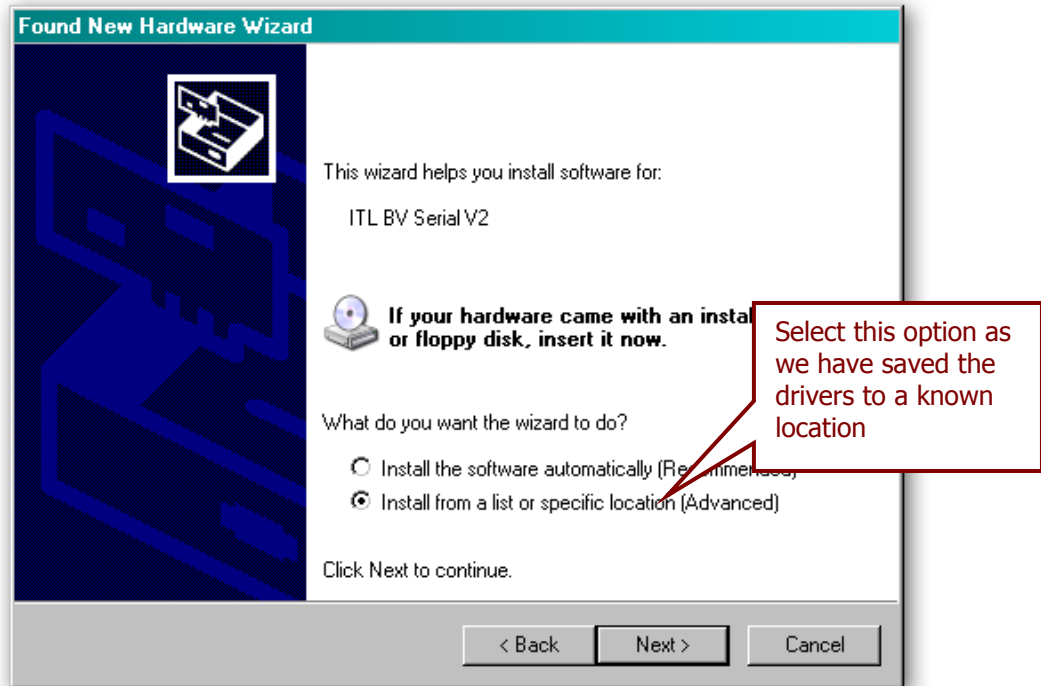


Information

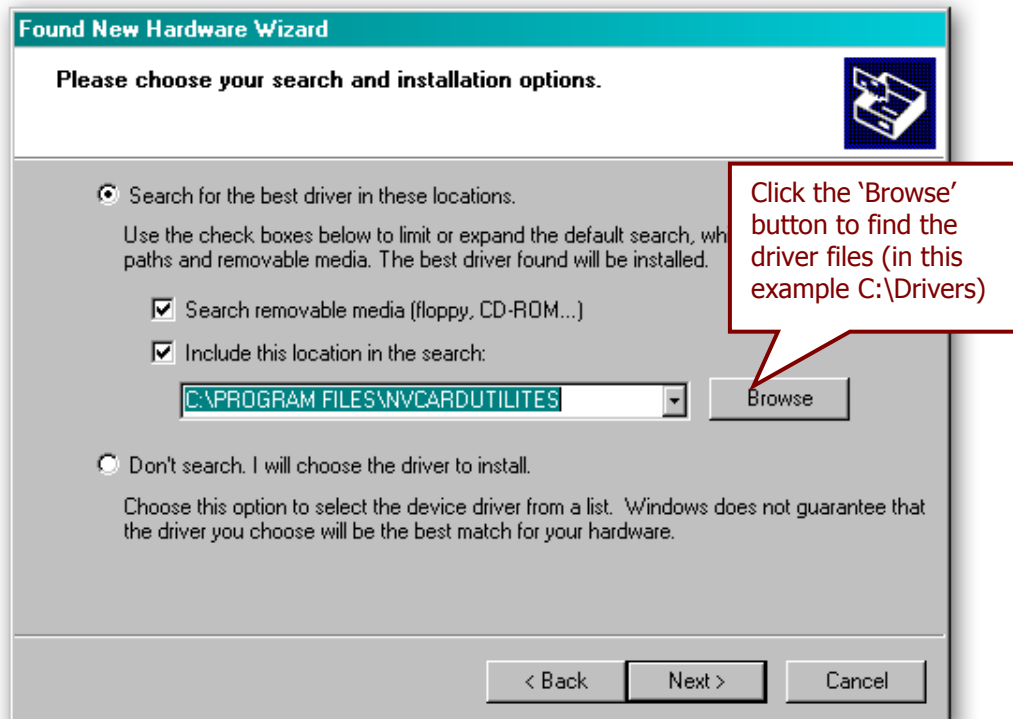
Only use V2 drivers

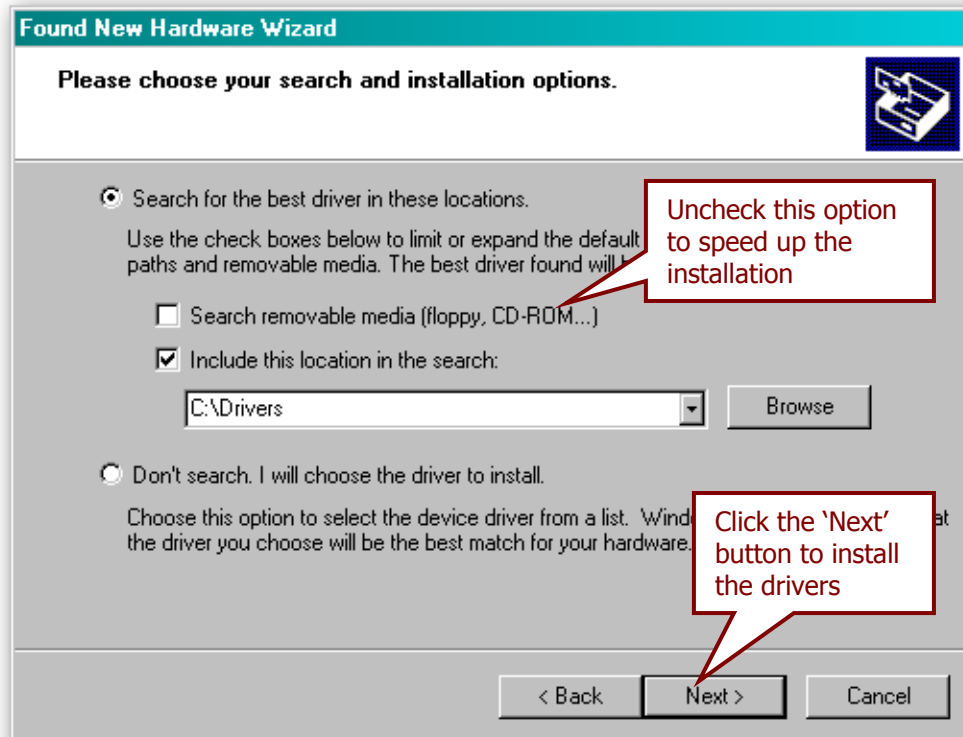
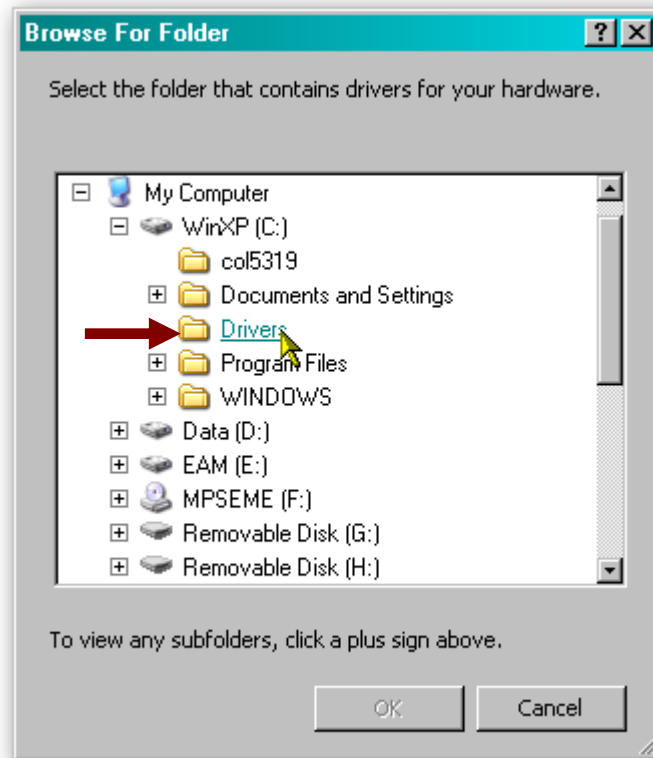
Please make sure that you are using the V2 drivers for the installation.



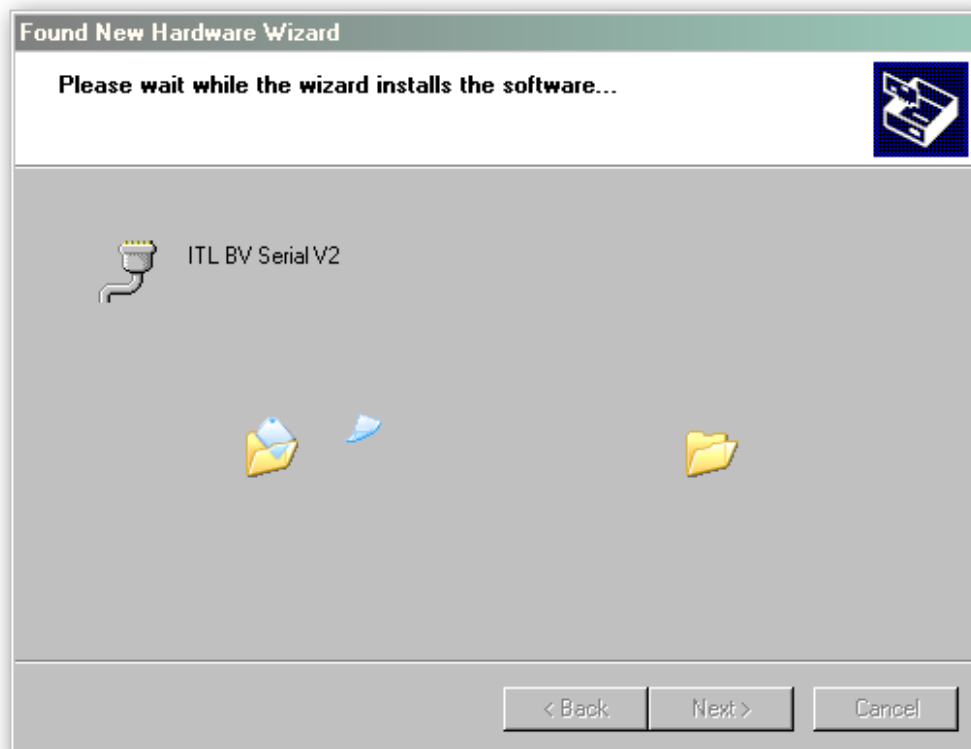
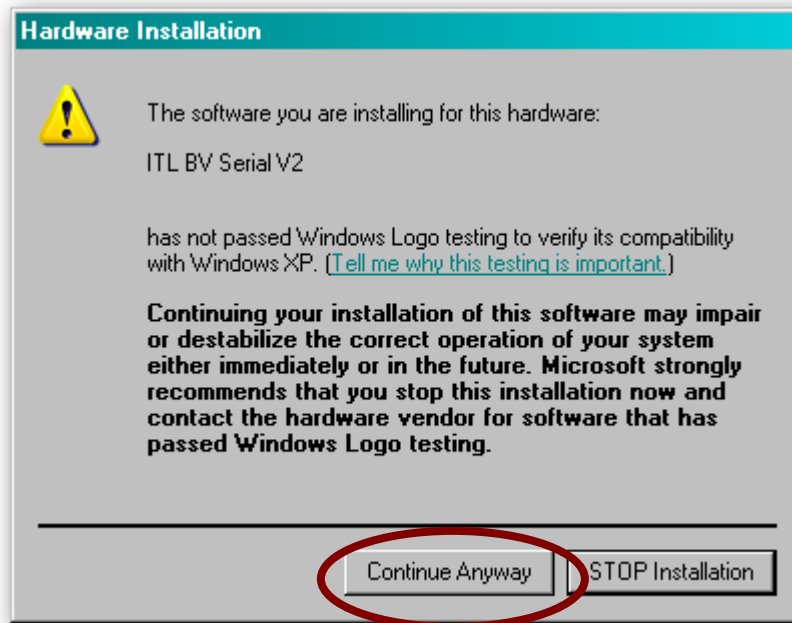


The next dialog box will ask you where to search for the drivers:





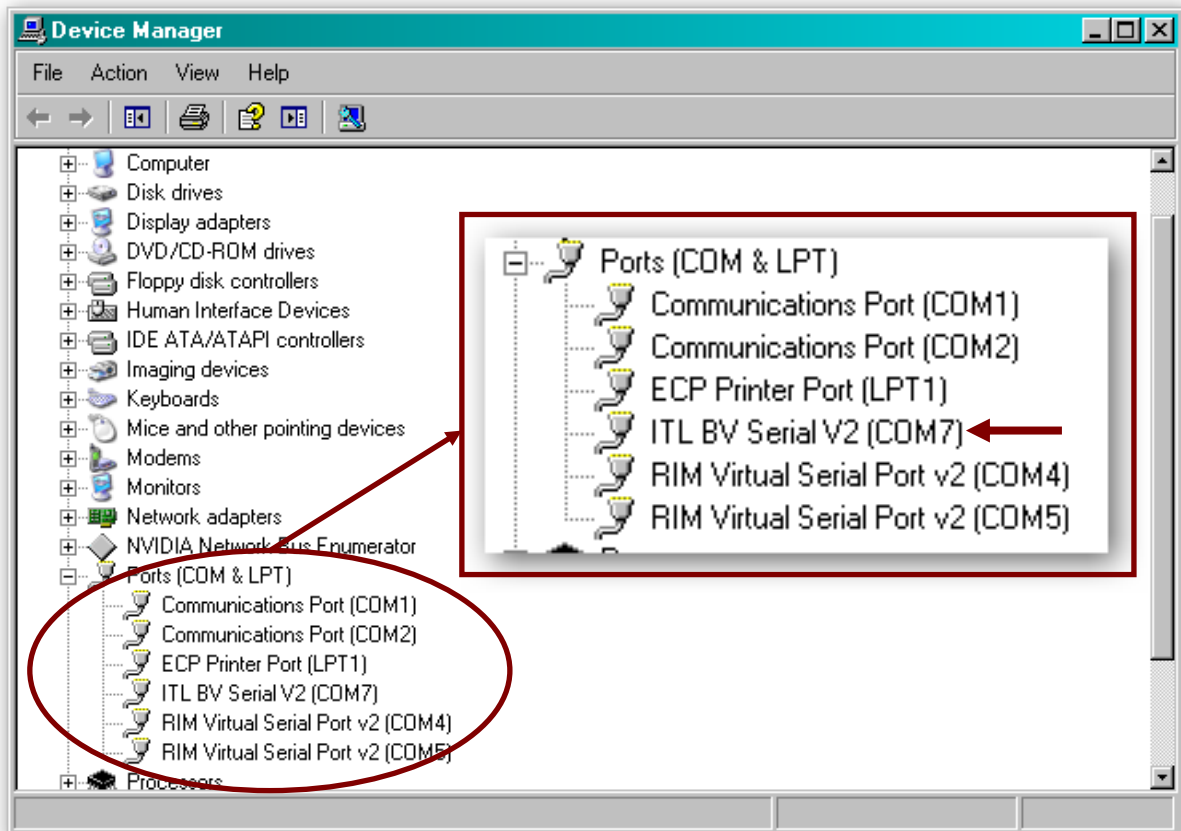
You may see a warning dialog saying that the drivers have not passed Windows logo testing – you can ignore this warning. Just click the 'Continue Anyway' button.





After completing the driver installation you can check that the communications port has been installed correctly.

Open Windows Device Manager, and click on the Plus symbol (+) next to the 'Ports' entry. This will expand the list of installed communications ports. You should see an entry for an '**ITL BV Serial V2**' port as shown here:

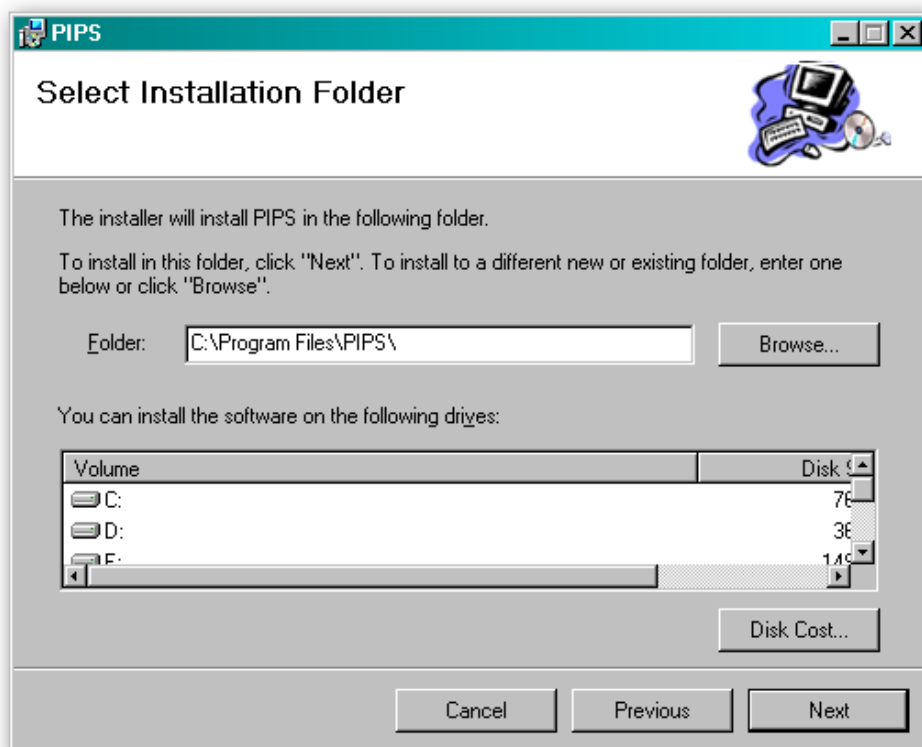


The actual communications port number (in our example COM7) may vary depending on your particular computer configuration.

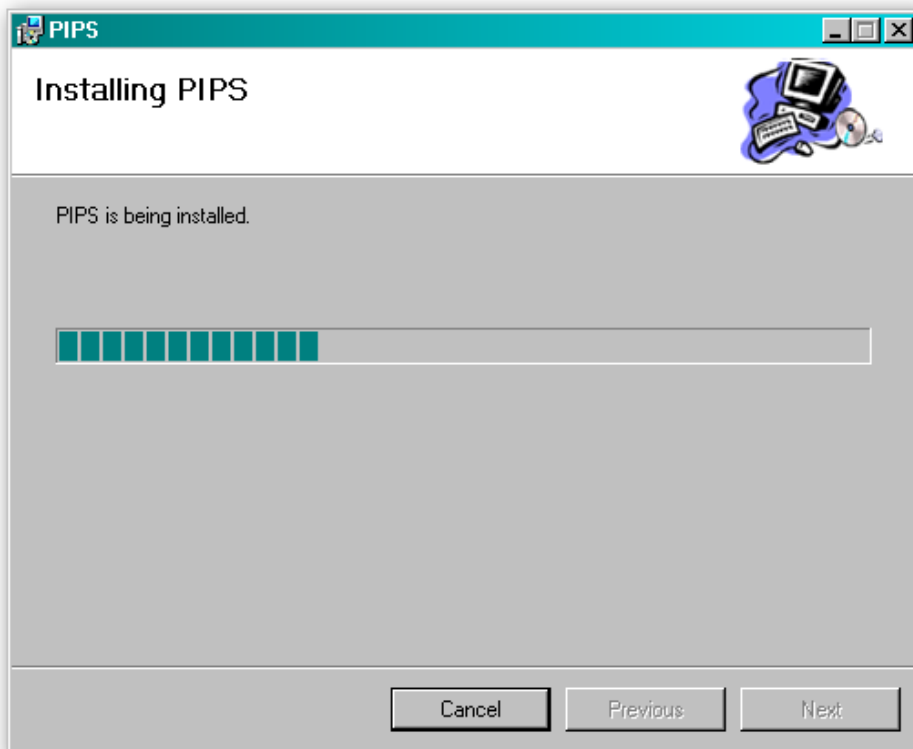
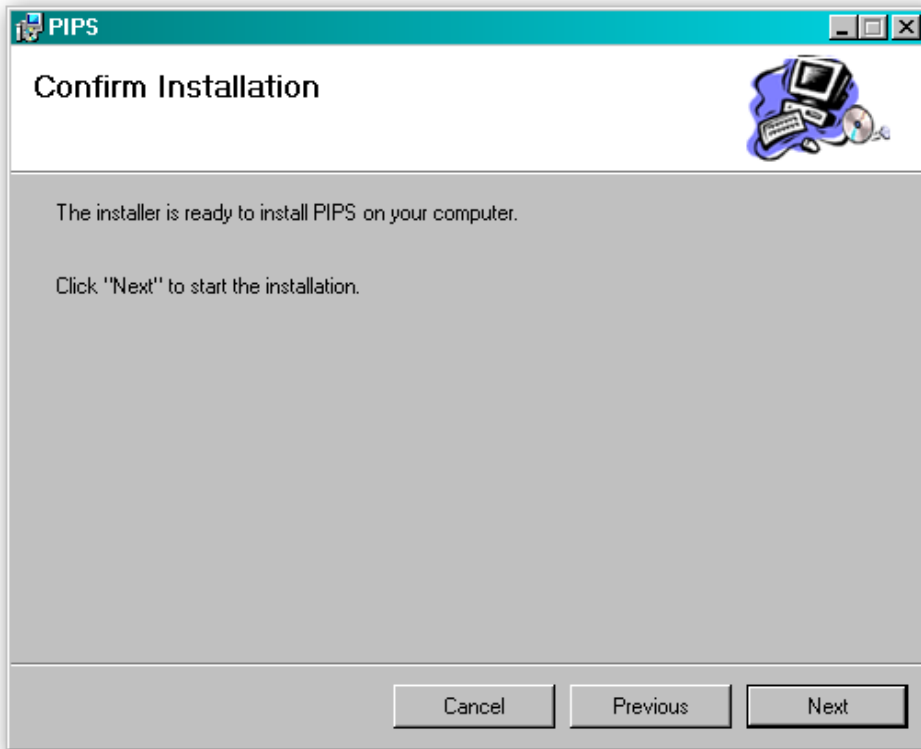
Now the drivers have been correctly installed you can install the PiPS software – this is covered next.

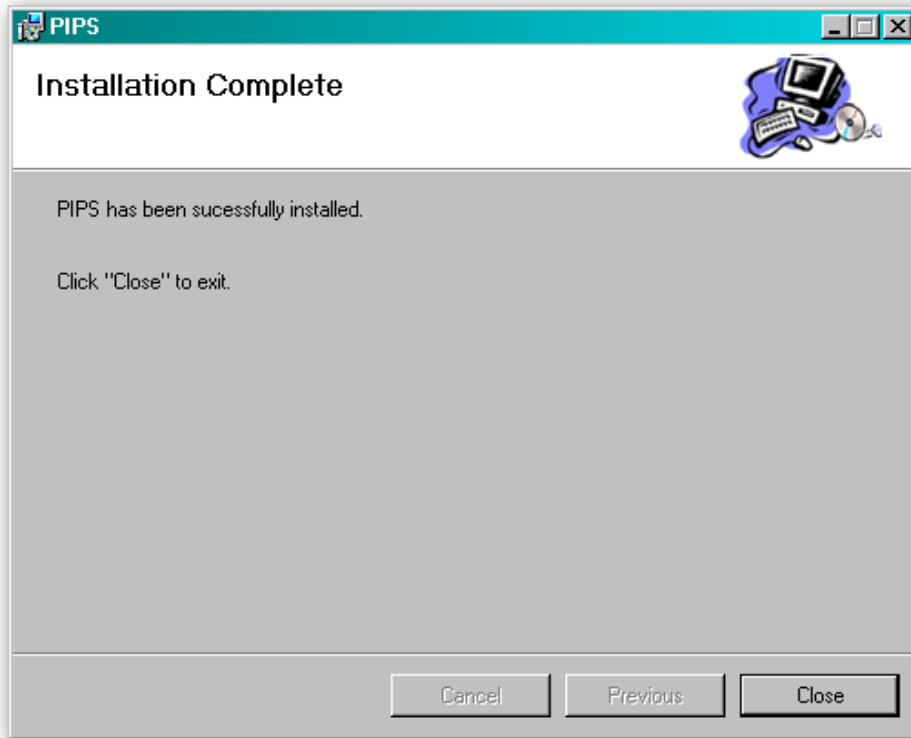
3.1.4 Installing the PiPS Software

Installing the PiPS software is very straightforward. Find the PiPS installation file you downloaded earlier, extract the installation file from the zipped file and double click the file (it has an .msi extension) – this will start the installation process:

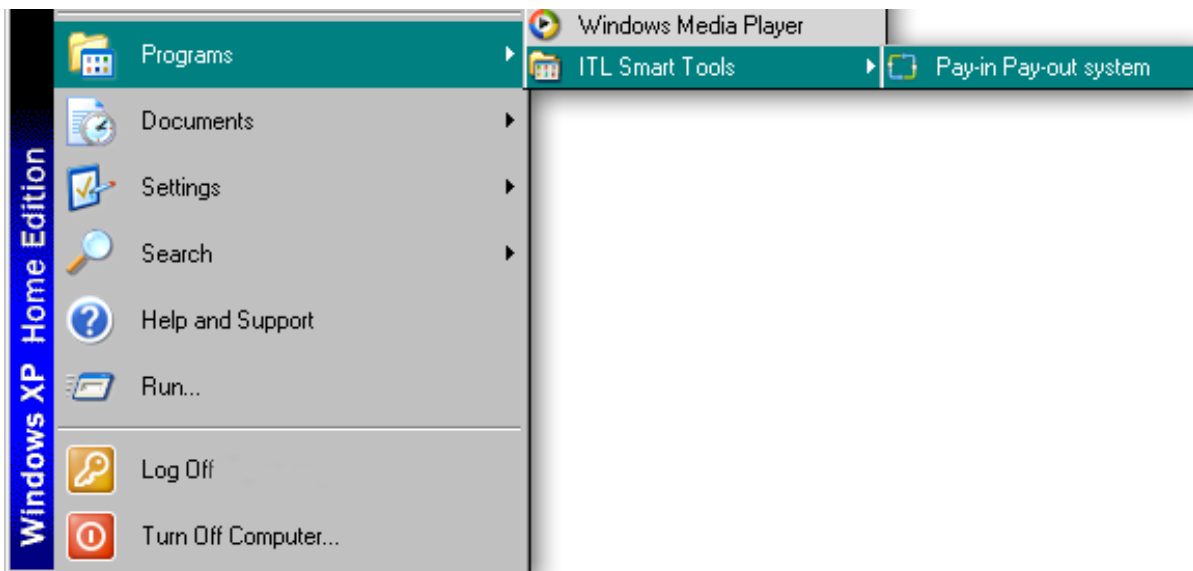


You can choose where you would like to install the software, or just accept the default location (as shown above). Clicking on the 'Next' button will then ask you to confirm the installation:





Once the installation is complete, you will have a new program group called 'ITL Smart Tools' in the Windows Start Menu, similar to the one shown here:

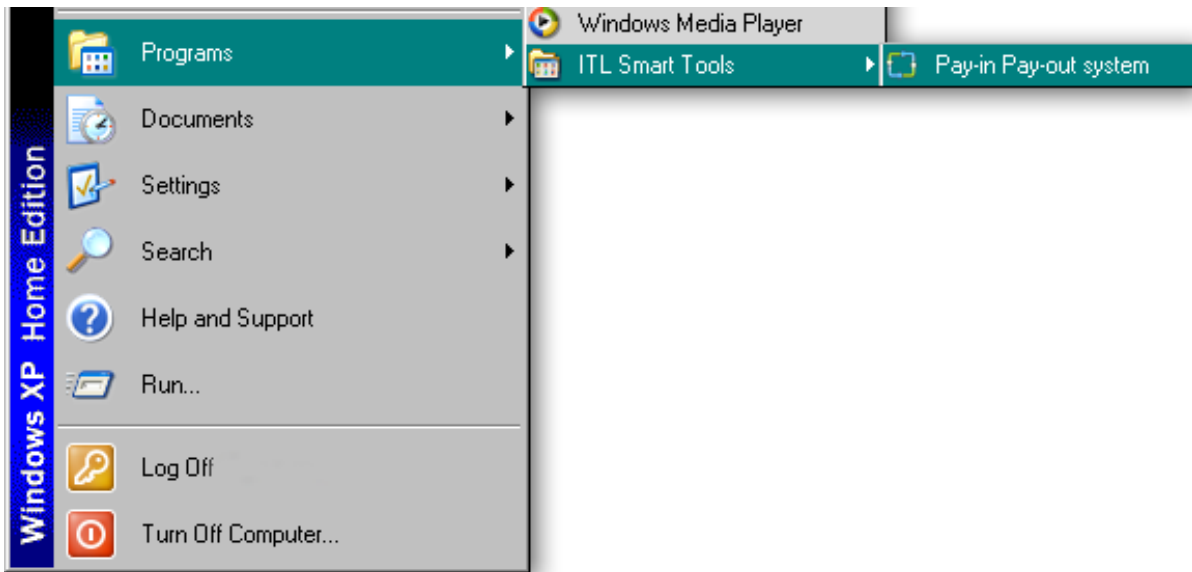


You can run the PiPS software by clicking the 'Pay-in Pay-Out system' menu entry; however, before you can use the PiPS software with a SMART Payout unit you will need to make sure that you have installed the BV interface drivers (as described earlier).

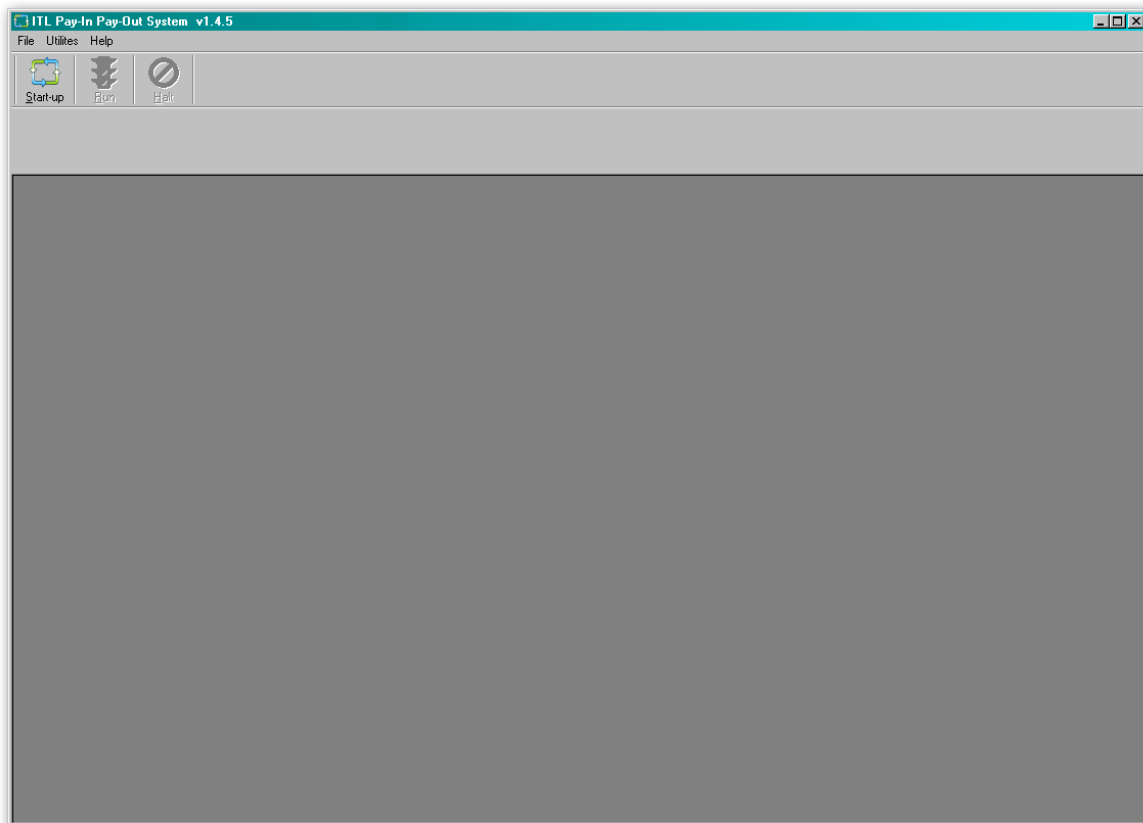


3.1.5 Starting the PiPS Software

The PiPS software is launched by clicking the 'Pay-in Pay-out system' entry in the 'ITL Smart Tools' menu group.

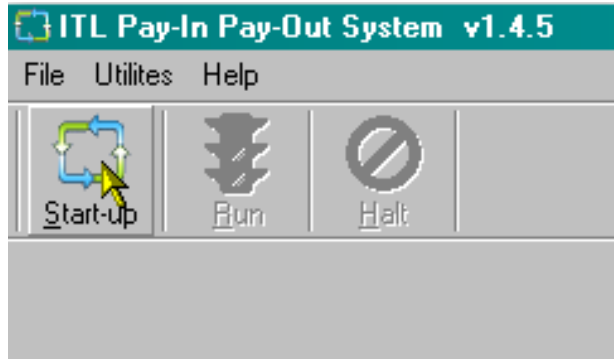


The initial program screen looks like this:

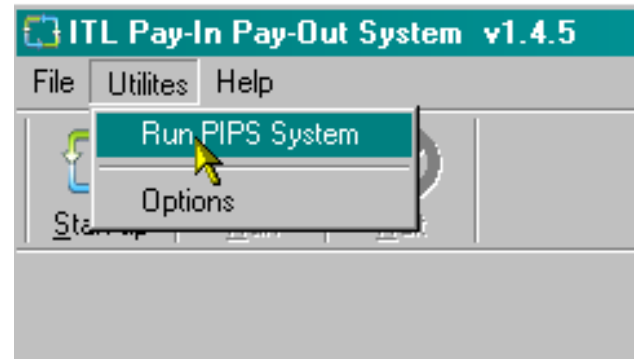


Make sure that the SMART Payout unit is powered up and the USB cable is connected before going any further.

Once the SMART Payout unit is connected, there are two ways to start the program operation:

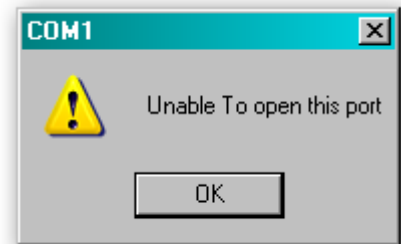


Click the 'Start-up' icon

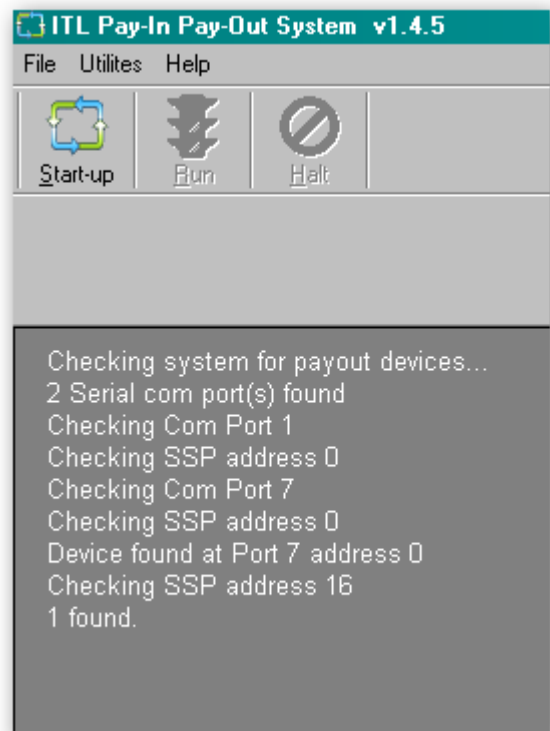


Click 'Utilities', then 'Run PIPS System'

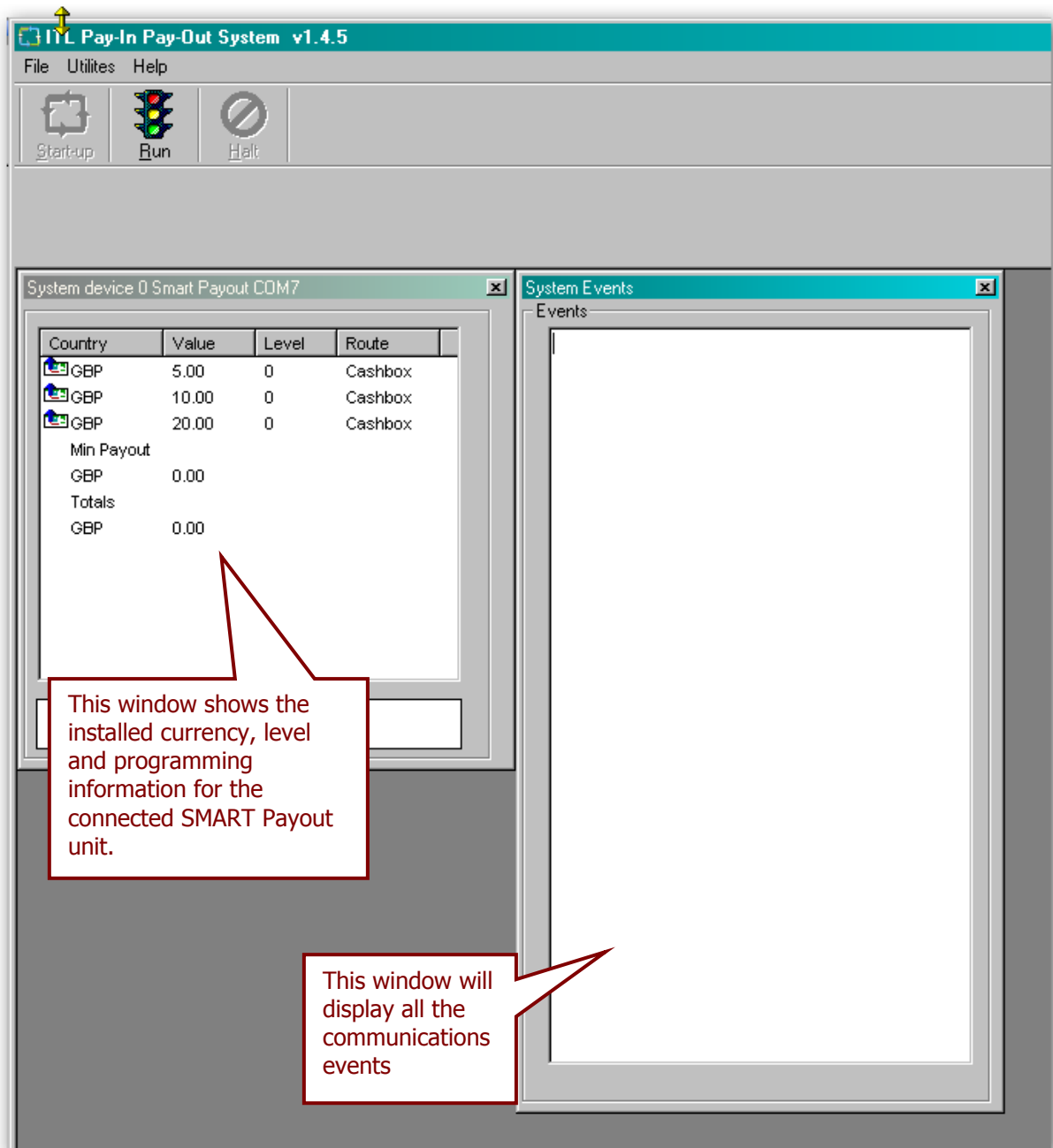
The PiPS software will then start to connect to the SMART Payout unit. Depending on the number and types of communications ports on your computer, you may get an error message similar to the one shown on the right saying 'Unable to open this port' – this isn't a problem, just click the 'OK' button.



You will see some text in the PiPS program window as the software checks the communications ports for the SMART Payout unit (similar to what is shown here) – this text may vary depending on your particular computer configuration.



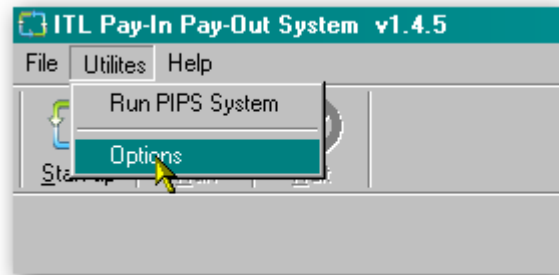
Once the SMART Payout unit has been found, two windows will appear on the screen:



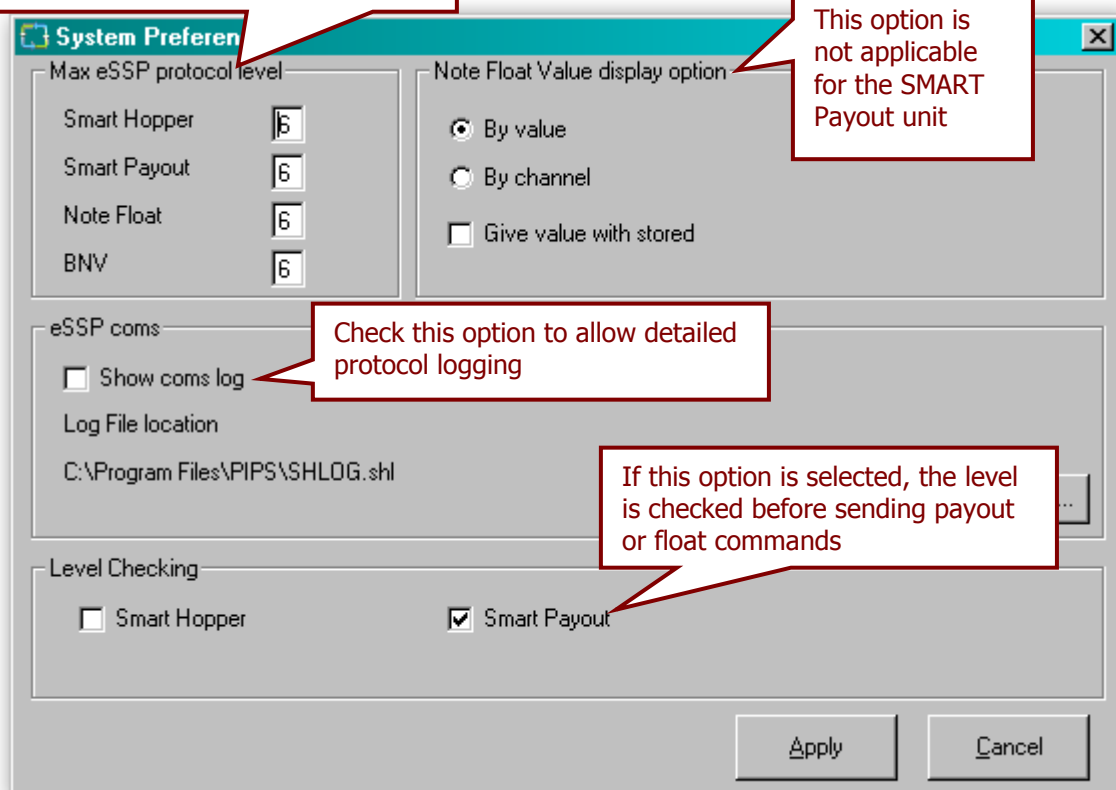
More details of the program options and operations that can be carried out will be covered in the next subsection.

3.1.6 Preferences, Settings and Options

The preferences for the PiPS software are accessible from the Utilities menu (as shown). Click the 'Options' entry to open a new dialog box:



This option sets the protocol version used for communications – contact ITL Technical Support for the current configuration details.



This option is not applicable for the SMART Payout unit

Check this option to allow detailed protocol logging

If this option is selected, the level is checked before sending payout or float commands

Normally, these preferences should not need changing.

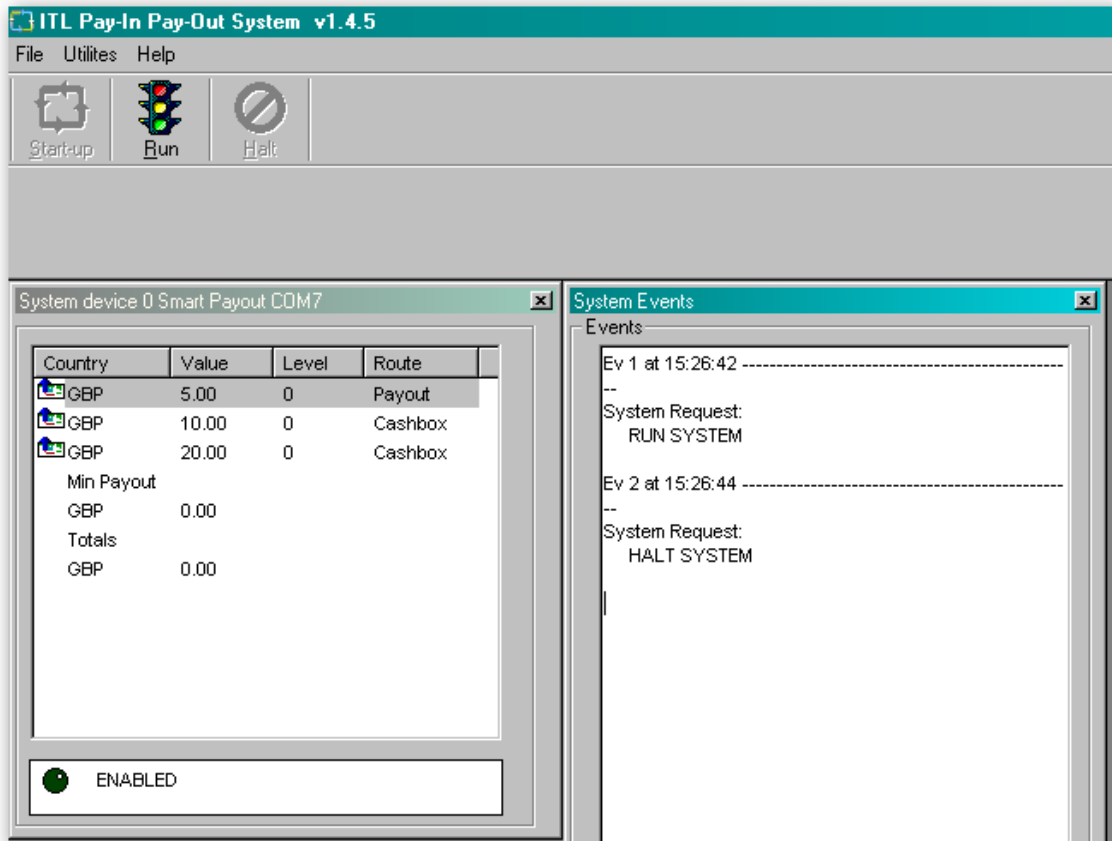
The settings and options for the SMART Payout unit vary depending whether the system is in the 'Run' or the 'Halt' state – generally the system will need to be halted before any changes to setup options can be made. Pay in/pay out operations are only available when in 'Run' state.

Halt State

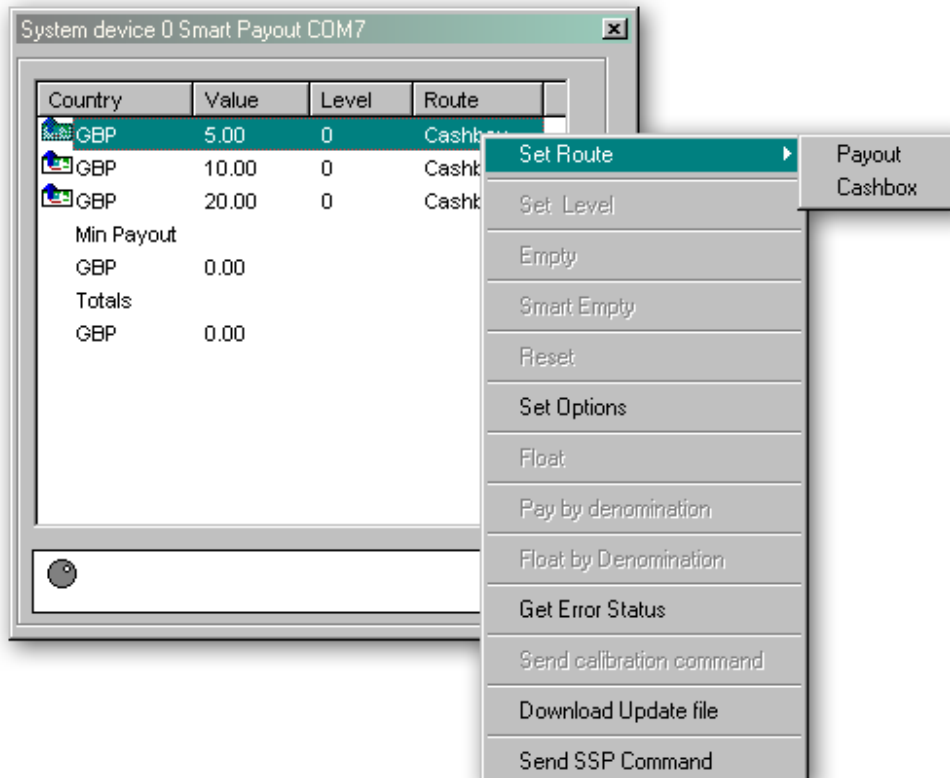
If the system is in 'Halt' state, the user will either have just started the PiPS software, or clicked on the 'Halt' button. The menu bar will look like this:



The main screen should look something like this:



The various settings and options can be accessed from a right click when the mouse cursor is over any of the system device entries:



Halt State Options

Set Route	To set the pay in route for inserted bank notes to either Cashbox or Payout module, select the desired denomination(s) and click the required route. The system will send the commands to the device and store these preferences so that they will be set again on the next start-up.
Set Options	Using this dialog, the user can setup the device SSP address and eSSP keys by double clicking on the required option.
Download Update File	This option allows the user to download an ITL update file to the connected device.
Send SSP Command	This option brings up the SSP communications dialog which allows the user to send individual commands to the connected device.



CAUTION!

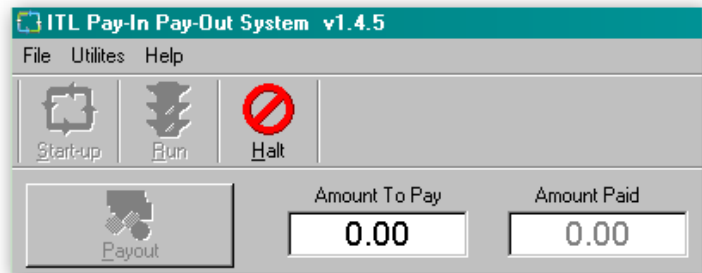
Take care when changing eSSP key

Exercise care when changing the device eSSP key. The user must make a note of the new key and change the host key to match. If the key is not known then device must be returned to ITL for key reset.



Run State

If the system is in 'Run' state, the user will have clicked on the 'Run' button and the menu bar will look like this:




Run State Options

<p>Set Route</p>	<p>To set the pay in route for inserted bank notes to either Cashbox or Payout module, select the desired denomination(s) and click the required route. The system will send the commands to the device and store these preferences so that they will be set again on the next start-up.</p>
<p>Empty</p>	<p>This command will empty all the stored notes in the connected Payout module into the device cashbox. After emptying the notes, counters on the device will be reset to zero.</p>
<p>Reset</p>	<p>This command will reset the connected payout device. After reset, the system will re-initialise the device for use.</p>
<p>Float</p>	<p>This option allows the user to run the device Float command - this command will tell the payout unit to leave a certain value of notes in the unit, with a requested minimum possible payout level. Clicking the option will bring up the Float dialog box.</p>
<p>Pay by denomination</p>	<p>If the connected device is running with SSP protocol version 6 or greater then this option will be enabled. This will bring up a 'pay by denomination' dialog which allows the user to select the notes required for payout.</p>
<p>Float by denomination</p>	<p>If the connected device is running with SSP protocol version 6 or greater then this option will be enabled. This will bring up a 'float by denomination' dialog which allows the user to select the notes to leave in the Payout module.</p>



3.2 Updating Firmware and Datasets

 **CAUTION!**

Do not power off

If an NV200 validator is connected to a payout module with the wrong version of firmware, the NV200 bezel will flash blue and green for about 10 seconds on start-up. This is the NV200 updating the payout module, and powering off the unit during this time can cause the payout module to stop working.


The SMART Payout unit firmware and dataset can be updated very easily using the PiPS software. The dataset files can be downloaded from the Innovative Technology Ltd website:

Select Validator:

Select Currency:


Display #

Name	Code	Issue	Validator		
UK (5-10-20-50)	GBP01606	6	NV200		
UK- Gibraltar (5-10-20)	GBP05603	3	NV200		
UK- Guernsey (1-5-10-20)	GBP04603	3	NV200		
UK- Isle of Man (1-5-10-2)	GBP02604	4	NV200		
UK- Jersey (1-5-10-20)	GBP03604	4	NV200		
UK- Northern Ireland (5-1	GBP09605	5	NV200		
UK- Scotland (5-10-20)	GBP06604	4	NV200		
UK- Scotland (B-B-5-10-20)	GBP10604	4	NV200		
UK-Jersey(1-5-10-20-50)	GBP13601	1	NV200		
UK-Northern Ireland(5-10-	GBP23601	1	NV200		
UK-Scotland(5-10-20-50)	GBP11603	3	NV200		

 **Information**

Check update file version.

Only update files from v4.08 and above will automatically update the payout module. Earlier versions require the payout module to be updated separately.

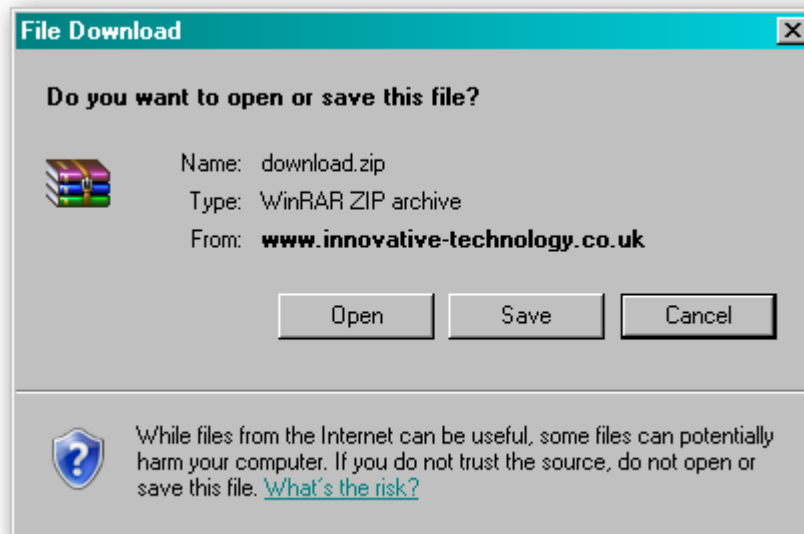
 **Information**

Combined data files

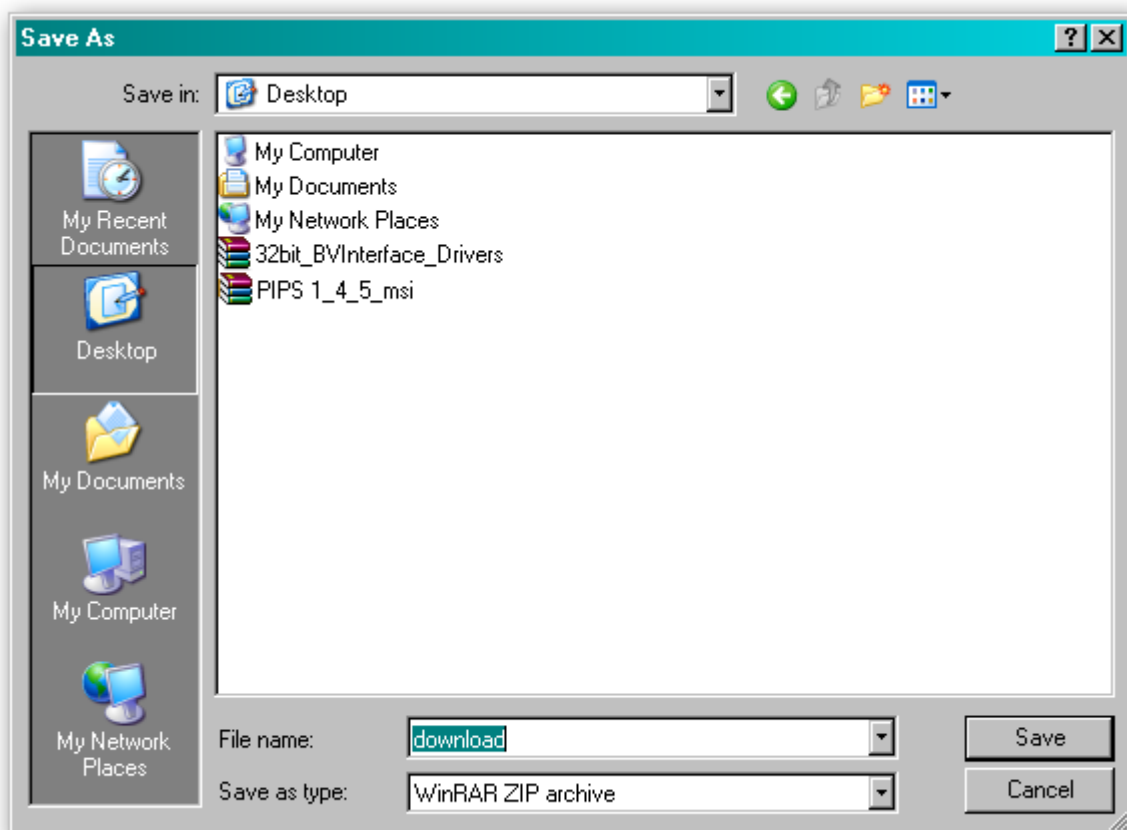
The firmware and dataset files for the SMART Payout unit are combined into a single file, so both will be updated when you carry out the update.



After selecting the dataset, a dialog will prompt you to save or open the file: select the **Save** option

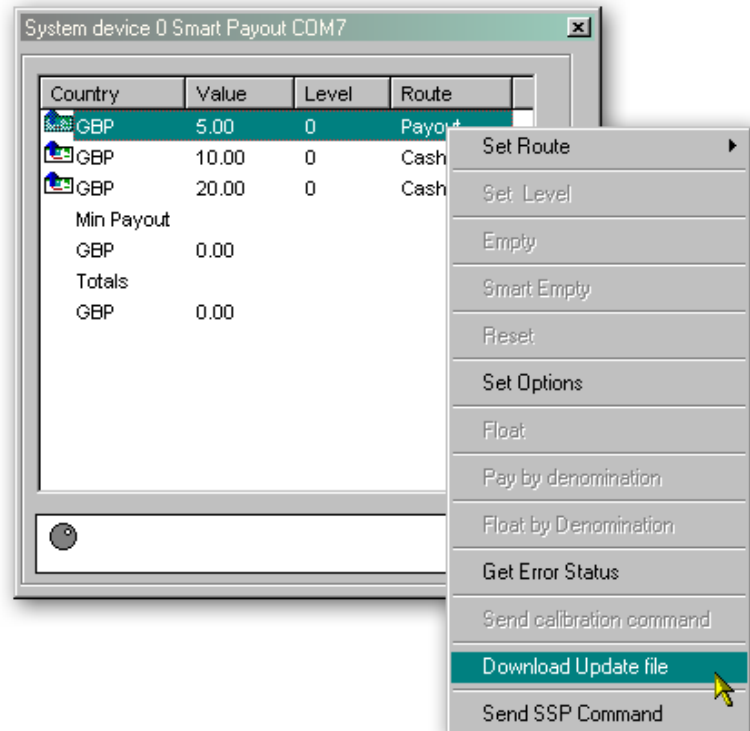


You can then choose where to save the file – choose a location that is convenient for you:

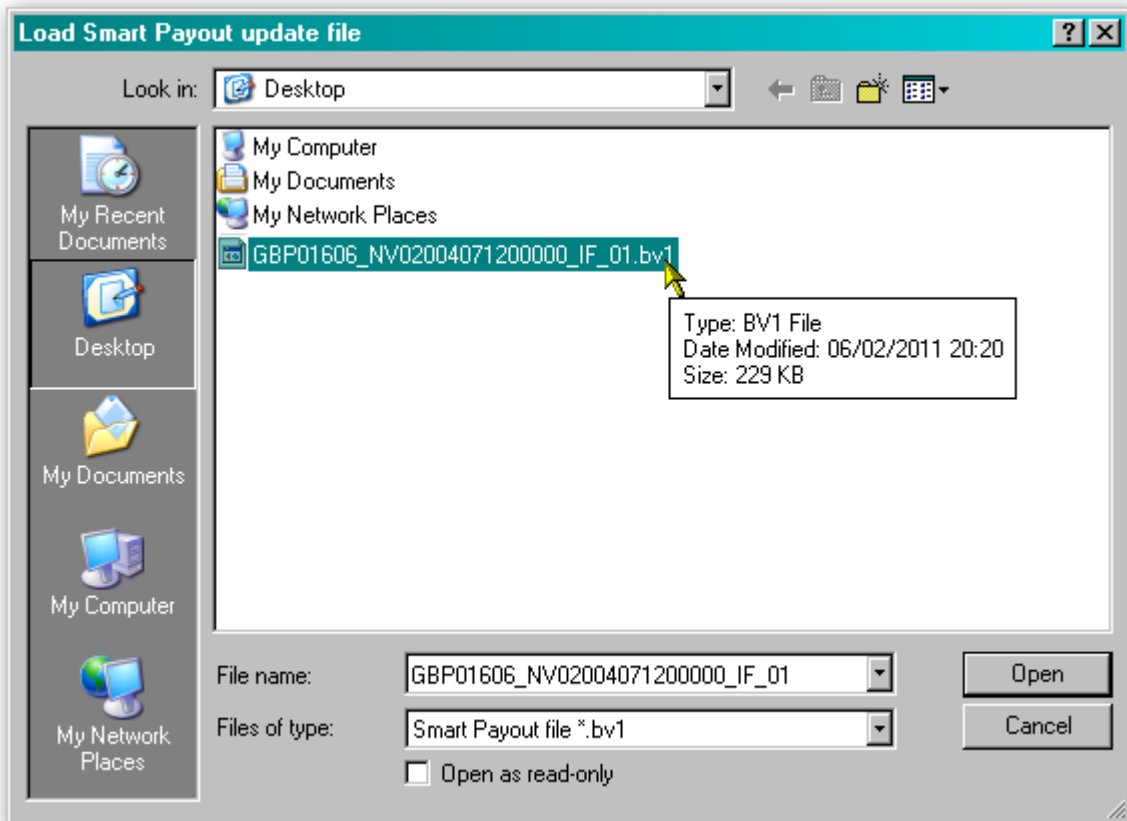


Once the dataset file is saved, unzip the file and you can then start the process to update the SMART Payout unit by connecting the USB cable and starting the PiPS software as described previously.

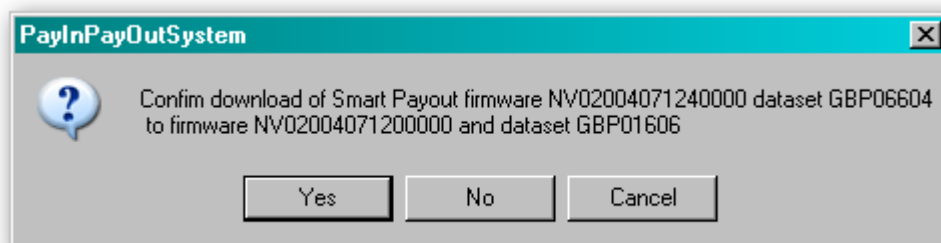
With the PiPS software in 'Halt' mode, right click on one of the currency entries and select 'Download Update File' from the dialog as shown here:



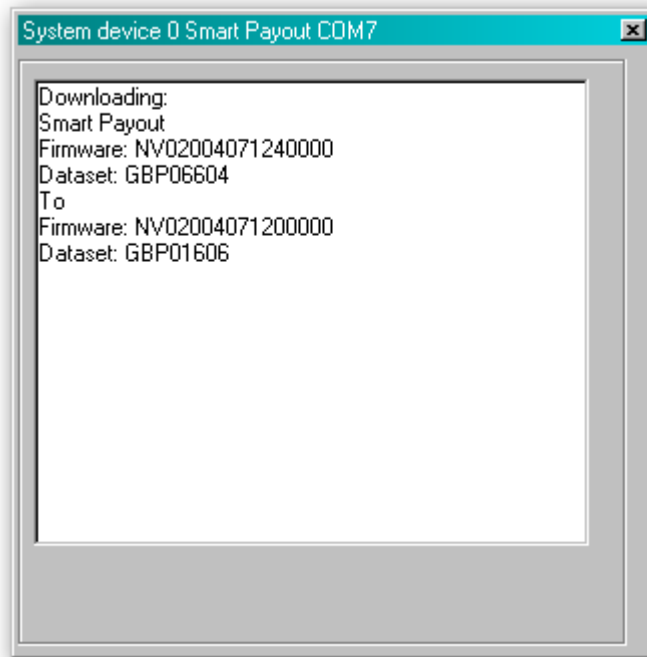
You will then be prompted to select the dataset file you downloaded and unzipped earlier – select the file and click the 'Open' button:



The PiPS software will then ask you to confirm that this is file you want to use to update the SMART Payout unit with – click the 'Yes' button to continue:

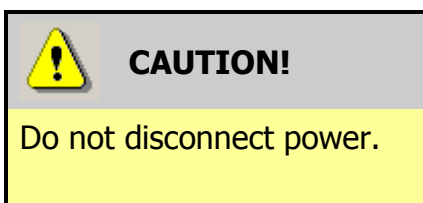


A new dialog will then appear showing the update status:



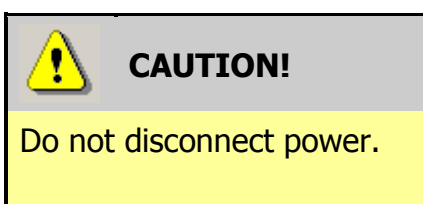
During the update, the Validator head bezel will display 3 states:

1. Blue Flash [■] – this indicates the NV200 validator is being updated with the firmware.
2. Green [■] - there is about a 5 second pause before the payout module is updated.



Do not disconnect the power or data connection, or separate the NV200 head from payout module at this point. Doing so could cause the unit to become un-usable.

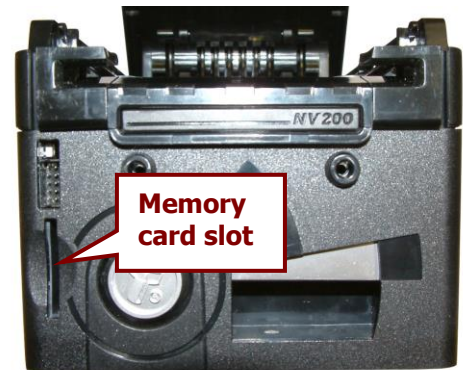
3. Green/Blue [■/■] – the NV200 is transferring and installing the update in the payout module.



Do not disconnect the power or data connection, or separate the NV200 head from payout module at this point. Any interruption in this process could result in an un-usable unit.

Once the payout module is successfully updated the SMART Payout unit will be reset and will then be ready for use with the new currency.

It is also possible to update the SMART Payout unit by using the memory card slot on the front of the NV200 validator (shown in the picture on the right):

**Information**

Only use 8mb Atmel Data Cards

Only Atmel 8MB DataFlash[®] cards can be used (ITL part number IC237). **Standard SD memory cards will not function.**

The memory card will need preparing using a DA3 Programming Unit and the NV Memory Card Utilities software - this procedure is documented in ITL Document number GA796 – NV Card Utilities.



**CAUTION!**

Check DA3 firmware version.

If using a DA3 and memory card to update the SMART Payout unit, the DA3 firmware should be up-to-date (check the ITL website for the latest version). Using older versions of the DA3 firmware can corrupt the validator.

Once the memory card has been programmed with the required information, the SMART Payout unit is re-programmed by simply inserting the card into the NV200's memory card slot – make sure that the SMART Payout unit is powered up before inserting the card.



During the update, the Validator head bezel will display 3 states:

1. Blue Flash [] – this indicates the NV200 validator is being updated with the firmware.
2. Green [] – there is about a 5 second pause before the payout module is updated.

**CAUTION!**

Do not disconnect power.

Do not disconnect the power or data connection, or separate the NV200 head from payout module at this point. Doing so could cause the unit to become un-usable.

3. Green/Blue [ / ] – the NV200 is transferring and installing the update in the payout module.

**CAUTION!**

Do not disconnect power.

Do not disconnect the power or data connection, or separate the NV200 head from payout module at this point. Any interruption in this process could result in an un-usable unit.

Once the payout module is successfully updated the SMART Payout unit will be reset and will then be ready for use with the new currency. After the update is complete, remove the memory card from the slot.

**Information**

Only use 8mb Atmel Data Cards

Only Atmel 8MB DataFlash[®] cards can be used (ITL part number IC237). Standard SD memory cards will **not** function.



3.3 Tools

3.3.1 Diagnostics

There are several software packages available for download from the Innovative Technology Ltd website that can be used to provide diagnostics and troubleshooting information.

These software tools include:

- NV Memory Card Utilities
- Bank Note Validator Diagnostics Tools
- PiPS

Use of the PiPS software has been covered earlier in this manual, but all the software packages have help files to assist you with the use of the particular program.

3.3.2 Connections

a. SMART Payout

The SMART Payout unit has two connectors that are used to allow interfacing and programming; these connectors are easily accessible on the top of the unit.

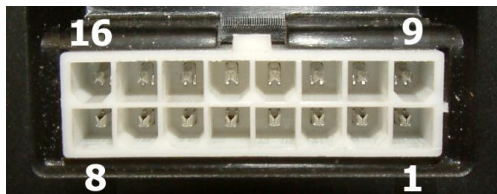


Information

Power always required regardless of connection type.

Power is always required on pins 1 and 9 of the 16 way connector.

The pin numbering of the socket is shown below, as well as an overview of the socket connections:



Pin	Description
1	0V / Ground Connection
9	+12V DC
14	Serial Data In (Rx)
16	Serial Data Out (Tx)

Power must be provided from the 16 way connector. USB port is for bench testing only – **NOT** to be used for host communications. An IF17 is to be used if USB is required.



SMART Payout SSP Interface:

Pin	Name	Type	Description
1	GND	Input	GND
2	Factory use only		Do not connect
3			
4	RxD Opto -	Input	Opto RxD -
5	Factory use only		Do not connect
6	RxD Opto +	Input	Opto RxD +
7	Factory use only		Do not connect
8	TxD Opto Emitter	Output	Opto isolated TxD Emitter
9	V In	Input	+12 V DC
10	Factory use only		Do not connect
11	RxD RS232	Input	RS232 RxD
12	Factory use only		Do not connect
13	TxD Opto Collector	Output	Opto Isolated TxD Collector
14	RxD	Input	TTL RxD
15	TxD RS232	Output	RS232 TxD
16	TxD	Output	TTL TxD

SMART Payout ccTalk (CC2) Interface:

Pin	Name	Type	Description
1	GND	Input	GND
2	Factory use only		Do not connect
3			
4			
5			
6			
7			
8			
9	V In	Input	+12 V DC
10	Factory use only		Do not connect
11			
12			
13			
14	RxD	Input	TTL RxD
15	Factory use only		Do not connect
16	TxD	Output	TTL TxD

**WARNING!****Risk of unit damage**

Do not make any connections to the interface socket pins marked '**Do not connect**' – making connections to these pins could cause severe damage to the unit.



b. NV200

As with the payout module, the NV200 validator has two connectors that are used to allow interfacing and programming; these connectors are easily accessible at the back of the validator – be aware that these connectors will not be accessible if the payout module is fitted.

The first connector is a 16 pin socket used to interface the NV200 either to the machine it is being installed in or the payout module. The pin numbering of the socket is shown here:



Caution!
Pin numbering differences

The pin numbering sequences on the NV200 and the payout module are different – bear this in mind if making your own cables.

The second connector is a USB connector – this is a standard Type 'B' USB socket, and is used for interfacing to the payout module; it can also be used for programming and serial communications. The function of pins 1 to 9 can change depending on which machine interface is being used with the NV200. When used with the payout unit, the validator will be using either SSP or ccTalk (CC2) interfaces; the socket connections for each of these interfaces are shown in the tables below:

NV 200 SSP Interface:

Pin	Name	Type	Description
1	TxD	Output	TTL TxD
2	TxD Opto Emitter	Output	Opto isolated TxD Emitter
3	RxD Opto +	Input	Opto RxD +
4	RxD Opto -	Input	Opto RxD -
5	RxD	Input	TTL RxD
6	TxD RS232	Output	RS232 TxD
7	RxD RS232	Input	RS232 RxD
8	Factory use only		Do not connect
9	TxD Opto Collector	Output	Opto Isolated TxD Collector
10	Factory use only		Do not connect
11			
12			
13			
14			
15	V In	Input	+12 V DC
16	GND	Input	GND



NV200 ccTalk (CC2) Interface:

Pin	Name	Type	Description
1	TxD	Output	TTL TxD – connect to pin 5
2	Factory use only		Do not connect
3			
4			
5			
6	Factory use only		Do not connect
7			
8			
9			
10			
11			
12			
13			
14			
15	V In	Input	+12 V DC
16	GND	Input	GND

**WARNING!****Risk of unit damage**

Do not make any connections to the interface socket pins marked '**Do not connect**' – making connections to these pins could cause severe damage to the unit.

3.4 Frequently Asked Questions

a. What settings should I use on the DIP switches on the rear of the unit?

- Look at the DIP switch tables in Section 1 of this manual set (subsection 1.4)

b. How do I use the encryption key?

- The encryption key is made up of two parts – this is explained in Section 5 of this manual set. The two parts of the encryption key are:
 - a) A variable key (one that is exchanged at start up by the host machine – read Section 5, subsection 5.2 for more information)
 - b) A fixed key (which can be set using the PiPS software as described in this manual). The default key value is 0x0123456701234567

c. My notes are always stacked in the cashbox even though I have chosen for them to go into the payout unit

- Check that the Green LED on the rear of the SMART Payout unit is flashing – see the Flash Codes in Section 1 of this manual set (subsection 1.9) if this is not the case.
- Make sure the diverter is in the correct position – with the unit powered up turn DIP switch 8 ON and OFF to make sure.
- The Payout module might be disabled in software - send an enable payout command.
- The Payout module might be full – check how many notes are stored using your host software.
- The notes might be detected as damaged or not straight – in this case they will be stacked in the cash box so that they will not jam the payout module.

d. My payout module is communicating in ccTalk but I want to update it. How can I do this?

- To do this, the validator head needs to be removed – you can find out how to do this by following the procedure in Section 1 of this manual set (subsection 1.1).
 - a) Provide power to the NV200 validator. Don't worry that the bezel lights are flashing as this is normal.
 - b) Turn DIP switch 8 on the rear of the validator up then down. The bezel will quickly flash then the unit will reset.
 - c) Remove the power and refit the validator to the payout module.
 - d) Update the unit using the PiPS software (as shown in subsection 3.2 of this manual).



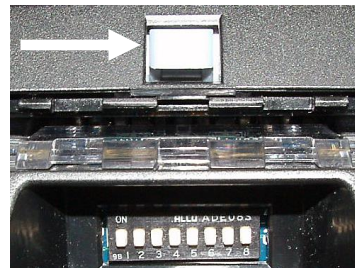
e. My payout module has stopped functioning and I want to return it for repair - however it has bank notes inside

- All bank notes that are inside payout modules returned to ITL are handled with the highest security and carefully tracked internally until their return to the customer - if you do not want to ship the unit with the bank notes inside, please follow the instructions for manual payout in Section 4 of this manual set (subsection 4.10).
- If manual payout is not possible please contact ITL technical support.

f. Is my NV200 validator compatible with the payout module?

- Early revisions of the NV200 did not support the payout module. Check for all of the following features to ensure compatibility:

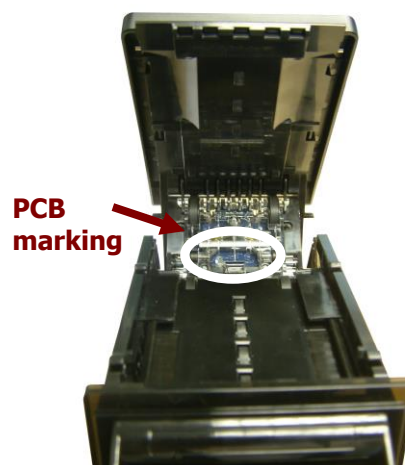
A grey diverter plunger on the rear of the NV200 validator head (just above the DIP switches)



Mounting brackets on the rear of the cash box housing



Open the NV200 validator lid and check the marking on the PCB where shown in this picture – the marking needs to read **PB266_4**



If any one of these features is not present, a new NV200 validator will be needed.



- g. Can I connect to the Host machine via USB?
- The direct USB port is for on the bench testing/Programming only. If a USB connection is desired, we recommend going through our IF17. The IF17 is a TTL to USB conversion box which filters out any noise and provides a smooth signal between the SMART Hopper and Host machine.