

SECTION 3

SMART Hopper 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.

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 Hopper devices.

3.1.1 Preparing for Installation

If you do not have the PiPS software, 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 Register - Create an account and follow the on-screen instructions.

To download a software file you must first login.

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](#)

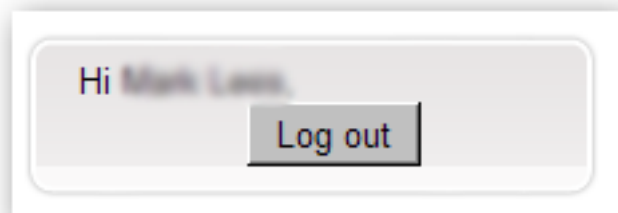
Latest Datasets

NOK0110300 (NV10)
NOK01603 (NV200)
NOK01103 (NV10USB)
NOK01603 (SMART [Payout](#))
CZK02201 (BV20)
TSR01201 (BV20)
BRL03211 (BV20)
BRL05203 (BV20)
GTQ01206 (BV20)
GTQ03201 (BV20)

Title	Version	File
Bank Note Validator Currency Manager	3.3.13	
VPS (Validator Programming System)	1.0.16	
SMART PIPS (Pay In Pay Out System)	1.4.5	
NV Card Utilities	1.3.1	
DA2 Drivers - 32 bit	1	
DA2 Drivers - 64 bit	1	
DA3 Drivers 32 bit	1	
DA3 drivers 64 bit	1	
BV Interface Driver Install - 32 bit	2	
BV Interface Driver Install - 64bit	2	

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.

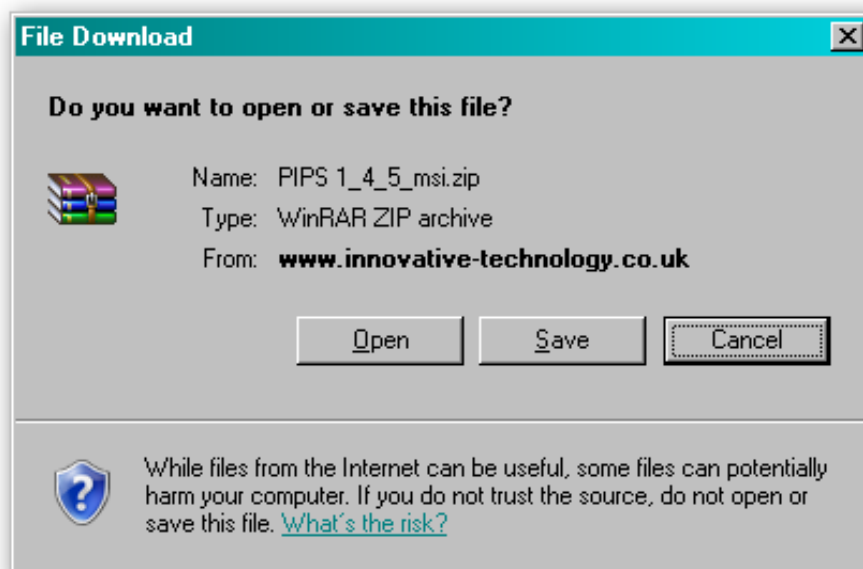


In this case, we want to download the PiPS software, so we click on the padlock icon opposite the 'SMART PIPS (Pay in Pay out System)' filename:

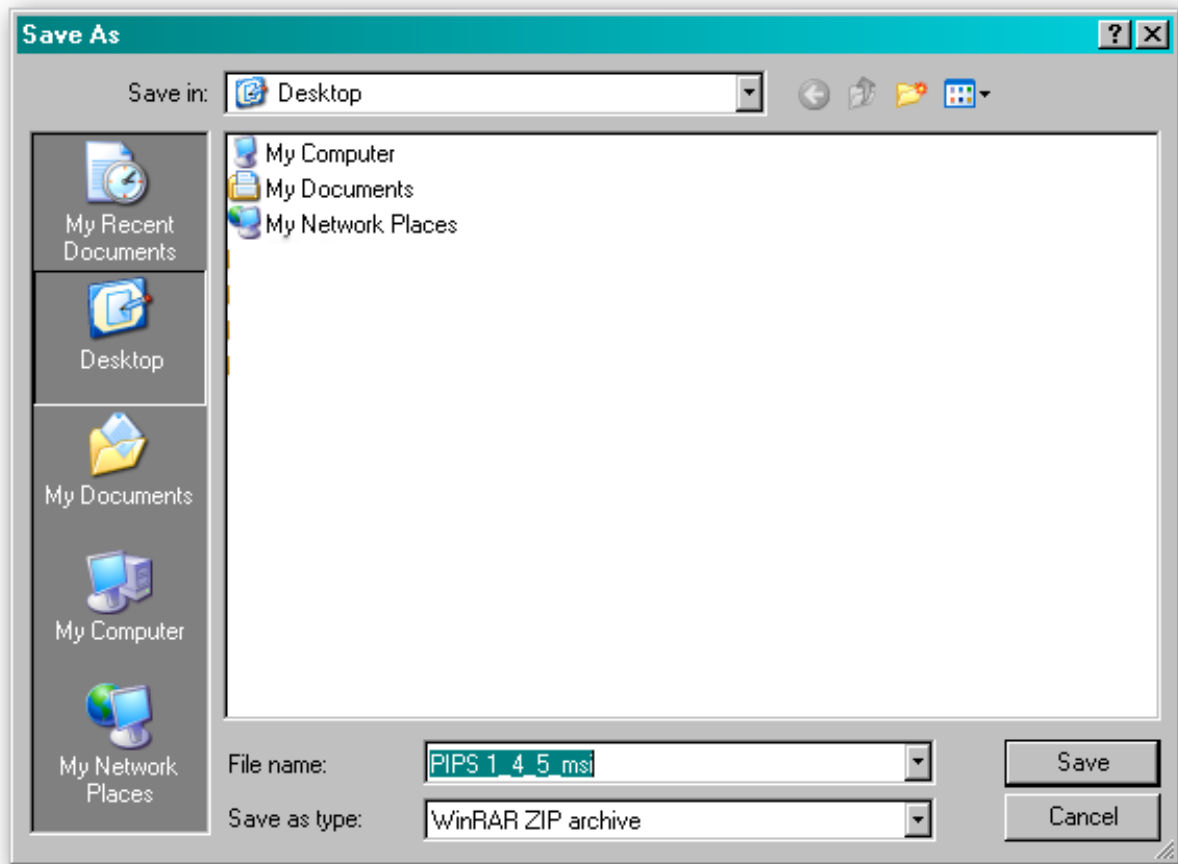


Title	Version	File		
VPS (Validator Programming System)	1.0.16			
Bank Note Validator Currency Manager	3.3.11			
Bank Note Validator Diagnostics Tools	1.0.4			
SMART PIPS (Pay In Pay Out System)	1.4.5			
DA2 Drivers - 32 bit				
DA2 Drivers - 64 bit	1			
BV Interface Driver Install - 32 bit	2			
BV Interface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

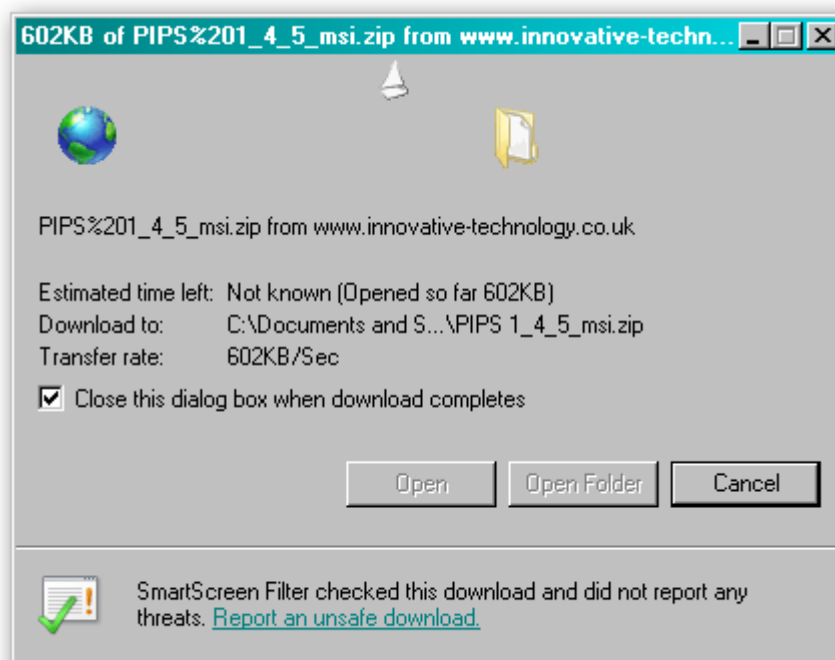
After clicking the link, a file download dialog box will appear – choose the option to **save** the file:



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.

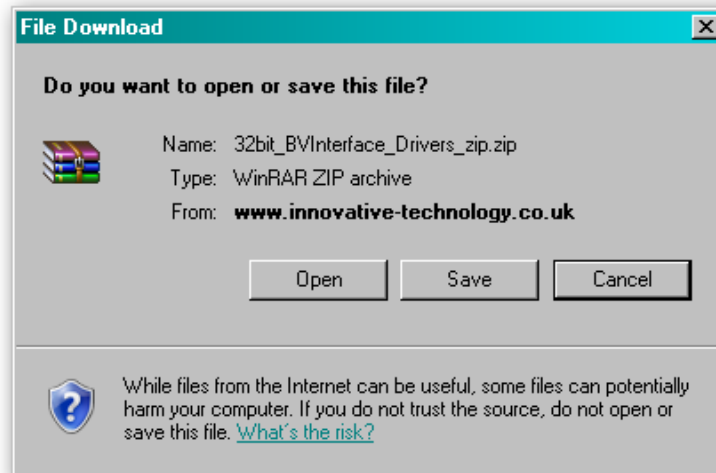


After choosing where to save the file, a file transfer dialog box will appear showing the progress of the file download:

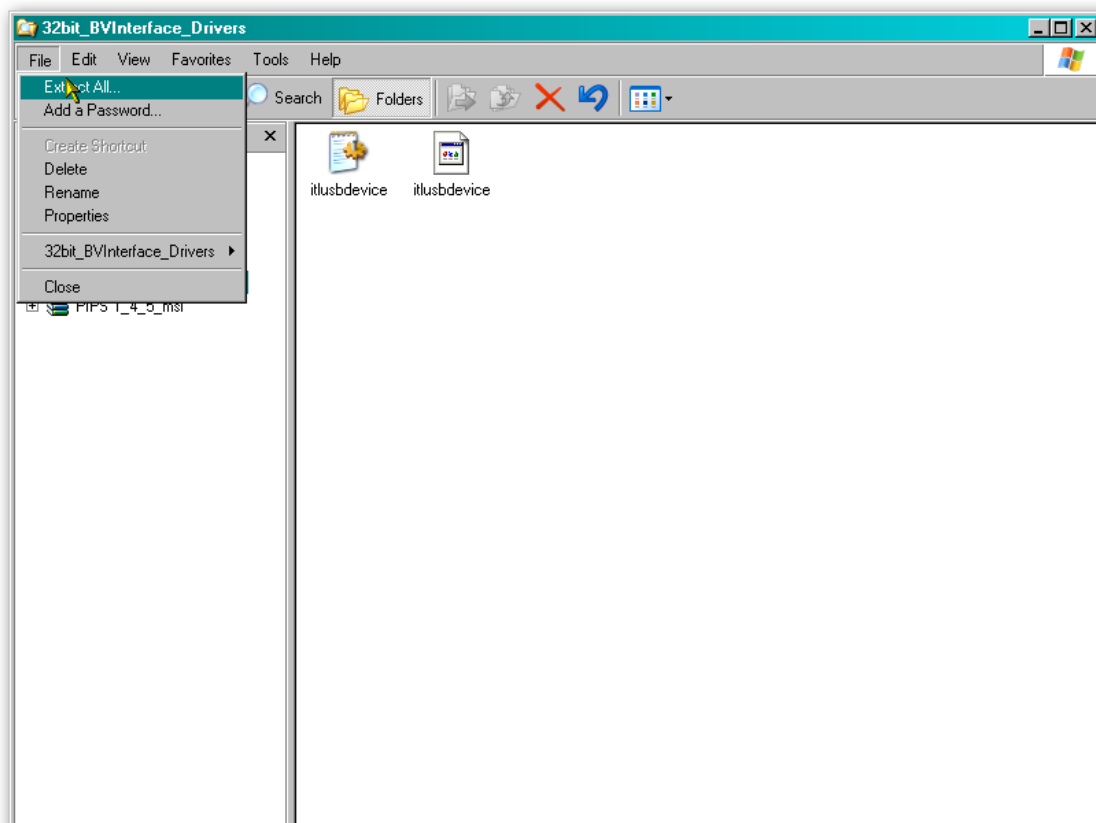


3.1.2 BV Interface Drivers

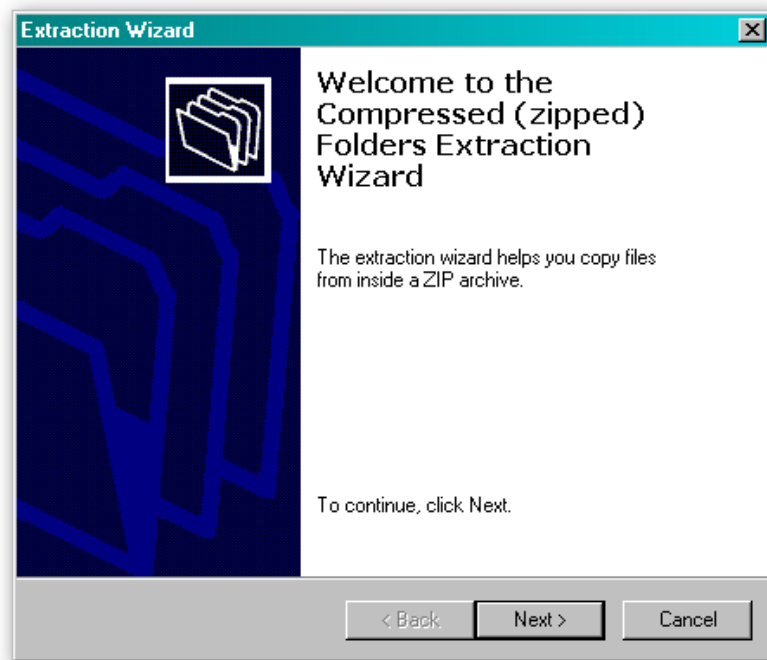
After downloading the PiPS software, you will also need to download the Banknote Validator (BV) Interface drivers – two versions are available (32 bit and 64 bit) so choose the correct type for your operating system. Again, remember where you saved the file.



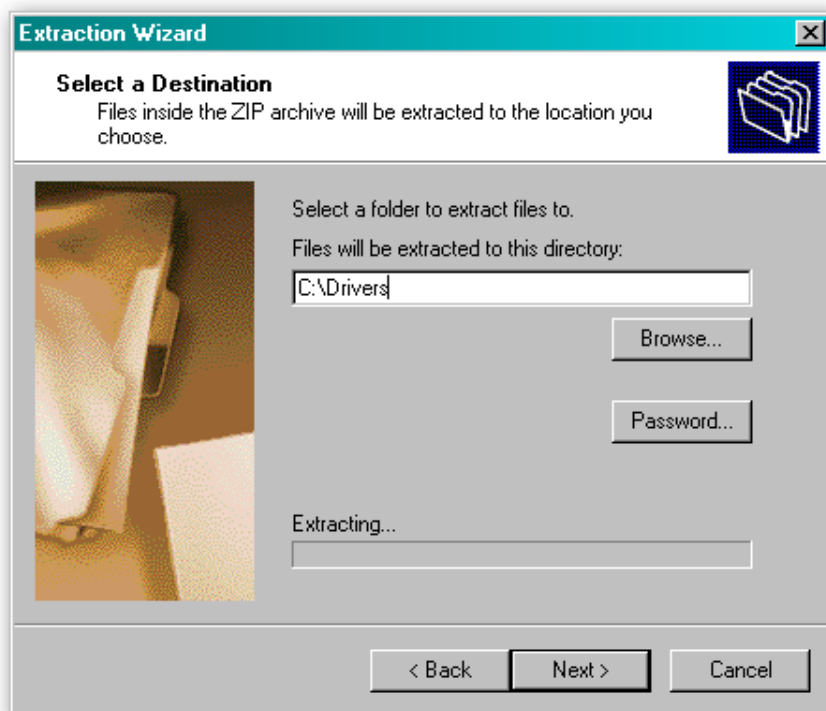
Both files are provided in a 'zipped' (compressed) form – you will need to extract the files from the zipped file before you can install the software or driver. Any version of Windows from Windows 98 onwards can open zipped files; or you may want to use a third party software tool such as Winzip or WinRAR.

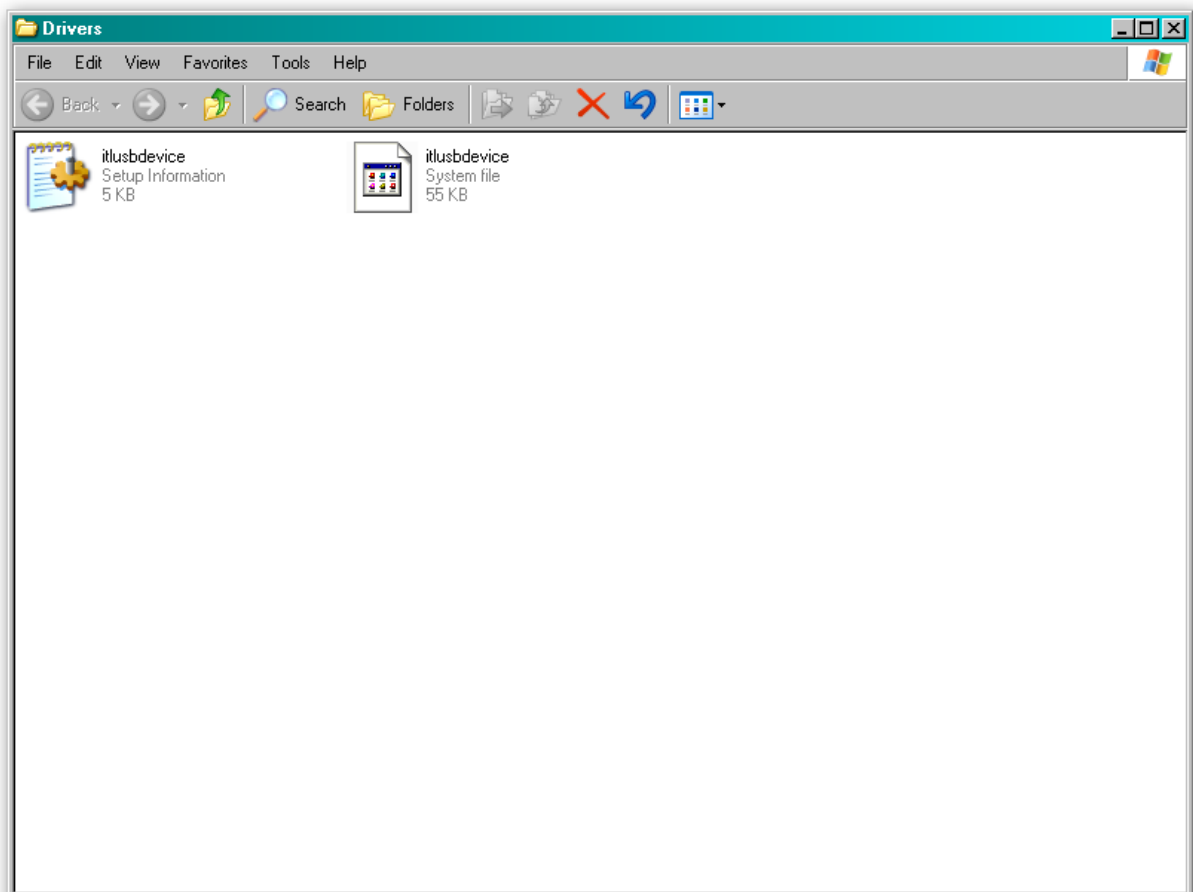
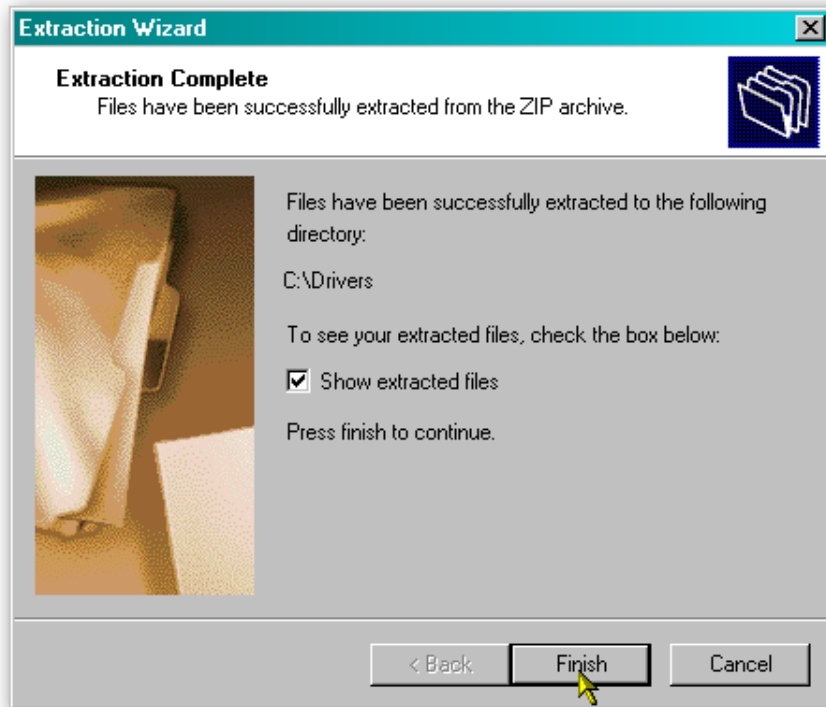


Extract the files to a convenient location – this might be an existing folder, or you may want to save them into a new folder.



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

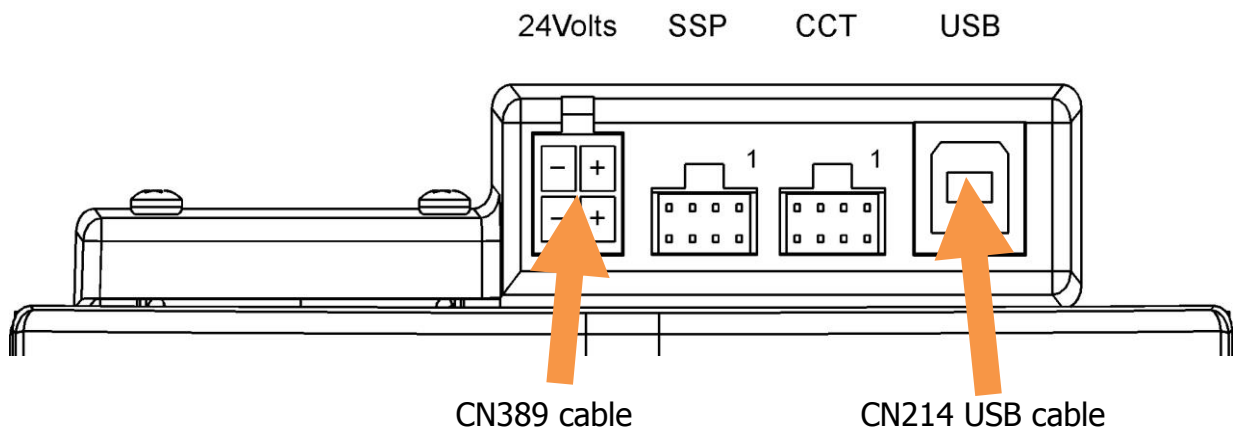




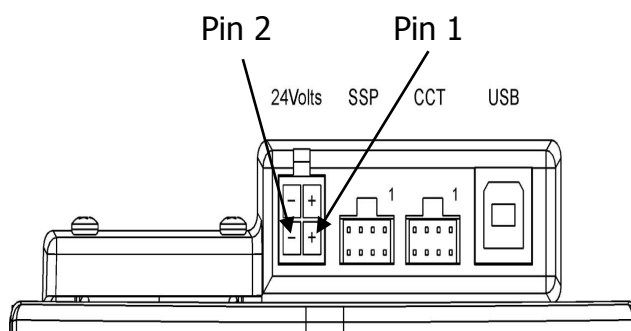
3.1.3 Installing the Drivers

If connecting your SMART Hopper via the IF17 then you can run the IF17 Driver installation.exe found in the Driver package.

If you are using the Direct USB for on the bench testing of the SMART hopper, then the BV Interface drivers will need to be installed – explained in the following section.



The SMART Hopper unit must be powered up for the interface to be recognised by Windows. If the SMART Hopper unit is not in the host machine, you will need to provide power to the 4 way interface connector first. The connection information and pin numbering is as follows:

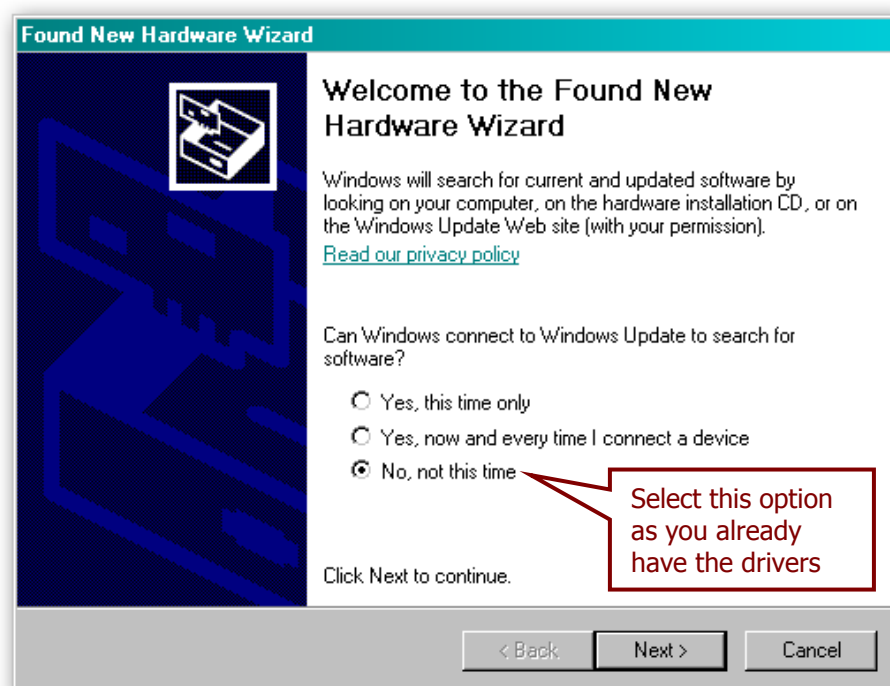


Pin	Description
1	0V / Ground Connection
2	+24V DC

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



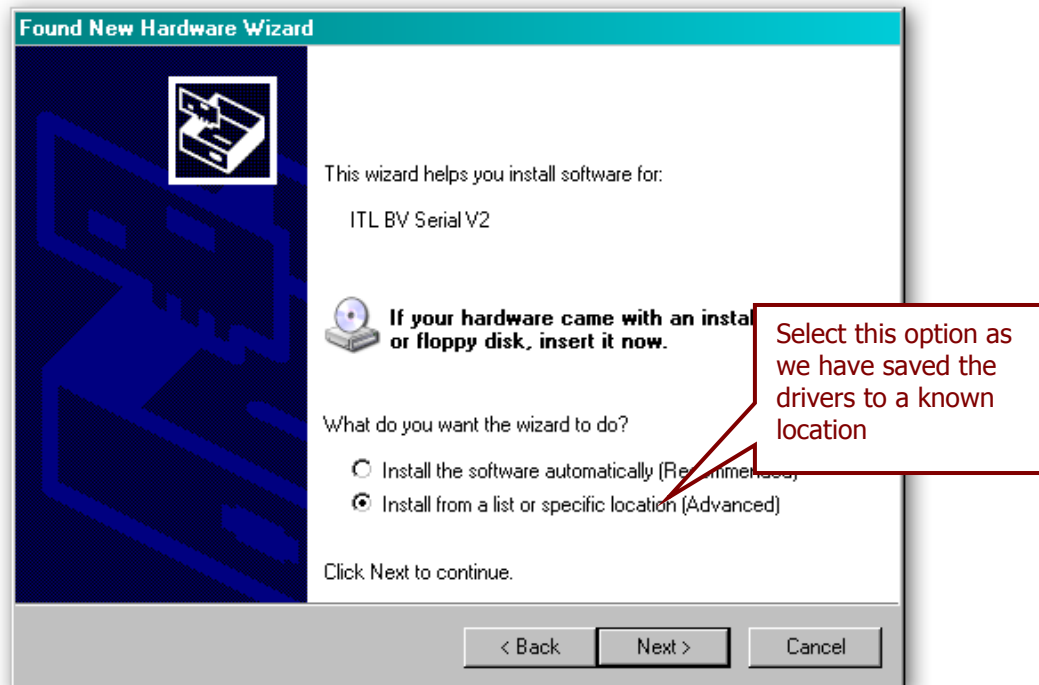
A 'Found New Hardware' wizard should then start to guide you through the installation process (this first screen is not always shown on some computers):

**Information**

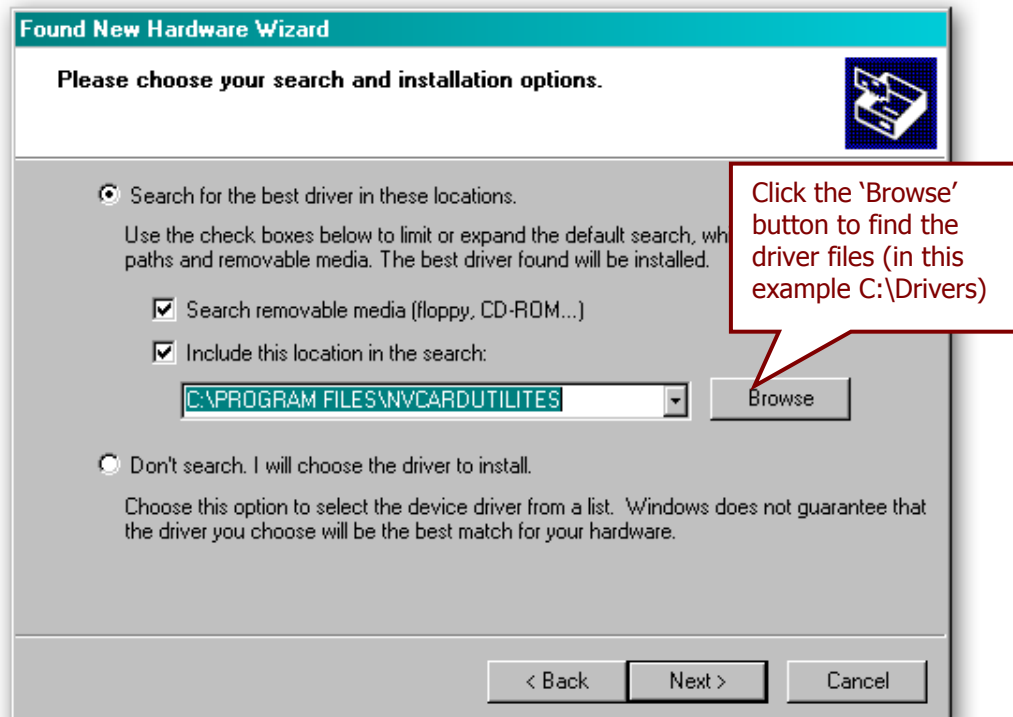
Only use V2 drivers

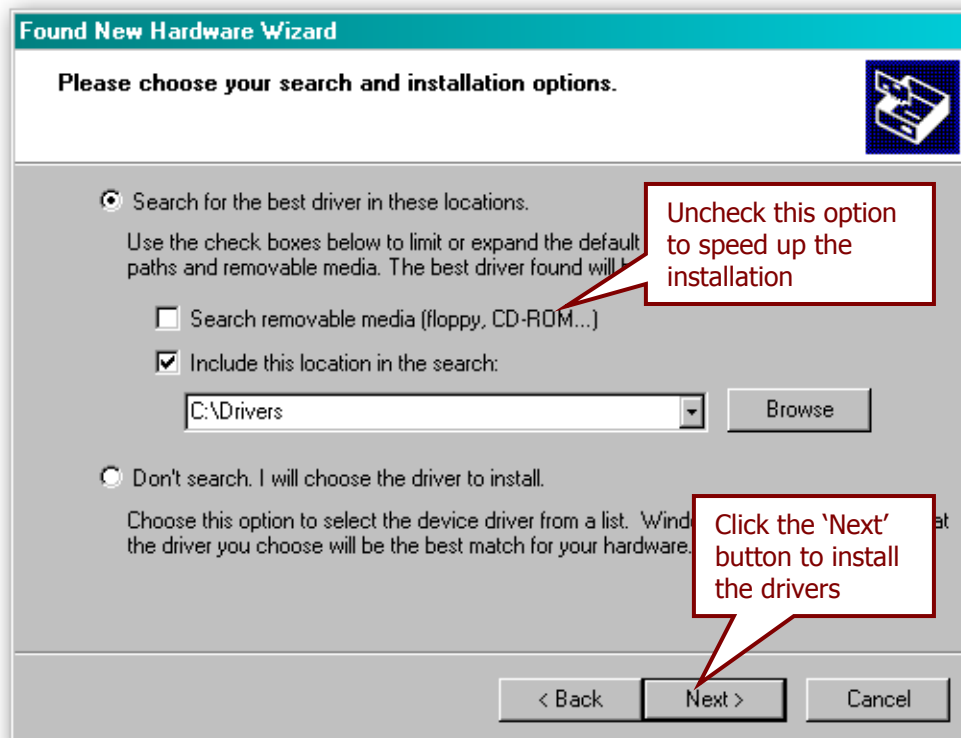
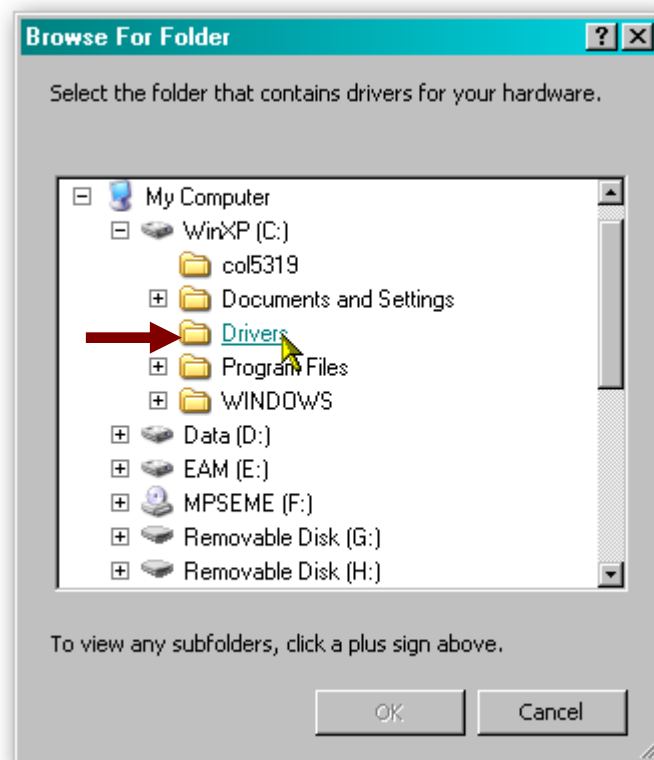
Please make sure that you are using the V2 drivers for the installation.



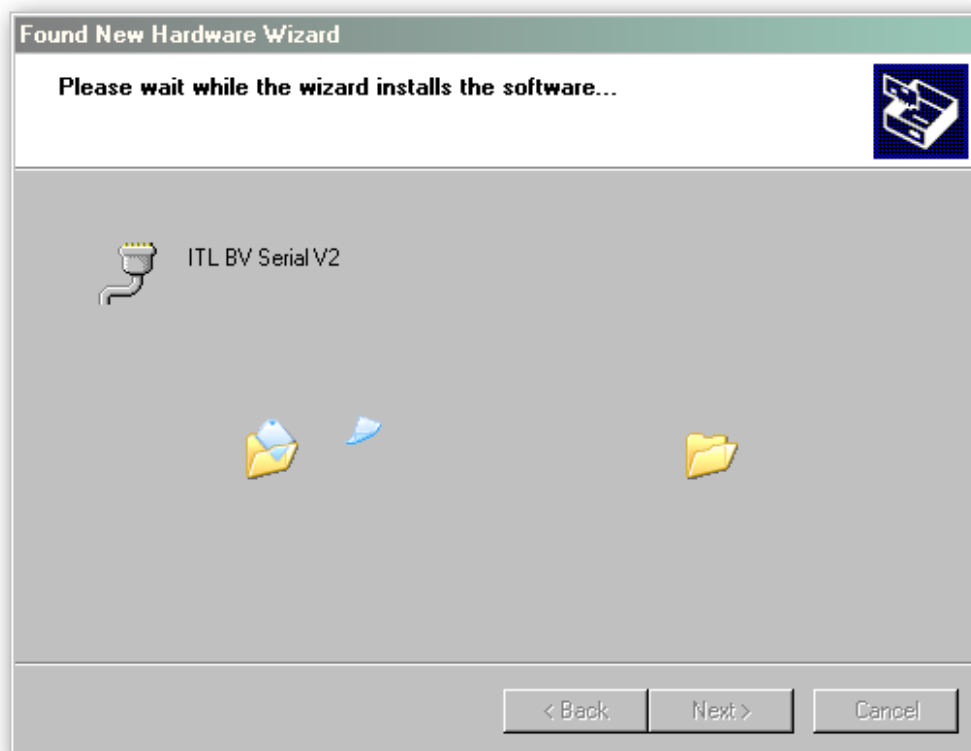
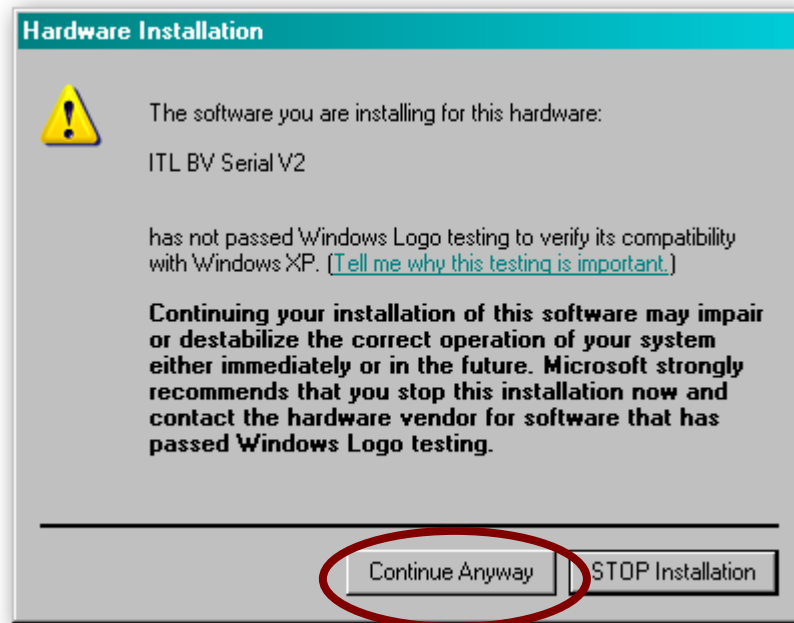


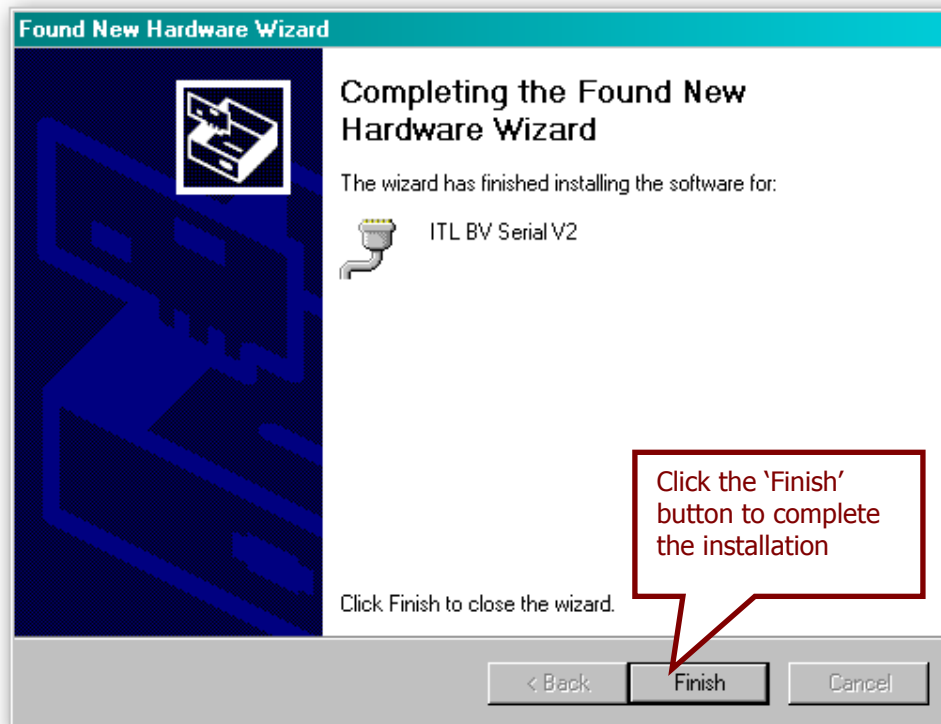
The next dialog box will ask you where to search for the drivers:





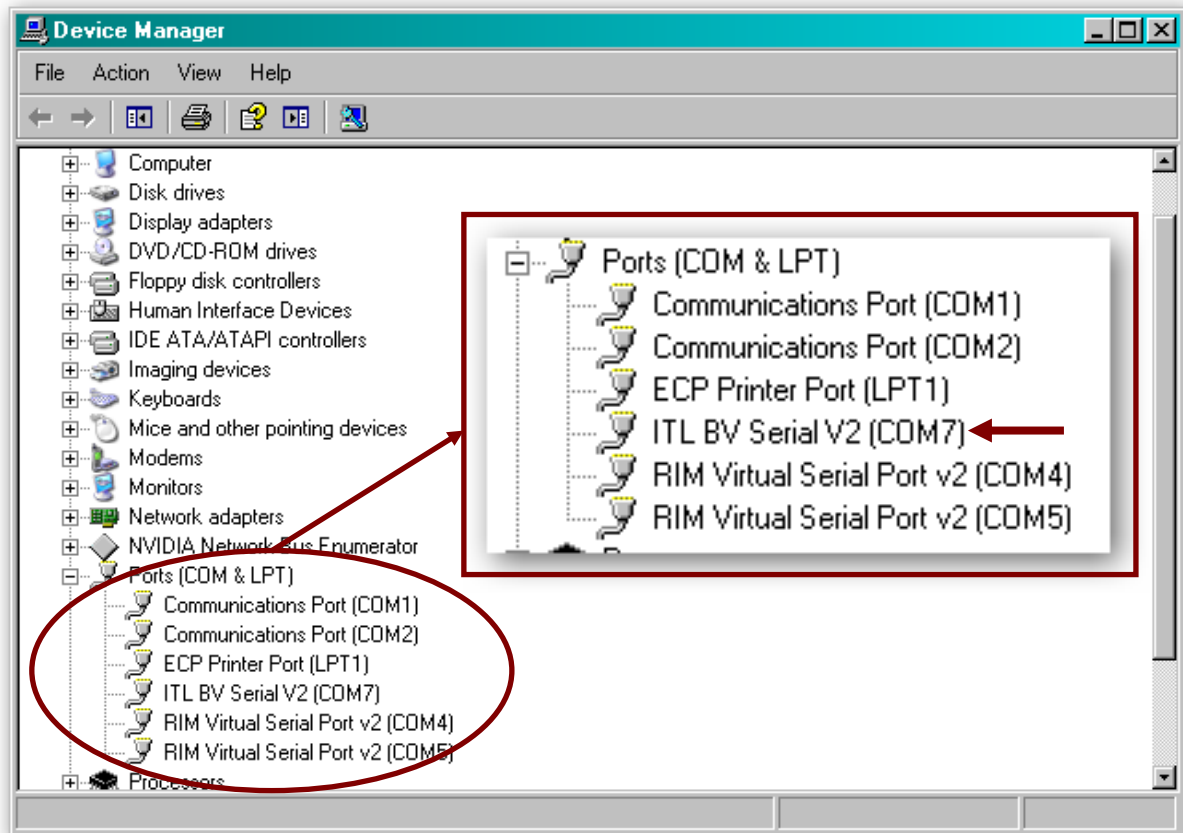
You may see a warning dialog saying that the drivers have not passed Windows logo testing – you can ignore this warning. Just click the 'Continue Anyway' button.





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:

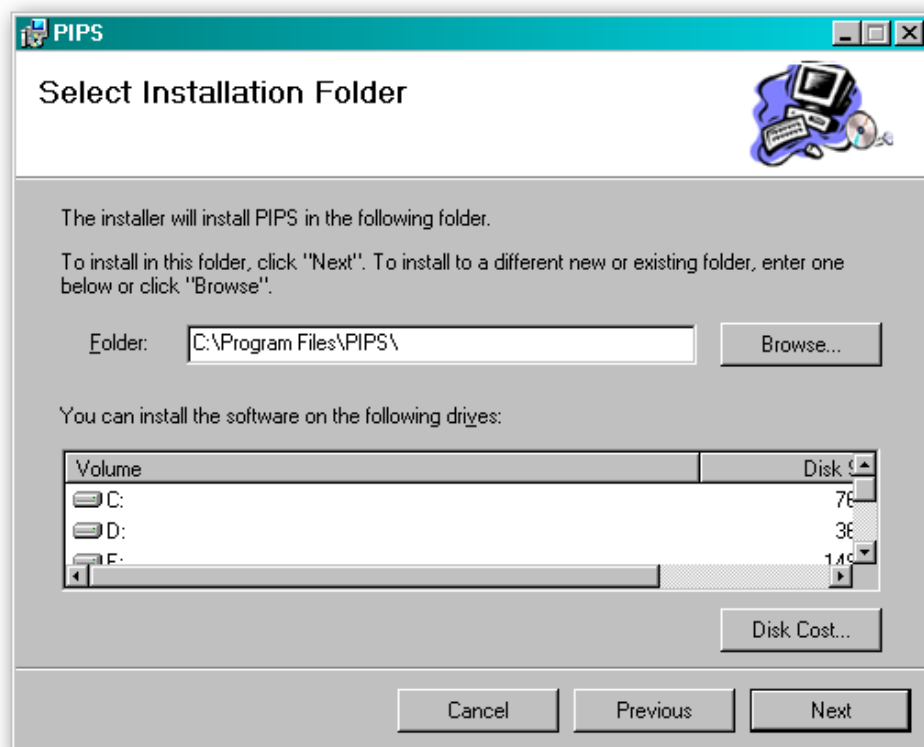


The actual communications port number (in our example COM7) may vary depending on your particular computer configuration.

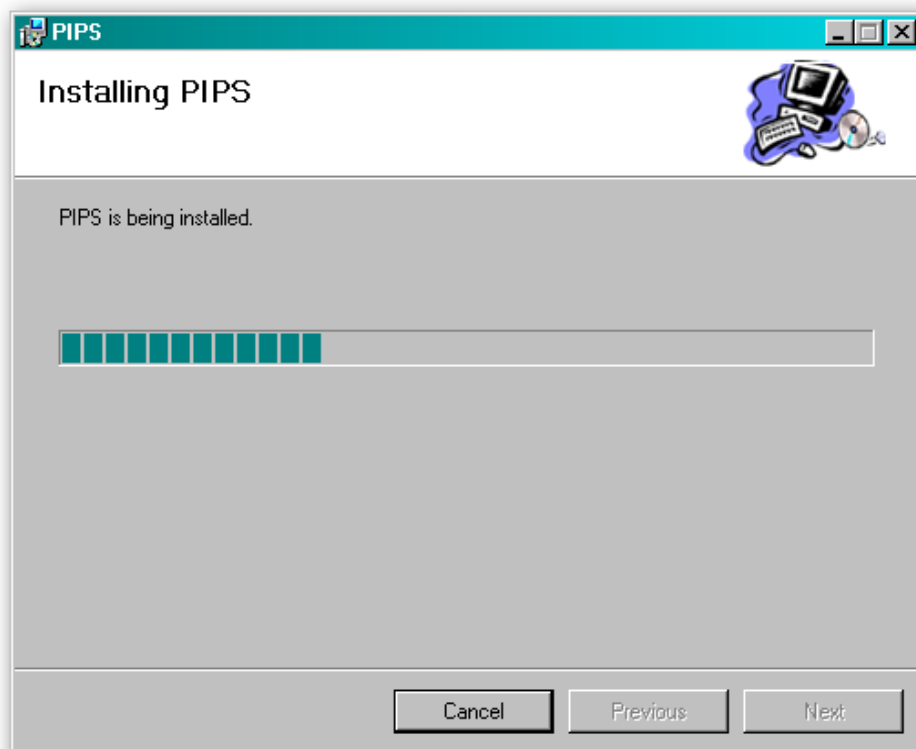
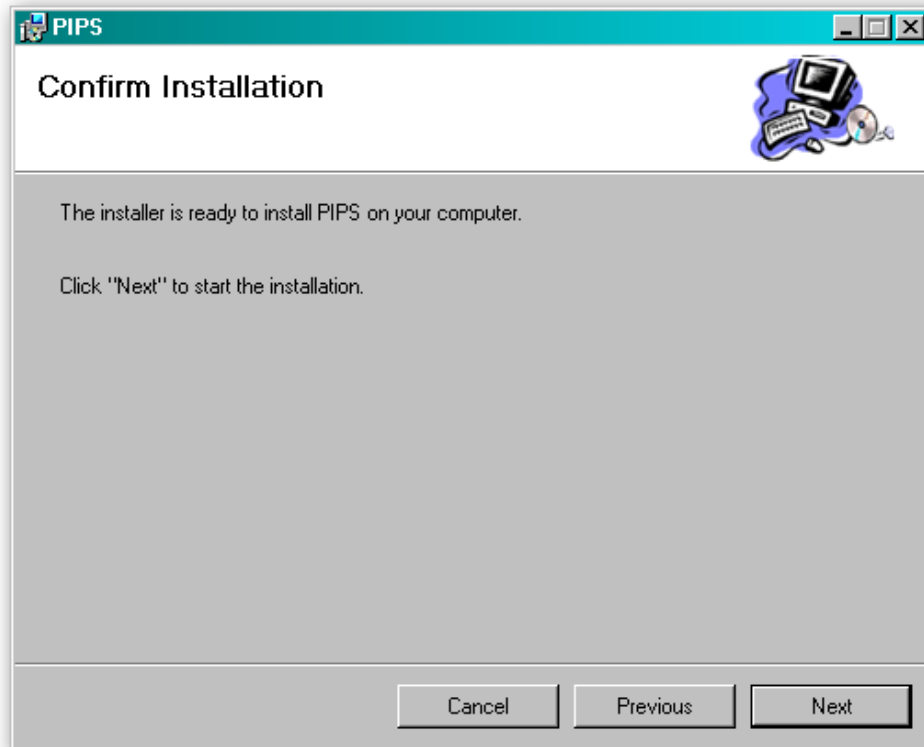
Now the drivers have been correctly installed you can install the PiPS software – this is covered next.

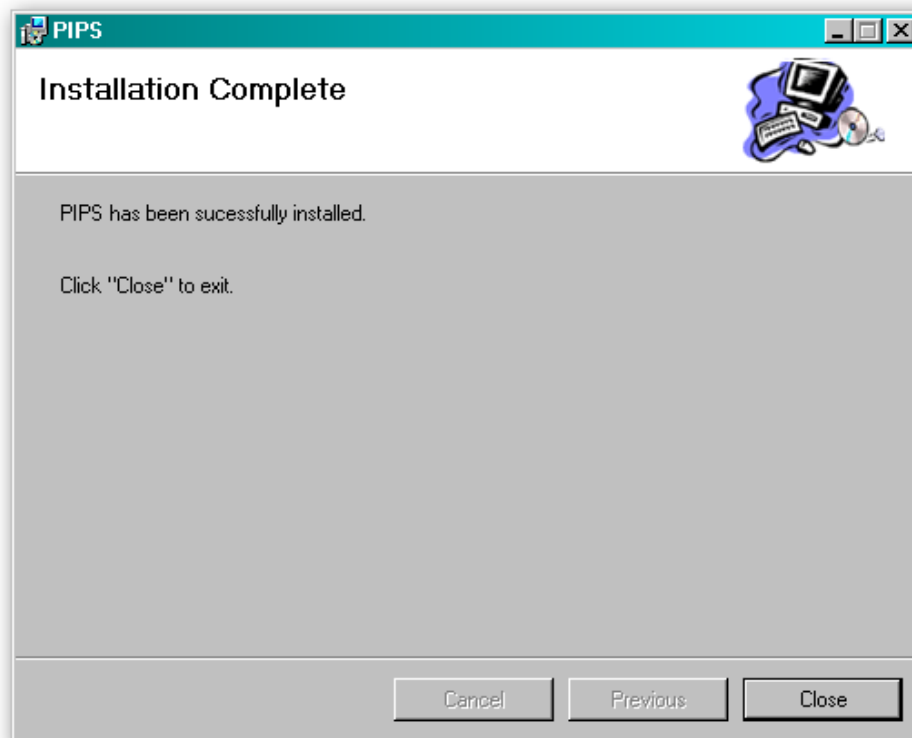
3.1.4 Installing the PiPS Software

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:

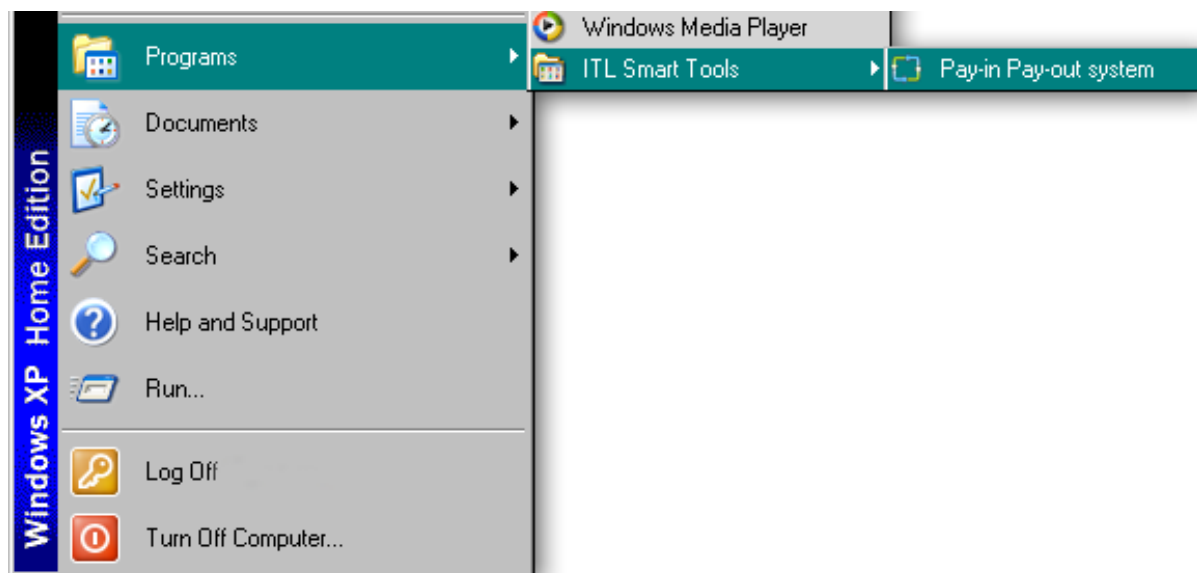


You can choose where you would like to install the software, or just accept the default location (as shown above). Clicking on the 'Next' button will then ask you to confirm the installation:





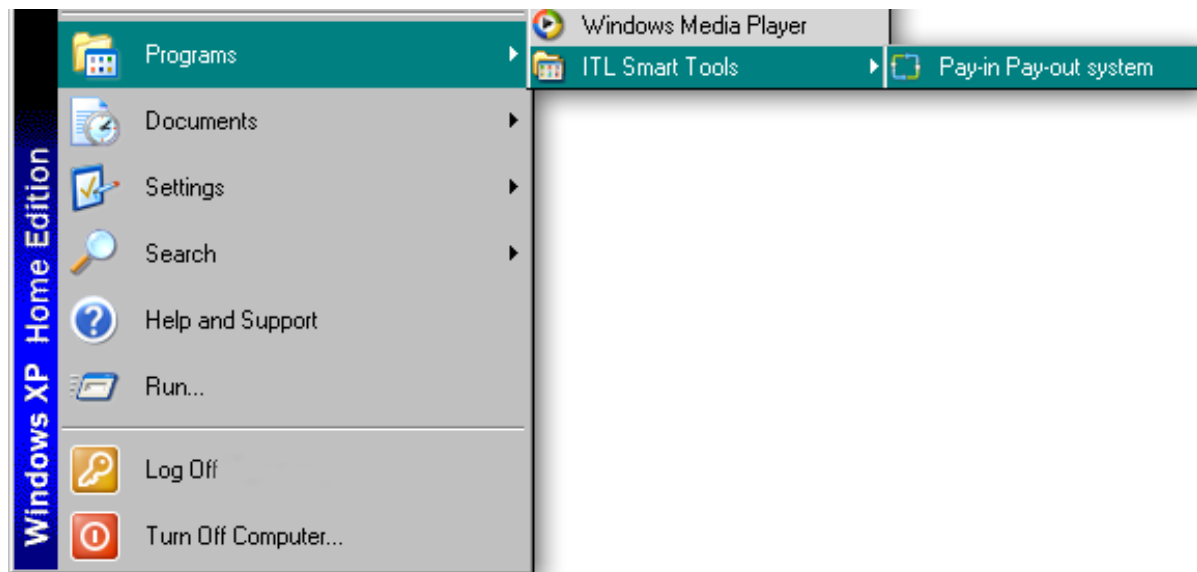
Once the installation is complete, you will have a new program group called 'ITL Smart Tools' in the Windows Start Menu, similar to the one shown here:



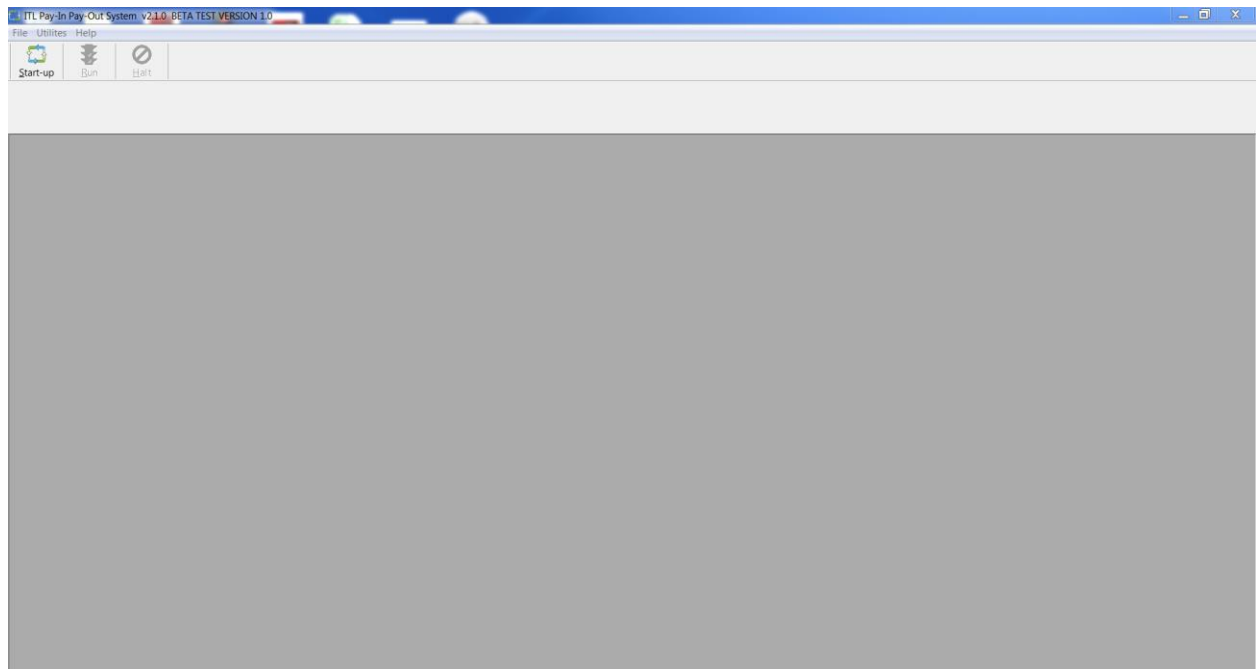
You can run the PiPS software by clicking the 'Pay-in Pay-Out system' menu entry; however, before you can use the PiPS software with a SMART Hopper unit you will need to make sure that you have installed the BV interface drivers (as described earlier).

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.

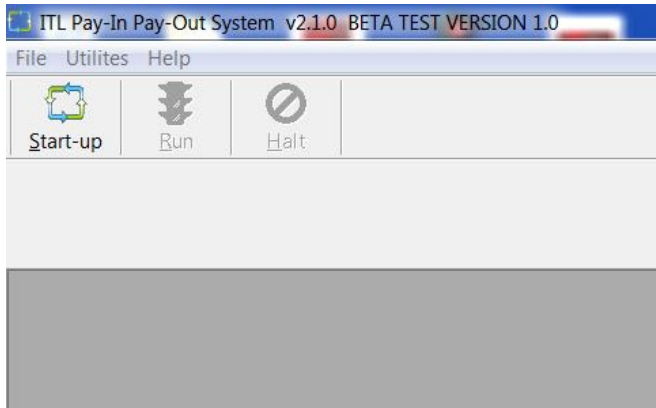


The initial program screen looks like this:

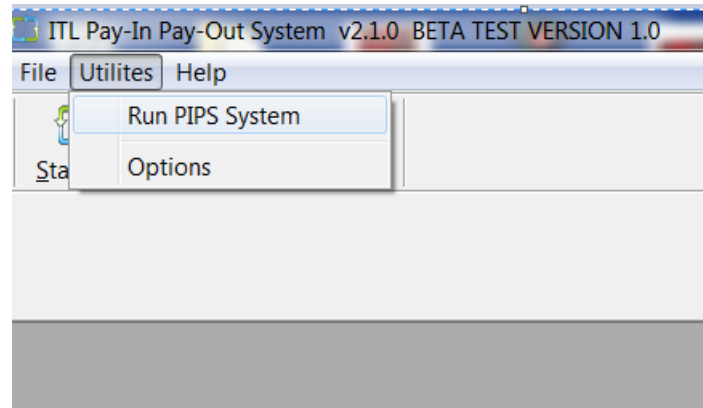


Make sure that the SMART Hopper unit is powered up and the USB cable is connected before going any further.

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

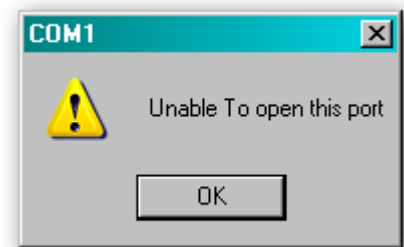


Click the 'Start-up' icon

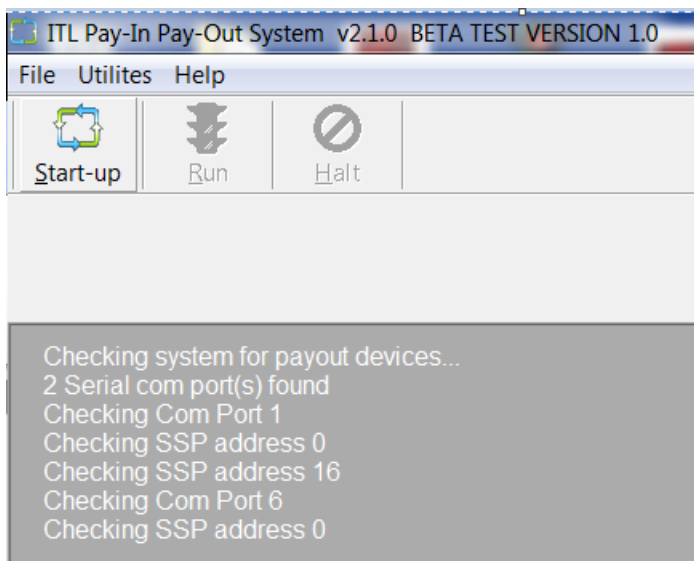


Click 'Utilities', then 'Run PIPS System'

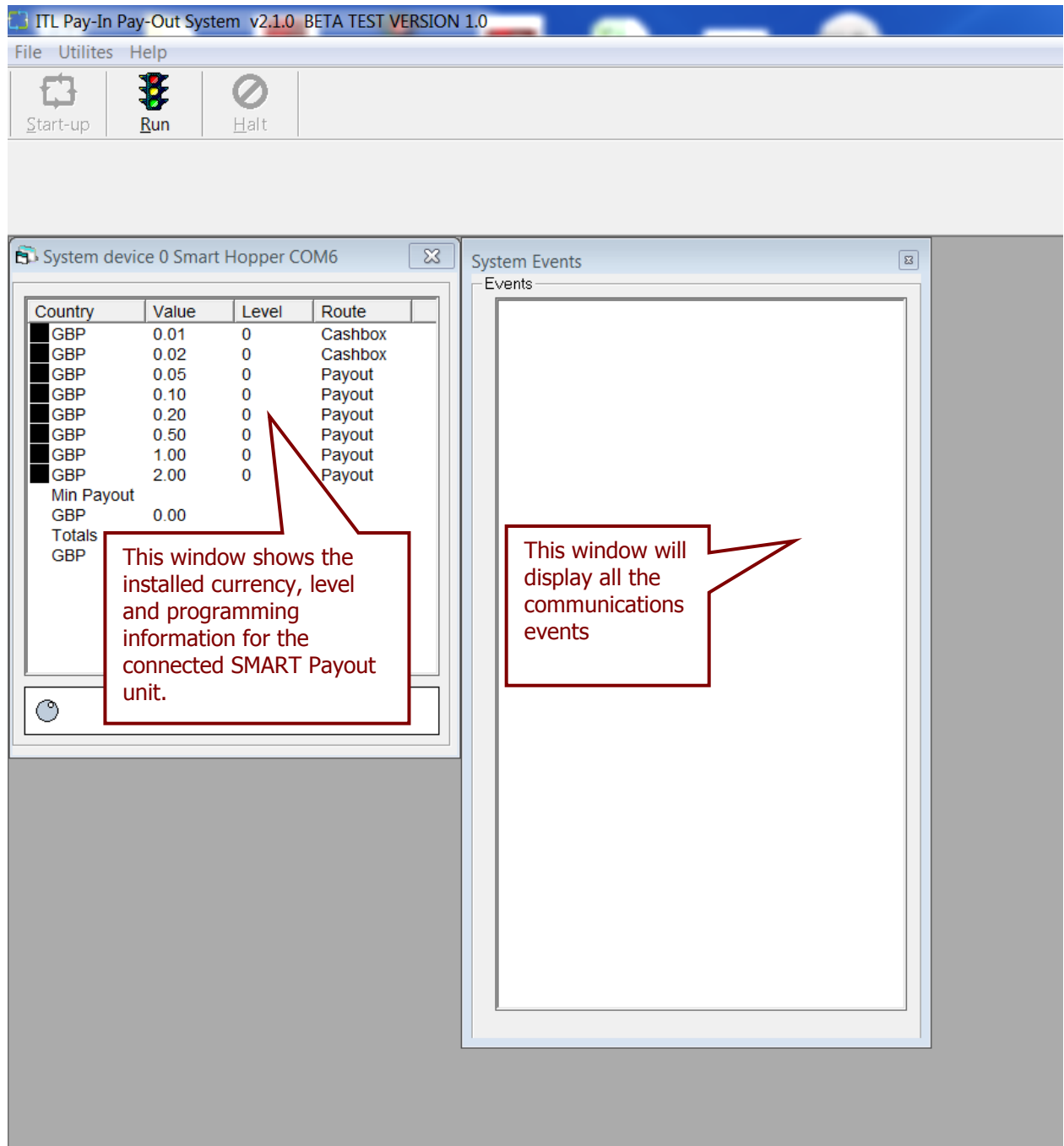
The PiPS software will then start to connect to the SMART Hopper unit. Depending on the number and types of communications ports on your computer, you may get an error message similar to the one shown on the right saying 'Unable to open this port' – this isn't a problem, just click the 'OK' button.



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



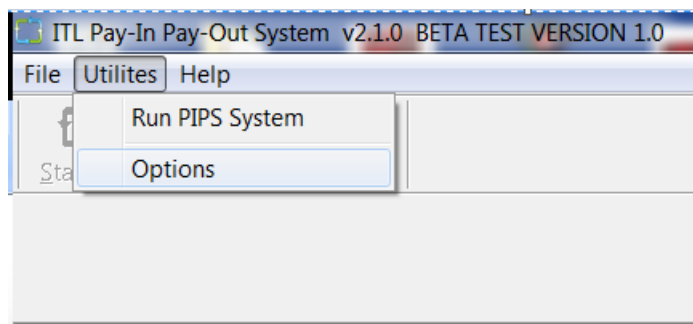
Once the SMART Hopper unit has been found, two windows will appear on the screen:



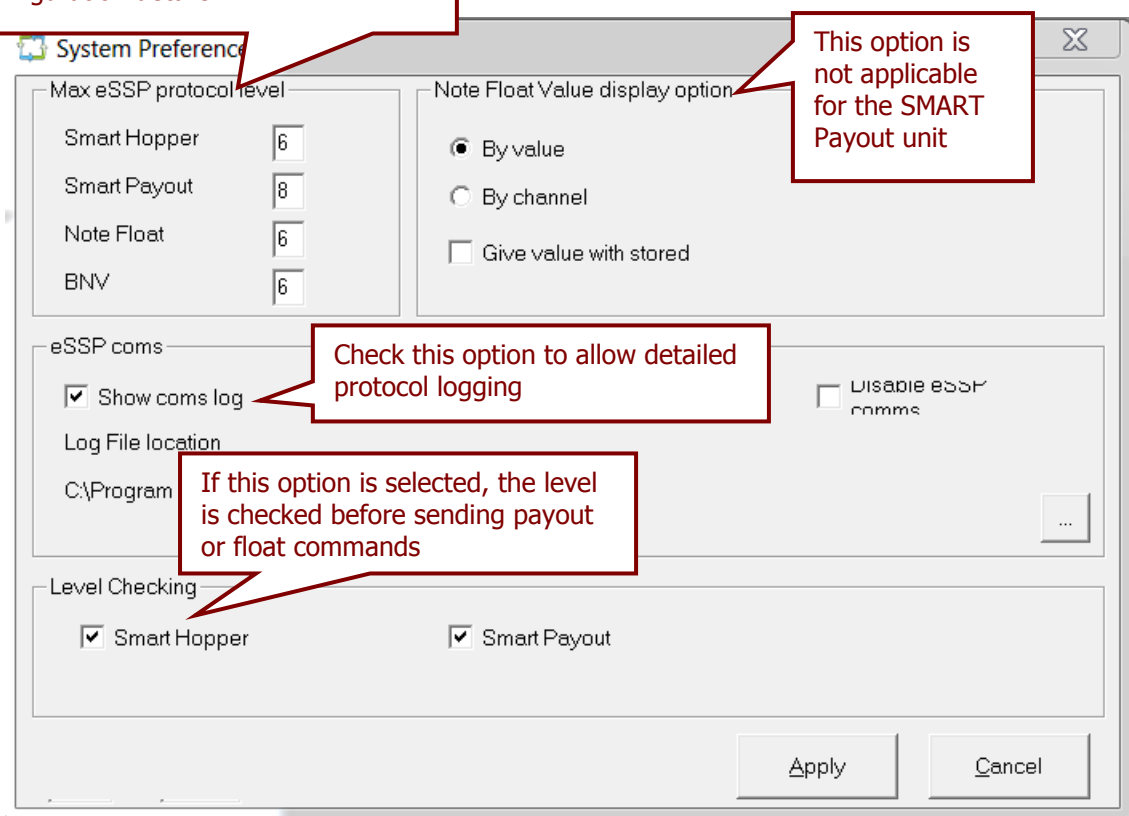
More details of the program options and operations that can be carried out will be covered in the next subsection.

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.

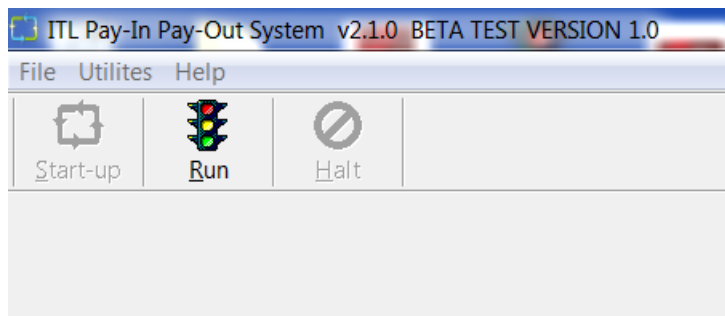


Normally, these preferences should not need changing.

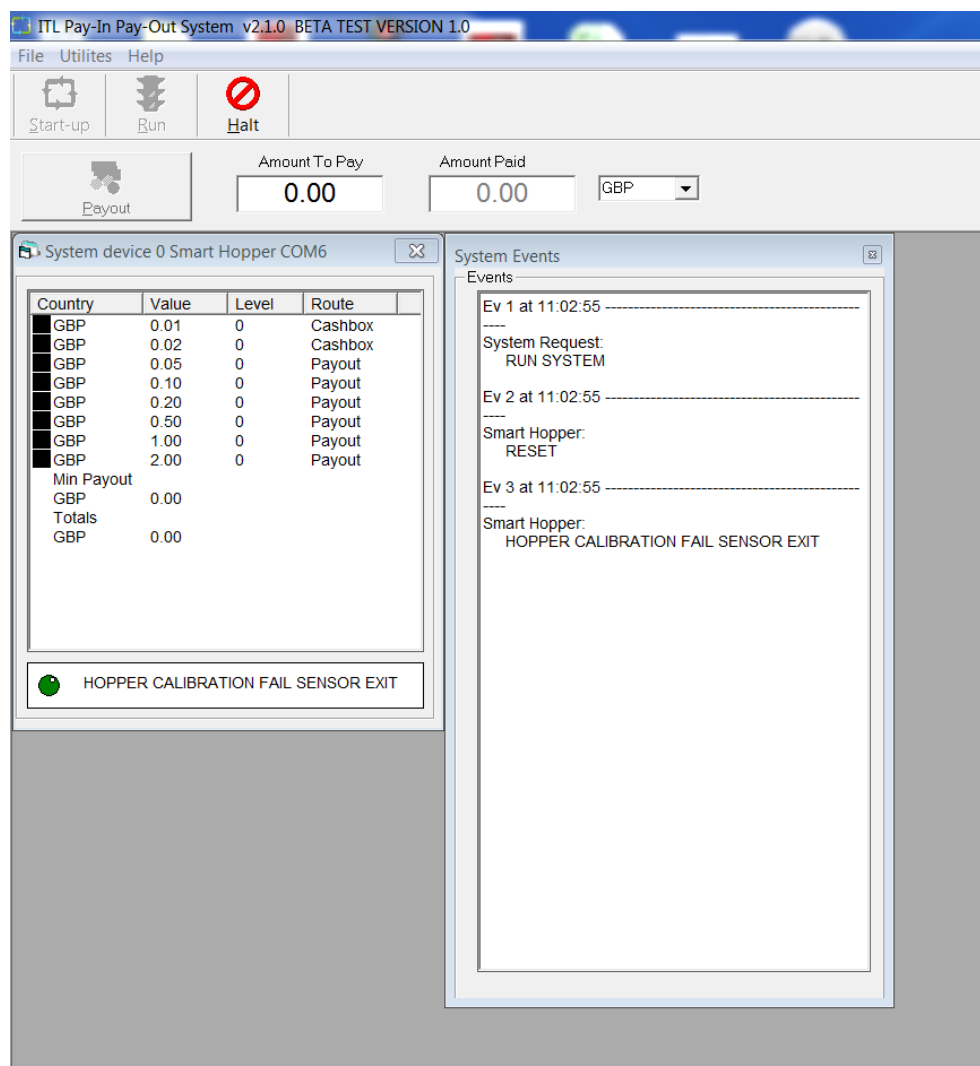
The settings and options for the SMART Hopper unit vary depending whether the system is in the 'Run' or the 'Halt' state – generally the system will need to be halted before any changes to setup options can be made. Pay in/pay out operations are only available when in 'Run' state.

Halt State

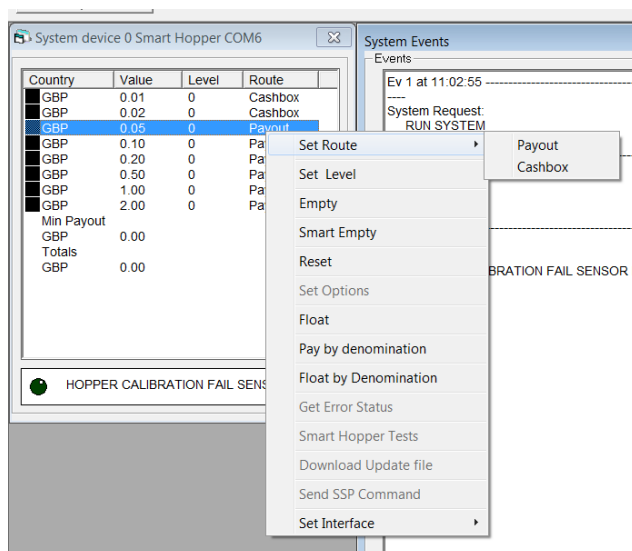
If the system is in 'Halt' state, the user will either have just started the PiPS software, or clicked on the 'Halt' button. The menu bar will look like this:



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!

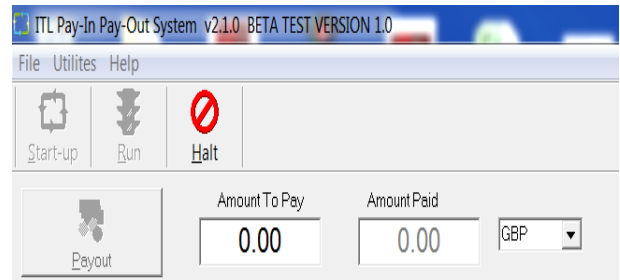
Take care when changing eSSP key

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

Set Level	To set the coins inside the Hopper click (right click) on the coin wanted to set the level and select coin level. A box pops up to enter number of coins for that type of coin in Hopper into the box on screen, repeat for other coins. The system will record the information as the float in the Hopper.
Empty	This command will empty all the stored coins in the Hopper. After emptying the coins, counters on the device will be reset to zero.
Reset	This command will reset the Hopper and indicate is anything wrong with the Hopper.
Float	This option allows the user to run the device Float command - this command will tell the Hopper unit to leave a certain value of coins in the unit, with a requested minimum possible payout level. Clicking the option will bring up the Float dialog box.
Pay by denomination	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 coins required for pay out.
Float by denomination	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 coins to leave in the Hopper module.

3.2 Updating Firmware and Datasets



CAUTION!

Do not power off

The SMART Hopper 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 #

<< Start < Prev 1 2 Next > End >>

Page 1 of 2

Name	Code	Issue	Validator		
Australia (10-20-100-200)	AUD02001	1	SMART Hopper		
Azerbaijan (10-20-50)	AZN01001	1	SMART Hopper		
Bulgaria(2,5,10,20,50,100)	BGN01001	1	SMART Hopper		
Brazil (5-10-25-50-100)	BRL01001	1	SMART Hopper		
Chile (50,100,500)	CLP01002	2	SMART Hopper		
China(10,50,100)	CNY02004	4	SMART Hopper		
Czech Republic(100,200,50)	CZK01005	5	SMART Hopper		
Czech Republic (100-200-5)	CZK02001	1	SMART Hopper		
Denmark (50-100-200-500-1)	DKK01001	1	SMART Hopper		
Euro(10-20-50-100-200)	EUR02001	1	SMART Hopper		
UK(0.01-0.02-0.05-0.10-0.)	GBP01005	5	SMART Hopper		
Hong Kong (50,100,500,100)	HKD01001	1	SMART Hopper		
Croatia(50, 100, 200, 500)	HRK01002	2	SMART Hopper		
Hungary(5,10,20,50,100,20)	HUF01002	2	SMART Hopper		
Macedonia(1,2,5,10,50)	MKD01003	3	SMART Hopper		
Mexico(50,100,200,500,100)	MXN01002	2	SMART Hopper		
Poland(20,50,100,200,500)	PLN01004	4	SMART Hopper		
Romania(10-50)	RON01002	2	SMART Hopper		
Serbia(100,200,500,1000,2)	RSD01002	2	SMART Hopper		
Russia (200,500,1000)	RUB04001	1	SMART Hopper		



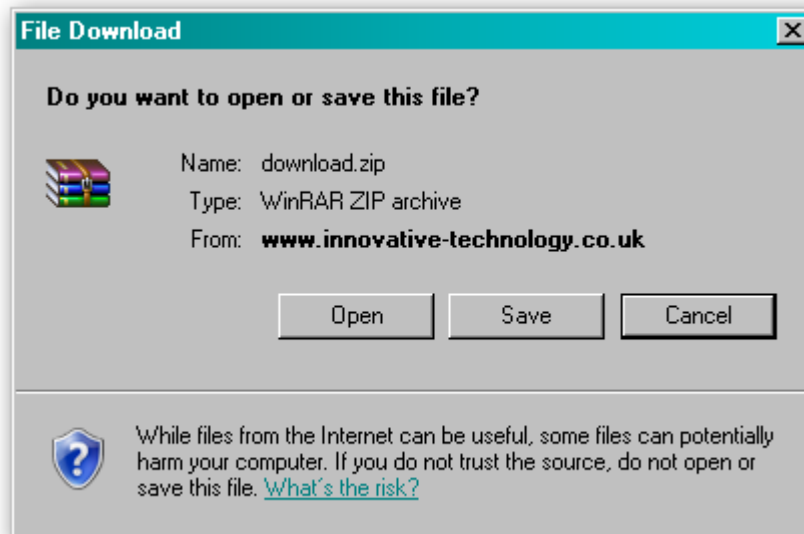
Information

Check update file version.

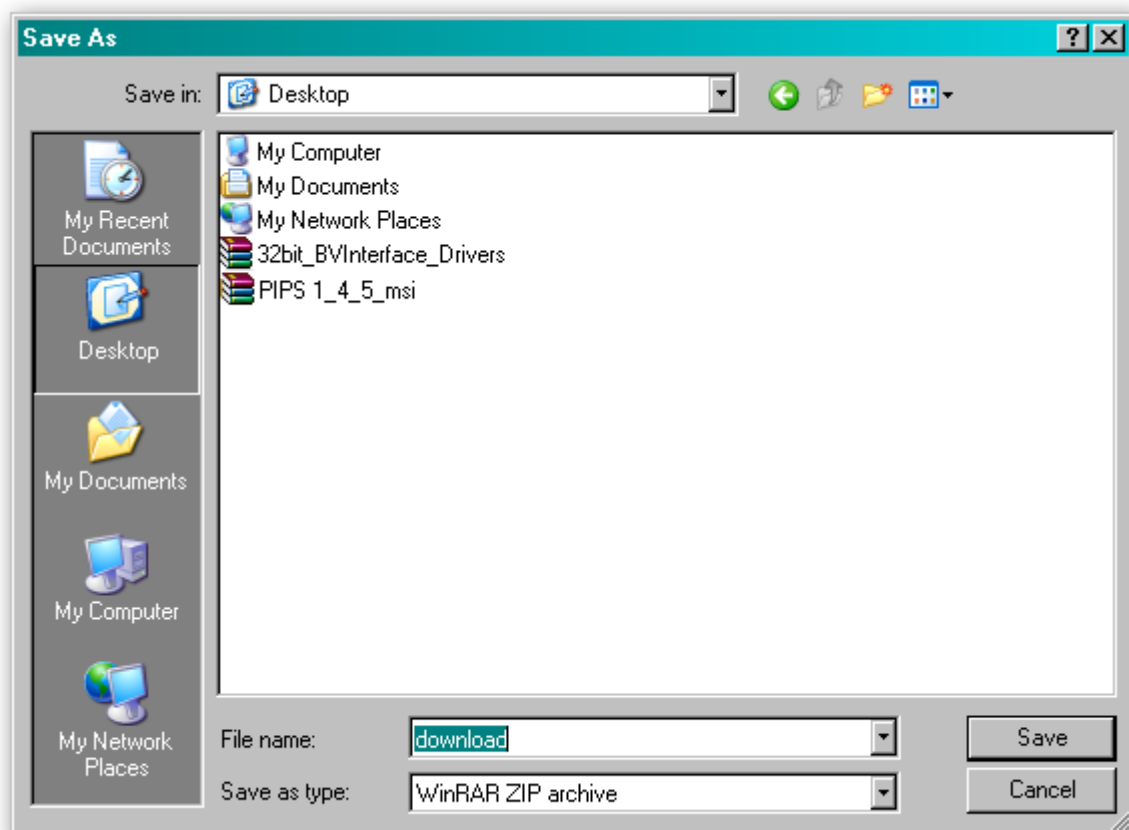
Only update files from v4.08 and above will automatically update the payout module. Earlier versions require the payout module to be updated separately.



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

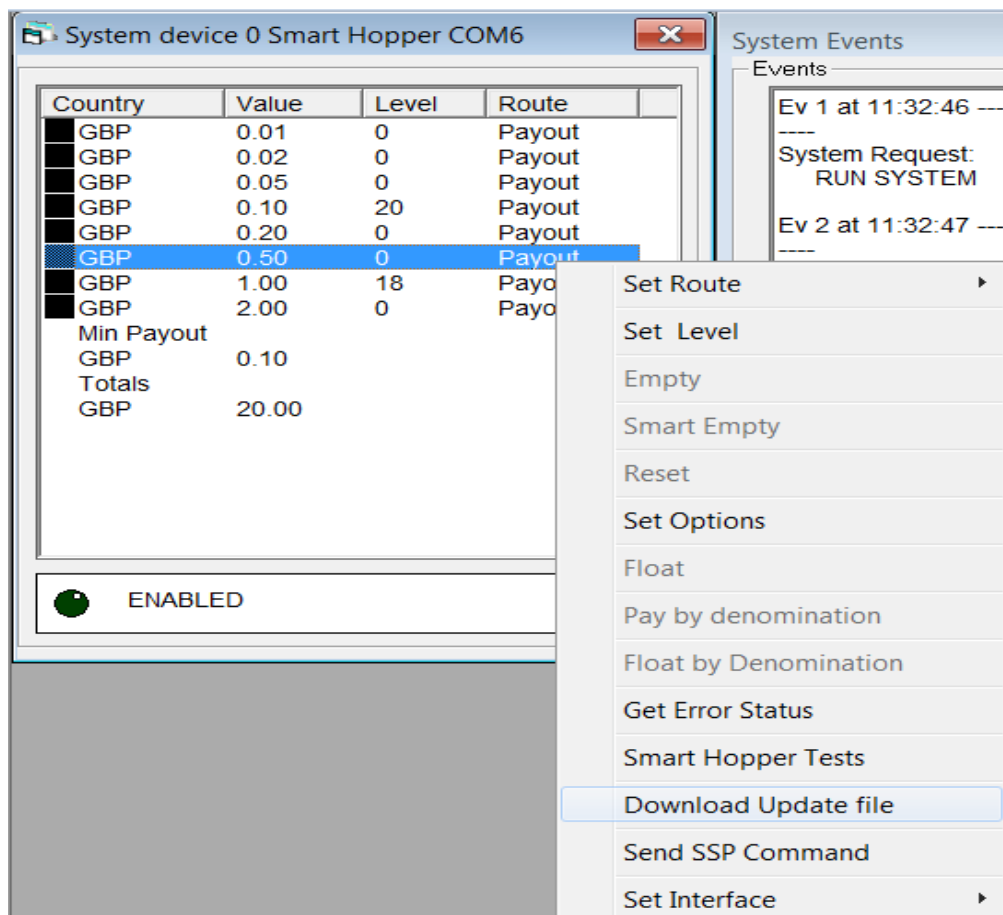


You can then choose where to save the file – choose a location that is convenient for you:

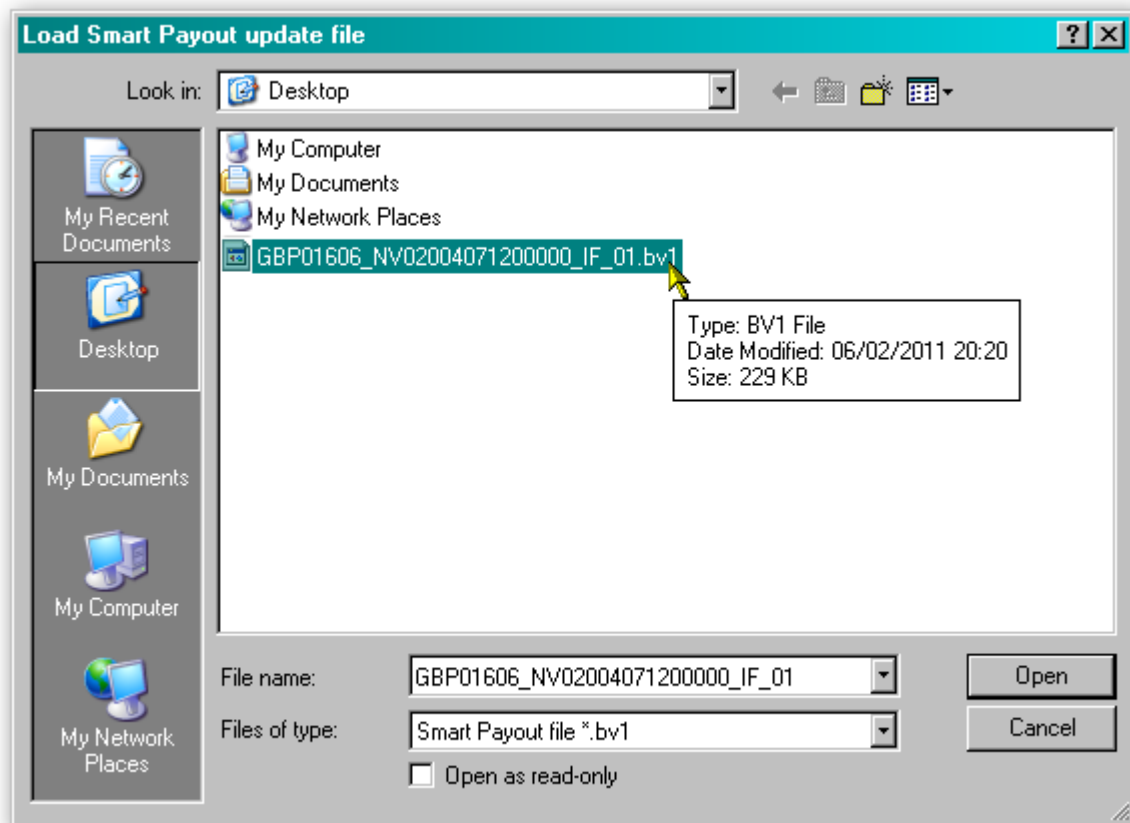


Once the dataset file is saved, unzip the file and you can then start the process to update the SMART Hopper unit by connecting the USB cable and starting the PiPS software as described previously.

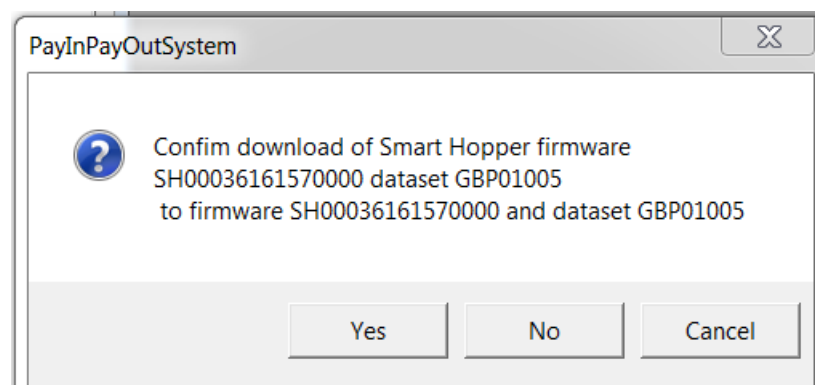
With the PiPS software in 'Halt' mode, right click on one of the currency entries and select 'Download Update File' from the dialog as shown here:



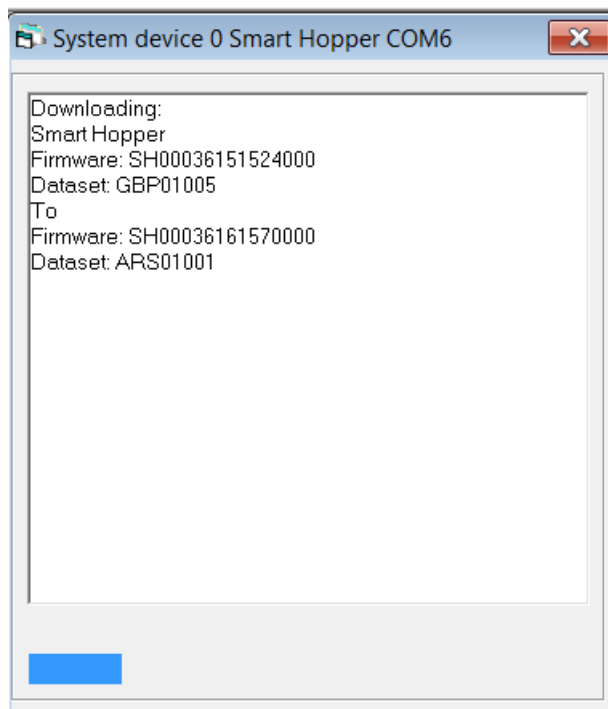
You will then be prompted to select the dataset file you downloaded and unzipped earlier – select the file and click the 'Open' button:



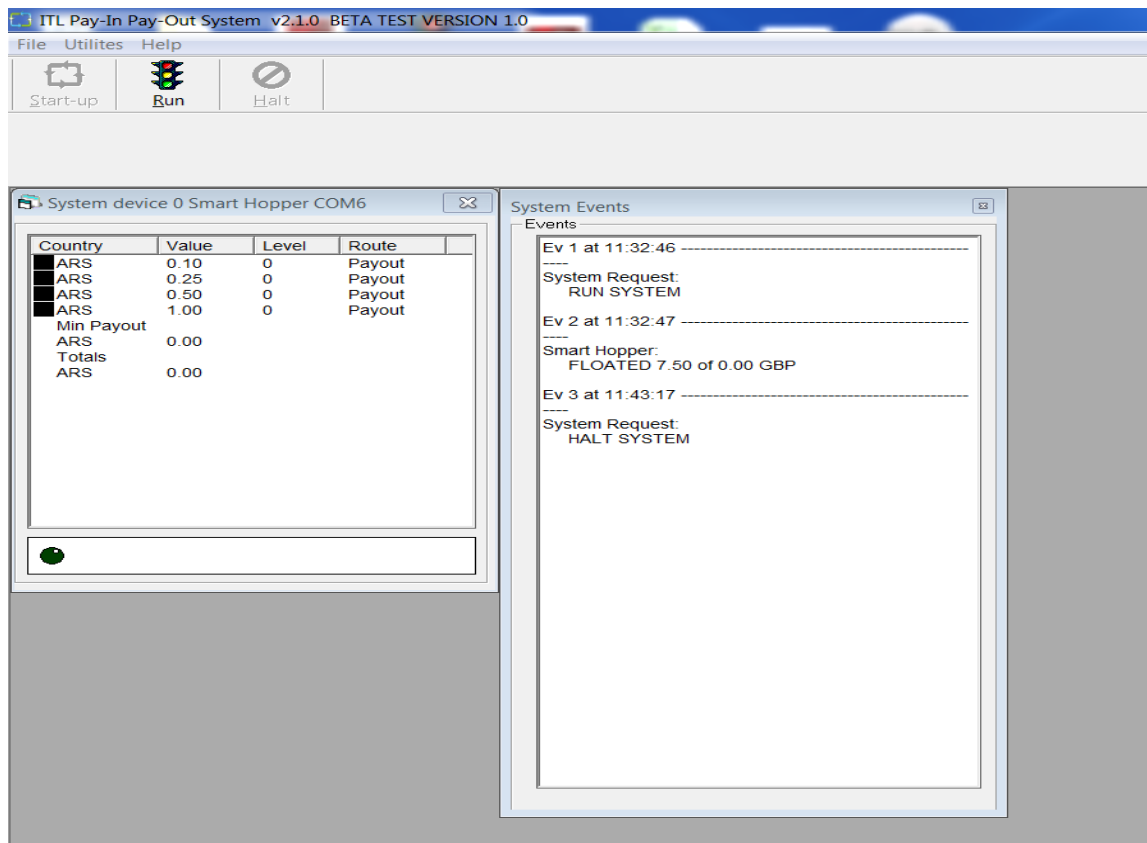
The PiPS software will then ask you to confirm that this is file you want to use to update the SMART Hopper unit with – click the 'Yes' button to continue:



During the update, a blue bar moves across the screen until fully across screen. DO NOT TURN POWER OFF WHEN DOWNLOADING as this can cause the unit to become corrupt.



Then screen returns to coins information:-



Once downloaded you can run pips again pressing run.



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:

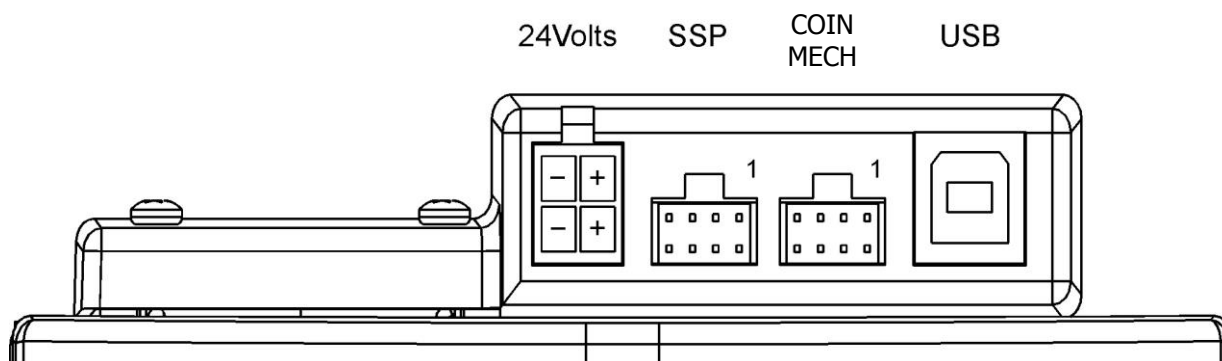
- NV Memory Card Utilities
- PiPS

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. If need any more information contact support@innovative-technology.co.uk

3.3.2 Connections

SMART Hopper

All the connectors needed to set up the SMART Hopper unit are easily accessible on the bottom base: there are four connectors that are used to allow interfacing and programming:



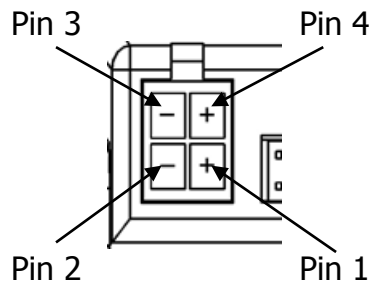
Information

Power always required regardless of connection type.

Power is always required on pins 1 and 2 of the 4 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.



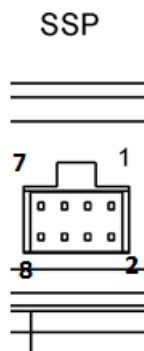
The first connector is a 4 pin socket used to power up the SMART Hopper.



Pin	Description
1	+24V DC
2	0V / Ground Connection
3	N/C
4	N/C

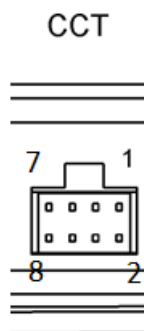
Communications from the SMART Hopper unit to the host machine can be achieved by the SSP connector (SSP and CC2 protocols).

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



Pin	Description
1	Serial Data Out (Tx)
2	Serial Data In (Rx)
7	N/C
8	0V / Ground Connection

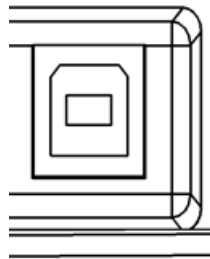
The Coin Mech port (sometimes referred to as CCT) pin numbering of the socket is shown below, as well as an overview of the socket connections:



Pin	Description
1	Serial Data Out (Tx)
2	Serial Data In (Rx)
7	+12 V
8	0V / Ground Connection

The USB connector is a standard Type B USB socket. The USB socket can be used for programming the SMART Hopper unit and also bench testing – a USB 2.0 compliant Type 'A' to 'B' lead can be used to do this. USB cables should be electrically shielded and less than 5 metres long. **Please note:** Direct USB should **NOT** be used for Host communications. If USB is required than our IF17 (TTL to USB) should be used.

USB



3.4 Frequently Asked Questions

a. What currencies does the SMART Hopper support?

- New currency dataset files are published on the ITL website as they are released. To find available datasets visit the Currency Download section within Support. Select the SMART Hopper and the currency you require to see all available dataset options. The blue i icon provides more details to assist selections.

b. I can't find the currency I need, how do I get it created?

- To create a new dataset, ITL requires 100 coins of each denomination. This process will take around 4 weeks to process and then coins can be returned and the dataset will be made available. Please email support@innovative-technology.co.uk for information.

c. Where can I get the software examples for the SMART Hopper?

- please email support@innovative-technology.co.uk for software example

d. 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.

e. What communication protocols does the SMART Hopper support?

- ENCRYPTED SSP (eSSP) is a secure serial interface specifically designed to address the problems experienced by cash systems in gaming machines. Problems such as acceptor swapping, reprogramming acceptors and line tapping are all addressed. The interface uses a master slave model, the host machine is the master and the peripherals (note acceptor, coin acceptor or coin hopper) are the slaves. Data transfer is over a multi-drop bus using clock asynchronous serial transmission with simple open collector drivers. The integrity of data transfers is ensured through the use of 16 bit CRC checksums on all packets. A Diffie-Hellman key exchange is used to allow the host machine and SMART hopper to jointly establish a shared secret key over an insecure communications channel. The encryption algorithm used is AES with a 128-bit key; this provides a very high level of security.

IMPORTANT: All transactions with the SMART Hopper must be encrypted to prevent dispense commands being recorded and replayed by an external device.

For detailed information and full protocol specification please refer to SSP Interface Specification (ITL Drawing GA138), this is available from the ITL website www.innovative-technology.co.uk.



f. How fast does the SMART Hopper pay out?

- The SMART Hopper can pay out up to 12 Coins per second.

g. How many coins does the SMART Hopper hold?

- The capacity of the SMART Hopper depends on the size of coins. The table below shows approximate capacity for various coins and assumes all the coins within the hopper are the same coin type.

Type	Diameter	Thickness	Approximate Capacity
UK £1	22.5mm	3.15mm	1300
UK £2	28.4mm	2.5mm	800
Euro €1	23.25mm	2.33mm	1500

- SMART Hopper Weights

Coin Type	Coin Weight	Total Weight
Empty	-	2.60kg
UK £1	9.5g	Approximately 14.95Kg when full (1300)
UK £2	12.0g	Approximately 12.20Kg when full (800)
Euro €1	7.5g	Approximately 13.85Kg when full (1500)



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