



Innovative Technology

INTELLIGENCE IN VALIDATION

NV200
Spectral

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USER MANUAL





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1 DOCUMENT INTRODUCTION

1.1 Related Documents

This document should be read together with the following:

For SSP/eSSP:

[Protocol Manual – SSP \(GA138\): SSP Interface Protocol Specification for integration](#)

[SSP Implementation Guide \(GA973\): Information for programmers and integrators](#)

For CCTalk:

[ITL BNV CCTalk Specification \(GA966\): CCTalk Integration Guide](#)

[CC2 Manual \(GA863\): CC2 Interface Protocol Specification for Integration](#)

For Software:

[Software Manual \(GA2037\) – ITL Software Guide](#)

For other third-party interface protocols contact support@innovative-technology.co.uk

1.2 Manual Amendments

Rev.	Date	Amendment Details	Issued by
1.0	27/04/2018	First Issue	CW
2.0	07/03/2019	Add new modules – BNF/Safe Interface / Spectral Payout Remove Smart Payout	CW
2.1	27/03/2019	Fixed Spectral Payout Flash Codes	CW
2.2	14/01/2019	Added the following : <ul style="list-style-type: none">- Stackerless Safe Interface- Note Quality Guidelines- Safe Interface Duty Cycle- BNF Mounting Instructions- SPO Extension Cable- BNF Path Inserts- 2K2 Cashbox Lock Inserts	CW

1.3 Copyright

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commencing on the date of purchase from Innovative Technology Ltd or its Authorized Reseller, and extending for the length of time stipulated by Innovative Technology Ltd.

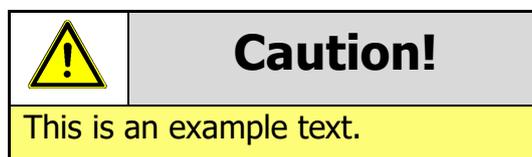
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1.5 Product Safety Information

Throughout this user manual, we may draw your attention to key safety points that you should be aware of when using or maintaining the product. These safety points will be highlighted in a box, like this:



This user manual and the information it contains is only applicable to the model stated on the front cover and must not be used with any other make or model.

1.6 Disclaimer

Innovative Technology Ltd is not responsible for any loss, harm, or damage caused by the installation and use of this product. This does not affect your local statutory rights. If in doubt contact Innovative Technology for details of any changes.

Innovative Technology Ltd has a policy of continual product improvement. As a result, the products supplied may vary from the specification described here.

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Safety Notice! Read before using this product!

Safety Notice - Warning. Ensure power is removed before allowing access to the inside of this product. Ensure any static build up is discharged before allowing access to any part of this product or media contained. Always earth this product/base plate in accordance with the manual.

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The power supply terminals and/or connectors are: Not investigated for field wiring
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Mechanical, Fire
- Equipment not investigated for accessibility to children – to be evaluated in end-user application

Sicherheitshinweis – Warnung: Es muss sichergestellt werden, dass das Gerät von der Versorgungsspannung getrennt wird, bevor ein Eingriff in das Innere des Gerätes erfolgt. Es muss sichergestellt werden, dass jegliche statische Aufladung des Gerätes entladen wird, bevor auf das Gerät oder auf innerhalb des Gerätes befindliche Objekte zugegriffen wird. Die Erdung des Gerätes muss immer gemäß Handbuch erfolgen.

Nur für die Verwendung in oder mit kompletter Ausstattung, dessen Eignung und Kombination von der UL LLC ermittelt wurde. Bei der Installation in einem Endprodukt, muss folgendes berücksichtigt werden:

- Die Spannungsversorgungsklemmen und/oder Verbinder sind: Feldverkabelung wurde nicht untersucht
- Der untersuchte Verschmutzungsgrad ist: 2
- Folgende Anforderungen an die Gehäuse des Endproduktes sind gefordert: Mechanisch, Feuer

Aviso de seguridad: Asegúrese de que la alimentación está desconectada y de que toda la energía estática es descargada antes de manipular este producto. Conecte a tierra la chapa base de la manera que se indica en el manual.

Solo para uso con dispositivos con los cuales la compatibilidad ha sido certificada por UL LLC. Tras su instalación en producto acabado, tener en cuenta lo siguiente:

- Los conectores y terminales de alimentación son: No se ha investigado/especificado cableado externo.
- El grado de contaminación determinado es: 2
- Los siguientes manuales/certificados de producto final son requeridos: Mecánico, Fuego

Avis de sécurité : Assurez-vous que l'alimentation est coupée et que toute l'énergie statique est déchargé avant de manipuler ce produit. Connecter à la terre, la plaque de base à la manière indiquée dans le manuel.

A utiliser Seulement avec les dispositifs dont la compatibilité a été certifiée par UL LLC. Après son installation dans le produit fini, prendre en considération ce qui suit:-

- Les connecteurs et les bornes d'alimentation sont : cela n'a pas été étudié/spécifié câblage externe.
- Le degré de contamination déterminé est : 2
- Les manuels suivants / les certificats du produit final sont nécessaires : mécanique, incendie

Bezpečnostní upozornění. Před manipulací uvnitř tohoto produktu se ujistěte, že je produkt odpojen od zdroje elektrického napětí. Ujistěte se, že jakýkoliv elektrostatický náboj byl vybit před manipulací s jakoukoliv částí tohoto produktu nebo obsaženým médiem. Vždy uzemněte tento produkt/základovou desku v souladu s návodem.

Pouze pro použití v nebo s kompletním vybavením, kde je přijatelnost kombinace určena UL LLC. Při instalaci v konečném produktu je třeba zvážit následující:

- Napájecí svorky a/nebo konektory: Nejsou sledované pro externí kabeláž
- Sledovaný stupeň znečištění je: 2
- Následující krytí konečného produktu jsou požadované: Mechanické, Protipožární





		Caution! – IR and UV Radiation	
			<ul style="list-style-type: none">• Possible skin or eye damage due to presence of IR and UV radiation internally• Disconnect power before servicing.• Employ appropriate PPE measures• Follow safety precautions given in IEC 62471
			





2 PRODUCT INTRODUCTION

2.1 General Description

The NV200 Spectral is a highly secure and technologically advanced banknote validator. State of the art spectral sensors offer complete note image capture by scanning over 4.8 million data points to authenticate the validity of notes. The unit boasts 99%+ first time acceptance of new and street grade notes with a note to note processing time of 2 seconds.

The unit contains a number of security features including optical and mechanical anti-stripping technology that delivers outstanding fraud protection. The NV200 Spectral's cutting-edge note centring mechanism, together with 4-way barcode acceptance bring the user exceptional note handling and increased ticket acceptance rates.

2.2 Key Features

- 100% note image capture - 4.8 million data points
- 99%+ first time acceptance of new & street grade notes
- Stained note detection
- 2 second note to note processing
- Modular design - recycler or ticket printer available

2.3 Typical Applications

The NV200 Spectral validator can be used in a variety of situations where high security and high-volume bank note acceptance and validation are needed. Some typical applications are:

- AWP and SWP applications
- Self-Serve and Retail
- Kiosks
- Casinos
- Parking and Ticketing
- Vending
- Retail environment.
- POS Systems





2.4 Component Overview



Cashbox Options



Module Options



2.4.1 NV200 Spectral Options

ITL Part Number	Description
PA02158	NV200 Spectral Head
PA03269	NV200 Spectral with UAP





2.4.2 Bezel Options

ITL Part Number	Description
PA00610	Standard Bezel (85mm)
PA00639	Metal Bezel
PA01038	Self-Aligning Bezel (White)
PA02053	Self-Aligning Bezel (Black)

2.4.3 Cashbox Options

ITL Part Number	Description
PA02738	500 Note Cashbox and Chassis
PA02930	1000 Note Cashbox and Chassis
PA03109	2200 Note Cashbox and Chassis *
PA02198	TEBS – Tamper Evident Bag System

*2200 note cashbox has a different chassis to the 500 and 1000 note cashbox due to the increased size

2.4.4 Module Options

ITL Part Number	Description
PA01062	Roll Top Ticket Module
PA02887	Spectral Payout Module
PA03120	Bunch Note Feeder (BNF) *
PA03007	Safe Interface (27mm)
PA02982	Safe Interface (80mm)
PA03489	Safe Interface Stackerless

*BNF can only be used with the NV200 Spectral and UAP – PA03269.

It cannot be fitted/retrofitted to a standard NV200 Spectral

2.4.5 Consumables

ITL Part Number	Description
PA02196	TEBS Safe Bag (Box of 140 Bags)
LB02012	Roll Tickets (Box of 12 Rolls)

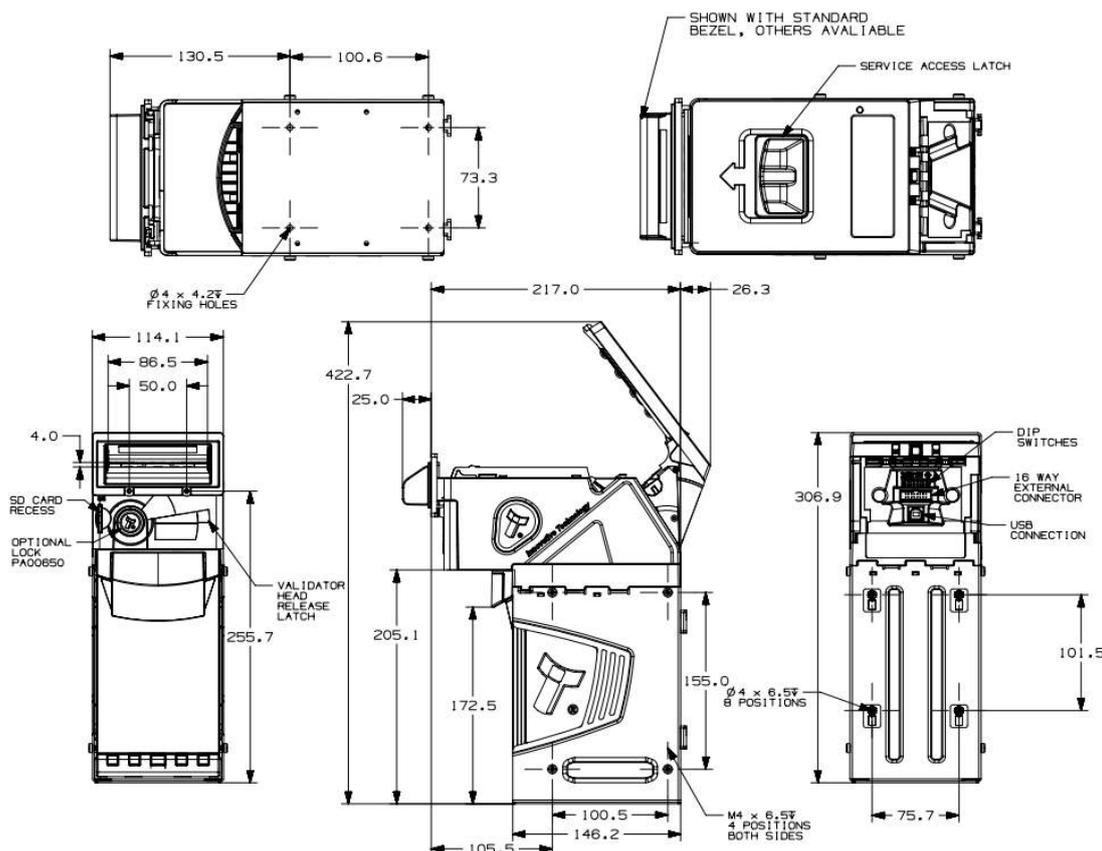




3 TECHNICAL DATA

3.1 Dimensions

The dimensions below are for the NV200 Spectral with 500 note cashbox. Other cashbox / module options will change the dimensions. For dimensional drawings of other configurations contact support@innovative-technology.co.uk



3.2 Weight

The tables below show the weights for the individual components of the product.

For example, and NV200 Spectral with Standard Bezel and 500 Note Cashbox with Chassis would weigh 3.21Kg (1.20 Kg + 2.01 Kg)

3.2.1 Standard Unit – No Cashbox

Unit	Weight Empty	Weight Full
NV200 Spectral – Standard Bezel	1.20 Kg	N/A

3.2.2 Cashbox Options

Unit	Weight Empty	Weight Full
500 Note Cashbox with Chassis	2.01 Kg	2.46 Kg
1000 Note Cashbox with Chassis	2.19 Kg	3.09 Kg
2200 Note Cashbox with Chassis	3.15 Kg	4.99 Kg
TEBS Cashbox (Tamper Evident Bag System)	6.95 Kg	7.75 Kg





3.2.3 Module Options

Unit	Weight Empty	Weight Full
Ticket Module	1.34 Kg	2.64 Kg
Spectral Payout Module	2.30 Kg	2.36 Kg
Bunch Note Feeder	1.00Kg	N/A
Safe Interface (27mm)	0.5Kg	N/A
Safe Interface (80mm)	0.6Kg	N/A
Safe Interface Stackerless	0.6Kg	N/A

3.3 Environmental Requirements

Environment	Minimum	Maximum
Temperature	+3°C	+50°C
Humidity	5%	95% Non-condensing

3.4 Power Requirements

3.4.1 Supply Voltages

Supply Voltage	Minimum	Nominal	Maximum
Supply Voltage (V DC)	+ 11.8 V DC / +22.6vDC	+ 12 V DC / +24vDC	+ 14.2 V DC / +26.4vDC
Supply Ripple Voltage	0 V	0 V	0.25 V @ 100 Hz

The TEBS cashbox and Ticket module require the unit is run at 24v (±10%).

3.4.2 Supply Currents

The supply current required to run the NV200 Spectral will vary during the phases of operation and the modules attached, see the tables below for 12vDC and 24vDC

NV200 Spectral Module Combination				Cashbox Type		12V DC		
NV200 Spectral	Spectral Payout	Bunch Note Feeder	Safe Interface	500, 1K, 2K2	TEBS	Standby (A)	Running (A)	Peak (A)
Y				Y		0.25	2.00	3.00
					Y	0.35	2.50	3.50
Y	Y			Y		0.35	4.00	5.50
					Y	0.45	4.00	5.50
Y		Y		Y		0.35	2.50	4.00
					Y	0.45	2.50	4.50
Y			Y	Y		0.30	2.50	3.50
					Y	0.40	3.50	4.50
Y	Y	Y		Y		0.40	3.50	5.50
					Y	0.50	4.50	5.50
Y		Y	Y	Y		0.40	3.00	4.00
					Y	0.50	4.00	5.50





NV200 Spectral Module Combination				Cashbox Type		24V DC		
NV200 Spectral	Spectral Payout	Bunch Note Feeder	Safe Interface	500, 1K, 2K2	TEBS	Standby (A)	Running (A)	Peak (A)
Y				Y		0.15	2.00	3.50
					Y	0.20	2.00	3.50
Y	Y			Y		0.20	2.50	4.00
					Y	0.25	2.50	4.00
Y		Y		Y		0.20	2.00	4.00
					Y	0.25	2.00	4.00
Y			Y	Y		0.20	2.00	3.50
					Y	0.25	2.00	3.50
Y	Y	Y		Y		0.30	3.00	5.50
					Y	0.35	3.00	5.50
Y		Y	Y	Y		0.30	3.00	5.00
					Y	0.35	3.00	5.00

3.4.3 Power Supply Guidance

Check the power requirements of the host machine and other peripherals to dimension a suitable power environment for the machine setup.

The unit shall be supplied from a source specified as Electrical Energy Source Class 1 (ES1) to IEC/UL 62368-1, or specified as SELV according to IEC/UL 60950-1

TDK Lambda manufactures suitable power supplies. See table below for further details.

Power Supply Unit	Specification	RS Stock Code	Farnell Stock Code	Suitable for use with
TDK Lambda RWS-50B-12	+12 V DC / 4.3 A	839-9626	2452725	NV200 Spectral Standalone
TDK Lambda RWS-150B-24	+24 V DC / 6.3 A	813-9103	2444003	NV200 Spectral with TEBS or Spectral Payout Module
TDK Lambda RWS-300B-24	+24 V DC / 12.5A	813-9128	2419997	NV200 Spectral with TEBS and Payout/Ticket Module

3.5 Interface Logic Levels

Interface Logic Levels	Logic Low	Logic High
Inputs	0V to +0.5V	+3.7V to +12V
Outputs with 2K2Ω pull-up resistor	+0.6V	Pull-up voltage of host interface
Maximum Current Sink	50mA per Output	

3.5.1 Opto-Isolated Inputs

The NV200 Spectral natively supports Opto-isolated communication, the connection requires a reciprocal circuit to be established on the host side. The pin outs for the opto-isolated inputs can be found in [Section 6.4.2](#).





3.6 Reliability Data

3.6.1 MCBI/MCBF

Below is an explanation outlining the Mean Cycles Between Failure (MCBF) & Mean Cycles Between Interruption (MCBI) for the NV200 Spectral. Where a cycle is defined as a note/ticket either stacked, stored or paid-out. An example is if £20 is accepted and a £10 paid out that would be classed as 2 cycles.

The difference between MCBF and MCBI is that a failure is classed as an event which will require a service call – e.g. unit is seeing poor acceptance. Whereas an interruption is an event which store/site staff could rectify without a trained engineer present – e.g. clearing a note path jam.

As shown in [Section 2.4](#) the NV200 Spectral is a modular solution and these modules increase the complexity of the system. As such, each time one of these additional modules are attached the current MCBF and MCBI is halved. The MCBF for the NV200 Spectral is 200,000 cycles.

3.6.2 Duty Cycle

When using the Safe Interface module, there is a maximum duty cycle. If this is exceeded, the operation of the unit will change. The number of notes inserted into the unit is counted for the previous 45 minutes:

Notes Counted	Delay Added Between Note Inserts
0 – 250	0 seconds
400	1 second
500+	1.5 Seconds

Between 250 notes and 400 notes the delay will gradually increase from 0 to 1s
Between 400 notes and 500 notes the delay will gradually increase from 1s to 1.5s

The number of notes inserted is also counted for the previous 5 minutes, the times above are adjusted accordingly:

Notes Counted	Delay Added Between Note Inserts
50+	1 x above delay
25 - 50	0.5 x above delay
0	Zero delay





3.7 Media Requirements

The NV200 Spectral is capable of handling multiple denominations simultaneously, the media that can be accepted includes but is not limited to: -

- Paper notes
- Polymer notes
- Windowed notes
- Barcoded tickets

The minimum and maximum dimension for media IN is as follows:

	Minimum	Maximum
Length	110mm	170mm
Width	56mm	85mm

When using the optional Spectral Payout module, the media dimensions for notes routed to the payout are as follows:

	Minimum	Maximum
Length	110mm	170mm
Width	56mm	82mm

When using the optional Smart Ticket module, the paper requirements are as follows:

Roll	Minimum	Maximum
Length	N/A	N/A
Width	80mm	80mm

General	Minimum	Maximum
Thickness	100µm	120µm
Perforation Strength	0.7kg	1.3kg





3.7.1 Note Quality Guidelines

When loading notes into the validator, ensure that notes are in good condition and are stacked neatly together to ensure optimum performance:



Do not load any of the following notes into the validator, this may cause poor performance or malfunction:

Damaged Notes



Taped Notes



Folded Notes



Torn Notes



Wet Notes



Caution!

Inserting any of the notes above can cause jams or notes to be left unprocessed in the Bunch Note Feeder



User Manual NV200 Spectral

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4 MECHANICAL INSTALLATION

4.1 Compatibility

4.1.1 Hardware Compatibility

4.1.1.1 Machine Mounting

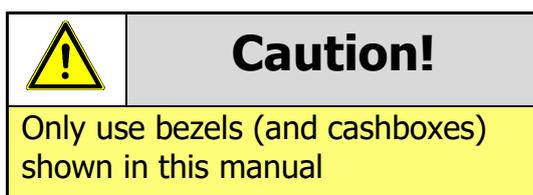
Assuming the suitable bezel (and cashbox) type has been ordered the NV200 Spectral can be used as fitting replacement for the following ITL products only:

- NV200

Innovative Technology Ltd. has a policy of continuous product improvement. Due to design changes older model or product bezels (and cashboxes) may not be compatible with the NV200 Spectral. Specifically, the NV200 Spectral head is not backwards compatible with the NV200 cashbox and chassis.

The 2200 note cashbox also has a larger chassis which means that it is not a suitable replacement for current installations.

However, new product deliveries always include a bezel (and cashbox) that must be used.

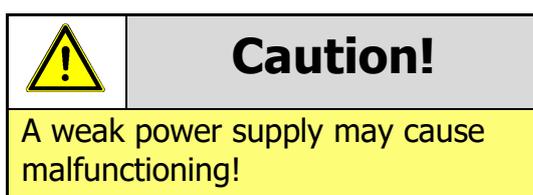


4.1.1.2 Machine Interfacing

By design the NV200 Spectral is pin to pin compatible with the suitable fitting replacement products listed in [Section 4.1.1.1](#). No changes to existing machine harnessing are required.

4.1.1.3 Power Supply

It is vital that the NV200 Spectral is connected to a power supply able to provide the required power environment. A weak power supply causes malfunctioning of the NV200 Spectral such as note rejects or missing credits. If the NV200 Spectral is used as a fitting replacement for an older model or product we recommend checking the power supply specifications of the machine. The power supply of the machine might be designed for the older model or product but not suitable for the NV200 Spectral. The NV200 Spectral might have higher power consumption. Refer to [Section 3.4](#) for full power requirement details of the NV200 Spectral.





4.1.2 Software Compatibility

4.1.2.1 Interface Protocols

When using the NV200 Spectral as a fitting replacement for an older model or product some events such as credits may be given incorrectly. This is due to improved firmware routines and faster motors being used. This may cause missing events such as credits in those host machines where timeouts are defined for the older model or product. Contact the machine manufacturer for full compatibility of the NV200 Spectral.

	Caution!
Timing issues may cause missing events such as credits!	

4.1.2.2 Re-programming

For re-programming the NV200 Spectral always use the latest version of Validator Manager available for download on our website. Older versions may not support the NV200 Spectral. For further details on Re-programming the NV200 Spectral refer to [Section 5.4](#).

	Caution!
Older versions of Validator Manager may not support the NV200 Spectral!	





4.2 Bezel Mounting

4.2.1 Bezel Fitting

1. Open Note Path

Pull the top latch in the direction shown to unlock the note path



2. Open Upper Note Path

When the note path has unlocked, lift the upper part to give clear access to the front.



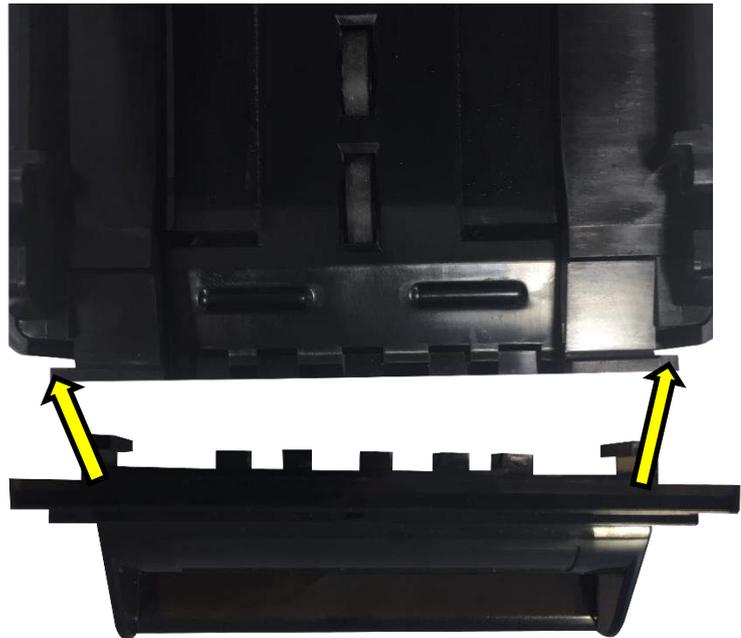
3. Attach Bezel Cable

Plug the bezel cable into the connection socket on the front. Ensure that the tab on the connector aligns with the notch on the socket.



4. Insert Bezel

Slide the bezel down into the slots on the front of the bezel



5. Close Note Path

Push the upper note path back down until you hear it click firmly back into place



4.3 Cashbox Removal & Opening

4.3.1 500 Note Cashbox

1. NV200 Spectral

The image to the right shows the NV200 Spectral with 500 note cashbox.



2. Cashbox Handle

Pull the cashbox handle forward, this will unlatch the cashbox, allowing it to be slid forward from the chassis.





3. Slide Cashbox Forward

Continue to pull the handle forward, sliding the cashbox completely free from the chassis



4. Turn Cashbox Over

To access the cash, turn the cashbox as the door is on the bottom.



5. Open Cashbox

Push the black door latch in and lift the door at the same time.





4.3.2 2200 Note Cashbox

1) Remove from Chassis

To remove the 2200 note cashbox from the chassis, lift the handle as shown and pull forward



2) Open Cashbox Door

Turn the cashbox over and press the red button on the side to open the door. Lift the door upwards to access the cash.



The push plate inside the cashbox is spring loaded, be careful when removing the contents of the cashbox as the





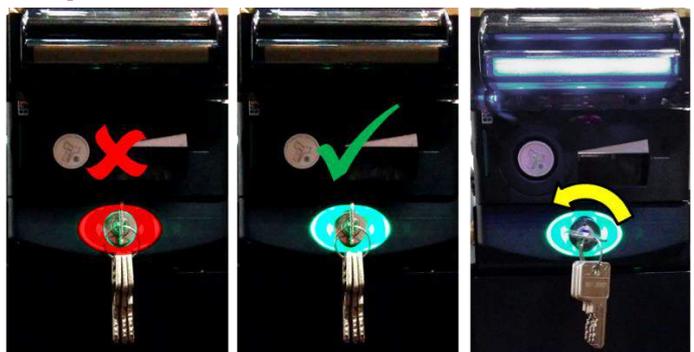
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plate can retract quickly and may cause injury

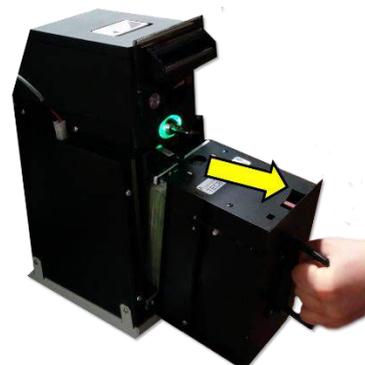


4.3.3 TEBS Cash Bag Removal & Replacement

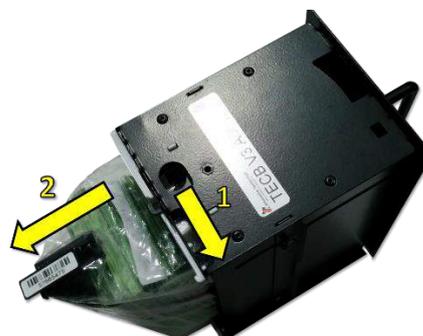
Unlike the traditional cashbox, the TEBS has both a software and hardware lock. Before the cashbox can be removed the software, lock must have been enabled (when enabled the lock is green).



Once the key has been turned the bezel will begin to flash the cashbox can be removed as shown on the right.



To remove the cashbag, slide the catch to the side and lift the cash bag out of the cashbox. As shown to the right.



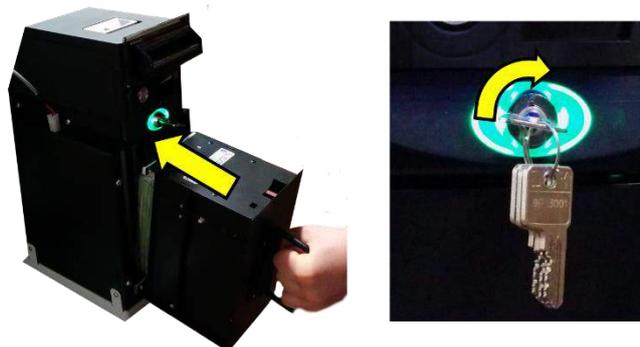


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To fit the cash bag insert the bottom lug, slide the latch to the slide and push the bag into place. Ensuring the barcode is sat in place.



Slide the cash bag back into the TEBS and turn the lock – the lock will go red. The stacker will audibly cycle and the bezel flash code will disable showing the barcode has been read.



4.4 Lock Mounting

4.4.1 Lock Fitting

1. Lock Location

The Lock can be fitted to the front of the NV200 Spectral replacing the red front insert (shown to the right) which ships by default





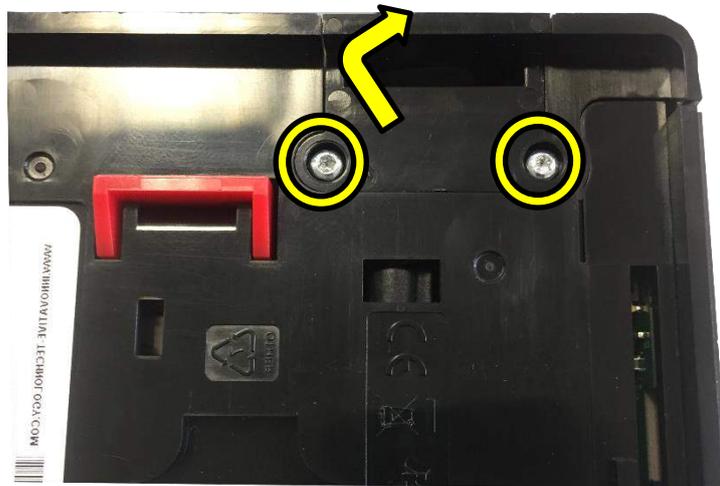
2. Remove head from chassis

Before the lock can be installed, remove the NV200 Spectral from the cashbox chassis. Lift the latch, slide the head forward and lift the head away from the chassis.



3. Remove red insert

There are 2xT8 screws located on the underside of the NV200 Spectral, remove those and lift away the plastic insert.



4. Remove Locking Cam

Press the plastic clip together and remove the locking cam.





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5. Remove Plastic Insert

To remove the plastic insert, from the lock mount, press the two clips on the side together and push through. Insert the cam lock in its place.



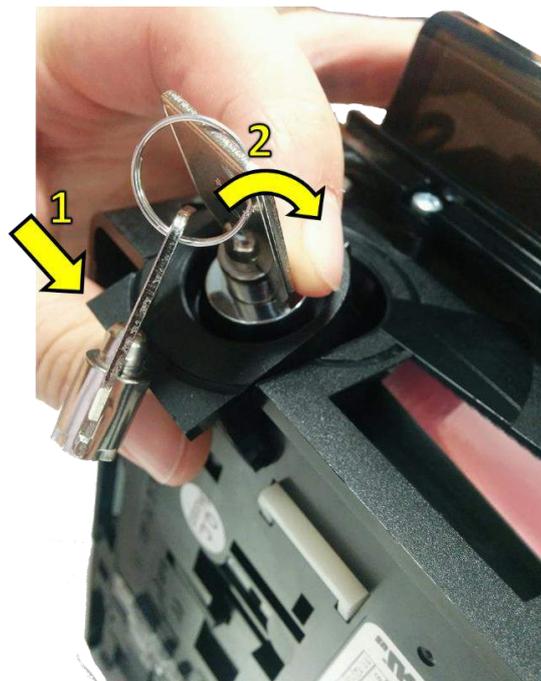
6. Re-attach Locking Cam

Re-attach the locking cam onto the barrel of the lock and tighten.



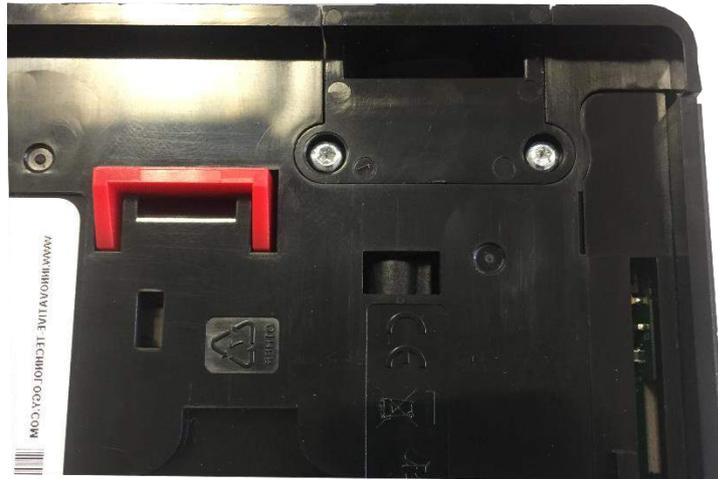
7. Fit Assembled Lock

To fit the assembled lock into the unit, place the bottom in first the push the top into position.



8. Screw in place

Turn the unit upside down and screw in the 2xT8 screws previously removed.





4.4.2 Lock fitting – Standard Cashbox

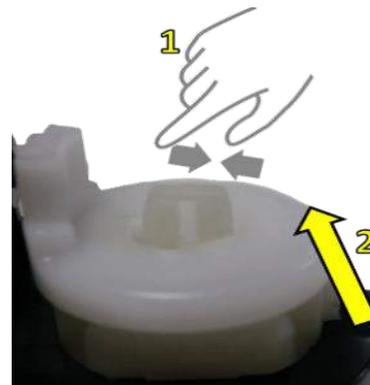
1. Cashbox Lock Location

The standard NV200 Spectral cashbox can be fitted with 2 locks for security. These are located on the bottom of the cashbox on the hinged door.



2. Remove Blanking Plates and Fit Lock

Similarly, to fitting a lock on the front of the NV200 Spectral remove the locking cam and blanking plate which is there by default and replace with the desired lock.



3. Finish Installation

With the lock in place add the washer and the locking cam.

Ensure when the keylock is turned the locking cam is inserted in the same position it was previously removed otherwise it can cause interference.





4.4.3 Lock Fitting - TEBS Cashbox

The TEBS comes installed with a lock from the factory. The standard lock fitting for the TEBS cashbox is PA02540.

4.4.4 Lock Specifications

Locks for the NV200 Spectral are available from Innovative Technology Ltd.

ITL Part Number: PA00650

Webshop Link: <http://innovative-technology.com/shop/NV200-spares/lock-detail>

There is also a keyless lock assembly available, this comes as standard on the 1000 note cashbox.

ITL Part Number: PA02713

There are various lock manufacturers and distributors. Refer to [Appendix 11.2](#) for lock specification.

4.4.5 Lock Cam

The following Lock Cam needs to be ordered from Innovative Technology Ltd. additionally to the lock for full locking capability.

NV200 Spectral Lock Cam Part Number: PM00614

Webshop Link: <http://innovative-technology.com/shop/NV200-spares/NV200-latch-and-base-assembly-detail>

Cashbox Lock Cam Part Number: MC00247

Webshop Link: <http://innovative-technology.com/shop/NV200-spares/NV200-cashbox-lock-cam-detail>



4.5 Docking Plate Mounting

When using the docking plate, you will need a different cable to connect the NV200 Spectral to the power supply as the connector is different.

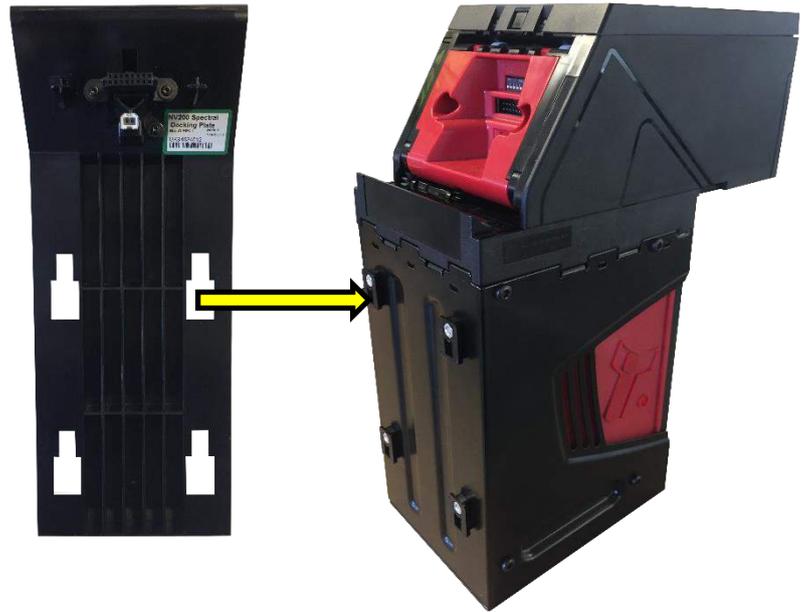
1. Slide NV200 Spectral Forward

Lift the latch on the front of the NV200 Spectral head and slide it forward on the chassis





- 2. Attach the docking plate**
Align the holes in the docking plate with the mounting points on the back of the NV200 Spectral chassis



- 3. Lock Docking Plate in place**
Press downwards on the docking plate to lock it into place on the chassis



- 4. Dock the NV200 Spectral head**
Firmly push the NV200 Spectral back along the chassis until it locks into place on the docking plate connectors.





4.6 Spectral Payout Mounting

1. Slide NV200 Spectral Forward

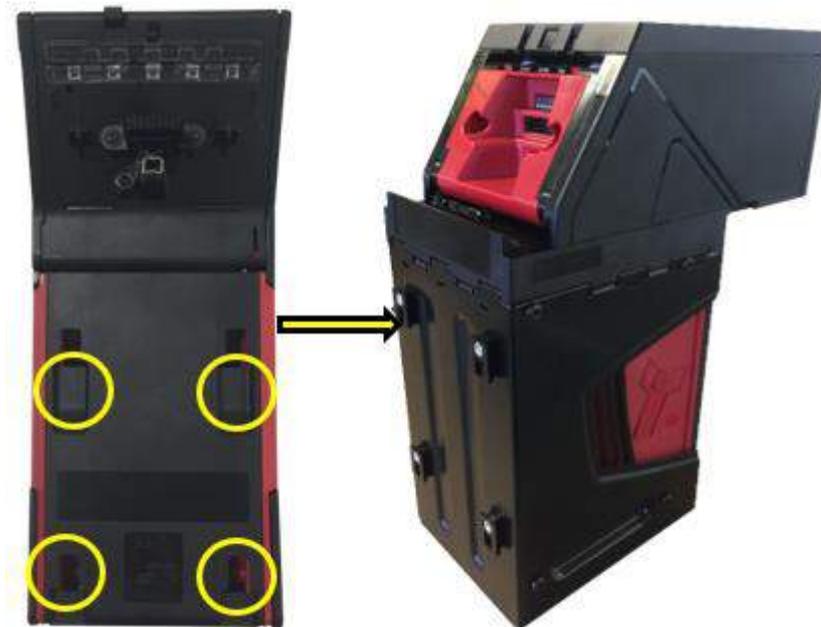
Lift the latch on the front of the NV200 Spectral head and slide it forward on the chassis





2. Attach the Spectral Payout module

Align the holes in the Spectral Payout with the mounting points on the back of the NV200 Spectral chassis



3. Lock Spectral Payout into place

Press downwards on the Spectral Payout to lock it into place on the chassis



4. Dock the NV200 Spectral head

Firmly push the NV200 Spectral back along the chassis until it locks into place on the Spectral Payout connectors.





4.7 Bunch Note Feeder Mounting

The BNF can only be used with an NV200 Spectral with UAP (PA03269). The UAP is riveted to the NV200 Spectral and cannot be removed.

1. **Open the Note Path as shown in the Bezel Fitting section**

2. **The BNF mounts like a normal bezel, slide the clips into the locating slots**



3. **Carefully but firmly push the BNF down onto the UAP so that the connectors dock together.**

Close the Note path when finished.



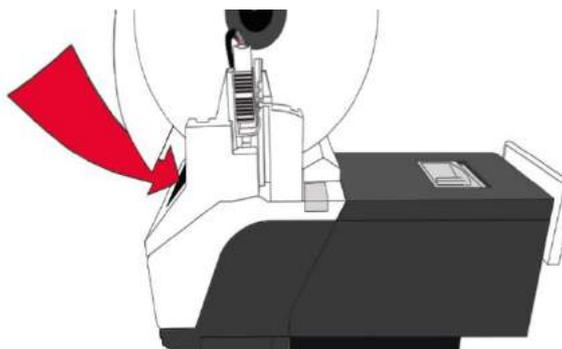


4.8 Loading Paper into the Smart Ticket

4.8.1 Roll

4.8.1.1 Top

The Roll paper is mounted orientated such that the paper edge goes straight from the roll into the Printer, as shown in the picture below.



4.9 Safe Interface Mounting

4.9.1 Safe Interface 27mm/80mm

The Safe Interface module consists of three main components. The Outer Safe Docking Plate, the Inner Safe Docking Plate and the Note Transport (either 27mm or 80mm).

When mounting the Safe Interface, it is vital that the Outer and Inner Docking plates line up exactly. If they are out of alignment the Note Transport will not dock correctly. See [Section 4.10.4](#) for a dimensional drawing of the Safe Interface including mounting points.

1) Attach the Inner Docking Plate

The Inner Docking Plate attaches to the top of the cashbox chassis. The cashbox is mounted inside the safe.

First, position the Inner Docking Plate on top of the cashbox chassis. It will extend slightly forward of the chassis initially below. Ensure are aligned chassis:



It will extend slightly forward of the chassis initially below. Ensure are aligned chassis: as per the picture that the locating tabs with the slots on the





2) Dock the Inner Docking Plate

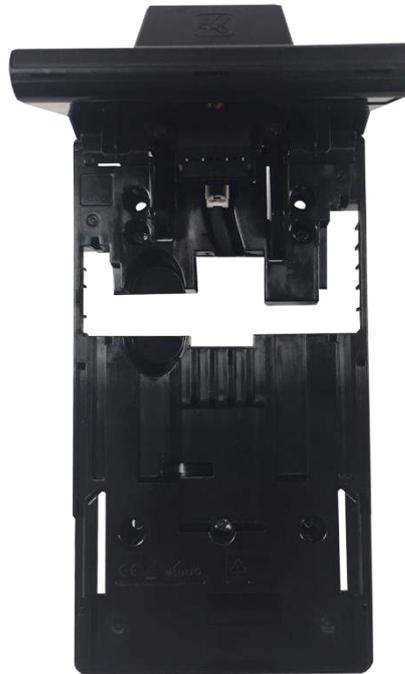
With the Inner Docking Plate correctly positioned, push it backwards until it clicks into place. The aperture on top of the Inner Plate should line up with the cashbox aperture on the chassis:





3) Attach the Outer Docking Plate

The outer docking plate mounts to the top of the safe, externally. The aperture for the Note Transport must be cut into the safe and it must line up exactly with the Inner Docking Plate mounted inside the safe.



4) Insert the Note Transport

The note transport is inserted into the top of the Outer Docking Plate. It will travel through the aperture in the top of the safe and dock into place on the Inner docking plate inside the safe.





4.9.2 Safe Interface Stackerless

The Stackerless version of the Safe Interface only consists of two parts: The Outer Safe Docking Plate and the Note Transport. This note transport differs from the standard Safe Interface options as it is designed to drop notes directly into a cashbag/box rather than stacking them.

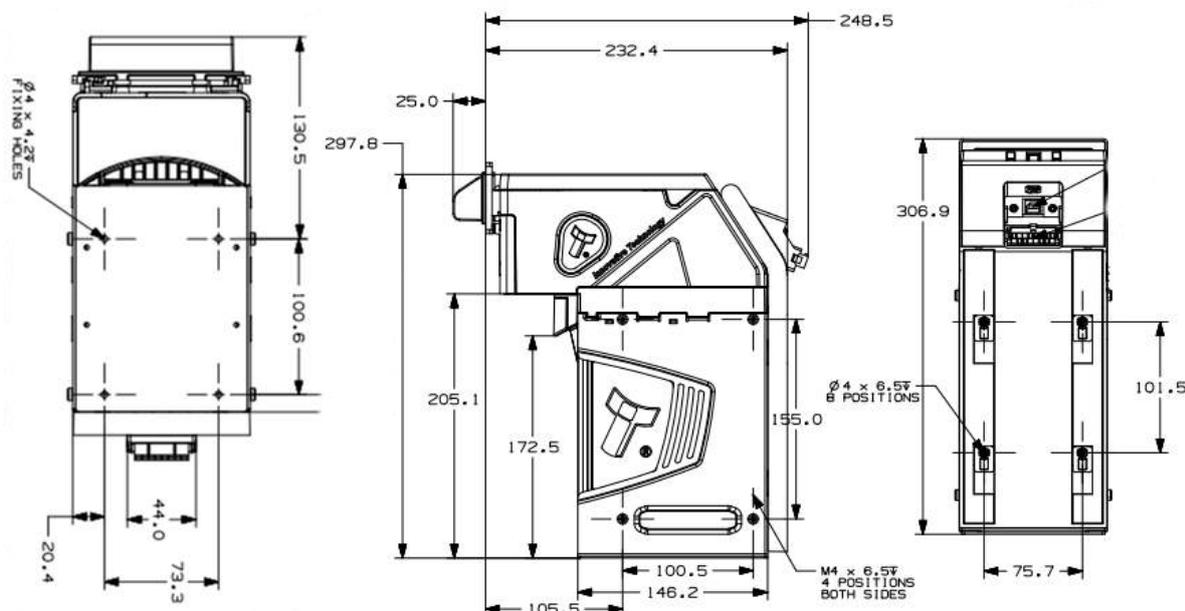
Mounting the Stackerless Safe Interface is easier because it is not necessary to align the Outer Docking Plate with the Inner Docking Plate, only to align an open cashbag/box inside the safe.

4.10 Machine Mounting

The mounting points for the NV200 Spectral differ depending on the cashbox and module options that are being used. The dimensional drawings below show the different mounting points and dimensions for some of these combinations.

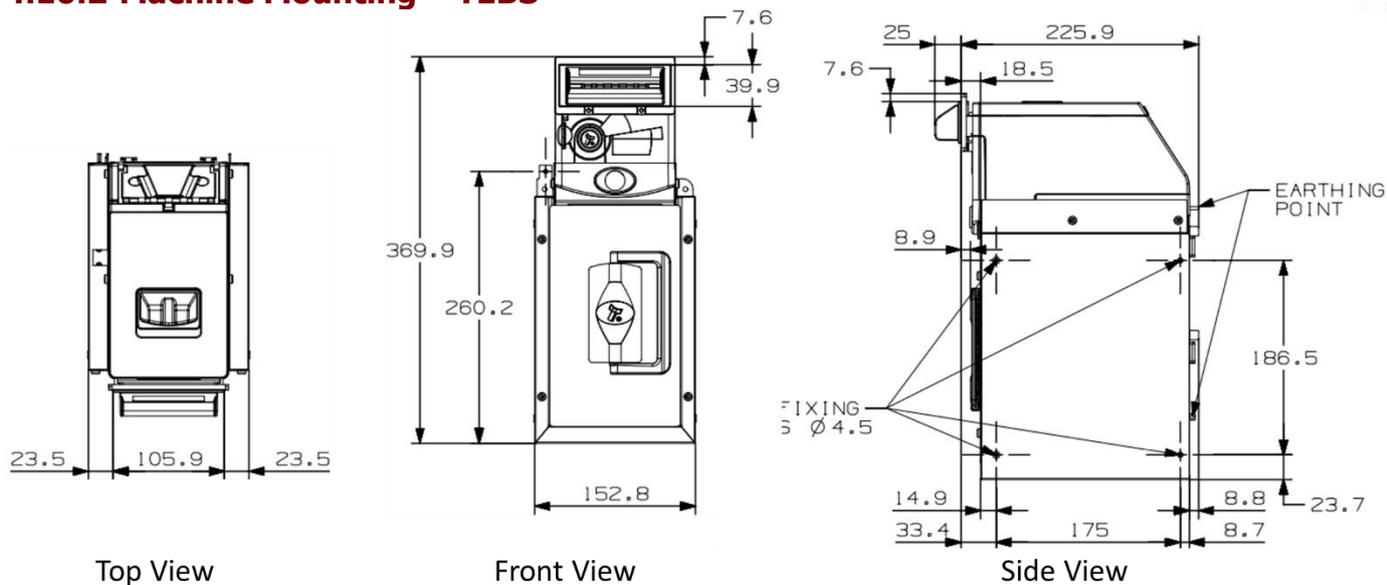
Further dimensional drawings can be found in the Appendix. If the drawing you require is not in this manual please contact support@innovative-technology.com

4.10.1 Machine Mounting – Standard Cashbox

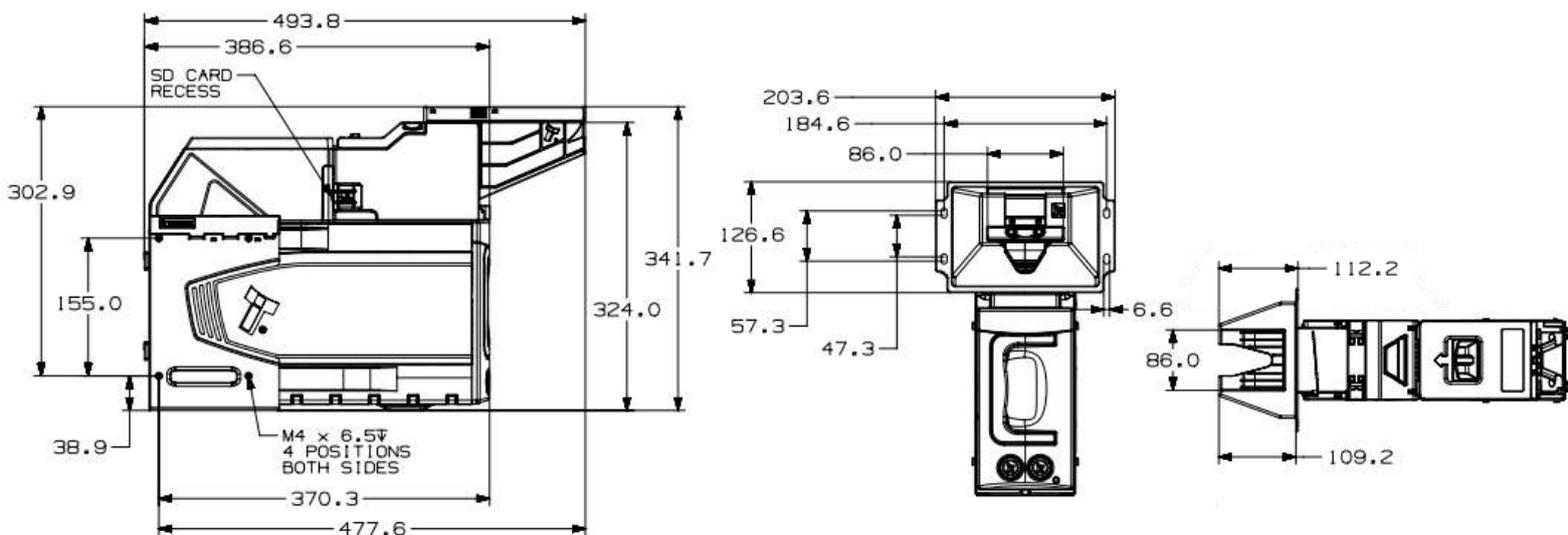




4.10.2 Machine Mounting – TEBS



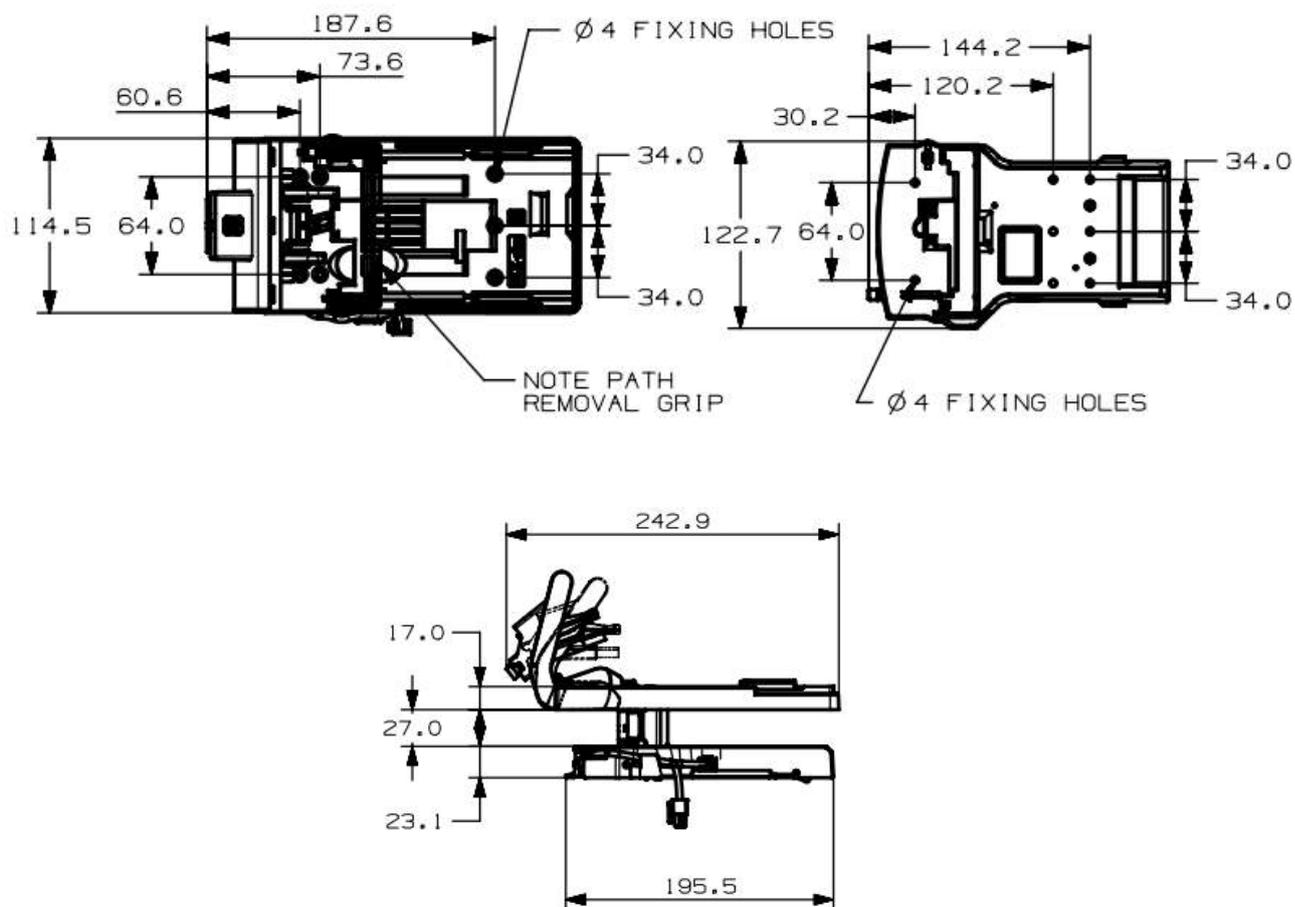
4.10.3 Machine Mounting – 2200 Note Cashbox





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4.10.4 Machine Mounting – Safe Interface



4.10.5 Earth Bonding

It is very important that the NV200 Spectral is properly bonded to earth, using one of the earth tabs. Earthing on the standard chassis can be affixed to the lower screw mounting points at the side of the unit:



The TEBS cashbox has earthing points at the back of the chassis as shown below. The plating on the chassis must be broken to create a proper earthing point on the chassis, it is recommended to use a cutting screw but and tool that can cut away the plating will suffice.



Lack of proper bonding can cause communication issues and other failures. The resistance between the chassis and Earth should be less than 0.7Ω.

	Caution!
Lack of proper earth bonding causes failures!	

4.10.6 Screw Specifications

The scope of delivery does not include screws for machine mounting. See table below for screw specification reference.

Location	Thread Type	Screw Length
Bezel	M3	12mm
Cashbox	M4	6mm
TEBS Cashbox	M4	16mm

4.10.7 Things to consider

When mounting an NV200 Spectral there are several things to consider including:

- Smart ticket – minimum distance surrounding the validator/ticket module.
- Weight of a fully loaded unit as defined in [Section 3.2](#)
- Accessibility – allow enough space to reach all connectors and switches if required.
- Cable management – ensure no connectors are damaged/removed from everyday use.



5 SOFTWARE INSTALLATION AND CONFIGURATION

5.1 Introduction

The NV200 Spectral leaves the factory programmed with the latest dataset and firmware files, unless specifically requested. However, it is important to ensure your device is kept up to date with the latest dataset and firmware. This section will give you a brief overview of the various update possibilities with the NV200 Spectral. For detailed instructions refer to the relevant manual package supplied with the software or contact support@innovative-technology.co.uk.

5.2 Software Downloads

All software from Innovative Technology Ltd is free of charge and can be downloaded from the website www.innovative-technology.com/support/secure-download once registered and logged in. If you are not registered, create an account via the Create an account form. A confirmation email will be sent to the registered email address once all contact details have been successfully submitted.

5.3 Drivers

The ITL drivers allow you to connect any of our validators to a compatible Windows device. If you are connecting via an IF17 then you will not need to follow this process as they are signed Microsoft Drivers and should install automatically. If this isn't the case or your computer is disconnected from the network, there is a standalone package included within the driver downloads.

5.4 Dataset/Firmware Programming

5.4.1 Validator Manager

5.4.1.1 General Description

Validator Manager is a utility which allows the user to reprogram any of ITL's validators, hoppers as well as coin and note recycler. Note that admin rights are required during installation. The validator must be in SSP for the Validator Manager to detect the device.

5.4.1.2 System Requirements

- .Net Framework 4.5
- 256mb ram
- 50mb hard disk free
- Connected NV200 Spectral with active com port



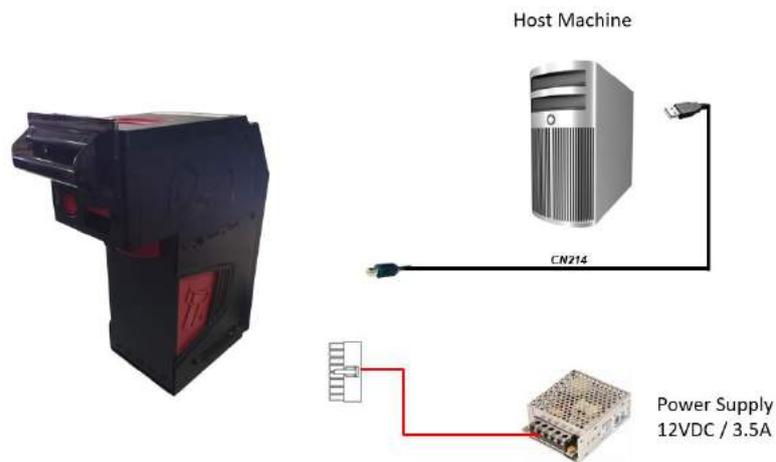
Caution!

We have seen instances where one of the dll's (itdata1.dll) used in Validator Manager are flagged as a Trojan, this is a false positive and if this happens you will need to add a rule to your antivirus to allow the file to run.



5.4.1.3 Hardware Setup

The connection example below shows a direct USB connection between the NV200 Spectral and the host machine (PC). This should only be used for programming/testing. For other connection examples see [Section 6.4.3](#)



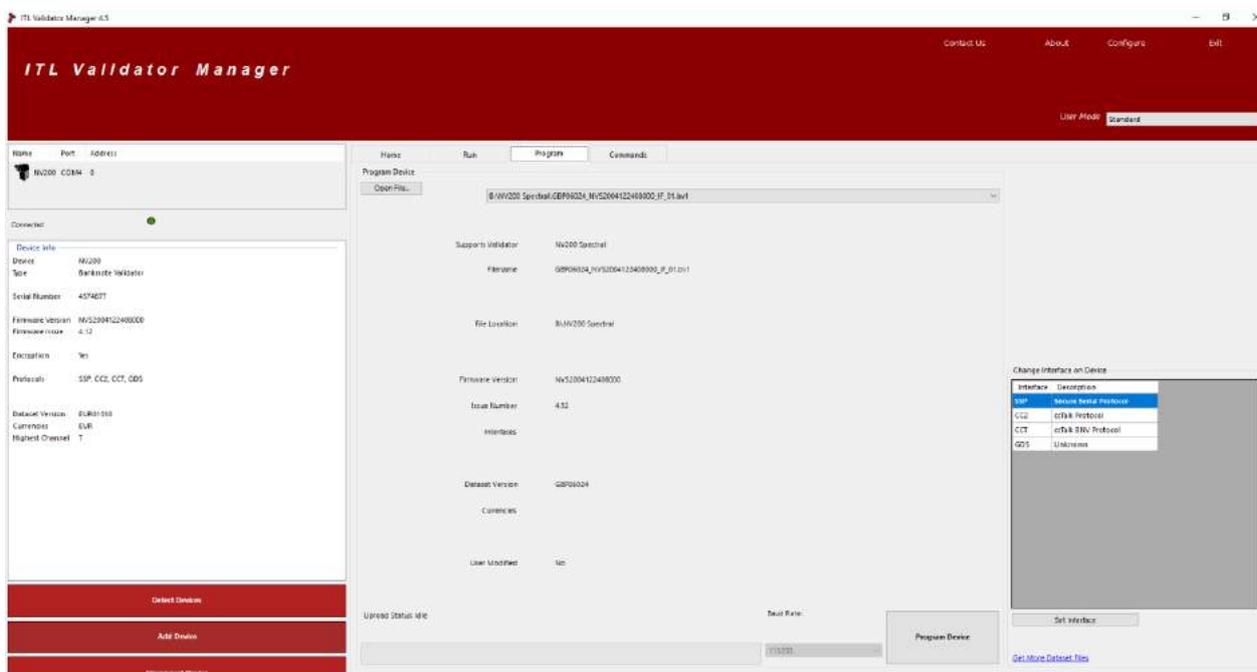
5.4.1.4 Switching to Programming Mode (SSP)

Before programming via the Validator Manager, the NV200 Spectral needs to be switched to its programming mode (SSP interface). Refer to [Appendix 11.5](#) for the procedure for doing this.

5.4.1.5 Programming the device

Once you have switched the unit into SSP, open Validator Manager and click detect devices. This will scan all active com ports for a unit, if the NV200 Spectral fails to connect ensure the correct drivers are installed and the unit is in SSP.

By selecting the Program tab, you can reprogram the NV200 Spectral. To begin the upload, click open file, then browse to the file location (usually Downloads) before clicking OK.



Once the file has been selected its information will be populated and the Program device tab will become active. Finally, hit 'Program Device', the unit's bezel will now begin to flash signaling the update has begun.

	<h2>Caution!</h2>
<p>Interrupting the download process can result in the unit entering a non-functional state, once the process has started it cannot be halted.</p>	

When completed the unit will restart and a pop-up box will appear saying Device Programming Complete.

5.4.2 SD Card

5.4.2.1 General Description

The NV200 Spectral can also be reprogrammed through the SD slot on the front of the unit. To do this the SD card must be correctly formatted and meet the hardware requirements defined in [Section 5.4.2.2](#) below.

5.4.2.2 Hardware Requirements

The SD card must meet the following hardware requirements:

- Minimum: 4GB – Class 4
- Maximum: 32GB – Class 10

The following SD card has been tested and recommended for best performance:
<https://www.sandisk.co.uk/home/memory-cards/sd-cards/ultra-sd>





5.4.2.3 Re-programming via SD Card

Follow the steps below to set up the SD card and perform the update:

- 1) Connect the SD card to your PC using an SD card reader.
- 2) Ensure that the card is FAT-32 formatted and is blank.
- 3) Create a folder on the SD card called nv200hs. **This must be lowercase**
- 4) Inside the folder, place the dataset file that you want to load on to the validator. Datasets can be downloaded from the [Innovative Technology website](#) or requested from our support team:
support@innovative-technology.co.uk
- 5) Ensure the NV200 Spectral is powered on and has booted up
- 6) Insert the SD card into the slot on the front. The bezel will now start flashing. **Do not unplug the validator during the update process.**
- 7) Wait until the bezel lights solid green. When it does, the SD card can be removed.
- 8) After the SD card has been removed, the unit will reboot. This takes around 10 seconds. Once it has rebooted the NV200 Spectral will have the new dataset on it and is ready to be used. **If there are modules attached (Payout/Ticket/TEBS) these will then be updated by the NV200 Spectral, do not unplug the unit during these updates.**

5.4.3 Remote Updates

5.4.3.1 General Description

The unit can be updated through an SSP command which sets the validator into an update mode before downloading the firmware file. Details of how this process is implemented can be found in ITL's eSSP Implementation Manual (GA973) and is available on request.

	Caution!
This is a complex operation and failure to implement correctly may damage units.	





6 PROTOCOLS AND INTERFACING

6.1 Introduction

The NV200 Spectral supports standard industry protocols. Interfaces that are not listed may be available upon request. For any queries regarding interfaces that are not listed contact support@innovative-technology.co.uk

	Caution!
The use of an encrypted protocol (preferable eSSP) is strongly recommended to achieve the highest security!	

6.2 Interface Connectors

The NV200 Spectral validator has two connectors that are used to allow interfacing and programming; these connectors are easily accessible at the back of the validator.

	Information
Power always required regardless of connection type.	

Power is always required on pins 15(+V) and 16(0V) of the 16-way connector.

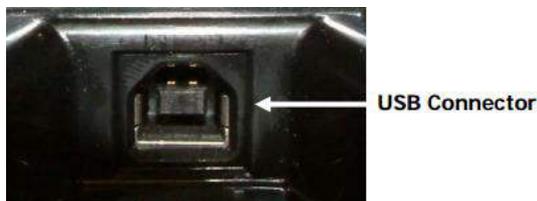
The first connector is a 16-pin socket used to interface the NV200 Spectral to the host machine. The pin numbering of the socket is shown below, as well as an overview of the socket connections:



When a Payout, Ticket Module or Docking Plate is connected a 16-pin Molex 0039012165 connector will replace the 16-pin Molex 9733272, the Pinout is below:



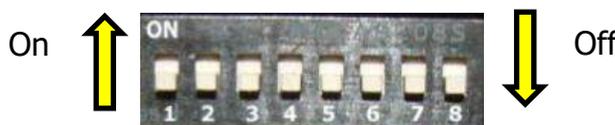
The USB connector is a standard Type 'B' USB socket which can be used for programming the NV200 Spectral – a USB 2.0 compliant Type 'A' to 'B' lead can be used to do this. The USB connection is not recommended for use in the final 'live' application.



6.3 User Interfaces

6.3.1.1 Dip Switches on the NV200 Spectral

The NV200 Spectral has a Dual Inline Package (DIP) switch bank that is used to set the various options for the unit. A summary of the switch options is shown below:



Switch	Option	Switch OFF (↓)	Switch ON (↑)	Default Setting
1	Disable Barcode	Read enabled	Read disabled	OFF
2	Channel 1 Inhibit	Channel enabled	Channel disabled	OFF
3	Channel 2 Inhibit	Channel enabled	Channel disabled	OFF
4	Channel 3 Inhibit	Channel enabled	Channel disabled	OFF
5	Channel 4 Inhibit	Channel enabled	Channel disabled	OFF
6	Channel 5 Inhibit	Channel enabled	Channel disabled	OFF
7	Channel 6 Inhibit	Channel enabled	Channel disabled	OFF
8	Protocol Select	*Switches between the primary (selected) protocol and SSP (used for Programming). The switch needs to be toggled ON and OFF to alternate between the two. This will cause the unit to reset.		OFF



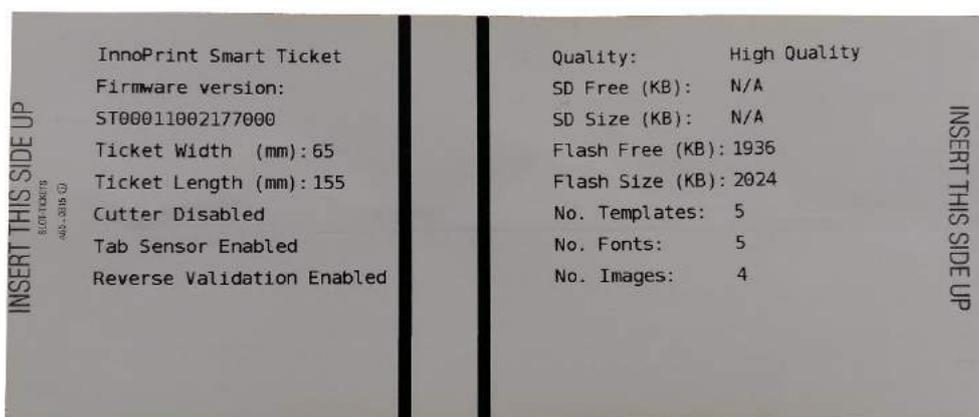
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6.3.1.2 Smart Ticket Button

The SMART Ticket Has a button on the rear of the unit.



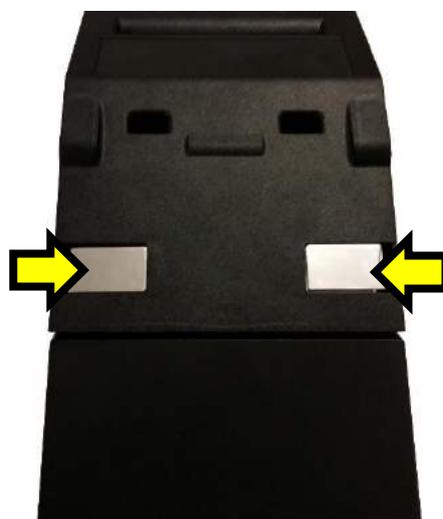
Pressing and holding this button will lead to a test ticket being printed, this ticket will show information on Firmware and the current printer settings.



6.3.1.3 Smart Ticket Dip Switches

The SMART Ticket has 4 Dipswitches in the unit, these switches can be found by opening the Ticket path.

To open the ticket path, squeeze the clips on the top of the SMART Ticket and lift the lid.



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Once there is a dock of 4 dipswitches at the hinge of the SMART Ticket on the Right Side.



Switch	Option	Default Setting
1-3	Not used	OFF
4	"Safe Mode" – stops the Printer from Printing any more tickets if the Paper Low Sensor is Triggered.	OFF





6.4 SSP and eSSP

6.4.1 General Description

Smiley® Secure Protocol (SSP) and Encrypted Smiley® Secure Protocol (eSSP) are field proven secure interfaces specifically designed by Innovative Technology Ltd. to address the problems by cash handling systems in gaming machines. Problems such as acceptor swapping, re-programming acceptors and line tapping are all addressed. This interface is recommended for all new designs. Innovative Technology Ltd. provides full SDK packages upon request including Interface Specification, Implementation Guide as well as source code examples for C++, C#.NET and Linux. Contact support@innovative-technology.co.uk for further information.

6.4.2 Pin Assignments



Pin	Name	Type	Description
1	TxD TTL	Output	Serial Data Out (Tx)
2	Factory Use Only – DO NOT CONNECT		
3			
4	TxD TTL	Output	Connect to Pin 1 for Smart Ticket
5	RxD TTL	Input	Serial Data In (Rx)
6	TxD RS232	Output	Serial Data Out (Tx)
7	RxD RS232	Input	Serial Data In (Rx)
8	TxD TTL	Input	Connect to Pin 5 for Smart Ticket
9	Factory Use Only – DO NOT CONNECT		
10			
11			
12			
13			
14			
15	+ Vin	Power	+12/24VDC Supply
16	0V	Power	0V Supply (GND)

	Caution!
+12VDC/+24VDC and 0V (GND) must always be connected, also when using USB connections.	

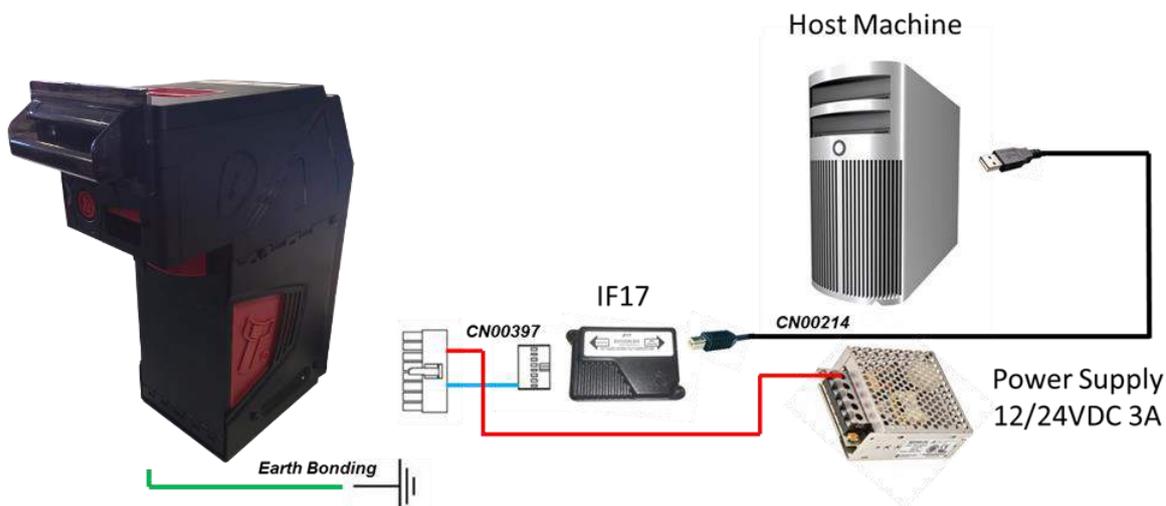




6.4.3 Setup Examples

The drawings below highlight how to connect the NV200 Spectral to an SSP host machine using available cables and interfaces from Innovative Technology Ltd. For cable drawings refer to [Appendix 11.1](#).

6.4.3.1 NV200 Spectral



Drawing 1 - NV200 Spectral USB connection

Part Name	Description	Quantity
NV200 Spectral	NV200 Spectral Note Validator	1
IF17	USB Interface Converter /	1
CN397	Docking Plate / Spectral Payout to Host Cable	1
CN214	USB A to B Cable Assembly	1

Table 1 - ITL Part Numbers

Power Requirements

This setup option requires a stable 24VDC / 3.5A power supply for the NV200 Spectral according to the product specification.

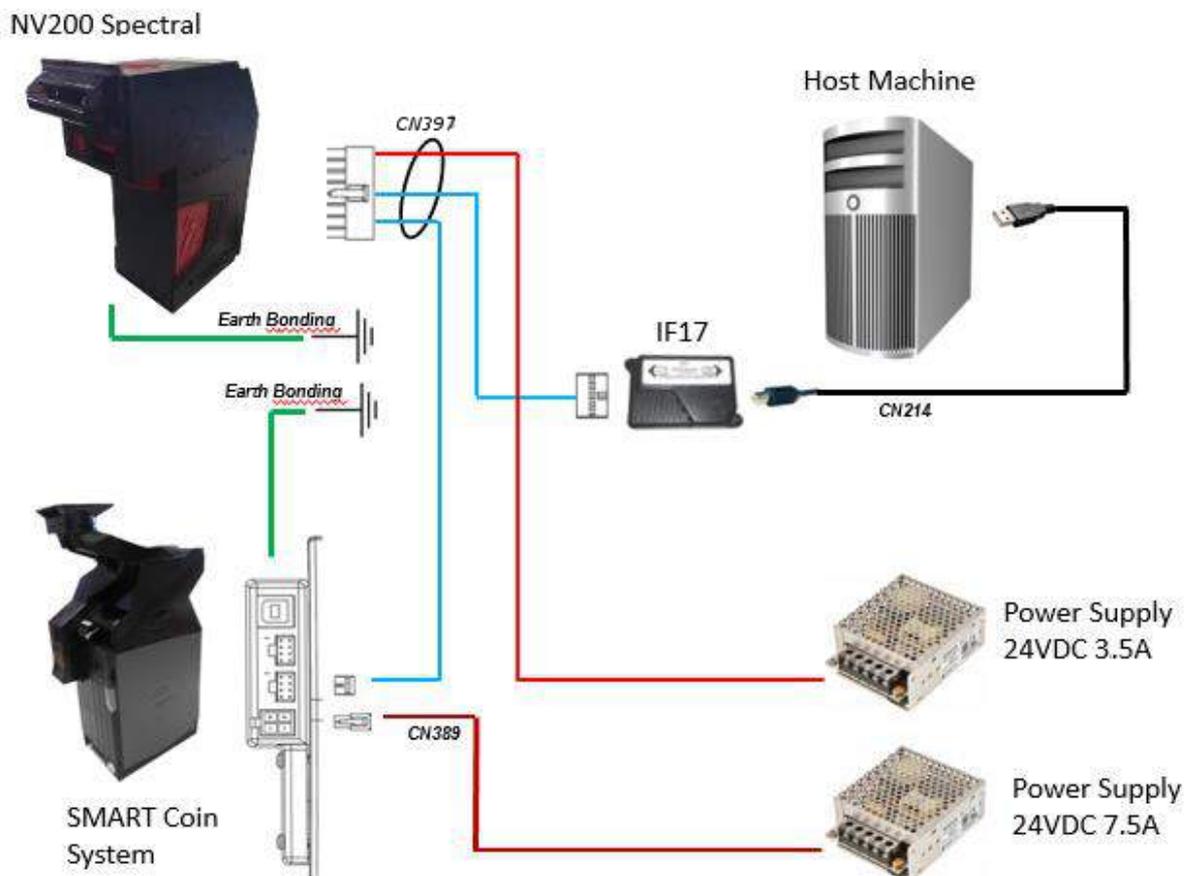
Check the power requirements of your host machine and other peripherals to dimension a proper power environment for your system setup.

Caution

It is very important that the cashbox chassis of the NV200 Spectral is bonded to earth, as lack of proper bonding can cause communication issues and failures. The earth bond on a NV200 Spectral should be made to the intended connection on the outer Cashbox. The resistance between the cashbox and the Earth pin on the mains plug should be less than 0.7 ohms.



6.4.3.2 NV200 Spectral and Smart Coin System



Part Name	Description	Quantity
NV200 Spectral	NV200 Spectral Note Validator	1
IF17	USB Interface Converter /	1
CN397	Docking Plate / Spectral Payout to Host Cable	1
CN214	USB A to B Cable Assembly	1

Power Requirements

This setup option requires a stable 24VDC / 3.5A power supply for the NV200 Spectral whilst the SCS requires 24V DC 7.5A according to the product specification.

Check the power requirements of your host machine and other peripherals to dimension a proper power environment for your system setup.

Caution

It is very important that the cashbox chassis of the NV200 Spectral is bonded to earth, as lack of proper bonding can cause communication issues and failures. The earth bonds on a NV200 Spectral should be made to the intended connection on the outer Cashbox. The resistance between the cashbox and the Earth pin on the mains plug should be less than 0.7 ohms.





6.5 ccTalk®

6.5.1 General Description

ccTalk® is a serial communications protocol designed by Money Controls to allow 3-wire interfacing between a host and cash handling peripherals.

Only the NV200 Spectral with standard cashbox and Spectral Payout module can communicate via ccTalk. The TEBS cashbox and Ticket module are currently only implemented in SSP.

Previously CC2 protocol was required to support a payout module, to implement the extra commands used for note recycling. When programmed to ccTalk the NV200 Spectral recognizes when a payout module is connected and automatically supports these extra commands, without needing to reprogram it to the CC2 protocol. For legacy support, the protocol can be locked to CC2 if required.

Contact support@innovative-technology.co.uk for further information.

	Caution!
Innovative Technology Ltd. provides full SDK packages including Interface Specification, Implementation Guide as well as source code examples for SSP and eSSP only!	

6.5.2 Pin Assignments



Pin	Name	Type	Description
1	TxD TTL	Output	Serial Data Out (Tx) (optionally link to Pin 5*)
5	RxD TTL	Input	Serial Data In (Rx) (optionally link to Pin 1*)
15	+ Vin	Power	+12/24VDC Supply
16	0V	Power	0V Supply (GND)

***If true CCTalk communication is required**

	Caution!
+12VDC and 0V (GND) must always be connected, also when using USB connections.	





6.5.3 ccTalk® DES Encryption

When using ccTalk® DES encryption, the NV200 Spectral and host machine must exchange a secret key which forms the basis of the communication encryption. This exchange is performed in a Trusted Mode maintaining security. The Trusted Mode can only be entered by a physical access to the NV200 Spectral. Refer to [Appendix 11.7](#) for details.

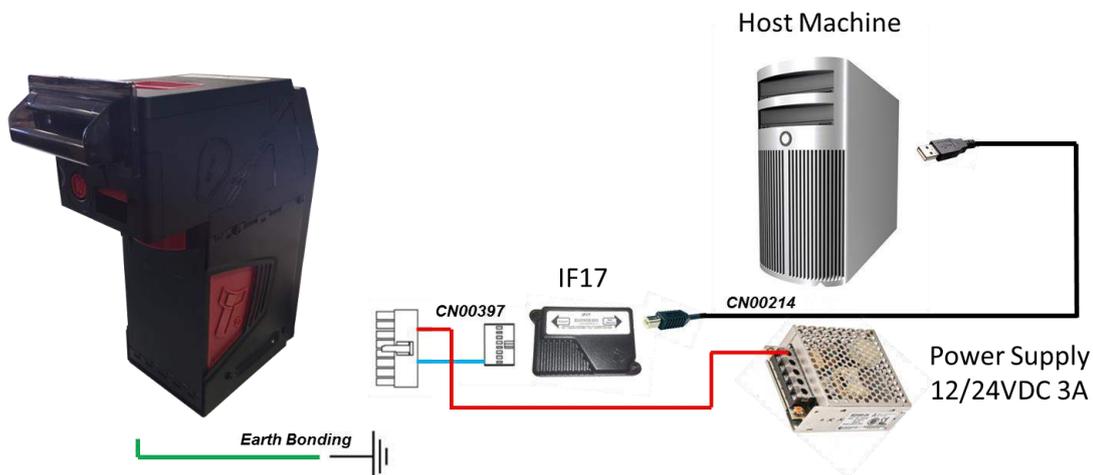
6.5.4 Setup Example Drawings

6.5.4.1 NV200 Spectral

The drawing below highlights how to connect the NV200 Spectral to a ccTalk host machine using available cables and interfaces from Innovative Technology Ltd.

This is not true ccTalk as the Tx and Rx pins are not joined, pin 1 and 5 can be connected if required.

For complete cable drawings refer to [Appendix 11.1](#).



6.5.4.2 NV200 Spectral with Spectral Payout Module

The drawing below highlights how to connect the NV200 Spectral Payout to a ccTalk host machine using available cables and interfaces from Innovative Technology Ltd.

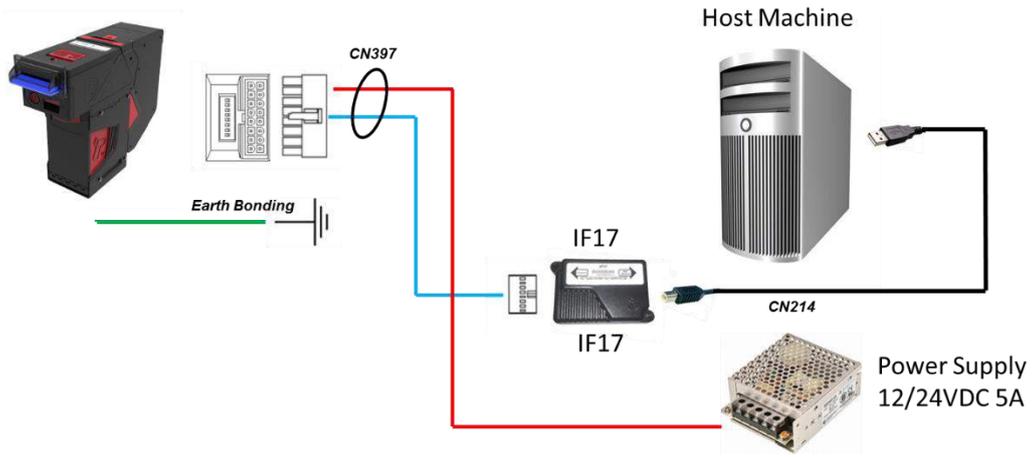
This is not true ccTalk as the Tx and Rx pins are not joined, pin 1 and 5 can be connected if required.

For complete cable drawings refer to [Appendix 11.1](#).



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7 ROUTINE MAINTENANCE

7.1 Introduction

The NV200 Spectral has been designed to minimise any problems or performance variations over time. This has been achieved by careful hardware and software design; this attention to the design means there is very little user maintenance required.

7.2 Recommended Cleaning Intervals

Innovative Technology Ltd recommends cleaning the optical lenses every month or as required. Dirt, dust or other residue leads to bad note acceptance and other performance degradation. Refer to the section below for detailed cleaning instructions.

7.3 Cleaning the NV200 Spectral

Disconnect the power **BEFORE** carrying out any cleaning operations to avoid the risk of causing damage to the validator.

7.3.1 Cleaning the Validator

 Caution!
Do not use solvent based cleaners on any part of the NV200 Spectral unit.

Do not use solvent based cleaners such as alcohol, petrol, methylated spirits, white spirit or PCB cleaner. Using these solvents can cause permanent damage to the units; only use a mild detergent solution as directed below.

The NV200 Spectral note path can be cleaned with the head still fitted to the chassis, although it may be easier to remove the head from the chassis assembly.

To remove the NV200 Spectral head unit, first lift the red head release catch located on the front of the NV200 Spectral

Finally, slide the head unit forward and lift it off the chassis

Head release catch



 WARNING!
Disconnect power BEFORE any cleaning operation





To open the note path cover, pull the top cover release latch forward (towards the bezel) and lift the cover as shown below (it is recommended to also remove the bezel to allow correct cleaning of the note path guides):



The note path is visible and can be cleaned. Carefully wipe the surfaces with a soft lint free cloth that has been dampened (NOT wet) with a water and mild detergent solution (e.g. household washing up liquid) - be very careful when cleaning around the sensor lenses and make sure they are clean and dry before closing the cover and powering the unit.

 **Caution!**
Do not use any lubricants.

Do not lubricate any of the note transport mechanism or any part of the note path, as this can affect the operation of the validator.

 **WARNING!**
Do not try to disassemble

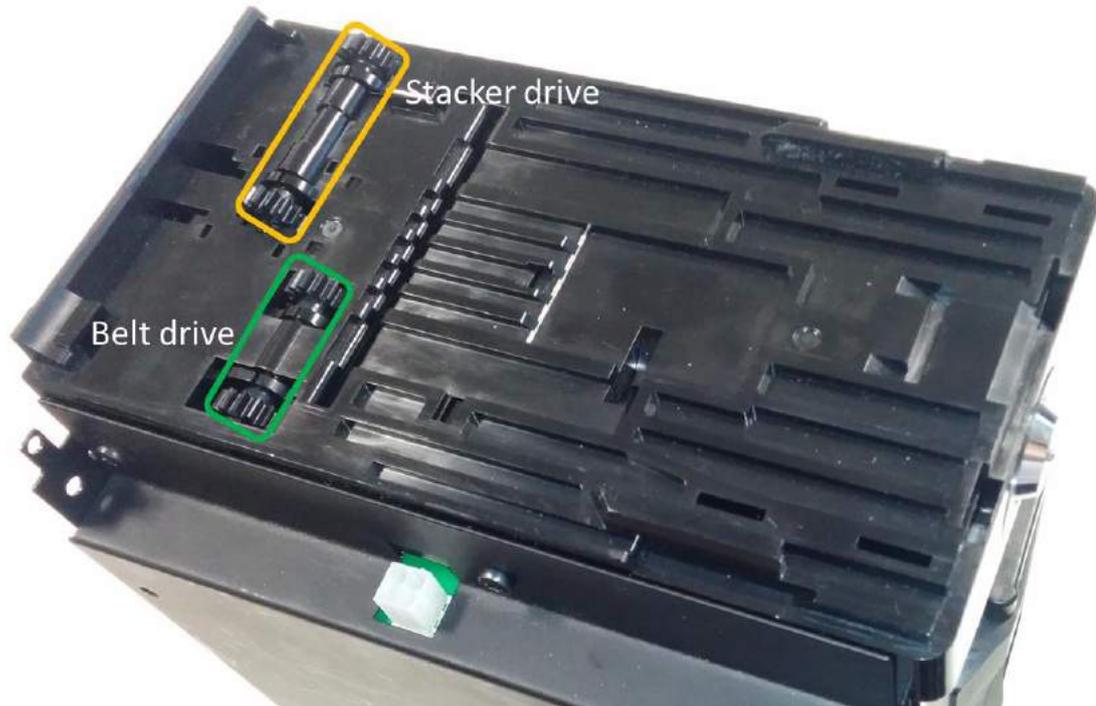
Do not attempt to disassemble the validator head – trying to do this could cause personal injury and will damage the unit beyond repair.

7.3.2 Cleaning the TEBS Cashbox

Remove the cashbox as this provides access to the moving parts within the TEBS cashbox. Once the cashbox has been removed, detach the NV200 Spectral head this provides access to the drive gears.

Manually turn the stacker drive this will move the stacker forward, when at the full extension there is a tactile bump. This will hold the stacker out allowing compressed air (Max pressure = 5 bar) to be blown into the unit.

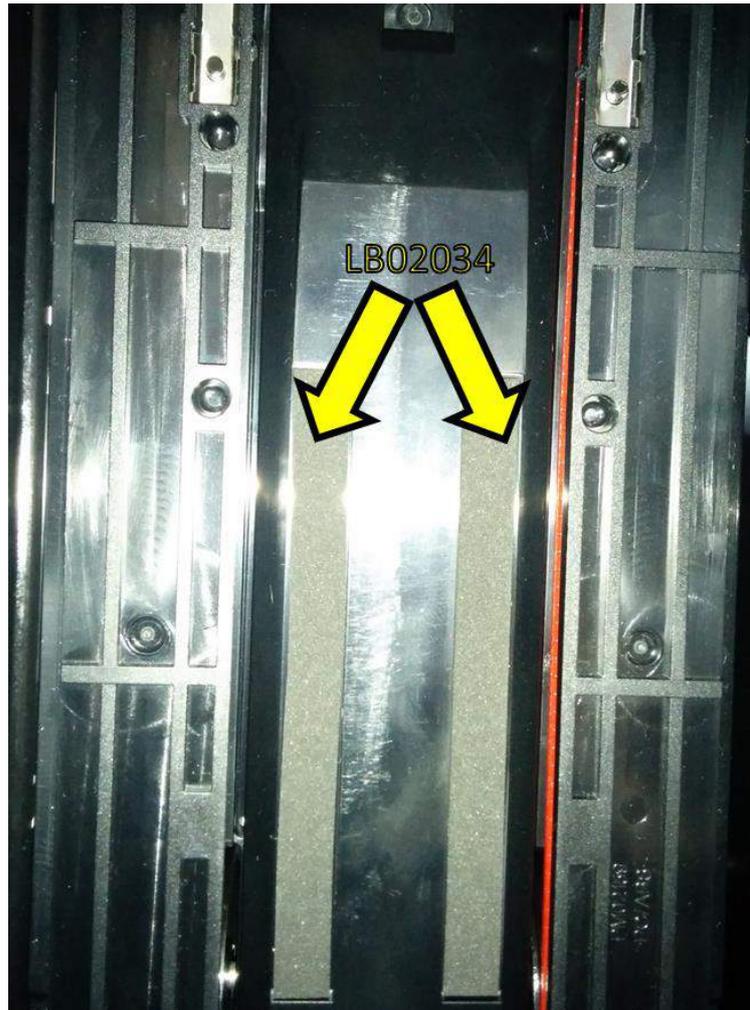




Once the debris has been cleared check foam strips on the stacker to ensure they are not damaged, if not move the stacker back into the rest position. If they are damaged, remove the stacker plate by pushing up and replace the strips with ITL part number LB2034.

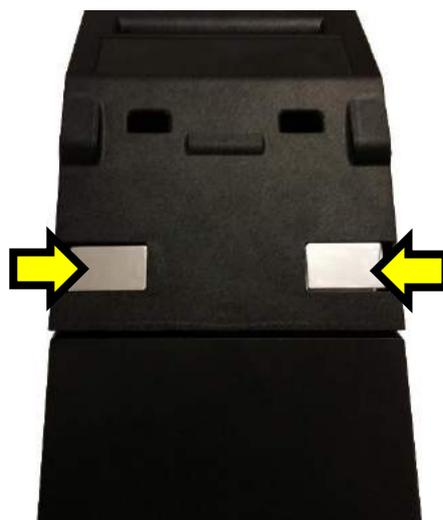


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7.3.3 Cleaning the Ticket Module

To Clean the Ticket module, open the printer by squeezing the clips on the top of the SMART Ticket and lifting the lid.



When opened the ticket path is accessible, as shown below:

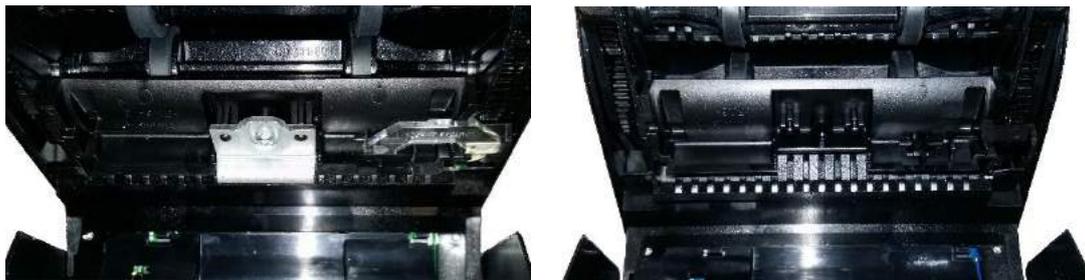




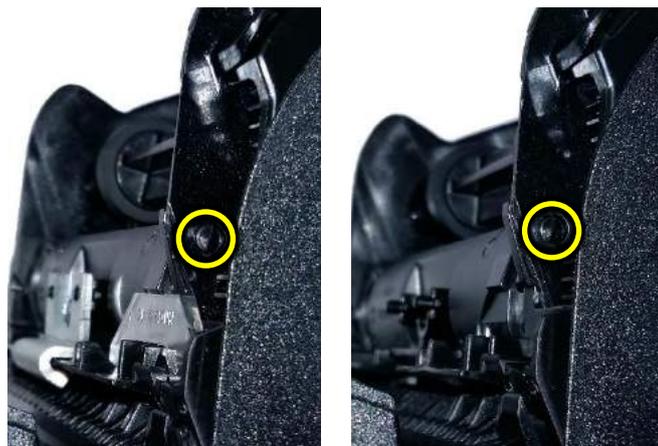
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Part of the SMART Ticket needs to be removed so the whole path can be cleaned. The PM01018 is used to guide the paper, the part is shown in situ below.

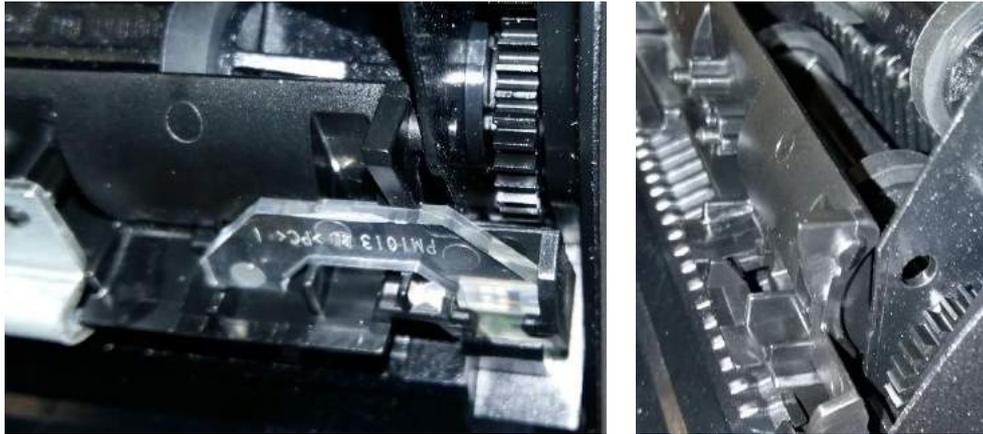


Remove this part by pressing into a lug on the side with a tool (e.g. a screwdriver) and lifting the PM01018 out of position.

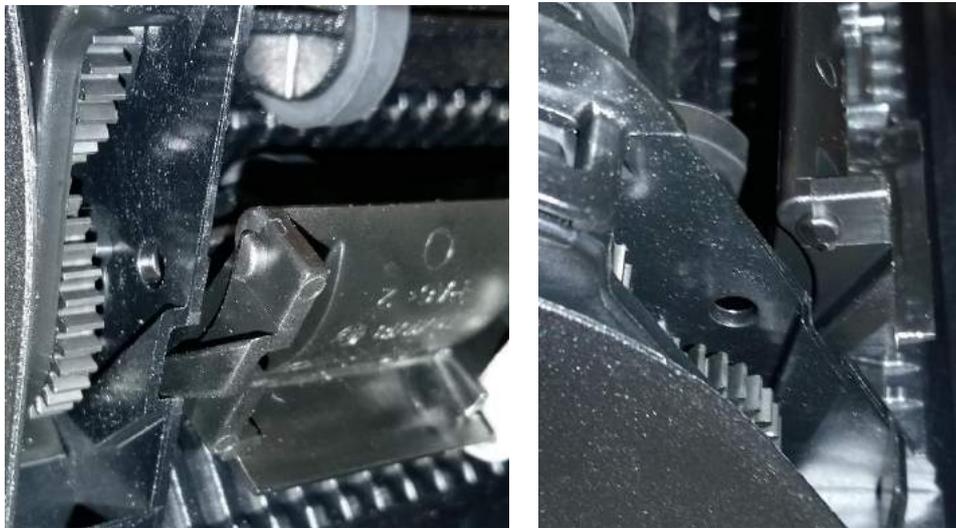




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There are Lugs on both sides, when one is unclipped, the other can be removed.



It can then be lifted out of position to reveal the rest of the ticket path.



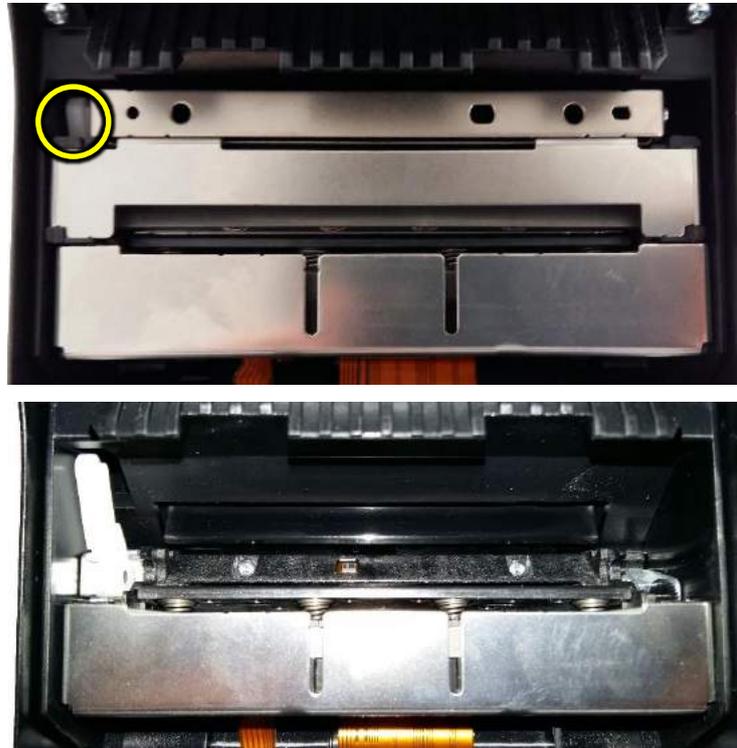
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Compressed air (Max pressure = 5 bar) should be used to clean the rollers and ticket path of debris. The ticket path can then be wiped off with a soft lint free cloth, this can be dampened (NOT wet) as required.

The printer should be opened so the cutter can have debris removed.

Pushing back on the white lever will pop the printer platen out of position.



Both the Printer body and the platen (the removed part) can be wiped off with a dampened (NOT wet) soft lint free cloth.

The Platen is reattached by pushing it back into position.

The detached plastic for the note path can be repositioned by aligning the plastic guides and pushing the nodules into position.



The Ticket Path can then be closed, and the unit can be powered.





7.3.4 Cleaning the Bunch Note Feeder

To clean the Bunch Note Feeder (BNF) follow the steps below:

1) Remove the BNF bezel

Pull the bezel forward and down as shown in the picture to unclip the bezel from the front of the BNF. When it is unclipped, pull forward to fully remove the bezel:



2) Open the Upper Note Path

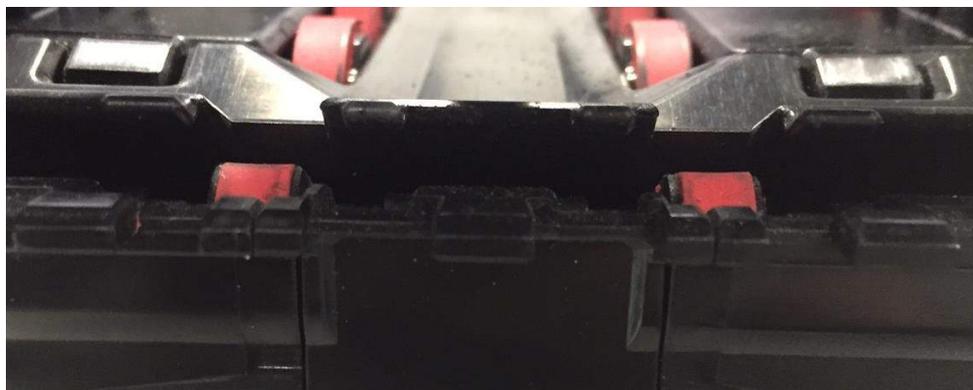
Clean the note path with a clean dry cloth, ensure that any debris is removed and the tyres are cleaned. Clean the rubber tongue on the upper lid.





3) Clean the rear tyres

Clean the pinch wheel tyres at the back of the unit, ensure that the diverter moves easily and is clear.





8 FIRST LEVEL SUPPORT

8.1 Bezel/Status LED Flash Codes

The NV200 Spectral Validator has inbuilt fault detection facilities. If there is a configuration or other error, the NV200 Spectral front bezel will flash in a particular sequence, and a summary of the Bezel Flash Codes for the NV200 Spectral is shown below:

Flashes	Indicated Status / Error		Recommended Action
	Red	Blue	
1	1	Note Path Open	Close the lid of the NV200 Spectral validator it will click into place as it shuts.
	2	Note Path Jam	<ol style="list-style-type: none"> 1. Power down the NV200 Spectral 2. Open the NV200 Spectral using the red catch on top and inspect the note path for any note debris 3. If there isn't any evidence of a note carefully remove the NV200 Spectral from the base using the red catch on the front. 4. A note could be just sticking out from the cashbox, remove power and the NV200 Spectral head. 5. If a note is visible remove the note. 6. Re-attach the head and power. 7. If the jam isn't cleared remove the cash bag as described in Section 4.3
	3	Unit Not Initialised	The NV200 Spectral will need to be returned to your nearest repair centre for repair
2	1	Cashbox Removed	Insert the cashbox. If it is a TEBS cashbox and the error is displayed with the cashbox inserted, remove the outer housing and check the barn door flag is operating
	2	Cashbox Jam	Follow the steps as advised in Section 9.2
	3	No TEBS Detected	Remove the NV200 Spectral head by lifting the red latch on the front of the unit. Replace the unit ensuring the NV200 Spectral is flush with the front of the TEBS unit. If the unit is displaying this error but is connected to a standard cashbox the NV200 Spectral cashbox flag should be changed in Validator Manager. If this doesn't solve the issue attempt a power cycle of both the NV200 Spectral and TEBS.
	4	Barcode Fail	If a new bag had been inserted and the unit fails to read the barcode; attempt a power cycle of the TEBS base by removing and replacing the 4 pin Molex on the left-hand side of the unit. If the unit doesn't recover a new bag will need to be inserted, replace the bag as outlined in Section 4.4
	5	Cashbox Unlocked	Issue an unlock command to the TEBS, physically unlock and relock the unit ensuring the lock has been completely turned.





	6	Currency Mismatch	Remove the current TEBS bag and reinsert a new bag.
	7	Firmware Error	Contact ITL support.
	8	Incompatible TEBS	The TEBS build revision is not supported by NV200 Spectral. Must be build revision 9 or higher.
3	1	Firmware Checksum Error	There has been an issue with the attempted download, retry the download with the recovery section on validator manager, if this fails arrange for the unit to be returned to the nearest repair centre; details of which can be found on our website.
	2	Interface Checksum Error	The firmware loaded doesn't contain the primary interface from the previous firmware. Download with the IF file containing the correct protocol.
	3	EEPROM Checksum Error	There has been an issue with the attempted download, retry the download with the recovery section on validator manager, if this fails arrange for the unit to be returned to the nearest repair centre; details of which can be found on our website.
	4	Dataset Checksum Error	
4	1	Power Supply too Low	Check the voltage on your power supply is within the specified voltage range as outlined in Section 3.4 If the voltage appears to be correct, check to ensure the power supply voltage doesn't vary by more than 10% under maximum current draw.
	2	Power Supply too High	Check the voltage on your power supply is within the specified voltage range as outlined in Section 3.4 If the voltage appears to be correct, check to ensure the power supply voltage doesn't vary by more than 10% under maximum current draw.
	3	Card Format	The data card inserted is incorrect, format the card using the latest NVCardUtilities.
	4	Payout Reset	The Spectral Payout is in the process of resetting, wait for it to recover.





5	1	Firmware Mismatch	The Firmware on the device connected doesn't match the firmware on the NV200 Spectral. Ensure the Firmware supports the connected device.
	2	Payout Jam	The spectral payout has encountered an issue and a note has jammed, follow the steps as described in Section 9.4
	4	Payout Jam recovery in progress	The spectral payout encountered a jam and is attempting to recover. 5 notes will be moved to the cashbox, from the payout. Once the unit has completed this it will go back in service.

8.2 NV200 Spectral Module Flash Codes

Each additional module for the NV200 Spectral has its own flash codes, outlined in the subsections below.

8.2.1 TEBS Lock Flash Codes

The TEBS cashbox can display a flash code on the lock cam.

Flashes		Indicated Status / Error	Recommended Action
Red	Blue		
3	2	Camera not Responding	Arrange for the unit to be returned to the nearest repair centre; details of which can be found on our website.
3	3	EEPROM Error	
3	4	TEBS Log CRC Error	

8.2.2 Spectral Payout Flash Codes

The LED on top of the Spectral Payout module can flash the following codes to indicate its status and aid troubleshooting

Flashes		Indicated Status / Error
Long	Short	
3	2	Sensor error
3	3	Tape error
3	4	Diverter Error
3	5	EEPROM Error
3	1	Other

Flashes		Indicated Status
Colour	Flash	
Green	Slow	Waiting for host machine to enable the payout module
Green	Fast	Idle
Blue	Fast	Busy – A payout/float/empty/pay-in is in progress
Turquoise	Fast	Waiting for NV200 Spectral to send the startup command





8.2.3 Ticket Module Flash Codes

The Button on the Rear of the SMART Ticket can flash Error codes to aid trouble shooting.

Flashes		Indicated Error	Recommended Action
Red	Yellow		
	Flashing	No Issue	Providing information, not an error.
Solid		Paper Low	Refill the Tickets.
1	Flashing	No Connection detected	1. Make sure a NV200 Spectral is connected. 2. Check the NV200 Spectral is powered. 3. Check the Firmware on the NV200 Spectral supports the SMART Ticket.
		Initialisation Fail	Contact repairs@innovative-technology.com .
		No Print Head	Reattach printer.
		Ticket Path Open	Shut the SMART Ticket.
2		No Paper	Insert paper into the printer
		Tab not found	Ensure the Fan Fold paper is inserted the correct way around.
		Load fail	1. Ensure there is nothing blocking the paper entering the printer and reinsert the paper. 2. Remove the printer platen see Section 7.3.3 , move the paper feed roll, reinsert the platen and reinsert the paper.
3		Diverter not opened	Ensure the NV200 Spectral diverter plunger isn't covered and there is nothing stopping the SMART Ticket Actuator from opening.
		Diverter not closed	Ensure there is nothing holding the diverter plunger down and there is nothing stopping the SMART Ticket Actuator from closing.
		Burst fail	Open the Ticket Path and remove the ticket that failed to print. Ensure the unit is clean and PA01132 is fitted correctly.
		Cut fail	Open the ticket path and remove the ticket that failed to print. Ensure the printer is clear of any debris or blockages.
		Unknown jam	See Section 9.6 for information on how to clear jams.
4		Unknown error	Reset the unit.
		Card Format	The inserted card must be in a Fat 32 format remove and format the card.





8.2.4 Bunch Note Feeder (BNF) Flash Codes

The LED strip on the BNF note path can flash error codes to aid with troubleshooting, see below

Flashes		Indicated Status / Error	Recommended Action
Yellow	Cyan		
1	1	BNF Lid Open	Close the BNF Lid
	2	Pay In Path Jam	Check the upper note path (where notes are inserted) and clear and jam/debris
	3	Pay Out Path Jam	Check the upper note path (where notes are returned) and clear and jam/debris
2	1	Note Transit Error	Open BNF lid, check that path is clear then close lid.
	2	Note Out Error	Open feeder and NV200 Spectral lid, clear out note from inside feeder, check reject tray for note half rejected, close lid to clear error
	3	Motor Stall	Open feeder lid, clear out notes from under tongue, close lid to reset
3	1	PSU Voltage	Power supply is above or below the operational range. Use power supply that meets the requirements in Section 3.4
	2	Note In Calibration Fail	Remove all notes from tray, clean lightpipe in tray, power cycle to reattempt startup, if issue persists return to nearest service centre
	3	Note Out Calibration Fail	Remove all notes from tray, power cycle to reattempt startup, if issue persists return to nearest service centre
	4	Note In Speed Fail	Remove all notes and power cycle to reattempt calibration, if persists return
	5	Note Out Speed Fail	Remove all notes and power cycle to reattempt calibration, if issue persists return to nearest service centre
4	2	EEProm Initialisation Fail	Return to nearest service centre
	3	Download Fail	NV200 Spectral could not update BNF, power cycle to reattempt download





8.3 Checking Power Connections

Check to ensure the power cables are correctly connected to the unit as shown in the sections below.

8.3.1 NV200 Spectral Connections

Ensure the NV200 Spectral has power applied, the pin-outs for the relevant connection can be found in [Section 6.4.2](#)

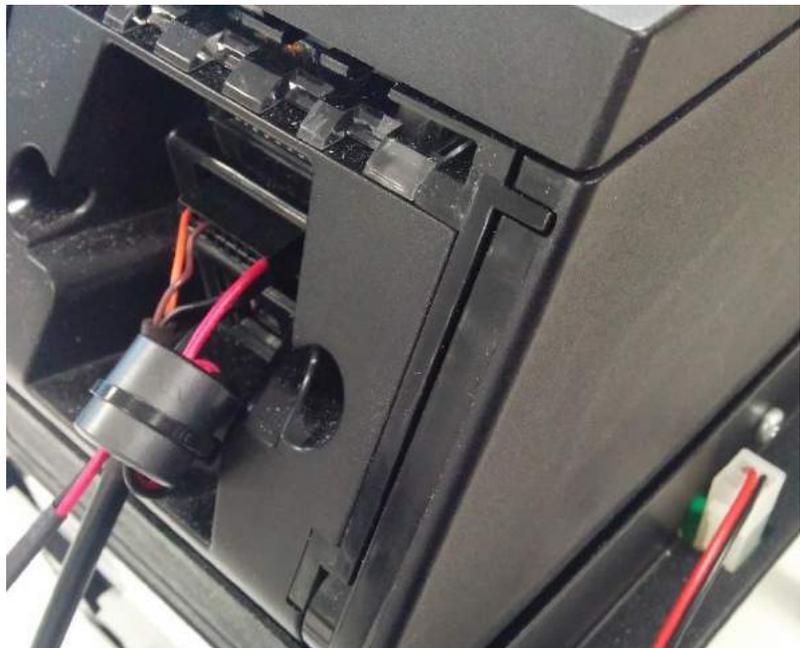
The NV200 Spectral connector and the IF17 connector are similar, the only difference is the power cables in pins 15 & 16 on the NV200 Spectral connector.



8.3.2 TEBS Connections

Ensure both the NV200 Spectral and TEBS cashbox have power applied

The NV200 connector and the IF17 connector are similar, the only difference is the power cables in pins 15 & 16 on the NV200 connector.





8.3.3 Spectral Payout Connection

The Spectral Payout has a 16-pin molex connector and a USB Type B socket.

These connectors are located on the rear of the module at the bottom as opposed to the top of the module on the Smart Payout. An adapter cable has been made to support legacy machines. See [Appendix 11.1.5](#)



8.3.4 Smart Ticket Connection

The SMART Ticket uses the same 16 pin molex connector as the Spectral Payout, additional pins need to be populated to carry communications to both the NV200 Spectral and printer. More details of this can be found in [Section 6.2](#)

An additional 4-pin molex connector is required for power, both must be connected before the unit will identify as a Smart Ticket. When power is supplied to the ticket the LED on the rear will be illuminated.



8.3.5 Checking the Supply Voltage

If the power supply seems to be powered and connections to the unit are in place, yet the unit isn't powered, check the voltage output from the power supply is sufficient and the polarity is correct. If this isn't the issue replace the cable as it may have been damaged. Should this not resolve the issue, contact your local repair centre, details of which can be found on our website.

8.4 Communication with the Host

If there is no communication with the host check the communication cable, typically this will be the IF17 and the port on the host system.

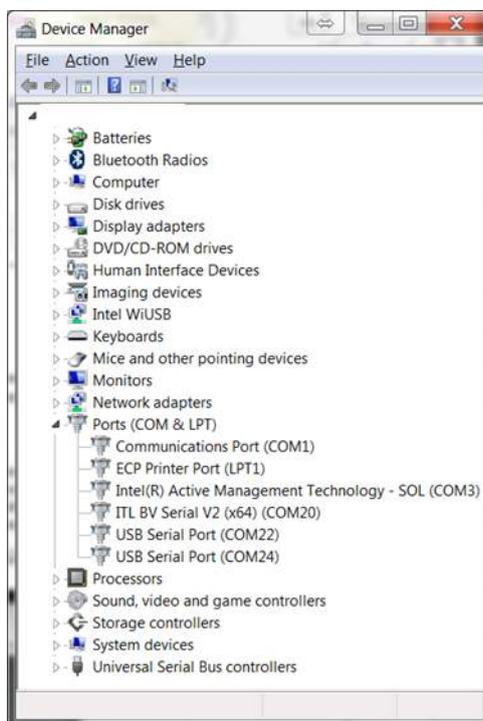
Ensure the cable is connected to the IF17 correctly, so the connectors are fully seated, and the USB cable is connected to the computer.



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If the unit is connected, enter device manager and check the active com ports, there should be a device labelled as USB Serial. If no com port is present replace the IF17 and a new device will register.



Check the connection to the host software, if there is still an issue replace the IF17 or switch com ports on the PC. If the unit is detected but there is a yellow triangle next to the serial port, then the drivers should be reinstalled.

For Linux use the dmesg console command as shown below:

```
File Edit View Search Terminal Help
james@james-VirtualBox ~ $ dmesg | grep tty
[  0.000000] console [tty0] enabled
[ 55.387744] usb 1-2: FTDI USB Serial Device converter now attached to ttyUSB0
james@james-VirtualBox ~ $
```





9 SECOND LEVEL SUPPORT

9.1 Obtaining Logs using SD Card

The NV200 Spectral has 128MB internal memory which is used to capture event and performance logs. To retrieve the logs from the internal memory, you can insert an SD card into the front slot. The SD card must be FAT-32 formatted and have an empty folder on there called **NV200HSL**. When this card is inserted the bezel will flash alternating colours, when it goes green the data transfer is complete and the SD card can be removed.

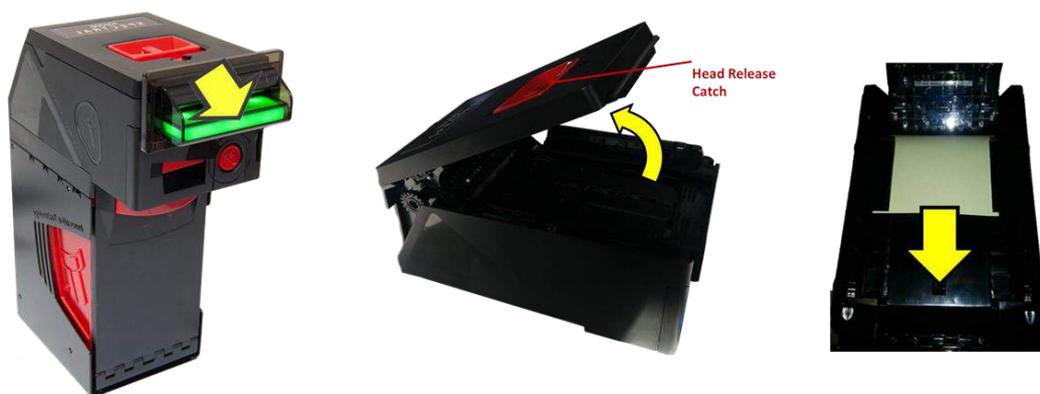
Alternatively, you can put an SD card in the slot that has two empty folders on it: **hsdata** and **valaudit**. This SD card will log all future events but does not extract logs currently stored on the internal memory. If this card is inserted all logs will be written to it instead of the internal memory.

See [Section 5.4.2.2](#) for the hardware requirements for the SD Card

9.2 Clearing a Jam from the NV200 Spectral

9.2.1 Note is in the note path

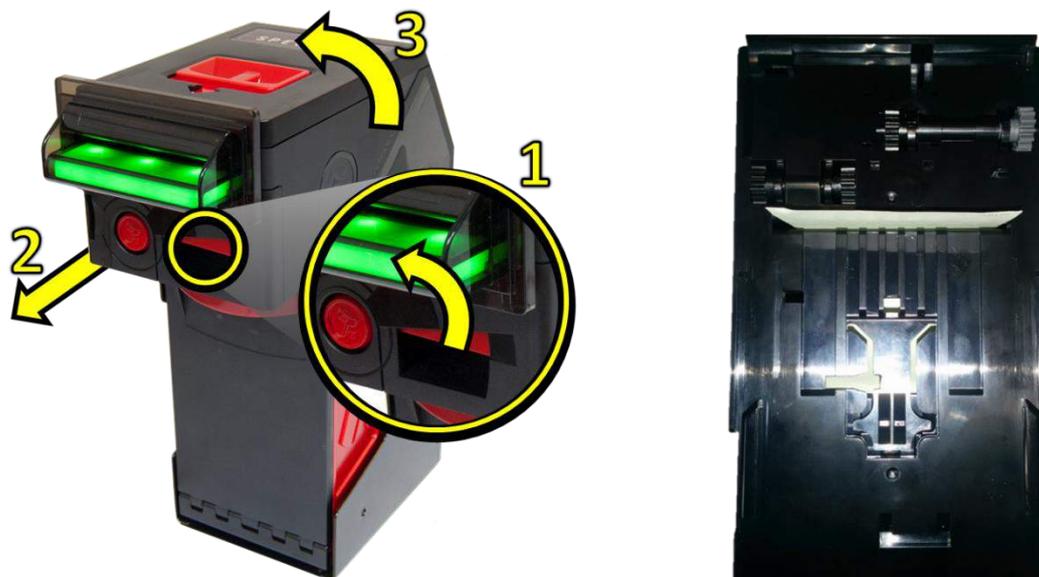
If the note is jammed in the note path it is possible to clear the jam by simply lifting the lid by pulling the catch toward you as shown in the picture below. Once the note path is clear you can then carefully pull the note out of the unit. Now shut the head and the unit should reinitialise.



9.2.2 Note is visible once the NV200 Spectral has been removed

To clear this type of jam you will need to disconnect the power and then remove the NV200 Spectral head. Once you remove the head as explained in the picture below, check to see if the note is protruding from the cashbox. If it is, this means the note hasn't been driven down into the cashbox, this jam can be cleared by winding the drive gears on the left of the unit and slowly pulling the note out. Once the note has been removed, replace the NV200 Spectral head and reconnect the power.





9.2.3 Note isn't visible once the NV200 Spectral has been removed

If the note isn't visible then there is a jam in the cashbox, remove the cashbox by pulling the handle on the front of the cashbox and sliding it forward. Turn the keyless lock to release the barn door, you will now have access to the cashbox to manually remove the note. Usually the note will be resting on or underneath the stack of notes and may be folded or torn. Once the note has been identified slowly pull the note out of the unit. Replace cashbox and the unit should run through internal diagnostics and then be back in service.





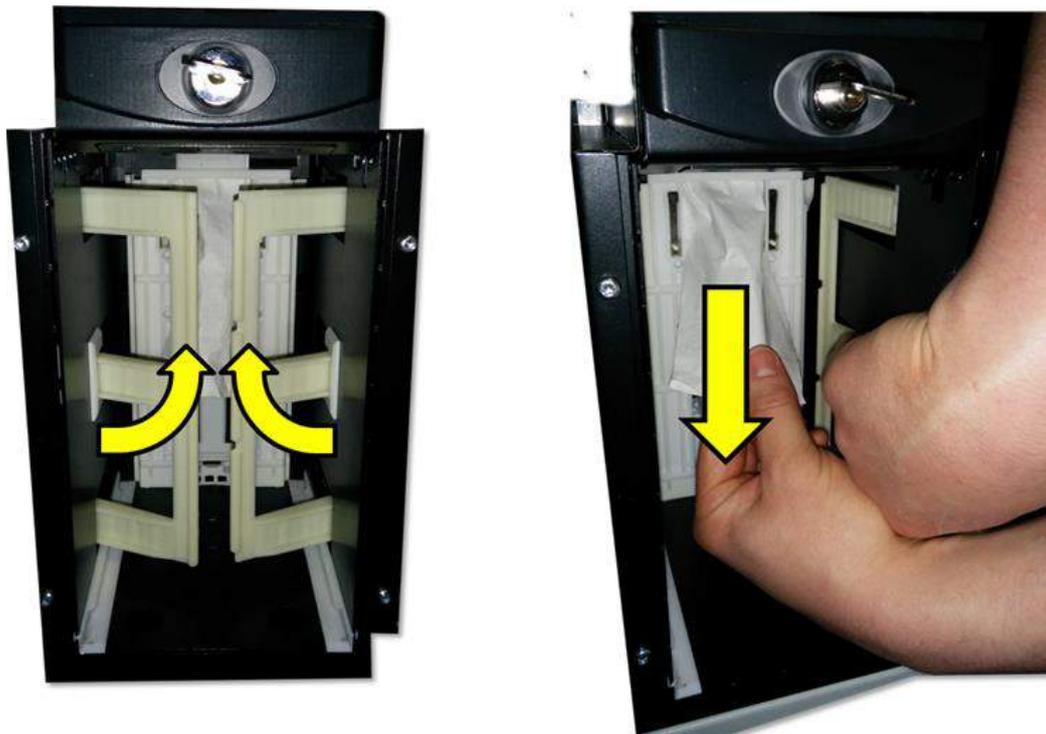
9.3 Clearing a Jam from the TEBS Cashbox

Ensure the TEBS is connected to power and remove the cashbox.

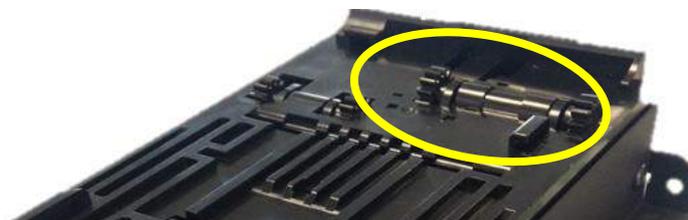
When the bag is removed, the note causing the jam condition hasn't been credited so will need to be re-inserted when the unit is back in service.

The note causing the jam will be visible; typically the note will be resting on top of the pusher plate and may be folded or torn. It can be behind the push plate.

Once the note has been identified, push the doors back and slowly pull the note out of the TEBS cashbox ensuring there is no debris left behind.



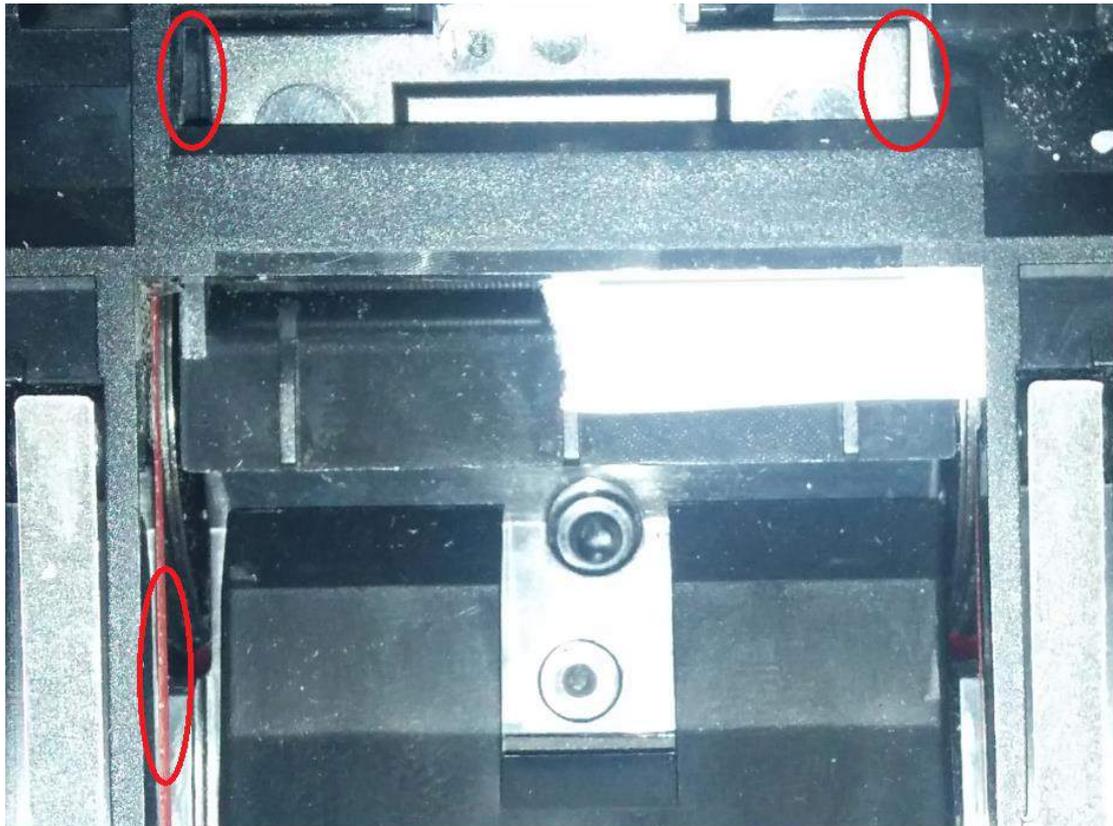
If the note is behind the stacker plate, it is still possible to recover the unit. Wind the stacker plate forward using the gears on top of the TEBS unit as highlighted below. Hold the gear in position while removing the note.



The stacker plate should sit approximately 5cm from the home position. Carefully pull the note out from behind the stacker plate and wind the plate back to its rest position.

Inspect the note when it is removed, should the note have a tear or have a piece missing it could be lodged within the unit and trigger another error. One way of checking for this is to shine a torch into the TEBS cashbox and carefully inspect the surround. Highlighted below is an example of paper located in the top of the TEBS unit, this is evident due to the white reflection on the right when compared to the left.





9.4 Clearing a Jam from the Spectral Payout Module

If a jam occurs in the Spectral Payout module, the device will attempt to run a jam recovery process, do not interrupt the device while it is doing so. If the jam recovery is unsuccessful the unit will report a Jammed event. Notes than can then be removed manually from the module. First remove the NV200 Spectral head from the device as described in Step 1 of [Section 4.6](#), then slide the Spectral Payout module upwards to remove it from the chassis.

With Spectral Payout module removed from the chassis, follow the steps below:

1) Open the access doors

The Spectral Payout has two access doors to allow better serviceability, making it easier to clear a note jam.

To open the top door: slide the red latch on top of the module forwards, pinch against the raised edge and lift the door, as per the picture below



To open the second door, press the red latch inside the first door as per the picture below. The second door will spring open:



Notes can now be removed from both areas where visible. Once the notes are removed follow the next step to ensure that tapes are properly tensioned.

2) Tension tapes

Using the small hex key that comes with the module, wind the tapes slightly until the tapes are properly tensioned. If they are already correctly tensioned then you do not need to wind tapes.





Turn slightly in both directions to check tapes are properly tensioned



9.5 Clearing a Jam from the Bunch Note Feeder

In case of a jam event in the Bunch Note Feeder (BNF), follow the instructions below to clear the note paths. **Ensure the power is removed from the unit before attempting to clear a jam:**

1) Remove the BNF bezel

Pull the bezel forward and down as shown in the picture to unclip the bezel from the front of the BNF. When it is unclipped, pull forward to fully remove the bezel:





2) Open the Upper Note Path

If the note is jammed on the way into the validator, remove all notes from the BNF bezel. Open the upper note path by pinching both red latches and lifting the lid. Remove the note or any debris:





9.6 Clearing a Jam from the Ticket Module

If a Jam has occurred in the SMART Ticket Power must be Removed, once removed disconnect the NV200 Spectral by lifting the red catch at the front of the NV200 Spectral and sliding it away from the cashbox, it is now possible to lift the Ticket module away. With the NV200 Spectral removed the Ticket Path can be opened as explained in [Section 7.3.3](#).

Remove any visible blockage then remove the loaded tickets. Ensure there is no debris built up in the SMART Ticket as explained in [Section 7.3.3](#)

Attach the NV200 Spectral and power. insert the paper once the unit has started up.

9.7 Clearing a Jam from the Safe Interface Module

Clearing a jam from the upper area of the Safe Interface Module is possible without access to the safe. If a jam occurs between the Note Transport and the cashbox, access to the safe will be required.

To clear the jam from the upper area:

1) Remove the NV200 Spectral Head

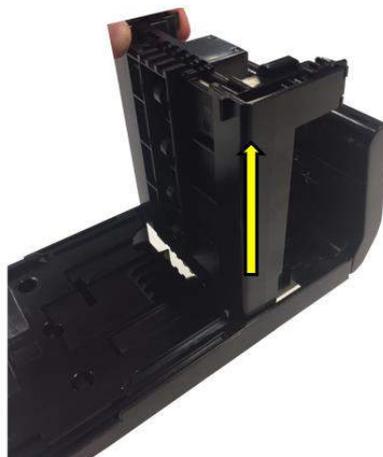
To remove the NV200 Spectral head from the Outer Docking Plate, lift the red latch on the front of the unit and slide the NV200 Spectral Head forward



2) Remove the Note Transport

With the NV200 Spectral head removed, the Note Transport can be lifted upwards to remove it from the safe. Check the Note transport for inserting back into re-attaching the

it from the safe. Check the jammed notes before Outer Docking Plate and head



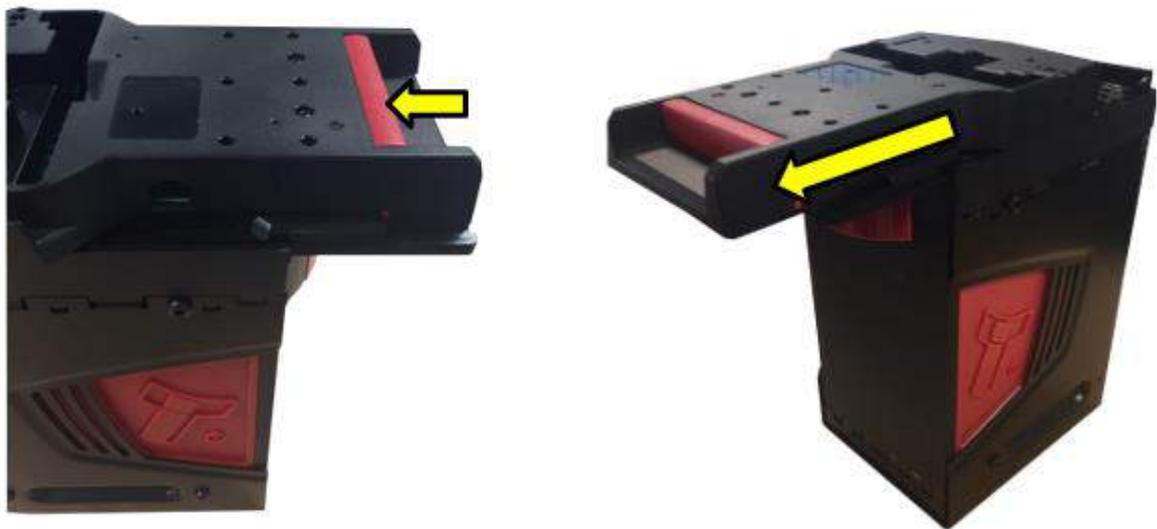


To clear a jam between the note transport and cashbox (access to the safe is required).
This is not applicable to the Stackerless version of the Safe Interface:

1) Follow the steps above to remove the Note Transport

2) Remove the Inner Docking Plate

Press the red latch on the Inner Docking Plate to unlock it, then slide forward to remove the docking plate from the cashbox chassis:



3) Remove any jammed notes

With the Safe Interface fully removed, clear any jammed notes or debris.
Re-assemble in reverse order once cleared.

9.8 Testing After an Error Has Been Cleared

Once an error has been cleared, ensure the device is tested by inserting bills and paying out notes/tickets where applicable. A recommended test is 10 notes in and 10 notes/tickets out, this will help limit the number of repeat calls for the same issue.





10 COMPLIANCES AND APPROVALS

10.1 EC Declaration of Conformity

The NV200 Spectral is fully compliant with the Declaration of Conformity (CE Marking) and RoHS.

It is currently undergoing testing for UL approval; this manual will be updated when certification is passed.

10.2 FCC Approval

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

10.3 Central Bank Approvals

As part of continual product improvement central banks are regularly visited to gain product certification.

The NV200 Spectral has received independent validation from the European Central Bank (ECB), Bank of England (BoE) and the Central Bank of Russia (CBR).

For more information visit our website linked below. This page has further links to the banks' individual websites where the results are published:

<http://www.innovative-technology.com/news-events/news/item/477-nv200-spectral-receives-independent-bank-test-approvals>

Any change in approval status is outlined in our tech bulletins a link to which can be found below:

<http://innovative-technology.com/support/technical-bulletins>





11 APPENDIX

11.1 Cable Drawings

NOTE: If required, IGES 3D models are available on request from ITL technical support.

All parts can be purchased as part of the ITL development kit, details of which can be found on our [website](#).

11.1.1 CN00214 – USB Type A to Type B Cable

DRAWING NO. **CN00214**
 SCALE **1**

Item	QTY	Description	Vendor
A	1	USB Type A Male Connector	-
B	1	USB Shielded High Speed 2.0 Cable 28AWG/1P+28AWG/2	-
C	1	USB Type B Male Connector	-

Comments

All dimensions are in mm ±0.1mm, unless specified.

Note to Manufacturers
 Certifications are needed for the following:
 ■ FCC/IS compliance ■ UL 94-V0 rated (connector housing) ■ UL 1581-VW1 rated (all other parts)

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHKD
1	10/01/2018	Initial Release	A	-
2	15/03/2017	Revised	A	-

DESIGNED BY: A
 DRAWN BY: A
 CHECKED BY: A
 APPROVED BY: A

DATE: 15/03/2017
 TITLE: USB A to USB B Cable Assembly

DESIGNED BY: C. Cardoza
 DATE: 15/03/2013

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHKD
1	10/01/2018	Initial Release	A	-
2	15/03/2017	Revised	A	-

DESIGNED BY: C. Cardoza
 DATE: 15/03/2013

REVISIONS

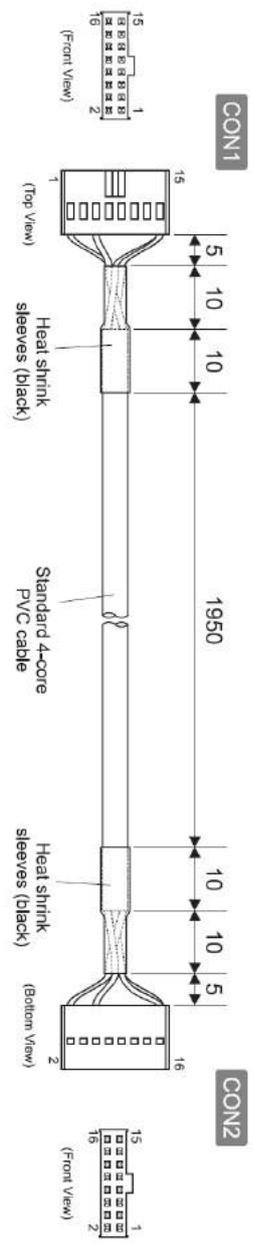
NO.	DATE	DESCRIPTION	BY	CHKD
1	10/01/2018	Initial Release	A	-
2	15/03/2017	Revised	A	-

DESIGNED BY: C. Cardoza
 DATE: 15/03/2013



11.1.2 CN00292 – SSP Interface Cable

DRAWING NO. **CN292**
ISSUE **4**



Terminal
CON1 Housing: Leotronics 2652-2161 (2x8way 2.54mm pitch with key)
CON2 Housing: Leotronics 2652-2161 (2x8way 2.54mm pitch with key)
Crimp 2653-2000 (tin plated)
 2653-2000 (tin plated)

*Accepted alternatives: 90119-0110 (Molex crimps) and 90142-0016 (Molex housing)

Connectivity by conductor

CON1 Pin	CON2 Pin	Gauge (AWG)	Colour	Comments
1	1	24	Orange	-
5	5	24	Brown	-
15	15	24	Red	VIN
16	16	24	Black	GND

Note:
 Pins 3,4,7,8,9,10,13 and 14 are unloaded
 Pins 2,6,11 and 12 are loaded but not connected

ISSUE NO.	4	ISSUE NO.	4
REV. NO.	-	REV. NO.	-
DATE	27/08/09	DATE	27/08/09
DESIGNED BY	A Lunsong	DESIGNED BY	A Lunsong
CHECKED BY	-	CHECKED BY	-
DATE	-	DATE	-
TITLE	IF10 - SSP to Binary Interface Cable	TITLE	IF10 - SSP to Binary Interface Cable
DRAWN BY	A Lunsong	DRAWN BY	A Lunsong
DATE	27/08/09	DATE	27/08/09
SCALE	NOT TO SCALE	SCALE	NOT TO SCALE
ALL DIMENSIONS IN mm ±2mm		ALL DIMENSIONS IN mm ±2mm	
Copyright of Innovative Technology Ltd		Copyright of Innovative Technology Ltd	
2009		2009	
All parts must be rated to at least UL94V-0		All parts must be rated to at least UL94V-0	
All connector housings must be rated to UL94V-0		All connector housings must be rated to UL94V-0	
INNOVATIVE TECHNOLOGY LIMITED		INNOVATIVE TECHNOLOGY LIMITED	
UNITED KINGDOM		UNITED KINGDOM	
TEL: +44(0)1928 928299		TEL: +44(0)1928 928299	
FAX: +44(0)1928 292393		FAX: +44(0)1928 292393	
3RD ANGLE PROJECTION		3RD ANGLE PROJECTION	



11.1.1.4 CN00487 – Smart Payout Cable

REV 1.0
CN487
1

Parts List

Item	QTY	Description	Vendor
A	1	39-01-27185 housing	Molex
B	6	(2x8way) 4.2mm pitch Mini-Fit Jr receptacle (0039000209 (tin plated, female, brass) crimps (4A @ 22AWG, 2A @ 26AWG))	Molex
C	2	30mm black heat shrink sleeve (big diameter to fit over IN02012)	-
D	2	CM choke (TTL P/N IN02012)	-
E	8	Black heat shrink sleeve (small diameter to fit)	-
F	1	Cable tie to secure ferrite sleeve into place	-
G	1	Ferrite sleeve (2 turns)	-
H	7	20mm black heat shrink sleeve (spread along the assembly length)	-
J	4	Standard AWG 26 wire	-
K	1	90142-0016 housing	Molex
L	1	(2x8way) 2.54mm pitch receptacle	Molex
M	3	90719-0120 (tin plated) crimps	Molex
N	1	Stackable red 4mm banana plug (553-0500-01)	Deltron
P	1	Stackable black 4mm banana plug (553-0100-01)	Deltron

Connectivity

CON1	CHOK1	CHOK2	CON2	CON3	CON4	Gauge (AWG)	Colour	Comment
1	B1	-	-	-	1	22	Black	GND
-	B2	-	16	-	1	22	Black	GND
-	A1	-	-	-	-	26	Red	V _{IN}
-	A2	-	-	1	-	22	Red	V _{IN}
-	-	-	-	-	-	26	Blue	SSP_RXD (host to Validator)
-	-	-	-	-	-	26	Blue	SSP_RXD (host to Validator)
-	-	-	-	-	-	26	White	SSP_TXD (Validator to Host)
-	-	-	-	-	-	26	White	SSP_TXD (Validator to Host)
-	-	-	-	-	-	26	White	Plus 16 and 7 are linked together
-	-	-	-	-	-	26	Blue	Plus 14 and 5 are linked together

Notes

- Ferrite sleeve needs to have >572Ω @ 100MHz.
- Recommended parts:
 - a) Würth 74270060 - 714Ω @ 100MHz (two turns)
 - b) Edgar FL8 RH10 x 20 x 6.35 - 724Ω @ 100MHz (two turns)

All cables go through the ferrite sleeve with two turns.

Comments

- CON1 connects to Smart Ticket
- CON2 connects to Host
- CON3 connects to V+ (24V)
- CON4 connects to V- (GND)

Note to Manufacturers

Certificates are needed for the following: ■ UL94-V0 rated (connector housing) ■ UL94-VW1 rated (all other parts)

■ RoHS compliance ■ UL94-V0 rated (connector housing) ■ UL94-VW1 rated (all other parts)

Smart Ticket to Host assembly (customer)

CHOKER 1

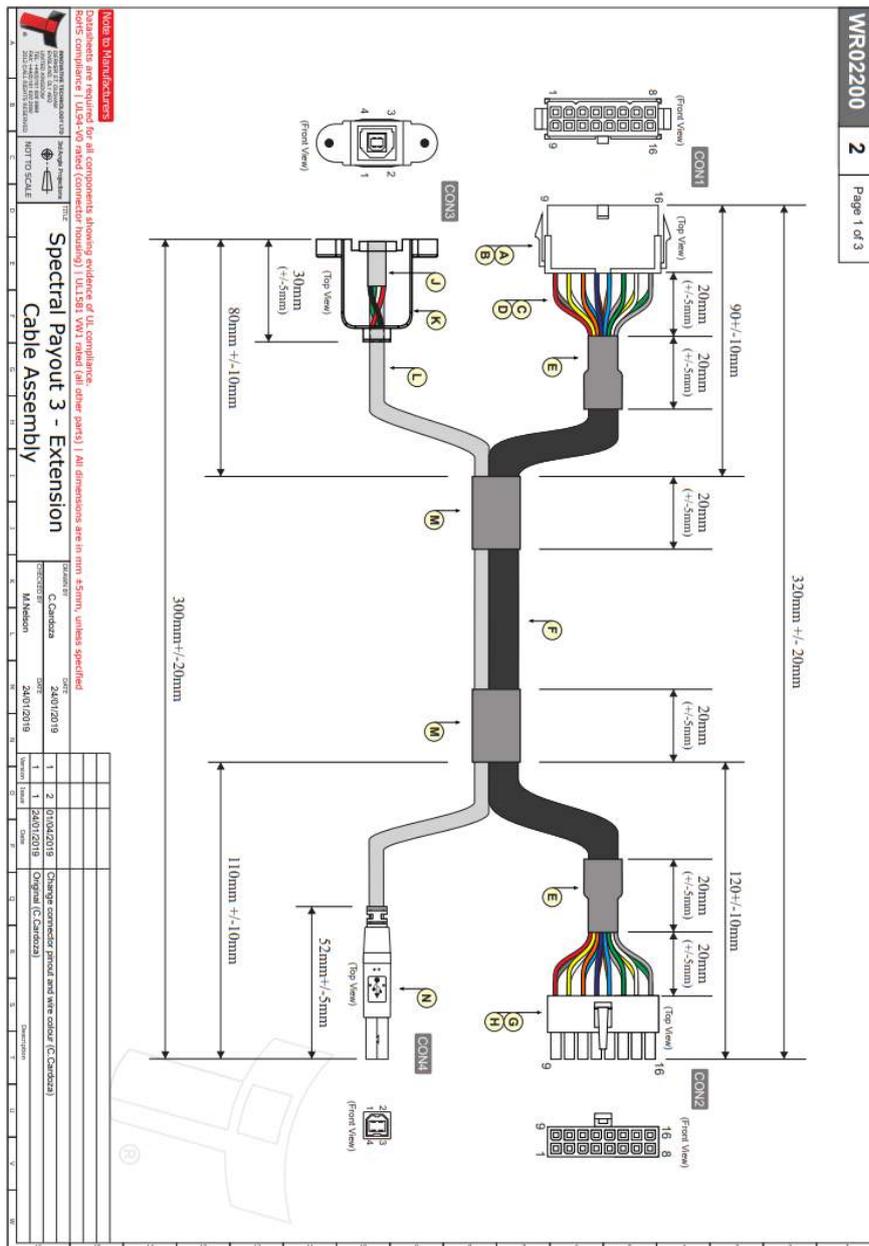
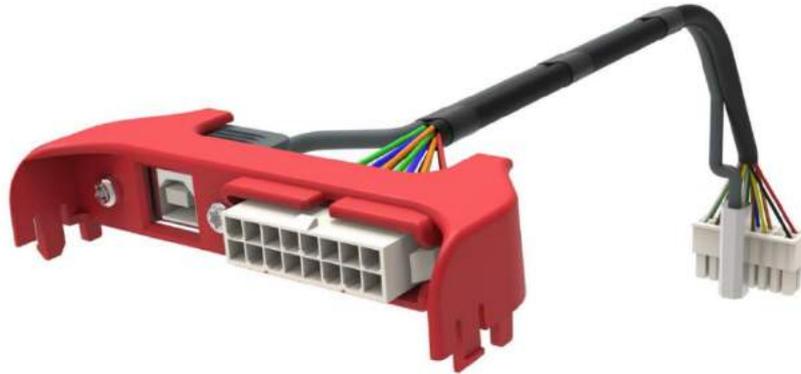
CHOKER 2

Note: Maximum key height = 1.5mm

All dimensions are in mm ±5mm, unless specified



11.1.5 WR02200 – Spectral Payout Extension Cable



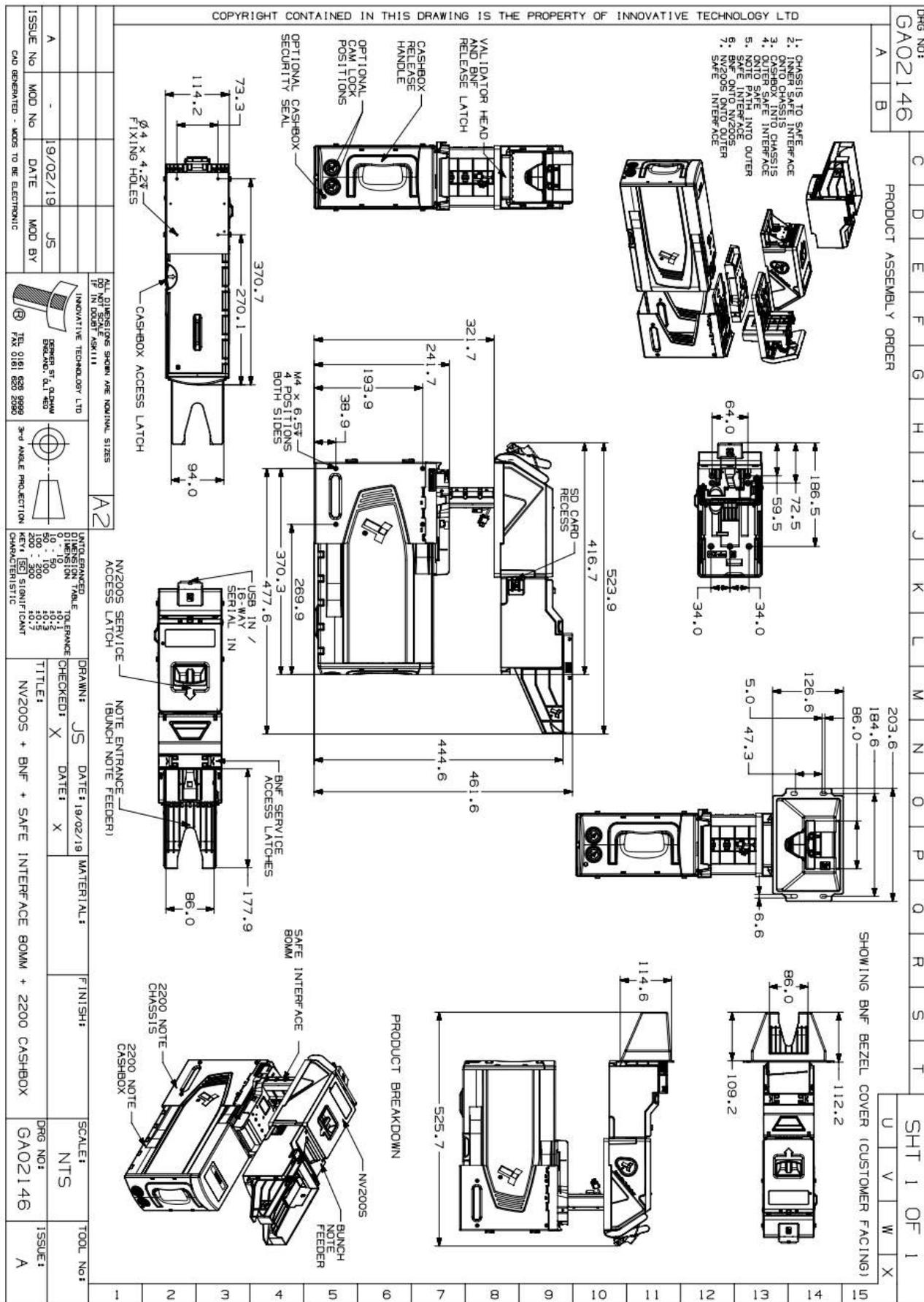
11.2 Dimensional Drawings

11.2.1 GA02146 – NV200S + BNF + 80mm Safe Interface + 2200 Cashbox



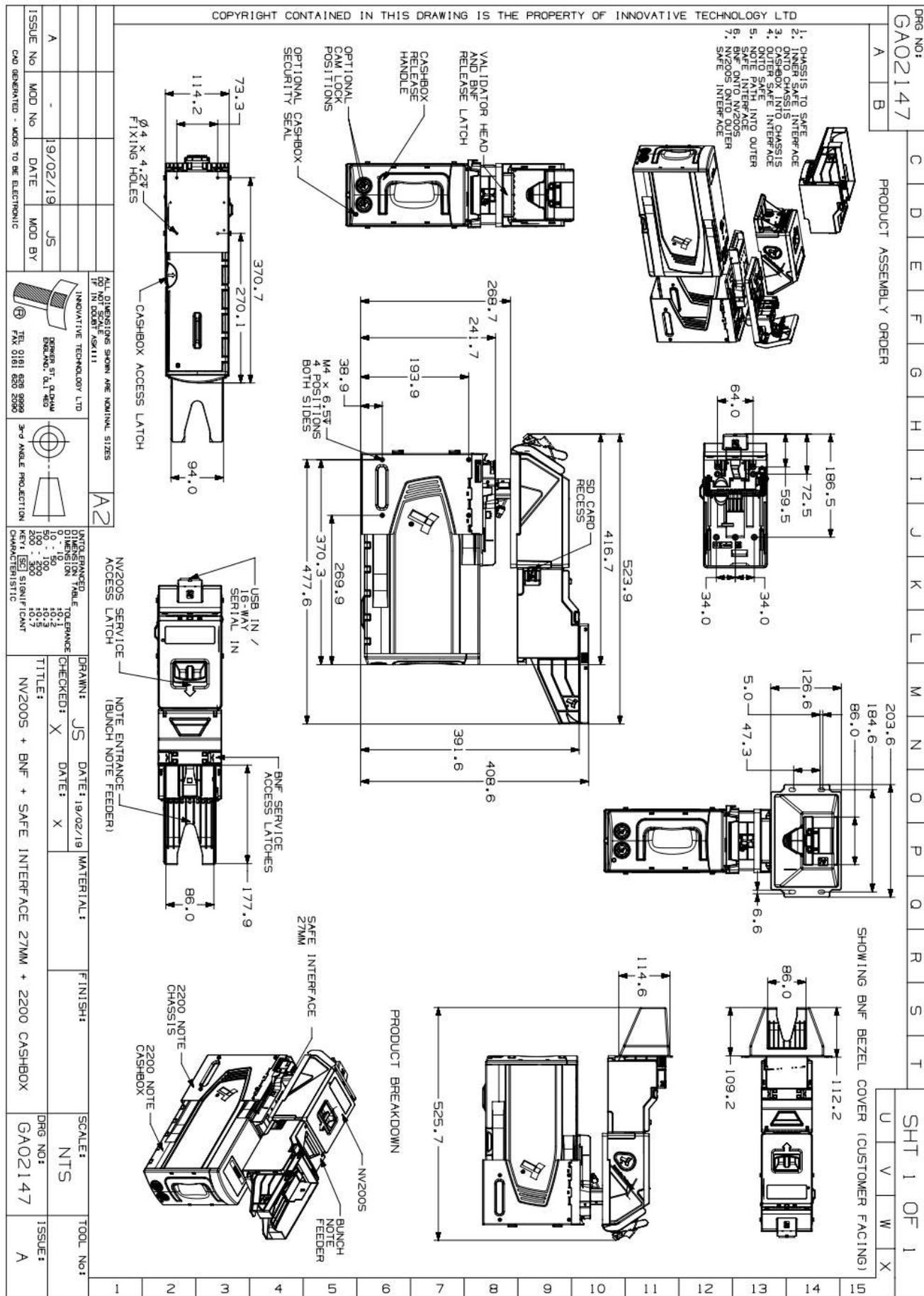
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11.2.2 GA02147 – NV200S + BNF + 27mm Safe Interface + 2200 Cashbox



11.2.4 GA02151 – NV200S + BNF + 80mm Safe Interface + 500 Cashbox

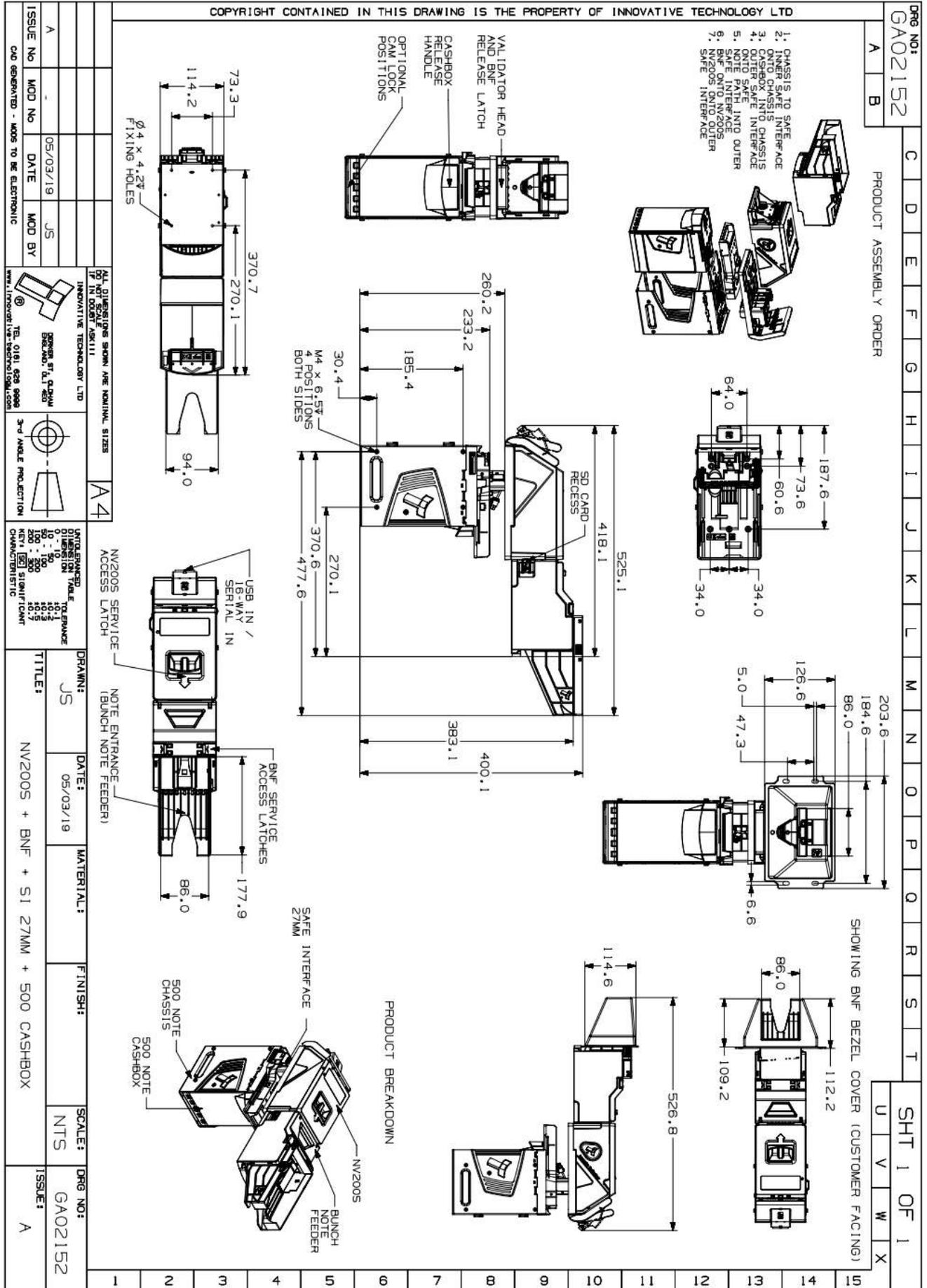


11.2.5 GA02152 – NV200S + BNF + 27mm Safe Interface + 500 Cashbox



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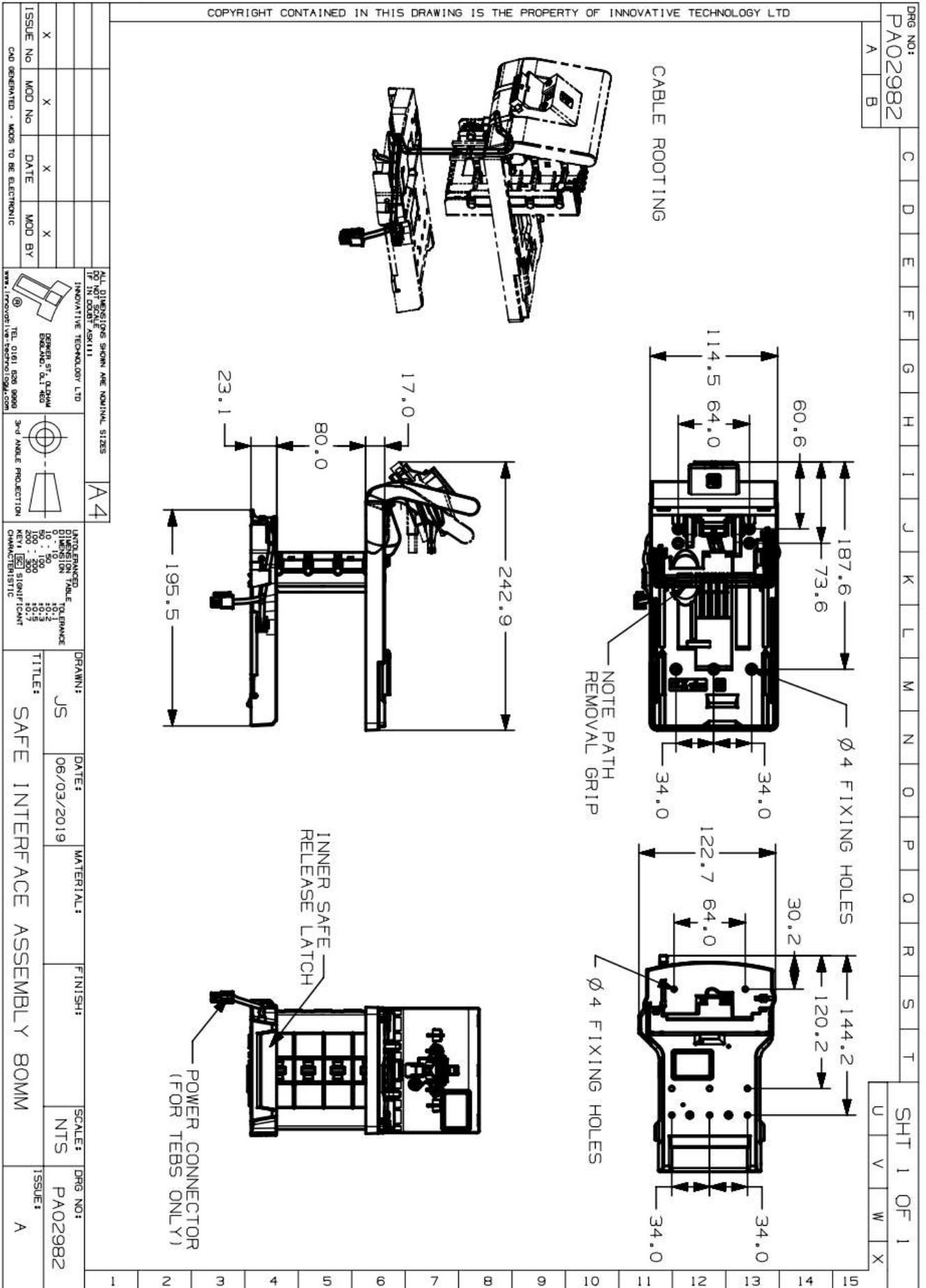


11.2.6 GA02982 – 80mm Safe Interface



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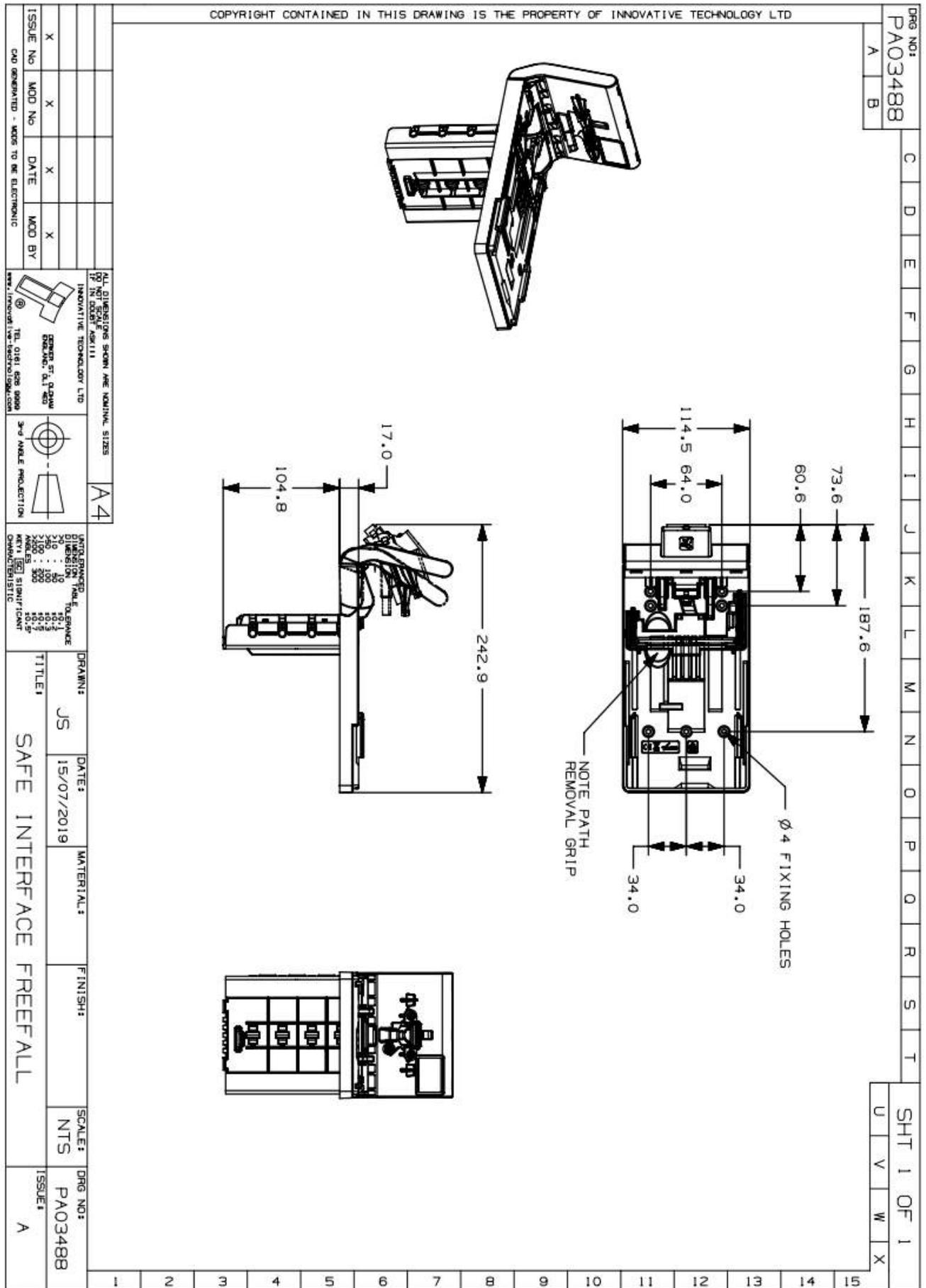


11.2.7 GA03007 – 27mm Safe Interface



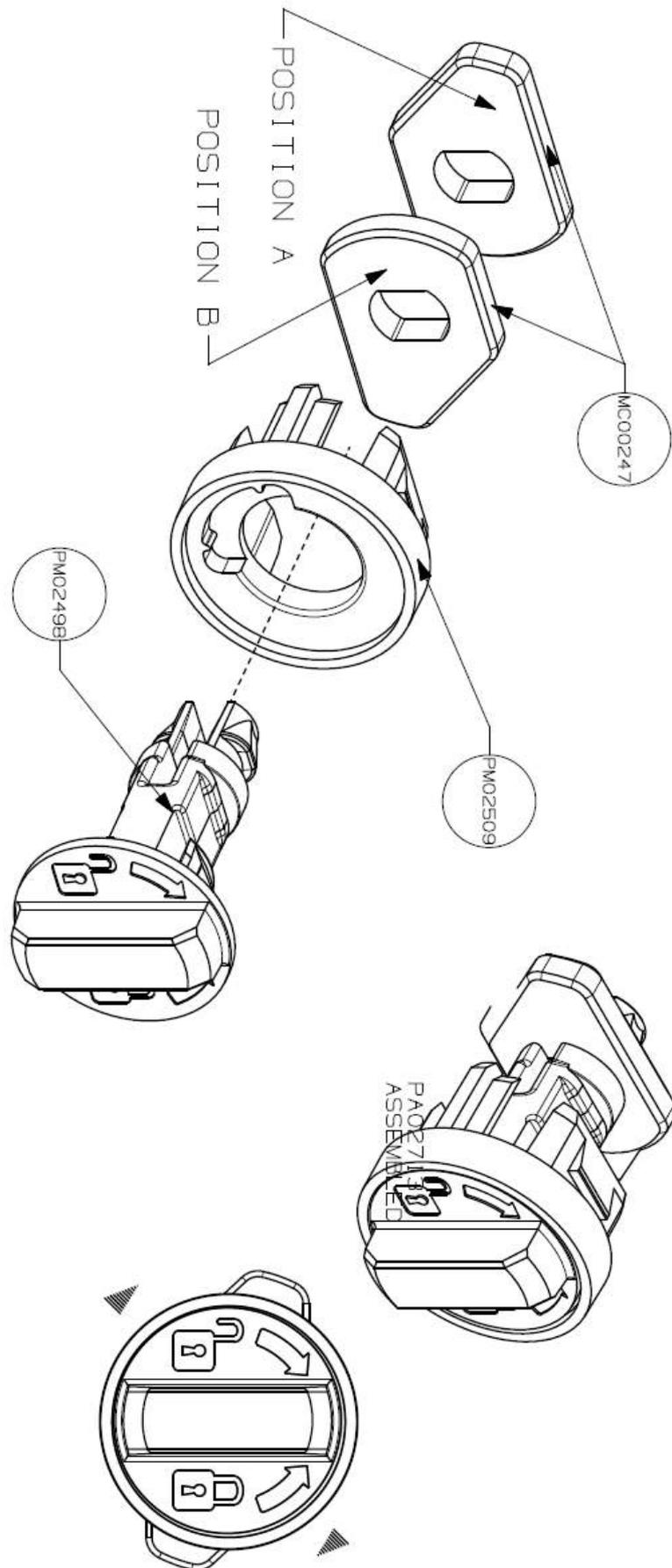


11.2.8 PA03488 - Safe Interface Stackers

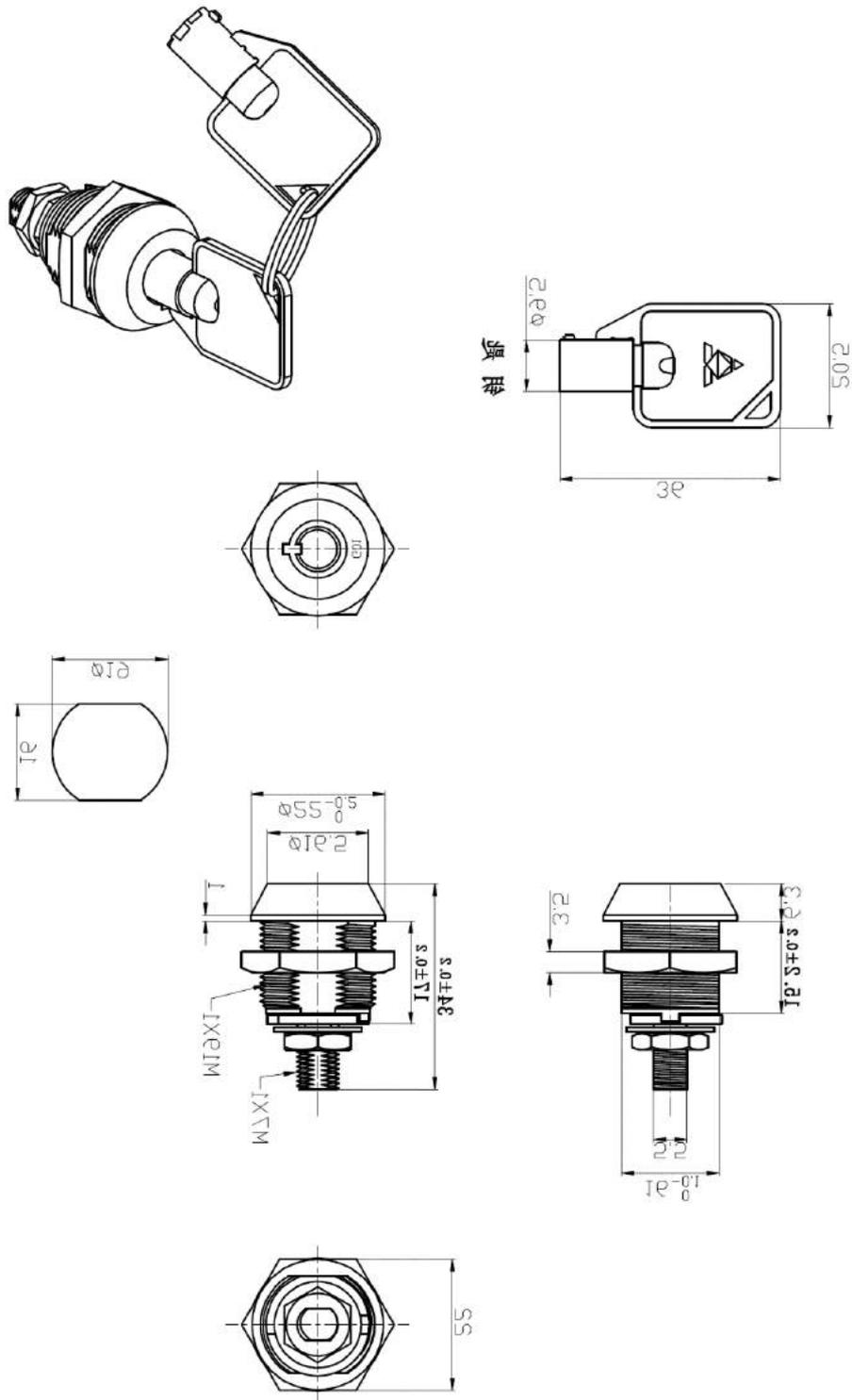


11.3.1 Keyless Locking Cam





11.3.2 TEBS Locking Cam





11.4 Connector Specifications

Type	Vendor	Part Number	Pins	Pitch	Polarising
Housing	Leotronics	2652-2161	2x8	2.54mm	With Key
Crimp	Leotronics	2653-2000			Female
Housing	Molex	90142-0016	2x8	2.54mm	With Key
Crimp	Molex	90119-2121			Female

11.5 Switching to Programming Mode (SSP)

If fitted remove the Payout or Ticket modules. Power the NV200 Spectral, once the unit has initialised toggle **dip-switch 8** up and down.

To switch the unit back repeat the procedure explained above.



WARNING!

Risk of unit damage

When in programming mode and performing an update, do not turn off the power before the operation is complete as this could make the unit unusable.

11.6 Cashbox Handling Advice

The NV200 Spectral cashbox and TEBS cash bag has been designed to remain intact after an impact of 75cm onto a concrete floor. Dropping the cashbox multiple times can result in physical damage to the cashbox/bag.

11.7 ccTalk DES Encryption – Trusted Mode

Ensure the NV200 Spectral has been configured to use DES encryption in Validator Manager, this setting can be found on the options tab. To pair the NV200 Spectral with a DES trusted machine follow the steps below:

1. Remove power from the unit then remove the cashbox
2. Re-power the unit, once the unit has started it should be in pairing mode.

If a Spectral Payout module is connected the unit must be empty before it can pair to the host.

11.8 Escrow

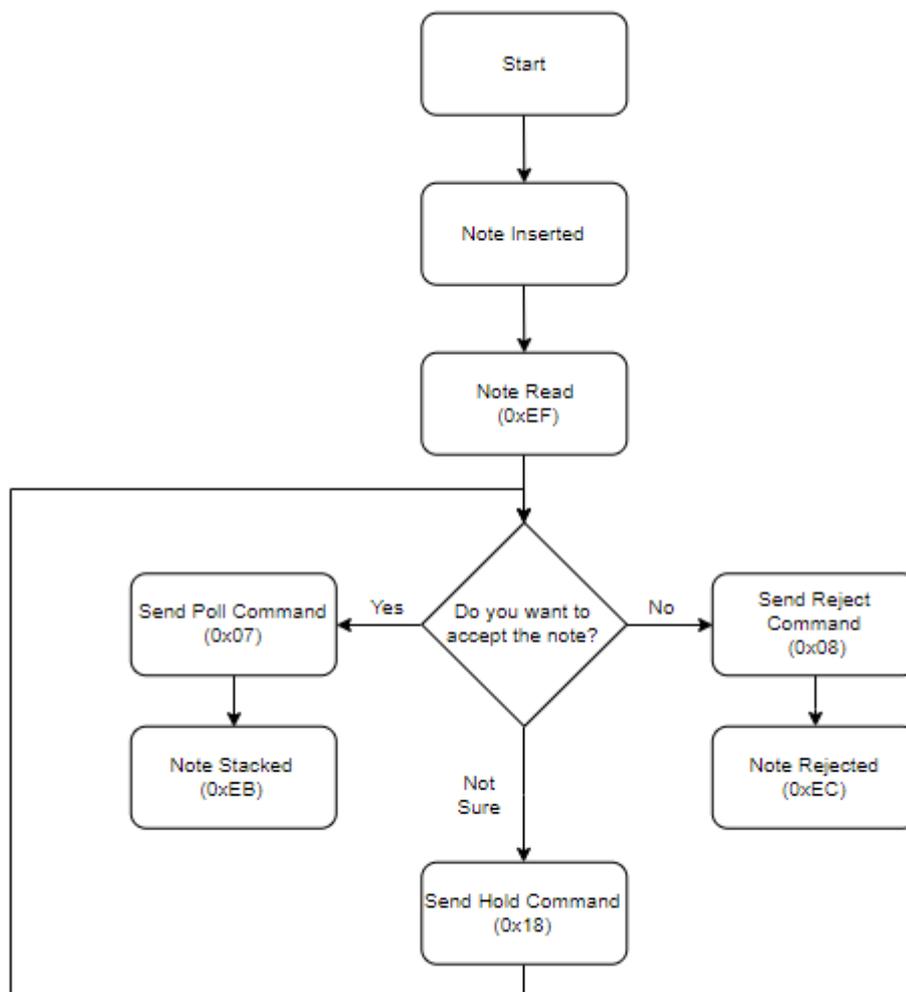
The NV200 Spectral has a single note escrow facility. This allows the NV200 Spectral to hold onto the note once validated, and only stack the note into a cashbox when the host machine confirms that the Vend operation has been completed. If no confirmation of the Vend is received, the note will be returned to the user after 30 seconds.

If the host machine itself aborts the transaction by sending the reject command (0x08). Similar commands can be sent depending on the protocol used. For information relating to other protocols contact support.



11.9 Escrow Control

The NV200 Spectral has a single note escrow facility. This allows the NV200 Spectral to hold onto the note once validated, and then only stack the note into a cashbox when the host machine confirms that the vend operation has been completed. The sequence of operation is as follows:



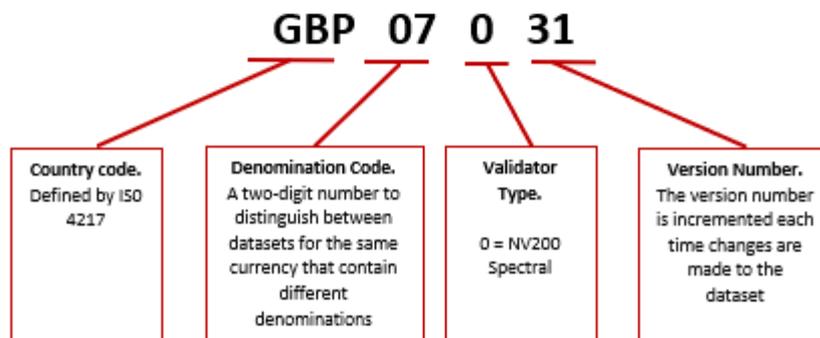


11.10 File Naming Convention

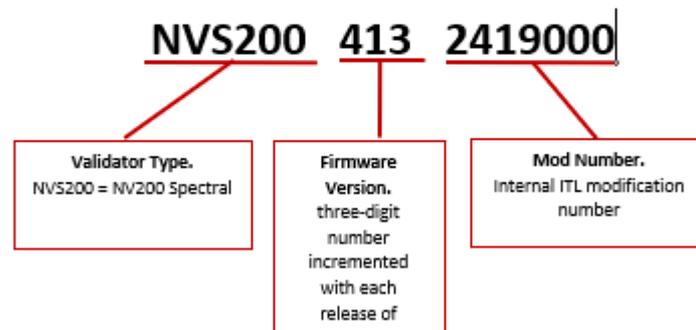
GBP07031_NVS2004132419000_IF_01.bv1



Dataset Code



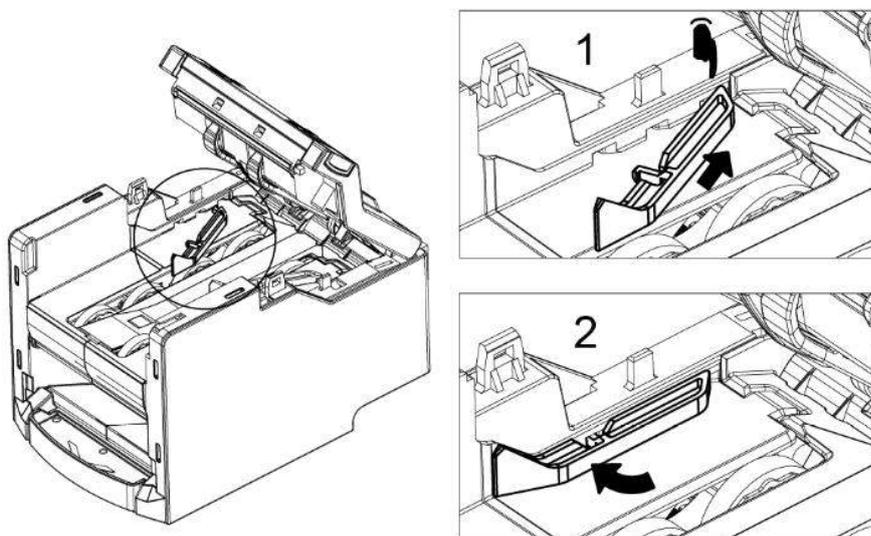
Firmware Code





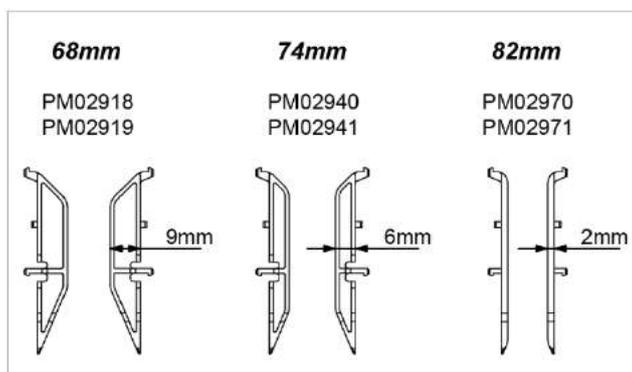
11.11 BNF Path Guide Inserts

The Bunch Note Feeder is supplied with a set of plastic inserts that can be clipped into the note path.



These adjust the note path width to optimise performance for different currencies. The table below shows the recommended path inserts for some of the different currencies:

Currency	Required path insert
Euro(5-10-20-50-100-200-500)	82mm
UK/Scotland/Northern Ireland(5-10-20-50)	None
Mexico(20-50-100-200-500-1000)	68mm
Russia(10-50-100-200-500-1k-2k-5k)	74mm
Thailand (20-50-100-500-1k)	74mm
United States(1-2-5-10-20-50-100)	68mm



If the currency you are using is not listed, use the insert that is closest to the maximum width denomination of that currency. If the maximum note width is bigger than the widths shown above, do not attach any of the inserts (e.g. GBP).

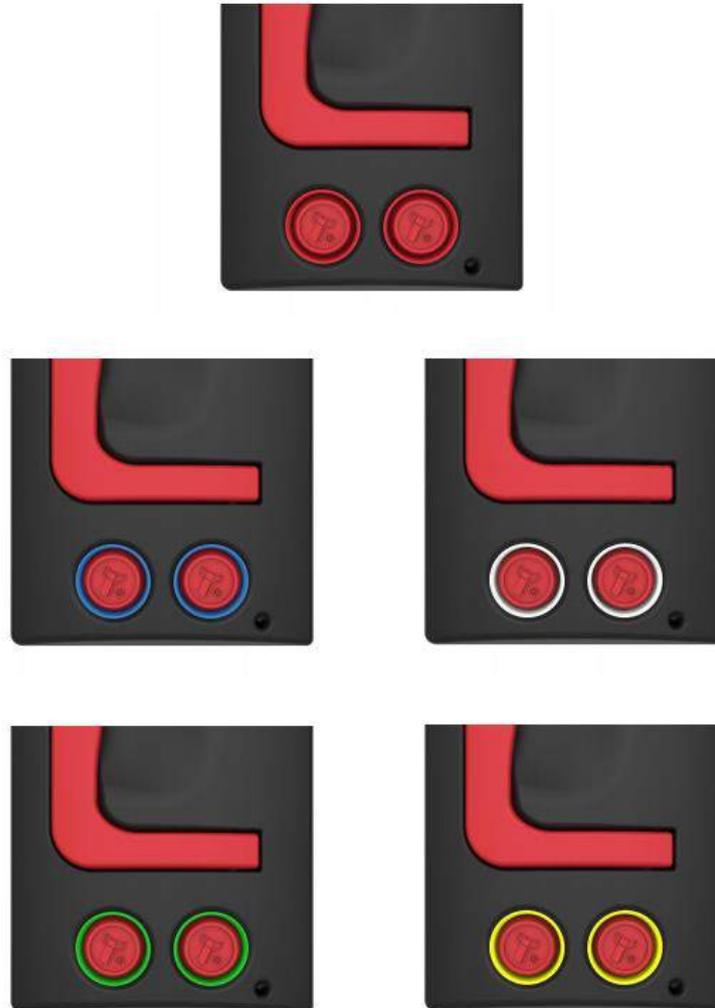




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11.12 Lock Inserts

The 2200 note cashbox can be fitted with a range of coloured inserts around the locks as shown in the picture below:



These are fitted in the same way as the lock, refer to [Section 4.4.2](#) for instructions.

