

BV50 OPERATIONS MANUAL

INTELLIGENCE IN VALIDATION

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1 INTRODUCTION

This manual describes the operation of the BV50 Bill Acceptor programmed with Firmware Version 4.04 or greater.

CAUTIONS:

- THIS PRODUCT MUST BE FITTED WITH A 2 AMP TIME DELAY FUSE BEFORE USE.
- DUE TO DIFFERENT BILL CYCLE TIMES THERE MAY BE TIMING DIFFERENCES FROM THE NV PRODUCTS.

We recommend that you study this manual as there are many new features permitting new uses and more secure applications.

If you do not understand any part of this manual please contact your local office for assistance, contact details are available from www.bellis-technology.com. In this way we may continue to improve our product.

WARNING

ONLY SUITABLY TRAINED PERSONNEL SHOULD CARRY OUT ANY WORK ON THIS EQUIPMENT IN ACCORDANCE WITH ALL CURRENT LOCAL, NATIONAL AND INTERNATIONAL HEALTH AND SAFETY REGULATIONS.

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2 ENVIRONMENT AND POWER REQUIREMENTS

ENVIRONMENT

Environment	Minimum	Maximum
Temperature	+3°C (37F)	+50°C (122F)
Humidity	5%	95% Non condensing

Table 1 – Environmental Requirements

POWER REQUIREMENTS

Electrical Supply	Minimum	Maximum
Supply Voltage (V DC) Absolute Limits	+11 V	+13.5 V
Supply Ripple Voltage	0 V	0.25 V @ 100 Hz
Supply Currents:		
Sleep (low power mode)		TBC
Standby		0.4 A
Validating		1.5 A
Peak (Motor Stall)		3.0 A

Table 2 – Power Requirements

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

Table 3 – Interface Logic Levels

3 GENERAL DESCRIPTION

The BV50 Bill Acceptor is a compact bill-validating machine suitable for most money machines. It will accept up to 16 different denominations of bills in the serial control mode. The BV50 is designed for easy installation in most machines with a choice of interface protocols as described in chapter 4.3 - Protocols.



Figure 1 - The BV50 bill acceptor

Bill sizes accepted	Width: 66mm, Length: 156mm
Weight	0.85kg
Bill to bill time	3 seconds
Escrow	Single bill
Cash box capacity	300 used bills for standard cash box. Up to a maximum capacity of 900 bills.
Interface	SSP, Parallel, Pulse, Binary, ccTalk, MDB. (Contact ITL for other interface availability)

Currency

The BV50 Bill Acceptor leaves the factory pre-set to at least one currency so that it is ready for immediate installation. If it is required to change the currency dataset this may be done using the PC based Validator Management software or with the DA3 Validator Programming System, see chapter 5 - Reprogramming the BV50 for more details.

New currencies and applications are being tested all the time, please refer to our web site or contact your local office for information concerning specific currencies if they are not already included on our approved list.

Cash Box

Various size cash boxes are available for the BV50. The standard cash box will hold approximately 300 bills. Cash box spacers can be added at the factory to increase the capacity. Each spacer will add an extra 200 note capacity with a maximum of 3 spacers. This gives a maximum capacity of approximately 900 bills. (see Appendix C – Cash Box Information for more details).

The Required cash box capacity must be stated at the time of ordering. If no capacity is specified, the standard cashbox will be delivered.

Note: cash box spacers can only be added at our factory, and once fitted cannot be removed.

Mounting

The BV50 is designed to easily mount onto existing mounting studs in many OEM machines. See drawing number GA800 in Appendix B – Dimension Drawings for location and dimensions of the mounting lugs.

Disconnect all power to the machine and mount the BV50 onto the mounting studs. Connect the interface cable from the machine to the BV50 and apply power to the machine.

Different harnesses are available depending on the required mode of operation (see chapter 4.2.4 - Hardware Options).

ORDERING INFORMATION

	BV50	USD01	404	CCT	300	123456
Product						
Dataset						
Firmware Version						
Firmware Interface						
Cashbox Capacity						
CcTalk Encryption Key						

Figure 2 - Order Code Example

Dataset – This code signifies the currency and bills included. For available datasets and dataset codes, please refer to the currency download section of our website www.bellis-technology.com.

Firmware – This code is the version of firmware required. If left blank, the latest current version will be programmed

Interface – This is the 3 letter code of the required communications interface. For more details of available interfaces, see chapter 4.3 - Protocols.

SSP – Smiley Secure Protocol

MDB – Multi-Drop-Bus (MDB in-line module required)

PL1 – Pulse Mode 1

SP4 – Special Pulse (always enabled)

CCT – ccTalk

PAR – Parallel

BIN – Binary

Cashbox Capacity – The required capacity of the cashbox. Sizes available are 300, 500, 700 or 900.

ccTalk Encryption Key – The required ccTalk encryption key if the selected interface is CCT. If left blank, a key of 123456 will be used.

4 MACHINE INTERFACES

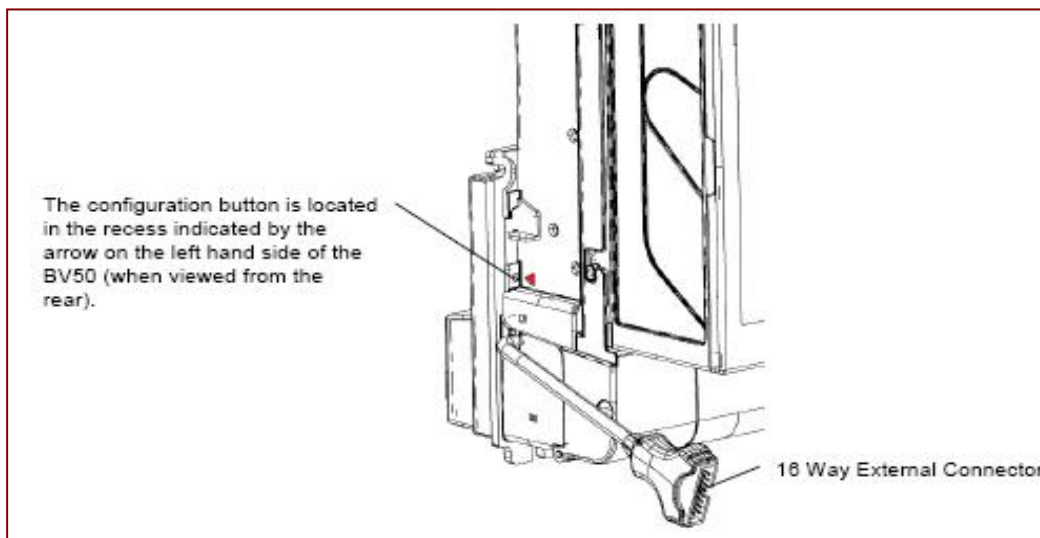
4.1 BEZEL LED's

The Bezel LED's are used to indicate a variety of status signals as described below in Table 5 - Bezel LED Diagnostic Codes.

Number of LONG flashes	Number of SHORT flashes			
	1	2	3	4
1	Note Path Open	Note Path Jam	Unit Not Initialized	
2	Cash Box removed	Cash Box Jam		
3	Firmware Checksum	Interface checksum	EEPROM Checksum	Dataset Checksum
4	PSU too Low	PSU too High		

4.2 HARDWARE

4.2.1 POINTS AND BUTTONS



4.2.2 INTERFACE PIN DETAILS

The function of pins 1-8 changes according to which machine interface is being used. See the individual interface descriptions for details.

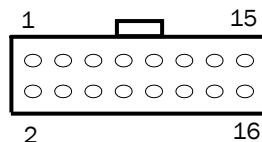


Figure 3 - BV50 Cable connections

Pin	Name	Type	Description
1	Vend 1	Output	Open collector outputs. Function changes depending on machine interface protocol (see individual interface descriptions for details)
2	Vend 2	Output	
3	Vend 3	Output	
4	Vend 4	Output	
5	Inhibit 1	Input	Inputs are held high to internal +5V via 10KΩ. Function changes depending on machine interface protocol (see individual interface descriptions for details)
6	Inhibit 2	Input	
7	Inhibit 3	Input	
8	Inhibit 4	Input	
9	Busy	Output	Active LOW when the BV50 is transporting, reading or stacking a note
10	Escrow	Input	Enable the escrow function by holding LOW in Parallel, Pulse or Binary modes (See Appendix E - Escrow Function)
11	-	-	Do not connect
12	-	-	Do not connect
13	Factory Use Only		Do not connect
14	Factory Use Only		Do not connect
15	+Vin	Power	Nominal 12V DC supply
16	0V	Ground	0V supply

Table 6 – 16 way External Connector Pin Out

4.2.3 CONFIGURATION BUTTON FUNCTIONS

The functions available via the Configuration Function Button are detailed in Table 7 - Configuration Button Functions.

Configuration Button	Power Status	Function
Press & Hold (>2 secs)	Powered ON	Sets BV50 to Programming Mode (SSP)
Press Once (<1 sec)	Powered ON	Enables Configuration Card Programming
Press twice (within half a second)	Powered ON	Current Setting Indicator
Press & Hold (as power is applied)	Powered OFF → ON	Resets ccTalk key to Default setting

Table 7 – Configuration Button Functions

BV50 Programming Mode

Press and Hold the Configuration Button for at least 2 seconds while the BV50 is powered up. The Bezel LED will flash rapidly to indicate that the SSP interface is being loaded. Once this process has finished the BV50 will reset. The BV50 will now be in Programming Mode (SSP) and allow connection to a PC via a DA1 or DA2 adapter or connection to a DA3.

Note: This mode can only be cancelled by re-programming with a Configuration Card or via the Validator Manager program. Please ensure you are aware of all the BV50 programmed settings before entering this mode. Failure to restore the original setting will stop the BV50 from operating in the host machine.

Configuration Card Programming Mode

Press the Configuration Button once while the BV50 is powered up. If done correctly the Bezel LED will flash every 1-second. This will allow the insertion of a Configuration Card to change the Firmware Protocol in the BV50. (See chapter 5.1 - BV50 Configuration Card for full details). This mode can be cancelled by again pressing the Configuration Button once.

Current Setting Indicator Mode

Press the Configuration Button twice within half a second while the BV50 is powered up. The BV50 Bezel LED will then perform a series of flashes to indicate the current settings within the bill acceptor. (See Program Check Procedure section of Appendix D – Configuration Cards for details on decoding the flashes)

Encryption Key Reset Function (ccTalk)

Note: This function will only be possible if the BV50 is programmed to ccTalk mode. It is not possible to reset the key from SSP mode.

Press and hold the Configuration Button while the BV50 powered is off. Apply the power and keep the button pressed for several seconds. The ccTalk Encryption key will now be restored to the default setting..

4.2.4 HARDWARE OPTIONS

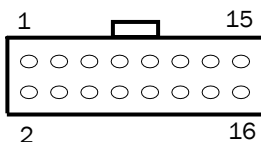
The BV50 can be used in machines with a 110V supply or an MDB machine with the addition of in-line modules. The in-line modules connect between the BV50 16-pin connector and the host machine. It is essential that the correct interface is programmed in the BV50 for the bill acceptor to operate correctly For the 110V option, the SP4 firmware interface must be programmed if the bill acceptor is to be always enabled. For the MDB option, the MDB Firmware option must be programmed. For more information on selecting the interface, see chapter 5 - Reprogramming the BV50.

4.3 PROTOCOLS

4.3.1 SMILEY® SECURE PROTOCOL (SSP)

SSP is a secure serial interface specifically designed to address the problems experienced by cash handling systems in gaming machines. Problems such as acceptor swapping, reprogramming acceptors and line tapping are all addressed. This interface is recommended for all new designs. The interface uses a master slave model, the host machine is the master and the peripherals (bill acceptor, coin acceptor or coin hopper) are the slaves. Data transfer is over a multi-drop bus using clock asynchronous serial transmission with simple open collector drivers. The integrity of data transfers is ensured through the use of 16 bit CRC checksums on all packets.

BV50 Connections



Pin	Name	Type	Description
1	Vend 1	Output	Serial Data Out (Tx)
2	Vend 2	Output	Not Used
3	Vend 3	Output	Not Used
4	Vend 4	Output	Not Used
5	Inhibit 1	Input	Serial Data In (Rx)
6	Inhibit 2	Input	Not Used
7	Inhibit 3	Input	Not Used
8	Inhibit 4	Input	Not Used
9	Busy	Output	Not Used
10	Escrow	Input	Not Used
11	-	-	Do not connect
12	-	-	Do not connect
13	Factory Use Only		Do not connect
14	Factory Use Only		Do not connect
15	+Vin	Power	Nominal 12V DC supply
16	0V	Ground	0V supply

Table 8 - SSP Pin Description

Other information:

Minimum time between Polls: - 200ms

Default SSP address: - 0x00

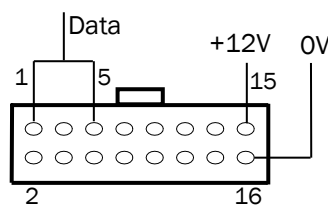
For detailed information and full protocol specification please refer to SSP Interface Specification ITL (Drawing GA138), this is available from the Bellis Technology website www.bellis-technology.com.

To help in the software implementation of the SSP, ITL can provide DLL controls and Visual Basic applications on request. Please contact supportusa@bellis-technology.com for more information.

4.3.2 ccTALK®

ccTalk® is a serial communication protocol commonly used in gaming machines. The protocol allows various types of cash handling equipment to be connected to the same 3-wire bus (+12V, 0V and Data). To use the BV50 in ccTalk mode, pins 1 and 5 (Tx and Rx) must be connected together as the data line.

BV50 Connections



Connections:

Pin	Name	Type	Description
1	Vend 1	Output	Serial Data. Must also be connected to pin 5
2	Vend 2	Output	Not Used
3	Vend 3	Output	Not Used
4	Vend 4	Output	Not Used
5	Inhibit 1	Input	Serial Data. Must also be connected to pin 1
6	Inhibit 2	Input	Not Used
7	Inhibit 3	Input	Not Used
8	Inhibit 4	Input	Not Used
9	Busy	Output	Not Used
10	Escrow	Input	Not Used
11	-	-	Do not connect
12	-	-	Do not connect
13	Factory Use Only		Do not connect
14	Factory Use Only		Do not connect
15	+Vin	Power	Nominal 12V DC supply
16	0V	Ground	0V supply

Table 9 - ccTalk Pin Description

Other Information:

For a list of supported commands please see Appendix F – Implemented ccTalk Commands
For detailed information and full protocol specification, please refer to www.cctalk.org

Default ccTalk address: - 0x28 (40 dec)

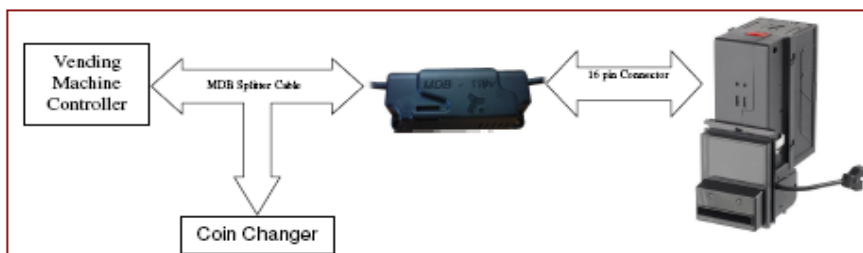
Encrypted ccTalk uses 16 bit CRC checksum. If the encryption is disabled, the user can select either simple 8 bit or 16 bit CRC checksums.

4.3.3 MDB (Multi Drop Bus)

MDB is a serial bus interface commonly used in electrically controlled vending machines. This is a 9600 Baud Master-Slave system where the BV50 Bill Acceptor is a slave to a master controller. A Vending Machine Controller (VMC) has the capability of communicating with 32 peripherals or slaves.

BV50 Connections:

To use the BV50 in MDB mode, an MDB in-line module is required. The in-line module regulates the power supply and opto-isolates the communication lines.



Other Information:

MDB address: - 0x30

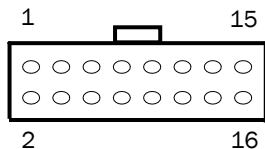
The BV50 supports the MDB Protocol Version 1, Level 1.

For detailed information and full protocol specification, please refer to www.vending.org.

4.3.4 PARALLEL

In parallel mode the BV50 will issue a 100ms ($\pm 3\%$) active LOW pulse on the relevant vend line. A maximum of 4 channels can be used.

BV50 Connections:



Pin	Name	Type	Description
1	Vend 1	Output	Channel 1 credit, 100ms ($\pm 3\%$) active LOW pulse.
2	Vend 2	Output	Channel 2 credit, 100ms ($\pm 3\%$) active LOW pulse.
3	Vend 3	Output	Channel 3 credit, 100ms ($\pm 3\%$) active LOW pulse.
4	Vend 4	Output	Channel 4 credit, 100ms ($\pm 3\%$) active LOW pulse.
5	Inhibit 1	Input	Inhibit channel 1 by holding this pin HIGH, hold LOW to enable.
6	Inhibit 2	Input	Inhibit channel 2 by holding this pin HIGH, hold LOW to enable.
7	Inhibit 3	Input	Inhibit channel 3 by holding this pin HIGH, hold LOW to enable.
8	Inhibit 4	Input	Inhibit channel 4 by holding this pin HIGH, hold LOW to enable.
9	Busy	Output	Active LOW when the NV200 is transporting, reading or stacking a note
10	Escrow	Input	Enable the escrow function by holding LOW (See APPENDIX E - ESCROW FUNCTION)
11	-	-	Do not connect
12	-	-	Do not connect
13	Factory Use Only		Do not connect
14	Factory Use Only		Do not connect
15	+Vin	Power	Nominal 12V DC supply
16	0V	Ground	0V supply

Table 10 - Parallel and Binary Pin Description

Vend Signals: Pins 1-4. Each of the four channels have their own individual output. If a bill is recognized and stacked then the relevant vend line is set low for a period of 100ms $\pm 3\%$. Pulses outside these limits should be rejected as a precaution against false triggering.

Inhibit Inputs: Pins 5-8. Channels 1 to 4 have their own inhibit input to allow the host machine to refuse specified bills. To inhibit a channel, the relevant inhibit input must be held high. To enable a channel, the corresponding inhibit must be latched low so that bills may be accepted. If all four inhibits are high simultaneously then the BV50 will be disabled. In this state the bezel will not illuminate and if a bill is inserted the motor will run in reverse preventing the insertion of the bill. All four inhibits may be connected together to create a 'global' inhibit. In this way the BV50 may be brought in and out of operation by the host machine.

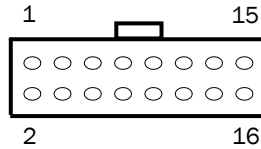
Busy Output: Pin 9. This is a general-purpose busy signal. It is active low while the BV50 is in operation.

Escrow Control: Pin 10. Hold this pin Low to enable the single bill escrow function. (See Appendix E - Escrow Function).

4.3.5 PULSE

In Pulse mode the BV50 outputs a number of pulses on Vend 1. The number of pulses for each channel is different and set to default values within the dataset. The number of pulses and duration can be modified using the Validator Manager software. Also a pulse multiplier and the pulse duration can be modified using a configuration card.

A maximum of 16 channels can be used in Pulse mode.



BV50 Connections:

Pin	Name	Type	Description
1	Vend 1	Output	Credit pulse stream output
2	Vend 2	Output	Not used
3	Vend 3	Output	Not used
4	Vend 4	Output	Not used
5	Inhibit 1	Input	Inhibit channel 1 by holding this pin HIGH, hold LOW to enable
6	Inhibit 2	Input	Inhibit channel 2 by holding this pin HIGH, hold LOW to enable
7	Inhibit 3	Input	Inhibit channel 3 by holding this pin HIGH, hold LOW to enable
8	Inhibit 4	Input	Inhibit channel 4 by holding this pin HIGH, hold LOW to enable
9	Busy	Output	Active LOW when the BV50 is transporting, reading or stacking a note
10	Escrow	Input	Enable the ESCROW function by holding LOW
11	-	-	Do not connect
12	-	-	Do not connect
13	Factory Use Only		Do not connect
14	Factory Use Only		Do not connect
15	+Vin	Power	Nominal 12V DC supply
16	0V	Ground	0V supply

Table 11 - Pulse Mode Pin Description

NOTES:

- Channels higher than 4 cannot be individually inhibited, but will be globally inhibited if inhibits 1 to 4 are inhibited simultaneously.
- When using the 110V PSU in-line module, the Special Pulse interface (SP4) must be used. This operates the same as the standard pulse mode but the bill acceptor is always enabled whatever the state of the inhibit lines.
- Red Wire: 12V DC power supply (min.1.5 amp) DC only.
- Black Wire: Ground Power Supply.
- Green Wire: Credit pulse (active low) to board or coin switch.

4.3.6 BINARY

In Binary mode, the BV50 will issue a binary pattern on vend lines 1 to as shown in Table 12 - Binary Credit Outputs. A maximum of 15 channels can be used.

Vend 1	Vend 2	Vend 3	Vend 4	Credit Channel
LOW	HIGH	HIGH	HIGH	Channel 1
HIGH	LOW	HIGH	HIGH	Channel 2
LOW	LOW	HIGH	HIGH	Channel 3
HIGH	HIGH	LOW	HIGH	Channel 4
LOW	HIGH	LOW	HIGH	Channel 5
HIGH	LOW	LOW	HIGH	Channel 6
LOW	LOW	LOW	HIGH	Channel 7
HIGH	HIGH	HIGH	LOW	Channel 8
LOW	HIGH	HIGH	LOW	Channel 9
HIGH	LOW	HIGH	LOW	Channel 10
LOW	LOW	HIGH	LOW	Channel 11
HIGH	HIGH	LOW	LOW	Channel 12
LOW	HIGH	LOW	LOW	Channel 13
HIGH	LOW	LOW	LOW	Channel 14
LOW	LOW	LOW	LOW	Channel 15

Table 12 - Binary Credit Outputs

Connections: Connections in Binary mode are the same as for Parallel mode described in Table 10 - Parallel and Binary Pin Description

NOTE: Channels higher than 4 cannot be individually inhibited, but will be globally inhibited if inhibits 1 to 4 are inhibited simultaneously.

4.3.7 NON-ISOLATED SERIALPROTOCOL (NIS)

To use NIS mode the NIS option of the interface firmware must be loaded into the BV50. This is available within the IF_O2 download file.

There is a single output DATA line from the BV50 and three control lines: two from the controller "ACCEPT ENABLE" and "SEND" and one from the bill acceptors IRQ (INTERRUPT) (see table 13).

For further details on this protocol please refer to the series 2000 interface manual (reference number 20105-002850046-PS), or contact supportusa@bellis-technology.com

Connection Details:

Signal	BV50 (Harness Wire Color)
+12V	15 (Red)
0V	16 (Black)
ACCEPT ENABLE	6 (Yellow)
SEND	7 (Brown)
IRQ (INTERRUPT)	2 (White)
DATA	1 (Orange)
OUT_OF_SERVICE	3 (Blue)

Table 13- Extended Interface USA Serial

5 RE-PROGRAMMING THE BV50

5.1 BV50 CONFIGURATION VARDS

The Configuration Cards offer the following functions:

- Select required Communication Interface (SSP, Pulse, Parallel etc).
- Adjust the channel and pulse configuration on a pre-programmed BV50 to your own requirements.

The Configuration Card Programming Function of the BV50 is enabled by pressing the 'Configuration Button' on the right hand side of the BV50 (see Chapter 4.2.1 - Ports and Buttons for the button location).

For details on how to complete the configuration cards please see Appendix D – Configuration Cards

1. Press the Configuration button once (<1second) while the bill acceptor is powered up.
2. The bezel LED's will now flash with a steady heartbeat until a Configuration Card is entered.
3. Once the Configuration Card has been entered the bill acceptor reads the card and immediately returns it.
4. The LEDs then flash rapidly while the interface is being changed. If the LEDs flash a number of times slowly, it is an indication of an error (For details of the Error Flash codes please see Appendix D – Configuration Cards
5. When the changes are complete the bill acceptor resets.

If a configuration card is not entered, this function can be cancelled by pressing the button again once. It is now possible to check the programmed settings of the BV50 by pressing the Configuration button twice quickly (double click). For details see Appendix D – Configuration Cards.

5.2 BANKNOTE VALIDATOR CURRENCY MANAGER SOFTWARE

The ITL BNV Currency Manager software offers the following functions:

- Adjust the channel and pulse configuration on a pre-programmed BV50 to your own requirements.
- Select required Communication Interface (SSP, ccTalk, Parallel etc).
- Program the bill acceptor by downloading pre-prepared download files via the DA1 or DA2 kit.
- Check the firmware version and currency set already loaded on a BV50 unit.
- Download an updated version of firmware onto the BV50.
- Use diagnostic functions to check bill acceptors operation

The BV50 is connected to either the serial port of a PC using a DA1 kit, or the USB port using a DA2 kit and set to programming mode using the configuration.

1. Press and hold the Configuration button (>2 seconds) while the bill acceptor is powered up.
2. The bezel LED's will illuminate. Release the configuration button. The Bezel LED's will flash rapidly as the SSP interface is being programmed
3. Use the ITL Bank Note Validator Currency Manager Software and select 'set validator options' from the 'tools' menu
4. The interface and other configurations can be altered to the desired settings
5. Click the apply changes button on the 'update changes' tab to download the new settings to the acceptor.

Notes:

- The Bill acceptor must be set to Programming Mode (SSP) when connected to a computer or DA3 (See Chapter 4.2.3 - Configuration Button Functions).
- The programming mode can only be cancelled by re-programming with a Configuration Card or via the Validator Manager program. Please ensure you are aware of all the BV50 programmed settings before entering this mode. Failure to restore the original setting will stop the BV50 from operating in the host machine.
- ITL BNV Currency Manager 3.2.2 or higher must be used to access the BV50 functions.

5.3 VALIDATOR PROGRAMMING SYSTEM (DA3)

The DA3 is a programming system designed to enable the programming of ITL Bill Acceptors in the field without the use of a PC.

Once the DA3 has been programmed the user can:

- Update the existing software within a bill acceptor to the latest versions using the BNV Match Download function.
- Reprogram the bill acceptor to accept a different currency using the BNV Override Download function
- Test the functionality of the bill acceptor away from the host machine.

For full DA3 operation and functionality details please refer to the DA3 User Manual (Document number GA339).

When programming a BV50 using the DA3 BNV Override Download function, the firmware interface is unchanged. A Configuration Card must be used after re-programming if a different interface is required.

6 LOW POWER OPTION

Low power Mode can be used with all none serial communication protocols to reduce the power consumption of the BV50 when idle in Parallel, Pulse and Binary Interfaces.

The BV50 goes into low power mode approximately 6 seconds after the bill acceptor is powered up and remains in this state until a bill is entered (Time A). Following a bill insertion the BV50 returns to Low Power mode approximately 1 second after the Busy line goes High (Time B).

NOTE:

- Low Power Mode can ONLY be used with Parallel, Pulse and Binary protocols
- Low power mode can only be enabled by correctly completing the configuration cards or via the ITL BNV Currency Manager software
- In low power mode the front sensor is checked every 1 second which can lead to a delay in accepting the bill when it is presented
- Configuration button functions are only available during power up before the BV50 goes into low power mode.

Electrical Supply	Minimum	Maximum
Supply Voltage (Absolute Limits)	+11 V	+13.5 V
Supply Ripple Voltage	0 V	0.25 V @ 100 Hz
Supply Currents:		
Sleep (low power mode)		TBC
Standby		0.4 A
Validating		1.5 A
Peak (Motor Stall)		3.0 A

Table 14 - Electrical Supply Specification

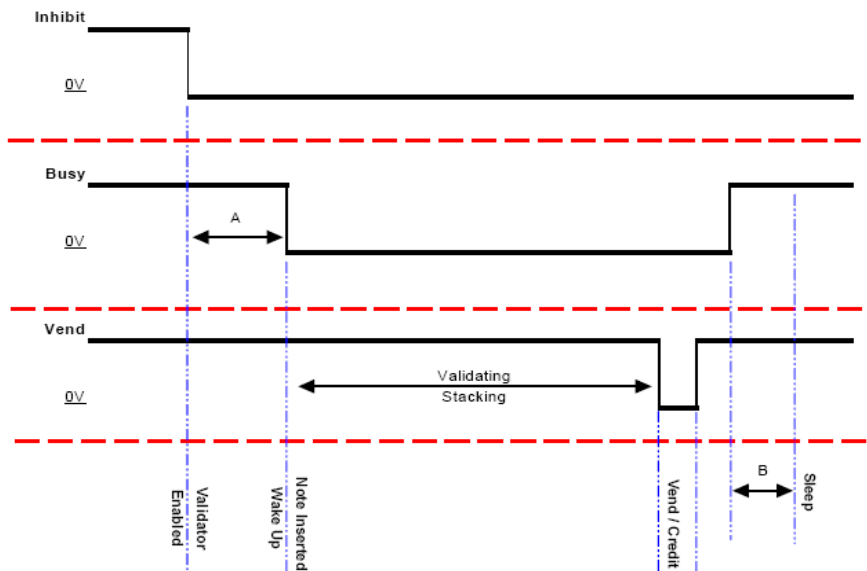


Figure 4 - Low Power Mode Timing Diagram

7 MAINTENANCE AND RE-INITIALISATION

7.1 ROUTINE MAINTENANCE

The BV50 Bill Acceptor has been designed to minimise any performance variation over time. Much of this is achieved by careful hardware and software design. However, depending upon the environment the BV50 may at some time require cleaning.

CAUTION: Do not use solvent based cleaners such as alcohol, petrol, methylated spirits, white spirit or pcb cleaner. This will result in permanent damage to the bill acceptor, only use a mild detergent.

To clean, push down the latch plates on the side of the bill acceptor, and allow the stacker/cashbox assembly to lower. The note path is now exposed for cleaning. Carefully wipe the surfaces with a soft lint free cloth that has been dampened with a water and mild detergent solution (i.e. household washing up liquid). Ensure the note path is clean and dry before closing the unit and inserting bills.

7.2 RE-INITIALISATION

The BV50 has an in-built self-calibration system that maintains the optical sensors at their best operating point. However if the BV50 is disassembled for any reason it will need to be re-initialized. Re-initialization may only be performed under license from ITL, contact support@innovative-technology.co.uk for further details. Re-initialization can only be performed in conjunction with the diagnostics function within the Bank Note Validator Currency Manager.

8 DIAGNOSTICS

Symptom	Possible Cause	Corrective Action
All Bills are rejected (Bezel LED's are on)	Incorrect currency file programmed	Check that the required dataset is programmed in to the bill acceptor using the validator manager software
	Bills are not included in the currency file	Check that the required denomination and issue are included in the currency file using the validator manager software
	Bills are inhibited by the host machine	Ensure the machine is ready to accept bills. If a coin hopper is in the machine ensure it is not empty. Ensure the maximum allowed credit on the host machine has not been exceeded.
Bills are not taken in (no bezel LED's)	No Power	Ensure the correct specification power is applied to the bill acceptor.
	Incorrect interface is programmed	Check which interface is programmed into the bill acceptor by double clicking the configuration button. The displayed code indicates which interface is programmed as described in Appendix D – Configuration Cards: Program Check Procedure.
Bills stacked but no credit given	Incorrect interface is programmed	Check which interface is programmed into the bill acceptor by double clicking the configuration button. The displayed code indicates which interface is programmed as described in Appendix D – Configuration Cards: Program Check Procedure.
	Rear bill detect sensor obscured	Remove the cash box and ensure no foreign objects are obstructing the sensors
Bezel LED's are flashing	See 4.1 for details of LED Status signals	
Motor continues to run	Foreign object or bill is stuck in the note path	Ensure the note path is clear and reset the bill acceptor. It may also be necessary to reset the host machine.

9 SUPPORT

The following support tools are available for use with the BV50 Bill Acceptor:

- Configuration Cards.
- ITL Bank Note Validator Currency Manager Software.
- Validator Programming System (DA3)
- Downloads from the Bellis Technology website: www.bellis-technology.com
- E-mail Support via supportusa@bellis-technology.com

9.1 CONFIGURATION CARDS

For full details of the use and function of the Configuration Cards please see Appendix D – Configuration Cards.

9.2 VALIDATOR PROGRAMMING SYSTEMS (DA3)

For full details of the use and function of the Validator Programming System and DA3, see chapter 5.3 - Validator Programming System (DA3) and the DA3 User Manual (Document number GA339).

9.3 INTERNET WEB SUPPORT

The Bellis Technology website provides the means to download new and updated currency sets and new versions of firmware for the BV50. You can obtain these along with technical bulletins by visiting www.bellis-technology.com.

9.4 EMAIL SUPPORT

If the data you require is not available over the Internet Bellis Technology supports an e-mail system to help customers with unusual requirements. The address is: supportusa@bellis-technology.com.

10 APPENDIX

10.1 APPENDIX A – BV50 ORDER FORM

To order the BV50, please print and fill the order form and send it to your nearest office by fax or email. Contact information is available in the introduction chapter of this document or on our website. If you do not know which office to send the order form to, send it to our main headquarters:

INNOVATIVE TECHNOLOGY LTD	Derker Street – Oldham – England - OL1 4EQ Tel: +44 161 626 9999 Fax: +44 161 620 2090 E-mail: support@innovative-technology.co.uk Web site: www.innovative-technology.co.uk
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If you have any questions about the information required for the order form, please see chapter 3 General Description. If you still have any questions, or you want to know more about other products and possibilities, do not hesitate to contact your nearest dealer.

We offer a wide range of products and accessories such as alternative bill acceptors, programming kits, interfaces, connecting cables, bezels and other elements. Please contact your nearest office for more information.

BV50	Date:
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Customer Details

Company	Phone Number:
Contact Person	Country:
Issue No.	Customer Part No:

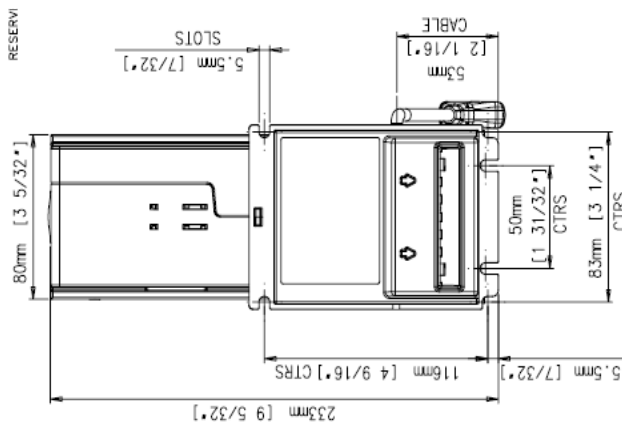
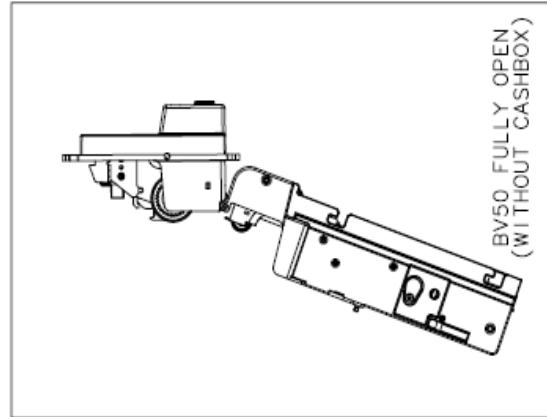
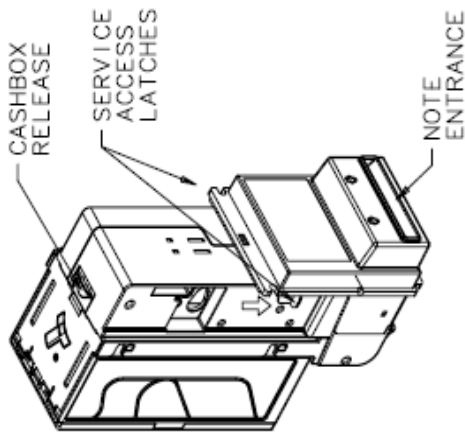
	BV50		
Product			
Dataset			
Firmware Version			
Firmware Interface			
Cashbox Capacity			
CcTalk Encryption Key			

APPROVED

Customer:	Innovative Technology:
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10.2 APPENDIX B – DIMENSION DRAWING

The following page contains drawing number GA800 which shows the dimension of the BV50 including positioning of the mounting slots.



ACCEPTS BILLS:

UP TO 66 mm x 160 mm LONG

SUPPLY AND POWER CONSUMPTION:

VOLTAGE: 10.8 - 13.2 V

RIPPLE: 0.25 V at 100 Hz

STAND BY: 150mA

VALIDATING: 550mA

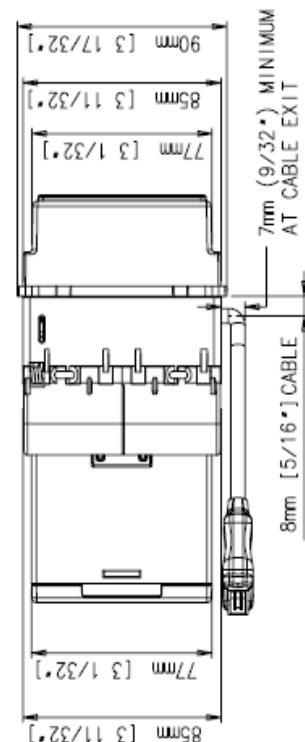
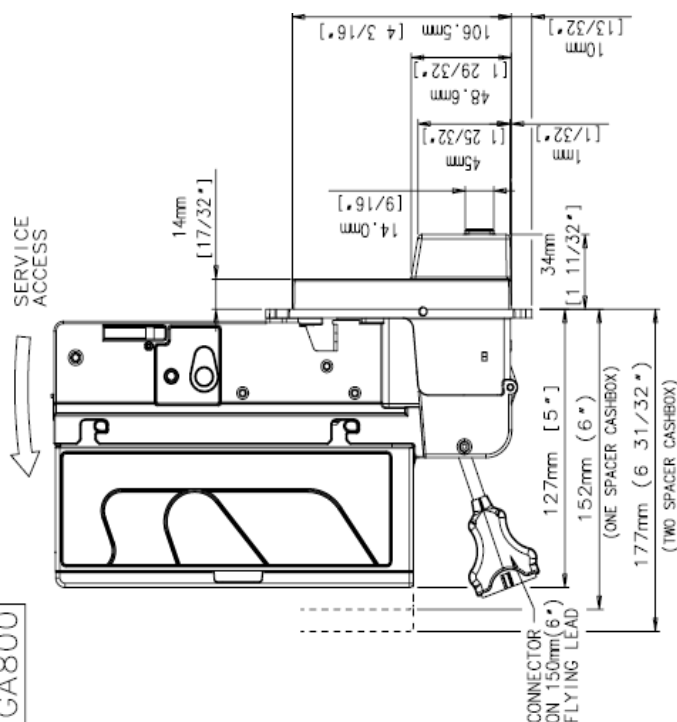
PEAK: 2200mA

ENVIRONMENTAL OPERATING RANGE:

+3 °C to +50 °C at 5% to 95% RH

(NON - CONDENSING)

UNLADEN WEIGHT: 0.85 KG



10.3 APPENDIX C – CASHBOX INFORMATION

There are different capacity cash boxes available for the BV50. The standard cash box will hold approximately 300 used bills. Cash box spacers can be added at the factory to increase the capacity. Each spacer will add an extra 200 bill capacity with a maximum of 3 spacers. This gives a maximum capacity of approximately 900 used bills.

Cash box capacity must be stated at the time of ordering. If no capacity is specified, the standard 300 size will be used.

Note: Cash box spacers can only be added at our factory, and once fitted cannot be removed.

Size A – Standard 300 bill cash box
Size B – One spacer cash box – 500 Bill capacity
Size C – Two spacer cash box – 700 Bill capacity
Size D – Three spacer cash box – 900 Bill capacity

10.4 APPENDIX D – CONFIGURATION CARDS

The following pages contain document number GA798 – BV50 Configuration Option Programming.

To print the cards, take care to ensure that the page scaling is set to 'none'. Take care to ensure that the card has printed with the correct dimensions before use.

Insert this end first

BV 50

Select interface

Parallel	<input type="checkbox"/>	<input type="checkbox"/>	Pulse
Enabled pulse	<input type="checkbox"/>	<input type="checkbox"/>	MDB

Select bill disable

\$1	<input type="checkbox"/>	<input type="checkbox"/>	\$50
\$5	<input type="checkbox"/>	<input type="checkbox"/>	\$100
\$10	<input type="checkbox"/>	<input type="checkbox"/>	\$2
\$20	<input type="checkbox"/>		

Select pulse options

High speed	<input type="checkbox"/>	<input type="checkbox"/>	Low speed
# pulse x1	<input type="checkbox"/>	<input type="checkbox"/>	# pulse x16
# pulse x2	<input type="checkbox"/>	<input type="checkbox"/>	# pulse x32
# pulse x4	<input type="checkbox"/>	<input type="checkbox"/>	# pulse x64
# pulse x8	<input type="checkbox"/>	<input type="checkbox"/>	# pulse x128

Select special options

Low power

GA 798 rev 1.2

CONFIGURATION CARDS

Instructions for use

1) Cut card around outline – check measurements 198mm (7 7/8”) x 66mm (2 5/8”). Check print options ‘Page scaling’ is set to ‘none’ when printing a file to ensure correct size.

2) Fill in sections as required. Use caution when filling in the selections. Stay inside the lines and fill boxes completely in like the example below.



3) Power up BV50 and allow it to reset.

4) Press the Configuration button once on the BV50 to access the Configuration Mode. The BV50 bezel LEDs should now be flashing at 1 second intervals.

5) Enter card into BV50 in direction indicated by arrows.

6) Card will be returned and if configuration was accepted the bezel LEDs will flash rapidly while the BV50 is programming. **USE CAUTION TO ENSURE POWER IS NOT DISCONNECTED DURING THIS STAGE, PERMANENT DAMAGE MAY OCCUR IF POWER IS DISCONNECTED DURING THIS STAGE.** When programming is complete the BV50 will reset.

If an error occurs the bezel LEDs will flash slowly displaying a code to indicate the cause of the error.

Error Codes

- 2 – Invalid card read – card entered improperly, card filled out improperly or wrong version of card has been used
- 3 – No interface selection was detected on card
- 4 – Multiple interface selections detected
- 5 – Invalid interface selected – the selected interface is not available for this BV
- 6 – Selected interface not compatible with BV version
- 7 - Pulse configuration error. Selected pulse options invalid.
- 8 – Not used
- 9 – Low power mode not available on this BV version

IMPORTANT CHECK THAT THE CONFIGURATION REQUESTED HAS BEEN SET IN THE BV50 BEFORE USE.

10.5 APPENDIX E – ESCROW FUNCTION

The BV50 has a single bill escrow facility (pin 10) used in Parallel, Pulse and Binary modes. This allows the bill acceptor to hold onto the bill once accepted, and then only stack the bill in the cash box when the host machine confirms that the Vend operation has been completed. If no confirmation of the Vend is received then the bill will be returned to the customer after 30 seconds See Figure 5 – Escrow Timing Diagram for Parallel Vends.

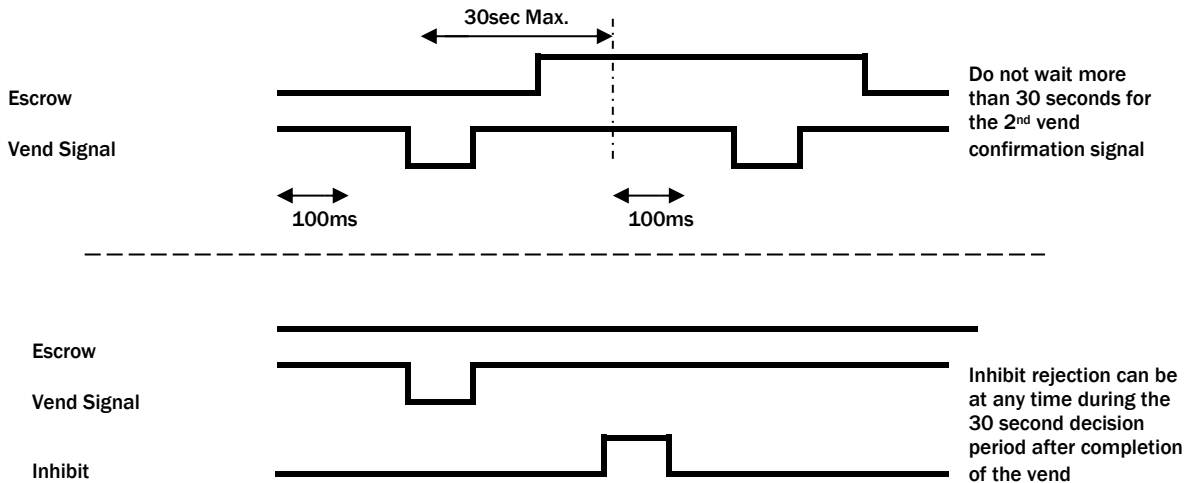


Figure 5 - Escrow Timing Diagram for Parallel Vends

If the host machine itself aborts the transaction by setting the corresponding inhibit input high, the bill is returned immediately. The sequence of operations is as follows:

- Pin 10 held low awaiting bill insertion.
- Bill inserted. Bill acceptor issues a 100ms pulse on the appropriate channel.
- The host machine initiates vend process.
- The host machine sets pin 10 high to indicate that it wants the bill. If this is not done within 30 seconds the bill acceptor will return the bill.
- The bill acceptor issues a 100ms pulse on the appropriate channel after pin 10 going high to indicate final acceptance of the bill. If the signal has not been received within 30 seconds it indicates the customer has forcibly retrieved the bill and the vend will be aborted.
- The vend process is completed.
- The host machine sets pin 10 low in expectation of the next vend.

The host machine can force the return of the bill to the customer by setting the inhibit line high, at any time before the end of the 30 second time-out. For channels above 4, setting all four inhibits high will cause a bill reject.

In the event of a bill being forcibly removed from the mouth of the BV50 during the 30-second interval, the BV50 will go out of service for 45 seconds.

10.6 APPENDIX F - IMPLEMENTED ccTALK COMMANDS

Command	Header
SIMPLE_POLL	254
ADDRESS_POLL	253
ADDRESS_CLASH	252
ADDRESS_CHANGE	251
ADDRESS_RANDOM	250
REQUEST_POLLING_PRIORITY	249
REQUEST_MANF_ID	246
REQUEST_EQUIP_CAT_ID	245
REQUEST_PRODUCT_CODE	244
SERIAL_NUMBER	242
REQUEST_SOFTWARE_REVISION	241
READ_OPTO_STATES	236
PERFORM_SELF_CHECK	232
SET_INHIBITS	231
REQ_INHIBITS	230
SET_MASTER_INHIBIT	228
REQ_MASTER_INHIBIT	227
REQUEST_INS_COUNT	226
REQUEST_ACCEPT_COUNT	225
REQUEST_DATA_STORAGE_AVAIL	216
REQUEST_OPTION_FLAGS	213
CALCULATE_ROM_CHECKSUM	197
REQUEST_BUILD_CODE	192
REQUEST_BASE_YEAR	170
REQUEST_ADDRESS_MODE	169
READ_BUFFERED_BILL_EV	159
REQUEST_BILL_ID	157
REQUEST_COUNTRY_SCALING	156
REQUEST_BILL_POSITION	155
ROUTE_BILL	154
MODIFY_BILL_OPERATING_MODE	153
REQUEST_BILL_OPERATING_MODE	152
STACKER_CYCLE	147
OPERATE_BI_MOTORS	146
REQUEST_CURRENCY_REVISION	145
SWITCH_ENCRYPTION_CODE	137
STORE_ENCRYPTION_CODE	136
READ_BARCODE_DATA	129
REQUEST_COMMS_REVISION	4
RESET_DEVICE	1

Table 15 - Implemented ccTalk Commands

Revision History

INNOVATIVE TECHNOLOGY LTD			
TITLE	BV50 OPERATIONS MANUAL		
DRAWING NO	AUTHOR	DATE	FORMAT
G820	RJS	18/03/08	MS Word 2000
ISSUE	RELEASE DATE	MODIFIED BY	COMMENTS
A	18/03/08	RJS	First Draft
B	17/09/08	RJS	Second Draft. Added configuration card appendix and re-ordered chapters
C	14/08/2014	MH	General Update