GBA ST2

Operations Manual

GBA *Global Bill Acceptors*

GBA ST2
Operations Manual

Contents:

Introduction:

This manual describes the operation and basic servicing of the GBA ST2 note validator. It is intended to assist the user in the set-up, installation and operation of the product.

If you have any questions about this or any other Astrosys International products then please visit our web sites at www.globalbillacceptors.com and www.microcoin.com, or contact your local sales office for assistance (see last page).

The GBA ST2 has been specially designed to retrofit into all applications previously served by the GBA stacker less product range. It is also designed for the rigours of the amusement and gaming markets and can be used in all applications. The following features are also offered:

- Sense Technology note discrimination
- Up to 32 note x 4 way acceptance
- Accepts notes from 61 to 85mm wide (and up to 170mm in length)
- Escrow
- Simple configuration using Programming Card or PC software
- Internal Optical and Mechanical Anti String protection as standard
- 12V (+/- 10%) operation
- Easy access to note path for servicing and cleaning
- On board tri-colour diagnostic LED
- Automatic calibration of optical sensors
- Automatic temperature compensation
- Blue illuminated runway note guide fitted as standard
- Various faceplate and bezel options to suit host machine
- Manufactured to ISO 9001 standards
- RoHS compliant

2.0 PRODUCT INFORMATION

2.1 General Specifications

Bill Insertion: Up to 32 bill denominations with 4 way insertion
Bill Dimensions: 61 to 85mm wide; up to 170 mm long
Bill Acceptance Rate: Typically greater than 98%
Cycle Time for Validation: Approximately 2 seconds
Interface Protocols Supported: Pulse, Parallel, cctalk$^{®}$ (plain & encrypted), bi-direction serial ("RS232"), NAMA MDB, SSP
Power Supply: 12Vdc +/-10% (Note: Tip positive for the DC power supply jack)
Power Consumption (Validating):   800mA @ 12V
                      (Idle):   200mA @ 12V
Environmental Range (Operating Temp):   0° to 60°C
                      (Operating Hum):   Up to 95% R.H., non-condensing
                      (Storage Temp):   -10° to 65°C

2.2 Product Assembly
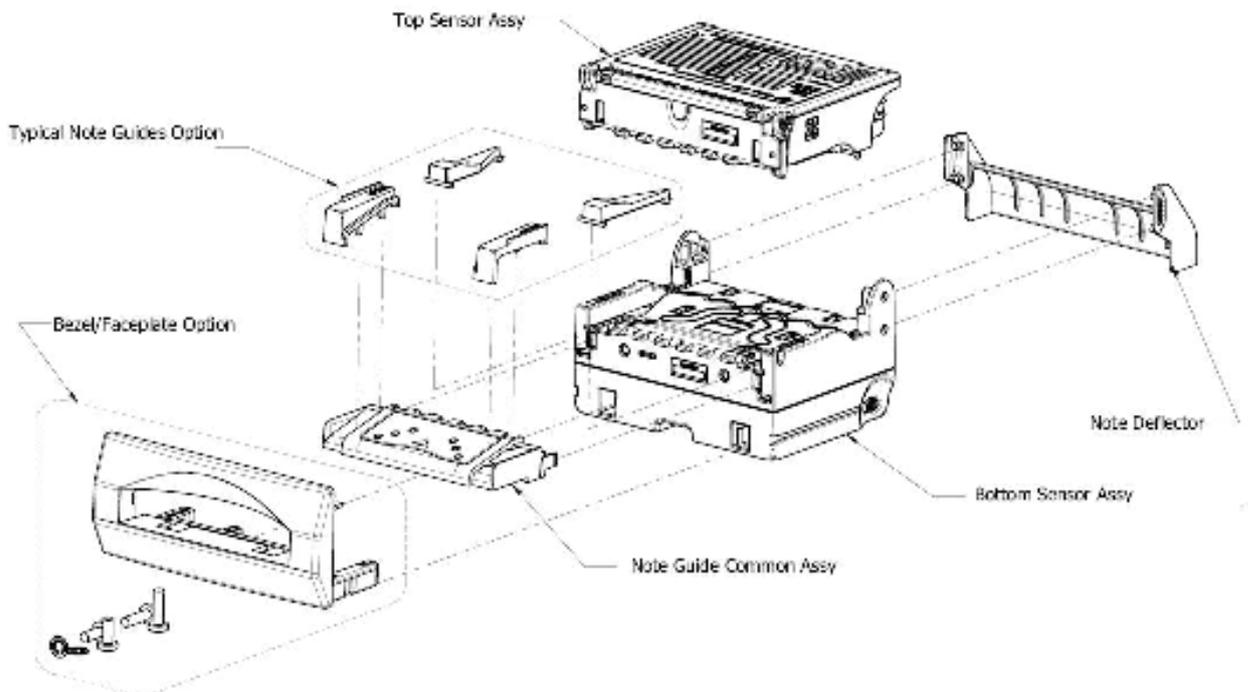
2.3 Build Options

2.3.1 Note Guide

Note guides are available in an illuminated, flashing style. The note guide can be configured in a number of options, to provide specific information to the user / technician. Note guides of specific widths are fixed to the note guide common assembly and to the internal path of the lower sensor assembly, to suit particular currencies. For information about the most appropriate design for your currency please contact your local regional office.

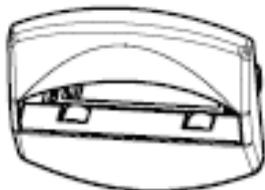### 2.3.2 Faceplate / Bezel options

Faceplates and bezels are available in four styles, to suit the host machine, please see details below. Please note that for currencies containing note denominations over 82mm, the Wide Compact Bezel must be used.

2.3.3 Standard Faceplate

2.3.3 Compact Bezel

2.3.3 Standard Bezel

2.3.3 Wide Compact Bezel

2.3.4 Interface Cable Assembly

The GBA ST2 is fitted with a 20 pin interface connector. All interfaces, with the exception of NAMA MDB, utilise this connector for communication to a host machine. For further details relating to interface and connection information, please refer to section 8.0 – Electrical Connections.

3.0 MECHANICAL CONFIGURATION

3.1 Faceplate and Bezel Fitting / Removal
Refer figure 3.1.1

To remove the faceplate / bezel, gently push the two purple bezel retainer buttons inwards until they are in contact with the validator. With these depressed, pull on the faceplate / bezel to remove from its locking stage. To fit the faceplate / bezel, simply insert the two black locating legs into the holes and push fully until you hear a loud clipping sound. Pull fully on the faceplate / bezel to ensure correct fitment.
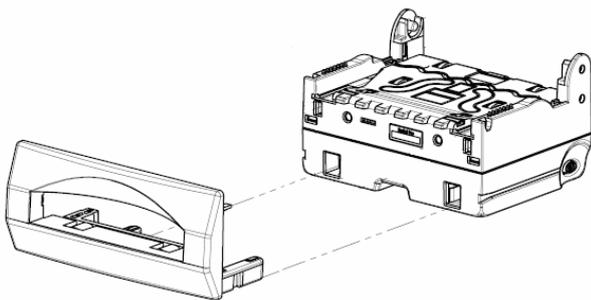
*3.1.1 - Images of faceplate fitment*
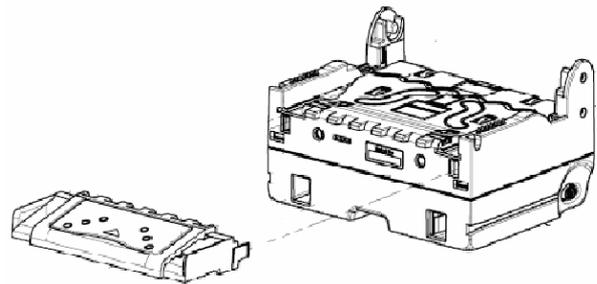
3.1.2 - Image of note guide fitting

3.1.2 Note Guide Fitting / Removal
Refer figure 3.1.2

To remove the note guide first remove the faceplate / bezel. Push together the two sides of the note guide and pull away from the validator. To fit the note guide, please ensure that the four pins locate fully into the four connection holes, then push the note guide so the clips are secure.

3.1.3 Note Guide Plate Fitting / Removal
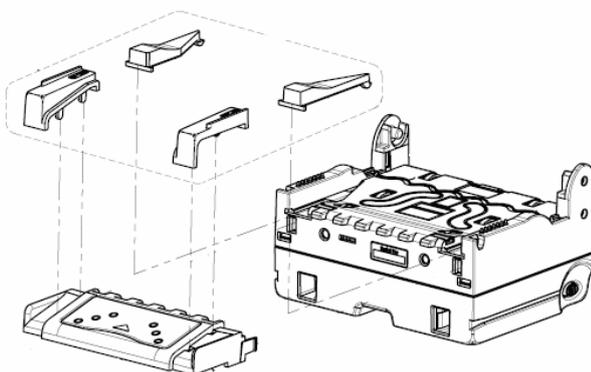
3.1.3 – Image of note plate fitting

The note guide uses note guide plates to aid insertion of the notes inserted. As listed above, these are available in a number of sizes, dependant on currency required. To remove these from the GBA ST2 you will first need to remove the note guide as per 3.1.2. To remove the plates, push down on the side of the plate and (if looking at side of note guide) twist it away from the note guide. To refit the note plate, insert the two location legs into the holes and push down.

4.0 INTERFACE PROTOCOLS

The GBA ST2 can communicate with a host (machine) via one of five base interface protocols. These protocols are; NAMA MDB, pulse, parallel, cctalk® and bi-directional serial ("RS232"). Variants to some of these protocols are also available, please contact your regional office for further details.

The product is connected to the host using an appropriate interface cable assembly. With the exception of MDB the GBA ST2 will be connected to the host machine using a cable assembly terminated with a 20-way connector, as denoted in section 8.0 – Electrical Connections.

4.1 NAMA MDB

If the GBA ST2 is used in an MDB interface application, an additional interface cable assembly is required to connect to a standard NAMA 6 pin connector. Please contact Technical Support for details.

4.2 CCTALK® INTERFACE

If the validator is used in a ccTalk® interface application, an alternative 20 pin harness is required.
Part Number: ASY-W-10265.
Please contact Technical Support for details.

For further details relating to the operation of specific interfaces please refer to the Interface Description Manual.

5.0 SOFTWARE CONFIGURATION
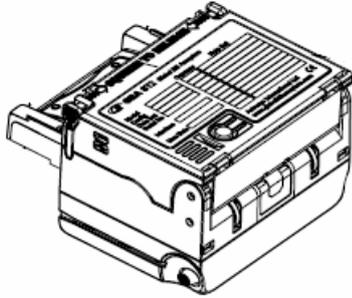
5.0 - Image illustrating top of ST2

The GBA ST2 can be configured using either the on-board push button, USB memory stick, or via a Windows based PC package – GBA Tools.

5.1 ON-BOARD PUSH BUTTON

The on-board push button is located on purple lid of the unit, next to the diagnostics LED. This push button will allow access to on-board programming modes including note enable, note disable and Primary Calibration / Configuration. A single long press of more than 2 seconds will cancel the programming mode. In the note enable and disable modes a sample note must then be presented for scanning. If the operation is successful the validator will return to normal operation mode. If it is unsuccessful, it will remain in the program mode. If the push button is held for more than 5 seconds an error is reported (LED solid red).

5.1.1 Configuration Procedure – Enable Note

Procedure:

1. Push button x 1, the diagnostic LED will flash green rapidly.
2. Insert the specific denomination required to be enabled.
3. The GBA ST2 will take the note in and then return it.
4. Enable complete. The diagnostic LED will return to solid green.

5.1.2 Configuration Procedure – Disable Note

Procedure:

1. Push button x 2, the diagnostic LED will flash red rapidly.
2. Insert the specific denomination required to be disabled.
3. The GBA ST2 will take the note in and then return it.
4. Disable complete. The diagnostic LED will return to solid green.

5.1.3 Configuration Procedure – Programming Card

Equipment Required;

Program Card. (PC software is available to print these cards. Please consult your local sales office)

Procedure;

1. Push button x3, the diagnostic LED will flash orange rapidly.
2. Insert the Program Card into the reader.
3. The Program Card will be taken into the validator and held for a small period of time, then returned in one smooth movement
4. Configuration is complete.

Note: Please ensure the programming card has been printed on a high quality printer with good solid black lines on the card.

5.1.4 Configuration Procedure – Re-Calibration

Although calibration of the GBA ST2 is not a necessity it is recommended periodically for preventative maintenance, and also after any change to the software configuration of the unit.

Equipment Required:

Calibration Paper.

Procedure:

1. The push button is located on the purple lid of the unit
2. Push button x3, diagnostic LED will rapidly flash orange.
3. Insert the Calibration paper into the reader.
4. The reader will draw in the paper until it reaches the internal string gate. At this point it will hold the paper momentarily before it is returned in several movements.
5. Remove the calibration paper from the note entry point.
6. Calibration is complete.

Note: Please ensure the ST2 calibration paper has 2 chamfered corners. The part number for this is ASY-W-10268

5.2 PC BASED GBA TOOLS

The GBA ST2 can also be configured using PC based software, GBA Talk. This software also provides calibration and diagnostic functions.

NB for full instructions on the GBATalk software package refer to the GBATalk Manual.

5.2.1 Configuration Procedure – GBA Talk PC Software Calibration

Equipment required;

GBA ST2 Calibration paper
GBA Talk Kit, consisting of PC software, Diagnostic harness and 20 pin harness.
Note: the 20 pin harness must contain a 4 pin socket connected to pins 18 and 20.

Procedure;

1. Clean Validator Bill path
2. Apply power to the Validator and connect it to a PC running the Talk software. This is done utilising the Astrosys International diagnostics harness.
3. Press upload data button to confirm connection.
4. Click on Calibrate button and follow on screen prompts.
5. Any errors will be notified to the user.

If errors occur, disconnect the unit and re-apply power, then start from point 3.

NB. The GBA ST2 is factory calibrated and should only require re-calibration after the on-board software or firmware has been changed or following modification to the configuration of the unit via a programming card or GBATalk Tools. In general, re-calibration of the unit should be carried out once every 6 months in normal conditions. When the note acceptor is located in areas that are particularly smoke filled or dusty, re-calibration should be carried out more frequently.

5.2.2 Configuration Procedure – GBA Talk PC Software Configuration
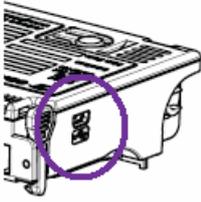
Equipment Required;

GBA Talk Kit, consisting of PC software, Diagnostic harness and 20 pin harness.
Note: the 20 pin harness must contain a 4 pin socket connected to pins 18 and 20.

Procedure;

1. Connect the GBA ST2 to the PC by placing the diagnostic harness into the DB9 connector of the PC, and the 4 pin connector into the 4 pin plug of the 20 pin harness.
2. With GBA Talk open, select "Upload" to see on screen the current configuration of the validator.
3. Make the required changes by using the drop down menus, then select the "Set All" button to send changes to the validator.
4. To complete the procedure, carry out the calibration process by selecting "Calibrate" from the Calibration window.

5.3 USB FLASH DOWNLOAD REPROGRAMMING

5.3 - image of USB input

Equipment Required:

USB memory stick

Procedure:

1. Ensure the supply to the validator is switched OFF.
2. Connect the USB memory stick with the required noteset file stored in it
3. The ST2 will automatically download the file and reprogram itself.
4. During this process the LED will rapidly alternate between Green and Red. Upon completion the LED will revert to a solid Green state.
5. Once the process is complete simply remove the USB memory stick and recalibrate the unit

5.4 SOFTWARE CONFIGURATION OPTIONS:

All of the software options below can be set using either the GBATalk PC program or Program Card facility, as mentioned above. Two kinds of program card are available. Firstly a card to set all options (all options must be specified) and secondly individual, specific option cards that will set only key options such as security level, ccTalk® Encryption Key or Note enable / disable.

Use Magnetic Sensor

Selectable for units fitted with a magnetic reader head, in combination with software containing "C" denotation, e.g., ST299*C*0419.100.

Interface:
The GBA ST2 can be set for use with the following interfaces:

(1) Pulse
(2) Parallel
(3) RS232
(4) MDB[1]
(5) ccTalk® Non Encrypted[2]
(6) ccTalk® Encrypted[3]

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[1] Note: MDB interface requires the use of a dedicated interface harness to connect to a standard NAMA 6 pin connector. Please contact your distributor or regional office for details.
[2] Note: ccTalk® interface requires the use of a dedicated interface harness. Please contact your distributor or regional office for details.

(7) Parallel XT
(8) Parallel Binary

Definitions of the above can be found in the Interface Description Manual.

ccTalk® Encryption Key Reset:

Should a validator require replacing in a ccTalk® application, the Encryption key will require resetting to the default in both the host machine and the note validator. This is achieved on the note validator by use of the ccTalk® Encryption Key Reset Programming Card, using the procedure described above in "Configuration Procedure – Programming Card". For resetting the host machine please refer to the machine user guide.

Escrow Time out period (Parallel interfaces only):

This option enables the Escrow time out period to be set in 1-second intervals between 1 and 255 seconds. **Please Note:** The standard escrow time is 26 seconds. Adjust with care! The host machine must be designed to work with any other time selected. Please contact Technical support for more details.

Low Power Mode: In this mode the quiescent current drawn by the unit is reduced by disabling the motor checks at start up.

This mode is designed to enable the GBA ST2 to be used in battery applications. It is anticipated that the unit is powered up only when a customer wants to present a note, e.g., by lifting up a flap, then the validator is powered down once transaction completed.

OPTICAL ANTI STRING GATE (OASG):

Introduction:

The OASG is a key component of the GBA ST2 security system. The sensor detects strings, tape or other foreign objects behind the note being validated. Should any objects be detected then the note is rejected. Options exist for the unit to be disabled if a preset limit of consecutive string attempts is detected.

Operation:

General:

Once the validator has completed the validation process and is satisfied the note is genuine, the note is moved from the escrow position, such that, the rear of the note is clear of the OASG sensor. A reading is taken and if it is within limits the note is transported to the cashbox and credit given. If the reading is outside limits the note is rejected.

Eight variables can be set in EEPROM memory to control the OASG operation.
1) No. of String Attempts Before OASG Locks Out
2) OASG Lock Out Period
3) OASG Recalibration Period (F/W 0230 onwards)
4) OASG Sensitivity
5) OASG Foreign Object Check
6) Note Jam Detect Limit
7) Note Returned Prior to Lock Out
8) Enable 2 Note Return check

Calibration:

When the unit is calibrated the OASG is set up to read 176 and above. The Ambient reading is stored. An option is available to recalibrate the OASG periodically during idle times. If the validator is in a jam or alarm condition then recalibration does not occur.

Soft options:

The following options can be set using the GBATalk set up program. Options 1, 2, 5 and 8 (above) can also be set using the Programming Sheet utility.

1) **String Attempts Before OASG Lock Out:**
   This option can be set from 0 to 255 and limits the number of successive OASG rejects that will be allowed. When the set value is reached the validator will issue an alarm signal (according to the interface in use). Additionally the validator will lock out (disable) for "x" minutes, where "x" is the setting of the "OASG Lock Out Period".

   Note: *This option can be turned off by setting this feature to zero.*

   Default setting is 0 attempts, as this feature is only applicable in a limited number of cases, where a specific security incident has been reported.

2) **OASG lock out period.**
   This option can be set from 0 to 255 and determines the time (in minutes) that the validator is disabled, following the detection of the set number of successive OASG rejects.
   If this option is set to zero, and the "String attempts before OASG lock out" is set to 1 or more, the unit will not lock out when the limit is reached, however it will return the note and give an alarm signal.

   Default setting is 5 minutes, as this acts as an effective deterrent to the persistent fraudster, whilst minimising disruption to the legitimate user.

3) **OASG Recalibration Period.**
   This option can be set from 0 to 255 and determines the time (in minutes) between OASG calibrations. This will ensure that long-term degradation of the sensors is compensated for. If this option is set to 0 then no recalibration will occur.

   Default setting is 10 minutes; this offers a regular automatic response to changes in environmental conditions.

4) **OASG Sensitivity.**
   This option can be set to Low, Standard, High or Disabled. Disabled removes operation of the OASG for string checks.

5) **OASG Foreign Object Check.**
   This option checks for the insertion of foreign objects into the bill path, if such an event is detected then the unit will lock out until the object is removed.

   Default setting is OFF as this feature is only applicable in a limited number of cases where a specific security incident has been reported.

6) **Note Jam Detect Limit.**
This option sets the change in conditions required to activate a "Note Jam" state. This limit should not be altered unless specifically advised by an official Astrosys representative.

Default setting is 40, as it has been calculated to be the optimum value for all applications.

7) **Note Returned Prior to Lock Out.**
This option specifies whether a note should be returned to the customer (ON) or held at the rear of the acceptor (OFF), if the "String attempts before OASG lock out" value is reached

Default setting ON, as this ensures that the note is returned to the customer, should a fault be detected.

8) **Enable "two note return check"**
This option is used to activate a security feature to detect specific fraud attempts, please contact your local office for more information.

Default setting is OFF, as this feature is only applicable in a limited number of cases where a specific security incident has been reported.

No	Options	Stacker less units		
		Default	Car Wash	Windowed Notes
1	String attempts before OASG lock's out.	0	0	0
2	OASG lock out period	5	5	5
3	OASG Recalibration period (minutes)	10	10	10
4	OASG sensitivity	Low	Low	Low
5	OASG Foreign object check	No	No	No
6	Note jam detect limit	40	40	40
7	Note returned prior to lock out	Yes	Yes	Yes
8	Enable 2 note return check	No	No	No
9	Discrimination security	Std	Low	Std

GBA ST2 DEFAULT SETTING GUIDELINES:
Note: The GBA ST2 can be configured in many ways allowing the user to customize the unit to their specific requirements. The configurations listed above are our default settings for this product within set applications.

Note: *Discrimination Security is explained further under the heading "security" within the "Configuration Procedure – GBATalk PC software 5.2.2." subject above.*

6.0 MECHANICAL INSTALLATION

With the faceplate (or bezel) mounted in the host machine, the GBA ST2 unit fitted with the appropriate note guide is simply clipped into place in the faceplate. Please note that the note guide must be fitted to the validator before inserting the validator into the faceplate.

Details of product dimensions can be found at the end of this document.

7.0 ELECTRICAL INTERFACE SPECIFICATION

7.1 Power

7.1.1 Power Supply

Voltage:	12VDC +/- 10% Regulated[3]
Signal Input High Voltage:	5.5VDC
Signal Minimum Voltage:	0V

7.1.2 Power Consumption

Quiescent:	200mA
Validating:	800mA
Stalled:	1.4A
Maximum Output Low Voltage:	0.4VDC
Minimum Output High Voltage:	2.4VDC
Maximum output sink current: (Open collector)	50mA @ 12VDC
Input pull up to 5V:	21K ohm

7.2 Outputs

Open Collector outputs;

Maximum Open Voltage	40V
Maximum Sink Current	50mA

I/O Drivers

Signal interfaces are buffered by use of Toshiba TD6283 or equivalent.

The outputs are open collector.
Inputs:
> High > 3.5 V
> Low < 0.3 V

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[3] For Power packs, 12vDC connection should be Tip Negative.
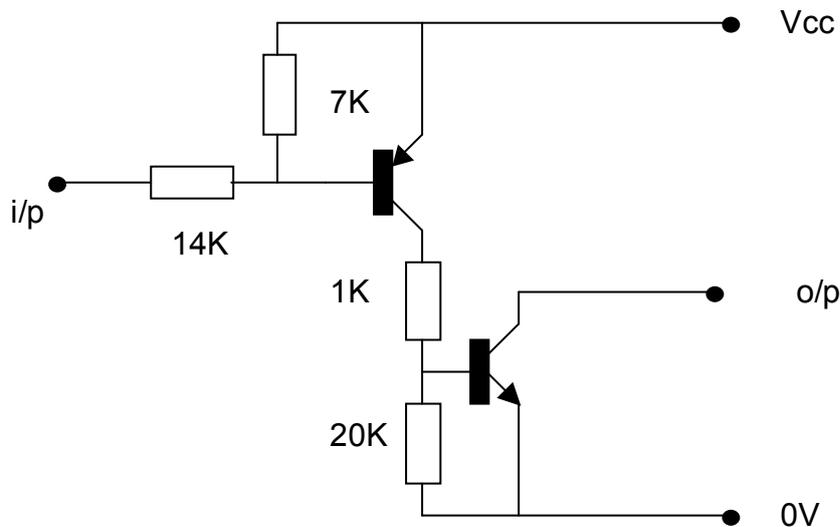
6283 Schematic

ccTalk® Connection

If the validator is used in a ccTalk® interface application, an additional harness is required.
Part Number: **HCC**
Please contact Technical Support for details.

MDB Connection

If the validator is used in an MDB interface application, an additional power supply or conversion board is required.
Part Number: **TBA**
Please contact Technical Support for details.

For further details relating to the operation of specific interfaces, please refer to the Interface Description Manual.

7.3 Environmental

Humidity	min	5%
	max	95% (non condensing)
Temperature	min	$0\,^{o}C$
	max	$+60\,^{o}C$

8.0 ELECTRICAL CONNECTIONS

Please note: care should be taken to avoid reversing the Ground and 12VDC connections, as this will cause damage to the unit.

View of connector

Pin		Parallel	Mars Serial	Pulse	Serial (R1)
1	Grey	/ABN Output	/ABN Output	/ABN Output	n.c.
2	Orange	n.c.	/Serial Select (Low)	Pulse (High) or n.c.	n.c.
3	White	/Vend 6 Output	/Busy	/Busy	n.c.
4	Yellow	/Escrow control	Clears /ABN and Stacker Full Signal	Clears /ABN and Stacker Full Signal	n.c.
5	Green	/ Vend 5 Output	TXD	n.c.	TXD
6	Brown	n.c.	Serial Send Signal (/RTS)	n.c.	n.c.
7	Black	/ Vend 3 Output	Gnd	n.c.	n.c.
8	Red	/ Vend 4 Output	n.c.	n.c.	n.c.
9	Whi/Blk/Grn	n.c.	n.c.	n.c.	RXD
10	Blue	Inhibit Control Input (/Enable)	Inhibit Control Input (/Enable)	Inhibit Control Input (/Enable)	n.c.
11	Violet	/ Vend 1 Output	Confirm Signal To Start Serial (/CTS)	n.c.	n.c.
12	Whi/Vio	n.c.	n.c.	/Pulse O/P	n.c.
13	Whi/Gry	/ Vend 2 Output	n.c.	n.c.	n.c.
14	Whi/Blk	Motor Ground	Motor Ground	Motor Ground	Motor Ground
15	Whi/Blk	Ground	Ground	Ground	Ground
16	Whi/Red	12 VDC +	12 VDC +	12 VDC +	12 VDC +
17	Whi/Red	12 VDC +	12 VDC +	12 VDC +	12 VDC +
18	Whi/Yel	PDT Terminal	PDT Terminal	PDT Terminal	PDT Terminal
19	Whi/Grn	PDT Terminal	PDT Terminal	PDT Terminal	PDT Terminal
20	Whi/Blu	PDT Terminal	PDT Terminal	PDT Terminal	PDT Terminal

Note: where a description is preceded by a "/" then that signal is active low.
        n.c. = not connected

*for cctalk[®] interface, please note that TXD & RXD must both be connected to the DATA line of the host machine.
See also Interface Description Manual for further details.

Signal	Description
/ABN (Alarm)	Output – low for 100ms (parallel interface) or permanently low to indicate error or alarm in serial and pulse interfaces.
/VEND n	The vend outputs 1 to 6 (parallel interface) are capable of sinking up to 50 MA at 12VDC.
/ESCROW	Input - when low this selects Escrow mode
PULSE , /SERIAL select	Input - when low selects Mars® Serial (A) mode. High or not connected selects pulse mode
/BUSY	Output – a low output indicates when the acceptor is operating
/DATA	Output - used to send data to the host machine
/CTS	Input - from host that tells acceptor that host is ready to receive the message
/Enable	Input - Determines whether or not the acceptor will accept bills. Logic low = accept bills
/RTS (Interrupt)	Output to host signal that the acceptor wishes to send a message to the host.
/PULSE O/P	The pulse credit output is capable of sinking up to 50mA. The pulse pattern is selectable via the programming card. In the normal mode the pattern is 50mS on/300ms off. In the fast mode a 50mS/50mS pattern results.
TXD	Output – UART, open collector
RXD	Input – UART, TTL level receive data

9.0 MAINTENANCE

9.1 CLEANING THE VALIDATOR NOTE PATH:

Equipment Required
Cotton Swab or lint free cloth.
Cleaning solution.
A mix of Water and up to 50% Isopropyl Alcohol is recommended.
(**DO NOT** use more than 50% Isopropyl alcohol)
(**NEVER** use cleaning agents such as "Amberclens" on this product as the unit may be severely damaged)

Procedure;
Anti-Static Precautions should be observed when cleaning validator head.

1. Ensure the supply to the validator is switched OFF.
2. Disconnect external host loom.
3. Move the two purple latches inwards to unlatch and then gently pivot top section backwards to open and remove.
4. Using the Cotton swab or cloth dipped in the cleaning solution – carefully clean all sensors and plastic windows using light force only.
5. Continue with swab etc to clean note path, all rollers and belts.
6. Use an additional swab or cloth to dry area cleaned, if required.
7. Re-attach top housing and gently push down on the lid until the latches re-engage.
8. Re-connect host loom.
9. The supply to the validator can now be switched ON.

9.2 Jam Clearance:

1. Ensure the supply to the validator is switched OFF.
2. Disconnect external host loom.
3. Move the two purple latches on the top of the reader inwards to unlatch and then gently pivot top section backwards to open and remove.
4. Clear any debris from note path.
5. Re-assemble unit.
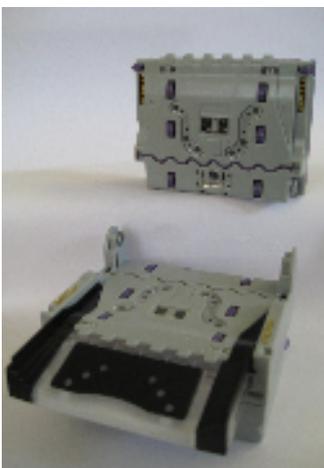
9.2 – Image of GBA ST2 in open position for cleaning and jam clearance.

10.0 DIAGNOSTICS & TROUBLESHOOTING

Introduction:

The GBA ST2 is fitted with a tri-colour (Red/ Green/Orange) status LED, located on the top of the unit. The following functionality describes the operation of the LED.
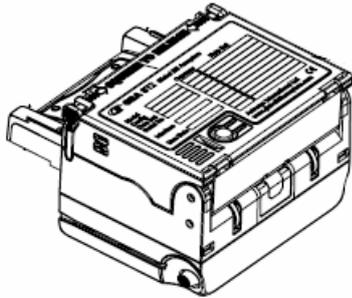
10.0 - Image of ST2 top plate

10.1 Diagnostics

LED Functionality:

The LED communicates validator status. This enables enhanced diagnostics for the user and for factory personnel when assisting customers over the phone or by email.

Normal Run Mode:
The LED will be permanently Green (solid on)

If a note is rejected a flash code is given (Green LED Flashed off):

If the note is rejected due to:	No of flashes (led goes off)
Unrecognised note	1
OASG Reject	2
Returned (due to escrow or SW inhibit)	3
Note slip during validation	4
Potential Note Cross-Validation	5

Validator Inhibited by Host:
If the host inhibits the unit then the green LED will flash slowly (rate 0.5Hz, approx 1 sec on / 1 sec off).

Fault Conditions:
Indicated by turning the LED Red.

Fault	LED State
Stacker full or Jam	Solid Red LED
Cashbox not present	Slow Flashing Red (approx. 0.5Hz)
OASG Lock out	Fast Flashing Red (approx. 1 Hz)

Order of precedence of Error Codes:

There may be situations where more than one fault/operating condition is applicable, in which case the order of precedence of displaying the codes is as follows:

1. Note Jam / Stacker Full   (solid red)
2. Anti-String Gate Lock-out   (fast flash red)
3. Calibration Mode   (flash red / green)
4. Cash Box Missing   (slow flash red)
5. Validator Master Inhibit On   (slow flash green)

10.2 Troubleshooting

The following information is presented for customers' guidance in identifying problems with the GBA ST2. It does not necessarily cover every possible situation.

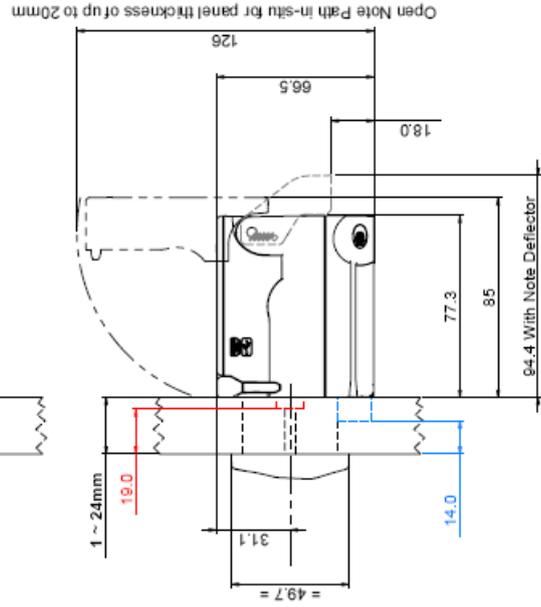| Problem Symptoms	Possible Cause	Investigate	Possible Solution
Unit does not work - belt motor does not run, no LED colour	1. Power supply not switched on. 2. Power supply not connected. 3. Poor electrical connection(s). 4. Unit carrying out self-test. 5. PSU failure	1. Power supply and power cable. 2. Diagnostics indicator or illuminated note guide (if fitted). 3. Interface cable assembly.	1. Ensure power to validator is connected and turned on. 2. Ensure Interface cable is connected firmly and correctly.
All programmed notes are rejected	1. Acceptance inhibited for all notes. 2. MASG not working. 3. Escrow sensor not working.	1. Software configuration. 2. Internal MASG	1. Use on-board button or GBA Talk to enable required notes. 2. Ensure internal MASG moves freely and is clear from obstruction.
Poor or no acceptance of one or more programmed notes	1. Note acceptance inhibited. 2. Poor sensor readings. 3. Insufficient power supply capacity.	1. Note inhibit settings. 2. Bottom Sensor Assembly fitting. 3. Note path cleanliness.	1. Use on-board button or GBA Talk to enable required notes. 2. Use GBA Talk to check sensor levels and re-calibrate if necessary. 3. Clean validator note path.
Unit does not communicate with host machine	1. Incorrect interface selected. 2. Poor electrical connection(s).	1. Configuration of validator. 2. Interface cable assembly.	1. Use on-board button or GBA Talk to select required interface. 2. Ensure Interface cable is connected firmly and correctly.
Belt motor runs continuously after power ON	1. Poor electrical connection(s)	1. Internal harnessing.	1. Ensure Interface cable is connected firmly and correctly.
Unit does not provide credit for accepted note	1. Incorrect interface selected. 2. Poor electrical connection(s).	1. Configuration of validator. 2. Interface cable assembly.	1. Use on-board button or GBA Talk to select required interface. 2. Ensure Interface cable is connected firmly and correctly.

GBA *Global Bill Acceptors*

GBA ST2 DIMENSIONS WITH COMPACT BEZEL
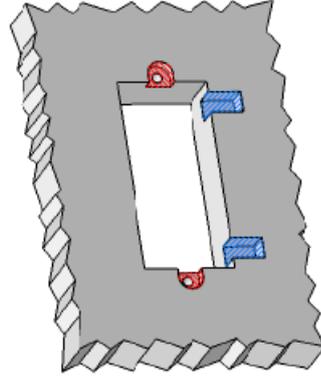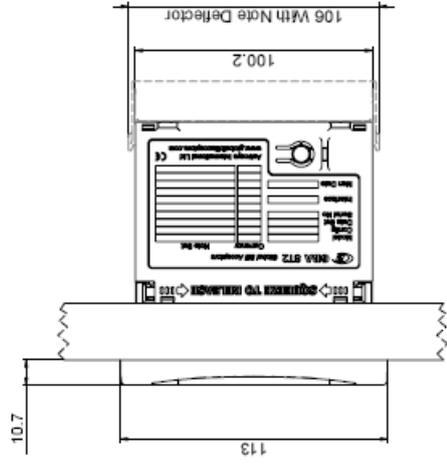
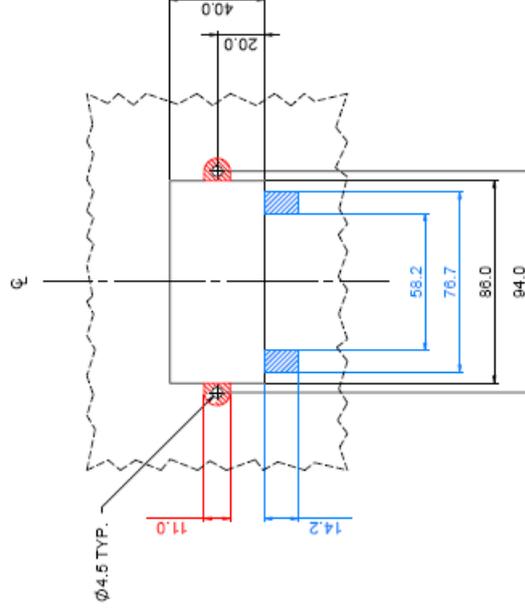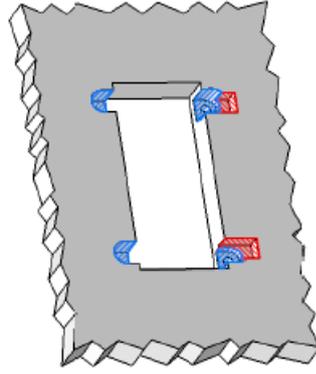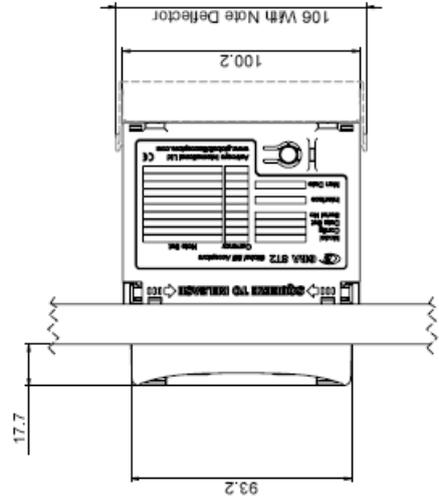| PANEL THICKNESS	SCREW LENGTH	
1.5 ~ 5.5	M4 x 10	*
5.5 ~ 9.5	M4 x 14	*
9.5 ~ 13.5	M4 x 18	
13.5 ~ 17.5	M4 x 22	
17.5 ~ 24.0	M4 x 26	

* Included with the Compact Bezel Assy

TYPICAL PANEL CUTOUT - Shown at 24mm

This recess needs to be added for panel thicknesses > 14mm

This recess needs to be added for panel thicknesses > 19mm

Ø4.5 TYP.

40.0
20.0
11.0
14.2
58.2
76.7
86.0
94.0

106 With Note Deflector
100.2
10.7
113

⇨ SQUEEZE TO RELEASE ⇦

Open Note Path in-situ for panel thickness of up to 20mm
126
66.5
18.0
1 ~ 24mm
19.0
31.1
= 49.7 =
14.0
77.3
85
94.4 With Note Deflector

GBA ST2 DIMENSIONS WITH STANDARD BEZEL

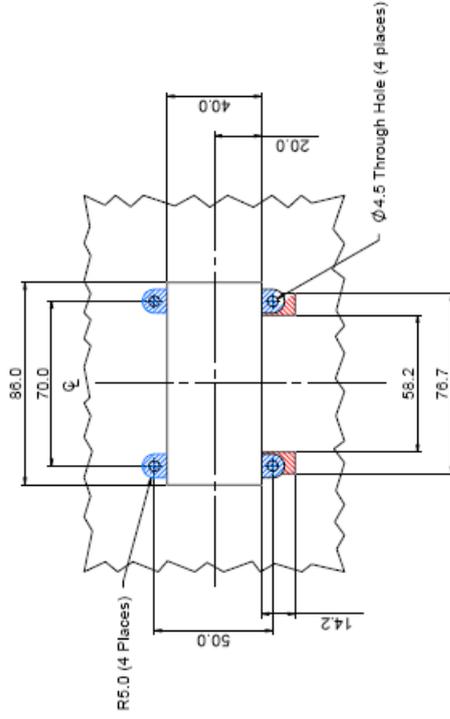| PANEL THICKNESS	SCREW LENGTH	
1 ~ 4	M4 x 10	*
4 ~ 17	M4 x 14	*

* Included with the Standard Bezel Assy

TYPICAL PANEL CUTOUT - Shown at 17mm

This recess needs to be added for panel thicknesses > 5mm

This recess needs to be added for panel thicknesses > 9mm

Ø4.5 Through Hole (4 places)

40.0

20.0

88.0

70.0

58.2

76.7

R5.0 (4 Places)

50.0

14.2

106 With Note Deflector

100.2

93.2

17.7

Open Note Path in-situ for panel thickness of up to 13.8mm

126

66.5

18.0

77.4

85

94.5 With Note Deflector
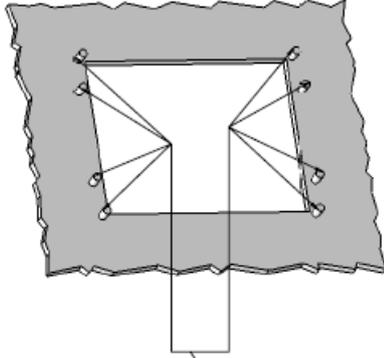
Panel Thickness 1 ~ 17.0mm

5.0

9.0

= 84.0 =
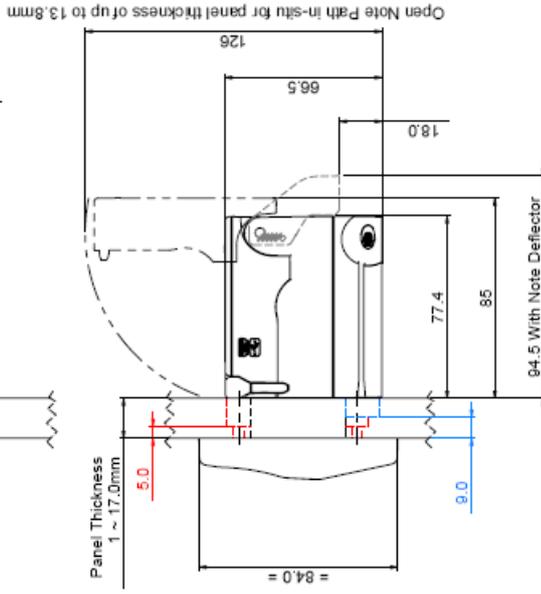
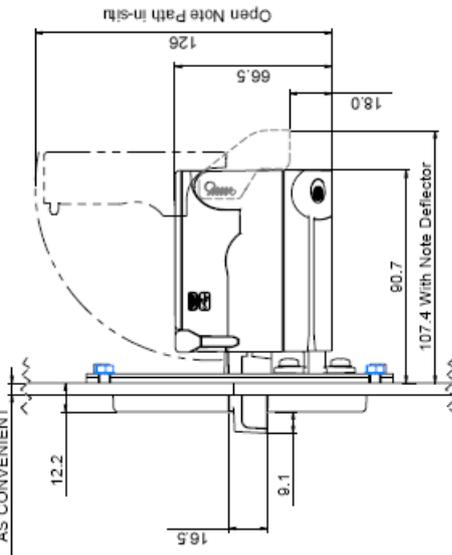## GBA ST2 DIMENSIONS WITH STANDARD FACEPLATE
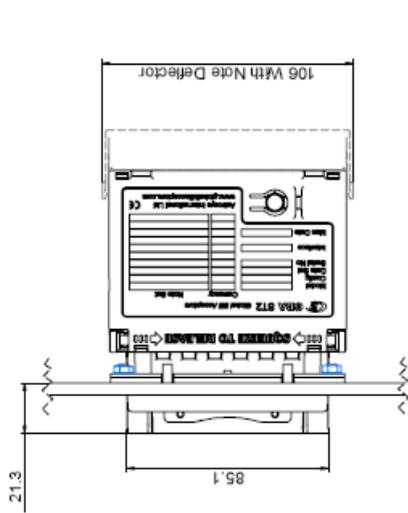
Recommended to use any combination of 2 mounting positions at the top of the cutout and 2 at the bottom. As convenient. Recommended studs M4 x 8mm

Alternatively, screws may be used in these positions if panel thickness allows.

TYPICAL PANEL CUTOUT

= 86.5 =

= 108.0 =

SECURITY PLATE DIMENSIONS

Mounting features symmetric about the slot

5.1

5.1

= 50.8 =

= 84.8 =

= 114.3 =

= 117.3 =

106 With Note Deflector

21.3

85.1

Open Note Path In-situ

126

66.5

18.0

90.7

107.4 With Note Deflector
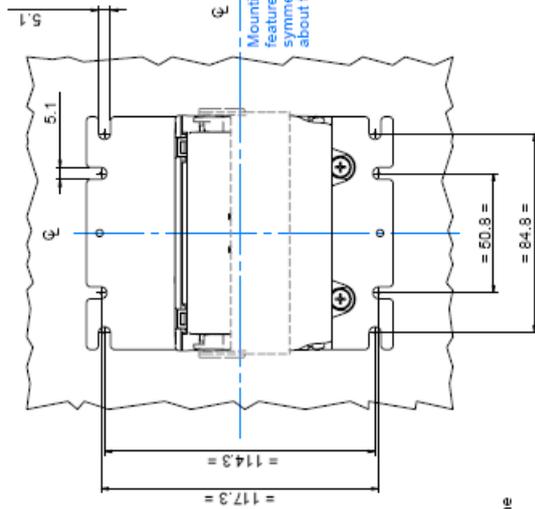
PANEL THICKNESS AS CONVENIENT

12.2

9.1

16.5

NOTE: Features with dimensions shown with = X.X = are symmetric about the centerline

Page 2 of 2
Ref File: ST2 PANEL MOUNTING DRAWINGS ASSY.sldasm

Revision	Date	Created By	Approved by	Comments
1.0	1 Aug 08	RB	RB	
1.1	22 Jan 09	SP		

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