Operation & Maintenance Manual

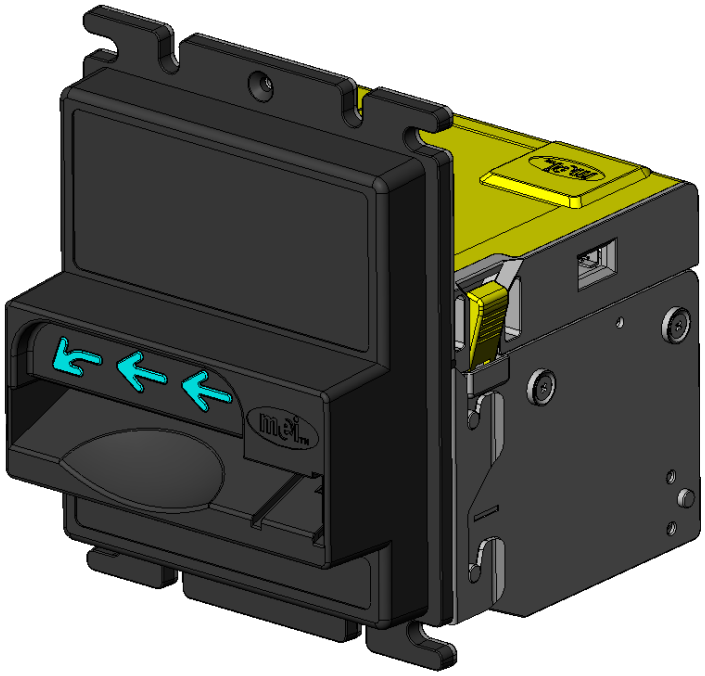


Table Of Contents

Technical Specification

The Geo® Gravity™ line of bill acceptors accepts bank notes through 85mm in width. The Geo Gravity comes pre-programmed, per customer specification, from the factory or can be reconfigured by customers utilizing the GFlash program for PC's. Software updates can also be uploaded into the Geo Gravity via a PC enabled with the GFlash program.

Operating Voltage: 12 VDC +/- 10%

Operating Current:

Idle	140 mA
Accepting:	500 mA
Accepting (MAS):	610 mA
Stalled:	1.1 A

Operating Temp: 5°C – 55°C (41°F – 131°F)
80% non-condensing

Notes Accepted: 22 Denominations

Note Orientation: Four (4) Directions

Interface Options: Pulse, Parallel, Serial (NISR), 'True' RS232, ccTalk

Sensor Suite: Optical

I/O Ports: 16 Pos. Mating Connector
RS232 Jack (Diagnostic/Software Uploads)

Mounting: Can be mounted at any angle from center.

Currency Range: Notes 60mm through 85mm in width.

Acceptance Speed: Approx. 22 notes/min
.

Net Weight: 1.5 lbs, 0.68 Kg

ESD Precautions

The Geo Gravity bill acceptor is used as an inside component of a gaming machine or similar host machine. Proper grounding is conducted by connecting the Geo Gravity metal mounting bracket to the metal surface of the machine chassis.

To minimize electrostatic discharge, observe the following precautions:

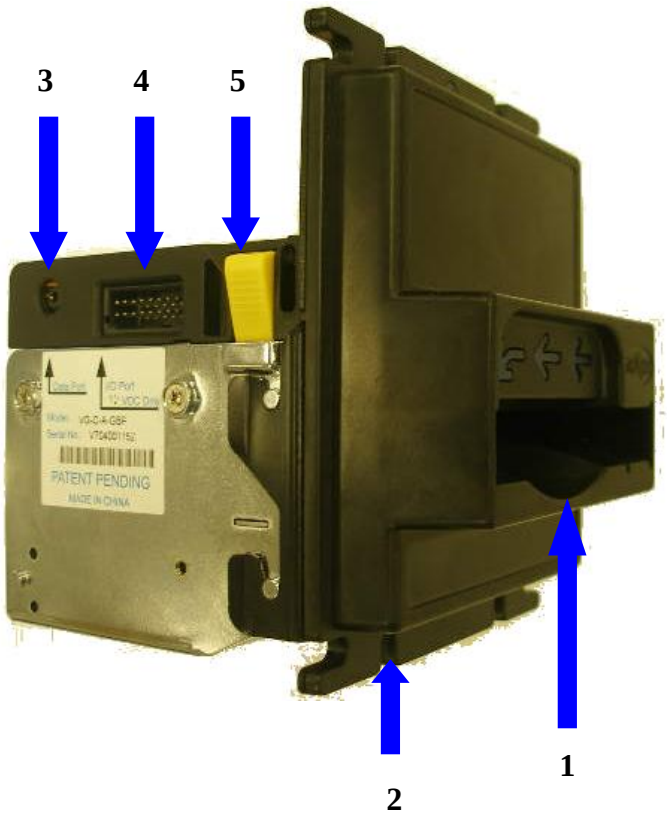
- When removing Geo Gravity from an anti-static bag, or the vending machine cabinet, lay it on an anti-static surface such as an ESD mat or a disposable anti-static mat.
- Always wear an anti-static wrist strap connected to metal surface on the chassis of the machine (ground) when working on Geo Gravity.
- Do not touch the I/O ports with hands.
- **Do not disassemble the unit.**

Technical Support

Support is available through our Help Desk and online at the MEI Website:

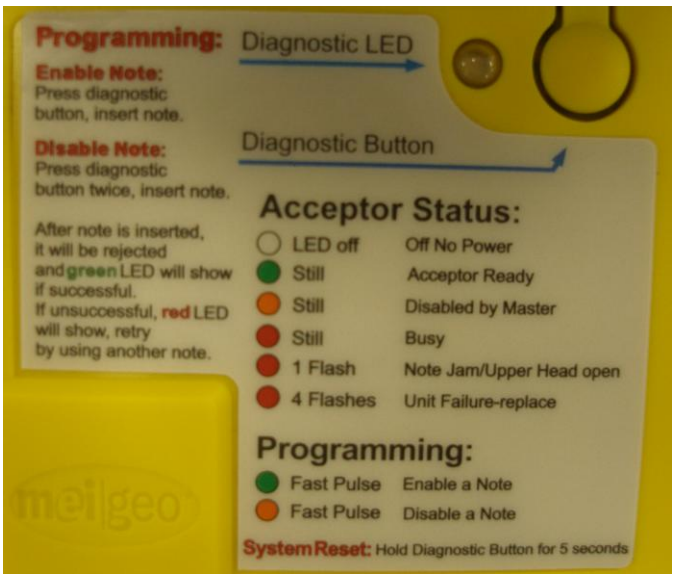
- www.meitechnical.com
- **Americas** 1 800 345 8172
- **Europe** +44 (0) 1189381100

Product Detail



1. Bill Entry Area
2. Mounting Bracket/BEG
3. Data Port
4. I/O Port
5. Upper section release button

Diagnostic Button Functionality



The Diagnostic Button on top of the Geo Gravity is capable of several functions:

- Enable a note in the currently installed dataset
- Disable a note in the currently installed dataset
- Field calibration
- Interface Switching (see page 7)

1) Enable a note

Press the Diagnostic Button once, the Diagnostic LED will turn green and flash quickly. Insert note to be enabled, the Geo Gravity will pull the note inside then return it. After the note is returned, Geo Gravity will reboot. Note inserted is now enabled.

2) Disable a note

Press the Diagnostic Button twice, the Diagnostic LED will turn red and flash quickly. Insert note to be disabled, the Geo Gravity will pull the note inside then return it. After the note is returned, Geo Gravity will reboot. Note inserted is now disabled.

3) Field calibration

Press the Diagnostic Button 3 times, the Diagnostic LED will turn red and flash quickly. Wait 2 seconds then all front bezel LED's will become lit. Press Diagnostic Button to confirm. Insert Calibration Paper when front bezel LED's flash quickly. Geo Gravity will pull the calibration paper inside, cycle it several times, then return it. After calibration paper is returned, Geo Gravity will reboot.

4) Interface Switching Mode

Press the Diagnostic Button 5 times to enter Interface Switching Mode. Please see page 7 for details.

Note: Pressing the Diagnostic 4 times produces no effect.

Cleaning

We recommend a regular cleaning schedule for your Geo Gravity acceptor. Depending on local environment and usage, the Geo Gravity should be cleaned at least every 3 months, more regularly in areas of high dust and contamination. The Geo Gravity utilizes IR sensors along the note path to collect data off the bank note. During use dust, contamination and foreign objects can collect along the note path and over the sensors, degrading their performance over time. Cleaning your Geo Gravity on a regular basis will assure maximum performance and validation rates.

On-site Cleaning

We realize that it may be impossible for you to remove your Geo Gravity out of its application while in the field to perform a thorough cleaning. In these instances, we recommend that you obtain a can of compressed air and guide the output toward the note entry area. This will remove any excess dust or foreign objects that may have collected over the sensors located along the note path.

Thorough Cleaning

To perform a more thorough cleaning of the Geo Gravity, open the upper section by pressing on the two yellow release buttons and lift gently (for further detail, refer to page 4 of this manual). This allows access to the note path. We recommend that you use a mild soap/water combination and damp, dust free towel and wipe the note path area and sensors. Do not put the water directly onto the acceptor, only apply to a cloth. Dry thoroughly and close the upper section.

DO NOT USE ALCOHOL OR AMMONIA to clean your Geo Gravity as this will degrade the sensor apertures and drive wheels and will seriously affect the long-term reliability.

Maintenance

The Geo Gravity was designed to provide you with simple, trouble-free operation. By keeping your Geo Gravity clean, you should enjoy many years of trouble-free use. Refer to the top mounted diagnostic LED on the Geo Gravity. If the LED is flashing, refer to the diagnostic card on the top of the unit to detail the possible problem. If you cannot rectify a problem on site, please contact your local MEI authorized service center or MEI.

Interface Descriptions

Field Configurable Interface Settings:

Interface Switching Mode

This feature is enabled only when the Geo Gravity is set to one of the following interfaces:

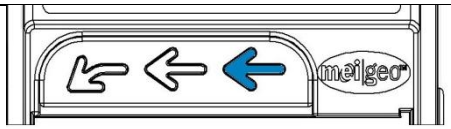
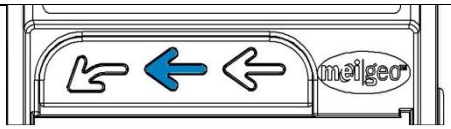
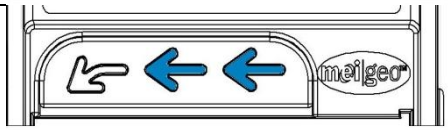
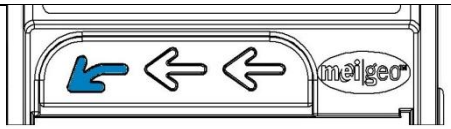
- Pulse
- Parallel
- Parallel binary
- ccTalk (ccTalk requires that a ccTalk interface module (VT-PCBA12) be installed in the Geo Gravity)

1. Power up the Geo Gravity and ensure that the PC-Link cable is disconnected
2. Press the Diagnostic Button 5 times. The Diagnostic LED will turn yellow and blink rapidly then after 2 seconds become solid green. The front bezel LED's will indicate the current interface configuration (see Table 1).
3. Press the Diagnostic Button to cycle the front bezel LED's until the desired communication interface is indicated.
4. Press and hold the Diagnostic Button until all front bezel LED's light up, then release the button.

The Geo Gravity will reset and the new communication interface will be activated.

Note: If the Interface Switching Mode is entered unintentionally, do not press any buttons for 10 seconds; the Geo Gravity will resume normal operation.

Table 1

Interface	Front Bezel LED Pattern
Pulse	
Parallel	
Parallel Binary	
ccTalk	

Reset ccTalk Communication Parameters

If the ccTalk communication address and encryption code have been changed and the default settings are required, then this procedure can restore ccTalk parameters back to the default settings of "40" for the address and "123456" for the encryption code.

1) Remove power from the Geo Gravity.
2) Press and hold the Diagnostic Button.
3) Power up the Geo Gravity continuing to hold the Diagnostic Button.
4) When the Diagnostic LED turns green, release and re-press the Diagnostic Button within 1 second.

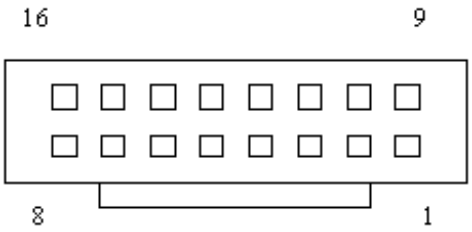
The Geo Gravity will reset and the ccTalk configuration will be restored back to defaults.

‘True’ RS232:

The ‘True’ RS232 interface provides for comms. between a Host (PC) and Slave (acceptor). This interface operates at ‘True’ RS232 levels and allows direct connection between the acceptor and PC comm. port without the need for special interface harness/loom. 9600 bps, 1 start bit, 1 stop bit, 7 data bit format.

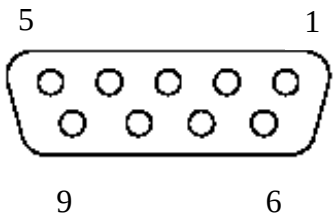
IF Cable: **VA-WIRA09**
Input Voltage: **+12 VDC ± 10%**
Interface Module: **VA-PCBA09**

View facing left side of acceptor



Pin 1: +12 VDC
Pin 2: Ground/Earth (power)
Pin 14: RXD (received data acceptor)
Pin 15: Common Signal
Pin 16: TXD (transmit data acceptor)

View facing towards connector (DB9 Female Connector)



Pin 2 Host (PC) RXD
Pin3: Host (PC) TXD
Pin5: Common (signal)

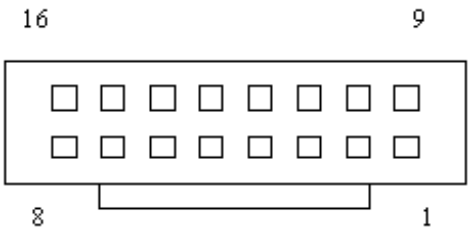
For complete technical detail on the RS232 interface, refer to manual 254053002

TTL RS232:

The TTL RS232 interface operates at TTL levels, 9600 bps, 1 start bit, 1 stop bit and 7 data bits.

IF Cable: **VA-WIRA05**
Input Voltage: **+12 VDC ± 10%**

View facing left side of acceptor



Pin1: +12 VDC
Pin 2: Ground/Earth (power)
Pin14: TTL RXD (receive data to acceptor)
Pin 15: Common
Pin 16: TL TXD (transmit data from acceptor)

For complete technical detail on the RS232 interface, refer to manual 254053002

ccTalk Interface:

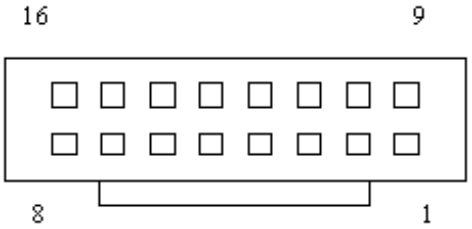
The ccTalk interface is a bi-directional, half-duplex, asynchronous, multi-drop serial protocol originally developed by Coin Controls (Money Controls) that operates at TTL voltages and utilizes a single data line. The ccTalk interface should see a voltage below 1.0V as an active state and a voltage above 3.5V as an idle state.

ccTalk b96.p0.v12.a12.d0.c5.m0.x16.e1.i0.r14

9600 baud rate
Open Collector interface
Nominal 12V supply
Serial Data pull-up voltage 12V (determined by external pull-up voltage)
Supply sink
Connector type 5 (IDC-10)
Slave device only
CRC-CCITT checksum
Encryption Type 1
Minor release 0
Major release 4

IF Cable:
Model Code "C": VT-WIRA12
Model Code "A": VG-WIRA37
Input Voltage: **+12 VDC ± 10%**
Interface Module: VT-PCBA12

View facing left side of acceptor



Pin 1: +12 VDC ± 10%
Pin 2: Ground/Earth (power)
Pin 14: Data

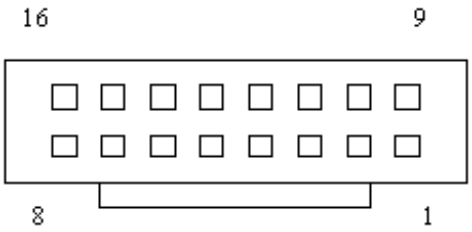
For complete technical detail on the RS232 interface, refer to manual 254057005

Pulse Interface:

The Pulse Interface provides a corresponding signal on the output line that designates the particular note validated.

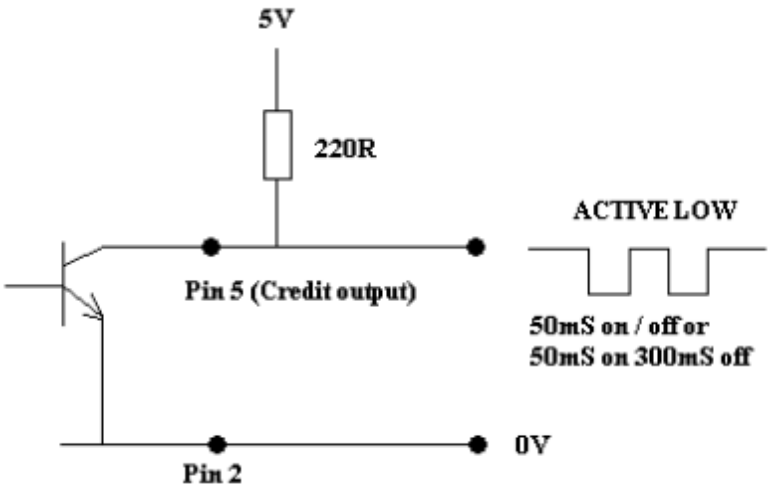
IF Cable: **VA-WIRA05**
Input Power: **+12 VDC ± 10%**

View facing left side of acceptor



Pin 1: +12 VDC
Pin 2: Ground/Earth (power)
Pin 4: Credit Pulse Output (open collector to Ground/Earth)
Pin 5: Alarm Output (open collector to Ground/Earth)
Pin 6: Enable Input (tied to Ground/Earth to enable acceptor)
Pin 12: Busy (open collector to Ground/Earth. Active LOW when busy)

Pulse Output circuit showing pull up to 5VDC



Pulses/Denomination: Factory set per customer specification or via GFlash program.

Pulse Output Rate: High: 50 msec ON/50 msec OFF
Low: 100 msec ON/300 msec OFF

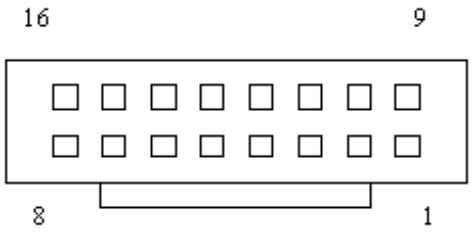
Always Enabled: The Geo Gravity can be configured to ignore the enable-input status and operate always enabled.

Parallel Interface:

The Parallel interface provides specific output lines for designating which note has been validated. This interface also provides for escrow and alarm functions. Outputs are open collector and can sink up to 100mA at up to 24VDC. Inputs are TTL Default setting for the outputs is active low, it is possible to set them to operate active high with the GFlash configuration software.

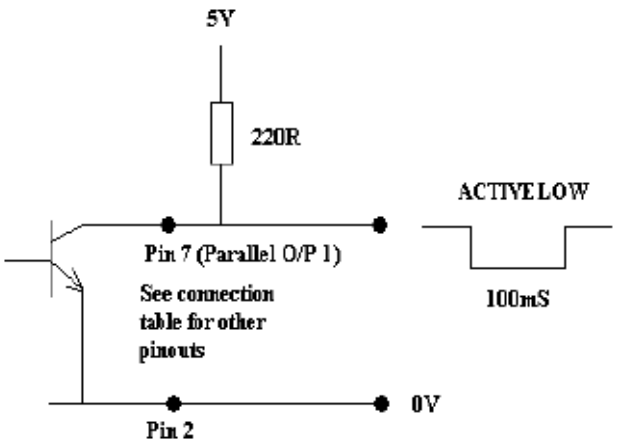
IF Cable: **VA-WIRA05**
Input Power: **+12 VDC ± 10%**

View facing left side of acceptor



Pin 1: +12 VDC
Pin 2: Ground/Earth (power)
Pin 3: Vend Line 5 (open collector to Ground/Earth)
Pin 4: Vend Line 6(open collector to Ground/Earth)
Pin 5: Alarm Output (open collector to Ground/Earth. Prog. Logic)
Pin 6: Enable Input (tie to Ground/Earth to enable acceptor)
Pin 7: Vend Line 1 (open collector to Ground/Earth)
Pin 8: Vend Line 2 (open collector to Ground/Earth)
Pin 9: Vend Line 3 (open collector to Ground/Earth)
Pin 10: Vend Line 4 (open collector to Ground/Earth)
Pin 11: Escrow Line
Pin 12: Busy Line

Vend output circuit showing pull up to 5VDC



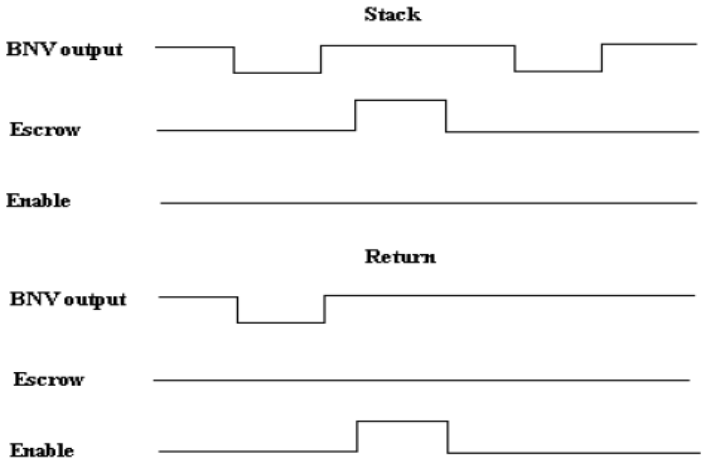
Escrow:

This mode allows 'on the fly' enabling and disabling of each denomination accepted by the bill acceptor. The enable and escrow lines are used in combination to allow this.

The procedure for accept and return is as follows;

1. Enable line and Escrow line are held low (0V) by the host machine. On insertion of a valid bill, the bill acceptor outputs the relevant pulse and holds the bill.
2. The host machine now has 25 seconds to accept or return this bill.
3. If the host machine wishes to accept the bill, then the escrow line should go high for at least 100mS (stack command); the bill acceptor will stack the bill and will issue a second output to confirm. This second output is the same as the first.
4. If the host machine wishes to return the bill, then the enable line should go high for at least 100mS (Return command). The bill acceptor will return the bill held in escrow to the customer.
5. If no action is taken within the time limit, then the bill will be returned to the customer.

Escrow timing diagram



Parallel Binary Interface:

This interface utilizes the first four of the Parallel outputs. Instead of a single pulse on each line to denote a particular denomination as in the Parallel interface, the Parallel Binary credit information is sent as a low going output pulse (100mSec) which is sent simultaneously on the required lines. This gives a maximum of 15 different denominations. The output is determined by the inserted denomination and is generally given in ascending order of value from lowest to highest. Please see Table 1 for details.

All inputs and other functions such as Escrow, busy etc. are as per the Parallel interface.

Table 1

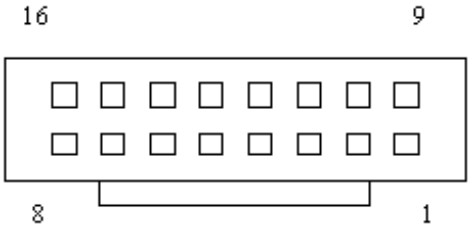
Denomination	*Output 1 pin 7*	*Output 2 pin 8*	*Output 3 pin 9*	*Output 4 pin 10*
1 i.e EUR 5	1	0	0	0
2 i.e. EUR 10	0	1	0	0
3 i.e. EUR 20	1	1	0	0
4 i.e. EUR 50	0	0	1	0
5 i.e. EUR 100	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1

Serial Interface (NISR):

The Serial interface is a MEI (NISR) compatible, bi-directional interface. It operates at 600 bps, 1 start bit, 1 stop bit and 8 data bits.

I/F Cable: **VA-WIRA05**
Input Voltage: **+12 VDC ± 10%**

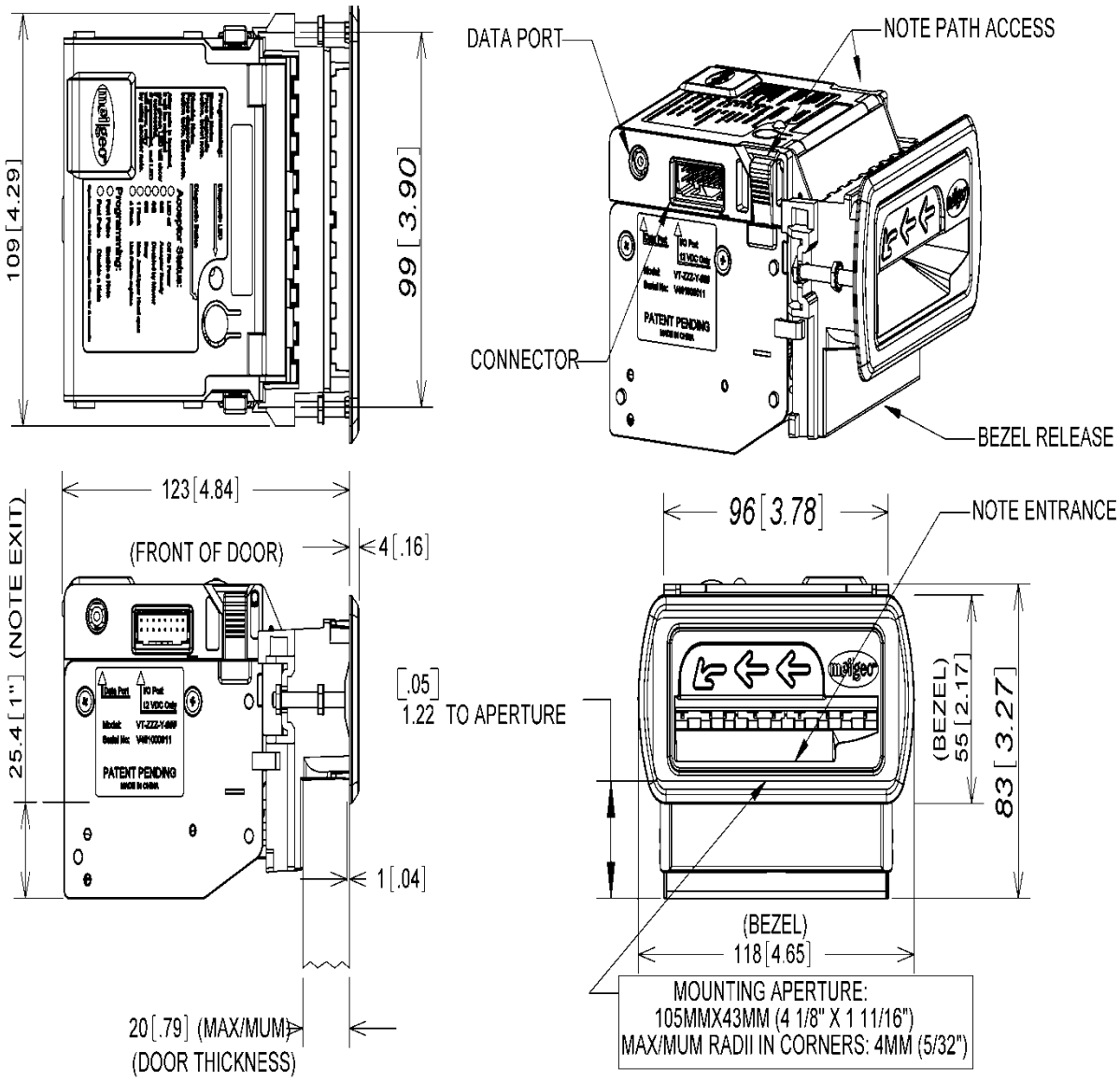
View facing left side of acceptor



Pin 1: +12 VDC
Pin 2: Ground/Earth (power)
Pin 5: Alarm Output (open collector to Ground/Earth. Programmable Logic)
Pin 6: Enable Input (tie to Ground/Earth to enable acceptor)
Pin 7: Interrupt (request to send data to host)
Pin 12: Busy (open collector to Ground/Earth, active LOW when busy)
Pin 13: Send (host ready)
Pin 16: TXD (transmit data from acceptor)

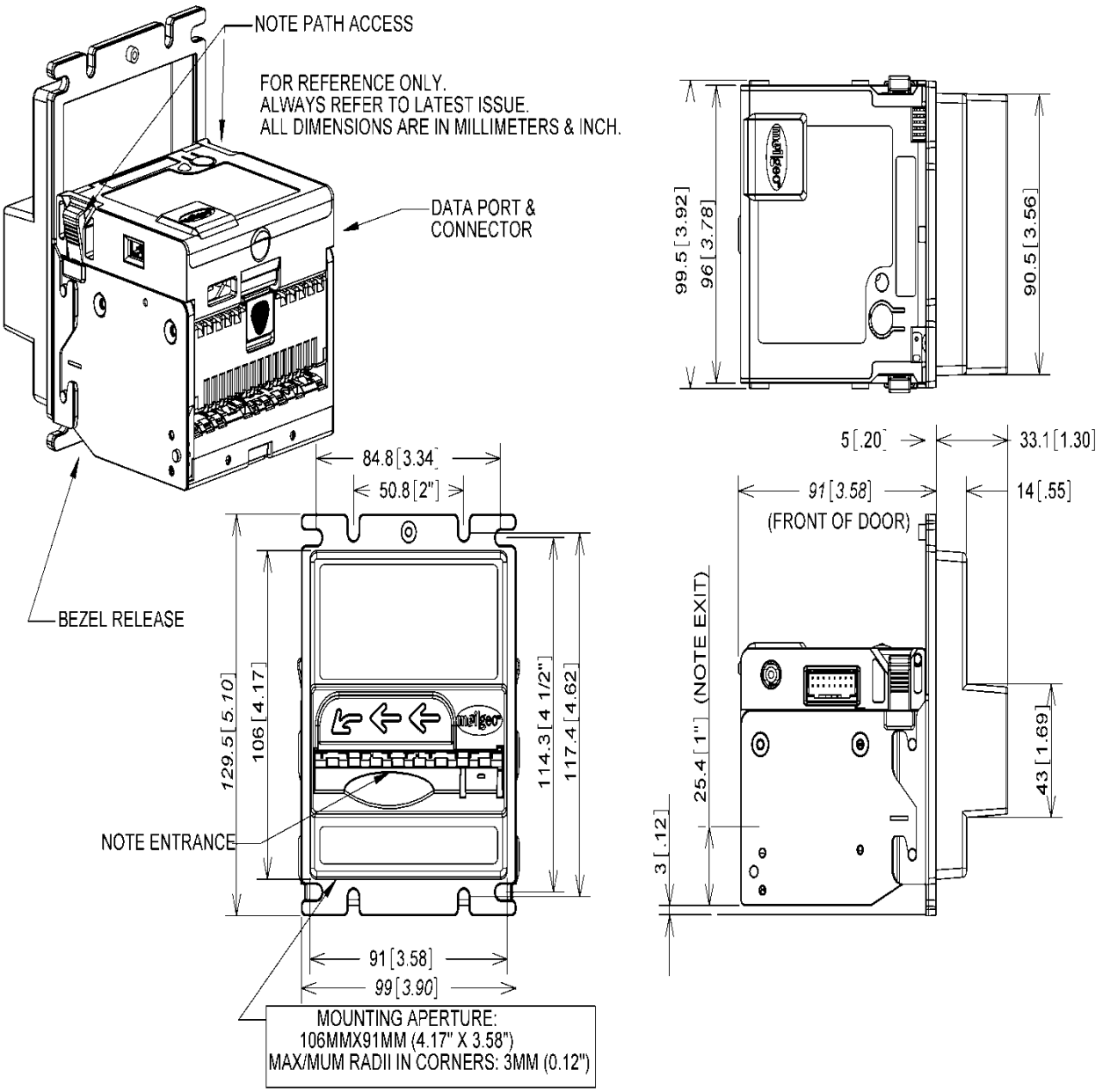
Dimensional Detail

Glass Mount Plastic Bezel Entry Guide

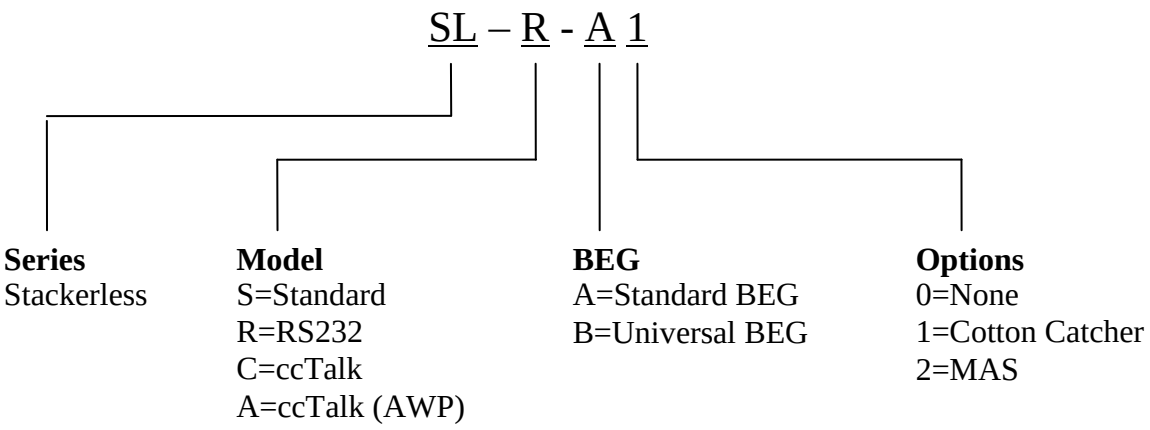


FOR REFERENCE ONLY.
ALWAYS REFER TO LATEST ISSUE.
ALL DIMENSIONS ARE IN MILLIMETERS & INCH.

Standard Mount Plastic Bezel Entry Guide



Model Number Detail

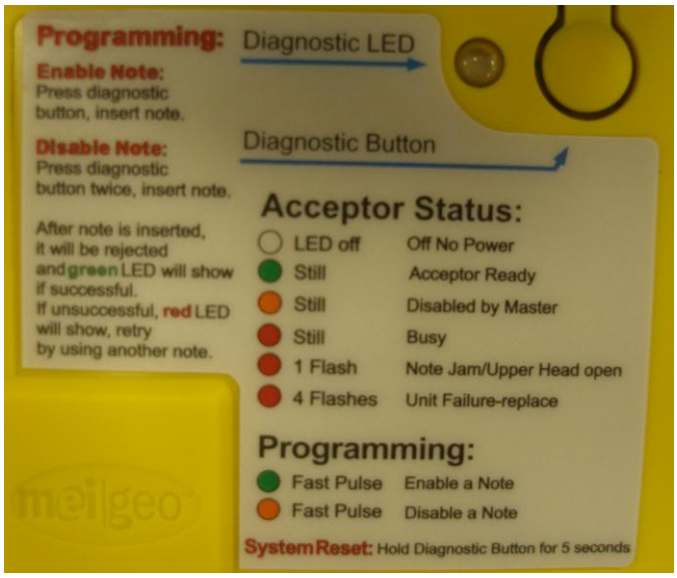


Diagnostic Codes

The Geo Gravity has been designed to include visual indicators to alert the user to the status of the validator's condition. These visual indicators can be located in two (2) distinct locations on the validator; the diagnostic LED located on the upper cover and the front bezel LED's. Each location has a separate and distinct function in regards to diagnostics and should be consulted in the event of issues occurring with the validator.

Diagnostic LED

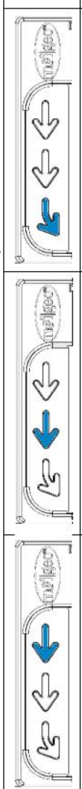
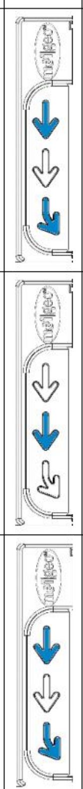
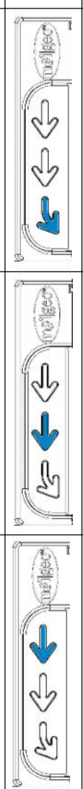
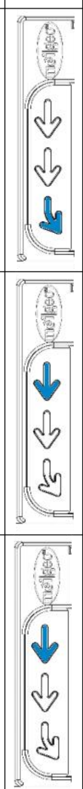
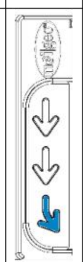
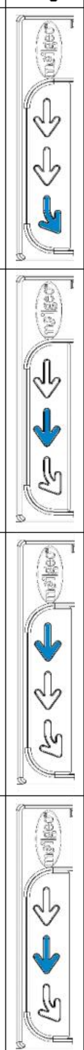
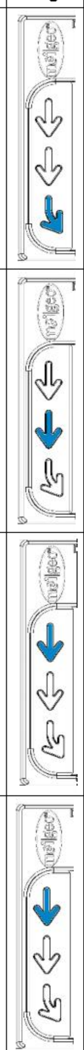
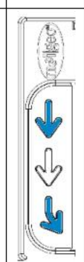
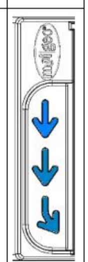
The Diagnostic LED is located on the upper cover of the Geo Gravity. It's color and flash pattern will indicate the operating condition of the validator.



LED Color		LED Flash Pattern	Condition	Resolution
No Color		Steady OFF	No Power	Connect unit to appropriate power supply
Green		Steady ON	Unit Ready	
Orange		Steady ON	1) PC-Link Cable plugged into unit 2) Disabled by Host Machine (Master)	1) Unplug PC-Link Cable 2) Check condition of Host Machine (Master)
Red		Steady ON	Unit Busy	
Red	1X	1 Pulse	1) Upper lid is open 2) Note jammed in notepath	1) Close lid completely 2) Remove jammed note
Red	2X	2 Pulses	MAS jam condition	Clear MAS jam
Red	3X	3 Pulses	1) Rear door is open 2) Note blocking exit sensor	1) Close rear door completely 2) Remove note
Red	4X	4 Pulses	1) EEPROM failure 2) Motor failure 3) Memory failure 4) Sensor failure during calibration	Can not be cleared, replace unit
Green	1X	1 Pulse	Sensor fails during power-up 1) Note jammed in notepath during power-up 2) Strong external light shining in note entry	1) Remove note 2) Remove or block light

Front Bezel LED’s

The Front Bezel LED’s located on the front of the Geo Gravity is exposed and visible without opening the host machine. They can be utilized for a quick visual indicator of the validator’s condition.

Front Bezel LED Diagnostic Patterns						
Condition	LED Pattern Explanation				LED Pattern Explanation	Definition
Normal Operation					LED's are lit in sequence from right to center to left at a steady pace with the pattern repeating	Unit is ready to accept notes
Calibration Required					LED's are lit in sequence; right and left together, then center, pattern repeats	Unit requires calibration
Calibration Mode					LED's are lit in sequence from right to center to left at a fast pace with the pattern repeating	Unit in calibration mode and ready for insertion of calibration paper.
Right Front Pick-Up Sensor Blocked					LED's are lit in sequence from right to center to left at a fast pace with the pattern repeating	Right front pick-up sensor is covered; will be accompanied by motor jogging forward and reverse, attempting to pull note in.
Front Pick-Up Sensors Blocked					Left LED is on steady	Front pick-up sensors are covered after accepting or rejecting a note: Note possibly left in unit
String Detected in Note path					Right LED is on steady for approx. 1 second, then changes to Normal Operation pattern	String detected in note path: Accompanied by motor action (forward, pause, jog (forward), jog (forward), reverse
OAS Sensor Saturated by Strong External Light					Right LED is on steady for approx. 1 second, then changes to Normal Operation pattern	OAS sensor has been saturated by strong external light shining into note path: accompanied by fast motor operation
Exit Sensor Blocked or Note Stuck in MAS					Right and Left LED's are on steady	Exit sensor is blocked or Note Stuck in MAS
Polling Rate Faster Than 90msec. (RS232 Only)					All 3 LED's on and blinking steady	RS232 polling rate is faster than 90msec. (RS232 Interface Only)