OCR310

Miniature OCR Reader Module

Product Manual

Revision 4

Jan 2010

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Access IS
Interfacing Solutions

About This Manual

OCR310 – Product Manual
Fourth Edition (Jan 2010)
Part No.OCR310 Series

www.access-is.com

Warnings

This manual contains important information regarding the installation and operation of the OCR310 reader. For safe and reliable operation of the reader, all users must ensure that they are familiar with and fully understand all instructions contained herein.

Warranty

Access Limited (trading as Access IS and formerly Access Keyboards Ltd) warrants that this product shall be free from defects in workmanship and materials for a period of one year from the date of original purchase. If the product should fail to operate correctly in normal use during the warranty period, Access Limited will replace or repair it free of charge. No liability can be accepted for damage due to misuse or circumstances outside Access Limited control. Also Access Limited will not be responsible for any loss, damage or injury arising directly or indirectly from the use of this product. Access Limited total liability under the terms of this warranty shall in all circumstances be limited to the replacement value of this product.

If any difficulty is experienced in the installation or use of this product that you are unable to resolve, please contact Access IS.

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Radio Frequency Energy

European EMC directive 89/336/EEC

This equipment has been tested and found to comply with the limits for a class A computing device in accordance with the specifications in the European standard EN55022. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions may cause harmful interference to radio or television reception. However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to correct the interference with one or more of the following measures: (a) Reorient or relocate the receiving antenna. (b) Increase the separation between the equipment and the receiver. (c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected. (d) Consult the supplier or an experienced radio / TV technician for help.

CE

FCC Compliance Statement (United States)

This equipment generates, uses and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a class A computing device in accordance with the specifications in Subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Canadian Department of Communications RFI statement

This equipment does not exceed the class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le règlement sur le brouillage radioélectriques publié par le ministère des Communications du Canada.

Revision History

Rev 1	July 2008	First Release
Rev 2	January 2009	Addition of mounting installation instructions
Rev 3	March 2009	Various updates and corrections
Rev 3.5	July 2009	More updates and corrections.
Rev 4	Jan 2010	Minor corrections

Contents

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1. Overview

The Access IS OCR310 series unit is a compact reader designed for use in document recognition of one, two and three line travel and identity documents using OCR B.

Features:

- Fast and reliable reading of passport, travel and identity documents up to 44 characters in length
- Bi-directional document reading
- Serial RS232 interface with selectable baud rate and USB with CDC and USB Keyboard emulation
- Low power consumption
- Low power sleep mode
- Compact design

2. Specifications

Dimensions: Length: 40mm
Height; 22mm (max)
Width; 24mm
Weight: 16g

Colour: Black

Environmental: Operating temperature 0º to 50ºC
Storage temperature 0º to 60ºC
Humidity 0 to 95%, non-condensing

Power Requirements: 3.3V DC +/- 10% Active: 100mA Nominal, Idle: 50mA Nominal , Sleep: 20mA Nominal

Electrical Interface: Serial LVCMOS or USB 1.1

Data Source: Machine Readable Passports (MRP) - 2 lines of 44 characters
Machine Readable Visas (MRV) -2 lines of 44 characters, 2 lines of 36 (size II)
Machine Readable Travel Cards - 2 lines of 36 (size II) & 3 lines of 30 (size I)

Font Type: OCR –B

Field of View: 19.6 mm nominal
Depth of Field: 1.0 mm nominal, 1.5mm Max

Data Standards: Conforms to ICAO 9303 standards

Approvals: To be confirmed.

Outputs: Open collector outputs for LED and sounder indication of good read/bad read.

Connection: 12 Way 0.5mm FFC

Pin Number	Function
1	RXD In 3.3V CMOS Non-Inverted
2	TXD Out 3.3V CMOS Non-Inverted
3	LED Out Open Collector Up to 5V 200mA
4	DC Power In 3.3V
5	USB D- Serially terminated
6	USB D+ Serially terminated
7	USB GND
8	CTS In 3.3V CMOS Non-Inverted
9	Power and Signal GND
10	RTS Out 3.3V CMOS Non-Inverted
11	Sounder Out Open Collector Up to 5V 200mA
12	Frame Ground

3. Configuration

The device has an automatic selection between serial and USB modes. If there is no USB connection to the device it will automatically switch to serial mode. When using USB mode it is recommended to tie the unused serial inputs to signal ground.

3.1 Serial Connection

The serial interface is configured by default as 3.3V CMOS suitable for connection to RS232 via an interface chip such as MAX3232 or direct to a 3.3V microprocessor. For evaluation a simple interface board with a linear regulator and a 3.3V to RS232 chip is supplied. As supplied, the CTS input to the unit activates the power down mode when it is inactive.

By default the output data is formatted to 9600 8 bits, no parity, 1 stop but can be changed to 7-bit even parity. Available baud rates are 1200, 4800, 9600 and 19,200. Please contact Access IS Support for information on modifying the protocol parameters.

For evaluation a simple board is available with a sounder, LED indicator, 3.3V linear regulator and a 3.3V serial to RS232 buffer chip. The schematics are in appendix 9.

3.2 USB Connection

The USB interface is a standard full-speed (12 Megabit) USB 2.0

The unit has three configurable device classes under USB. These are CDC, HID Keyboard and Custom HID.

CDC Class

The CDC interface is the standard USB CDC class as defined in the Universal Serial Bus Class Definitions for Communications Devices Revision 1.2 and PSTN subclass specifications.

Power down mode is enabled by deactivating the DTR line by sending the SetControlLineState command with bit 0 of wValue set to zero.

Under Microsoft Windows the unit appears as a virtual COM port under Device Manager and can be accessed in a similar way to other COM ports. This also handles the virtual COM port; port number can be set from Device Manager.

For Microsoft Windows a suitable .INF file is supplied to enable the device to be used with the standard Microsoft CDC driver. The .INF file can be downloaded from the link indicated below

http://downloads.access-is.com/0126b.inf

HID Keyboard Class emulation

The HID Keyboard Class emulation follows the USB HID 1.1 specification boot interface as defined in appendices B, C and F. Note that power saving mode is not available in keyboard emulation mode

Custom HID Class

This is a custom HID interface following the USB HID 1.1 specification. It is used where a virtual COM port or keyboard output is not appropriate. It usually requires installing a custom driver to bring the data into the application.

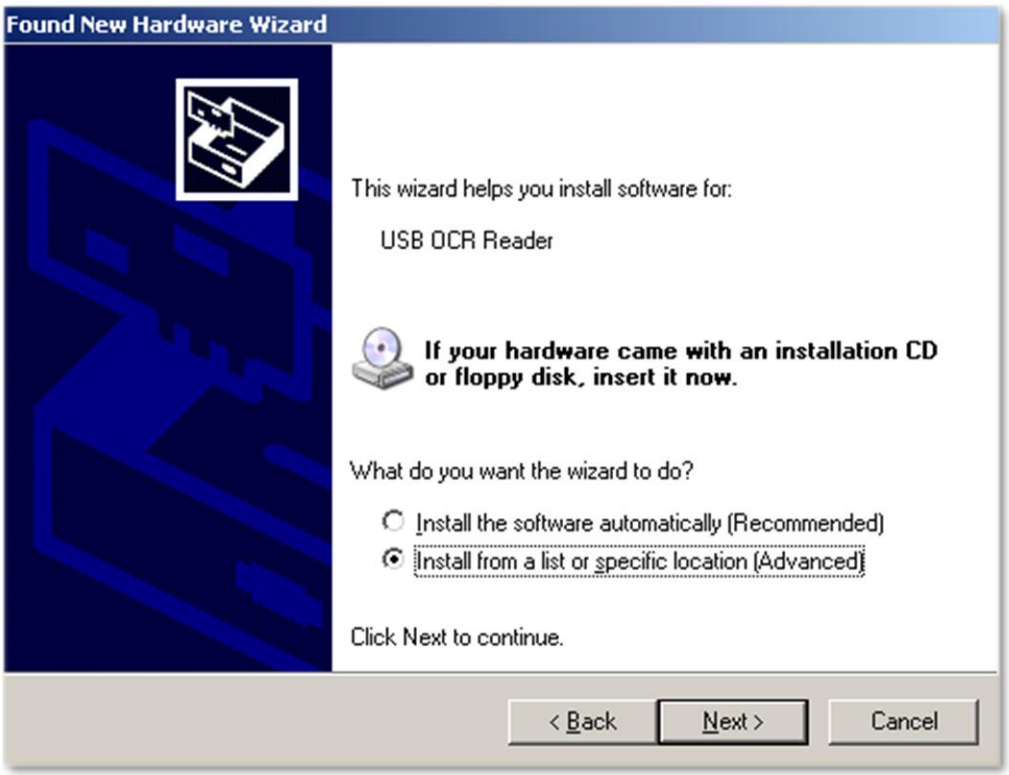
It is recommended to use XP service pack 3 with the unit although it can be used with service pack 2. For evaluation purposes a simple USB interface board with a sounder, LED indicator and linear 5V to 3.3V regulator is available. The schematics are in appendix 9.

4. Installation

Microsoft Windows USB CDC Mode

Plug the unit into a USB port. This will bring up the Found New Hardware Wizard.

Click on “No, not this time” and then on “Next>”



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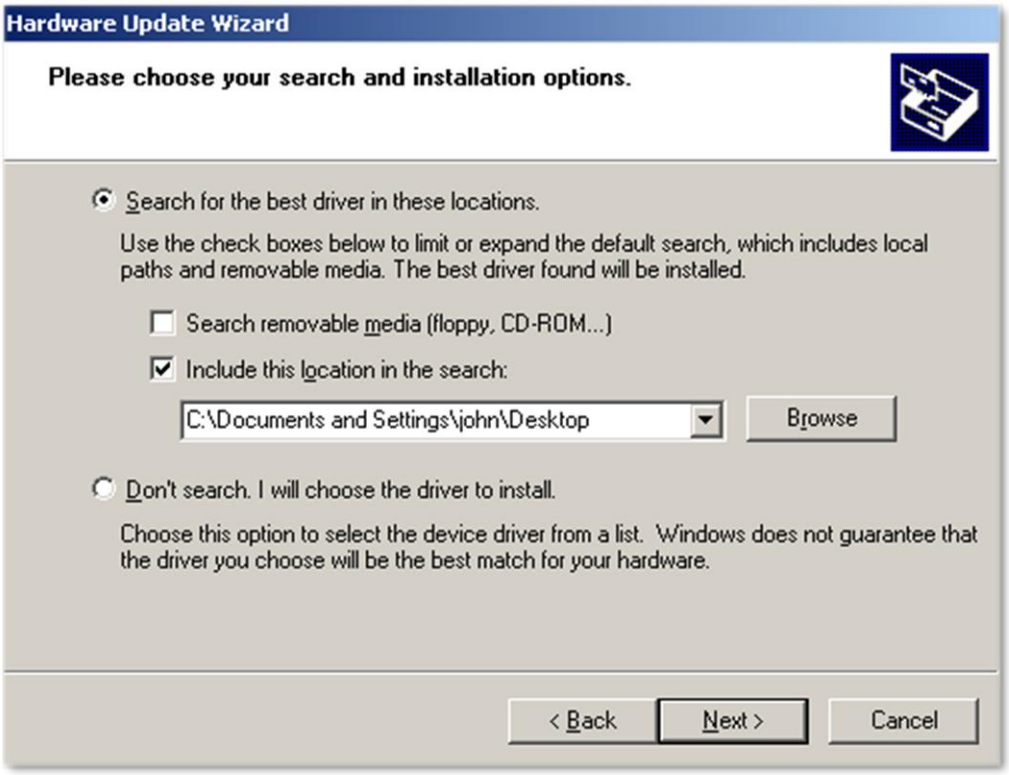
Click on Install from a list or specific location and then “Next >”.



Then Click on “Search for the best driver in these locations” and click on “Browse” to locate the file 126a.inf

Then click in “Next >”

Then Click on “Continue anyway”

Then Click on “Finish” to complete.

Microsoft Windows USB Keyboard HID Mode

Plug the unit into USB and after a few messages the device will be automatically installed.

5. Output Data Format

The OCR310 is supplied pre-configured with a simple output format. Other output formats are available on request. Please contact Access IS Support Department for details:

<STX>

If present <Line 1 Data><CR>

If present <Line 2 Data><CR>

If present <Line 3 Data><CR>

<ETX>

It is also possible to configure the unit to send <CR><LF> instead of <CR> if the application needs it.

6. Operation

The unit will produce an output once a document is swiped. It will substitute an asterisk for any character it does not recognise. If it has more than seven characters it does not recognise then it outputs thirty asterisks. If it does not recognise the document at all it will disregard the read and output nothing.

If there are any errors there are three short pulses on the sounder output and a pulse on the LED output. For a good read there is one short pulse on the sounder output and no pulse on the LED output.

7. Configuration

In normal use no setup is required.

The configuration mode can be enabled by sending an escape sequence to the unit.

This is “<ESC> L ~” (0x1B, 0x4C, 0x7E)

This brings up a menu which allows various parameters to be set and saved in non-volatile memory.

The menu looks something like this but may vary due to different firmware versions and options.

```
*** SYSTEM SETUP(V1.0) ***

Mar 17 2009 11:16:14

AKOCRS20A-0032M


1 - HOST PORT: 8 bit, No Parity

2 - HOST PORT: 9600 baud

3 - SOUNDER:   Enabled

4 - HOST CTS:  ON

6 - PROTOCOL:  Unformatted

9 - USB CLASS: CDC

A - BAD ERRORS: NO OUTPUT

K - KEYBOARD EMULATE: US

S - SAVE & EXIT SETUP

X - EXIT SETUP WITHOUT SAVE

 Enter 1 to 9, S or X:
```

Option 1 selects the format for serial output between 8 bit, no parity, one stop bit and 7 bit, even parity, one stop bit. The default is 8 bit, no parity one stop. This has no effect on USB.

Option 2 selects the speed of the serial output between 9600, 19200, 1200 and 4800 baud. The default is 9600 and has no effect on USB.

Option 3 enables and disables the sounder output for status reporting.

Option 4 Enables and disables the serial handshaking and has no effect on USB

Option 6 Allows changing the format of the output data between the default “Unformatted” data bracketed by the EXT and STX control characters and other custom protocols.

Option 9 selects between the three USB classes. CDC, Keyboard HID and Custom HID. Note that this does not affect the serial output. However setting the Keyboard HID mode means that the setup menu is then inaccessible over USB and will need to be changed using the serial connection.

Option A selects the behaviour when a document is determined to be unreadable. The two settings are Ignore or output 30 asterisks. This is useful if you need confirmation that a document was swiped even if it was not readable. The default is no output.

Option K selects the language of the keyboard used when USB class is set to Keyboard HID. The current choices are US, UK, DK, IS, ES, DE and FR. The default is US. Other languages are available by special request please contact Access IS Support for details.

Option S will save the changed settings and exit the setup menu. The settings will not take effect until the unit is repowered.

Option X discards the changed settings and exits the setup menu.

All other options are reserved.

8. Application Notes

Under USB CDC mode the unit works as a virtual COM port under Microsoft Windows this is handled exactly like a real COM port including handling the control lines.

The device can be put into a lower power mode where the document scanning is disabled but can be re-enabled in less than 1ms. This mode is controlled by the CTS line when using serial communications or setting the virtual serial port DTR line when using USB.

Note that if the device is unplugged from the USB bus whilst opened in the program then reattached the device will not be accessible. In this case is necessary to close the device in the program (even if an error is returned) and unplug and reconnect the unit. If the device is closed before reconnecting then the device should be accessible on reconnection.

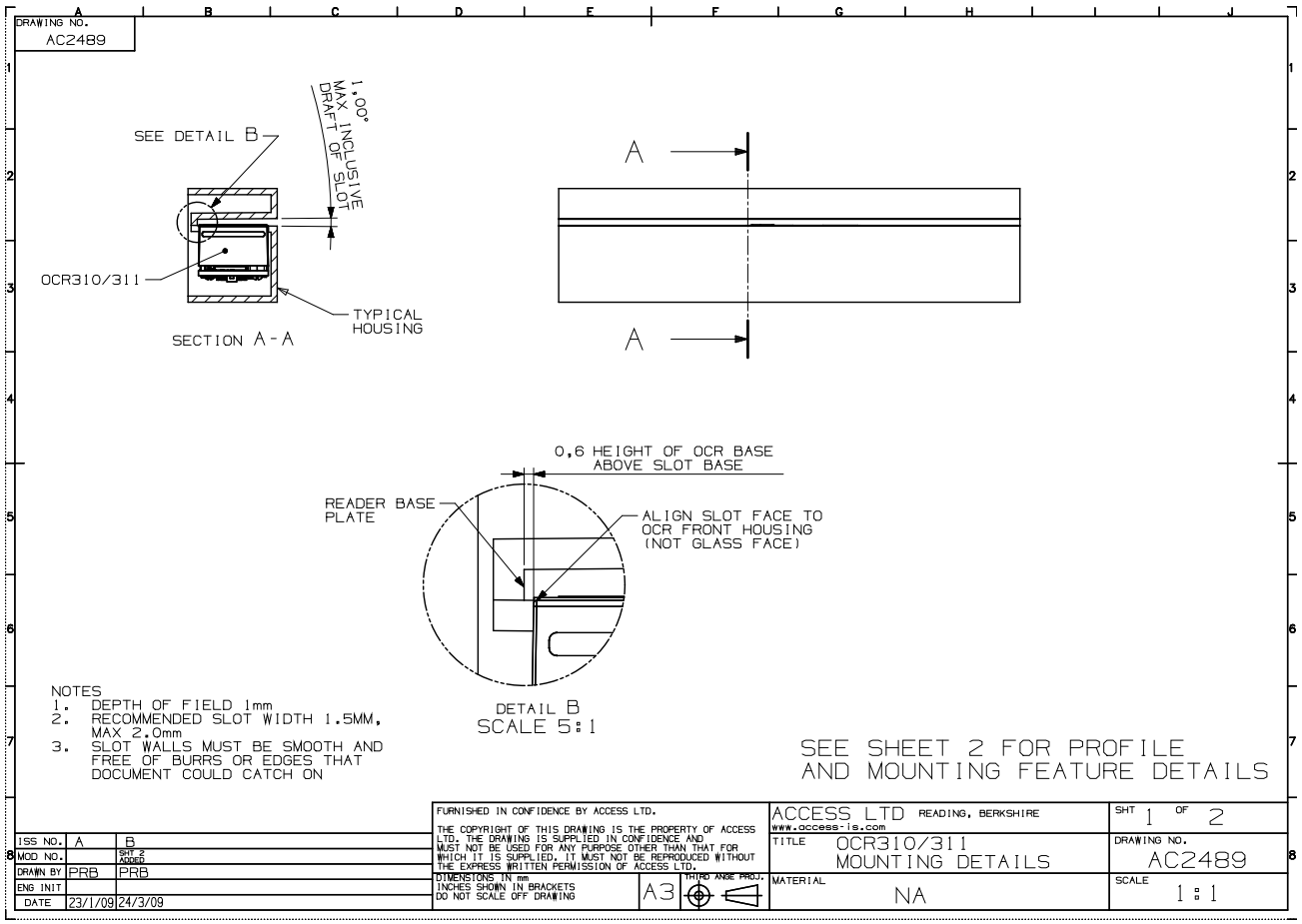
9. Mounting Recommendations

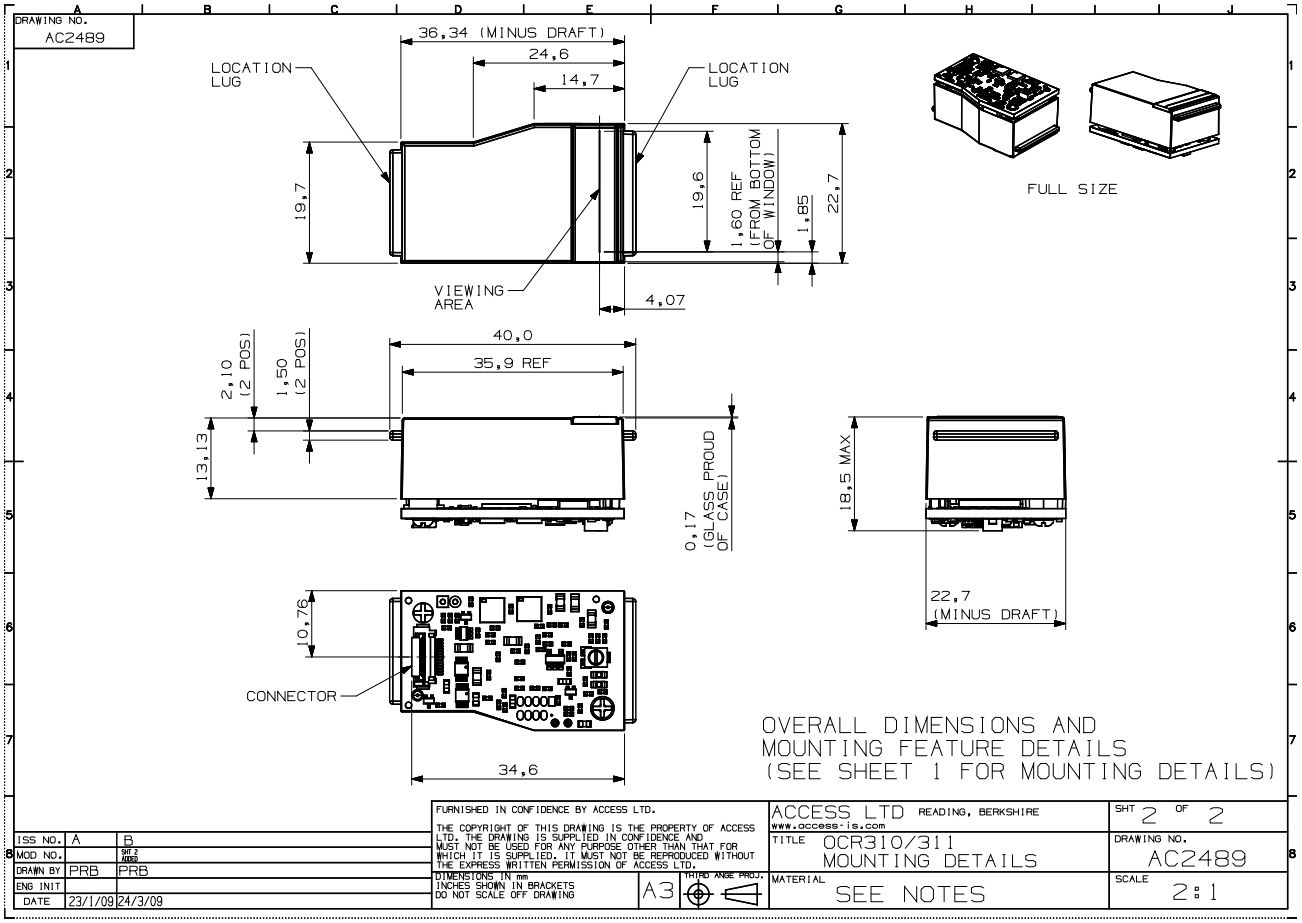
The unit is designed to be flush mounted against the wall guide that the document is swiped along. The document should be held close to the camera window during the swiping operation.

Recommend slot width should be 1.5mm, with a maximum of 2.0mm allowable. Please also ensure that the camera window area is directly opposite a matt black surface on the opposing wall.

To ensure a smooth swipe action and thus reliable read, Access IS recommends the use of a smooth wear resistant stainless steel track guide. This will also help reduce the possibility of debris occurring from swiped media which could cause reading problems.

Example dimensional position of the unit within the track assembly:-





10. Example Interface Schematics