



SECURITY SYSTEMS

*C Series Access Controllers, Protocol
Converters, Card Readers & Accessories*

Hardware Manual



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Chapter 1 - Introduction

1.1 Secusys Overview

SECUSYS is an access control manufacturer with its head office in Hong Kong and manufacturing in Shenzhen, China. Its product range includes multiple series of access controllers, communication devices, integrated security system software, card readers, credentials, DVR's, locks and accessories. This manual applies to the SECUSYS C Series of access controllers, protocol converters, card reads and accessories. No other series are covered in this manual.

1.2 C Series

The SECUSYS C Series of access controllers consists of two different ranges which are interchangeable if required. The V3.5 hardware version range is based on an 8 bit microprocessor and is a low cost entry level range consisting of 1, 2, 4 and 8 door fully intelligent controllers. The V4 hardware version is an advanced range based on a 32 bit microprocessor also consisting of 1, 2, 4 and 8 door controllers. Both ranges can be used in a standalone or networked configuration mode, and both ranges are compatible with the C Series Lift Controllers and Multi IO Controllers. Both ranges can be connected to a TCP/IP network if required.

Note that unlike previous hardware versions, the SECUSYS V3.5 controllers do not have any TCP/IP components on board so the previously supplied plug in TCP/IP module as used with the SECUSYS V3 PCB's cannot be used with the SECUSYS V3.5 PCB's. All the SECUSYS C Series access controllers come complete with a SECUSYS Standard steel cabinet and a DC 12V 6A switched mode power supply with battery charging. Controllers are also available as PCB's only. All the hardware listed in this manual is compatible with the SECUSYS 2000 Integrated Security Systems Software. For detailed information on the software refer to the Software user manuals.

1.3 Model Identifiers

All SECUSYS C Series access controllers are easily identifiable by their model numbers as follows:

The 1st letter is always a "S" and stands for SECUSYS

The 2nd letter is always a "C" and stands for C Series

The 3rd (and 4th letter if there is one) varies depending upon the type of controller where "D" stands for Door Controller, "L" for Lift or Elevator controller and "IO" for Input/Output Controller

The 1st number means the number of doors or in the case of a lift controller the number of floors for the base unit (with no modules attached) or in the case of an input/output controller, the number of inputs.

The 2nd number means the number of readers that can be connected to this controller or in the case of an input/output controller the number of outputs.

The "T" at the end of the model number signifies that the controller has an in built 100MHz TCP/IP port

1.4 Models

The following 5 models are from the V3.5 Economical hardware range, have no inbuilt TCP/IP Port (although can be connected to a TCP/IP network via a TCP/IP to RS-485 Protocol Converter) and are based on an 8 bit microprocessor:

SCD12, (*SECSYS, C Series, Door Controller, 1 Door, 2 Readers*) is an economical single door access controller allowing for the connection of both In and Out card readers.

SCD22, (*SECSYS, C Series, Door Controller, 2 Doors, 2 Readers*) is an economical two door access controller allowing for the connection of two In card readers with two REX buttons for exit. The SCD22 can also be software configured to a single door, dual reader configuration (SCD12).

SCD44, (*SECSYS, C Series, Door Controller, 4 Doors, 4 Readers*) is an economical four door access controller allowing for the connection of four In card readers with four REX buttons for exit. The SCD44 can also be software configured to a dual door, dual reader configuration (2 x SCD12).

SCD48, (*SECSYS, C Series, Door Controller, 4 Doors, 8 Readers*) is an economical eight door access controller allowing for the connection of four In card readers and four Out card readers.

SCD88, (*SECSYS, C Series, Door Controller, 8 Doors, 8 Readers*) is an economical eight door access controller allowing for the connection of eight In card readers with eight REX buttons for exit.

The following 5 models are from the V4 Advanced hardware range; have an inbuilt 100MHz TCP/IP port and a 32 bit microprocessor

SCD12T, (*SECSYS, C Series, Door Controller, 1 Door, 2 Readers, TCP/IP Enabled*) is an advanced single door access controller allowing for the connection of both In and Out card readers

SCD22T, (*SECSYS, C Series, Door Controller, 2 Doors, 2 Readers, TCP/IP Enabled*) is an advanced two door access controller allowing for the connection of two In card readers with two REX buttons for exit. The SCD22T can also be software configured to a single door, dual reader configuration (1 x SCD12T)

SCD44T, (*SECSYS, C Series, Door Controller, 4 Doors, 4 Readers, TCP/IP Enabled*) is an advanced four door access controller allowing for the connection of four In card readers with four REX buttons for exit. The SCD44T can also be software configured to a dual door, dual reader configuration (2 x SCD12T).

SCD48T, (*SECSYS, C Series, Door Controller, 4 Doors, 8 Readers, TCP/IP Enabled*) is an advanced four door access controller allowing for the connection of four In card readers and four Out card readers

SCD88T, (*SECSYS, C Series, Door Controller, 8 Doors, 8 Readers, TCP/IP Enabled*) is an advanced eight door access controller allowing for the connection of eight In card readers with eight REX buttons for exit.

The following are additional controllers that are compatible with both the V3.5 Economy and V4 Advanced range of SECUSYS C Series access controllers and have an inbuilt 100MHz TCP/IP port.

SCIO168T, (*SECSYS, C Series, Input Output Controller, 16 Inputs, 8 Outputs, TCP/IP Enabled*) is an advanced fully intelligent Ethernet enabled controller based on a 32 bit microprocessor.

SCL161T, (*SECSYS, C Series Lift Controller, 16 Floors, 1 Reader, TCP/IP Enabled*) is a fully intelligent Ethernet enabled controller based on a 8 bit ARM microprocessor. The SCL161T can by itself control 16 floors with no additional hardware and can be expanded to up to 128 floors by the use of the SCL160 modules.

The **SCL160** (*SECSYS, C Series Lift module, 16 Floors, 0 Readers*), is a plug in module that increases the base 16 floors provided by the SCL161T controller by another 16 floors. Connecting via a daisy chain ribbon cable, up to 7 SCL160 lift modules can attach to a SCL161T controller. With each SCL160 lift module supporting 16 floors, a SCL161T lift controller with 7 x SCL160 modules can support 128 floors. If only a single module is required to give a total of 32 floors, then this module can be piggybacked on top of the SCL161T.

Chapter 2 – Controller Structure and Specifications

2.1 General Features

The SECUSYS C Series access controllers are all fully intelligent and can be used in a standalone or networked configuration. Programming is done via a PC however once programming has been completed the PC can be removed if required and only connected when additional programming is required or the event buffer needs to be uploaded to the PC.

The SECUSYS C Series access controllers come standard with a RS-232 port for direct connection to a PC plus a RS-485 port for connection to a RS-485 line. Up to 127 controllers can be networked on a single RS-485 communication line giving a maximum of over 500 doors. The system supports up to 10 x RS485 individual communication lines giving a theoretical maximum of over 5000 serial connected doors on a single system.

The V3.5 controllers can be connected to a TCP/IP Protocol Convertor via an RS-485 line. Using this method up to 127 controllers can be connected to a single IP address.

The V4 controllers have an inbuilt 100MHz TCP/IP port for direct connection to a TCP/IP network and using this method each controller has a unique TCP/IP address.

There is no theoretical limit to the number of TCP/IP controllers connected either directly or via a TCP/IP to RS-485 Protocol Convertor. There is however a practical limit and that relates to the number of transactions per second and the ability of the SQL database server and associated TCP/IP network to cope with the traffic.

The SECUSYS C Series access controllers support both directional and bidirectional doors.

2.2 Wiegand Protocol

The SECUSYS C Series of access controllers can support any Wiegand output device that gives an output of between 24 and 72 bits.

2.3 Multi Format

Wiegand formats can be individually configured to allow for most common standard and proprietary card formats. EM, MIFARE, all the HID Prox formats plus Indala formats can be accepted. Also multiple formats are available for every reader on the system at any one time, not just available to single readers or controllers as in some systems. Refer to the software manual for more information.

2.4 Cardholder Database

The SECUSYS C Series of access controllers support up to 30,000 cardholders and this is fixed. There is no memory upgrade option available. Note that in some special cases where custom firmware is used and the firmware is modified to suit particular requirements, this figure may be reduced.

2.5 Event Buffer

The SCD12, 22, 44, 12T, 22T and 44T models store up to 15,000 events in off line mode

The SCD48, 88, 48T and 88T models store up to 7000 events in off line mode

Note that in some special cases where custom firmware is used and the firmware is modified to suit particular requirements, this figure may be reduced

2.6 Access Options

Supports multi programmable access methods: Card, Card + 4 digits PIN, Card Only mode (Max 1500 x 8 digit PIN's) Super 8 digits Master PIN, Multi-cards and Anti pass back.

2.7 Time Zones

Supports 15 Time Zones per door.

2.8 Multi-Door Status Schedule

Every door can be programmed to change its status at a specified date/time. There are several statuses of doors that can be defined according to user requires such as: Normal (uses card to open the door), Always Open, Always Closed and PIN required. Door Open Time can be programmed from 1 to 255 seconds.

2.9 Hardware Components

Memory 64K ROM, 512K SRAM

2.10 Self Monitoring

System self checks are supported

Data checksum protected

2.11 High Voltage Protection

All inputs and outputs are protected from high voltage.

5 years Lithium cell for maintaining memory and real time clock

Data is stored up to 90 days without power

2.12 Inputs & Outputs

Door Sensor Inputs: Normally Closed (N.C.), one per door

Exit Button Inputs: Normally Open (N.O.), one per door

Door Relay Outputs: NC/NO, one per door

Auxiliary Inputs & Outputs: Normally Closed (N.C.) or Normally Open (N.O.), varies as follows:

Model SCD12 3 inputs and 2 outputs

Model SCD22 4 inputs and 2 outputs

Model SCD44 2 inputs and 2 outputs

Model SCD48 4 inputs and 4 outputs

Model SCD88 0 inputs and 0 outputs

2.13 Communication

RS-232/RS-485 Baud rate: 19200/9600/4800 1,1,n

TCP/IP: 100MHz

2.14 Dimensions

The following are the actual PCB sizes. Allow at least 20mm all round and 10mm on top for cables

V3.5 Hardware & V4 Hardware

SCD12 & SCD12T PCB: 174mm x 133mm x 22mm

SCD22 & SCD22T PCB: 174mm x 133mm x 22mm

SCD44 & SCD442T PCB: 174mm x 133mm x 22mm

SCD48 & SCD48T PCB: 184mm x 133mm x 22mm

SCD88 & SCD88T PCB: 184mm x 133mm x 22mm

Mild steel metal cabinet: 403mm high x 384mm wide x 72mm deep

Weight of PCB in cabinet with DC 12V 6A Power Supply = 4.7 Kg

Chapter 3 – Controller Communication

This chapter covers the various communication protocols and methods. The Protocol Converters themselves are covered in chapter 6.

3.1 Introduction

A standard Windows based PC using either Windows XP SP3, or Windows 7 as the operating system can be used to run the SECUSYS 2000 software. This software connects to the controller to allow controller programming and the uploading of review events. The controllers will run in off line mode if no PC is available although the events will be overwritten when the event buffer is full, oldest event overwritten first.

There are 4 different methods of communication available to connect a PC running the SECUSYS 2000 software to the SECUSYS C Series of access controllers. Two of these use RS-232 serial data ports, the other 2 use TCP/IP. These 4 options are listed in detail in the following sections below.

In this manual RS-232 communication is sometimes referred to as Serial Communication or Serial Data Communication, all these terms mean the same thing. RS-232 is a serial data communication protocol used extensively for the connection of single devices. The standard data PIN connections for RS-232 from a PC to any of the converters listed in Chapter 3 are below (figure 3-1-1)

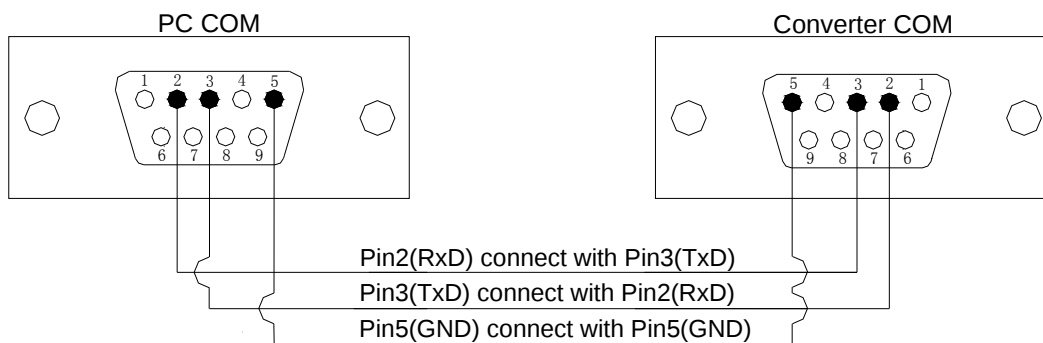


Figure 3-1-1

3.2 Option 1 - PC RS-232 Serial Com Port to controller RS-232 port directly

The 1st option uses a RS-232 serial communication port (or a USB port) and allows the PC to communicate with a single panel only. This is often used for technician programming and firmware upgrades and can be used permanently providing the PC is within 15 meters (50 feet) of the panel. A free communication port is required

Note that most computers now do not have a true RS-232 Port and a USB to Serial adaptor is required to provide serial data from a USB port. However be aware that although these devices are suitable for installer testing, they are quite often unreliable and a true serial port card slotted into the motherboard is recommended

for any installation

The following schematic diagram shows the connection between the PC and controller (figure 3-2-1).

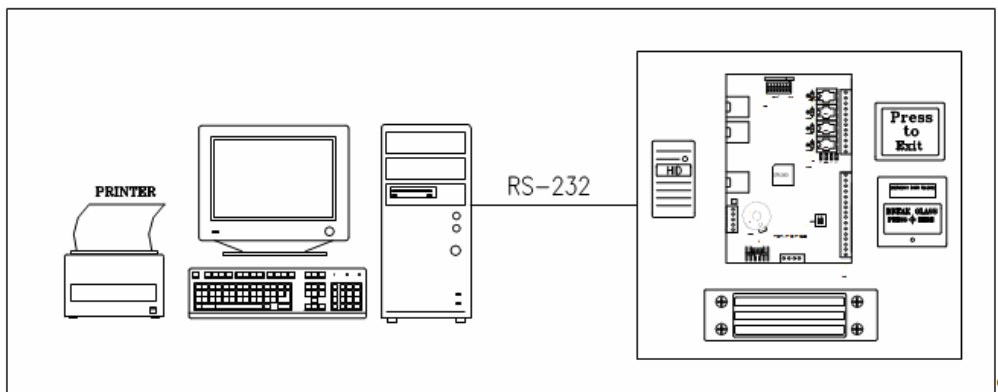


Figure 3-2-1

3.3 Option 2 – RS-232 PC Serial Com Port via RS-232 to RS-485 converter

The 2nd option uses a RS-232 serial communication port and an external RS-232 to RS-485 converter. This option is used where the PC is more than 15 meters from the controller or where more than one controller is required. RS-232 serial data is used from the PC to the converter then RS-485 is used from the converter to the controller(s).

There are two models of converter available that can be used.

3.3.1 Connection using PTC USB-232/485

The PTC USB-232/485 Protocol Converter is used to convert USB or RS-232 serial port data to RS-485. It enables 1 x USB or serial port to communicate with 127 controllers via RS-485. Note this device is suitable for testing only and should not be used to replace an on board RS-232 Serial Card (figure 3-3-1-1)



Figure 3-3-1-1

3.3.2 Connection Using PTC 232/485

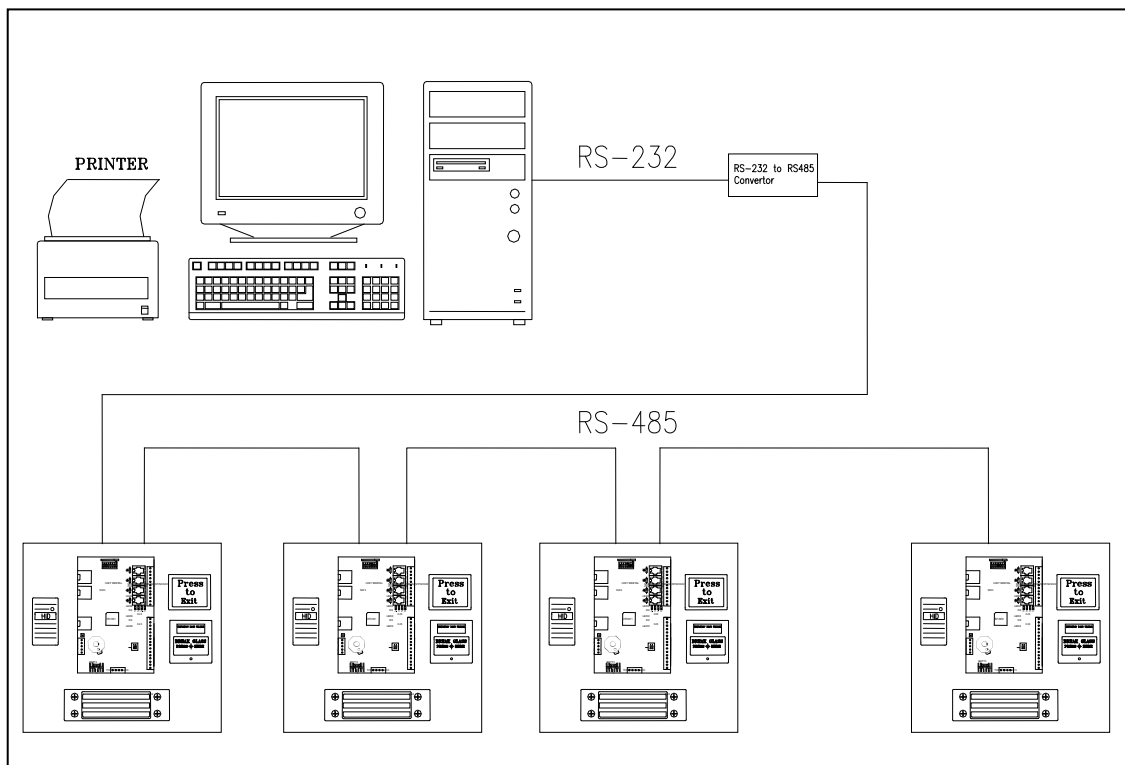
The PTC 232-485 Protocol Converter is used to convert RS-232 serial port data to RS-485. It enables 1 x serial port to communicate with up to 127 controllers via RS-485 (figure 3-3-2-1).



Figure 3-3-2-1

Using these 2 methods a maximum of 127 controllers can be connected to a single RS-232 serial port. The last controller can be located at a maximum distance of 1200 meters (4000 feet) from the converter. As with Option 1, a free communication port is required.

The below diagram shows the PTC 232-485 Protocol Converter connecting the RS-232 output from a computer serial port (or USB to serial adaptor) into RS-485 for connection to the controllers (figure 3-3-2). If the PTC USB-232/485 Protocol Converter is used the only difference is that the input can be either USB or RS-232.



*Figure
3-3-2*

3.4 Option 3 - TCP/IP to a TCP/IP enabled controller

The 3rd communication option uses the onboard 100MHz TCP/IP port on the SECUSYS C Series V4 controller to connect to a TCP/IP based network. The PC running the SECUSYS 2000 software is connected to the local network (LAN) hub/switch which in turn is connected to the controller. This connection can be direct, ie off the same hub/switch or indirect, through gateways, routers, WAN's or the Internet. This methods uses one IP address per controller (figure 3-4-1).

Notes:

1. The V3.5 hardware does not have a TCP/IP port on board
2. The maximum distance for any TCP/IP LAN segment using standard UTP cable is 100m.
3. The plug in TCP/IP modules C2000 and C2100 previously used for the V3 hardware is not compatible with the SECUSYS C Series controllers.

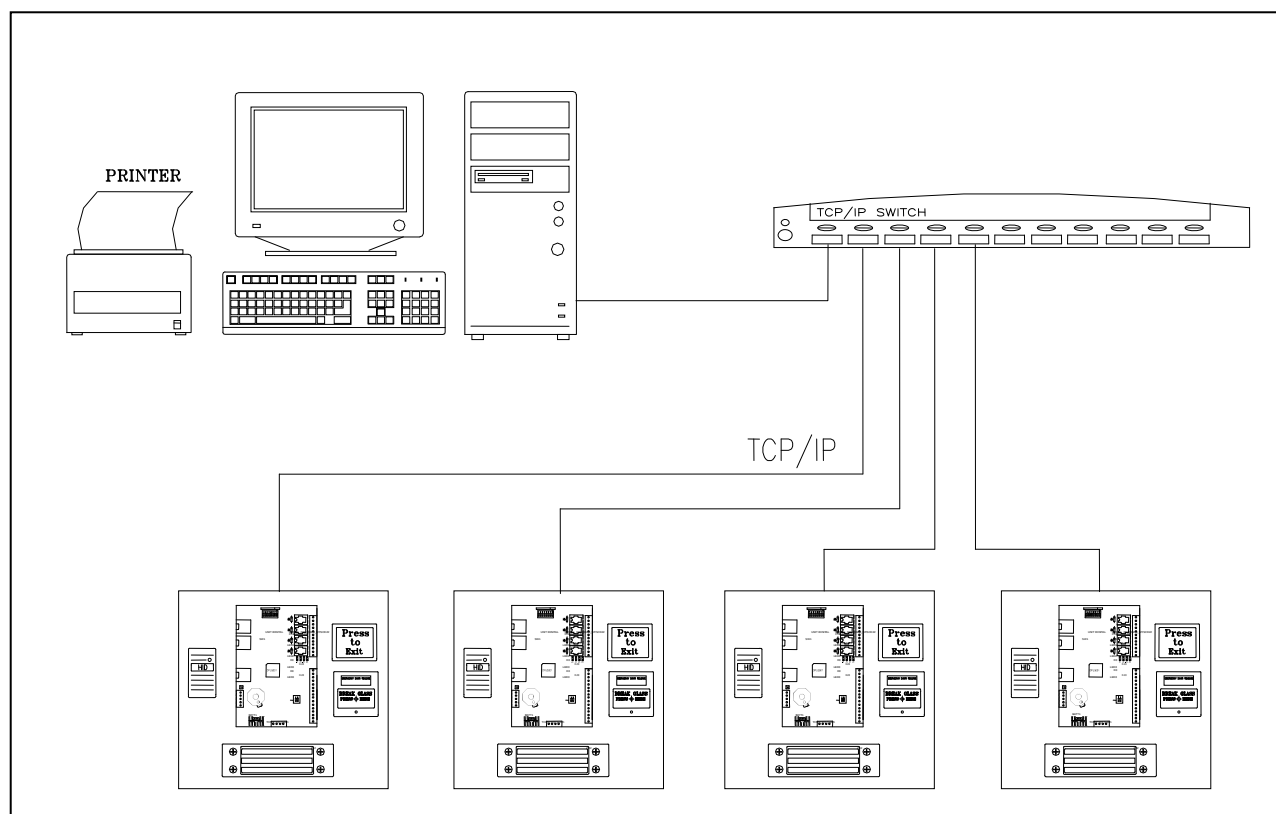


Figure 3-4-1

3.5 Option 4 - TCP/IP to RS-485 Converter

The 4th communication option uses a SECUSYS PTC TCP/IP-485 Protocol Converter (figure 3-5-1) to convert TCP/IP data to RS-485. The PTC TCP/IP-485 unit allows 1 x TCP/IP address to communicate with 127 controllers via RS-485. The PC is connected to the local LAN as in option 3.4 however at the controller end a TCP/IP to RS-485 converter is used. As with option 3.4 the controller can be located on the same LAN as the PC or at a different location provided that there is a TCP/IP connection between the PC and the converter. This option allows a PC to connect to up to 127 controllers over a maximum distance of 1200 meters using a single converter IP address (figure 3-5-2).



Figure 3-5-1

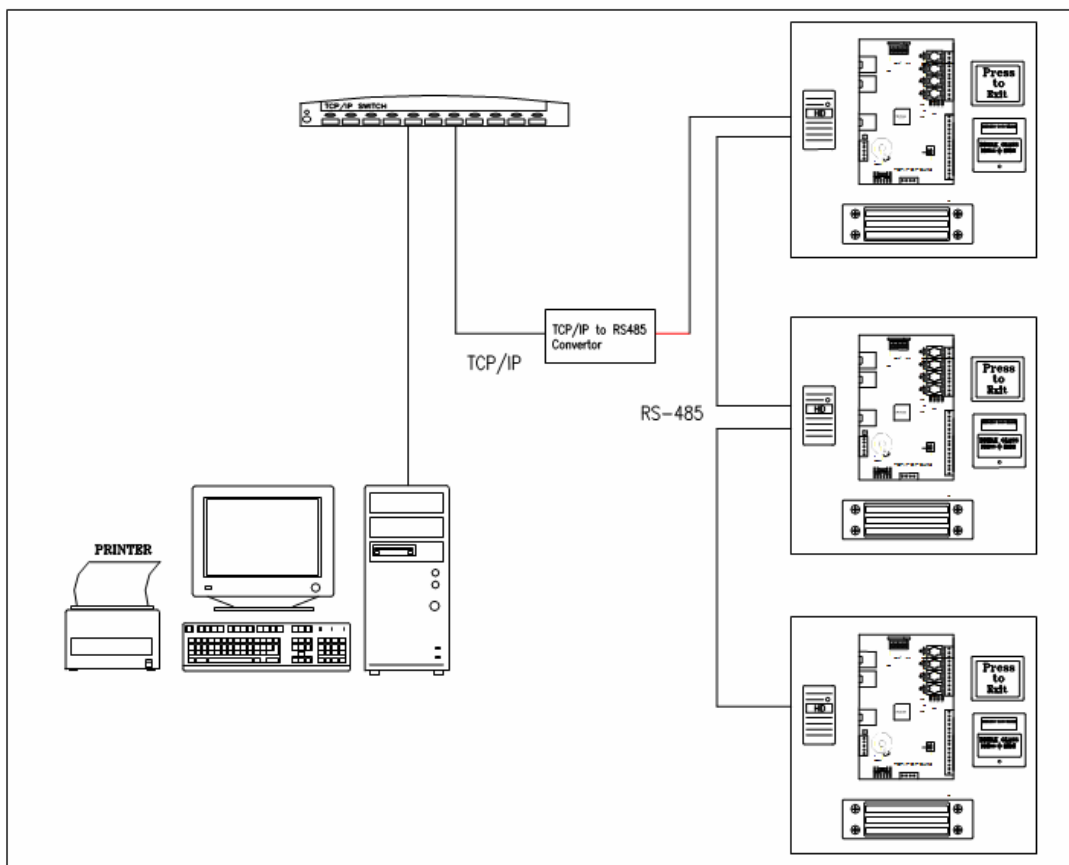


Figure 3-5-2

3.6 RS-485 Interface Notes

The following notes refer to the RS-485 Protocol used with the SECUSYS Hardware.

In RS-485 mode the SECUSYS C Series access controllers use the half-duplex RS-485 protocol. This protocol has a maximum distance of 1200 meters (4000 feet) so the distance between the 1st and last device on a RS-485 network can be no greater than 4000 ft without some sort of amplification. All controllers in the same RS-485 line must be connected in a daisy chain or multi dropped configuration. (figure 3-6-1) The RS-485 cable must not be connected at any points other than the controller(s) and the RS-485 interface. Do not connect any RS-485 wires to the GND of the controller.

If a shielded cable is used then the shield must be connected to a strong ground or earth at a single point only in order to avoid earth loops and data corruption. Where the RS-485 shielded cable connects to a controller the shield between the IN cable and the OUT cable should be looped together but insulated from ground. Note that if a RS-232 to RS-485 converter is being used to connect to a desktop PC then the RS-485 line could, but not always, be earthed via the computer.

The last controller on a RS-485 LAN must be terminated using a 120 ohm termination resistor. (figure 3-6-1). Note that the diagram shows an external termination resistor however a jumper inserted on the pins located adjacent to the RS-232/485 terminal block on the controller inserts an internal termination resistor in the circuit. Only one controller per RS-485 line needs to be terminated.

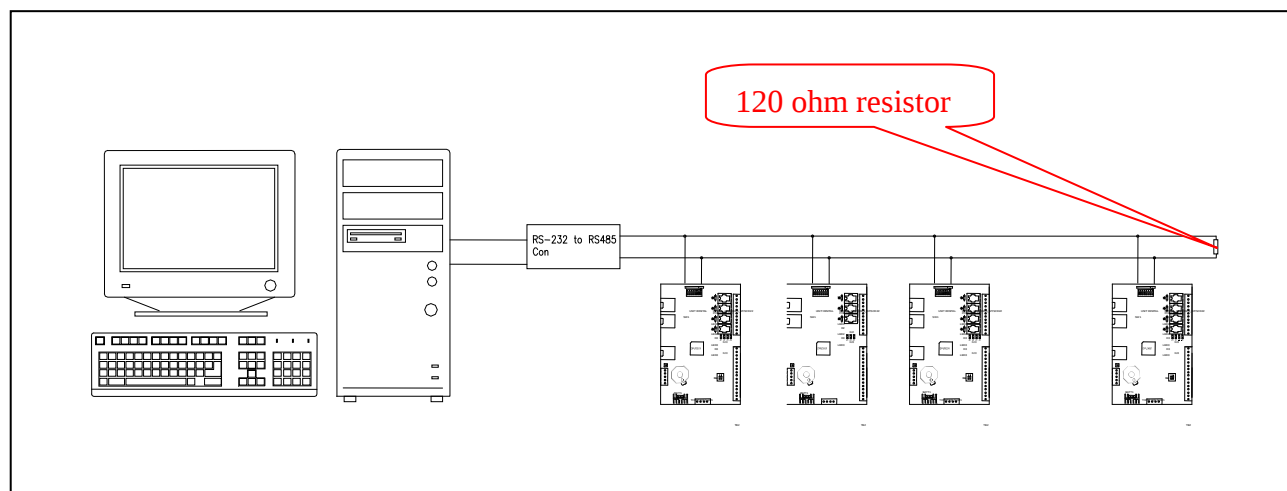


Figure 3-6-1

3.7 WAN/Internet Connection

Using TCP/IP communication in either option 3 or 4 in this chapter allows a controller to be connected to a PC running the SECUSYS 2000 software over a WAN or the internet. The diagram below shows a complex system where a number of TCP/IP enabled controllers plus a TCP/IP to RS-485 converter are connected via TCP/IP to the PC (figure 3-7-1) For this configuration to work the PC running the software (or its internet address, ie the gateway) must have a static IP address. All controllers require only a dynamic or DHCP allocated IP address. Specialist IT support will be required if controllers are to be connected through gateways and routers as TCP/IP port 8000 needs to be opened for incoming traffic and this port redirected to the PC running the SECUSYS 2000 software.

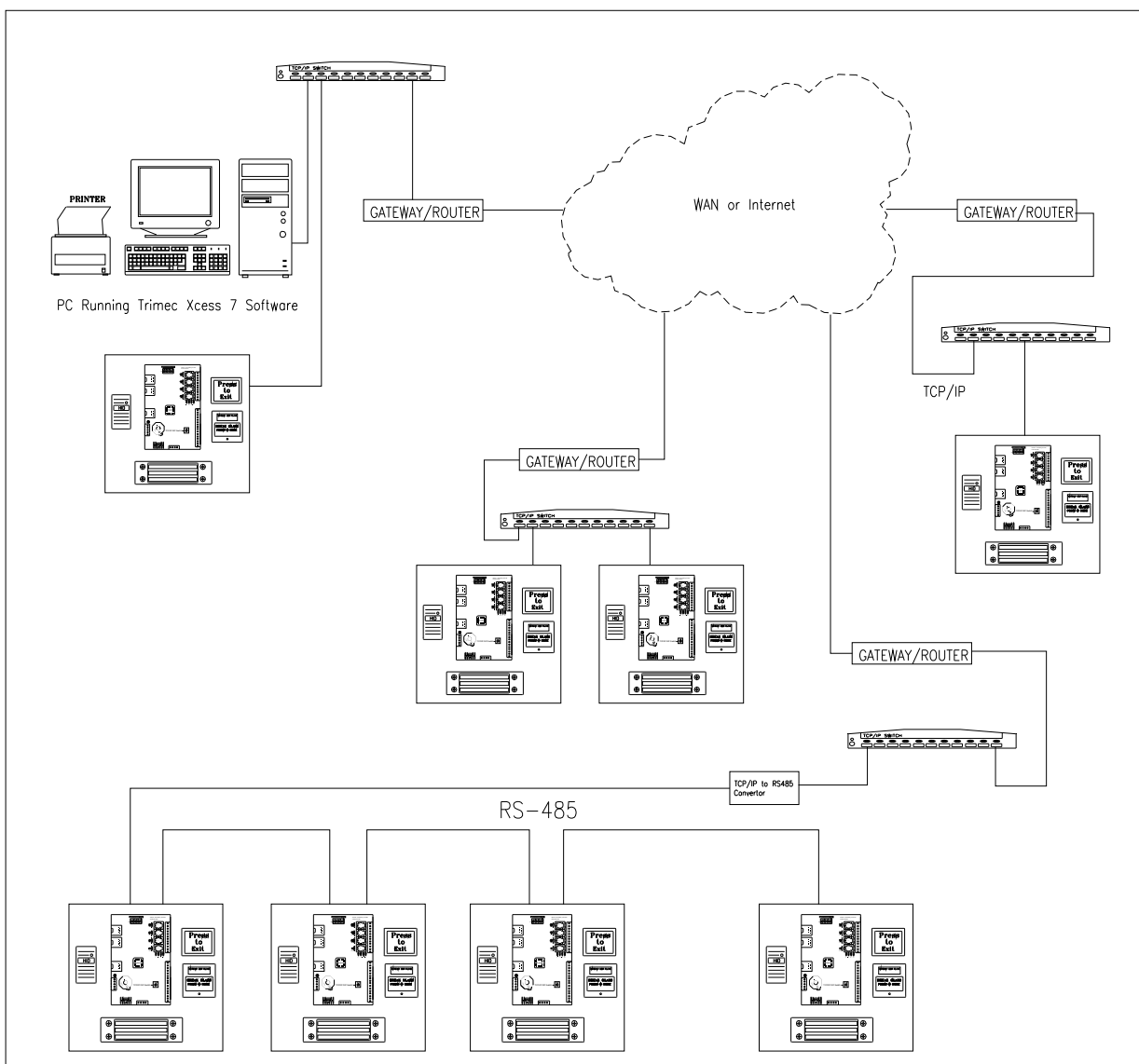


Figure 3-7-1

Chapter 4 – Controller Wiring

4.1 General Features

This chapter covers the system wiring required to install and connect a SECUSYS controller including the power supply connection, communication connections, reader connections, lock connections, inputs/outputs and cable specifications. Before installation of any SECUSYS controller, any data in the RAM should be cleared. Set switch 8 on Dip Switch 1 to on, apply power, press the reset button, wait 5 seconds, de-power, return switch 8 to off. Note that this does a COLD reset which clears all data from memory. This data cannot be recovered.

4.2 Wiegand Interface Wiring

In all hardware versions previous to V3.5, the Wiegand card reader connection to the controller was made via a RJ-45 connector. The primary reason for this was to lower the footprint size of the PCB's. However with the advent of many integrated processors the number of components on the V3.5 and V4 PCB's has been reduced so there is now no requirement to save space by using RJ-45 connectors. So all V3.5 and V4 SECUSYS controllers have the standard Green screw terminal connectors.

Due to its low cost, installers nowadays use Cat 5 or above UTP cable for connecting of the card readers to the controller. UTP cable is normally sufficient unless the cable is being run long distances parallel to mains voltage cables or is being run through an area where there is excessive electromagnetic interference in which case a shielded cable should be used. Note that if a twisted pair cable is used the two Wiegand data lines should be in the same pair to limit any interference. If a shielded cable is used then the shield can be earthed at the controller only.

All the SECUSYS controllers use a 6 way removable Green screw connector that plugs into a corresponding socket on the PCB. This makes board changes very quick. The PIN connections for this connector are from left to right:

PIN No	Function	Suggested Colour
1	12VDC	Red
2	Green LED	Orange or blue
3	Data 0	Green
4	Data 1	White
5	Ground	Black
6	Buzzer	Yellow

Figure 4.2.1

The following tables list the correct PIN connections for the most common type of Wiegand devices.

4.2.1 SECUSYS Readers

PIN No	Function	Suggested Colour	Reader Colour
1	12VDC	Red	Red
2	Green LED	Orange	Orange
3	Data 0	Green	Green
4	Data 1	White	White
5	Ground	Black	Black
6	Buzzer	Yellow	Yellow

Figure 4.2.1.1

4.2.2 HID Readers

PIN No	Function	Suggested Colour	Reader Colour
1	12VDC	Red	Red
2	Green LED	Orange	Orange
3	Data 0	Green	Green
4	Data 1	White	White
5	Ground	Black	Black
6	Buzzer	Yellow	Yellow

Figure 4.2.2.1

4.2.3 Chinese Readers

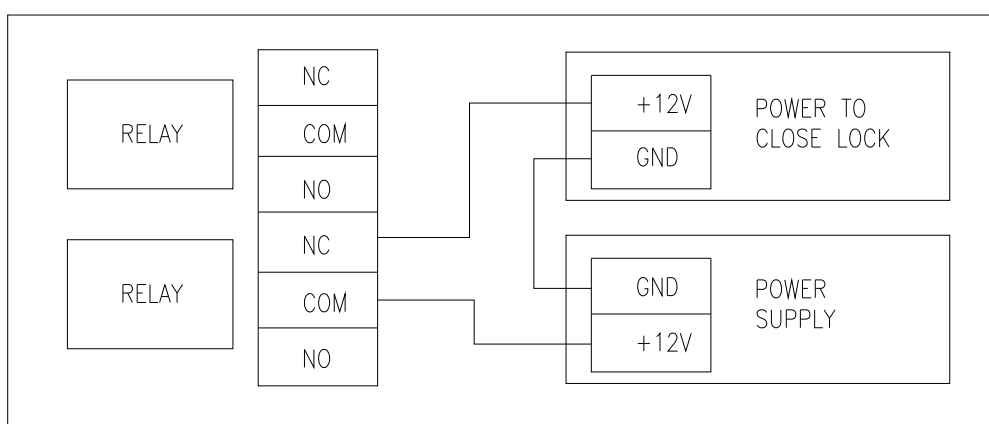
Some Chinese manufactured readers use the Blue wire for the Green LED instead of the orange.

PIN No	Function	Suggested Colour	Reader Colour
1	12VDC	Red	Red
2	Green LED	Blue	Blue
3	Data 0	Green	Green
4	Data 1	White	White
5	Ground	Black	Black
6	Buzzer	Yellow	Yellow

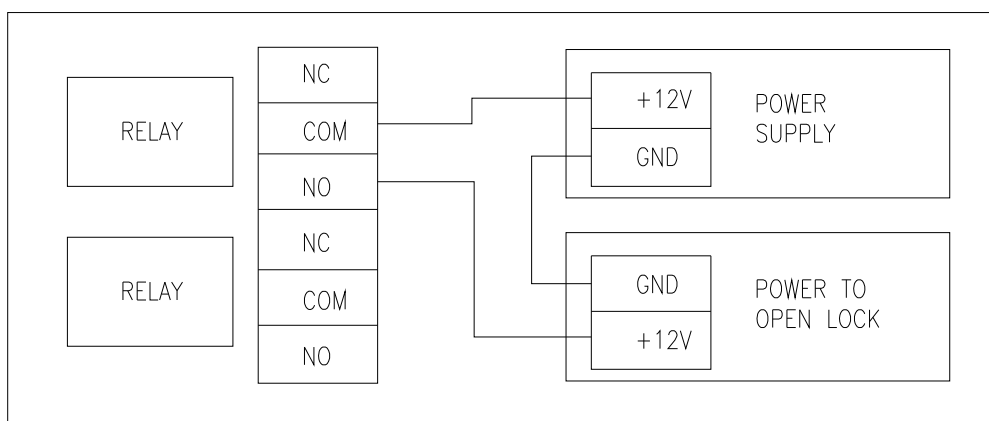
Figure 4.2.3.1

4.3 Lock Wiring

Both PTO (power to open) and PTL (power to lock) locks can be used with the SECUSYS controllers. PTO locks are also called Fail Secure and PTL locks Fail Safe. Back EMF protection is required to be used. If the lock does not have an internal back EMF protective diode then an external one must be fitted. This is placed across the lock power supply cables and prevents any dangerous back EMF voltages from damaging the controller electronics. Installers should take a note of equipment connected and the current draw so as to not overload the power supply. Figure 4-3-1 shows the connections for a standard 12V Power to Close lock while figure 4-3-2 shows the connections for a standard 12V Power to Open lock.



*Figure
4-3-1*



*Figure
4-3-2*

4.4 RS-232/485/TCP Communication Wiring

All models support RS-232/RS-485 communication protocols plus TCP/IP for the V4 Hardware PCB's. Note that the controllers can only support a single communication interface at any one time. Refer to Chapter 3 for more information on the Communication Protocols.

4.5 Controller Wiring

A detailed wiring table appears on the next page listing the cable specifications for wiring connected to the SECUSYS C Series Controllers. Below however is a schematic showing the major cable types used in access control systems and their uses (figure 4-5-1). Connected to a controller there are normally 5 cables as follows:

Cable 1 – The card reader cable. This can be either 6 core, 3 or 4 pair UTP or twisted shielded depending upon distance and electromagnetic interference.

Cable 2 – The input cable. This can be an 8, 10 or 12 core cable, 0.2 mm² or 0.5 mm² connecting the various inputs with the controller. These inputs could include the REX, door contact, auxiliary input, bond or tongue sense inputs or a break glass monitoring input.

Cable 3 – This is the power cable that supplies the lock. The lock power must be kept in a separate cable from the input cable as spikes created by electromagnetic locks can be induced into input cables if these are run in the same cable. This cable is normally run to the emergency break glass unit then to the lock.

Cable 4 – The cable connecting the controller to another controller, converter or TCP/IP switch/hub.

Cable 5 – The 230V power supply cable to the controller fuse block.

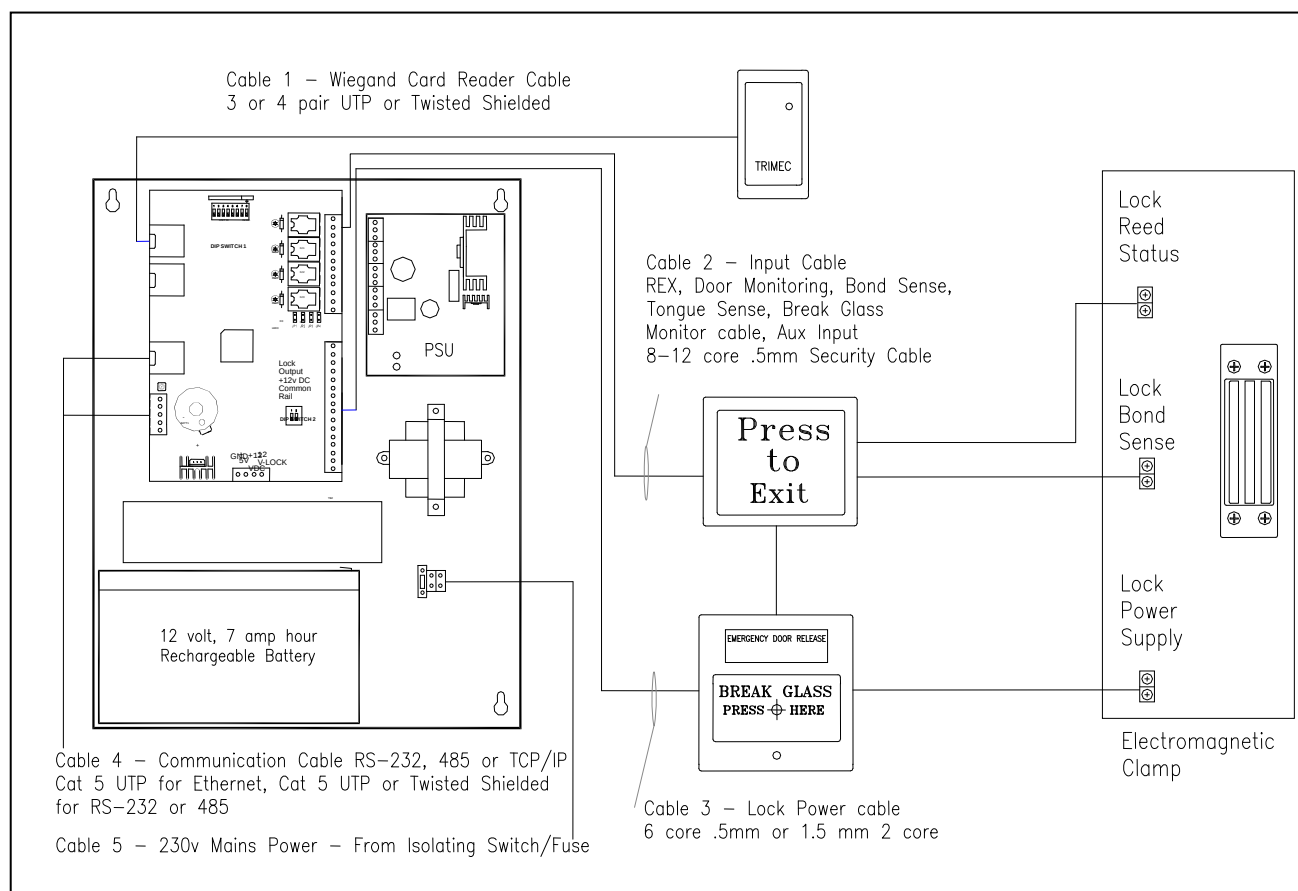


Figure 4-5-1

4.6 Cable Specifications

The table below lists the recommended cables for use with the SECUSYS C Series Controllers (figure 4-6-1)

Use	Wiring Location	Cable Specification
Cable 1 Wiegand Reader Cable	From Wiegand reader to controller	4 pair shielded twisted pair .24AWG (0.206mm) is recommended (Belden 9841) however parallel core security cable or Cat 5 UTP will work adequately in areas of low electromagnetic interference. Maximum distance 150m (500 feet)
Cable 2 Assorted Inputs	Door sensor, REX, break glass monitoring, bond sense, tongue sense, auxiliary input	6, 8, 10 or 12 core 0.2 mm ² or 0.5 mm ² parallel core security cable or standard Cat 5 UTP. Does not normally need to be shielded unless in an area of exceptionally high electromagnetic interference
Cable 3 Lock Power Cable	From controller and power supply to locks via break glass (if fitted)	This cable depends upon distance and lock current draw. For small runs (up to 10-15m) a twin 0.75mm ² cable is normally sufficient. For longer runs a twin 1mm ² , a twin 1.5mm ² or even a twin 2.5mm ² cable could be required, not shielded.
Cable 4a RS-485 Cable	From converters to controllers and from controllers to controllers	4 pair shielded twisted pair .24AWG (0.206mm) is recommended.(Belden 9841) The maximum range is 1200m (4000 ft) Cat 5 UTP will work adequately in areas of low electromagnetic interference however a shielded cable is recommended.
Cable 4b TCP/IP Cable	From converters/controllers to a TCP/IP hub/switch	Cat 6 or above UTP. Maximum distance 100m
Cable 5 230v Power Supply Cable	From a switched 230 volt power supply source to the controller power supply	A single twin and earth 1.5mm ² or similar depending upon local regulations
Controller Earth	From the Ground terminal of the controller or power supply to a valid earth	A single core 1mm ² or similar

Figure 4-6-1

Chapter 5 – PCB Layouts & Connections

5.1 PCB Model Introduction

The SECUSYS C Series product range comprises the following models:

- SCD12**, (*SECSYS, C Series, Door Controller, 1 Door, 2 Readers*)
- SCD22**, (*SECSYS, C Series, Door Controller, 2 Doors, 2 Readers*)
- SCD44**, (*SECSYS, C Series, Door Controller, 4 Doors, 4 Readers*)
- SCD48**, (*SECSYS, C Series, Door Controller, 4 Doors, 8 Readers*)
- SCD88**, (*SECSYS, C Series, Door Controller, 8 Doors, 8 Readers*)
- SCD12T**, (*SECSYS, C Series, Door Controller, 1 Door, 2 Readers, TCP/IP Enabled*)
- SCD22T**, (*SECSYS, C Series, Door Controller, 2 Doors, 2 Readers, TCP/IP Enabled*)
- SCD44T**, (*SECSYS, C Series, Door Controller, 4 Doors, 4 Readers, TCP/IP Enabled*)
- SCD48T**, (*SECSYS, C Series, Door Controller, 4 Doors, 8 Readers, TCP/IP Enabled*)
- SCD88T**, (*SECSYS, C Series, Door Controller, 8 Doors, 8 Readers, TCP/IP Enabled*)
- SCIO168T**, (*SECSYS, C Series, Input Output Controller, 16 Inputs, 8 Outputs, TCP/IP Enabled*)
- SCL161T**, (*SECSYS, C Series Lift Controller, 16 Floors, 1 Reader, TCP/IP Enabled*)
- SCL160** (*SECSYS, C Series Lift module, 16 Floors, 0 Readers*)

All models are fully intelligent in off line mode. The PCB layout for each of these models appears on the following pages. Although the 4 and 8 door PCB's are slightly larger than the 1 and 2 door PCB's, the mounting holes are all identical so the same standard SECUSYS cabinet fits all controller PCB's without modification. All PCB's use the green plug in connectors for easy replacement of PCB's.

In the V3.5 boards, the SCD21, SCD22 and SCD 44 all use the SCD44 PCB.

In the V3.5 boards, the SCD48 and SCD88 both use the SCD88 PCB.

In the V4 boards, the SCD21T, SCD22T and SCD 44T all use the SCD44T PCB.

In the V4 boards, the SCD48T and SCD88T both use the SCD88T PCB.

The SCD22 and SCD22T configuration by default is 2 doors and 2 readers and the SCD44 and SCD44T configuration by default is 4 doors and 4 readers. So by default these controllers are preprogrammed for reader entry and REX button exit. However in both these cases the programming can be changed by the SECUSYS software to reader entry and reader exit. The SCD22 and SCD22T can be reconfigured to provide one door with both in and out readers (SCD12 and SCD12T). And the SCD44 and SCD44T can be reconfigured to provide two doors with both in and out readers (2 x SCD12 and SCD12T).

5.2 SCD12 (V3.5 PCB)

The SECUSYS Model SCD12 is a single door controller used with 2 readers, an IN and an OUT reader to give bi-directional access control (figure 5-2-1)

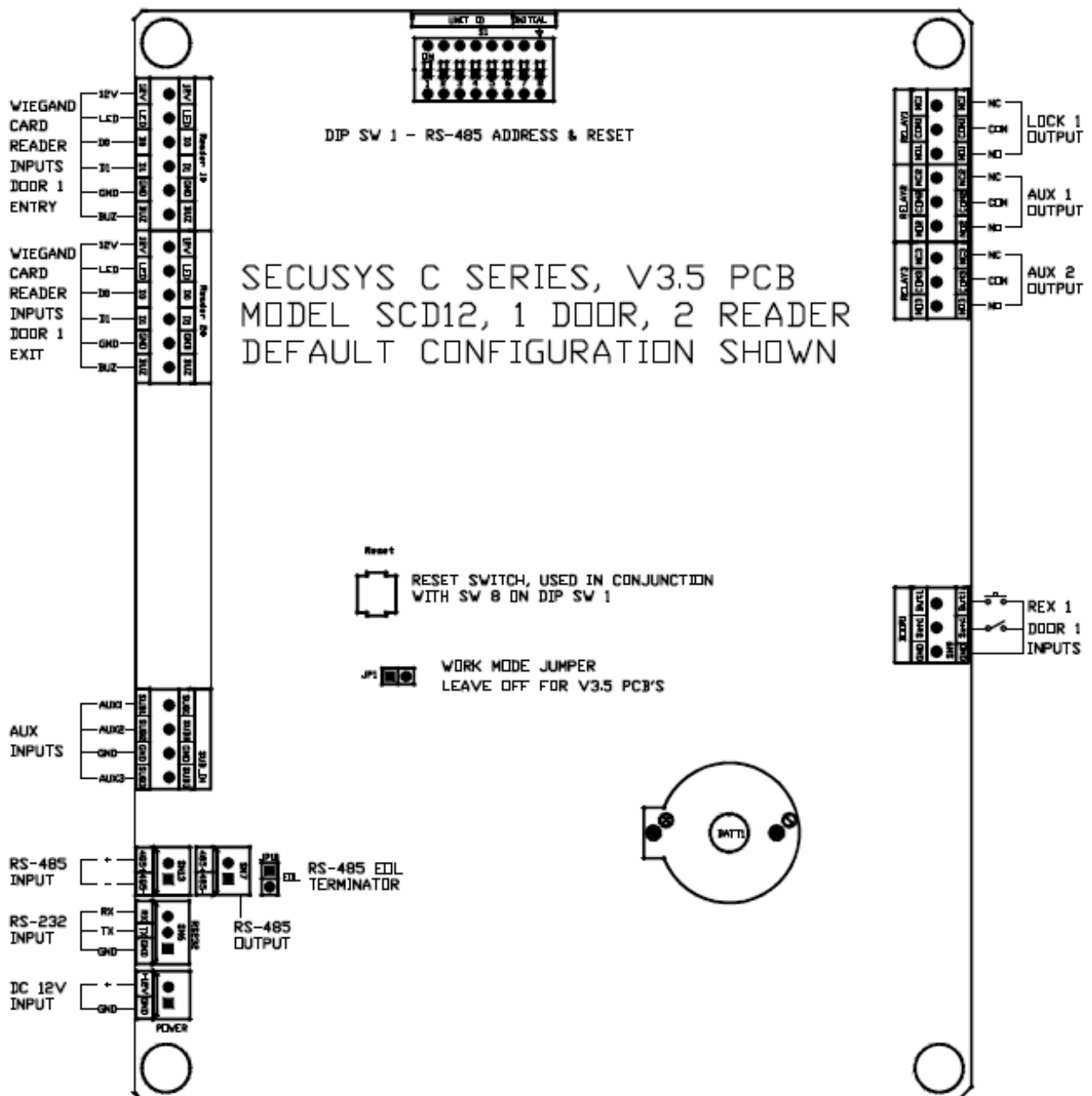


Figure 5-2-1

5.3 SCD22 (V3.5 PCB)

The SECUSYS Model SCD22 is a dual door controller that by default uses 2 readers for entry with REX buttons for exit, but can be software configured to provide an IN and an OUT reader to give bi-directional access control (figure 5-3-1)

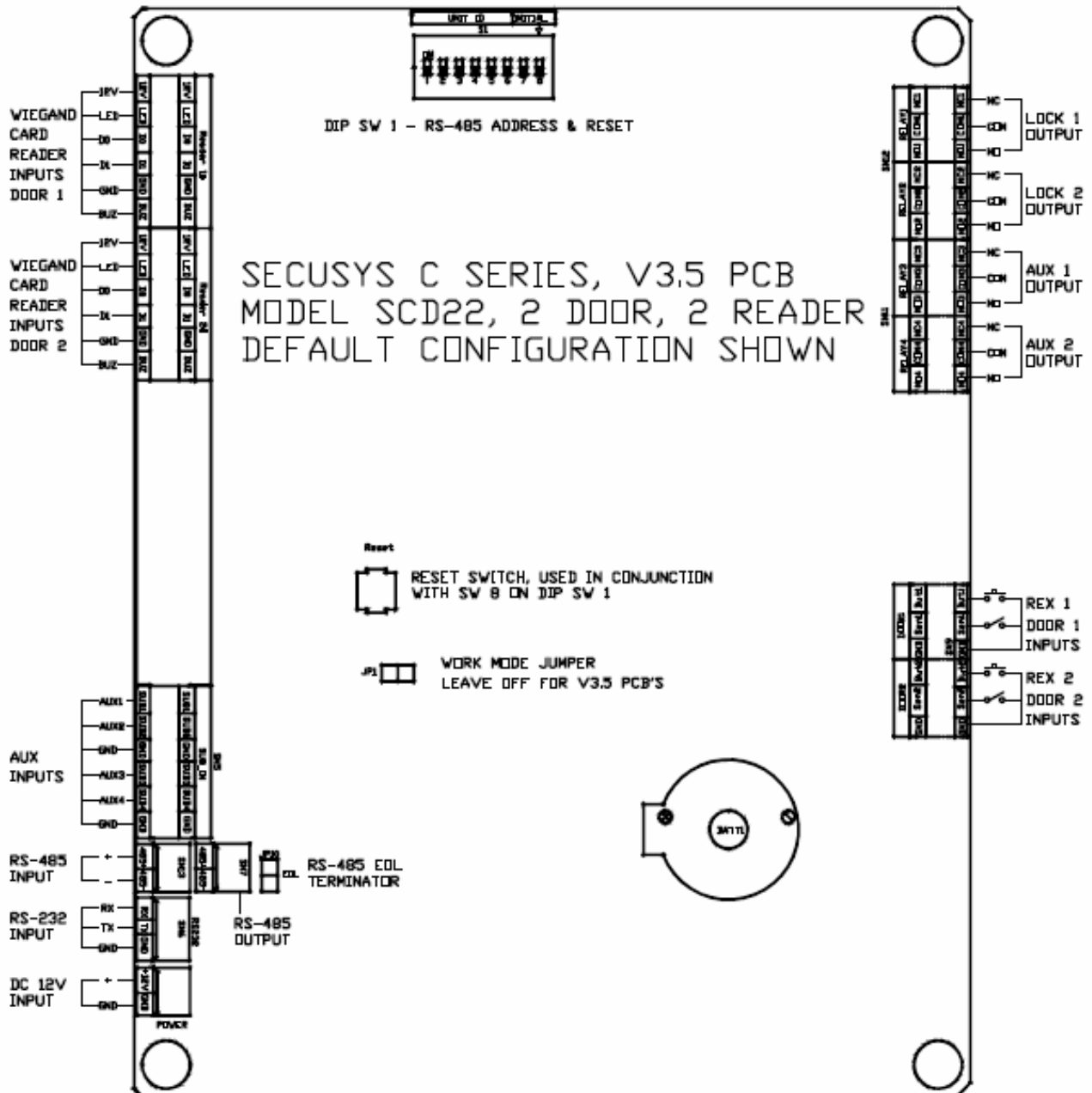


Figure 5-3-1

5.4 SCD44 (V3.5 PCB)

The SECUSYS Model SCD44 is a 4 door controller that by default uses 4 readers for entry with REX buttons for exit, but can be software configured to provide 2 sets of IN and an OUT readers to give 2 doors bi-directional access control (2 x SCD12) (figure 5-4-1)

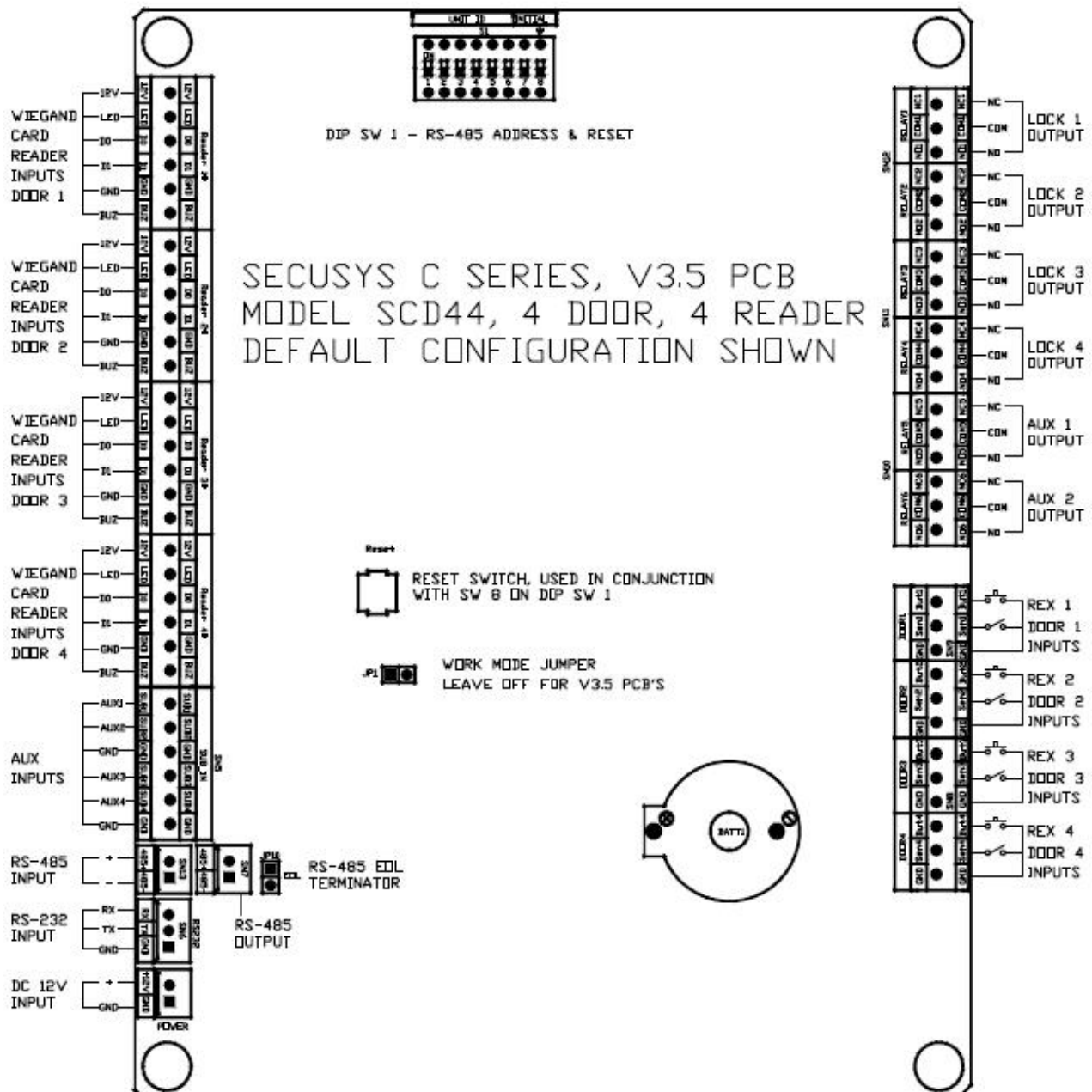


Figure 5-4-1

5.5 SCD48 (V3.5 PCB)

The SECUSYS Model SCD48 is a four door controller that has 4 readers for entry with 4 readers for exit. (figure 5-5-1)

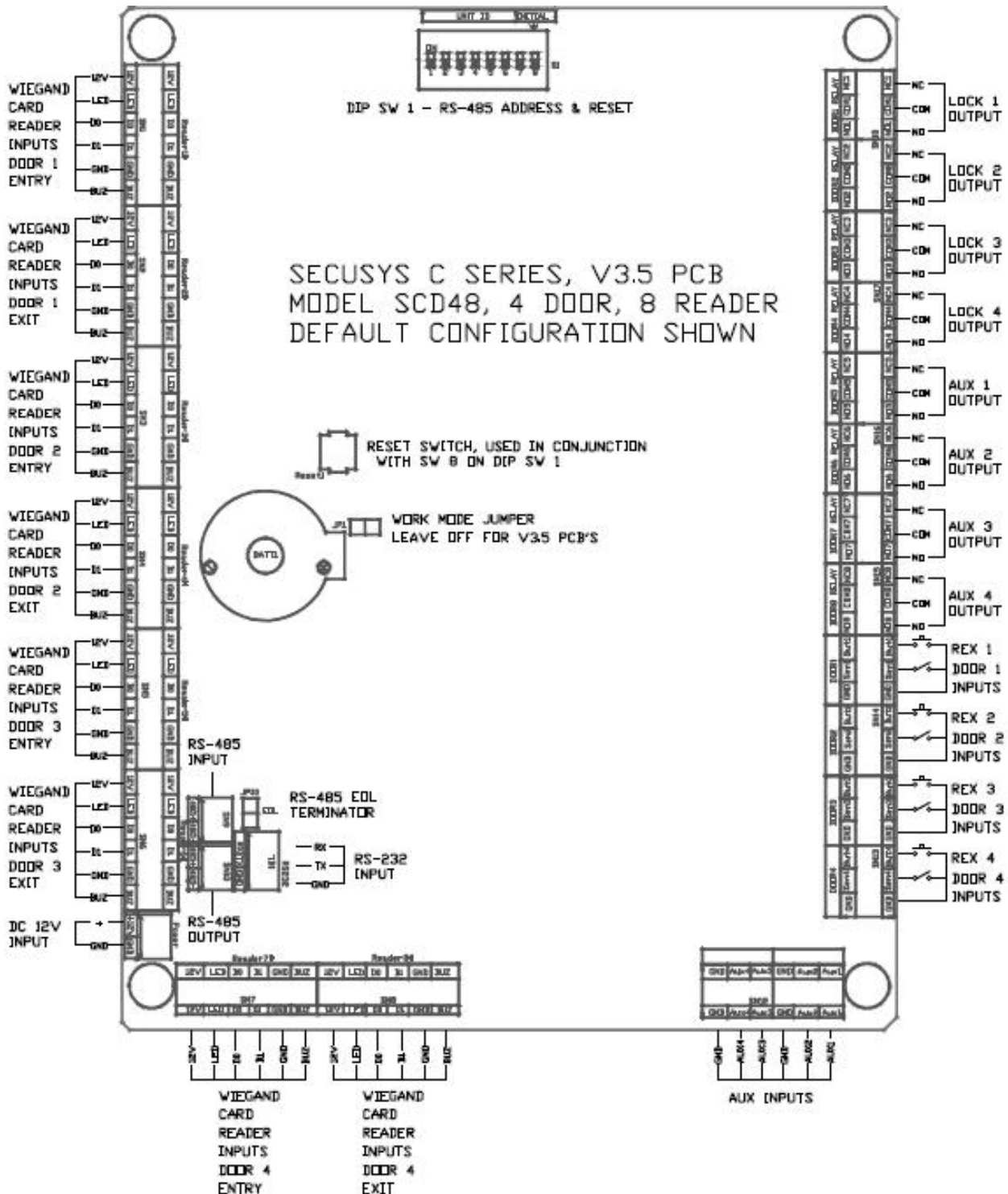


Figure 5-5-1

5.6 SCD88 (V3.5 PCB)

The SECUSYS Model SCD88 is an eight door controller that has 8 readers for entry with REX buttons for exit.
(figure 5-6-1)

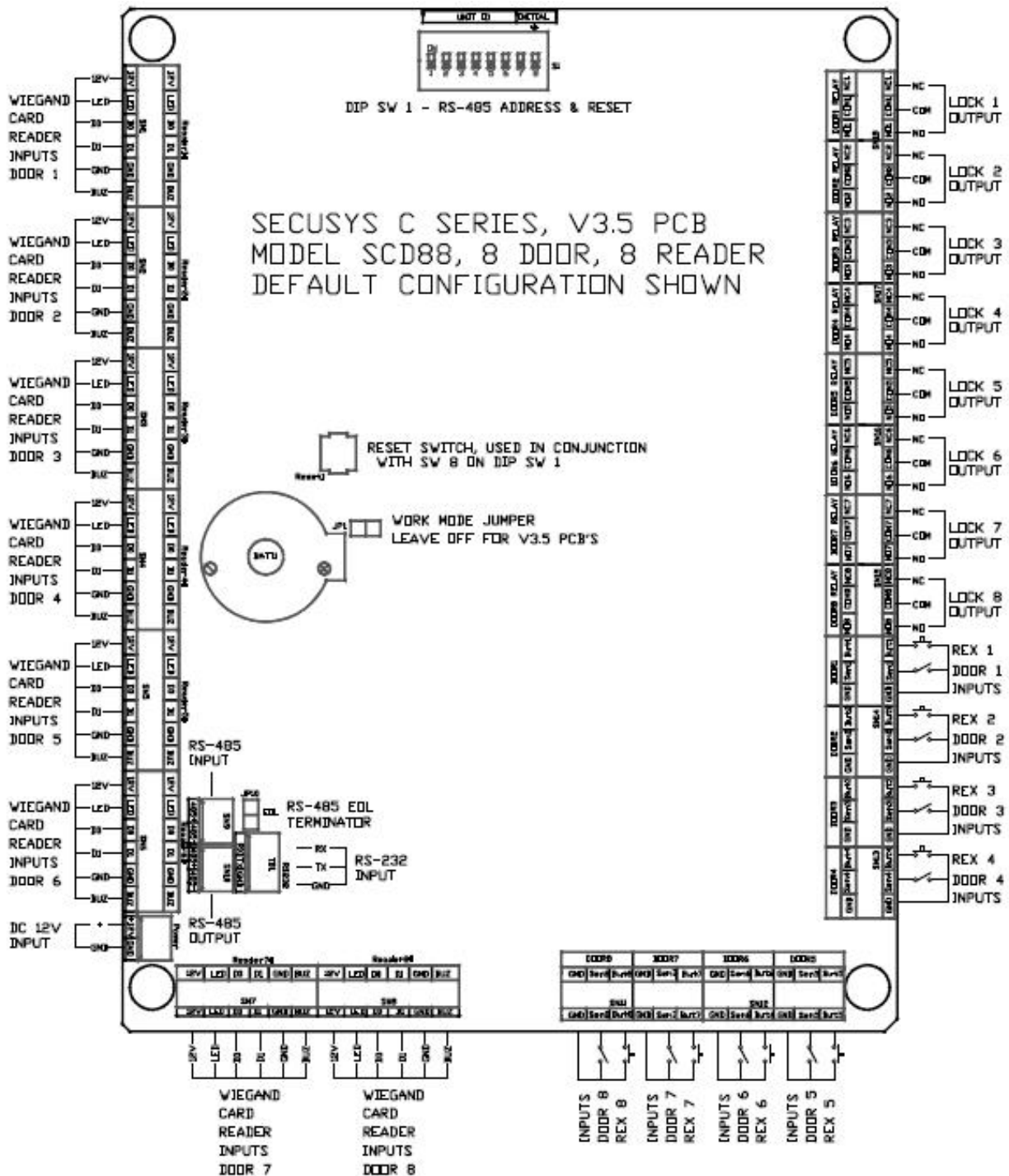


Figure 5-6-1

5.7 SCD12T (V4 PCB)

The SECUSYS Model SCD12T is a single door controller (TCP/IP enabled) used with 2 readers, an IN and an OUT reader to give bi-directional access control (figure 5-7-1)

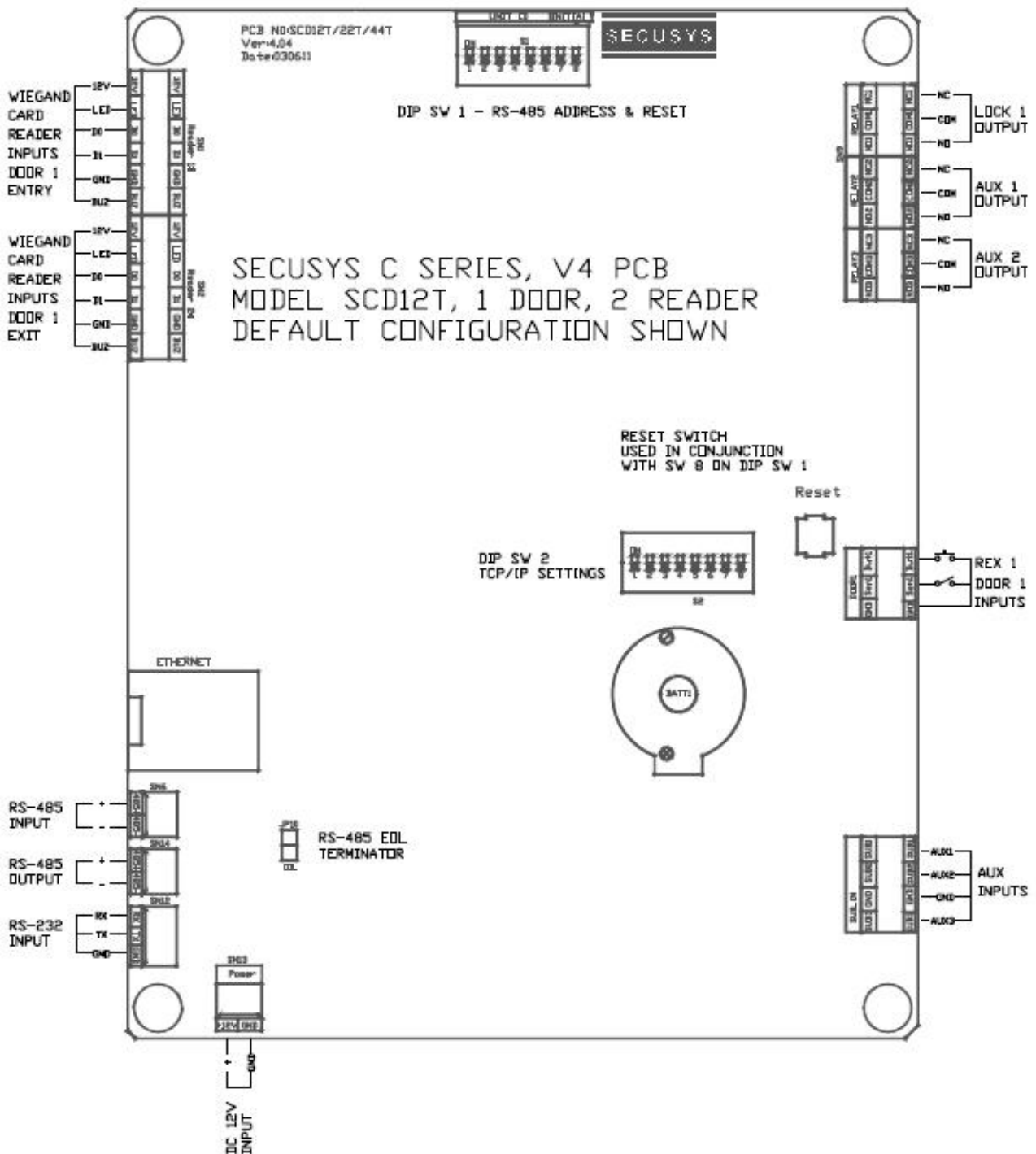


Figure 5-7-1

5.8 SCD22T (V4 PCB)

The SECUSYS Model SCD22T is a dual door controller (TCP/IP enabled) that by default uses 2 readers for entry with REX buttons for exit, but can be software configured to provide an IN and an OUT reader to give bi-directional access control (figure 5-8-1)

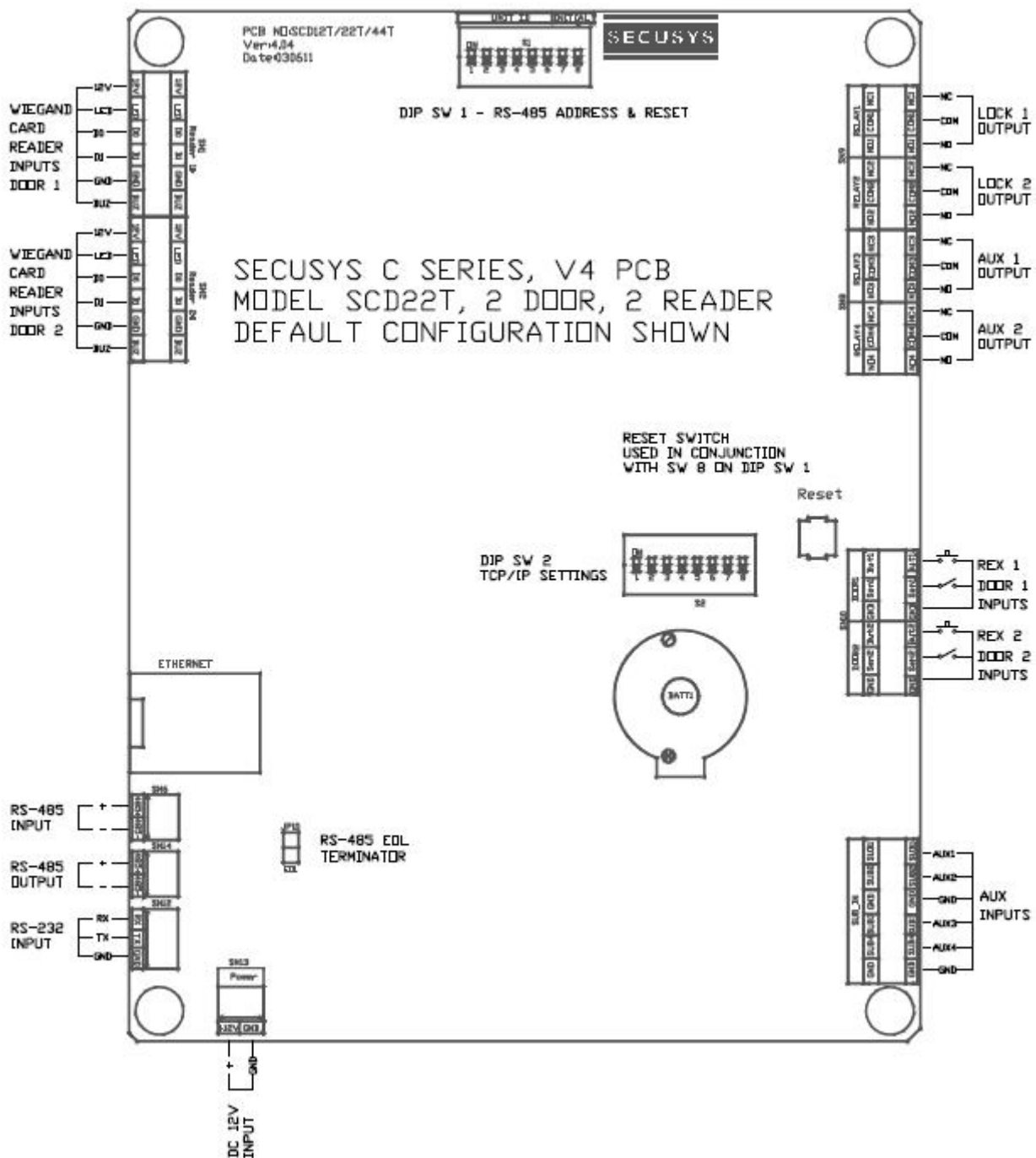


Figure 5-8-1

5.9 SCD44T (V4 PCB)

The SECUSYS Model SCD44T is a 4 door controller (TCP/IP enabled) that by default uses 4 readers for entry with REX buttons for exit, but can be software configured to provide 2 sets of IN and an OUT readers to give 2 doors bi-directional access control (2 x SCD12T) (figure 5-9-1)

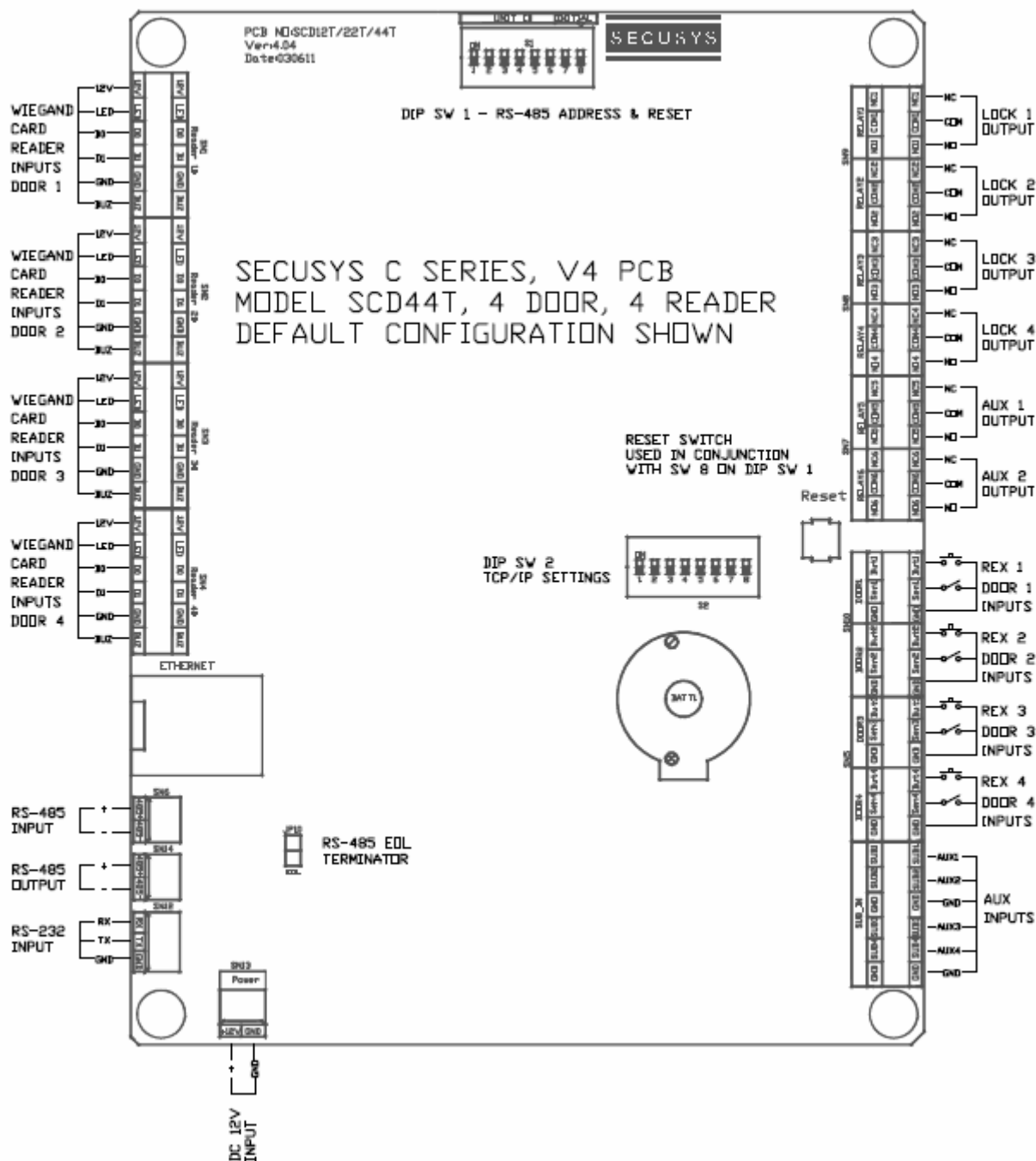


Figure 5-9-1

5.10 SCD48T (V4 PCB)

The SECUSYS Model SCD48T is a four door controller (TCP/IP enabled) that has 4 readers for entry with 4 readers for exit. (figure 5-10-1)

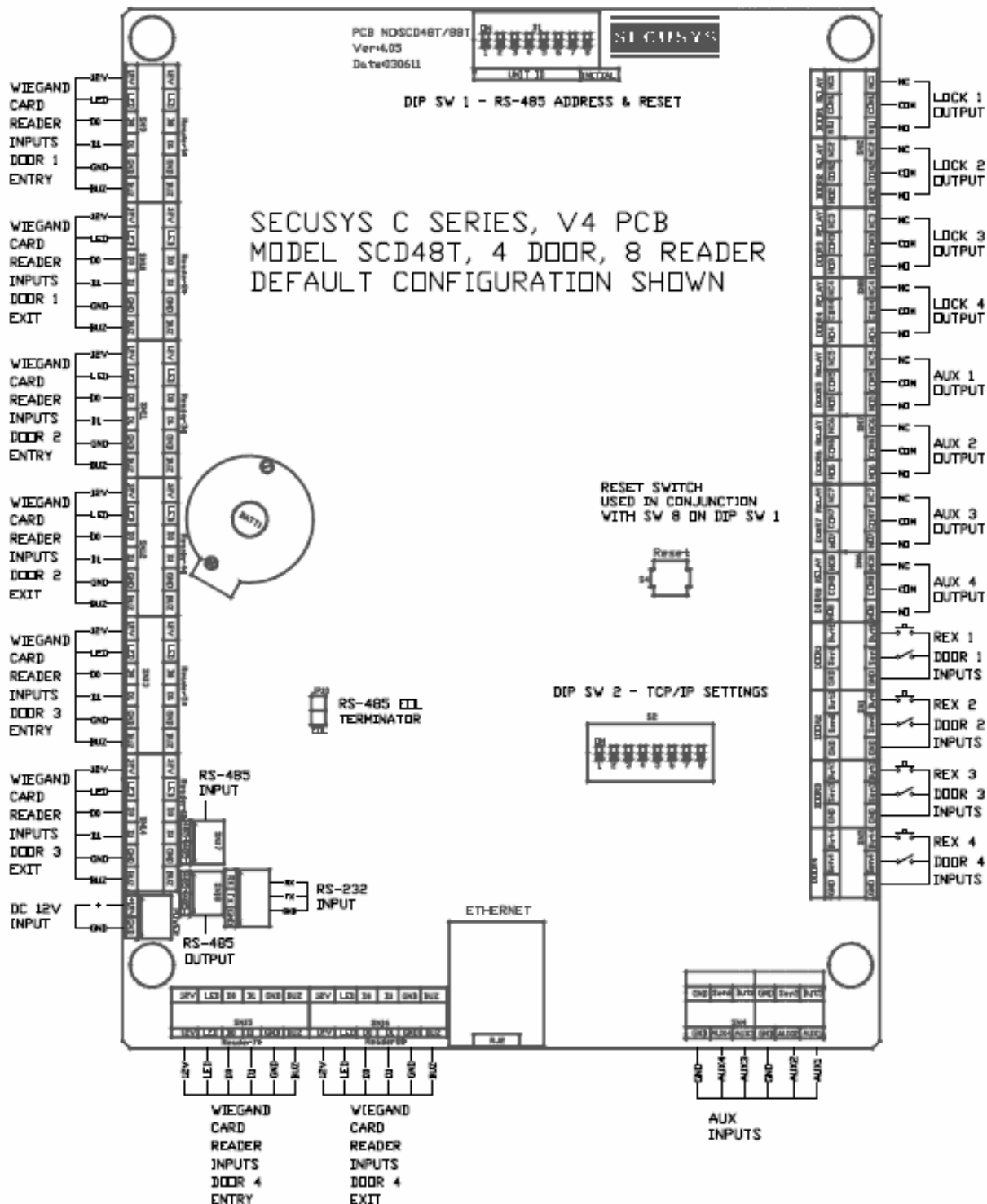


Figure 5-10-1

5.11 SCD88T (V4 PCB)

The SECUSYS Model SCD88T is an eight door controller (TCP/IP enabled) that has 8 readers for entry with REX buttons for exit. (figure 5-11-1)

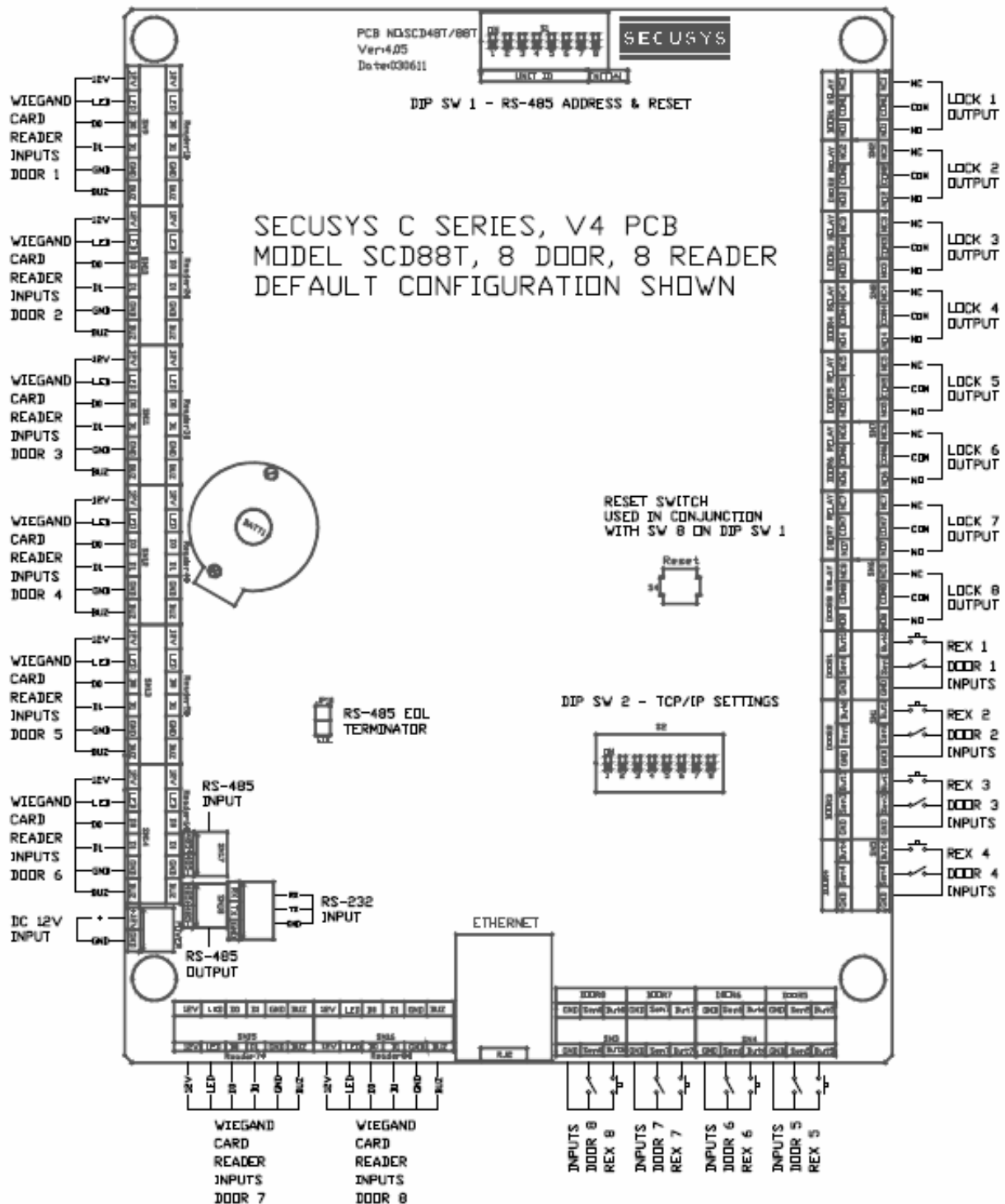
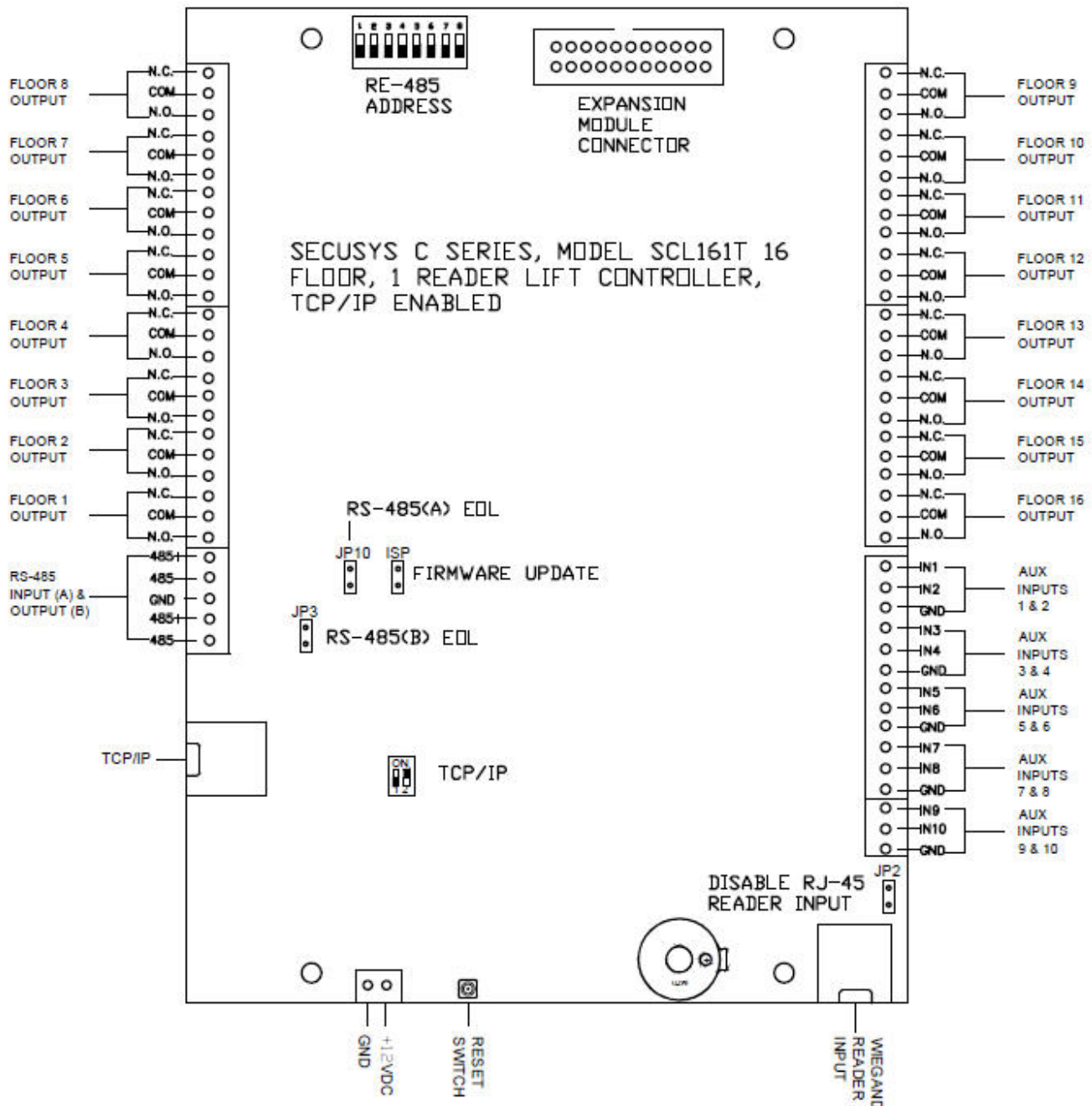


Figure 5-11-1

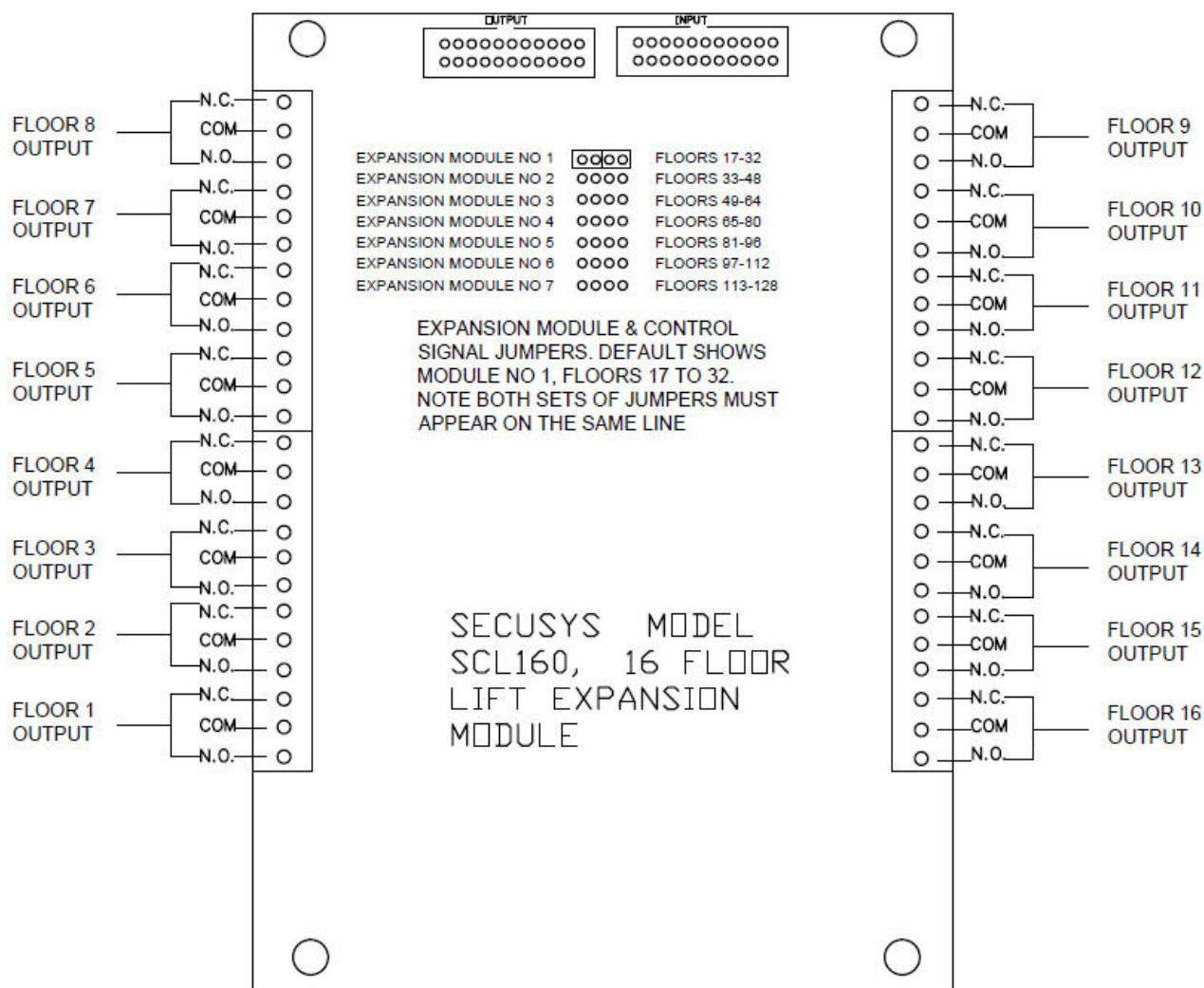
5.12 SCL161T Lift Controller

The SCL161T is a 16 Floor, 1 reader TCP/IP enabled controller compatible with both the V3.5 Economy and V4 Advanced range of SECUSYS C Series access controllers. The SCL161T can by itself control 16 floors with no additional hardware. When used with the SCL160 modules, the SCL161T controller can control access to up to 128 floors



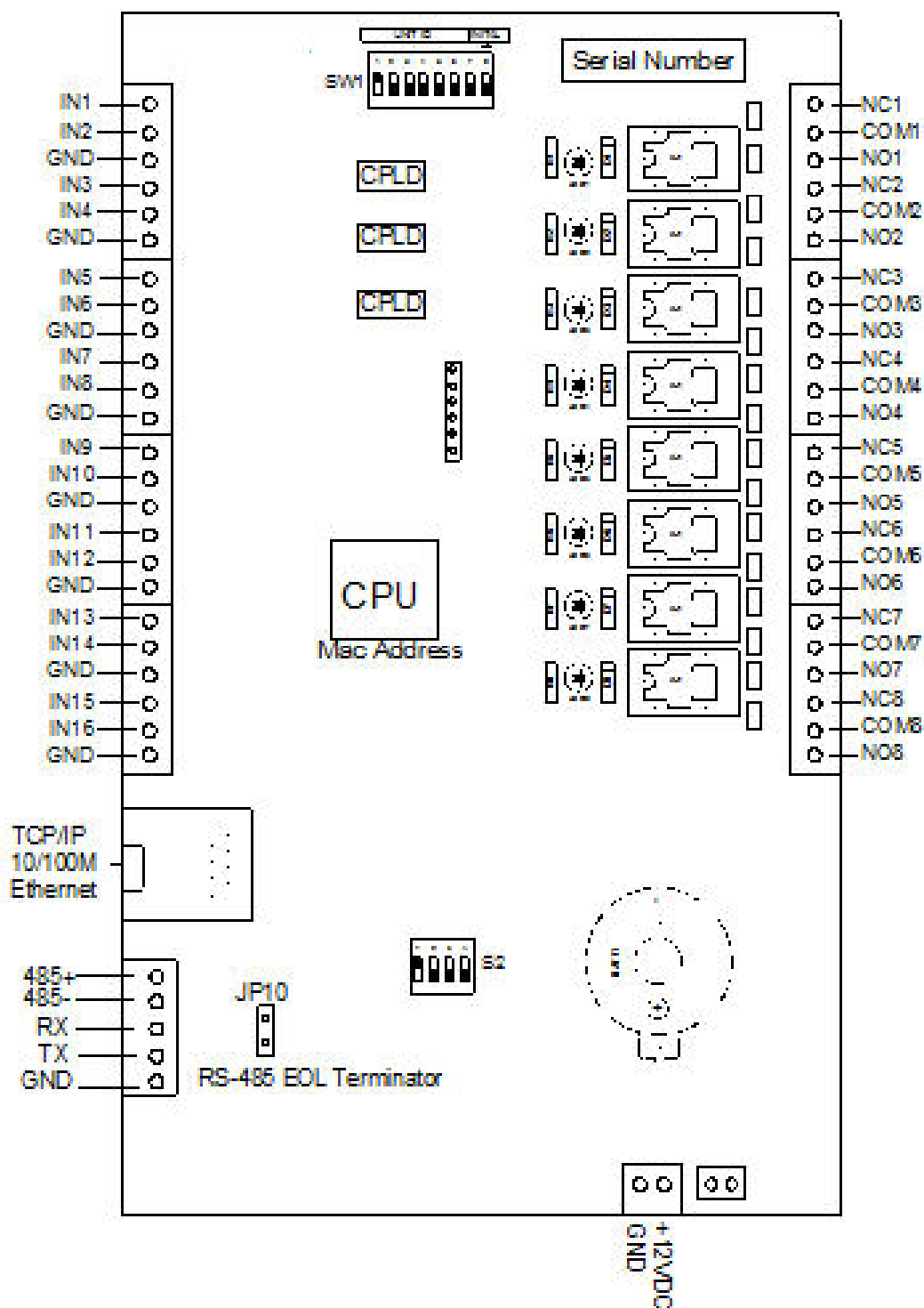
5.13 SCL160 Lift Module

The SCL160 is a plug in module that increases the base 16 floors provided by the SCL161T controller by another 16 floors. Connecting via a daisy chain ribbon cable, up to 7 SCL160 lift modules can attach to a SCL161T controller. With each SCL160 lift module supporting 16 floors, a SCL161T lift controller with 7 x SCL160 modules can support 128 floors. If only a single module is required to give a total of 32 floors, then this module can be piggybacked on top of the SCL161T.



5.14 SCIO168T Input/Output Controller

The SCIO168T is a 16 Input and 8 Output TCP/IP enabled controller compatible with both the V3.5 Economy and V4 Advanced range of SECUSYS C Series access controllers.



5.15 Controller Dipswitches

Both the V3.5 and V4 controllers have Dip Switches for the controller configuration. The V3.5 hardware PCB's have a single 8 way switch while the V4 hardware PCB's have 2 x 8 way dip switches.

5.15.1 Dip Switch 1

S1 or Dip Switch 1 is a blue 8 way Dip Switch located at the top of the PCB in the centre. This switch is identical on both the V3.5 and V4 hardware. This switch is used for two functions, the controllers RS-485 address and for setting the initialization. When using RS-485 each controller must have its own ID selected by DIP Switches S1-S7. A "0" address is invalid. The 1st 7 switches of Dip Switch 1 are used for setting the RS-485 ID address using Binary. When the switch is ON this means a 1, when it is OFF it means a 0. The 1st position is a 1, the 2nd a 2, the 3rd a 4, the 4th a 8, the 5th a 16, the 6th a 32 and the 7th a 64. So if all these 7 switches are on it means an address of: $1 + 2 + 4 + 8 + 16 + 32 + 64 = 127$. So the largest address is "111111" in Binary which is 127 in decimal (figures 3-8-1-1 & 3-8-1-2) (figures 3-10-1-1 & 3-10-1-2)

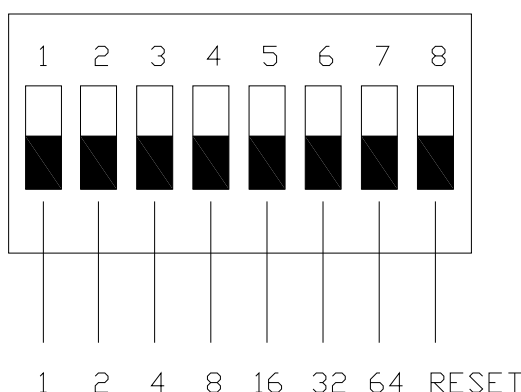


Figure 5-15-1-1

Switches 1 to 7 = RS-485 address, Sw 8 = Cold/Hot Reset

DIP
Switch 1
(RS-485)

DIP ID \	1	2	3	4	5	6	7	8	
1	ON							Status	Reset
2		ON						ON	COLD
3	ON	ON							
.....								OFF	HOT
127	ON	ON	ON	ON	ON	ON	ON		

Figure 5-15-1-2

Note: You must have a RS-485 address of at least 1

Switch 8 of DIP Switch 1 is used when resetting the controller and selects either a "COLD" or a "HOT" reset. A "HOT" reset (switch 8 off) restarts the program, a "COLD" reset (switch 8 on) clears all memory and restarts the program (figure 5-15-1-2).

5.15.2 Dip Switch 2

S2 or Dip Switch 2 is the 2nd dip switch on the controllers and this is located on the bottom half of the PCB. The V3.5 hardware has no switch because it cannot be connected directly to a TCP/IP network. The V4 hardware has a blue 8 way switch. S2 is used to control the TCP/IP communication settings and the diagram below shows the dip switch settings for normal use.(figure 5-15-2-1).

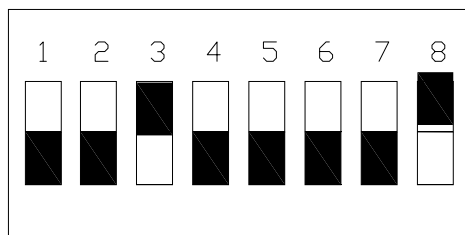


Figure 5-15-2-1

The functions for Dip Switch 2 are detailed below (figure 5-15-2-1)

Switch	State	Function Description	Details
DIP 1	OFF	Write Protect	Parameters including Password, IP, Host IP cannot be changed.
	ON	Configurable, Writeable	All parameters can be changed.
DIP 2	OFF	Normal	
	ON	Force the IP of the converter to the default IP of 10.1.1.10	When the IP address of the controller is not known, switch DIP2 to on. The IP address will default to 10.0.0.10, and the user name & password will default to system & system
DIP 3	OFF	ARM_JTAG	Update Firmware only
	ON	Normal	Normally ON.
DIP 4	OFF		Should be OFF
	ON		
DIP 5	OFF		Should be OFF
	ON		
DIP 6	OFF		Should be OFF
	ON		
DIP 7	OFF		Should be OFF
	ON		
DIP 8	OFF	Disable WDT (Watchdog)	
	ON	Enable WDT	Normal

Figure 5-15-2-2

The Lift Controller and the Input/Output Controller have a 2 and 4 position dip switch for the TCP/IP instead of the 8 position switches on the V3.5 and above door controllers. However the 1st 2 positions on the respective dip switches are the same as the diagram above (figure 5-15-2-2).

5.16 Controller Jumpers

Both the V3.5 and V4 controllers have Jumpers for the controller configuration, refer the diagrams in Chapter 5 for the exact locations.

5.16.1 EOL Terminator Jumper

At the bottom left of both the V3.5 and V4 PCB's next to the white RS-485 connectors is a jumper marked "EOL." This jumper inserts a 120 ohm resistor across the RS-485 line and should only be applied if the controller is at the end of the RS-485 line.

5.16.2 Work Mode Jumper

At the centre left of the V3.5 PCB's is a Reset Switch. Adjacent to the Reset Switch is a jumper marked "Work Mode" which switches the controller between a RS-485 mode and a TCP/IP mode. On the V3.5 boards this jumper should always be off as there is no TCP/IP work mode on the V3.5 hardware. This jumper is not present on the V4 boards.

Chapter 6 – V4 PCB's

6.1 Overview

The SECUSYS V4 controllers are an advanced 32 bit controller and offer many features over the economical V3.5 series. One advantage is that they have a true 100MBit on board Ethernet port and as such can be directly connected to a TCP/IP network without the need for an additional protocol convertor. This also means that they can be configured by using a standard internet browser.

6.2 Ethernet Interface

The Ethernet Interface uses a standard RJ45 socket with 2 x built in LED's (figure 9-2-1). The controller uses an auto sensing TCP/IP interface so the cable between the controller and the PC or Switch HUB can be a crossover or straight through cable.

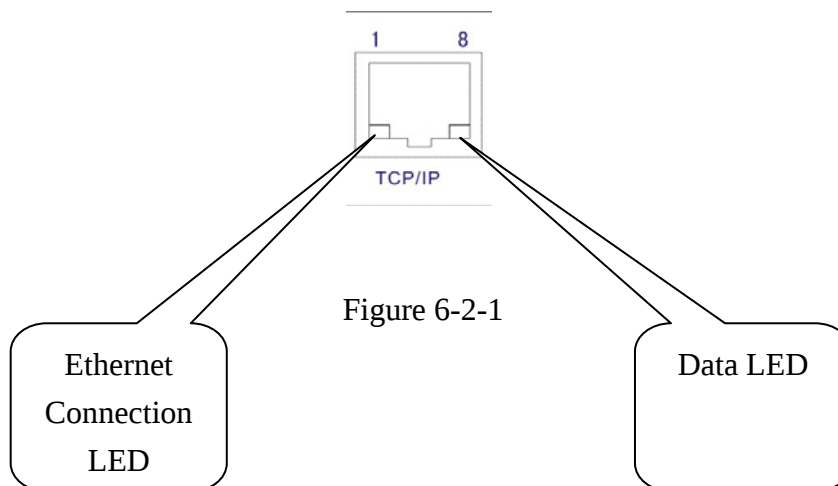


Figure 6-2-1

Ethernet LED: When the cable is connected between the controller and a Switch HUB or PC, the Ethernet ID will be lit.

Data LED: When the cable is connected between the controller and a Switch HUB or PC and data is being transferred, the Data LED will flash.

6.3 Connecting via a Browser

Before connecting to a controller via a browser there are several things that need to be known:

The IP address. The default IP address when shipped from the factory is **192.168.1.100**.

The PC and controller are connected to the same TCP/IP subnet, ie the PC's IP address is 192.168.1.2 or similar

The controller is powered up.

Open an Internet browser and type the current IP address of the V4 controller. <http://192.168.1.100>. The following image will appear (figure 6-3-1). Logon with SECUSYS as the user name and secusys as the password and if the login is successful the Status & Configuration screen will appear (figure 6-3-2)

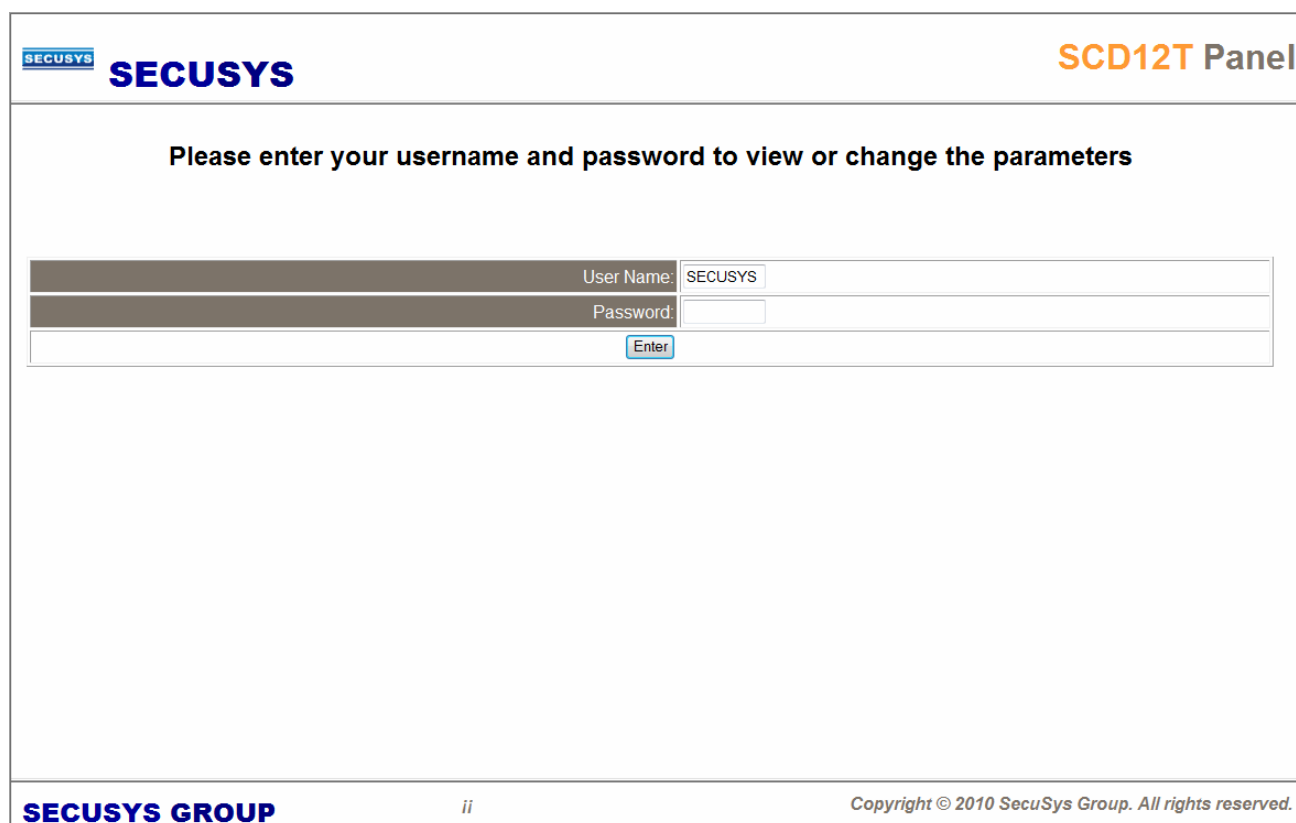
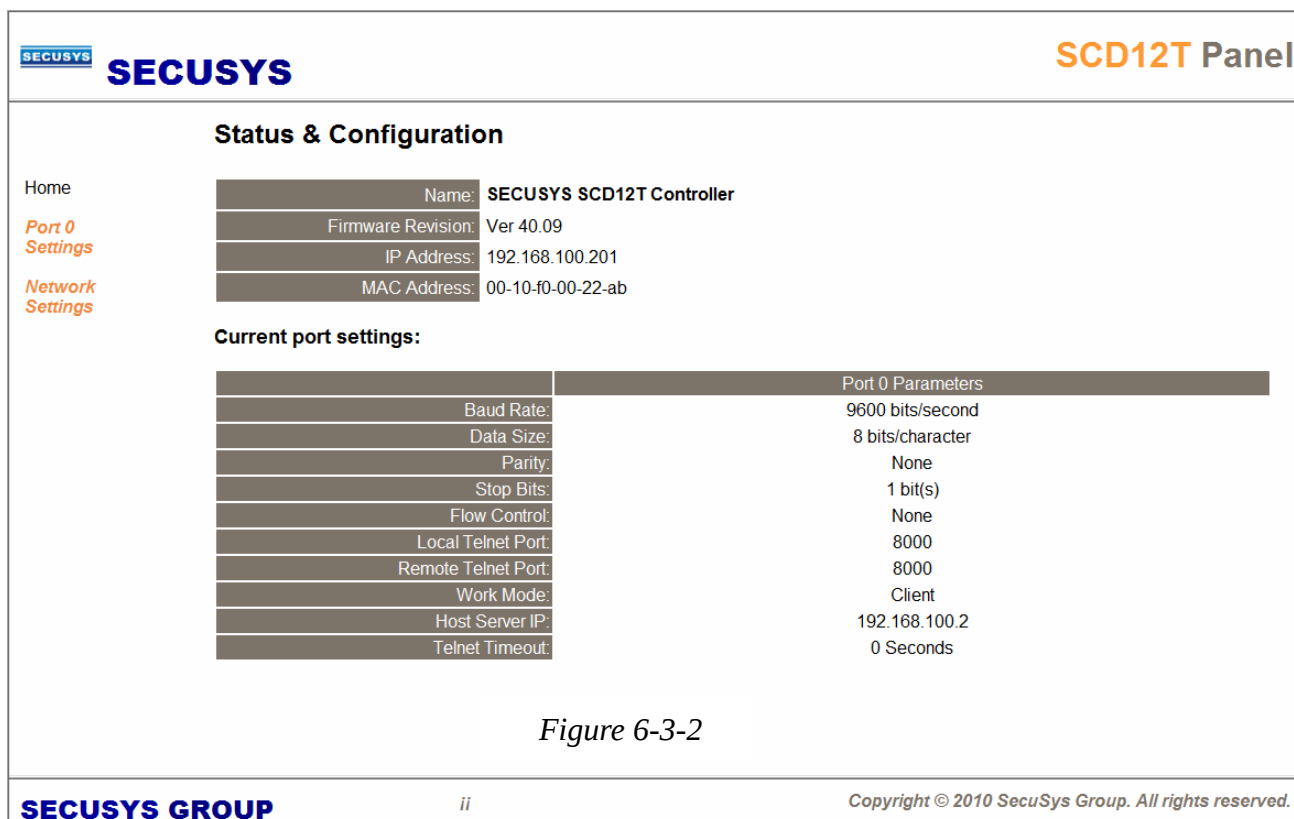


Figure 6-3-1

There are 4 navigation menus on the left hand side of the screen. These are:

- “HOME”: Homepage.
- “Port0 Settings”: Serial COM Port Parameters.
- “Network Settings”: Network Parameters.



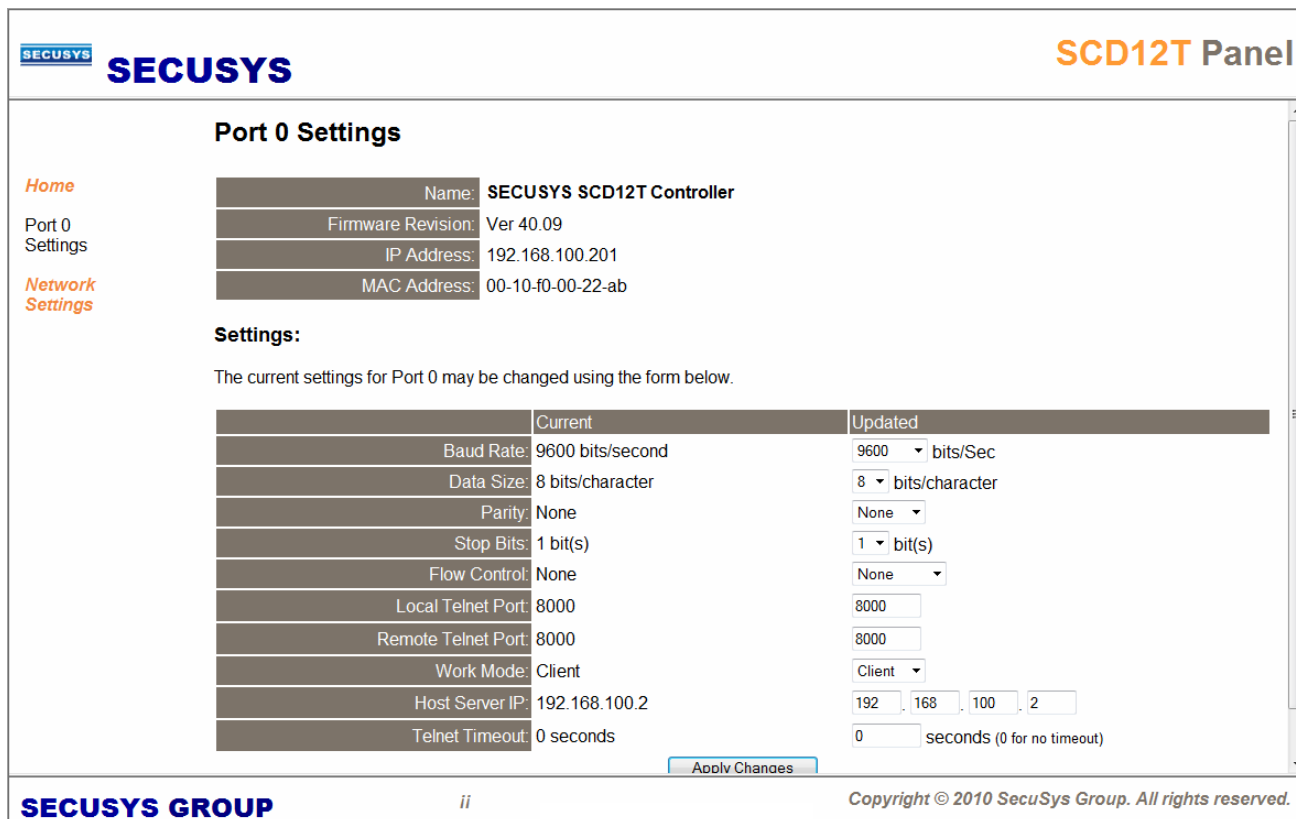
Status & Configuration

<u>Name:</u>	Controller name, eg SECUSYS SCD12T Controller ;
<u>Firmware Revision:</u>	SCD12T firmware version.
<u>IP Address:</u>	The current SCD12T IP address, ie 192.168.1.100 (default value).
<u>MAC Address:</u>	Every Ethernet based controller has a unique fixed Mac Address.

Current Port Settings

<u>Baud Rate:</u>	Default value is 9600bps
<u>Data Size:</u>	Data Length, default value is 8 bits
<u>Parity:</u>	Odd/Even Parity, default is None.
<u>Stop Bits:</u>	Default is 1 bit
<u>Flow Control:</u>	Default is None.
<u>Local Telnet Port:</u>	The Local Port of the SCD12T, default value is 8000
<u>Remote Telnet Port:</u>	The Host Port, default value is 8000
<u>Work Mode:</u>	TCP/IP or Client, default is Client.
<u>Server IP:</u>	Host IP (default is 192.168.1.11).
<u>Telnet Timeout:</u>	Default is 0.

Click “Port0 Settings” (figure 6-3-2) to open the Port) settings screen (figure 6-3-3)



SECUSYS SCD12T Panel

Port 0 Settings

Home
Port 0 Settings
Network Settings

Name: SECUSYS SCD12T Controller
Firmware Revision: Ver 40.09
IP Address: 192.168.100.201
MAC Address: 00-10-f0-00-22-ab

Settings:

The current settings for Port 0 may be changed using the form below.

	Current	Updated
Baud Rate:	9600 bits/second	9600 bits/Sec
Data Size:	8 bits/character	8 bits/character
Parity:	None	None
Stop Bits:	1 bit(s)	1 bit(s)
Flow Control:	None	None
Local Telnet Port:	8000	8000
Remote Telnet Port:	8000	8000
Work Mode:	Client	Client
Host Server IP:	192.168.100.2	192 . 168 . 100 . 2
Telnet Timeout:	0 seconds	0 seconds (0 for no timeout)

Apply Changes

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Figure 6-3-3

Port 0 Setting (Serial COM Port):

<u>Baud Rate:</u>	Default value is 9600bps
<u>Data Size:</u>	Data Length, default value is 8 bits
<u>Parity:</u>	Odd/Even Parity, default is None.
<u>Stop Bits:</u>	Default is 1bit
<u>Flow Control:</u>	Default is None.
<u>Local Telnet Port:</u>	The local Port of 7-4-8T, default value is 8000
<u>Remote Telnet Port:</u>	The Host Port, default value is 8000
<u>Work Mode:</u>	Work Mode, TCP/IP or Client, default is Client.
<u>Host Server IP:</u>	The Host Server IP address (the PC running the SECUSYS software).
<u>Telnet Timeout:</u>	0 seconds is default (No timeout).

“Apply Changes”: Click on the Apply Changes button to apply all changes.

Click “Network Settings” (figure 6-3-2) to open the Network settings screen (figure 6-3-4)



SECUSYS

SCD12T Pane

Home

Port 0 Settings

Network Settings

Miscellaneous Settings

Name:	SECUSYS SCD12T Controller
Firmware Revision:	Ver 40.09
IP Address:	192.168.100.201
MAC Address:	00-10-f0-00-22-ab

IP Address Selection

Address Type:	Static IP
Static IP Address:	192 . 168 . 100 . 201
Subnet Mask:	255 . 255 . 255 . 0
Default Gateway:	0 . 0 . 0 . 0

Username and Password

User Name:	SECUSYS
Old Password:	
New User Name:	
New Password:	
Confirm Password:	

General Configuration Settings

Module Name:	SECUSYS SCD12T Controller
UPnP port number:	6911

Restore Factory Defaults

SECUSYS GROUP

ii

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Figure 6-3-4

IP Address Selection

Address Type: “DHCP/Auto IP”: Dynamic IP, The controller will get an IP address automatically by the DHCP service of the router. **This mode of operation is not recommended.**
 “Static IP”: Fixed IP.

Static IP address: The IP Address of the controller, 192.168.100.201

Subnet Mask: For example: 255.255.255.0;

Default Gateway: Gateway of this subnet, eg 192.168.100.1.
"Update Settings": After any details have been changed, click "Update Settings" to save the configuration.

User Name and Password

User Name: The current user name for logging onto the controller using a browser
Old Password: The current password
New User Name: The new user name for logging onto the controller using a browser
New Password: The new password
Confirm Password: The new password again
"Change Password": After the details have been changed, click "Change Password" to save the changes.

General Configuration Settings

Module Name: The controller name, this can be modified by the user.
UPnP Port number: Default value is 6911
"Update Settings": After any details have been changed, click "Update Settings" to save the configuration.

Restore Factory Defaults Click the "Restore Defaults" button to default the controller.

If the IP address of the controller is not known or the default IP address of 192.168.1.100 has been change, or, the password is not known then follow the steps below: Prior to installation please ensure that if there are multiple TCP/IP enabled controllers on the same network they have different IP addresses.

6.4 Setting a New IP Address

If the password and the IP address of the controller is known, proceed with the previous section. If the Password and/or IP address is not known then proceed with the following:

1. Take a note of the controller dip switch settings for S2, then move DIP1 and DIP2 of S2 to ON, with DIP3 and DIP4 OFF. Repower to read the new settings
2. Setup the IP address of the PC to 10.1.1.X, with X being any number from 1 to 254 except 10. Make a note of the current IP address settings before changing these.
3. Open the Windows Browser, and type <http://10.1.1.10>, the following image will appear (figure 6-4-1) Note the highlighted IP address.
4. Log on using the original default login of system for the user name and system for the password
5. Click "Network Settings", and enter a new user name and password. Use system and system as the old user name & password.
6. Also under Network Settings allocate the controller a static IP Address that is on the same subnet as the computer is normally on, for example 192.168.1.100. Then click "Update Settings". A message will

appear to say that the software “Cannot find the page”.

7. Return the controller dip switches to the previous settings.
8. Reset the computers IP address back to what it was previously, open a browser and type the new controllers address into the browser and press enter. The controller home page should appear.

If for any reason the browser cannot find or connect then open the SECUSYS software and search using the TCP/IP settings submenu option of on the Setup, hardware menu.

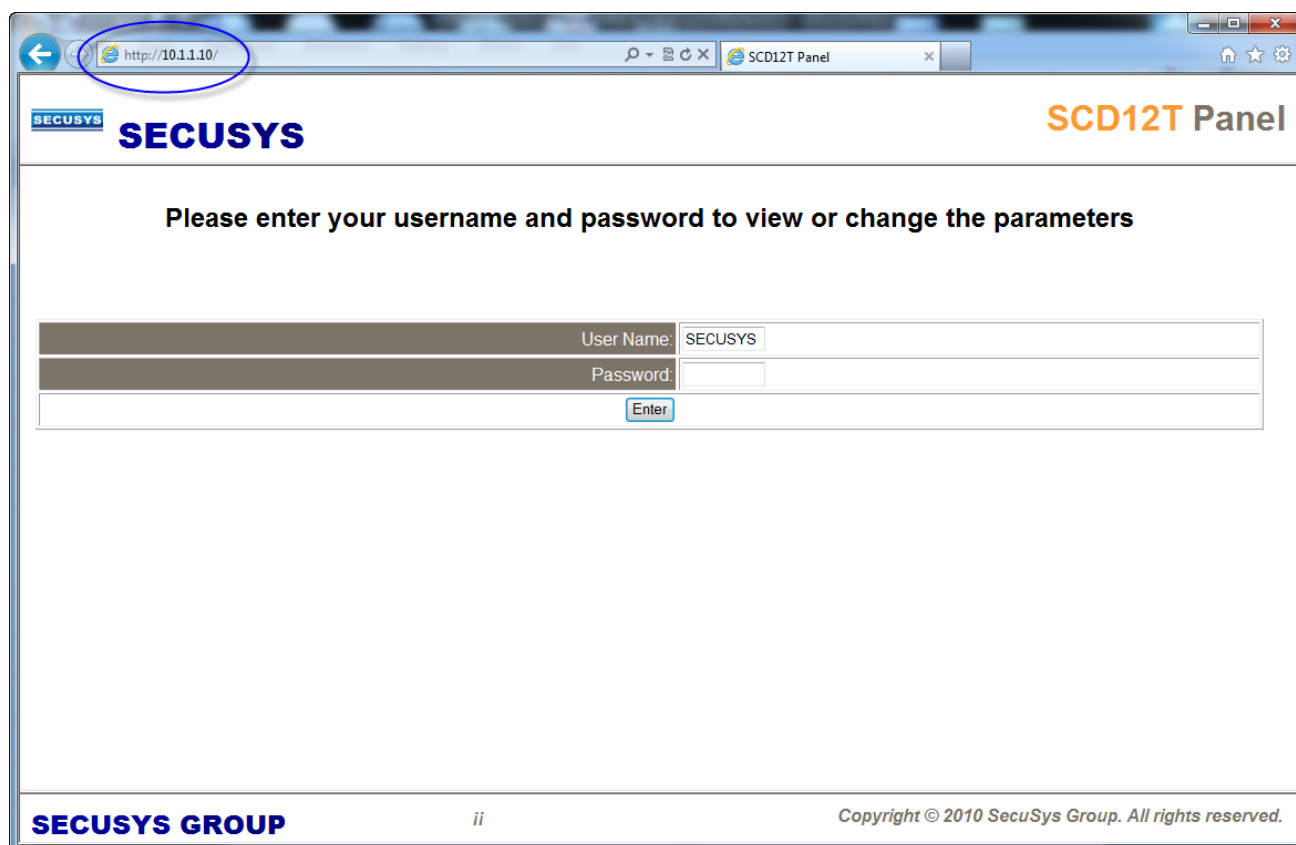


Figure 6-3-5

Chapter 7 – Protocol Convertors

7.1 PTC USB-232/485 Protocol Converter

The PTC USB-232/485 Protocol Converter is used to convert USB or RS-232 serial port data to RS-485 (figure 7-1-1). It enables 1 x USB or serial port to communicate with 127 controllers via RS-485. It is used with Option 2, Section 3.3.1 earlier this chapter. The maximum distance of the RS-485 line is 1.2 km, 4000 feet, from the converter to the last controller. The maximum distance that the converter can be away from the PC USB port is 1 meter and the maximum distance from the PC serial port is 15 m, 50 feet. The same diagram and settings as the PTC 232/485 apply (see next section) except that the PTC USB-232/485 unit has a USB input in addition to the RS-232 input.

Note: The DB9 cannot be connected directly to the computer otherwise damage will result. Use the supplied connection lead.



Figure 7-1-1

Driver Setup

Drivers must be loaded before the PTC USB-232/485 Protocol Converter can be used. The drivers are available on the SECUSYS ftp site. Connect the PTC USB-232/485 Protocol Converter to a spare USB port on the computer using the USB connection cable. The computer should find the new hardware and display the Found New Hardware Wizard screen. Tick “No, not this time then click Next. (figure 7-1-2)



Figure 7-1-2

Select the Automatic install option and click “Next”. (figure 7-1-3)

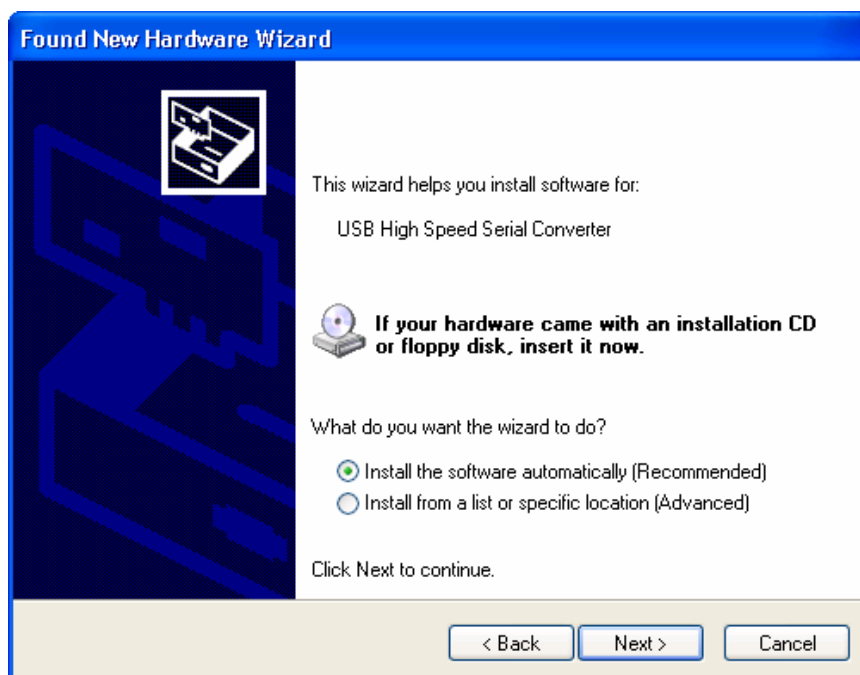


Figure 7-1-3

If the Hardware Installation warning screen appears then select the Continue Anyway button. (figure 7-1-4)



Figure 7-1-4

Windows will now install the drivers for the serial converter. Once complete the Finish Screen will appear. Click Finish to complete the driver installation. (figure 7-1-5)



Figure 7-1-5

Windows will now install the COM Port Emulation Driver. The procedure is the same for the serial converter installation.

Once complete the Found New Hardware wizard will display the following message. (figure 7-1-6)

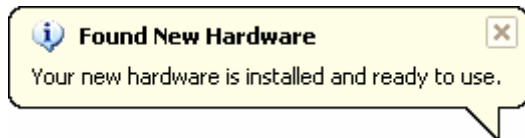


Figure 7-1-6

Windows now needs to be checked to make sure that the converter has been correctly recognized and to find the Serial Com Port that Windows has allocated the device. Open the Control Panel, select and open Device Manager, click the Hardware Tab and click Device Manager. The device should appear under the Ports setting with the label USB Serial Port with the Com Port in brackets. (figure 7-1-7)

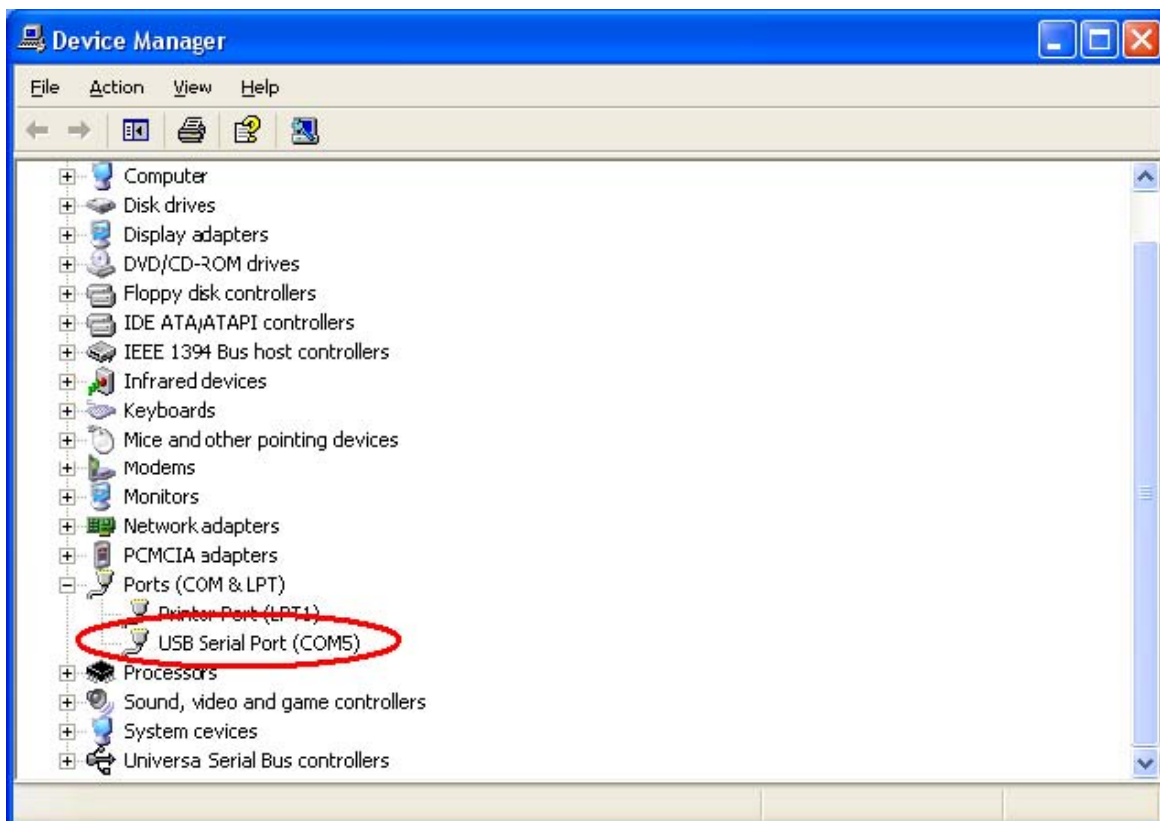


Figure 7-1-7

7.2 PTC 232/485 Protocol Converter

The PTC 232-485 Protocol Converter is used to convert RS-232 serial port data to RS-485 data for use with the SECUSYS controllers (figure 7-2-1). It enables 1 x serial port to communicate with up to 127 controllers via RS-485. It is used with Option 2, Section 3.3.2 in chapter 3. The maximum distance of the RS-485 line is 1.2 km, 4000 feet, from the converter to the last controller. The maximum distance that the converter can be away from the PC serial port is 15 m, 50 feet.



Figure 7-2-1

Dip Switch Settings

A 4 way dip switch allows baud rate configuration and data format selection. Dip switches 1-3 are used to set the baud rate, (figure 7-2-2) and dip switch 4 is used to set the data format selection, (figure 7-2-3). 9600 baud is the default setting for the baud rate and “ON” is the default setting for the Data Format Switch.

Baud rate (bps)	DIP 1	DIP 2	DIP 3	Baud rate (bps)	DIP 1	DIP 2	DIP 3
300	OFF	OFF	OFF	4800	OFF	OFF	ON
600	ON	OFF	OFF	9600	ON	OFF	ON
1200	OFF	ON	OFF	19200	OFF	ON	ON
2400	ON	ON	OFF	38400	ON	ON	ON

Figure 7-2-2

Switch	State	Function Description:
DIP 4	OFF	Standard 11 bits transmitting mode (8,1,1,n modes)
	ON	Auto-checking data bits (default setting).

Figure 7-2-3

7.3 PTC TCPIP-485 Protocol Converter

The SECUSYS PTC TCPIP-485 Protocol Converter (figure 7-3-1) is used to convert TCP/IP data to RS-485. The PTC TCPIP-485 unit allows 1 x TCP/IP address to communicate with 127 controllers via RS-485. It is used with Section 3.5, Option 4 in Chapter 3. The maximum distance of the RS-485 line is 1.2 km, 4000 feet. The maximum distance that the converter can be away from the TCP/IP hub or switch is 100m



Figure 7-3-1

Dip Switch Settings

A 4 way dip switch allows the installer to configure the converter, (figure 7-3-2)

When using the PTC TCPIP-485 converter with the SECUSYS C Series controllers and the SECUSYS 2000 software, DIP SW 1,2 and 3 should be OFF.

Switch	State	Function
DIP 1	OFF	Write Protect
	ON	Configurable
DIP 2	OFF	Normal Status
	ON	Reset the IP to the default (10.1.1.10)
DIP 3	OFF	Not Used
	ON	Not Used
DIP 4	OFF	Normal
	ON	Restart

Figure 7-3-2

7-4 HUB 485-232

The HUB 485-232 is a RS-485 Hub with either RS-232 or RS-485 inputs (figure 7-4-1) It provides 4 x RS-485 lines, each line can have up to 127 controllers. The RS-485 Hub/Repeater has two modes of operation.



Figure 7-4-1

The 1st mode is that it is a RS-485 Repeater. In this mode it can be used to extend the distance of a RS-485 line from the 1.2 km maximum (4000 ft) for another 1.2 km. Up to 2 x RS-485 Hub/Repeaters may be cascaded on the same RS-485 line.

The 2nd mode is as a splitter. RS-485 communications are designed to be in a multi drop or daisy chain configuration. However, in some instances it may be impractical to run cables in a daisy chain configuration and a star type configuration would be more convenient. When used in this mode it can offer 4 x RS-485 lines.

The HUB 485-232 uses an external 9-12V DC power supply. Every RS485 line has a communication status LED which blinks for normal communication and turns red when there's a communication problem with the controllers.

7.5 PTC W-232/485

The PTC W-232/485 is a Protocol Converter to convert Wiegand data to RS-232 or RS-485. It is suitable for converting Wiegand data up to 72 bits (figure 7-5-1). The PTC W-232/485 is a bi-directional device.



Figure 7-5-1

Specifications

<u>Power:</u>	7 – 15V DC, 500ma
<u>Protocol:</u>	RS-232 Baud Rate: 9600bps , Data Format: 1 + 8 + 1
<u>Current:</u>	Static 35mA Operating: 40mA.
<u>Operating Temperature:</u>	-14°C ~ +70°C.
<u>Humidity:</u>	10% ~90%
<u>Dimensions:</u>	90mm long x 60mm wide x 25mm high
<u>Max Distances:</u>	Wiegand Input or Output 60m, RS-232 15m

PIN Connections

Wiegand Data In (RJ45 Socket): (figure 7-5-2)

Pin	WG_Input	Description
Pin1	GND	Power Supply Ground
Pin2	GND	Power Supply Ground
Pin3	LED	LED Control
Pin4	N/A	Not Used
Pin5	D0	Data 0
Pin6	D1	Data 1
Pin7	+12V	12VDC, Power Supply for Reader
Pin8	+12V	12VDC, Power Supply for Reader

Figure 7-5-2

Wiegand Data Out (DB9, Male): (figure 7-5-3)

Pin	WG_Output	Description
Pin1	N/A	Not Used
Pin2	+12V	12VDC, Power Supply
Pin3	N/A	Not Used
Pin4	N/A	Not Used
Pin5	LED	Green LED Control
Pin6	GND	Power Supply Ground
Pin7	N/A	Not Used
Pin8	D0	Data 0
Pin9	D1	Data 1

Figure 7-5-3

RS-232/RS-485/RS-422 Out (DB9, Female): (figure 7-5-4)

Pin	RS-232	RS-485	RS-422
Pin1		485-	T-
Pin2	RX	485+	T+
Pin3	TX		R+
Pin4			R-
Pin5	GND	GND	
Pin6			
Pin7			
Pin8			

Figure 7-5-4

RJ-45 socket: (figure 7-5-5)

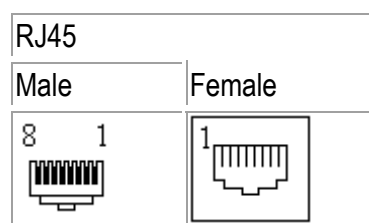


Figure 7-5-5

RS-232 Cable Connection

The below diagram shows the RS-232 connections between the PTC W-232/485 and a computer 9 PIN serial port (figure 7-5-6)

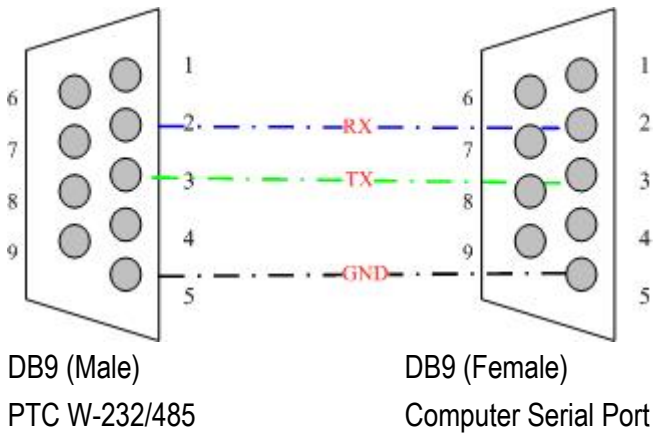


Figure 7-5-6

Work Modes

The PTC W-232/485 supports 3 type of work modes and these are RS-232, RS-485 and RS-422. The different work modes are configured by jumpers inside the metal case The default work mode is RS-232 (figure 7-5-7)

Model Jump	RS232	RS485	RS422
J1	485 422 ○ ○ ○	485 422 □ ○ ○	485 422 ○ □ ○
J2	232 422 □ ○ ○	232 422 ○ ○ ○	232 422 ○ □ ○
J3	232 485 □ ○ ○	232 485 ○ □ ○	232 485 ○ □ ○
J4	○ ○ 485---- 422 ●●	□ ○ 485---- 422 ●●	○ ○ 485---- 422 ●●

Figure 7-5-7

LED Indication

- PWR Power LED
- RX Receiving LED for Data from Wiegand Device
- TX Transmitting LED for Data to Access Controller

Communication Protocol

Data Format

0xa5 + 0xa5 + W Length (1B) + W Data (8B) + CRC16 Checksum(2B)

Head	Head	W Length (1Byte)	W Data (9 Bytes)	CRC16 (2 Bytes)
A5	A5	1A	00 00 00 00 00 00 E3 43 A7	85 9D

Notes:

The High Bit should be in front of the Low Bit.

Wiegand Data is always 72 bits (9 bytes), if you want to transfer 26 Bits only, add 46 x "0" in front of the data.

The PTC W-232/485 supports up to 72 Bits of Wiegand data.

PC and PTC W-232/485 will use the same data format to communicate.

Event Codes

Code(Hex)	Description	Remark
A1	Ok, Receive correct data	
A2	Fail to check CRC16, or W Length is wrong	

Notes:

The PTC W-232/485 will return to the PC these event codes after it receives data from the RS-232 interface.

The PC will not return event codes to the PTC W-232/485 after it sends data to the PC, unless another application sends this data by this serial port.

CRC16

CRC16 adopts the CCITT standard and the first value is 0xFFFF.

CRC16 will calculate the value from "W Length" to "W Data", the total is 10 bytes.

PTC W-232/485 Buffer

The PTC W-232/485 buffer will store the last card record.

If PC sends the string "A5 A5 00 00 00 00 00 00 00 00 00 00 E1 39" to the PTC W-232/485, then this means the PC wants to get the last card record from the PTC W-232/485.

After the PC takes the buffer data, the PTC W-232/485 will clear the buffer automatically.

If the PTC W-232/485 returns "A5 A5 00 00 00 00 00 00 00 00 00 00 E1 39" to the PC, that means the buffer is empty.

7.6 CON-ABA2WG

The CON-ABA2WG is an ABA Track 2 to Wiegand convertor to convert the ABA format from a Magnetic reader to Wiegand data for use with the SECUSYS C series controllers (figure 7-7-1). The CON-ABA2WG can output Wiegand 26, 34, 42 or 66 bits.



Figure 7-6-1

Specifications

Power: 7 – 15V DC, 500ma
Protocol: RS-232 Baud Rate: 9600bps , Data Format: 1 + 8 + 1
Current: Static 35mA Operating: 40mA.

Operating Temperature: -14°C ~ +70°C.

Humidity: 10% ~90%
Dimensions: 90mm long x 60mm wide x 25mm high
Max Distances: ABA Input 60m, Wiegand Output 60m

DIP Switch Settings (figures 7-7-2 & 7-6-3)

	DIP1	DIP2	DIP3	DIP4
Wiegand 26 Output	OFF	OFF		
Wiegand 34 Output	ON	OFF		
Wiegand 42 Bits Output	OFF	ON		
Wiegand 66 Bits Output	ON	ON		
Last Digit is valid			OFF	
First Digit is valid			ON	
MG100 Input				OFF
MR500 Input				ON

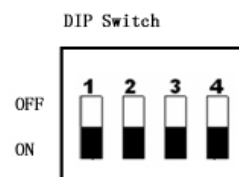


Figure 7-6-3

Figure 7-6-2

Wiring Diagrams

MG100 Magnetic Reader (figure 7-6-4)

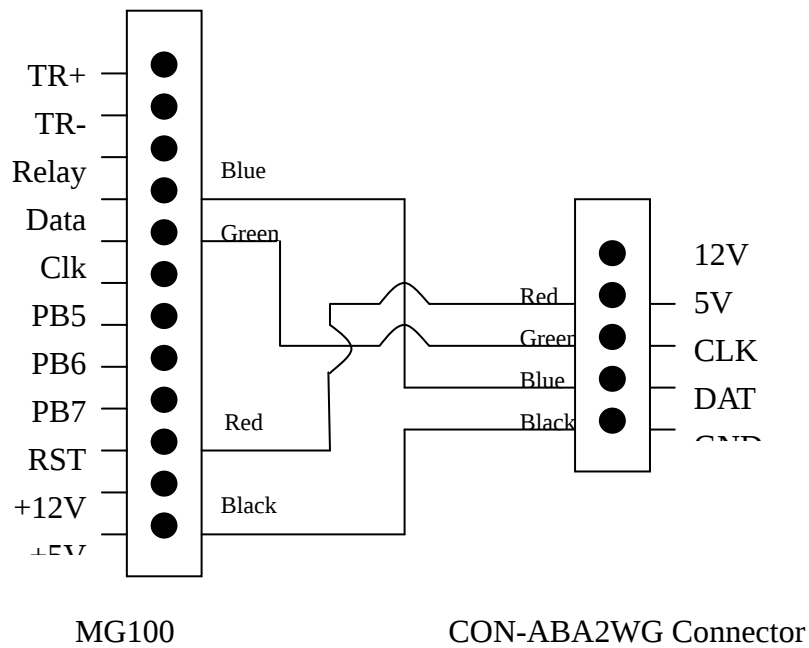


Figure 7-6-4

MR500 Magnetic Reader (figure 7-6-5)

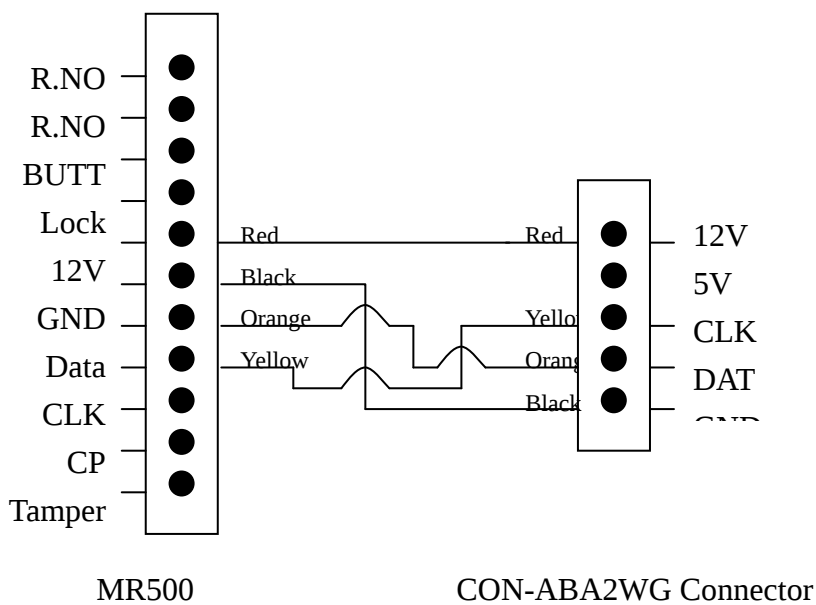


Figure 7-6-5

Wiegand Out Interface (figures 7-6-6 & 7-6-7)

RJ 45 PIN No	Function	Suggested Colour
1	Ground	Black
2	Ground	Black
3	Green LED	Blue
4	Red LED	Brown
5	Data 0	Green
6	Data 1	White
7	+12V DC	Red
8	+12V DC	Red

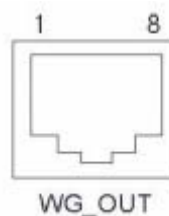


Figure 7-6-7

Figure 7-6-6

LED Indication



Power LED

Receiving LED for Data from Magnetic Reader

Transmitting LED for Data to Access Controller

Chapter 8 –Power Supplies

8.1 SMPS 1260 Power Supply

The SMPS1260 is a heavy duty Switch Mode Power Supply with a 110-123V input. It has 2 outputs, a 12V DC 6 Amp primary output and a secondary 12V DC battery charging output. It is housed in a sturdy plastic case. (figure 8-1-1).



Figure 8-1-1

8.1.1 Model Definitions

The SMPS 1260 is from a family of Switch Mode Power Supplies. The model definitions are below (figure 8-1-1-1)

SM PS 12 60

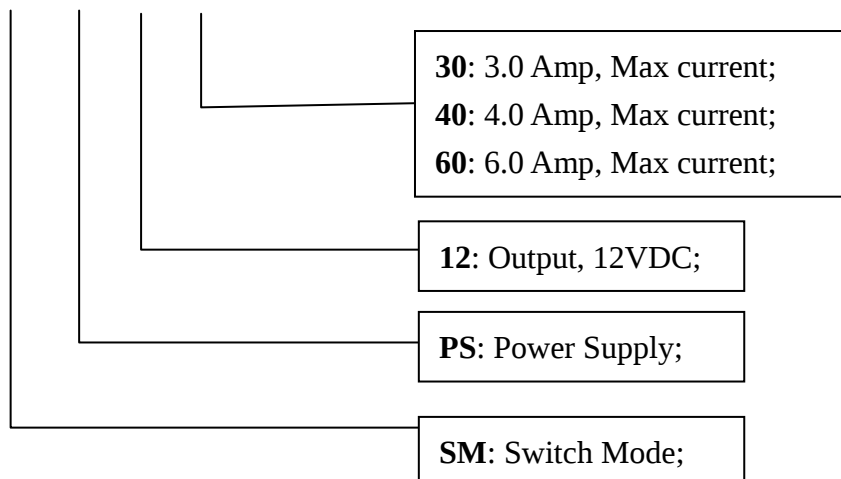


Figure 8-1-1-1

8.1.2 Specifications

<u>Input:</u>	100-240V AC
<u>Output:</u>	9-16V DC, 6A
<u>Dimensions:</u>	110mm (W) x 155mm (H) x 45mm (D)
<u>Weight:</u>	300 grams

8.1.3 Layout

The layout of the SMPS1260 is as follows (figure 8-1-3-1)

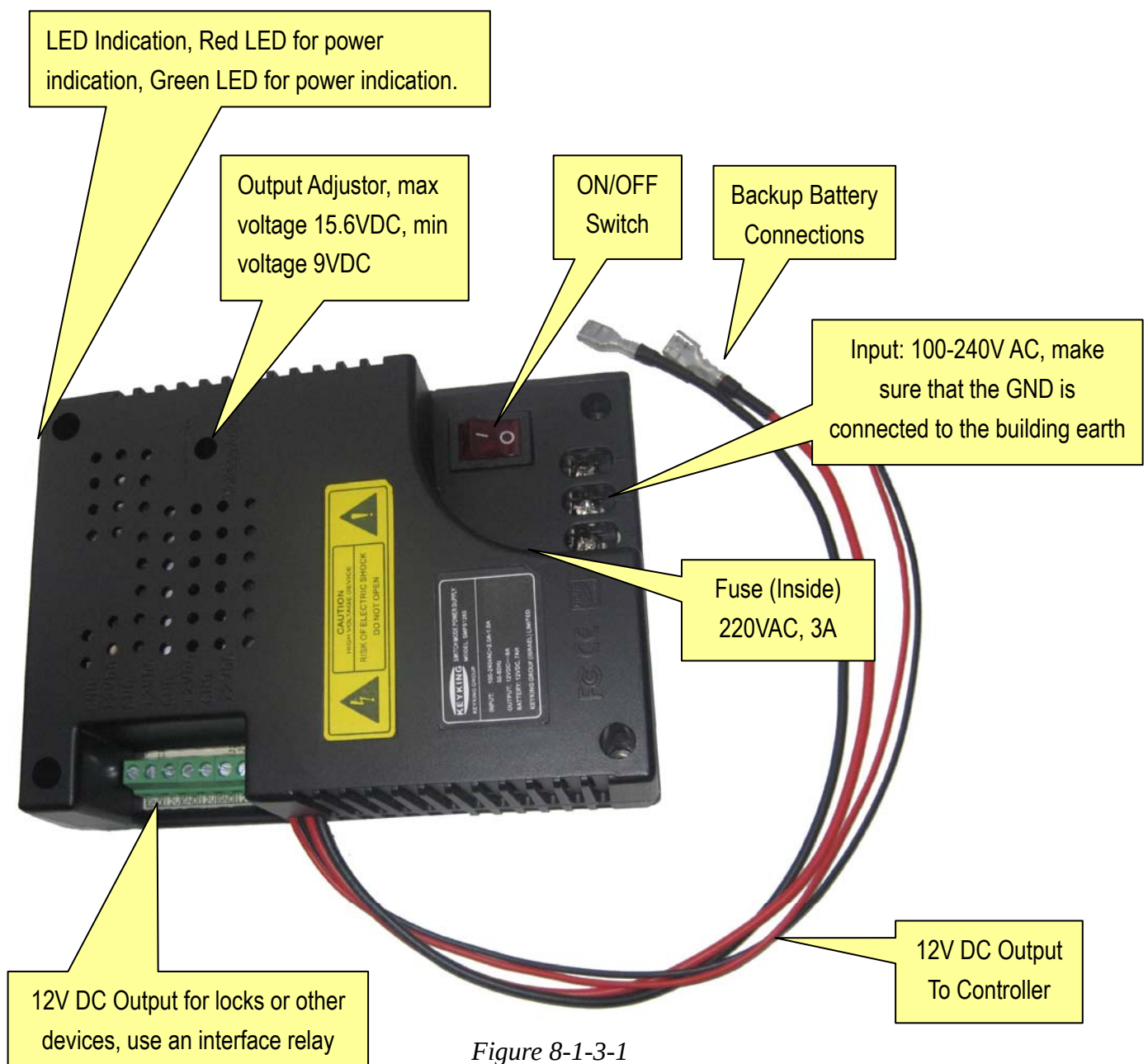


Figure 8-1-3-1

8.2 PSWC1230 Power Supply

The SECUSYS Model PSWC1230 is a 12V, 3A power supply unit that is available as an alternative to the SECUSYS Standard Switch Mode Power Supply (figure 8-2-1) It can accept either a 12-17V AC input or a 18-22V DC input. It provides 3 x 12v DC general purpose outputs, 1 x 5 amp relay output, a push button input and a battery charging output. Two LED's provide indication of AC Power (Red) and battery charging (Green).

The built in relay is suitable for a simple access system. The lock can be connected to the unit (figure 8-2-2) The +12V rail is internally connected to the relay common terminal. A normally open push button can be connected which, when pressed will operate the relay for the time set by the adjustment potentiometer. The time for the relay output can be adjusted to between 1 – 30 seconds.

Note that the SECUSYS 12v PSU PCB is rated at 3 amps. However the transformer as shipped are only rated at 40VA and will therefore supply only 2 amps at 16v AC. That is why the power supplies themselves are only continuously rated at 2 amps. If the full 3 amps is required from the power supply then the transformer needs to be upgraded to a 60 VA transformer supplying 16-17 V AC.

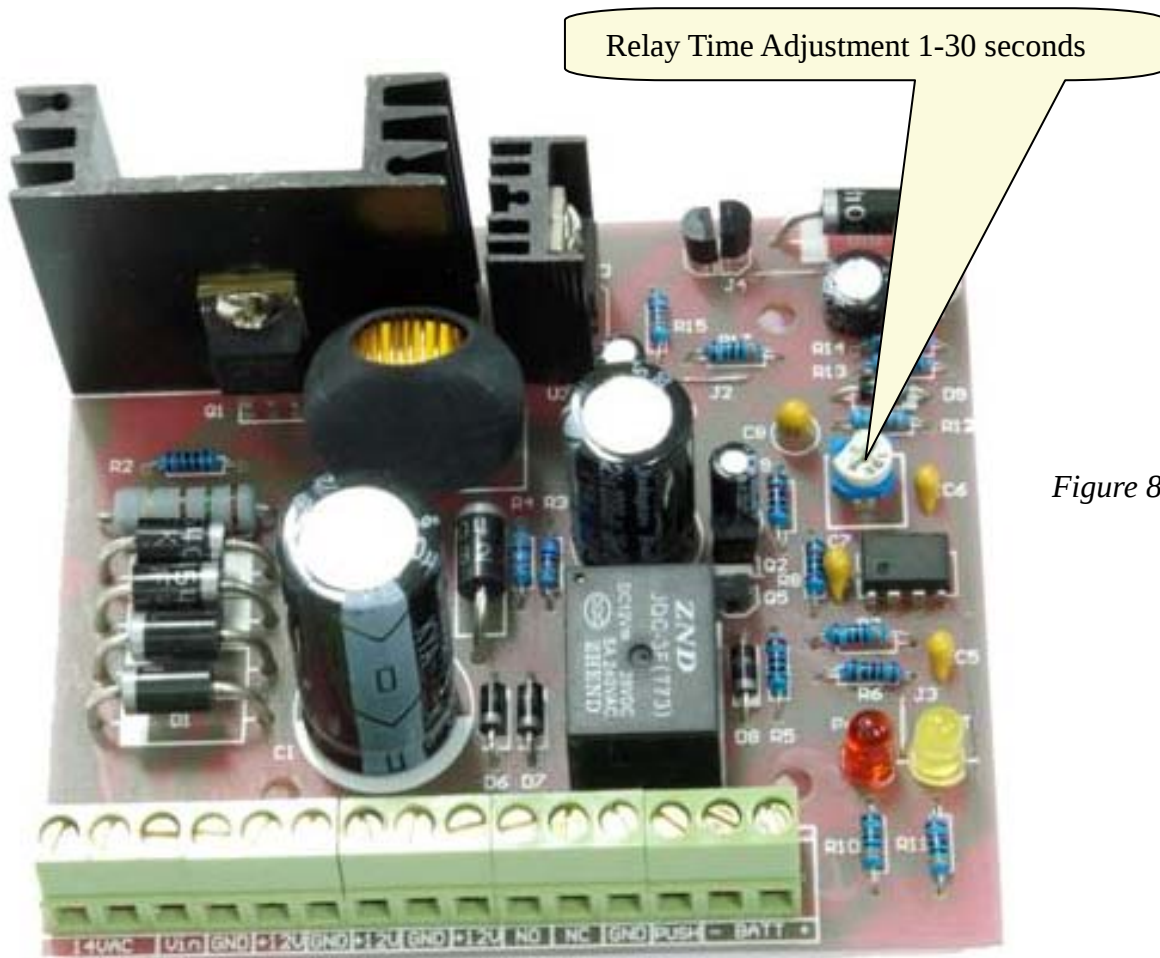
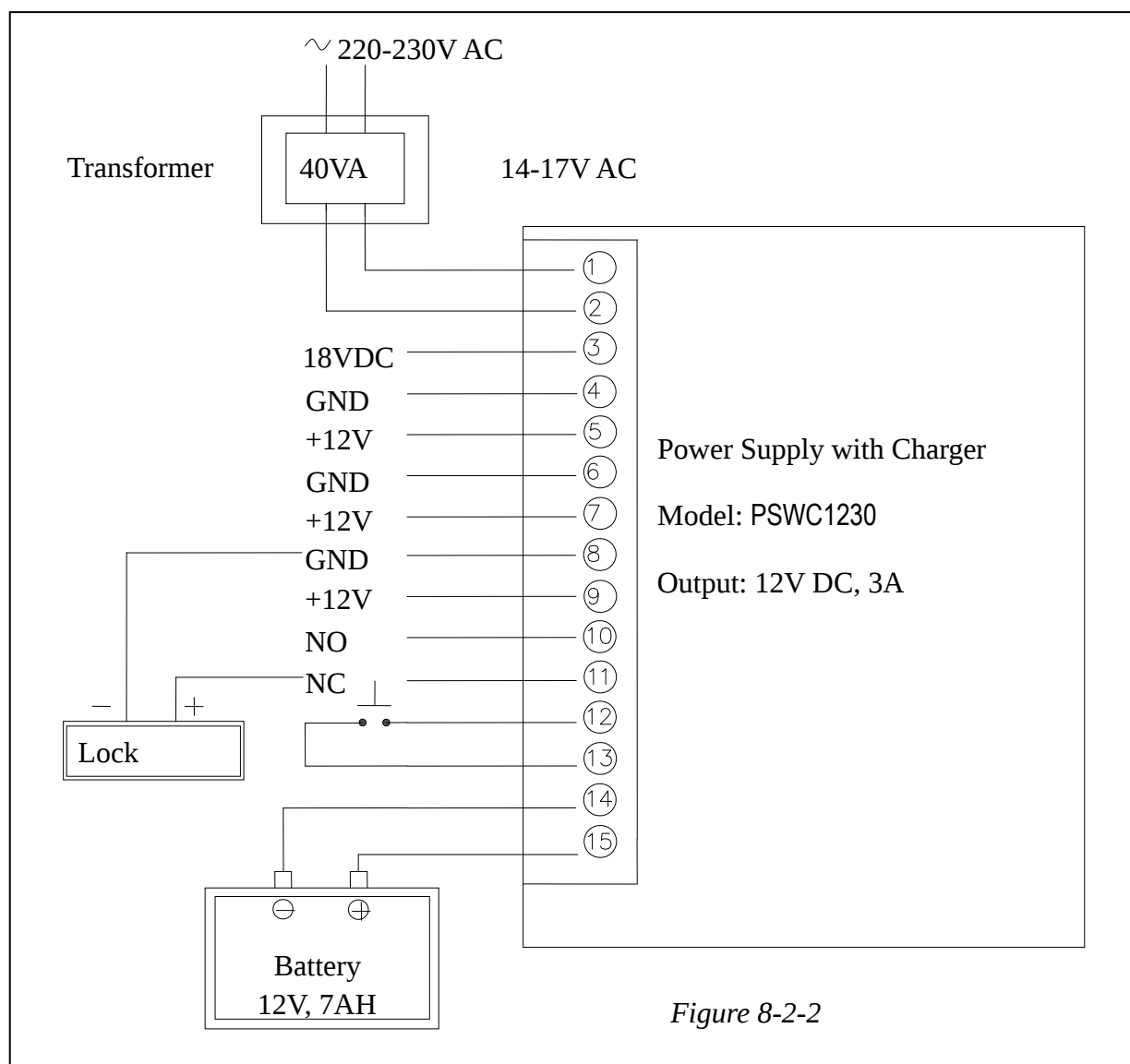


Figure 8-2-1

Terminals from the left hand side are as follows:

<u>14V AC in</u>	AC Input for 14-17V AC
<u>Vin & Gnd</u>	DC Voltage in, between 18-22v DC
<u>+12v & Gnd</u>	12V DC output
<u>NO</u>	Normally open relay contact, ie no voltage when relay de-energised
<u>NC</u>	Normally closed relay contact, ie 12V DC when relay de-energised
<u>Gnd & Push</u>	Input for push button. When shorted the relay energises
<u>Batt</u>	12V DC for back up battery



Chapter 9 – Card Readers

9.1 6609/6610 Series Card Reader

To be added

9.2 6611 Series Card Reader

To be added

9.3 AVR6619/AVR6620 Series Card Reader

To be added

9.4 6688LE Card Reader

To be added

9.5 5510H Card Reader

To be added

9.6 5588 Series Card Reader

To be added

9.7 CPU Series Card Readers

9.7.1 Overview

The SECUSYS CPU Series card readers read CPU based cards as well as Mifare sectors and Mifare CSN and replace the SECUSYS RC series readers. Currently they consist of the following models:

5512U, 6608U, 6609U, 6611U, 6611ICU

By default the CPU reader on power up will only read CPU cards and will not read a standard Mifare CSN or Sector reader until enabled by a programmed CPU MasterSmartCard.

9.7.2 Wiring

No.	Purpose	Description
1	+12V	Power Supply
2	D1	Data 1
3	D0	Data 0
4	LED	LED control, when shorted to GND the LED will change color. Blue LED: Normal mode, Green LED: The LED also changes colour when reading cards or if controlled by this wire.
5	GND	GND, Ground Wire
6	BUZ	Buzzer control, when shorted to GND the Buzzer will beep.

9.7.3 Operation

The CPU series readers are all programmed by a CPU MasterSmartCard. The CPU MasterSmartCard itself is programmed using the 5588RW Mifare Sector Encrypted Desktop Reader/Writer/Encoder (section 9.8) in conjunction with the MasterCard4 Application (section 9.9). All authorization information is programmed and stored in the CPU MasterSmartCard and this information is transferred to the CPU series readers on Power Up.

To transfer the information from the CPU MasterSmartCard to the CPU series reader place the CPU MasterSmartCard next to the CPU series reader, then power the up the CPU series reader. If you hear “Di Di Di Di Di” the information transfer is complete. This information needs to transfer within 5 seconds of power up otherwise the CPU series reader reverts to normal card reader operation. Once the CPU series reader has been programmed by a specific CPU MasterSmartCard, it will only read the User Cards conforming to the information stored on the CPU MasterSmartCard.

9.8 5588RW - Mifare Sector Encrypted Desktop Reader/Writer (M+RC+CPU)

9.8.1 Overview

The Mifare Sector Encrypted Desktop Reader/Writer also called a MasterCard Encoder, (figure 9-8-1-1) is used with the MasterCard4 application covered in section 9.9. It is used to program MasterCards and UserCards for use with the SECUSYS CPU series readers. The unit supports any chips based on the MIFARE S50 & S70 series. For a complete list of supported cards refer to section 9.8.4.



Figure 9-8-1-1

There are several different models of the 5588RW encoder available as per the following chart (figure 9-8-1-2)

Model	Supports ISO Standard	Mark
5586RW-1	ISO14443A	Default
5586RW-2	ISO14443B Feilica (TYPE-C)	Support Chinese 2# ID
5586RW-3	ISO15693	
5586RW-X	All, including ISO14443A, ISO14443B, TYPE-C	

Figure 9-8-1-2

9.8.2 Connection

The reader/writer/encoder comes complete with a interface lead that has a single D9 Female Serial port connector and 2 x USB connectors. Plug the RS-232 lead into a RS-232 Serial Port or into a USB to RS-232 Serial Port adaptor. The shorter of the 2 x USB cables connects to a USB port and provides the power for the reader/write. The longer of the 2 x USB cables connects to the reader/writer device itself (figure 9-8-2-1).

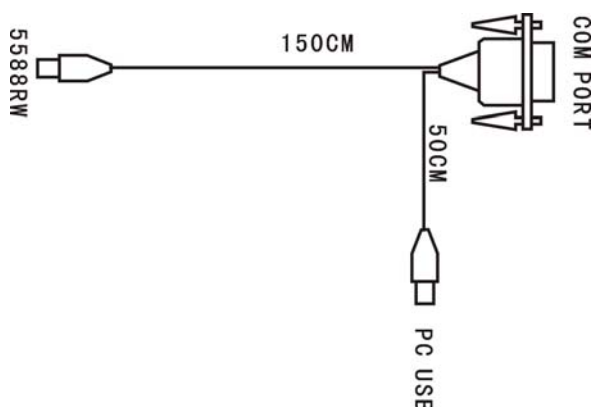


Figure 9-8-2-1

9.8.3 Specifications

<u>Voltage:</u>	5VDC	<u>Current:</u>	120mA
<u>Communication:</u>	RS-232	<u>Protection Level:</u>	IP65
<u>Operating Temperature:</u>	-10°C to +70°C	<u>Humidity:</u>	0 ~ 95%
<u>Antenna:</u>	Resistance 50 ohms	<u>Color:</u>	Silver
<u>Size:</u>	115(L)×80(W)×20-25(H)mm	<u>Cable:</u>	USB+RS232
<u>Status Indication:</u>	LED & Buzzer	<u>LED:</u>	Red Power LED & controlled by application
<u>Operating Distance:</u>	70mm(Data Card) , 40mm(CPU Card), >100mm(15693 card)		
<u>Card:</u>	Mifare-1, S50, S70 or compatible card.		
<u>Supports:</u>	ISO14443, Type A, B & C, ISO15693		

9.8.4 Supported Card Types

	Factory	SN	Read	Write	Lock Data	Common Command
ISO14443A						
Mifare® Std	Philips	✓	✓	✓	✓	✓
Mifare® Ultralight	Philips	✓	✓	✓	✓	✓
MF1 IC70	Philips	✓	✓	✓	✓	✓
Mifare® Prox	Philips	✓				✓
DESFire	Philips	✓				✓
SHC1102	HuaHong	✓	✓	✓	✓	✓
ISO14443B						
AT88F020	ATMEL	✓	✓	✓	✓	✓
SR1X4K	ST	✓	✓	✓	✓	
SR176	ST	✓	✓	✓	✓	
Chinese 2# ID	HuaHong	✓				✓
ISO14443C						
Feilica	SONY	✓				✓
ISO15693						
EM4135	EM	✓	✓	✓	✓	✓
I-CODE 2	Philips	✓	✓	✓	✓	✓
Tag-it	TI	✓	✓	✓	✓	✓
My-D	Infineon	✓	✓	✓	✓	✓

9.9 MasterCard4 Application

9.9.1 Overview

The MasterCard Encoder in conjunction with the MasterCard4 Application software is used to program CPU MasterSmartCards (sometimes called MasterCards or Mothercards) These cards once programmed are then used to program a Mifare Sector Reader in Sector Mode. Please close any Bluetooth COM ports before you run the MasterCard4.0 application otherwise a conflict can occur.

9.9.2 Software Installation

The software normally comes in a .rar or .zip file, see highlighted file below (figure 9-9-2-1). Once unzipped the following files can be viewed. To install the application run the MasterCard 4.0.0.3.exe file. Note the “PassWord for MasterCard.txt file” which includes the Serial Number required for the installation and the Password.

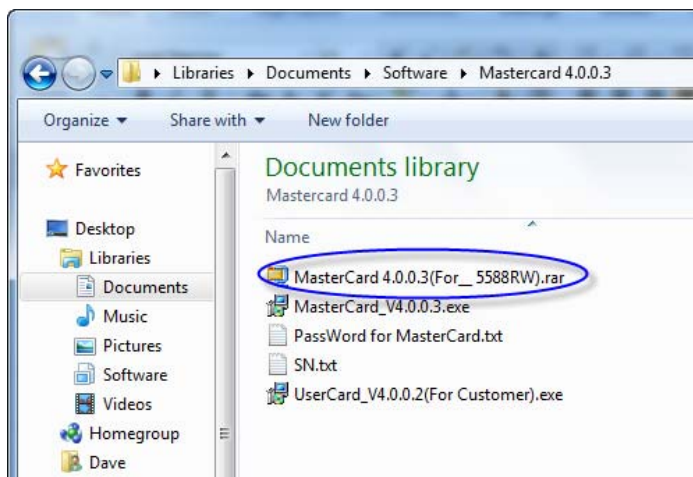


Figure 9-9-2-1

When the security warning appears click the “Run” button (figure 9-9-2-2)

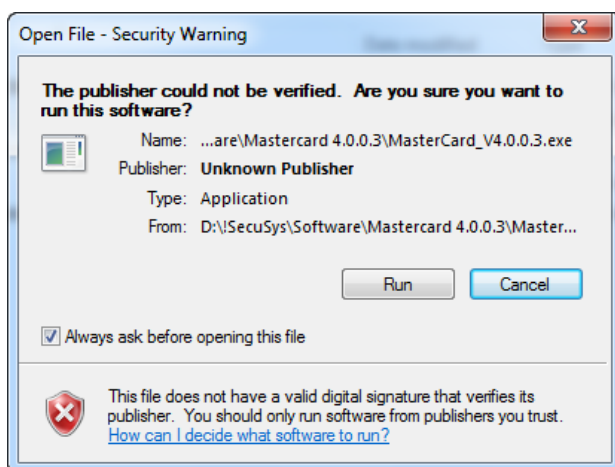


Figure 9-9-2-2

Click “Next” to continue (figure 9-9-2-3).

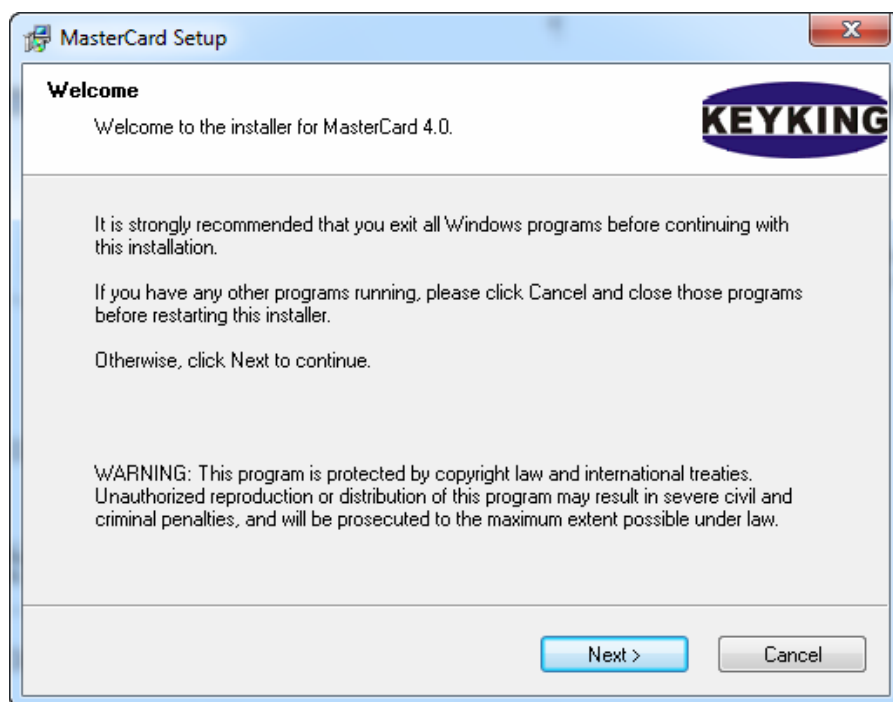


Figure 9-9-2-3

Accept the agreement and click “Next” to continue (figure 9-9-2-4).

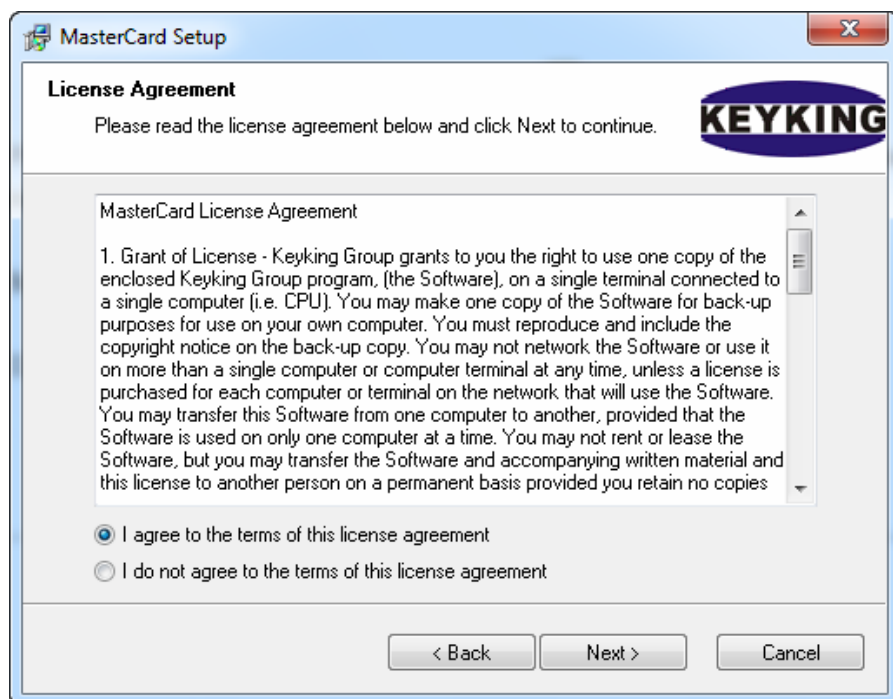
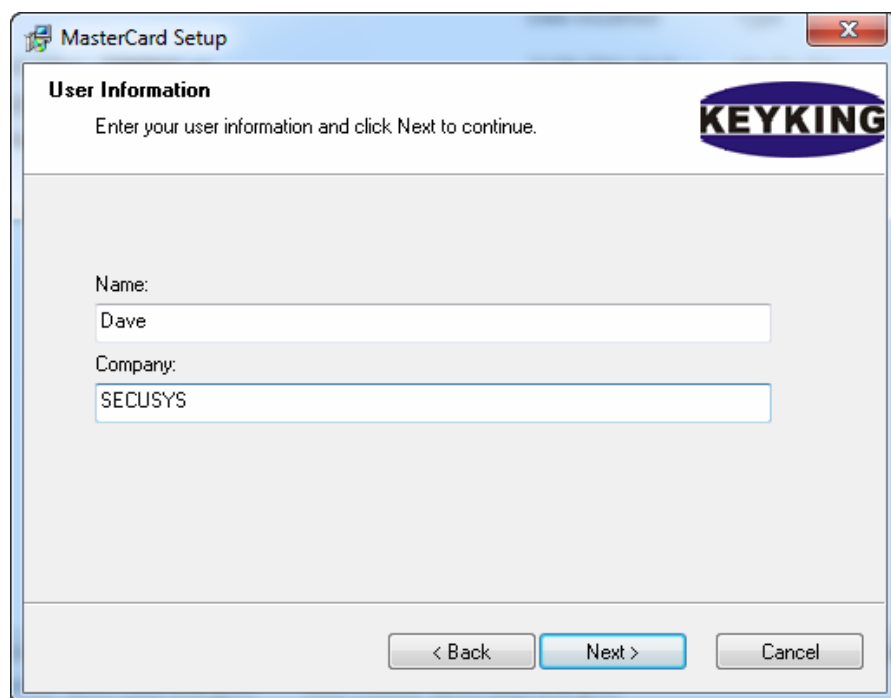


Figure 9-9-2-4

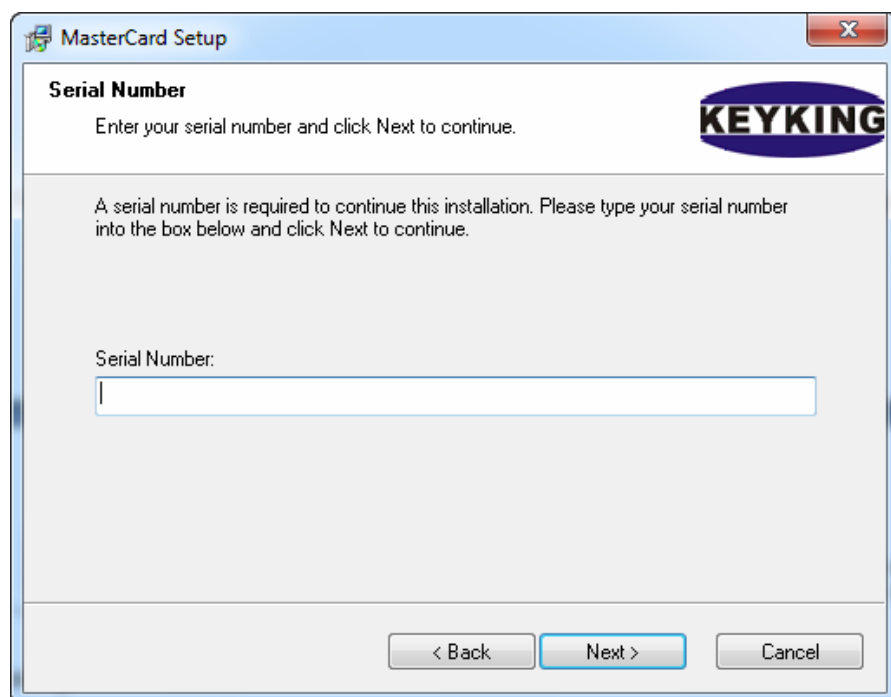
Enter your name and company then click “Next” to continue (figure 9-9-2-5).



The screenshot shows a Windows-style window titled "MasterCard Setup". Inside, the "User Information" section is active. It contains the instruction "Enter your user information and click Next to continue." and the KEYKING logo. Below this, there are two text input fields: "Name:" with the value "Dave" and "Company:" with the value "SECUSYS". At the bottom of the window, there are three buttons: "< Back", "Next >" (which is highlighted in blue), and "Cancel".

Figure 9-9-2-5

Enter the serial number from the supplied “PassWord for MasterCard.txt file” (figure 9-9-2-6).



The screenshot shows the same "MasterCard Setup" window, but now the "Serial Number" section is active. It contains the instruction "Enter your serial number and click Next to continue." and the KEYKING logo. Below this, a message states: "A serial number is required to continue this installation. Please type your serial number into the box below and click Next to continue." There is a single text input field labeled "Serial Number:" which is currently empty. At the bottom, the same three buttons are present: "< Back", "Next >" (highlighted in blue), and "Cancel".

Figure 9-9-2-6

Click “Next” to continue (figure 9-9-2-7).

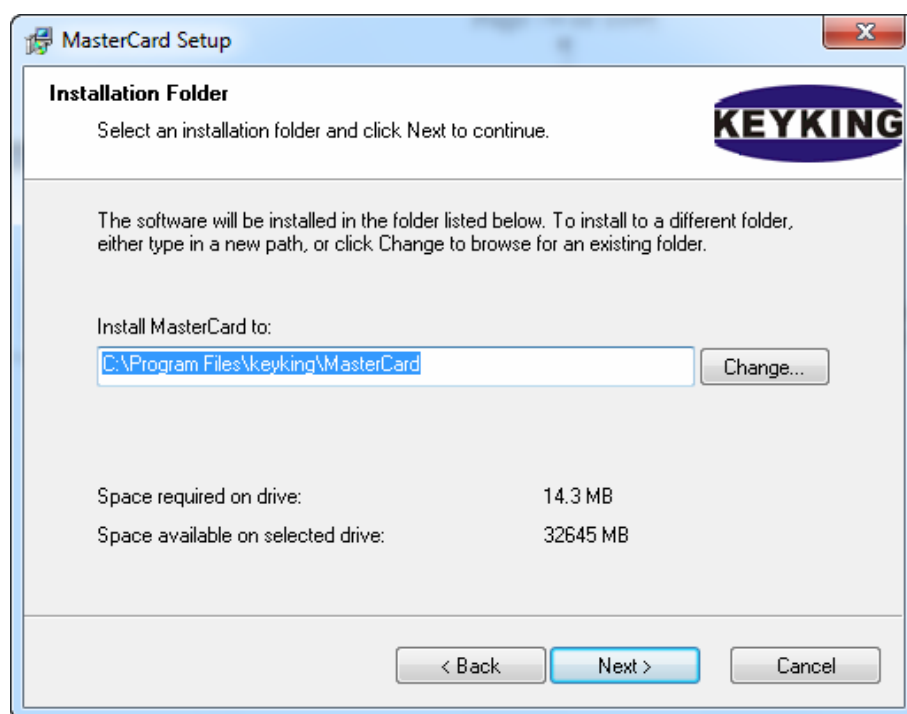


Figure 9-9-2-7

Click “Next” to continue (figure 9-9-2-8).

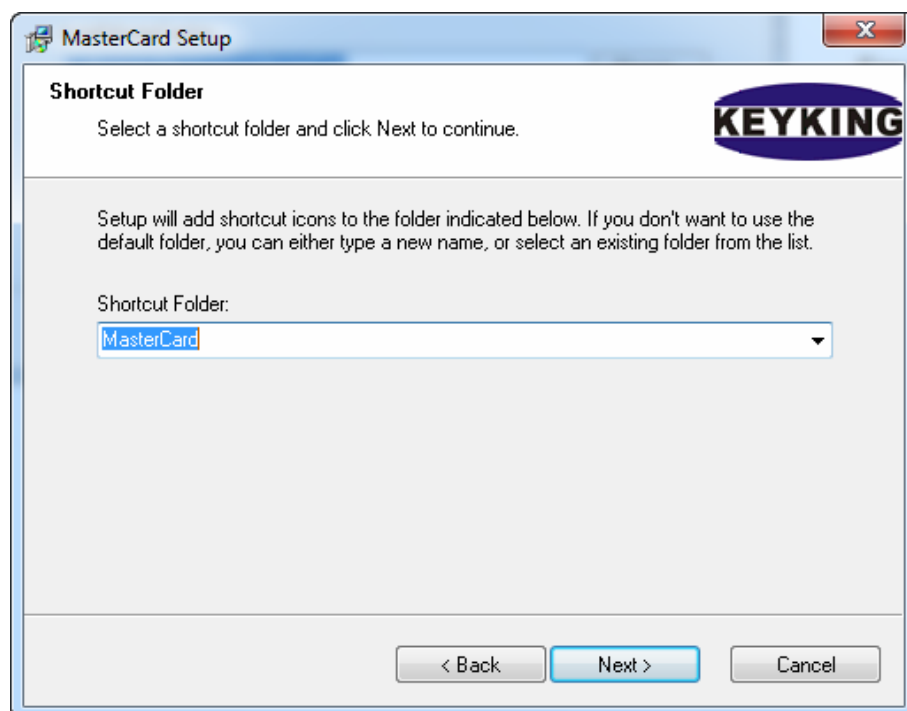


Figure 9-9-2-8

Click “Next” to continue (figure 9-9-2-9).

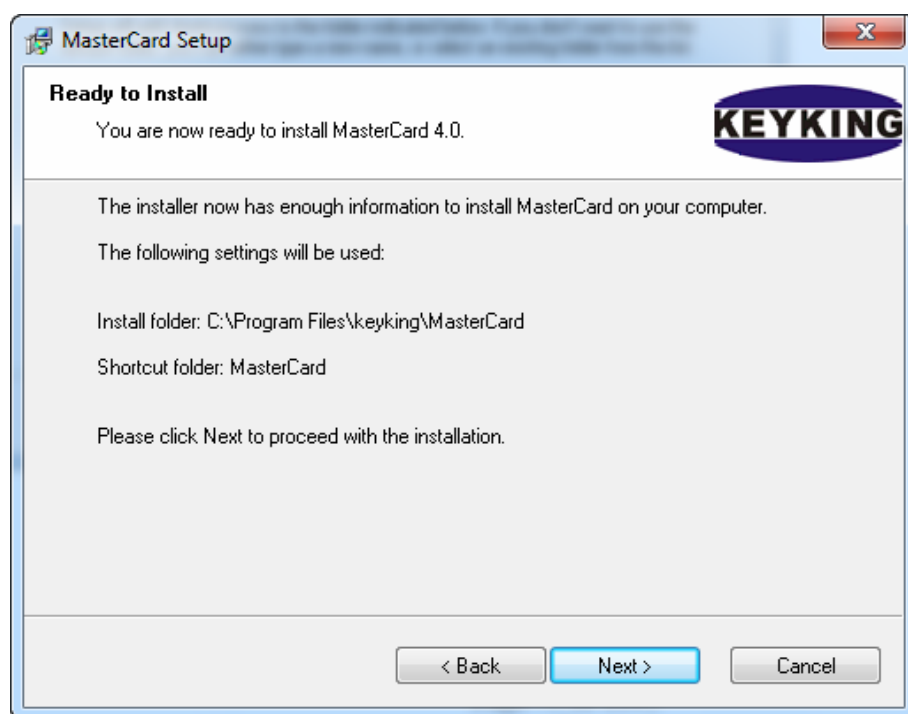


Figure 9-9-2-9

Wait for the program to install (figure 9-9-2-10)

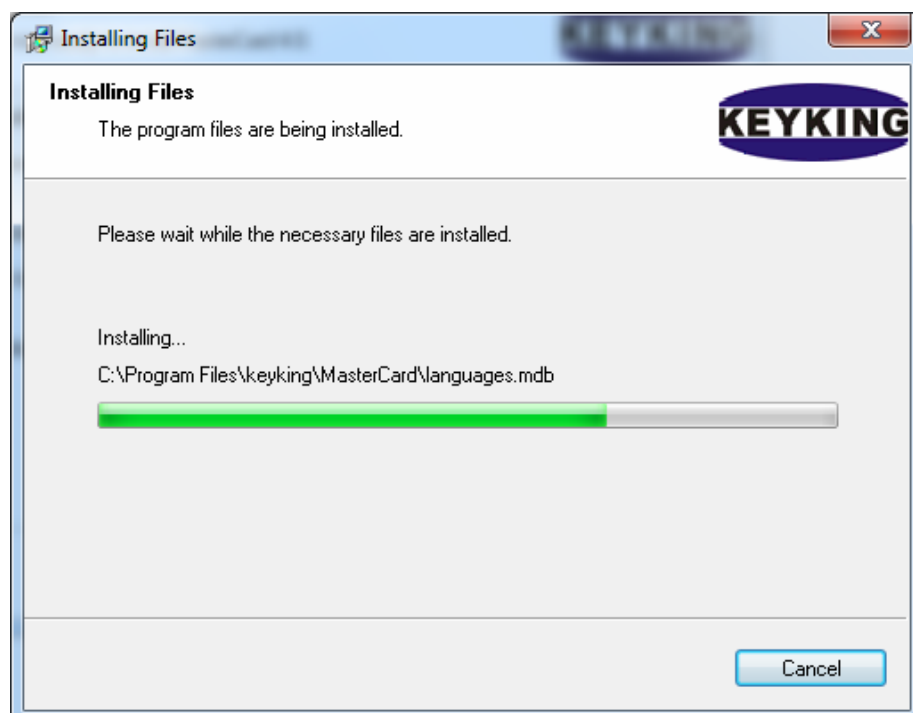


Figure 9-9-2-10

Click “Finish” to continue (figure 9-9-2-11)

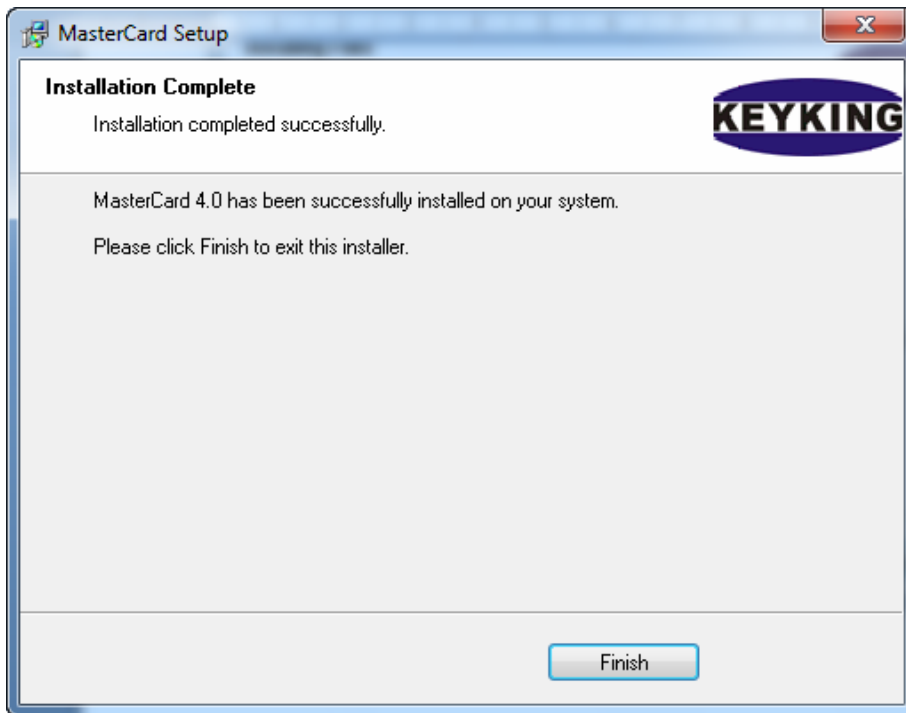


Figure 9-9-2-11

9.9.3 Software Operation

Prior to running the software, connect the MasterCard Encoder as per the instructions in Section 9.8

To run the software go Start, Program Files, MasterCard, MasterCard or click on the MasterCard icon on the desktop (figure 9-9-3-1)

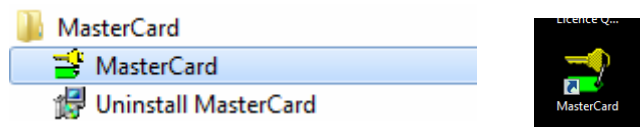


Figure 9-9-3-1

If this is the 1st time that this software has been installed then the Language Selection screen will appear (figure 9-9-3-2). Click on the arrow to show the languages available and select the desired language then click “OK” to proceed.

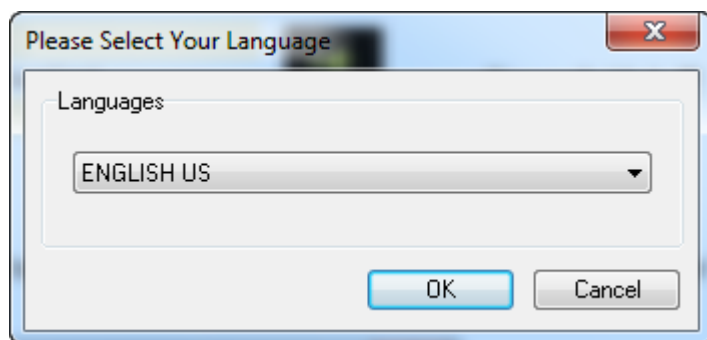


Figure 9-9-3-2

At the Password screen (figure 9-9-3-3), enter the password supplied in the “PassWord for MasterCard.txt file” (figure 9-9-2-1)

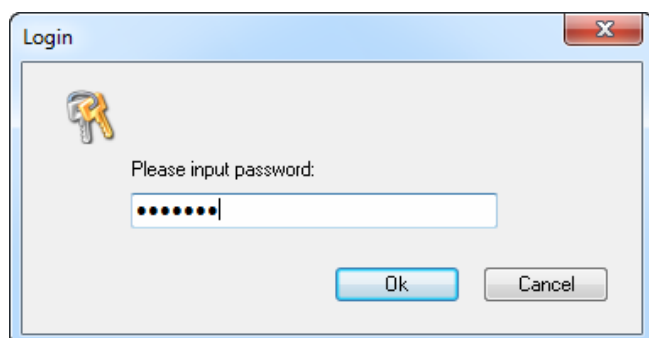


Figure 9-9-3-3

If the password is correct the Main Screen will appear. If the connections to the MasterCard Encoder are correct as per section 9-8, then the Successfully Connect message will appear at the bottom left of the screen and the green connect tick in the menu bar will be grayed out. If the MasterCard Encoder is not connected correctly then the green connect tick will be green and there will be a failed to connect message at the bottom of the screen. Check the cables, connections and the PC Com Port using Windows Device Manager then click on the green connect tick to try and connect again (figure 9-9-3-4)

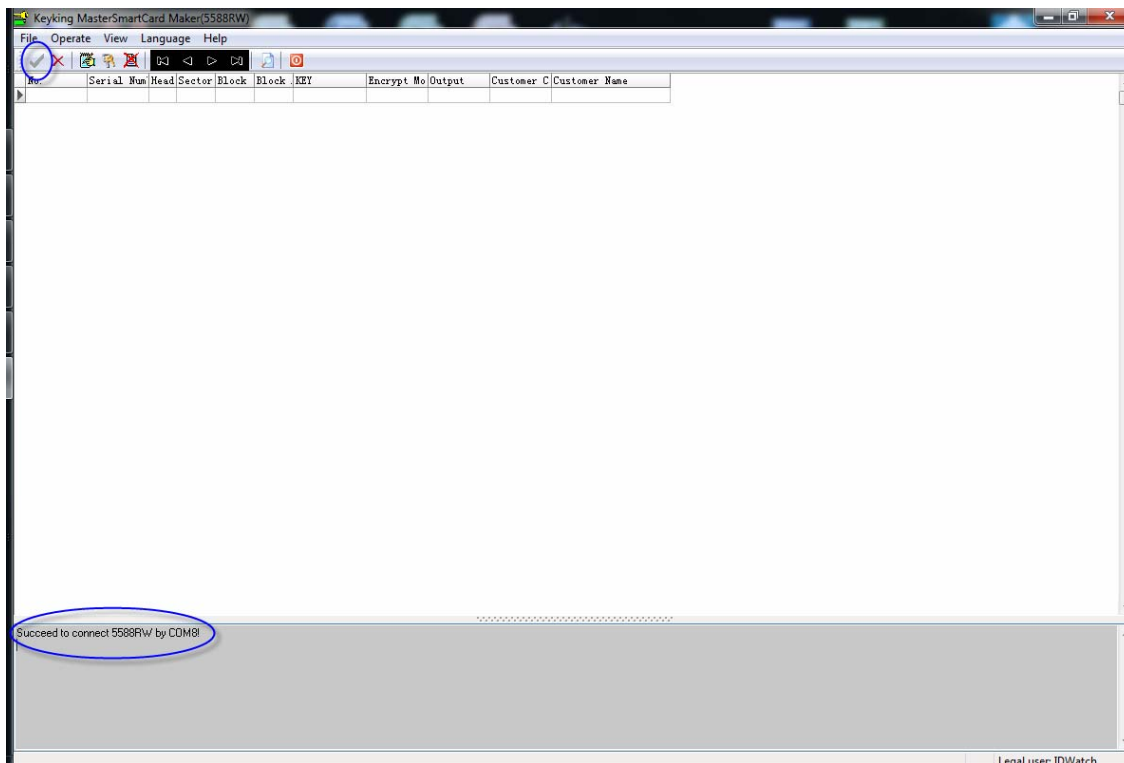


Figure
9-9-3-4

If the MasterCard Encoder still cannot be found then select “Setup Com Port” from the file menu again (figure 9-9-3-4) and select the correct Com Port from the drop down menu (figure 9-9-3-5)

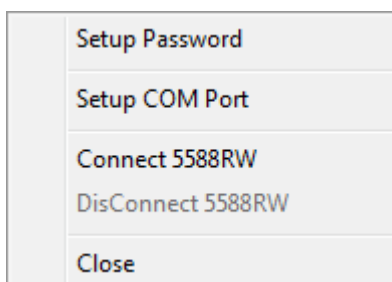


Figure
9-9-3-4

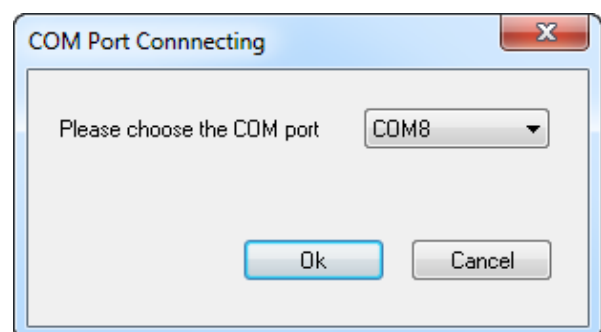


Figure
9-9-3-5

9.9.4 Writing the CPU MasterSmartCard

From the Operate menu select Write MasterCard (figure 9-9-4-1) to bring up the Write CPU MasterSmartCard screen (figure 9-9-4-2). This screen is explained in more detail in the next section, Section 9.9.5.

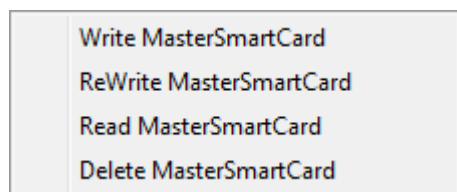


Figure 9-9-4-1

The, “Basic information” and “Customer Information” sections are necessary but the Extended Information and the Sector for User Information sections are both optional (figure 9-9-4-2). Once the required information has been entered then place a blank CPU MasterSmartCard on the 5588RW and click “OK”

Write MasterSmartCard

Base Information

Sector

- ☒ Sector 0#
- ☐ Sector 1#
- ☐ Sector 2#
- ☐ Sector 2#
- ☐ Sector 4#
- ☐ Sector 5#
- ☐ Sector 6#
- ☐ Sector 7#
- ☐ Sector 8#
- ☐ Sector 9#
- ☐ Sector 10#
- ☐ Sector 11#
- ☐ Sector 12#
- ☐ Sector 13#
- ☐ Sector 14#
- ☐ Sector 15#
- ☐ Serial Number

Block

- ☒ Block 0# ☐ Block 2#
- ☐ Block 1#

Block Address

0

Encrypt Mode

- ☒ Normal
- ☐ Dynamic
- ☐ Normal + SN
- ☐ Dynamic + SN

Output

- ☐ Wiegand26
- ☐ Wiegand32
- ☒ Wiegand34
- ☐ Wiegand37
- ☐ Wiegand66
- ☐ ABA Track II

☐ Use Fixed Facility 0

KEY for UserCard[HEX] FFFFFFFFFF

Extend Information

Read Control

- ☐ Read the serial number
- ☐ Read the serial number
- ☐ Enable 15693 protocol
- ☐ Read the serial number
- ☐ Enable other protocol

Sector for user information

- ☐ Sector 0# ☐ Sector 9#
- ☐ Sector 1# ☐ Sector 10#
- ☐ Sector 2# ☐ Sector 11#
- ☐ Sector 2# ☐ Sector 12#
- ☐ Sector 4# ☐ Sector 13#
- ☐ Sector 5# ☐ Sector 14#
- ☐ Sector 6# ☐ Sector 15#
- ☐ Sector 7# ☒ None
- ☐ Sector 8#

Customer Information

Customer Code

Customer Name

Ok Cancel

Figure 9-9-4-2

If the writing is successful the message below will appear (figure 9-9-4-3) and the MasterCard details will appear in the main screen area (figure 9-9-4-4)

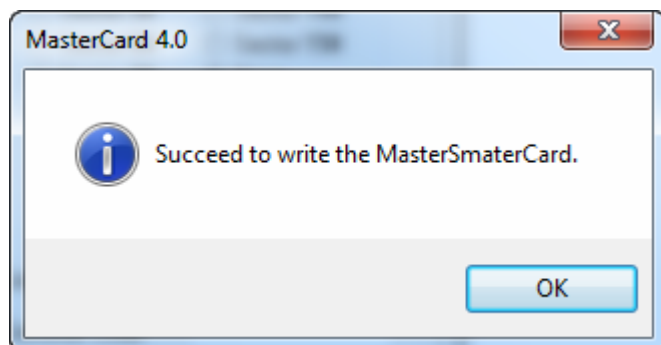


Figure 9-9-4-3

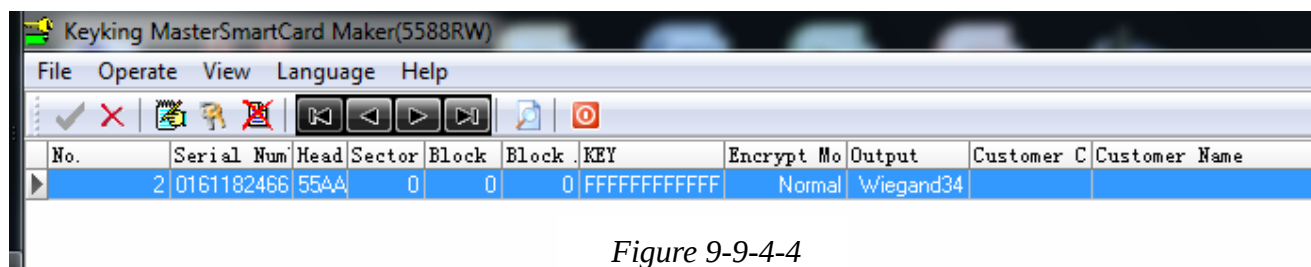


Figure 9-9-4-4

Previously programmed cards can also be Read, Re-Written or Deleted from the list using the Operate menu.

9.9.5 MIFARE SmartCard Information

MIFARE is a read/write technology that uses 13.56 MHz and meets the ISO 14443, type A standard for contactless smartcards. The maximum effective distance (read range) for the 14443 standard is 100mm. The Philips MIFARE technology is available in six different product families which use the S50 and S70 cards. The S50 is a 1 Kbyte card and the S70 is a 4 Kbyte card. The S50 is the most common MIFARE chip used so the following applies to the S50 although the same logic also applies to the S70 although the sizes are different.

Each S50 MIFARE chip can be divided into 16 sectors of 64 bytes each. (16 x 64 bytes = 1024 bytes or 1 Kbyte) These are numbered 0 – 15. Each sector can be further divided into 4 blocks, each block is 16 bytes and the blocks are numbered 0 -3. (4 x 16 bytes = 64 bytes) So in a S50 card there are 64 different locations where data can be stored. Sector 0 is where the directory is located and block 0 of sector 0 is where the Card Serial Number (CSN) is stored. The CSN is fixed at the time of manufacture and cannot be changed. The CSN is 32 bits long. The CSN is also known as the UID (Unique ID) or serial number.

SECUSYS manufacture several models of sector readers called Universal MIFARE readers that can be programmed to read either the CSN or information stored on a sector. The SECUSYS Universal MIFARE Readers come defaulted to read the CSN at Block 0 of Sector 0 however they can be re-programmed in the field to read sector information. This is done by presenting a Programming or Configuration card called a MasterCard at the reader. Note that only **some** SECUSYS MIFARE readers are Universal Readers. Note that **non** Universal Readers even though they may read MIFARE credentials are fixed for CSN reading only and cannot be reprogrammed.

Configuring the SECUSYS RC Series readers and cards for sector mode operation is a 3 step process.

Step 1: The CPU MasterSmartCard itself is programmed by a desktop SECUSYS desktop reader/writer using the MasterCard4 application software (Section 9.9).

Step 2: Once the CPU MasterSmartCard is programmed as per step 1 above, the information in the CPU MasterSmartCard is transferred to the RC series reader (Section 9.8).

Step 3: The MIFARE cards themselves need to be programmed with the data required to be read. This is done using the SECUSYS Reader/Writer and the UserCard 4 application software (Section 9.10)

The **WriteMasterCard** screen contains all the information necessary to set up a MasterCard and the following applies to this screen (figure 9-9-4-3).

Sectors:

There are a total of 16 sectors in each MIFARE S50 1K card (0-15) but only 15 available to be programmed. Sector 0 is preprogrammed with the CSN (Card Serial Number) and cannot be changed. Select the sector that the information is to be written to.

Serial Number:

The RC series reader will read the Serial Number of the Mifare card, not the User Card Number inside a sector.

Block

There are 4 blocks in each sector, 0 to 3. The User Card Number will be written into this block of that sector.

Block Address:

The User Card Number will be written into this block of that sector from this address.

Encrypt Mode

There are 4 different levels of Encrypt mode depending upon the level of security required.

Normal (Usual security)

Dynamic (More security)

Normal + SN (Even more security)

Dynamic + SN (More security still)

Output

The output format of the RC reader can be programmed as follows:

Wiegand 26 bit

Wiegand 32 bit

Wiegand 34 bit

Wiegand 37 bit (Not available for RC series reader)

Wiegand 66 bit (Not available for RC series reader)

ABA Track II (for Special RC series reader only)

KEY for UserCard

This is the password to encrypt the UserCard, and it is also the Key A of the Mifare card in HEX. The default is FFFFFFFFFF. Note that if this is changed and then lost the card readers will be locked and unable to be unlocked.

Additional Information

For future use with other applications.

Sector for User Information

For future use with other applications.

Customer Information

Customer Code: A suggestion here is to use the digits on the back of the CPU MasterSmartCard.

Customer Name: A "unique client name"

9.10 UserCard4 Application

9.10.1 Overview

The UserCard4 application software programs MIFARE S50 cards into sector mode for use with the SECUSYS RC series card readers.

9.10.2 Software Installation

The UserCard4 software will normally come in a .zip or a .rar file. Upon unzipping there will be 2 files, a SN.txt file that contains the serial number and password, and the actual installation .exe file (figure 9-10-2-1)

Name	Date modified	Type	Size
SN.txt	6/01/2009 10:30 a....	Text Document	1 KB
UserCard_V4.0.0.2(For Customer).exe	10/01/2009 10:52 a...	Application	5,790 KB

Figure 9-10-2-1

To install the software run the UserCard4.exe installation file (figure 9-10-2-1)

When the security warning appears click the “Run” button (figure 9-10-2-2)

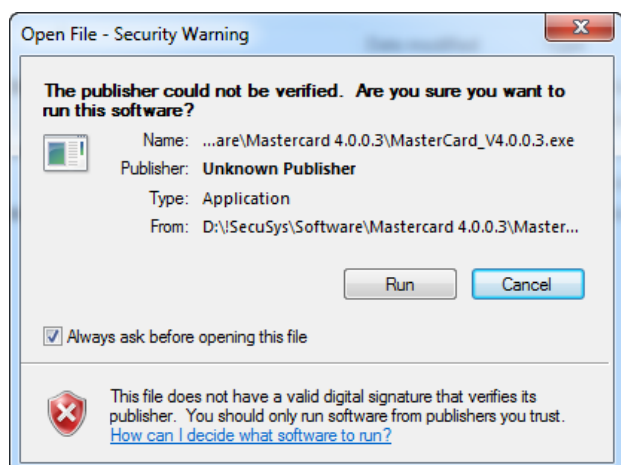


Figure 9-10-2-2

Click “Next” to continue (figure 9-10-2-3).

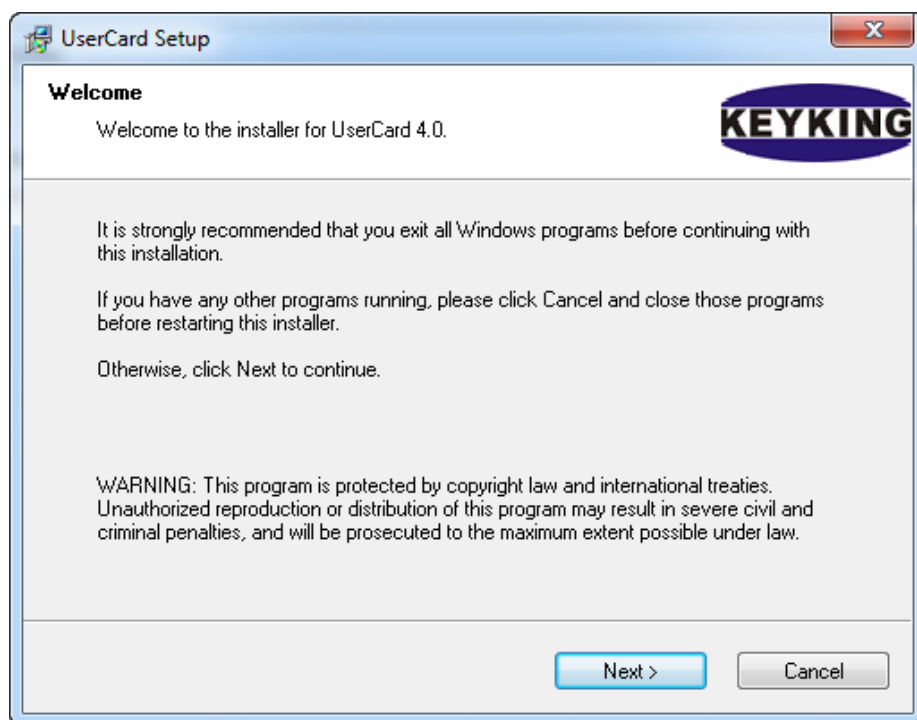


Figure 9-10-2-3

Accept the agreement and click “Next” to continue (figure 9-10-2-4).

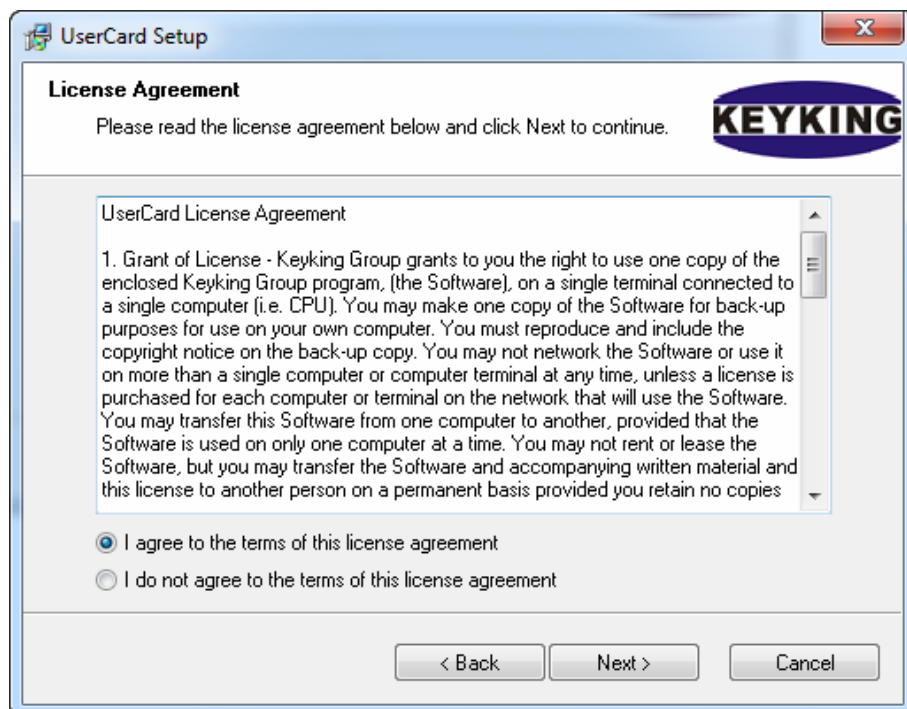
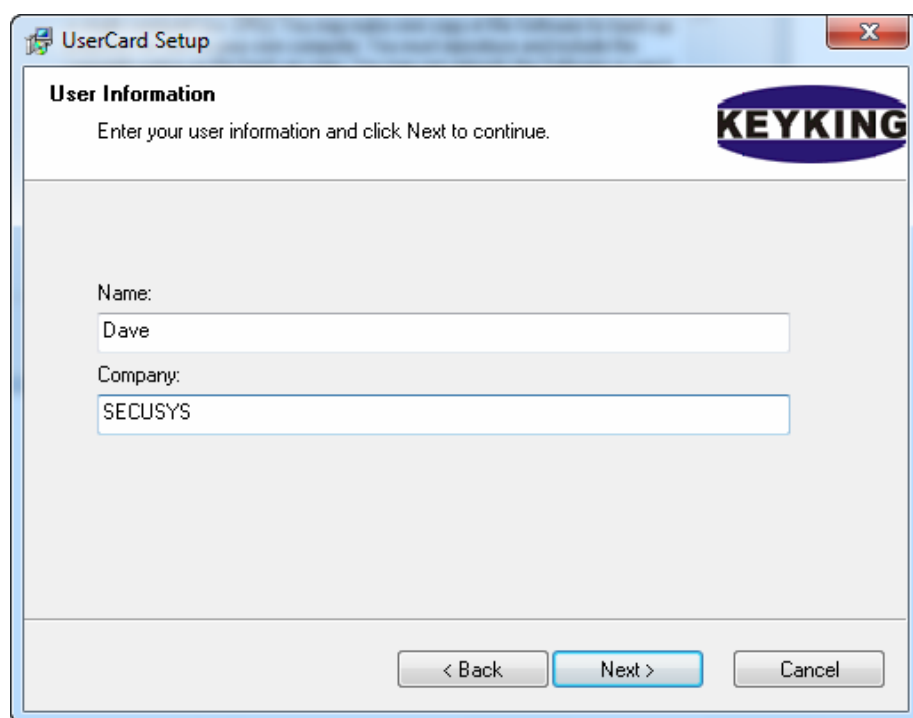


Figure 9-10-2-4

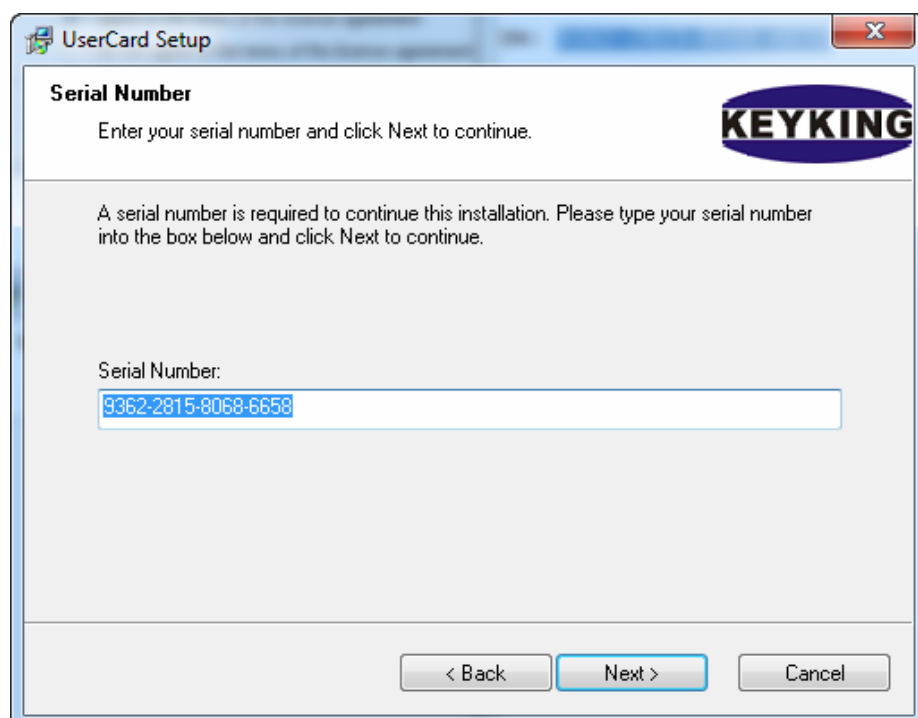
Enter your name and company then click “Next” to continue (figure 9-10-2-5).



The screenshot shows a Windows-style dialog box titled "UserCard Setup". It has a standard title bar with minimize, maximize, and close buttons. The main content area is titled "User Information" and contains the instruction "Enter your user information and click Next to continue." in the top left. In the top right corner of the content area is the "KEYKING" logo. Below the instruction, there are two text input fields. The first is labeled "Name:" and contains the text "Dave". The second is labeled "Company:" and contains the text "SECUSYS". At the bottom of the dialog box, there are three buttons: "< Back", "Next >" (which is highlighted with a blue border), and "Cancel".

Figure 9-10-2-5

Enter the serial number from the supplied “SN.txt file” (figure 9-10-2-6).



The screenshot shows a second Windows-style dialog box titled "UserCard Setup". It has a standard title bar. The main content area is titled "Serial Number" and contains the instruction "Enter your serial number and click Next to continue." in the top left. In the top right corner of the content area is the "KEYKING" logo. Below the instruction, there is a paragraph of text: "A serial number is required to continue this installation. Please type your serial number into the box below and click Next to continue." Below this text is a single text input field labeled "Serial Number:" which contains the serial number "9362-2815-8068-6658". At the bottom of the dialog box, there are three buttons: "< Back", "Next >" (highlighted with a blue border), and "Cancel".

Figure 9-10-2-6

Click “Next” to continue (figure 9-10-2-7).

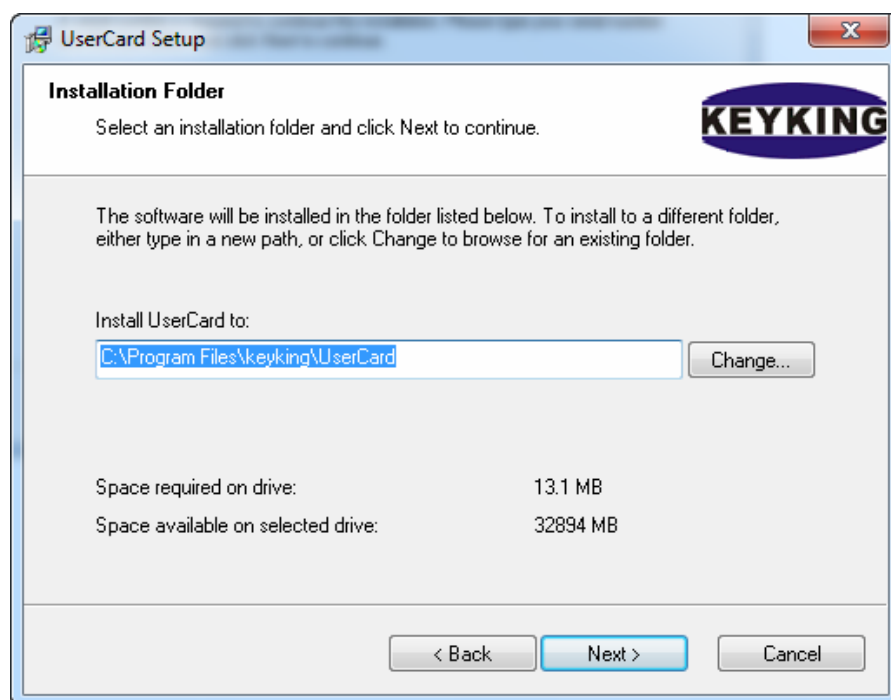


Figure 9-10-2-7

Click “Next” to continue (figure 9-10-2-8).

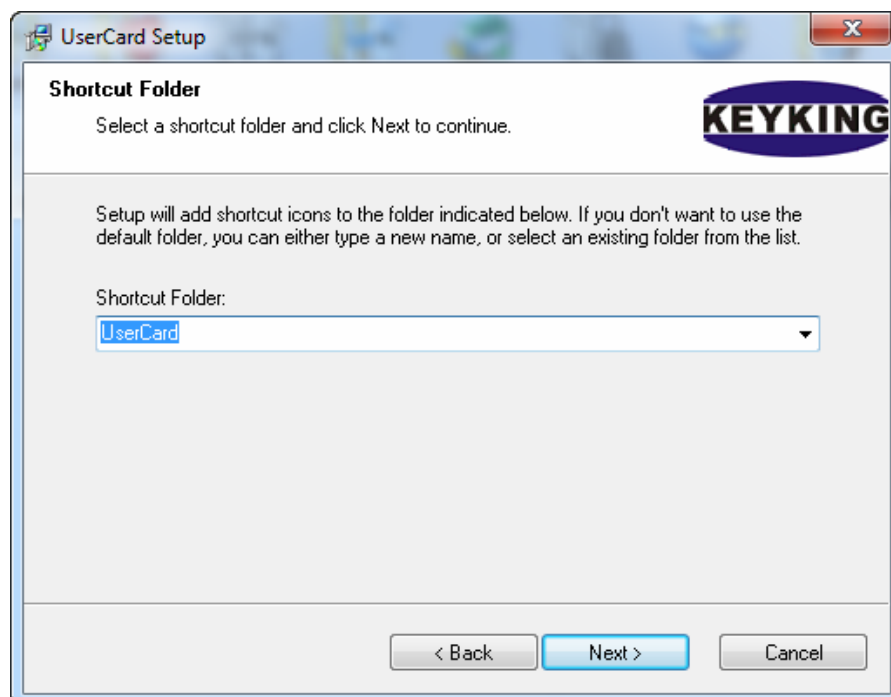


Figure 9-10-2-8

Click “Next” to continue (figure 9-10-2-9).

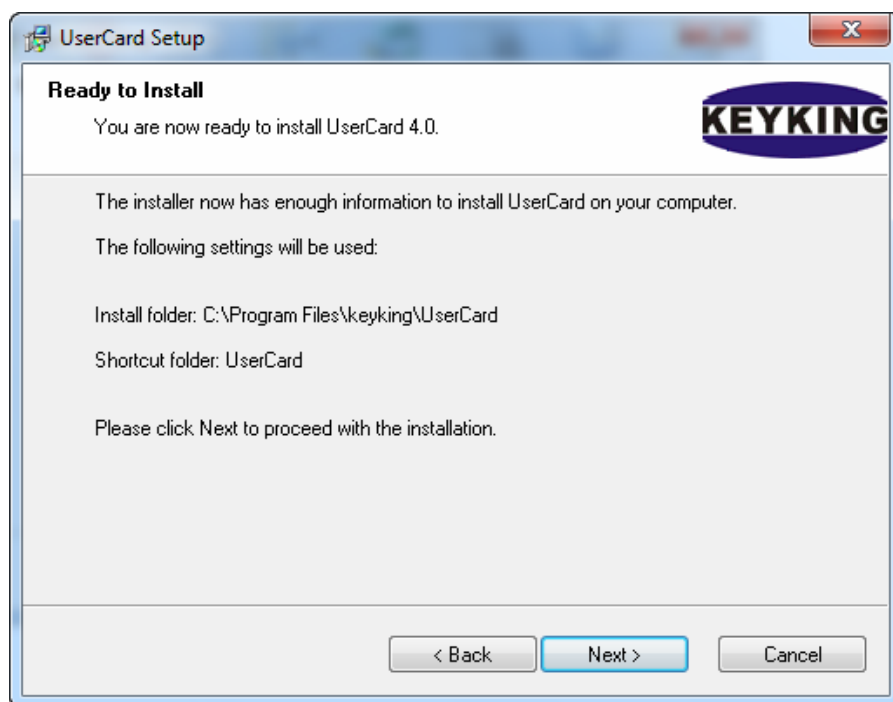


Figure 9-10-2-9

Wait for the program to install (figure 9-10-2-10)

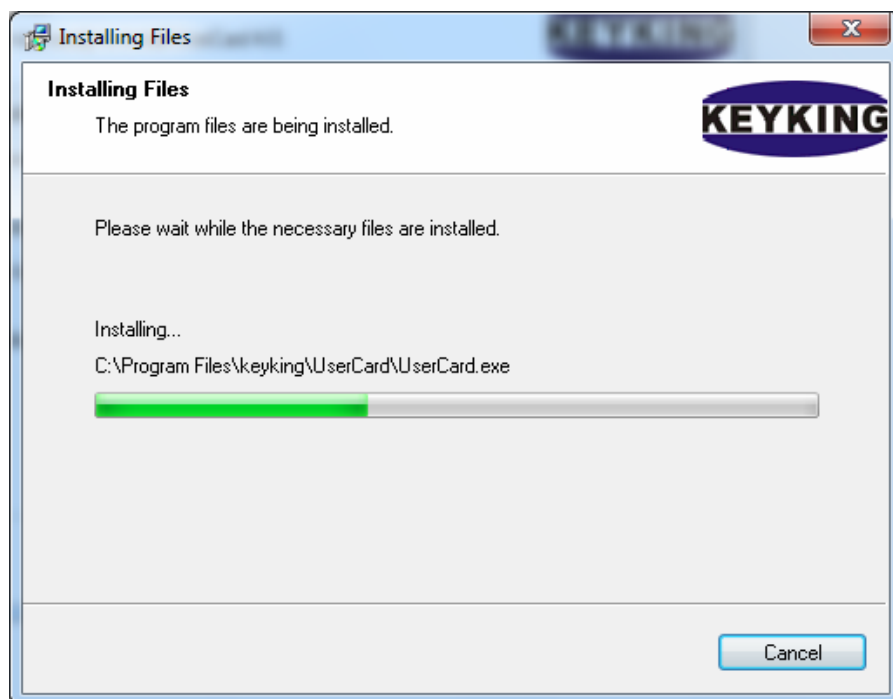


Figure 9-10-2-10

Click “Finish” to continue (figure 9-10-2-11)

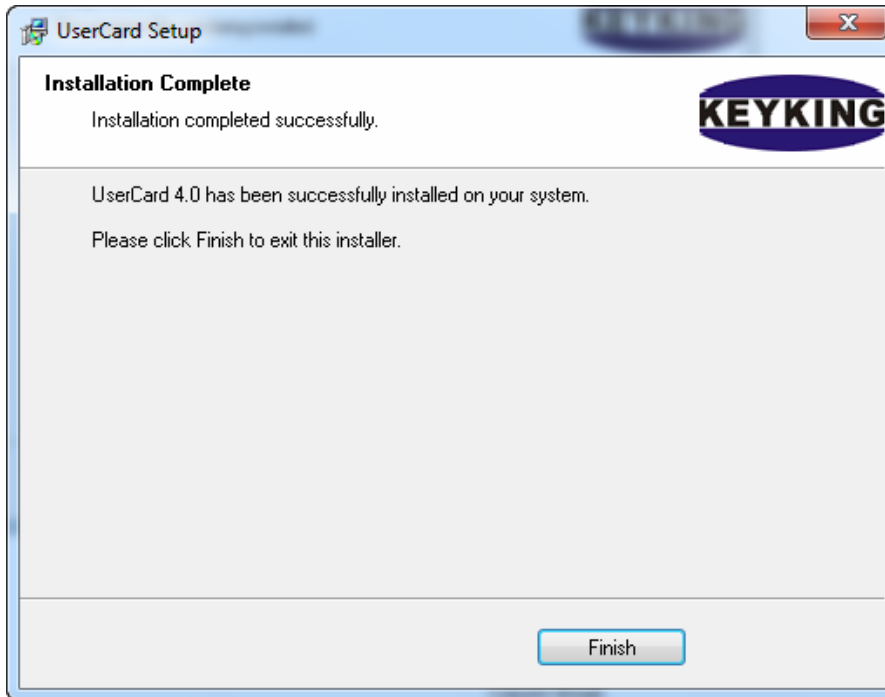


Figure 9-10-2-11

9.10.3 Software Operation

Prior to running the software, connect the MasterCard Encoder as per the instructions in Section 9.8

To run the software go Start, Program Files, UserCard, UserCard or click on the UserCard icon on the desktop (figure 9-10-3-1)

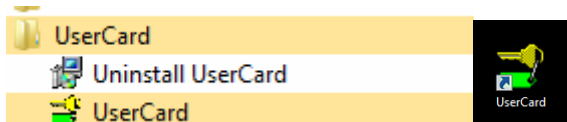


Figure 9-10-3-1

If this is the 1st time that this software has been installed then the Language Selection screen will appear (figure 9-10-3-2). Click on the arrow to show the languages available and select the desired language then click “OK” to proceed.

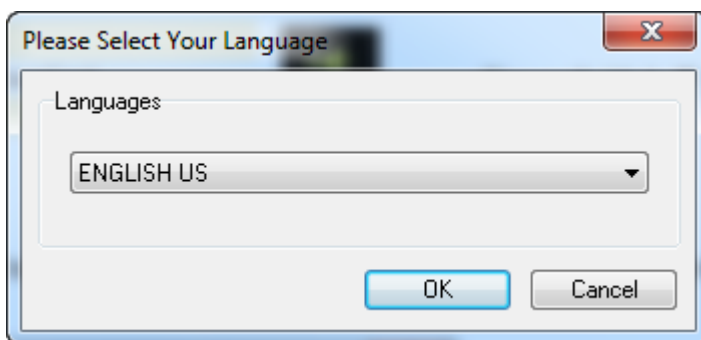


Figure 9-10-3-2

At the Password screen (figure 9-10-3-3), enter the password supplied in the “SN.txt file” (figure 9-10-2-1)

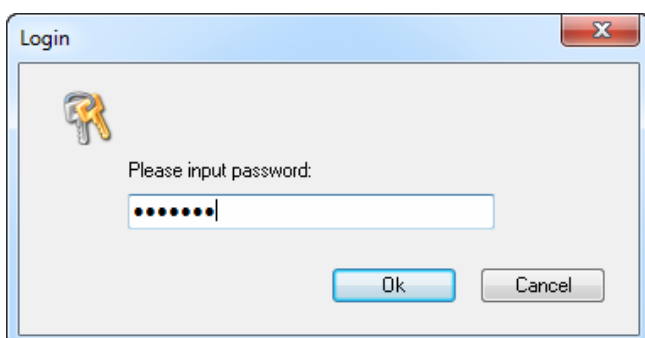


Figure 9-10-3-3

If the password is correct the Main Screen will appear. If the connections to the MasterCard Encoder are correct as per Section 9-8, then the Successfully Connect message will appear at the bottom left of the screen and the green connect tick in the menu bar will be grayed out. If the MasterCard Encoder is not connected correctly then the green connect tick will be green and there will be a failed to connect message at the bottom of the screen. Check the cables, connections and the PC Com Port using Windows Device Manager then click on the green connect tick to try and connect again (figure 9-10-3-4)

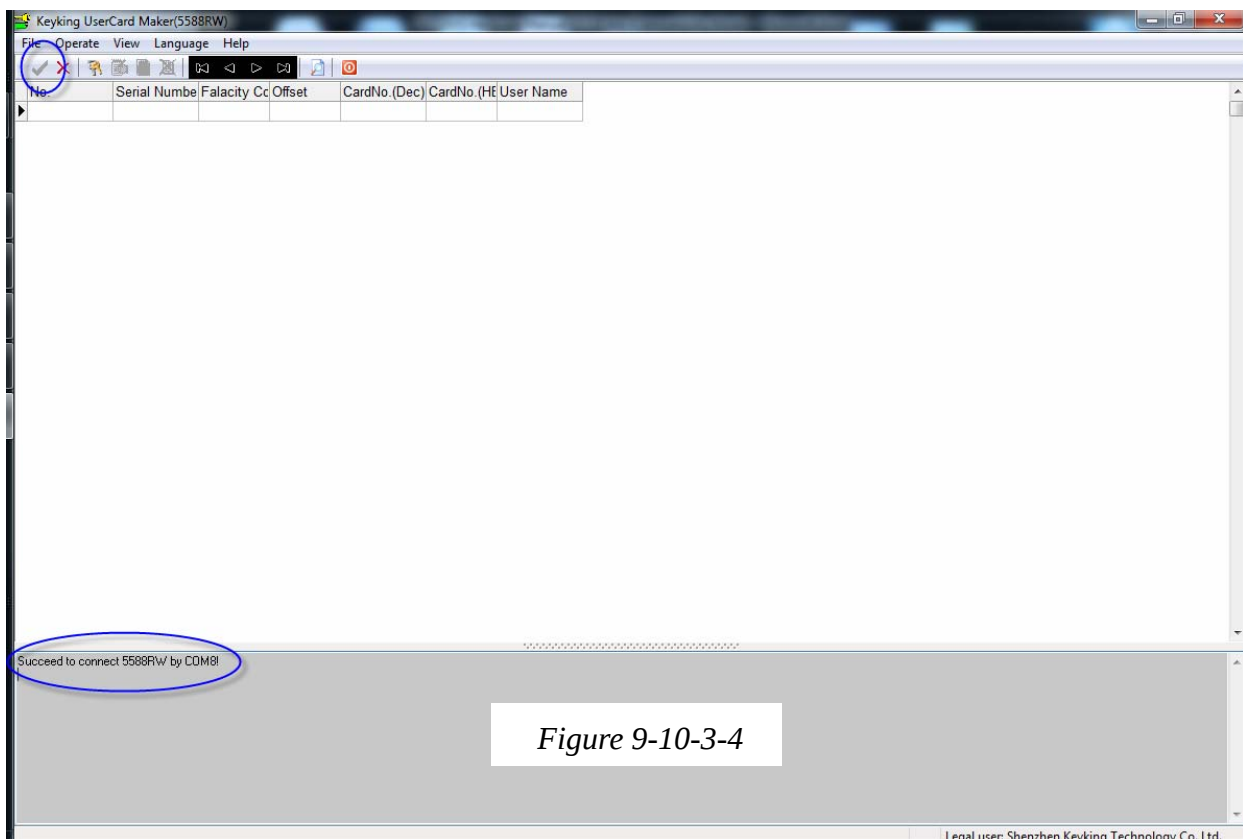


Figure 9-10-3-4

If the MasterCard Encoder still cannot be found then select “Setup Com Port” from the file menu again (figure 9-10-3-4) and select the correct Com Port from the drop down menu (figure 9-10-3-5)

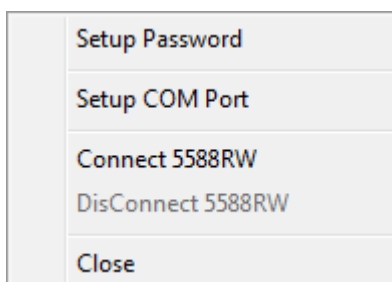


Figure
9-10-3-4

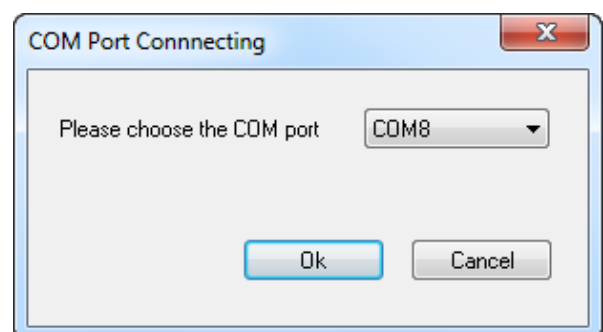


Figure
9-10-3-5

9.10.4 Writing the User Cards

The first step is to read the information off the CPU MasterSmartCard with regards to sector programming, password, security level and the customer information so that this sector information can be written to the user cards. So a CPU MasterSmartCard must have previously been programmed as per section 9.9. Place a preprogrammed CPU MasterSmartCard on the 5588RW reader/writer and select Read CPU MasterSmartCard from the Operate menu (figure 9-10-4-1). Note that until this information has been read, the UserCards cannot be programmed.

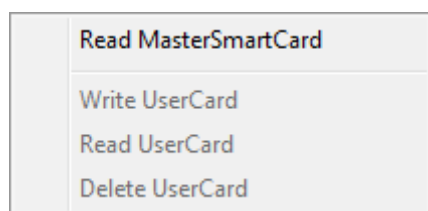


Figure 9-10-4-1

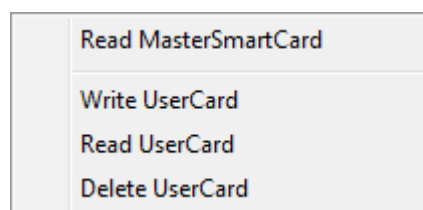


Figure 9-10-4-2

Once the CPU MasterSmartCard information has been read then the UserCard menu options are available for use (figure 9-10-4-2). To write to a user card place a MIFARE card on the reader/writer and click the “Write UserCard” option from the Operate menu. This will bring up the Write UserCard screen where the additional information is entered prior to writing the data to the user cards.

Figure
9-10-4-3

Card Number Display

Wiegand: Display the card number in Wiegand data format

Decimal: Display the card number in Decimal format

HEX: Display the card number in HEX data format

Rules

+1 Increment each card number automatically by adding 1

-1 Increment each card number automatically by subtracting 1

Manual Modify: Do not increment automatically, allow manual input

Card Number

Facility Card:

Offset: Any offset that is required to be added to this card

User Name:

9.11 BioScript Finger Print

XXXXXX



V-Flex/V-Pass/V-Prox FingerPrint reader

V-Flex/V-Pass/V-Prox CABLE COLOUR	RJ45 male connector	RJ45 Connector PIN Out
Power GND (Black)	PIN1 & PIN2	
Power +VDC (Red)	PIN7 & PIN8	
Weigand Out Data0 (Green)	PIN5	
Weigand Out Data1 (White)	PIN6	
Weigand GND (Black/White)	PIN1 & PIN2	

9.12 T2EH Card Copier

9.12.1 Overview

The T2EH is a one to one card copier for 125 KHz cards only (figure 9-12-1-1) It will not copy Mifare or HID iClass cards. The T2EH is not a card programmer, it is a card copier. It can copy the data from EM and HID Prox cards and write it into a Termic blank T5567 card. Note that the copier cannot copy the data from a EM card to another EM card as EM cards are read only. The Termic T5567 card must be used.



9.12.2 Specifications

<u>Power:</u>	7-14 VDC $\pm$ 10%, 500mA
<u>Dimensions:</u>	180mm (H) x 135mm (W) x 60mm (D)
<u>Weight:</u>	300 grams
<u>Operating Frequency:</u>	125KHZ:
<u>Operating Modes:</u>	EM to Termic blank T5567 card & HID to Termic blank T5567 card.
<u>Read Range:</u>	2 to 5 cm
<u>LED indicators:</u>	Green for HID mode, Red for EM mode, Red & Green together = Writing Data.

9.12.3 Layout (figures 9-12-3-1 & 9-12-3-2)





Figure
9-12-3-2

The 2TEH is powered by a DC9V supply and connects to a computer via an RS-232 serial cable (figure 9-12-3-2).

9.12.4 Operation

To copy an EM Card

Please keep the power supply on during the procedure. Press the EM button. A message will appear on the LCD display "Reader EM, Reading.....". The device is waiting to read an original EM proximity card. The EM led will be lit. Place an original EM proximity card on the RFID area. A message will appear on the LCD display "Reader EM, EM:<0800F8F202>" and a beep will sound. The device has read the card and is displaying the number in HEX. Press the COPY button. A message will appear on the LCD display "Copy card , Writing.....". The device is waiting to write this above card number (0800F8F202) into a blank proximity card. The EM and HID LEDs (Red, Green) will be lit. Place a blank T5567 proximity card on the RFID area. A "Bi..." will sound and the LCD display will return back to the message "Reader EM, Reading.....". The device has already written the card number 0800F8F202(HEX) into the blank T5567 proximity card.

To copy a HID Card

Please keep the power supply on during the procedure. The device supports most HID formats up to Wiegand 37 Bits. Press the HID button. A message will appear on the LCD display "Reader HID, Reading.....". The device is waiting to read an original HID proximity card. The HID led will be lit. Place an original HID proximity card on the RFID area. A message will appear on the LCD display "Reader HID, HID<W26>, HID:<01003B74F5>" and a beep will sound. The device has read the card and is displaying the number in HEX and the Wiegand format. Press the COPY button. A message will appear on the LCD display "Copy card <HID>, Writing.....". The device is waiting to write this above card number (01003B74F5) into a blank proximity card (Model:T5567). The EM and HID LEDs (Red, Green) will be lit. Place a blank T5567 proximity card on the RFID area. A beep will sound and the LCD display will revert back to the message "Reader HID, Reading.....". The device has already written the card number 01003B74F5 (HEX) into the blank T5567 proximity card.

Chapter 10 – Firmware Upgrades

10.1 Overview

The SECUSYS C Series of access controllers use either an 8 bit processor or a 32 bit processor which is soldered onto the PCB. From time to time to be able to receive new program features the firmware will need to be upgraded. This is done by flashing or upgrading the firmware program within the processor. This is not a procedure that the user can undertake and must be carried out by SECUSYS staff or authorized and trained engineers. Note that to be able to use any new features both the firmware and software must be upgraded. This chapter covers the firmware upgrade procedure for both the SECUSYS C Series V3.5 and V4 controllers. For the software updating procedure please refer to the SECUSYS Software manual.

10.2 Current Version

Check the existing version number by connecting to a controller with the SECUSYS software and searching for controllers. The version number will start with a 3 for V3.5 PCB's (figure 10-2-1) or a 4 for V4 PCB's (figure 10-2-2)

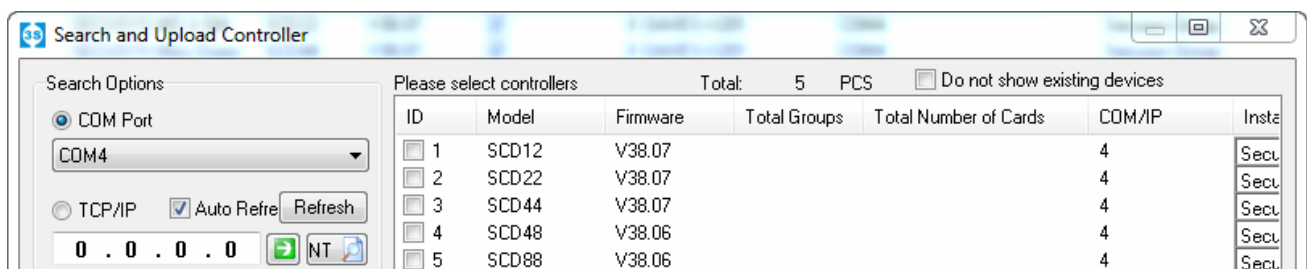


Figure 10-2-1

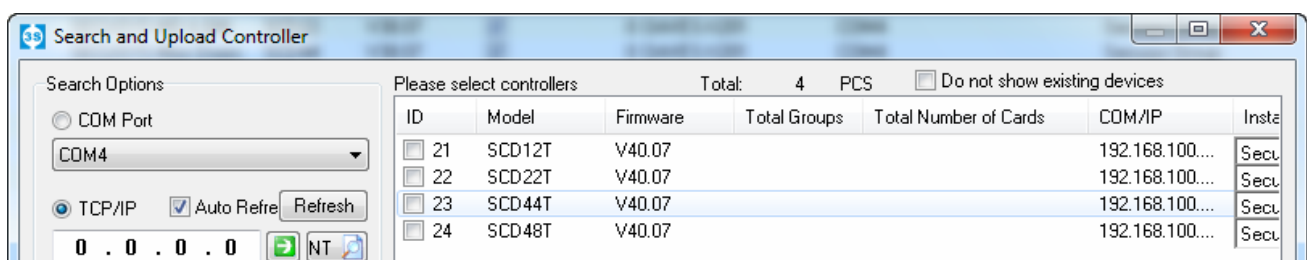


Figure 10-2-2

10.3 Types of Upgrades

There are 2 types of firmware upgrades available, one with serial number and one without. The upgrade with serial number requires the controller serial number to be supplied to SECUSYS. An upgrade file will then be supplied for that controller(s) only. This is used where a customer requires specific features and has paid to have those features developed. Standard released features that are available for general distribution uses the "Without Serial Number File". This file will upgrade any SECUSYS controller.

10.4 Upgrade Files

The upgrade file package will normally be available via a .rar or a .zip file. Upon unzipping the .rar or .zip file 2 directories will be created (figure 10-4-1)..

SCD12-88 Upgrade Application for V3.5	14/07/2011 9:16 a....	File folder	
SCD12-88T Upgrade Application for V4	14/07/2011 9:16 a....	File folder	
SCD Firmware Application.rar	14/07/2011 9:15 a....	WinZip File	6,715 KB

Figure 10-4-1

The 1st directory contains the V3.5 application and a firmware folder that contains the actual firmware upgrade files for the V3.5 PCB's. Note the V3.5 on the end of the Update Application exe file (figure 10-4-2).

Document	14/07/2011 9:13 a....	File folder	
Firmware	14/07/2011 9:13 a....	File folder	
Accessflash.jpg	14/07/2011 10:35 a...	JPEG image	141 KB
EDSOCKSERVER.DLL	14/07/2011 10:22 a...	Application extens...	132 KB
upconfig.dll	14/07/2011 10:22 a...	Application extens...	1 KB
UPDATEAPP.DLL	14/07/2011 10:22 a...	Application extens...	136 KB
UpdateApp_V3.5.exe	14/07/2011 10:22 a...	Application	2,680 KB

Figure 10-4-2

The 2nd directory contains the V4 application and a firmware folder that contains the actual firmware upgrade files for the V4 PCB's. Note the V4 on the end of the Update Application exe file (figure 10-4-3).

Document	14/07/2011 9:12 a....	File folder	
Firmware	14/07/2011 9:12 a....	File folder	
AccessAbout.jpg	14/07/2011 9:18 a....	JPEG image	25 KB
Accessflash.jpg	14/07/2011 10:23 a...	JPEG image	141 KB
EDSOCKSERVER.DLL	14/07/2011 10:21 a...	Application extens...	132 KB
upconfig.dll	14/07/2011 10:21 a...	Application extens...	1 KB
UPDATEAPP.DLL	14/07/2011 10:21 a...	Application extens...	136 KB
UpdateApp_V4.0.exe	14/07/2011 10:21 a...	Application	2,655 KB

Figure 10-4-3

Expanding the respective firmware folder will list the actual firmware application files (figure 10-4-4 & figure 10-4-5)

SCD12_V3807.V35
SCD22_V3807.V35
SCD44_V3807.V35
SCD48_V3807.V35
SCD88_V3807.V35

Figure 10-4-4

SCD12T_V4009.V40
SCD22T_V4009.V40
SCD44T_V4009.V40
SCD48T_V4009.V40
SCD88T_V4009.V40

Figure 10-4-5

10.5 V3.5 PCB Upgrade Procedure

Connect to the panel via a fixed serial port or a USB to RS-232 adapter. The location of the RS-232 connector on the controller is located in the bottom left corner of the V3.5 door controller PCB's and it is the only 3 PIN white socket on the PCB. (figures 10-5-1 & 10-5-2) For the exact location refer to the detailed layout diagrams in Chapter 5 of this manual.

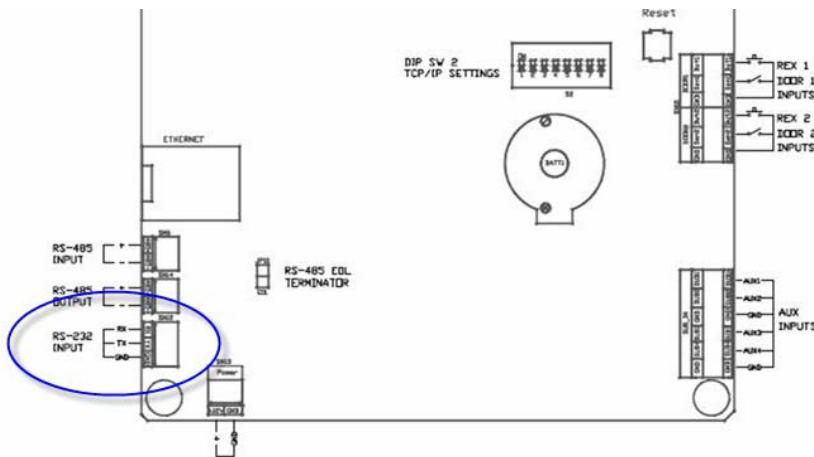


Figure 10-5-1

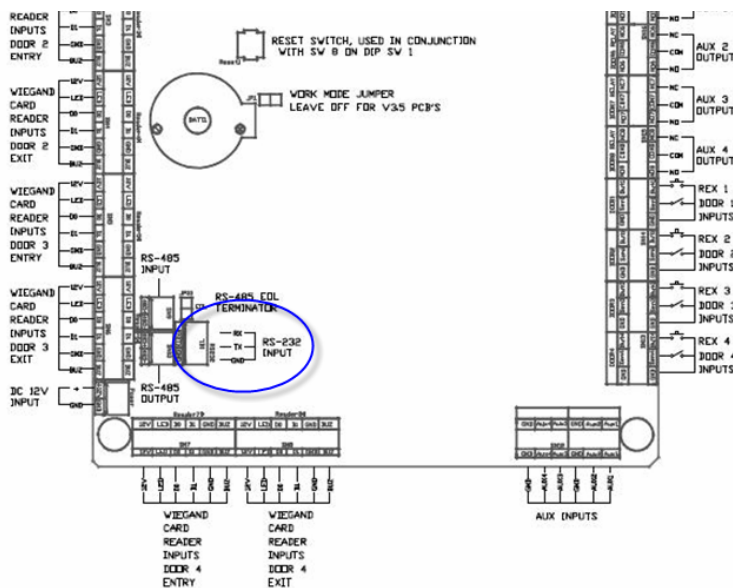


Figure 10-5-2

Run the V3.5 update file for the V3.5 economy range PCB's. If a Windows Firewall message appears then allow access on private networks (figure 10-5-3). This message is from a PC running Windows 7.

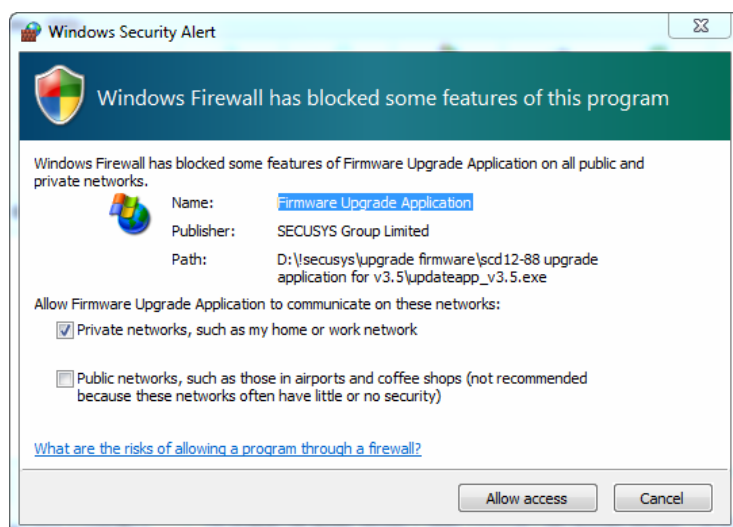


Figure 10-5-3

The main update window will open (figure 10-5-4). Select the Com Port that the computer is using to connect to the controller. If this is unknown go to Windows Device Manager and see what Com Port Windows has allocated (figure 10-5-5). Ensure that this port is free and ensure that the SECUSYS 2000 software is shut down. Connecting via a Virtual Port or via TCP/IP is not recommended.

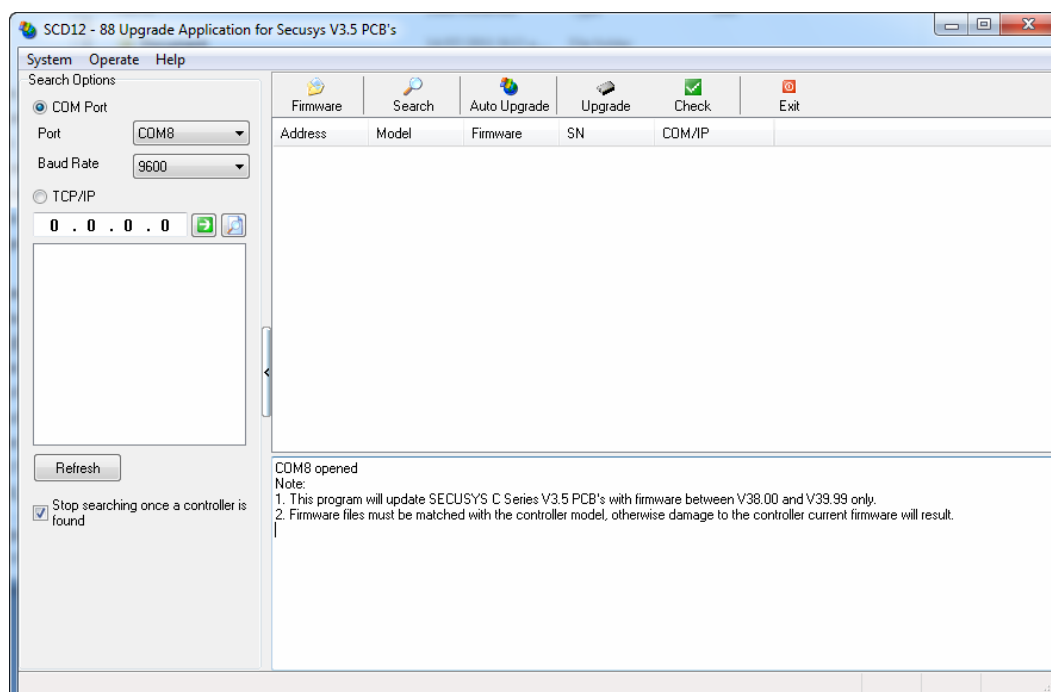


Figure 10-5-4

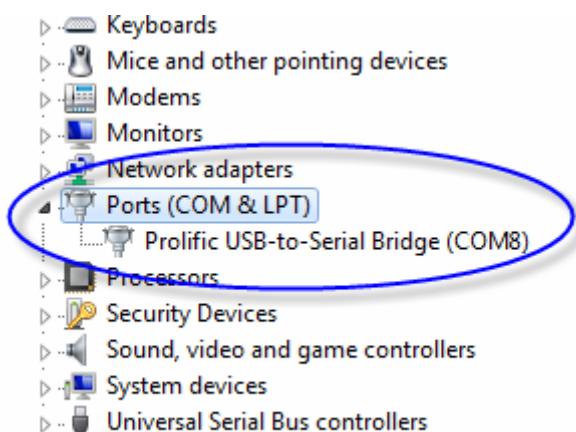


Figure 10-5-5

Click on the Search icon and the search bar will appear on the screen (figure 10-5-6). If it does not check any error messages that appear in the Notes section at the bottom of the screen. If the Com Port is the correct port then a COM X Opened message will appear. If no controller appears after 30 seconds then check that the RX LED on the controller board is flashing. If it is not check your PC port and the cable connections. Also check that the correct Com Port is being used. Open Device Manager and check to see that the port selected is actually the same Com Port that Windows has allocated.

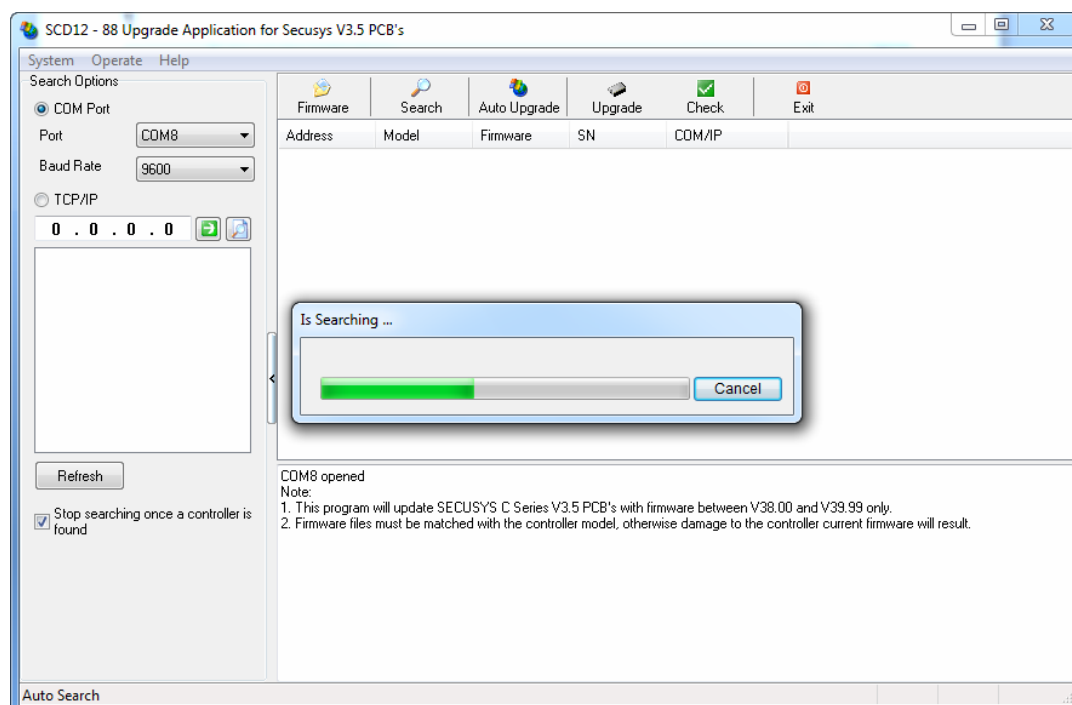


Figure 10-5-6

Once the controller has been found then it will be listed (figure 10-5-7). Check the model number and the current firmware version.

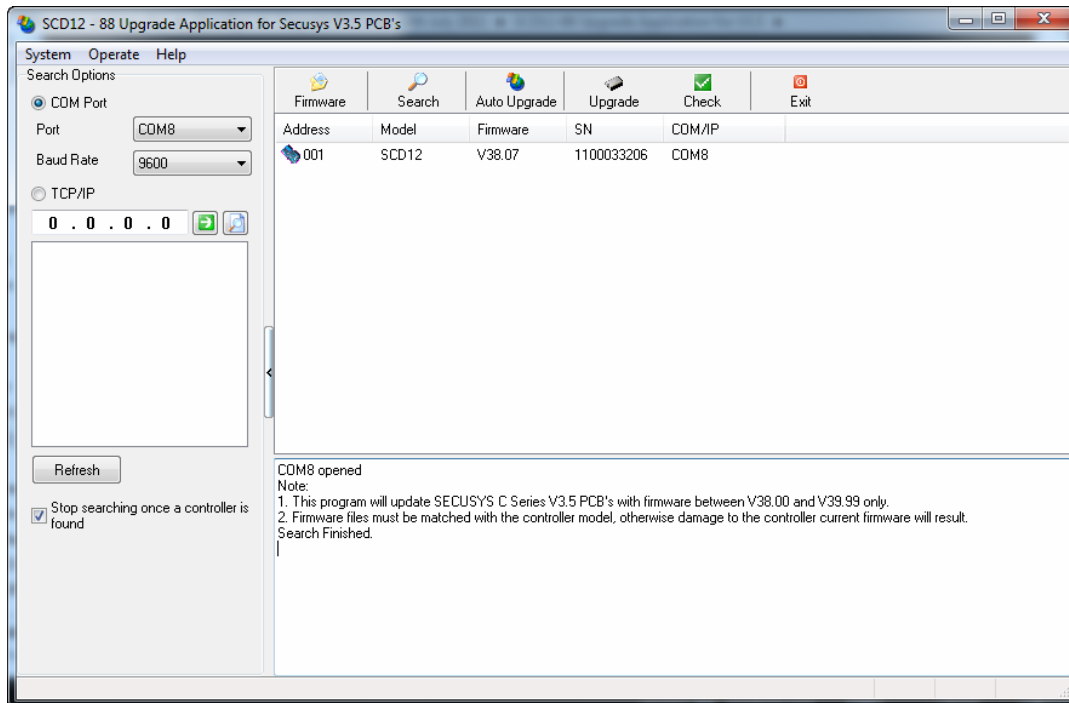


Figure 10-5-7

Highlight the controller, then click on the Firmware icon, navigate to the required firmware folder and select the required file. Note in the example below the firmware file is actually the same version as what is already in the controller but normally this will not be the case (figure 10-5-8)

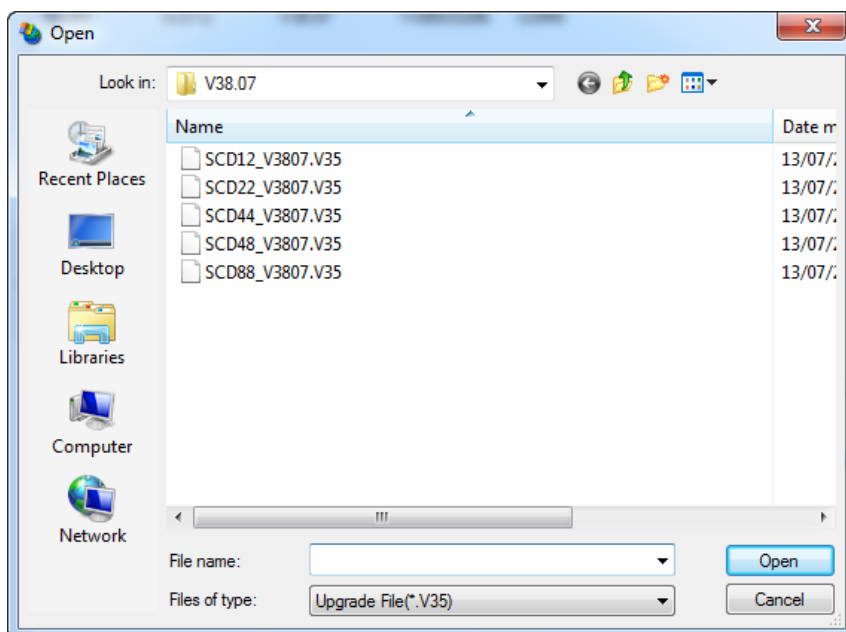


Figure 10-5-8

Click on the Upgrade icon and the upgrade process will start with the log recording “Writing Application” (figure10-5-9)

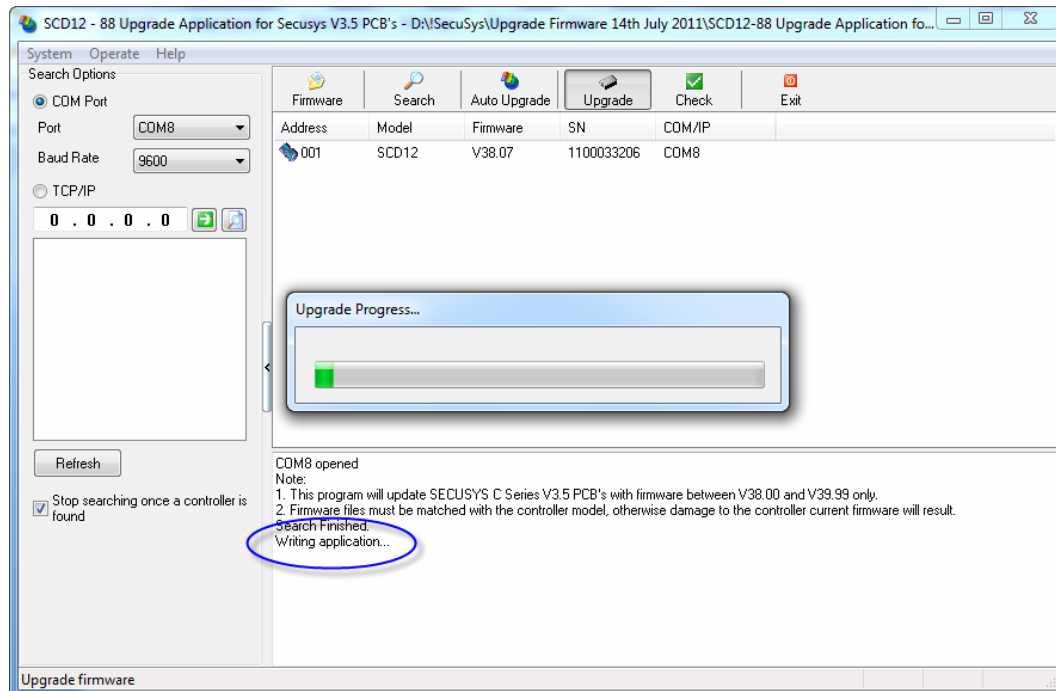


Figure 10-5-9

During the actual firmware upgrade process the PC may slow down or appear to be frozen or the “Not Responding” message may appear (figure 10-5-10) Under **NO CIRCUMSTANCES** interrupt the firmware upgrading process while data is being written to the controller. If this process is interrupted then the controller will need to be returned to SECUSYS for repair, a time consuming and expensive process.

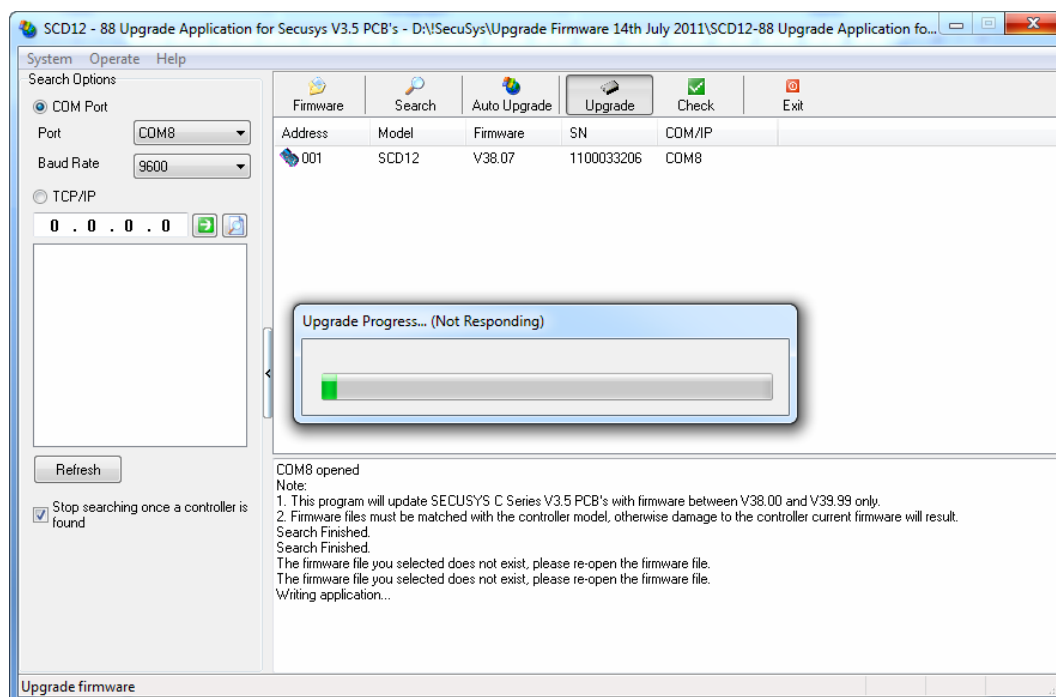


Figure 10-5-10

If successful the “Write Application Successful” message will appear (figure 10-5-11)

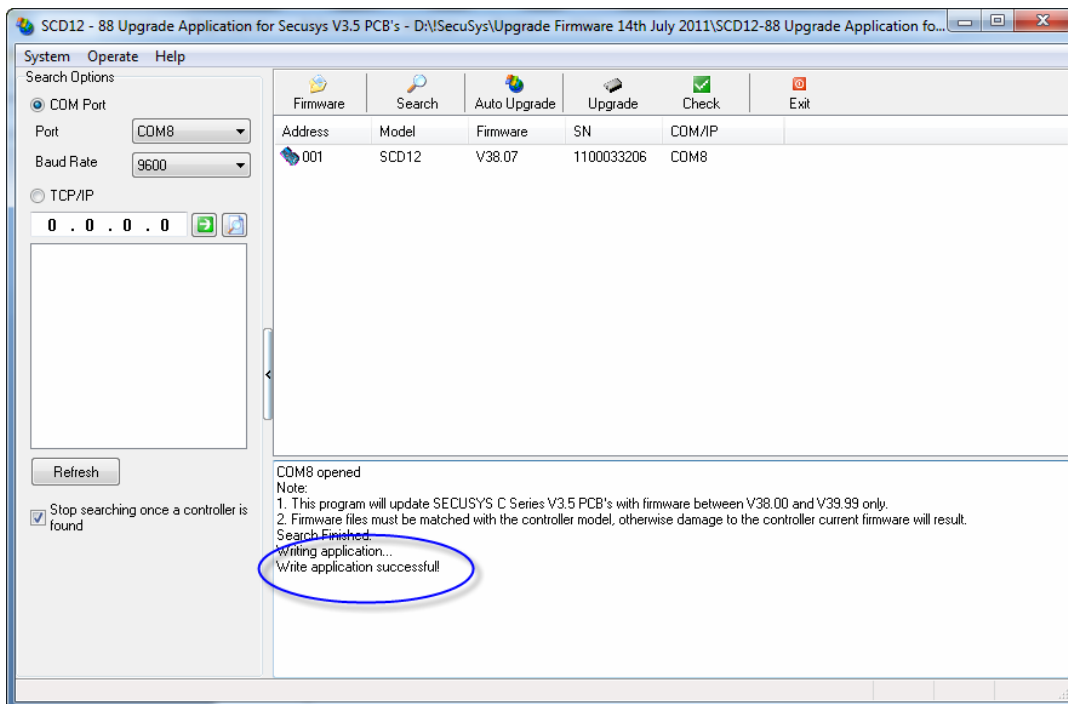


Figure 10-5-11

Once the successful message appears then click on the “Check” icon and the firmware in the controller will be checked (figure 10-5-12). By selecting the “Auto Upgrade” icon instead of the “Upgrade” icon, the application will automatically undertake the “Check” function.

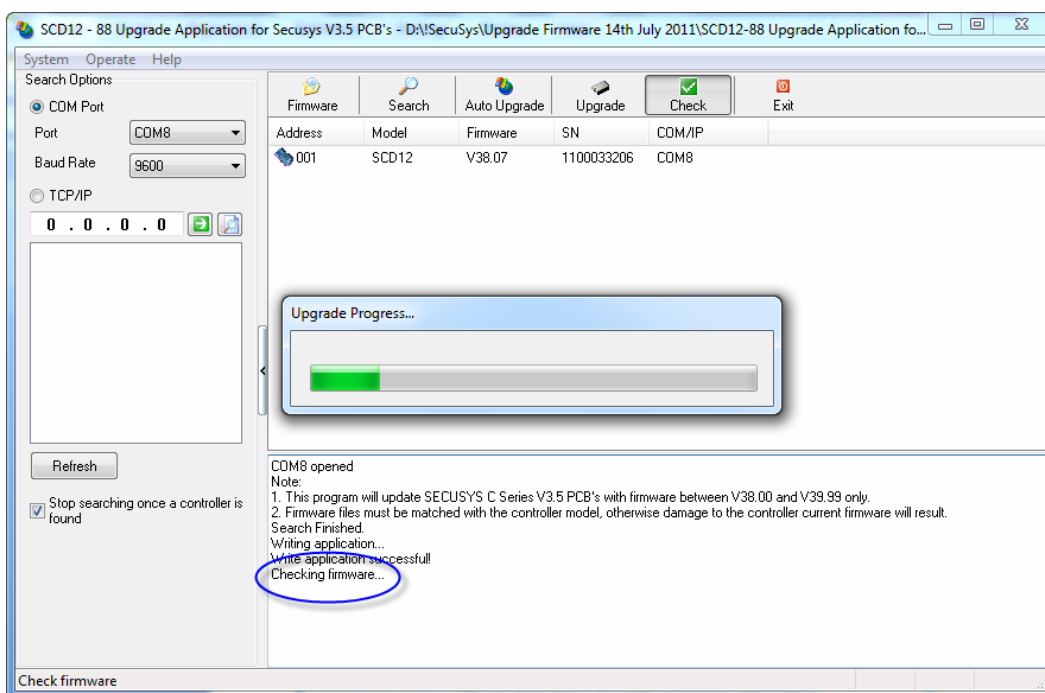


Figure 10-5-12

If the firmware check is ok then a corresponding upgrade successful message will appear (figure 10-5-13)

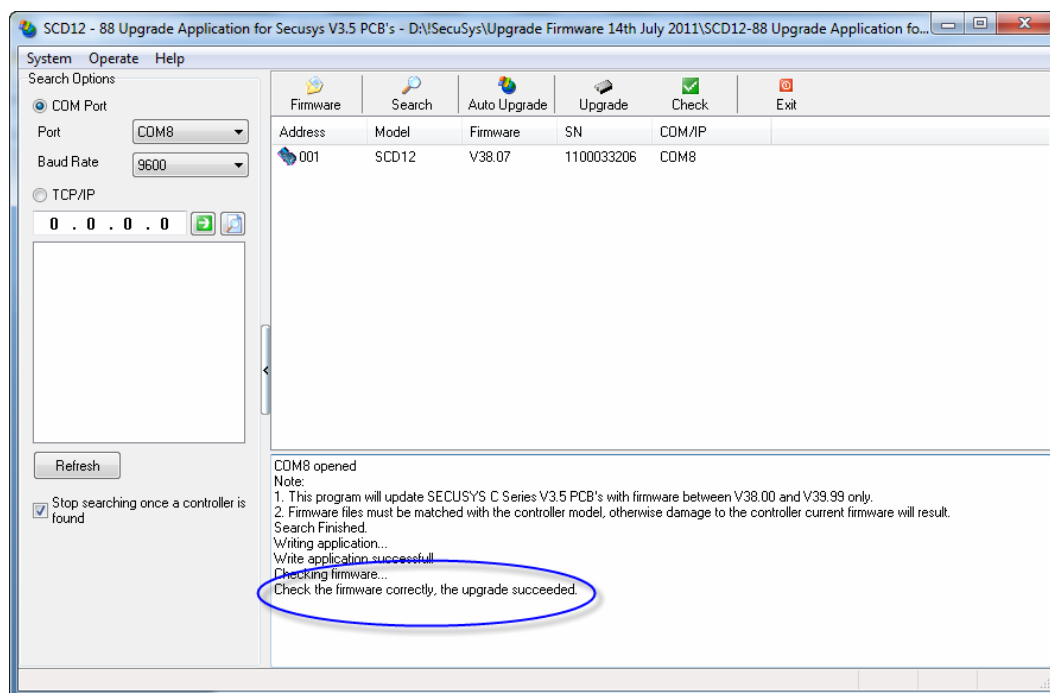


Figure 10-5-13

This completes the upgrade procedure.

10.6 V4 PCB Upgrade Procedure

The procedure for the updating of the V4 PCB's is very similar to the procedure for updating the V3.5 PCB's. Connect to the panel via a fixed serial port or a USB to RS-232 adapter. The location of the RS-232 connector on the controller is located in the bottom left corner of the V4 door controller PCB's and it is the only 3 PIN white socket on the PCB. (figures 10-6-1 & 10-6-2) For the exact location refer to the detailed layout diagrams in Chapter 5 of this manual.

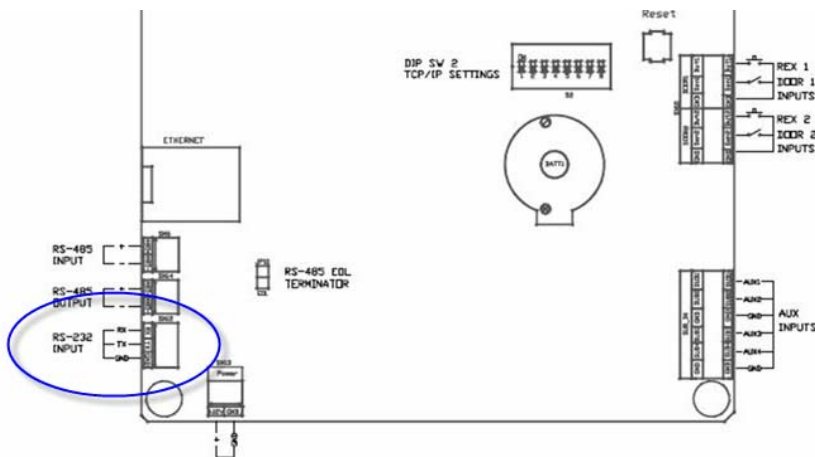


Figure 10-6-1

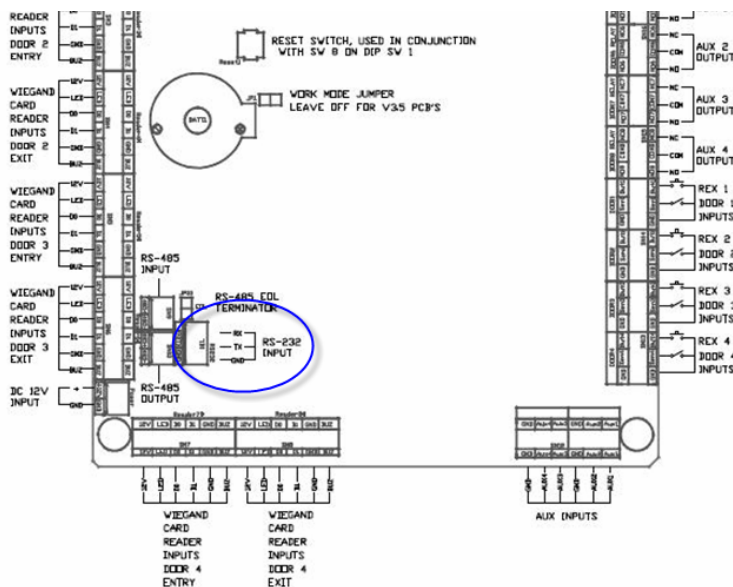


Figure 10-6-2

Run the V4 update file for the V4 advanced range PCB's. If a Windows Firewall message appears then allow access on private networks (figure 10-6-3). This message is from a PC running Windows 7.

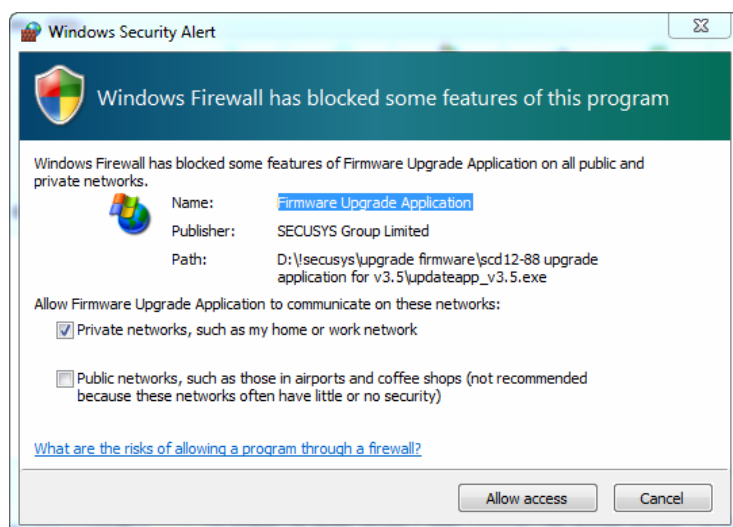


Figure 10-6-3

The main update window will open (figure 10-6-4). Select the Com Port that the computer is using to connect to the controller. If this is unknown go to Windows Device Manager and see what Com Port Windows has allocated (figure 10-6-5). Ensure that this port is free and ensure that the SECUSYS 2000 software is shut down. Connecting via a Virtual Port or via TCP/IP is not recommended.

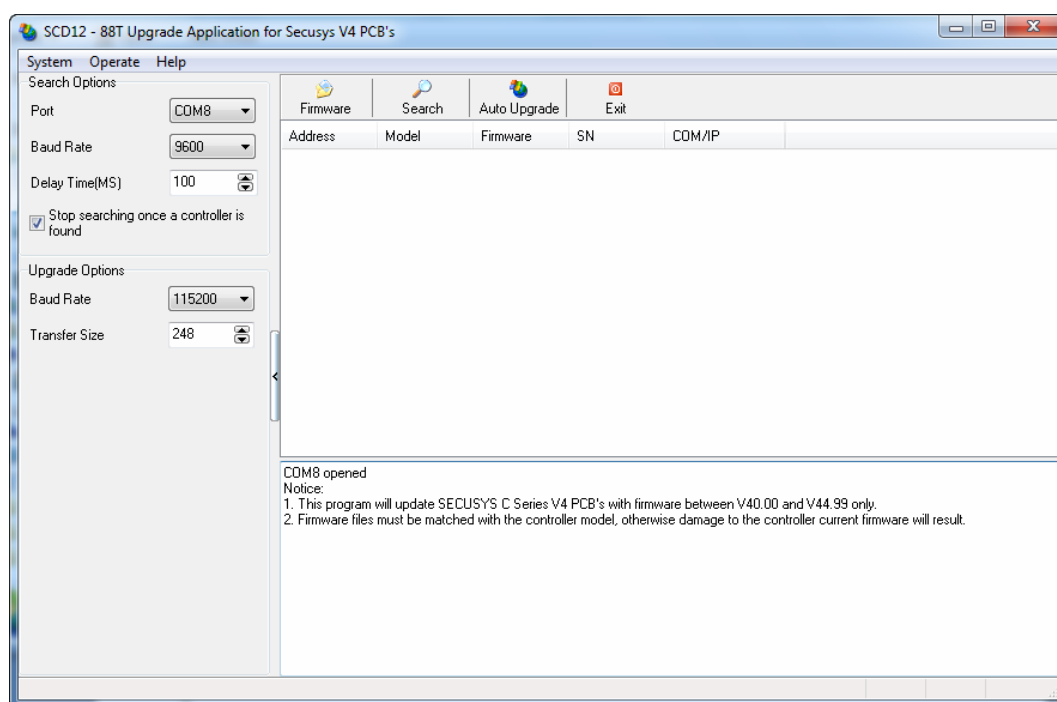


Figure 10-6-4

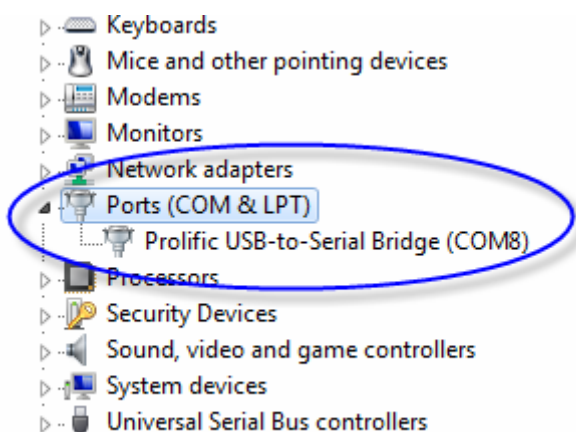


Figure 10-6-5

Click on the Search icon and the search bar will appear on the screen (figure 10-6-6). If it does not check any error messages that appear in the Notes section at the bottom of the screen. If the Com Port is the correct port then a COM X Opened message will appear. If no controller appears after 30 seconds then check that the RX LED on the controller board is flashing. If it is not check your PC port and the cable connections. Also check that the correct Com Port is being used. Open Device Manager and check to see that the port selected is actually the same Com Port that Windows has allocated.

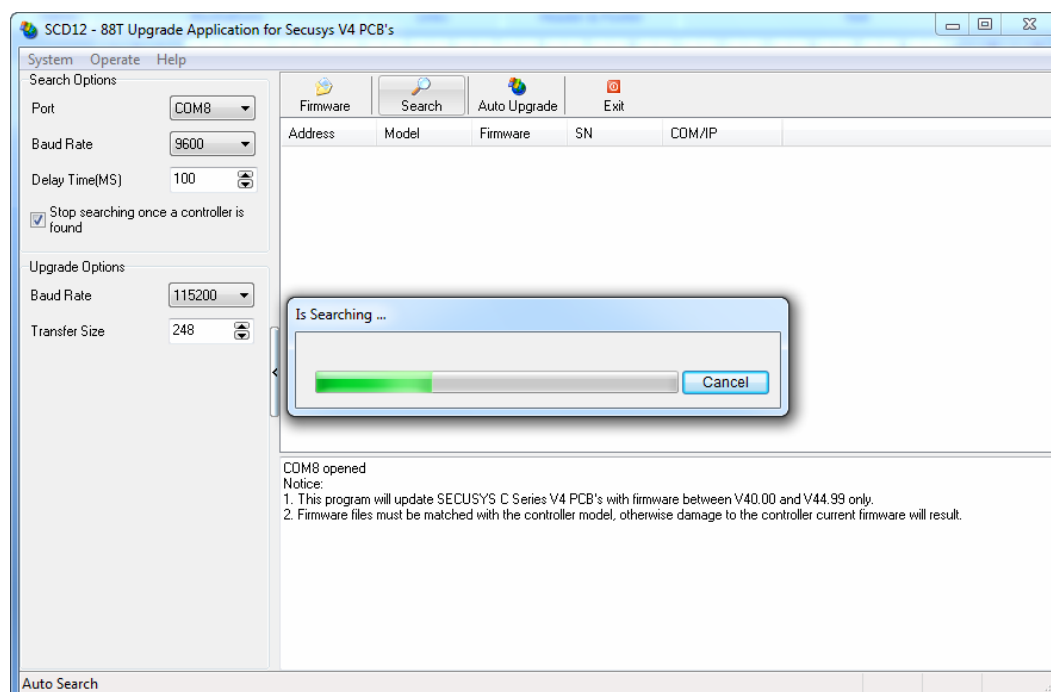


Figure 10-6-6

Once the controller has been found then it will be listed (figure 10-6-7). Check the model number and the current firmware version.

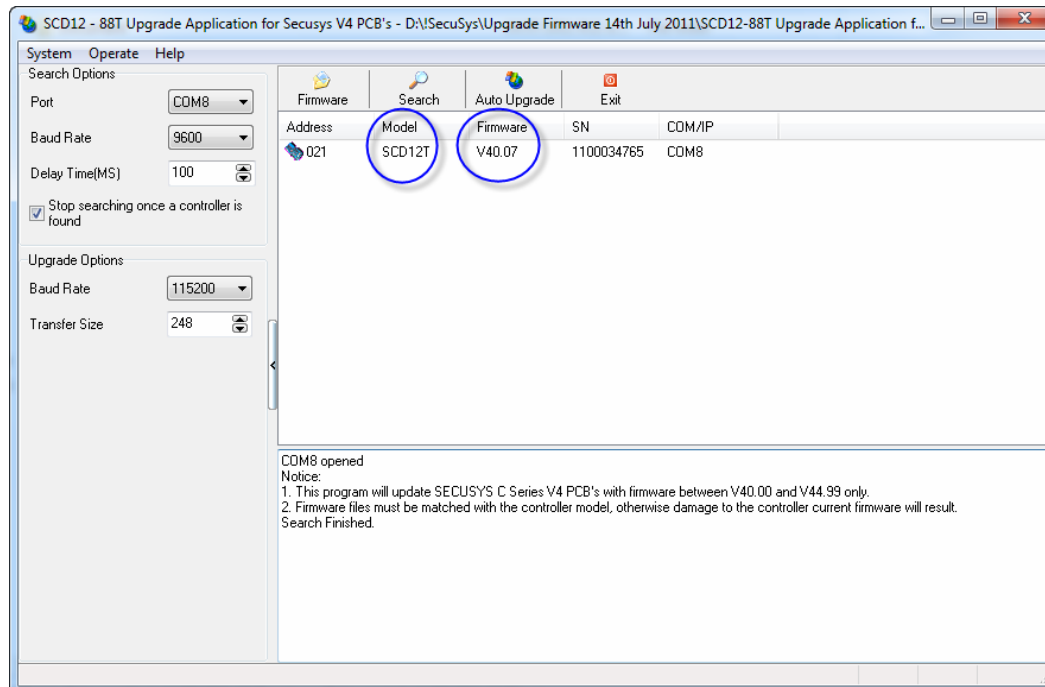


Figure 10-6-7

Highlight the controller, then click on the Firmware icon, navigate to the required firmware folder and select the required file. Note in the example below the firmware file is V40.09 and the one in the controller is V40.07. This is normal, the firmware in the file should be newer than in the controller. (figure 10-6-8)

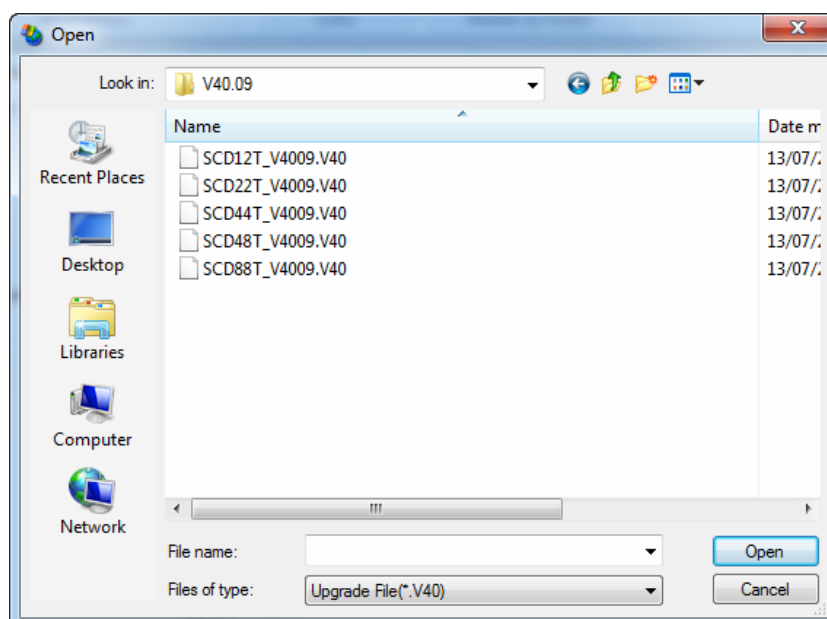


Figure 10-6-8

Click on the Auto Upgrade icon and the upgrade process will start with the log recording “Writing Application”

(figure10-6-9) During the actual firmware upgrade process the PC may slow down or appear to be frozen or the “Not Responding” message may appear (figure 10-6-9) Under **NO CIRCUMSTANCES** interrupt the firmware upgrading process while data is being written to the controller. If this process is interrupted then the controller will need to be returned to SECUSYS for repair, a time consuming and expensive process.

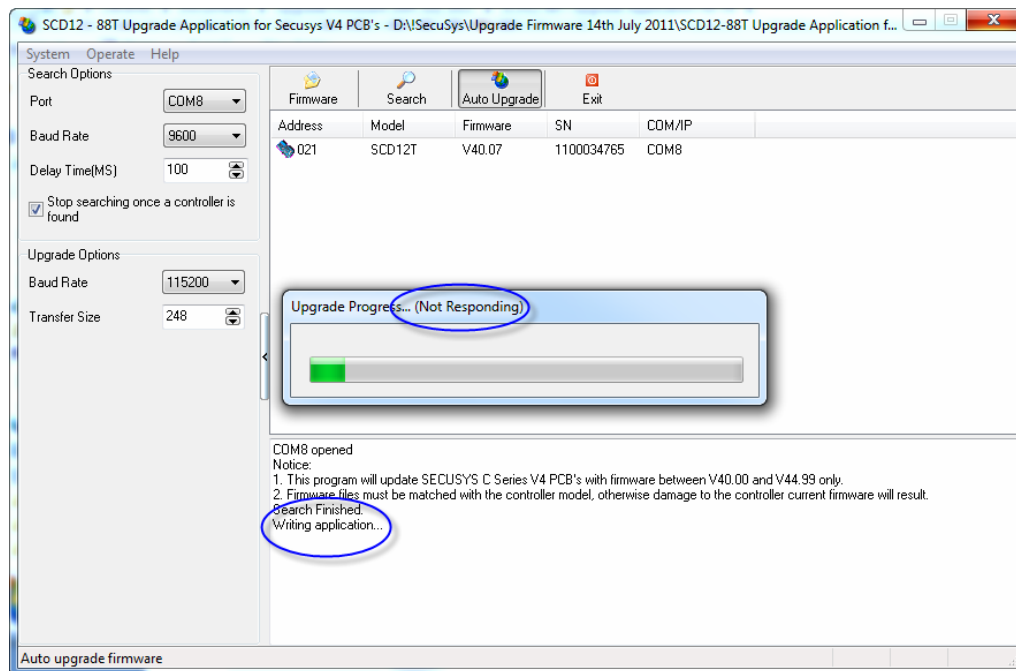


Figure 10-6-9

If successful the Version number will have changed and the “Write Application Successful” message will appear (figure 10-6-10) The V4 Upgrading Application checks automatically so there is no “Check” icon. This completes the upgrade procedure.

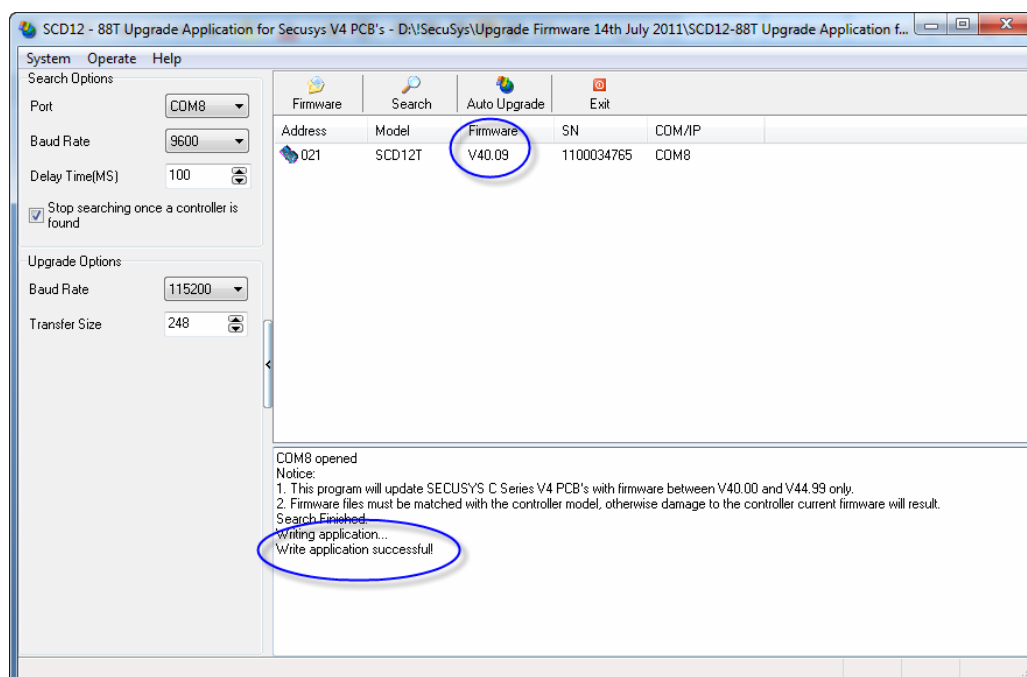


Figure 10-6-10

Chapter 11 – Installation

11.1 Safety

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

- The controller should be installed at maximum distance of 1.5 meters from the AC Power outlet.
- Power disconnection is done by unplugging the system from the mains of the AC Power outlet.
- Service procedures, including assembly of the AC Power plug, must be done by qualified personnel. A safety approved connector has to be used, according to the local standards.
- The controller must be powered OFF before opening its metal case.

Injury Precautions

Use Correct Power Cord	To avoid fire hazard, use only the power cord specified for this product.
Avoid Electric Overload	To avoid electric shock or fire hazard, do not apply a voltage to a controller that is outside the range specified for that controller.
Ground the Product	This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the inputs or outputs of the controller, ensure that the controller is properly grounded.
Do Not Operate Without Cover	To avoid electric shock or fire hazard, place the controller inside a metal box.
Use Proper Fuse	To avoid fire hazard, use only the fuse type and rating specified for this product.
Do Not Operate In Wet/Damp Conditions	To avoid electric shock, do not operate this product in wet or damp conditions.
Do Not Operate In An Explosive Atmosphere	To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Product Damage Precautions

Use Proper Power Source	Do not operate this product from a power source that applies more than the voltage specified.
Use Proper Mains Fuse	Use only a 20 x 5mm 0.5A fast acting fuse located at the mains connector.

11.2 Electronic EMF Protection

Never install the controller inside a high voltage electrical power box and never place it in close to large transformers or high voltage/current source devices. Since the controller may require maintenance, it is important to consider the accessibility of the unit.

The controller board must be separately grounded. Therefore, one must verify in advance whether the installation site provides adequate grounding facilities.

The cover or case that contains the controller must be tightly screwed down or locked in place.

It is essential to plug the controllers power supply (90-230V) into a “clean” line (i.e., a line which is not being used for other pieces of heavy equipment) or into an independent line, which has been specifically allocated to the terminal, with a good earth ground.

Never use the system cables guide to pass wires from another system, like loud bells, electric door openers etc.

Four categories of cables go to, or from, the controller, the 220 volt cable, the cables connecting readers, alarm entries and exit-buttons, the communication cable and the cable connecting the electrical door opener (locks) or an exterior release device. These categories must be installed as far as possible one from each other.

11.3 Installation Procedure

Install the controller metal housing on the wall and pay make sure that there is easy access to the unit, effective Ventilation to the unit and a clear Electromagnetic Environment

Select the communication method from RS-232, RS-485 or TCP-IP. Each communication interface uses different methods, refer to chapter 3, Communication

Set the controller ID (controller address) through switches 1-7. Note that this must be a unique address.

Power the card readers according to its consumption, see its technical manual. If using power from the SECUSYS controllers, make sure that the total power consumption is 1000mA at maximum.

When using a DC voltage to an electric door lock, install a diode ON THE LOCK ITSELF. Fail-Safe and Fail-Secure will use different connections, refer chapter 4 for more information

Connect the different door sensors between the corresponding inputs and the GND. The door sensors operating mode (NO or NC) is defined by the software.

Connect an effective ground to the dedicated lag located at the protective ground pin (screw) in the controller metal housing. Use a proper tool to fix the ground wire into the lag or solder it.

Connect the mains AC power (100-230v). Use a 4mm wide strip to attach the mains cable to the proper fixation inside the controller housing.

Program the system

Chapter 12 – Trouble Shooting

Symptom	Possible Cause	Remedy
Yellow power LED dead	No power or low power	Check the input voltage at the terminals on the bottom of the PCB. It should be between 12V and 14VDC.
LED on reader dead	No power or low power	Check voltage at reader, it should be approximately 12v DC between red and black. Check that the total current draw from the controller is within limits.
Reader range is too short.	There is a magnetic field near the reader	Remove the item which produces the magnetic field.
	The reader cable is not shielded.	Use the shielded cable. Confirm there is at least 100mm between the reader cable and any high voltage cables.
	The reader has been mounted on a metallic surface.	Remount the reader on a non metallic surface
Cannot open the door when flashing the cards. (Check review event on PC first)	The card is invalid for the door.	Use software to enable the card for the door
	Time zone of the card is invalid.	Use software to set the user time zone to valid
	Communication problem between reader and the controller.	Check to see if the problem is caused by electromagnetic interference. If so increase the distance between the reader cable and the interference or use shielded cable
	Lock problem	Check if the lock is working correctly
With power on, the reader goes "BEEP" but the controller cannot process the information.	Wrong connection between controller and readers.	Check the connection is correct.
	Wiegand format is not correct.	Please check your reader and card formats. As a test place all bits as 1 in the Wiegand Format Setup screen in the software for that particular bit format.
	Losing data from the controller.	Download the data again from the PC.
The controller cannot communicate with the converter.	Converter power is off.	Supply power.
	The baud rate setting is incorrect.	Set the baud rate the same as the software
	The RS-485 wires are reversed	Use the correct connections
Converter cannot communicate	The COM port setting is incorrect.	Correct the Com Port setting. Note use Windows Device Manager to find the correct comm. port.

with PC.	The RS-232 connections are reversed	Use the correct connections.
	The power supply of the converter is not sufficient.	The 9v PSU must be able to supply at least 300mA. If you use a USB cable as a PSU, please use a 2nd USB socket for the PSU or use a 12V 300mA PSU.
Some of the controllers on the RS-485 LAN cannot communicate.	Duplicate addresses	Make sure controllers have unique addresses
	The data in the RAM of the controller is corrupted.	Download the configuration again by using the software.
	RS485+ and RS485- reversed	Use the correct connections
The lock cannot be locked.	No power or low power for the lock.	Check the power supply for lock. Check that the output relay operates
The card number is different to what is expected	The reader output is set to 26 when 34 is required or the other way around	Reset reader output
Communication with the controllers intermittent	On a busy network the communication to the controllers may time out	Increase the "Network Delay Time" to 200ms, see the software manual, communications Section 7.8
No communication with controllers	The software uses Port 8000 to communicate with the controllers. Make sure that no other software is using port 8000.	Change the SECUSYS software to use another port
No communication with RS-232 or RS-485 controllers	The Desktop reader software could be using the same port as the controller communication	Check and change the Desktop reader port, see the software manual, communications Section 7.8