TC3XY NT/MT

Access Controller

Version 1.0

Installation Manual

2005–08–27

Contents

I. Introduction

I.1. The TC3XY controller

The TC3XY controller is a microprocessor electronic board dedicated to applications such as access control, time attendance, alarm monitoring, building management, etc….
Many different applications can be run on the TC3XY controller, according the software installed on the system.
This manual described how to install the controller. Refer to the corresponding User Manual of the application installed on the board for details of using the system.
The software enables you to define the specific time and entries for the personnel accessibility. The system has an online facility that enables you to control and verify with the employee's photo if the permitted cardholder is the one using it.

I.2. General Safety summery

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 outlet.
- Power disconnection is done by unplugging the system from the mains AC outlet.
- Service procedures, including assembly of the AC plug, must be done by a qualify personnel. A safety approval connector has to be used, according to the local standards.
- The controller must be powered OFF before opening.

Injury Precautions

Use Proper 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 terminal that is outside the range specified for that terminal.
Ground the Product	This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Do Not Operate Without Cover	To avoid electric shock or fire hazard, do not operate this product with cover removed.
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 20x5mm 0.5A fast acting fuse located at the mains connector.

I.3. Electronic Disturbance Protection

1. The controller must never be installed inside a high voltage electrical power box and must never be placed in close proximity 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.
2. The TC3XY board must be separately grounded. Therefore, one must verify in advance whether the installation site provides adequate grounding facilities.
3. The cover or case that contains the control unit housing the microprocessor must be tightly screwed down or locked in place.
4. It is essential to plug the TC3XY's power supply (90-230V) into a "clean" line (i.e., a line not being used other pieces of heavy equipment) or into an independent line, which has been specifically allocated to the terminal, ***with a good earth ground.***
5. Never use the system cables guide to pass wires from another system, like loud bells, electric door openers etc...
6. Four categories of cable go to, or from, the terminal:
   - The 220 volt sector cable
   - The cables connecting readers, alarm entries and exit-buttons
   - The communication cable
   - The cable connecting the electrical door opener or an exterior release device. These categories must be installed as far as possible one from the other.

I.4. Installation procedure

I.4.1. Step 1:

Install the TC3XY metal housing on the wall or the dedicated emplacement and pay attention to the following points:

- Easy access to the unit
- Effective Ventilation to the unit
- Clear Electromagnetic Environment (see 1.3)

I.4.2. Step 2:

Set the kind of communication used among RS232/RS485/TCP-IP. Each communication interface would use differently methods. Refer Part VI for more information.

I.4.3. Step 3:

Set the controller ID (controller address) through switches 1-7 (see the connection diagram). On installation where several TC3XY boards are used, avoid using the same ID for different boards.

I.4.4. Step 4:

Connect the card reader as explained on Part. 4 and pay attention to the following points:

- Prepare a RJ45 connector and cable for each reader
- If using external power supplies for readers, make sure the readers have common ground with controller.
- Power the card readers according to its consumption, see its technical manual. If using power from TC3XY board, make sure the total power consumption is 1000mA at max

I.4.5. Step 5:

Connect the electric door opener using 20 AWG wires as explained on par. 6. Pay attention to the following points:

- When using a DC voltage to an electric door lock, installed a diode ON THE LOCK ITSELF.
- Fail-Safe and Fail-Secure will use different connections, see Part V for more information

I.4.6. Step 6:

Connect the different door sensors between the corresponding inputs and the GND, as explained in part. IV. The door sensors operating mode (NO or NC) is defined by software. (See Sphinx User manual for more information).

I.4.7. Step 7:

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

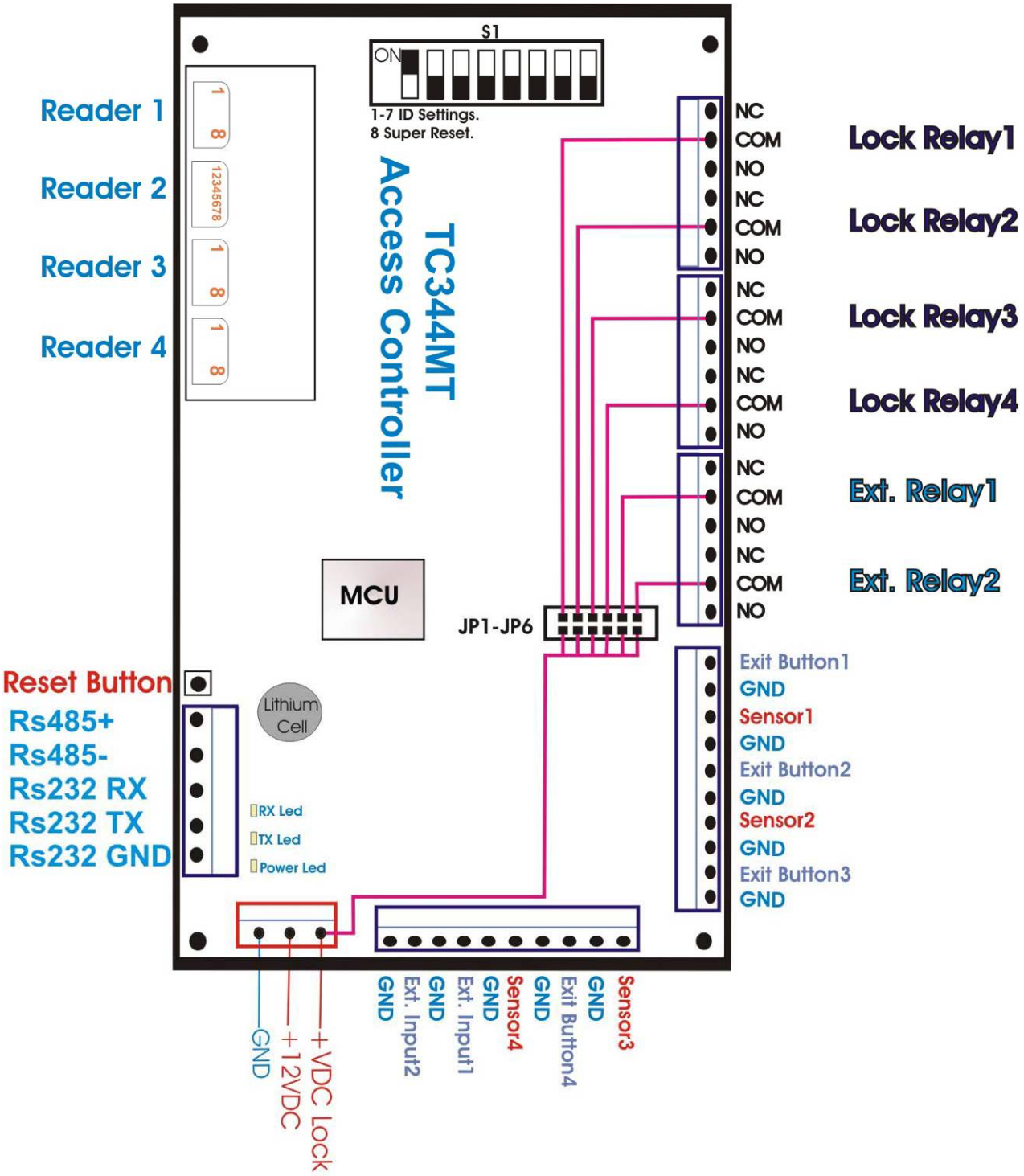
I.4.8. Step 8:

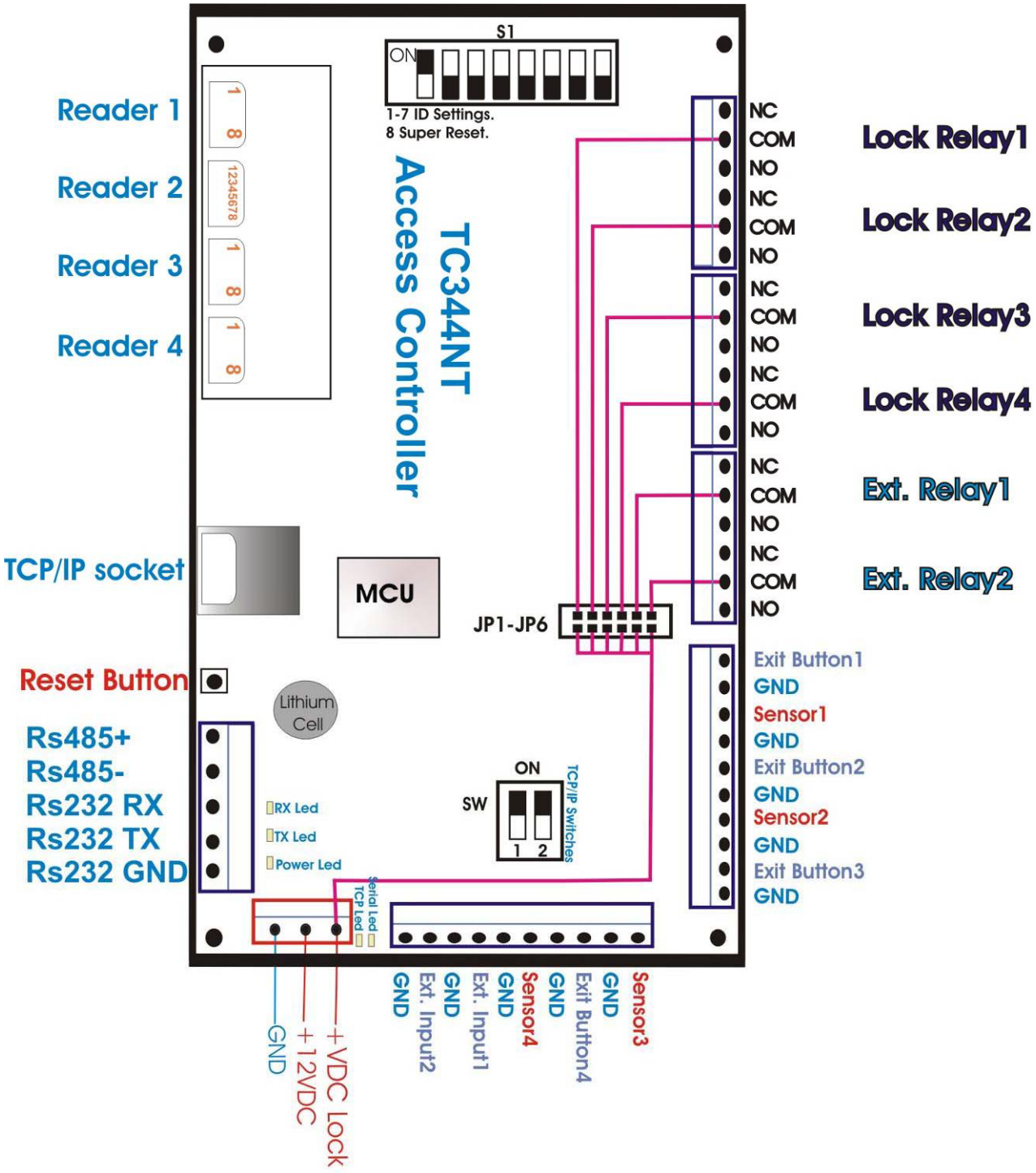
Connect the mains AC power (90-230v). Use a 4mm wide strip to attach the mains cable to the proper fixation inside the controller housing.

I.4.9. Step 9:

Program the system, Refer the Sphinx Software user manual for more information.

II. The Electronic Board and its DIP switches, Connectors, Button





DIP Switch S1 – ID settings	RX/TX/Power Leds
S1 to S7 – Controller ID/Address S8 – Using this switch with Reset Button to reset data/configuration of controller. This switch must be OFF when operating controller	RX led blinks when receiving data from PC. TX led blinks when sending data to PC Power led blinks every one second when the controller operates normally.

Resetting

S8 – OFF, press and hold the Reset Button within 5 seconds to reset all inputs/outputs.
S8 – ON, press and hold the Reset Button within 5 seconds to reset all inputs/outputs + data/configurations inside controller memory.

JP1 - JP6

Those jumpers are used to connect the COM of relays to external power supply

TCP Switches

SW1: TCP settings lock, ON – Lock, OFF – Unlock
SW2: ON - Force Default Settings, OFF – Operating mode

GND/+VDC/+VDC Lock

GND, +12VDC - main power for controller board
+VDC Lock – external power supply for locks

Reader 1/2/3/4 sockets

Those sockets are used to connect Weigand (26 to 34 bits) reader. Note that the reader consuming more than 250 mA **CANNOT** be powered by the controller.

III. Readers Types and Connection

III.1. Connecting the proximity 6601E/6602E/5512KE reader series


6601E


6602E


6601M


6602M

5512KE


6688LE

CABLE COLOUR	RJ45 male connector	RJ45 Connector PIN Out
Black *(GND)*	PIN1 & PIN2	
Red *(+VCD)*	PIN7 & PIN8	
Blue *(Led)*	PIN3	
Green *(Data0)*	PIN5	
White (Data1)	PIN6	
Others	Reserved	

III.2. Connecting the BioScrypt Finger Print

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	

IV. Door Sensor, Exit Buttons, Extension Inputs

A magnetic contact, passive infra-red unit, request to exit button or any other form of dry contact can be monitored via the Sphinx system. All the eight standard inputs can be set up, via software, so as to open doors when activated, activate sirens/bells or just inform security of a change of state of a monitored device.

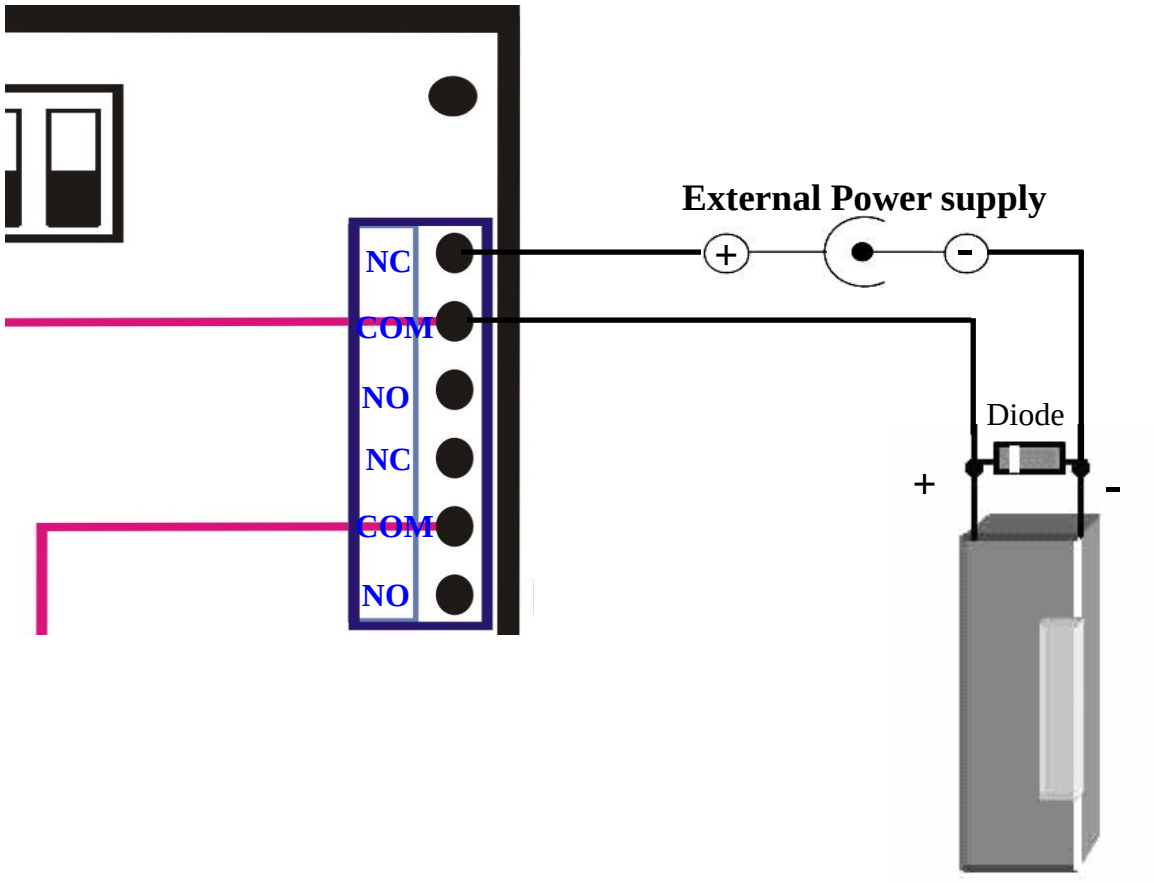
Protection against RFI interferences:

The following must be rigidly adhered to, in order to prevent malfunctions or interruptions:

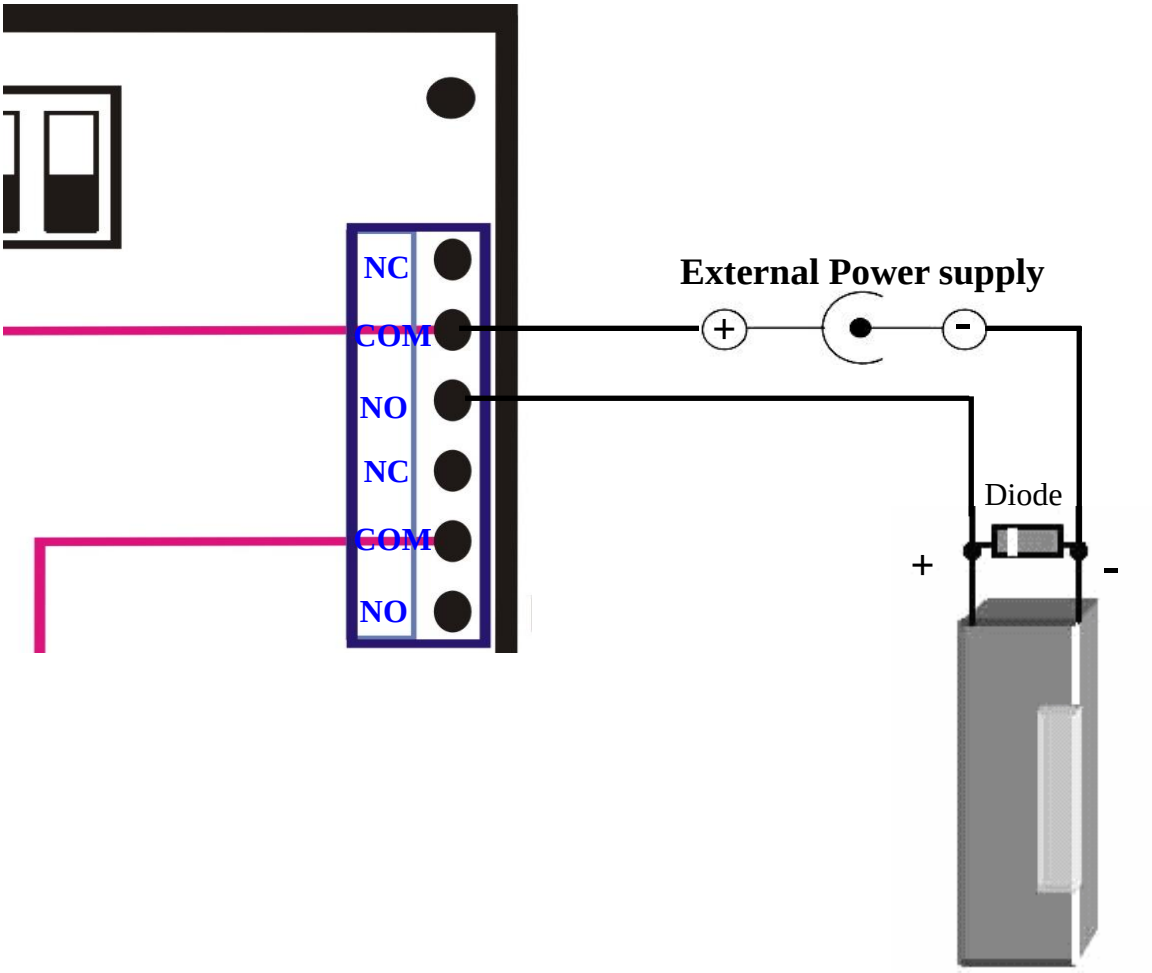
- If the distance between the alarm detector, exit-button, etc., and the electronic board is greater than 10 meters, use a shielded cable and connect the shields to the ground point of the control unit.
- Always ensure that a distance of at least 50 cm, separates the connecting cables from both high-tension cables and electrical door opener cable.

V. Fail-Safe/Fail-Secure Locks, Relay Outputs Connection

V.1. Fail-Safe locks connecting



V.2. Fail-Secure locks connecting



V.3. Important notes:

- If the release mechanism has a charge that exceeds the authorized limit or has a strong inductive charge (as in the case, for example, of revolving doors or turnstiles), it will be necessary to use an intermediate relay between the system and the charge. THE CHARGE MUST BE POWERED WITH A SEPARATE POWER SUPPLY. The intermediate relay and the electronic board may be powered with the same power supply, the one of the board for example.

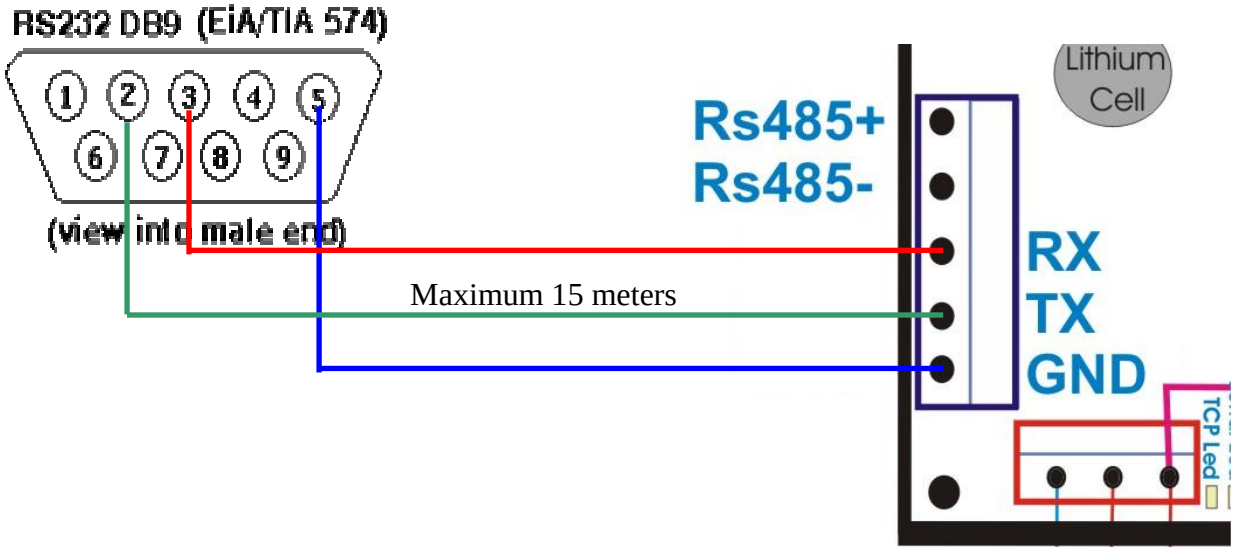
- The cable connecting the release mechanism to the control unit (or to the intermediate relay) must be isolated, and there must be a distance of at least 50 cm, between this cable and all the other cables.

VI. RS232/RS485/TCP-IP port connection

If the controller has to be connected to PC at less than 15 meters, its RS232 port maybe used. If the distance is bigger than 15meters or if several controllers must be connected together to a PC, the RS485 must be used.

The TCP/IP may be used in case of reducing installation cost and the site has TCP network infrastructure.

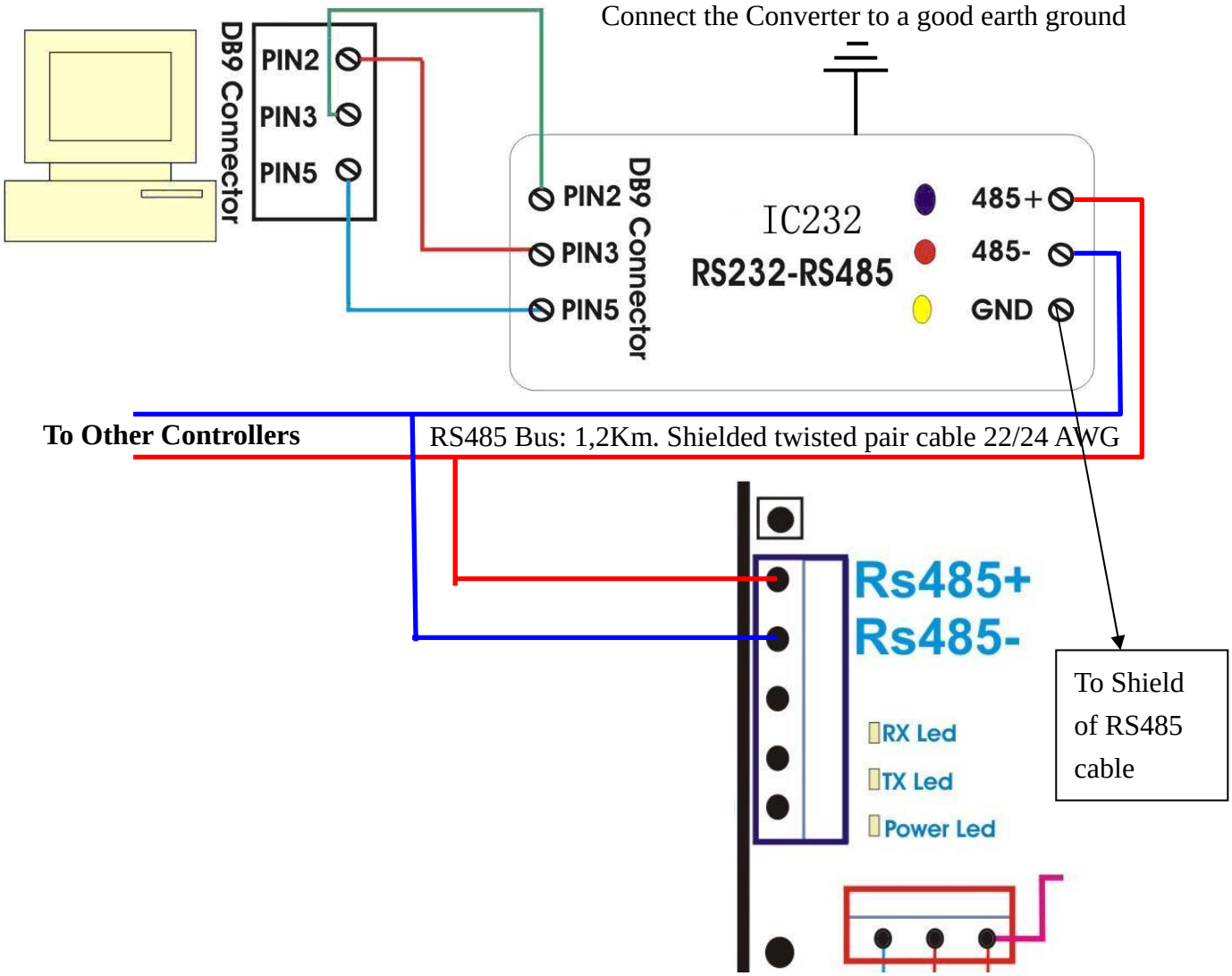
VI.1. RS232 Serial Port Connection



Pin No.	Name	Notes / Description
1	DCD	
2	RD	Receive Data (RxD, Rx)
3	TD	Transmit Data (TxD, Tx)
4	DTR	
5	SGND	GND
6	DSR	
7	RTS	
8	CTS	
9	RI	

- Connect RxD of COM port to TX of controller.
- Connect TxD of COM port to RX of controller.
- Connect GND of COM port to GND of controller.

VI.2. RS485 Serial Port Connection



Notes:

1. Do not connect the communication cable at any points other than the RS232/RS485 interface end.
2. Each controller must have it own ID selected by DIP Switches S1-S7

Protection against RFI interferences:

Most of the interference will come by induction to the cable shield, on which high and very high voltage may appear because of RFI interferences or lightning bolts.

To prevent perturbations, the following rules must then be respected:

1. Use a shielded 22AWG triple-wire cable ("Receive"/"Transmit"/0v) for the RS232

connection and use a shielded 22 AWG twisted pair cable for the RS485 connection.

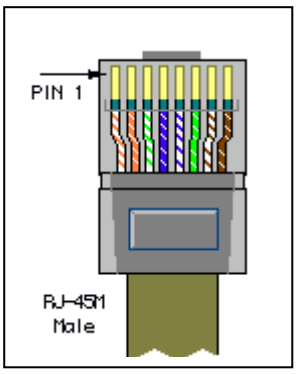
2. A good quality cable shield must be used and the shield must be connected to a strong earth. The shield should be from copper rather than aluminum, since the latter provides only partial attenuation.
3. All communication cable shielding should be connected to only one extremity (and not both), in order to avoid the problem of "ground loops". Whereas the connection for the RS485 wire shield should be carried out at the level of the concentrator and the connection for the RS232 wire shield should be carried out at the level of the terminal.
4. A distance of at least 50 cm must separate all such connecting cables from high-tension cables, from cables connected to an electrical power box controlled by the system, or from any cables capable of generating strong interference (such as cables connected to high-power motors, generators, wireless telephone, etc.). Since it is often located besides a variety of cables, the external telephone line can also be a source of strong interference.
5. Extremely high tension produced by lightning bolts can enter the terminals through these above lines. Such tension can reach the level of hundreds of thousands of volts. It is therefore advised to use the DDS SP200 protection unit at the NTL level. (This protection is included in the RS232/RS485 interface)

VI.3. TCP/IP Port Connection

- Connect TC3XYNT to HUB/Switch by using “Straight Through” cable. If you want to connect the controller to your PC directly, please use a “Crossover” cable.
- Discussion

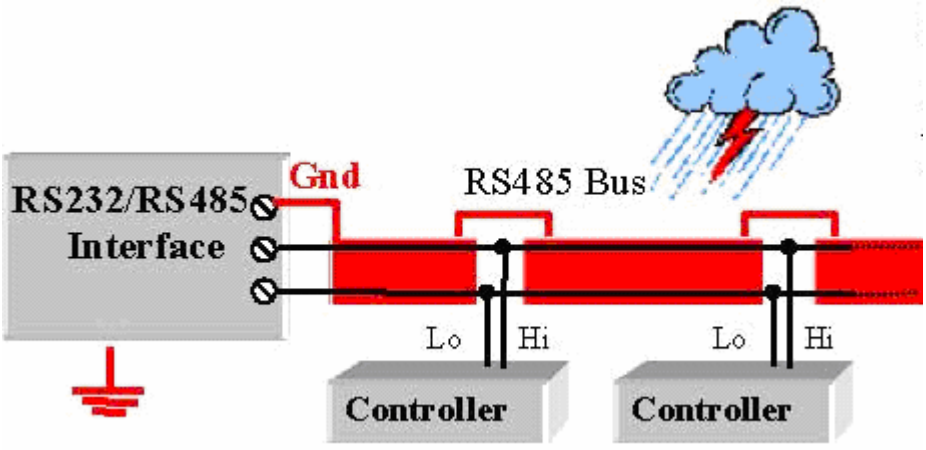
Crossover Cable	
RJ-45 PIN	**RJ-45 PIN**
1 Rx+	3 Tx+
2 Rc-	6 Tx-
3 Tx+	1 Rc+
6 Tx-	2 Rc-

Straight Through Cable	
RJ-45 PIN	**RJ-45 PIN**
1 Tx+	1 Rc+
2 Tx-	2 Rc-
3 Rc+	3 Tx+
6 Rc-	6 Tx-



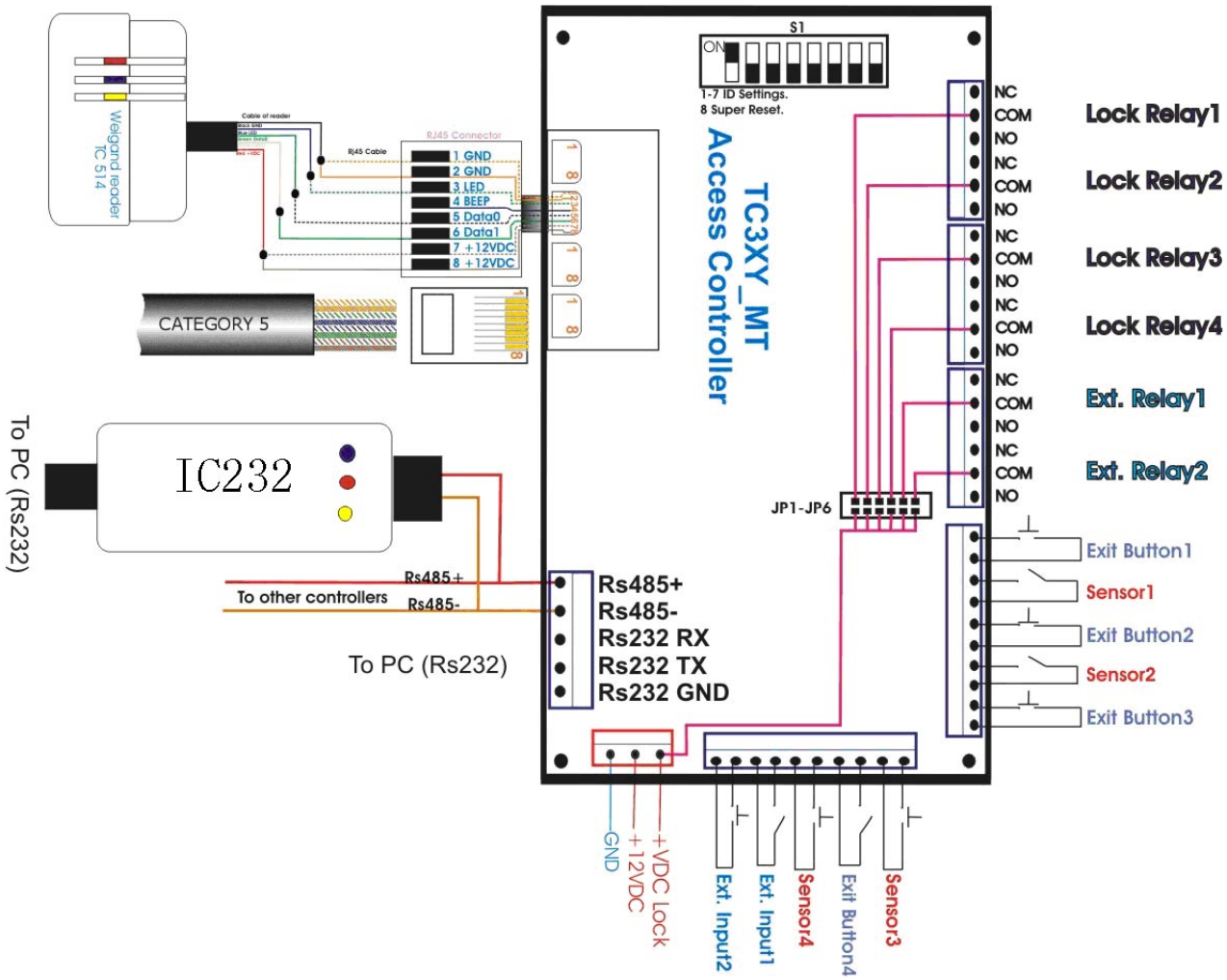
VII. A few Commandments for Installer

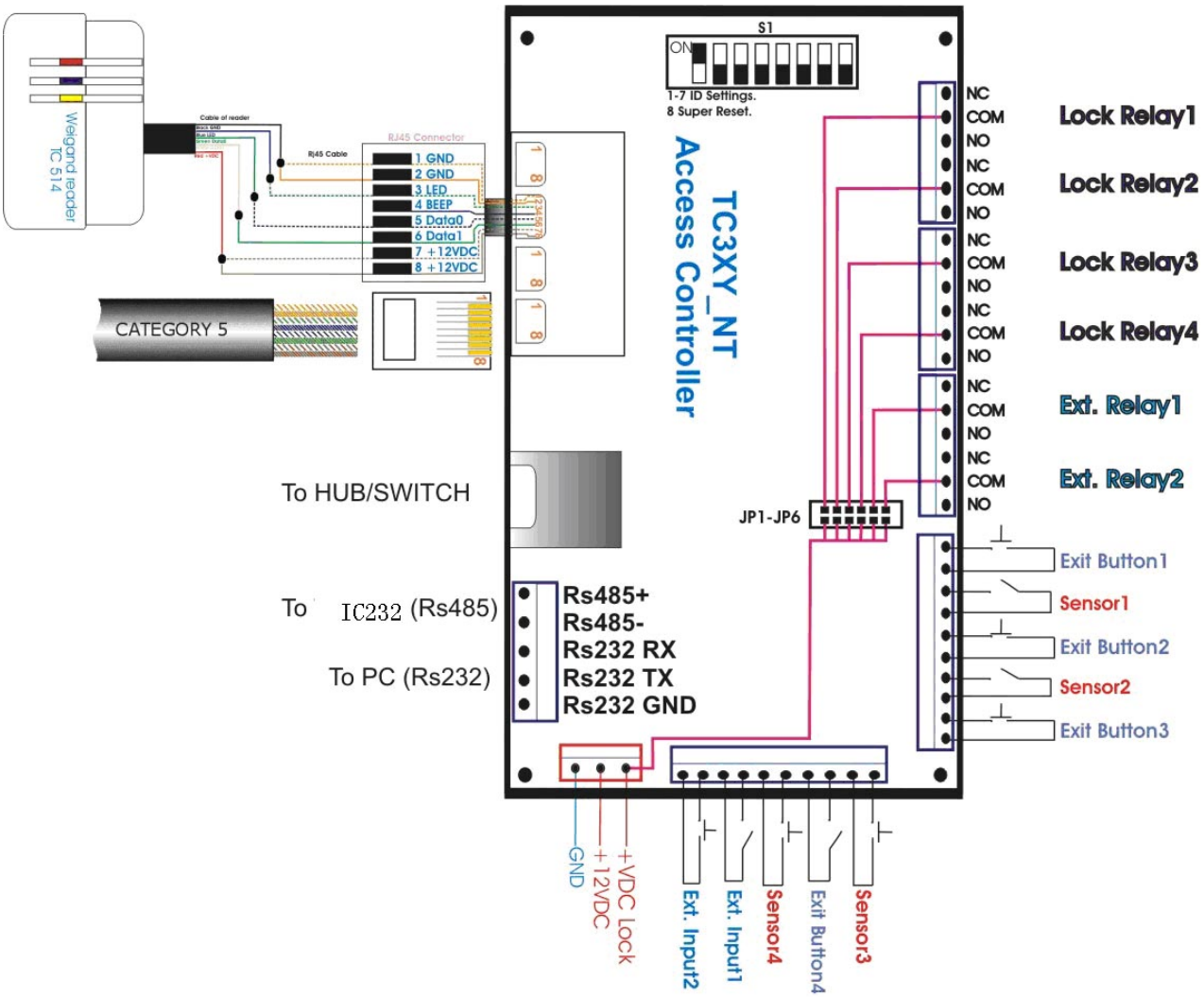
1. Never pass the lock cable near the other cables: it must be at least 10cm from all other cables.
2. Always use a diode between +VDC and GND if the lock is DC powered.
3. You may need to install a 120ohm termination resistor at the end of RS485 Bus.
4. Never install a controller or its cables near a high voltage line or heavy duty electric devices (motors, transformers, high voltage sources, etc…)
5. Link all the RS485 wire shields together and connect it at the RS232/RS485 converter end, NOT at the controllers end.



6. Use a very good Earth Ground at the RS232/RS485 converter
7. Never use the same power supply for Controllers/Readers and Locks.

VIII. Connection diagrams TC3XYMT, TC3XYNT




Wiegand reader
IC 514
Cable of reader
RJ45 Cable
RJ45 Connector
1 GND
2 GND
3 LED
4 BEEP
5 Data0
6 Data1
7 +12VDC
8 +12VDC
CATEGORY 5
To HUB/SWITCH
To IC232 (Rs485)
To PC (Rs232)
S1
ON
1-7 ID Settings.
8 Super Reset.
TC3XY_NT
Access Controller
JP1-JP6
NC
COM
NO
Lock Relay1
Lock Relay2
Lock Relay3
Lock Relay4
Ext. Relay1
Ext. Relay2
Exit Button1
Sensor1
Exit Button2
Sensor2
Exit Button3
Rs485+
Rs485-
Rs232 RX
Rs232 TX
Rs232 GND
GND
+12VDC
+VDC Lock
Ext. Input2
Ext. Input1
Sensor4
Exit Button4
Sensor3