

Forced Door Open Alarm

When the door is opened by force, the door contact sensor will be activated. For this application, you have to install the door contact sensor and properly set the door contact time and outputs to the alarm devices. The Forced Door Open Alarm will be generated until the alarm is disconnected.

Door Open Timeout Alarm

The Door Open Timeout Alarm will be generated when the door is open for longer than a certain time limit, even after the door is opened followed by a normal authentication process. The Overtime Door Open Alarm will continue to ring until the door is closed.

Anti-pass Back

If an additional proximity reader is used, the Anti-pass back mode can be applied. In the Anti-pass back mode, a user is not allowed to enter or exit when the user violates the one entry/one exit rule. For example, an identical user won't be able to enter if he or she previously exited the door without going through a proper authentication process.

Duress Alarm

In case of duress, enter the 2-digit Duress Password and press the <ENT> key before the normal access process. The door can be opened as usual, but the duress alarm is also generated at the same time. The duress alarm output will be sent to the TTL output and an alarm event will be sent to the host PC.

ARM / DISARM Function for Alarm Panel

While a device is in the ARM condition, its reader ports are all frozen and inputs to the ports are not processed so that no one can get access to the door. When this mode is applied, the **Star LX007 / IDTECK LX007SR** sends signals to other connected security devices so that they can function accordingly.

Two Men Operation

This feature is used to configure the **Star LX007 / IDTECK LX007SR** to allow a certain user (e.g. a visitor) to pass the door only when that user is accompanied by another special user (e.g. a guide). Both of the visitor and the guide should be authorized together for access.

4 Level Individual Door Opening Time Setting

This feature is used only for setting four different door opening times.

Name Display

The **Star LX007 / IDTECK LX007SR** can display the user name when a user gains access.

Function Key Name Display

You can assign names for each function key via software. Using this feature, for example, you can give certain keys names like punch-in and punch-out and tell the employees to press one of the function keys according to the nature of their access prior to each access attempt. This way, you will be able to identify punch-in and punch-out events on the software.

6.2 Product Explanation

6.2.1 Panel Description

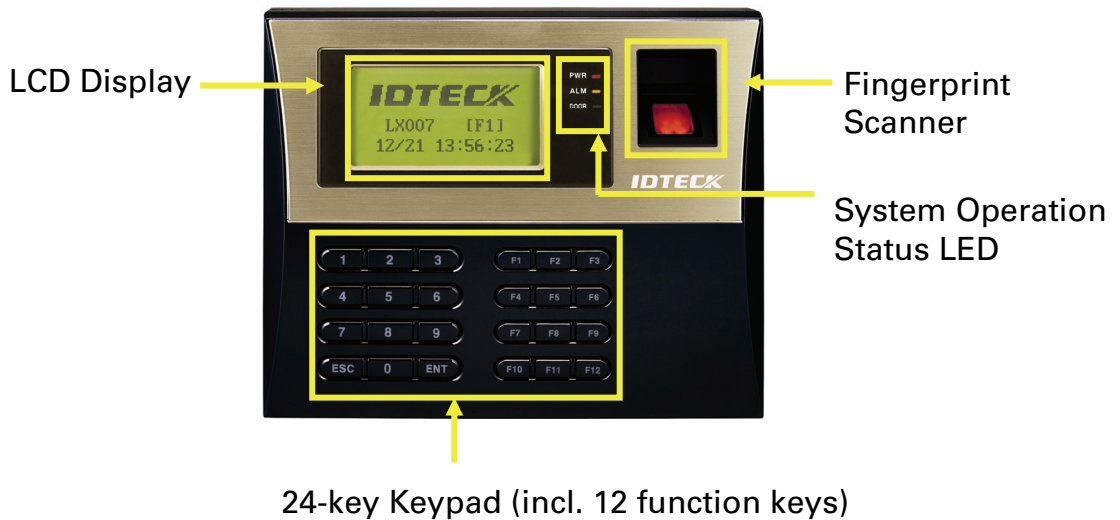


Figure: Description of LX007 Front Panel

- **LCD Module:** The LCD screen displays the status of the LX007.
- **System Operation Status LED:**
 When the power is applied to the LX007, the red LED is turned on.
 When the Relay #1 operates, the green LED is turned on.
 When the Relay #2 operates, the yellow LED is turned on.
- **24-key Keypad:** The keypad can be used to manually operate the LX007 with ease.
- **Function Keys:** The LX007 has 12 function keys ([F1] ~ [F12]).

6.2.2 Connection Layout

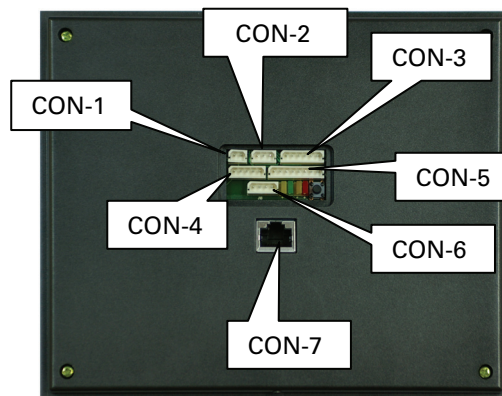


Figure: Connector Layout

6.2.3 Color Coded & Wiring Table

I/O PORT NAME	SIGNAL NAME	WIRE COLOR
CON-1(2PIN CONNECTOR)		
Main Power (+12V)	DC 12V	Red
Power Ground	GND (-)	Black
CON-5 (5PIN CONNECTOR)		
RS485-RTX(+)	RS485-A(+)	Yellow wire
RS485-RTX(-)	RS485-B(-)	Gray wire
RS232-TX	TXD	Black wire with white stripe
RS232-RX	RXD	Red wire with white stripe
RS232-GND	GND	Black
CON-3 (6PIN CONNECTOR)		
TTL OUTPUT #1	TTL#1, WD0	Orange wire with white stripe
TTL OUTPUT #2	TTL#2, WD1	Brown wire with white stripe
Aux Input #1	IN#1	Green
Aux Input #2	IN#2	Green wire with white stripe
Wiegand DATA 0	DATA-0	Pink
Wiegand DATA 1	DATA-1	Cyan
CON-4 (8PIN CONNECTOR)		
Door RELAY(NC)	NC(1)	Blue wire with white stripe
Door RELAY(COM)	COM(1)	Gray wire with red stripe
Door RELAY(NO)	NO(1)	White wire with red stripe
Alarm RELAY(NC)	NC(2)	Purple wire with white stripe
Alarm RELAY(COM)	COM(2)	White
Alarm RELAY(NO)	NO(2)	Purple
Exit Button	EXIT	Orange
Door Sensor	CONTACT	Yellow wire with red stripe
CON-2 (3PIN CONNECTOR : Serial Printer)		
RS232-RX	RXD	Pink wire with white stripe
RS232-TX	TXD	Cyan wire with white stripe
RS232-GND	GND	Black
CON-6 (4PIN CONNECTOR : Door Phone (Optional))		
DP_VCC		Orange wire with red wire
DP_GND		Orange wire with black stripe
DP_D0	DATA-0	Blue
DP_D1	DATA-1	Brown
CON-7: TCP/IP RJ45 CONNECTOR		

7. Installation Tips & Check Point

7.1 Check Points before Installation

7.1.1 Selection of Cable

The system installation cables should be connected as follows;

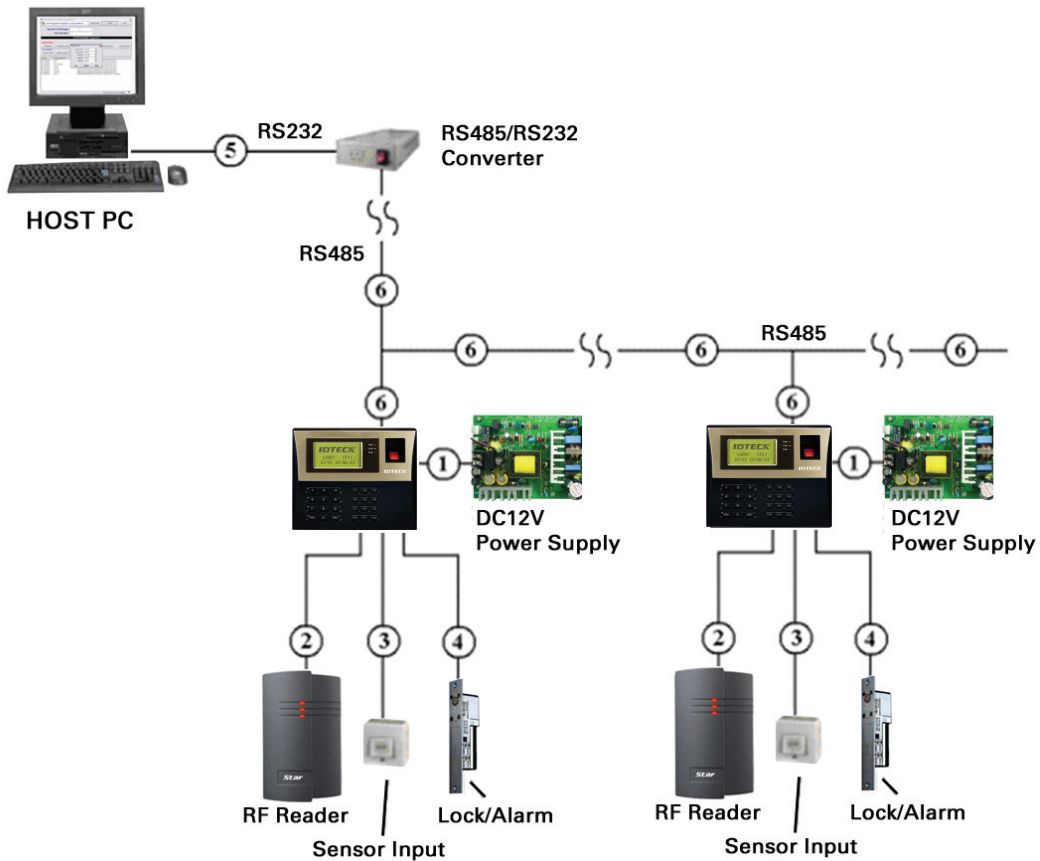


Figure: System Installation Layout

7.1.2 Recommended Cable Type and Permissible Length

Reference	Description	Cable Specification	Maximum Distance
1	LX007 Power (DC12V) DC Power -> LX007	Belden #9409, 18 AWG 2 conductor, unshielded	30m
2	Reader (Power and Data) Exit Reader -> RF20	Belden #9512, 22 AWG 4 conductor, shielded	150m
		Belden #9514, 22 AWG 8 conductor, shielded	
3	Door Contact Exit Button Sensor Input Input -> LX007	Belden #9512, 22 AWG 4 conductor, shielded	300m
		Belden #9514, 22 AWG 8 conductor, shielded	
4	Door Lock, Alarm Device Lock (Alarm) -> LX007	Belden #9409, 18AWG 2 conductor, unshielded	300m
5	RS232 Cable Converter -> Host P.C.	Belden #9829, 24 AWG 2-twisted pair, shielded	15m
6	RS485 Cable LX007 -> LX007 LX007 -> Converter	Belden #9829, 24 AWG 2-twisted pair, shielded	1,200m

***: Thicker wires are needed if you connect a reader with high current consumption.**

7.2 Check Point during Installation

7.2.1 Termination Resistor

Termination resistors are used to match impedance of the network to the impedance of the transmission line being used. When impedance is mismatched, the transmitted signal is not completely absorbed by the receiver and a portion of signal is reflected back into the transmission line. The decision whether or not to use termination resistors should be based on the cable length and data rate used by the communication system.

For example, if you use 9,600 baud rate and 1,200m length of cable, the propagation velocity of cable is 0.66 x speed of light (This value is specified by the cable manufacturer), if we assume the reflections will damp out in three round trip up and down the cable length, the transmitted signal will stabilize 18.6us after the leading edge of a bit. Since the data bit is captured in the middle of the bit which is approximately 52us after the leading edge of a bit. The reflection stabilizing time 18.6us is much before the center of the bit therefore the termination resistors are not required.

However, if you install the cable to maximum length, the impedance of cable and network is mismatched and the transmitted signal is overlapped by the reflected signal. In this case, it is recommended to add termination resistors to the end of the receiver lines. A 120Ω resistor can

be used for termination resistor in parallel between the receiver lines "A" and "B" for 2 wires RS485 system. A termination resistor of less than 90Ω should not be used and no more than 2 terminations should be used in one network system.

7.2.2 How to Connect Termination Resistors

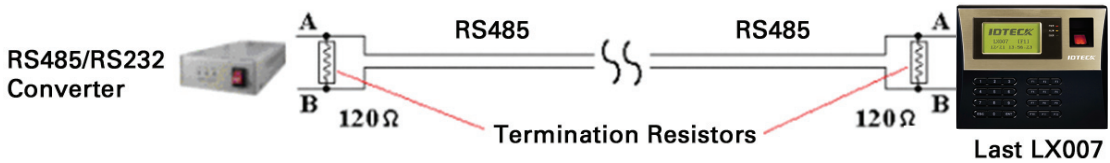


Figure: Termination resistors for 2 wire RS485 communication system

7.2.3 Grounding System for Communication Cable

We recommend you to use a proper grounding system for the communication cables. The best grounding method is to put the shield wire of the communication cable to the 1st class earth grounding; however bringing the earth ground to the communication cable isn't easy and the installation cost increases. There are three grounding points you can find during installation;

1. Earth Ground
2. Chassis Ground
3. Power Ground

The most important point about grounding system is not to connect both ends of shield wires to the grounding system; in this case, there will be a current flow through the shield wire when the voltage level of both ends of shield wire is not equal and this current flow will introduce some noise and interference to communications. For better grounding, we advise you connect ONLY one end of shield wire of communication cable to the grounding system; If you find earth ground nearby, then connect one end of the shield wire to the earth ground; If you do not have earth ground nearby, then find chassis ground and connect one end of shield wire to chassis ground; If you do not find either earth ground or chassis ground, then connect one end of shield wire to power ground. (GND of LX007) Note that if the chassis ground is not properly connected to the earth and floated from the ground level, then grounding to the chassis ground will give the worst communication. Therefore, we recommend you use power ground instead of chassis ground if that is the case.

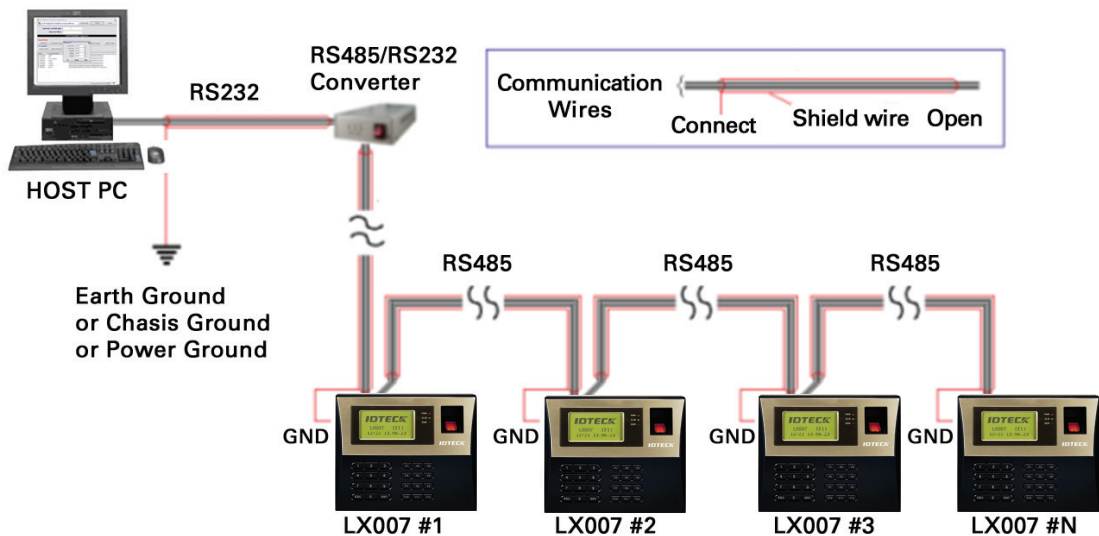


Figure: Grounding system

7.2.4 Reverse Diode Connection

If you connect an inductor (Door Locks or Alarm device) to the output relays, there will be a high surge voltage created while the inductor is turning on and off. If you do not connect a reverse diode, the surge voltage will transfer and damage the electronic circuit of the controller. It is strongly recommended to add a reverse diode between the inductor coils to absorb this surge voltage.

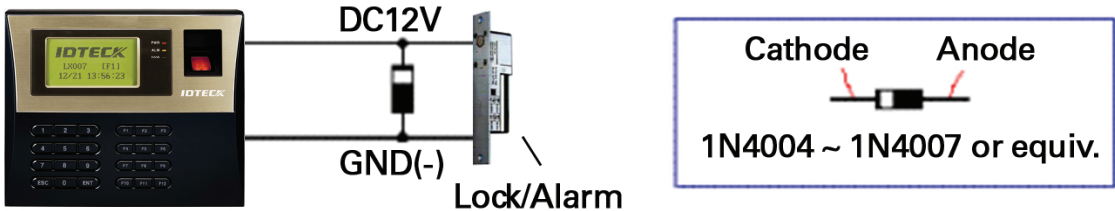


Figure: Reverse Diode Connection

8. Installation of Product

8.1 Wall Mount (Unit: mm)

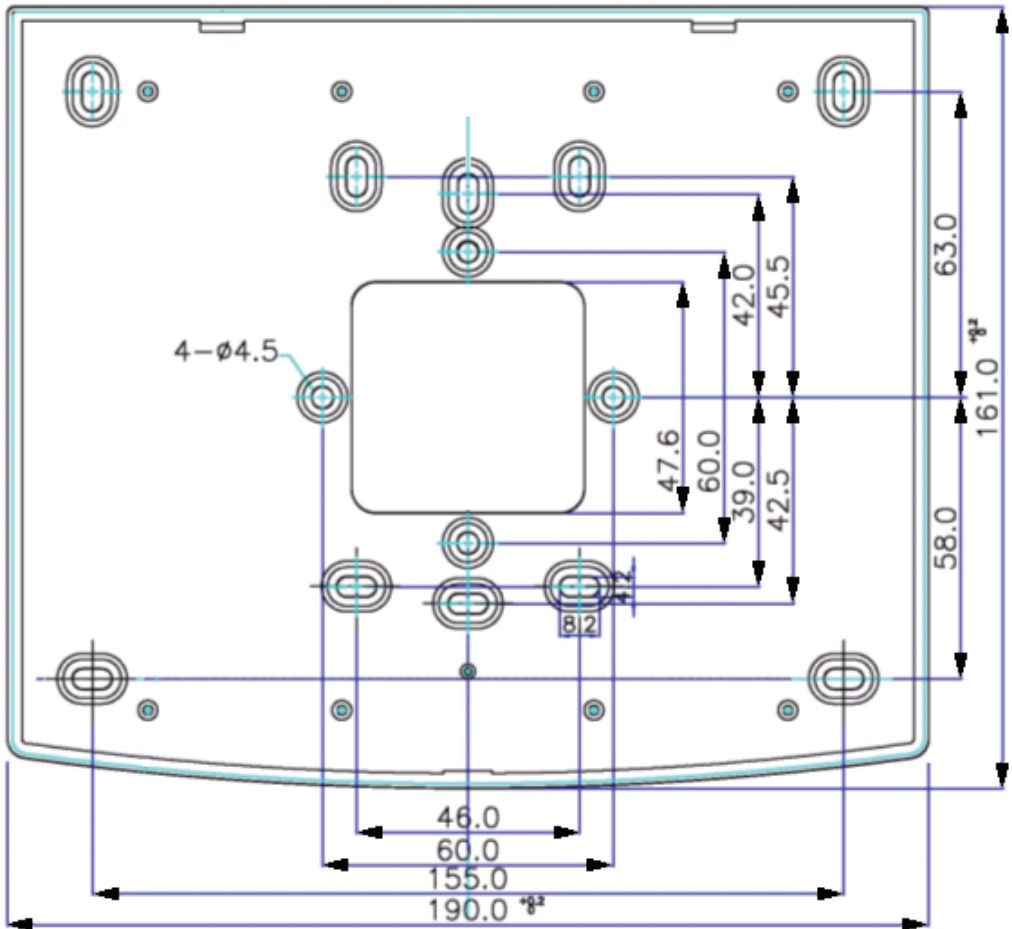
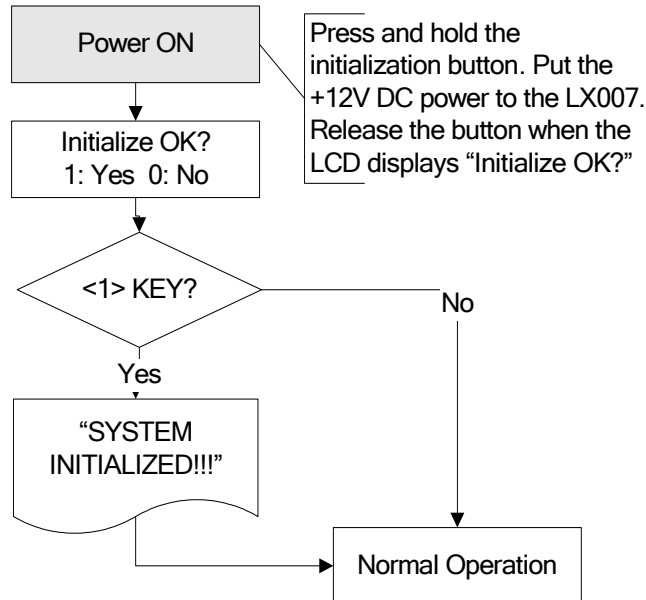


Figure: Wall Mount Layout

8.2 System Initialization (External Reader Port)

After the installation and connections are completed, apply power (DC12V) to the LX007 with the initialization button held down. Then, the LCD will first display **"Initialize OK? 0:No 1:Yes"**. Press **<1>** key if you want to initialize the system. After all the initialization process is completed, the system will be operating in the normal mode and the LCD will display **"IDTECK, LX007 [F1], Date Time"**.



8.3 Wall Mount Installation

1. Position the Wall Mount to the location at which you want to install the unit and mark 4 x drilling positions. Drill 6-32 holes for at least 4 mounting points.
2. Drill a 1/2" hole on the center of the Wall Mount.
3. Using 4 screws, install the Wall Mount to the proper location.
4. Take out the cable through the center hole.
5. After the wiring is done as explained in the next section, put the Main Unit on the Wall Mount and screw it.

8.4 Wiring

8.4.1 Power Connection

1. Connect (+) wire of DC 12V Power Supply to Red wire.
2. Connect GND (-) wire of DC 12V Power Supply to Black wire.

8.4.2 Input Connection

Exit Button Connection

1. Connect one wire from an Exit Button to Orange wire.
2. Connect the other wire from the Exit Button to GND.

Door Contact Sensor Connection

1. Connect one wire from Door Contact Sensor to Yellow wire with Red stripe.
2. Connect the other wire from Door Contact Sensor to GND.

Auxiliary Input Connection

(Applicable to Aux Input #1(Green wire), Aux Input #2(Green wire with white stripe))

1. Connect one wire from Auxiliary Input Device to one of Aux Input #1 or Aux Input #2.
2. Connect the other wire from Auxiliary Input Device to GND.

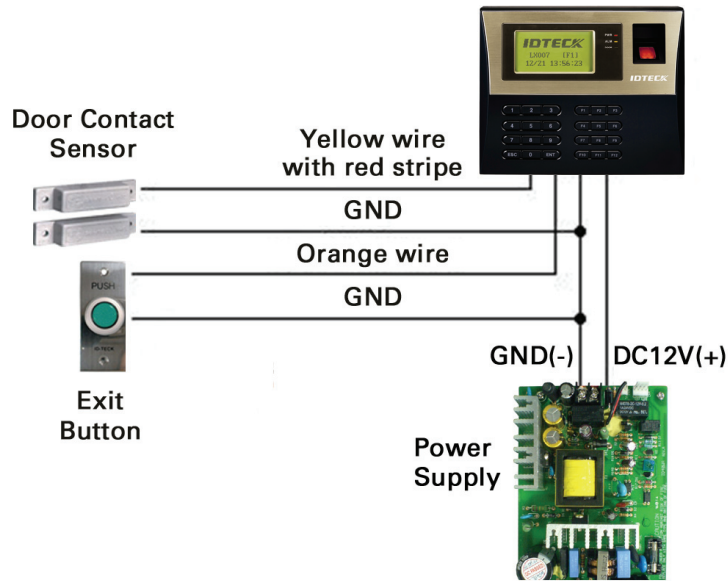


Figure: Input Device Connection

2.2K Resistor Connection for Cut Off Check

You have to connect a 2.2K resistor between the input wire (e.g. Orange wire) and the GND to apply the Cut Off Check feature. First, select whether or not to check the cutoff status of each device from [F5 SETUP MENU] -> Cut Off Check. Second, set the desired output that will be generated in the event of a cutoff from [F5 SETUP MENU] -> Cut Off Alarm.

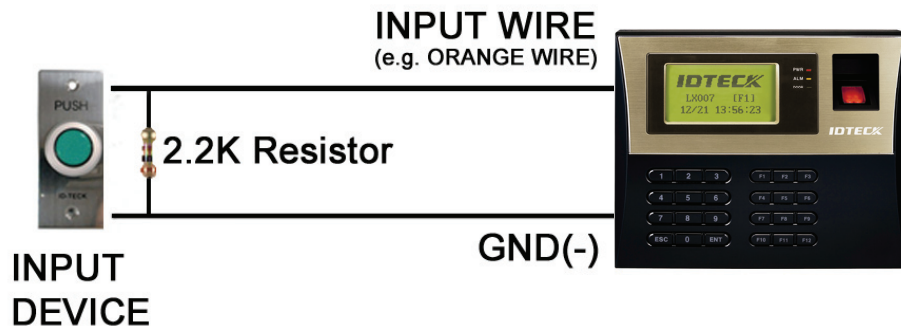


Figure: 2.2K Resistor Connection for Cut Off Check

8.4.3 Output Connection

Door Lock (Power Fail Safe) Connection (Door Relay)

1. Connect COM wire of Door Relay, White wire with Red stripe to +12V.
2. Connect NC wire of Door Relay, Blue wire with White stripe to (+) wire of Door Lock.
3. Connect GND wire to (-) wire of Door Lock.

Door Lock (Power Fail Secure) Connection (Door Relay)

1. Connect COM wire of Door Relay, Gray wire with Red stripe to +12V.
2. Connect NO wire of Door Relay, White wire with Red stripe to (+) wire of Door Lock
3. Connect GND wire to (-) wire of Door Lock.

Alarm Device Connection (Alarm Relay)

1. Connect COM wire of Alarm Relay and White wire to +12V.
2. Connect NO wire of Alarm Relay, Purple wire to (+) wire of Alarm device.
3. Connect GND port to (-) wire of Alarm device.

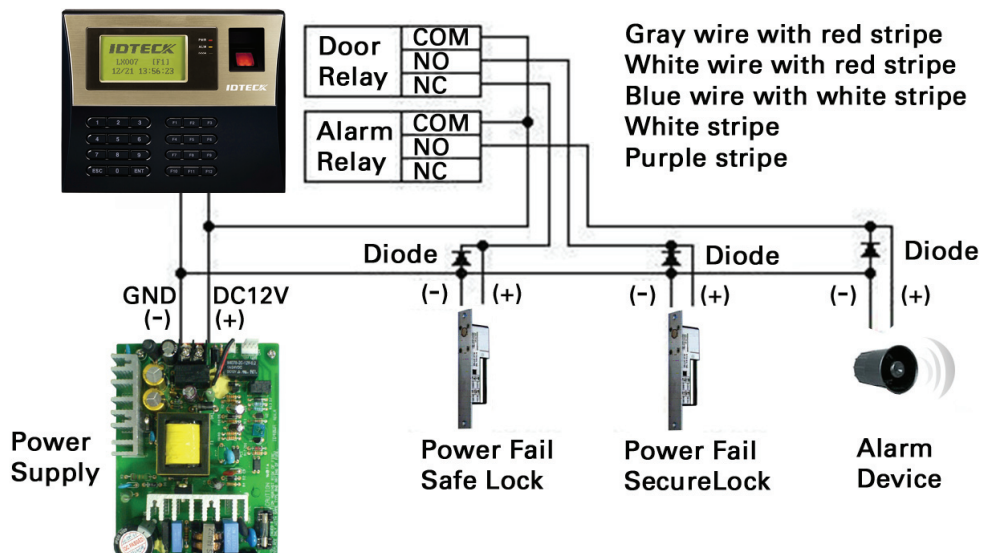


Figure: Door Lock, Alarm Device Connection

CAUTION: You should connect REVERSE DIODES as shown in the picture above. A desirable DIODE is a Fast Recovery DIODE (current=min. 1A), 1N4004 - 1N4007 or similar.

8.4.4 External Reader Connection

Proximity Reader Connection

1. Connect (+) wire of the Proximity Reader to DC +12V.
2. Connect (-) wire of the Proximity Reader to GND.
3. Connect Data-0 wire of the Proximity Reader to the Pink wire.
4. Connect Data-1 wire of the Proximity Reader to the Cyan wire.

- **Compatible Readers (External Reader):**

- **Star LX007:**

- Standard 26bit Wiegand Format Proximity Readers

- Standard 26bit Wiegand + 8bit Burst Format Proximity and keypad Reader

- **IDTECK LX007SR:**

- Standard 34bit Wiegand Format Proximity Reader

- Standard 34bit Wiegand + 8bit Burst Format Proximity and keypad Reader

- **Recommended Readers**

- **Star LX007:** RF TINY, RF10/20/30/70/500, RFK101, FGR006, FGR006EX

- **IDTECK LX007SR:** SR10/20/30, SRK101, FGR006SRB

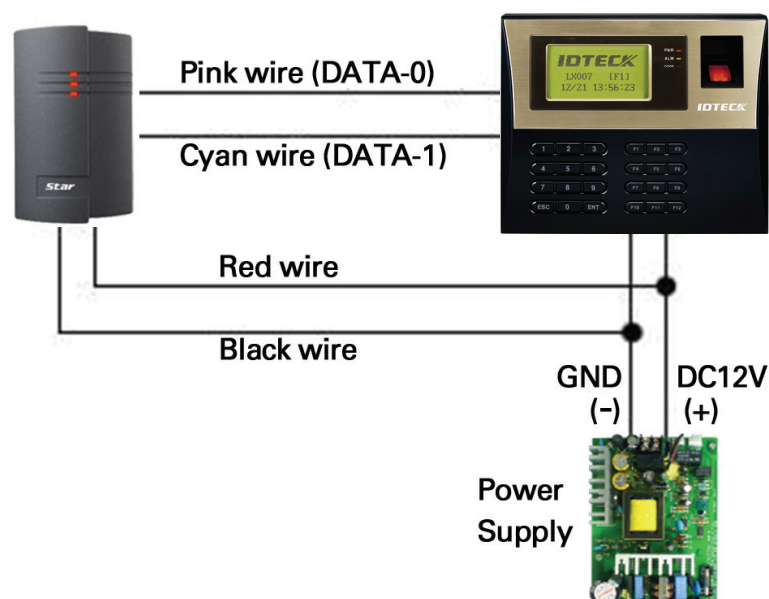


Figure: External Reader Connection

9. Communication

9.1 RS232 Communication Port Connection

A 9-pin connector (Serial communication connector, female) is needed to connect the LX007 with a host PC via RS232 communication.

Please follow the steps below.

1. Connect RS232-TX, Black wire with white stripe to the pin #2 (RXD) of the 9-pin connector.
2. Connect RS232-RX, Red wire with white stripe to the pin #3 (TX) of the 9-pin connector.
3. Connect GND, Black wire to the pin #5 of the 9-pin connector.
4. Plug in the 9-pin female connector to COM1 or COM2 Port of the host PC.
5. Install and run the LX007 Application Software.

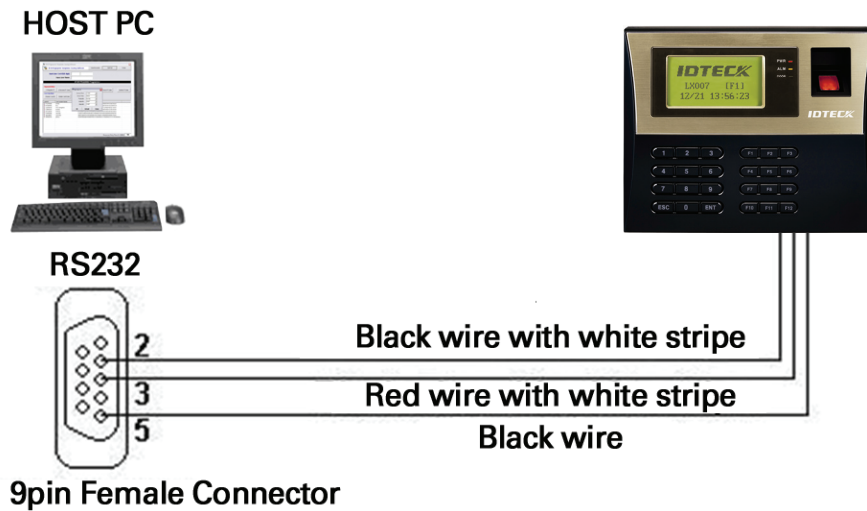


Figure: RS232 Communication

9.2 RS485 Communication Port Connection

9.2.1 RS485 Connection (Standalone Unit)

An RS485/RS232 converter is needed to use the RS485 communication between the LX007 and a host PC. Please follow the steps below.

1. Connect RS485-RTX (+), Yellow wire to RS485-A port of the converter.
2. Connect RS485-RTX (-), Gray wire to RS485-B port of the converter.
3. Plug the RS232, 9-pin connector of the converter into the COM1 or COM2 Port of the host PC.
4. Install and run the LX007 Application Software

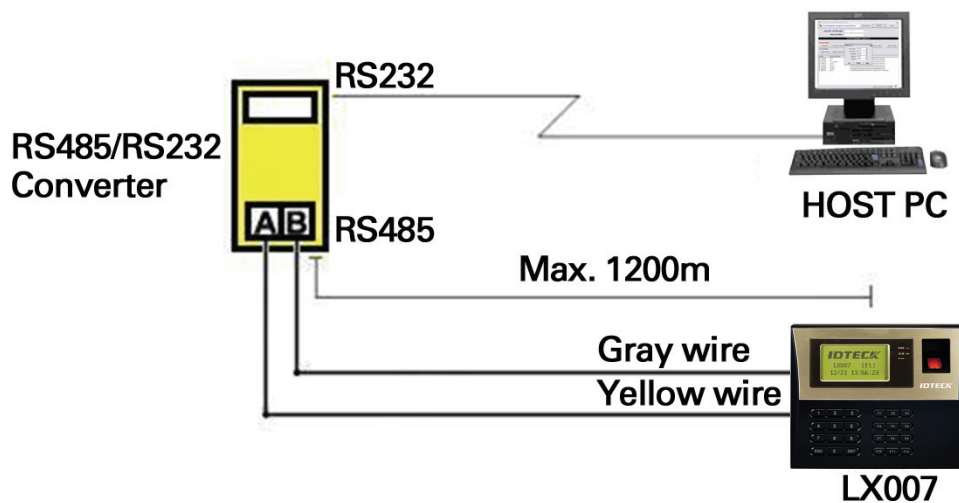


Figure: RS485 Connection between the LX007 and a Host PC

9.2.2 RS485 Connection (Multiple Units)

An RS485/RS232 converter is needed to use RS485 communication between multiple LX007 units and a host PC. Please follow the instructions below.

First, connect all RS485 ports of LX007 units in parallel.

(Max. of 32 LX007 Units can be connected)

1. Connect RS485-RTX (+) (Yellow wire) of one LX007 to RS485-RTX (+) (Yellow wire) of another LX007.
2. Connect RS485-RTX (-) (Gray wire) of one LX007 to RS485-RTX (-) (Gray wire) of another LX007.
3. Set different COMM IDs for each LX007.

Second, connect one of the RS485 ports of the LX007 units to the RS485/RS232 converter.

1. Connect RS485-RTX (+) (Yellow wire) of one LX007 to RS485-A port of the Converter.
2. Connect RS485-RTX (-) (Gray wire) of one LX007 to RS485-B port of the Converter.
3. Plug the RS232 (9-pin connector) of the Converter into the COM1 or COM2 port of the host PC.
4. Install and run the LX007 application software.

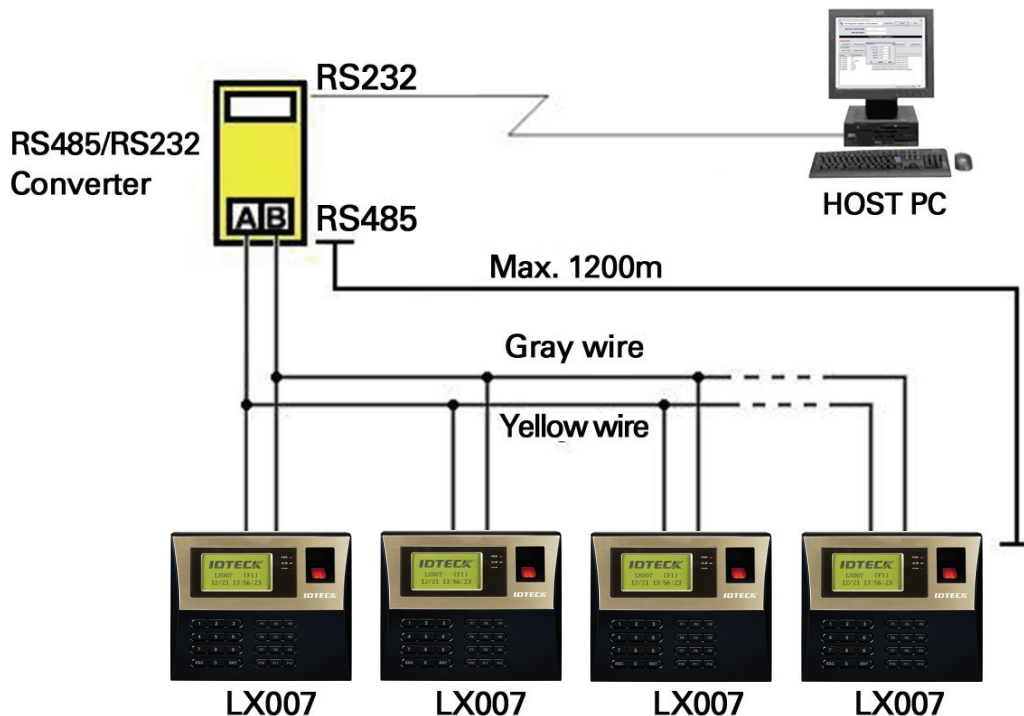


Figure: RS485 Communication between Multiple LX007 Units and a PC

9.3 TCP/IP Communication Port Connection (Optional)

An optional TCP/IP Module is needed for TCP/IP communication to the host PC. Follow the next instruction.

1. Connect RJ45 plug, LAN cable of the network system to RJ45 jack of the LX007.
2. If you install multiple LX007 units and only one TCP/IP port is available, you may connect one LX007 to TCP/IP and then connect all the LX007 units using the RS485 multiple communication as shown in the below figure.
3. Set different COMM IDs for each LX007.
4. Install and run the LX007 Application Software.

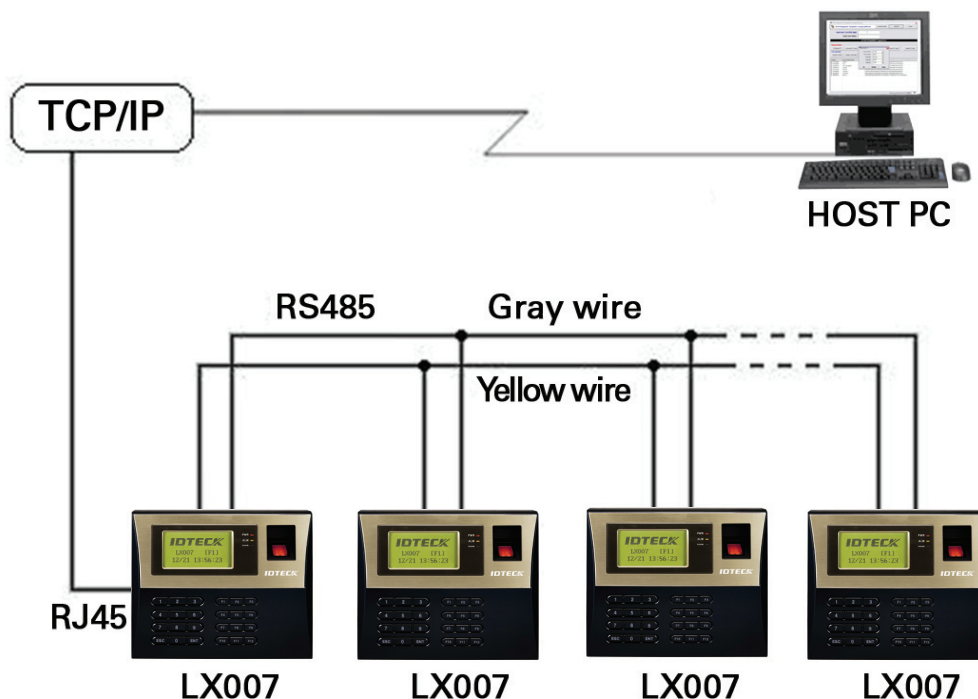


Figure: TCP/IP Communication between Multiple LX007 units and a host PC

9.4 Serial Printer Connection

A 9-pin connector (Serial communication connector, female) is needed to connect the LX007 with a serial printer via RS232 communication. Please follow the steps below.

1. Connect RS232-TX, Cyan wire with white stripe to the pin #2 (RXD) of the 9-pin connector.
2. Connect RS232-RX, Pink wire with white stripe to the pin #3 (TX) of the 9-pin connector.
3. Connect GND, Black wire to the pin #5 of the 9-pin connector.
4. Plug in the 9-pin female connector to COM1 or COM2 Port of the serial printer.
5. Set the **Print Output** setting to 'Auto Print' or 'Manual Print' from **[F3 SETUP MENU]**.

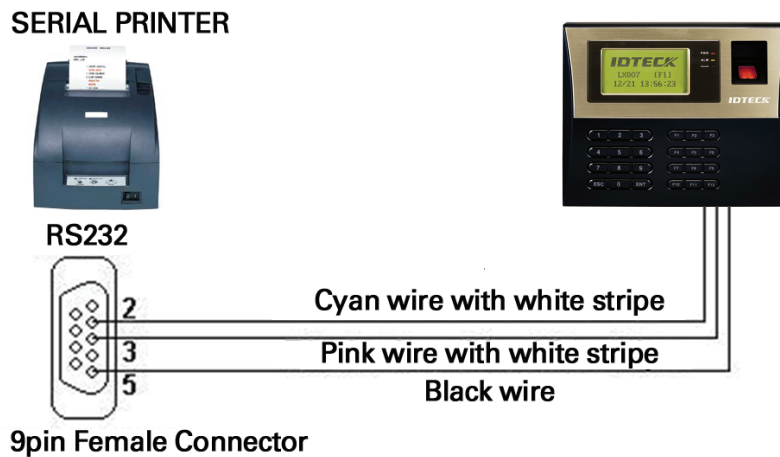
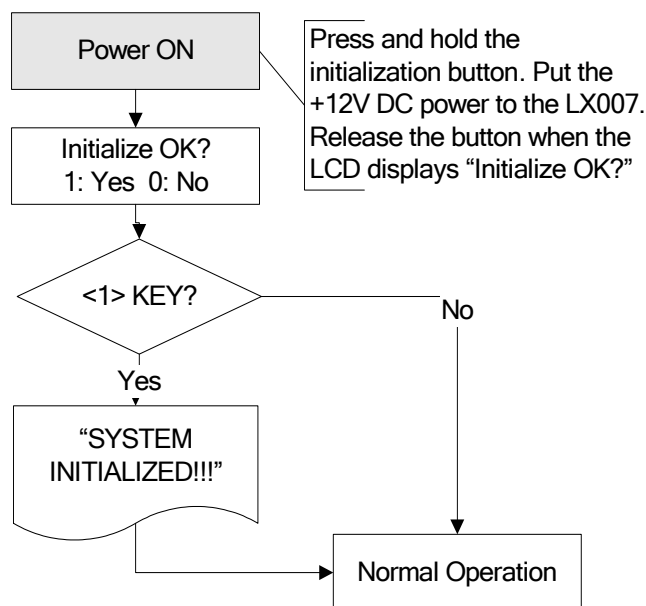


Figure: RS232 Communication between LX007 and a Serial Printer

10. Basic Setting

10.1 Initialization of LX007

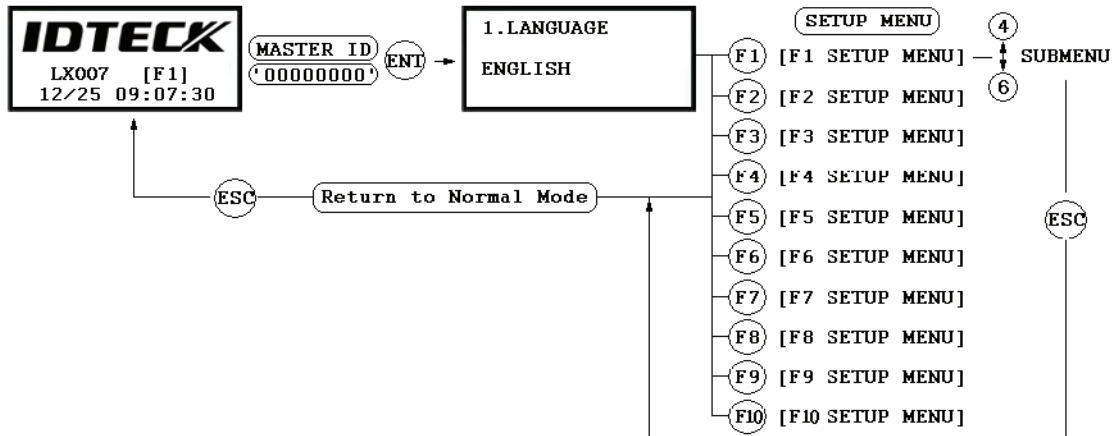
After the installation and connections are completed, supply power (DC +12V) to the LX007 with the initialization button held down. Then, the LCD will first display **"Initialize OK? 0:No 1:Yes"**. Press <1> key if you want to initialize the system. After all the initialization process is completed, the system will be operating on the normal mode and the LCD will display **"IDTECK, LX007 [F1], Date Time"**.



10.2 How to Enter the SETUP MENU

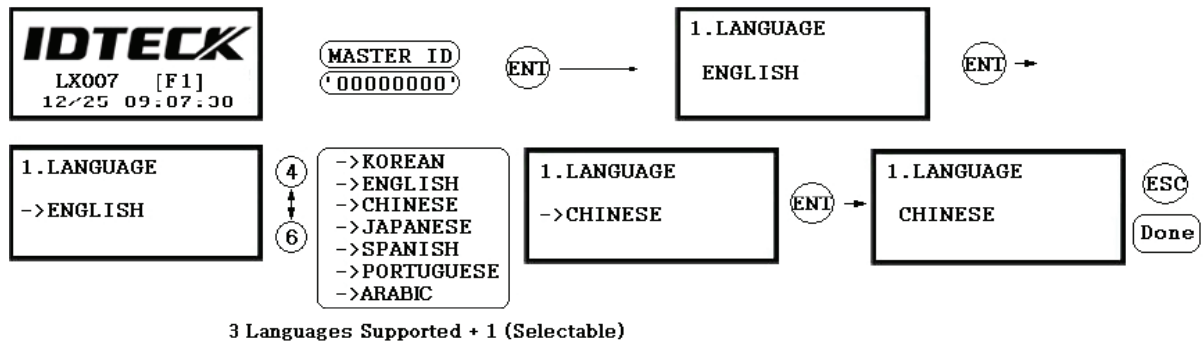
To set up the LX007 or to change the settings, you have to enter the **SETUP MENU** first. To do so, press **<0>** key eight (or ten) times and **<ENT>** key on the keypad. (The **Default Master ID** is '00000000'. For the **LX007SR**, it's '0000000000'.)

There are **10 SETUP MENUS** and you automatically enter **[F1 SETUP MENU]** first. You can move to other **SETUP MENUS** by pressing **<F1>** to **<F10>** keys. For example, if you want to go to **[F2 SETUP MENU]**, then press **<F2>** key. To enter **[F5 SETUP MENU]**, press **<F5>** key, and so on and on. There are several **SUBMENUS** inside each **SETUP MENU** and you can scroll up and down the **SUBMENU** by pressing **<4>** and **<6>** key. If you don't press any key within 60 seconds or if you press **<ESC>** key, the LX007 will exit the **SETUP MENU** and return to the normal operating mode. You can change the **Master ID** in the **[F7 SETUP MENU]**.



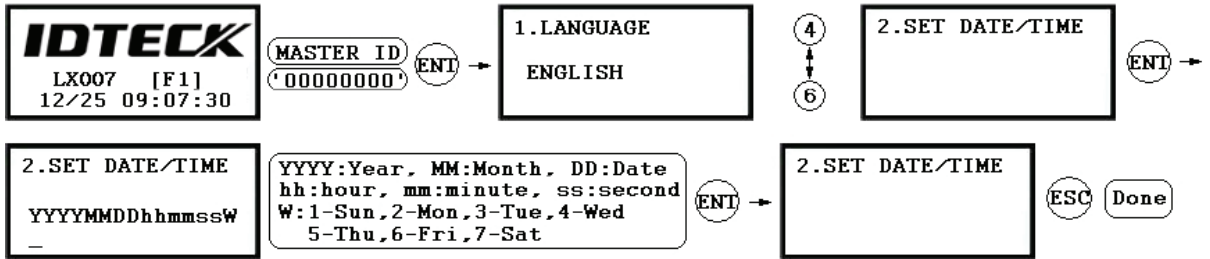
10.3 Language Setting

Select **[LANGUAGE]** in **[F1 SETUP MENU]** then press **<ENT>** key to select which language to use. The steps below show how to choose Chinese, for example.



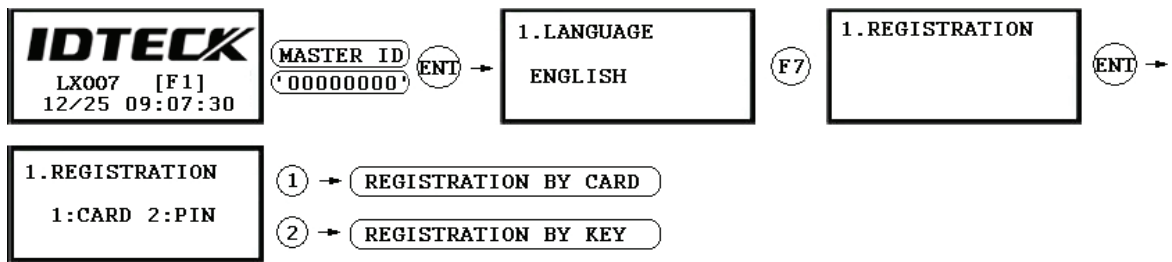
10.4 Date /Time Setting

Select [SET DATE/TIME] in [F1 SETUP MENU] and enter the total of 15 digits (i.e. Year / Month / Date / Hour / Minute / Second / Day) as shown below. The LCD will display the new Date and Time after the time setting is completed, but the year and day will not be displayed. The LX007 has a 24 hours system. Day codes are 1 for Sunday, 2 for Monday, 3 for Tuesday, 4 for Wednesday, 5 for Thursday, 6 for Friday and 7 for Saturday.

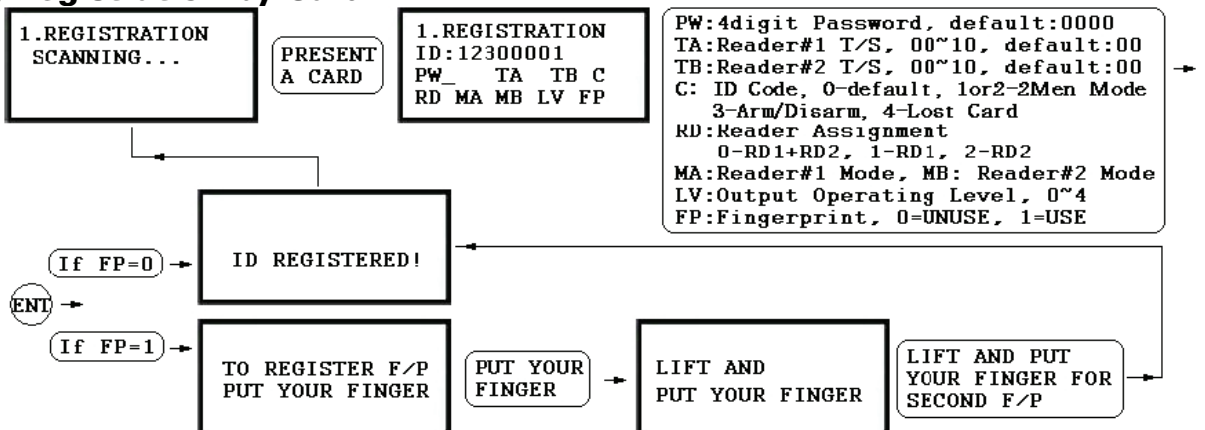


10.5 ID Registration

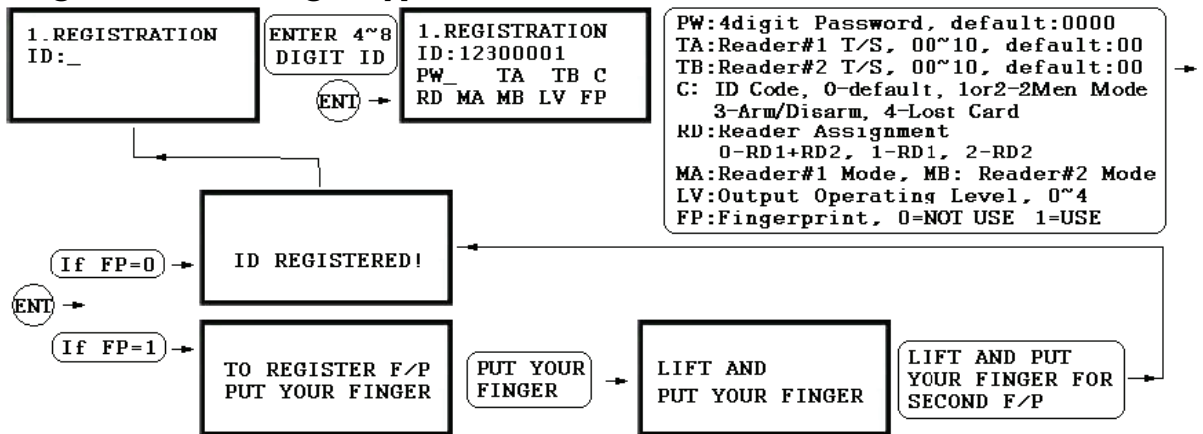
To register a User ID to the LX007, select [F7 SETUP MENU] -> [REGISTRATION]. You can choose to register an ID **a)** using the card or **b)** by entering the PIN.



a) Registration by Card



b) Registration Using Keypad



NOTE In case you make a typing mistake during the registration process, you can press the F1 button to erase the errors.

1. **Scanning** – means the reader is waiting for an ID number to be entered. The number of the card will appear with a beep sound when you present a card.
2. **ID** – refers to a Personal Identification Number (PIN) that consists of 4-8 digits. Enter a 4-8 digit ID number (PIN) and press <ENT> key. (An ID number of the LX007SR consists of 4-10 digits.)
3. **PW** – stands for a password that is required for verification in the RF + Password operating mode.
4. **TA** – refers to the Time Schedule code ('00' ~ '10') for the Reader#1 (i.e. the built-in reader). Cardholders are granted access only during the Time Intervals of the Time Schedule code entered to this TA field. To set the Time Intervals for each Time Schedule code, refer to the instructions on the Time Schedule Setup in the **[F4 SETUP MENU]**. If you want to allow the cardholder access to the door anytime, enter the default Time Schedule code '00' for the value.
5. **TB** – refers to the Time Schedule code ('00' ~ '10') for the Reader#2 (i.e. Exit Reader). Cardholders are granted access only during the Time Intervals of the Time Schedule code entered to this TB field. To set the Time Intervals for each Time Schedule code, refer to the instructions on the Time Schedule Setup in the **[F4 SETUP MENU]**. If you want allow the cardholder access to the door anytime, enter the default Time Schedule code '00' for the value.
6. **RD** – refers to the Reader Assignment code for the cardholder. Entering the code '0'