

SY-7xx (71x/75x/777)
Installation Manual

Synel Industries Ltd.

**Refer to: <ftp://synel.com/docs/> for
enhanced documentation!**

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1. Technical Specifications

1.1 Common to all 7xx terminals

- Magnetic Badge Reader (Track II) conforming to ISO 2894/3554 / Barcode (Code 39) slot reader model / (RF) Proximity reader / Wiegand (SY-777 only)
- 128K of protected RAM
- Protected Real Time date/time clock
- Rechargeable backup battery (one year capacity) for the memory and Real time clock
- Rechargeable backup battery for operation with auto shut-off for use during power outages
- RS232 and RS485 communication
- Audible tones
- Variable baud rate - 1200 to 19200

1.2 Functional Differences between 7xx terminals

	SY-711/751	SY-715/755	SY-777
Display	16 character LCD with back light display	2x16 character LCD with back light display	2x16 character LCD with back light display
	14 x 64.5mm	14 x 64.5mm	20 x 95mm
Function keys	6 programmable function keys	12 numeric keys- 6 are also programmable function keys	8 programmable function keys (4 special control keys: Escape, Return, Line Up, and Line Down)+ 10 numeric keys+dot
Ethernet (Optional)	Net card type B	Net card type B	Net card type A or B

1.3 Casing

Metal for SY751/SY755/SY777 terminals

Plastic for SY711/SY715 terminals

1.4 Option

- Optional 14,400 bps internal modem
- Optional 30VDC 1A relay for controlling an announcement bell or door lock:
- Net connection (Ethernet)

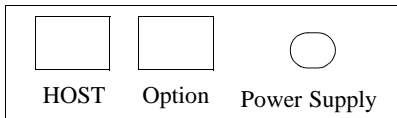
1.5 Electrical Characteristics

- Voltage: 115 VAC or 230 VAC
- Current: up to 100 mA for 115 VAC, up to 50 mA for 230 VAC

1.6 Bottom connector panel

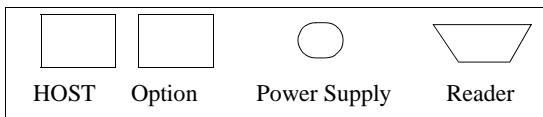
The connector panel is located at the bottom of the casing.

SY71x



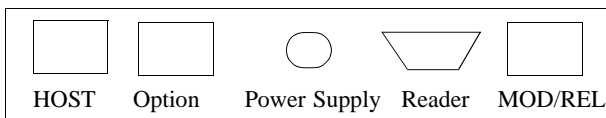
Option:
Net/Modem/
Relay/Sensor

SY75x



Option:
Net/Modem/
Relay/Sensor

SY777



Option:
Net/Modem/
Relay/Sensor

Internal components

1. Battery back-up modules:
The terminal has two back-up battery modules, one for the real time clock memory and the other for operation during a power failure. The standard memory back-up module is a 1 year span lithium battery, keeping the internal clock running and the memory intact.

The battery (in addition to the standard memory back-up) is self-contained, this allows operation during a power failure as follows:

For SY-777: in a standard configuration (Not including an optioncard) for 1 1/2 hours.

For SY-71x/75x:: in a standard configuration (Not including an optioncard) for 40 minutes.

A shut down timeout feature enables longer operation time.

During a power failure, the user presses the battery key to activate the terminal. Data can then be entered and stored in the terminal memory. Timeout will cause the terminal to shut down automatically after the last use of the terminal, until the battery key is pressed again.

Note: You must plug the terminal into a main power source, for at least 18 hours continuously before using it for the first time.

2. Memory:
The series contain have a 128 Kbyte user memory, providing storage for data from more than 10,000 simple operations depending on programming tables length, and the complexity of collected data.
3. Serial RS-232/485 internal Card.

2. Unpacking

Note: Do not throw away the box or packing materials.

Check the box and contents for signs of damage that may have occurred during shipment. Carefully unpack and check contents:

2.1 Contents

The terminal package contains:

- Terminal
- Mounting panel
- 1 connecting/splitter box (included only when network communication is not available)

- Communication cable either a short RS-232/485 or a short TCP/IP bridge cable
- Four Phillips flat head 3.5x30mm anchors, for terminal mounting
- Mounting template
- Connector cover

3. Installation

3.1 Mounting the terminal on a wall

Make sure the unit is unplugged. If you have already connected the terminal to a PC, disconnect it. You can reconnect after mounting has been completed.

Caution: *The terminal contains computer components. It should not be mounted where it will be exposed to extreme heat or cold, water, steam, violent vibrations, high electromagnetic radiation including high voltage power lines and electrical equipment.*

Step 1: Place the terminal near an easily accessible power outlet. Select an appropriate location for the terminal and mount it at employee shoulder-height. Do not place the communication cable near a source of electromagnetic radiation or radio interference such as power lines, large machinery, etc. If the communication cable is to be threaded into the wall, make sure that it is safe to drill a hole at the desired location. The recommended height from top edge is 140cm (4'7").

Step 2: Only in SY-711/715 - Remove the back panel by sliding it to the side and pulling it out.

Warning: *Live wires in the vicinity may be 115V or 220V. Make sure not to drill into any live electric wires. Overlooking this warning may result in harmful contact with an electrical current.*

Step 3: Place the panel on the wall as a template and mark the place for drilling the holes.

Step 4: Drill holes using a 6 mm. (1/4") drill bit. If the communication cable is to be wired through the wall, wire one end.

Step 5: Screw the panel to the wall.

Step 6: Only in SY-711/715 - Slide the terminal over the panel hinges.

Step 7: Connect the communication cable:
Plug one end of the communication cable into the communication socket of the terminal.




- Step 8: Plug the terminal into the power socket.
Step 9: Re-place the connector cover at the bottom.

3.2 Communication connections

- Step 1: Select a location for the connection box.
The box must be positioned where both the communication line and the terminal can be connected to it.
- Step 2: Plug the terminal communication cable into the connection box.
- Step 3: Wire an additional connection for Ethernet.
- Step 4: If an internal modem has been added and the modem is used, plug the RJ-45 connector of a standard telephone cable into the telephone line. Do not use the terminal communication cable.

4. Technician Mode (Setup)

Enter into Technician Mode:

- In SY777: by clicking both the line up/down keys six times simultaneously (if the terminal is not programmed key-in 6 times 0 + **Enter**). Use the  **Enter** key to scroll between screens, and the line up/down keys for moving between options within the selected screen. To return to the previous screen use the  key. To exit technician mode double-click the  key.
- In SY71x/75x: by clicking both the In/Out keys six times simultaneously (if the terminal is not programmed key-in 6 times 0 + **Enter**). To exit technician mode double-click the **Enter** key.

Technician mode enables setting up:

- Real Time Clock (RTC) Calibration
- Baud rate
- Printer Baud rate
- Station ID settings
- Modem rings
- Network connection
- User Field - A field in which the user can fill-in 4 digits that will characterize that terminal.

Enter into Technician Mode:

The display screen flashes for a five seconds interval and displays the version then flips to display time and date alternately, (time&date are adjusted from the PC). For further information you can refer to the extended user manual.

5. Terminal-Host Interfacing

The terminal data collection terminal can be connected to the host computer using either an RS-232 or an RS-485 connection with an asynchronous serial port. RS-232 is used for a single device with a point to point connection, for distances of up to 50 meters (160 ft). RS-232 is the communication standard used by nearly all PCs and modems. Cabling distance is limited to 50 meters (160 ft) and only one terminal may be connected to the same COM port. The RS-485 standard extends the potential cabling distance to 1,000 meters (3,280 feet). Using 9600 baud enables multi-COM port connections. It uses only two communication wires. The SY-65 communication adapter converts RS-232 to RS-485.

Note: Most PCs use DTE type connectors on their RS-232 ports. The terminal is equipped with an RJ45 (telephone jack) connector. Thus, you will need a connection box intermediating the terminal and the host.

5.1 Installing communication cables

1. The cable should not be installed near EMI sources, such as:
 - Motors, generators, alternators, and transformers
 - Air conditioners, elevators
 - Radio/television transmitters, signal generators and internal communication networks
2. Cables should not be within:
 - 30 cm. (1 foot) range from less than 5 KVA power lines.
 - 60 cm. (2 feet) range from 5-10 KVA power lines.
 - 1.5 meters (5 feet) range of power lines of exceeding 10 KVA.
3. Cables should not run parallel to power lines for more than 15 meters (49 feet).
4. Use a single continuous cable for the communication line. If this is not possible, the cable should have only one indoor connection as follows:
 - a. Using two connectors with appropriate shielding and cover.
 - b. Using a connection box.
5. For aerial installation, use NYY shielded cables.

5.2 Connecting your PC to the SY-65

SY-65 must be set to one of the RS-485 modes: 4,5,6 and 7 dip-switches. For more information, refer to the manual for the SY-65 communication adapter. The diagrams below describe the pin outs for the cable connecting PC - SY-65 communication adapter. For 9-pin connector PC refer to first diagram, for a 25-pin connector refer to the second diagram.

SY65 9Pin D-Type	Computer	
	9Pin	25Pin
2	3	2
3	2	3
5	5	7

5.2.1 If communication problems occur

1. Lower the baud rate.
2. Use cables with a heavier gauge conducting wire.
3. Connect 120 ohm resistors between the MRxD and PRxD, and also between MTxD and PTxD that are at the ends of the wire of the following two connectors:
 - a. The connector on the computer.
 - b. The connector on the last terminal of the multi-drop line.
4. EMI protection is integrated into the terminal, but it is best to use an external protector for lightning problems.

5.3 Making a multi-drop connection

Note: Terminal IDs are set using the technician mode. There is no procedure for hardwiring the terminal ID as in the SY-1XX and SY-4X terminals.

All terminals and their connection boxes are connected in exactly the same way, regardless of their terminal IDs. The multi-drop line may be created in one of two ways: creating a chain of connection boxes, using a junction box.

Method 1

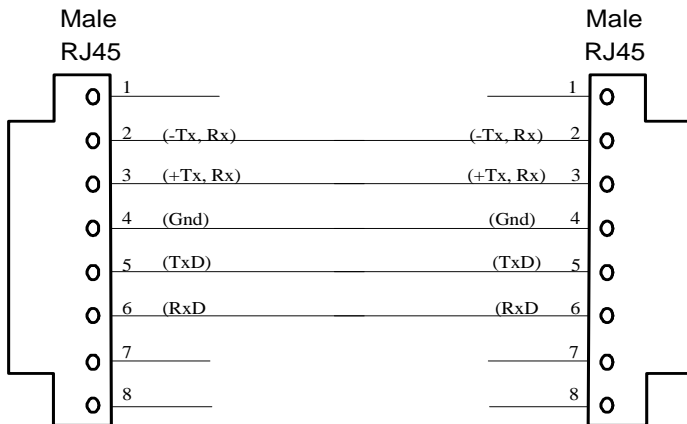
The SY-65 is connected to a connection box which cascading another connection box.

Method 2

The SY-65 is connected to a junction box. A separate cable is connected from each connection box to the junction box.

5.3.1 Cable from the terminal to the connection box

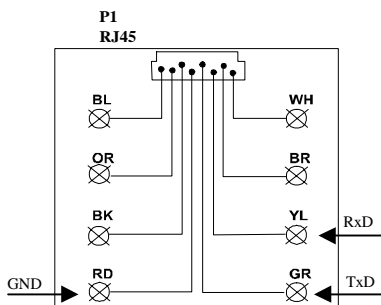
This is a standard 6 wire telephone cable with an RJ45 connector cable which is supplied with the terminal. The pin locations are illustrated below. Cable length should not exceed 30 meters (98feet).



The RJ45 connector on the terminal’s side must be a short (12.35mm) RJ45 connector to enable the terminal connector case to close.

5.4 Terminal to RS-232 PC port direct connection

- Step 1: Open the connection box.
- Step 2: Connect the TXD wire to the connection marked GR.
- Step 3: Connect the RXD wire to the connection marked YL. Connect the ground wire to the connection marked RD.
- Step 4: Close the connection box.



6. Maintenance

6.1 How to cause the memory to crash

Warning: *Must be performed by qualified personnel only! It requires working with an open unit. Make sure to unplug the unit wherever the instructions call for it. Take extreme care during the stages where the terminal is plugged into a power source.*

6.1.1 Location of jumpers

Step 1: Unplug the terminal and make sure that it is off.

The back-up battery automatically supplies power for approx. 15 seconds.

Step 2: Unscrew and remove the front panel.

Step 3: Remove the J3 jumper from the 1-2 position to 2-3 position.

Step 4: Reposition J3 to (1-2).

Step 5: Plug the terminal back into a power source and make sure that *MEM CRASH* reappears in the terminal display.

6.2 Formatting the memory if a crash occurs

If the memory crashes a *CRASH* message will appear. You will need to clear the terminal's memory and return the terminal to the *NO PROGRAMMING* state according to the procedure below.

Step 1: Press 6 times on the 0 key.

Step 2: Press on the Enter key once. Press 3 times on the arrow (up) key.

Step 3: Press twice on the arrow (down) key. Press 3 times on the arrow (up) key.

The message **CLEAR MEMORY?** will appear on the display.

Step 4: Press twice on the arrow (down) key.

Step 5: The message **MEMORY CLEARED** will appear on the display.

Step 6: You receive a **NO PROG** display.

The terminal then will be in the Technician mode. The message on the display will alternate between *TECHNICIAN MODE* and the date and time in the following format: DD/DW hh:mm:ss where DW represents the day of the week.

If you make an error on steps 3 through 6, the terminal will revert to the mode prior to step 3. If you are unable to complete this operation, exit technician mode by pressing the **Enter** key twice. Then begin again.

Appendix - A - External Connectors

HOST RJ-45 (8 pin) - P4 Communication with Host computer

Pin	Signal	Value	Remarks
1	NC		
2	RS-485 (-TRX)	0-5 Volt	
3	RS-485 (+TRX)	0-5 Volt	
4	GND		
5	RS - 232 (TXD)	-12:+12Vdc	
6	RS - 232 (RXD)	-12:+12Vdc	
7	NC		
8	NC		

RJ-45 (Ethernet - P1 Optional net card:

A. For Ethernet: (Set J15, J16 and J17)

Pin	Signal	Value	Remarks
1	Transmit data	TX +	
2	Transmit data	TX-	
3	Receive data	RX +	
4	NC/Vin/Shield		10Base-T/Power over LAN/100Base-T
5	NC/Vin/Shield		
6	Receive data	RX -	
7	NC/GND/Shield		10Base-T/Power over LAN/100Base-T
8	NC/GND/Shield		10Base-T/Power over LAN/100Base-T

B. For 14,400 Modem: (Set J15, J16 and J17)

Pin	Signal	Value
1	NC	
2	NC	
3	Ring	OP -
4	TIP	OP +
5,6	NC	

C. RJ11 For 2,400 Modem + I/O

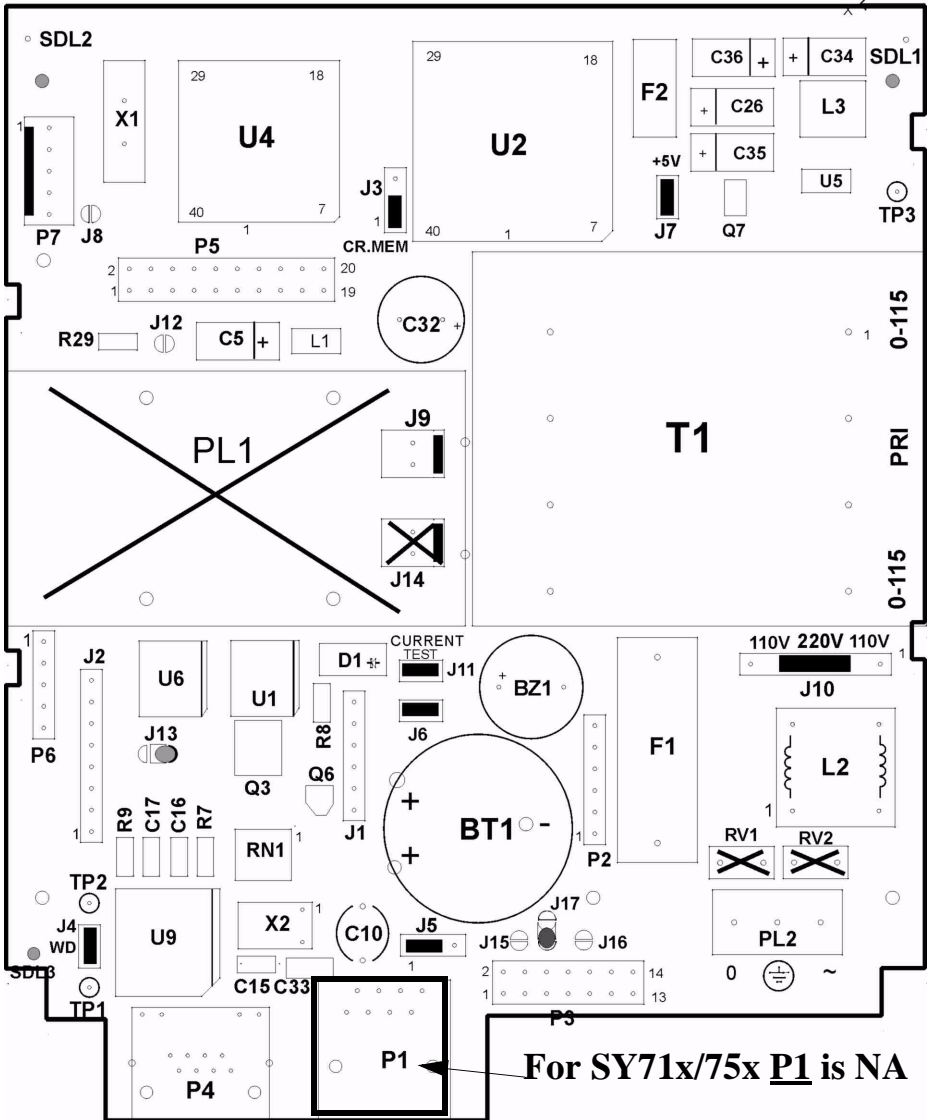
Pin	Signal	Function
1	Relay 1	Output
2	Sensor 1	Input
3	Ring	Modem
4	TIP	Modem
5	Sensor 2	Input
6	Relay 2	Output

SY-777/75x - D-Type 9pin - Female (For external bar-code)

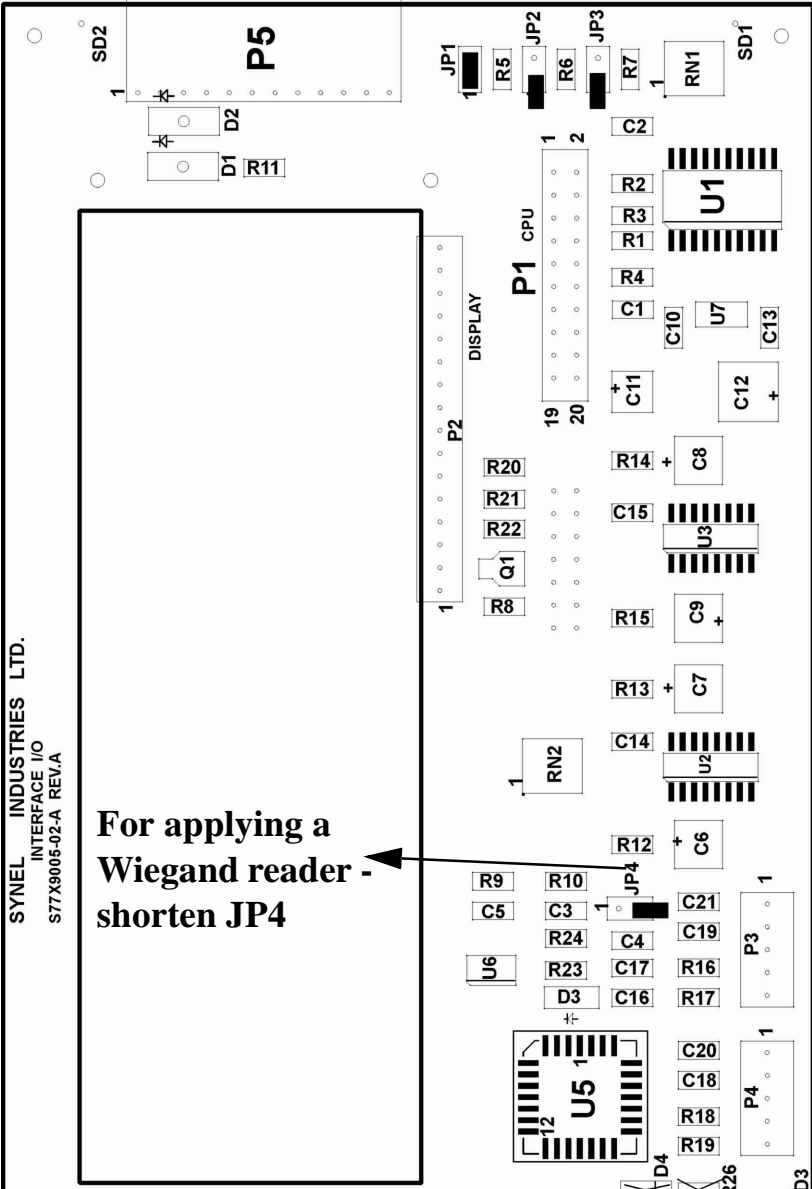
Pin	Signal
2	VCC
4	DATA
7	GND

Appendix B - Jumpering

Printed side (PCB No. 310-C112-05-C)



Display Card- SY777



Miscellaneous

Jumper	Description	Value	Default/Note
J3	Memory crash enabled	[1-2] Disabled [2-3] Enables	Disabled
J4	Watch Dog in	Open WDI Disable Closed - Normal work	Closed
J5	RTC	[1-2] Normal work [2-3] Calibration	Normal work
J6	Back-up memory battery (current test)	Closed - Normal work Open - Test current	Closed
J7	VCC (current test)	Closed - VCC ON Open - VCC OFF	Closed
J10	Network voltage selection (~220V/~110V)	[2-3] 220Vac [1-2] [3-4] 110Vac	220Vac
J11	Battery (current test)	Open Battery OFF Closed Battery ON	Closed
J13 (SMD)	Back-up battery voltage selection (9V/7.2V)	[2-3] 9V battery* [1-2] 7.2V battery**	Per terminal: SY71x or SY777
J15/16/17 (SMD)	TCP/IP or modem selection	15 - Open] 16 - Open] - TCP/IP 17 [1-2]] ----- 15 - Close] 16 - Close] - Modem 17 [2-3]]	TCP/IP

* - SY-71x/75x terminals

** - SY-777 terminals

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