

HRX 5000

Technical Manual

Version 1.2

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Specification



The HRX 5000 is a Proximity card reading terminal with TCP/IP connection, Fire Alarm printout, Access Control for 2 doors and optional internal Modem.

Dimensions:	280mm (W) X 170mm (H) X 60mm (D)
Display:	16 X 2 Large character LCD with LED Backlight Display area: 100mm X 25mm
Clockings:	15,000 in circular buffer
Employees:	25 to 1,000, remotely upgradeable
Firmware:	Flash memory upgradeable over TCP/IP
Configuration:	1 Master, up to 15 Slaves
Reader:	Type: 125KHz HID type Range: 80mm (ISO & Clamshell badges) 30mm (Keyfobs)
Battery Backup:	Lithium battery for data and clock for 3 years
Enclosure:	Material – Flame retardant ABS IP rating – standard purchase is unsealed Optionally sealed to IP66 (hosedown)
Weight:	1 KG.
UPS:	Optional external

Connections:	Power	9-12v DC 350mA to 500mA
	TCP/IP	10/100 Base-T
	RS/232	Second, alternative, PC connection
	RS485	Slave clocks. 2 connectors for buss
	RS232	Fire Alarm printer
	Digital IN	Fire Alarm Panel
	Remote Reader A	8 core up to 50 metres
	Relay A	SPCO up to 250V 0.5A
	Door Ajar A	From magnetic contact
	Egress A	From egress button
	Remote Reader B	8 core up to 50 metres
	Relay B	SPCO up to 250V 0.5A
	Door Ajar B	From magnetic contact
	Egress B	From egress button
	Modem	Line connector

Modem Options: Internal PSTN type
Internal GSM type (data SIMM contract required)

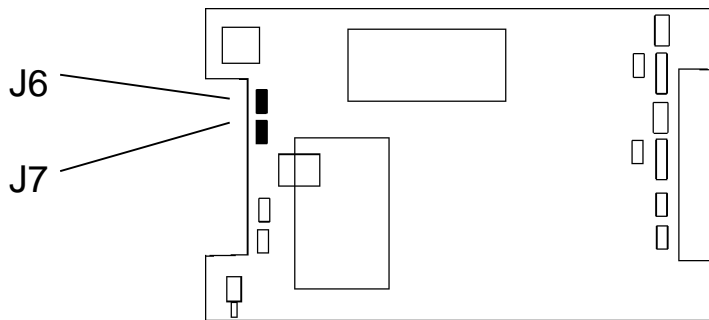
Power Supply: Wall Mount
IN: 240V AC
OUT: 9V DC
95mm X 45mm X 25mm

Connectors

RS-485 Network Connectors (J6 and J7)

J6, J7

Pin	Signal	Direction
1	-ve	In/Out
2	+ve	In/Out
3		
4	Screen	



A Master HRX5000 is able to communicate with up to 15 Slave HRX5000s (or HRX3000s) over a twisted pair RS-485 bus. 2 connectors are fitted in each clock to make wiring easier in the field.

End to end cable length can be up to 1Km. The cable required is single twisted pair with shield.

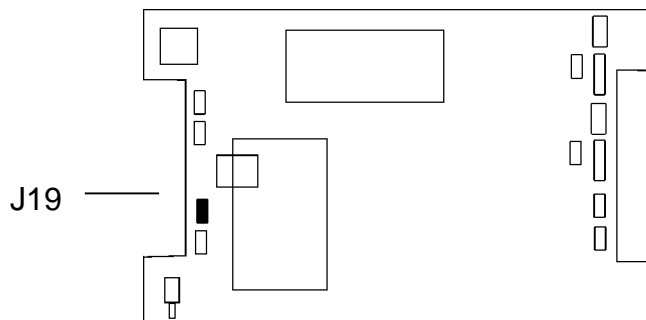
A suitable cable is Belden 9501 which is 24 awg (7X32) stranded, single twisted pair with shield, PVC insulation. The RS Part Number 382-576 is for 1 box of 304 metres at £75.

J6 and J7 are connected pin to pin on the PCB. I.e. J6 pin 1 connects to J7 pin 1 etc. To connect 2 units together, wire pin 1 to pin 1 and pin 2 to pin 2. Keep the screen pigtail as short as possible.

RS-232 to Printer (J19)

J19

Pin	Signal	Direction	Printer DB-25	Notes
1	Power	Out		5-9 volts available to power an external line driver. Current limited to approx 50mA
2	TXD	Out	RXD pin 3	Transmit data. 9600 baud, 8 data, 1 stop, no parity
3	RXD	In	RTS pin 20	Hardware handshake from printer. Connect to Printer RTS (Output) signal
4	0V		0V pin 7	Signal Ground



The terminal uses an RS-232 output to a printer for the Fire Alarm evacuation reports. The report is triggered by a contact closure on the Fire Alarm Input. It can also be initiated from the PC.

The data format of the transmitted data to the printer is:

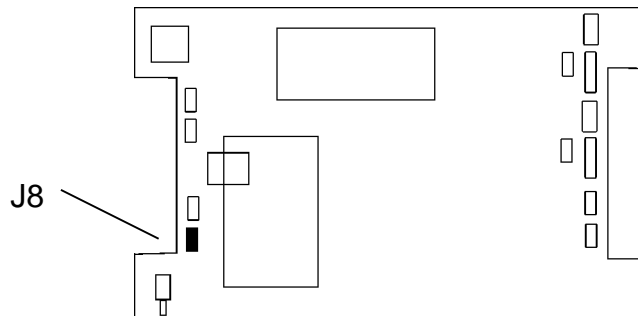
9600 baud, 8 Data bits, 1 Stop Bit, No Parity.

Using the Focus Software it is possible to command test printouts to be sent from the Terminal to the printer. It is also possible to inspect the state of the Printer's hardware handshake line. See menu option **System | Fire Alarm**.

RS-232 to PC (J8)

J8

Pin	Signal	Direction	Notes
1	Power	Out	5-9 volts available to power an external line driver. Current limited to approx 50mA
2	TXD	Out	Transmit data. 19,200 baud, 8 data, 1 stop, no parity
3	RXD	In	Receive data. 19,200 baud, 8 data, 1 stop, no parity
4	0V		Signal Ground

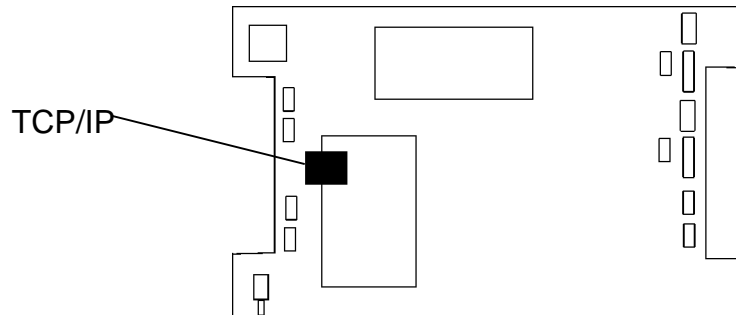


The terminal can communicate with the PC either by TCP/IP, RS-232 or Modem. The connection method is set up in the Focus **System | Clock Utilities | Connection Setup** screen. Here you specify a terminal name and a connection method.

Connections:

Pin	Signal	Direction	PC 9 Way	PC 25 Way
1	Power	Out		
2	TXD	Out	RXD (pin 2)	RXD (pin 3)
3	RXD	In	TXD (pin 3)	TXD (pin 2)
4	0V		0V (pin 5)	0V (pin 7)

TCP/IP



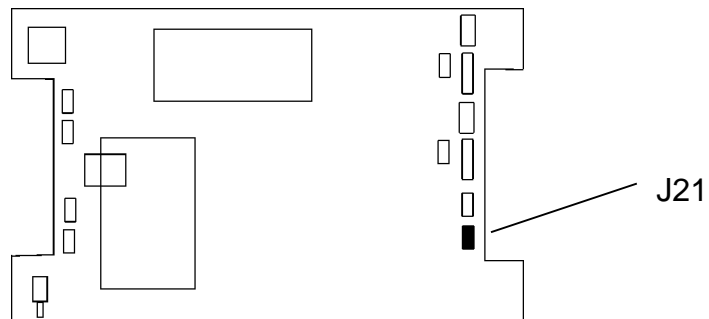
The TCP/IP connection supports Ethernet 10/100 Base-T.

The IP address of the unit is set up via the Focus software using the **System | Clock Utilities | TCP/IP** Tab. A password is required to modify the TCP/IP address of the unit as inadvertent changes will cause loss of communication. You would normally modify the IP Address by communicating over the RS232 cable from the PC.

Power (J21)

J21

Pin	Signal	Direction	Notes
1	0V		Signal Ground connected to pin 2
2	0V		
3	+ve	In	9-12 volts DC at up to 500mA
4	+ve	In	Connected to Pin 3



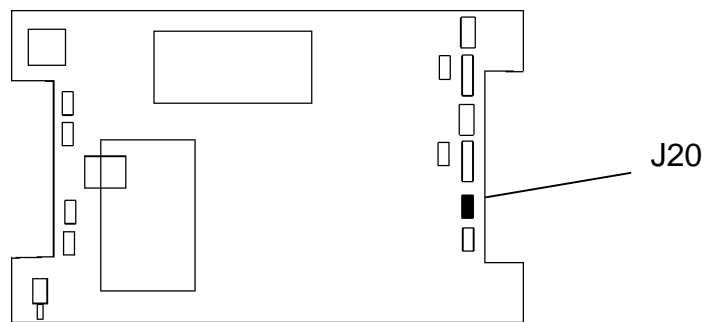
The unit requires 9 to 12 volts DC at up to 500mA depending on configuration.

The unit is protected internally against reverse polarity connection.

Fire Alarm Input (J20)

J20

Pin	Signal	Direction	Notes
1	FA	In	Fire Alarm Input
2	0V		Signal Ground
3	FA	In	Connected internally to Pin 1
4	0V		Connected internally to Pin 2



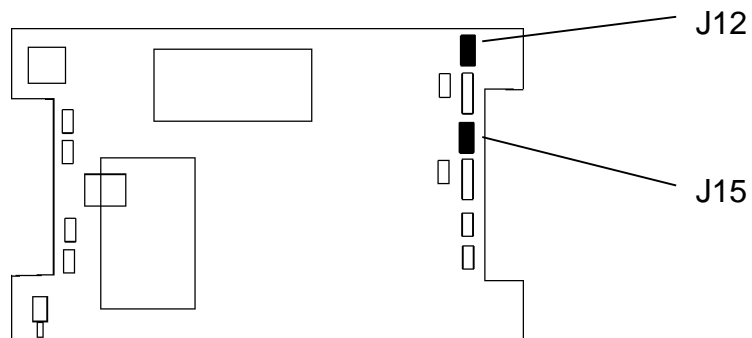
The Fire Alarm Input triggers the Fire Evacuation Report to be printed via the RS-232 printer port. A voltage free pair of contacts triggers the report on contact closure. The connections are doubled up on the connector with Pins 1 and 3 connected and Pins 2 and 4 connected. If desired, a push button switch can be connected to one pair and the Fire Alarm panel connected to the other pair. This will give a manual test or trigger input.

Pins 1 and 3 will normally show +5 volts with both inputs open circuit.

Relays (J12, J15)

J12, J15

Pin	Signal	Direction	Notes
1	NC	In/Out	Normally Closed Contact
2	C	In/Out	Common Contact
3	NO	In/Out	Normally Open Contact



The two relays each provide one set of changeover contacts for operating a door release mechanism or a sounder.

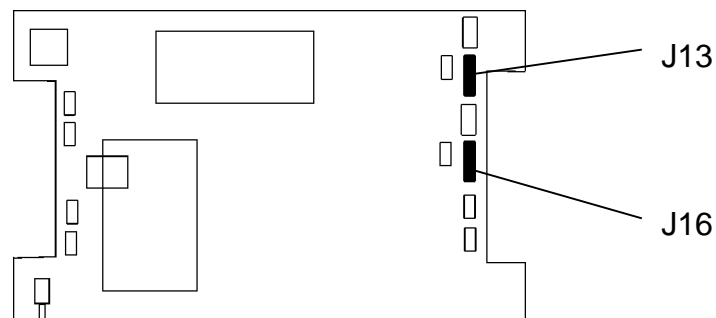
The contacts are rated at up to 240 volts AC 100mA , or 12V DC 2 Amps. The contacts are protected internally by transient suppressing Varistors.

Remote Readers (J13, J16)

J13, J16

Pin	Signal	Colour	Direction	Required
1	9 Volts	Red	In	Yes
2	Card Load Signal	Violet	In	
3	Signal Ground	Black		Yes
4	Data	Green	In	Yes
5	Clock	White	In	Yes
6	Green LED	Orange	Out	Yes
7	Red LED	Brown	Out	
8	Sounder	Yellow	Out	

NB: Pin 1 located at the TOP of the connector

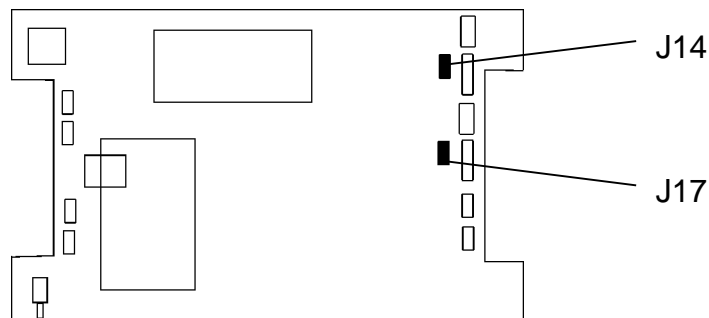


Recommended cable for extending the reader distance:
Belden 9538 which is 8 core 24 awg (7X32) with overall screen.
RS Part number 382-475 is for 304 metres at £175.

Remote Door Inputs (J14, J17)

J14, J17

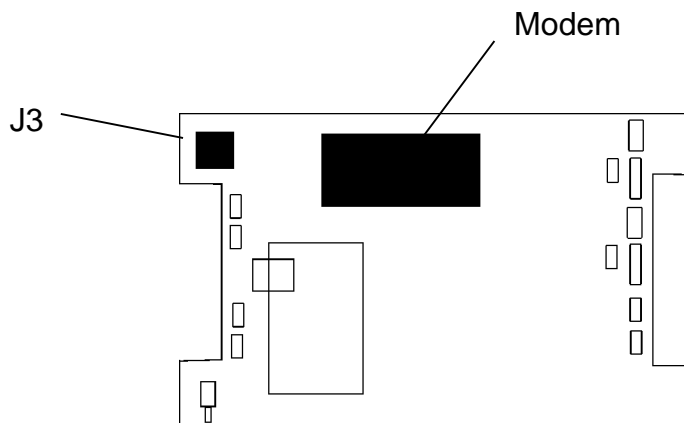
Pin	Signal	Direction	Notes
1	AJAR	In	Door Ajar
2	0V		
3	EXIT	In	Exit Pushbutton
4	0V		



Pin 1 and 2 connect to a normally closed door sensor such as a magnetic reed contact. The contacts open when the door opens. With the contacts open there is a 5 volt signal present on Pin 1.

Pin 3 and 4 connect to a Door Exit pushbutton. These contacts are normally open when there will be a 5 volt signal on Pin 3. Egress timing is carried out by the software in the terminal.

Modem (J3)



The unit can accept a plug in Modem which sits underneath the LCD. The footprint is compatible with a PSTN landline modem or a GSM radio modem.

The PSTN Modem connects to the phone line via J3 which is a standard modem line socket.

The GSM modem has a flying lead connecting to an aerial which, for best results, should be mounted remotely from the clocking terminal itself.

Access Control

The HRX5000 supports Access Control for 2 Doors. Two independent groups of connectors allow for connection to:

1. Proximity reader;
2. Door release device (latch or magnet) driven by a built in changeover relay;
3. Door open sensor;
4. Door Exit button.

Each relay has an alternative use as a bell actuator.

1. Proximity Reader.

With the recommended minimum 5 wire connection the LED/Sounder sequence is as follows:

	LED	Sounder	Indicating
Idle	Red		Power ON
Card Presented	Flashes GREEN	Beeps	Card read
If Access Granted	Relights GREEN for the duration the Door is released		Access Grant
If Access Denied	Remains RED		Access Deny

2. Door Release.

The contacts are rated at up to 240 volts AC 100mA , or 12V DC 2 Amps. The contacts are protected internally by transient suppressing Varistors.

3. Door Open sensor.

Connects to a set of contacts that are closed when the door is closed (such as a magnetic reed switch). These contacts are monitored and can initiate a Door Forced Alarm and a Door Ajar Alarm.

4. Door Exit switch.

Connect a Normally Open push button to this input to release the door for a predetermined interval. When the contacts close (button pressed) the door relay will operate (door released). When the contacts open (button released) the Door Release timer starts. This can be set from the Focus software Access Control | Doors screen. At the end of the timeout period the relay will de-energise, locking the door.

Master/Slave systems

In a Master/Slave configuration, the master holds all the Door Rules and the Access Rules as well as the Access Clocking Records. The Access Clocking records are downloaded at the same time as the Time and Attendance Records.

The Master holds:

- 20 Door Rules
- 100 Access Rules
- 100 Access Groups
- 10,000 Time & Attendance and Access clockings

Fire Alarm Interaction

Each door can be individually programmed to unlock on Fire Alarm activation. This is carried out by setting the Fire Alarm Release timer in the Door Definition within Focus Clock Utilities.

Bells

The HRX5000 holds up to 20 Bell time records that can be shared between the 2 relays. Each record specifies:

- The relay 1 or 2
- The activation time in hours and minutes (no seconds)
- The duration in seconds (up to 60 seconds)
- The days of the week on which the rule applies.

Fire Alarm Printer

The terminal uses RS-232 to send data to the fire alarm printer. This enables a dedicated cable to be used (rather than using the network infrastructure) and distances of around 50 metres can be achieved.

The printer must be capable of printing 'Raw Text'. Many printers only work when driven by an application using Windows or similar printer drivers. Before sourcing a printer ensure it can print raw text and has either an RS-232 interface (preferable) or a 'parallel Centronics' interface (also referred to as IEEE 1284 Bi-directional parallel).

Recommended Printer:

OKI B4250 Mono Laser plus optional serial RS-232 interface. Source www.printerland.co.uk.

If the printer does not have a serial interface it is possible, though less convenient, to use an external Serial-to-Parallel converter. This must be capable of converting serial data in the format 9600 Baud, 8 data bits , 1 Stop bit to Parallel data.

One such converter is the 'Autostop' or SPC-10 converter. This requires an external power supply delivering 9 to 12 volts AC or DC. If DC is used the polarity on the connector must be observed, which is **NEGATIVE TO THE TIP**. Wire the 25 way connector in accordance with the table for J19. In normal operation, all the DIP switches on the converter should be OFF, giving the correct baud rate and word format for the terminal.

Note that it is not possible to interface to a printer USB port.

Issue History

Issue	Date	Firmware	Focus	Changes
V1.0	July 2006			Original Issue
V1.1	11/9/2006	2.002	2.07	Access Control and Bells Descriptions Added
V1.2	29/9/2006			Fire Alarm printer details added.