Storm Interface

420 Series RS232 Encoder for Keypad Applications - Installation Instruction

Storm 420 Series Encoders allow interfacing between a Storm keypad and host system using the RS232 communications protocol. This model will also drive a 4 line x 20 character LCD display. For additional information download the 420 Encoder Application / Engineering Manual from www.storm-interface.com

SPECIFICATIONS

Input Power …………. 5V dc ± 0.25 V , regulated supply
RS232 Output ………. (via 6 pin Molex 2.54mm (.100") Pitch KK®)

Drives Powertips 80 Character LCD Display
(uses Hitachi HD44780U   LCD-II Controller/Driver)

Overall Size   W 89mm   x L 66mm   x H 32mm
Mounting Centres at   73.5mm   x   43.2mm
Temp Rating   -20 deg C to +70 deg C
Direct connection for underpanel fixing ……. 12, 16, 20 way Storm Keypads
Ribbon Cable needed for top panel fixing   4, 12 ,16 way Storm Keypads

Display Controls :
On host system : Ctrl + L - clears the display, Ctrl + C toggles cursor on and off

Keypad Connector (on reverse of pcb)   ✓ = pin connection made

KEYPAD TYPE	1	2	3	4	5	6	7	8	9	10	11	12	13	Direct connection to rear of keypad ?
20 WAY BACKLIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	YES
20 WAY NOT BACKLIT Fit polarising pin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Fit polarising pin	YES
12 / 16 WAY BACKLIT Fit polarising pin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Fit polarising pins		YES —fit polarising pins to positions 1,12 and 13
12 / 16 WAY NOT BACKLIT Fit polarising pins		✓	✓	✓	✓	✓	✓	✓	✓	✓	Fit polarising pins			YES
4 WAY BACKLIT Fit polarising pin	✓	Fit polarising pin	✓	✓	✓	✓					✓	Fit polarising pin	✓	NO —separate cable required - See Note 1 below STD version needs 5 way cable BACKLIT version needs 7 way cable Fit polarising pins as required
4 WAY NOT BACKLIT Fit polarising pins			✓	✓	✓	✓					✓	Fit polarising pins		

Encoder Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
R = ROW, C = COLUMN To Keypad	LED CATHODE	TAMPER IN	R1	R2	C1	C2	C3	C4	R4	R3	R5 FUNCTION KEYS	TAMPER OUT	LED ANODE
	PIN 1 ON REVERSE												

RS232 OUTPUT
DTR
GND
NC
RTS
RX
TX (Pin 1)

JUMPER SETTING CONTROLS BACKLIT KEYPAD LED COLOUR

RED   ⊖—⊖ ⊖—⊖
GREEN   ⊖ ⊖   ⊖ ⊖
JP8   FACTORY USE ONLY

Input Power Terminals

LCD Display Contrast Adjustment

PN 4200-001

FIRMWARE VERSION eg 5v02

Keymat Technology

60 mm

88.9 mm

Configuration Switches

NOTE 1—Connections for 4 way keypads

ENCODER PIN	TO	KEYPAD PIN	
		STD	BACKLIT
2		NC	1
11		1	2
5		5	6
6		4	5
7		3	4
8		2	3
13		NC	7
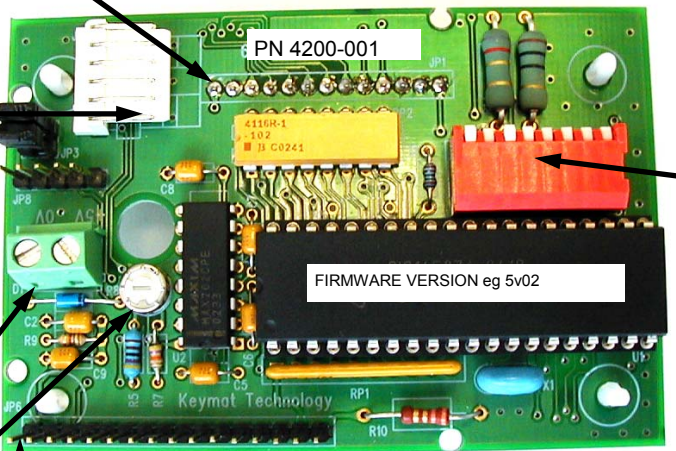
LCD Display Connector, 16 pins, 0.1" square pins

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Symbol	Vss	Vdd	Vo	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	A	K

ORDERING DETAILS

Stock No   Item
4200-00[X]   RS232 Encoder

[X] denotes packaging variant

free downloads from www.storm-interface.com :-

420 Encoder Application/Engineering Manual
Test Software

FC CE

REGISTERED UKAS QUALITY MANAGEMENT 003

FM39602

www.storm-interface.com

Fitted to 4, 12 or 16 WAY KEYPAD

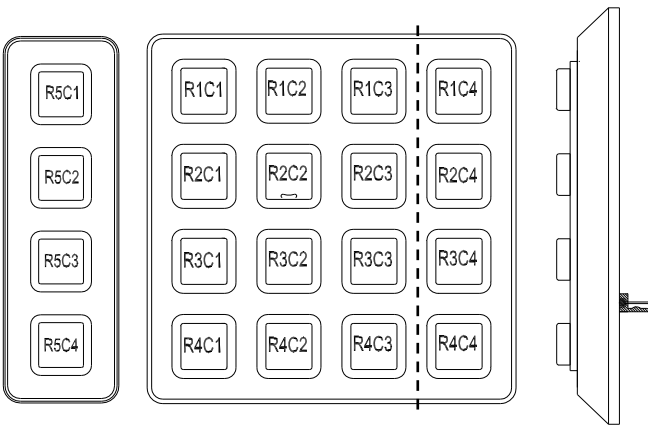| Configuration Switch Settings	1	2	3	4	5	6	7	8		Installation Checklist
4 Way Keypads	ON	CHARACTER ECHOING SELECTOR	OFF	ON	ON	ON	OFF	BAUD RATE SELECTOR OFF=9600 BAUD ON=1200 BAUD		✓Keypad
12 and 16 Way Telephone Layout Keypads	ON		OFF	OFF	OFF	OFF	ON			✓Encoder , configuration switch set
12 and 16 Way Calculator Layout Keypads	ON	ON = ECHO ON	OFF	ON	OFF	OFF	ON			✓Panel Fixing prepared
		OFF = ECHO OFF								✓+5V regulated supply
										✓RS 232 cable with 6 way Molex socket
										✓Ribbon cable keypad to encoder if needed
										✓LCD and 16 way ribbon cable if needed
										✓Polarising pins fitted to encoder

ROW / COLUMN DESIGNATIONS (KEYPADS FRONT VIEW)

For Example R1C2 = Row 1 Column 2.   NB : A 20 way keypad is treated as 4 way + 16 way.

4 Way Front View   12 / 16 Way Front View   Side View

TYPICAL INSTALLATION
(rear view, encoder direct connection to keypad, LCD display used)

↑ To LCD Display ↑

Power Input

↑ Keypad Pin 1

↓ RS232 Output

1K120101
BN 14022
QC PASSED

PIN-OUT FOR 4, 12 and 16 WAY MATRIX KEYPADS

4 WAY KEYPAD (NO BACKLIGHT) CONTACT CONNECTIONS (REAR VIEW)

PINS	• • • • •
PIN NUMBER	5 4 3 2 1

CONTACT MATRIX

PIN	ROW / COLUMN
1	R5
2	C4
3	C3
4	C2
5	C1

4 WAY BACKLIT KEYPAD CONTACT CONNECTIONS (REAR VIEW)

PINS	• • • • • • •
PIN NUMBER	7 6 5 4 3 2 1

CONTACT MATRIX

PIN	ROW / COLUMN
1	LED POWER
2	R5
3	C4
4	C3
5	C2
6	C1
7	LED POWER

12 / 16 WAY KEYPAD (NO BACKLIGHT) CONTACT CONNECTIONS (REAR VIEW)

PINS	• • • • • • • •
PIN NUMBER	8 7 6 5 4 3 2 1

CONTACT MATRIX (NO BACKLIGHT)

PIN	ROW / COLUMN
1	R1
2	R2
3	C1
4	C2
5	C3
6	C4 (16 WAY ONLY)
7	R4
8	R3

12 / 16 WAY BACKLIT KEYPAD CONTACT CONNECTIONS (REAR VIEW)

PINS	• • • • • • • • • •
PIN NUMBER	10 9 8 7 6 5 4 3 2 1

CONTACT MATRIX (WITH BACKLIGHT)

PIN	ROW / COLUMN
1	LED POWER
2	R1
3	R2
4	C1
5	C2
6	C3
7	C4 (16 WAY ONLY)
8	R4
9	R3
10	LED POWER

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ASCII CODE TABLES

4 WAY KEYPAD ASCII CODES

ROW/ COLUMN	R5
C1	11
C2	12
C3	13
C4	14

NOTE 1 : These codes are non-printing ASCII device control codes. The application software will need to assign usage

NOTE 2 : The COMMON pin on a 4 way is termed ROW 5 to be consistent with applications using 4 function keys.

12 / 16 WAY TELEPHONE KEYPAD ASCII CODES

ROW/ COLUMN	C1	C2	C3	C4
R1	31	32	33	61
R2	34	35	36	62
R3	37	38	39	63
R4	2A	30	23	2E

12 / 16 WAY CALCULATOR KEYPAD ASCII CODES

ROW/ COLUMN	C1	C2	C3	C4
R1	37	38	39	1B
R2	34	35	36	0C*
R3	31	35	33	05
R4	7F	30	0D	2E

* = Form Feed Code to give CLEAR function

Storm data entry technology
420 Series RS232 only Encoder for Keypad Applications

Fitted to INTEGRATED 20 WAY KEYPAD AND DISPLAY

Configuration Switch Settings	1	2	3	4	5	6	7	8	Installation Checklist
Integrated 20 Way Keypad and Display - Telephone Layout	OFF	CHARACTER ECHOING SELECTOR ON = ECHO ON OFF = ECHO OFF	ON	OFF	OFF	ON	OFF	BAUD RATE SELECTOR OFF=9600 BAUD ON=1200 BAUD	✓Integrated 20 way Keypad ✓Encoder , configuration switch set ✓LCD and 16 way ribbon cable if needed ✓Panel Fixing prepared ✓+5V regulated supply ✓RS 232 cable with 6 way Molex KK socket ✓13 way ribbon cable keypad to encoder if needed ✓Polarising pins fitted to encoder
Integrated 20 Way Keypad and Display - Calculator Layout	OFF		ON	ON	ON	ON	OFF		
Note : Remove Jumpers from JP3 and JP4 in this configuration.									

ROW / COLUMN DESIGNATIONS (KEYPAD FRONT VIEW)

For Example R1C2 = Row 1 Column 2.   NB : A 20 way keypad is treated as 4 way + 16 way.
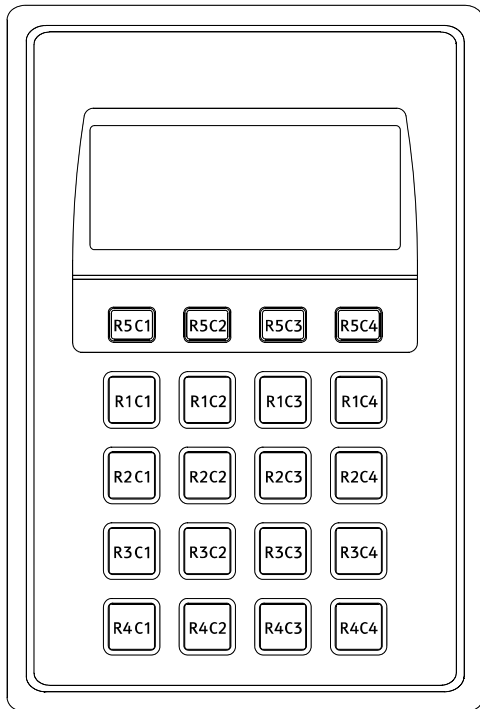
ASCII CODE TABLES

Row / Column	Telephone Layout		Calculator Layout	
	Character	ASCII	Character	ASCII
R5C1	▲	11	▲	11
R5C2	▲	12	▲	12
R5C3	▲	13	▲	13
R5C4	▲	14	▲	14
R1C1	1	31	1	31
R1C2	2 ABC	32	2	32
R1C3	3 DEF	33	3	33
R1C4	A	41	ENTER	1B
R2C1	4 GHI	34	4	34
R2C2	5 JKL	35	5	35
R2C3	6 MNO	36	6	36
R2C4	B	42	CLEAR	0C
R3C1	7 PQRS	37	7	37
R3C2	8 TUV	38	8	38
R3C3	9 WXYZ	39	9	39
R3C4	C	43	?	05
R4C1	* CLR	2A	*	7F
R4C2	0	30	0	30
R4C3	# ENT	23	#	0D
.	ENTER	2E	CANCEL	2E
ANTI- TAMPER OPEN CIRCUIT		07*		07*
	* = CODE REPEATS EVERY 10 SECONDS WHILST CONDITION REMAINS ACTIVE			

PIN-OUT FOR 20 WAY KEYPAD

20 WAY KEYPAD CONTACT CONNECTIONS (REAR VIEW)

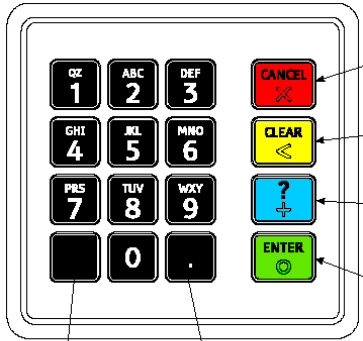| PINS	• • • • • • • • • • • • •
PIN NUMBER	13 12 11 10 9 8 7 6 5 4 3 2 1

CONTACT MATRIX

PIN	ROW / COLUMN
1	NOT USED
2	TAMPER IN
3	R1
4	R2
5	C1
6	C2
7	C3
8	C4
9	R4
10	R3
11	R5
12	TAMPER OUT
13	NOT USED

420 Series RS232 only Encoder for Keypad Applications

Storm data entry technology

Fitted to 6000 SERIES PINPAD

Configuration Switch Settings	R3	1	2	3	4	5	6	7	8
6000 Series Pinpad - Basic Layout	fitted	OFF	CHARACTER ECHOING SELECTOR	ON	OFF	ON	OFF	OFF	BAUD RATE SELECTOR
6000 Series Pinpad - UK Layout	Remove before use	OFF		ON	OFF	ON	OFF	OFF	
6000 Series Pinpad - USA Layout	Remove before use	OFF	ON = ECHO ON	ON	ON	ON	OFF	OFF	OFF=9600 BAUD
Note : R3 may need to be removed depending on the configuration required.			OFF = ECHO OFF						ON=1200 BAUD

Installation Checklist
- ✓ Keypad
- ✓ Encoder , configuration switch set
- ✓ Panel Fixing prepared
- ✓ +5V regulated supply
- ✓ RS 232 cable with 6 way Molex KK socket
- ✓ 13 way ribbon cable keypad to encoder if needed
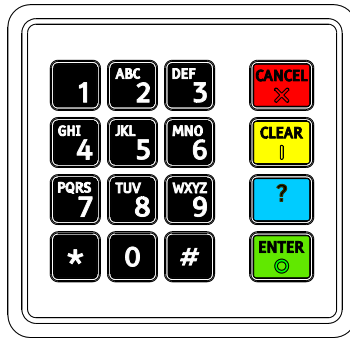- ✓ Polarising pins fitted to encoder
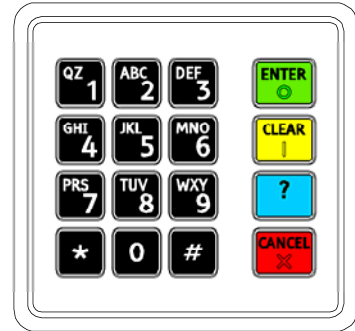
BASIC LAYOUT

BLANK KEY
No Key Code with Standard Firmware

Key Code = Decimal Point
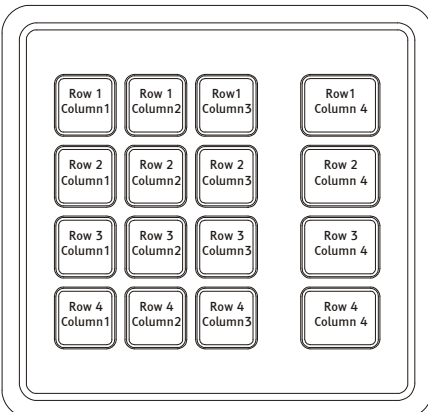
UK LAYOUT

USA LAYOUT

ROW / COLUMN DESIGNATIONS

PIN-OUT FOR 16 WAY MATRIX PINPAD

CONTACT CONNECTIONS
(REAR VIEW)

PINS ● ● ● ● ● ● ● ● ● ● ● ● ●

PIN NUMBER 13 12 11 10 9 8 7 6 5 4 3 2 1

CONTACT MATRIX

PIN	ROW / COLUMN
1	NOT USED
2	TAMPER
3	R1
4	R2
5	C1
6	C2
7	C3
8	C4
9	R4
10	R3
11	NC
12	TAMPER
13	NOT USED

ASCII CODE TABLES

Row / Column	Basic Layout			UK Layout			USA Layout		
	Marking	Base Key	ASCII	Marking	Base Key	ASCII	Marking	Base Key	ASCII
R1C1	1 QZ	Black	31	1	Black	31	1 QZ	Black	31
R1C2	2 ABC	Black	32	2 ABC	Black	32	2 ABC	Black	32
R1C3	3 DEF	Black	33	3 DEF	Black	33	3 DEF	Black	33
R1C4	CANCEL	Red with raised Cross	0D	CANCEL	Red with raised Cross	0D	ENTER	Green with raised circle	1B
R2C1	4 GHI	Black	34	4 GHI	Black	34	4 GHI	Black	34
R2C2	5 JKL	Black with Homepip	35	5 JKL	Black with Homepip	35	5 JKL	Black with Homepip	35
R2C3	6 MNO	Black	36	6 MNO	Black	36	6 MNO	Black	36
R2C4	CLEAR	Yellow with raised vertical line	7F	CLEAR	Yellow with raised vertical line	7F	CLEAR	Yellow with raised vertical line	7F
R3C1	7 PRS	Black	37	7 PQRS	Black	37	7 PRS	Black	37
R3C2	8 TUV	Black	38	8 TUV	Black	38	8 TUV	Black	38
R3C3	9 WXY	Black	39	9 WXYZ	Black	39	9 WXY	Black	39
R3C4	?	Blue with raised Plus	05	?	Blue	05	?	Blue	05
R4C1		Black	No Code	*	Black	2A	*	Black	2A
R4C2	0	Black	30	0	Black	30	0	Black	30
R4C3	.	Black	2E	#	Black	23	#	Black	23
R4C4	ENTER	Green with raised circle	1B	ENTER	Green with raised circle	1B	CANCEL	Red with raised Cross	0D
ANTI-TAMPER OPEN CIRCUIT			07*			07*			07*
*= CODE REPEATS EVERY 10 SECONDS WHILST CONDITION REMAINS ACTIVE. TO RESET—DISCONNECT POWER FOR 30 SECONDS.									

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