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®)

Overall Size W 89mm x L 66mm x H 32mm
Mounting Centres at 73.5mm x 43.2mm

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

Direct connection for underpanel fixing ……. 12, 16, 20 way Storm Keypads
Ribbon Cable needed for top panel fixing 4, 12 ,16 way Storm Keypads

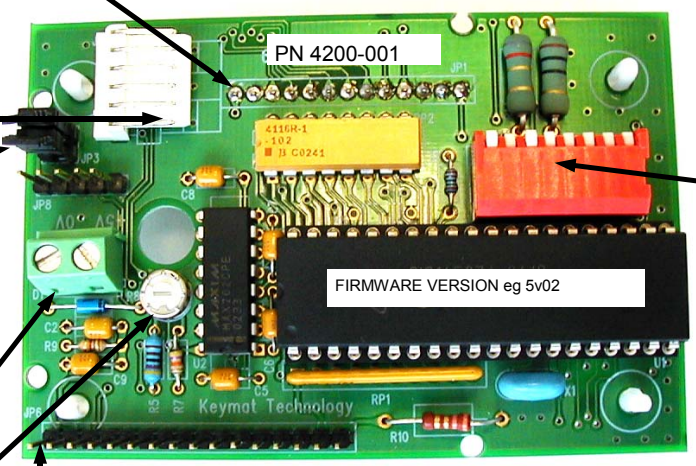
***Display Controls** :*
On host system : Ctrl + L - clears the display, Ctrl + C toggles cursor on and off

***Keypad Connector** (on reverse of pcb)*	✓ *= pin connection made*												***Direct connection to rear of keypad ?***
KEYPAD TYPE													
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*
4 WAY NOT BACKLIT	*Fit polarising pins*			✓	✓	✓	✓			✓	*Fit polarising pins*			*STD version needs 5 way cable* *BACKLIT version needs 7 way cable* *Fit polarising pins as required*

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													

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



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

Configuration Switches

***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

Whilst every effort is made to ensure details are correct at time of print, specifications are subject to change without notice.

FM39602

www.storm-interface.com

420 Series RS232 only Encoder for Keypad Applications

Fitted to 4, 12 or 16 WAY KEYPAD

Configuration Switch Settings	1	2	3	4	5	6	7	8
4 Way Keypads	ON	CHARACTER ECHOING SELECTOR	OFF	ON	ON	ON	OFF	BAUD RATE SELECTOR
12 and 16 Way Telephone Layout Keypads	ON		OFF	OFF	OFF	OFF	ON	
12 and 16 Way Calculator Layout Keypads	ON	ON = ECHO ON	OFF	ON	OFF	OFF	ON	OFF=9600 BAUD
		OFF = ECHO OFF						ON=1200 BAUD

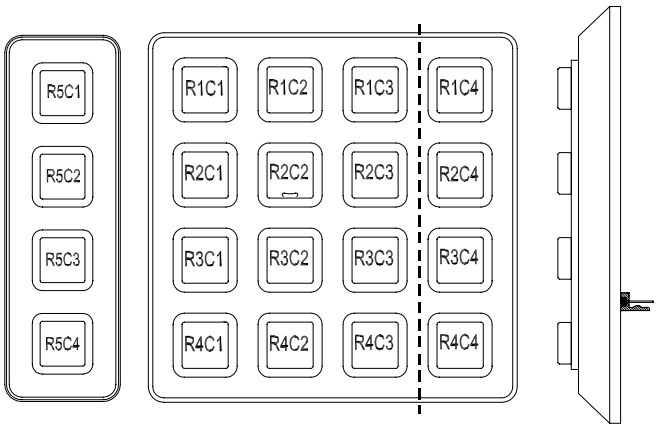
Installation Checklist

- ✓Keypad
- ✓Encoder , configuration switch set
- ✓Panel Fixing prepared
- ✓+5V regulated supply
- ✓RS 232 cable with 6 way Molex 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



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

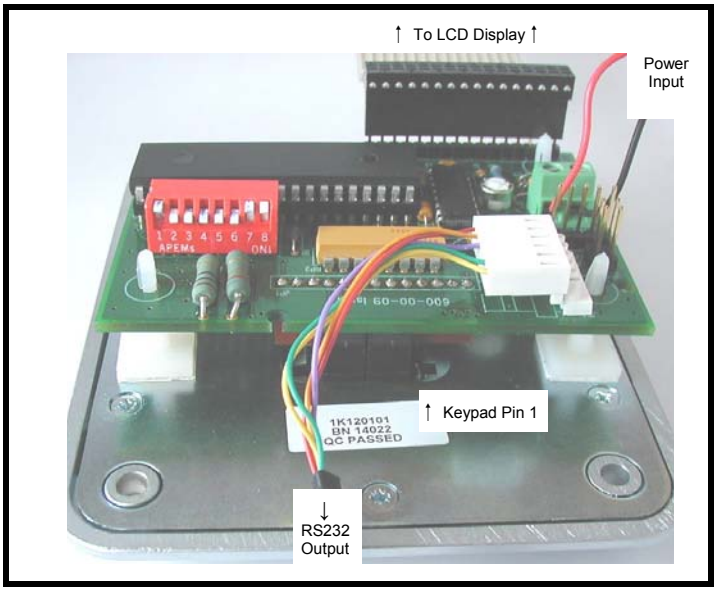
12 / 16 WAY BACKLIT KEYPAD CONTACT CONNECTIONS (REAR VIEW)

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

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



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

420 Series RS232 only Encoder for Keypad Applications

Fitted to INTEGRATED 20 WAY KEYPAD AND DISPLAY

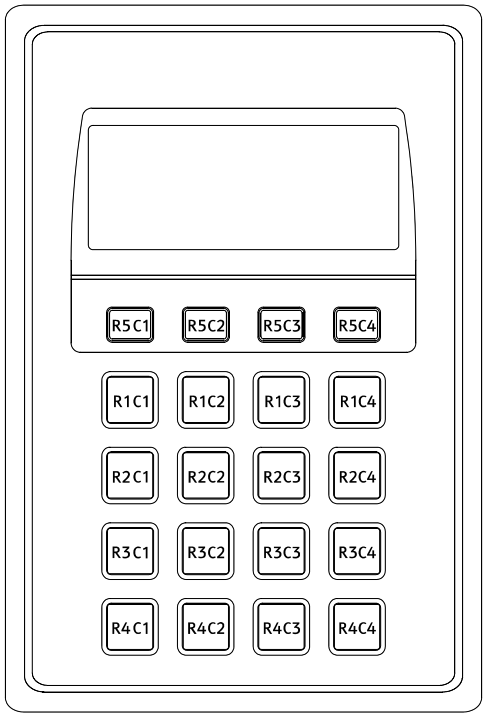
Configuration Switch Settings	1	2	3	4	5	6	7	8
Integrated 20 Way Keypad and Display - Telephone Layout	OFF	CHARACTER ECHOING SELECTOR	ON	OFF	OFF	ON	OFF	BAUD RATE SELECTOR
Integrated 20 Way Keypad and Display - Calculator Layout	OFF		ON	ON	ON	ON	OFF	
Note : Remove Jumpers from JP3 and JP4 in this configuration.		ON = ECHO ON OFF = ECHO OFF						OFF=9600 BAUD ON=1200 BAUD

Installation Checklist

- ✓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

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.



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

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			

420 Series RS232 only Encoder for Keypad Applications

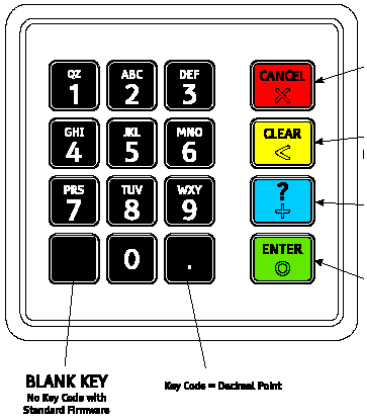
Fitted to 6000 SERIES PINPAD

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

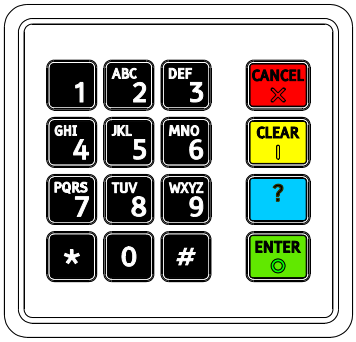
Installation Checklist

- ✓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

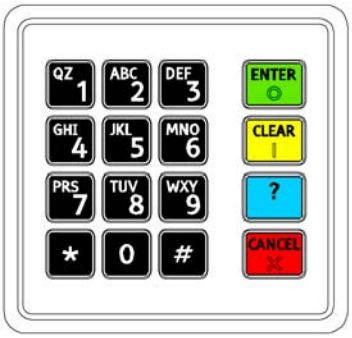
BASIC LAYOUT



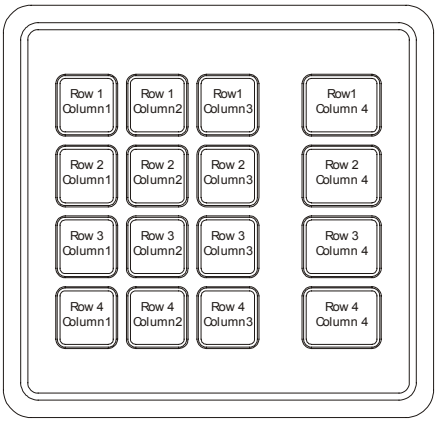
UK LAYOUT



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 verti-cal line	7F	CLEAR	Yellow with raised vertical line	7F	CLEAR	Yellow with raised verti-cal 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.								