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	Overall Size — W 89mm x L 66mm x H 32mm
RS232 Output ……… (via 6 pin Molex 2.54mm (.100") Pitch KK®)	Mounting Centres at 73.5mm x 43.2mm
	Temp Rating -20 deg C to +70 deg C
Drives Powertips 80 Character LCD Display	Direct connection for underpanel fixing ……. 12, 16, 20 way Storm Keypads
(uses Hitachi HD44780U LCD-II Controller/Driver)	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	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
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

PN 4200-001

FIRMWARE VERSION eg 5v02

Keymat Technology

Configuration Switches

60 mm

88.9 mm
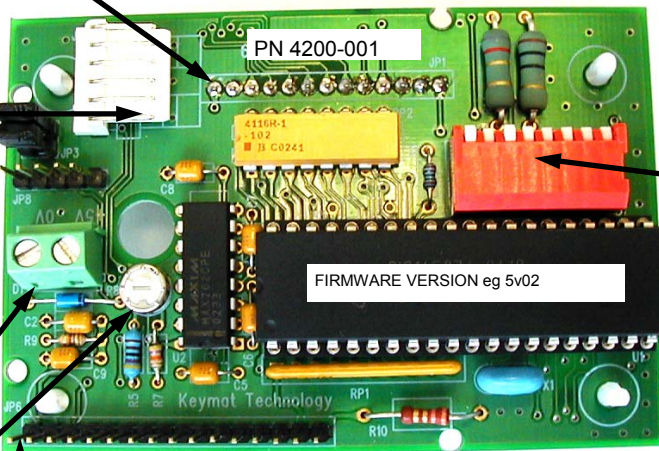
LCD Display Connector, 16 pins, 0.1" square pins

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

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

REGISTERED UKAS QUALITY MANAGEMENT 003

FM39602

www.storm-interface.com

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

Fitted to 4, 12 or 16 WAY KEYPAD

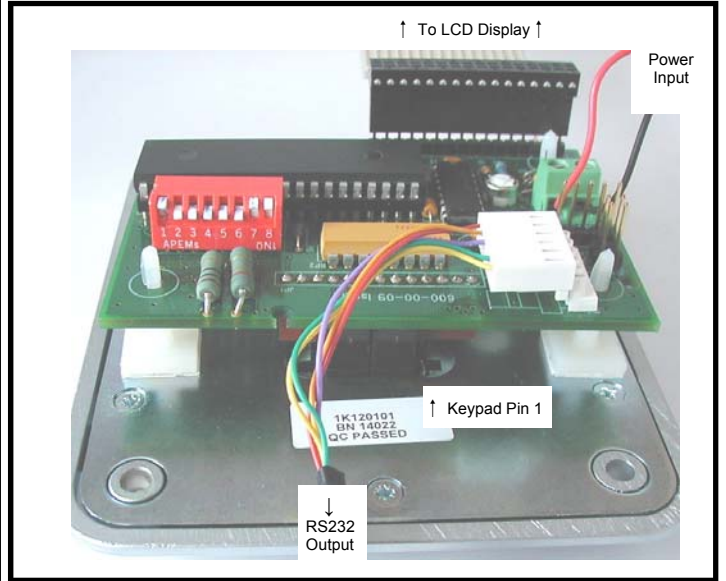| Configuration Switch Settings	1	2	3	4	5	6	7	8	Installation Checklist
4 Way Keypads	ON	CHARACTER ECHOING SELECTOR	OFF	ON	ON	ON	OFF	BAUD RATE SELECTOR OFF=9600 BAUD ON=1200 BAUD	✓Keypad ✓Encoder , configuration switch set ✓Panel Fixing prepared ✓+5V regulated supply ✓RS 232 cable with 6 way Molex socket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

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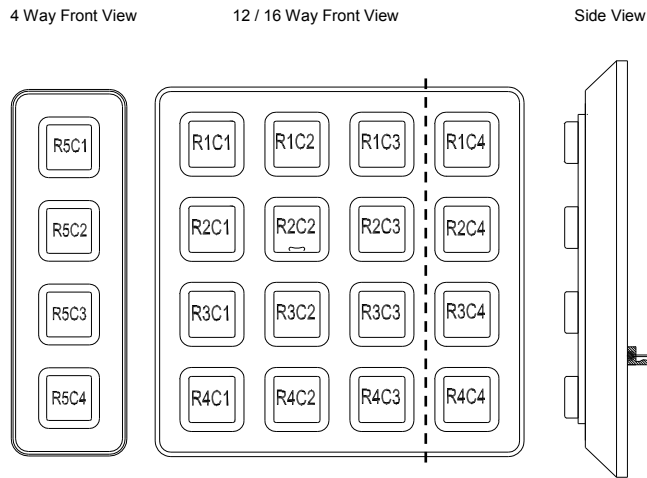
TYPICAL INSTALLATION
(rear view, encoder direct connection to keypad, LCD display used)

↑ 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
Integrated 20 Way Keypad and Display - Telephone Layout	OFF		ON	OFF	OFF	ON	OFF	
Integrated 20 Way Keypad and Display - Calculator Layout	OFF	CHARACTER ECHOING SELECTOR	ON	ON	ON	ON	OFF	BAUD RATE SELECTOR
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
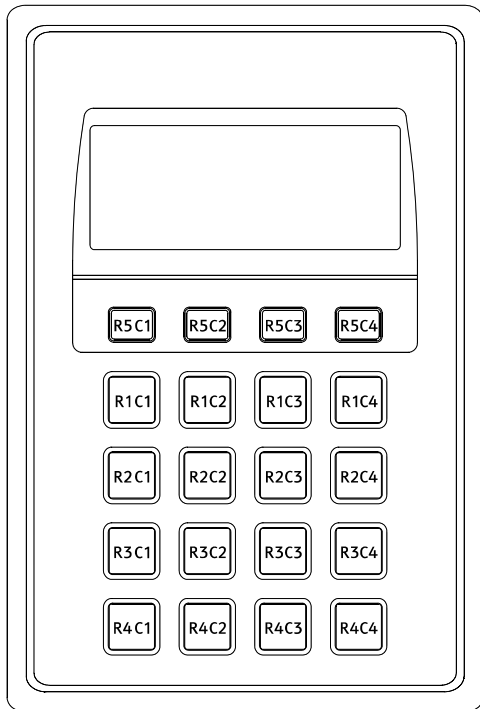
ASCII CODE TABLES

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			