

SERVICE MANUAL

for

Numerical Keypad



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The information contained in this service manual may be subject to change without prior notice.

1.0 PREPARING UNIT FOR REPAIR

First remove the unit from its mounting frame before attempting any repairs to the PCB. The unit can be snapped out using a small flat bladed screwdriver to lever the clips up. Push the unit forward, and it should pop out fairly easily.

Next the rear frame will need to be removed from the front moulding. At either the top or the bottom, using a small flat bladed screwdriver, lever the moulding up over the protrusion, and repeat of the other side. The rear frame can now be removed.

Next, using a small pozi screwdriver, undo the four screws holding the PCB into the moulding. **DO NOT LOOSE THEM.**

The unit is now ready for repair.

2.0 CIRCUIT DESCRIPTIONS

The keypad is designed to transmit 6 bit ppm control commands via a single wire to the controller. A small uController U2 operates as a key scanner and IR code generator. When a button is depressed the Row connection is pulled low when the processor pulls the Column line low (sequentially) via the resistors R4, R5 & R7. The IR command is then generated by U1 via RA1 (pin20). The NOR gates of U1 are used to 1) Enable mixing or IR signals from the J1 input and 2) For the NMS to block these signals via U3:D when an IR transmission from a button depression is in progress. U4 is a hex buffer than ensures that the signal is transmitted cleanly along lengths of CAT-5 cable up to 100 metres.

Transistor Q1 forms a 'Brown Out' circuit which monitors the supply voltage to the uController U2, resetting it in the event of the voltage falling to a point where the software may run erratically.

For details of the PCB, items list and circuit diagram please refer to Appendix B.

3.0 UNIT RE-ASSEMBLY

To re-assembly the unit, reverse the instructions in 1.0. Locate the PCB into position, and re-fit the screws. The rear frame clips in top and bottom, but is a slightly fiddly operation to complete.

APPENDIX A

NMS Main Assembly

Drawing Number: Q10453/IL

Items List for: Q10453/AS

Approved for Production: _____



SYSTEMLINE NUMERICAL KEYPAD WHITE

Issue: 1

Date: 05/02/2001

Change Number: _____

Item No.	Part No.	Description	Units	Manf. Part No.	Qty	Iss	Remarks
A							
1	ZPCB090	NUMERICAL KEYPAD PCB ASSEMBLY		Q10455/AS	1	1	
2							
3	ZMLD200	NUMERICAL BUTTON SET WHITE		Q10391/AR/002	1	1	
4							
5	ZENC121	SHORT REAR MOULDING		Q10067/DE	1	1	
6	ZMLD010	NUMERICAL KEYPAD MOULDING WHITE		Q10368/DE	1	1	
7							
8							
9							
10	ZSRW019	POZI PAN ZINC K18 X 6			4		
11							
12							
13	ZCAR021	UNIVERSAL KEYPAD/EYE PACKAGING			1		
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Drawing Number: Q10454/IL

Items List for: Q10454/AS

Approved for Production: _____



SYSTEMLINE NUMERICAL KEYPAD BLACK

Issue: 1

Date: 05/02/2001

Change Number: _____

Item No.	Part No.	Description	Units	Manf. Part No.	Qty	Iss	Remarks
A							
1	ZPCB090	NUMERICAL KEYPAD PCB ASSEMBLY		Q10455/AS	1	1	
2							
3	ZMLD201	NUMERICAL BUTTON SET BLACK		Q10391/AR/002	1	1	
4							
5	ZENC121	SHORT REAR MOULDING		Q10067/DE	1	1	
6	ZMLD011	NUMERICAL KEYPAD MOULDING BLACK		Q10368/DE	1	1	
7							
8							
9							
10	ZSRW019	POZI PAN ZINC K18 X 6			4		
11							
12							
13	ZCAR021	UNIVERSAL KEYPAD/EYE PACKAGING			1		
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

APPENDIX B

NMS PCB Assembly

Drawing Number: Q10455/IL

Items List for: Q10455/AS

NMS PCB ASSEMBLY

Approved for Production: _____



Issue: 1

Date: 19/01/2001

Change Number: _____

Item No.	Part No.	Description	Units	Manf. Part No.	Qty	Iss	Remarks
A	Q10455/TS	NMS TEST SPECIFICATION			REF	1	
B							
C							
1	PCB-M-00003	SYSTEMLINE NMS PCB	EA		1	1	
2							
3							
4							
5	SWA-S-0001	SWITCH TACTILE 6MM 7.3 HIGH (SQU)	EA	Diptronics DTSM-644KB	12		SW1 - SW12
6	CRY-S-00001	CRYSTAL 4MHz HC49 SMT	EA	ANGLIA 607-009	1		X1
7	CON-T-0003	CONNECTOR PCB-CABLE VERT HDR 6WAY	EA	TOBY 110-28-106-01	1		J1
8	CON-T-0014	CONN PCB-CABLE VERT HDR 6WAY PRINTED	EA	TOBY 110-28-106-01	1		J2 PRINTED WITH "DATA OUT"
9							
10	DIO-S-0001	DIODE RECTIFIER GF1A SM DO214	EA	RS 422-242	1		D1
11	DIO-S-0010	DIODE ZENER BZX84C5V1LT1 SM SOT23	EA	RS 348-5971	1		D2
12	TRA-S-0001	TRANSISTOR BC856BLT1 SOT23 SMT	EA	RS112-6210	1		Q1
13							
14							
15	ICL-S-0003	LOGIC HEF4001BT SOIC14	EA	RS 355-8120	1		U1
16	ICP-S-0001	PIC16C54C-04/SS	EA	MICROCHIP	1		U2 SOFTWARE = NUMKP.ASM
17	ICR-S-0001	REGULATOR L78M05CDT DPAK-R	EA		1		U3
18	ICL-S-0004	LOGIC HEF4502BT SOIC16	EA	RS 355-9202	1		U4
19							
20	CAP-S-00181	CAP 22pF 5% 50V 0603	EA	RS 204-0498	2		C1, C2
21	CAP-S-00026	CAP ELEC SM 47uF 16V 85C CASE D	EA	RS 108-211	2		C3, C4
22							
23							

Drawing Number: Q10455/IL

Items List for: Q10455/AS
NMS PCB ASSEMBLY

Approved for Production: _____

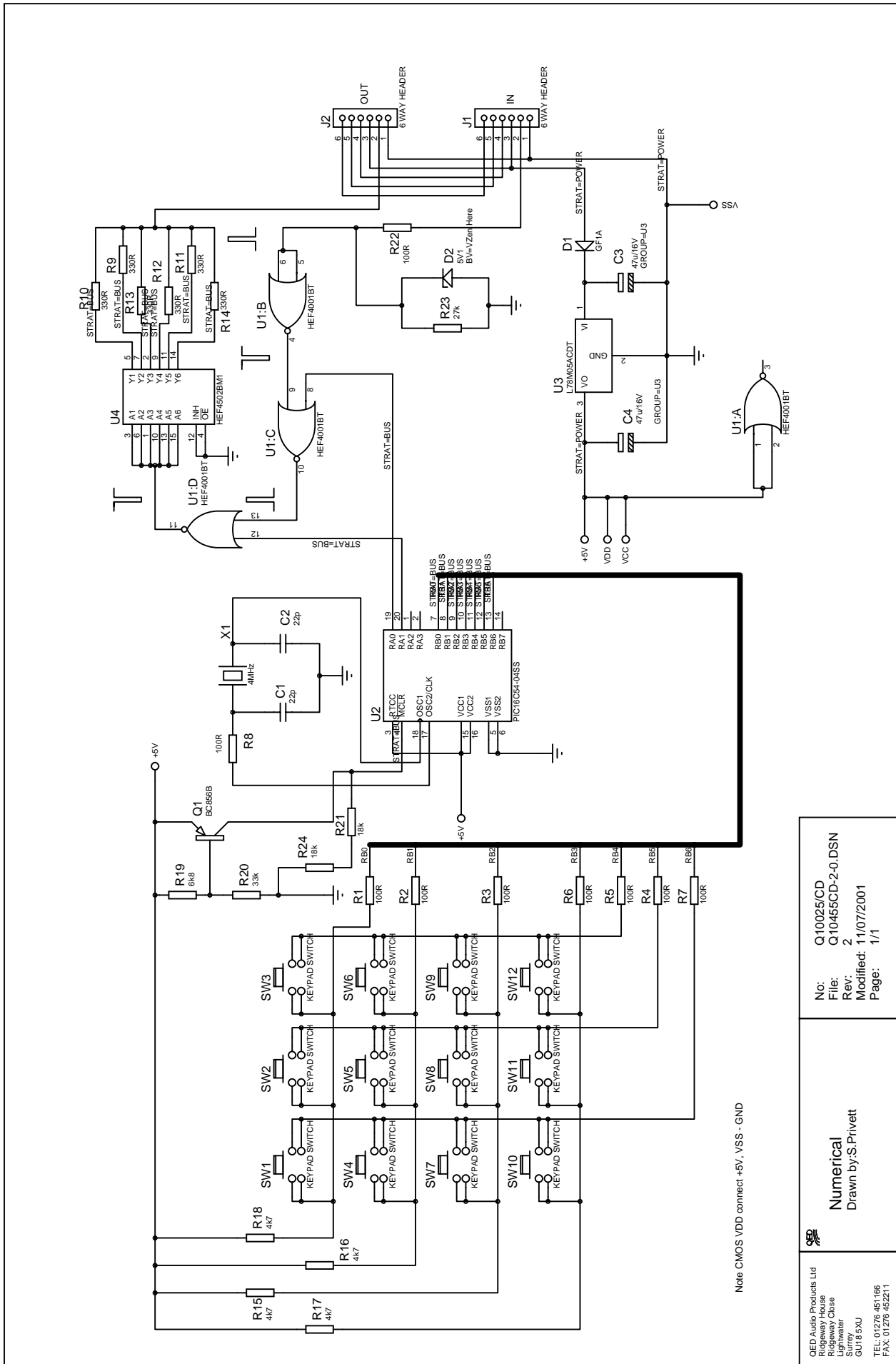


Issue: 1

Date: 19/01/2001

Change Number:

Item No.	Part No.	Description	Units	Manf. Part No.	Qty	Iss	Remarks
24							
25	RES-S-0266	RES 100R 1% 0.01W 0603	EA	RS 213-2143	9		R1 - R8, R22
26	RES-S-0272	RES 330R 1% 0.01W 0603	EA	RS 213-2200	6		R9 - R14
27	RES-S-0286	RES 4K7 1% 0.01W 0603	EA	RS 213-2367	4		R15 - R18
28	RES-S-0288	RES 6K8 1% 0.01W 0603	EA	RS 213-2389	1		R19
29	RES-S-0296	RES 33K 1% 0.01W 0603	EA	RS 213-2474	1		R20
30	RES-S-0293	RES 18K 1% 0.01W 0603	EA	RS 213-2446	2		R21, R24
31	RES-S-0295	RES 27K 1% 0.01W 0603	EA	RS 213-2468	1		R23
32							
33							
34							
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Note CMOS VDD connect +5V, VSS - GND

No: Q10025/CD
 File: Q10455CD-2.0.DSN
 Rev: 2
 Modified: 11/07/2001
 Page: 1/1

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