

# MD351 CONTROLLER

REVISION NUMBER - 01.11

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# 1 GENERAL INFORMATION

The Softcon MD351 controller is an input/output (I/O) controller, with 7 outputs and 48 virtual I/O ports. The virtual ports are configured as input or output, in groups of 8, giving combinations of 48 in; 40 in / 8 out; 32 in / 16 out; 24 in / 24 out; 16 in / 32 out; 8 in / 40 out; 48 out.

The controller is automatically programmed with which virtual ports are ins and outs. As these can vary per controller, a setting is required for the inputs in the . Output setting is not required (ports not inputs are outputs). One of two options can be used (only one option used in a system) and the option used depends on a setting in the file c:\softwin\access.md351.xli.

# 2 OPTIONS

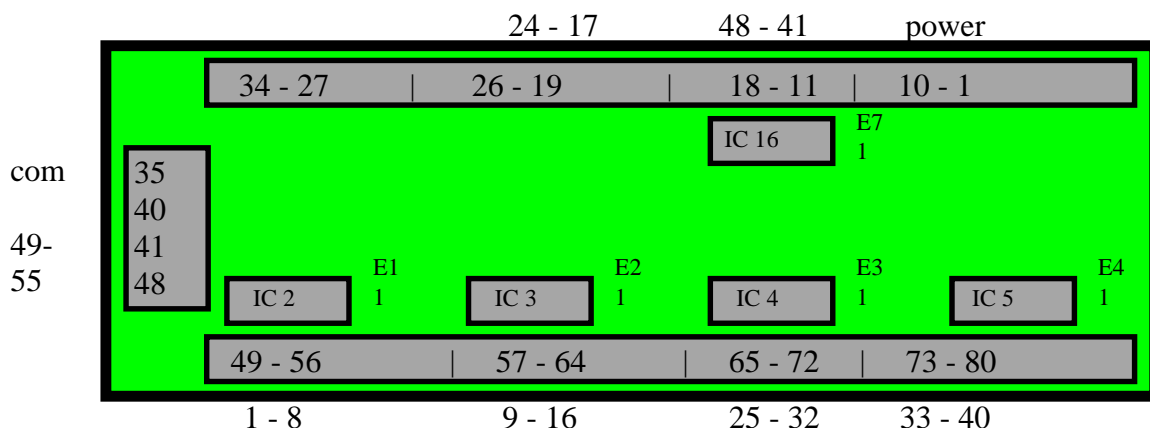
**Option 1:** (the default shipped) requires that the inputs are wired (connected) in the bottom ports, from input 1 (inputs and outputs cannot be mixed). This option requires that number of inputs be set for each MD351 controller in the controller set-up menu – only values 0, 8, 16, 24, 32, 40, 48 are valid. Output values are not used in any calculation or set-up, i.e. the setting is ignored. Inputs start at port 1, followed by outputs (e.g. with 16 inputs set, inputs are port 1 to 16, outputs are from port 17 to 55).

**Option 2 (SoftWin only, not SoftWin3):** allows inputs and outputs to be mixed (in groups of 8) and requires that a value indicating the group of ports which are inputs are set, given in a binary calculation. Calculate as follows: if group 1 is input, add 1; if 2 is input add 2; if 3 is input add 4; if 4 is input, add 8; if 5 is input, add 16; if 6 is input, add 32. In table form:

GROUP	PORTS	ADD
1	1 to 8	1
2	9 to 16	2
3	17 to 24	4 not buffered
4	25 to 32	8
5	33 to 40	16
6	41 to 48	32

For example if groups 1, 2, 5 are inputs, set  $1+2+16=19$ , if groups 2, 3, 5, 6 are inputs, set  $2+4+16+32=54$  and if no ports and in, set 0. This option requires a change in c:\softwin\access\md351.xli which is done by the installer (changing the position of comments /\* \*/).

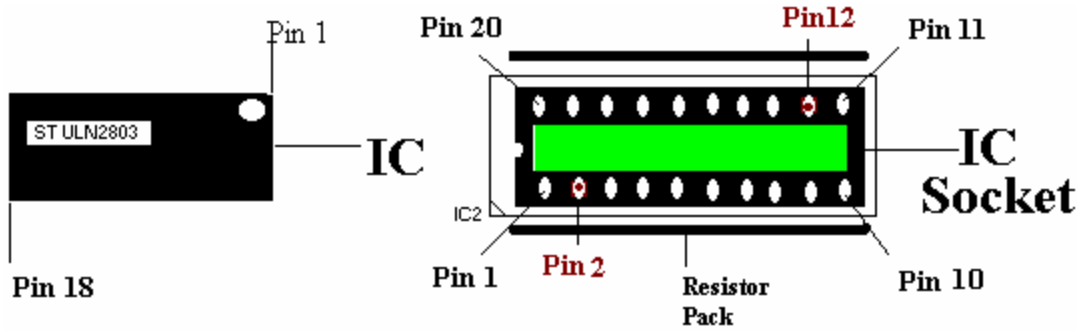
The positions of the ports are as follows:



For a virtual I/O port (group of 8) to be inputs, the associated IC must be an ULN2803, installed upside down, with pin 1 of the IC positioned at pin 12 of the IC holder (pins 10 and 11 of the IC holder are open). The associated link field must be 1-2 and 3-4.

For a virtual I/O port (group of 8) to be outputs, the associated IC can be a ULN2803 (sink, with the associated link

1-2 and 3-4) or a UDN2981 (source, with the associated link 1-4 and 2-3). The IC is the correct way around with pin 1 of the IC at pin 2 of the IC holder (pins 1 and 20 of the IC holder are open). Output port 49 is a relay with contact on terminal 41 and 42. Output ports 49 to 55 (terminals 43 to 48) are only sink.



**For inputs pin 1 of the IC must be at pin 12 of the IC holder. Leaving 11 & 10 open.**

**For outputs pin 1 of the IC must be at pin 2 of the IC holder. Leaving 1 & 20 open.**

**Note that there will always be 2 open spaces on the IC holder.**

The associated ICs and links are:

1-8	IC2	E1
9-16	IC3	E3
17-24	none	none
25-32	IC4	E3
33-40	IC5	E4
41-48	IC16	E7

Ports 17-24 are not buffered, while all others are buffered which invert the signal.

When the virtual ports are inputs and outputs, inputs always start at port 1 and run consecutively, with the outputs last. In the configuration of , the first output on the controller is set as port 1, i.e. inputs start at 1 and outputs start at 1. For example, for 24 inputs and 24 outputs, the inputs are 1-8, 9-16, 17-24 (set as input ports 1 to 24 for the controller) and outputs are 25-32, 33-40, 41-48 (set as output ports 1 to 24 for the controllers).

### 3 STEPS TO SETTING UP A MD351

#### Step 1

7 outputs are fixed outputs, consisting of one relay and 6 open collector (sink only). It has a fixed IC and is situated on the board between port's 50-55.

#### Step 2

If more than 7 outputs are required, the extra outputs can be type of output sink or source. **Sink** outputs supply negative (-) on the output terminal. **Source** outputs supply positive (+) on the output terminal.

**NB:** Inputs start at port 1 and run in sequence (unless changes are made for translator files as described for option 2 above), i.e. inputs and output groups are not mixed.

#### Step 3

Swap IC's around to configure inputs and outputs. Choose one of the two options as described above. For each group of source outputs, the outside resistor bank (the one nearest to the connector) must be removed. E.g. if **group 1 UDN2981** (port 1-8) is source outputs, remove resistor bank RP1.

#### Step 4

Set-up the type of controller in controller set-up as MD351.

#### Step 5

Set-up each input and output in via the database editor (Softedit in SoftWin, set-up editor in SoftWin3) in the Input and Output setup menus. For any help with setting up Inputs and Outputs, read the help file on input and output setup.

## 4 TERMINAL CONNECTIONS

TERM NO	FUNCTION	I/O NUM	I/C NUM	REMARK
1	+5V out			UPREG
2	GND			UPREG
3	+12V IN			UPREG
4	+USER OUT			USER REG
5	GND			USER REG
6	+12V IN			USER REG
7	+12VAC			USER SUPPLY
8	+12VAC			USER SUPPLY
9	+12VAC			ELECTRONIC SUPPLY
10	+12VAC			ELECTRONIC SUPPLY
11	I/O	41	IC16	OPEN COLLECTOR
12	I/O	42	IC16	OPEN COLLECTOR
13	I/O	43	IC16	OPEN COLLECTOR
14	I/O	44	IC16	OPEN COLLECTOR
15	I/O	45	IC16	OPEN COLLECTOR
16	I/O	46	IC16	OPEN COLLECTOR
17	I/O	47	IC16	OPEN COLLECTOR
18	I/O	48	IC16	OPEN COLLECTOR
19				NOT USED
20				NOT USED
21				NOT USED
22				NOT USED
23				NOT USED
24				NOT USED
25				NOT USED
26				NOT USED
27				NOT USED
28				NOT USED
29				NOT USED
30				NOT USED
31				NOT USED
32				NOT USED
33				NOT USED
34				NOT USED
35	OUTPUT	50		
36	GND			
37	RS485			
38	RS485			
39	RS232			
40	RS232			
41				RELAY NC
42	OUTPUT	49		RELAY COM
43	OUTPUT			RELAY NO
44	OUTPUT	51		OPEN COLLECTOR
45	OUTPUT	52		OPEN COLLECTOR
46	OUTPUT	53		OPEN COLLECTOR
47	OUTPUT	54		OPEN COLLECTOR
48	OUTPUT	55		OPEN COLLECTOR
49	OUTPUT	1	IC2	OPEN COLLECTOR
50	I/O	2	IC2	OPEN COLLECTOR
51	I/O	3	IC2	OPEN COLLECTOR
52	I/O	4	IC2	OPEN COLLECTOR
53	I/O	5	IC2	OPEN COLLECTOR

54	I/O	6	IC2	OPEN COLLECTOR
55	I/O	7	IC2	OPEN COLLECTOR
56	I/O	8	IC2	OPEN COLLECTOR
57	I/O	9	IC3	OPEN COLLECTOR
58	I/O	10	IC3	OPEN COLLECTOR
59	I/O	11	IC3	OPEN COLLECTOR
60	I/O	12	IC3	OPEN COLLECTOR
61	I/O	13	IC3	OPEN COLLECTOR
62	I/O	14	IC3	OPEN COLLECTOR
63	I/O	15	IC3	OPEN COLLECTOR
64	I/O	16	IC3	OPEN COLLECTOR
65	I/O	25	IC4	OPEN COLLECTOR
66	I/O	26	IC4	OPEN COLLECTOR
67	I/O	27	IC4	OPEN COLLECTOR
68	I/O	28	IC4	OPEN COLLECTOR
69	I/O	29	IC4	OPEN COLLECTOR
70	I/O	30	IC4	OPEN COLLECTOR
71	I/O	31	IC4	OPEN COLLECTOR
72	I/O	32	IC4	OPEN COLLECTOR
73	I/O	33	IC5	OPEN COLLECTOR
74	I/O	34	IC5	OPEN COLLECTOR
75	I/O	35	IC5	OPEN COLLECTOR
76	I/O	36	IC5	OPEN COLLECTOR
77	I/O	37	IC5	OPEN COLLECTOR
78	I/O	38	IC5	OPEN COLLECTOR
79	I/O	39	IC5	OPEN COLLECTOR
80	I/O	40	IC5	OPEN COLLECTOR

## NOTES