Instructions for IQ500M Special Functions Module

IQ500M

This is a special functions module which plugs into and attaches to an IQ-500 relay. If communications are used in conjunction with the module, the PONI module is mounted over the IQ500M after the DIP switch settings are made. Both modules are held in place by two retaining screws, one in the upper left-hand corner and the other in the lower right-hand corner.

The IQ500M module provides three special functions: Jam, Underload and Long Acceleration. It is possible to program the module to give either a special-function-trip-only or a special-function trip **and** a main-relay trip in response to a special-function trip condition.

The module has four eight-position DIP switches (DIP 3 through DIP 6 — Refer to Figure 1), two Form C relay outputs①, and two LEDs②. Program the IQ500M module before it is attached to an IQ-500 device. Be sure that Position 8 of DIP switch 5 is OFF. If Position 8 is ON, all other settings on the IQ500M module are changed to work as load control.
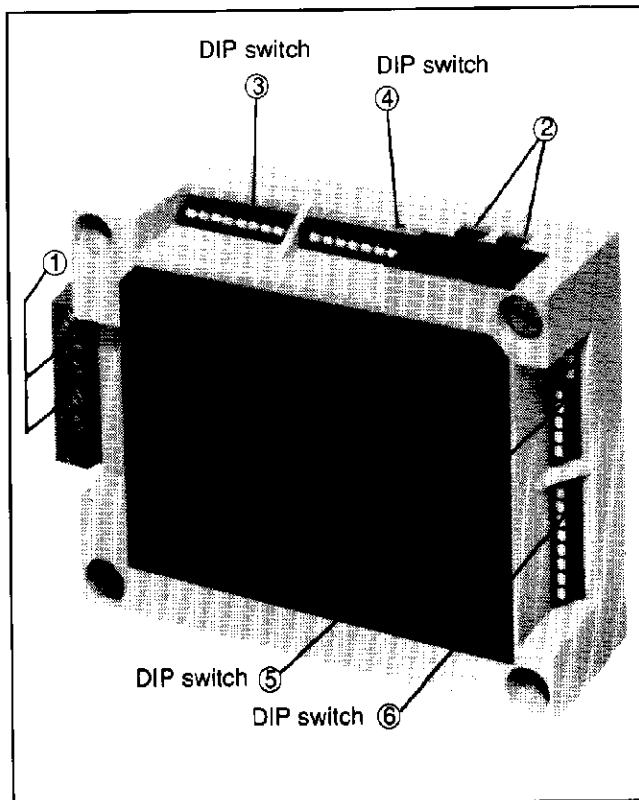

Fig. 1 IQ500M Special Functions Module

INSTALLATION AND SETTINGS

Installation – This industrial type control is designed to be installed, operated, and maintained by adequately trained individuals. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, operation, or maintenance. Care must be exercised to comply with local, state, and national regulations, as well as safety practices, for this class of equipment.

IQ500M DIP Switches – The DIP switches must be set to application requirements. Each DIP switch contains eight single-throw switches. DIP switches are shipped with all eight switches in the OFF condition, which is with the lever away from the position numbers. To turn a switch to the ON condition slide the lever toward the position number.

NOTE: In the tables that follow, ON is shown as "1" and OFF is shown as "0"

DIP Switch 3 Settings – DIP switch 3, located at top left of the IQ500M module, is used to program the following features:

Underload Trip Level – Positions 4 through 1 are used to select the underload trip level as a percentage of the reference (overload trip) current selected.

UNDERLOAD TRIP LEVEL
DIP SWITCH 3
1 = ON & 0 = OFF
SETTINGS BASED ON PERCENT OF REFERENCE
(OVERLOAD TRIP) CURRENT

TRIP LEVEL	SETTING FOR POSITION 4	SETTING FOR POSITION 3	SETTING FOR POSITION 2	SETTING FOR POSITION 1
Inhibited	0	0	0	0
20%	0	0	0	1
24%	0	0	1	0
28%	0	0	1	1
32%	0	1	0	0
36%	0	1	0	1
40%	0	1	1	0
44%	1	1	1	1
48%	1	0	0	0
52%	1	0	0	1
56%	1	0	1	0
60%	1	0	1	1
64%	1	1	0	0
68%	1	1	0	1
72%	1	1	1	0
76%	1	1	1	1

SEE TECHNICAL DATA 17287 FOR MORE INFORMATION ON THE IQ-500 PRODUCT LINE

DIP Switch 3 Settings (cont.)

Long Acceleration Time – This value is set by Positions 8 through 5 of DIP switch 3.

LONG ACCELERATION TIME
DIP SWITCH 3
1 = ON & 0 = OFF

PERMISSABLE ACCELERATION TIME	SETTING FOR POSITION 8	SETTING FOR POSITION 7	SETTING FOR POSITION 6	SETTING FOR POSITION 5
Inhibited	0	0	0	0
12 sec.	0	0	0	1
16 sec.	0	0	1	0
20 sec.	0	0	1	1
24 sec.	0	1	0	0
28 sec.	0	1	0	1
32 sec.	0	1	1	0
36 sec.	0	1	1	1
40 sec.	1	0	0	0
44 sec.	1	0	0	1
48 sec.	1	0	1	0
52 sec.	1	0	1	1
56 sec.	1	1	0	0
60 sec.	1	1	0	1
64 sec.	1	1	1	0
68 sec.	1	1	1	1

DIP Switch 4 Settings – DIP switch 4 is located at the top right of the IQ500M module. This DIP switch is used to set the jam trip level. Settings are shown in Table C. The trip level is a percentage of the reference (overload trip) current selected.

TABLE C: JAM TRIP LEVEL
DIP SWITCH 4, POSITIONS 8 THROUGH 1 FROM LEFT TO RIGHT
1 = ON & 0 = OFF
SETTINGS BASED ON PERCENT OF REFERENCE
(OVERLOAD TRIP) CURRENT

JAM TRIP SETTING	SETTING POSITION (87654321)	JAM TRIP SETTING	SETTING POSITION (87654321)
Inhibit	00000000		
75%	00010100	200%	10110000
80%	00011010	210%	10110111
85%	00100000	220%	10111010
90%	00100111	230%	10111101
95%	00101101	240%	11000000
100%	00110011	250%	11000100
105%	00111001	260%	11000111
110%	01000000	270%	11001010
115%	01000110	280%	11001101
120%	01001100	290%	11010000
125%	01010010	300%	11010011
130%	01011001	310%	11010110
135%	01011111	320%	11011001
140%	01100101	330%	11011100
145%	01101011	340%	11100000
150%	01110010	350%	11100011
155%	01111000	360%	11100110
160%	01111110	370%	11101001
165%	10000100	380%	11101100
170%	10001011	390%	11101111
175%	10010001	400%	11110010
180%	10010111	410%	11110101
185%	10011101	420%	11111001
190%	10100100	430%	11111100
195%	10101010	440%	11111111

DIP Switch 5 Settings – DIP switch 5 is located on the upper right side of the IQ500M module. It is used to program the underload start delay, underload trip delay and the nullifying function.

Underload Start Delay – The underload start delay is programmed using Positions 4 through 1.

UNDERLOAD START DELAY
DIP SWITCH 5
1 = ON & 0 = OFF

UNDERLOAD START DELAY	SETTING FOR POSITION 4	SETTING FOR POSITION 3	SETTING FOR POSITION 2	SETTING FOR POSITION 1
0.5 sec.	0	0	0	0
2.0 sec.	0	0	0	1
4.0 sec.	0	0	1	0
6.0 sec.	0	0	1	1
8.0 sec.	0	1	0	0
10.0 sec.	0	1	0	1
12.0 sec.	0	1	1	0
14.0 sec.	0	1	1	1
16.0 sec.	1	0	0	0
18.0 sec.	1	0	0	1
20.0 sec.	1	0	1	0
22.0 sec.	1	0	1	1
24.0 sec.	1	1	0	0
26.0 sec.	1	1	0	1
28.0 sec.	1	1	1	0
30.0 sec.	1	1	1	1

Underload Trip Delay – Underload trip delay is programmed using Positions 7 through 5.

UNDERLOAD TRIP DELAY
DIP SWITCH 5
1 = ON & 0 = OFF

UNDERLOAD TRIP DELAY	SETTING FOR POSITION 7	SETTING FOR POSITION 6	SETTING FOR POSITION 5
0.0 sec.	0	0	0
0.5 sec.	0	0	1
1.0 sec.	0	1	0
1.5 sec.	0	1	1
2.0 sec.	1	0	0
2.5 sec.	1	0	1
3.0 sec.	1	1	0
3.5 sec.	1	1	1

Load Control Position – The switch in Position 8 of DIP switch 5 must be OFF or else the jam and underload settings are nullified. This switch position is turned ON only with load control. See Load Control, page 3.

DIP Switch 6 Settings – DIP switch 6 is located in the lower right side of the IQ500M module. It is used to program the jam start delay, the jam trip delay and the relay control feature.

Jam Start Delay – The jam start delay is programmed using Positions 4 through 1.

JAM START DELAY
DIP SWITCH 6
1 = ON & 0 = OFF

JAM START DELAY	SETTING FOR POSITION 4	SETTING FOR POSITION 3	SETTING FOR POSITION 2	SETTING FOR POSITION 1
0.5 sec.	0	0	0	0
2 sec.	0	0	0	1
4 sec.	0	0	1	0
6 sec.	0	0	1	1
8 sec.	0	1	0	0
10 sec.	0	1	0	1
12 sec.	0	1	1	0
14 sec.	0	1	1	1
16 sec.	1	0	0	0
18 sec.	1	0	0	1
20 sec.	1	0	1	0
22 sec.	1	0	1	1
24 sec.	1	1	0	0
26 sec.	1	1	0	1
28 sec.	1	1	1	0
30 sec.	1	1	1	1

Jam Trip Delay – Jam trip delay is programmed using Positions 7 through 5 of DIP switch 6.

**JAM TRIP DELAY
DIP SWITCH 6
1 = ON & 0 = OFF**

JAM TRIP DELAY	SETTING FOR POSITION 7	SETTING FOR POSITION 6	SETTING FOR POSITION 5
None	0	0	0
0.5 sec.	0	0	1
1.0 sec.	0	1	0
1.5 sec.	0	1	1
2.0 sec.	1	0	0
2.5 sec.	1	0	1
3.0 sec.	1	1	0
3.5 sec.	1	1	1

Relay Control – This feature is programmed by Position 8. It permits separation or merger of the special-function trip signals. If the switch in Position 8 is OFF, then upon a module-trip condition, only the IQ500M module and its LED will operate. If the switch is ON, then with a module-trip condition both the IQ 500M module and the IQ-500 relay will operate. The module is reset either manually or automatically. If automatically reset then the time is either 10 seconds or 90 seconds.

IQ500M LEDs – The IQ500M LEDs are found on the front of the unit. They are labeled UNDERLOAD for underload trip and JAM for jam trip. The LEDs have the following meanings:

LED PATTERN	MEANING
Constant ON	Normal Operation
Constant OFF	Trip Condition or Unselected

Load-Control Feature – This feature is used to control the motor in a remote branch circuit which contributes to the loading of the branch circuit being monitored. There is a special label included with the IQ500M module that must be positioned over the existing label on the module if load control is used. This new label is necessary since most of the DIP switch settings take on new meanings. Only the Long Acceleration Time settings remain unchanged.

The load-control function can direct a remote motor to stop and restart based on a percentage of the selected overload trip current in the branch circuit being monitored. There are four programmable parameters associated with the load-control feature. These are load-shed level, load-resume level, load-shed time-delay and load-resume time-delay. These parameters combine to specify the conditions under which the remote load is shed and restored.

Load-Resume Level – Use Positions 4 through 1 of DIP switch 3 to select the load-resume level. Positions 8 through 5 still control long acceleration. The load-resume level is expressed as a percentage of the reference (overload trip) current selected on the IQ-500.

**LOAD-RESUME LEVEL
DIP SWITCH 3
1 = ON & 0 = OFF
SETTINGS BASED ON PERCENT OF REFERENCE
(OVERLOAD TRIP) CURRENT**

LOAD RESUME SETTING	SETTING FOR POSITION 4	SETTING FOR POSITION 3	SETTING FOR POSITION 2	SETTING FOR POSITION 1
Inhibited	0	0	0	0
20%	0	0	0	1
24%	0	0	1	0
28%	0	0	1	1
32%	0	1	0	0
36%	0	1	0	1
40%	0	1	1	0
44%	0	1	1	1
48%	1	0	0	0
52%	1	0	0	1
56%	1	0	1	0
60%	1	0	1	1
64%	1	1	0	0
68%	1	1	0	1
72%	1	1	1	0
76%	1	1	1	1

Load-Shed Level – Positions 8 through 1 of DIP switch 4 are used to select the load-shed level as a percentage of the reference (overload trip) current. See Table D.

**TABLE D: LOAD-SHED LEVELS
DIP SWITCH 4, POSITIONS 8 THROUGH 1 FROM LEFT TO RIGHT
1 = ON AND 0 = OFF
SETTINGS BASED ON PERCENT OF REFERENCE
(OVERLOAD TRIP) CURRENT**

LOAD-SHED LEVEL	POSITION (87654321)	LOAD-SHED LEVEL	POSITION (87654321)
Inhibit	00000000		
75%	00010100	200%	10110000
80%	00011010	210%	10001000
85%	00100000	220%	10010010
90%	00100111	230%	10011100
95%	00101101	240%	10100110
100%	00110011	250%	10110000
105%	00111001	260%	10110110
110%	01000000	270%	10111001
115%	01000110	280%	10111011
120%	01001100	290%	10111110
125%	01010010	300%	11000000
130%	01011001	310%	11000011
135%	01011111	320%	11001001
140%	01100101	330%	11001000
145%	01101011	340%	11001010
150%	01110010	350%	11001101
155%	01111000	360%	11001111
160%	01111110	370%	11010010
165%	10000100	380%	11010100
170%	10001011	390%	11010111
175%	10010001	400%	11011001
180%	10010111	410%	11011100
185%	10011101	420%	11011110
190%	10100100	430%	11100001
195%	10101010	440%	11100011

Load-Resume Delay – Positions 7 through 1 of DIP switch 5 are used to select the load-shed delay time. This parameter is programmed as shown in Table E.

Load-Control ON/OFF Switch – The switch in Position 8 of DIP switch 5 must be ON or the load control settings are nullified.

Load-Shed Delay – Positions 7 through 1 of DIP switch 6 are used to select the load-resume delay time. This parameter is programmed as shown in Table F.

TABLE E: LOAD-RESUME DELAY
DIP SWITCH 5, POSITIONS 7 THROUGH 1 FROM LEFT TO RIGHT
1 = ON & 0 = OFF

SETTINGS SELECT TIME-DELAY IN SECONDS

SEC.	POSITION (7654321)	SEC.	POSITION (7654321)
0	0000000	32	1000000
1	0000010	33	1000010
2	0000100	34	1000100
3	0000110	35	1000110
4	0001000	36	1001000
5	0001010	37	1001010
6	0001100	38	1001100
7	0001110	39	1001110
8	0010000	40	1010000
9	0010010	41	1010010
10	0010100	42	1010100
11	0010110	43	1010110
12	0011000	44	1011000
13	0011010	45	1011010
14	0011100	46	1011100
15	0011110	47	1011110
16	0100000	48	1100000
17	0100010	49	1100010
18	0100100	50	1100100
19	0100110	51	1100110
20	0101000	52	1101000
21	0101010	53	1101010
22	0101100	54	1101100
23	0101110	55	1101110
24	0110000	56	1110000
25	0110010	57	1110010
26	0110100	58	1110100
27	0110110	59	1110110
28	0111000	60	1111000
29	0111010	61	1111010
30	0111100	62	1111100
31	0111110	63	1111110

TABLE F: LOAD-SHED DELAY
DIP SWITCH 6, POSITIONS 7 THROUGH 1 FROM LEFT TO RIGHT
1 = ON & 0 = OFF

SETTINGS SELECT TIME-DELAY IN SECONDS

SEC.	POSITION (7654321)	SEC.	POSITION (7654321)
0	0000000	32	1000000
1	0000010	33	1000010
2	0000100	34	1000100
3	0000110	35	1000110
4	0001000	36	1001000
5	0001010	37	1001010
6	0001100	38	1001100
7	0001110	39	1001110
8	0010000	40	1010000
9	0010010	41	1010010
10	0010100	42	1010100
11	0010110	43	1010110
12	0011000	44	1011000
13	0011010	45	1011010
14	0011100	46	1011100
15	0011110	47	1011110
16	0100000	48	1100000
17	0100010	49	1100010
18	0100100	50	1100100
19	0100110	51	1100110
20	0101000	52	1101000
21	0101010	53	1101010
22	0101100	54	1101100
23	0101110	55	1101110
24	0110000	56	1110000
25	0110010	57	1110010
26	0110100	58	1110100
27	0110110	59	1110110
28	0111000	60	1111000
29	0111010	61	1111010
30	0111100	62	1111100
31	0111110	63	1111110