

GENERAL PURPOSE OVERRIDE UNIT

Application

A remote override for analogue adjustment (0-10V) and timer (typically extension) control (voltage free digital input). The unit can be used on the Ambiflex range of controllers or any suitable BMS controller.

Functions

Analogue Adjustment:	Typically temperature setpoint adjustment, the unit provides a 0-10V signal, biased at 5V which can be adjusted up or down for remote setpoint control, or other applications.
Analogue Adjustment Remote Reset:	Allows remote control to terminate setpoint adjustment.
Timer Control:	Typically timer extensions used on plant override, a voltage free contact is provided (low voltage only) to provide a digital input for any BMS system.
Timer Control Remote Reset:	By means of on-board switches, this feature can be enabled such that if activated via a remote voltage free contact then: <ol style="list-style-type: none">1. The selected time period can be cancelled.2. The selected time period can be frozen until the reset is released when timing will continue.

Specification:

Power Supply	:	+15Vdc or 12Vac @ 1VA transformer rating
Power Consumption	:	60mA
Timer Range	:	3 - 6 hours (selectable via switch)
Timer Setting	:	15 min or 30 min periods (selectable via switch)
Timer Reset	:	Selectable via switch
Timer Contact	:	Solid state normally open switch (closed for timing) for use with low voltage low power circuits
Analogue Output	:	0 – 10 Vdc 10mA max
Analogue Reset	:	Selectable via switch
Cable	:	Screened cable on all connections, earthed at host BMS controller
Terminals	:	Found on the lower PCB (see Figure 2)

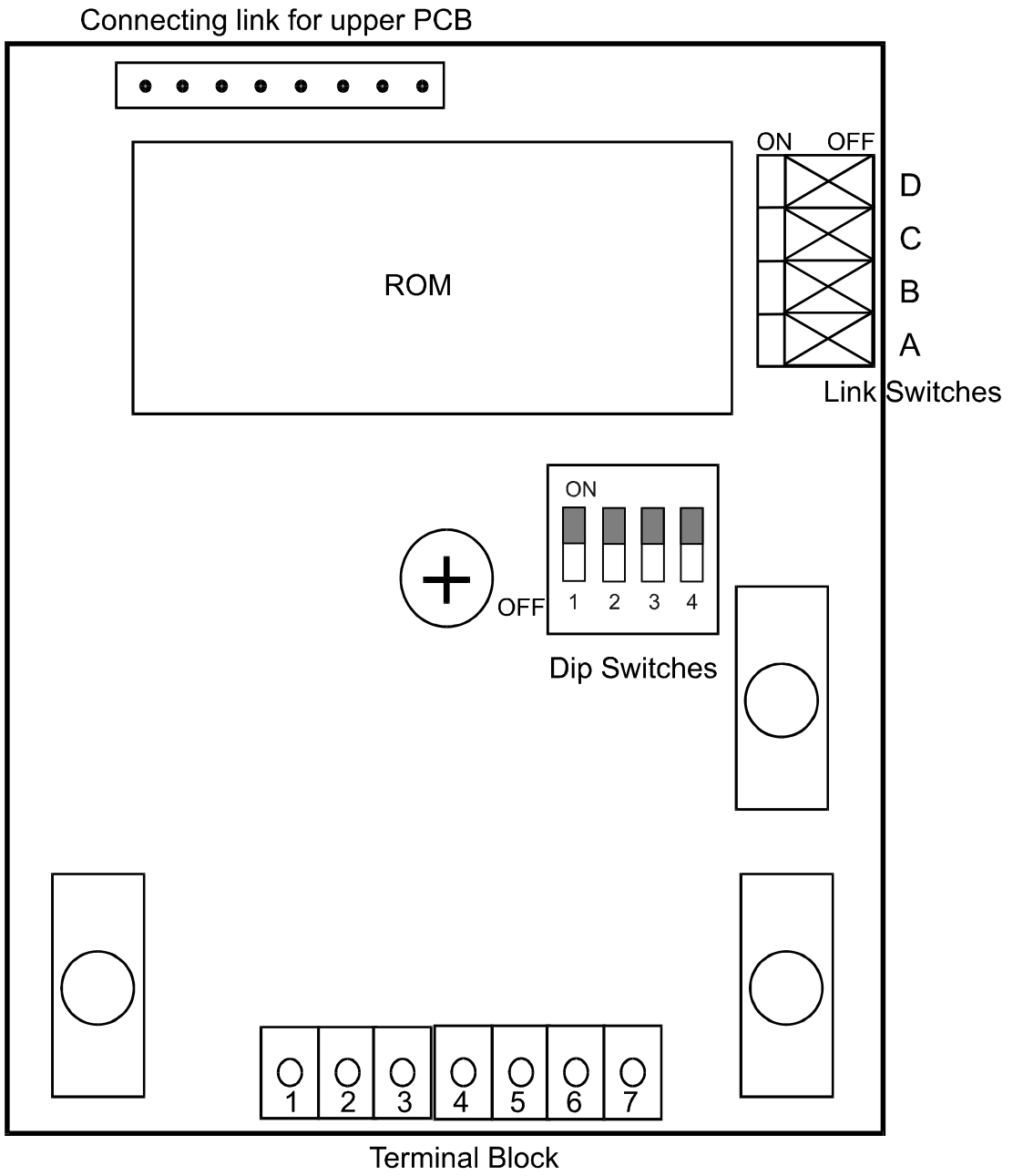


Figure 1

General Purpose Override Unit - Lower PCB Layout

Physical layout and installation

The unit consists of two printed circuit boards within a small wall mounted housing. Follow this procedure to install the unit:

- 1 Remove three buttons by pulling off.
- 2 Squeeze the rear sides of the case gently to release the cover catches, and lift the cover off.
- 3 Carefully pull off upper (display) pcb assembly. The pcb must not be twisted whilst pulling otherwise damage may result.
- 4 Undo central retaining screw and lift lower pcb assembly out.
- 5 Cut out rectangular wiring access in base of housing. Run control wiring in and fix to mounting surface. Make sure that the fasteners used cannot contact the lower pcb assembly when it is reinstalled - if possible use the outer slotted fixing holes which are outside the pcb footprint.
- 6 Refit lower PCB assembly to base and connect wiring to terminal block as required by application. DO NOT apply power yet. Check that DIP switch settings and links are correct for the application: change these settings if required (see following options).
- 7 Making sure connector is properly aligned, reinstall the upper PCB assembly. Excessive force should not be applied.
- 8 Refit cover and switch buttons.

Note: Always remove power before dismantling the unit. It may be damaged if it is taken apart or reassembled with power applied to it, or if power is applied to the lower PCB when the upper one is not installed.

Selecting Operating Options

Below is a summary of the switch settings needed to select the required operating options:

Timer range:	Dipswitch 2
OFF	Short – up to 3 hours
ON	Long – up to 6 hours
Adjustment steps:	Dipswitch 4
OFF	Fine – Analogue +/- 8 steps Timer 12 steps
ON	Coarse – Analogue +/- 4 steps Timer 6 steps
Display mode:	Link D
OFF	Continuous column
ON	Low power mode – moving spot

Analogue auto reset:

Dipswitch 3

- OFF No
- ON yes – resets 4 hours after last analog keypress

Timer input Function:

Dipswitch 1

- OFF Input circuit closed forces timer off
- ON Input circuit closed - timer output goes on
- timer countdown on hold
open - timer allowed to run (Note 1)

Timer link to Analogue:

Link C

- OFF No internal link between analog and timer sections.
- ON When timer output is 'on' analogue section is enabled (Note 2)

Composite Analogue Output:

Link B

- OFF Analogue output depends only on analogue section; range 5V +/- 5
- ON Analogue output depends on timer and analogue sections; 6V +/- 4V (Note 3)

Note 1

In this mode either the timer section being activated OR its control input circuit closing will turn its output 'on'. As the input circuit also stops the timer counting down, the resulting action is an extension timer on the input signal.

input ___ 111111 ___ 11111111111111111111 _____

timer set _____ HHHHHHHHTTTTTTTT _____ TTTTTT _____

output ___ YYYYYY ___ YYYYYYYYYYYYYYYYYYYY _____ YYYYYY _____

where HHH... shows the timer on hold, and TTT... is the timing period set.

Note 2

The analogue section may also be enabled by its own input circuit.

Note 3

The composite analogue output is 0V when the timer output is 'off'. With the timer 'on' its nominal value is 6V, operation of the analogue section will vary it over the range 2V (maximum depression) to 10V (maximum boost).

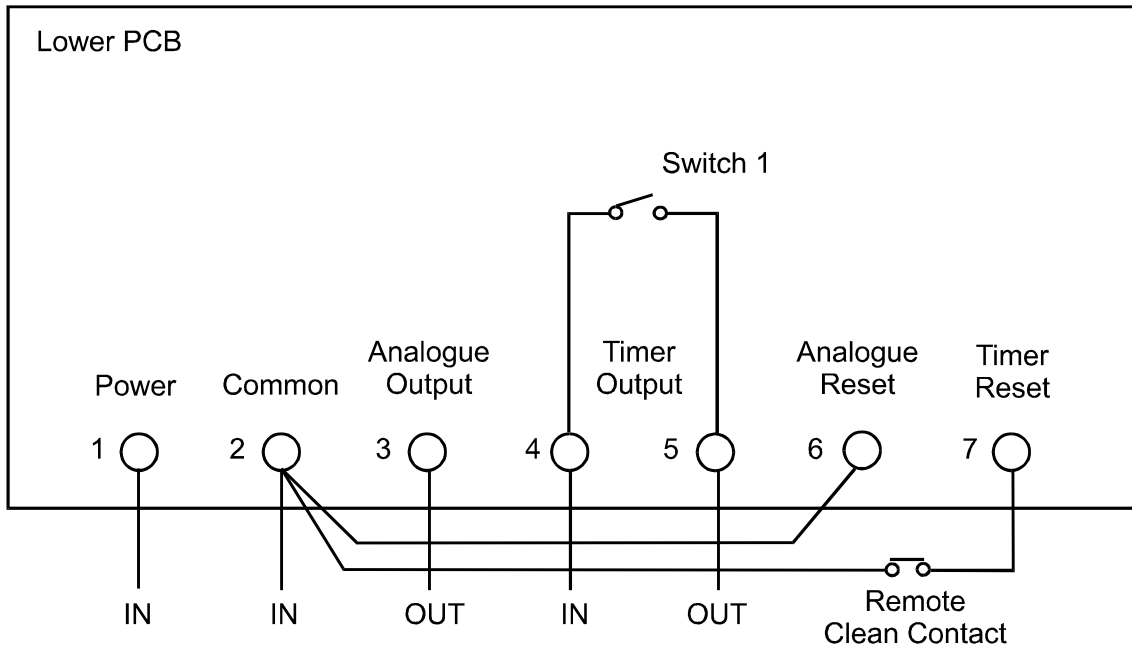


Figure 2

Typical Wiring to Ambiflex BMS Controller
for Timer and Setpoint Adjust

Typical Wiring to Ambiflex Controllers

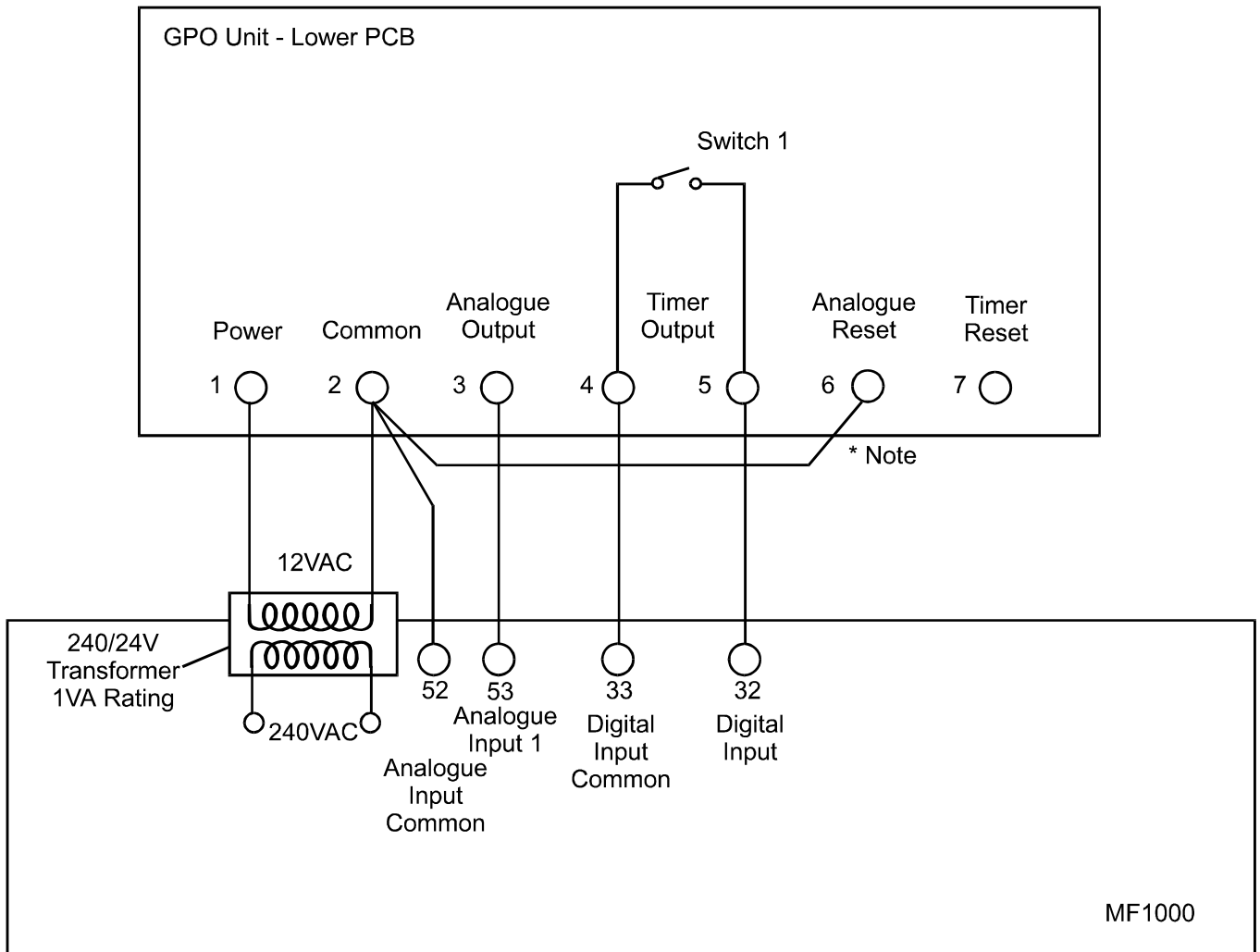


Figure 3

Typical Wiring from GPO Unit to MF1000

* Note: For the Analogue Output to operate normally, a link must be fitted between 2 and 6. See Typical Applications for further details.

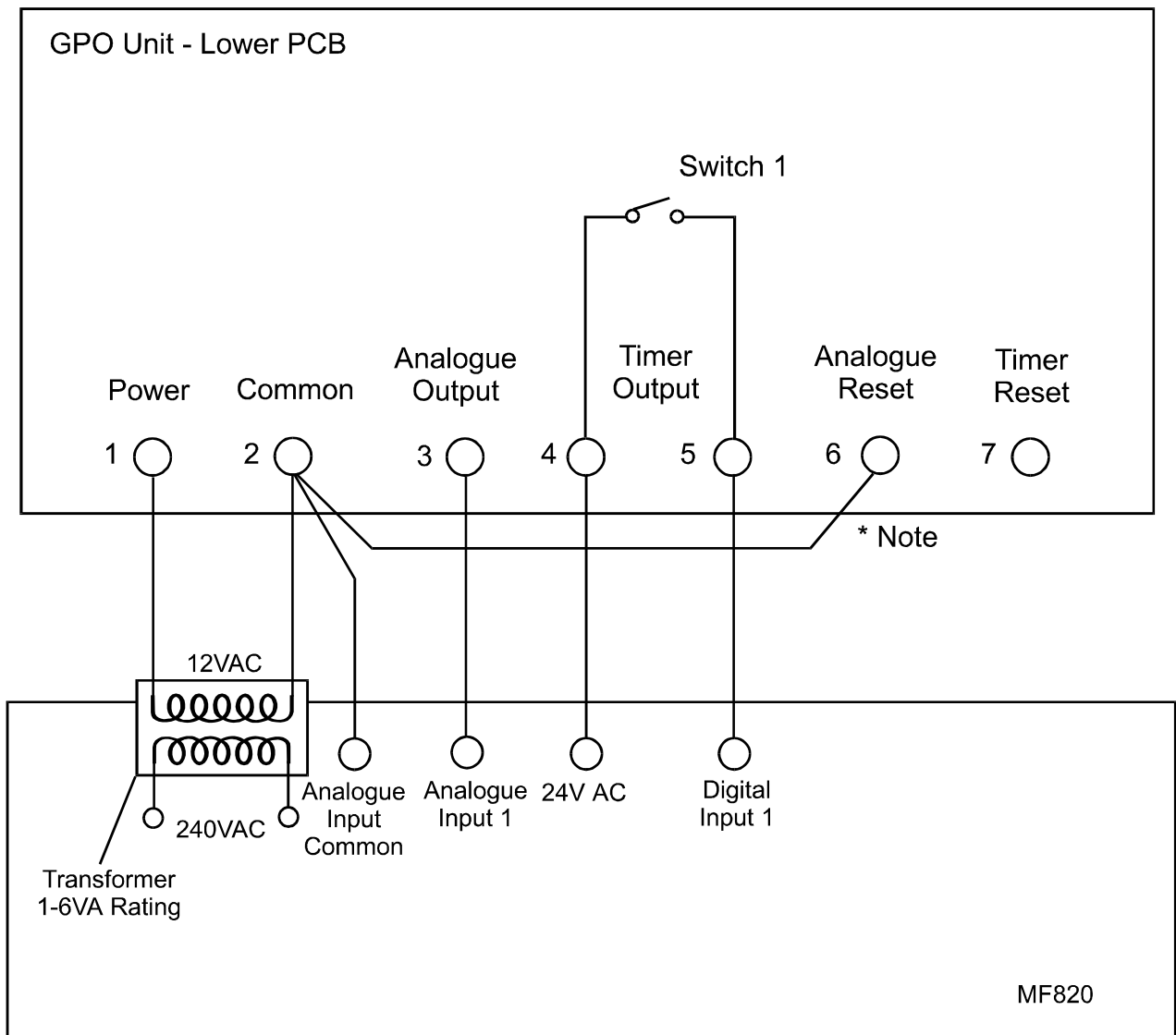


Figure 4
 Typical Wiring from GPO Unit to MF820

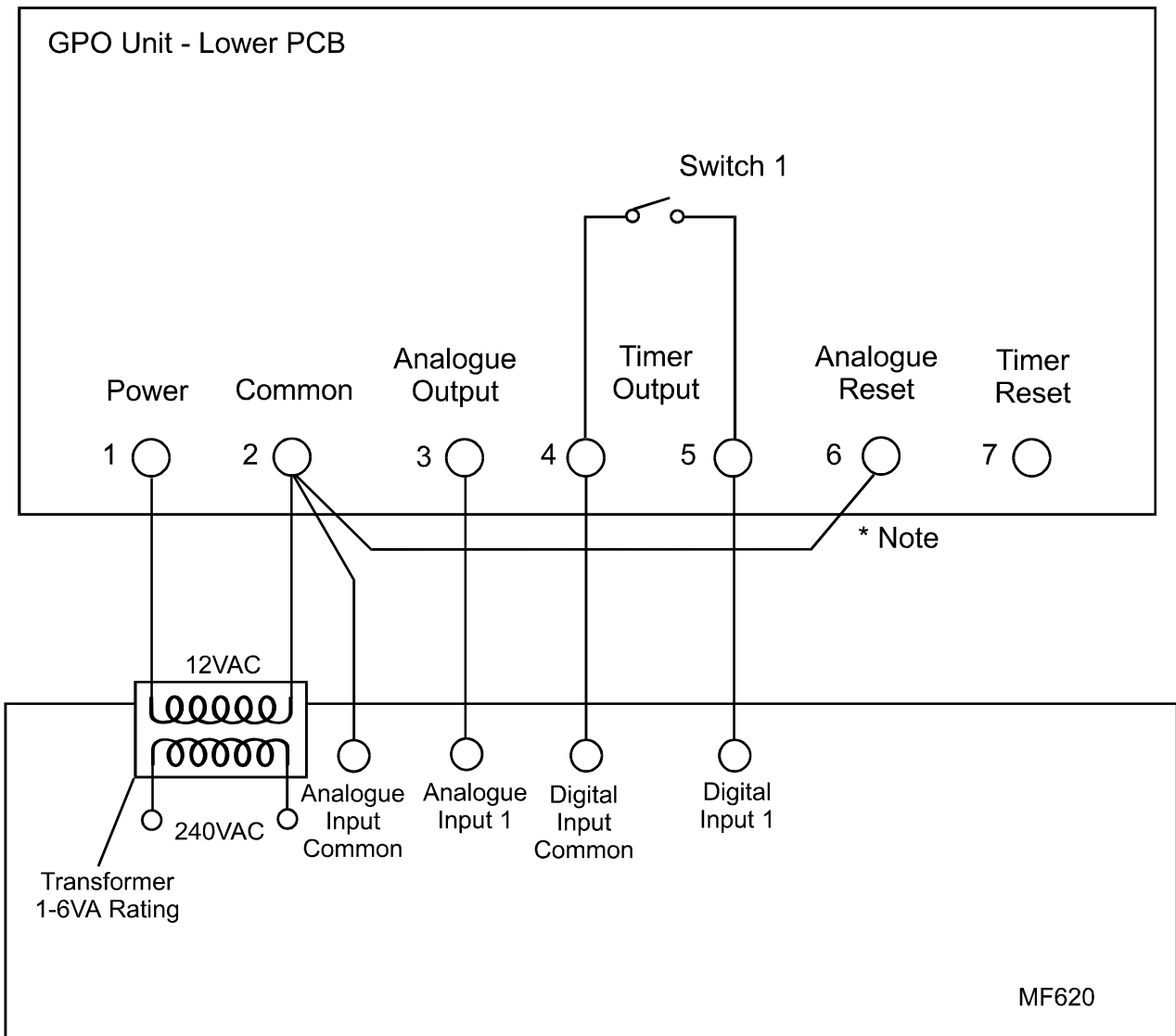


Figure 5

Typical Wiring from GPO Unit to MF620

COMMISSIONING PROCEDURES

Typical Applications:

1. Timer Control

The yellow LED serves as both power onto the unit and also indication of timer functions (see below). In the ready state the LED is steady.

For the timer contact to close (Terminals 4,5) the timer pushbutton is pressed several times depending on the time period required.

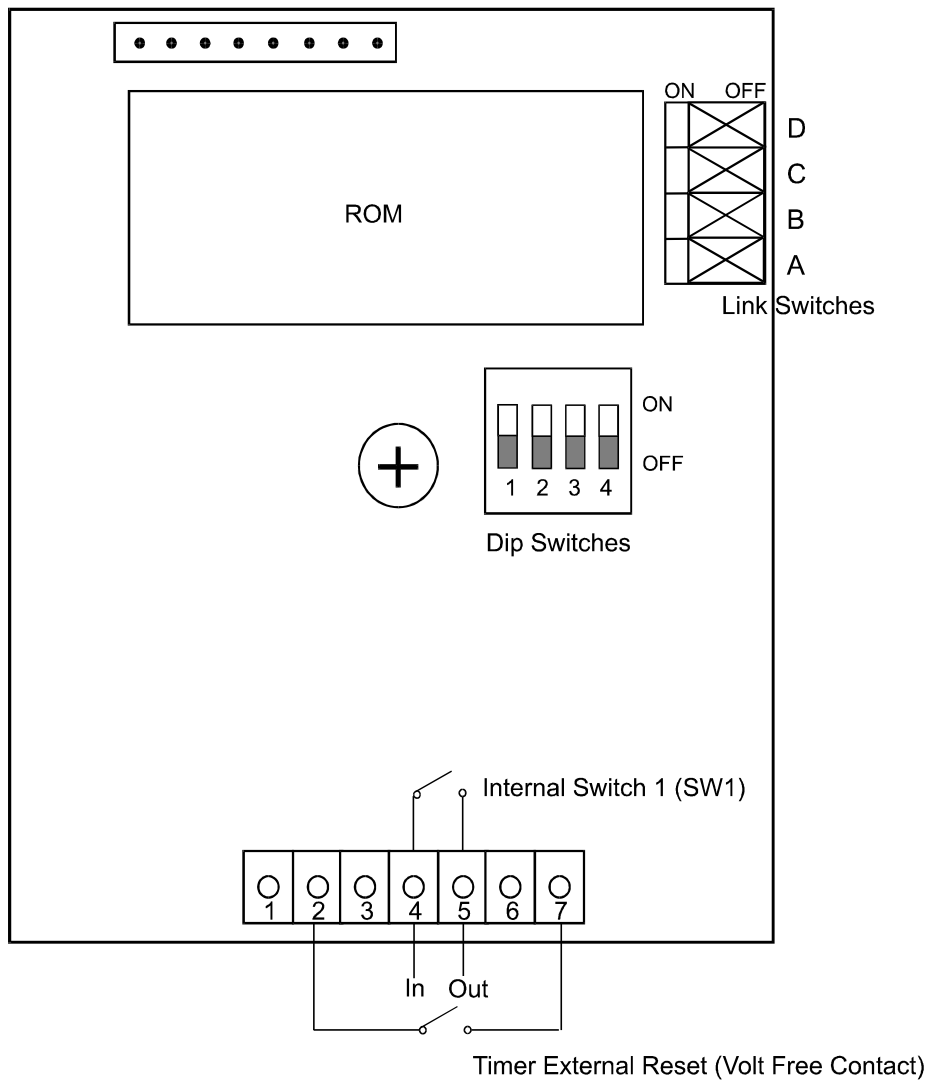


Figure 6 Lower PCB

Time Period

- For each push on the button, 30 or 60 minutes is added to the extension timer and indicated on the red LED's, for up to 6 hours in total.

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 7																								
Extension Timer button pressed for 1 hour period	N/a	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td>X</td></tr> <tr><td>X</td><td>X</td><td>X</td><td></td></tr> </table>	1	2	3	4				X	X	X	X		<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	On	Rapid Flashing	1st LED on full for each 1 hour required	N/a	N/a
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Extension Timer button pressed for ½ hour period	N/a	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td></tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	On	Rapid Flashing	1st LED on half brightness for ½ hour	N/a	N/a
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Extension Timer Button pressed for another ½ hour period	N/a	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td></tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	On	Rapid Flashing	1st LED on full brightness for 1 hour required	N/a	N/a
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- To reduce the total time period to 3 hours dipswitch 2 is switched on

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 7																								
Extension Timer button pressed for 30 minute period	N/a	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td>X</td><td></td><td>X</td></tr> <tr><td>X</td><td></td><td>X</td><td></td></tr> </table>	1	2	3	4		X		X	X		X		<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	On	Rapid Flashing	1st LED on full for each 30 minutes required	N/a	N/a
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	X		X																													
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Extension Timer button pressed for 15 minute period	N/a	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td>X</td><td></td><td></td></tr> <tr><td>X</td><td></td><td>X</td><td>X</td></tr> </table>	1	2	3	4		X			X		X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	On	Rapid Flashing	1st LED on half brightness for 15 minutes required	N/a	N/a
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Extension Timer Button pressed for another 15 minute period	N/a	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td>X</td><td></td><td></td></tr> <tr><td>X</td><td></td><td>X</td><td>X</td></tr> </table>	1	2	3	4		X			X		X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	On	Rapid Flashing	1st LED on full brightness for 30 minutes required	N/a	N/a
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	X																															
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Timer External Reset

This function allows resetting of the timer via external forcing to either freeze or clear the time period (See Figure 6).

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 7																								
To clear the timer (timer is reset to zero and will be held off until reset contact is clear)	N/a	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr> <td></td> <td>X</td> <td>D</td> </tr> <tr> <td></td> <td>X</td> <td>C</td> </tr> <tr> <td></td> <td>X</td> <td>B</td> </tr> <tr> <td></td> <td>X</td> <td>A</td> </tr> </table>		X	D		X	C		X	B		X	A	Off	Off Flash longer than On Flash	Off	N/a	Made
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	X	D																														
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To freeze the timer (timer will be held on and time period frozen until reset contact is clear, timer will then continue to time down).	N/a	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>	1	2	3	4	X					X	X	X	<table border="1"> <tr> <td></td> <td>X</td> <td>D</td> </tr> <tr> <td></td> <td>X</td> <td>C</td> </tr> <tr> <td></td> <td>X</td> <td>B</td> </tr> <tr> <td></td> <td>X</td> <td>A</td> </tr> </table>		X	D		X	C		X	B		X	A	On	On Flash longer than Off Flash	On	N/a	Made
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	X	X	X																													
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Note: Pressing and holding any button for 3 seconds will clear timer.

2. Analogue Output Control

The yellow LED serves as a power on indication and also indication of timer functions (see below). In the ready state the LED is steady, and the output voltage is at 5 Vdc.

If being used for setpoint adjustment the controller receiving this signal should be configured for zero adjustment at 5 Vdc. To make adjustments, the corresponding + or – buttons are pressed.

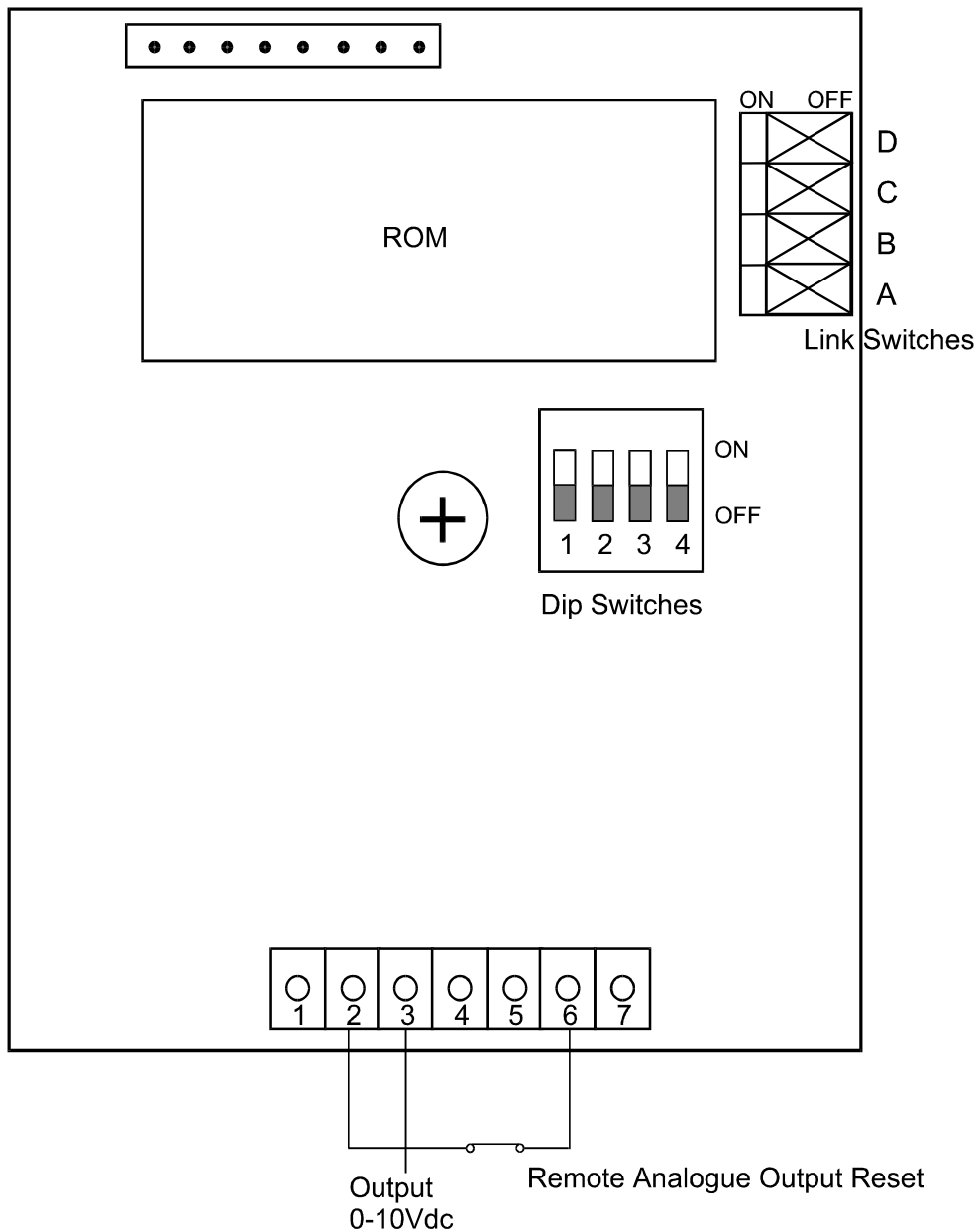


Figure 7

Analogue Adjust

To raise or lower the desired setpoint for a remote control loop use the controller analogue input circuit to receive this signal.

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 6																								
Setpoint adjust Note: The reset circuit must be linked to enable		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td>X</td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> </table>	1	2	3	4				X	X	X	X		<table border="1"> <tr> <td></td> <td>X</td> <td>D</td> </tr> <tr> <td></td> <td>X</td> <td>C</td> </tr> <tr> <td></td> <td>X</td> <td>B</td> </tr> <tr> <td></td> <td>X</td> <td>A</td> </tr> </table>		X	D		X	C		X	B		X	A					
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No Button Pressed	5			N/a	Steady	Off	Off	Made																								
+ Button Pressed	6.25			N/a	Steady	1 On	Off	Made																								
+ Button Pressed	7.5			N/a	Steady	2 On	Off	Made																								
+ Button Pressed	8.75			N/a	Steady	3 On	Off	Made																								
+ Button Pressed	10.00			N/a	Steady	4 On	Off	Made																								
- Button Pressed	3.75			N/a	Steady	Off	1 On	Made																								
- Button Pressed	2.5			N/a	Steady	Off	2 On	Made																								
- Button Pressed	1.25			N/a	Steady	Off	3 On	Made																								
- Button Pressed	0			N/a	Steady	Off	4 On	Made																								
Setpoint adjust but with fine control of voltage (typical example)		<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr> <td></td> <td>X</td> <td>D</td> </tr> <tr> <td></td> <td>X</td> <td>C</td> </tr> <tr> <td></td> <td>X</td> <td>B</td> </tr> <tr> <td></td> <td>X</td> <td>A</td> </tr> </table>		X	D		X	C		X	B		X	A					
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X	X	X	X																													
	X	D																														
	X	C																														
	X	B																														
	X	A																														
+ Button Pressed	5.6			N/a	Steady	1 On Dim	Off	Made																								
+ Button Pressed	6.25			N/a	Steady	1 On Bright	Off	Made																								
+ Button Pressed	6.8			N/a	Steady	2 On Dim	Off	Made																								
+ Button Pressed	7.5			N/a	Steady	2 On Bright	Off	Made																								

Analogue Adjust Reset

This function allows the analogue output to be disabled after 4 hours or left on permanent. For 4 hours disabling dipswitch 3 is set on. Dipswitch 3 off enables analogue output voltage permanent at desired adjustment.

Analogue Adjust Remote Reset

This function clears the present adjustment if the reset is off and disables any further adjustment. Once the reset is back on, adjustments are enabled from the mid point.

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 6																								
Setpoint adjust Enabled for 4 hours only + Button Pressed	6.25	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td>X</td><td></td></tr> <tr><td>X</td><td>X</td><td></td><td>X</td></tr> </table>	1	2	3	4			X		X	X		X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	N/a	Steady	1 On	Off	Made
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Setpoint adjust Permanently on	6.25	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td></tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	N/a	Steady	1 On	Off	Made
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Setpoint adjust Cleared remotely (no adjustment allowed until remote reset link made)	5	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td></tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td></td><td>X</td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C		X	B		X	A	N/a	Flashing	Off	Off	Open
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	X	D																														
	X	C																														
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Analogue Binary Control/Timer Interlock:

This function allows an output voltage from 2-10 Volts to be set via the pushbuttons and then switched whenever the timer output is on.

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 6																								
Timer Output On	10	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td></tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td>X</td><td></td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C	X		B		X	A	On	Steady	4 On	Off	Made
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Timer Output Off	0	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td></tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr><td></td><td>X</td><td>D</td></tr> <tr><td></td><td>X</td><td>C</td></tr> <tr><td>X</td><td></td><td>B</td></tr> <tr><td></td><td>X</td><td>A</td></tr> </table>		X	D		X	C	X		B		X	A	Off	Flashing	Off	Off	Made
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X	X	X	X																													
	X	D																														
	X	C																														
X		B																														
	X	A																														

Note: with Switch 1 off, analogue output resets to zero after each timer operation.

Analogue Timer Interlock

This function allows the analogue adjustment to operate only when the timer is on.

Action	Output Voltage	Dipswitch	Link Switch	SW1	Yellow LED	Red LED +	Green LED -	Reset Link 2 - 6																								
Timer Off Analogue Pushbuttons Disabled	5	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>	1	2	3	4					X	X	X	X	<table border="1"> <tr> <td></td> <td>X</td> <td>D</td> </tr> <tr> <td>X</td> <td></td> <td>C</td> </tr> <tr> <td></td> <td>X</td> <td>B</td> </tr> <tr> <td></td> <td>X</td> <td>A</td> </tr> </table>		X	D	X		C		X	B		X	A	Off	Flashing	Off	Off	Open
1	2	3	4																													
X	X	X	X																													
	X	D																														
X		C																														
	X	B																														
	X	A																														
Timer On	5			On	Steady	Off	Off	Open																								
Timer On + Pushbutton Pressed	5.6			On	Steady	1 LED On	Off	Open																								

Note: Output voltage resets to 5 Volts after timer operation.