MICROSTART Generator Controller

REMOTE ALARMS ('R') OPTION & REMOTE RELAY PCB (MSRP)

The 'remote alarms' (or 'R') option Microstart has been designed to meet those applications which require the individual, remote signalling of faults (e.g. oil pressure, overspeed, failed to start, etc.) in addition to the 'common alarm' outputs found on all Microstarts ('klaxon', 'alert' and 'alarm').

The 'R' option Microstart has 14 extra outputs, each corresponding to a particular type of generator fault. Each output may be used to drive individual relays, the contacts of which are used in turn for local or remote signalling. Alternatively, the outputs may be directly connected to a purpose designed PCB – available from Modex as an optional extra (type number MSRP) – which contains 14 relays and LED indicators (one for each 'R' option output).
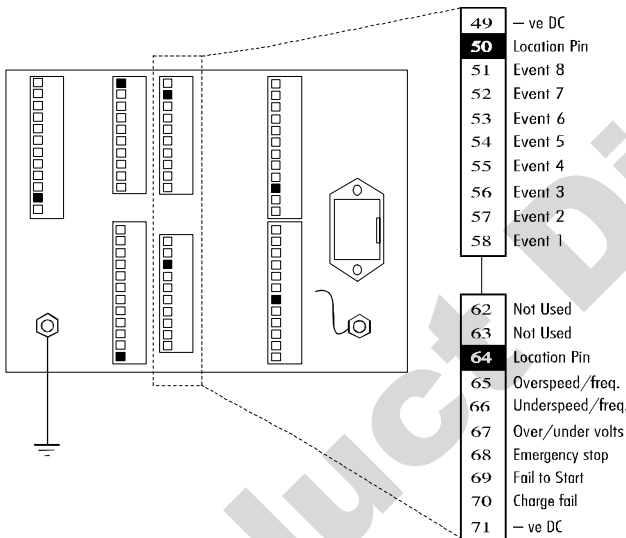
'R' OPTION MICROSTART

FAMILIARISATION

Microstarts with the 'remote alarms' facility are identified by an 'R' in the part number, e.g. MS1A**R**. (The part number may be found on the yellow connection label on the top side of each unit.)

The units have 2 extra terminal blocks at the rear for the connection of the individual alarm outputs; apart from the additional connection and operation of these, the 'R' option Microstart is in all respects the same as any standard unit: fitting to the panel, general connection, programming and operation are all therefore the same.

CONNECTING UP

The extra outputs are assigned to the two terminal blocks as follows:

|	
49	− ve DC
50	Location Pin
51	Event 8
52	Event 7
53	Event 6
54	Event 5
55	Event 4
56	Event 3
57	Event 2
58	Event 1
62	Not Used
63	Not Used
64	Location Pin
65	Overspeed/freq.
66	Underspeed/freq.
67	Over/under volts
68	Emergency stop
69	Fail to Start
70	Charge fail
71	− ve DC

Each output is an open collector, active low type (please see the specification overleaf for maximum operating limits). Two pins (49 and 71) are used as the common return for all the outputs on each block, and should be connected to battery –ve DC. One position in each block (pins 50 and 64) is used as a location pin, preventing the connection of each block into the wrong receptacle.

As previously mentioned, the outputs may typically be connected in one of two ways:

a) On an individual basis, using each output to drive a local, panel mounted relay. This arrangement is most suitable where one or only a few of the 14 outputs are used.

b) By direct connection to the Modex MSRP relay PCB. This solution is usually more convenient and cost effective where several or all of the 14 outputs need to be connected.

Alternative b) is dealt with below in the separate section on the remote PCB. For a), each output is typically connected as follows ('overspeed' alarm shown):
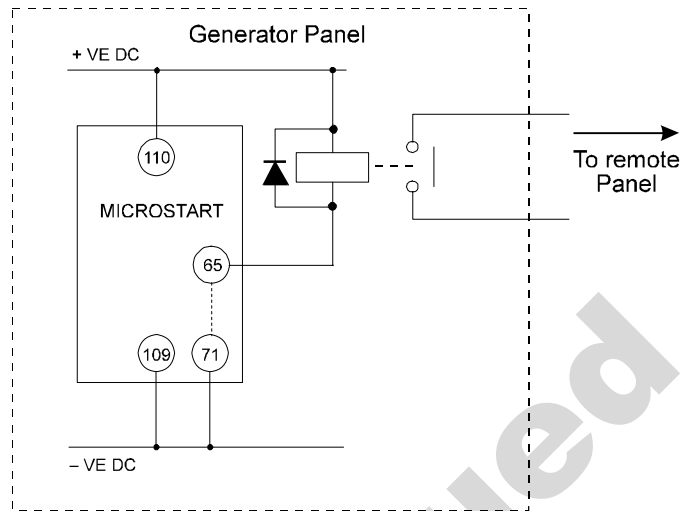
When any output becomes active, the relay energises, closing the circuit from the remote site. WARNING: a flywheel diode (as shown above), or an equivalent snubber network, must be used to suppress the relay coil at source. Failure to fit such suppression can result in voltage spikes and electrical interference as the result of 'back e.m.f.s' from the de-energising relay coil. This may in turn result in erroneous operation of Microstart (and hence the generator system), and can in extreme cases result in permanent damage to Microstart's control circuits.

OPERATION

Normal Running

When no generator or plant faults are present, all the individual alarm outputs remain inactive.

'Alert' type faults.

These faults require the operator to be alerted, but are not sufficiently urgent to warrant Microstart shutting down the generator. They include:

- any event input programmed to 'alert' (e.g. low fuel)
- charge fail
- underspeed/freq. (when under volts/freq. has been programmed to 'dump load')
- under voltage (when an under voltage has been detected and 'under voltage/freq.' has been programmed to 'dump load').

When such faults are detected, the corresponding output immediately becomes active. If the fault clears, the output goes inactive. Several 'alert' outputs can be active at once, thus indicating the actual state of the generator at any one time.

Event input 'alert' faults may be activated at any time, regardless of whether the generator is running or not; underspeed/freq. and under voltage will only activate while the generator is running, and then only after the 'override' time has expired.

'Alarm type' faults

These faults require the immediate shutdown and latching out of the generator. Examples include:

- any event input programmed to 'alarm' (e.g. low oil pressure)
- failed to start
- emergency stop
- overspeed
- underspeed/freq. (when 'under volts/freq.' has been programmed to 'shutdown')
- over or under voltage (always on over voltage, but only during an under voltage when 'under voltage/freq.' has been programmed to 'shut down').

doc.ref. 010405 issue2 19/9/95 p1/2

When alarm faults occur, the corresponding output will activate. Note that any other (alert type) outputs which happen to be active at the time of the shutdown will also remain active, even if the fault subsequently clears (The outputs reflect the plant state at shutdown)

Subsequent faults (those which occur after the shutdown) are not registered, and the outputs can only be de-activated by resetting Microstart (via the keyswitch or by powering down).

Other faults

Note that the 'R' option Microstart only provides individual outputs for the most common faults. 'Mag. pickup failure', 'contactor failed to engage', 'bad oil pressure', and the various 'system faults' do not have individual outputs. The panel designer may use the three 'common alarm' outputs ('klaxon', 'alert' or 'alarm') to remotely signal that one or more of these faults has occurred, but cannot individually signal which one(s).

REMOTE RELAY PCB (type MSRP)

### FAMILIARISATION

This PCB is a separate device, available as an optional extra, which may be used as a convenient and cost effective alternative to the separate connection of relays and wiring to each of the 'R' option outputs. The PCB contains 14 relays (one for each individual alarm output), an LED to indicate when each is active, a wiring loom for direct connection to the 'R' option Microstart, and terminals for the DC power supply and remote signal wiring.

FITTING TO THE PANEL AND CONNECTION

The PCB is normally fitted inside the same panel as Microstart. It should be mounted in the vertical plane, in a position which is free from ingress of moisture, excessive build up of dust and excessive temperature. Four fixing pillars are supplied, one at each corner; M4 fixings (not supplied), of minimum length 25mm should be used to secure the board. The overall and fixing dimensions of the PCB are:

dimensions in mm.
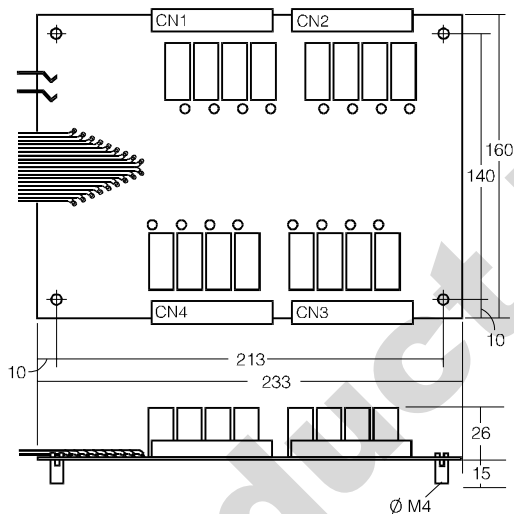
Each PCB is fitted with an integral wiring loom for direct connection to an 'R' option Microstart. The standard loom length is 1 metre, but other lengths are available to special order. The electrical connection schematic is:

MICROSTART with 'R' option (rear view)

MSRP remote relay PCB (component side view)
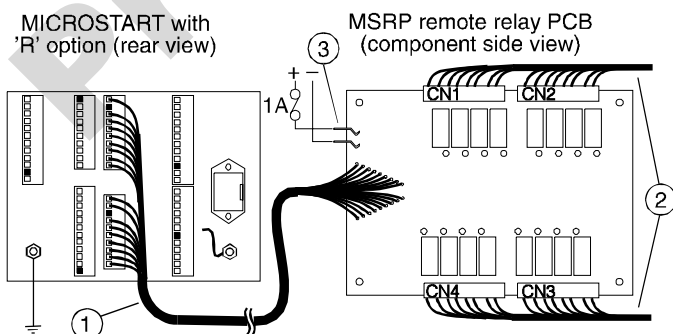
Connection may be divided into 3 groupings, as labelled ① - ③ above:

① Connection of the wiring loom to Microstart

One end of the loom is supplied pre-soldered to the PCB; the other end is fitted with 2 terminal blocks ready for direct connection to pins 49 - 58 and 62 - 71 on the 'R' option Microstart. Location pins in the blocks are used to distinguish which connector goes into what receptacle.

The loom includes wiring for all of the individual alarm outputs and the two -ve DC returns. Each of the relay coils on the remote PCB is suppressed at source. (No additional suppression is therefore needed.)

② Connection of the relay outputs (for the remote signalling)

The SPCO contacts for each relay are accessed via 4 'two-part' connectors, 2 on each side of the PCB. Along the edge of each of the 4 connectors (CN1 - CN4), the terminals are numbered on the PCB silk-screen ident:

Event						
Event 8	NC	212	301		Not used	
	NO	211	302			
	CO	210	303			
Event 7	NC	209	304		Not used	
	NO	208	305			
	CO	207	306			
Event 6	NC	206	307	CO	Overspeed	
	NO	205	308	NO		
	CO	204	309	NC		
Event 5	NC	203	310	CO	Underspeed	
	NO	202	311	NO		
	CO	201	312	NC		
Event 4	NC	112	401	CO	Under/over Voltage	
	NO	111	402	NO		
	CO	110	403	NC		
Event 3	NC	109	404	CO	Emergency Stop	
	NO	108	405	NO		
	CO	107	406	NC		
Event 2	NC	106	407	CO	Failed to Start	
	NO	105	408	NO		
	CO	104	409	NC		
Event 1	NC	103	410	CO	Charge Fail	
	NO	102	411	NO		
	CO	101	412	NC		

③ Connection of the DC supply voltage

The MSRP must be powered independently of Microstart; two ¼" blade terminals are provided for this purpose. The nominal supply voltage and polarity are shown on the PCB silk-screen ident, next to the two terminals. (Note: unlike Microstart itself, the supply voltage for the remote relay PCB – 12 VDC or 24 VDC – must be specified at time of order.)

The unit may be protected from supply voltage surges by the use of a 1A anti-surge fuse in the +ve DC line.

OPERATION

The MSRP relay outputs are designed to directly mimic the operation of the individual 'R' option outputs, as detailed in the separate section above: each relay energises, and its LED lights, when the corresponding output on the 'R' option Microstart becomes active.

PRODUCT SPECIFICATIONS

Microstart 'R' Option	*(all other specifications as for the standard Microstart)*
Individual alarm outputs	open collector (active low) type, maximum rating 250mA @ 33 V DC
MSRP remote PCB	
Supply Voltage: 12V	10.0 - 16.0 V DC
24V	18.0 - 32.0 V DC
Output relays	SPCO contacts, rated 5A at 240 VAC (resistive load)
Operating temperature	0 - 55 °C