MICROSTART Generator Controller

PROGRAMMING

This sheet gives a simple guide to setting up Microstart's programmable functions. Programming is designed to be as user friendly as possible: the operator should aim to be able to program a unit - mostly without reference to literature - after only a few attempts.

The programmable functions - a full list is shown right - allow the generator or panel manufacturer to custom configure Microstart for a wide range of generator specifications. The settings of these functions are crucial in determining how Microstart operates, and MUST therefore be checked (and re-programmed if necessary) BEFORE the unit is used. Warning: failure to ensure the correct programming of Microstart may result in the faulty operation of, and possible damage to, the generator and plant.

Programming may be carried out either after the installation of the unit into the panel (see our separate 'Installing Microstart' sheet ref. 010402) or 'on the bench' if this is more convenient. For the latter case, Microstart need only be powered up through its DC supply terminals (+ve DC to pin 110, –ve DC to pin 109) and a link placed across the emergency stop terminals (pins 107 and 108).

GETTING INTO 'PROGRAM MODE'

With the DC power supply connected, turn the key to ✋ and wait for the lamp test cycle to finish (this lasts about 3 seconds, and is followed by two audible 'bleeps'). The screen then displays...

```
MAN: Engine stopped
Program mode ?      ↵
```

...whereupon the ↵ key should be pressed immediately and held down for about 1 second. (Note: if ↵ is left unpressed, or not held for the full 1 second, Microstart reverts to normal manual mode operation after a few seconds.) The display should then read:

```
PROGRAM - enter PIN
XXXX  ←↑↓→  ↵
```

Entering the PIN (Personal Identification Number) is a measure designed to prevent any re-programming by unauthorised personnel. Microstart is supplied with its PIN initially set to XXXX, meaning that anyone may access program mode at the first attempt by simply pressing ↵ in response to this screen. Once program mode has been accessed, this PIN may be set or changed so that future attempts to gain access require the correct number to be entered. Warning: any changes to the PIN must be remembered or recorded. If the PIN is forgotten or lost, re-programming can only be carried out by a return to Modex of the complete unit.

Once this PIN has been changed, programming access can only be gained by altering the displayed XXXX to the correct number: use ← and → to select each of the four digits in turn (the currently selected digit is indicated by an underlining cursor), ↑ and ↓ to alter the value of each digit (to 1, 2, 3, etc.), and ↵ to 'enter' when the 4 digit number reads correctly. If an incorrect number is entered, Microstart displays 'INCORRECT PIN, ACCESS DENIED', before reverting after a few seconds to normal manual mode operation. To re-attempt programming, the key must be turned to O and the above procedure repeated.

PROGRAMMING

Once the correct PIN has been entered, all the programmable functions may be accessed and changed. While Microstart is in program mode, all of its other functions and outputs are disabled. (Note: all the front facia lamps and LEDs go out, and Microstart does not respond to any external stimulus, e.g. a mains fail.)

The program functions have been categorised into five groups: alarm events, charge fail, timers, system values and 'switches' (miscellaneous functions). A brief description of each function, and its default program setting, is given opposite.

The functions are programmed by using the cursor keys to step through the five groups, entering a group by pressing ↵, and stepping through and editing each function as it is displayed in

		Default setting
CONFIGURE ALARMS ?		
Description	*8 event input fault messages, each of up to 20 characters long.*	ch1 LOP, ch2 HET ch3-8 various
Configuration	*Set to match the fault state and polarity of each event input's remote sensor/contact. (i.e. open/closed to +ve/-ve DC)*	close to -ve (all channels)
Status	*Event input response: 'Alarm' (engine shutdown) or 'alert' (warning only) .*	ch.1-4 alarm ch.5-8 alert
CHARGE FAIL?		
Description	*Charge fail fault message, up to 20 characters long.*	'charge fail'
SET TIMERS ?		
Mains fail latency	*0 - 5 secs.: the delay between sensing of mains voltage failure and release of mains contactor (mains must stay below 'mains healthy level for the duration or timer resets).*	0 sec
Start delay	*0 - 60 secs: the delay between release of mains contactor and engine start (mains must stay failed for the duration or timer resets) .*	2 secs
Preheat period	*1 - 45 secs: the preheat output is active for this time prior to each engine cranking.*	1 sec
Crank period	*3 - 30 secs: sets the maximum cranking time of each start attempt..*	10 secs
Starter Cool	*5 - 30 secs: allows the batteries and starter to recover before any subsequent start attempt.*	10 secs
Alarm override	*5 - 30 secs: 'alarmed' events are overridden for this period after engine running is detected.*	10 secs
Engine warm-up time	*1 - 60 secs: delays loading of generator after engine running is first detected.*	1 sec
Contactor delay	*0 - 30 secs: sets the minimum time between the disengagement of one contactor, and the engagement of the other (or same) contactor.*	1 sec
Restoration time	*1 - 60 mins: time delay between mains returning and load transfer back to mains. The timer resets if mains fails again.*	5 mins
Engine cool period	*1 - 30 mins: allows the engine to run off load before it is stopped and returned to standby. Mains must stay healthy during the cool time, otherwise cool and restoration timers reset and the load is switched back to the generator.*	3 mins
SET SYSTEM VALUES ?		
No. flywheel teeth	*set to 50 to 350 if using a pickup for speed sensing or 'no mag. pickup' if sensing from alternator.*	no mag. pickup
Overspeed level	*(only when using pickup) 1000 - 5400 RPM generator is shut down if speed exceeds this level.*	1650 RPM
Underspeed level	*(only when using pickup) 500 - 3500 RPM: below this level, generator is shut down or load 'dumped'*	1350 RPM
Nominal engine speed	*(only when using pickup) 750 - 3600 RPM*	1500 RPM
Gen. overfreq.	*50 - 90 Hz.: above which generator is shut*	55 Hz.

MODEX AUTOMATION LTD.   Tel: +44 (0)1705 463971   Fax: +44 (0)1705 461686

turn on the screen. Each program mode display 'screen' usually takes the form:

```
a)
b)                    c)
```

a) On the top line, the function currently being programmed

b) On the lower line, the currently selected value or option

c) In the bottom right hand corner, the cursor keys which are necessary to re-program this function and/or move on to the next.

Generally, the function of each cursor key is:

⬆ To increase the value of, or step up the list of options for the current function.

⬇ To decrease the value of, or step down the list of options for the current function. If a function *group* is displayed, press this key to bypass the programming of this group.

⬅ To move the cursor left (for descriptions and PINs), or to exit the programming of the alarm 'event' channels.

➡ To move cursor right (for descriptions and PINs).

↵ To enter the displayed value/option of the current function and move on to the next function. If a function *group* is displayed, press this key to begin editing functions in this group.

As a step-by-step guide to program mode, a full 'programming map' is shown below.

EXITING 'PROGRAM MODE'

Once the programmable functions have been checked and set correctly, the programming sequence must be followed to the '*exit program mode?*' screen. To exit program mode and save any just completed changes, press ↵ in response then turn the key to O (OFF). If the key is turned to O before this stage, or if the unit powers down for any reason, all of the recently completed program changes are disregarded and the previously held values are restored. The previous values are also restored (and Microstart reverts to normal manual mode) if the cursor keys are left untouched for more than 5 minutes.

Once correctly installed and programmed, Microstart is ready for use. Note that the program settings are held in non-volatile memory (the settings are retained even when the unit is turned off or disconnected).

Further technical assistance on Microstart is available by contacting Modex direct on:

Tel: +44 (0)1705 463971, or Fax: +44 (0)1705 461686.