MUST SYSTEM 3

Solderability Test System for Electronic Circuit Boards and Components

Technical Manual Version 3.00

GEN3 SYSTEMS

System Maintenance

FUSES

The MUST System 3 is fitted with two 20 mm fuses, one in the live line and one in the neutral line, fitted in the mains filter inlet. 220/240 V systems are fitted with 3.15A anti-surge fuses and 110 V systems are fitted with 6.3A anti-surge fuses.

IT IS ESSENTIAL THAT FUSES ARE REPLACED WITH THE SAME TYPE AND RATING.

Fuse Replacement

WARNING: BEFORE REMOVING THE FUSES DISCONNECT THE SYSTEM FROM THE POWER SUPPLY.

To replace the fuses remove the power lead from the mains filter inlet at the right-hand rear of the machine. The fuses are located in the filter between the power lead inlet and the ON/OFF switch. The fuse is removed by pulling the fuse holder back away from the instrument and allowing it to drop down. The faulty fuse can now be removed and replaced and the fuse draw pushed back into the mains filter.

If a fuse repeatedly fails when it is replaced, there is an internal short circuit in the system. SWITCH OFF THE SYSTEM IMMEDIATELY AND DO NOT RECONNECT TO THE POWER SUPPLY UNTIL THE FAULT HAS BEEN RECTIFIED.

SOLDER BATH

ALWAYS TAKE CARE WHEN DEALING WITH HOT MOLTEN SOLDER.

OPERATORS SHOULD WEAR PROTECTIVE CLOTHING, E.G. OVERALLS,

SUITABLE EYE PROTECTION, E.G. SAFETY GOGGLES, AND THE HEAT

RESISTANT GLOVES PROVIDED.

CHANGING THE SOLDER

Please refer to Section 2.6.4 IPC J-STD002/003 Pages 49 to 52 for recommendations on Solder bath maintenance.

The solder in the solder bath will slowly pick up contamination from the materials being tested. The nature of the contamination will obviously depend on the base material being tested, but the most common contaminant will be copper from copper lead frames. Other contaminants are likely to be gold and silver from termination platings, and zinc from brass terminals.

Excessively high contamination levels will affect the surface tension and melting point of the solder and will alter the wetting characteristics of the solder. It is not practical to analyse such a small volume of solder to monitor the contamination levels, instead it is recommended that the solder is changed whenever the surface appearance of the solid solder is not bright and clean when cold.

To change the solder remove the thermocouple from the solder by lifting it with a pair of forceps and rotating it clockwise until it rests on the solder bath casing. Switch off the system and allow the solder to cool overnight.

When you restart the system select CHANGE BLOCK and remove the solder bath receptacle. Turn the solder bath upside down and tap it on a block of wood to release the solid block of solder. Remove the solder and refit the solder bath to the system, turn on the heater and refill the solder bath with new solder. The system is supplied filled with either 60/40 tin/lead (bath and globules with BLUE end plates) or SAC305 lead free solder (bath & globules with GREEN end plates). Refer to your test standard for further guidance on solder alloys.

GLOBULE BLOCKS

The solder globules require little maintenance. The most important factor is to keep the blocks clean and to NEVER heat the globule blocks without a solder pellet in position on the iron pin. Heating the pin while it is exposed may cause the iron to become dewetted and it can only be re-wetted by using an aggressive flux.

The top of the globule block can be cleaned with a flux-soaked cotton bud during use. The sides of the block are best cleaned with a plastic scraper or brass wire brush when the block is cold.

Do not allow solder to build up between the globule block and the drip tray or between the globule block and the base. A build up of solder will drain heat away from the globule block and produce inaccurate solder temperatures.

Uncharred flux can be removed from the drip tray, globule block cover and the globule block by using a cloth soaked in Isopropyl Alcohol (IPA).

COMPONENT CLIPS

The component clips should be cleaned in IPA after each testing session. If extensive testing programmes are in progress then more regular cleaning may be required.

WARNING

There are NO user serviceable parts within the MUST 3.

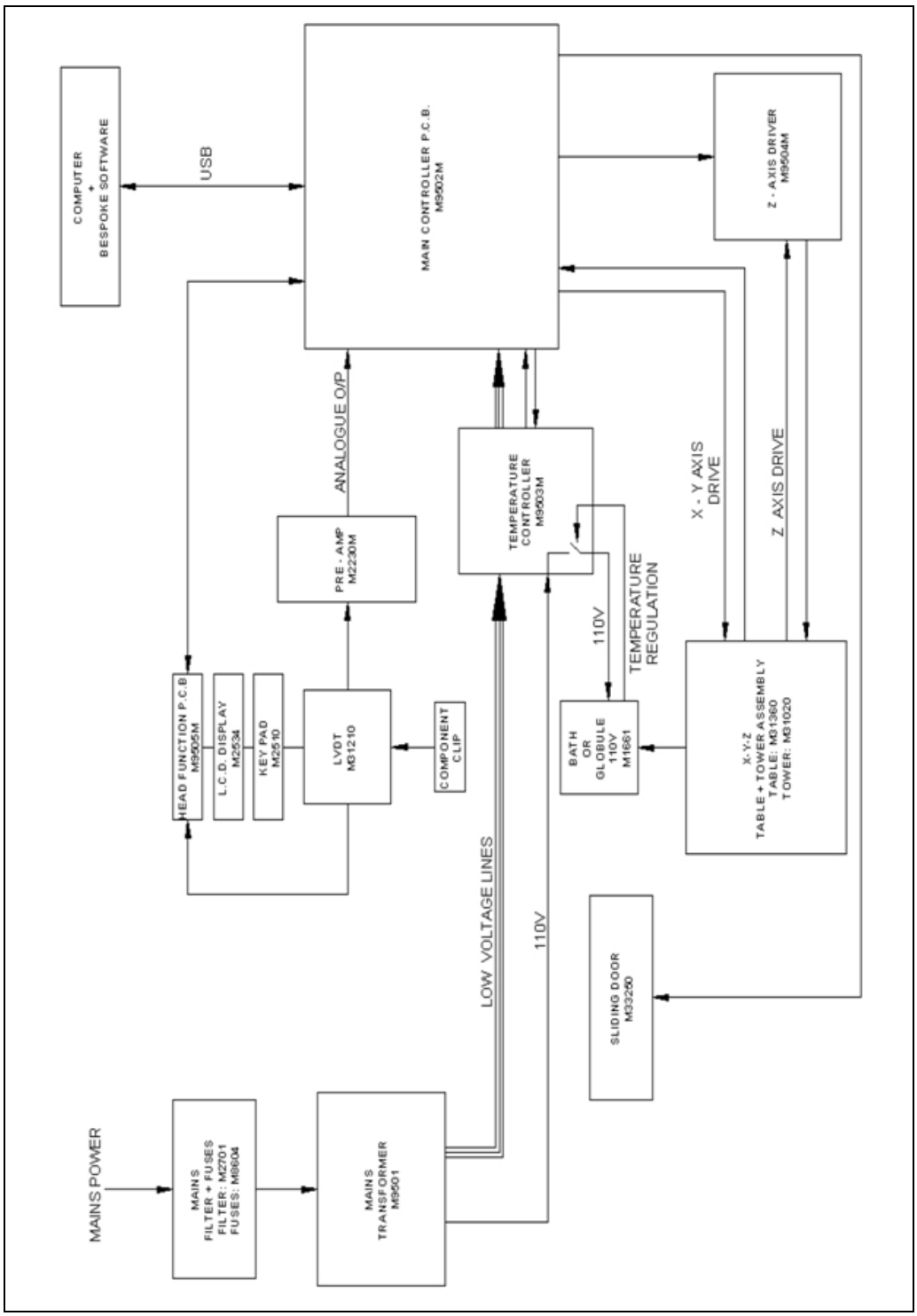
The covers are only to be removed by a Gen 3 Systems trained service engineer

Calibration should only be carried out by a Gen 3 Systems trained calibration engineer

Parts within the MUST 3 carry mains voltages

Circuit boards within the MUST 3 are ESD sensitive and may be damaged by incorrect handling

MUST 3 BLOCK DIAGRAM

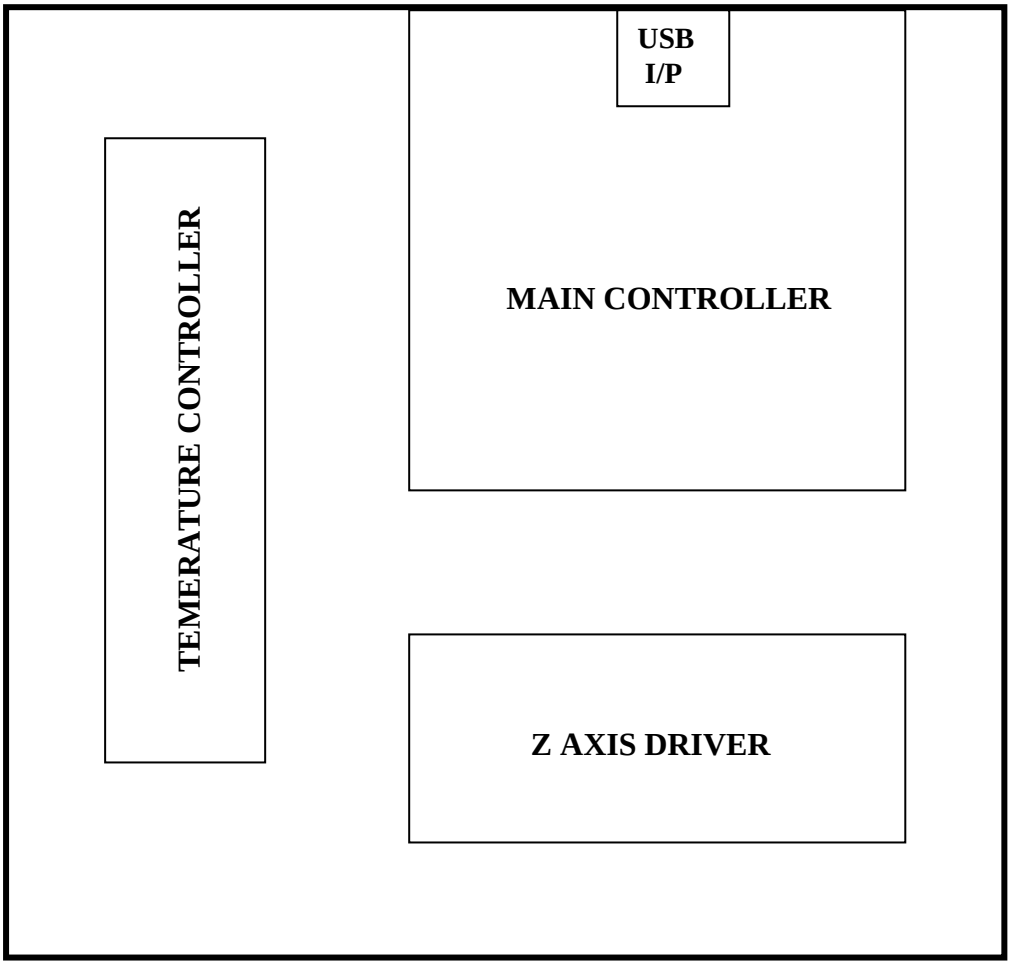


LEFT HAND SIDE of the MUST 3

DISCONNECT THE MUST FROM THE MAINS POWER SUPPLY BEFORE REMOVING ANY COVERS

The mains isolation transformer is mounted on the base plate in the left-hand side of the instrument. Access to the transformer is obtained by releasing the fixing screws at the rear of the left-hand moulding and sliding the moulding forward to release the four keyhole screws and then lifting the moulding up.

RIGHT HAND SIDE of the MUST 3



Access to the all the boards listed above is obtained by releasing the fixing screws at the rear of the right-hand moulding and sliding the moulding forward to release the four keyhole screws and then lifting the moulding up.

DO NOT HANDLE THE BOARDS UNLESS YOU ARE WEARING AN EARTH STRAP AS SOME OF THE BOARDS MAY BE DAMAGED BY STATIC ELECTRICITY.

SLIDING COVER GENERAL

The system is provided with a sliding cover to prevent the operator coming into contact with molten solder or hot metal. The solder receptacle will not drive up until the cover has fully opened and the software will not continue after a test until the cover has fully closed. Do not obstruct the sliding cover during operation.

During servicing and repair it may be desirable to operate the system with the sliding cover open. The sliding cover should be opened under software control and then the MUST switched off. The right hand side moulding complete with the sliding door assembly can be removed by unplugging the sliding door connector from the Control Board.

Z-AXIS DRIVER LED

The Z-axis driver is fitted with a LED that will illuminate if a fault develops on the driver. The LED is located at the top left corner of the board and should normally be off.

LVDT ASSEMBLY

Access to the LVDT assembly is obtained by removing the screws underneath the head cover and removing the four screws securing the LCD housing and pulling the cover off from the back of the machine. This unit should not normally require servicing, but may be damaged by rough handling.

DO NOT remove the specimen clips from the instrument by pulling them directly down. The specimen clips should be removed by rotating them backwards to release the magnetic lock.

If the LVDT system is mechanically damaged it may be forced out of its calibration range. If this occurs the system will not be able to find its automatic tare value before a test and the test may be aborted. Damage to the LVDT will cause inaccurate triggering which can be pre-trigger before the contact with the component and worse still, late or no triggering causing a collision between the bath or globule and component clip.

LCD BACK LIGHT

The brightness of the LCD back light can be adjusted by using the thumb wheel located on the back of the head casting. The back light is always ON when the instrument is switched on.

Z-AXIS MOTOR AND LEADSCREWS

DISCONNECT THE SYSTEM FROM THE POWER SUPPLY BEFORE REMOVING THE HEAD COVER.

Access to the Z-axis motor is obtained by removing the screws underneath the head cover and in the LCD housing and pulling the cover off from the back of the machine. Next remove the grey cover from the force pre-amplifier box and disconnect the two plugs from the board. Remove the pre-amplifier board and remove the grey box.

The Z-motor can now be disconnected from the wiring loom and removed.

NEVER DISCONNECT THE MOTOR FROM THE WIRING LOOM WITH THE INSTRUMENT

CONNECTED TO THE POWER SUPPLY.

LEADSCREWS

The leadscrews requires no maintenance other than to keep them clean and free from flux residues that can build up during use.

X/Y TABLE & LEADSCREWS

The leadscrews require no maintenance other than to keep them clean and to apply a light coating of CASTROL LM grease every three months. Access to the leadscrews is gained by selecting the ALIGNMENT mode and driving the X/Y table up to the top of the instrument, removing the solder receptacle and stainless steel covers. DO NOT DRIVE THE TABLE FORWARD WHILE IT IS IN THIS POSITION.

Important Documentation

Software Licence

Gen3 Systems Limited, supplier of the enclosed software program, grants you a non-transferable, non-exclusive right to use the enclosed program on a single system.

Title and all intellectual proprietary rights remain the property of Gen3 Systems Limited.

Copyright

You may not modify the licensed main program in any way. You may modify data files and system support files if you desire, or if directed by Gen3 Systems Limited.
You may not use, copy, or modify the enclosed licensed program or any copy, in whole or in part except as provided in this agreement.

Gen3 Systems Limited allows you to make one backup copy of the program for archival purposes only, the purpose of which is to restore the program should it become lost or unusable. The backup copy may only be used with the original system supplied.

Extent of Warranty

Gen3 Systems warrants the media on which the enclosed program is supplied to be free from defects in material and workmanship under normal use.

Gen3 Systems warrants that the licensed program as supplied conforms to its program specification provided that the program is properly used on the equipment.

Gen3 Systems shall remedy any breach of the warranty conditions by provisions of a replacement software package provided that the notified fault is reproducible under normal use according to the instructions given in this User Manual. Neither Gen3 Systems or anyone else associated with the creation, production or delivery of the enclosed program shall be liable for any interruption of business nor organisation direct, indirect or consequential or accidental damages arising from the use or inability to use the enclosed software program.

This license agreement shall be governed by laws of England and subject to the jurisdiction of the English courts.

Guarantee

By law, all goods sold must comply with their description and must be of merchantable quality and be fit for their intended purpose.

This guarantee does not in any way affect the seller's legal obligation or the consumer's rights under any Statute, including the Sale of Goods Act, 1979.

All Gen3 Systems equipment hardware and software is fully guaranteed against faulty workmanship, operation or performance for a period of ONE YEAR from date of purchase by the user of the product.

All claims against this guarantee must be supported by evidence of purchase, such as a bill of sale or invoice, and it is the responsibility of the claimant to furnish such proof. The Equipment Registration Form MUST also have been registered with Gen3 Systems at the time of purchase.

In the first instance claims should be made through the original agent from whom it was purchased. In the event of difficulty, users are requested to contact Gen3 Systems.

Gen3 Systems, or an Appointed Distributor, will at their discretion repair or replace part or all of the product to provide, in their judgement, a satisfactory performance of the system consistent with its age and apparent usage.

This guarantee covers the cost of both parts and labour required to correct the malfunction, but specifically excludes: wear and tear, consumables, physical damage due to incorrect use or misuse and damage or faulty operation due to unauthorised or inexpert repairs.

This guarantee is limited to the performance of the system only, and Gen3 Systems Limited accepts no responsibility for any consequential loss or damage, nor claimed or implied performance, when the system is used with any other equipment or software.

This guarantee may be invalidated if the system is subject to inappropriate use, use in adverse environments or conditions outside the specification or the system has been subjected to unauthorised modifications.

This guarantee does not cover the expense of service engineers' visits to the site to repair or commission the system.