SMEMA Extension Module
– for PC assisted board transfer –
(Installation manual)
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- **SMT demo center**
  800 sqm in Timisoara

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  at your service since 1997

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ICCO EMT service & support team
Package description and contents

The purpose of the SMEMA Extension Module is to give extra control access over board transfer between two SMT manufacturing equipments which don’t have supplementary functions already implemented in the software.

The unit is controlled via RS-232 signals through which the application is able to block or allow the board transfer, depending on certain conditions.

Before proceeding to configure your equipment, please check that you received everything with your delivery:

- Installation manual (this manual)
- SMEMA Control box
- SMEMA Extension Cable assembly
- SMEMA Adaptor cables (2 pcs.)

Optional accessories:

- DC Power supply
- USB to RS-232 converter cable
- Driver CD for converter cable
- Fuse (300mA/250V)

Once you are sure you have all the mentioned parts and learned how to install this device, you may proceed to the installation procedure.
Getting to know the SMEMA Control box

The control box have no switches or other adjustments on its front or rear panels. There are no controls inside the box either. The only way this unit is to be controlled is over RS-232 connection.

As you may notice from the figure above, the front panel of the control box is fitted with a fuse socket and six LED indicators (1 red and 5 green).

The fuse is of 5x20mm 300mA/250V Fast. Please replace with this type of fuse only, if necessary.

The meaning of the LEDs

From left to right:

- Check Fuse (red) – this LED will be lit continuously if there is no or damaged fuse. It will light momentarily when applying power to the control box, to give you information that the fuse checking circuit is functional. Note: the LED might be partially lit when the box is power from an unregulated power supply;
- Power ON – this LED will be lit continuously while there is power applied to the control box. The LED will be off if there is no or damaged fuse;
- PC Connected – this LED will become lit when the PC opens the communication port;
- UBA (Upstream Board Available) – will become lit when a board is available on the runout of the upstream machine;
- DMR (Downstream Machine Ready) – will become lit when the downstream machine is ready to receive a new board;
- Board Transfer – becomes lit when the PC gives the transfer board signal.
Fig. 2 – SMEMA Control box (rear view)

On the back of the SMEMA Control box there is only one multipurpose connector.

Connect the SMEMA Extension Cable assembly to this connector. A detailed pinout of this connector and the cable schematic is displayed in the figure below.

Fig. 3 – SMEMA Extension Cable schematic
Understanding the SMEMA Protocol

SMEMA is the short term for Surface Mount Equipment Manufacturers Association. Its main purpose is to ensure appropriate communication while transferring boards between SMT manufacturing equipments.

Below is a schematic block of a typical SMEMA arrangement.

Assuming the board manufacturing process is flowing from left to right, the SMEMA convention says that the machine at the left of the one you are in front of is the Upstream (or Upper) machine and the one at the right is the Downstream (or Lower) machine.

Each machine should have two SMEMA connectors named Upstream and Downstream respectively.

The connection between the two machines is made with a standard SMEMA cable which is placed between the Upstream connector on the Lower one and the Downstream connector on the Upper one.

Although the SMEMA connector have 14 poles, the standard cable used for board transfer only (with no additional signals or flags) use only 4 wires.

![Fig. 4 – Typical SMEMA arrangement](image-url)
Installing the SMEMA Extension Module

**CAUTION!** Please wait for the manufacturing equipment to become empty then turn its servo power off. You may suspend the loading machine in order to stop feeding the machines you are going to work at. Please take all the safety precautions according to the specifications of your equipment.

**Step-by-step instructions**

1. Disconnect the SMEMA cable existent between the two equipments you want to control;
2. Connect the SMEMA cable adaptor marked UPPER to the Downstream connector of the Upper machine;
3. Connect the SMEMA cable adaptor marked LOWER to the Upstream connector of the Lower machine;
4. Connect the two SMEMA cable adaptors to the Cable assembly DB9 connectors (male and female on the short wires);
5. Connect the Cable assembly to the SMEMA Control box (DB25 connector);
6. Connect the power wires to an 18-24Vdc power supply or 24Vdc rail inside your equipment or…
   a. Connect the provided dc power supply to a 230Vac socket;
7. Connect the RS-232 cable (DB9 Female connector on the long cable) of the Cable assembly to an unused COM port on the PC. If you don’t have an unused COM port or don’t have a port at all on your PC, then please read the next subchapter about how to install the USB to RS-232 optional converter cable.

**Installing the USB to RS-232 converter cable in Windows XP**

Install the driver on the CD prior to connecting the cable to the PC.

1. Insert the provided CD into the CD-ROM drive. The installation in Windows should start automatically. If it doesn’t, then click Start->Run and type d:/setup (assuming d: is your CD-ROM drive letter);
2. Follow the on-screen instructions;
3. Restart your PC if asked;
4. Connect the USB to RS-232 converter cable. Windows should automatically install the appropriate driver;
5. Right-click My Computer and select Properties or go to Control Panel and open System, point to Hardware tab and press Device Manager button;
6. Click the plus sign (+) ahead of Ports (COM & LPT) to expand it and make sure you see the Prolific USB-to-Serial Comm Port (COM…) in the list like in the image below;

![Device Manager](image)

**Fig. 5 – USB to RS-232 converter cable driver installation**

7. Take note of the port# specified at (COM…). This is the port to be accessed in order to communicate with the Control box;
8. Connect the RS-232 cable (DB9 Female connector on the long cable) of the Cable assembly to the RS-232 end of the USB to RS-232 converter cable;
9. Please double check your connections and make sure it looks like the schematic in the next image.
Fig. 6 – SMEMA Extension Module in-line integration
Specifications

Power
18 – 24Vdc / 100mA max.
FUSE 300mA / 250V Fast
12Vdc output @ 20mA max.
Insulation voltage: 250V max. (connectors limit)

Operating temperature
0 – 60 °C

Storage temperature
-10 – 80 °C

Dimensions
Control box (L x W x H) (mm): 115 x 90 x 35
Cable assembly length (m): RS-232 cable – 3;
Upper, Lower and Power cables – 0.6
SMEMA adaptor cables (m): 2

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