

## 7 PIB Process Interface Board

### 7.1 General

The PIB is an I/O unit with integrated wire feed regulator communicating directly with the ABB robot control system S4Cplus for control and monitoring of the robot welding.

The configuration is done in the same way as for a standard I/O unit.

The PIB characteristics are determined by the transfer of configuration parameters for power sources and feed units, which gives a high degree of flexibility.

The communication with the robot computer is serial and is maintained by way of a CAN bus, which means considerably simplified wiring and less dependence on the location.

The PIB I/O connections are grouped together for direct cable connection to units such as power sources, wire feed units, gun cleaners, sensors, etc. See Figure 17.

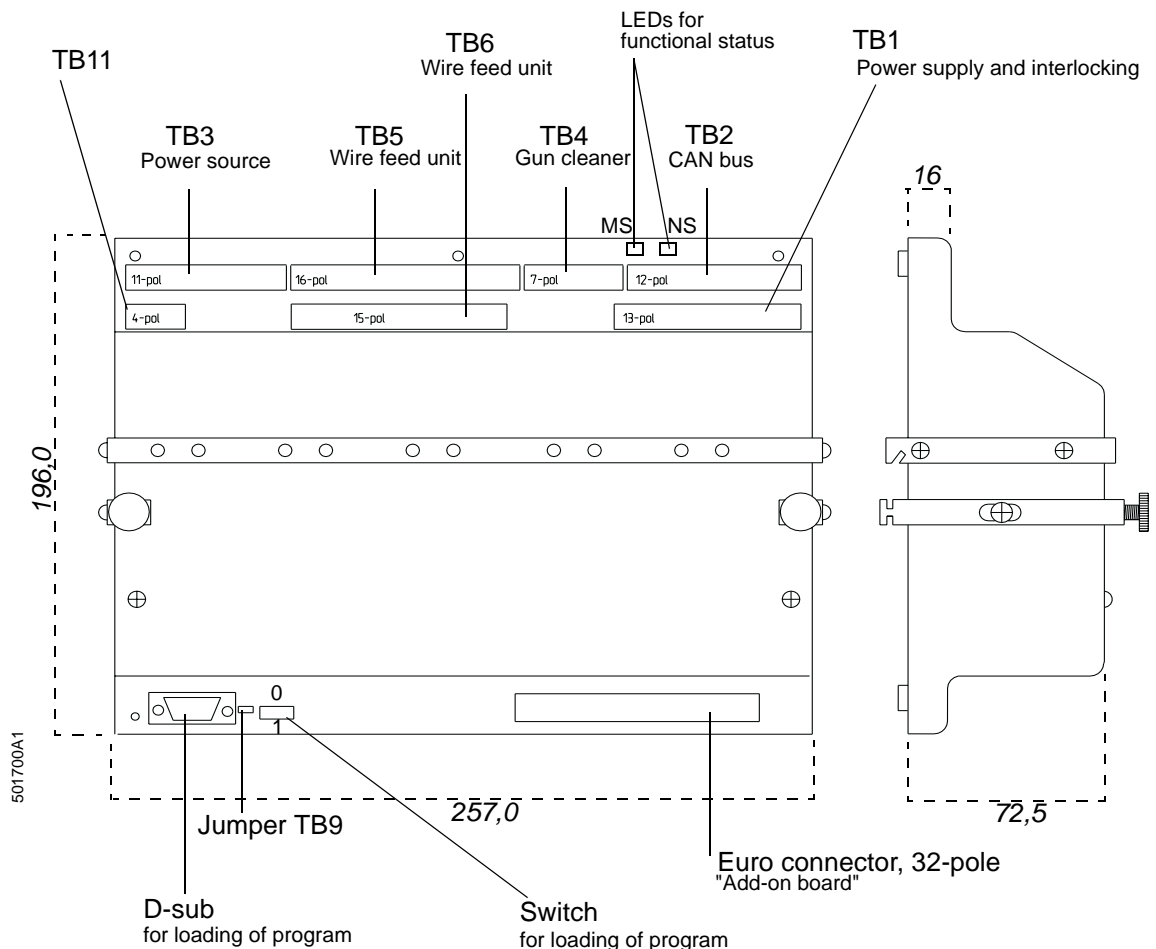


Figure 17 Dimensions and Terminal Designations.

## 7.2 Voltage Version - Power Supply - Article Number

PIB is available in two voltage versions:

- for feed units with voltage supply to the final stage of the feed unit regulator of max. 42V AC/ 10A, article no. 501 700-880.
- for feed units with voltage supply to the final stage of the feed unit regulator of max. 115V AC/ 3.5A, article no. 501700-881.

They are marked Low voltage or High voltage. See Figure 18.

**Warning!** Connecting 115V AC to the low-voltage version of PIB will destroy the PC board.

### Personal safety

#### The high-voltage version:

**A protective earth conductor (min. 2.5 mm<sup>2</sup>) shall be connected between the upper PIB metal bar and the protective earth bar of the robot cabinet before the unit is switched on.**

There are transformers available for the particular voltage. They are to be connected to terminal XT21 for 230V AC/ 3.15A in the robot cubicle.

See the section *Transformers on page 56*.

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## 7.3 Program Versions

PIB includes two program versions. Which program version is active is determined by the TB9 jumper. See Figure 19.

- 1 For robot systems from **S4Cplus** with Flexible (see section 7.5) and ARCI-TEC-LRB/LRC **the TB9 jumper shall be open** (removed or parked on one of the pins).

The jumper in this position supports:

- The transfer of configuration data from the robot programming unit.
- Automatic transfer of configuration data from the robot when changing PIB.

- 2 For the robot system S4C with ARCITEC/LRA the TB9 jumper must be closed.
  - The transfer of configuration data according to point 1 is not supported.
  - The configuration for ARCITEC/LRA is done on delivery.

### **Note:**

*When a complete system is delivered the TB9 position is determined.*

*All PIB equipment delivered separately or as spare part are pre-configured for ARCITEC/LRA and wire feeder A314 (jumper TB9 closed) on delivery.*

*For use together with **S4Cplus** the jumper is removed and the parameter transfer takes place according to point 1.*

## 7.4 Marking and Version Handling

Figure 18 shows the location and disposition of the article and manufacturing numbers. This marking indicates the hardware version of PIB – not the software one.

The software version is indicated under the configuration menu in the programming unit of the robot as a non-editable three-digit number. (Software revision, see section 7.14.3.) The number is automatically updated when the software version is changed.

The software version is also indicated when using the simulation program (BF). See the section *Service and Programming Aids on page 40*. Then the software version is indicated in the form of a letter and a two-digit number.

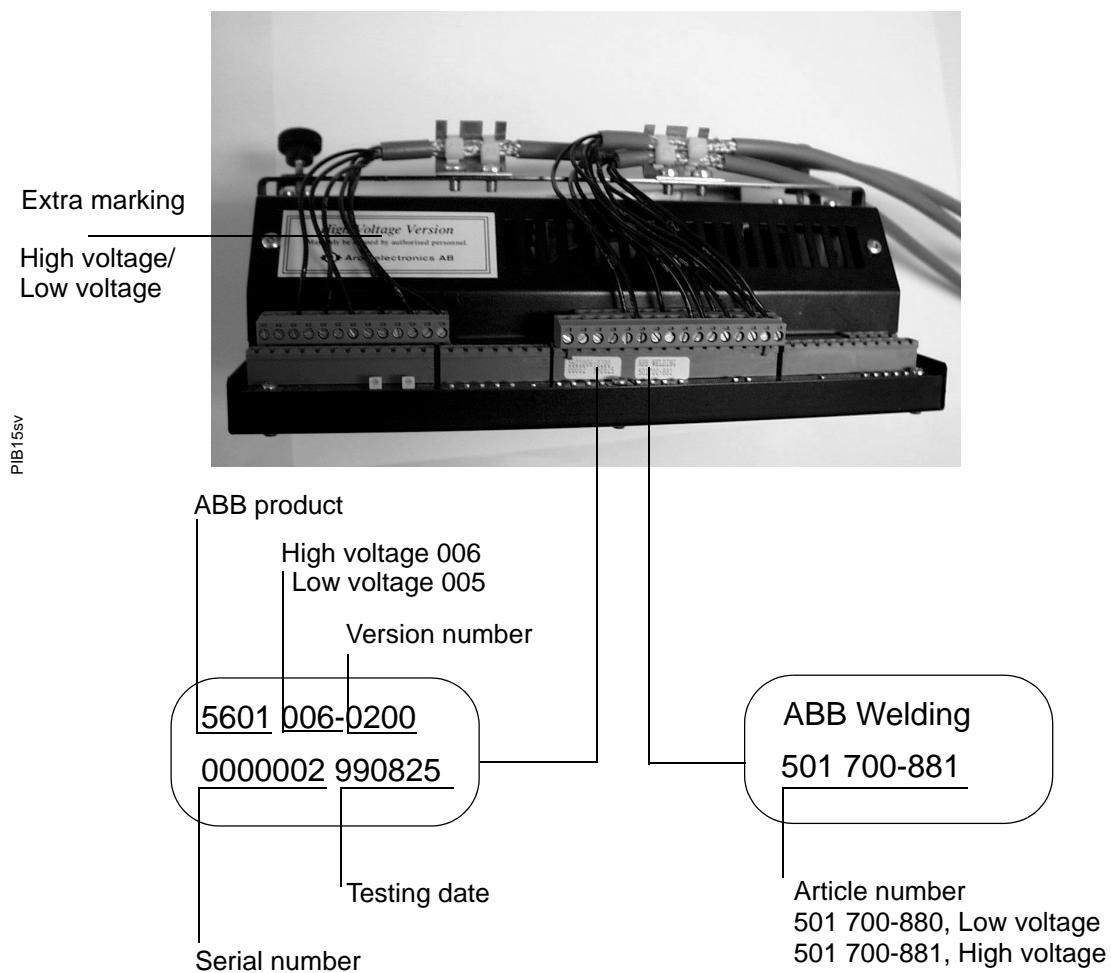


Figure 18 Marking and Version Handling.

## 7.5 Configuration

Programmable parameters enable the adaptation to different types of welding equipment. The configuration parameters determine:

- the control properties
- the scale factors
- the offset values
- the max. and min. values, etc.

### **Flexible**

- A manual standard power source enabling remote control by way of analogue references and with the ON/OFF function (for example LAW 350R/500R, RPA 400, Miller Delta Weld).
- A wire feeder of the DC type with AC/DC tachometer as speed feed-back.

### **ARCITEC**

- A wire feeder of the DC type with AC/DC tachometer as speed feed-back.

These factors are listed and their values can be edited under the menu: **Misc\System\Parameters\IO signals\Types⇒Units\PIB-name (=configured IO-name)** on the programming unit of the robot. Modified values are automatically transferred to the PIB board when starting the robot.

When changing the PIB, previously configuration parameters stored in the robot will automatically be transferred to the new PIB card when the voltage is switched on.

Configuration data for ABB's standard welding equipment are included in the AW system configuration diskettes, which can be ordered according to the price list for standard products.

See the *Table - Configuration Parameters on page 53* where all the parameters are listed and defined.

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## 7.6 Options for Increased Functionality

PIB is prepared for connection of a supplementary board increasing the functionality. The board is to be connected to a 32-pole connector of the Euro type. See Figure 17 on page 35.

### **Smartac (joint search and tracking device):**

See section 7.17.

## 7.7 Software Maintenance

By way of a PC, the loader program DosFlash and a cable connected between the serial port of the PC and the programming terminal of PIB new software can be transferred to the PIB program memory.

The cable shall be a 9-pole D-sub extension cable of the pin-pin connection type with socket contacts.

PIB is set to programming position

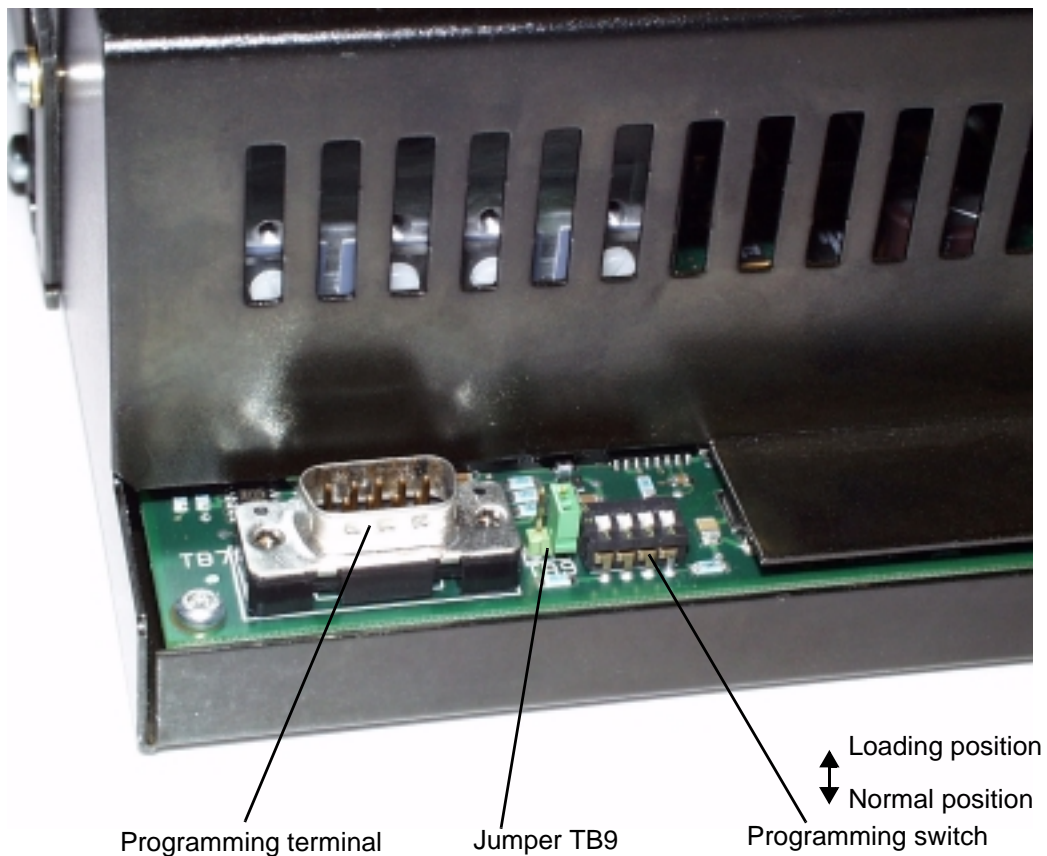
- by setting the programming switches to position 0 which is the loading position (all switches).

After the download the switches must be reset to position 1 (all switches).

See Figure 19.

The loader program with description and revised software can be ordered free of cost.

To obtain the cable, please apply to a supplier of data equipment.



*Figure 19 Jumper.*

## 7.8 Service and Programming Aids

A simulation tool in PC Windows environment has been developed for the PIB. The designation of the program is BF, version 2.2.

- Configuration parameters can be loaded into or read from the PIB.
- All inputs and outputs can be activated as well as the functions of the power source and the wire feed unit.
- The functions of PIB and other connected units can be tested. The CAN bus cable between the PIB and the robot is connected to the tool instead of the robot.

To use the simulation program a PC CAN interface is required, consisting of a PCMCIA board with dongle.

The BF program is supplied on request free of cost. With the delivery you get information from us about supplier and type of CAN bus tool.

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## 7.9 Diagnostics – Error Handling

The PIB is provided with two light-emitting diodes according to the DeviceNet specification. See Figure 17 on page 35.

One of the diodes has the designation NS (Network Status) and indicates the function of the CAN bus. The other one has the designation MS (Module Status) and indicates the PIB function.

Correct function is indicated by a green light coming on and incorrect function by a red one. During the phase of initiation, which can last for a couple of seconds, the light of the diodes changes.

**All other error indications are in the form of messages sent to the robot programming unit.**

**The PIB is checked for registered errors only in the course of running.**

The errors are categorised as **Warning** errors and **Stop** errors. A text comes up to explain the error and to recommend action.

When an error of the **Stop** category occurs, PIB stops the wire feed unit and the gas flow. By way of the monitoring of the process (welding current and gas) welding errors are registered in Arc Supervision. When using standard welding power sources. See the section *Configuration on page 38*.

**Error messages are acknowledged by pressing OK.**

When starting the computer only the last error occurred is displayed. When the error is remedied a message comes up to confirm the correction. If two or more errors are eliminated at the same time only the last one is confirmed. Remaining error, if any, is displayed next time the program is started.

The main heading of the errors is 80001 and is stored in the robot error log under the heading of User defined.