

To : **Purchase and technical office**

ARTEL S.R.L presentation

ARTEL s.r.l. was born in 1998, with the aim of realizing printed circuit boards design (PCB) and providing qualified prototypes to its customers, within reasonable timing and timescales. To date, the PCB design activity remains the warhorse of the company. Over the years, in order to meet the special needs of the customers, we have extended our activities and thus we are now able of providing products such as circuits boards unpopulated or assembled circuits boards included the components procuraments.

Nowadays ARTEL s.r.l. is able to promptly satisfy the requests of its custom with a wide variety of products and services. Starting from the project and electronic schematic, we can make the PCB design, provide the PCB and/or the electronic components, take care of the mounting process, as well as provide the assembled circuit itself.

We are use to be oriented towards prototypes and small productions. Within our capabilities we are glad to take into consideration also bigger and/or scheduled orders.

"PRODUCTS & SERVICES"

"Schematic Design"

The schematic design is developed in the frame of an efficient collaboration with electronic engineer, able to deal with a wide variety of schematics (e.g. digital cards, analog cards, power electronics cards), and with software developers, that complete the part relative to the design development.

"PCB Design"

Nine people are currently devoted to the design of the PCBs (masters). Thanks to stimulating collaborations, over the years we have developed a deep experience, especially in boards for switching power supplies, boards for power electronics (included circuits for currents above 200 A), embedded computer boards (PC104, ETX, Q7). A particular attention is given to the design of signal transmitters boards and high frequency bus systems (USB3, LVDS, CLOCK, DDR3, VIDEO, PCI-EXPRESS, etc.).

In order to guarantee high quality we use HyperLynx, a software for design analysis and verification, mostly aimed to identify, resolve, and verify critical design issues. In the following we report the minimal required input files that the customer is asked to provide, the softwares we are equipped with for the design, and the output files and documentation. We also try to give a feeling of the way we usually proceed.



Input files

- electronic schematic on paper to be inserted on file (DxDesigner)
- netlist from CAD (usually OrCAD or Altium, but also other CAD system)
- mechanic drawing on paper or on file .dwg or .DXF

Softwares

- xDX Designer
- OrCAD CIS
- Xpedition Enterprise
- PADS Power PCBs
- OrCAD PCB Designer
- HyperLynz (for signal and power integrity and thermal analysis)
- FloTHERM
- AutoCAD

Output files and documentation

- Gerber and NC Drill files
- assembly plan (.dwg or .DXF file, 2D and 3D)
- insertion of test points for IC test and list of their coordinates
- files for pick & place
- PCB documentation (pdf format)
- list of signal properties (length, delay, cross/talk, characteristic and differential impedence, theoretical resistance, current loading, electromagnet susceptivity)
- analysis (signal, power and thermal)

• we additionally give the possibility to add in the library your own codes and/or serial number, in such a way to have them as an output associated to the reference designator

Typical design phases A first discussion (usually by the customer) is mandatory (kick off meeting), in order to be introduced to the project and understand the general requirements and needs. The layout will be then elaborated and the files sent for the evaluation. Depending on the feedback of the customer, we proceed with the PCB design and consequential sending of the output files, or we further discuss and find a proper solution. Once the PCB design is considered finished, the documentation is completed and added to the output files. If necessary, we can do the work (or part of it) by the customer.

"PCB Production & assembly "

Manufacturing and assembling of PCBs is a domain towards which we extended only recently. Developing this sector on ourselves alone would have required a pretty large investment in terms of money, energy, time and people, at the expense of the quality and delivery timing of the other products and services.

We thus decided to establish a close and strong partnership with important and qualified companies specialized in this domain.



Manufactury The range of products we can offer is quite wide: double side PCB, multilayer (with FR4+glass/teflon, polyimide), blind and buried vias, lines/space and drill diameter respectively down to 50 μ m and 100 μ m.

Assembling In the early times of PCB production, the assembling phase could be done relatively easily in the majority of the laboratories, without involving sofisticated instrumentation. Nowadays, after the advent of Surface Mounting Device (SMD), the assembly requires a special machinery, which usually only specialized companies are equipped with. In a joint effort with our partners, we are able to provide the customer both with traditional and SMD board. Moreover, all the PCBs undergo automated

optical inspection in order to prevent and identify any assembly or soldering defect. For ball grid array (BGA) boards, or any other kind of PCB that can not be optically inspected, we investigate it by X-ray techniques.

Components We have in stock almost all the passive components (resistors and capacitors), from 0201 to 1206 case. All missing components are easily be purchased by us.

ISO certifications and any other kind of documentation can be provided on request.

Time to delivery?:

For the sake of honesty, we do not want to give a number. Each board and each project has its own story, and can be more or less exposed to risk of delays caused by external factors. Nevertheless, we can give a rough (but reasonable) estimate of the timing required by the different phases:

• board design: we start working on the new design immediately after the first kick off meeting. The duration of the work depends on the complexity of the design.

• realization of the prototype: 5 working days

• assembling: 5 to 8 working days (mostly depending on the availability of the components).

"Customers

We interface with an heterogeneous clientele, whose area of interest can be roughly splitted in the following sectors:

- Automotive (10%)
- Research (30%)
- Industrial Automation (30%)
- Defense (20%)
- Biotechnology (5%)
- Other (5%).

Best regards. ARTEL S.r.l.

Antonio Soano