

# Rápido

Laser System for selective precision Soldering



# Rápido

## Selective precision Soldering with Rápido

The industrial laser system Rápido – ideal for demanding selective soldering processes.

The diameter of the laser radiation can be narrowed down to as little as 0.1 mm at the working point. Depending on the task, the adaptation of the laser beam can be managed through a large number of optical lens assemblies available. The focussed laser beam can be circular or have different shapes fitting the solder pad. The control electronics have standard interfaces for easy integration in the production setting being used.



The size of the heated zone can be as small as 0.1 mm. Therefore structures with a fine pitch like miniature connectors can be soldered safely.

## Reliable Diode Laser Modules with a long Lifetime

Diode laser modules with a long lifetime generate optical output powers between 30 W and 400 W. The wavelength is 980 nm. The high degree of efficiency of 40 % results in low power consumption and a practically maintenance-free usage.

The optical fibers which are used to transport the laser power are armored. They are flexible and provide safer operation than free space beam delivery systems. The length of the optical fiber may vary between 3 m and up to 50 m.

## Powerful Control Electronics

16 digital I/O ports (5 V or 24 V) isolated by opto couplers as well as an analog port (10 V) are used for the integration of Rápido in variable production systems. A serial interface connects Rápido with computers or other instruments. If rapid changes of the laser power are needed, the analog interface 0-10 V allows the manipulation within milliseconds.

The user interface is easy to use. It shows the selected operational mode, the actual current as well as the power values and displays all safety-relevant values in clear text. All important values like the diode laser temperature are controlled.



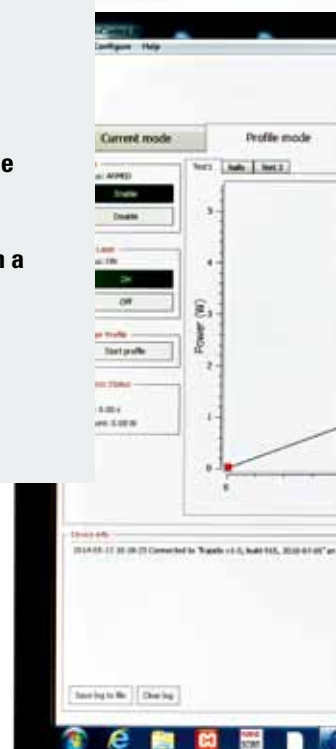
A CCD camera mounted on the focusing lense+ supports the image data processing and allows the visual inspection and documentation of the soldering point.

Important parameters and messages are displayed in clear text on the user interface as well as on the unit.

The electronics has a laser safety circuit for compliance with the requirements of laser safety class 1. The emergency stop function meets all electrical safety regulations.

## Advantages of Laser Soldering

- The laser beam fits the solder pad precisely
- Local heating
- Guaranteed high quality of soldering
- Focus down to 0.1 mm
- No bridging
- Parallel soldering of multiple points
- Temperature range between a few °C and up to 1200 °C
- Suitable for all soldering materials



## Programmable Power Profiles

Three profiles with maximum 20 discrete power levels each can be programmed. The maximum duration of a profile is 600 s. The warm-up time, soldering time and cooling-down time can be optimized for the specific soldering process bringing forth a consistent high quality and steady results.

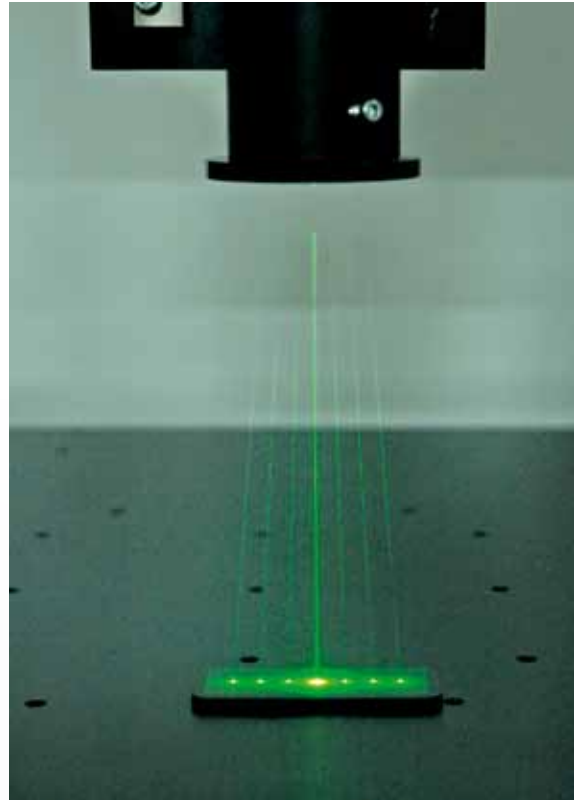
## Temperature Control

Some special tasks require precise temperature control at the soldering point. An analog interface corresponding to the output of the temperature measurement instrument like a pyrometer adjusts the laser power within milliseconds.

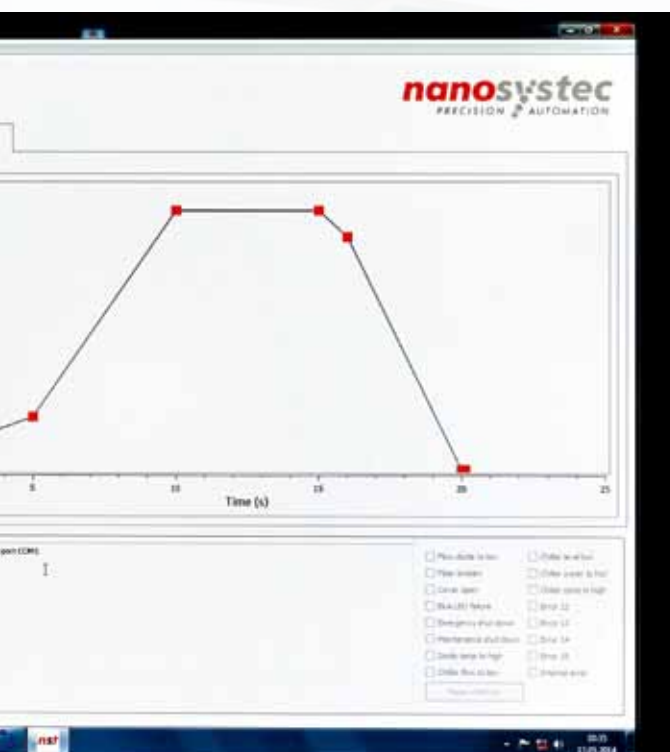
## Lens assemblies

With single beam lens assemblies a focus of 0.1 mm is attainable. The power distribution in the focus of the laser beam is uniform resulting in a homogenous heating of the solder point.

A CCD camera attached to the lens assembly supports the image data processing and documentation of the results.



A Multi Beam Optic reduces the process time as a number of soldering joints can be processed simultaneously.



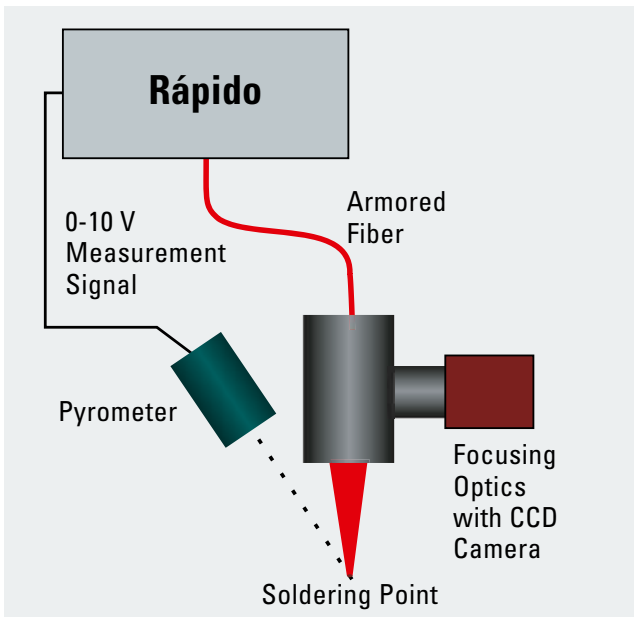
Moving the laser beam with a **XY scanner with flat field optic** from soldering point to soldering point within a few milliseconds reduces the processing time. A computer controls the movement of the laser beam within a field of approximately 100 mm x 100 mm. Any pattern can be programmed.

The **multi-beam optics (MBO)** is ideal for high production volumes and a constant pattern of soldering points. The optic splits the incoming laser beam up into several subbeams which hit each solder pad. The time reduction is proportional to the number of soldering points.

### High productivity

Assuming the solder time per point is 1.5 s with a total of 10 soldering points, a total time of 15 s is needed, positioning time not included.

With a MBO, the time remains 1.5 s for all 10 soldering points which is an increase in productivity by a factor of 10.



In order to maintain a constant temperature at the soldering point, a signal of a temperature sensor is used to correct the laser power. An analog signal of the electronics changes the applied power within a few milliseconds and subsequently the temperature.

## Technical Data

Optical Output Power	30 W, 50 W, 100 W, 150 W, 250 W, 400 W
Wavelength	980 nm
Pilot laser	650 nm, 1 mW (optional, not available for all modules)
Pulse width	2 ms to continuous emission, full power
Trigger signal	TTL and/or 24 V
Power profile	20 power values over 600 s
Electrical supply	120/230 V, 50/60 Hz
Cooling	Water (tap water or recirculating chiller)
Dimensions	19 in. rack mount, 4 HU, 600 mm depth
Weight	23 kg



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