
INDEPENDENT HARDWARE + FIRMWARE DEVELOPMENT

Printhead Control System

Drive Boards × Control Firmware

The platform covers printheads from several brands, with adaptations developed for new models as needed.



Ricoh / Seiko / Toshiba / Konica Minolta / Xaar / Kyocera

PRODUCT CATALOGUE / 2026.09

01 / System positioning

From data to droplets: control every firing event

FHES develops its own printhead control boards and firmware, configuring the drive system for each printhead's electrical interface and print job.

Two components form one control platform

The board provides the printhead interface and electrical drive signals. Firmware manages firing timing, print data and operating logic. Hardware and software are matched to the specific printhead; one board does not directly drive every model.

01 / BOARD

Printhead control board

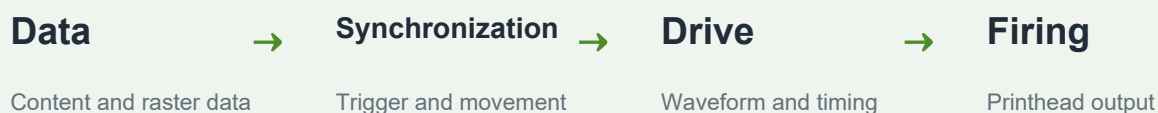
Design the drive solution around the interface, voltage, timing and load requirements.

02 / FIRMWARE

Printhead control firmware

Coordinate image data, firing timing, triggers and status management in one operating sequence.

A clear control chain



Specific functions depend on the control board, printhead variant and firmware version and are confirmed by project testing before delivery.

02 / Hardware design

Circuit design for the printhead interface

Electrical and timing requirements differ between printheads. Each control board is designed for a defined target interface.

01 / INTERFACE

Interface matching

Check the connector, pin definitions, data link and printhead version.

02 / DRIVE

Drive and power supply

Design the circuit around the target printhead's drive, power and protection requirements.

03 / SIGNAL

Signals and timing

Coordinate high-speed data, trigger signals and firing timing.

04 / SERVICE

On-site maintenance

Module labels, wiring and status checks support assembly and fault finding.

Accept hardware and firmware together

First verify the physical printhead and its documentation, then check power-up, communication, drive output and printed samples. Even similar models may need different adaptations because of variant, nozzle layout or electrical interface differences.

Goal: make each adaptation reusable, traceable and upgradeable.

03 / Control firmware

Control the firing process with upgradable firmware

Firmware configures data, triggers, waveforms and operating status for the printhead and the printing application.

01 / RASTER

Data organization

Arrange print data to match the nozzle layout and operating method.

02 / TIMING

Firing timing

Synchronize printhead data transfer, drive timing and printing action.

03 / SYNC

Production-line synchronization

Configure trigger, encoder or position-based synchronization for the project.

04 / PROFILE

Drive parameters

Manage waveforms and operating parameters based on tests with the printhead and ink.

05 / STATUS

Status diagnostics

Record available board and printhead status to support troubleshooting.

06 / UPGRADE

Version development

Develop matching boards and firmware for new printheads and applications.

Firing waveforms, available status monitoring and update methods depend on the printhead and board versions; the final project delivery list governs.

Ricoh and Seiko printhead platforms

Existing development covers several printhead series. Variants and interface versions within a series must be checked individually.

Brand / Vendor	Series or Model already covered
Ricoh / Japan	G2 · G4 · G5 · G6 · G5F

Seiko / Japan	508 · 510 · 1020 · 1536
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Four checks for each adaptation

Complete printhead order code / Connector and cable pinout / Drive conditions and waveform version / Ink and actual print job

Model note

This is FHES's development coverage list. It does not mean every variant from a brand is directly interchangeable. Seiko 1020 uses the model name supplied by the customer; the exact order code remains subject to project confirmation.

Supporting more industrial printhead platforms

Adapt each project with a suitable control board and firmware, while allowing development for future models.

Brand / Vendor	printhead Series / Fit Direction
Toshiba	C4, CF6R.
Konica Minolta	KM1024i Series
Xaar	Xaar 2002
Kyocera	Adapted to the specific printhead model

Moving from a model list to a platform capacity

For each new jettor type, the data interface, drive conditions, wave-form requirements and mechanical connection are confirmed, the card and firmware are designed or adjusted to complete the printing and stability certification. The over-covered model is reusable development experience to expedite the evaluation and implementation of the follow-up project.

The listed brands and models describe printhead compatibility coverage only; they do not imply authorization by or partnership with the printhead manufacturers.

06 / Ongoing development

Expand the control platform as new printheads arrive

FHES can develop corresponding boards and firmware for future printhead models, extending the complete machine platform.

01

Confirm the Printhead

Check the full model code, official documentation, interface and drive requirements.

02

Design the Control Board

Plan connections, power, signals and drive circuits.

03

Develop firmware

Implement data mapping, timing and project control logic.

04

On-line validation

Complete electrical checks, waveform tuning and print sample tests.

05

Machine Integration

Verify the ink supply, software and production workstation together before delivery.

Development and adaptation capabilities are expandable; project validation determines delivery time and performance.

Specify the solution for the printhead, ink and workstation

Control-system selection begins with the full printhead model code and is confirmed with printed samples and continuous-run testing.

Printhead Verification	Brand, complete model, sub-version, nozzle configuration and interface information.
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Print job	Print width, resolution, line speed, print direction and content.
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Ink and Waveform	Ink type, operating temperature and drive requirements of the selected printhead.
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Integration Interfaces	Requirements for sensors, encoders, host systems and machine control.
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Delivery Verification	Wiring, firmware version, print-sample quality and stable-operation records.
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Compatibility limits

Models listed here represent development coverage or future development directions. The board, firmware, functions and supply status for a specific printhead are defined by the project proposal and validation results. Third-party brand names belong to their respective owners.



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