

**Internal distribution code:**

- (A) [ - ] Publication in OJ
- (B) [ - ] To Chairmen and Members
- (C) [ - ] To Chairmen
- (D) [ X ] No distribution

**Datasheet for the decision  
of 21 January 2025**

**Case Number:** T 2621/22 - 3.4.02

**Application Number:** 17194770.8

**Publication Number:** 3306819

**IPC:** H03L7/06, H03L7/081

**Language of the proceedings:** EN

**Title of invention:**

Phase control of clock signal based on feedback

**Applicant:**

Analog Devices, Inc.

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

Inventive step - main request (yes)



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0

Case Number: T 2621/22 - 3.4.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.02**  
**of 21 January 2025**

**Appellant:** Analog Devices, Inc.  
(Applicant) One Analog Way  
Wilmington, MA 01887 (US)

**Representative:** Horler, Philip John  
Withers & Rogers LLP  
2 London Bridge  
London SE1 9RA (GB)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 26 July 2022  
refusing European patent application No.  
17194770.8 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** G. Flyng  
**Members:** C.D. Vassoille  
C. Almberg

## Summary of Facts and Submissions

- I. The appeal of the applicant lies against the decision of the examining division with which European patent application no. 17 194 770.8 was refused.
- II. The following documents are relevant for the present decision:
- D1: US 7 657 773 B1  
D2: US 2011/0221486 A1  
D3: EP 3 035 536 A1  
D4: US 2005/099208 A1  
D5: EP 1 575 170 A1
- III. In the contested decision, the examining division concluded *inter alia* that the subject-matter of claim 1 of each of the then main request and auxiliary requests 1 and 2 lacked novelty under Article 54 EPC over document D2 and that the subject-matter of claim 1 of each of the then auxiliary requests 3, 4 and 5 did not involve an inventive step under Article 56 EPC in view of the same document.
- IV. On appeal, the appellant initially maintained the first-instance requests, with the then auxiliary requests 3 to 5 reordered.
- V. In a communication under Article 15(1) RPBA annexed to a summons to oral proceedings, the board informed the appellant *inter alia* of its preliminary view according to which it considered the subject-matter of claim 1 of the then auxiliary request 2 to be new and based on an inventive step with regard to documents D1 to D5. The board noted that these findings did not, however, apply

to the independent method claims 9 and 14 of the then auxiliary request 2.

VI. With letter of 4 November 2024 the appellant submitted a set of claims 1 to 8 according to a sole new main request, corresponding to the previous auxiliary request 2 but with claims 9 to 15 deleted, replacing all previous requests on file. The appellant requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of the new main request.

VII. With notification of 12 November 2024 the oral proceedings before the board were cancelled and the procedure continued in writing.

VIII. Claim 1 of the new main request has the following wording:

"A system (20) with clock signal phase adjustment, the system comprising:

    a first data converter (12a) configured to receive a first clock signal and to provide a first feedback signal, wherein the first feedback signal comprises information indicative of a phase of a signal at a sampling node within the first data converter, and wherein the phase of the signal at the sampling node within the first data converter is based on the first clock signal;

    a second data converter (12n) configured to receive a second clock signal and to provide a second feedback signal, wherein the second feedback signal comprises information indicative of a phase of a signal at a sampling node within the second data converter, wherein the phase of the signal at the sampling node

within the second data converter is based on the second clock signal; and

a clock generator (24) configured to provide the first clock signal and the second clock signal and receive the second feedback signal from the second data converter, the clock generator comprising:

a feedback signal processor (32) configured to receive the first feedback signal from the first data converter and to compute a phase control signal based on the first feedback signal and the information comprised in the second feedback signal, wherein the phase control signal is indicative of a phase adjustment of the first clock signal to synchronize the phase of the signal at the sampling node within the first data converter relative to the phase of the signal within the sampling node of the second data converter; and

a clock generating circuit (34) configured to adjust the phase of the first clock signal relative to the phase of the second clock signal based on the phase control signal."

Claims 2 to 8 are dependent on claim 1.

## **Reasons for the Decision**

### **1. New main request - Amendments (Article 123(2) EPC)**

1.1 Claim 1 of the new main request is essentially a combination of the original claims 1, 2 and 6 and also of parts of the original description in paragraphs [0057] and [0059].

1.2 The board therefore concurs with the examining division's finding in respect of the then auxiliary request 2 and considers that the amended claim 1 of the new main request meets the requirement of Article 123(2) EPC.

### **2. New main request - Clarity of the claims and support in the description (Article 84 EPC)**

2.1 The examining division did not object under Article 84 EPC to claim 1 of the then auxiliary request 2, which is identical to claim 1 of the new main request, and also the board sees no reason to do so.

2.2 The board therefore considers that the new main request meets the requirements of Article 84 EPC.

### **3. New main request - Inventive step (Article 56 EPC)**

3.1 The subject-matter of claim 1 of the new main request is new and involves an inventive step with regard to the prior art documents D1 to D5, which were cited in the contested decision.

Distinguishing feature

- 3.2 Claim 1 of the new main request specifies that the devices are data converters and that the node is a "sampling node" within the first and second data converters. The board considers that there is a substantial difference between the terms "node" and "sampling node". In particular, the board is convinced that the term "sampling node" refers to a specific point in the circuit where the analogue signal is converted into a digital signal or *vice versa*. This sampling process involves capturing the value of the signal at a particular instant in time, converting it into digital data (in an ADC), or reconstructing it into an analogue signal (in a DAC). Furthermore, from the description in paragraph [0071] of the application it is clear that a "sampling node" is located somewhere between the input and the output of the data converter.
- 3.3 Document D2 discloses data converters (see in particular in figure 5 the individual elements "DAC", "ADC" of element 520). However, it is not directly and unambiguously derivable from document D2 that these first/second data converters provide feedback signals comprising information indicative of a phase at a sampling node within the first/second data converters.
- 3.4 In the contested decision, the examining division essentially held that the term "sampling nodes" did not read differently for the skilled person than the "nodes" at which the clock signals arrived on the lines Distance#1 and Distance#N at and inside the block 520 of document D2.

The board does not agree with this finding. As noted above, the term "sampling node" in the context of a

data converter denotes a specific location where sampling takes place. This function thus inherently assigns a specific role and purpose to the "sampling node", distinguishing it from other arbitrary points or "nodes" within the data converter.

- 3.5 The subject-matter of claim 1 of the new main request is therefore considered to be new with respect to document D2.

Objective technical problem

- 3.6 In accordance with the appellant's argument, the objective technical problem of the distinguishing features relating to the sampling node of a data converter, can reasonably be considered to be that of how to achieve a more accurate synchronisation of the operations of the data converter.

Non-obviousness of the solution

- 3.7 The distinguishing feature is not merely common general knowledge, nor is it disclosed or suggested in the other documents D1, D3, D4 and D5 to provide first/second data converters that are configured to perform the functions as defined in claim 1 of the new main request, in particular a data converter that is configured to provide a feedback signal which comprises information indicative of a phase of a signal at a sampling node within the data converter.
- 3.8 The subject-matter of claim 1 of the new main request therefore involves an inventive step within the meaning of Article 56 EPC with regard to document D2 in combination with any of the other prior art documents cited in the contested decision.

**4. Decision in written proceedings (Article 12(8) RPBA)**

The appellant has been heard on the grounds and evidence underlying this decision, and oral proceedings are neither requested nor expedient. Therefore, the decision is handed down in written proceedings.

**5. Final remarks**

The board concludes that the appellant's new main request meets the requirements of the European Patent Convention and that the application is therefore in order for a patent to be granted on the basis of the claims of the new main request and the drawings as originally filed. However, the appellant has not submitted an amended description that is fully adapted to the new claims according to the new main request and that appropriately reflects the relevant prior art in accordance with Rule 42(1)(b) EPC. In light of this, and in the interest of procedural efficiency, the case is remitted to the examining division for further prosecution pursuant to Article 111(1) EPC for the purpose of adapting the description to the claims of the new main request.

## Order

### For these reasons it is decided that:

1. The contested decision is set aside.
2. The case is remitted to the examining division with the order to grant a patent with the following claims and a description to be adapted thereto, and the drawings as originally filed:

#### Claims:

No. 1 to 8 filed with the letter of 4 November 2024

The Registrar:

The Chairman:



K. Boelicke

G. Flyng

Decision electronically authenticated