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**Datasheet for the decision  
of 18 April 2023**

**Case Number:** T 0503/21 - 3.5.05

**Application Number:** 15751545.3

**Publication Number:** 3108607

**IPC:** G06F13/38, G06F13/42

**Language of the proceedings:** EN

**Title of invention:**

CONTROL OF TX/RX MODE IN SERIAL HALF-DUPLEX TRANSCEIVER  
SEPARATELY FROM COMMUNICATING HOST

**Applicant:**

Texas Instruments Incorporated

**Headword:**

Controlling TX/RX mode of a UART / TI

**Relevant legal provisions:**

EPC Art. 56  
RPBA 2020 Art. 11

**Keyword:**

Inventive step - main request (no) - auxiliary request (yes)  
Remittal - (yes)



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Case Number: T 0503/21 - 3.5.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.05**  
**of 18 April 2023**

**Appellant:** Texas Instruments Incorporated  
(Applicant) P.O. Box 655474  
Mail Station 3999  
Dallas, TX 75265-5474 (US)

**Representative:** Zeller, Andreas  
Texas Instruments Deutschland GmbH  
Haggertystraße 1  
85356 Freising (DE)

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted on 21 December  
2020 refusing European patent application No.  
15751545.3 pursuant to Article 97(2) EPC.

**Composition of the Board:**

**Chair** A. Ritzka  
**Members:** P. Tabery  
E. Mille

## Summary of Facts and Submissions

- I. The appeal is directed against the examining division's decision to refuse the European patent application.
- II. The examining division decided that the application did not meet the requirements of Article 56 EPC (main request and auxiliary request 1), while auxiliary request 2 was not admitted into the proceedings.
- III. The cited documents included:
- D3** WO 97/42730 A1
- D5** CN 1 389 800 A
- IV. In its statement of grounds of appeal, the appellant requested that a patent be granted on the basis of the claims in accordance with either the main request or an auxiliary request (identical to former auxiliary request 1), copies of both requests being submitted with the statement setting out the grounds of appeal. In the event that neither of the requests was found to be allowable, oral proceedings were requested.
- V. The board issued a summons to oral proceedings. It also set out its preliminary opinion on the case (Article 15(1) RPBA 2020).

The board concurred with the findings of the examining division that the **main request** did not meet the requirements of Article 56 EPC.

However, the board considered that the **auxiliary request** did involve an inventive step over document **D3**.

The board indicated that, in view of the other relevant documents cited, it was inclined to remit the case to the examining division.

VI. In a reply dated 8 March 2023, the appellant withdrew its request for oral proceedings.

VII. By a notification dated 20 March 2023, the board informed the appellant that the oral proceedings had been cancelled.

VIII. **Claim 1** of the **main request** reads as follows:

"An integrated circuit apparatus, comprising:

a host processor (23);

a universal asynchronous receiver/transmitter UART (12) coupled for communication with the host processor (23) and configured for serial half-duplex communication with a transceiver (13) that is external to the apparatus; and

logic (21) that is separate from the host processor (23), coupled to the UART (12), and responsive to operation of the UART (12) for signaling to the transceiver (13) respective indications of when to assume a transmit mode and when to assume a receive mode."

**Claim 1** of the **auxiliary request** further specifies that transmitted frames are monitored, this then being used to indicate to the external transceiver when to assume the transmit or receive mode.

## **Reasons for the Decision**

1. The present application concerns a universal asynchronous receiver/transmitter (UART) device having an external transceiver for industrial control systems.

2. Main request

The main request is identical to the main request considered in the decision under appeal.

2.1 Novelty (Article 54(1) EPC)

2.1.1 The board holds that document **D3** discloses the following features of **claim 1** (the references in parentheses relate to that document; strike-through is used to mark features it does not disclose):

An integrated circuit apparatus, comprising:  
(see fig. 2)

a host processor;  
("CPU 210", see fig. 2)

a universal asynchronous receiver/transmitter UART  
(UART 200, see fig. 2)

coupled for communication with the host processor  
(via line 202, see fig. 2)

and configured for serial half-duplex communication with a transceiver that is external to the apparatus;  
(the "half duplex mode of operation", see page 8, line 14, is also suitable for communication with an external transceiver)

and

logic that is separate from the host processor,  
("Logic Unit 290", see fig. 2)

~~coupled to the UART,~~

and responsive to operation of the UART for signaling ~~to the transceiver~~ respective indications of when to assume a transmit mode and when to assume a receive mode.

(page 7, line 33 - page 8, line 15)

2.1.2 In the decision under appeal, the examining division notably considered that the claimed UART was not a

transceiver, thus claim 1 did not define two transceivers. It thus held that the claimed subject-matter differed from the disclosure of document **D3** in that the transceiver was external, whereas document **D3** disclosed the transmitter/receiver as being part of the UART.

2.1.3 The appellant emphasised that claim 1 mentioned two separate transceivers (reference signs 12 and 13, respectively). This constituted a substantial structural difference between claim 1 and the disclosure in fig. 2 of document **D3**.

2.1.4 The board concurs with the appellant in that claim 1 mentions two separate transceivers, the UART and the external transceiver. Also, according to document **D3**, the logic is integrated into the UART. Hence the differences between the subject-matter of claim 1 and that of document **D3** reside in that the logic is coupled to the UART and configured for signaling to an external transceiver respective indications of when to assume a transmit mode and when to assume a receive mode.

Thus the subject-matter of **claim 1** is novel over the disclosure of document **D3**.

2.2 Inventive step (Article 56 EPC)

2.2.1 In the decision under appeal, the examining division considered that the difference of having an external transceiver related to a mere "*packaging option*" and constituted one of several straightforward possibilities. It was therefore considered not to involve an inventive step.

2.2.2 The appellant argued that the aim of the invention according to claim 1 was to reduce the turnaround time needed to transition the transceiver from the TX mode to the RX mode, e.g. to avoid data to be received after a transmission being lost because the transceiver was not switched into receive mode fast enough. This was not hinted at by document **D3**, as the latter had a different aim.

2.2.3 The board considers that, when faced with the task of coupling the half-duplex UART of document **D3** with a remote station, the skilled person would readily perceive that the remote station needs to be informed when the UART is transmitting in order not to send at the same time as well, as that would interfere with the half-duplex operation. The skilled person would thus have considered providing information suitable for determining "*whether to enable or disable receiver 270 over line 226*" (see page 7, lines 31-32) already available within the UART to the remote station as well. This way, the skilled person would have arrived at this aspect of the claimed invention without employing any inventive skill. The board notes in this context that the commonly-known RS-232 socket - which typically uses a UART - provides an RTS (Request To Send) contact for half-duplex operation. As to the other difference of the logic being coupled to the UART, the board holds that it does not produce a technical effect and thus cannot contribute to an inventive step.

Therefore the board considers that the subject-matter of claim 1 is not inventive in view of the disclosure of document **D3**.

2.3 In view of the above, the **main request** is not allowable.

3. Auxiliary request

The auxiliary request is identical to auxiliary request 1 considered in the decision under appeal.

3.1 Inventive step (Article 56 EPC)

3.1.1 In the decision under appeal, the examining division held that the added feature allowed for broad interpretation. Therefore the monitoring of the transmit buffer could be equated to the monitoring "*of the transmit [sic] frames*" of document **D3**.

3.1.2 The appellant argued that document **D3** did not monitor the transmitted frames and thus did not give a signal to assume a receive mode based on the monitored transmitted frames either. The approach of document **D3** could not be as accurate as using the frames actually transmitted to get the best timing of switching to receive mode.

3.1.3 The board considers the appellant's arguments convincing. The added feature that the frames actually transmitted are monitored is not known from document **D3**, which discloses monitoring of the data prepared for transmission. The added features yield the technical effect of providing better timing for sending to an external transceiver a signal to switch into the transmit mode. The objective technical problem could thus be formulated as being how to modify the solution according to document **D3** to provide better timing for sending to an external transceiver a signal to switch



into the transmit mode. The board considers at present that, although the skilled person could have modified what is disclosed in document **D3** to arrive at the claimed solution, said document does not provide any motivation actually to do so.

Therefore the board holds that the subject-matter of claim 1 of the auxiliary request is not rendered obvious by document **D3** taken alone.

3.2 Consequently, the objections raised in the decision under appeal with respect to **auxiliary request 1** are not pertinent in the board's view and the decision under appeal has to be set aside.

4. Remittal (Article 11 RPBA)

Under Article 11 RPBA the board may remit the case to the department whose decision was appealed if there are special reasons for doing so.

The board notes that the examining division decided on novelty and inventive step only in view of document **D3** taken alone. Thus novelty and inventive step have not been assessed in view of either document **D5**, which was also cited as a relevant document in the Supplementary European Search Report, or document **D3** in combination with one or more of the other cited documents.

Under these circumstances, the board does not consider it appropriate to decide on the issues of novelty and inventive step of the auxiliary request having regard to document **D5** and the further cited documents without a decision of the examining division. Thus the board decides to remit the case to the examining division for further prosecution on the basis of the auxiliary request.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division for further prosecution.

The Registrar:

The Chair:



K. Götz-Wein

A. Ritzka

Decision electronically authenticated