

INVESTIGATION REPORT	Preliminary ☐
	Final ☒

Accident ☐

Incident ☒

Reference		Commercial File	N/A
Accident / Incident report	RIs 2017 / 033	Preliminary Information report A(I)	N/A

Data				
Date of occurrence	Occurrence place		Operator	
21-02-2017	Porto Rico		Helicorp Inc.	
Aircraft type	S/N		Registration	
AS350B3	3228		N413LP	
Engine type	S/N	TSN	TSO	
ARRIEL 2B	22082	1809	N/A	
Accessories				
Designation, P/N	S/N	Work performed	TSN	TSO
P/N: 70BMN01030	520	Memory download	Unk	N/A
Circumstances reported to SAFRAN HELICOPTER ENGINES				
While performing an autorotation training flight, during the power recovery phase, the pilot reported an overspeed and completed the autorotation by carrying out a hard landing. On the ground, the presence of fire was observed in the engine compartment. It was contained thanks to extinguishers.				
Conclusion				
The DECU data was downloaded successfully. Nevertheless the incident event contexts were not available. The 4 discrepancy blocks were registered within 12 seconds. The first one which registered (N1) has no effect on the control system behavior which remains in automatic mode. Then the loss of the two N2 sensors led to a total failure of the control mode. The engine was operating with no discrepancy before the event.				

VALIDATION		APPROVAL	
DATE	Validated by	DATE	Validated by
May 31 2017	DZSTE A	May 31 2017	DZS / TEA

1 INTRODUCTION

The Digital Engine Control Unit (DECU), part number 70BMN01030, s/n 520, was on-board helicopter AS350B3 registration N413LP which suffered an accident in Porto Rico on 21 February 2017.

The DECU was brought to Safran HE by a Bureau d'Enquête et Analyse pour l'Aviation Civile (BEA) representative for data download. This report details the information that could be extracted.

Note: the DECU is not a « black box » data recorder such as found on civilian airliners for example. The recorded data is intended for maintenance purposes only.

The DECU is capable of recording 32 blocks (events) of information. Each block is identified by a block number and contains a DECU power-up number, the time since the last DECU power-up and up to eight "failure codes". One or more "failure codes" may be recorded whenever a discrepancy is encountered.

Based on the DECU power-up number and the time since the last DECU power-up, it is possible to determine the blocks associated with the most recent flight.

When a new block is recorded the oldest one is erased.

1.1 DATE & LOCATION OF THE DECU DOWNLOAD

Date : 3 May 2017

Location : SafranHE, Bordes plant, France

1.2 ATTENDEES

The following organisations were present during the DECU download :

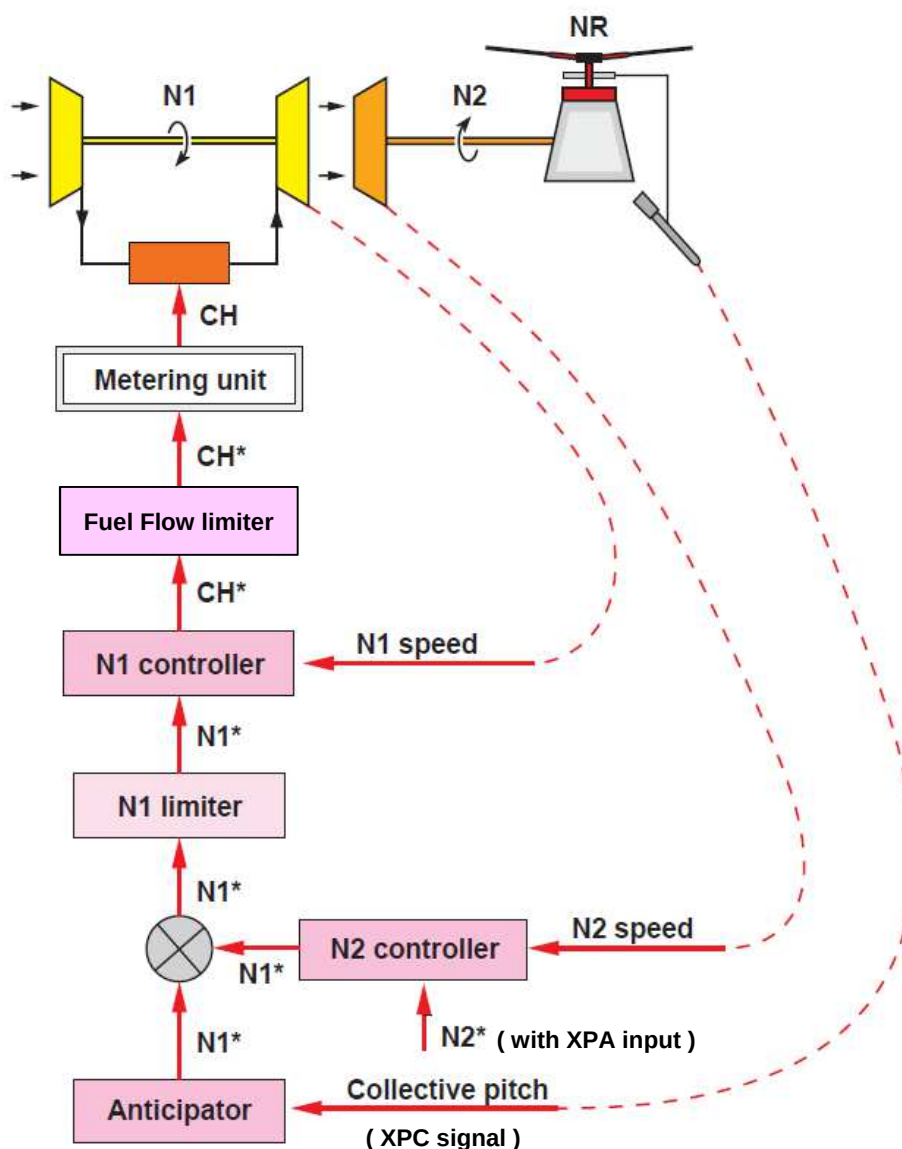
- Bureau d'Enquêtes et d'Analyses pour l'Aviation Civile (BEA)
- Safran Helicopter Engines

1.3 OTHER INFORMATION

Two cameras filmed the helicopter's last moments of the flight. One video shows the helicopter coming to land in a slight slope when it suddenly rose and then landed with smoke. The second one, from the left side of the helicopter shows smoke and fire on the rear part of the cowlings/ engine compartment.

1.4 BRIEF OVERVIEW OF ENGINE CONTROL

The DECU aims to maintain the Power Turbine speed (N2) and hence the rotor speed (NR) at nominal value. It does so by assessing the speed (N1), and hence the power, delivered by the Gas Generator. The target N1 is obtained by modifying the fuel flow to the engine. Actions on the collective pitch lever (XPC signal) and/or Yaw pedals (XPA signal) can have an effect on the target N1 and fuel flow. Action on the twist grip has an effect on the fuel flow.



2 DECU'S PRELIMINARY CHECKS

2.1 VISUAL CHECKS

The DECU came in a protective antistatic wrapping. Once opened, the connectors were checked. On J1 connector, the green “carpet” was found cracked. On J3 connector one pin was found slightly bent. It was straightened.



2.2 ELECTRICAL CHECKS (SEE APPENDIX 2 FOR FULL RESULTS)

Prior to downloading any information, electrical checks were performed on the DECU's connectors to check for potential internal damage.

The electrical check results were satisfactory and the download could go ahead.

3 DATA DOWNLOAD

3.1 SET-UP

The DECU download was achieved with the help of the specific Engine Interface Software TL0248G108. The software had been installed on a computer previously.

A separate “slave” DECU was connected to the computer through cables connected to an electrical cabinet in order to check the proper operation of the TL0248G108 software.

The DECU is powered by a 28V power supply and connected to an electrical cabinet that simulates an engine's sensors' inputs.



3.2 DATA DOWNLOAD

DECU s/n 520 was connected to the electrical cabinet and the TL0248G108 software was started.

The event contexts and the failure contexts were downloaded (see attached files).

3.3 EVENT

32 events are available but the power-on time is wrong and is always at 65535. So we cannot use it. In relation with the diagnostic time (4407 seconds = 1h 13mn 27sec) and the VEMD time (1h 13mn 18 sec) we know that the four blocks 12/32 to 15/32 were recorded at the time of the accident.

3.3.1 Block 15/32

This bloc is the first registered during the event at time 4407 seconds. It has two messages:

T1 measurement / OSS: this is an information delivered by the operating system but it is not a discrepancy.

N1 measurement alternator / AS :

This discrepancy is in relation with one of the gas generator speed measurement. The control system includes two equipment to perform this measure of speed : 1 sensor and 1 alternator.

The discrepancy is raised by three possibilities:

- either the N1 measurement is above 111%
- or N1 variation measurement is above 100%N1 / sec
- or the difference between the two measures is greater than 3%.

The control system keeps controlling the engine in automatic mode in case of a breakdown of a single speed measurement (redundancy failure).

3.3.2 Block 14/32

This block was recorded 2 seconds after the previous one at time 4409 seconds. It has three messages:

N1 measurement alternator :

This message shows that the discrepancy above-mentioned is still present at this time.

N2 measurement sensor1 / AS :

This message indicates a discrepancy with the Power Turbine speed measurement. It occurs when :

- the value is out of limits
- or the rate of change is out of limits,
- or if the difference between both measurements is more than 3%.

This failure can range from loss of redundancy (level Fail 0) to total invalidity of the signal (level Fail 3). In this case, N2 reached level Fail 3. In this situation, the control software declares a red Gov signal.

In relation with VEMD data we assume that N2 went out of maximum limit (141%)

N2 measurement sensor2 / AS :

Idem sensor1

The consequence of the loss of the two N2 sensors is a total discrepancy of the control system.

3.3.3 Block 13/32

This block was recorded 2 seconds after the previous one at time 4411 seconds. It has the three previous discrepancies meaning they are still present at this time and the two following new ones:

Raw torque measurement/ AS :

This message is issued when

- the raw torque is out of limits [-5.8% / 175%]
- or its gradient is above than 2500 daNm / sec.

This failure level is level Fail 2 : the control system keeps controlling the engine in automatic mode with a degraded mode indication (amber GOV).

Torque slope measurement/ AS :

This message is issued when the resistor (Torque slope) measurement is out of limits.

This failure is of level 1: the control system keeps controlling the engine in automatic mode in case of a breakdown of a Torque slope detection after the EECU power-up (redundancy failure).

3.3.4 Block 12/32

This block was recorded 11 seconds after the previous one at time 4422 seconds. It has the five previous discrepancies meaning they are still present at this time and the three following new ones:

E/L ARR / AS
E/L RAL / AS
E/L VOL / AS

These messages are in relation with a selector three positions breakdown [Stop/Idle/Flight]: all three messages are issued together.

This message is issued when :

- no input is received
- or more than one input (stop, idle, or flight) is selected.

This failure is of level 2 : the control system keeps controlling the engine in automatic mode with a degraded mode indication (amber GOV).

The engine control mode is Flight when the breakdown occurs in Flight or Idle.

3.4 DISCREPANCIES CONTEXTS

The DECU registers 8 discrepancies contexts associated to the last eight events. In each discrepancy context are registered engines data at the time of the event.

The eight contexts were registered between time 0 seconds and time 156 seconds whereas the first event was registered at time 4407 seconds.

So we assume that more than eight powering-up were performed after the event. So there is no data available in relation with the event.

APPENDIX 1

Electrical Check Results

30 Mai 2017

Procédure de test d'isolement des calculateurs Fadec B avant mise sous tension.

RIS2017033 - DECU SN 520 ARRIEL2B P22082

But :

S'assurer de l'absence de court circuit sur les entrées / sorties des ressources liées aux faisceaux hélicoptère (J202 et J204) avant début de l'expertise.

Moyens d'essais :

- deux boîtes de coupure J202 et J204
- multimètre de table
- cordons de test

Tests :

Contrôle de l'alimentation 28V voie A:

Après branchement des boîtes de coupure au calculateur, vérifier :

Connecteurs		Impédance théorique	Impédance mesurée
J2-55 (commun de la mesure)	J2-54 (point chaud de la mesure)	> 100Ω	330kΩ

Contrôle de l'alimentation 28V voie B:

Connecteurs		Impédance théorique	Impédance mesurée
J4-62 (commun de la mesure)	J4-63 (point chaud de la mesure)	> 100Ω	2,57Ω

Contrôle de l'alimentation 28V voyant voie B:

Connecteurs		Impédance théorique	Impédance mesurée
J4-3 (commun de la mesure)	J4-2 (point chaud de la mesure)	> 100Ω	91Ω

Contrôle de l'alimentation 28V survitesse:

Connecteurs		Impédance théorique	Impédance mesurée
J4-58 (commun de la mesure)	J4-51 (point chaud de la mesure)	> 100Ω	141Ω

Commande de puissance :

Connecteurs		Impédance théorique	Impédance mesurée
J4-24	J4-63	>1MOhm	2.1 MΩ
J4-24	J4-62	>1MOhm	19

Sorties commandes de voyants:

Connecteurs		Impédance théorique	Impédance mesurée
J4-5	J4-3	>1MOhm	28 MΩ
J4-7	J4-3	>1MOhm	28
J4-11	J4-3	>1MOhm	22
J4-12	J4-3	>1MOhm	28
J4-14	J4-3	>1MOhm	28
J4-15	J4-3	>1MOhm	28
J4-20	J4-3	>1MOhm	28
J4-23	J4-3	>1MOhm	28
J4-32	J4-3	>1MOhm	∞
J4-40	J4-3	>1MOhm	28
J4-41	J4-3	>1MOhm	∞
J4-5	J4-2	>1MOhm	∞
J4-7	J4-2	>1MOhm	∞
J4-11	J4-2	>1MOhm	∞
J4-12	J4-2	>1MOhm	48
J4-14	J4-2	>1MOhm	44
J4-15	J4-2	>1MOhm	40
J4-20	J4-2	>1MOhm	30
J4-23	J4-2	>1MOhm	23
J4-32	J4-2	>1MOhm	∞
J4-40	J4-2	>1MOhm	14
J4-41	J4-2	>1MOhm	∞

APPENDIX 2

Event

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 1/32

Désignation Unité Valeur

Diagnostic time s 8

Block number 1

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - FMU resolver measurement / AS;DECU;

Panne 3 - E/L PVD / AS;DECU;

Panne 4 - N2 measurement sensor1 / AS;N2 sensor 1;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:01 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 2/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 2

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - T4 Measurement / AS;T4 Sensor;

Panne 3 - Torque slope measurement / AS;Torque slope resistance;

Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:01 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 3/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 3

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - T4 Measurement / AS;T4 Sensor;

Panne 3 - Torque slope measurement / AS;Torque slope resistance;

Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 4/32

Désignation Unité Valeur

Diagnostic time s 2

Block number 4

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T4 Measurement / AS;T4 Sensor;

Panne 2 - Raw torque measurement / AS;Torque sensor;

Panne 3 - Torque slope measurement / AS;Torque slope resistance;

Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 5/32

Désignation Unité Valeur

Diagnostic time s 0

Block number 5

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T4 Measurement / AS;T4 Sensor;
Panne 2 - Raw torque measurement / AS;Torque sensor;
Panne 3 - Torque slope measurement / OSS;Torque slope resistance;
Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 6/32

Désignation Unité Valeur

Diagnostic time s 2

Block number 6

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T4 Measurement / AS;T4 Sensor;
Panne 2 - Raw torque measurement / AS;Torque sensor;
Panne 3 - Torque slope measurement / AS;Torque slope resistance;
Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 7/32

Désignation Unité Valeur

Diagnostic time s 0

Block number 7

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T4 Measurement / AS;T4 Sensor;
Panne 2 - Raw torque measurement / AS;Torque sensor;
Panne 3 - Torque slope measurement / OSS;Torque slope resistance;
Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 8/32

Désignation Unité Valeur

Diagnostic time s 2

Block number 8

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T4 Measurement / AS;T4 Sensor;

Panne 2 - Raw torque measurement / AS;Torque sensor;

Panne 3 - Torque slope measurement / AS;Torque slope resistance;

Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 9/32

Désignation Unité Valeur

Diagnostic time s 0

Block number 9

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T4 Measurement / AS;T4 Sensor;

Panne 2 - Raw torque measurement / AS;Torque sensor;

Panne 3 - Torque slope measurement / OSS;Torque slope resistance;

Panne 4 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 10/32

Désignation Unité Valeur

Diagnostic time s 2

Block number 10

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - Raw torque measurement / AS;Torque sensor;

Panne 2 - Torque slope measurement / AS;Torque slope resistance;

Panne 3 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 11/32

Désignation Unité Valeur

Diagnostic time s 0

Block number 11

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - Raw torque measurement / AS;Torque sensor;

Panne 2 - Torque slope measurement / OSS;Torque slope resistance;

Panne 3 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 12/32

Désignation Unité Valeur

Diagnostic time s 4422

Block number 12

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - Raw torque measurement / AS;Torque sensor;

Panne 2 - Torque slope measurement / AS;Torque slope resistance;

Panne 3 - E/L ARR / AS;DECU;

Panne 4 - E/L RAL / AS;DECU;

Panne 5 - E/L VOL / AS;DECU;

Panne 6 - N1 measurement alternator / AS;DECU;

Panne 7 - N2 measurement sensor1 / AS;DECU;

Panne 8 - N2 measurement sensor 2 / AS;N2 sensor 2;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 13/32

Désignation Unité Valeur

Diagnostic time s 4411

Block number 13

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - Raw torque measurement / AS;DECU;

Panne 2 - Torque slope measurement / AS;Torque slope resistance;

Panne 3 - N1 measurement alternator / AS;DECU;

Panne 4 - N2 measurement sensor1 / AS;DECU;

Panne 5 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 14/32

Désignation Unité Valeur

Diagnostic time s 4409

Block number 14

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - N1 measurement alternator / AS;DECU;

Panne 2 - N2 measurement sensor1 / AS;DECU;

Panne 3 - N2 measurement sensor 2 / AS;DECU;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 15/32

Désignation Unité Valeur

Diagnostic time s 4407

Block number 15

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N1 measurement alternator / AS;DECU;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:02 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 16/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 16

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T1 measurement / OSS;T1 Sensor;
Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 3 - No failure ;No failure;
Panne 4 - No failure ;No failure;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 17/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 17

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T1 measurement / OSS;T1 Sensor;
Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 3 - No failure ;No failure;
Panne 4 - No failure ;No failure;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 18/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 18

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T1 measurement / OSS;T1 Sensor;
Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 3 - No failure ;No failure;
Panne 4 - No failure ;No failure;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 19/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 19

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 20/32

Désignation Unité Valeur

Diagnostic time s 291

Block number 20

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 2 - No failure ;No failure;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 21/32

Désignation Unité Valeur

Diagnostic time s 289

Block number 21

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - Helicopter ARINC / AS;DECU;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 22/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 22

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108**Traitement**

Ack/Status OK Réception : Bonne 23/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 23

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 24/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 24

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 25/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 25

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Événements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 26/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 26

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 27/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 27

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 28/32

Désignation Unité Valeur

Diagnostic time s 11

Block number 28

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:03 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 29/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 29

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;

Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;

Panne 3 - No failure ;No failure;

Panne 4 - No failure ;No failure;

Panne 5 - No failure ;No failure;

Panne 6 - No failure ;No failure;

Panne 7 - No failure ;No failure;

Panne 8 - No failure ;No failure;

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:13:04 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 30/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 30

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;

Panne 1 - T1 measurement / OSS;T1 Sensor;
Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 3 - No failure ;No failure;
Panne 4 - No failure ;No failure;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:04 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 31/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 31

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T1 measurement / OSS;T1 Sensor;
Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 3 - No failure ;No failure;
Panne 4 - No failure ;No failure;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:04 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

Evénements techniques - ARINC 429 - TL0248G108

Traitement

Ack/Status OK Réception : Bonne 32/32

Désignation Unité Valeur

Diagnostic time s 5

Block number 32

Power up number 65535

Fault over flow 1

Panne - Identification;Localisation;
Panne 1 - T1 measurement / OSS;T1 Sensor;
Panne 2 - N2 measurement sensor 2 / AS;N2 sensor 2;
Panne 3 - No failure ;No failure;
Panne 4 - No failure ;No failure;
Panne 5 - No failure ;No failure;
Panne 6 - No failure ;No failure;
Panne 7 - No failure ;No failure;
Panne 8 - No failure ;No failure;
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:13:04 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111241.evt

APPENDIX 3

Discrepancies contexts

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

Ack/Status OK 1/8

[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)

5 1000
65535 30,27
1004,1 0,00
0,00 0,00
1039,8 56,48
0,992 8,36
-1,02 65,00
52,0 0,95
-5,00 0,96
-6,6 14,36
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:14:45 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 1/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1
[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

```

Control mode = INITIALIZATION 0
Control mode = STOP 1
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0
0 0
0 0
0 0
0 0
MANUAL mode 0
0 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
0 0
TOTAL fault 0
0 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
0 0
TOTAL fault 0
0 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
0 0
TOTAL fault 0
0 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70B
03/05/2017 11:14:45 C:\TURBOMECA\TL02

```

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 1/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

0 0

0 0

Neutral position input 1

STOP discrete 1

FLIGHT discrete 0

```

IDLE discrete 0

```

0 0

MANUAL discrete 0

0 0

P/PI input 0
Bleed valve position input 1

Ble
0.0

0	0
0	0

0	0
0	0

0	0
0	0

0 0
Sand filter active input 0

Sand
@ @

0 0
0 0

Neutral position input 1

Neutral position
STOP discrete 1

STOP discrete 1
FLIGHT discrete 0

FLIGHT discrete
IDLE discrete 0

```

IDLE discrete 0
0 0

```

```

0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:45 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

```

Ack/Status OK 1/8
[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1
Watchdog trip 0
N2 trim fault 0
Start selector fault 0
0 0
Collective pitch fault 0
Raw T4 fault 1
T0 helicopter fault 0
P3 fault 0
Raw torque fault 0
T4 conformation fault at power-up 0
Torque conformation fault at power-up 1
T4 conformation fault after power-up 0
Torque conformation fault after power-up 0
EECU internal fault 0
P3 drift or engine flame-out 0
P0 engine fault 0
Fuel metering valve resolver fault 0
Stepper motor fault 0
Bleed valve fault 0
T4 helicopter fault 0
N2 B fault 1
N1 B fault 0
N2 A fault 0
N1 A fault 0
P0 helicopter fault 0
No ARINC message from helicopter 0
Alternator fault 0
28 volts fault 0
P0 incoherence 0
Stop electro-valve fault 0
Stepper motor serious fault 0
Real time software fault 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:45 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

```

Ack/Status OK 2/8
[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)
10 1000
65535 30,27
1004,1 0,00
0,00 0,00
35,6 56,48
0,998 7,40
-0,94 65,00
52,0 0,95
-5,00 0,96

```

-6,6 14,35
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:45 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 2/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1

[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

```

0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:45 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 2/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

```

0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0

```

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

Ack/Status OK 2/8

[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1

```

Watchdog trip 0
N2 trim fault 0
Start selector fault 0
0 0
Collective pitch fault 0
Raw T4 fault 1
T0 helicopter fault 0
P3 fault 0
Raw torque fault 0
T4 conformation fault at power-up 0
Torque conformation fault at power-up 1
T4 conformation fault after power-up 0
Torque conformation fault after power-up 0

```

```
EECU internal fault 0
P3 drift or engine flame-out 0
P0 engine fault 0
Fuel metering valve resolver fault 0
Stepper motor fault 0
Bleed valve fault 0
T4 helicopter fault 0
N2 B fault 1
N1 B fault 0
N2 A fault 0
N1 A fault 0
P0 helicopter fault 0
No ARINC message from helicopter 1
Alternator fault 0
28 volts fault 0
P0 incoherence 0
Stop electro-valve fault 0
Stepper motor serious fault 0
Real time software fault 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan
```

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

Ack/Status OK 3/8

```
[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)
10 1000
65535 30,02
1004,1 0,00
0,00 0,00
275,9 56,48
0,998 7,46
-1,00 65,00
52,0 0,95
-5,00 0,96
-6,6 14,36
0,00 0,00
0,00
```

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 3/8

```
[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1
[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1
Engine bench mode 0
Self test or stepper motor test in progress 0
Self test terminated 1
Control mode = INITIALIZATION 0
Control mode = STOP 1
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0
0 0
Engine bench mode 0
Self test or stepper motor test in progress 0
Self test terminated 1
Control mode = INITIALIZATION 0
Control mode = STOP 1
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0
0 0
Engine bench mode 0
```

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 3/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

0 0

0 0

Neutral position input 1

STOP discrete 1

FLIGHT discrete 0

IDLE discrete 0

0 0

MANUAL discrete 0

0 0

P/PI input 0

Bleed valve position input 1

0 0

0 0

0 0

0 0

Sand filter active input 0

0 0

0 0

Neutral position input 1

STOP discrete 1

FLIGHT discrete 0

IDLE discrete 0

```

0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

```

Ack/Status OK 3/8
[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1
Watchdog trip 0
N2 trim fault 0
Start selector fault 0
0 0
Collective pitch fault 0
Raw T4 fault 1
T0 helicopter fault 0
P3 fault 0
Raw torque fault 0
T4 conformation fault at power-up 0
Torque conformation fault at power-up 1
T4 conformation fault after power-up 0
Torque conformation fault after power-up 0
EECU internal fault 0
P3 drift or engine flame-out 0
P0 engine fault 0
Fuel metering valve resolver fault 0
Stepper motor fault 0
Bleed valve fault 0
T4 helicopter fault 0
N2 B fault 1
N1 B fault 0
N2 A fault 0
N1 A fault 0
P0 helicopter fault 0
No ARINC message from helicopter 1
Alternator fault 0
28 volts fault 0
P0 incoherence 0
Stop electro-valve fault 0
Stepper motor serious fault 0
Real time software fault 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

```

Ack/Status OK 4/8
[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)
156 1000
65535 30,47
1004,1 0,00
0,00 0,00
1039,8 56,48
1,004 7,50
-1,04 65,00

```

52,0 0,95
-5,00 0,96
-6,6 14,38
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:46 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 4/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1
[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 4/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

0 0
0 0

Neutral position input 1

STOP discrete 1

FLIGHT discrete 0

IDLE discrete 0

0 0

MANUAL discrete 0

0 0

P/PI input 0

Bleed valve position input 1

0 0

0 0

0 0

0 0

Sand filter active input 0

0 0

0 0

Neutral position input 1

STOP discrete 1

FLIGHT discrete 0

IDLE discrete 0

0 0

MANUAL discrete 0

0 0

P/PI input 0

Bleed valve position input 1

0 0

0 0

0 0

0 0

Sand filter active input 0

0 0

0 0

Neutral position input 1

STOP discrete 1

FLIGHT discrete 0

IDLE discrete 0

0 0

MANUAL discrete 0

0 0

P/PI input 0

Bleed valve position input 1

0 0

0 0

0 0

0 0

Sand filter active input 0

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

Ack/Status OK 4/8

[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1

Watchdog trip 0

N2 trim fault 0

Start selector fault 0

0 0

Collective pitch fault 0

Raw T4 fault 1

T0 helicopter fault 0

P3 fault 0

Raw torque fault 0

T4 conformation fault at power-up 0

Torque conformation fault at power-up 1

T4 conformation fault after power-up 0
Torque conformation fault after power-up 0
EECU internal fault 0
P3 drift or engine flame-out 0
P0 engine fault 0
Fuel metering valve resolver fault 0
Stepper motor fault 0
Bleed valve fault 0
T4 helicopter fault 0
N2 B fault 1
N1 B fault 0
N2 A fault 0
N1 A fault 0
P0 helicopter fault 0
No ARINC message from helicopter 0
Alternator fault 0
28 volts fault 0
P0 incoherence 0
Stop electro-valve fault 0
Stepper motor serious fault 0
Real time software fault 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

Ack/Status OK 5/8

[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)
0 0
0 0,00
0,0 0,00
0,00 0,00
0,0 0,00
0,000 0,00
0,00 0,00
0,0 0,00
0,00 0,00
0,0 0,00
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 5/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1
[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1
Engine bench mode 0
Self test or stepper motor test in progress 0
Self test terminated 0
Control mode = INITIALIZATION 0
Control mode = STOP 0
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0
0 0
Engine bench mode 0
Self test or stepper motor test in progress 0
Self test terminated 0
Control mode = INITIALIZATION 0
Control mode = STOP 0
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0

```

0 0
Engine bench mode 0
Self test or stepper motor test in progress 0
Self test terminated 0
Control mode = INITIALIZATION 0
Control mode = STOP 0
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0
0 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 0
Failure with no effect on control 0
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 0
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 0
Failure with no effect on control 0
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 0
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 0
Failure with no effect on control 0
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 0
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 5/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

```

0 0
0 0
Neutral position input 0
STOP discrete 0
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 0
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 0
STOP discrete 0

```

```

FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 0
0 0
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 0
STOP discrete 0
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 0
0 0
0 0
0 0
0 0
Sand filter active input 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

Ack/Status OK 5/8

[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1

Watchdog trip 0

N2 trim fault 0

Start selector fault 0

0 0

Collective pitch fault 0

Raw T4 fault 0

T0 helicopter fault 0

P3 fault 0

Raw torque fault 0

T4 conformation fault at power-up 0

Torque conformation fault at power-up 0

T4 conformation fault after power-up 0

Torque conformation fault after power-up 0

EECU internal fault 0

P3 drift or engine flame-out 0

P0 engine fault 0

Fuel metering valve resolver fault 0

Stepper motor fault 0

Bleed valve fault 0

T4 helicopter fault 0

N2 B fault 0

N1 B fault 0

N2 A fault 0

N1 A fault 0

P0 helicopter fault 0

No ARINC message from helicopter 0

Alternator fault 0

28 volts fault 0

P0 incoherence 0

Stop electro-valve fault 0

Stepper motor serious fault 0

Real time software fault 0

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

Ack/Status OK 6/8

[074] PowOnTime (sec) [306] Power-on time counter (h)

[076] Number of power-on [213] T0 helicopter (DegC)

[212] P0 engine (mbar) [053] Torque (%)

[346] N1 (%) [344] N2 filtre (%)

[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)

[264] P3 (bar) [332] XR (Deg)

[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)

[007] Flow datum (l/h) [232] Torque conformation slope

[235] Torque conformation offset (%) [233] T4 conformation slope

[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)

[066] dN1/dt (%) [203] dN2/dt (%)

[327] N1 max since power-on (%)

4 1000

65535 15,15

1004,1 0,00

0,00 0,00

1039,8 56,48

0,998 -4,02
-1,59 65,00
52,0 0,95
-5,00 0,96
-6,6 14,34
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)

03/05/2017 11:14:47 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 6/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1

[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1

Engine bench mode 0

Self test or stepper motor test in progress 1

Self test terminated 0

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

```

0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:48 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 6/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

```

0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0

```

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
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Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

Ack/Status OK 6/8

[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1

```

Watchdog trip 0
N2 trim fault 0
Start selector fault 0
0 0
Collective pitch fault 0
Raw T4 fault 1
T0 helicopter fault 0
P3 fault 0
Raw torque fault 0

```

T4 conformation fault at power-up 0
Torque conformation fault at power-up 1
T4 conformation fault after power-up 0
Torque conformation fault after power-up 0
EECU internal fault 0
P3 drift or engine flame-out 0
P0 engine fault 0
Fuel metering valve resolver fault 0
Stepper motor fault 0
Bleed valve fault 0
T4 helicopter fault 0
N2 B fault 1
N1 B fault 0
N2 A fault 0
N1 A fault 0
P0 helicopter fault 0
No ARINC message from helicopter 1
Alternator fault 0
28 volts fault 0
P0 incoherence 0
Stop electro-valve fault 0
Stepper motor serious fault 0
Real time software fault 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:48 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

Ack/Status OK 7/8

[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)

4 1000
65535 30,23
1005,3 0,00
0,00 0,00
1039,8 56,48
0,998 8,07
-0,91 65,00
52,0 0,95
-5,00 0,96
-6,6 14,37
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
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Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 7/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1
[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1

Engine bench mode 0
Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

```

0 0
PROPORTIONAL mode 0
0 0
Engine bench mode 0
Self test or stepper motor test in progress 0
Self test terminated 1
Control mode = INITIALIZATION 0
Control mode = STOP 1
Control mode = START 0
Control mode = N1 IDLE 0
Control mode = FREEZE 0
Control mode = RUN UP 0
Control mode = FLIGHT 0
Control mode = EXTINCTION 0
0 0
Bleed valve shut off 0
0 0
PROPORTIONAL mode 0
0 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:48 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan
Contexte de panne - ARINC 429 - TL0248G108
Entrées Logiques
Ack/Status OK 7/8
[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0

```

Neutral position input 1
STOP discrete 1
 FLIGHT discrete 0
 IDLE discrete 0
 0 0
 MANUAL discrete 0
 0 0
 P/PI input 0
Bleed valve position input 1
 0 0
 0 0
 0 0
 0 0
 Sand filter active input 0
 0 0
 0 0
Neutral position input 1
STOP discrete 1
 FLIGHT discrete 0
 IDLE discrete 0
 0 0
 MANUAL discrete 0
 0 0
 P/PI input 0
Bleed valve position input 1
 0 0
 0 0
 0 0
 0 0
 Sand filter active input 0
 Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
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Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

Ack/Status OK 7/8
[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1
 Watchdog trip 0
 N2 trim fault 0
 Start selector fault 0
 0 0
 Collective pitch fault 0
Raw T4 fault 1
 T0 helicopter fault 0
 P3 fault 0
 Raw torque fault 0
 T4 conformation fault at power-up 0
Torque conformation fault at power-up 1
 T4 conformation fault after power-up 0
 Torque conformation fault after power-up 0
 EECU internal fault 0
 P3 drift or engine flame-out 0
 P0 engine fault 0
 Fuel metering valve resolver fault 0
 Stepper motor fault 0
 Bleed valve fault 0
 T4 helicopter fault 0
N2 B fault 1
 N1 B fault 0
 N2 A fault 0
 N1 A fault 0
 P0 helicopter fault 0
 No ARINC message from helicopter 0
 Alternator fault 0
 28 volts fault 0
 P0 incoherence 0
 Stop electro-valve fault 0
 Stepper motor serious fault 0
 Real time software fault 0
 Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
 03/05/2017 11:14:48 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

Contexte de panne - ARINC 429 - TL0248G108

Param. numériques

Ack/Status OK 8/8
[074] PowOnTime (sec) [306] Power-on time counter (h)
[076] Number of power-on [213] T0 helicopter (DegC)
[212] P0 engine (mbar) [053] Torque (%)
[346] N1 (%) [344] N2 filtre (%)
[260] T4 conforme (DegC) [336] Rudder bar anticipation (%)
[264] P3 (bar) [332] XR (Deg)
[237] Actuator position offset (Deg) [054] Corrected N1 datum (%)
[007] Flow datum (l/h) [232] Torque conformation slope
[235] Torque conformation offset (%) [233] T4 conformation slope
[234] T4 conformation offset (DegC) [056] Collective pitch (XPC) (%)
[066] dN1/dt (%) [203] dN2/dt (%)
[327] N1 max since power-on (%)
 5 1000
 65535 15,15
 1004,1 66,51

0,00 0,00
1039,8 56,48
0,998 2,71
-0,27 65,00
52,0 0,95
-5,00 0,96
-6,6 14,36
0,00 0,00
0,00

Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
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Contexte de panne - ARINC 429 - TL0248G108

Sorties Logiques

Ack/Status OK 8/8

[371] Logical output 1 at cycle n-1 [353] Logical output 1 at cycle n [372] Logical output 1 at cycle n+1

[373] Logical output 2 at cycle n-1 [354] Logical output 2 at cycle n [374] Logical output 2 at cycle n+1

Engine bench mode 0

Self test or stepper motor test in progress 1

Self test terminated 0

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

Engine bench mode 0

Self test or stepper motor test in progress 0

Self test terminated 1

Control mode = INITIALIZATION 0

Control mode = STOP 1

Control mode = START 0

Control mode = N1 IDLE 0

Control mode = FREEZE 0

Control mode = RUN UP 0

Control mode = FLIGHT 0

Control mode = EXTINCTION 0

0 0

Bleed valve shut off 0

0 0

PROPORTIONAL mode 0

0 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

0 0

AUTO mode 1

0 0

MIXED mode 0

Controlled start accessories 0

0 0

0 0

MANUAL mode 0

0 0

0 0

Degraded control 1

Failure with no effect on control 1

0 0

0 0

TOTAL fault 0

0 0

```

0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
0 0
0 0
MANUAL mode 0
0 0
0 0
Degraded control 1
Failure with no effect on control 1
0 0
0 0
TOTAL fault 0
0 0
0 0
AUTO mode 1
0 0
MIXED mode 0
Controlled start accessories 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:49 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Entrées Logiques

Ack/Status OK 8/8

[375] Logical input at cycle n-1 [355] Logical input at cycle n [376] Logical input at cycle n+1

```

0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
0 0
0 0
Neutral position input 1
STOP discrete 1
FLIGHT discrete 0
IDLE discrete 0
0 0
MANUAL discrete 0
0 0
P/PI input 0
Bleed valve position input 1
0 0
0 0
0 0
0 0
Sand filter active input 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:49 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

```

Contexte de panne - ARINC 429 - TL0248G108

Mots pannes

Ack/Status OK 8/8

[360] Fault flag 1 at cycle n+1 [361] Fault flag 2 at cycle n+1

```

Watchdog trip 0
N2 trim fault 0
Start selector fault 0
0 0
Collective pitch fault 0
Raw T4 fault 1
T0 helicopter fault 0

```

P3 fault 0
Raw torque fault 0
T4 conformation fault at power-up 0
Torque conformation fault at power-up 1
T4 conformation fault after power-up 0
Torque conformation fault after power-up 0
EECU internal fault 0
P3 drift or engine flame-out 0
P0 engine fault 0
Fuel metering valve resolver fault 0
Stepper motor fault 0
Bleed valve fault 0
T4 helicopter fault 0
N2 B fault 1
N1 B fault 0
N2 A fault 0
N1 A fault 0
P0 helicopter fault 0
No ARINC message from helicopter 0
Alternator fault 0
28 volts fault 0
P0 incoherence 0
Stop electro-valve fault 0
Stepper motor serious fault 0
Real time software fault 0
Base de données : TL0248-20140825144540.mdb (70BMB01030 - 30/03/2009 11:07:33 - OPERATEUR)
03/05/2017 11:14:49 C:\TURBOMECA\TL0248G108\DATA\70BMB01030_520_03052017111431.pan

