AMCS Functional description logbook and maintenance system

Alewijnse Netherlands B.V.

FID

This functional description describes briefly the principles of:

- AMCS interfaces with DeepBlue (maintenance system)
- AMCS data export for Digital log book

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Revision	Issue date	Content of Modification	Author
1.00	1-2-2024	First issue after meeting OT/YARD/Alewijnse	S. de Leeuw
1.01	28-06-2024	IDEA interface: Decreased baudrate; Added unit. Logbook: Replaced separator from "," to "|". Updated file name format.	S. de Leeuw
1.02	21-08-2025	Logbook: DI, DO, TK added. IDEA interface: changed to Deepblue, Modbus protocol.	S. de Leeuw

	Name	Position	Date	Signature
Written by:	S. de Leeuw	Software engineer	1-2-2024	
Verified by:	R. Judele	Technical project manager	1-2-2024	
Approved by:			1-2-2024	

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1 DEEPBLUE INTERFACE (MAINTENANCE SYSTEM)

1.1 Principle

Data will be communicated via Modbus protocol. Alewijnse is the Modbus RTU master* in the communication. It will write data to the registers at the Deepblue Modbus slave. A Moxa Mgate MB3270I Modbus gateway will be used to convert Modbus RTU to Modbus TCP/IP (serial to ethernet). This conversion prevents that the AMCS network will be coupled directly to the DeepBlue network.

*Note: Modbus master (RTU) == Modbus (TCP) Client, Modbus (RTU) Slave == Modbus (TCP) Server

Data will be send from a CM PTP communication module on a AMCS panel in the wheelhouse

1.2 Data

Following data will be send to maintenance server:

- All analog inputs values (“AI”)
  Amount: 660
- All analog output values (“AO”)
  Amount: 44
- Hour counters (“HC”) which are present on the hour counter mimic
  Amount: 51
- All tank volumes (“TK”)
  Amount: 52

1.3 Modbus addressing

All data will be send by means of Modbus FC16. FC3/FC16 are registers in 40000 range (Holding Registers)
When using a 0-base modbus offset: 0 = 40.000
When using a 1-base modbus offset: 0 = 40.001

1.3.1 AI

Data type: Floating point (4 bytes, 2 registers)
AI.0000 ; register offset 0, 1
AI.0001 ; register offset 2, 3
AI.0002 ; register offset 4, 5
..
AI.0659; register offset 1318, 1319

1.3.2 AO

Data type: Floating point (4 bytes, 2 registers)
AO.0000 ; register offset 2000, 2001
AO.0001 ; register offset 2002, 2003
AO.0002 ; register offset 2004, 2005
..
AO.0043..; register offset 2086, 2087

1.3.3 HC (see Appendix A for an overview of all Hour counters)

Data type: Double Word (4 bytes, 2 registers)
HC.0171 ; register offset 3000, 3001
HC.0174 ; register offset 3002, 3003
HC.0190 ; register offset 3004, 3005
..
HC.1909; register offset 3100, 3101

1.3.4 TK

Data type: Floating point (4 bytes, 2 registers)
TK.0000 ; register offset 4000, 4001
TK.0001 ; register offset 4002, 4003
TK.0002 ; register offset 4004, 4005
..
TK.0051 ; register offset 4102, 4103

1.4 Interval

The values of the selected tags will be send each 60 seconds to the DeepBlue server.

2 DATA EXPORT FOR DIGITAL LOG BOOK

2.1 Principle

The scada servers will export a list of values to a CSV file as logs for the “digital log book”.

2.2 Data

Following data will be exported:

- All digital inputs values (“DI”)
  Amount: 2536
- All digital outputs values (“DO”)
  Amount: 376
- All analog inputs values (“AI”)
  Amount: 660
- All analog output values (“AO”)
  Amount: 44
- Hour counters (“HC”) which are present on the hour counter mimic
  Amount: 51
- All tank volumes (“TK”)
  Amount: 52

2.3 Format

The csv files will be saved with a standard format filename: Logbook_<yyyy-mm-dd> <hhmmss> (e.g. “Logbook_2024-06-26 111949”) on “D:\Reports\LogBook” folder on Station1 and Station2. As example, the standard content format of the export is shown below:

```
Tagname|Description|Value|Unit
AMS_AI_0016|DG1 PS enclosure temperature|34.500|°C
AMS_HC_1320|Heat recovery circulation pump 2|105|hr
```

2.4 Interval

The data will be exported each hour.

APPENDIX A – MODBUS ADDRESSING HOUR COUNTERS

Hour counter	Address
HC.0171	3000
HC.0174	3002
HC.0190	3004
HC.0425	3006
HC.0428	3008
HC.0429	3010
HC.0584	3012
HC.0587	3014
HC.0588	3016
HC.0614	3018
HC.0615	3020
HC.0616	3022
HC.0622	3024
HC.0653	3026
HC.0654	3028
HC.0912	3030
HC.0913	3032
HC.0949	3034
HC.0952	3036
HC.1320	3038
HC.1323	3040
HC.1326	3042
HC.1329	3044
HC.1336	3046
HC.1343	3048
HC.1346	3050
HC.1349	3052
HC.1352	3054
HC.1353	3056
HC.1354	3058
HC.1360	3060
HC.1363	3062
HC.1367	3064
HC.1370	3066
HC.1373	3068
HC.1380	3070
HC.1387	3072
HC.1390	3074
HC.1393	3076
HC.1396	3078
HC.1399	3080
HC.1400	3082
HC.1401	3084
HC.1696	3086
HC.1704	3088
HC.1712	3090
HC.1721	3092
HC.1725	3094
HC.1836	3096
HC.1908	3098
HC.1909	3100