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**Quality Assurance and Device Registration**

**Conformance Test Report** **February 2, 2018**

For the:

**Corporation Name** **L-mag Device Type** **0xE2A6**

Prepared for:

**Corporation Name**

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By

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# Executive Summary

On November 29, 2017, the PROFIBUS DP Test Lab at CQC in Beijing, China received the Corporation Name Lmag electromagnetic flowmeter for registration as per CQC *Quality Assurance and Device Registration Procedure*. (FCG PD20012).

This report summarizes testing and compliance assessment of the Corporation Name L-mag electromagnetic flowmeter (Expanded Device Type Code 0xE2A6; Device Revision  0x01; Software Revision 0x01, Hardware Revision 0x01).

The PROFIBUS DP Test Lab at CQC performed 124 tests during the course of assessing the L-mag, and CQC analyzed the data produced.

Based on this testing and analysis, the L-mag complies with the PROFIBUS DP Communication Protocol Requirements.

The  Corporation Name L-mag submitted for registration is a non-burst mode external-powered field device that supports PROFIBUS DP Protocol Revisior  7.

# INTRODUCTION

## Contact Information

Name:

Company:

Address:

Email:

Phone:

## DUT Identification

Manufacturer Name: Corporation Name

Model Name(s): L-mag

Manufacture ID Code (HEX): 0x601E

Expanded Device Type Code (HEX): 0xE2A6

Device ID (HEX): 0x000002

Device Profile (HEX): 0x01

Device Revision: 0x01

Hardware Revision: 0x01

Software Revision: 0x01

PROFIBUS DP Protocol Revision: 7

Burst Mode Support: No

Physical Layers Supported: FSK

FSK Physical Device Category: 4-wire high-impedance transmitter

## Scope

This report summarizes the testing and compliance assessment of the Corporation Name L-mag electromagnetic flowmeter (Expanded Device Type Code 0xE2A6; Device Revision 0x01).

As per the requirements in CQC *Quality Assurance and Device Registration Procedure* (FCG

PD20012), the registration package supplied by Corporation Name was reviewed and audited (see Section 2).

The  L-mag is a wired device and the following tests were performed:

* **DP-V0** - MS0, Sync, Freeze, Fail\_Safe, Auto\_Baud, Set\_Slave\_Add
* **DP-V1** - MS1, Prm\_Block\_Structure, Alarms, Ext\_Prm\_SAP, MS2, I&M
* **DP-V2** - IsoM, Lifesign, DXB Publisher, DXB Subscriber
* **Profiles** - PROFIsafe, PROFIdrive, PROFIBUS PA

The test equipment used during testing is listed in Subsection 1.8. Upon completion of the testing the data and results were assessed for compliance. The results are discussed in Section 3 and Summarized in the Annexes. Conclusions, based on the testing and assessments, are provided in Section 4.

## Overview

The Device Under Test (DUT) is a Corporation Name L-mag electromagnetic flowmeter (Expanded Device Type Code 0xE2A6; Device Revision 0x01). The DUT is a 4-wire high-impedance transmitter as per the *FSK Physical Layer Specification* (HCF\_SPEC-54, FCG TS20054 Revision 9.1). As such, the DUT must be tested per CQC *Quality Assurance and Device Registration Procedure* (FCG PD20012).

The DUT includes an FSK interface that supports current-loop (4-20mA) output as well as PROFIBUS DP signaling. Access to the FSK interface is via a wiring terminal on the device.

On November 29, 2017, the PROFIBUS DP Test Lab at CQC in Beijing, China received the DUT and testing commenced shortly thereafter. Issues were found and an updated device was received and began testing on 3 January, 2018.

This report refers to the DUT with Expanded Device Type Code 0xE2A6, Device Revision 0x01, Software Revision 0x01, and Hardware Revision 0x01.

## Confidentiality

This report is provided for the exclusive use of the Product's Manufacturer. The Manufacturer is authorized to distribute this report only internally and only in its entirety. Any other distribution requires the express written permission of CQC and the Product's Manufacturer.

## References

The following documents provided the basis for conformance testing.

GB/T 20540.1-2006～GB/T 20540.6-2006 Measurement and control digital data communication industrial control system used fieldbus type 3: PROFIBUS specification part 1～6 (idt. IEC 61158 Digital data communication for measurement and control -Filedbus for use in industrial control system – Part 1～ Part 6, Type 3: PROFIBUS)

## Test Equipment

The following equipment was used to perform the Conformance Test:

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Function** | **Name/Type** | **Manufacture** |
| 2 | Master Class 1 | CPU 414-2 | SIEMENS |
| 3 | Master Class 1+2 | PROFIBUS PA Tester 3.5  PROFIboard-PCI PB-IF-2MS | itm  Softing |
| 4 | Master Class 1+2 | PROFIBUS PA Tester 3.5  PROFIboard-PCI PB-IF-2MS | itm  (Softing) |
| 14 | DP Slave | Remote IO: PIO-DI20DO12R2 | Beijing D&S Fieldbus  Technology Co. Ltd |
| 15 | DP Slave | Remote IO: CC-PB-1.0 IO-DO8R5 | Beijing D&S Fieldbus Technology Co. Ltd |
| 16 | DP Slave | Remote IO: ET200M | SIEMENS |
| 17 | DP Slave | Remote IO: 750-343, 466, 402, 554 | WAGO |
| 18 | DP Slave | Frequency converter: VLT 2807 | Danfoss |
| 19 | DP Slave | Reomote IO: LB4005, LB3005, LB5004, LB1008, LB9006 | P+F |
| 20 | DP Slave | Motor Control & Protection Unit: M102-P | ABB |
| 21 | DP Slave | SLIO: IM 053-1DP00 | VIPA |
| 22 | DP Slave | Remote IO: 152-6PH50 | VIPA |
|  | Segment Coupler | DP/PA Coupler (Non-Ex) | SIEMENS |
| 8 | PA Slave | Flowmeter: MFE-S | SIC |
| 10 | PA Slave | Differencial Pressure Transmitter: 264DS | ABB |
| 11 | PA Slave | Temperature Transmitter: TMT 184 | Endress + Hauser |
| 12 | PA Slave | Positioner: SIPART PS2 PA | SIEMENS |
| 13 | PA Slave | Positioner: 3785 | SAMSON |
|  | Bus Monitor | Diagnositics-Monitor | itm |

## Definitions, Acronyms and Symbols

**1.9.1 Definitions**

All terms and phrases unique to DP or critical to understanding this report are defined in this section.

**Send Data with Acknowledge (SDA)**

This service allows an user to send data to a single remote station. If an error

occurred, the data transfer shall be repeated.

**Send Data with No Acknowledge (SDN)**

This service allows an user to transfer data to a single remote station, to many

remote stations (Multicast), or to all remote stations (Broadcast) at the same

time without any confirmation.

**Send and Request Data with Reply (SRD)**

This service allows an user to transfer data to a single remote station and at

the same time to request data from the remote station. If an error occured, the

data transfer shall be repeated.

**Cyclic Send and Request Data with Reply (CSRD)**

This service allows an User to cyclically transfer data to a remote station and

at the same time to request data from the remote station.

**1.9.2 Acronyms and Symbols**

All Symbols and Abbreviations used in this report are listed in this section.

APDU Application Protocol Data Unit

DPDU Data-link Protocol Data Unit

DUT Device Under Test

STO Slave Time-Out

SOM Start Of Message

**1.9.3 Test Result Definitions**

All test results used in this report are listed in this section

**Passed**: The device is conformant.

**Not Applicable**: The test case does not apply to this device.

**Failed**: The device is not conformant.

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# REVIEW OF CONFORMANCE TEST PACKAGE

## Conformance Test Package Contents

The manufacturer supplied registration package was reviewed. A summary of the supplied versus required materials is shown in Table 1.

**Table 1. Summary of Materials Supplied with Registration Package.**

|  |  |  |
| --- | --- | --- |
| Product Registration. PROFIBUS DP Product Exhibit.xls  Properly completed | Yes  Yes |  |
| *PROFIBUS DP Field Device Test Report HCF\_FRM-156, CQC FR20156* | Yes |  |
| The product specification including device specific details as per *Field Device Specification Guide* (HCF\_LIT-18) | Yes | Document: LMAGD001-lit18.doc |
| Sample of device | Yes |  |
| Purchase order for testing and registration fee | Yes |  |
| Other supplied by manufacturer | No |  |

# INDEPENDENT TESTING BY CQC

As per *CQC Quality Assurance and Device Registration Procedure* (CQC PD20012), all devices submitted for registration shall be independently tested by CQC. This Section summarizes the testing performed by CQC, and the resulting findings of CQC.

## DP-V0

MS0, Sync, Freeze, Fail\_Safe, Auto\_Baud, Set\_Slave\_Add.

## DP-V1

MS1, Prm\_Block\_Structure, Alarms, Ext\_Prm\_SAP, MS2, I&M

## DP-V2

IsoM, Lifesign, DXB Publisher, DXB Subscriber.

## Profiles

PROFIsafe, PROFIdrive, PROFIBUS PA

# CONCLUSIONS

The Corporation Name L-mag electromagnetic flowmeter (Expanded Device Type Code  0xE2A6, Device

Revision 0x01) meets all the requirements for registration based on CQC *Quality Assurance and Device Registration Procedure* (FCG PD20012). Testing and analysis of the L-mag demonstrated the product compliance with the PROFIBUS DP Communication Protocol Requirements.

The Corporation Name L-mag submitted for registration supports PROFIBUS DP Protocol Revision 7 as a nonburst mode external-powered electromagnetic flowmeter.

# TEST SUMMARIES

Test Class