Aidon RJ12 HAN Interface

Feature Description

Public

Version 1.4 A

Makes sense.

Contents

1 Preface

1.1 Overview

This document describes the RJ12 HAN interface on Aidon Energy Service Devices (ESD).

The HAN interface in the devices is activated from the Aidon head-end system for direct connected and current transformer connected Meter types.

See the Aidon System Module types that support the integrated RJ12 HAN from Aidon ESD User Manual (REF7).

1.2 References

Reference	Description
REF1	IEC 62056-7-5:2016: Electricity metering data exchange - The DLMS/COSEM suite - Part 7-5: Local data transmission profiles for Local Networks (LN)
REF2	IEC 61334-6:2000: Distribution automation using distribution line carrier systems - Part 6: A-XDR encoding rule
REF3	IEC 62056-46:2002+AMD1:2006 CSV Consolidated version: Electricity metering - Data exchange for meter reading, tariff and load control - Part 46: Data link layer using HDLC protocol
REF4	IEC 62056-5-3: Electricity metering data exchange – The DLMS/COSEM suite – Part 5-3: DLMS/COSEM application layer
REF5	EXCERPT DLMS UA Blue Book: COSEM interface classes and OBIS identification system http://dlms.com/documents/Excerpt_BB12.pdf
REF6	Branschrekommendation för lokalt kundgränssnitt för elmätare v1.2
REF7	Aidon ESD User Manual

2 RJ12 HAN interface

2.1 Role of HAN interface in the AMI system

The role of the HAN interface in the AMI system is to provide near real time information for the customer of their energy usage. The following picture below shows Energy service device where HAN is available on the front of cover.

Figure 1: Integrated HAN interface on Aidon ESD.

2.2 RJ12 HAN interface HW structure

The Aidon RF2 System Modules have a physical HAN interface that is an implementation of the H1 port described in [REF6]. The System Modules hold a female RJ12 connector, where the external HAN device with male RJ12 plug can be connected. The RJ12 connector is available on the front cover of the energy service device. Table 1 shows the pin order of the HAN connector.

Pin	Signal	Description
1	5V	+5V power feed to HAN device (250 mA max.)
2	Data Request	Data request input
3	GND	-
4	NC	Not connected
5	Data	HAN data output (open collector)
6	GND	-

Table 1: HAN interface pinout

The interface is galvanically isolated from mains and Aidon ESD metrology core, as presented in Figure 2.

The +5V power feed to HAN device is controlled by the System Module and can be turned on or off under software control. Maximum current allowed is 250 mA. In the +5V pin there is an overcurrent protection mechanism, which triggers at 280±20 mA. If overcurrent protection triggers, HAN port enters a "hiccup" mode, where +5V power feed is repeatedly turned on for a short time to test, whether the overload condition is still present.

The data request input is activated by HAN device by setting it high (4.0 V/5.0 V/5.5 V, min./nom./max.). The data request input is designed to sink a current of 4.0–10.0 mA when activated. Data request pin is protected against overvoltage, short circuit and negative voltages.

The data output from meter to HAN device is an open collector output. The output low voltage level is max. 1,0V with max. sinking current of 30 mA. Data output is protected against overvoltage, short circuit and negative voltages.

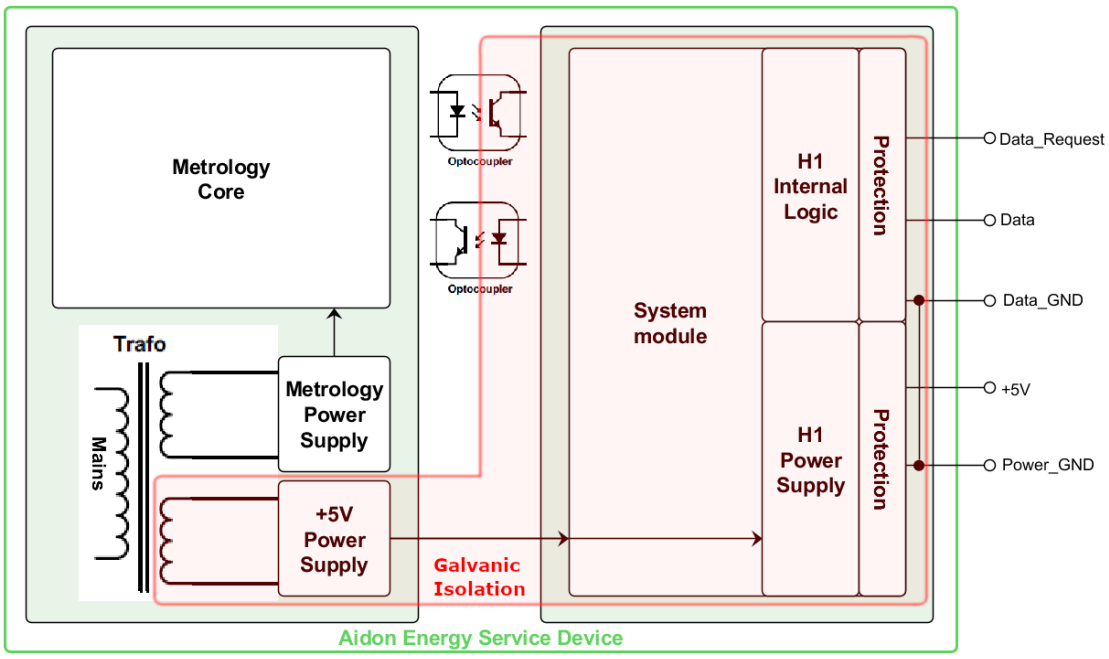

Figure 2: Block diagram of H1 port in Aidon ESD

The maximum cable length allowed to connect to the RJ12 connector is 3 meters. The interface of the HAN device that is connected to the Aidon ESD has to be double isolated from the mains.

3 Swedish HAN interface data profile

The following table lists the available measurements via RJ12 HAN interface that are according to the *Branschrekommendation för lokalt kundgränssnitt för elmätare* [REF6].

Data	Unit
Meter's time and date	N/A
Cumulative hourly active import energy (A+) (Q1+Q4)	kWh
Cumulative hourly active export energy (A-) (Q2+Q3)	kWh
Cumulative hourly reactive import energy (R+) (Q1+Q2)	kVArh
Cumulative hourly reactive export energy (R-) (Q3+Q4)	kVArh
Momentary Active power+ (Q1+Q4)	kW
Momentary Active power - (Q2+Q3)	kW
Momentary Reactive power + (Q1+Q2)	kVAr
Momentary Reactive power - (Q3+Q4)	kVAr
Momentary Active power+ (L1)	kW
Momentary Active power - (L1)	kW
Momentary Active power+ (L2)*	kW
Momentary Active power - (L2)*	kW
Momentary Active power+ (L2)*	kW
Momentary Active power - (L3)*	kW
Momentary Reactive power+ (L1)	kVAr
Momentary Reactive power - (L1)	kVAr
Momentary Reactive power+ (L2)*	kVAr
Momentary Reactive power - (L2)*	kVAr
Momentary Reactive power+ (L2)*	kVAr
Momentary Reactive power - (L3)*	kVAr
Momentary RMS Phase voltage L1	V
Momentary RMS Phase voltage L2*	V
Momentary RMS Phase voltage L3*	V
Momentary RMS Current phase L1	A
Momentary RMS Current phase L2*	A
Momentary RMS Current phase L3*	A

* Not available on 1-phase meters

3.1 RJ12 HAN interface activation

By default, the interface is not activated and even the power supply to the HAN device is not activated. The activation can be done from the Aidon head-end system.

When the HAN interface is activated:

- The power supply is active and power up to 1,25 W can be drawn from the interface
- List is pushed every 10 seconds

3.2 Data format

3.2.1 Data framing

HAN data packets are sent inside an HDLC frame. The following COSEM classes are used:

- Data (class_id 1)
- Register (class_id 3)
- Clock (class_id 9)

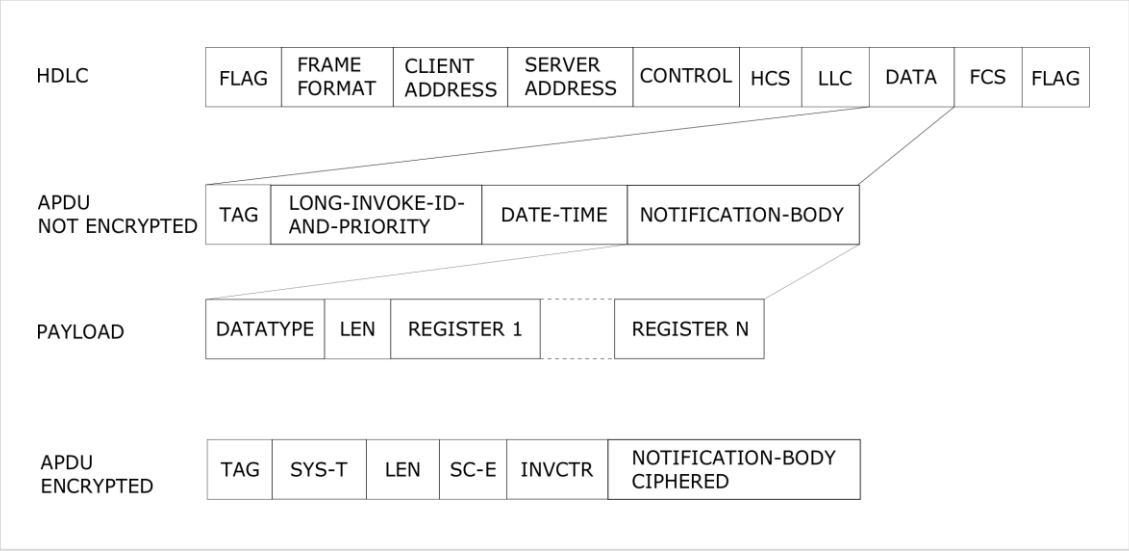

Figure 3: Data format

3.3 Push setup

The following chapters describe the push setups for AIDON_H0001 lists. COSEM objects that do not exist for a specific meter type, are not pushed.

Data	class ID	OBIS code	Attribute
Clock and date in meter	8	0-0:1.0.0.255	1,2
Cumulative hourly active import energy (A+) (Q1+Q4)	3	1-0:1.8.0.255	0
Cumulative hourly active export energy (A-) (Q2+Q3)	3	1-0:2.8.0.255	0
Cumulative hourly reactive import energy (R+) (Q1+Q2)	3	1-0:3.8.0.255	0
Cumulative hourly reactive export energy (R-) (Q3+Q4)	3	1-0:4.8.0.255	0
Momentary Active power+ (Q1+Q4)	3	1-0:1.7.0.255	0
Momentary Active power - (Q2+Q3)	3	1-0:2.7.0.255	0
Momentary Reactive power + (Q1+Q2)	3	1-0:3.7.0.255	0
Momentary Reactive power - (Q3+Q4)	3	1-0:4.7.0.255	0
Momentary Active power+ (L1)	3	1-0:21.7.0.255	0
Momentary Active power - (L1)	3	1-0:22.7.0.255	0
Momentary Active power+ (L2)*	3	1-0:41.7.0.255	0
Momentary Active power - (L2)*	3	1-0:42.7.0.255	0
Momentary Active power+ (L3)*	3	1-0:61.7.0.255	0
Momentary Active power - (L3)*	3	1-0:62.7.0.255	0
Momentary Reactive power+ (L1)	3	1-0:23.7.0.255	0
Momentary Reactive power - (L1)	3	1-0:24.7.0.255	0
Momentary Reactive power+ (L2)*	3	1-0:43.7.0.255	0
Momentary Reactive power - (L2)*	3	1-0:44.7.0.255	0
Momentary Reactive power+ (L3)*	3	1-0:63.7.0.255	0
Momentary Reactive power - (L3)*	3	1-0:64.7.0.255	0
Momentary RMS Phase voltage L1	3	1-0:32.7.0.255	0
Momentary RMS Phase voltage L2*	3	1-0:52.7.0.255	0
Momentary RMS Phase voltage L3*	3	1-0:72.7.0.255	0
Momentary RMS Current phase L1	3	1-0:31.7.0.255	0
Momentary RMS Current phase L2*	3	1-0:51.7.0.255	0
Momentary RMS Current phase L3*	3	1-0:71.7.0.255	0

* Not available on 1-phase meters

3.1 Examples of sent data

3.1.1 List from 3-phase ESD

```
7e a243 41 0883 13 85eb e6e700
  0f 40000000 00
  011b
    0202 0906 0000010000ff 090c 07e30c1001073b28ff8000ff
    0203 0906 0100010700ff 06 00000462 0202 0f00 161b
    0203 0906 0100020700ff 06 00000000 0202 0f00 161b
    0203 0906 0100030700ff 06 000005e3 0202 0f00 161d
    0203 0906 0100040700ff 06 00000000 0202 0f00 161d
    0203 0906 01001f0700ff 10 00000202 0fff 1621
    0203 0906 0100330700ff 10 004b0202 0fff 1621
    0203 0906 0100470700ff 10 00000202 0fff 1621
    0203 0906 0100200700ff 12 09030202 0fff 1623
    0203 0906 0100340700ff 12 09c30202 0fff 1623
    0203 0906 0100480700ff 12 09040202 0fff 1623
    0203 0906 0100150700ff 06 00000000 0202 0f00 161b
    0203 0906 0100160700ff 06 00000000 0202 0f00 161b
    0203 0906 0100170700ff 06 00000000 0202 0f00 161d
    0203 0906 0100180700ff 06 00000000 0202 0f00 161d
    0203 0906 0100290700ff 06 00000462 0202 0f00 161b
    0203 0906 01002a0700ff 06 00000000 0202 0f00 161b
    0203 0906 01002b0700ff 06 000005e2 0202 0f00 161d
    0203 0906 01002c0700ff 06 00000000 0202 0f00 161d
    0203 0906 01003d0700ff 06 00000000 0202 0f00 161b
    0203 0906 01003e0700ff 06 00000000 0202 0f00 161b
    0203 0906 01003f0700ff 06 00000000 0202 0f00 161d
    0203 0906 0100400700ff 06 00000000 0202 0f00 161d
    0203 0906 0100010800ff 06 00995986 0202 0f00 161e
    0203 0906 0100020800ff 06 00000008 0202 0f00 161e
    0203 0906 0100030800ff 06 0064ed4b 0202 0f00 1620
    0203 0906 0100040800ff 06 00000005 0202 0f00 1620
be40 7e
```