S-DAQ User Manual V0.1



SEMES Test&Package Team

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[Revision History]

Version	Date	Change History	Author	Confirmed by
V0.1	20170923	draft	Yong-Seok Jang	Yong-Seok Jang

1. Introduction

S-DAQ is a device for transferring voltage signal and equipment information to an agent PC through wired/wireless communication. Users are advised to read carefully all manuals provided with the package, to ensure safe and efficient use of S-DAQ unit. This manual explains necessary skills and information for setting up and using S-DAQ.

2. S-DAQ Basic Specifications

S-DAQ comprises three boards (CPU Board, DAQ¹ Board, RS-232² Board) and each board contains following components.

1) Board Components

- A. CPU Board: CPU, Power Module, Communication Module (WIFI, LAN)
- B. DAQ Board: ADC Module (40 Channels), FPGA
- C. RS-232 Board: RS-232 (9 Channels)

2) Exterior

The picture is of the S-DAQ board and case. The front panel of S-DAQ has power port (24Vdc), power on/off switch, USB memory port, LAN 2Port, Mini-USB Port, a port for an external antenna. The rear panel houses LED, FG, DAQ Port, RS-232 Port connections.



Figure1. S-DAQ Exterior



Figure2. S-DAQ Front Panel



Figure3. S-DAQ Rear Panel

- A. Power: 24Vdc supply.
- B. WIFI: Port for connecting external antenna.
- C. LANO, LAN1: LAN Port for Ethernet communication with other devices using TCP/IP.
- D. Mini-USB: Developer's Debug Port.
- E. USB: used for S-DAQ FW update.
- F. Power Switch: Power On/Off switch.
- G. ADC: Receives analogue voltage inputs up to 40 channels.
- H. LED (1,2,3): Status LED
- I. RS-232: for serial communications with other devices (supports up to 9 channels).
- J. FG: Frame Ground for noise reductions. Connects to host equipment ground.

3) H/W Specifications

- A. S-DAQ internal H/W has following characteristics.
 - (1) Freescale i.MX6 Qual Core(1 GHz imes 4)
 - 2 Dual Band WIFI, 802.11 a/b/g, Ethernet communications support
 - ③ FPGA(SPARTAN LX4) support

B. DAQ Board H/W Details

ITEM	SPECIFICATION	
ADC CH	SINGLE 40CH, DIFFERENCIAL 20CH 16BIT	
INPUT	MAX +/- 10V	
FILTER	40CH 300KHz LOWPASS FILTER	
SAMPLE RATE	40CH 1KSPS (NORMAL), 5CH 64KSPS (MAX)	
REFERNCE VOLTAGE	4.096V	
ADC CONTROL	SPARTAN-6 FPGA SERIES	
ISOLATION POWER (1)	2W 5V to 7V DC-DC CONVERTER	
ISOLATION POWER (2)	2W 24V to +/- 12V DC-DC CONVERTER	
ISOLATION VOLTAGE	MAX 6500VRMS 1SEC	
ADC I/F	SPI 3.3MHz 5CH	
CPU I/F	SPI 20MHz 1CH	
FPGA PROGRAMMING	SPI 20MHz 1CH	
SUPPLY POWER (1)	3.3V	
SUPPLY POWER (2)	5V	
SUPPLY POWER (3)	24V	
SIZE	100 X 100 X 16 (mm)	

C. CPU Board H/W Details

ITEM	SPECIFICATION		
ADC CH	SINGLE 40CH, DIFFERENCIAL 20CH 16BIT		
INPUT	MAX +/- 10V		
FILTER	40CH 300KHz LOWPASS FILTER		
SAMPLE RATE	40CH 1KSPS (NORMAL), 5CH 64KSPS (MAX)		
REFERNCE VOLTAGE	4.096V		
ADC CONTROL	SPARTAN-6 FPGA SERIES		
ISOLATION POWER (1)	2W 5V to 7V DC-DC CONVERTER		
ISOLATION POWER (2)	2W 24V to +/- 12V DC-DC CONVERTER		
ISOLATION VOLTAGE	MAX 6500VRMS 1SEC		
ADC I/F	SPI 3.3MHz 5CH		
CPU I/F	SPI 20MHz 1CH		
FPGA PROGRAMMING	SPI 20MHz 1CH		
SUPPLY POWER (1)	3.3V		
SUPPLY POWER (2)	5V		
SUPPLY POWER (3)	24V		
SIZE	100 X 100 X 16 (mm)		

D. RS-232 Board H/W Details

ITEM	SPECIFICATION
ADC CH	SINGLE 40CH, DIFFERENCIAL 20CH 16BIT
INPUT	MAX $+/-$ 10V
FILTER	40CH 300KHz LOWPASS FILTER
SAMPLE RATE	40CH 1KSPS (NORMAL), 5CH 64KSPS (MAX)
REFERNCE VOLTAGE	4.096V
ADC CONTROL	SPARTAN-6 FPGA SERIES
ISOLATION POWER (1)	2W 5V to 7V DC-DC CONVERTER
ISOLATION POWER (2)	2W 24V to +/- 12V DC-DC CONVERTER
ISOLATION VOLTAGE	MAX 6500VRMS 1SEC
ADC I/F	SPI 3.3MHz 5CH
CPU I/F	SPI 20MHz 1CH
FPGA PROGRAMMING	SPI 20MHz 1CH
SUPPLY POWER (1)	3.3V
SUPPLY POWER (2)	5V
SUPPLY POWER (3)	24V
SIZE	100 X 100 X 16 (mm)

3. How to Install and Use

1) S-DAQ Installations



- 2) S-DAQ Connection Check
- A. Change IP Address for Data PC to 192.168.0.5

Internet Protocol Version 4 (TCP/IPv4) 🛥	id 🔹 👔			
일반				
네트워크가 IP 자동 설정 기능을 지원하면 IP 설정이 자동으로 할당되도록 할 수 있습니다. 지원하지 않으면, 네트워크 관리자에게 적절한 IP 설정값 을 문의해야 합니다.				
 ○ 자동으로 IP 주소 받기(0) ○ 다음 IP 주소 사용(S): IP 주소(I): 	192 . 168 . 0 . 5			
서브넷 마스크(U): 기본 게이트웨이(D):	255 . 255 . 255 . 0			
● 자동으로 DNS 서버 주소 받기(B) ● CH음 DNS 서버 주소 사용(E):				
기본 설정 DNS 서버(P):	10 . 41 . 128 . 98			
보조 DNS 서버(A):	10 . 41 . 128 . 99			
🕅 끝낼 때 설정 유효성 검사(L)	고글(∀)			
	확인 취소			

B. Power on and confirm LED2 is blinking green.



C. Do a ping test to S-DAQ from Data PC to confirm connection.

전 관리자: C:\Windows\#system32\#cmd.exe	
Microsoft Windows [Version 6.1.7601] Copyright (c) 2009 Microsoft Corporation. All rights reserved	. É
C:#Users#Hoyoul>ping 192.168.0.21	
Ping 192.168.0.21 32바이트 데이터 사용: 192.168.0.21의 응답: 바이트-32 시간<1ms TTL=64 192.168.0.21의 응답: 바이트-32 시간<1ms TTL=64 192.168.0.21의 응답: 바이트-32 시간<1ms TTL=64 192.168.0.21의 응답: 바이트-32 시간<1ms TTL=64	
192.168.0.21에 대한 Ping 통계: 패킷: 보냄 = 4, 방음 = 4, 손실 = 0 (0% 손실), 왕북 시간(밀리초): 최소 = Ows, 최대 = Ows, 평균 = Ows	
C:#Users#Hoyoul>_	-
	 International (1998)

- 3) ADC Connector (D-SUB 62 Male)
- 4) RS-232 Connector (D-SUB 37 Female)



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29	<u> </u>		RxD5
-10	Lo		GND5
- 28	-0		
9			. <u>TxD6</u>
- 21			RxD6
8			GND6
26	Ľ.		
	L		. TxD7
25	<u> </u>		. RxD7
			GND7
24			
<mark> 5</mark>			TxD8
23	<u> </u>		RxD8
4			GND8
22			
3			TxD9
21			RxD9
2	0		GND9
20		• • • • • • • • • • • • • • • • • • •	
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DB37-F	EMALE	-RA	

4. HW Specifications

	S-DAQ	Case		
Sensor Type	ADC & Serial Interface	Size	110 X 110 X 50 mm	
Function	Voltage Measurement & RS-232	Weight		
I unet fon	vortage measurement a no 202	Installation	Bolt (M4)	
Measurement	± 10V	Pe	ort	
Range		1011		
DAQ SNR	89dB			
Channel	ADC: 40Channel			
Channer	RS-232: 9Channel			
Resolution	0.378uV/LSB			
DAQ Data	1 / 2 / 4 / 8 kHz		Power	
Rate				
Baud-Rate	9600 / 19200 / 38400			
	/ 57600 / 115200	LAND LAN1 USB Power		
Operation	5℃ ~ 50℃		Switch	
Temperature				
	IEEE 802.11 a/b/g	ADC - 400	hannal	
Wireless	(2.4 GHz / 5.2 GHz)	ADC. 40C		
	- AES	RS-232 : 9	Channel 🚳 🛶 FG	
LAN	LAN x 2	8/		
SUPPLY				
POWER	24Vdc (±2.4V), 500mA			
Additional	- OTA F/W Upgrade			
Functions	– USB OTG			

- ¹ DAQ: Stands for Data Acquisition. General terminology for measurement of analog input/output and digital counter/timer.
- ² RS-232: Serial type communication interface between PC and devices such as sound coupler and modem.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio, TV technical for help.
- Only shielded interface cable should be used.

Finally, any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the users authority to operate such equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

Caution: Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device is operation in 5.15 – 5.25 GHz frequency range, then restricted in indoor use only.

RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

[S-DAQ Undertaking Engineer]

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