# AMI305-AR16

# 140414 Edition

Project Name	AMI305 - AR16
Specification Type	Basic Design / Detailed Design / Program Design Others (Operating instructions)
Function	Evaluation Kit
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Change Log			
Version	Date of Change	Change Detail	Author
130621 Ver. Preliminary	2013/06/21	Initial issue	Mori
130904 Ver. Preliminary	2013/09/04	Changes to accommodate additional functions	Mori
130904 Ver. Preliminary	2014/04/14	FT232R driver install	Mori

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#### 1. To begin

This document describes the specifications and operating instructions for AMI305-AR16.

#### 2. About AMI305-AR16

(1) List of Structures

No.	Element	Name	Detail	Reference
1	Application	Teraterm (Windows)	Sensor output, device control	This document
		AmiLineSensor.exe	Compensation calculations, sensor output	
2	Magnetometer	AMI305	Sensor	AMI305 delivery specifications

#### (2) Application Structure

AMI305-AR16 is capable of simultaneous measurement of 16 magnetometers and is controlled by Teraterm. In addition, by using AmiLineSensor.exe (higher level application) it is easy to visualize the change in output.





(3) Hardware structure

(3)-1Hardware block diagram



(3)-2 External diagram



#### 3. Initial setting

Step1) Delete old version of FTDI driver if installed.

🐻 767560ม	自加と削除	ШВ	
5	現在インストールされているプログラム: 🛛 更新プログラムの表示(①)	並べ替え(S): 名前	*
プログラムの	15° oragon 1.0	918	
& ECHIPAND	n and a second s	サイズ	51.35MB
	🔛 DVD-RAMドライバー	サイズ	1.29MB
プログラムの	Fagle 1.0 Delete this program	サイズ	151.00MB
道加创		サイズ	141.00MB
-	Tagle 2.4	サイズ	143.00MB
<u> </u>	Rree Video Converter V 1.3	サイズ	10.15MB
windows コンポーネントの	🛃 FTDI USB Serial Converter Drivers		16756356353 - L = H
20月11日11日本(日)	Soogle Larth	サイズ	25.26MB
	Go Google Toolbar for Internet Explorer	サイズ	2.34MB
プログラムの	🚓 Google アップデータ	サイズ	2.49MB
アクセスと 既定の設定(0)	🥵 εοοスティック		
	😼 hi-ho カンタン入会プログラム	サイズ	4.64MB
	🛃 HotKey Appendix	サイズ	0.84MB
	🔀 Hotkey Driver for Panasonic PC		

Note. Delete old driver by accessing Control Panel <sup>r</sup> Add and Remove Programs <sub>J</sub>

Step2) Install FT232R driver.

- Copy the FT232R driver file to C:¥drivers¥CDM 2.02.04 WHQL Certified <u>http://www.ftdichip.com/Drivers/VCP.htm</u>
- Connect the AMI305-AR16 to the PC with a USB cable.
- · When the following window appears, select as shown and click Next.

Hardware Update Wizard	
	Welcome to the Hardware Update Wizard
	This wizard helps you install software for:
	USB Serial Port (COM3)
	If your hardware came with an installation CD or floppy disk, insert it now.
	What do you want the wizard to do?
	O Install the software automatically (Recommended)
	Install from a list or specific location (Advanced)
	Click Next to continue.
	< <u>B</u> ack <u>N</u> ext > Cancel

• When the following window appears, select the upper button and click Next after selecting the driver file.

Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
Include this location in the search:
C:\driver\CDM 2.04.16 WHQL Certified
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

• When this following window appears, please wait.

Hardware Update Wizard	
Please wait while the wizard searc	hes
USB Serial Port	
	3
	<u> </u>

• When this following window appears, select the upper option and then click Next.

新しいハードウェアの検出ウィザード			
下の一覧からハードウェアに最適	なソフトウェアを選ん	でください。	
USB Serial Con	verter		
[	バージョン 製造元	場所	
USB Serial Converter	2.2.4.0 FTDI	c:¥driver¥cdm 2.02.04 whql certi	fied¥ftdibus.ir
💱 USB Serial Converter	2.2.4.0 FTDI	Windows Update	
このドライバはデジタル器  ドライバの署名が重要が	雪名されています。 <u>3理由</u>	< 戻る(B) /太へ(N) >	  キャンセル

• When the following window appears, click Finish.

新しいハードウェアの検出ウィザード	
	新しいハードウェアの検索ウィザードの完了
	次のハードウェアのソフトウェアのインストールが完了しました。
	USB Serial Converter
	[完了] をクリックするとウィザードを閉じます。
	< 戻る(B) [

Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
✓ Include this location in the search:
C:\driver\CDM 2.04.16 WHQL Certified
O Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

• When the following window appears, click Next.



 $\cdot$  When the following window appears, select the upper button, then select the driver file before clicking Next.

新しいハードウェアの検出ウィザード
検索とインストールのオブションを選んでください。
<ul> <li>○ 次の場所で最適のドライバを検索する(S)</li> <li>下のチェック ボックスを使って、リムーバブル メディアやローカル パスから検索できます。検索された最適のドラ イバがインストールされます。</li> <li>□ リムーバブル メディア (フロッピー、CD-ROM など)を検索(M)</li> <li>▽ )次の場所を含める(Q):</li> </ul>
C:¥driver¥CDM 2.02.04 WHQL Certified ■ ● 検索しないで、インストールするドライバを選択する(D) 一覧からドライバを選択するには、このオプションを選びます。選択されたドライバは、ハードウェアに最適のもの とは限りません。
< 戻る(B) 次へ(N) > キャンセル

• When the following window appears, select the upper file location and click Next.

新しいハードウェアの検出ウィザード	
下の一覧からハードウェアに最適なソフトウェアを選んでください。	$\geqslant$
USB Serial Port	
説明   バージョン  製造元  場所	
🛒 USB Serial Port 2.2.4.0 FTDI c:¥driver¥cdm 2.02.04 whql certified¥ftdiport.inf	
₩USB Serial Port 2.2.4.0 FTDI Windows Update	
このドライバはデジタル署名されています。 <u>ドライバの署名が重要な理由</u>	
< 戻る( <u>B</u> ) 次へ( <u>N</u> ) > キャンセル	

• When the following window appears, click Finish.

新しいハードウェアの検出ウィザード	
	新しいハードウェアの検索ウィザードの完了
	次のハードウェアのソフトウェアのインストールが完了しました
	USB Serial Port
	[完了] をクリックするとウィザードを閉じます。
	< 戻る(日) (二元7 キャンセル

· Open Device Manager > USB controllers > USB Serial Converter > Properties



Checked Load VCP and reconnect USB-cable

12 FEB 14 14 14 19 19			
General	Advanced	Driver   Details	
1	USB Serial	Converter	
Confi	guration		
Use t	hese settings	to override normal device beha	viour.
	oad VCF;		

Step3) Confirm the COM Port number.

- Open Port (COM and LPT) in the Device Manager.
- Remember the COM number. In this case it is COM3.



#### 4. Teraterm

4.1 Communication Specifications Interface USB2.0 or higher Application Teraterm (Windows) Port setting

	Item	Specification
1	Bits/sec	1250000
2	Data bit	8
3	Parity	None
4	Stop bit	1
5	Flow control	None
6	Newline code	CR

Download link

http://en.sourceforge.jp/projects/ttssh2/releases/ <sup>r</sup>teraterm-4.78.exe J

4.2 Command Specifications

#### 4.2.1 Main commands

Detail	command	send parameter	receive parameter
Start measurement and measurement frequency setting (Measurement frequency is set with para2 argument )	mes	Para1 : 0 Para2 : Measurement frequency 0-13: 13ms 14: 14ms  254: 254ms	Para1: #01-X Mag (LSB) Para2: #01-Y Mag (LSB) Para3: #01-Z Mag (LSB)  Para47: #16-Y Mag (LSB) Para48: #16-Z Mag (LSB)
Stop measurement	mes	Para1:1	
Single measurement	mea	None	Para1: #01-X Mag (LSB) Para2: #01-Y Mag (LSB) Para3: #01-Z Mag (LSB)  Para47: #16-Y Mag (LSB) Para48: #16-Z Mag (LSB) Para1: #01-Serial Number Para2: #02- Serial Number
Obtain Serial number	sng	None	Para16: #16- Serial Number
Make ready to receive command (Pauses serial data output)	q	None	None
Exit from ready to receive command status	С	None	None

4.2.1 Main commands (cont)

Detail	command	send parameter	receive parameter
Carry out single measurement.	mea	None	Para1: #01-X Mag (LSB) Para2: #01-Y Mag (LSB) Para3: #01-Z Mag (LSB)  Para47: #16-Y Mag (LSB) Para48: #16-Z Mag (LSB)
Obtain calibrated output	eca	None	None
Obtain uncalibrated output	dca	None	None

Note1) By sending <sup>r</sup> eca <sub>J</sub> command, it is possible to obtain calibrated magnetic outputs.

The angle of axial interference is +/-1degree, sensitivity is 1000LSB/gauss +/-2% .

#### 4.2.3 Sequence example



4.3 Communication Setting

Step1) Start TeraTerm

Step2)	Selec	t Seria	I – P	ort

○ TCP/ <u>I</u> P	Hos <u>t</u> ; myhost.exa	mple.com	7
	₽ Hist <u>o</u> ry		
	Service: C Telnet	TCP port#: 22	
	ଙ <u>୍</u> ଷ SH	SSH version: SSH2	-
	C Other	Protocol: UNSPEC	-
• Serial	Port: COM3: USB	Serial Port (COM3)	-
• Serial	Po <u>r</u> t: COM3: USB	Serial Port (COM3)	-

Step3) Setup – Terminal as shown below

Terminal size     80   X   24	New-line <u>R</u> eceive: CR+LF • OK
✓ Term <u>s</u> ize = win si	ze Trans <u>m</u> it: CR  Cance
erminal <u>I</u> D: VT100	✓ Local echo     ✓ Local echo
	Kanji (transmit)
Kanji (receive)	The second secon

Step4) Setup – Serialport as shown below

Port:	СОМЗ	ОК
<u>B</u> aud rate:	1250000 -	
<u>D</u> ata:	8 bit 💌	Cancel
P <u>a</u> rity:	none 💌	
<u>S</u> top:	1 bit 💌	<u>H</u> elp
	Second Second	

Commun	ication	Settinas
••••••••		•••••

Value		
250000		
lone		
lone		

Step5) Input <sup>r</sup>mes 0 20 <sup>a</sup> and press Enter to start measurement at 20ms Step6) Input <sup>r</sup>q<sup>a</sup> and press Enter to pause measurement Step7) Input <sup>r</sup>mes 1 <sup>a</sup> and press Enter to stop measurement

📴 COM3:1250000baud - Tera Term VT	
Eile Edit Setup Control Window Help	
mes:184,83,349,170,162,293,157,185,221,134,105,100,298,325,153,335,214,-182, 24,-401,-48,161,-117,156,48,-14,186,128,90,182,76,90,201,0,32,136,27,66,157, 5,207,22,97,133,-44,-17	18,1 70,4
mes 185,80,346,173,162,292,157,186,221,135,104,102,298,324,153,337,215,-183, 22,-403,-48,160,-118,157,47,-18,188,126,91,183,76,92,202,0,32,136,27,65,157,	18,1 73,4
5,208,22,96,133,-41,-18, mes 184,82,347,171,163,291,156,186,221,134,104,102,297,326,153,335,214,-183, 23,-402,-47,161,-118,156,48,-16,187,128,91,181,76,94,201,-1,34,136,28,66,156	18,1 ,70,
45,208,22,96,131,-41,-18, mes 183,83,348,171,163,293,156,187,222,134,105,102,297,324,151,335,217,-182, 23,-400,-48,160,-118,156,49,-16,187,127,93,183,74,92,201,1,32,135,28,67,155,	18,1 70,4
5,208,21,96,135,-44,-18, mes¦183,83,348,170,164,294,156,186,222,134,106,102,296,325,153,337,215,-183, 23,-401,-48,160,-117,157,48,-15,186,126,92,182,74,90,202,-1,31,136,27,66,156	19,1
45,208,21,98,132,-44,-17, mes¦183,85,346,170,161,293,157,187,221,133,105,102,299,325,152,335,215,-182, 23,-400,-46,160,-119,157,47,-14,187,126,92,182,75,91,202,0,32,136,28,65,155, 6 207 21 97 133 -44 -18	17.1 70,4
gimes 1 mesiOK:Measurement Stop	
act act IOK:	•

4.4 Data Specification

#### (1) Data format

The default data format is as follows

No.	1	2	3	4	5		47	48
Item	#01	#01	#01	#01	#02		#16	#16
	X-axis	Y-axis	Z-axis	X-axis	Y-axis		Y-axis	Z-axis
	Mag	Mag	Mag	Mag	Mag		Mag	Mag
	(1)	(1)	(1)					
unit	LSB							

(1) Refer to AMI305 Specification for polarity.

http://www.aichi-mi.com/old\_pages/3\_products/121223\_AMI305\_Spec\_preliminary\_E.pdf

#### 5. Application <sup>r</sup> AmiLineSensor.exe J

Use this application to visualize the outputs of AMI305-AR16 in real time.



<sup>r</sup> AmiLineSensor.exe 」 Full screen display

5.1 Explanation of Functions

