AN14103 NAFE applications with MCUXpresso Rev. 1 – 6 May 2024

Application note

Document information

Information	Content
Keywords	NAFE, analog front-end, software, MCUXpresso, platform, measurement, industrial, voltage, current, temperature, weight
Abstract	This article introduces the precompiled NAFE software library for NXP proprietary MCUXpresso platform. The library consists of ready-to-use measurement script for the industrial applications (voltage, current, temperature and weight) with NAFE evaluation KIT as discussed in AN14102.



1 Introduction

This application note introduces the precompiled NAFE software library for the NXP proprietary MCUXpresso platform. The library consists of ready-to-use measurement scripts for industrial applications (voltage, current, temperature, and weight) with the NAFE evaluation KIT as discussed in <u>AN14102 "Industrial application measurements using NXP AFE"</u>.

The application note contains the code snippets for all four applications and walks the reader through different steps of the scripts to achieve these measurements.

2 MCUXpresso IDE

The MCUXpresso Integrated Development Environment (IDE) is a fully featured, free software development environment for NXP's ARM-based microcontroller units (MCU) and includes all the tools necessary to develop high-quality embedded software applications. The MCUXpresso IDE is based on the Eclipse IDE and includes the industry-standard ARM GNU toolchain. The MCUXpresso brings developers an easy-to-use and unlimited code-size development environment for NXP MCUs based on Cortex-M cores (LPC, Kinetis, and iMX RT). The IDE combines the best of the widely popular LPCXpresso and Kinetis Design Studio IDEs, providing a common platform for all NXP Cortex-M microcontrollers. It provides an intuitive and powerful interface with profiling, power measurement on supported boards, GNU tool integration and library, multicore-capable debugger, trace functionality, and more. MCUXpresso IDE debug connections support Freedom, Tower, EVK, LPCXpresso, and custom development boards with industry-leading open-source and commercial debug probes, including MCU-Link, MCU-Link Pro, LPC-Link2, PEmicro, and SEGGER.

2.1 MCUXpresso installation

Download and install the IDE from the <u>NXP website</u> and follow the instructions in the installation window.

MCUXpresso Integrated Deve MCUXpresso-IDE Receive alerts ©	lopment Environment (IDE)
Overview Software Details Documentation Design Resources ①	Training Support DOWNLOADS
<complex-block></complex-block>	The MCUXpresso IDE brings developers an easy-to-use Eclipse-based development environment for NXP® MCUs based on Arm® Cortex®-M cores, including its general purpose crossover and wireless - enabled MCUs. The MCUXpresso IDE offers advanced editing, compiling, and debugging features with the addition of MCU-specific debugging views, code trace and profiling, multicore debugging, and integrated configuration tools. The MCUXpresso IDE debug connections support Freedom, Tower® system, LPCXpresso, IMX RT-based EVKs, and your custom development boards with optimized open- source and commercial debug probes from NXP, P&E Micro®, and SEGGER®.
	USER GUIDE
	aaa-054916
Figure 1. IDE installation	

2.2 MCUXpresso setup

Download the software development kit (SDK) pack "NAFE MCUXpresso Demo Project for LPC54S018" from <u>Highly Configurable 8 Channel ±25 V Universal Input Analog Front-End | NXP Semiconductors</u>

Click File \Rightarrow Open Projects from File System and select the directory where the SDK pack is downloaded.



Figure 3. File location

Once the directory is selected, Eclipse IDE will automatically import the entire project into a workspace as shown in <u>Figure 4</u>.

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The source folder has main files corresponding to applications – voltage sensing, current sensing, RTD, and weigh scale. Follow the <u>steps</u> to run the selected application:

1. Right click the desired xx_main.c file (inside source folder) to compile it and go to **Resource Configurations** ⇒ **Exclude from Build**.

	1 10 10			
semihost	hardfault.c			
VoltageSe	nsing_Main.c			
CurrentS	ensing_Main.c			
RTD2W	New			
RTD4Wi	Open			
Weight	Show In	Alt+Shift+W >		
irtup	Open With			
bug	Show in Local Terminal			
E demo	Сору	Ctrl+C		
g_sio_br/ 4628 Prd	Paste			
	🗙 Delete	Delete		
	Move			
	Rename	F2		
	🔄 Import			
	👍 Export			
	Build Project			
	📄 Refresh	F5		
	Build Selected File(s)			
	Clean Selected File(s)			
	Resource Configurations	>	Exclude from Build	
	Profiling Tools		Reset to Lefault	
	👂 Run As	>		
			aaa-054909	
Figure 5. Resource configuration				

2. Select **Debug** and **Release** to exclude from the compilation as shown in Figure 6.

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	🔀 Exclude from build — 🗆 🗙
	Exclude object(s) from build in the following configurations
	 ☑ Debug ☑ Release
	Select All Deselect All OK Cancel
	aaa-054912
Figure 6. Select Debug and Release	

- 3. Repeat steps 1 and 2 to exclude the old, active main file from the compilation.
- 4. Configure the serial terminal and add a COMx port as shown in <u>Figure 7</u> to run the project. Click the blue button to open the terminal sheet, choose **Serial Terminal**, and **Serial port** as applicable.

IN PINE		
🗉 Console 🦼 Terminal 🗙 🔜 Image	e Info 🛛 🕵 Debugger Console 🛛 🛼 Offline Peripherals	🔍 🔍 🦷 🖿
		\bigcirc
		aaa-054895

Figure 7. Configure terminal and port

	🔀 Launch Terminal	– 🗆 X	
	Choose terminal:		
	Settings		
	Serial port: COM4	~	
	Baud rate: 115200	~	
	Data size: 8	~	
	Parity: None	~	
	Stop bits: 1	~	
	Encoding: Default (ISO-8859-1)	~	
	2	OK Cancel	
		aaa-054913	
Figure 8. Select terminal and port			

3 NAFE drivers

Figure 9 shows the project structure:



Figure 9. Project structure

The NAFE driver uses the following software components to perform various functions:

- *NAFESDK_Init*(**nafe_t*** instance, **uint32_t** spiClkFreq): Initialize the LPC peripheral.
- *NAFESDK_WriteReg16B*(**nafe_t** *instance, **uint8_t** reg_addr, **uint16_t** val): Write 16-bit register, <u>refer to the NAFE13388 data sheet.</u>
- NAFESDK_ReadReg16B(nafe_t *instance, uint8_t reg_addr): Read 16-bit register, refer to the NAFE13388 data sheet.
- *NAFESDK_CmdAbort*(**nafe_t** *instance): Send abort command to stop continuous conversion.
- NAFESDK_CmdReset(nafe_t *instance): Send reset command to reset the device.
- NAFESDK_SPIRead(nafe_t *instance, uint8_t *buf, uint32_t len): Read NAFE data via SPI bus.
- NAFESDK_SendCmd(nafe_t *instance, uint16_t cmd, uint8_t dir, uint8_t *buf, uint32_t len): Send command.
- NAFESDK_CmdSetCurrentPointer(nafe_t *instance, uint8_t adc_chl): Set channel pointer.
- startScsr(nafe_t *instance): Start single channel single reading.
- startSccr(nafe_t *instance, int numReads): Start and handle (via DMA) single channel continuous reading.
- startMccr(nafe_t *instance, int numReads, uint16_t channelMask, bool drdybPinSeq): Start and handle (via DMA) multichannel. continuous reading, channel mask is a mask for enabled channels, drdybPinSeq is to choose data ready at each conversion or at the end of sequence.
- startMcmr(nafe_t *instance, uint16_t channelMask, bool drdybPinSeq): Start and handle (via DMA)
 multichannel multireading, channel mask is a mask for enabled channels, drdybPinSeq is to choose data
 ready at each conversion or at the end of sequence.
- *NAFESDK_GetReadingsRemaining*(**nafe_t** *instance): Get the remaining samples of the current DMA reading.
- *NAFESDK_GetRBCount*(**nafe_t** *instance): Get the empty positions into ring buffer.
- NAFESDK_ReadFromRB(nafe_t *instance, uint8_t *buf, uint32_t len): Read data inside ring buffer.

4 NAFE application specific code

This section describes various application cases implemented on the MCUXpresso. Refer to <u>AN14102</u> <u>"Industrial application measurements using NXP AFE"</u> for application theory and device configuration. Every application has the following common high-level steps:

- Reset the NAFE to avoid any carryover configuration.
- Assignment of channel pointer and register configuration as per the application requirements discussed in <u>AN14102 "Industrial application measurements using NXP AFE"</u>.
- NAFE conversion and data capture.
- Code conversion to meaningful data: voltage, current, temperature, or weight.

In the following subsections, the full code for the application is presented first, followed by highlighted blocks to explain the step-by-step sequence executed by the code.

4.1 Voltage sensing

The following <u>code snippet</u> shows the steps to configure the NAFE for voltage sensing according to the example presented in <u>AN1402 "Industrial application measurements using NXP AFE"</u>:

- 1. Perform a device reset before a new configuration of the NAFE registers with the NAFESDK_CmdReset() function, followed by a 10 ms delay.
- 2. Set Current Register Pointer with the NAFESDK_CmdSetCurrentPointer() function. With this action, the subsequent actions will be linked to the chosen channel.
- 3. Configure CH_CONFIG0, CH_CONFIG1, and CH_CONFIG2 through the NAFESDK_WriteReg16B() function.
- 4. To use the value of the PGA gain setup, save it inside an array after the conversion to appropriately scale the voltage.
- 5. Repeat steps 3, 4, and 5 for every channel. In Figure 10, six channels are used.

NAFESDK_CmdReset(&instance); delay(10);	
<pre>// Voltage Reference A NAFESDK_CmdSetCurrentPointer(&instance,0); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[0]=0.2;</pre>	<pre>// Set Pointer to ch0 0x1711); // AI1P to AICOM - GAIN 0.2x 0x28); // SINC4 - 12000Sps 0x2C00); // Delay 16.493us</pre>
<pre>// Voltage Reference B NAFESDK_CmdSetCurrentPointer(&instance,1); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[1]=0.4;</pre>	<pre>// Set Pointer to ch1 0x7131); // AI1N to AICOM - GAIN 0.4x 0x1028); // SINC4 - 12000Sps 0x2C00); // Delay 16.493us</pre>
<pre>// Power Supply rail C NAFESDK_CmdSetCurrentPointer(&instance,2); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[2]=0.2;</pre>	<pre>// Set Pointer to ch2 0x2711); // AI2P to AICOM - GAIN 0.2x 0x18); // SINC4 - 24000Sps 0x2C00); // Delay 16.493us</pre>
<pre>// Power Supply rail D NAFESDK_CmdSetCurrentPointer(&instance,3); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[3]=0.4;</pre>	<pre>// Set Pointer to ch3 0x2731); // AI1N to AICOM - GAIN 0.4x 0x1018); // SINC4 - 24000Sps 0x2C00); // Delay 16.493us</pre>
<pre>// Sensor E NAFESDK_CmdSetCurrentPointer(&instance,4); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[4]=0.4;</pre>	<pre>// Set Pointer to ch4 0x3731); // AI3P to AICOM - GAIN 0.4x 0x1038); // SINC4 - 6000Sps 0x3800); // Delay 33.4us</pre>
<pre>// Sensor F NAFESDK_CmdSetCurrentPointer(&instance,5); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[5]=2;</pre>	0x7391); // AI3N to AICOM - GAIN 2x 0x4038); // SINC4 - 6000ps 0x3800); // Delay 33.4us
<pre>// Sensor F NAFESDK_CmdSetCurrentPointer(&instance,6); NAFESDK_WriteReg16B(&instance, CH_CONFIG0, NAFESDK_WriteReg16B(&instance, CH_CONFIG1, NAFESDK_WriteReg16B(&instance, CH_CONFIG2, gains[6]=16;</pre>	0x44F1); // AI4P to AI4N - GAIN 16x 0x7071); // SINC4+1 - 50ps 0x2C00); // Delay 16.493us
	aaa-055694

Figure 10. NAFE channels configuration for voltage sensing

Once the NAFE is configured, the conversion command is issued, digital code is captured, the code is translated to voltage (marked up by the red box) and the results are printed on the console using the script shown in <u>Figure 11</u>.







The following is a step-by-step explanation of the highlighted block in Figure 12:

- 1. Set Current Register Pointer with the NAFESDK CmdSetCurrentPointer() function. With this action, the subsequent single conversion will be linked to the chosen channel.
- 2. Start a counter in order to measure the conversion's elapsed time.
- 3. Start a single-channel single-reading (SCSR) conversion with the startScsr() function. This function sends the command ID 0x2000, as explained in the "CMD reading modes" section of the NAFE13388 data sheet in Secure Files.
- 4. Wait for the data-ready pin to go high and capture the valid data.
- 5. Start a counter in order to measure the conversion's elapsed time.

The highlighted block in Figure 13 reads the ADC buffer and translates the ADC output code to voltage value.

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Figure 13. ADC code read and voltage translation

- 1. To read an ADC conversion, send a SPI request to read 3 bytes (24 bits). To do this, use the NAFESDK_SPIRead() function, specifying the number of bytes (3) and the buffer (array of uint8_t).
- 2. With some bitwise operations, arrange the read 3 bytes to build a 24-bit word that will be saved into a int32_t type.
- 3. Do a conversion from 24-bit to a decimal signed number (see ADC code to voltage translation in the NAFE13388 data sheet), sINT24 = [(adc_res + 2^{23}) % 2^{24}] 2^{23} .
- 4. Do a conversion to scaled voltage (see ADC code to voltage translation in the NAFE13388 data sheet), VG = $10 / 2^{24} *$ (sINT24 / GAIN). Save it on an array where each result will be stored.

The result is displayed on the console using the highlighted code shown in Figure 14.



Figure 14. Code for result display

The console prints the voltage measured on each channel and the actual readout time (including the console's print time), as calculated in <u>AN14102 "Industrial application measurements using NXP AFE"</u>.



Figure 15. Voltage sensing console printout

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4.2 Current sensing



The current sensing application uses a code sequence similar to voltage sensing to reset, configure, issue a conversion command, and capture digital code from the NAFE. The current is calculated by dividing the measured voltage by the known resistor value of 250 ohms, as in the example discussed in <u>AN1402 "Industrial application measurements using NXP AFE"</u>. The code prints <u>the below results</u> on the console.



4.3 4-wire RTD sensing

<u>AN14102 "Industrial application measurements using NXP AFE"</u> discusses the theory and implementation of 2wire, 3-wire, and 4-wire applications using the NAFE. As the code sequence is similar, this document will focus on the 4-wire RTD application using MCUXpresso.

<pre>// RTD Sensing and Forcing MAFESDK_undSetCurrentPointer(&instance,0); // Set Pointer to ch0 MAFESDK_UnteRegis(B(&instance, CH_CONFIG), 0x183); // ALIP to ALIM - GAIM 4x MAFESDK_UnteRegis(B(&instance, CH_CONFIG), 0x3697); // SLNC4H - 11255ps MAFESDK_UnteRegis(B(&instance, CH_CONFIG), 0x3697); // SLNC4H - 11255ps MAFESDK_UnteRegis(B(&instance, CH_CONFIG), 0x36910); // Current - Positive Pol - 750uA - A12P gsin=3;</pre>	
<pre>while(1){ PRINTF(^\r\n-xLlick any button to start one Conversion Sequences-\r\n"); GETCHAR(); // Wait a keyboard import to start a conversion sequence. MATESON(_codeCurventPointer(&instance,0); // Start a Single Channel Continuous Conversion while(WAFESON (cetRedurgeRemaining(&instance): =0) {}; // Kait for Conversion end. WATESON(_codeCurventPointer(): =0) {}; // Kait for Conversion end. WATESON(_codeCurventPointer(&instance); // git length of buffer // convert sample to voltage and sum if in order to perform an average PRINTF('\r\nr\n'); for(1=9; KMFESON (cetRedurgeRemainter(&instance); // git) // Wait for Conversion to 24 bit neguti to int32_t for (); for(1=9; KMFESON (cetRedurgeRemainter(Astroner\r\n'); for(1=9; KMFESON (cetRedurgeRemainter(Astroner\r\n'); for(1=9; KMFESON (cetRedurgeRemainter(Astroner</pre>	ormat £) -R0)/(A*R0)); Lation of
	aaa-054892

Figure 18. 4-wire RTD sensing

In the highlighted snippet shown in <u>Figure 19</u>, startSccr() initiates a continuous conversion command and the direct memory access (DMA) handler is configured to sync with the NAFE signal (data ready or SYNC) in order to catch and save every valid conversion inside a buffer.

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Figure 19. RTD code conversion and capture

The NAFESDK_GetReadingsRemaining() function returns the free positions of the buffer. The conversion is complete when the position becomes 0.



Figure 20. RTD voltage to temperature translation

Once the 50 samples are complete, 3 bytes of output code are extracted from the DMA buffer using the NAFESDK_ReadFromRB() inside the for loop as highlighted in <u>Figure 20</u>.

The remaining lines of code handle the serial console and convert the voltage to a temperature value using the transfer function discussed in <u>AN14102 "Industrial application measurements using NXP AFE"</u>.

The console prints the raw voltage measurement across the RTD and the converted temperature value for all 50 samples. Any temperature change the RTD probe is exposed to during this time, for example, if it is dipped in a cup of ice, will be captured in the console readout.

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Sample 0: Worlage NTD=A 083399/, Temperature NTD=28.65423C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65430C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65540C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65240C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65340C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65430C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65430C Sample 1: Vorlage NTD=A 083399/, Temperature NTD=28.65430C Sample 2: Vorlage NTD=A 083399/, Temperature NTD=28.65430C Sample 2: Vorlage NTD=A 083399/, Temperature NTD=28.65430C Sample 2: Vorlage NTD=A 083399/, Temperature NTD=28.65430C <th>Secola A: Valtage PTD-0 003300V</th> <th>Tannanatura PTD=28 CE2101C</th> <th></th>	Secola A: Valtage PTD-0 003300V	Tannanatura PTD=28 CE2101C	
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Sample 3: Voltage RTD=0.083397/, Temperature RTD=28.668230C Sample 5: Voltage RTD=0.083397/, Temperature RTD=28.65423C Sample 6: Voltage RTD=0.083397/, Temperature RTD=28.650036C Sample 7: Voltage RTD=0.083397/, Temperature RTD=28.650036C Sample 3: Voltage RTD=0.083397/, Temperature RTD=28.650036C Sample 3: Voltage RTD=0.083397/, Temperature RTD=28.657041C Sample 11: Voltage RTD=0.083397/, Temperature RTD=28.657041C Sample 12: Voltage RTD=0.083397/, Temperature RTD=28.55294C Sample 13: Voltage RTD=0.083397/, Temperature RTD=28.55294C Sample 13: Voltage RTD=0.083397/, Temperature RTD=28.55294C Sample 11: Voltage RTD=0.083397/, Temperature RTD=28.55294C Sample 21: Voltage RTD=0.083397/, Temperature RTD=28.55294C Sample 21: Voltage RTD=0.083397/, Temperature RTD=28.55294C Sample 21: Voltage RTD=0.083397/, Temperature RTD=28.557162C Sample 22: Voltage RTD=0.083397/, Temperature RTD=28.555162C Sample 22: Voltage RTD=0.083397, Temperature RTD=28.555162C Sample 23: Voltage RTD=0.083397, Temperature RTD=28.55640C Sample 24: Voltage RTD=0.083397, Temperature RTD=28.55640C Sample 25: Voltage RTD=0.083397, Temperature RTD=28.55640C Sample 26: Voltage RTD=0.083397, Temperature RTD=28.55640C Sample 27: Voltage RTD=0.083397, Temperature RTD=28.55640C Sample 39: Voltage RTD=0.083397, Temperature RTD=28.55640C Sample 49: Voltage RTD=0.083397, Temperature RTD=28.55664C Sample 49: Vol	Sample 2: Voltage RTD=0.083399V,	Temperature RTD=28.654623C	
Sample 4: Voltage RTD=8.083399, Temperature RTD=28.65423C Sample 5: Voltage RTD=8.083397, Temperature RTD=28.65423C Sample 5: Voltage RTD=8.083397, Temperature RTD=28.65408C Sample 9: Voltage RTD=8.083397, Temperature RTD=28.65408C Sample 9: Voltage RTD=8.083397, Temperature RTD=28.65294C Sample 10: Voltage RTD=8.083397, Temperature RTD=28.65294C Sample 11: Voltage RTD=8.083397, Temperature RTD=28.65216C Sample 12: Voltage RTD=8.083397, Temperature RTD=28.65216C Sample 13: Voltage RTD=8.083397, Temperature RTD=28.655162C Sample 24: Voltage RTD=8.083397, Temperature RTD=28.656642 Sample 34: Voltage RTD=8.083397, Temperature RTD=28.656642 Sample 34: Voltage RTD=8.083397, Temperature RTD=28.656642 Sample 34: Voltage RTD=8.083397, Temperature RTD=28.656642 Sample 44: Voltage RTD=8.083397, Temperature RTD=28.656642 Sample 44: Voltage RTD=8.083397, Temperature	Sample 3: Voltage RTD=0.083397V,	Temperature RTD=28.649529C	
Sample 5: Voltage RTD=6.0833997, Temperature RTD=28.654623 Sample 7: Voltage RTD=6.0833977, Temperature RTD=28.655464C Sample 9: Voltage RTD=6.0833977, Temperature RTD=28.655464C Sample 9: Voltage RTD=6.0833977, Temperature RTD=28.655464C Sample 11: Voltage RTD=6.0833977, Temperature RTD=28.655464C Sample 11: Voltage RTD=6.0833977, Temperature RTD=28.655464C Sample 11: Voltage RTD=6.0833977, Temperature RTD=28.655544C Sample 12: Voltage RTD=6.0833977, Temperature RTD=28.655544C Sample 21: Voltage RTD=6.0833977, Temperature RTD=28.65544C Sample 21: Voltage RTD=6.0833977, Temperature RTD=28.655147C Sample 22: Voltage RTD=6.0833977, Temperature RTD=28.65542C Sample 22: Voltage RTD=6.0833977, Temperature RTD=28.65542C Sample 21: Voltage RTD=6.0833977, Temperature RTD=28.65542C Sample 31: Voltag	Sample 4: Voltage RTD=0.083400V,	Temperature RTD=28.658176C	
Sample 6: Voltage RTD=6.083394), Temperture RTD=28.653606 Sample 8: Voltage RTD=6.083404), Temperture RTD=28.65208C Sample 9: Voltage RTD=6.083404), Temperture RTD=28.65208C Sample 10: Voltage RTD=6.083404), Temperture RTD=28.65208C Sample 11: Voltage RTD=6.083404), Temperture RTD=28.65208C Sample 11: Voltage RTD=6.083404, Temperture RTD=28.65208C Sample 12: Voltage RTD=6.083404, Temperture RTD=28.65208C Sample 12: Voltage RTD=6.083397, Temperture RTD=28.643520C Sample 13: Voltage RTD=6.083397, Temperture RTD=28.653162C Sample 20: Voltage RTD=6.0833997, Temperture RTD=28.653176C Sample 20: Voltage RTD=6.0833997, Temperture RTD=28.653176C Sample 21: Voltage RTD=6.0833997, Temperture RTD=28.653162C Sample 22: Voltage RTD=6.0833997, Temperture RTD=28.655162C Sample 22: Voltage RTD=6.0833997, Temperture RTD=28.655402 Sample 22: Voltage RTD=6.0833997, Temperture RTD=28.655402 Sample 23: Voltage RTD=6.0833997, Temperture RTD=28.655402 Sample 24: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 25: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 29: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 30: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 31: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 42: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 44: Voltage RTD=6.0833997, Temperture RTD=28.656402 Sample 44: Voltage RTD=6.0833997, Tempertur	Sample 5: Voltage RTD=0.083399V,	Temperature RTD=28.654623C	
Sample 8: Voltage RTD=0.0833997, Temperature RTD=28.655640C Sample 9: Voltage RTD=0.0833087, Temperature RTD=28.655640C Sample 10: Voltage RTD=0.0833087, Temperature RTD=28.65741C Sample 11: Voltage RTD=0.0833087, Temperature RTD=28.65284C Sample 11: Voltage RTD=0.0833087, Temperature RTD=28.65284C Sample 11: Voltage RTD=0.0833087, Temperature RTD=28.651570C Sample 11: Voltage RTD=0.0833087, Temperature RTD=28.651570C Sample 11: Voltage RTD=0.0833087, Temperature RTD=28.651570C Sample 11: Voltage RTD=0.0833087, Temperature RTD=28.652504C Sample 11: Voltage RTD=0.0833097, Temperature RTD=28.645520C Sample 11: Voltage RTD=0.0833097, Temperature RTD=28.645021C Sample 11: Voltage RTD=0.0833097, Temperature RTD=28.655176C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.655176C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.655162C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.655162C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.655640C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.655640C Sample 22: Voltage RTD=0.0833097, Temperature RTD=28.655640C Sample 22: Voltage RTD=0.0833097, Temperature RTD=28.655640C Sample 22: Voltage RTD=0.0833097, Temperature RTD=28.655640C Sample 24: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 24: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 25: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 20: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 20: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 21: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 31: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 41: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 41: Voltage RTD=0.0833097, Temperature RTD=28.656540C Sample 41: Voltage RTD=0.0833097, Temp	Sample 5: Voltage RTD=0.083398V,	Temperature RTD=28.652086C	
Sample 9: Voltage RTD=0.083400V, Temperature RTD=28.662408C Sample 11: Voltage RTD=0.083400V, Temperature RTD=28.651594C Sample 11: Voltage RTD=0.083398V, Temperature RTD=28.651597C Sample 11: Voltage RTD=0.083398V, Temperature RTD=28.651597C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.651597C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.651597C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.649529C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.649529C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.649529C Sample 12: Voltage RTD=0.083397V, Temperature RTD=28.65157C Sample 21: Voltage RTD=0.083397V, Temperature RTD=28.65157C Sample 21: Voltage RTD=0.083397V, Temperature RTD=28.65162C Sample 21: Voltage RTD=0.083397V, Temperature RTD=28.65162C Sample 22: Voltage RTD=0.083397V, Temperature RTD=28.65162C Sample 22: Voltage RTD=0.083397V, Temperature RTD=28.651642C Sample 23: Voltage RTD=0.083397V, Temperature RTD=28.651642C Sample 24: Voltage RTD=0.083397V, Temperature RTD=28.651642C Sample 25: Voltage RTD=0.083397V, Temperature RTD=28.651642C Sample 25: Voltage RTD=0.083397V, Temperature RTD=28.651642C Sample 29: Voltage RTD=0.083397V, Temperature RTD=28.651642C Sample 31: Voltage RTD=0.083397V, Temperature RTD=28.65102C Sample 41: Voltage RTD=0.083397V, Temperature RTD=28.65102C Sample 41: Voltage RTD=0.083397V, Temperature RTD=28.65102C Sample 41: Voltage RTD=0.083397V, Temperature RTD	Sample 8: Voltage RTD=0.083399V,	Temperature RTD=28.655640C	
Sample 16: Voltage RTD=0.083403, Temperature RTD=28.65294C Sample 11: Voltage RTD=0.083390, Temperature RTD=28.65294C Sample 11: Voltage RTD=0.083390, Temperature RTD=28.651570C Sample 11: Voltage RTD=0.083390, Temperature RTD=28.651570C Sample 11: Voltage RTD=0.083390, Temperature RTD=28.65294C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.65294C Sample 11: Voltage RTD=0.083397V, Temperature RTD=28.657162C Sample 12: Voltage RTD=0.083397V, Temperature RTD=28.657162C Sample 12: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 22: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 22: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 22: Voltage RTD=0.083397V, Temperature RTD=28.65654C Sample 23: Voltage RTD=0.083397V, Temperature RTD=28.65654C Sample 24: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 25: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 25: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 26: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 27: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 30: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 31: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 31: Voltage RTD=0.083397V, Temperature RTD=28.65664C Sample 32: Voltage RTD=0.083397V, Temperat	Sample 9: Voltage RTD=0.083400V,	Temperature RTD=28.660208C	
Sample 11: Voltage RTD=0.03398V, Temperature RTD=28.65208C Sample 13: Voltage RTD=0.03398V, Temperature RTD=28.65208C Sample 13: Voltage RTD=0.0349V, Temperature RTD=28.65208C Sample 15: Voltage RTD=0.03398V, Temperature RTD=28.65294C Sample 15: Voltage RTD=0.03398V, Temperature RTD=28.65294C Sample 17: Voltage RTD=0.03399V, Temperature RTD=28.645921C Sample 19: Voltage RTD=0.03399V, Temperature RTD=28.645921C Sample 19: Voltage RTD=0.03399V, Temperature RTD=28.645921C Sample 21: Voltage RTD=0.03399V, Temperature RTD=28.65516C Sample 22: Voltage RTD=0.03399V, Temperature RTD=28.65564C Sample 22: Voltage RTD=0.03399V, Temperature RTD=28.65564C Sample 22: Voltage RTD=0.03399V, Temperature RTD=28.65654C Sample 24: Voltage RTD=0.03399V, Temperature RTD=28.65654C Sample 25: Voltage RTD=0.03399V, Temperature RTD=28.65654C Sample 26: Voltage RTD=0.03399V, Temperature RTD=28.65654C Sample 26: Voltage RTD=0.03399V, Temperature RTD=28.651972C Sample 29: Voltage RTD=0.03399V, Temperature RTD=28.651972C Sample 31: Voltage RTD=0.03399V, Temperature RTD=28.651972C Sample 32: Voltage RTD=0.03399V, Temperature RTD=28.651972C Sample 31: Voltage RTD=0.03399V, Temperature RTD=28.651972C Sample 41: Voltage RTD	Sample 10: Voltage RTD=0.083403V	, Temperature RTD=28.667841C	
Sample 1:1 Voltage RTD=0.033954), Temperature RTD=28.651570C Sample 1:1 Voltage RTD=0.033954), Temperature RTD=28.651570C Sample 1:1 Voltage RTD=0.033954), Temperature RTD=28.651570C Sample 1:1 Voltage RTD=0.033974, Temperature RTD=28.65122C Sample 1:1 Voltage RTD=0.033974, Temperature RTD=28.649520C Sample 1:1 Voltage RTD=0.033974, Temperature RTD=28.649520C Sample 1:1 Voltage RTD=0.033974, Temperature RTD=28.651716C Sample 2:1 Voltage RTD=0.033974, Temperature RTD=28.651540C Sample 2:1 Voltage RTD=0.033974, Temperature RTD=28.651640C Sample 2:1 Voltage RTD=0.033974, Temperature RTD=28.651640C Sample 3:1 Voltage RTD=0.033974, Temperature RTD=28.651640C Sample 3:1 Voltage RTD=0.033974, Temperature RTD=28.65140C Sample 3:1 Voltage RTD=0.033974, Temperature RTD=28.65640C Sample 3:1 Voltage RTD=0.033974, Temperature RTD=28.65640C Sample 3:1 Voltage RTD=0.033974, Temperature RTD=28.65640C Sample 4:1 Voltag	Sample 11: Voltage RTD=0.083398V	, Temperature RID=28.652594C	
 Sample 14: Voltage RTD=0.083401/, Temperature RTD=28.661222 Sample 15: Voltage RTD=0.083397V, Temperature RTD=28.649529C Sample 17: Voltage RTD=0.083397V, Temperature RTD=28.649529C Sample 18: Voltage RTD=0.083397V, Temperature RTD=28.649529C Sample 19: Voltage RTD=0.083397V, Temperature RTD=28.64921C Sample 19: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 21: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 21: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 22: Voltage RTD=0.083397V, Temperature RTD=28.65540C Sample 22: Voltage RTD=0.083399V, Temperature RTD=28.65540C Sample 23: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 24: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 25: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 26: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 27: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 29: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 29: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 29: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 30: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 32: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 33: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 34: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 35: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 47: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 48: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 49: Voltage RTD=0.083399V,	Sample 13: Voltage RTD=0.083398V	. Temperature RTD=28.651579C	
Sample 15: Voltage RTD=0.083398V, Temperature RTD=28.652594C Sample 17: Voltage RTD=0.083397V, Temperature RTD=28.652594C Sample 18: Voltage RTD=0.083397V, Temperature RTD=28.652594C Sample 21: Voltage RTD=0.083398V, Temperature RTD=28.652594C Sample 21: Voltage RTD=0.083398V, Temperature RTD=28.652594C Sample 22: Voltage RTD=0.083398V, Temperature RTD=28.652594C Sample 24: Voltage RTD=0.083398V, Temperature RTD=28.652594C Sample 25: Voltage RTD=0.083398V, Temperature RTD=28.652694C Sample 26: Voltage RTD=0.083398V, Temperature RTD=28.652694C Sample 29: Voltage RTD=0.083398V, Temperature RTD=28.651072C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.651072C Sample 32: Voltage RTD=0.083398V, Temperature RTD=28.651072C Sample 33: Voltage RTD=0.083398V, Temperature RTD=28.651072C Sample 34: Voltage RTD=0.083398V, Temperature RTD=28.651072C Sample 35: Voltage RTD=0.083398V, Temperature RTD=28.65116C Sample 35: Voltage RTD=0.083398V, Temperature RTD=28.65116C Sample 35: Voltage RTD=0.083398V, Temperature RTD=28.655162C Sample 41: Voltage RTD=0.083398V, T	Sample 14: Voltage RTD=0.083401V	, Temperature RTD=28.661222C	
Sample 16: Voltage RTD=0.083397V, Temperature RTD=28.649520C Sample 17: Voltage RTD=0.083397V, Temperature RTD=28.649520C Sample 18: Voltage RTD=0.083397V, Temperature RTD=28.657162C Sample 29: Voltage RTD=0.083398V, Temperature RTD=28.6551640C Sample 21: Voltage RTD=0.083398V, Temperature RTD=28.657162C Sample 22: Voltage RTD=0.083398V, Temperature RTD=28.657162C Sample 22: Voltage RTD=0.083398V, Temperature RTD=28.651640C Sample 22: Voltage RTD=0.083398V, Temperature RTD=28.65162C Sample 22: Voltage RTD=0.083398V, Temperature RTD=28.651630C Sample 22: Voltage RTD=0.083398V, Temperature RTD=28.651640C Sample 23: Voltage RTD=0.083398V, Temperature RTD=28.651640C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.65180C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.65180C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.65180C Sample 32: Voltage RTD=0.083398V, Temperature RTD=28.65642C Sample 33: Voltage RTD=0.083398V, Temperature RTD=28.656540C Sample 33: Voltage RTD=0.083398V, Temperature RTD=28.656540C Sample 33: Voltage RTD=0.083398V, Temperature RTD=28.656540C Sample 34: Voltage RTD=0	Sample 15: Voltage RTD=0.083398V	, Temperature RTD=28.652594C	
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Sample 19: Voltage RTD=0.0834007, Temperature RTD=28.658176C Sample 20: Voltage RTD=0.0833997, Temperature RTD=28.65540C Sample 21: Voltage RTD=0.0833997, Temperature RTD=28.65654C Sample 22: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 24: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 24: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 25: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 26: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 27: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 29: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 29: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 29: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 30: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 31: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 35: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 36: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 37: Voltage RTD=0.0833997, Temperature RTD=28.65664C Sample 44: Voltage RTD=0.0833997, Temperature RTD=28.65654C Sample 45: Voltage RTD=0.0833997, Temperature RTD=28.65654C Sampl	Sample 17: Voltage RTD=0.083397V Sample 18: Voltage RTD=0.083399V	, Temperature RTD=28.649021C	
Sample 29: Voltage RTD=0.083399/ Temperature RTD=28.655640C Sample 21: Voltage RTD=0.083399/ Temperature RTD=28.655640C Sample 22: Voltage RTD=0.083399/ Temperature RTD=28.655630C Sample 22: Voltage RTD=0.083399/ Temperature RTD=28.655230C Sample 22: Voltage RTD=0.083399/ Temperature RTD=28.652304C Sample 22: Voltage RTD=0.083399/ Temperature RTD=28.652604C Sample 23: Voltage RTD=0.083399/ Temperature RTD=28.655640C Sample 31: Voltage RTD=0.083399/ Temperature RTD=28.655101C Sample 31: Voltage RTD=0.083399/ Temperature RTD=28.65654C Sample 31: Voltage RTD=0.083399/ Temperature RTD=28.65654C Sample 32: Voltage RTD=0.083399/ Temperature RTD=28.65654C Sample 33: Voltage RTD=0.083399/ Temperature RTD=28.65654C Sample 34: Voltage RTD=0.083399/ Temperature RTD=28.65654C Sample 35: Voltage RTD=0.083399/ Temperature RTD=28.65654C Sample 36: Voltage RTD=0.083399/ Temperature	Sample 19: Voltage RTD=0.083400V	, Temperature RTD=28.658176C	
Sample 21: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 22: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 23: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 24: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 25: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 27: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 27: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 28: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 28: Voltage RTD=0.083399V, Temperature RTD=28.65640C Sample 39: Voltage RTD=0.083399V, Temperature RTD=28.65640C Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.65640C Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.65640C Sample 32: Voltage RTD=0.083399V, Temperature RTD=28.65640C Sample 33: Voltage RTD=0.083399V, Temperature RTD=28.65640C Sample 34: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 35: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 42: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 42: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 42: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 44: Voltage RTD=0.083399V, Tempera	Sample 20: Voltage RTD=0.083399V	, Temperature RTD=28.655640C	
Sample 22: Voltage RTD=0.083399, Temperature RTD=28.65654C Sample 24: Voltage RTD=0.083398V, Temperature RTD=28.65654C Sample 24: Voltage RTD=0.083398V, Temperature RTD=28.65664C Sample 26: Voltage RTD=0.083398V, Temperature RTD=28.65664C Sample 27: Voltage RTD=0.083398V, Temperature RTD=28.6564C Sample 29: Voltage RTD=0.083398V, Temperature RTD=28.6564C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.6564C Sample 32: Voltage RTD=0.083398V, Temperature RTD=28.6564C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.65564C Sample 41: Voltage RTD=0.083398V, Temperature RTD=28.655416C Sample 42: Voltage RTD=0.083398V, Temperature RTD=28.655147C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.655147C Sample 45: Voltage RTD=0.083398V, Temperature RTD=28.65147C Sample 45:	Sample 21: Voltage RTD=0.083399V	, Temperature RTD=28.657162C	
Sample 24: Voltage RTD=0.033997, Temperature RTD=28.652394 Sample 25: Voltage RTD=0.033987, Temperature RTD=28.652394 Sample 25: Voltage RTD=0.034967, Temperature RTD=28.656286 Sample 27: Voltage RTD=0.033987, Temperature RTD=28.656634 Sample 29: Voltage RTD=0.033987, Temperature RTD=28.656634 Sample 29: Voltage RTD=0.033987, Temperature RTD=28.656634 Sample 31: Voltage RTD=0.033987, Temperature RTD=28.656634 Sample 31: Voltage RTD=0.033987, Temperature RTD=28.6561362 Sample 31: Voltage RTD=0.033987, Temperature RTD=28.6561362 Sample 31: Voltage RTD=0.033987, Temperature RTD=28.6561362 Sample 31: Voltage RTD=0.033987, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.033987, Temperature RTD=28.6561362 Sample 31: Voltage RTD=0.0339879, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.0339879, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.0339897, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.0339997, Temperature RTD=28.65654C Sample 41: Voltage RTD=0.0339997, Temperature RTD=28.65654C Sample 42: Voltage RTD=0.0339997, Temperature RTD=28.65654C Sample 43: Voltage RTD=0.0339997, Temperature RTD=28.65654C Sample 44: Voltage RTD=0.0339997, Temperature RTD=28.65654C Sample 44: Voltage RTD=0.0339997, Temperature RTD=28.65614C Sample 44: Voltage RTD=0.0833997, Temperature RTD=28.65614C Sample 44: Voltage RTD=0.0833997, Temperature RTD=28.65614C Sample 45: Voltage RTD=0.0833997, Temperature RTD=28.656147C Sample 45: Vo	Sample 22: Voltage RTD=0.083399V	, Temperature RTD=28.656654C	
Sample 25: Voltage RTD=0.083398V, Temperature RTD=28.653608C Sample 25: Voltage RTD=0.083398V, Temperature RTD=28.65654C Sample 28: Voltage RTD=0.083398V, Temperature RTD=28.656654C Sample 28: Voltage RTD=0.083398V, Temperature RTD=28.656654C Sample 28: Voltage RTD=0.083398V, Temperature RTD=28.656654C Sample 39: Voltage RTD=0.083398V, Temperature RTD=28.654623 Sample 39: Voltage RTD=0.083398V, Temperature RTD=28.654624C Sample 39: Voltage RTD=0.083398V, Temperature RTD=28.654624C Sample 39: Voltage RTD=0.083398V, Temperature RTD=28.65461C Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 34: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 35: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 39: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 39: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 39: Voltage RTD=0.083399V, Temperature RTD=28.65664C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.65614C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.655130C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.655130	Sample 24: Voltage RTD=0.083398V	Temperature RTD=28.652594C	
Sample 26: Voltage RTD=0.083409V, Temperature RTD=28.666208C Sample 27: Voltage RTD=0.083309V, Temperature RTD=28.655640C Sample 28: Voltage RTD=0.083309V, Temperature RTD=28.655640C Sample 31: Voltage RTD=0.083309V, Temperature RTD=28.655640C Sample 31: Voltage RTD=0.083309V, Temperature RTD=28.655101C Sample 31: Voltage RTD=0.083309V, Temperature RTD=28.655101C Sample 31: Voltage RTD=0.083309V, Temperature RTD=28.655101C Sample 33: Voltage RTD=0.083309V, Temperature RTD=28.655101C Sample 34: Voltage RTD=0.083309V, Temperature RTD=28.65664C Sample 35: Voltage RTD=0.083309V, Temperature RTD=28.65664C Sample 35: Voltage RTD=0.083309V, Temperature RTD=28.65664C Sample 35: Voltage RTD=0.083309V, Temperature RTD=28.65664C Sample 37: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 37: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 37: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 40: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 40: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 41: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 42: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 43: Voltage RTD=0.083309V, Temperature RTD=28.65640C Sample 44: Voltage RTD=0.083309V, Temperature RTD=28.656140C Sample 45: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 46: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 46: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 47: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 46: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 46: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 46: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 47: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 46: Voltage RTD=0.083309V, Temperature RTD=28.65510C Sample 47: Voltage RTD=0	Sample 25: Voltage RTD=0.083398V	, Temperature RTD=28.653608C	
Sampla 27: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 29: Voltage RTD=0.083399V, Temperature RTD=28.055649C Sampla 29: Voltage RTD=0.083399V, Temperature RTD=28.0561301C Sampla 31: Voltage RTD=0.083399V, Temperature RTD=28.056131C Sampla 32: Voltage RTD=0.083399V, Temperature RTD=28.056136C Sampla 34: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 34: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 36: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 36: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 37: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 36: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 37: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 38: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 48: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 48: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.056654C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.056634C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.056634C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.056137C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.055137C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.055137C	Sample 26: Voltage RTD=0.083400V	, Temperature RTD=28.660208C	
Sample 29: Voltage RTD=0.633394, Temperature RTD=28.55640C Sample 39: Voltage RTD=0.633394, Temperature RTD=28.55640C Sample 30: Voltage RTD=0.683399V, Temperature RTD=28.55640C Sample 31: Voltage RTD=0.683399V, Temperature RTD=28.55641C Sample 31: Voltage RTD=0.683399V, Temperature RTD=28.55640C Sample 34: Voltage RTD=0.683399V, Temperature RTD=28.55640C Sample 35: Voltage RTD=0.683399V, Temperature RTD=28.55640C Sample 36: Voltage RTD=0.683399V, Temperature RTD=28.55640C Sample 37: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 38: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 39: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 49: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 40: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 42: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 42: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 43: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 44: Voltage RTD=0.683399V, Temperature RTD=28.556640C Sample 44: Voltage RTD=0.683399V, Temperature RTD=28.556140C Sample 45: Voltage RTD=0.683399V, Temperature RTD=28.556140C Sample 46: Voltage RTD=0.683399V, Temperature RTD=28.556140C Sample 46: Voltage RTD=0.683399V, Temperature RTD=28.555140C Sample 46: Voltage RTD=0.683399V, Temperature RTD=28.555140C Sample 47: Voltage RTD=0.683399V, Temperature RTD=28.555140C Sample 48: Voltage RTD=0.683399V, Temperature RTD=28.555140C Sample 49: Voltage RTD=0.683399V, Temperature RTD=28.555140C Sample 49: Voltage RTD=0.683399V, Temperature RTD=28.65237C	Sample 27: Voltage RTD=0.083399V	, Temperature RTD=28.656654C	
Sampla 38: Voltage RTD=6.083399V, Temperature RTD=28.654623C Sampla 31: Voltage RTD=6.083398V, Temperature RTD=28.653181C Sampla 32: Voltage RTD=6.083398V, Temperature RTD=28.65416C Sampla 33: Voltage RTD=6.083398V, Temperature RTD=28.65654C Sampla 34: Voltage RTD=6.083398V, Temperature RTD=28.65654C Sampla 35: Voltage RTD=6.083398V, Temperature RTD=28.65654C Sampla 36: Voltage RTD=6.083398V, Temperature RTD=28.65654C Sampla 37: Voltage RTD=6.083398V, Temperature RTD=28.65654C Sampla 38: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 38: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 38: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 49: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 40: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 41: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 42: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 44: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 44: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 44: Voltage RTD=6.083399V, Temperature RTD=28.65654C Sampla 45: Voltage RTD=6.083398V, Temperature RTD=28.65634C Sampla 45: Voltage RTD=6.083398V, Temperature RTD=28.65634C Sampla 45: Voltage RTD=6.083398V, Temperature RTD=28.65634C Sampla 46: Voltage RTD=6.083398V, Tempe	Sample 29: Voltage RTD=0.083399V	. Temperature RTD=28.6510/2C	
Sample 31: Voltage RTD=0.083398V, Temperature RTD=28.653101C Sample 32: Voltage RTD=0.083399V, Temperature RTD=28.656116C Sample 33: Voltage RTD=0.083499V, Temperature RTD=28.656634C Sample 35: Voltage RTD=0.083399V, Temperature RTD=28.658684C Sample 35: Voltage RTD=0.083399V, Temperature RTD=28.658684C Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.658684C Sample 37: Voltage RTD=0.083399V, Temperature RTD=28.658634C Sample 38: Voltage RTD=0.083399V, Temperature RTD=28.656543C Sample 39: Voltage RTD=0.083399V, Temperature RTD=28.656543C Sample 48: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 49: Voltage RTD=0.083399V, Temperature RTD=28.656147C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.656147C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.655147C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.651370C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.65237C 	Sample 30: Voltage RTD=0.083399V	, Temperature RTD=28.654623C	
Sample 32: Voltage RTD=0.083399V, Temperature RTD=28.656464 Sample 33: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 36: Voltage RTD=0.083409V, Temperature RTD=28.656646 Sample 36: Voltage RTD=0.083409V, Temperature RTD=28.656646 Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 31: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 48: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 49: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 49: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 49: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 42: Voltage RTD=0.083399V, Temperature RTD=28.656646 Sample 43: Voltage RTD=0.083399V, Temperature RTD=28.656146 Sample 44: Voltage RTD=0.083399V, Temperature RTD=28.656147 Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.656147 Sample 45: Voltage RTD=0.083398V, Temperature RTD=28.656147 Sample 46: Voltage RTD=0.083398V, Temperature RTD=28.6551301 Sample 46: Voltage RTD=0.083398V, Temperature RTD=28.6551302 Sample 47: Voltage RTD=0.083398V, Temperature RTD=28.6551302 Sample 48: Voltage RTD=0.083398V, Temperature RTD=28.6551302 Sample 48: Voltage RTD=0.083398V, Temperature RTD=28.651379C Sample 49: Voltage RTD=0.083404V, Temperature RTD=28.65237C	Sample 31: Voltage RTD=0.083398V	, Temperature RTD=28.653101C	
Sample 33: Voltage KTD=0.83496V, Temperature RTD=28.65654C Sample 35: Voltage RTD=0.83469V, Temperature RTD=28.65664C Sample 36: Voltage RTD=0.83399V, Temperature RTD=28.65664C Sample 37: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 38: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 48: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 49: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 41: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 41: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 41: Voltage RTD=0.83399V, Temperature RTD=28.656654C Sample 42: Voltage RTD=0.83399V, Temperature RTD=28.65654C Sample 42: Voltage RTD=0.83399V, Temperature RTD=28.65654C Sample 44: Voltage RTD=0.83399V, Temperature RTD=28.65654C Sample 45: Voltage RTD=0.83399V, Temperature RTD=28.656316C Sample 45: Voltage RTD=0.83399V, Temperature RTD=28.655136C Sample 46: Voltage RTD=0.83398V, Temperature RTD=28.655130C Sample 46: Voltage RTD=0.83398V, Temperature RTD=28.655130C Sample 47: Voltage RTD=0.83398V, Temperature RTD=28.655130C Sample 48: Voltage RTD=0.83398V, Temperature RTD=28.655130C Sample 48: Voltage RTD=0.83398V, Temperature RTD=28.65310C Sample 48: Voltage RTD=0.83398V, Temperature RTD=28.65237C 	Sample 32: Voltage RTD=0.083399V	, Temperature RTD=28.654116C	
Sample 35: Voltage RTD=0.0833409V, Temperature RTD=28.655640C Sampla 36: Voltage RTD=0.083399V, Temperature RTD=28.655640C Sampla 36: Voltage RTD=0.083399V, Temperature RTD=28.655640C Sampla 38: Voltage RTD=0.083399V, Temperature RTD=28.656543C Sampla 40: Voltage RTD=0.083399V, Temperature RTD=28.656634C Sampla 40: Voltage RTD=0.083399V, Temperature RTD=28.656634C Sampla 41: Voltage RTD=0.083399V, Temperature RTD=28.656634C Sampla 42: Voltage RTD=0.083399V, Temperature RTD=28.656634C Sampla 42: Voltage RTD=0.083399V, Temperature RTD=28.656634C Sampla 44: Voltage RTD=0.083399V, Temperature RTD=28.656147C Sampla 45: Voltage RTD=0.083399V, Temperature RTD=28.656147C Sampla 46: Voltage RTD=0.083398V, Temperature RTD=28.656147C Sampla 46: Voltage RTD=0.083398V, Temperature RTD=28.655130C Sampla 47: Voltage RTD=0.083398V, Temperature RTD=28.655130C Sampla 48: Voltage RTD=0.083398V, Temperature RTD=28.655130C Sampla 48: Voltage RTD=0.083398V, Temperature RTD=28.655130C Sampla 49: Voltage RTD=0.083398V, Temperature RTD=28.655130C Sampla 49: Voltage RTD=0.083398V, Temperature RTD=28.65237C	Sample 33: Voltage RID=0.083399V	Temperature RID=28.65654C	
Sample 36: Voltage RTD=0.083399V, Temperature RTD=28.655640C Sample 37: Voltage RTD=0.083399V, Temperature RTD=28.659543C Sample 38: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 49: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 43: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 44: Voltage RTD=0.083399V, Temperature RTD=28.65654C Sample 44: Voltage RTD=0.083399V, Temperature RTD=28.65614C Sample 44: Voltage RTD=0.083399V, Temperature RTD=28.655147C Sample 45: Voltage RTD=0.083398V, Temperature RTD=28.655140C Sample 45: Voltage RTD=0.083398V, Temperature RTD=28.655140C Sample 46: Voltage RTD=0.083398V, Temperature RTD=28.655140C Sample 47: Voltage RTD=0.083398V, Temperature RTD=28.655140C Sample 48: Voltage RTD=0.083398V, Temperature RTD=28.655130C Sample 48: Voltage RTD=0.083349V, Temperature RTD=28.65237C	Sample 35: Voltage RTD=0.083400V	, Temperature RTD=28.658684C	
Sample 37: Voltage RTD=0.083399V, Temperature RTD=28.657162C Sample 38: Voltage RTD=0.083399V, Temperature RTD=28.656642C Sample 49: Voltage RTD=0.083399V, Temperature RTD=28.656642C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.656642C Sample 41: Voltage RTD=0.083399V, Temperature RTD=28.656642C Sample 42: Voltage RTD=0.083399V, Temperature RTD=28.656642C Sample 43: Voltage RTD=0.083399V, Temperature RTD=28.656142C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.656142C Sample 44: Voltage RTD=0.083398V, Temperature RTD=28.655142C Sample 46: Voltage RTD=0.083398V, Temperature RTD=28.655142C Sample 48: Voltage RTD=0.083398V, Temperature RTD=28.655142C Sample 48: Voltage RTD=0.083398V, Temperature RTD=28.655142C Sample 49: Voltage RTD=0.083398V, Temperature RTD=28.655142C Sample 49: Voltage RTD=0.083348V, Temperature RTD=28.652142C Sample 49: Voltage RTD=0.083348V, Temperature RTD=28.652142C Sample 49: Voltage RTD=0.083481V, Temperature RTD=28.652142C Sample 49: Voltage RTD=0.083481V, Temperature RTD=28.652142C	Sample 36: Voltage RTD=0.083399V	, Temperature RTD=28.655640C	
Sampla 38: Voltage RTD=0.083397, Temperature RTD=28.650543C Sampla 39: Voltage RTD=0.083397, Temperature RTD=28.65654C Sampla 49: Voltage RTD=0.0833997, Temperature RTD=28.65654C Sampla 41: Voltage RTD=0.0833997, Temperature RTD=28.656146C Sampla 42: Voltage RTD=0.0833997, Temperature RTD=28.656147C Sampla 44: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 45: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 45: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 45: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 46: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 47: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 48: Voltage RTD=0.0833987, Temperature RTD=28.655147C Sampla 48: Voltage RTD=0.0833987, Temperature RTD=28.655147C	Sample 37: Voltage RTD=0.083399V	, Temperature RTD=28.657162C	
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Average Conversion	Average Conversion		
Voltage RTD=0.083399V, Temperature RTD=28.655130C	Voltage RTD=0.083399V, Temperatu	re RTD=28.655130C	

Figure 21. Raw voltage and temperature console print out

4.4 Weight scale (load cell)

Refer to <u>AN14102 "Industrial application measurements using NXP AFE"</u> for the theory of weight scale application and implementation using the NAFE.

The NAFE offset needs to be compensated and can be calibrated with a known weight for an accurate measurement. The below code in <u>Figure 22</u> asks the user to remove the weight from the scale, if any, to measure the scale offset using the NAFE startSccr() and NAFESDK_GetReadingsRemaining() functions. Three conversions are performed and an average value is stored in a variable called offset.

<pre>NAFESDK_CmdReset(&instance); delay(10);</pre>	
<pre>// Ch0 Force/Sense Configuration NAFESOK_EndSetCurrentFointer(&instance,0); // Set Pointer to ch0 NAFESOK_WriteRegle@(&instance, cH_CONFIG0, 0x11F1); // A1P to A1N - GAIN 16x NAFESOK_WritERegle@(&instance, cH_CONFIG1, 0x70Ad); // SIG441 - 1005ps NAFESOK_WritERegle@(&instance, cH_CONFIG1, 0x72A0); // Delay 16.5us NAFESOK_WritERegle@(&instance, CH_CONFIG3, 0x3410); // Voltage - Positive Pol - 6V - A12P gain=16;</pre>	
<pre>PRINTF("-> Calculation of Coefficient <-\r\n"); PRINTF("\r\n> 1 Step :offset Calculation <-\r\n"); PRINTF("Leave the weight scale without weight and click any buttons. \r\n"); GETCHAR(); // Wait a keyboard import to start a conversion sequence.</pre>	
<pre>NAFESDK_CmdSetCurrentPointer(&instance,e); // Set Pointer to che startSccr(&instance,conversionNumber); // start a Single Channel Conversion, in order to get "conversionNumber" results while(NAFESDK_CdreadingsRemaining(&instance) l= 0) {}; // Wait for conversion end. NAFESDK_CmdAbort(&instance);</pre>	
<pre>voltage = 0; // Initialize result variable len = NAFESDK_GetRaCount(&instance); // get length of buffer // convert sample to voltage and sum it in order to perform an average for(i=0; i(an / ADC_READ_SIZE; i++) {</pre>	
<pre>sINT24 = ADC_READING_TO_SINT24(adc_res); //Apply Conversion to 24 bit Integer (see <u>datasheet</u>) voltage += sINT24_TO_V6(SINT24, gain); //Apply Conversion from 24 bit to voltage value } offset = voltage/conversionhumder; //Average Calculation PRINTF("-> 1 Step : Done <-\r\n");</pre>	
	54915



The below highlighted part of the code in Figure 23 asks the user to put the known weight on the scale and pass the value of it (in grams) to the program. This known value is used to calibrate the NAFE for accurate measurements. The first loop block is used to get user input and confirmation of the value (in kilograms) of the weight put on the weigh scale for calibration. The serial console prints the value provided by user. The console then asks the user if the saved known value is correct. Otherwise, the console asks the user to again input the weight value. Once the user input is confirmed, the calibration coefficient is calculated. This coefficient is required to accurately convert the voltage value into weight.





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Now the device is calibrated for weight measurement and the user can start taking measurements by pressing any keyboard button, as shown in <u>Figure 24</u>. The NAFE measurement (in millivolts) and the converted weight measurement (in kilograms) is printed on the console.

while(1) {	PRINTF("->Click any button to start one Conversion sequences<-\r\n"); GETCHAB(): // Wait a keyboard import to start a conversion sequence.
	startSccr(&instance,conversionNumber); // Start a Single Channel Conversion, in order to get "conversionNumber" results:
	while(WAFESDK_GetReadingsRemaining(&instance) != 0) {}; // Wait for conversion end.
	NAPEDAL_MOADOP(QIIIstance); voltage = 0; // Initialize result variable
	<pre>len = NAFESDK_GetRBCount(&instance); // get length of buffer (/ convertence)</pre>
	for(i=0; i <len adc_read_size;="" i++)<="" td=""></len>
	<pre>NAFESDK_ReadFromR8(&instance, buf, 3); adc_res = (buf(@]<\16) + (buf[1]<\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</pre>
}	<pre>/ voltage = voltage/conversionNumber; //Average Calculation PRINIF("Voltage Load Cell=%6fmV, Weight=%1fg\r\n", voltage*1000,coefficient*(voltage-offset)); //Calculation of Temperature.</pre>
	aaa-054901

Figure 24. Weight scale measurements

<u>Figure 25</u> shows the console printout of Offset Calculation (\rightarrow 1 Step) and the Coefficient Calculation (\rightarrow 2 Step), followed by the weight measurement.

	-> Calculation of Coefficient <-		
	-> 1 Step :Offset Calculation <- Leave the weight scale without weight and click any buttons. -> 1 Step : Done <-		
	-> 2 Step :Coefficient Calculation <- Put an object of known weight on the scale Please, digit the weight on the scale and click enter The weight on the scale is 233g, do you confirm(y/n)? -> 2 Step : Done <-		
	->Click any button to start one Conversion sequences<- Voltage Load Cell=0.291597mV, Weight=233.000000g ->Click any button to start one Conversion sequences<- Voltage Load Cell=0.260416mV, Weight=107.261124g ->Click any button to start one Conversion sequences<- Voltage Load Cell=0.260916mV, Weight=145.56865g ->Click any button to start one Conversion sequences<- Voltage Load Cell=0.200282mV, Weight=146.013445g ->Click any button to start one Conversion sequences<-		
	-	aaa-054903	
Figure 25. Weig	ight scale console print out		

5 Revision history

Table 1.	Revision	history
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Document ID	Release date	Description
AN14103 v.1.0	06 May 2024	Initial version

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Date of release: 6 May 2024 Document identifier: AN14103