KFORCE by KINVENT

PLATES
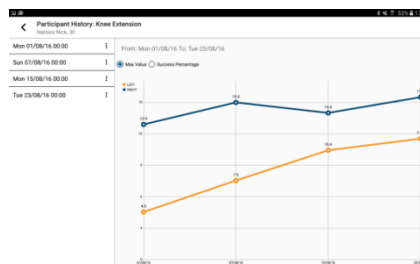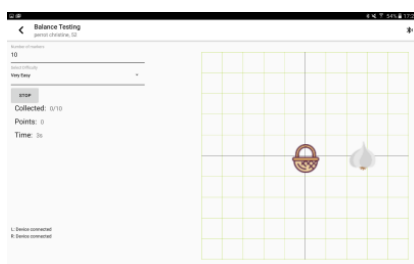
GRIP

MUSCLE controller

API Guide

WE MEASURE PROGRESS

This manual is applied to K-FORCE products. The information content of this manual belongs to KINVENT, and is provided only for the purpose of operating K-FORCE devices and software.

This manual is subject to modifications. The latest version is available on k-invent.com.

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Date	Changes
27.02.2017	Original document, covering Kforce v1 devices
14.04.2018	Created table with all commands available. First draft of the new protocol of 14bytes. Added button press application draft
20.07.2018	Change to 17bytes to the protocol and information on new devices. Added "USB and BLE collaboration", "Device power states", new UUID and service CHAR.
10.08.2018	Addition of new commands 0x85, 0x43, 0x50, 0x51 0x60, filtering section, document changes table, Status on power up from sleep/initialization section, corrected 11byte protocol sends 16bits in v2. Changed command description to GET instead of READ. Maximum value is 4095 for the v1 device measurements. Button press generates a 0x42 packet only in the 17byte protocol.
05.10.2018	Addition of indicator led explanation table. Echo is no longer supported as of FW 2.03, x85 responses updated to the actual values as of FW 2.03, button switch off, baseline update for v2, status of charge added for v2.
20.10.2018	Addition of commands x08 and 0x53. x11 and x10 were inverted in the document compared to rev1. Addition of USB PID and VID information.

Last revision: 20-10-2018

CE

Complies with MDD93/42/EEC Directive Requirements

Contents

Introduction

Thank you for integrating a K-FORCE product in your application.

K-FORCE is the product line for the assessment of the human force through precise dynamometry instruments. The product line of K-FORCE is the complete tool for the evaluation of human forces. It consists of 3 products, all of them equipped with high precision measuring systems and the KINVENT's excellence in both mechanics and electronics. K-FORCE is composed by:

- **GRIP** for the evaluation of hand grip strength

- **MUSCLE controller** KINVENT's muscular dynamometer

- **PLATES** for the assessment of lower limb strength as well as balance.

Minimum Requirements: Android 5.0+, Bluetooth Low Energy, 5'' Screen

About us

 KINVENT is specialized in the design and manufacturing of biomechanics equipment. Our strength is that we can conceive and realize solutions to any challenge of sports biomechanics and physical rehabilitation. Our products include force plates, inertial wireless sensors, simulators and various custom-made applications, ready-to-use.

Find more information on our products at www.k-invent.com.

Important safety notice

Photosensitive seizure warning

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns that may appear in video games. Even people who have no history of seizures or epilepsy may have an undiagnosed condition that can cause these "photosensitive epileptic seizures" while watching video games. These seizures may have a variety of symptoms, including altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, or momentary loss of awareness. Seizures may also cause loss of consciousness or convulsions that can lead to injury.

Immediately discontinue playing and consult a doctor if you experience any of these symptoms. Parents should watch for or ask their children about the above symptoms.

Safety

K-FORCE products have been designed with the greatest concern on safety.

- Do not use the system or accessories near water
- Do not allow small particles or liquid particles or other small objects to get into the K-FORCE system or any of its accessories

- Do not expose the system to dust, steam or smoke. Don't place or use the system in areas with excessive smoke or dust.

- Don't expose any K-FORCE components to high temperatures, high humidity, or direct sunlight.

- Don't place any K-FORCE components on unstable surfaces, or surfaces subject to vibration.

- When carrying any K-FORCE component be careful to have a good grip or the system may fall causing potential damage or injury.

- **Never disassemble or modify the system or accessories**. Use the system according to the instruction in this documentation or any other documentation provided by **K**INVENT. **No** authorization is provided for any modification, analysis of circuit or mechanics configurations. An unauthorized modification will void your warranty.

General Operating Conditions

Operating Environment

K-FORCE devices must be used indoors. K-FORCE must only be used in clean, dry rooms with level floors. Make sure you have plenty of space around you while you train.

Storage, Packaging and Transportation

Temperature: -10 ºC to 40 ºC

Air Humidity: 30 % to 75 %

Calibration

K-FORCE gives you metrics on the human muscular force. Therefore, and for an ease of use, K-FORCE is sold already calibrated.

We recommend that the product should be tested for calibration at least once a year. For more information on calibration, please contact your K-FORCE dealer.

API Guide

Establish Connection

Firstly, you have to establish a Bluetooth Connection between a K-FORCE device and your own Bluetooth Device. You can recognize a K-FORCE device by its name ('K-FORCE' + Type p.e. 'Grip').

In this communication, **K-FORCE is the client, and the mobile device is the server**.

Consider using the following library which will make the development way easier (or any other that suits your needs), it can handle all the communication between the mobile device and the grip. It uses the Android's BLE API to do it:

https://android-arsenal.com/details/1/3348

The home page of the library provides detailed examples on how to scan, connect to a device's characteristic and subscribe to notifications (force received from the grip for example).

Once you have scanned and identified the Grip, first establish the connection like the example, and then setupNotification

with this characteristic UUID for version 1

UUID.fromString("0000ffe1-0000-1000-8000-00805f9b34fb")

Or this characteristic UUID for version 2.

UUID.fromString("49535343-1e4d-4bd9-ba61-23c647249616")

Then subscribe to the notificationObservable. This will let you "hear" all incoming bytes from the connection with the grip.

From the same examples, you can send bytes to the device by using writeCharacteristic(), with the same UUID.

Also note, that byte in java is signed, so you need to cast it to a bigger type, like an int, like this:

int anUnsignedByte = aByte & 0xFF

In the case of K-FORCE Plates, you need to connect 2 devices on the same time, one that is called K-FORCE PlateR, and one that is called K-FORCE PlateL (right and left plate).

Digital Command Set

The devices operate as a virtual COM port. Various commands are available depending on FW version

Decimal	Hex	Command type	Available during sampling	Command Data	Answer	Result	V1 FW version	V2 FW version
8	0x08	GET Device type	No	NO	Variable length 10-15bytes	**"K-INVENT KFORCE","KFORCEGrip" "KFORCEMuscle","KFORCEPlateL" "KFORCEPlateR","KFORCEBubble"**	--	2.0.4
9	0x09	GET Firmware version	no	No	16 bytes	**K-INVENT_V_X.XXX**	1.0	2.0.1
16	0x10	SET sampling =off	**YES**	No	no	no	1.0	2.0.1
17	0x11	SET sampling=on	**YES**	No	Byte stream 11 bytes packet length	11 Bytes, See section "**Measurement packets**" (default)	1.0	2.0.1
32	0x20	SET Coefficient for channel 1	no	6 bytes [0x30-0x39]	no	See section "**Calibration settings packets**"	1.0	2.0.1
32	0x20	Identify device	No	No	No	One short red blink	1.06	2.06
33	0x21	GET Coefficient for channel 1	no	no	6 bytes 0x30-0x39, or 0xFF	**XXXXXX** Where XXXXXX/1000000 = **Coef1**	1.0	2.0.1
48	0x30	GET Coefficient for channel 2	no	6 bytes [0x30-0x39]	no	See section "**Calibration settings packets**"	1.0	2.0.1
49	0x31	GET Coefficient for channel 2	no	no	6 bytes 0x30-0x39, or 0xFF	**XXXXXX** Where XXXXXX/1000000 = **Coef2**	1.0	2.0.1
64	0x40	SET Coefficient for channel 3	no	6 bytes [0x30-0x39]	no	See section "**Calibration settings packets**"	1.0	2.0.1
65	0x41	GET Coefficient for channel 3	no	no	6 bytes 0x30-0x39, or 0xFF	**XXXXXX** Where XXXXXX/1000000 = **Coef3**	1.0	2.0.1
66	0x42	SET baseline creation=on	no	no	16 bytes V2 12 bytes V1	**BasesOK={MSB LSB MSB LSB MSB LSB MSB LSB }** **{CH1 CH2, CH3, CH4}** V1 only supports CH1 and CH2 See section "**Calibration settings packets**"	1.10	2.0.1

67	0x43	GET baseline	no	no	8 bytes	`MSB LSB MSB LSB MSB LSB MSB LSB` `{CH1 CH2, CH3, CH4}`	--	2.0.1
69	0x45	GET Bluetooth connection log	no	no	Up to 30 bytes	`OK+CONN,` `OK+LOST`	1.10	Not Appl.
70	0x46	SET frequency to high	**YES**	no	6 bytes V1 8 bytes (null padded)	`F=75Hz` `F=XXHz to F=XXXXHz in >v. 2.0`	1.03	2.0.1
80	0x50	SET Coefficient for channel 4	no	6 bytes [0x30-0x39]	no	See section "**Calibration settings packets**"		Up to 2.0.1
81	0x51	GET Coefficient for channel 4	no	no	6 bytes 0x30-0x39, or 0xFF	`XXXXXX` Where XXXXXX/1000000 = **Coef4**	---	Up to 2.0.1
83	0x53	GET Serial of Device	No	No	20 bytes			2.0.6
86	0x56	SET Measurement protocol to timestamp + 24bit (17 byte)	**No**	No	No	17 Bytes, See section "**Measurement packets**"		2.0.1
96	0x60	SET Low/High frequency	**no**	4 bytes	No	See section "Custom frequencies"		2.0.1
102	0x66	SET frequency to low	**YES**	no	6 bytes V1 8 bytes (null padded)	`F=25Hz` `F=XXHz to F=XXXXHz in >v. 2.0`	1.03	2.0.1
86	0x76	SET Measurement protocol to the default 11byte	**No**	No	No	no		2.0.1
122	0x7A	Deactivate device	**YES**	no	No	no	1.03	2.0.1

133	0x85	Configure/Change name of BLE device {Grip/Muscle /PlateL/PlateR/Bubble}	**NO only available from USB**	0x10-0x14	`$$$CMD> SS,C0\r`
					`AOK \r\n`
					`CMD>SN,KFORCE******\r`
					`AOK \r\n`
					`CMD>SDN,K-INVENT\r`
					`AOK \r\n`
					`CMD>S%,<$,#>`
					`AOK \r\n`
					`CMD>SW,0A,07\r`
					`AOK \r\n`
					`CMD>SW,0B,04\r`
					`AOK \r\n`
					`CMD>R,1`
						If the CMD> or AOK prompt is missing, error in BLE module, incorrect shutdown please make sure BLE is not bonded or paired. Power cycle and retry.	--	2.0.3

					Rebooting\r\n <$REBOOT#>			
172	0xAC	READ EEPROM location	no	4 bytes	5 bytes	See section "**EEPROM settings packets**"	1.06	2.0.1
202	0xCA	WRITE EEPROM location	no	5 bytes	5 bytes	See section "**EEPROM settings packets**"	1.06	2.0.1
All other*		ECHO		1 byte	1 byte	prior to 2.02, all unknown HEX is echoed. During sampling the HEX commands if unavailable will not echo.	1.0	Upto 2.02

Status on power up from sleep/initialization

The devices on wake-up resets parameters to the following defaults

Option	Status	comments
Sampling	High	High and Low speed are maintained if set using 0x60 command
Protocol	11byte	
Sleep time	3min	
Name	Maintained	
BLE connection	Dropped	Advertising
Coefficients	Maintained	
Calibration	Simple	One coefficient over the whole scale of the each sensor
Baseline	Maintained	

Measurement packets

The default measurement packets have a length of 11 bytes, in the following format:

Header			Measure1 (12bits of force v1) (16 bits of force v2) **GRIP**, **MUSCLE**, **PLATES** Rear sensor		Measure2 12bits of force v1) (16 bits of force v2) **PLATES** Front sensor		Reserved		Battery	
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10
0xFF	0xFF	0xFE	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB

For the K-FORCE grip, you are interested in the **measure 1**. Join the two bytes of this measure and you'll get a number between 0 and 4095 (v1) or 0 and 65535 (v2). You can use the first measurement as a Baseline, assuming there is no force applied on the device.

For the K-FORCE Plates, you are interested in the **measure 1** and **2** (back of the plate, forth of the plate). Join the two bytes of the measure 1 and you'll get a number between 0 and 4095 (v1) or 0 and 65535 (v2). You can use the first measurement as a Baseline, assuming there is no force applied on the device. Same for the **measure 2.**

With no force applied on the device, this number should be around 3000-3500 (v1). Putting force on the device, this number decreases down to around 500 (v1) for 60 kilograms of force.

You can calculate precisely the force with the following manner:

Before setting sampling to on with command 0x11, send 0x21. The device responds with 6 bytes that represent an ASCII number (0x30 equals to the zero ASCII, 0x39 is 9). Join these numbers in a row and divide by 1000000. You'll get a number near 0.033000 (v1) or 0.001525 (v2) which is your coefficient for the measure 1. Send 0x31 for the coefficient of **measure 2**.

EXAMPLES

Readout For Grip and Muscle	Example Response	Calculation
SEND 0x21 while *Sampling=off*	**30 33 33 34 34 30**	ASCII= 033440 **Coef1**=033440/1,000,000= 0.033440 Kg/unit **OR** **Coef1**=033440/1,000= 33.44 g/unit
SEND 0x11 **RECEIVE** 1st packet	FF FF FE **0D AC** 00 00 00 00 00 40	**0D AC= dec. 3500** **Baseline**
RECEIVE Nth packet {assuming load}	FF FF FE **09 AC** 00 00 00 00 00 40	**09 AC= dec. 2476** **Weight = (Baseline- Nth value)* Coef1 [Kg]** **(3500-2476)*0.03344=1024*0.03344 =*34.24 Kg***

Readout For PLATES	Example Response	Calculation
SEND 0x21 while *Sampling=off*	**30 33 33 34 34 30**	ASCII= 033440 **Coef1**=033440/1,000,000= 0.033440 Kg/unit **OR** **Coef1**=033440/1,000= 33.44 g/unit
SEND 0x31 while *Sampling=off*	**30 33 34 32 32 30**	ASCII= 034220 **Coef2**=034220/1,000,000= 0.034220 Kg/unit **OR** **Coef2**=034220/1,000= 34.22 g/unit
SEND 0x11 **RECEIVE** 1st packet	FF FF FE **0D AC 0D 44** 00 00 00 40	**0D AC= dec. 3500 Baseline1 (Rear)** **0D 44 = dec. 3396 Baseline2 (Front)**
RECEIVE Nth packet {assuming load}	FF FF FE **09 AC 09 CA** 00 00 00 40	**09 AC= dec. 2476** **Weight Rear = (Baseline- Nth value)* Coef1 [Kg]** **(3500-2476)*0.03344=1024*0.03344 =*34.24 Kg*** **09 CA = 2506** **Weight Front = (Baseline1- Nth value)* Coef2 [Kg]** **(3396 -2506)*0.03422=890*0.03422 =*30.46 Kg*** ***TOTAL WEIGHT =Front+Rear = 64.7 Kg***

The 17 byte measurement packets have the following format:

Header			Timestamp in 100 us		Measure1 24 bits of force			Measure2 24 bits of force			Measure3 24 bits of force			Measure4 24 bits of force		
Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10	Byte11	Byte12	Byte13	Byte14	Byte15	Byte16
0xFF	0xFF	0xFE	MSB	LSB	MSB	...	LSB	MSB	...	LSB	MSB	...	LSB	MSB	...	LSB

Readout For PLATES	Example Response	Calculation
SEND 0x11 **RECEIVE** 1st packet	FF FF FE **00 AC 0A DC FF 0C DC FC 0E AC FC 10 20 30**	**00 AC = timer** **0A DC FF = dec. 711,935/10 =71,193.5 g Front Left** **0C DC FC = dec. 843,004/10 = 84,300.4 g Front Right** **0E AC FC = dec. 961,788/10 =96,178.8 g Rear Left** **10 20 30 = dec 1,056,816/10 =105,681.6 g Rear Right** Total Weight =357,354.3 g = 357.354 kg

The maximum force per channel is 300kg => 3,000,000 points

The coefs given are multiplied by a factor of 1,000,000 then multiplied by a 16bit ADC value and finally divided by 100 to produce the 24bit value.

Max acceptable factor before overflow = 0.025600 => 1677,697 kg

The timer value varies between 0 and 18761, while each LSB indicates a time difference of **10,66μs**, which gives a rollover every **200ms.**

When the button is pressed during the 17byte protocol an 0x42 packet is generated.

Readout From any	Example Response	Calculation
RECEIVE Nth packet {assuming load/no load}	42 42 42 **42 42 42 42 42 42 42 42 42 42 42 42 42 42**	**The Button has been pressed during the last sampling cycle.**

USB and BLE collaboration

The V2 devices feature full USB 2.0 compatibility. The devices appear as USB CDC (Communications Device Class) and create a VCP device (Virtual COM port). The port settings in the COM are not evaluated since this is an actual USB device. The devices create one 64byte USB In endpoint and one 64 byte USB out endpoint. The necessary drivers can be downloaded from Microchip {mchpcdc.cat & mchpcdc.inf}.

Caution after FW 2.03 !
The devices have a unique PID assigned by sublicensing from Microchip VID_04D8&PID_EE2A
In Win10 environment the devices are automatically installed as winusb device. Under Win. 8 & 8.1 a signed device driver is required for the specific device. Currently the self-signing procedure has to be followed using the software downloaded from https://zadig.akeo.ie/ . In the next months a signed version would be supplied by K-Invent. For more information on the procedure contact us.

The communication is performed in packets of 63bytes, although this is mostly handled in the driver level of the OS.

When connected to the USB bus, the devices are enumerated and are ready to accept all commands as if they were send via BLE. While connected, the BLE remains active and it also accepts commands, with the exception that the measurement packets are throttle above 200Hz over BLE. This allows remotely starting and stopping the device while it is connected to a PC.

If a frequency higher than 200 Hz is setup the BLE connection will throttle to 1/25 of the set speed to avoid congestion on the BLE queue, while the USB connection will get the set speed. The Maximum Speed is set at 2000Hz for the high speed and 300Hz for the low speed. If a different setting is given the board will default to 25/75 Hz.

Due to the high accuracy of the measurements please note that sampling during charging via a wall adapter or connected to the USB may influence the baselines of the measurements. For best results use well isolated chargers and good quality USB power adapters. If noise is detected, please remove any noise sources such as high voltage power cables or Mobile phones during calls/ringing.

Device power states [Version 2 only]

Due to the low power and ease of use demands, version 2 incorporates multiple power states.

From a deep sleep mode, when the device is connected via USB, the device will charge the internal battery and indicate this via a flash every 2sec of the RED light. Once the battery stops charging the device will indicate this by switching to permanent lit RED. If power is removed all Lights will switch off.

The device can wake up only via a button press or by applying force. The keypress activates the device instantly, while applying force for 2 secs results to power on.

> **Caution!**
> Applying force for prolonged periods of time may drain the battery as the device will not enter deep sleep

The device resumes operation and the Green led begins blinking.

If the device is connecting to a charger or to a pc the led will perform a triangle lighting effect indicating charging. Once charging is complete the device switches to permanent Green. The device upon wake up re-enumerates the USB.

If the device is currently sampling, then a wave effect is shown via the LED.

When a successful connection over BLE is attained then the color Green is replaced by Blue while all the lighting effects remain the same as previously presented.

If the device is powered only by the internal battery the LED will still perform the wave and blink light routines with the Green LED until a connection over BLE is attained and then switch to Blue LED.

If a low battery condition is present, then the RED light will flash intermittently three times and then wait a few seconds, and the device will switch off if the battery voltage drops below a 3.3V threshold. The measurement accuracy may be reduced when operating in the low bat condition.

If at any time the button is pushed momentarily the device will indicate the level of the battery charge via either Red, Yellow or Green color and high intensity light.

Please consult the following table with all the LED status

BLUETOOTH	STATE	NOT CHARGING	CHARGING	FULL
NOT CONNECTED	IDLE	BLINK FAST	TRIANGLE	BLINK FAST
	SAMPLING	WAVE	WAVE	WAVE
	OFF	ALL OFF	BLINK SLOW (2s)	RED PERMANENT ON
CONNECTED	IDLE	BLINK FAST	TRIANGLE	BLINK FAST
	SAMPLING	WAVE	WAVE	WAVE

	BUTTON PUSH	LOW BATTERY
IDLE	100% Bright (RED/YELLOW/GREEN)	BLINK FAST 3 TIMES WAIT 5SEC
SAMPLING	100% Bright (RED/YELLOW/GREEN)	BLINK FAST 3 TIMES WAIT 5SEC
OFF	N/A (POWERS ON)	N/A

WAVE	TRIANGLE	BLINK
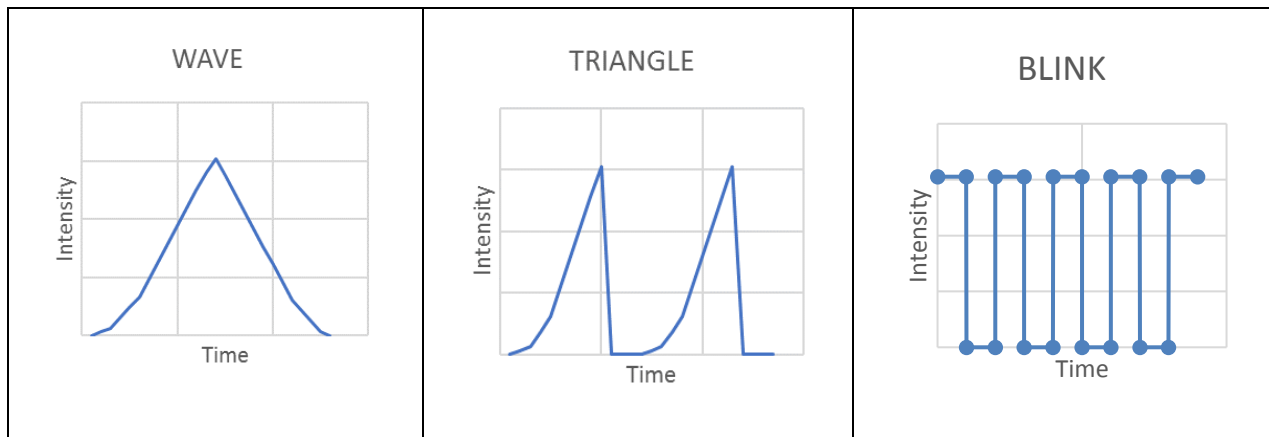
Improving Force calculation

The device features an oversampling system that will give an average of 128 Measurements when the sampling speed is below 300, and the average of 16 measurements when the speed is above 300 till 2000Hz. An on-board 2KHz filter is in place to reduce noise.

For more information on filtering contact us.

Switching off the device

The device switches off automatically if it doesn't receive anything after 3 minutes. From time to time, you can send a byte 0x11 in order to keep it alive.

If you need to switch off the device, send 0x7A ('z').

In the V2 devices holding the button pressed for 5sec will switch off the device.

You can check that separately on a Bluetooth Terminal App. There are plenty on Google Play and on the AppStore.

Calibration settings packets

In order to perform a calibration, the device MUST be send to an accredited service, or directly to us. The calibration requires precise weights and methodology. Using the commands without prior agreement will void your warranty.

EEPROM/FLASH {V2} settings packets

Adjusting the sleep time

Reading the sleep time	Example Response	Calculation
SEND 0xAC 00 11 BD while **Sampling=off**	**AC 00 11 03 BE**	03 = dec 3 = sleep time in minutes

Setting the sleep time	Example Response	Calculation
SEND 0xCA 00 11 05 DE while **Sampling=off** **DE= Xor of the 4 last bytes** **05 = time in minutes**	**AC 00 11 05 B8**	05 = dec 5 = sleep time in minutes

Reading the Baselines

Reading the Baseline1 / CHANNEL 1 (V2)	Example Response	Calculation
SEND 0xAC 00 14 B8 while **Sampling=off** **SEND 0xAC 00 15 B9** while **Sampling=off**	**AC 00 14 0D B5** **AC 00 15 AC 15**	**0D** = MSB **AC** = LSB **0D AC = dec. 3500**

Reading the Baseline2 /CHANNEL 2 (V2)	Example Response	Calculation
SEND 0xAC 00 16 BA while **Sampling=off** **SEND 0xAC 00 17 BB** while **Sampling=off**	**AC 00 16 0D B7** **AC 00 17 AC 17**	**0D** = MSB **AC** = LSB **0DAC = dec. 3500**

Reading the CHANNEL 3 (V2)	Example Response	Calculation
SEND 0xAC 00 18 BA while **Sampling=off** **SEND 0xAC 00 19 BB** while **Sampling=off**	**AC 00 18 0D B7** **AC 00 19 AC 17**	**0D** = MSB **AC** = LSB **0DAC = dec. 3500**

Reading the /CHANNEL 4 (V2)	Example Response	Calculation
SEND 0xAC 00 20 BA while **Sampling=off** **SEND 0xAC 00 21 BB** while **Sampling=off**	**AC 00 20 0D B7** **AC 00 21 AC 17**	**0D** = MSB **AC** = LSB **0DAC = dec. 3500**

AUTO Power off

Disabling AUTO Power off	Example Response	Calculation
SEND 0xCA 00 10 50 8A while *Sampling=off*	AC 00 10 50 EC	**RESET DEVICE WITH 0x7A**

Activating AUTO Power off	Example Response	Calculation
SEND 0xCA 00 10 FF 25 while *Sampling=off*	AC 00 10 FF 43	**RESET DEVICE WITH 0x7A**

Caution!

In V2 devices this is not implemented yet (FW 2.06)

Legal Information

Warranty Terms

This warranty shall not apply if the product

- is used with non-compatible products
- is used for commercial purposes such as rental
- is modified
- is damaged by accident, misuse, wear or any other cause not related to defectiveness of materials or fabrication.

A valid proof of purchase in the form of a bill of sale or receipt must be presented to obtain warranty services.

KINVENT excludes all liability for any data loss, loss of profit or any other loss or damage suffered by the end customer.

Warranty terms: EU

K-FORCE is warranted in electronics and all mechanical component for a period of 2 years from the purchase date when used in accordance with the present user's manual. KINVENT can proceed to replace a K-FORCE device covered by the warranty free of charge. The warranty is invalid in case of modification or replacement of any component in a K-FORCE device, made without the KINVENT's authorization or the authorized K-FORCE dealer's authorization. KINVENT doesn't guarantee any therapeutic result when using K-FORCE. You must contact KINVENT or your authorized dealer to receive a return authorization and shipping instructions.

Warranty terms: Rest of the World

K-FORCE is warranted in electronics and all mechanical component for a period of 1 year from the purchase date when used in accordance with the present user's manual. KINVENT can proceed to replace a K-FORCE device covered by the warranty free of charge. The warranty is invalid in case of modification or replacement of any component in a K-FORCE device, made without the authorization of KINVENT or the authorized K-FORCE dealer. KINVENT doesn't guarantee any therapeutic result when using K-FORCE. You must contact KINVENT or your authorized dealer to receive a return authorization and shipping instructions.

Service policy

You acknowledge that any time your K-FORCE product is serviced, this service may change your settings, cause loss of data or some functionalities. Back up your data in a regular basis.

Warning

K-FORCE is a medical device. K-FORCE must be used according to the present User's Manual and its recommendations. Failure to do so may result in personal injury.

Users are responsible for their exercise manner and the manner in which they use K-FORCE. Movement promoted by K-FORCE can be associated to risks of injury.

Consult in a regular basis KINVENT's website for available information on contra-indications, risks or side effects concerning K-FORCE. K-FORCE doesn't offer treatment advice or any medical diagnosis.

In case your are currently under medication, injured or in delicate medical condition, consult a qualified medical person prior to the use of any K-FORCE product.

KINVENT doesn't guarantee any therapeutic result when using K-FORCE.

FCC information

K-FORCE is a product using certain radio-frequencies during functioning. All K-FORCE devices are 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 generates, 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. If the equipment does cause any harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try one or more of the following : increase the separation between the equipment and the receiver, consult your dealer.

Contact Information

For any information or Assistance, please contact :

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WE MEASURE PROGRESS