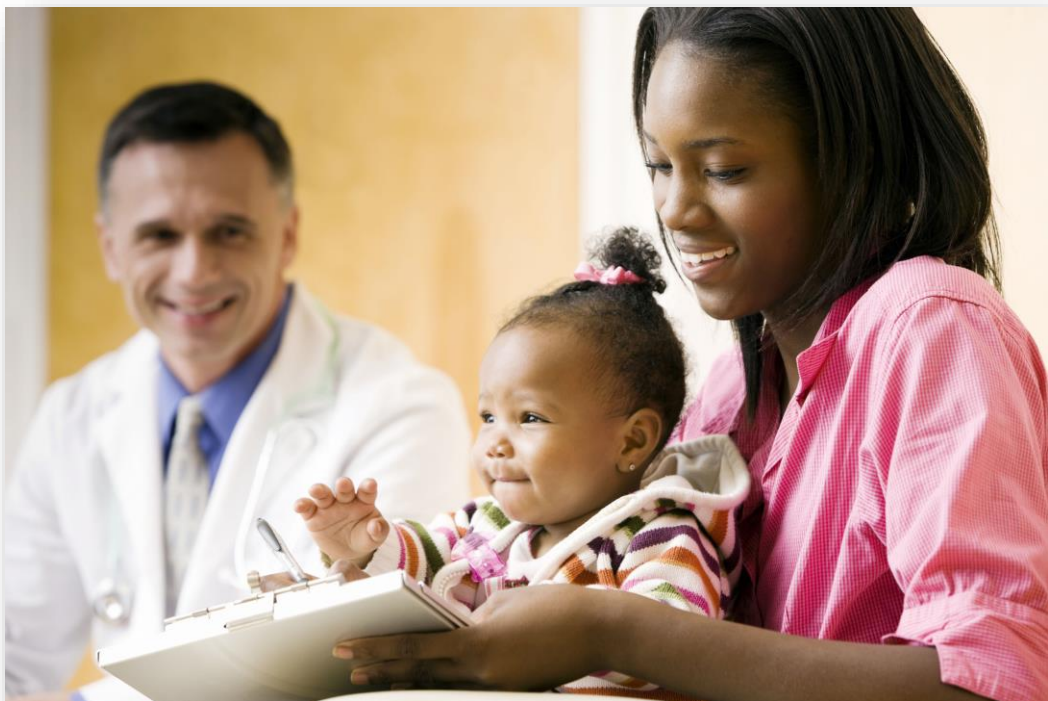




Storage, Handling and Data Loggers 101

Rene' Havner & Rachel Sample | June 12 &13, 2023



- Demonstrate how to properly set-up a vaccine storage unit.
- Describe the Cold Chain.
- Interpret the data generated by the KDHE supplied digital data loggers.
- List steps for monitoring and documenting temperatures per the data logger.
- Apply and integrate information provided into practice to decrease the incidence of vaccine loss due to temperature excursions.

Vaccine Storage Unit Set-Up



- Good air circulation around the outside of the unit is important for maintaining stable temperatures.
- Refrigerated vaccines: Between 2° to 8° C.
Frozen vaccines: Between -15° to -50° C.
- Vaccines kept in original packaging with lids closed. Keep vaccines 2"-3" from walls, ceiling, floor and door.
- Rotate stock placing shortest expiration dates in the front.
- If indicated, place water bottles on the top shelf, floor and in the door racks.
- Label shelves and/or vaccines to clearly identify funding source.

Source: cdc.gov/vaccines/hcp/admin/storage/toolkit/index.html

Cold Chain



A cold chain is a temperature-controlled supply chain that includes all vaccine-related equipment and procedures. The cold chain begins with the cold storage unit at the manufacturing plant, extends to the transport and delivery of the vaccine and correct storage at the provider and ends with administration of the vaccine to the patient.

Source: [cdc.gov/vaccines/hcp/admin/storage/toolkit/index.html](https://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/index.html)

What Happens if the Cold Chain Fails?

If the cold chain is not properly maintained:

- Vaccine potency may be lost, resulting in an unusable vaccine supply.
- Extra dose to the patient.
- Increased cost to the provider.
- Damage to public confidence.

Digital Data Loggers (DDL)

KIP provides a DDL which serves as the primary temperature monitoring device.

- The DDL ***must always*** be with the vaccine.
- DDL probes must be positioned in the center of the vaccine storage unit.
- DDLs must be downloaded monthly, anytime there is a temperature excursion, or anytime there is an “X” displayed on the DDL.
- DDL Reports: PDF & TXT formats, both electronic reports must be saved onto a computer and retained for 3 years.

**** KSWebIZ does not save your data monthly uploads ****

In the event of a temperature excursion, we require the PDF and TXT reports be submitted to your Regional Immunization Consultant for review.

PDF DDL Report

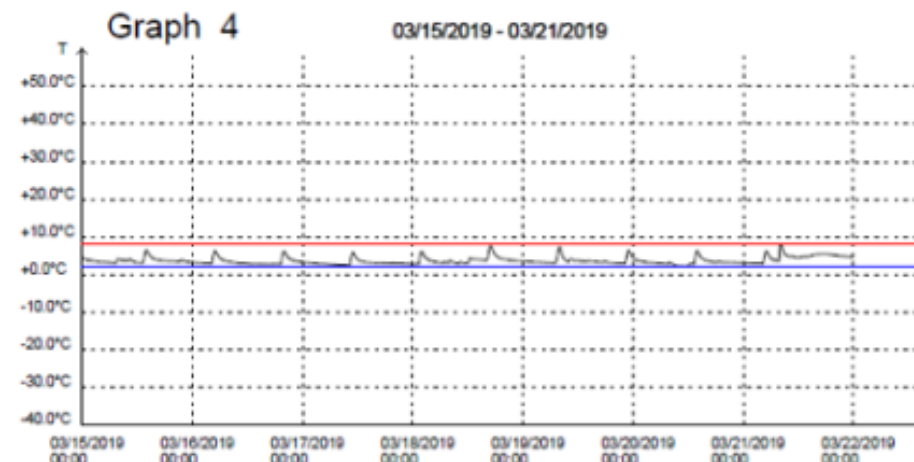
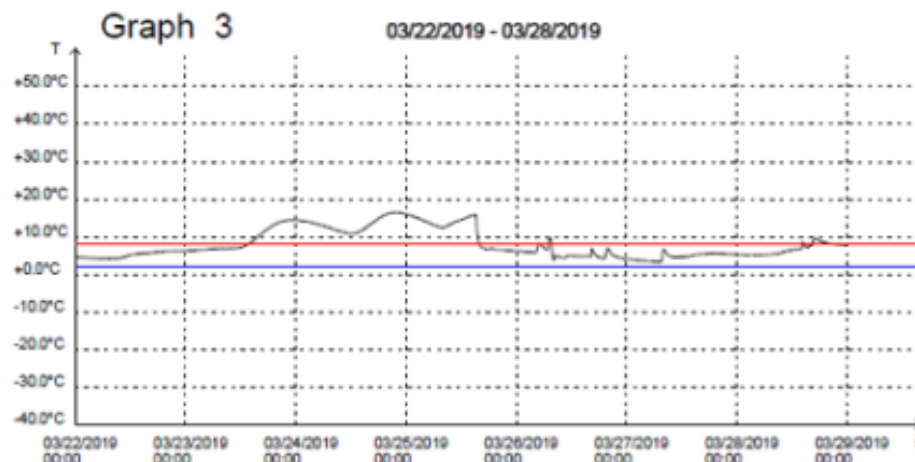
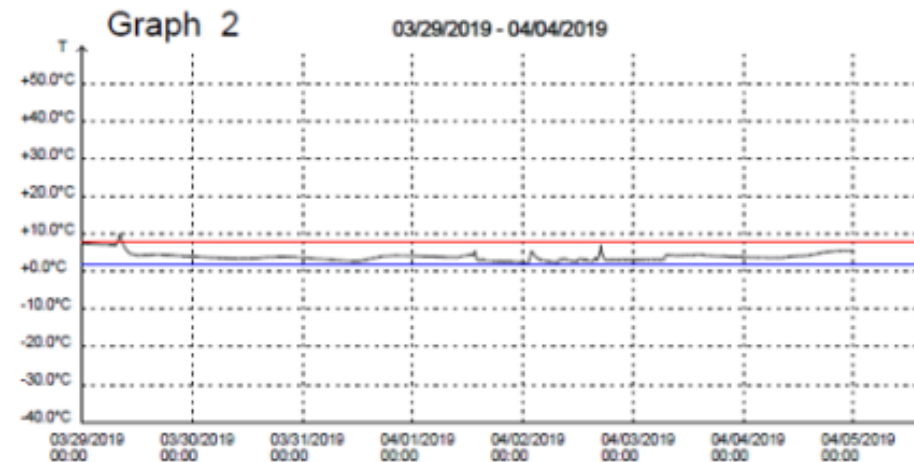
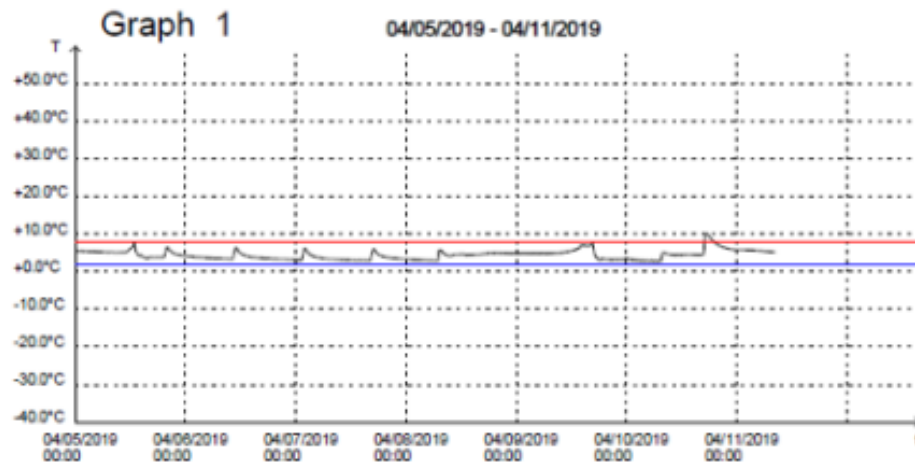
No.	Date (MM/dd/yyyy)	Events ²⁾	Average temp.	Lower alarm limit				Upper alarm limit				Ext. sensor connection error			Signature / notes Action taken
				Status	Min. temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max. temp.	Cumulative daily time above the limit	Alarm trigger time	Status	Duration	Alarm trigger time	
1	Today		+5.6°C	In progress	+5.2°C	0min		In progress	+6.1°C	0min		ALARM!	56min	08:40h	
2	04/10/2019		+4.9°C	ok	+2.7°C	0min		ALARM!	+10.3°C	2h 2min	18:01h	ok	8min		
3	04/09/2019		+4.9°C	ok	+3.1°C	0min		ok	+8.0°C	0min		ok	0min		
4	04/08/2019		+4.3°C	ok	+2.9°C	0min		ok	+5.9°C	0min		ok	0min		
5	04/07/2019		+3.7°C	ok	+2.9°C	0min		ok	+6.4°C	0min		ok	0min		
6	04/06/2019		+3.8°C	ok	+3.2°C	0min		ok	+6.6°C	0min		ok	0min		
7	04/05/2019	12:02	+5.0°C	ok	+3.6°C	0min		ok	+8.3°C	4min		ok	0min		
8	04/04/2019	08:03	+4.5°C	ok	+3.7°C	0min		ok	+5.8°C	0min		ok	0min		
9	04/03/2019	06:52	+4.0°C	ok	+3.0°C	0min		ok	+4.8°C	0min		ok	0min		
10	04/02/2019	16:56	+3.2°C	ok	+2.4°C	0min		ok	+7.2°C	0min		ok	0min		
11	04/01/2019	13:30	+3.6°C	ok	+2.5°C	0min		ok	+5.8°C	0min		ok	0min		
12	03/31/2019		+3.6°C	ok	+2.7°C	0min		ok	+4.5°C	0min		ok	0min		
13	03/30/2019		+3.8°C	ok	+3.5°C	0min		ok	+4.2°C	0min		ok	0min		
14	03/29/2019	10:52	+5.7°C	ok	+4.0°C	0min		ALARM	+10.1°C	1h 4min	08:42h	ok	0min		
15	03/28/2019		+6.6°C	ok	+5.0°C	0min		ALARM	+9.5°C	4h 49min	17:30h	ok	1min		
16	03/27/2019	07:58	+4.6°C	ok	+3.1°C	0min		ok	+6.7°C	0min		ok	0min		
17	03/26/2019	07:31	+5.4°C	ok	+3.7°C	0min		ok	+9.8°C	59min		ok	0min		
18	03/25/2019	07:42	+11.5°C	ok	+6.1°C	0min		ALARM	+16.2°C	15h 57min	00:00h	ok	0min		
19	03/24/2019		+13.4°C	ok	+10.8°C	0min		ALARM	+16.5°C	1d	00:00h	ok	0min		
20	03/23/2019		+9.1°C	ok	+6.1°C	0min		ALARM	+14.5°C	10h 22min	14:39h	ok	0min		
21	03/22/2019		+5.1°C	ok	+4.1°C	0min		ok	+6.3°C	0min		ok	0min		
22	03/21/2019		+4.5°C	ok	+2.7°C	0min		ok	+8.2°C	10min		ok	0min		
23	03/20/2019		+3.1°C	ok	+2.0°C	0min		ok	+6.4°C	0min		ok	0min		
24	03/19/2019	13:22	+3.5°C	ok	+2.8°C	0min		ok	+7.4°C	0min		ok	0min		
25	03/18/2019		+3.8°C	ok	+2.5°C	0min		ok	+7.7°C	0min		ok	0min		
26	03/17/2019		+2.9°C	ok	+2.2°C	0min		ok	+5.9°C	0min		ok	0min		
27	03/16/2019		+3.3°C	ok	+2.5°C	0min		ok	+6.3°C	0min		ok	0min		
28	03/15/2019		+3.6°C	ok	+2.9°C	0min		ok	+6.5°C	0min		ok	0min		

PDF DDL Report

No.	Date (MM/dd/yyyy)	Events ²⁾	Average temp.	Lower alarm limit				Upper alarm limit				Ext. sensor connection	
				Status	Min. temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max. temp.	Cumulative daily time above the limit	Alarm trigger time	Status	Duration
1	Today	08:27	+15.5°C	In progress	+10.6°C	0min		ALARM	+17.6°C	8h 43min	00:00h	In progress	5min
2	04/22/2018		+8.7°C	ok	+4.4°C	0min		ALARM	+14.9°C	11h 15min	13:45h	ok	0min
3	04/21/2018		+4.7°C	ok	+4.5°C	0min		ok	+5.1°C	0min		ok	0min
4	04/20/2018	08:24, 16:05	+4.7°C	ok	+4.4°C	0min		ok	+5.1°C	0min		ok	0min
5	04/19/2018	08:21, 16:28	+4.7°C	ok	+4.4°C	0min		ok	+5.1°C	0min		ok	0min
6	04/18/2018	08:19, 16:13	+4.7°C	ok	+4.4°C	0min		ok	+5.2°C	0min		ok	0min
7	04/17/2018	08:23, 15:55	+4.8°C	ok	+4.4°C	0min		ok	+5.9°C	0min		ok	0min
8	04/16/2018	08:28, 16:03	+4.7°C	ok	+4.5°C	0min		ok	+5.0°C	0min		ok	0min
9	04/15/2018		+4.7°C	ok	+4.4°C	0min		ok	+5.1°C	0min		ok	0min
10	04/14/2018		+4.6°C	ok	+4.4°C	0min		ok	+5.0°C	0min		ok	0min
11	04/13/2018	08:23, 15:32	+4.4°C	ok	+3.4°C	0min		ok	+5.0°C	0min		ok	0min
12	04/12/2018	08:21, 16:52	+3.9°C	ok	+3.4°C	0min		ok	+4.5°C	0min		ok	0min
13	04/11/2018	08:22, 15:26	+3.9°C	ok	+3.5°C	0min		ok	+4.5°C	0min		ok	0min
14	04/10/2018	08:28, 15:36	+4.0°C	ok	+3.6°C	0min		ok	+4.6°C	0min		ok	0min
15	04/09/2018	08:20, 16:01	+4.0°C	ok	+3.6°C	0min		ok	+4.6°C	0min		ok	0min
16	04/08/2018		+3.9°C	ok	+3.6°C	0min		ok	+4.5°C	0min		ok	0min
17	04/07/2018		+4.1°C	ok	+3.7°C	0min		ok	+4.8°C	0min		ok	0min
18	04/06/2018	08:25, 16:47	+4.3°C	ok	+4.0°C	0min		ok	+4.9°C	0min		ok	0min
19	04/05/2018	08:25, 17:00	+4.3°C	ok	+4.0°C	0min		ok	+4.9°C	0min		ok	6min
20	04/04/2018	08:26, 15:19	+4.5°C	ok	+4.1°C	0min		ok	+4.9°C	0min		ok	0min
21	04/03/2018	08:28, 16:04	+4.4°C	ok	+4.1°C	0min		ok	+4.8°C	0min		ok	0min
22	04/02/2018	08:26, 15:55	+4.5°C	ok	+4.2°C	0min		ok	+5.0°C	0min		ok	0min
23	04/01/2018		+4.7°C	ok	+4.4°C	0min		ok	+5.1°C	0min		ok	0min
24	03/31/2018		+4.6°C	ok	+4.4°C	0min		ok	+5.0°C	0min		ok	0min
25	03/30/2018		+4.7°C	ok	+4.4°C	0min		ok	+5.1°C	0min		ok	0min
26	03/29/2018	08:36, 17:31	+4.9°C	ok	+4.4°C	0min		ok	+5.4°C	0min		ok	0min
27	03/28/2018	08:29, 16:49	+5.0°C	ok	+4.8°C	0min		ok	+5.3°C	0min		ok	0min
28	03/27/2018	08:32, 15:33	+4.9°C	ok	+4.7°C	0min		ok	+5.3°C	0min		ok	0min

1) Correlation and data resolution: 10min intervals

PDF DDL Report

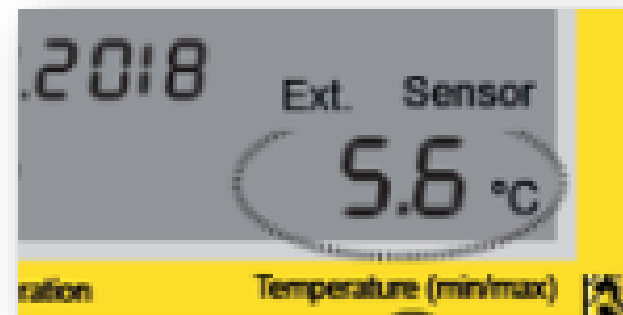


After 10 minutes without a connection between the device and the external sensor (probe) the following display appears and:

- The buzzer will beep twice at intervals of three minutes for a maximum of 7-days.
- The whole display starts blinking.
- Any confirmation will stop the display from blinking.
- The buzzer only stops if the connection error is corrected.

Please check the following two points:

1. Is the external sensors properly connected with the device?
2. Does the external sensor cable have any defects?

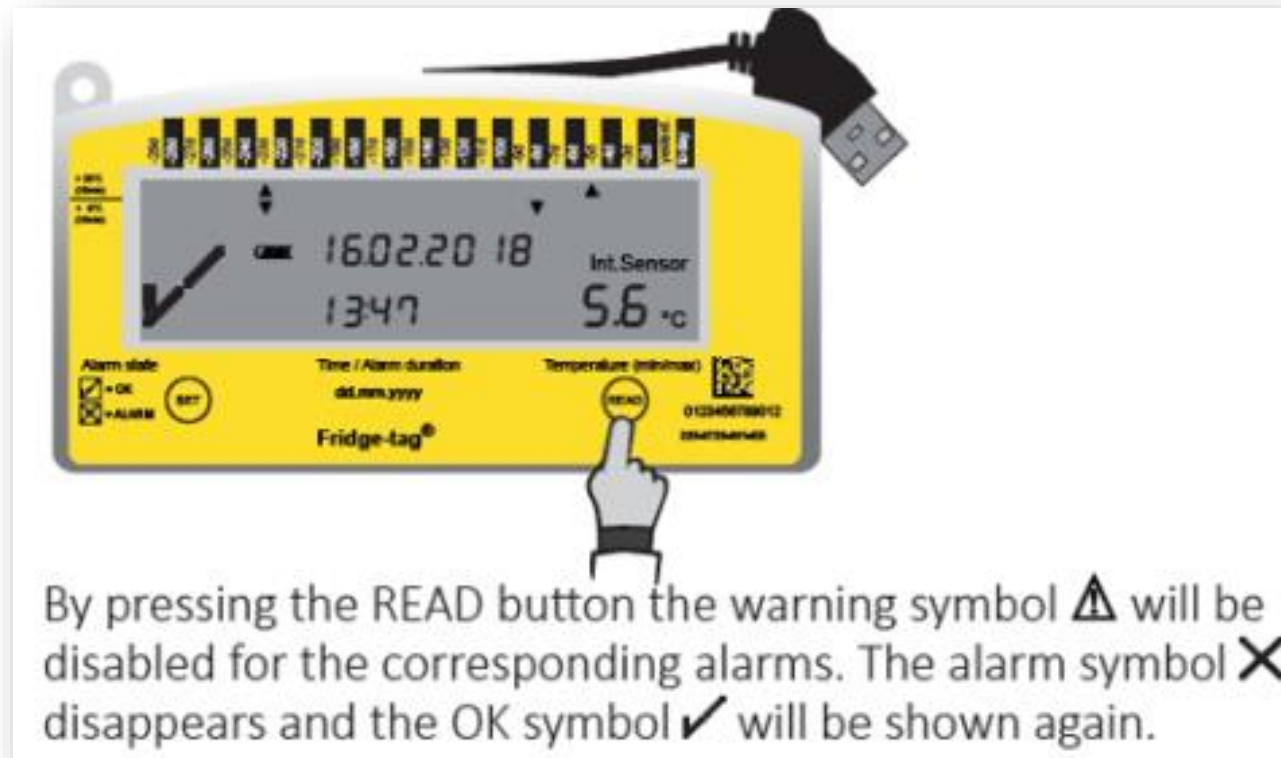


External Sensor **Correct**



External Sensor **Error**

Source: berlinger.com/fileadmin/user_upload/temperature-monitoring/training_and_support/user_manuals/fridge-tag_2_L/201805_User_Manual_Fridge_tag_2L_EN_V2.pdf



Source: berlinger.com/fileadmin/user_upload/temperature-monitoring/training_and_support/user_manuals/fridge-tag_2_L/201805_User_Manual_Fridge_tag_2L_EN_V2.pdf

Reviewing and Recording Temperatures

At least 1 hour prior to clinic closure:

1. For each storage, view the DDL for any alarms.
2. Record the temperature displayed on the DDL in the “PM” space provided.
3. Press the “Read” button twice to review the maximum and minimum temperatures (does not need to be documented) and then press “Set”. This will time stamp your data logger report.
4. Record the exact time the DDL info was reviewed.
5. Record the initials of the person completing the manual temperature reading.

****IMMEDIATE ACTION SHOULD BE TAKEN IF TEMPERATURES ARE IN THE SHADED AREAS****

KIP DL Temperature Log for Vaccines (Celsius) VFC PIN #: _____ Refrigerator Name: _____ Freezer Name: _____ Month/ Year: _____

Day of Month	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15			
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM		
Exact Time																																
Current Refrigerator Max/Min	/																															
Previous day Refrigerator Max/Min	/																															
Refrigerator Temp	≥11°																															
	10°																															
	9°																															
	8°																															
	7°																															
	6°																															
	5°																															
	4°																															
	3°																															
	2°																															
	1°																															
0°																																
<-1°																																
Freezer Temp	≥-12°																															
	-13°																															
	-14°																															
	-15°																															
	-16°																															
	-17°																															
	-18°																															
	-19°																															
≤-20°																																
Current Freezer Max/Min	/																															
Previous day Freezer Max/Min	/																															
Staff Initials																																

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Thank you/Questions



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