November 28th, 2018

Sub-metering IoT: Efficiently Measuring Measures of Efficiency

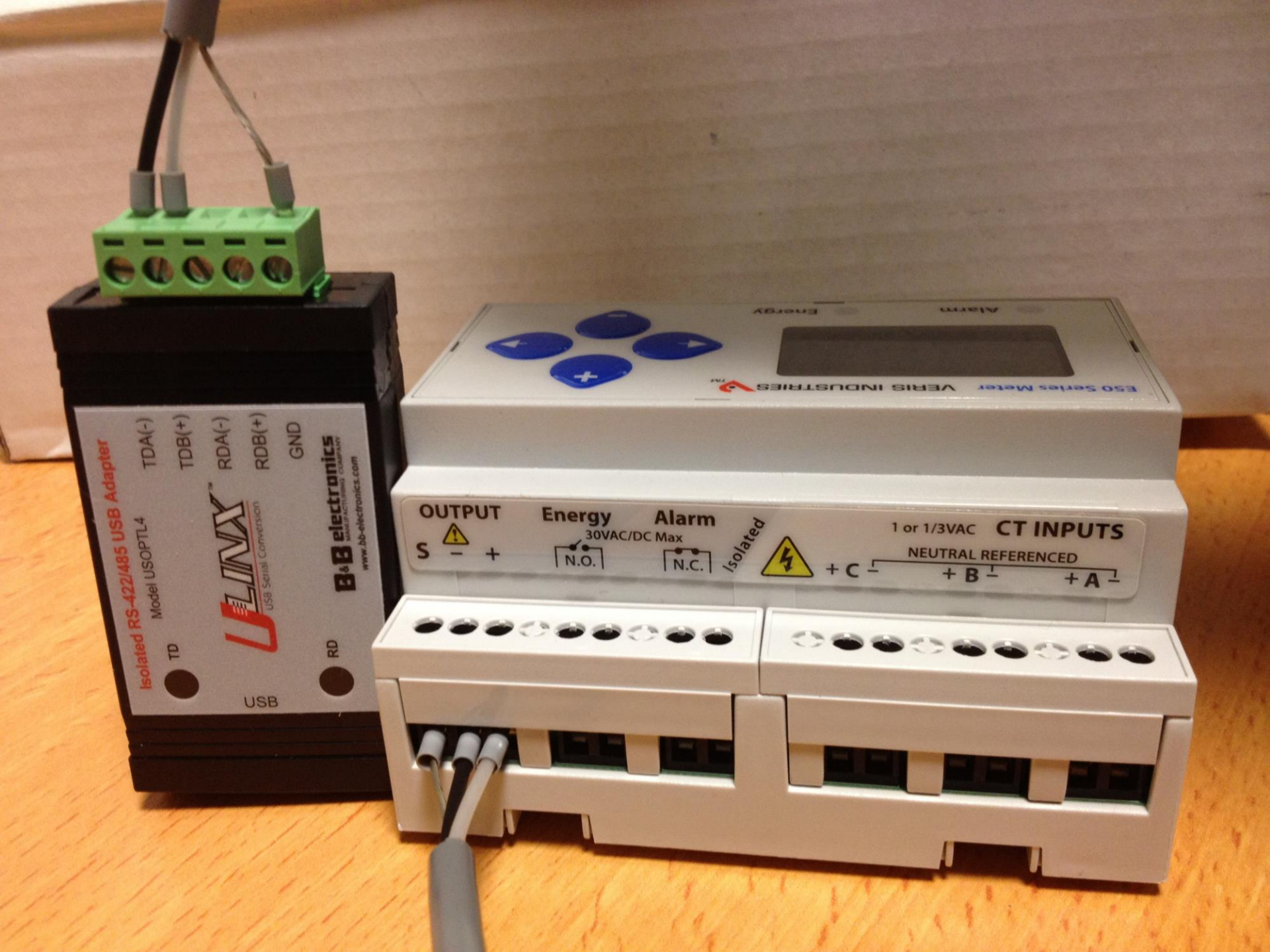
Thomas Fisher

VEIC

AMTROL
BRADFORD WHITE
AEROTHERM
ENERGYGUIDE
155
1295
ENERGY STAR

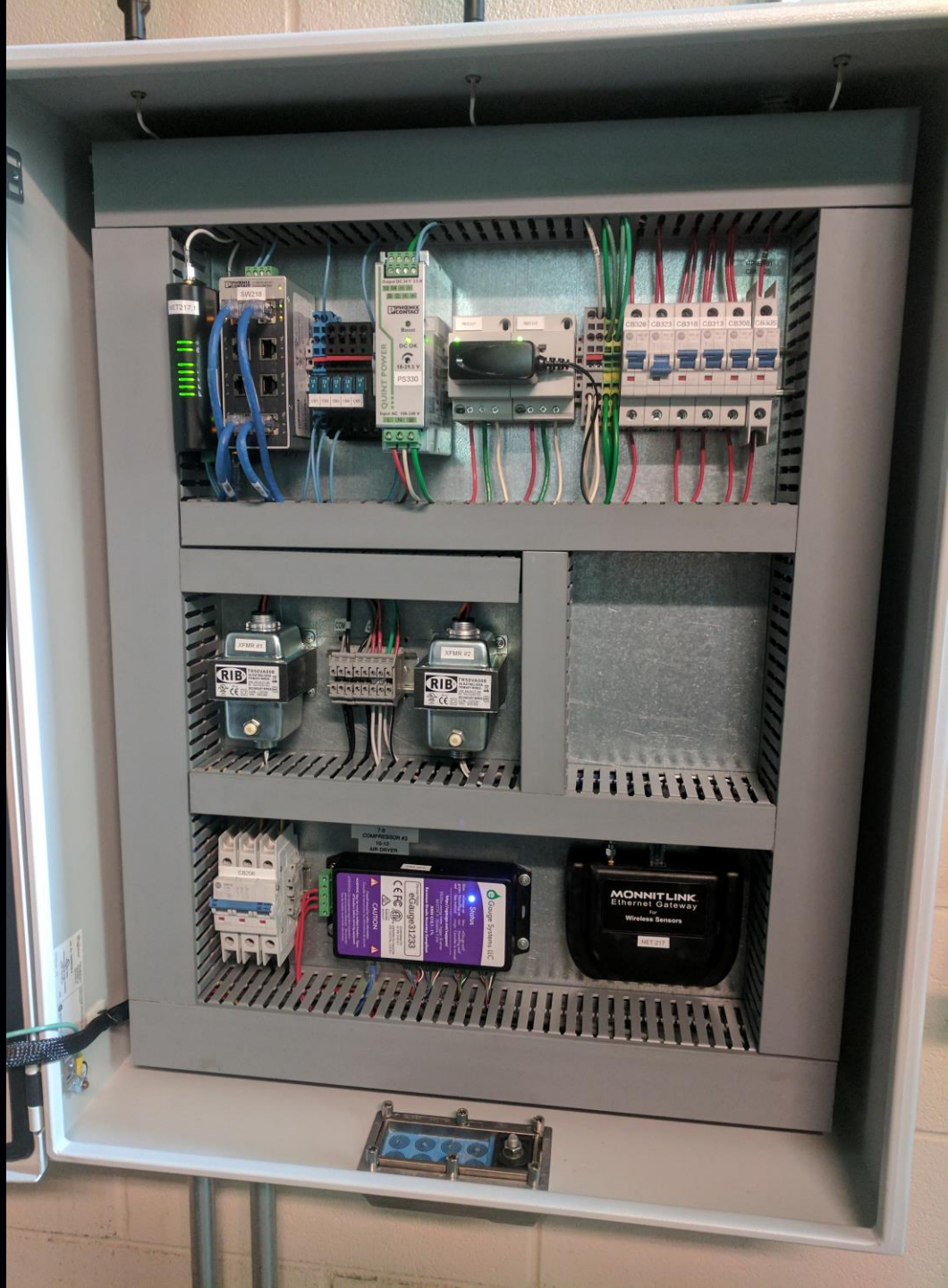
TR8
TECHNOALPIN
COMPRESSED AIR

onset
H-129
HOBO® data logger
temp/RH/light/ext channel

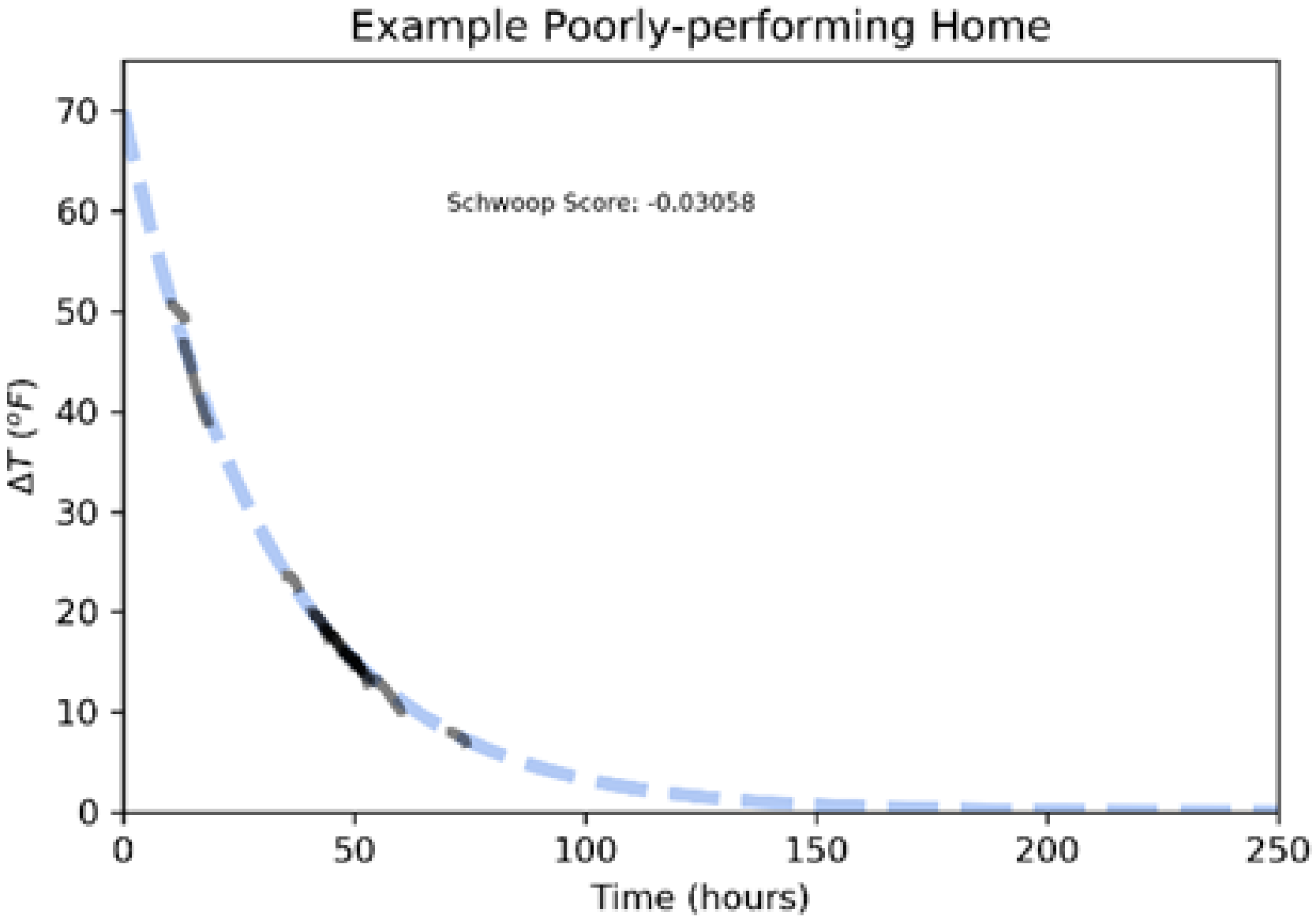

Isolated RS-422/485 USB Adapter
Model USOPTL4
TDA(-)
TDB(+)
RDA(-)
RDB(+)
GND
TD
RD
USB
USB Serial Conversion
B&B electronics
www.bb-electronics.com
Energy
Alarm
VERIS INDUSTRIES
E50 Series Meter
OUTPUT
S
Energy
Alarm
30VAC/DC Max
N.O.
N.C.
Isolated
1 or 1/3VAC
CT INPUTS
NEUTRAL REFERENCED
+C
+B
+A

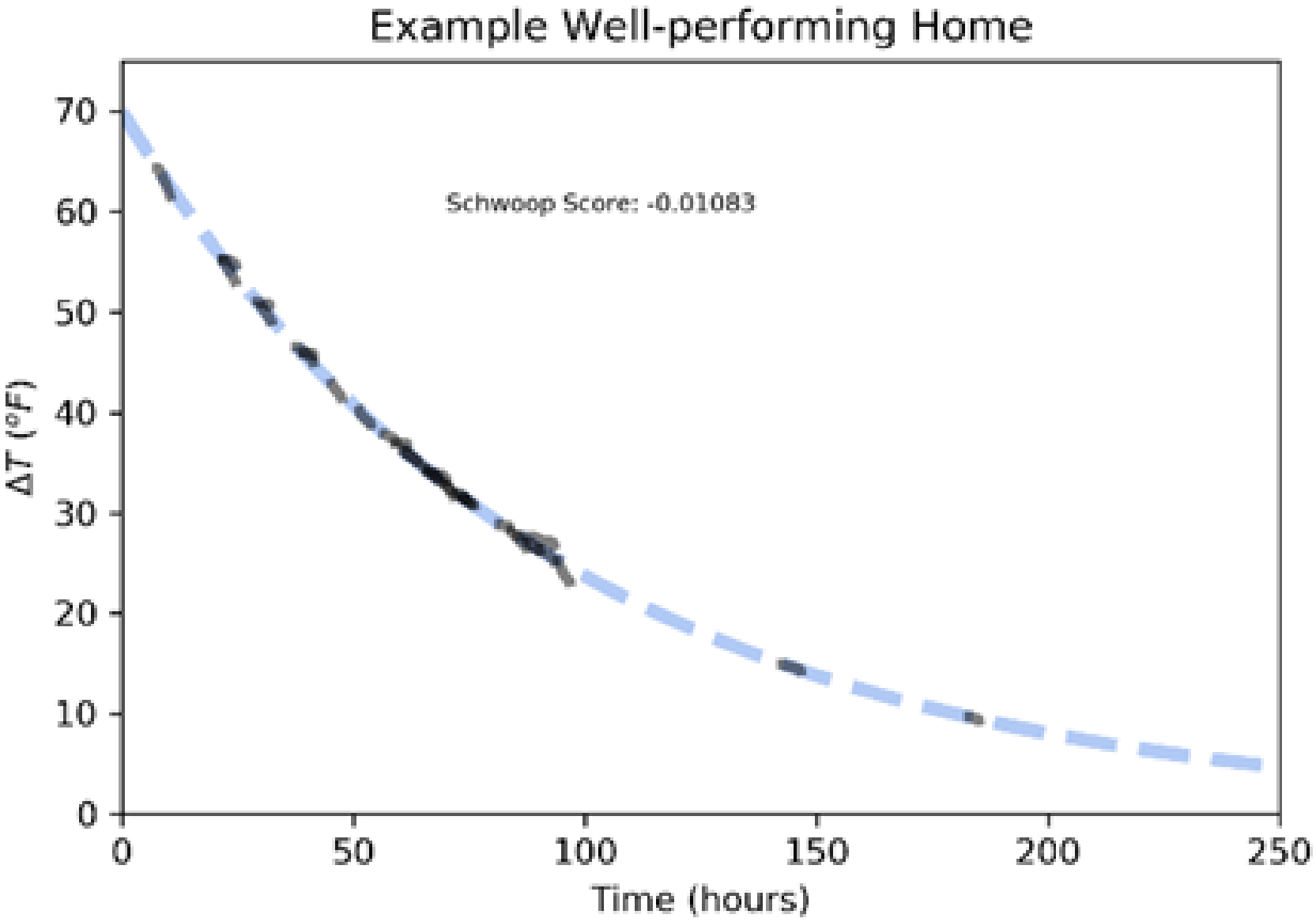
CH 4
CH 3
CH 2
CH 1
Efficiency Vermont
D-48
P1201035
DENT
INSTRUMENTS
ELITEpro SP™
POWER METER
DIGITAL
LOGGING
ON
1
2
COMM

eGauge38974
eGauge Systems
EG4115 Meter, Data Logger, Server
CAUTION/ATTENTION
CAT III 0.333Vac
MAX BR1 Mini
VEC 37
SPB-015-05
SPB-015-24
RIB
TR50VA008
YC-10-3D


QUINT POWER
PS330
RIB
MONNIT LINK
Ethernet Gateway
For
Wireless Sensors

nest
65
IN 20 MIN
68


Example Poorly-performing Home
Schwoop Score: -0.03058
ΔT (°F)
Time (hours)
0
10
20
30
40
50
60
70
0
50
100
150
200
250


Example Well-performing Home
Schwoop Score: -0.01083
ΔT (°F)
Time (hours)
0
10
20
30
40
50
60
70
0
50
100
150
200
250

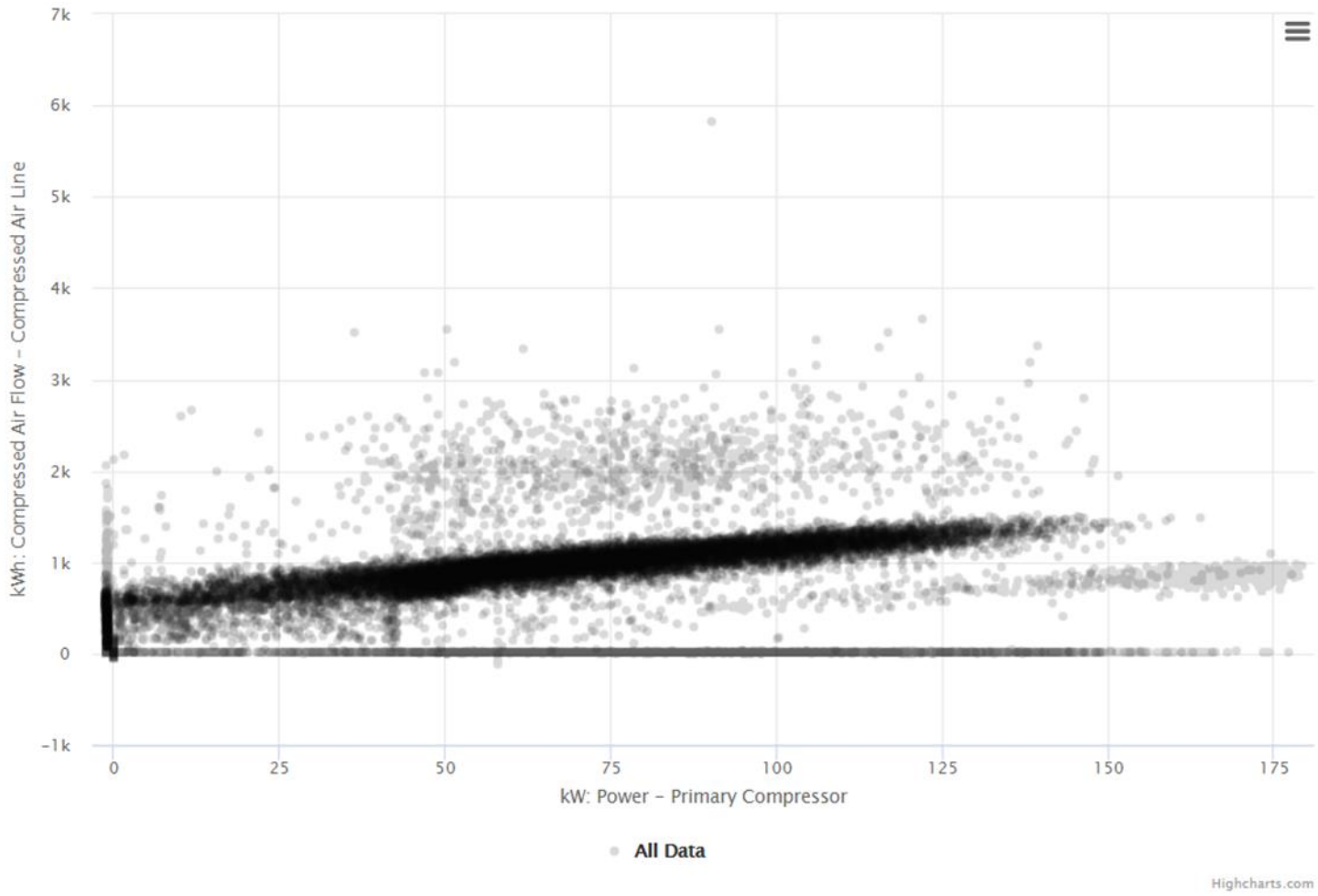
Vermont Energy Investment Corporation

Signal

Help

Timeseries | Scatterplot | Heatmap

Independent: kW ▾ Dependent: kWh ▾



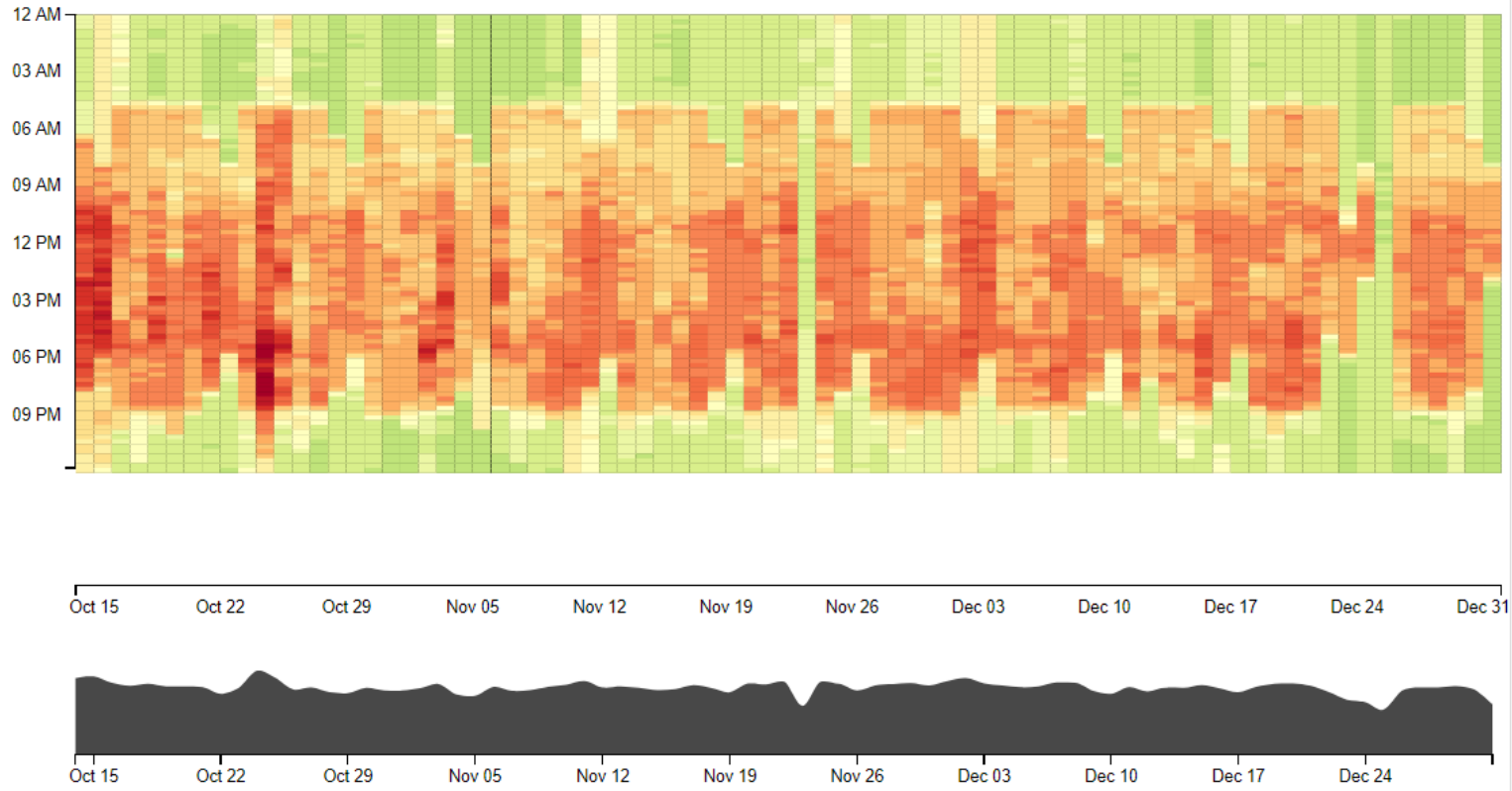
VEIC

AMI Data Explorer v1.1.2

Help Sign out

AMI data for account 1891668152GMP and servicepoint 1898410834GMP

Time series - daily | Time series - 6 hour | Time series - hourly | Time series - 15 min | Heatmap



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Efficiency Vermont

Dashboard Account

All Locations

Location 1

1st Floor Freezer

Beer Cooler

Cooler 2

Box 4

Location 2

OVERVIEW

REFRIGERATION UNIT HEALTH

GOOD 2

ALERTS 2

COST PER MONTH

AVERAGE	LAST MONTH	THIS MONTH
$230	$241	$139

ALERTS

LOCATION 1 6:30AM >

First Floor Freezer

Box temperature is above 31F

LOCATION 1 6:30AM >

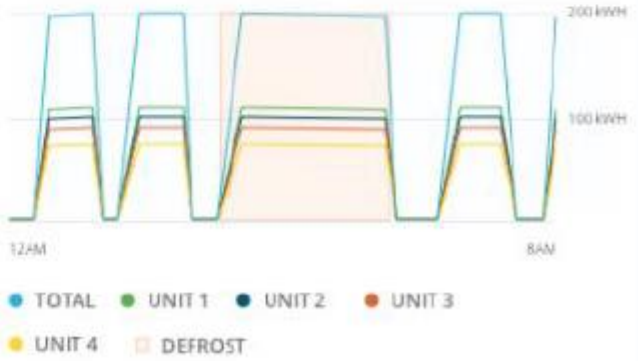
First Floor Freezer

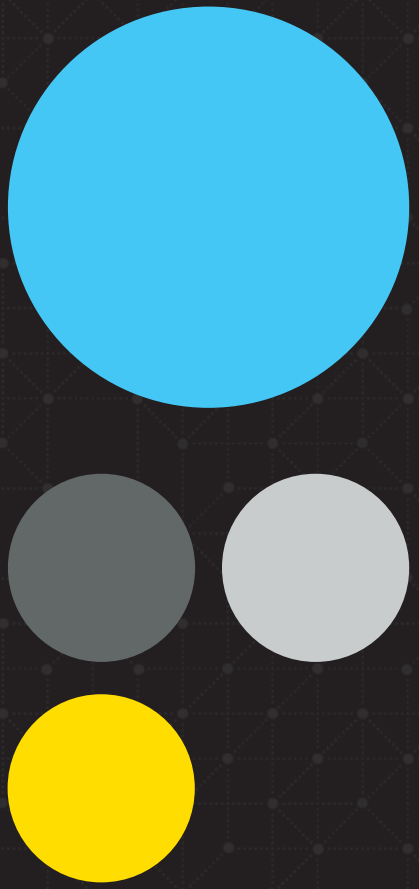
Box temperature is above 31F

ANALYTICS

COST PER UNIT

POWER



2 million
BTU Boiler
Hurst
BOILER CO., INC.
Backup Oil
Furnace

Questions?