

MINX0003 Quick Setup Guide & Demo

1. Introduction

This quick setup guide describes the key items for setting up MINX on a DHCP server enabled computer network. A laptop or computer on the same network will be required. Two simple demonstrations illustrate MINX's basic features and use.

For non-DHCP networks or a direct MINX-to-computer connection, refer to ***MINX0003 Network Setup Guide***.

2. Physical Setup

2.1. Package Contents

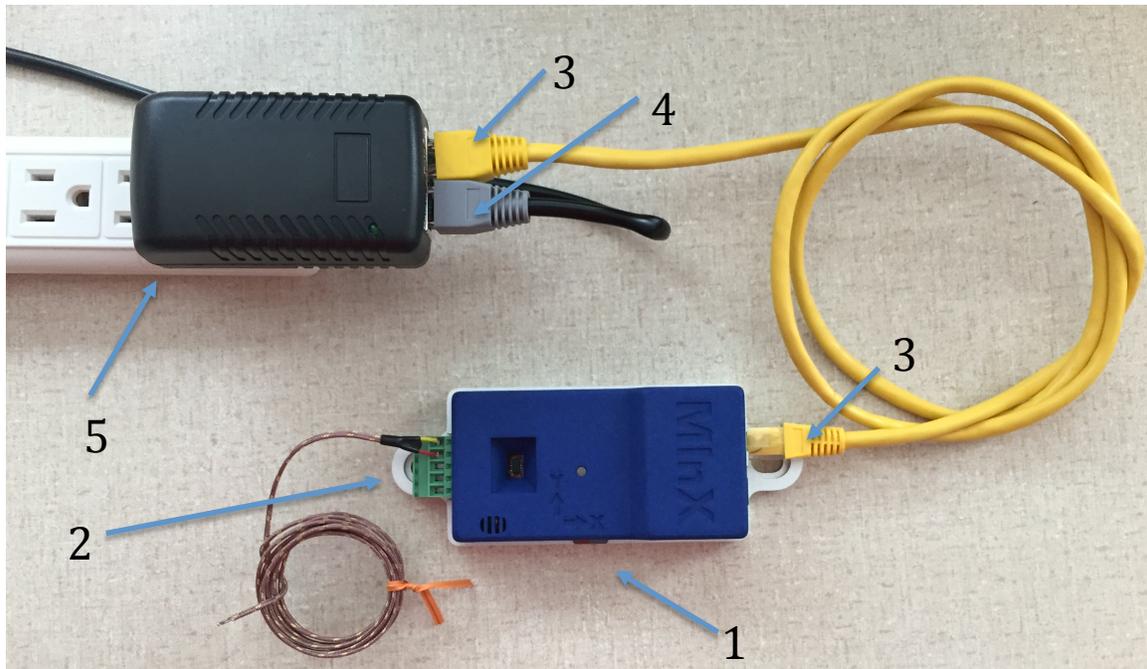
Locate and remove contents from packaging (Minx, POE Injector, Ethernet Cable, SD Card, Accessory Connector with Thermocouple).



2.2. Hardware Connections

Complete the following steps:

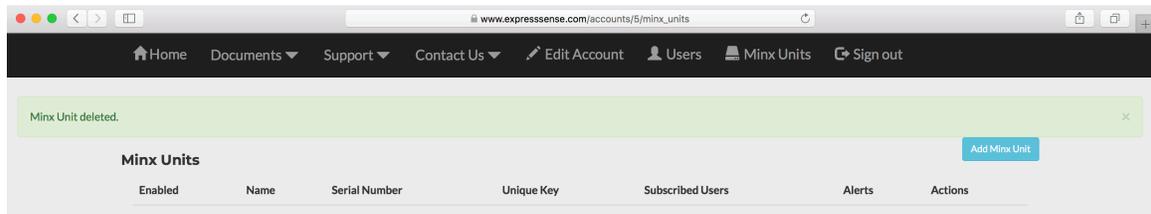
- 1) Install SD card into MINX.
- 2) Attach Accessory Connector with Thermocouple to MINX.
- 3) Connect MINX Ethernet Port to POE Injector's "POE"/"Data &Power Out" port using user supplied Ethernet Cable.
- 4) Attach User's DHCP computer network to POE Injector's "LAN"/"Data In" Port using user supplied Ethernet cable.
- 5) Plug POE Injector to 120V wall socket.



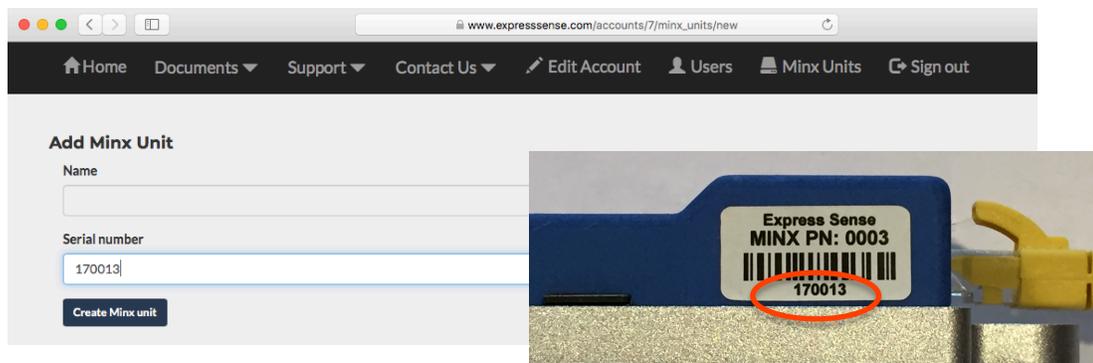
3. MINX Unit Registration

To receive email and text alerts, register each MINX unit with ExpressSense's Alert Server. Complete the following steps:

- 1) Navigate from any computer web browser to www.ExpressSense.com/users/sign_up.
- 2) Enter the required information and create a password. If you wish to receive alerts by SMS text, enter an additional Email-to-SMS email address for a cellphone number as provided by the phone's carrier (ex 5551234567@txt.att.net).
- 3) A confirmation email, *subject: 'Confirmation Instructions', from: 'no-reply@www.expresssense.com'*, will be sent to the registered email address. Open this email in any email reader, and click the **link** provided in the email labeled 'Confirm my Account'.
- 4) The link will open a new web browser window will open at www.ExpressSense.com with a Sign-In page. Enter your registered email address and chosen password.
- 5) A web page to manage your MINX units will appear. Click the button 'Add Minx Unit'.

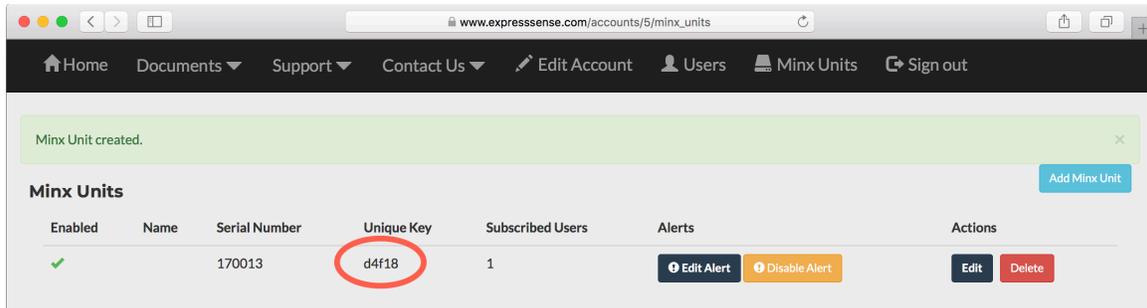


- 6) A web page to register a MINX unit will appear. Enter the 6 digit Serial Number located on the label attached to your Minx unit.



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- 7) The MINX Units web page will return to show a list of your registered MINX units. By default, unit owner is subscribed for receiving alerts from the newly added MINX unit.



- 8) The system generates a Unique Key that will identify your physical MINX unit to the system and thereby ensure only the true owner receives the generated alerts. The Unique Key will be used in the following steps; please make a note of it.

Unique Key _____

4. MINX Webpage

Each individual MINX unit generates and serves a dynamic webpage that allows users to control the unit and access the unit's data. Access the MINX webpage using a computer attached to the same local network (Wi-Fi or Ethernet).

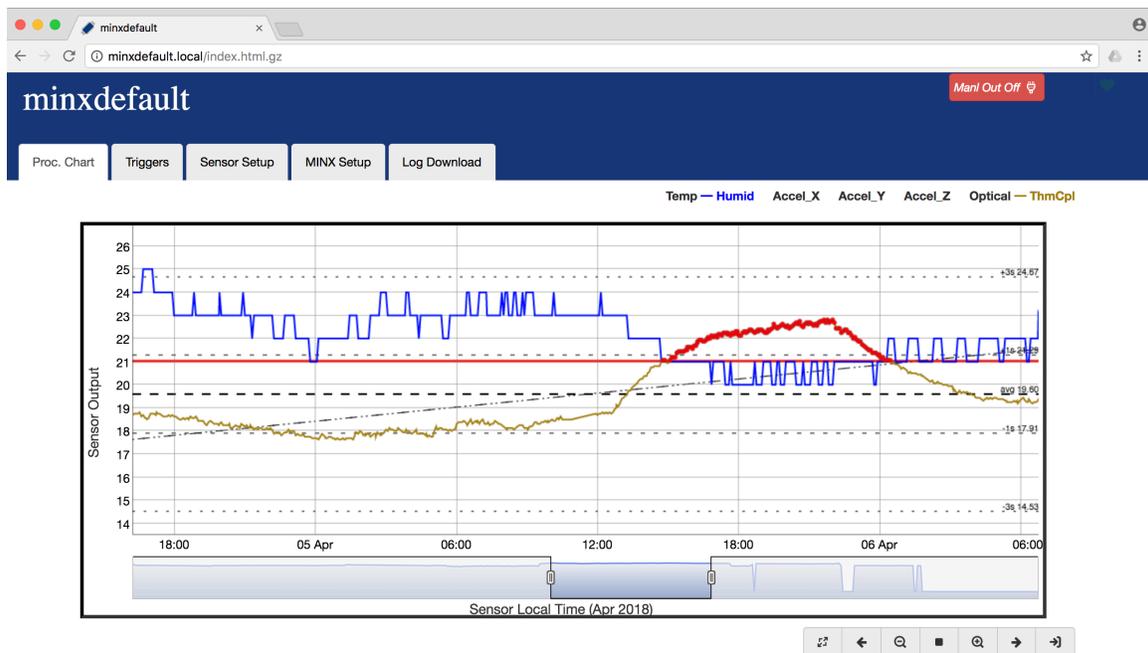
4.1. Browser Navigation

From the network connected computer open a web browser (ex: Chrome, Safari, Internet Explorer, etc.).

The MINX webpage is accessed by navigating the web browser to an address that includes the MINX unit's *name* (MINX_ID). By factory default, the MINX unit's ID is 'minxdefault'. If setup has been completed previously and the MINX given a unique name, that MINX_ID must be substituted per the following table.

MINX State	Operating System	Web Address
Factory Default	Windows PC	http://minxdefault
	macOS/OSX, iOS, Linux	http://minxdefault.local
After First Setup: Unique name = 'MINX_ID'	Windows PC	http:// + MINX_ID
	macOS/OSX, iOS, Linux	http:// + MINX_ID + .local

For the computer's given operating system, enter the corresponding Web Address into the browser's Address Bar and hit Enter. MINX will serve a webpage to the browser.

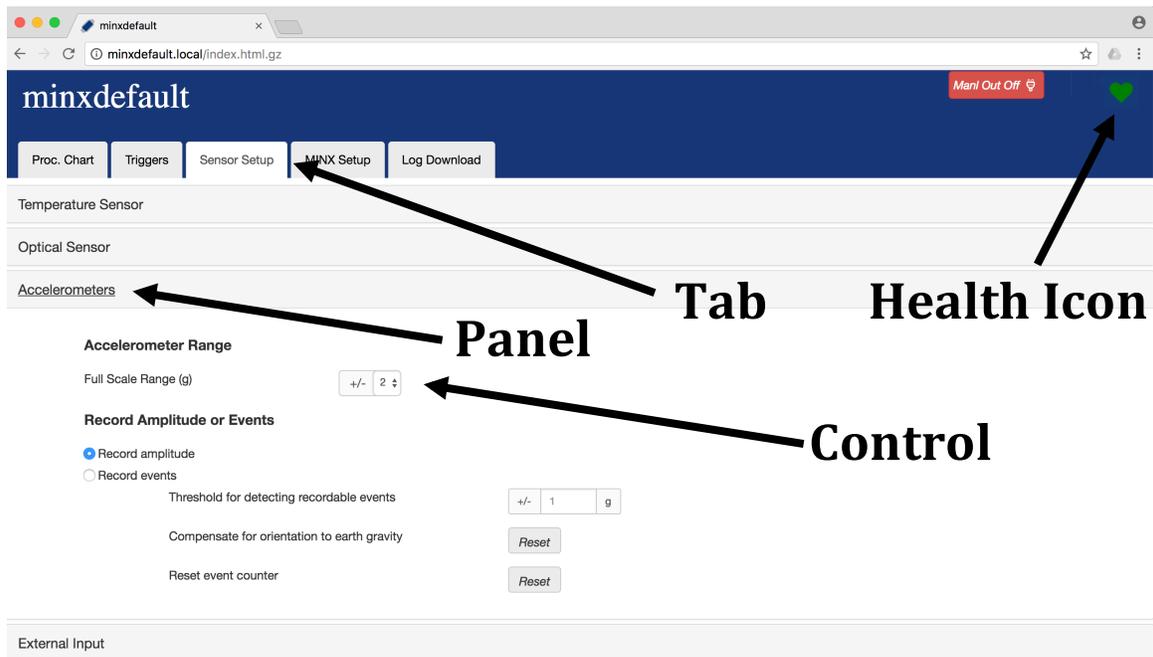


4.2. Site Layout and Navigation

The MINX webpage contains several navigation **Tabs**, accessed by clicking on the Tab. Some Tabs also include collapsible **Panels**, recognizable by their grey horizontal bars. Clicking on the Panel bar will hide/unhide the panels information

Each Tab and/or Panel contains various **Controls** (InputBoxes, CheckBoxes, RadioButtons, and Buttons) used to configure MINX or access its data. The following sections reference these various controls with the following format:

Tab -> Panel: Control



4.3. Network Connection and Health State

MINX indicates the current network connection state and health using a Health Icon displayed in the upper-right corner of the web-page. A green blinking Heart icon indicates good network and health status. A red blinking Exclamation icon indicates an error condition on the MINX unit. A short error message about the condition will also be displayed. A spinning re-load icon indicates the browser has lost network communication with MINX.

Icon	Status
	Network connected, Health Good
	Network connected, Error Condition
	Network not connected

5. MINX Unit Setup

Perform the setup using the MINX webpage and navigating to the indicated **TAB** and **PANEL** listed, then adjust the **CONTROL** as specified in each of the following steps:

MINX_Setup->General_Setup: MINX ID

Give this minx unit a unique name, then hit Enter. Make note of this name, as all future access will use the given MINX_ID.

Check the name is entered correctly and hit confirm in the message box that appears. (ex: Oven-2). This change will cause MINX to re-register itself on the network with this new *name*.

The gives each MINX on the network a unique name and makes it easy to remember each unit's function in the process

ENTER THE NEW WEB ADDRESS INTO THE BROWSER'S ADDRESS BAR!

Operating System	Web Address
Windows PC	http:// + MINX_ID
macOS/OSX, iOS, Linux	http:// + MINX_ID + <i>.local</i>

Consider creating a Bookmark or Shortcut for future use

MINX_Setup->General_Setup: Time Zone

Set the Time Zone where the MINX unit resides

The ensure MINX logs and displays the proper hour for the time zone.

MINX_Setup->Alert_Setup: Alert Identity Key

Enter the unit's unique key provided during the MINX Unit Registration process at www.ExpressSense.com (part 3, step 8).

The unique serial number & key pair ensures the unit owner's account controls the alerts.

MINX_Setup->Alert_Setup: Send Test Alert

Click the Test Button; See Alert Status change to "Alert successfully transmitted to server (XX:XX:XX on XX-XX-XX)"; If Alert Status instead reads "Alert refused by server. Ensure key XXXXX is correct...", double check the registered unit and the corresponding key provided.

Check your email account for receipt of test email with *subject: 'Alert from XXXXX at XX:XXam on XX/XX/XX', from: 'no-reply@www.expresssense.com'*

This ensures alerts are processing through the server and reach the intended recipient

Sensor_Setup->External_Input_1: Select External Input Type

Choose the Thermocouple RadioButton

This instructs MINX that the external input will be from a Thermocouple; In the Thermocouple Type pull-down menu, select 'K' type thermocouple, which corresponds to the sample thermocouple provided.

Sensor_Setup->External_Input_1: MINX(raw) Temp / Point1

Enter 0

This clears any previous 2-point thermocouple calibration

Sensor_Setup->External_Input_1: Known(ref) Temp / Point1

Enter 0

This clears any previous 2-point thermocouple calibration

Sensor_Setup->External_Input_1: MINX(raw) Temp / Point2

Enter 100

This clears any previous 2-point thermocouple calibration

Sensor_Setup->External_Input_1: Known(ref) Temp / Point2

Enter 100

This clears any previous 2-point thermocouple calibration

Sensor_Setup->External_Input_1: Record Amplitude or Events

Choose the Record Amplitude RadioButton

This instructs MINX to log and plot the temperature of the thermocouple

Triggers->Trigger_Settings: Trigger Select

Using the pull-down, choose "ThmCpl"

This instructs MINX to generate triggers by analyzing the thermocouple temperature

Triggers->Trigger_Settings: High Limit

Enter a High Limit value of 25C; Check the High Limit CheckBox

This instructs MINX to generate triggers when thermocouple temperature is greater than 25C

Triggers->Trigger_Settings: Alert Email

Check the Alert Email CheckBox

This instructs MINX that when a trigger event occurs, an email should be sent

Triggers->Trigger_Settings: Alert Email Custom Message

Enter a short message in the InputBox

This instructs MINX to add this custom to the alert emails

6. Demonstration 1 – Thermocouple and Alert Trigger

6.1. Process chart

Switch to the “Proc Chart” tab to see the MINX generated Process Control Chart.

In the Chart Legend, click on the following Trace Titles to hide them: **Humid, Accel_X, Accel_Y, Accel_Z, Optical**. Each clicked Trace Title turns black when hidden and the trace disappears from the Chart.

Click the Zoom-Live ↗ Icon, and click the Zoom-In 🔍 icon once. (Note that it may take up to 30minutes for MINX Ambient temperature sensor to settle to the actual ambient conditions after initial power on.)

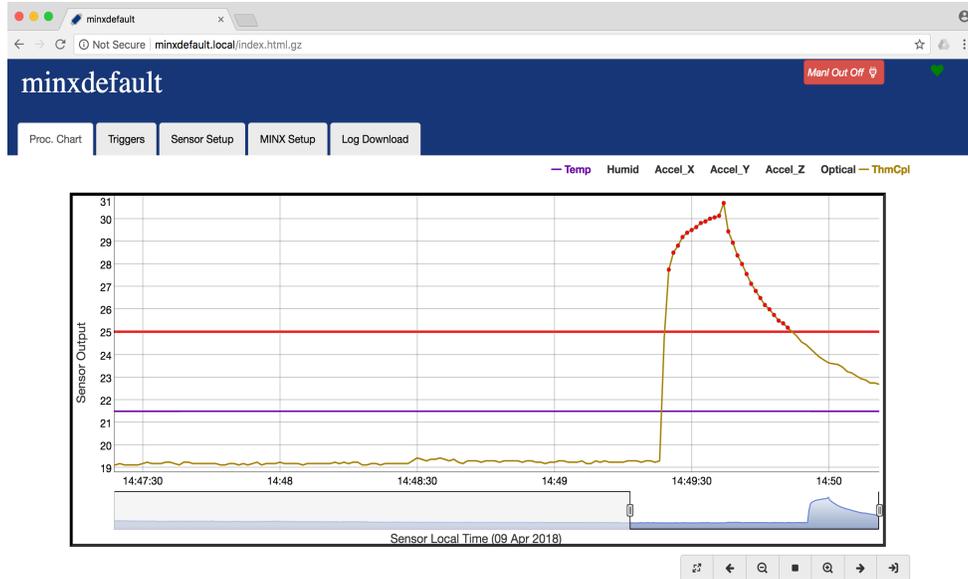


6.2. Trigger Event

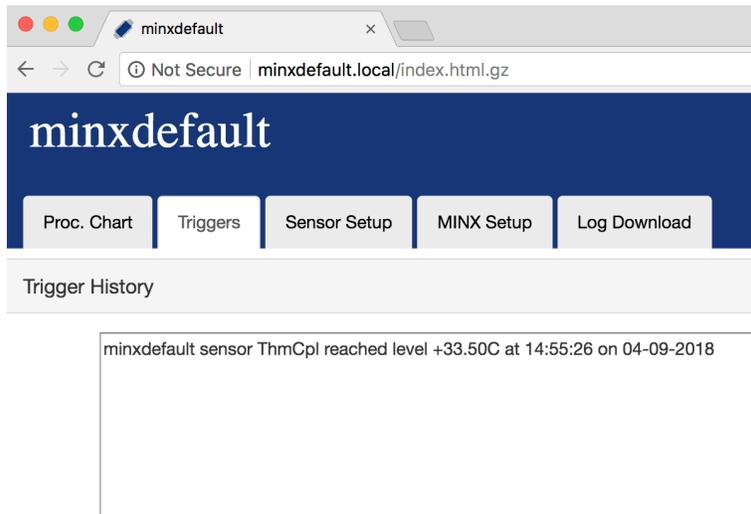
Pinch the tip of the thermocouple between fingers for approximately 30 seconds. The thermocouple will heat from body temperature. The process chart auto-scales to fit the new data. Alternately right-click over the chart to access a context menu that controls the vertical axis.

When the temperature of the thermocouple exceeds 25C, a trigger event is generated. Note the red Control Limit at 25C that matches the Trigger settings. Any Thermocouple measurement that exceeds the limit is highlighted in red.

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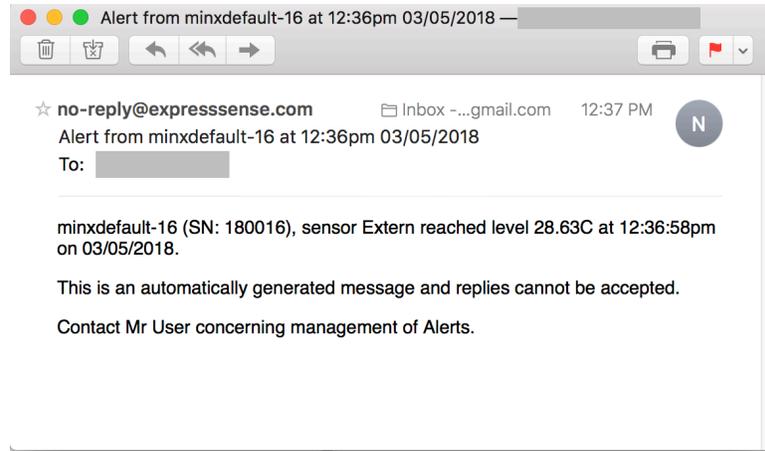


A new trigger entry will appear in the Trigger History (**Triggers Tab** >**Trigger_History Panel**). Double-clicking while hovering over the text of the trigger history will cause the webpage to jump to the Process Control chart and zoom to the event.



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At the time of the event, MINX will have communicated with the www.ExpressSense.com server, and an alert email will have been generated and sent to the email address registered. Check your email account for receipt.



7. Demonstration 2 - Optical Counting

For the optical counting demonstration, place MINX on flat table aimed up at the ceiling. (Note that if ceiling is more than 2.0m away an error message will result, “optical fault”, but it will not affect the outcome of this demonstration). Ensure cables/wires do not intrude on the optical window, or the cone defined by the angled walls of the MINX case.

7.1. Setup Sensor and Trigger

Sensor_Setup->Optical_Sensor: Record Amplitude or Events

Choose the Record Events RadioButton

This instructs MINX to log and display optical events rather than the actual optical distance

Sensor_Setup->Optical_Sensor: Record Amplitude or Events

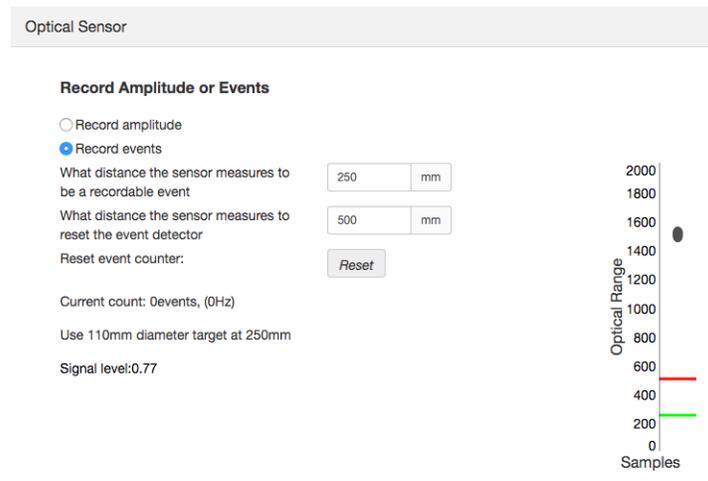
Set trigger distance limit to 250mm

This defines an optical event as being an optical distance measure less than 250mm

Sensor_Setup->Optical_Sensor: Record Amplitude or Events

Set reset distance to 500mm

This tells MINX to not generate additional events until the optical measure is greater than 500mm



The plot on the right side of the Optical_Sensor panel, displays the maximum, minimum, and average optical distance values for the last three seconds. The data is delayed approximately 2 seconds and updates once per second. Note the green trigger line that corresponds to trigger distance limit 250mm and the red reset line at 500mm. Place a 110mm(4”) diameter or larger object (e.g. and open hand) within 250mm (10”) of the MINX optical sensor, measured from the rear of the base plate. Note one or more plot samples appear below the red trigger line. Move the object at least 500mm (20”) from the MINX, or entirely out of the MINX optical view, and note the plot samples change. Note the Current Count increases each time MINX detects the object below the trigger line. This tool is helpful when setting up optical

event counting and choosing parameters. If the target is too small, or other error conditions occur, a red error message may appear.

Sensor_Setup->Optical_Sensor: Record Amplitude or Events

Click event counter reset button

This instructs MINX to reset the accumulated optical event count

Triggers->Trigger_Settings: Alert Email

Un-check the Alert Email CheckBox (previously checked in Demo1)

This instructs MINX NOT to send emails when a trigger is detected

Triggers->Trigger_Settings: Trigger Select

Using the pull-down, choose Optical

This instructs MINX to generate triggers by analyzing the thermocouple temperature

Triggers->Trigger_Settings: High Limit

Check the High Limit CheckBox; Enter a High Limit value of 12evts (“evts”=events)

This instructs MINX to generate triggers when the optical event count reaches 12

Triggers->Trigger_Settings: Triggered External Output

Check the Triggered External Output CheckBox

This instructs MINX to drive the external output in response to a trigger

Triggers->Trigger_Settings: Triggered External Output, Output only stays set...

Check the 'Output Only Stays Set As Long As Trigger Event State Lasts' Button

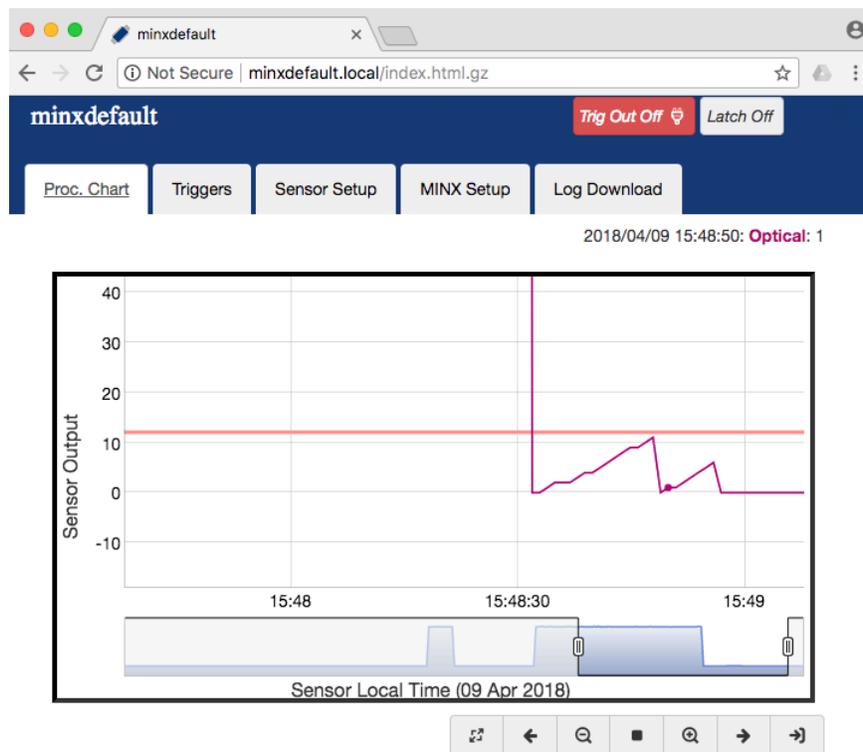
This instructs MINX to drive the external output for only the time period when trigger condition exists

7.2. Process chart

Switch to the Proc_Chart tab to see the Process Control Chart.

In the Chart Legend, hide all traces other than Optical, by clicking on the Trace Titles to hide/unhide them. To see Live Data, click the Zoom-Live  Icon, click the Zoom-In  icon once.

Note the Buttons in the upper-right corner. The first button, the External Mode control button, reads “Trig Out Off;’ indicating the External Switched 5V output, is presently OFF, because the Trigger Condition (counted events >12) is not currently present.



Initially, the Optical sensor will be plotted as value 0evts (zero events). Reset the count again if necessary. The vertical axis will scale automatically, to show any optical values captured previously. If prior Optical Distance (e.g. amplitude) values were captured in the data set, the vertical axis may extend up to two thousand (2000). The vertical axis may be zoomed-in by using your mouse to define a vertical region for zooming: Left-Click-Hold on a position just above the region of interest, then Drag-Down to a position below the region of interest, then Release the mouse button. To pan the vertical axis, hold down the shift-key, then left-click mouse while over the chart background and drag the mouse up or down. The vertical axis may also be controlled via the context menu that is presented by right-clicking while

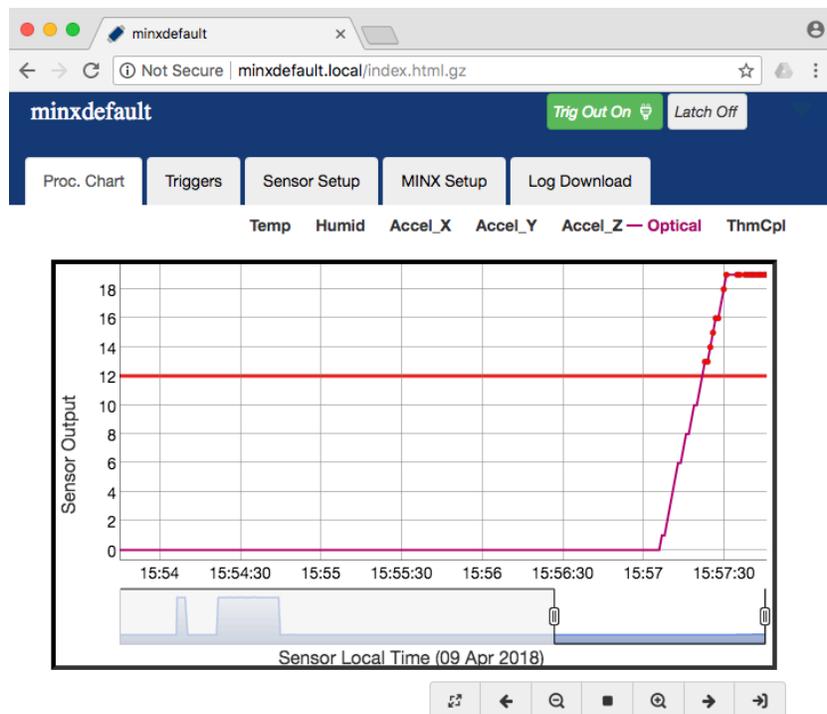
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over the graph region. The graph may be zoomed-out by Double-Clicking multi-times anywhere in the graph, or use the various graph controls icons.

Place a 110mm(4”) diameter or larger object (e.g. and open hand) no more than 250mm (10”) from the MINX, then remove the object or move the object to a position further than 500mm. The event count displayed in the process chart will increment each time the object is brought within the trigger distance. Note the while the optical counter can detect up to 5 events per second, the graph only updates once per second.

Upon reaching a value that of 12 or greater, the External Output Mode Control Button will switch to “Trig Out On” and turn green. The External Output pin on the Accessory connector will now be driving 5V.

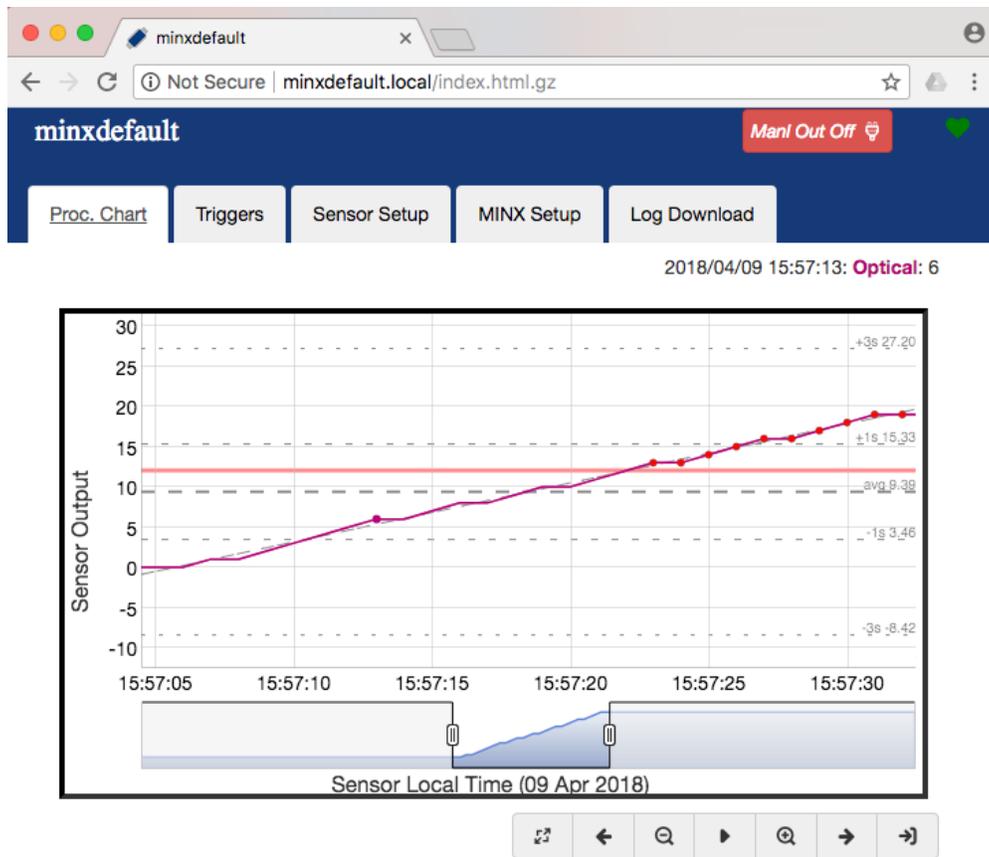
In addition to the “automatic” trigger control, the external output can be manually controlled by clicking on the External Output Button to toggle its state. Taking “manual” control will automatically disable automatic trigger control mode. Click the External Output Button, causing the External Output Mode Control Button to switch to “Manl Out Off” and turn red. Click the External Output Button again, causing the External Output Mode Control Button to switch to “Manl Out On” and turn green. In each of these cases, the External Output pin on the Accessory connector will now be driving 0V and 5V respectively.



7.3. Data Inspection

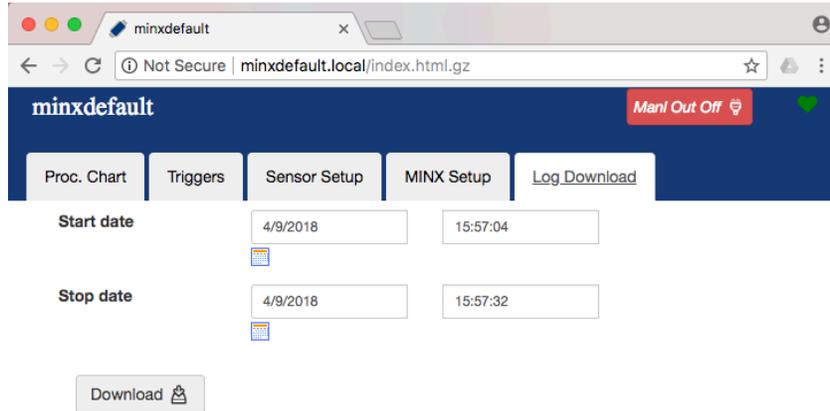
As new data is sampled, it is displayed on the right side the Process Control Chart, and the oldest displayed sample disappears from the left side of the chart. This scrolling of Live Data can be stopped by clicking the Stop  Icon. This is helpful for inspecting events. Using the Icon buttons located below the process chart Pan and Zoom the Process Control Chart to center on the Optical counter events.

Hover the mouse over the trace and see the highlighted point. Detail of the points Time and the measured value appear in the Legend. Click the mouse while over a highlighted point to enable the display of Statics for the trace. Trend, Average, ± 1 Sigma, and ± 3 Sigma lines are plotted on the process control chart. Hover and click on any point to disable plotting statistics.



7.4. Data Download

Switch to the Log Download tab. Note the date fields are automatically set to encompass the data presently displayed on Process Control Chart. Press the Download button. See minx_data.csv file is downloaded to browser’s download folder.



Navigate computer to browser’s download folder and user any suitable spreadsheet program to open minx_data.csv file.

	A	B	C	D	E	F	G	H
1	Time (S)	Temp (C)	Humid (%RH)	Accel_X (g)	Accel_Y (g)	Accel_Z (g)	Optical (mm)	ThmCpl (C)
2	1522495988	14.5	40	0.148	-1.06	-0.08	34	0.4
3	1522495988	14.5	40	0.148	-1.06	-0.08	34	0.4
4	1522495989	14.5	40	0.136	-1.1	-0.12	82	0.4
5	1522495989	14.5	40	0.136	-1.1	-0.12	82	0.4
6	1522495990	14.6	40	0.148	-1.092	-0.172	69	0.4
7	1522495990	14.6	40	0.148	-1.092	-0.172	69	0.4
8	1522495991	14.6	40	0.128	-1.064	-0.064	66	0.4
9	1522495992	14.6	40	0.144	-1.08	-0.124	70	0.4
10	1522495992	14.6	40	0.144	-1.08	-0.124	70	0.4
11	1522495993	14.6	40	0.14	-1.044	-0.136	63	0.39
12	1522495993	14.6	40	0.14	-1.044	-0.136	63	0.39
13	1522495994	14.6	40	0.136	-1.064	0.084	60	0.39

Downloaded CSV data includes headers to identify current MINX configuration of sensor units. Time Column is in seconds since Jan 1, 1970 12:00:00AM (e.g. Unix Time); this is easily converted to Day, Month, Year, Hour, Minute, Seconds using template found on www.ExpressSense.com. Note Optical column data displays accumulated event counts.

For large data sets, remove the SD card from MINX and transfer to computer via an SD card reader. A download of 24 hours of data takes approximately 2 minutes on a typical network.