Configure XL

Software Version 2.12

Audience: This guide is for the person responsible for driving improvement with XL.

Purpose: Spend an hour or two to configure key settings (network, date and time, reasons, digital inputs, time schedule, parts), printing barcodes for your application, and optionally to configure XL Enterprise email alerts.

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Important User Information

XL products are not designed or intended for control applications, and MUST NOT be used for control applications under any circumstances. There are fundamental differences in the design methodology of a control product such as a Programmable Logic Controller (PLC) and a non-control product such as an XL device. Outputs (e.g., relays) are provided for annunciation only, and MUST NOT be used for control purposes.

This product is designed and intended for use solely in indoor industrial applications, and MUST be installed by a qualified electrician.

This product is designed and intended for use solely in a secure, private network environment.

It is the responsibility of all persons applying this product to a given installation and/or application to carefully review the installation and/or application to evaluate and ensure the suitability of this product for the intended application.

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SHOCK HAZARD: This product has more than one source of power. Relay outputs may be at mains potential from a secondary power source. Always disconnect power from all power sources before installing or servicing the XL device, and before opening the user access plate. Do not reapply power until the access plate has been reinstalled and securely closed. Failure to follow these precautions could result in personal injury or death due to electric shock.

ATTENTION: This product must be operated at or below Pollution Degree 2 (an environment where only non-conductive pollution occurs except for occasional and temporary conductivity caused by condensation) and Over Voltage Category II (circuits directly connected to local-level distribution).

Contact Information

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Vorne has an extensive network of international partners. More information can be found at: https://www.vorne.com/about-us/xl-partners.htm.

Network Settings

The XL platform consists of two parts:

- **XL Productivity Appliance™:** A device that monitors a manufacturing process and is installed on the Local Area Network (LAN) with a static IP or DHCP IP address.
- **XL Enterprise:** An optional cloud-based application that provides additional services for the XL Productivity Appliance™. XL Enterprise runs on an Amazon Web Services (AWS) platform.

Users of the XL Productivity Appliance™ will need a LAN connection to configure the XL device and to access the built-in dashboards and reports. Once configured, the XL device can run without a LAN connection (this is not recommended as users will be unable to access dashboards and reports).

To take advantage of the features provided by XL Enterprise, the XL Productivity Appliance™ needs access to the Internet (and this may initially be prohibited by your network settings). We have prepared an **IT Brief**, and we are delighted to answer any questions from your IT team. Feel free to contact us!

Step 1 – Confirm Network Settings

Contact your IT representative to review how they would like to provision LAN settings and Cloud access.

LAN Settings (required)

Your IT representative will want to either reserve a **DHCP address** or assign a **static IP address**.

To reserve a DHCP address:

- Provide your IT representative with the **XL MAC address**. It is printed on a white sticker on the back panel of the device, printed on a white sticker on the side of the shipping box, and will be displayed on the LED screen if no IP address is available on system start.
- Your IT representative will provide you with an IP address you can use to access XL.

To assign a static IP address:

- Ask your IT representative for an IP Address, Subnet Mask, Default Gateway, Preferred DNS Server, and Alternate DNS Server (the Alternate DNS Server is optional).
- Confirm that **Port 80** is open (this allows communication between XL and your browser).

Cloud Network Settings (Required for XL Enterprise)

Request that the following ports are opened:

- **Port 53** (DNS - SNTP time updates, firmware updates, and email alerts)
- **Port 123** (NTP - SNTP time updates)
- **Port 443** (HTTPS - firmware updates and email alerts)

Request that the following websites are whitelisted:

- **xl-enterprise.com** (automated firmware updates)
- **xl.vorne.com** (automated email alerts and other XL Enterprise functionality)
- **updates.xl-enterprise.com** (automated firmware updates)
- ***.vornexl.pool.ntp.org** (SNTP - you can alternatively use internal SNTP servers)

Step 2 – Verify Ethernet and Barcode Scanner

Verify that the XL Device has:

- An ethernet connection to your network.
- A barcode scanner installed.
- The rear access plate securely attached.

If the device does not have an ethernet connection or a barcode scanner, refer to the **Install XL** guide for installation instructions.

Step 3 – Apply Power

SHOCK HAZARD: This product must be grounded. Never defeat the ground conductor or operate the product in the absence of a suitably installed ground conductor.

ATTENTION: This product is suitable for connection to a TN-S power distribution system (AC Hot and AC Neutral lines with a separate protective grounding conductor).

1. Grab a pen and paper. When the XL device powers up it will display network address information that you will write down.
2. Apply AC main power to the XL device.
3. The scoreboard will go through a series of power-up steps. After displaying the software version, the scoreboard will either display a MAC address (left image) or an IP address (right image). **Write this address down**. If you miss this information, disconnect and reapply mains power to the XL device.
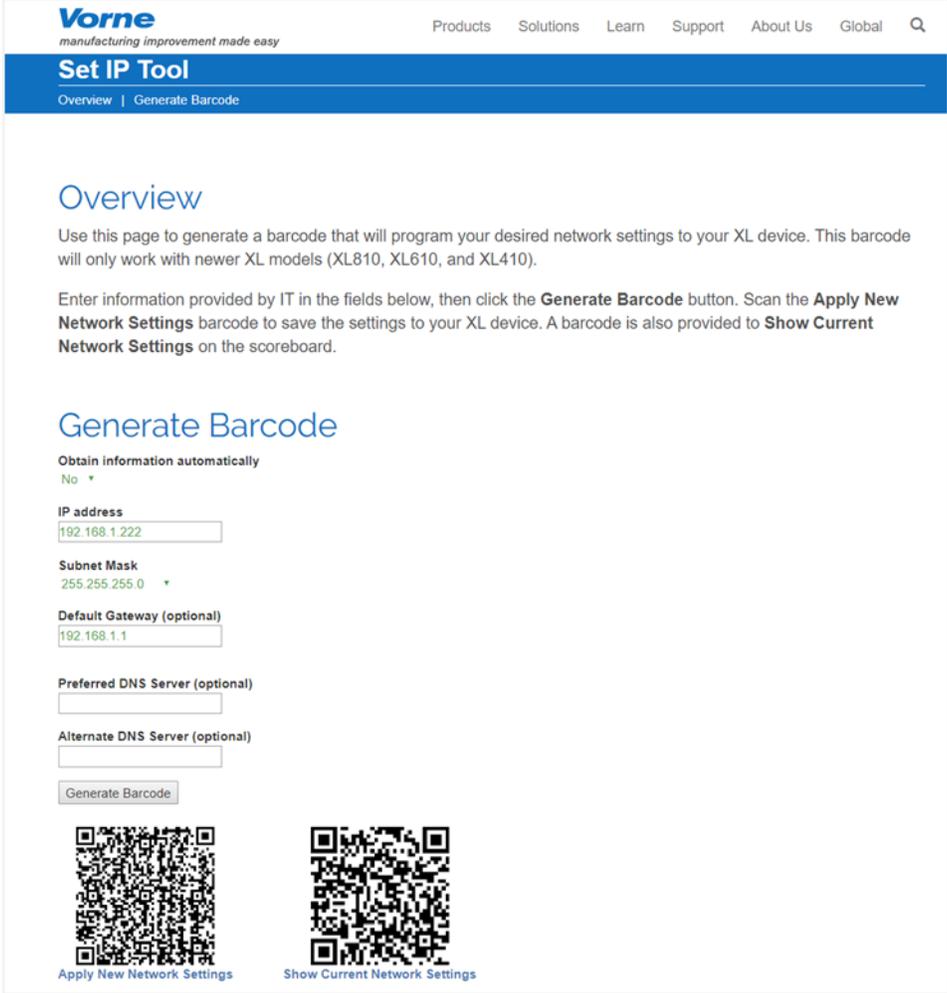

If a MAC address is displayed (left image) go to the next step: **Step 4 – Set Static IP Address**.

If an IP address is displayed (right image) skip to: **Step 5 – Access XL with a Browser**.

Step 4 – Set Static IP Address (no DHCP)

In this step, you will use the Vorne website to generate a 2D barcode with the static IP address and other network information from **Step 1 – Confirm Network Settings**.

1. Open your web browser and navigate to **www.vorne.com/set-ip**.

2. Set Obtain information automatically to **No**.
3. Enter the following information provided by IT: **Required:** IP Address, Subnet Mask, Default Gateway, Preferred DNS Server. **Recommended:** Alternate DNS Server.
4. Click the **Generate Barcode** button.
5. Print the page (from your browser).
6. Scan the **Apply New Network Settings** barcode to save the network settings to your XL device.
7. Scan the **Show Current Network Settings** barcode to confirm the new network settings on the scoreboard. Each scan shows a new screen of information.
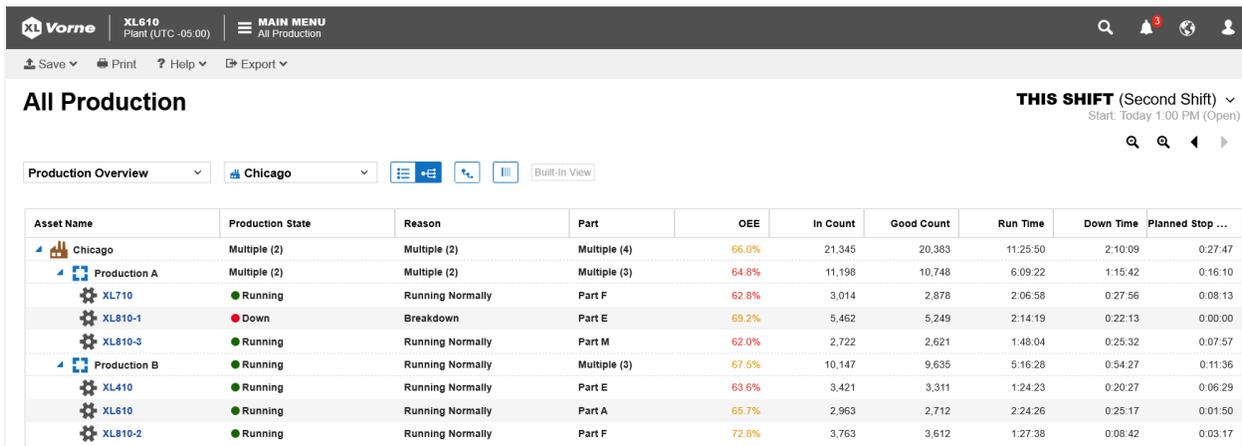8. You are now ready to access the XL device with your web browser.

Step 5 – Access XL with a Browser

In this step you will confirm that you can access the XL device with your web browser. For the best experience with XL we recommend using Google Chrome, Microsoft Edge, or Mozilla Firefox. Older or unsupported browsers may not provide the functionality needed by XL.

To access XL (on any network-connected computer or mobile device) simply open a browser and type in the IP address (either the IP address copied from the scoreboard in Step 3 or the static IP address assigned in Step 4). E.g.:

If the address is correct, you will see the **All Production** web page:

Asset Name	Production State	Reason	Part	OEE	In Count	Good Count	Run Time	Down Time	Planned Stop ...
⌂ Chicago	Multiple (2)	Multiple (2)	Multiple (4)	66.0%	21,345	20,383	11:25:50	2:10:09	0:27:47
Production A	Multiple (2)	Multiple (2)	Multiple (3)	64.8%	11,198	10,748	6:09:22	1:15:42	0:16:10
XL710	● Running	Running Normally	Part F	62.8%	3,014	2,878	2:06:58	0:27:56	0:08:13
XL810-1	● Down	Breakdown	Part E	69.2%	5,462	5,249	2:14:19	0:22:13	0:00:00
XL810-3	● Running	Running Normally	Part M	62.0%	2,722	2,621	1:48:04	0:25:32	0:07:57
Production B	● Running	Running Normally	Multiple (3)	67.5%	10,147	9,635	5:16:28	0:54:27	0:11:36
XL410	● Running	Running Normally	Part E	63.6%	3,421	3,311	1:24:23	0:20:27	0:06:29
XL610	● Running	Running Normally	Part A	65.7%	2,963	2,712	2:24:26	0:25:17	0:01:50
XL810-2	● Running	Running Normally	Part F	72.8%	3,763	3,612	1:27:38	0:08:42	0:03:17

If you ever need to check your Network Settings, scan the following barcode:

Show Current Network Settings

If you scan the barcode multiple times, the screen will scroll through each of the network settings in the XL device.

Configure (One-Time Settings)

In this section we will configure XL for the first time on your process. Please note that there are additional configuration options that can fine-tune your deployment, and our support team will be delighted to go over these with you.

The settings menu is restricted to the **Administrator** role:

1. Click the [icon] **Log In** icon on the right side of the navigation bar.
2. For Role select **Administrator**.
3. Enter the Administrator password. The default Administrator password is **aragorn**.
4. Click the [icon] **Settings** icon to open the settings menu.

Note that default passwords can be changed at any time by navigating to **Settings / Device / Passwords**.

Step 1 – Set Locale and Location

XL supports country-specific languages and data formats. The Locale page sets the default and scoreboard language for all users. Each user can set their own browser language by clicking on the 🌐 Globe icon on the right side of the navigation bar. The current release includes:

- Data formatting for 28 locales and eleven machine-translated languages (Chinese, Dutch, English, French, German, Italian, Japanese, Korean, Polish, Portuguese, and Spanish). Professional translations will be rolled out with future releases.
- Scoreboard message translations for eight languages (Dutch, English, French, German, Italian, Polish, Portuguese, and Spanish).
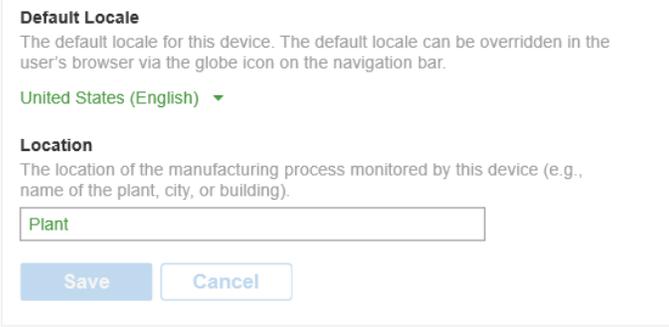
Default Locale
The default locale for this device. The default locale can be overridden in the user's browser via the globe icon on the navigation bar.

United States (English) ▼

Location
The location of the manufacturing process monitored by this device (e.g., name of the plant, city, or building).

Plant

[Save] [Cancel]

1. Navigate to **Settings / Device / Locale**.
2. Select your country (and preferred language if applicable) from the dropdown menu.
3. In the Location section, enter the name of your plant. This will be displayed in the menu bar at the top of the page.
4. Click the **Save** button.

Step 2 – Set Date and Time

Set time-related settings so that XL is configured for the correct time zone and to synchronize the device internal clock to either our cloud-based time server, or your network time server.

Time Zone

Time Zone determines the appropriate daylight-saving time rules and the UTC time offset.
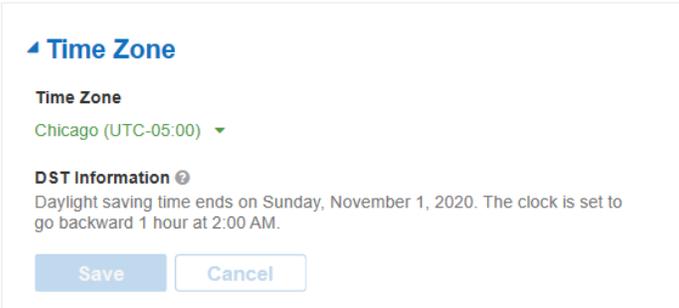
◢ Time Zone

Time Zone
Chicago (UTC-05:00) ▼

DST Information ⓘ
Daylight saving time ends on Sunday, November 1, 2020. The clock is set to go backward 1 hour at 2:00 AM.

[Save] [Cancel]

1. Navigate to **Settings / Device / Date and Time**.
2. Select your time zone from the dropdown menu.
3. Click the **Save** button.

Time Source

We highly recommend using an SNTP server to keep XL time synchronized to a central time authority. By default, Automatic Time Updates is set to **Yes**, and XL will attempt to synchronize with our cloud-based server (this requires internet access, see **Step 1 – Confirm Network Settings**). Alternatively, your IT representative can provide you with the settings for a local network-accessible time server.

1. Navigate to **Settings / Device / Date and Time**.
2. Obtain the internal SNTP server IP address from your IT department and enter it as Time Server 1.
3. Click the **Save** button.

Clock

If Automatic Time Updates is set to **No** you have the option to manually set the XL clock, either to match your computer clock or to a specific date and time. This is a one-time update, which is why we recommend using an SNTP server as described above. To manually set the time to your computer clock:
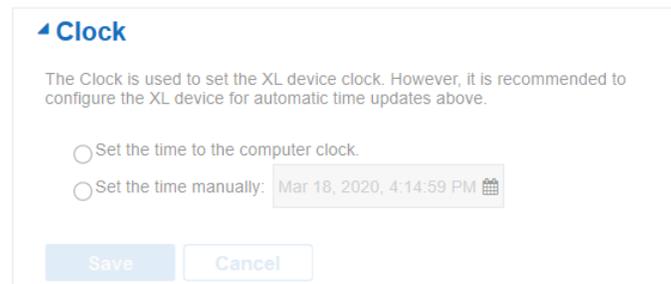
1. Navigate to **Settings / Device / Date and Time**.
2. In the Clock form select Set the time to the computer clock.
3. Click the **Save** button.

Step 3 – Configure Asset Name and Hierarchy

Set the Asset Name of the XL device to describe the machine or process that it is monitoring and configure the Hierarchy if you have more than one XL device.

Asset Name

The Asset Name is displayed in the navigation bar of the web page interface and should describe the machine or process being monitored (e.g., Stamping Line 12).
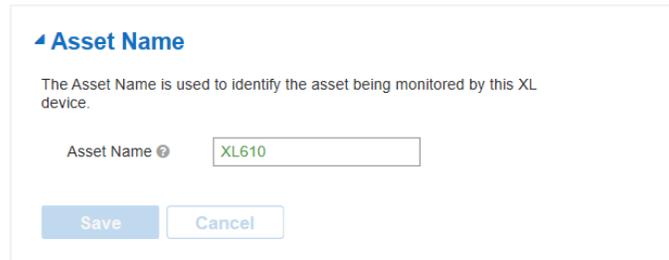
1. Navigate to **Settings / Device / Name and Hierarchy**.
2. In the Asset Name form, type in the name you would like to use to identify the manufacturing process monitored by this XL device.
3. Click the **Save** button.

Hierarchy

The Hierarchy is only set if you have multiple XL devices, in which case it enables you to view real-time and historical rolled-up reporting for every XL device accessible on your network.
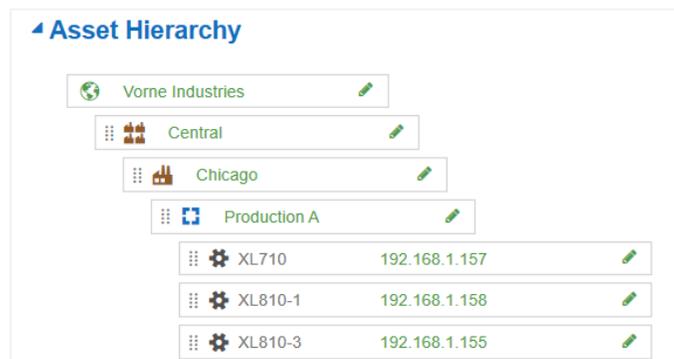
1. Navigate to **Settings / Device / Name and Hierarchy**.
2. To add a node click **Add Node** button.
3. If the node is a Manufacturing Process, enter the IP address of the XL device.
4. If the node is a Division, Plant, or Area enter a descriptive name.
5. To modify the name of an Enterprise, Division, Plant, or Area, click on the green text.
6. To move a node within the hierarchy, use the drag handle to move it to the desired new location.
7. To delete a node, click on the ✖ icon that appears when hovering over the node.
8. Click the **Save** button.

Step 4 – Configure Signal Inputs

Configure how XL responds to signal inputs from your manufacturing process. XL is designed to automatically detect run and down time, but if you need manual run detection please refer to the **Deploy XL: Manual Run Detection** guide. Refer to the **Install XL** guide, **Identify Signal Requirements** section for information and recommendations on where to obtain signal inputs.

The simplest recommended approach is to:

- Provide a single input - **In Count**, at the entry of the process constraint (and to designate this as the **Cycle Input** to detect cycles, small stops, and down time).
- You would then train operators to scan Reject reasons to track OEE Quality. If you intend to use a barcode scanner to track rejects, do not configure a **Good Count** input.

Optionally you could:

- Provide an **In Count** and one or more automated **Reject Counts** (with Reasons).
- Provide an **In Count** with one or more automated **Good Counts**.

Do not:

- Provide automated inputs for both **Good Count** and **Reject Count**, as XL will calculate either Good or Reject depending on the combination of signals you provide.

Input ❓	Type ❓	Function ❓	Cycle Detection ❓	Debounce ❓	Inhibit (s) ❓	Input Prescaler ❓	Reject Reason ❓
1	Count ▾	In Count ▾	Cycle ▾	Low Speed ▾	0.0 ✎	0.961056436736... ✎	N/A
2	Count ▾	Reject Count ▾	No ▾	Low Speed ▾	0.0 ✎	1 ✎	Reject ▾
3	No Type Assigned ▾	N/A	No ▾	N/A	N/A	N/A	N/A
4	No Type Assigned ▾	N/A	No ▾	N/A	N/A	N/A	N/A
5	No Type Assigned ▾	N/A	No ▾	N/A	N/A	N/A	N/A
6	No Type Assigned ▾	N/A	No ▾	N/A	N/A	N/A	N/A
7	No Type Assigned ▾	N/A	No ▾	N/A	N/A	N/A	N/A
8	No Type Assigned ▾	N/A	No ▾	N/A	N/A	N/A	N/A

Input Type ❓
Sinking ▾

API Access ❓
☐ Allow the XL API to trigger digital inputs.

1. Navigate to **Settings / Connections / Digital Inputs**.
2. Select the Input Type as either **Sinking** (used for sensors with NPN outputs) or **Sourcing** (used for sensors with PNP outputs, and devices with 5V DC to 24V DC outputs). This setting affects all the digital inputs.
3. Hover over the ❓ icon in each column to learn more about settings available for each input.
4. Select the **Type** and **Function** for each input that you will use. If the Counter is Reject Count you can also select an appropriate Reject Reason.
5. Set **Cycle Detection** to **Cycle** for one input. XL will use this signal for calculating OEE Performance by detecting cycles, small stops, and for tracking down time. By default, this is Input 1 (In Count).
6. The Input Prescaler is usually 1. The exception is any count input where one input signal does not represent one manufacturing cycle. This most commonly occurs with encoders.
7. Debounce is usually Low Speed. The exception is if the input signal is faster than 50 Hz.
8. Inhibit is usually 0.0 seconds. The exception is if you want to ignore subsequent inputs for a period of time after receiving a valid input (e.g., a conveyer with swinging parts).
9. Click the **Save** button.

Step 5 – Create Shift and Team Names

XL tracks production using two people-based dimensions:

- **Shifts** (Required): A Shift is a period of time in a day, normally controlled by the Time Schedule.
- **Teams** (Optional): A team is a combination of people and headcount that exist within a Shift.

Modify Shift Names

XL needs to be configured with the names of your Shifts. XL doesn't currently support an alternating shift schedule so if your plant rotates shifts, we recommend configuring a "Day" and "Night" shift only.

1. Navigate to **Settings / Metrics & Dimensions / Shifts and Teams**.
2. Enter or change the default Shift Names.
3. Click the **Save** button.

Add Team Names

Configuring Teams allows you to analyze Labor Productivity. If it is against your company policy to track labor-based metrics, do not configure Teams and select the checkbox to hide the **Analyze > Teams and Labor** page.


1. If you want to track **Teams**, create teams where the Team ID is either the name of the crew, the crew supervisor, or an individual person.
2. Enter the number of people on each Team.
3. Click the **Save** button.

Administer (Ongoing Settings)

In this section, we will configure initial values for items that are likely to need ongoing adjustments and updates by supervisors: Reasons, Parts, Time Schedules, and Barcodes. These types of settings are all available in the Plant Floor column in the **Management Console** available through the ⚙ icon.

Access to some settings is restricted to the Administrator role.
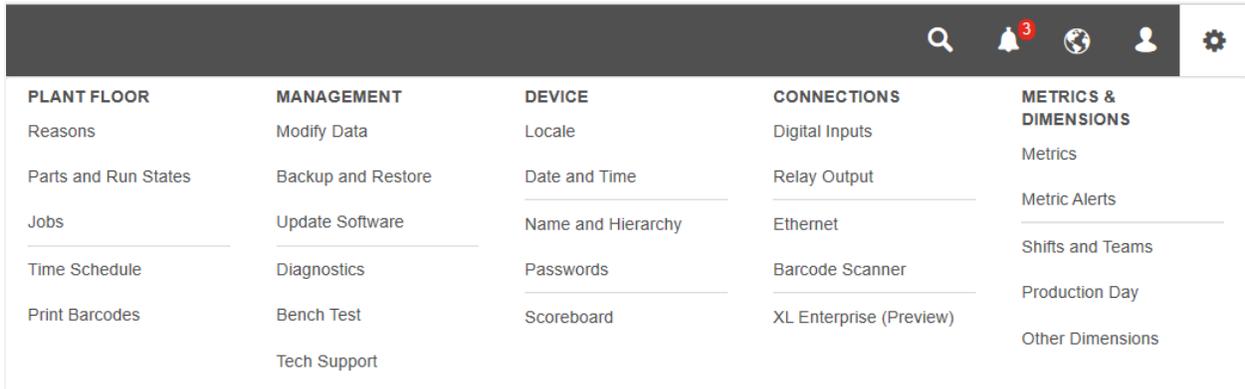
PLANT FLOOR	MANAGEMENT	DEVICE	CONNECTIONS	METRICS & DIMENSIONS
Reasons	Modify Data	Locale	Digital Inputs	Metrics
Parts and Run States	Backup and Restore	Date and Time	Relay Output	Metric Alerts
Jobs	Update Software	Name and Hierarchy	Ethernet	Shifts and Teams
Time Schedule	Diagnostics	Passwords	Barcode Scanner	Production Day
Print Barcodes	Bench Test	Scoreboard	XL Enterprise (Preview)	Other Dimensions
	Tech Support			

1. Click the 👤 **Log In** link on the right side of the navigation bar.
2. For Role select **Administrator**.
3. Enter the password. The default Administrator password is **aragorn**.
4. Click the ⚙ **Settings** icon to open the settings menu.

Create Reasons

Every moment of time is assigned an impact value, production state, and reason. This provides you with a consistent way to view information, perform analytics, and generate reports. XL starts with the reason and based on that assigns the production state and impact value.

Impact	Reasons
Running	XL automatically assigns reasons for: Running Normally, Slow and/or Small Stops, Running Poor Quality, Slow with Poor Quality. Reject Reasons are assigned to rejects that are detected during Running conditions.
Unplanned Stop	Unplanned Stop reasons are often called Down reasons – e.g. Breakdown, Jam, Adjustment, No Operator.
Planned Stop	Planned Stop reasons are split into the production states of Changeover (normally associated with a Part change), and Maintenance (normally scanned by an operator or engineer).
Not Scheduled	Not Scheduled reasons are split into the production states of Meal/Break reasons (normally triggered by the time schedule), Meeting (normally scanned), No Production (either triggered by the time schedule, or scanned), and Not Monitored (automatically detected).

For more information about how XL analyzes production time, refer to the **Meet XL** guide.

Down Reasons

Down reasons are allocated to down time events. Your operators can scan a down Reason while the process is stopped (and XL is displaying the Line Down message), or after the process has restarted. While XL allows you to create an unlimited number of down reasons, we recommend starting with no more than 25. Having a limited number of reasons makes it much more likely that operators will scan the correct reason. We then recommend adding more reasons over time, once the operators demonstrate that they're scanning consistently and accurately.

1. Navigate to **Settings / Plant Floor / Reasons**.
2. Select **Down** from the dropdown menu.
3. Click **Add Reason** button.
4. Enter the name of the new down reason.
5. Click the **Save** button.

Changeover Reasons

Changeover reasons are allocated to planned stop events. While you can print these reasons as separate barcodes, if you associate a generic Changeover Reason (e.g." Setup") with each Part, your operator can scan a single barcode to start a part run that will also immediately start the selected changeover event.

1. Navigate to **Settings / Plant Floor / Reasons**.
2. Select **Changeover** from the dropdown menu.
3. Click **Add Reason** button.
4. Enter the Reason Name of the new changeover reason.
5. Select how the changeover ends from the **End Event** dropdown list.
6. Optionally, set a **Default Target Time** for the changeover.
7. Click the **Save** button.

Reject Reasons

Reject Reasons are used to assign reasons to rejected parts. There are three ways to input a reject:

1. **Digital input**: Configured in Configure / Step 4 – Configure Signal Inputs.
2. **Barcode scan**: Either with each scan inputting one reject, or by entering multiple rejects by reason. Refer to the **Print Barcodes** section.
3. **API input**: Our Technical Support team are delighted to answer any questions about the API.

In all cases, there is always an associated reject reason. By default, this reason is **Reject**. It is also easy to configure additional reasons for your application. To create additional reject reasons:
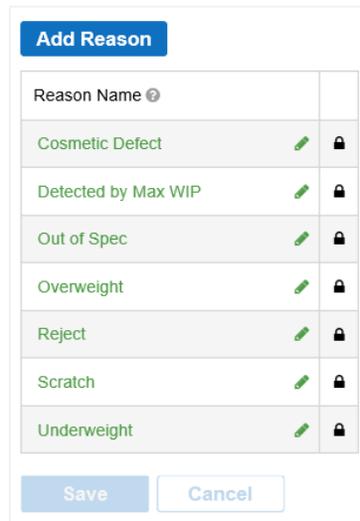
4. Navigate to **Settings / Plant Floor / Reasons** and click the **Reject Reasons** tab.
5. Click **Add Reason** button.
6. Enter the names for your new reject reasons.
7. When you have entered all reasons, click the **Save** button.

Create Parts

The Parts page is where you define settings for each part produced by your manufacturing process.

Add Part	Export	Import							
Part ID ❔	Alternate Part ID ❔	Ideal Cycle Time ❔	Takt Time ❔	Target Labor per Piece ❔	Down ❔	Count Multipliers ❔	Start with Changeover ❔		
Bag of coffee ✏	029741925441 ✏	0h 0m 1.000s ⧗	0h 0m 1.200s ⧗	0h 0m 1.000s ⧗	0h 3m 0s ⧗	1, 1, 1, 1, 1, 1, 1, 1 ✎	Yes (Part Change; No Target; By Definitely Running)	✎	⚙

Every part manufactured by your process should be entered in the **Parts** table. You can manually enter parts, upload them from a Microsoft Excel file, or use the XL API (to load part information in real-time from an ERP system). Contact our team to discuss the XL API.

The Part Settings that are available are:

Part Setting	Description
Part ID	The name of this Part. You can alternatively enter a barcode number to start this Part using an existing barcode (enable on the **Settings / Connections / Barcode Scanner** page).
Alternate Part ID	An optional alternative way of identifying the part. Typically used for matching to your existing barcodes for this part (enable on the **Settings / Connections / Barcode Scanner** page) or for ERP integration.
Ideal Cycle Time	The theoretical fastest possible time to complete one manufacturing cycle. Ideal Cycle Time is used to calculate Performance and OEE metrics.
Takt Time	The expected pace of production (including all losses). It drives the Target Counter including Target Count and Efficiency metrics. It's usually easiest to enter manufacturing time and expected pieces and let XL calculate Takt Time.
Target Labor per Piece	The expected amount of labor time to manufacture one piece. It is used to calculate Earned Labor and Labor Efficiency.
Down	The length of time after a cycle before the manufacturing process is considered as Down.
Count Multipliers	The number of pieces per input signal. For most applications this will be 1.
Start with Changeover	The Changeover settings that will be activated when the part is started (including changeover reason, target time, and how the changeover is ended).

Manually Input Parts

1. Navigate to **Settings / Plant Floor / Parts and Run States**.
2. Click on the **Parts** tab.
3. Click on the **Add Part** button and input your Part settings.
4. Click the **Save** button.

Import Parts using Microsoft Excel

Alternatively export the parts table, make your edits, and then import it.

1. Navigate to **Settings / Plant Floor / Parts and Run States**.
2. Click on the **Export** button. The part data downloads as a Microsoft Excel file.
3. Add new parts or edit existing parts in the exported file.
4. When you are finished, save the edited file.
5. Click on the **Import** button and select the edited Microsoft Excel file.
6. After import, any data errors will be indicated in the parts table with a red underline. Correct any errors in order to save.
7. Click the **Save** button.

Configure Time Schedule

The time schedule enables XL to automatically identify Not Scheduled time (time where production is not expected). Typically, this includes all time outside of shifts, and time for breaks within shifts.

The easiest way to setup a schedule is to configure one day (e.g., Monday), copy that to other days, and then make any further changes as needed.

Navigate to Time Schedule

1. Navigate to **Settings / Plant Floor / Time Schedule**. You will be in the Schedules tab with Default Schedule selected. This is where you define your regularly repeating weekly schedule. You can optionally create multiple schedules for future use. Delete Unused Shifts

If you normally operate with three shifts, skip this step. Otherwise, delete shifts that don't apply.
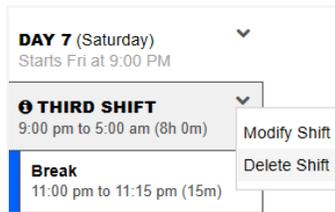
2. Locate DAY 2 (Monday).
3. If you normally operate with two shifts, click the ⌄ dropdown next to THIRD SHIFT and select **Delete Shift**.
4. If you normally operate with one shift, click the ⌄ dropdown next to SECOND SHIFT and THIRD SHIFT and in each case select **Delete Shift**.
5. Click the **Save** button.

Modify Shift Settings

Repeat the following for each shift on Monday to adjust the start and end times to match your schedule.
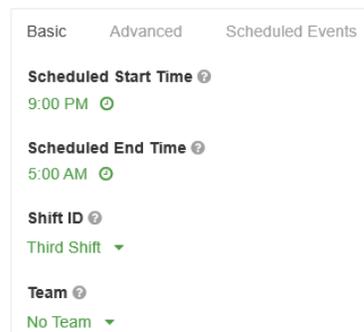
1. Click the ⌄ dropdown next to the shift name as above, but this time select **Modify Shift**.
2. Modify the **Scheduled Start Time** and **Scheduled End Time** to match your schedule.
3. Modify the **Shift ID** to select the correct Shift ID.
4. If this shift will always start with the same Team select the appropriate **Team ID**.
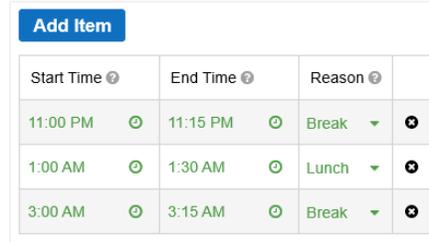5. Click the **Save** button.

Modify Scheduled Events

Repeat the following for each shift on Monday to adjust the breaks to match your schedule.
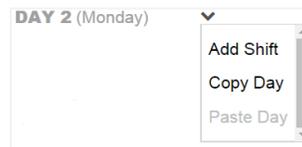

1. Click the ⌄ dropdown next to the shift name and select **Modify Shift**.
2. Click on the **Scheduled Events** tab. There should be one event for each break (including meal periods).
3. If you need additional events, click **Add Item** to add an event to the shift.
4. If there are too many events, click the ⊗ icon to delete an event from the shift.
5. Modify **Start Time**, **End Time**, and **Reason** of each event to match your schedule.
6. Click the **Save** button.

Copy to Other Days

You should now have one day in the time schedule that matches your actual work schedule. The next step is to copy that day to your other workdays.

1. Click the ⌄ dropdown next to **DAY 2 (Monday)** and select **Copy Day**.
2. Click the ⌄ dropdown next to each remaining workday and select **Paste Day**.
3. Click the **Save** button at the bottom of the page.

Modify Other Days as Needed

Follow the instructions in the **Modify Shift Settings** and **Modify Scheduled Events** sections above for each workday as needed to match your actual work schedule.

Additional Features

Now let's explore the other two tabs of the **Time Schedule** page.

The Calendar tab shows the schedule as it appears for each week. You can configure one-time modifications in this tab.

1. Click the ⌄ dropdown next to a day to **Make Day Not Scheduled** or to **Add Shift**.
2. Click the ⌄ dropdown next to a shift to **Modify Shift** or **Delete Shift**.

The **Exceptions** tab makes it easy to add exceptions and to see modifications in the schedule (and to undo any modifications).

Print Barcodes

When initially deploying XL you will want to print **Down** barcodes, and **Part** barcodes. As you develop your use of XL you may want to provide additional barcodes to your operators so that you can capture additional information. All barcodes can be printed from the **Settings / Plant Floor / Print Barcodes** page.

If you change the name of any Reason, Reject Reason, Part, Team, or Shift then the associated barcode needs to be reprinted. Job barcodes need to be reprinted if the Job ID, Part ID or Goal change. Part barcodes only need to be reprinted if the Part ID is changed (you can change other settings without reprinting Part barcodes).

General Barcodes

Located under the **Settings / Plant Floor / Print Barcodes** page, **General** tab, you can print the following types of barcodes:

Barcode Type	Description
Down	Assigns the down reason to the most recent down event (including the current down event).
Event	Enables a process state with scanned reason. Used in some applications to start unscheduled stops (e.g. cleaning, breaks). Most companies do not print Event barcodes to start changeover events, instead they associate changeovers with Part changes as configured on the **Settings / Plant Floor / Parts and Run States** page.
Part	Start the next part run (and associated changeover). As an alternative to printing these barcodes, some companies use a barcode that already exists on a product or work order document (see **Frequently Asked Questions** for more information).
Production	The **Split Down Event** barcode allows a down event to be split into multiple events. The **Start Production** barcode disables every process state and forces XL to automatically detect Running or Down.
Reject	Each **Reject Reason** barcode will increment the rejects per reason by 1. Used in applications where Operators are manually detecting reject pieces. If your process can detect rejects automatically, these reject reason can be assigned using digital inputs on the **Settings / Connections / Digital Inputs** page.
Shift	Start or end shifts. Most companies use the time schedule to automate shift start and end time. If you're using the time schedule, you probably don't want to print these barcodes.
System	Provides additional features such as displaying network settings on the scoreboard and confirming that the barcode scanner is correctly connected.
Team	Start and end Teams (if configured). Teams are used to track headcount.

Numeric Entry

Located under the **Settings / Plant Floor / Print Barcodes** page, **Numeric Entry** tab, you can print the following types of barcodes:

| Barcode Type	Description
Numeric Entry	Allows an operator to input a multiple quantity of rejects. These barcodes are used with the **Reject** barcodes.

Organize and Print Barcode Sheets

When printing barcodes, we recommend printing one Barcode Type per page (so operators don't get confused about their functionality). To print **General** barcodes:

1. Navigate to **Settings / Plant Floor / Print Barcodes**.
2. Click on the **General** tab.
3. Enter a title for the group of barcodes such as "Down Reasons".
4. Add simple instructions that will be helpful to your operators (e.g., "First fix the problem and then scan the best matching down reason. You can scan a down reason even after the process is running.")
5. Click the **Add Barcode** dropdown and select **All** or select **individual barcodes** for the group.
6. Delete unneeded barcodes by clicking the ⊗ icon that shows when hovering over the barcode.
7. Arrange barcodes in the group by dragging them with your mouse.
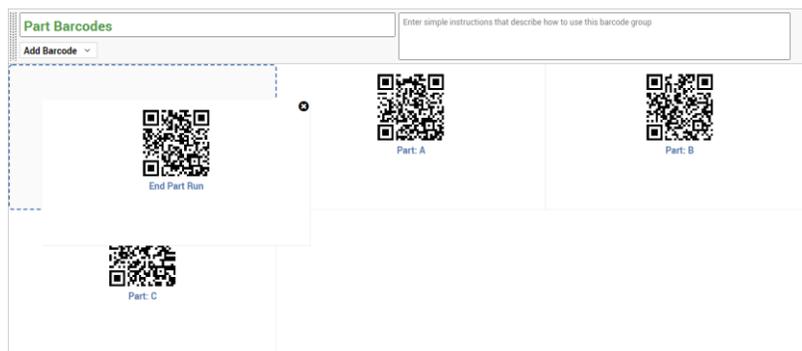
8. Create additional barcode groups as needed.
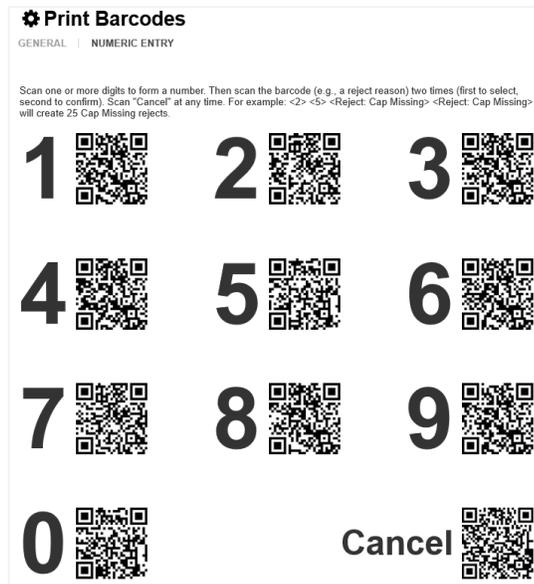9. To force a barcode group to a new sheet, check the **Page Break Before** check box.
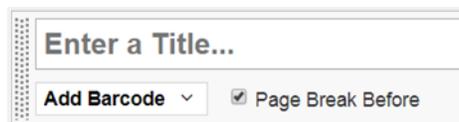
10. To open a preview page, click the **Print** button in the command bar (just below the navigation bar).
11. To print the barcode sheets, click the **Print** button in the upper right corner.

Print Numeric Entry Barcodes

Numeric entry barcodes allow users to scan one or more digits to form a number. These barcodes are used to enter multiple rejects with an assigned reject reason code.
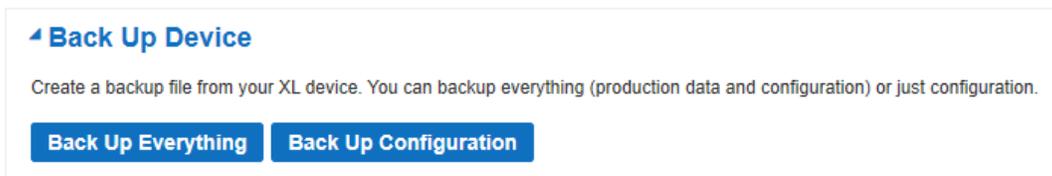
1. Navigate to **Settings / Plant Floor / Print Barcodes**.
2. Click on the **Numeric Entry** tab.

3. To open a preview page, click the **Print** button in the command bar (just below the navigation bar).
4. To print the barcode sheets, click the **Print** button in the upper right corner.

Export a Backup File

Now that XL has been configured, we recommend backing up your configuration.

1. Navigate to **Settings / Management / Backup and Restore**.
2. Click on the **Back Up Configuration** button in the Back Up Device form.
3. Save the file to your computer.

XL Enterprise

XL Enterprise is a cloud-based application hosted on Amazon Web Services (AWS) using data centers located in the USA. Communication between XL and XL Enterprise uses token authentication and HTTPS communication protocol. XL Enterprise currently provides the following free services:

- **Email Alerts** (real-time email alerts based on metrics, targets, and production states).
- **End of Shift Report** (a summary of your shift data automatically emailed at shift end).
- **Updates** (software updates delivered to XL devices and ready to install at a time of your choosing).
- **SNTP** (time server synchronization – you can optionally specify internal SNTP addresses).

XL Enterprise Email Alerts retrieves metrics associated with the current production to create an alert but doesn't store that data – i.e. there is no historical data storage on the XL Enterprise cloud server.

Step 1 – Confirm Internet Connectivity

The XL Productivity Appliance™ needs an Internet connection to the cloud-based XL Enterprise application. To determine if your XL device can connect to XL Enterprise:
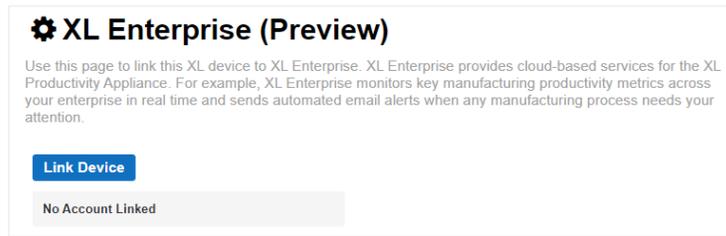
1. Log in as **Administrator**.
2. Navigate to **Settings / Connections / XL Enterprise (Preview)**.
3. If your device can communicate with XL Enterprise, you will see a **Link Device** button.
4. Click the **Link Device** button.
5. Proceed to Step 2 – Create Organization.
6. If your device cannot communicate with XL Enterprise, you will see a Failed Connection notice:
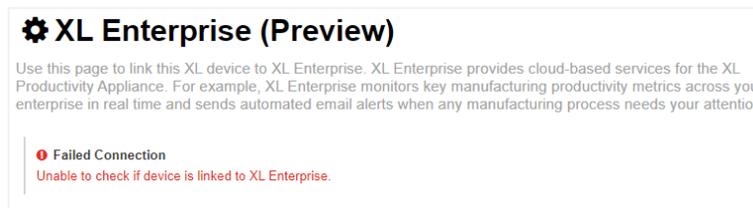
7. If you have a Failed Connection, contact your IT representative to review your network settings:

Failed Connection

Next Steps - Use the instructions on **Page 5 of this guide** to verify:
- XL has the correct LAN settings.
- The necessary Ports are open.
- The required websites are whitelisted.

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Step 2 – Create Organization

In XL Enterprise, an organization is a cluster of XL devices that all share the same alert rules. You may want to create a single organization for your company (so every user and device has the same alert configuration), or multiple organizations within a company (to provide different configurations of users and alerts for clusters of XL devices). In the future we plan to add controls that set alerts based on your asset hierarchy.

When you click on **Link Device** in the XL Device, your browser will open a new tab with the XL Enterprise home page. Alternatively type: **https://xl.vorne.com** into your browser address bar.

If your company has already created an XL Enterprise organization skip to **Step 4 – Link Additional XL Devices**.
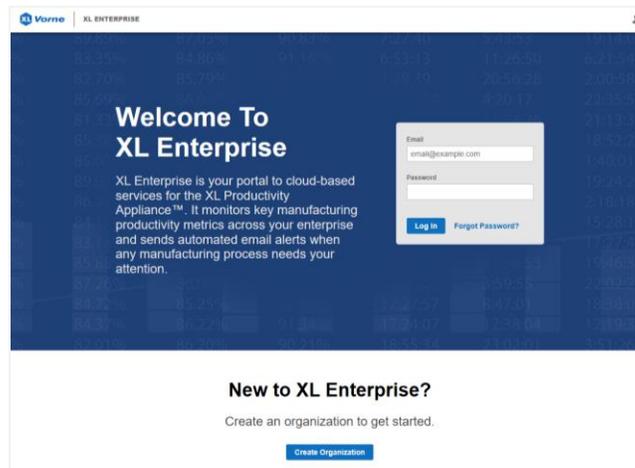
If you need to create a new organization click the **Create Organization** button:

1. Enter your Organization Name, Name, Email Address, Password, and select the correct time zone.
2. Review the **Terms of Use** and click the check box to confirm your agreement.
3. Click the **Create** button to create your organization.
4. You will automatically receive an email asking you to validate your account before you can log-in to XL Enterprise.

Step 3 – Link First XL Device

Having just created an XL Enterprise organization, your user profile is designated as an Admin User. You can continue to link your first XL device to your new XL Enterprise organization.

1. Log into your XL Enterprise organization.
2. XL Enterprise will immediately show the Link Device screen. Click the **Link Device** button.

Step 4 – Link Additional XL Devices

The process for linking additional devices to XL Enterprise is very similar to linking the first device.

> **Important Notes:**
> Each XL device can be linked to only one XL Enterprise organization.
>
> Because communication between the XL Productivity Appliance™ and XL Enterprise is secured using token authentication you will need to individually link each XL Productivity Appliance™ to XL Enterprise.

1. In your browser, enter the IP address for the XL Device that you want to link to your organization.
2. Log in as Administrator.
3. Navigate to **Settings / Connections / XL Enterprise (Preview)**.
4. Click the **Link Device** button.
5. XL Enterprise should open to the Link XL Device screen (you may need to log in first), click the **Link Device** button.
6. If XL Enterprise does not open in a new browser tab, click the link provided to open XL Enterprise:
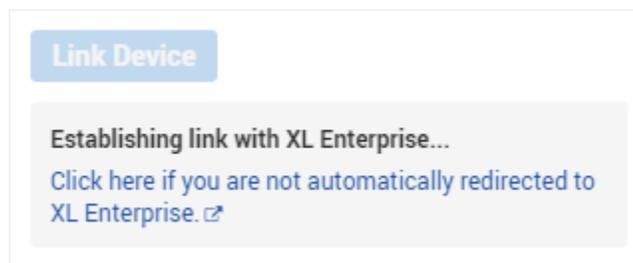
7. Repeat steps 1 – 5 for every additional XL device that you want to connect to XL Enterprise.

Step 5 – Define Alerts

Admin users create alerts on the **Settings / Plant Floor / Alert Definitions** page. These alerts are available to every linked XL device in the organization. Users then subscribe to the alerts they want to receive on **Step 7 – Subscribe to Alerts and Reports**. Admin users can check the Alert Definitions page to see which users have subscribed to each alert. There are three types of alerts:

1. **Metric Alerts:** Are triggered based on your Shift Efficiency, OEE, Availability, Performance, or Quality being above or below a configured threshold.
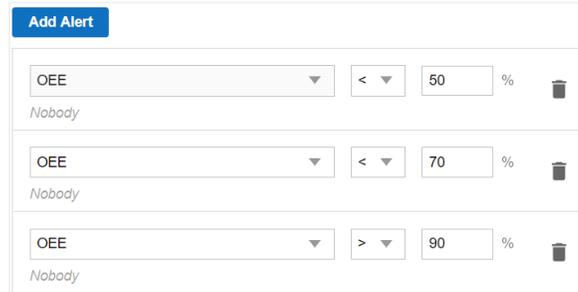
2. **Production State Time Alerts:** Are triggered based on the currently detected production state in the XL device.
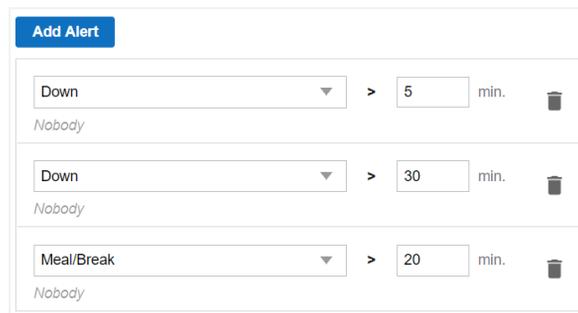
3. **Production State Target Alerts:** Are triggered by events that have an associated Target Time. These alerts can either trigger before a target time has been reached (e.g. to alert a member of the Quality team that a changeover will be ready for inspection in 5 minutes), or if an event has exceeded the target time.
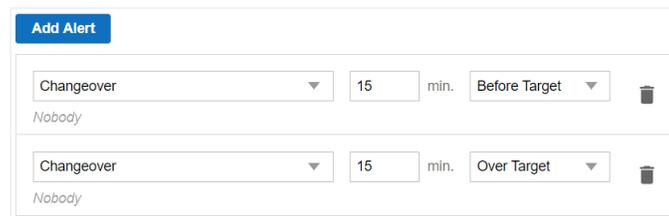
> **Important Notes:**
>
> The **Over Target** alerts will only trigger for events that are configured to end By Barcode or By Definitely Running.
>
> Events that end by Target Time will automatically switch to Run/Down when the target time has elapsed (ending the event that has the associated target time).

Step 6 – Add Users

Admin users can invite users to subscribe to the XL Enterprise platform. Once a user is invited, they'll be asked to create a unique password and to subscribe to alerts.

There are two levels of XL Enterprise user: **Admin** (can link and unlink XL devices, create alerts, add users), and **Regular User** (can subscribe to configured alerts for linked XL devices).

## Add Users

Admin users can add Users to XL Enterprise.
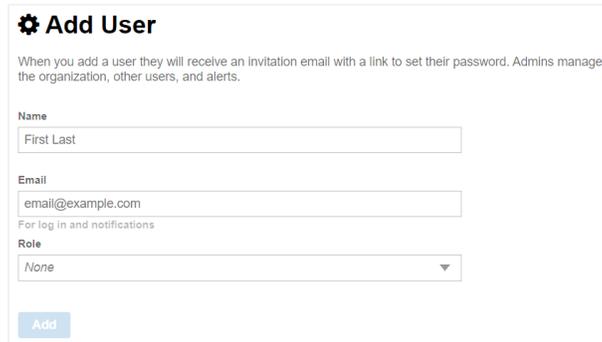
Important Notes:

Please ensure that you have the permission of each user to enter their contact details into XL Enterprise.

Every user will be asked to agree to **Terms of Use** for XL Enterprise when they confirm their account.

1. Navigate to XL Enterprise: **https://xl.vorne.com**.
2. Log in to your Account.
3. Navigate to **Settings / Organization / All Users**.
4. Click the **Add User** button.
5. Enter the **Name** and **Email Address** of your new user.
6. Define the **Role** using the drop-down menu.
7. Click the **Save** button.

User Action

Each User will receive an email asking them to set a password and to validate their account. Users will not receive alerts until they log-in and complete their alert subscriptions (**Step 7 – Subscribe to Alerts and Reports**).
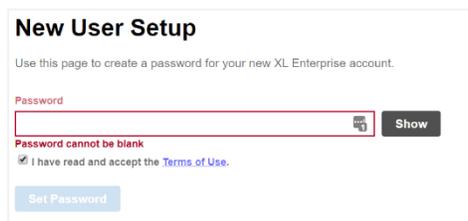
Step 7 – Subscribe to Alerts and Reports

XL Enterprise can automatically send alerts (as emails and text messages) and reports.

Alerts can be sent as emails and additionally as text message alerts. Text message alerts are sent using 'text message gateways' provided by cellular providers. Not all carriers provide this service, those that do may levy message and data rate charges, and some carriers only provide text message gateways as a premium service with additional charges.

XL Enterprise currently supports an End of Shift report. This report cannot currently be edited.

Log In

To log into your Organization and configure alerts:

1. Navigate to XL Enterprise: **https://xl.vorne.com**.
2. Log in to your Organization.
3. Navigate to the **Main Menu / Alerts** page.

Select Alerts

Select the **Alerts** you want to subscribe to using the drop-down menu and click the **Save** button. You will receive these alerts for all selected Assets.

Select Alerts (2) ▼
Metric
☑ Efficiency < 50%
☐ OEE < 50%
Production State Time
☑ Down > 5 min.
☐ Down > 30 min.
☐ Down > 60 min.
☐ Down > 120 min.
☐ Meal/Break > 20 min.
Production State Target
☐ Changeover 15 min. Before Target
☐ Changeover 15 min. Over Target

Configure Receive Window

You can configure a receive window to establish when you would like to receive alerts. Typically, this would be set to match your regular working hours and then click the **Save** button.

If you want to turn off alerts for a period of time (e.g. because you're on vacation), set the Receive Window to **Never** until you're back in the office.

Only Send Alerts During Receive Window ▼			
Day	**Receive Alerts**	**Start Time**	**End Time**
Sunday	☐	07:00 AM	03:00 PM
Monday	☑	07:00 AM	03:00 PM
Tuesday	☑	07:00 AM	03:00 PM
Wednesday	☑	07:00 AM	03:00 PM
Thursday	☑	07:00 AM	03:00 PM
Friday	☑	07:00 AM	03:00 PM
Saturday	☐	07:00 AM	03:00 PM

Save   Cancel

Receive SMS Alerts

XL Enterprise can send mobile alerts using the mobile gateway service provided by your carrier. Not all carriers provide this service, some carriers only provide it as a premium service, and carriers may change these addresses without notifying us.

A mobile gateway combines your cellular number with an email address suffix. Here is an example:

- If your carrier is T-Mobile USA, the mobile gateway is **##########@tmomail.net**
- If your cellular number is **123-456-7890**
- Your mobile gateway address will be: **1234567890@tmomail.net**

Mobile Gateways

XL Enterprise can send you alerts as emails or text messages. Email is preferred as it includes the most information. Text messages can be useful if you do not have a mobile-accessible company email address AND your mobile carrier supports email to text message gateways. Please note that message and data rates from your mobile carrier may apply to text messages sent to you by XL Enterprise.

XL uses email gateways provided by mobile carriers to send text messages. Not all carriers provide this service and some carriers only provide it as a premium service with additional charges. SMS gateways are preferred as the messages are often delivered faster. Locate your country and carrier below, and use the email address format to construct an email address for alerts (using your phone number in place of the # symbols).

[International] [Australia] [Canada] [Germany] [Mexico] [New Zealand] [South Korea] [United Kingdom] [United States]

▲ International

Carrier	Gateway Address Format	Activation Required by Carrier
Esendex	##########@echoemail.net	No
Globalstar	##########@msg.globalstarusa.com	No
Google Fi	##########@msg.fi.google.com	No
Iridium	##########@msg.iridium.com	No

▲ Australia

Carrier	Gateway Address Format	Activation Required by Carrier
Optus Mobile	##########@optusmobile.com.au	No
SMS Broadcast	##########@send.smsbroadcast.com.au	No
SMS Central	##########@sms.smscentral.com.au	No
SMSPUP	##########@smspup.com	No
Telstra	##########@online.telstra.com.au	No
UTBox	##########@sms.utbox.net	No

While logged into XL Enterprise:

1. Navigate to **Settings / User / Account**.
2. In the Text-Only Email section, click on the link for **Mobile carrier gateway**.
3. Lookup your cellular provider.
4. Copy the complete text in the Gateway Address Format field.
5. Note: If the Activation Required by Carrier field is marked Yes, you may need to contact your carrier before this service will work.
6. Press the **Back** button on your browser.
7. Click the Add Text-Only Email button.
8. Paste the copied number into the Text-Only Email field.
9. Replace the # symbols with your cellular number.
10. Click the **Add Email** button.

Add Text-Only Email

Enter the email address to use for text messages. This email address will include your mobile phone number and a domain specific to your mobile carrier. See Mobile Gateways for more information.

Text-Only Email

1234567890@tmomail.net

11. You will have to click on the link in the verification text message in order to receive Text-Only email.

Receive Reports

You can configure XL Enterprise to automatically email you production reports. Currently only the End of Shift Report is available. This report is sent shortly after the shift has ended.

Report Subscriptions

Check the box below to have end-of-shift reports automatically emailed to your primary email address. Reports will be sent for all shifts for each asset to which you are subscribed.

☑ Email me a report of key metrics when the shift ends

Save　Cancel

While logged into XL Enterprise:

1. Navigate to **Main Menu / Subscriptions / Reports**.
2. Select the **tick** box.
3. Click the **Save** button.

Select Assets

Having selected Alerts and Reports, choose which Assets should be monitored by XL Enterprise. You will receive Alerts and Reports for every asset selected.

Asset Subscriptions

Select the assets for which you would like to receive notifications.

Select Assets (1)　▼

Save　Cancel

While logged into XL Enterprise:

1. Navigate to **Main Menu / Subscriptions / Assets**.
2. In the drop-down menu select the Assets that you want to monitor for Alerts and Reports
3. Click the **Save** button.

Frequently Asked Questions (FAQ)

Some common questions are answered in this FAQ. For assistance implementing any of these items, please contact Vorne technical support (call +1.630.875.3600 or email support@vorne.com).

How many people can access the system?

XL has no specific limit to the number of simultaneous users that can access the web page interface. It can easily support dozens of simultaneous users. However, only one person can be logged in as an Administrator or Supervisor at any given point of time.

Can I change scoreboard messages?

Yes. You can change the metrics that are shown while running.

1. Log in as **Administrator**.
2. Navigate to **Settings / Device / Scoreboard**.
3. The **Field** column is where you select the metric you want to display.
4. The **Interval** column is where you select the time interval for which to show the metric (Shift, Part, or Hour).
5. The **Label** column is where you control the text to be shown on the scoreboard. XL automatically generates label text, however, in some instances the automatically generated label may need to be shortened.
6. To display an additional screen of metrics, change **Rotate Fields** to **Yes** to display additional metrics. This is only an option on the XL810-1.

7. Click the **Save** button.

How does XL use Definitely Running?

XL uses a condition called Definitely Running to indicate when we have a high level of certainty that your process is running. XL uses this Definitely Running condition to end various planned and unplanned stop events (e.g. Part Changes, Shift Starts, scanned Events).

Definitely Running is configured on the **Settings / Plant Floor / Parts and Run States** page under the **Run States** tab.

The default settings are:

- **Running:** After 1 Cycle Input.
- **Definitely Running:** When average speed is at least 50% of the fastest possible speed across 10 cycle inputs.

Can I track a Job or Batch ID in addition to the Part Name?

Yes. On the **Settings / Plant Floor / Jobs** page you can configure a list of Jobs, where each Job has a unique ID and an associated Part from the Parts table, and a Job Goal. Typically, Job ID's are used by ERP systems to associate data in XL to a unique production run in the ERP system.

Jobs can either be manually entered into the table, imported as an Excel spreadsheet, or entered in real-time using the XL API.

Can I use existing barcodes to start Part and Job Runs?

Yes. If you already have barcodes on your Work Order documentation or on your consumer packaging, you can use these barcodes to either:

- Start a Part Run.
- Start a Job.
- Tag the currently active Part Run with a new Job ID.

Scan a Barcode to Start a Part Run

To start a Part Run with an existing barcode:

1. Navigate to the **Settings / Plant Floor / Parts and Run States** page.
2. In the **Alternate Part ID** field, add your unique barcode ID for each Part.
3. Navigate to **Settings / Connections / Barcode Scanner** page.
4. Select the Unrecognized Barcode as **Match to Part ID and Start Part Run**.
5. Click the **Save** button.
6. Scan your barcode to immediately start that part.

Scan a Barcode to Start a Job

To start a Job with an existing barcode:

1. Navigate to the **Settings / Plant Floor / Jobs** page.
2. In the **Job ID** field, add your unique barcode ID for each Job.
3. Navigate to **Settings / Connections / Barcode Scanner** page.
4. Select the Unrecognized Barcode as **Match to Job ID and Start Job**.
5. Click the **Save** button.
6. Scan your barcode to immediately start that Job and associated Part.

Scan a Barcode to Tag the Current Part Run with a Job ID

To apply a Job ID to the current part run:

1. Navigate to **Settings / Connections / Barcode Scanner** page.
2. Select the Unrecognized Barcode as **Tag as Job ID for Current Part Run**.
3. Click the **Save** button.
4. Scan your barcode to immediately apply the scanned Job ID to the currently active Part Run.

Can I change the color thresholds for scoreboard metrics?

Yes, for normalized (i.e., percentage-based) metrics. XL uses a feature called Metric Alerts to control when metrics change color on the scoreboard and the web page interface. Metric Alerts are configured at **Settings / Metrics & Dimensions / Metric Alerts**.

⚙ Metric Alerts

Use this page to configure the thresholds XL uses to alert you about metrics that need attention. XL automatically highlights metrics that need attention on web pages and on the scoreboard (if displayed). XL also provides pop-up notification in the web browser if configured for notifications on this page.

Value ❓	Directionality ❓	Critical ❓	Warning ❓	Caution ❓	Good ❓	Notification Threshold ❓	Notify for Each ❓
Availability	Higher Better	Below 50.0%	50.0% ✏ to 79.9%	80.0% ✏ to 89.9%	90.0% ✏ and above	Critical ▾	Shift ▾
Availability Loss	Lower Better	Above 50.0%	50.0% ✏ to 20.1%	20.0% ✏ to 10.1%	10.0% ✏ and below	No Notification ▾	Hour ▾
Cycle Loss	Lower Better	Above 50.0%	50.0% ✏ to 15.1%	15.0% ✏ to 5.1%	5.0% ✏ and below	No Notification ▾	Hour ▾
Down Loss	Lower Better	Above 50.0%	50.0% ✏ to 20.1%	20.0% ✏ to 10.1%	10.0% ✏ and below	No Notification ▾	Hour ▾
Efficiency	Higher Better	Below 75.0%	75.0% ✏ to 89.9%	90.0% ✏ to 99.9%	100.0% ✏ and above	Critical ▾	Shift ▾